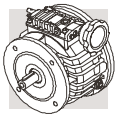


20.1 - Tabelle dati tecnici V Nema | ***20.1 Rating chart*** | **20.1 - Tabellen technische daten** | ***20.1 - Tableaux caracteristiques techniques***

V_NEMA

P₁ (kW/hp)	n_2 rpm	n_2' rpm	n_1 rpm	M_2 in-lbs	M_2' in-lbs	Rn_2 Lbs	Rn_2' Lbs			Flangia Nema *Nema flange*	
0.18/0.25	1100	230	1700	11.5	35.4	160	260	**V 025_**	**N56**	C	86-89
0.25/0.33	810	153	1100	23	71	230	400	**V 0.5_**	**N56**	C	86-89
	1100	230	1700	14.2	44	160	260	**V 0.25_**	**N56**	C	86-89
	2200	460	3400	8.0	23	130	215	**V 0.25_**	**N56**	C	86-89
0.37/0.5	810	153	1100	36	71	230	400	**V 0.5_**	**N56**	C	86-89
	1210	230	1700	22	71	200	350	**V 0.5_**	**N56**	C	86-89
	2200	460	3400	11.5	35	130	215	**V 0.25_**	**N56**	C	86-89
0.55/0.75	810	153	1100	50	142	320	500	**V 1_**	**N143T**	C	86-89
	1210	230	1700	36	106	200	340	**V 0.5_**	**N56**	C	86-89
	2420	460	3400	17.7	44	160	270	**V 0.5_**	**N56**	C	86-89
0.75/1.1	810	153	1100	68	142	320	550	**V 1_**	**N143T**	C	86-89
	1210	230	1700	45	142	280	480	**V 1_**	**N56**	C	86-89
	2420	460	3400	24	71	160	270	**V 0.5_**	**N56**	C	86-89
1.1/1.5	1210	230	1700	68	212	280	480	**V 1_**	**N143T**	C	86-89
	2420	460	3400	35	106	220	380	**V 1_**	**N143T**	C	86-89
1.5/2	1210	230	1700	89	283	370	635	**V 2_**	**N145T**	C	86-89
	2420	460	3400	45	142	220	380	**V 1_**	**N143T**	C	86-89
2.2/3	1210	230	1700	135	354	580	1000	**V 3_**	**N182T**	C	86-89
4.0/5.5	1210	230	1700	219	637	580	1000	**V 5.5_**	**N184T**	C	86-89
5.5/7.5	1210	230	1700	327	761	720	1260	**V 10_**	**N213T**	C	86-89
7.5/10	1210	230	1700	434	1026	720	1260	**V 10_**	**N213T**	C	86-89

Fattore di conversione:
1 in-lbs = 0.11301 Nm

Conversion factor :
1 in-lbs = 0.11301 Nm

Umrechnungsfaktor:
1 in-lbs = 0,11301 Nm

Facteur de conversion:
1 in-lbs = 0,11301 Nm

NB. :
I carichi in uscita Rn_2 indicati in tabella sono da considerare applicati sulla mezzeria dell'albero. Per carichi la cui linea d'azione non coincide con la mezzeria dell'albero in esame, effettuare le verifiche riportate a pag. 10.

NOTE:
Admissible overhung loads Rn_2 indicated in the table refer to mid-point of shaft. Where loads are applied at any other position of shaft, follow procedure detailed on page 10 to verify compatibility.

HINWEIS:
Die in der Tabelle angegebenen Kräfte am Abtrieb Rn2 sind als auf die Wellenmitte applizierte Kräfte zu kalkulieren. Für Kräfte, deren Wirkungslinie nicht mit der Mitte der zur Frage stehenden Welle übereinstimmt, sind die auf Seite 10 angeführten Kontrollen vorzunehmen. Hinweis.

N.B.:
Il faut considérer les charges radiales en sortie Rn_2 , indiquées sur le tableau, comme appliquées au milieu de l'arbre. Pour les charges dont la ligne d'action ne coïncide pas avec le milieu de l'arbre concerné, effectuer les vérifications indiquées à page 10.

AVVERTENZA: Si sconsiglia l'utilizzo del variatore con velocità in ingresso inferiori a 300 min^{-1}.

WARNING: Use of the variator with an input speed lower than 300 min^{-1} is NOT recommended.

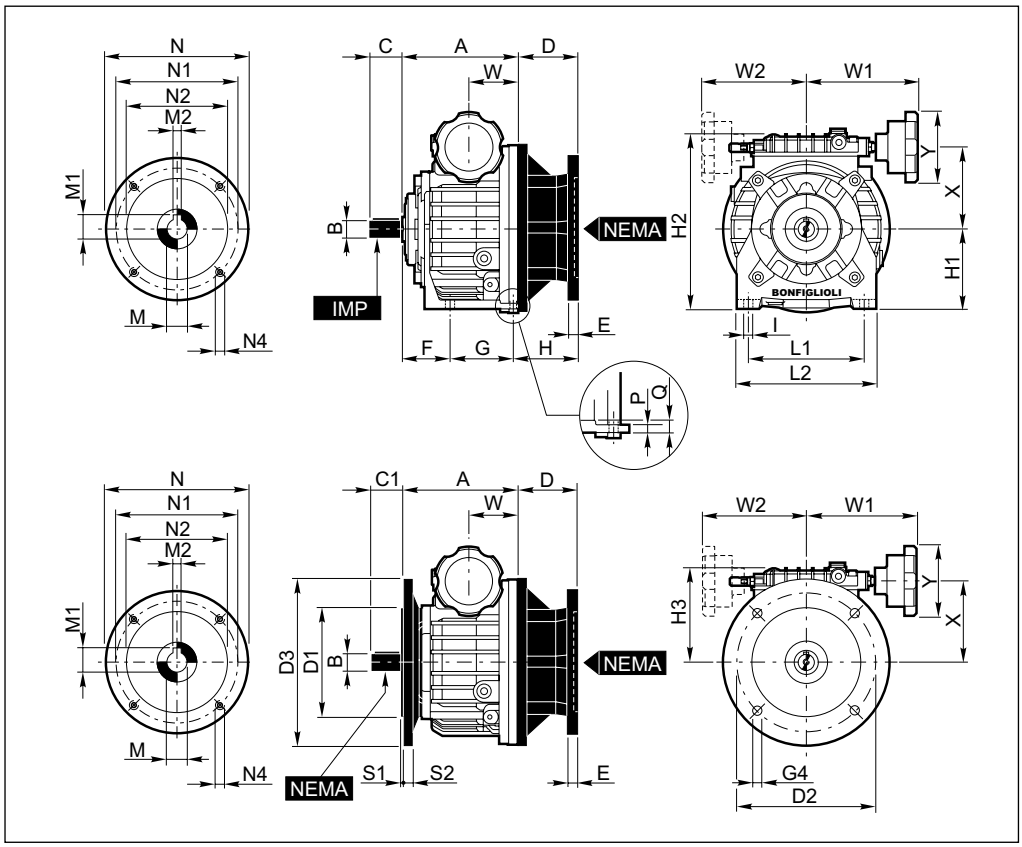
ACHTUNG: Wenn die Eingangsdrehzahl des Antriebs unter 300 min^{-1} liegt, wird von der Verwendung des Verstellgetriebes abgeraten.

N.B. : Il n'est pas conseillé d'utiliser le variateur avec une vitesse en entrée inférieure à 300 min^{-1}.

20.2 - Dimensioni V Nema | ***20.2 - Dimensions of Nema-specs V*** | **20.2 - Maße - V Nema** | ***20.2 - Dimensions V Nema***

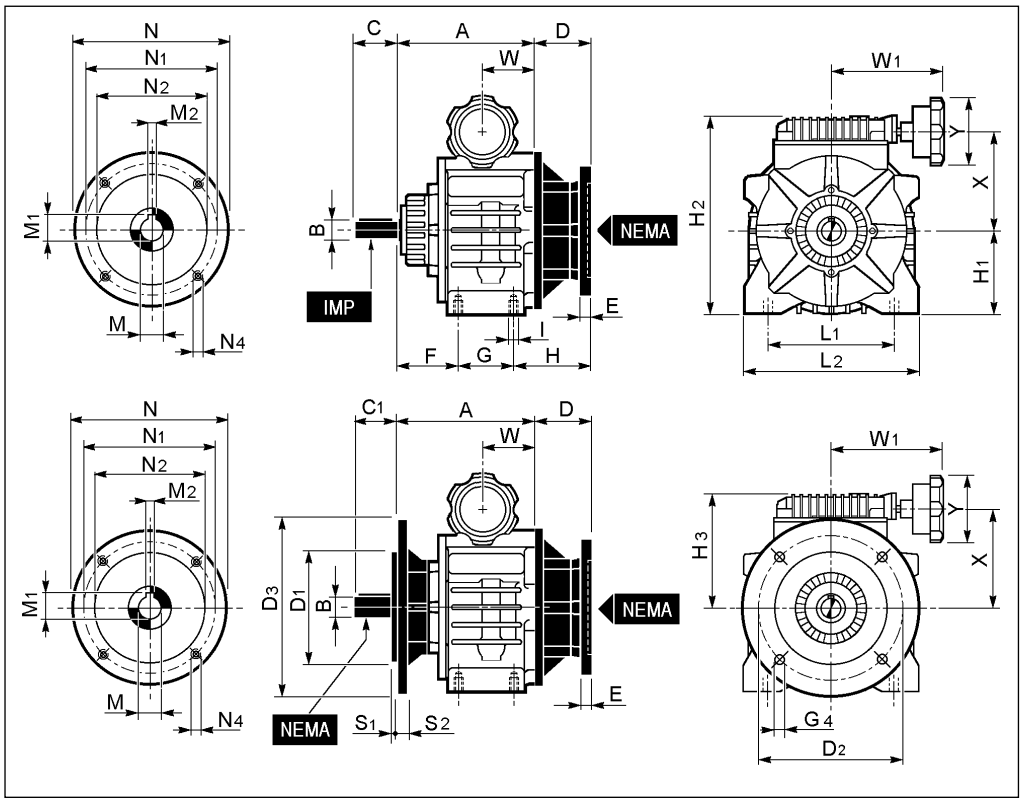
V_UP IMP_N
(V 0.25 - V 2)

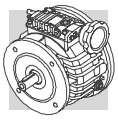
V_UF(Nema) IMP_N
(V 0.25 - V 2)



V_U IMP_N
(V 3 - V 10)

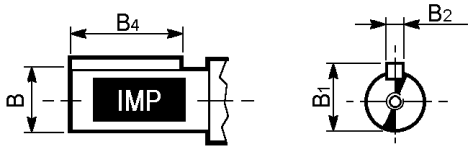
V_UF(Nema) IMP_N
(V 3 - V 10)





V_U IMP_N - V_UF(Nema) IMP_N - V_U_N - V_UF_N								
	N	N1	N2	N4	M	M1	M2	E
V 0.25_N56	6.496"	5.875"	4.5"	0.413"	0.625"	0.707"	0.19"	0.472"
V 0.5_N56	6.496"	5.875"	4.5"	0.413"	0.625"	0.707"	0.19"	0.512"
V 1_N56	6.496"	5.875"	4.5"	0.413"	0.625"	0.707"	0.19"	0.472"
V 1_N143T	6.496"	5.875"	4.5"	0.413"	0.875"	0.961"	0.19"	0.512"
V 2_N145T	6.496"	5.875"	4.5"	0.413"	0.875"	0.961"	0.19"	0.512"
V 3_N182T	8.898"	7.25"	8.5"	0.531"	1.125"	1.276"	0.252"	0.630"
V 5.5_N184T	8.898"	7.25"	8.5"	0.531"	1.125"	1.276"	0.252"	0.630"
V 10_N213T	8.898"	7.25"	8.5"	0.531"	1.375"	1.512"	0.314"	0.827"

V U IMP - UF(Nema)_IMP				
	B j6	**B1**	**B2**	**B4**
V 0.25	0,625"	0,689"	0,187"	1.378"
V 0.5	0,625"	0,689"	0,187"	1.378"
V 1	0,625"	0,689"	0,187"	1.378"
V 2	0,875"	0,943"	0,187"	1.378"
V 3	1,125"	1,220"	0,25"	1.752"
V 5.5	1,125"	1,220"	0,25"	1.752"
V 10	1,375"	1,449"	0,312"	2.382"



V_U																		
	A	C	D	F	G	H	H1	H2	I	L1	L2	P	Q	X	Y	W	W1	W2
V 0.25	4,272"	1,875"	2,322"	1.890"	2,028"	2,676"	2,756"	6,378"	0.354"	4,803"	5,787"	—	0.354"	2.756"	3,268"	1,772"	4.528"	4.331"
V 0.5	4,370"	1,875"	2,204"	1,850"	2,244"	2,480"	2,913"	6.850"	0.354"	4,331"	5,315"	0.197"	0.354"	3,071"	3,268"	1,870"	4.528"	4.331"
V 1	5,394"	1,875"	2,244"	2,146"	2,795"	2.697"	3,740"	8.425"	0.433"	5,433"	6.535"	0.276"	0.433"	3.819"	3,268"	2,441"	5.236"	4.882"
V 2	6,339"	2,25"	2,268"	2,461"	3,780"	2,366"	4,291"	9.606"	0.433"	6,457"	7.874"	0.315"	0.433"	4.449"	3,268"	2,917"	5.394"	4.724"
V 3	8,386"	2,75"	3,090"	3.031"	4,725"	3,720"	5,197"	12.008"	M12	7,874"	10,709"	—	—	5,925"	4,291"	3,582"	6.791"	—
V 5.5	8,386"	2,75"	3,090"	3.031"	4,725"	3,720"	5,197"	12.008"	M12	7,874"	10,709"	—	—	5,925"	4,291"	3,582"	6.791"	—

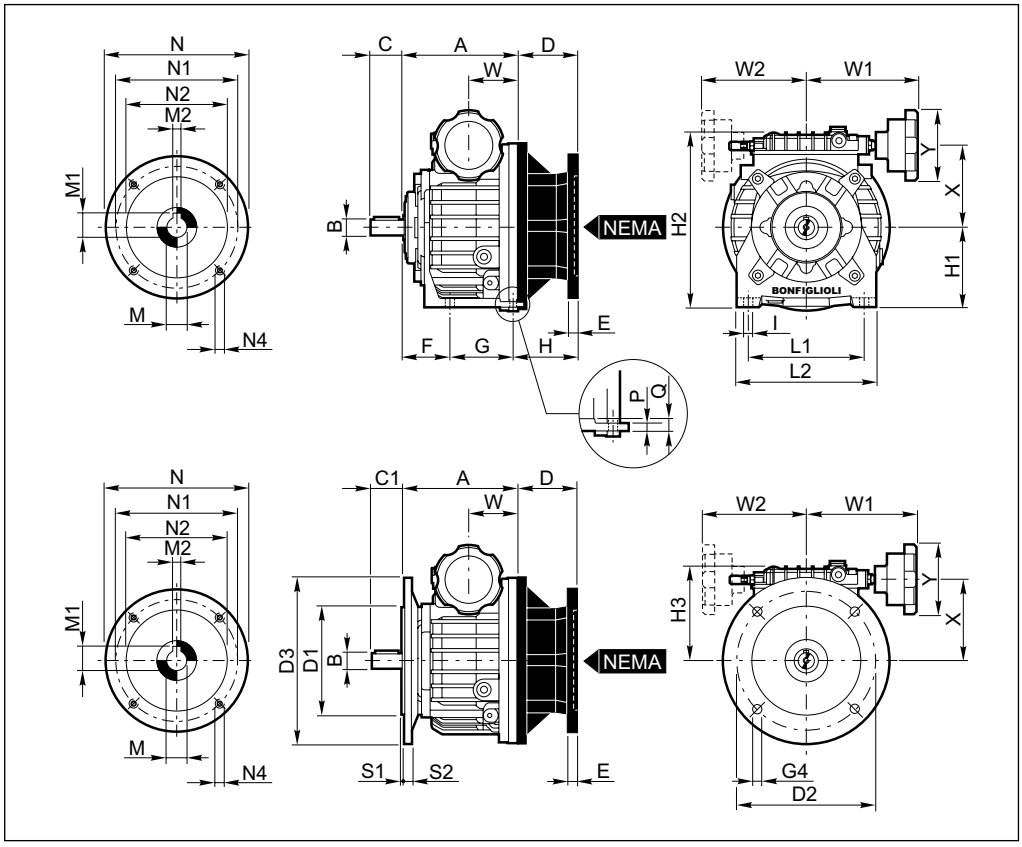
V_UF(Nema)															
	A	C1	D	D1	D2	D3	G4*	H3	S1	S2	X	Y	W	W1	W2
V 0.25 UF56C_	4,118"	2,029"	2,322"	4,5"	5,875"	6.496"	3/8"-16	3.622"	0,137"	0.512"	2.756"	3,268"	1,772	4.528"	4.331"
V 0.5 UF56C_	4,177"	2,068"	2,204"	4,5"	5,875"	6.496"	3/8"-16	3.937"	0,137"	0.512"	3,071"	3,268"	1,870	4.528"	4.331"
V 1 UF56C_	5,201"	2,068"	2,244"	4,5"	5,875"	6.496"	3/8"-16	4.685"	0,137"	0.512"	3.819"	3,268"	2,441	5.236"	4.882"
V 2 UF145T_	6,458"	2,13"	2,268"	4,5"	5,875"	6.496"	3/8"-16	5.315"	0,137"	0.512"	4.449"	3,268"	2,917	5.394"	4.724"
V 3 UF182T_	8,496"	2,64"	3,090"	8,5"	7.25"	8.898"	1/2"-13	6,811"	0,255"	0.531"	5,925"	4,291"	3,582	6.791"	—
V 5.5 UF184T_	8,496"	2,64"	3,090"	8,5"	7.25"	8.898"	1/2"-13	6,811"	0,255"	0.531"	5,925"	4,291"	3,582	6.791"	—
V 10 UF213T_	10.012"	3,383"	3,819"	8,5"	7.25"	8.898"	1/2"-13	9.179"	0,255"	0.787"	8,13"	4,291"	4,252	7,618"	—

* Filettatura serie "UNC" / *Thread "UNC" series* / Serienäßiges Gewinde "UNC" / *Filetage série "UNC"*

* Filettatura metrica "ISO" / *"ISO" Metric thread* / Metrisches Gewinde "ISO" / *Filetage métrique "ISO"*

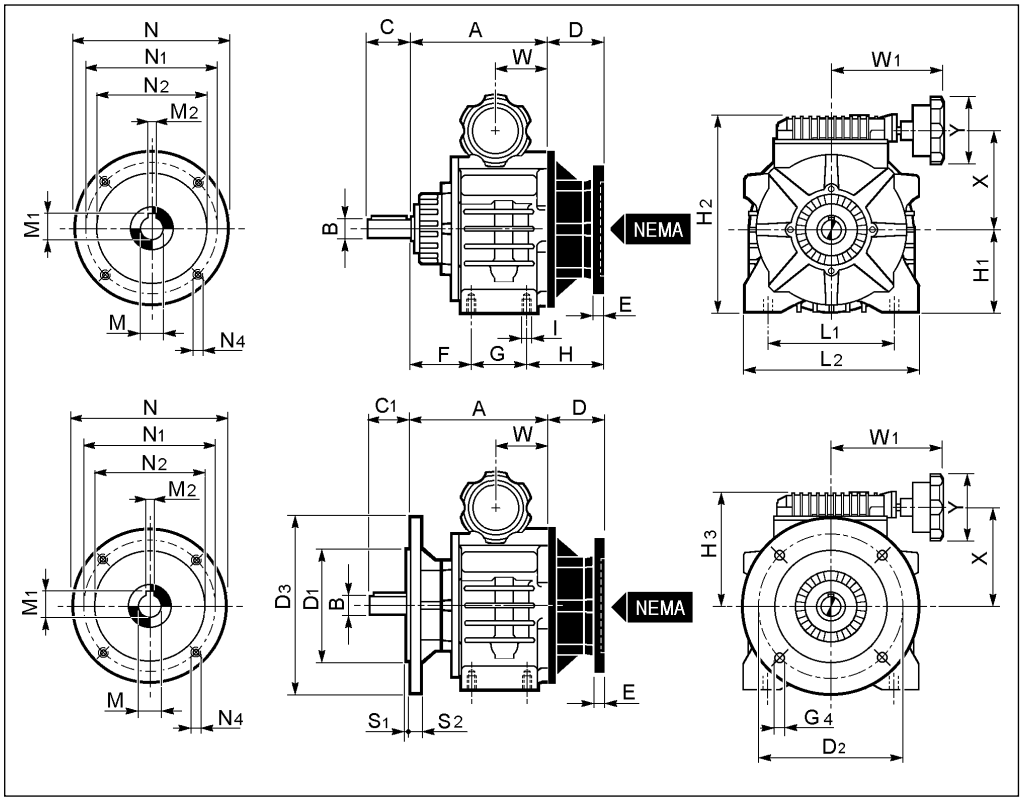
Fattore di conversione / *Conversion factor* / Umrechnungsfaktor / *Facteur de conversion: 1" = 25.4 mm*

V_UP_N
(V 0.25 - V 2)

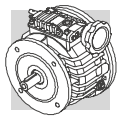


V_UF_N
(V 0.25 - V 2)

V_U_N
(V 3 - V10)

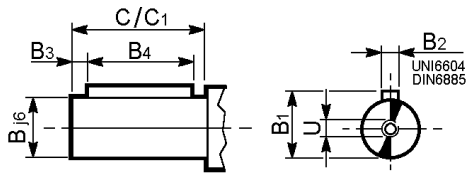


V_UF_N
(V 3 - V10)



V_U IMP_N - V_UF(Nema) IMP_N - V_U_N - V_UF_N								
	N	N1	N2	N4	M	M1	M2	E
V 0.25_N56	6.496"	5.875"	4.5"	0.413"	0.625"	0.707"	0.19"	0.472"
V 0.5_N56	6.496"	5.875"	4.5"	0.413"	0.625"	0.707"	0.19"	0.512"
V 1_N56	6.496"	5.875"	4.5"	0.413"	0.625"	0.707"	0.19"	0.472"
V 1_N143T	6.496"	5.875"	4.5"	0.413"	0.875"	0.961"	0.19"	0.512"
V 2_N145T	6.496"	5.875"	4.5"	0.413"	0.875"	0.961"	0.19"	0.512"
V 3_N182T	8.898"	7.25"	8.5"	0.531"	1.125"	1.276"	0.252"	0.630"
V 5.5_N184T	8.898"	7.25"	8.5"	0.531"	1.125"	1.276"	0.252"	0.630"
V 10_N213T	8.898"	7.25"	8.5"	0.531"	1.375"	1.512"	0.314"	0.827"

V U - UF								
	B j6	B1	B2	B3	B4	C	C1	U
V 0.25_D11(D14)	11(14)	12.5(16)	4(5)	2.5(2.5)	18(25)	23(30)	—	M4(M5)
V 0.5_D14(D19)	14(19)	16(21.5)	5(6)	2.5(5)	25(30)	30(40)	—	M5(M6)
V 1_D19(D24)	19(24	21.5(27)	6(8)	5(5)	30(40)	40(50)	—	M6(M8)
V 2_D24(D28)	24(28)	27(31)	8(8)	5(5)	40(50)	50(60)	—	M8(M10)
V 3_D28(D38)	28(38)	31(41)	8(10)	5(5)	50(70)	60(80)	58(78)	M10(M12)
V 5.5_D28(D38)	28(38)	31(41)	8(10)	5(5)	50(70)	60(80)	58(78)	M10(M12)
V 10_D38(D42)	38(42)	41(45)	10(12)	5(10)	70(90)	80(110)	78.5(108.5)	M12(M16)



V_U																	
	A	D	F	G	H	H1	H2	I	L1	L2	P	Q	X	Y	W	W1	W2
V 0.25	108.5	60	48	51.5	68	70	162	9	122	147	—	9	70	83	45	115	110
V 0.5	111	56	47	57	63	74	174	9	110	135	5	9	78	83	47.5	115	110
V 1	137	57	54.5	71	68.5	95	214	11	138	166	7	11	97	83	62	133	124
V 2	161	57.6	62.5	96	60.1	109	244	11	164	200	8	11	113	83	74.1	137	120
V 3	213	78.5	77	120	94.5	132	305	M12x22	200	272	—	—	150.5	109	91	172.5	—
V 5.5	213	78.5	77	120	94.5	132	305	M12x22	200	272	—	—	150.5	109	91	172.5	—
V 10	254.5	97	101.5	132	118	170	403	M12x30	220	250	—	—	206.5	109	108	193.5	—

V_UF														
	A	$D1_{j6}$	D	D2	D3	G4	H3	S1	S2	X	Y	W	W1	W2
V 0.25 UF63_	108.5	95	60	115	140	9	92	3	8	70	83	45	115	110
V 0.25 UF71_	108.5	110	60	130	160	9	92	3.5	8	70	83	45	115	110
V 0.5 UF71_	111	110	56	130	160	9	100	3.5	8	78	83	47.5	115	110
V 0.5 UF80_	111	130	56	165	200	11.5	100	3.5	10	78	83	47.5	115	110
V 1 UF80_	137	130	57	165	200	11.5	119	3.5	10	97	83	62	133	124
V 1 UF90_	137	130	57	165	200	11.5	119	3.5	10	97	83	62	133	124
V 2 UF90_	161	130	57.6	165	200	11.5	135	3.5	12	113	83	74.1	137	120
V 2 UF100_	161	180	57.6	215	250	14	135	4	14	113	83	74.1	137	120
V 3 UF100_	215	180	78.5	215	250	14	173	4	14	150.5	109	91	172.5	—
V 3 UF132_	215	230	78.5	265	300	14	173	4	14	150.5	109	91	172.5	—
V 5.5 UF112	215	180	78.5	215	250	14	173	4	14	150.5	109	91	172.5	—
V 5.5 UF132_	215	230	78.5	265	300	14	173	4	14	150.5	109	91	172.5	—
V 10 UF132_	256	230	97	265	300	14	233	4	16	206.5	109	108	193.5	—
V 10 UF160_	256	250	97	300	350	18	233	5	15	206.5	109	108	193.5	—

Fattore di conversione / *Conversion factor* / Umrechnungsfaktor / *Facteur de conversion: 1 mm = 0.0394"*

21.0 - ACCESSORI

Indicatore di giri digitale CGY

È un indicatore programmabile (a microcontrollore) che rileva segnali provenienti da sonde amplificate NPN, PNP, NAMUR e se collegato al variatore configurato con opzione PDN o PNP (par. 19.4) consente la visualizzazione diretta del numero di giri in uscita al variatore o ne permette eventuali trasformazioni.

Caratteristiche tecniche:

- contenitore da pannello 96x48x100
- morsettiere estraibili
- dima di foratura 92.3X44.5 mm
- scatola in pvc nero DIN43700
- display a 6 cifre ad alta efficienza
- tastiera interna di programmazione
- menù di programmazione guidato
- scale e risoluzioni programmabili
- protezione dei programmi
- alimentazione (da specificare in fase di ordine):
  110V-50/60 Hz
  220V-50/60 Hz

Funzionamento:
Tramite un menù di programmazione guidato (tastiera di programmazione interna al pannello frontale) è possibile ottenere:

- visualizzazione diretta del numero di giri in uscita al variatore;
- visualizzazione della velocità in uscita ad un riduttore posto a valle del variatore
- visualizzazione di valori derivanti da conversioni in varie unità di misura (Kg/min, litri/min, metri/min)

Esempi di programmazione:

1) Visualizzazione dei giri in uscita al variatore.

Numero fori della ruota fonica nf=10.
Impostare nel menù di programmazione i seguenti valori:
n=10, U=1, S=1, r=4, d=1, t=1, F=0, a=0, u=0, E=0.

2) Visualizzazione dei giri in uscita a un riduttore accoppiato al variatore.

Numero fori della ruota fonica nf=10.
Rapporto di riduzione del riduttore i=36.82.
Impostare nel menù di programmazione i seguenti valori:
n=10x36.82=368.2=368 (introdurre solo numeri interi),
U=1, S=1, r=4, d=1, t=1, F=0, a=0, u=0, E=0.

21.0 - ACCESSORIES

Indicatore di giri digitale CGY

It is a programmable indicator (on microprocessor) which detects signals from amplified probes NPN, PNP and NAMUR and, if connected to the variator preset for PDN or PNP option (par. 19.4), it allows the variator output rpms to be directly displayed or allows possible conversions.

Technical features:

- *panel container 96x48x100*
- *removable terminal boards*
- *template 92.3X44.5 mm*
- *black PVC box according to DIN43700*
- *hi-efficiency 6-digit display*
- *inner programming keypad*
- *guided programming menu*
- *programmable scales and resolutions*
- *program protections*
- *power supply (specify when pla- cing the order):*
  110V-50/60 Hz
  220V-50/60 Hz

Operation:
The following can be displayed through a guided programming menu (front panel inner programming keypad):

- *direct display of the variator output rpms;*
- *display of output rpms of a gearbox downstream the variator*
- *display of values after conversion into different measurement units (Kg/min, liters/min. and meters/min).*

Programming examples:

1) Display of variator output rpms

Number of holes in the phonic wheel nf=10.
Set the following values in the programming menu:
n=10, U=1, S=1, r=4, d=1, t=1, F=0, a=0, u=0, E=0.

2) Display of output rpms of a gearbox downstream the variator.

Number of holes in the phonic wheel nf=10.
Gearbox reduction ratio i=36.82.
Set the following values in the programming menu:
n=10x36.82=368.2=368 (enter only integers),
U=1, S=1, r=4, d=1, t=1, F=0, a=0, u=0, E=0.

21.0 - ZUBEHÖR

Digitale Drehzahlanzeige CGY

Hierbei handelt es sich um eine programmierbare Anzeigevorrichtung (mit Mikrosteuerbaustein), die die von den NPN- PNP- oder NAMUR-Sonden ausgehenden Signale erfaßt. Wenn sie an einem Verstellgetriebe, dessen Konfiguration die Option PDN oder PNP (Par. 19.4) aufweist, angeschlossen, wird, ermöglicht sie die direkte Anzeige der Umdrehungszahl am Abtrieb des Verstellgetriebes und erlaubt eventuelle Umformungen.

Technische Eigenschaften:

- Behälter für Platte 96 x 48x100
- Ausziehbare Klemmenleisten
- Bohrungsschablone 92.3X44.5 mm
- Gehäuse aus schwarzem PVC DIN43700
- Hochleistungsfähiges sechsstelliges Display
- Interne Programmiertastatur
- Geführtes Programmiermenü
- Programmierbare Skalen und Auflösungen
- Programmschutz
- Anschluß (muß im Auftrag spez- fiziert werden):
  110V-50/60 Hz
  220V-50/60 Hz

Betrieb:
Mittels eines geführten Programmiermenüs (die Programmiertastatur befindet sich in der Fronttafel) sind die Angabe folgender Anzeigen möglich:

- Abtriebsdrehzahl des Verstellgetriebes;
- Geschwindigkeit am Abtrieb eines Getriebes, das dem Verstellgetriebe nachgeschaltet ist;
- Werte, die sich aus Umrechnungen in verschiedene Maßeinheiten (kg/Min, Liter/Min, Meter/Min) ergeben.

Programmierbeispiele:

1) Anzeige der Drehzahl am Abtrieb des Verstellgetriebes.

Anzahl der Bohrungen des Impulsgebers nf=10.
Im Programmiermenü folgende Werte einstellen:
n=10, U=1, S=1, r=4, d=1, t=1, F=0, a=0, u=0, E=0.

2) Anzeige der Drehzahl am Ab trieb eines dem Verstellgetriebe

nachgeschalteten Untersetzungsge triebes.
Anzahl der Bohrungen des Impuls- gebers nf=10.
Untersetzung des nachfolgenden Getriebe i=36.82.
Im Programmiermenü folgende Werte einstellen:
n=10x36.82=368.2=368 (nur ganze Zahlen eingeben),
U=1, S=1, r=4, d=1, t=1, F=0, a=0, u=0, E=0.

21.0 - ACCESSOIRES

Indicateur de tours digital CGY

Il s'agit d'un indicateur programmable (à microcontrôleur) qui détecte les signaux provenant de sondes amplifiées NPN, PNP, NAMUR et, lorsqu'il est relié au variateur confi- guré avec l'option PDN ou PNP (par.19.4), il permet l'affichage direct du nombre de tours en sortie du variateur ou en permet d'éventueles transformations.

Caractéristiques techniques :

- *Boîtier de panneau 96x48x100*
- *Borniers amovibles*
- *Gabarit de perçage 92.3X44.5 mm*
- *Boîte en PVC noir DIN43700*
- *Afficheur à 6 chiffres à performance élevée*
- *Clavier de programmation interne*
- *Menu de programmation guidé*
- *Echelles et résolutions programmables*
- *Protection des programmes*
- *Alimentation (à spécifier au moment de la commande) :*
  110V-50/60 Hz
  220V-50/60 Hz

Fonctionnement :
A l'aide d'un menu de programmation guidé (clavier de programmation à l'intérieur du panneau frontal), il est possible d'obtenir :

- *l'affichage direct du nombre de tours en sortie du variateur;*
- *l'affichage de la vitesse en sortie d'un réducteur situé à aval du variateur;*
- *l'affichage des valeurs dérivant de conversions dans différentes unités de mesure (Kg/min, litres/min, mètre/min).*

Exemples de programmation :

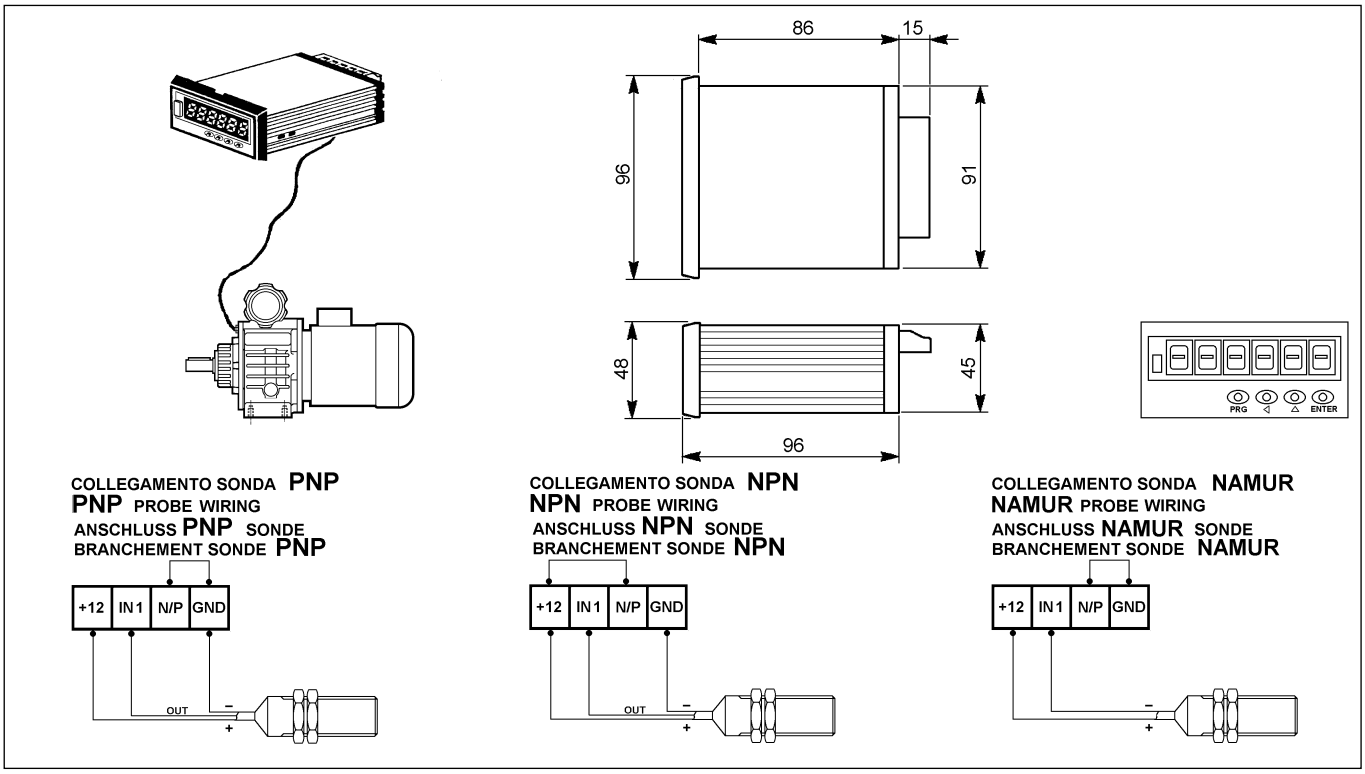
1) Affichage des tours en sortie du variateur.

Nombre d'encoches de la roue phonique nf=10.
Dans le menu de programmation, programmer les valeurs suivantes :
n=10, U=1, S=1, r=4, d=1, t=1, F=0, a=0, u=0, E=0.

2) Affichage des tours en sortie d'un réducteur en aval du variateur.

Nombre d'encoches de la roue phonique nf=10.
Rapport de réduction du réducteur i=36.82.
Dans le menu de programmation, programmer les valeurs suivantes :
n=10x36.82=368.2=368 (introduire uniquement des nombres entiers),
U=1, S=1, r=4, d=1, t=1, F=0, a=0, u=0, E=0.

(C10)



Kit per rilevamento di giri KITCGY

È un kit di montaggio per il rilevamento di giri applicabile su alberi esterni al variatore o su catene cinematiche generiche.

Il kit è composto da:

A - un indicatore di giri digitale CGY (per le caratteristiche ed il funzionamento dell'indicatore vedi pag. 90)
B - una sonda rilevatrice a forcella tipo NAMUR con cavo di connessione,
C - una ruota fonica a 30 impulsi/giro.

Nella tabella (C11) sono riportati un esempio di applicazione, le dimensioni della sonda e della ruota fonica e lo schema di collegamento.

KITCGY rpm detection kit

Speed detector kit. Can get the signal from a separate shaft or from a connected drive.

The kit consists of:

A - a digital rpm indicator of the CGY type (refer to page 90 for technical features and operation of the indicator).
B - a fork probe of the NAMUR type with its proper connecting cable
C - a phonic wheel with 30 impul- ses/rotation.

The table (C11) shows an application example, probe and phonic wheel size and wiring diagram.

Anbausatz zur Drehzahlermittlung KITCGY

Hierbei handelt es sich um einen Anbausatz zur Drehzahlermittlung, der z.B. außen an der Welle des Verstellgetriebes oder der Maschine angebracht werden kann.

Der Anbausatz besteht aus:

A - einer digitalen Drehzahlanzeige CGY (für Eigenschaften und Betrieb des Anzeigers siehe Seite 90),
B - eine Gabelermittlungssonde vom Typ NAMUR mit Anschlußkabel,
C - ein Impulsgeber mit 30 Impulsen/Drehung.

In der Tabelle (C11) sind ein Anwendungsbeispiel, die Abmessungen der Sonde und des Impulsgebers, sowie der Anschlußplan aufgeführt.

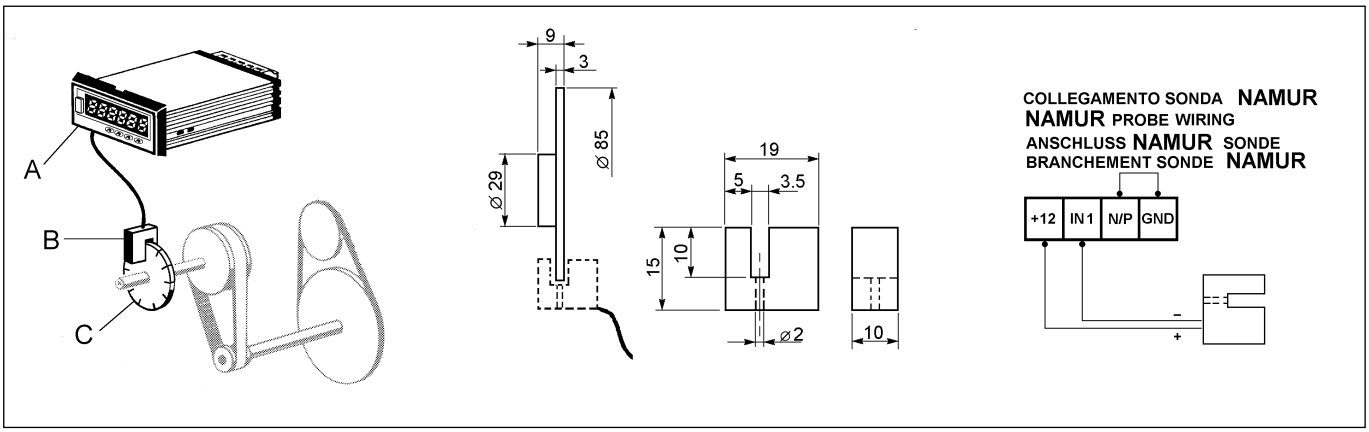
Kit pour détection de tours KITCGY

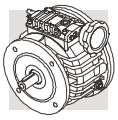
Il s'agit d'un kit de montage pour la détection de tours, applicable sur les arbres à l'extérieur du variateur ou sur des chaînes cinématiques en général.

Le kit se compose des éléments suivants :
A - un indicateur de tours digital CGY (en ce qui concerne les caractéristiques et le fonctionnement de l'indicateur, voir page 90).
B - une sonde de détection à fourche type NAMUR avec câble de branchement.
C - une roue phonique à 30 impulsions/tours.

Le tableau (C11) présente un exemple d'application, les dimensions de la sonde et de la roue phonique ainsi que le schéma de branchement.

(C11)





Ingresso con albero veloce sporgente ENTHS

Questo accessorio, costituito da un albero supportato da cuscinetti in costruzione chiusa, è applicabile all'ingresso dei variatori V 0.25...V 10 in tutte le forme costruttive nella configurazione P... (IEC) e permette di disporre di un albero sporgente utilizzabile per l'azionamento del variatore.

AVVERTENZA

Il kit **ENTHS** non è lubrificato autonomamente. Prima di assemblare il kit adattatore sulla flangia P(IEC) del variatore rimuovere l'anello di tenuta presente su quest'ultima, al fine di consentire la lubrificazione degli organi interni del kit.

Input with ENTHS input solid shaft

The add-on ENTHS kit consists of a solid shaft supported by bearings and a connecting flange. It interfaces the variator's motor adapter, in the P(IEC) style. The solid input shaft can then be used to drive the variator.

WARNING

*The kit **ENTHS** is not lubed independently. Prior to installing the adapter kit onto the P(IEC) input flange remove the oil seal that is present on the latter, so that inner parts of the adapter kit get lubricated.*

Antrieb mit freier Eingangswelle ENTHS

Dieses Zubehörteil, das aus einer gelagerten Welle besteht, kann an den Antrieb der Verstellgetriebe V 0.25...V 10 in allen Bauformen in der Konfiguration P ... (IEC) angebracht werden. Dadurch erhält man eine freie Antriebswelle, die für die Installation von Anbauteilen an das Verstellgetriebe verwendet werden kann.

ACHTUNG

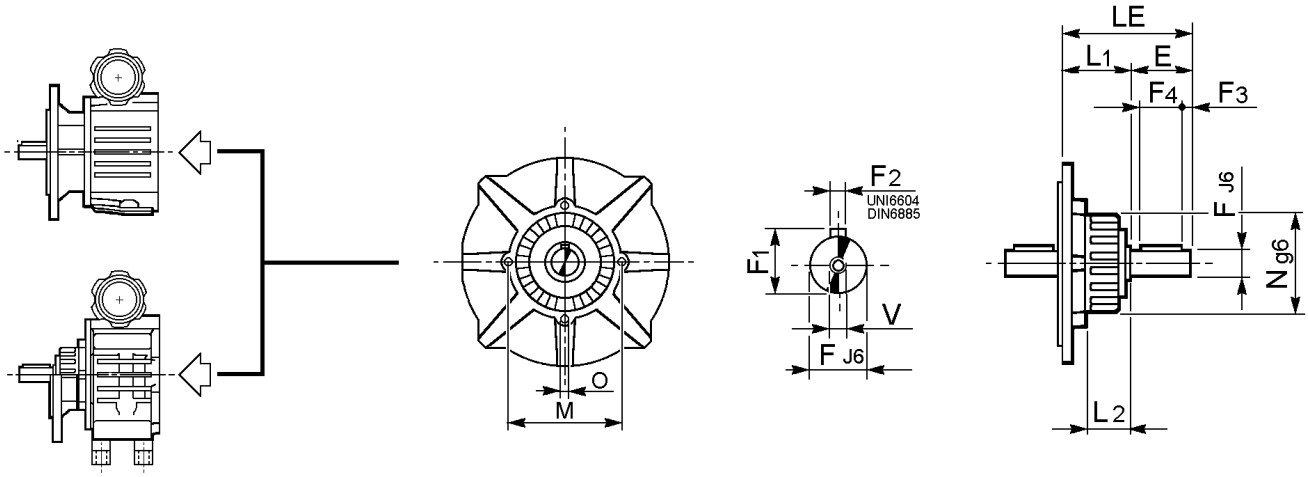
Das Kit **ENTHS** wird nicht unabhängig geschmiert. Vor der Montage des Adapterkits an den P(IEC)-Eingangsflansch den vorderen Dichtring entfernen, damit die innenliegenden Teile des Adapterkits geschmiert werden.

Entrée avec arbre rapide sortant ENTHS

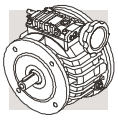
Cet accessoire, constitué d'un arbre supporté par des roulements en construction fermée, est applicable à l'entrée des variateurs V 0.25...V 10, quelle que soit la forme de construction dans la configuration P.. (IEC), il permet de disposer d'un arbre sortant utilisable pour l'actionnement du variateur.

ATTENTION

*Le **ENTHS** n'est pas lubrifié autonomement. Avant d'assembler l'kit adaptateur sur la bride P(IEC) du variateur, ôter la bague d'étanchéité présent sur cette dernière, au fin de permettre la lubrification des organes internes du kit.*



	E	F	F1	F2	F3	F4	LE	L1	L2	M	N	O	V
ENTHS V 0.25	23	11	12.5	4	2	20	58.5	35.5	26	68	55	M6	M4
ENTHS V 0.5	30	14	16	5	2.5	25	67	37	20	85	65	M6	M5
ENTHS V 1	40	19	21.5	6	5	30	88.5	48.5	25.5	95	80	M8	M6
ENTHS V 2	50	24	27	8	5	40	103.5	53.5	32	118	100	M8	M8
ENTHS V 3	60	28	31	8	5	50	121.5	61.5	37	150	110	M10	M10
ENTHS V 5.5	60	28	31	8	5	50	121.5	61.5	37	150	110	M10	M10
ENTHS V 10	80	38	41	10	5	70	160.5	80.5	64.5	200	135	M12	M12



Ingresso con modulo predisposto NEMA ENTN_

Questo accessorio è applicabile all'ingresso dei variatori V 0.25...V 10 in tutte le forme costruttive nella configurazione P...(IEC) e consente di disporre di una predisposizione Nema "C" Flange per il collegamento a motori elettrici rispondenti a tale normativa.

AVVERTENZA

Il kit **ENTN_** non è lubrificato autonomamente. Prima di assemblare il kit adattatore sulla flangia P(IEC) del variatore rimuovere l'anello di tenuta presente su quest'ultima, al fine di consentire la lubrificazione degli organi interni del kit.

Input with NEMA ENTN_ adaptor

The add-on ENTN_ kit interfaces the variator's input flange, in the P(IEC) style, and allows a motor adapter to NEMA standard, to be used.

WARNING

*The kit **ENTN_** is not lubed independently. Prior to installing the adapter kit onto the P(IEC) input flange remove the oil seal that is present on the latter, so that inner parts of the adapter kit get lubricated.*

Anbausatz für NEMA-Motore Baueinheit ENTN_

Dieses Zubehörteil kann an den Antrieb der Verstellgetriebe V 0.25...V 10 in allen Bauformen in der Konfiguration P ... (IEC) angebracht werden. Hierdurch erhält man eine Anbaumöglichkeit für die nach der NEMA "C" Richtlinie genormten Elektromotoren.

ACHTUNG

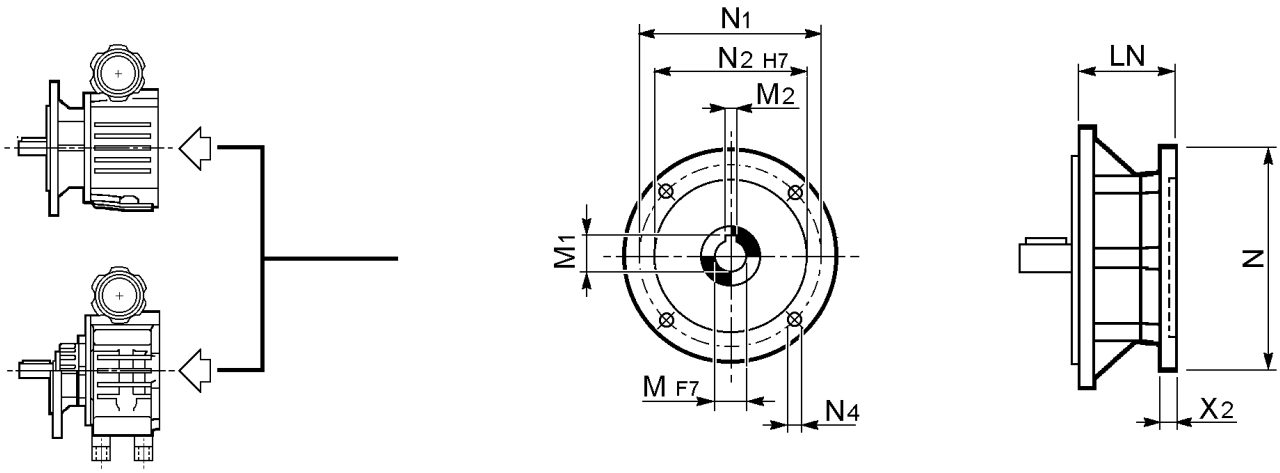
Das Kit **ENTN_** wird nicht unabhängig geschmiert. Vor der Montage des Adapterkits an den P(IEC)-Eingangsflansch den vorderen Dichtring entfernen, damit die innenliegenden Teile des Adapterkits geschmiert werden.

Entrée avec module prédisposé NEMA ENTN_

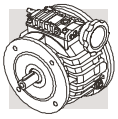
Cet accessoire est applicable à l'entrée des variateurs V 0.25...V 10 quelle que soit la forme de construction dans la configuration P... (IEC), il permet de disposer d'une prédisposition Nema "C"-Brides pour l'accouplement aux moteurs électriques conformes à cette norme.

ATTENTION

*Le **ENTN_** n'est pas lubrifié autonomement. Avant d'assembler l'kit adaptateur sur la bride P(IEC) du variateur, ôter la bague d'étanchéité présent sur cette dernière, au fin de permettre la lubrification des organes internes du kit.*



	LN	N	N1	N2	N4	M	M1	M2	X2
ENTN56 V 0.25	59	165	149.225	114.3	10.5	15.875	17.958	4.826	12
ENTN56 V 0.5	56	165	149.225	114.3	10.5	15.875	17.958	4.826	13
ENTN56 V 1	57	165	149.225	114.3	10.5	15.875	17.958	4.826	12
ENTN143T V 1	57.6	165	149.225	114.3	10.5	22.225	24.409	4.826	13
ENTN145T V 2	57.6	165	149.225	114.3	10.5	22.225	24.409	4.826	13
ENTN182T V 3	78.5	226	184.15	215.9	13.5	28.575	32.4	6.4	16
ENTN184T V 5.5	78.5	226	184.15	215.9	13.5	28.575	32.4	6.4	16
ENTN213T V 10	97	226	184.15	215.9	13.5	34.925	38.4	7.976	21

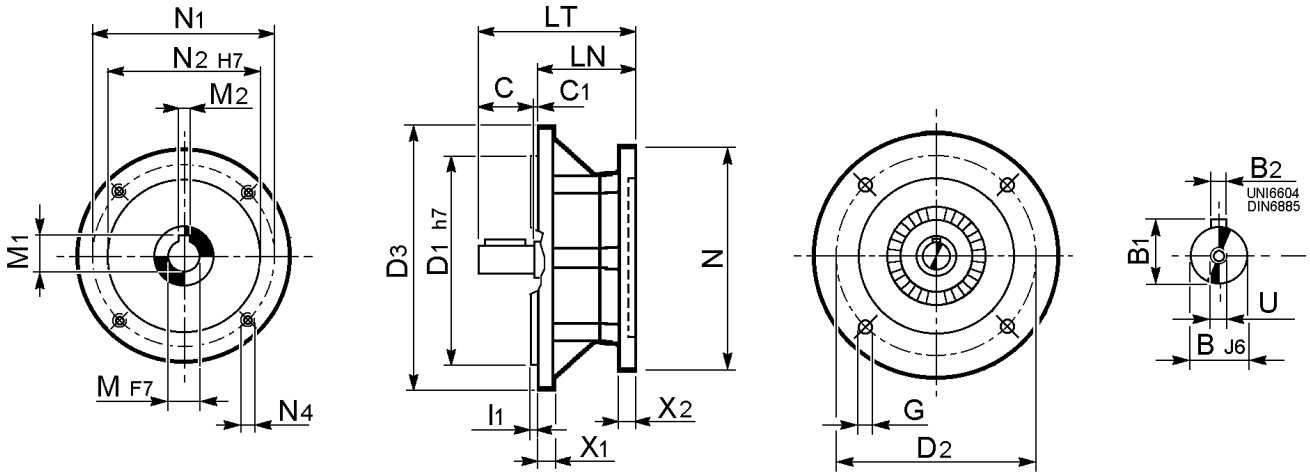


Questo accessorio è ulteriormente disponibile in esecuzione con cuscinetti autolubrificati per l'installazione in applicazioni generiche dove vi sia l'esigenza di trasformare una predisposizione IEC in una predisposizione NEMA "C" Flange.

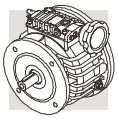
This accessory is also available with self-lubricating bearings for standard applications in which a IEC adaptor must be converted into a NEMA "C" Flange adaptor.

Dieses Zubehör steht darüber hinaus auch in einer Ausführung mit geschlossenen Lagern zur Verfügung, falls man einen IEC-Anbausatz in einen NEMA "C"-Anbausatz umwandeln. möchte.

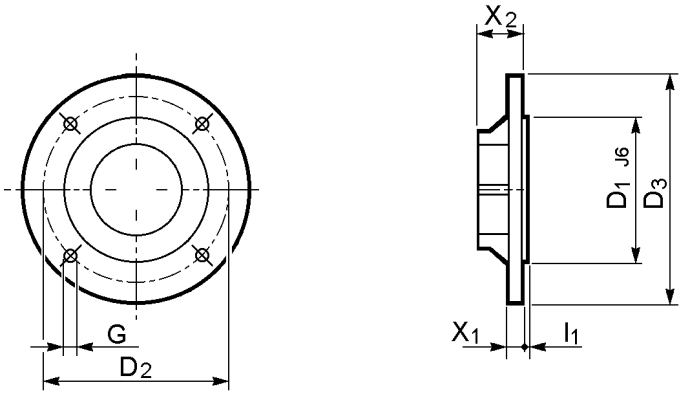
Cet accessoire est aussi disponible avec roulements autolubrifiants pour l'installation sur des applications nécessitant la transformation d'une prédisposition IEC en une prédisposition NEMA "C"-Brides.



	IEC	B	B1	B2	C	C1	D1	D2	D3	G	I1	LN	LT	N	N1	N2	N4	M	M1	M2	U	X1	X2
ENTN56 P63	63	11	12.5	4	23	—	95	115	140	8.5	3	58.5	81.5	165	149.225	114.3	10.5	15.875	17.958	4.826	M4	7.5	12
ENTN56 P71	71	14	16	5	30	3	110	130	160	9	3.5	55.5	88.5	165	149.225	114.3	10.5	15.875	17.958	4.826	M5	7	13
ENTN56 P80	80	19	21.5	6	40	3	130	165	200	11	3.5	56.5	99.5	165	149.225	114.3	10.5	15.875	17.958	4.826	M6	7	12
ENTN143T P80	80	19	21.5	6	40	2.5	130	165	200	11	3.5	57.1	99.6	165	149.225	114.3	10.5	22.225	24.409	4.826	M6	7	13
ENTN145T P90	90	24	27	8	50	2.5	130	165	200	11	3.5	57.1	109.6	165	149.225	114.3	10.5	22.225	24.409	4.826	M8	7	13
ENTN182T P100	100	28	31	8	60	2.5	180	215	250	14	4	78	140.5	226	184.15	215.9	13.5	28.575	32.4	6.4	M10	7	16
ENTN184T P112	112	28	31	8	60	2.5	180	215	250	14	4	78	140.5	226	184.15	215.9	13.5	28.575	32.4	6.4	M10	7	16
ENTN213T P132	132	38	41	10	80	-1	230	265	300	13	4	96.5	175.5	226	184.15	215.9	13.5	34.925	38.4	7.976	M12	14	21



Flange di fissaggio *Mounting flange kit* **Abtriebsflansch-Kit** *Kit bride de fixation*

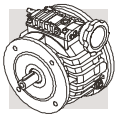


			D1	D2	D3	G	l1	X1	X2
V 0.25_UP	—	**FLANGIA F63**	95	115	140	8.5	3	8	13,5
		FLANGIA F71	110	130	160	8.5	3.5	8	13,5
V 0.5_UP	**VD 0.5_UP**	**FLANGIA F71**	110	130	160	8.5	3.5	8	13,5
		FLANGIA F80/90	130	165	200	11.5	3.5	10	13,5
V 1_UP	**VD 1_UP**	**FLANGIA F80/90**	130	165	200	11.5	3.5	10	16
V 2_UP	**VD 2_UP**	**FLANGIA F80/90**	130	165	200	11.5	3.5	12	20,5
		FLANGIA F100/112	180	215	250	14	4	14	20,5

			D1	D2	D3	G	l1	X1	X2
V 3_U	**VD 3_U**	**FLANGIA F100/112**	180	215	250	14	4	14	40
		FLANGIA F132	230	265	300	14	4	14	40
V 5.5_U	**VD 5.5_U**	**FLANGIA F100/112**	180	215	250	14	4	14	40
		FLANGIA F132	230	265	300	14	4	14	40
V 10_U	**VD 10_U**	**FLANGIA F132**	230	265	300	14	4	16	66
		FLANGIA F160/180	250	300	350	18	5	15	66

			D1	D2	D3	G	l1	X1	X2
VR 0.25 U_	—	**FLANGIA F71**	110	130	160	9	3	8	16
VR 0.5 U_	**VDR 0.5 U_**	**FLANGIA F71**	110	130	160	9	3	8	16
VR 1 U_	**VDR 1 U_**	**FLANGIA F80/90**	130	165	200	11.5	3.5	10	12
VR 2 U_	**VDR 2 U_**	**FLANGIA F100/112**	180	215	250	13	4	12	20

			D1	D2	D3	G	l1	X1	X2
VR 3 U_	**VDR 3 U_**	**FLANGIA F132**	230	265	300	14	4	16	14
VR 5.5 U_	**VDR 5.5 U_**	**FLANGIA F132**	230	265	300	14	4	16	14
VR 10 U_	**VDR 10 U_**	**FLANGIA F160/180**	250	300	350	18	5	15	16



Piedi di fissaggio

Questo accessorio è costituito da due basi applicabili ai variatori V 0.25...V 10 nella forma costruttiva U e permette di disporre di fori di ancoraggio passanti e collocati all'esterno dell'ingombro del variatore stesso.

Fastening feet

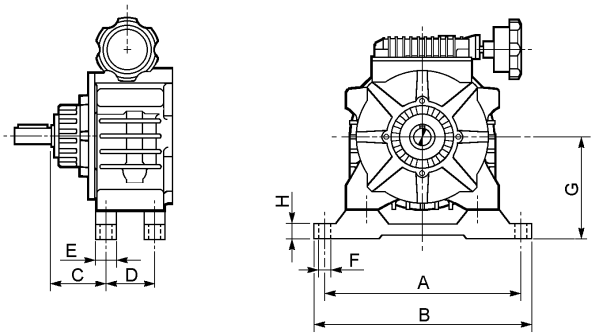
The add-on foot kit bolts underneath V variators, in the U version, and carries through holes for the connection of the variator to the base plate.

Fußplatte

Dieses Zubehörteil besteht aus zwei Platten, die an den Verstellge- trieben V 0.25...V 10 in der Bauform U angebracht werden können. Es ermöglicht die Montage des Getriebes durch Bohrungen, die seitlich vom Gehäuse des Getriebes liegen.

Pieds de fixation

Cet accessoire est constitué de deux bases applicables aux variateurs V 0.25...V 10 dans la forme de construction U et permet de disposer d'orifice de fixation passants et situés à l'extérieur de l'encombrement du variateur.



	A	B	C	D	E	F	G	H
PIEDI V 0.25	164	183	48	51.5	20	9	83	10
PIEDI V 0.5	172	191	47.5	57	20	9	89	9
PIEDI V 1	220	242	59.5	71	26	11	115	12
PIEDI V 2	245	267	62.5	96	30	11	140	23
PIEDI V 3	297	323	76.5	120	35	13	169	27
PIEDI V 5.5	297	323	76.5	120	35	13	169	27
PIEDI V 10	314	336	101.5	160	55	13	210	28

Indicatore gravitazionale INDGRAV

È un indicatore di posizione a reazione gravitazionale applicabile sul volantino di comando dei variatori e indica, su una doppia scala graduata, i giri e frazioni di giro compiuti dal volantino stesso durante il movimento di rotazione e deve operare con l'asse orizzontale o avente piccoli angoli di inclinazione (Max. 15°).

INDGRAV gravitational indicator

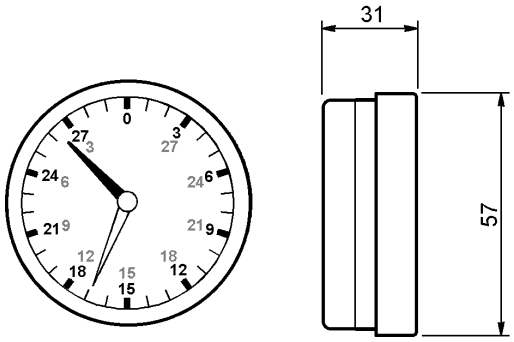
The device is a gravitational turns indicator which can be fitted onto the variator control handwheel for indicating rpms and turn fractions on a double graduated scale during the rotation. This indicator works only with horizontal axis or small angles of inclination (Max. 15°).

Lageanzeige INDGRAV

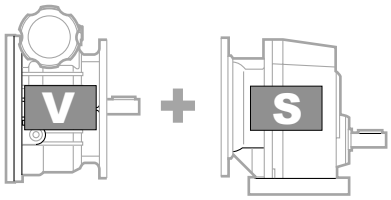
Hierbei handelt es sich um eine nach dem Schwerkraftsgesetz arbeitende Lageanzeige, die auf dem Handrad der Verstellgetriebe angebracht werden kann. Sie ibt auf einer doppelten Grad - skala die vom Handrad ausgeführten Umdrehungen an. Die Achse der Anzeige muß möglichst waagrecht sein, da die Anzeige sonst nicht einwandfrei arbeiten kann (Max. 15°).

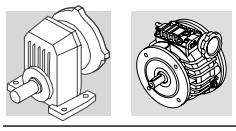
Indicateur gravitationnel INDGRAV

Il s'agit d'un indicateur de position à réaction gravitationnelle applicable sur le volant de commande des variateurs, il indique, sur une double échelle graduée, les tours et fractions de tours accomplis par le volant durant le mouvement de rotation, il doit opérer avec l'axe horizontal ou ayant de faibles angles d'inclinaison (Max. 15°).



22.0 - MOTOVARIARIDUTTORI
MOTORIZED GEARED VARIATOR
VERSTELLGETRIEBEMOTOREN
MOTOVARIAREDUCTEURS





22.1 - Designazione riduttore | ***22.1 - Gearbox designation*** | **22.1 - Getriebe-bezeichnung** | ***22.1 - Désignation réducteur***

S 10 1 P 1.4 V05 B3 .....

OPZIONI / *OPTIONS*
OPTIONEN / *OPTIONS*

POS. DI MONTAGGIO / *MOUNTING POSITIONS*
EINBAULAGEN / *POS. DE MONTAGE*

B3 (Standard)**, B5** (Standard)**,B51, B52, B53, B6, B7, B8, V1, V3, V5, V6**

DESIGNAZIONE INGRESSO / *INPUT DESIGNATION*
BEZEICHNUNG DER ANTRIEBSSEITE / *DESIGNATION ENTREE*

V + grandezza variatore = Predisposto per variatore compatto
V + *variator size* = *suitable to match compact variator*
V + Verstellgetriebegröße = für kompaktes Verstellgetriebe geeignet
V + *grandeur variateur* = *prédisposé pour variateur compact*

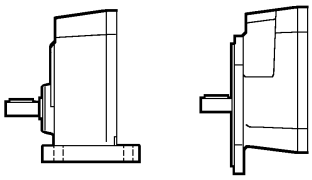
V025	V05	V1	V2	V3	V55	V10
V 0.25	V 0.5	V 1	V 2	V 3	V 5.5	V 10

P + grandezza motore = Predisposto per variatore flangiato
P + *motor size* = *suitable to match a flanged variator*
P + Motorgrösse = für geflanschtes Verstellgetriebe geeignet
P + *taille moteur* = *prédisposé pour variateur avec bride*

P63	P71	P80	P90	P100	P112	P132
V 0.25	V 0.5	V 0.5 V 1	V 1 V 2	V 3	V 5.5	V 10

RAPPORTO DI RIDUZIONE / *GEAR RATIO*
ÜBERSETZUNG / *RAPPORT DE REDUCTION*

FORMA COSTRUTTIVA / *VERSION* / BAUFORM / *FORME DE CONSTRUCTION*



P **F**

N° STADI DI RIDUZIONE / *REDUCTIONS*
ANZAHL DER GETRIEBESTUFEN /*N.bre ETAGES DE REDUCTION*

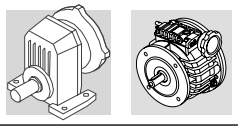
1

GRANDEZZA RIDUTTORE / *GEARBOX SIZE*
GETRIEBEBAUGRÖSSE / *TAILLE REDUCTEUR*

10, 20, 30, 40, 50

TIPO RIDUTTORE: **S** = monostadio
GETRIEBETYP: **S** = Stirnradgetriebemotore-Einstufig

GEARBOX TYPE: **S** = *single stage*
TYP DU REDUCTEUR: **S** = *à un étage de réduction*



22.2 - Designazione variatore | ***22.2 - Designation of variator*** | **22.2 - Bezeichnung für Drehzahlwandler** | ***22.2 - Désignation variateur***

V □ 0.5 C □ □ P71 B3 1 PDN SCT ....

OPZIONI / *OPTIONS*
OPTIONEN / *OPTIONS*

TIPO DI COMANDO / *REMOTE CONTROL TYPE*
VERSTELLEINRICHTUNG / *TYPE DE COMMANDE*
A, VG, VA, VAG, SCT (3∅), TC (1∅)

SONDA RILEVATRICE / *SPEED SENSOR*
MEßSONDE / *SONDE DE DETECTION*
PDN, PDNA, PDP

POSIZIONE DISPOSITIVO DI COMANDO / *SPEED KNOB POSITION*
EINBAULAGE DER VERSTELLEINRICHTUNG / *POSITION COMMANDE*
1 (default), **2** (V 3...V 10)

POSIZIONE DI MONTAGGIO / *MOUNTING POSITION*
MOTOR BAUFORM / *FORME DE CONSTRUCTION DU MOTEUR*
B3 (default)**, B6, B7, B8, V5, V51, V52,V53, V6, V61, V62, V63**

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CONFIGURAZIONE INGRESSO /*INPUT CONFIGURATION*
BEZEICHNUNG DER ANTRIEBSSEITE /*DESIGNATION ENTREE*

P (IEC) - predisposizione IEC / *Provided with IEC motor adaptor*
vorbereitet für den Anbau eines IEC-Motors / *prédisposé IEC*
HS - albero cilindrico / *solid input shaft* / freier Antriebswelle / *arbre rapide sortant*
HSF - albero cilindrico e flangia riportata / *solid input shaft and bolt-on flange*
freier Antriebswelle und Flansch / *arbre rapide sortant et adjonction de bride*
N (NEMA) - predisposizione motore NEMA / *provided with Nema motor adaptor*
vorbereitet für den Anschluß eines NEMA-Motors / *prédisposé moteur NEMA*
G (IEC) - flangia IEC maggiorata / *provided with IEC extended adaptor*
mit zusätzlicher Baueinheit für IEC-Motore / *avec module supplémentaire prédisposé IEC*

DIAMETRO ALBERO LENTO / *OUTPUT SHAFT BORE*
ABTRIEBSWELLE DURCHMESSER / *DIAMETRE ARBRE LENT*

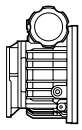
D + diametro in mm / *diameter in mm*
Durchmesser in mm / *diamètre en mm* **(11,14,...)**

D11	D14	D19	D24	D28	D28	D38
(V 0.25)	(V 0.5)	(V 1)	(V 2)	(V 3)	(V 5.5)	(V 10)

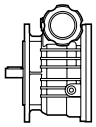
IMP albero in pollici / *inch series shaft* / Nema-Welle / *arbre NEMA*

TIPO DI FISSAGGIO (per gruppi tipo U) / *OUTPUT CONFIGURATION (only for U version)*
MONTAGEMÖGLICHKEIT (ausschließlich für die Bauform U) / *TIPE DE FIXATION (pour forme de costruction U)*
F (IEC) - flangia IEC riportata / *bolt-on IEC flange* / Flansch IEC / *adjonction de bride IEC*
F (NEMA) - flangia NEMA / *NEMA flange mounted*/ NEMA Flansch / *bride Nema*

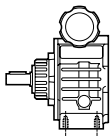
FORMA COSTRUTTIVA / *VERSION* / BAUFORM / *VERSION*



C



F



U

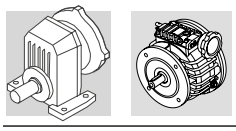
GRANDEZZA VARIATORE / *VARIATOR SIZE* / BAUGRÖSSE / *TAILLE VARIATEUR*
0.25, 0.5, 1, 2, 3, 5.5, 10

DIFFERENZIALE / *DIFFERENTIAL* / DIFFERENTIAL / *DIFFERENTIEL*
D

VARIATORE / *VARIATOR TYPE* / VERSTELLGETRIEBETYP / *TYPE VARIATEUR*
V

22.3 - Designazione motore | ***22.3 - Motor designation*** | **22.3 - Motor bezeichnung** | ***22.3 - Désignation moteur***

27 27 27 27



22.4 - Opzioni riduttori

SO

I riduttori S10, S20, S30, S40, solitamente forniti con lubrificante da BONFIGLIOLI RIDUTTORI, sono forniti privi di lubrificante.

LO

Il riduttore S50 solitamente sprovvisto di lubrificante, è richiesto con olio sintetico del tipo correntemente utilizzato da BONFIGLIOLI RIDUTTORI e riempito in accordo alla posizione di montaggio richiesta.

VV

Anello di tenuta in Viton sull'albero veloce.

PV

Tutti gli anelli di tenuta in Viton.

22.4 - Gearbox options

SO

Gearboxes S10, S20, S30, S40, supplied without oil.

LO

Gearbox S50, usually supplied without oil, to be supplied with synthetic oil currently used by BONFIGLIOLI RIDUTTORI and filled according to requested mounting position.

VV

Viton oil seal on input shaft.

PV

All oil seals in Viton.

22.4 - Getriebe Optionen

SO

Bei Lieferung ohne Schmierstoff (nur bei S10, S20, S30 und S40).

LO

Für Getriebe S50, die gewöhnlich ohne Schmiermittel geliefert werden, in Übereinstimmung mit der Einbaulage gefüllt mit dem normalerweise von BONFIGLIOLI RIDUTTORI verwendeten synthetischen Schmierstoff.

VV

Wellendichtringe aus Viton auf der eintreibenden Welle.

PV

Alle Wellendichtringe aus Viton.

22.4 - Options réducteurs

SO

Les réducteurs S10, S20, S30, S40, habituellement fourni avec lubrifiant par la société BONFIGLIOLI RIDUTTORI, sont demandés sans lubrifiant.

LO

Le réducteurs S50, habituellement dépourvus de lubrifiants, sont demandés avec huile synthétique du type couramment utilisé par BONFIGLIOLI RIDUTTORI et remplis conformément à la position de montage demandée.

VV

Bague d'étanchéité en Viton sur l'arbre rapide.

PV

Toutes les bagues d'étanchéité en Viton.

22.5 - Opzioni variatori

CU

Cassa universale con piano di appoggio spianato e relativi fori di fissaggio (pag. 30).

FL

Cassa universale con fianchi laterali spianati e relativi fori di fissaggio (pag. 30).

PDN

Predisposizione al rilevamento di giri digitale incorporato all'interno del variatore con sonda rilevatrice di tipo NPN.

PDP

Predisposizione al rilevamento di giri digitale incorporato all'interno del variatore con sonda rilevatrice di tipo PNP.

La tabella (D01) riporta le possibilità di applicazione e le dimensioni delle sonde NPN e PNP utilizzate.

22.5 - Variator options

CU

Universal casing featuring machined supporting surface with drilled and tapped holes (page 30).

FL

Universal casing featuring machined sides with drilled and tapped holes (page 30).

PDN

Configured for digital speed detection by NPN sensor incorporated into variator.

PDP

Configured for digital speed detection by PNP sensor incorporated into variator.

Chart (D01) shows applicability of the NPN and PNP speed sensors, with relevant threading.

22.5 - Optionen – Verstellgetriebemotor

CU

Universalgehäuse mit plangeschliffener Auflagefläche und entsprechenden Befestigungsbohrungen (Seite 30).

FL

Universalgehäuse mit plangeschliffenen Seitenflanken und entsprechenden Befestigungsbohrungen (Seite 30).

PDN

Vorbereitet für im Verstellgetriebe eingebaute digitale Vorrichtung für die Drehzahlerhebung über eine NPN-Sonde.

PDP

Vorbereitet für im Verstellgetriebe eingebaute digitale Vorrichtung für die Drehzahlerhebung über eine PNP-Sonde.

In der Tabelle (D01) werden die möglichen Applikationsmöglichkeiten der verwendeten NPN- und PNP-Sonden aufgeführt.

22.5 - Options variateurs

CU

Caisse universelle avec plan d'appui aplati et orifices de fixation correspondants (page 30).

FL

Caisse universelle avec flancs latéraux aplatis et orifices de fixation correspondants (page 30).

PDN

Prédisposition pour le dispositif de mesure du nombre de tours digital incorporé à l'intérieur du variateur avec sonde de détection de type NPN.

PDP

Prédisposition pour le dispositif de mesure du nombre de tours digital incorporé à l'intérieur du variateur avec sonde de détection de type PNP.

Le tableau (D01) indique les différentes possibilités d'application ainsi que les dimensions des sondes NPN et PNP utilisées.

(D01)

Riduttore *Gearbox* Getriebe *Réducteur*	Sonda *Plug thread* Sonde *Sonde* (NPN/PNP)	Variatore *Variator* Verstellgetriebe *Variateur*	Forme costruttive / *Versions* Bauformen / *Formes de construction*		
			V_		V_D
			C	F-UF	UF
S 101	M8x1	V 0.25	#		
	M8x1	V 0.5	#		
S 201	M8x1	V 0.25	#		
	M8x1	V 0.5	#		
	M10x1	V 1	#		
S 301	M8x1	V 0.25	#		
	M8x1	V 0.5	#		
	M10x1	V 1	#		
		V 2	#		

Riduttore *Gearbox* Getriebe *Réducteur*	Sonda *Plug thread* Sonde *Sonde* (NPN/PNP)	Variatore *Variator* Verstellgetriebe *Variateur*	Forme costruttive / *Versions* Bauformen / *Formes de construction*		
			V_		V_D
			C	F-UF	UF
S 401	M8x1	V 0.5	#		
	M10x1	V 1	#		
		V 2	#		
	M12x1	V 3/5.5	—		
S 501	M10x1	V 1	#		
		V 2	#		
	M12x1	V 3/5.5			
		V 10	—		

Applicazioni disponibili

Applicazione disponibile per le posizioni di montaggio B3, a richiesta (come esecuzione speciale) per le altre posizioni di montaggio.

Option availability

 # The option is available for units in the B3 mounting position. For other positions, please enquire with Bonfiglioli.

Zur Verfügung stehende Anwendungen

Anwendung auch für die Montagepositionen B3 erhältlich; auf Anfrage (als Sonderausführung) auch für die anderen Montagepositionen.

Applications disponibles

 # Application disponible pour les positions de montage B3, sur demande (exécution spéciale) pour les autres positions de montage.

PV

Anelli di tenuta in Viton.

SO

I variatori V 0.25...V 10 solitamente forniti con lubrificante da Bonfiglioli Riduttori sono forniti privi di lubrificante. Questa opzione non è prevista per i variatori con differenziale VD 0.5...VD 10 con ingresso P.. in quanto normalmente forniti privi di lubrificante.

PV

Viton seals

SO

The V 0.25...V 10 variators – normally factory-filled with oil – are supplied dry. This option is not available on the VD 0.5...VD 10 variators with differential unit and P.. input, that are normally supplied dry.

PV

Dichtringe in Viton.

SO

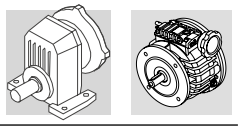
IDie üblicherweise von der Bonfiglioli Riduttori mit Schmiermittel gelieferten Verstellgetriebe V 0.25...VBG 10 werden bei dieser Ausführungsart ohne Schmiermittel geliefert. Diese Option ist bei den Verstellgetrieben mit Antrieb P.. VD 0.5...VD 10 mit Differential nicht gegeben, da diese normalerweise ohne Schmiermittel geliefert werden.

PV

Bagues d'étanchéité en Viton

SO

Les variateurs V 0.25...V 10 généralement fournis avec du lubrifiant par Bonfiglioli Riduttori sont fournis sans lubrifiant. Cette option n'est pas prévue pour les variateurs avec différentiel VD 0.5...VD 10 avec entrée P.. dans la mesure où il sont normalement fournis sans lubrifiant.



22.6 - Lubrificazione

Lubrificazione riduttori serie S

I riduttori dal tipo S101 al tipo S401 compreso, sono forniti con lubrificazione permanente ad olio sintetico e non necessitano di alcuna manutenzione.
Il tipo S501 è o predisposti per la lubrificazione ad olio e pertanto dotato dei tappi di carico, livello e scarico olio (tabella D03); sarà cura dell'utente immettere il lubrificante avvalendosi delle quantità (litri) indicate in tabella (D02).
Evidenziamo però che tali quantità sono indicative, pertanto l'esatto livello dovrà essere valutato osservandolo dall'apposita spia (con il riduttore già installato nella corretta posizione di montaggio).

22.6 - Lubrication

Lubrication of S gearboxes

Gearboxes S 101 through S 401 are life lubricated with synthetic oil and do not require any periodical oil changes.
The remaining unit S501 is designed for oil lubrication and therefore carries filling, level and drain plugs (table D03).
Users must fill the units with oil, consulting table (D02), with the correct quantity (litres).
However, it must be underlined that these quantities are only indicatives and users should check the correct level through the sight glass (when the gearbox is installed in its actual mounting position).

22.6 - Schmierung

Schmierung der Getriebe der Serie S

Die Getriebe von Typ S101 bis Typ S401 werden mit Dauerschmierung mit Syntheseöl geliefert und sind wartungsfrei.
Die anderen sind für die Ölschmierung vorgerüstet und verfügen daher über einen Einfüllverschluß, Ölstands-und Ölablaßschrauben (Tabelle D03).
Das Öl muß vom Kunden in der in Tabelle (D02) angegebenen Menge (Liter) eingefüllt werden.
Wir weisen jedoch darauf hin, daß es sich bei diesen Angaben nur um Richtwerte handelt und daher der tatsächlich Ölbedarf durch das Schauglas geprüft werden muß (das Getriebe muß sich hierzu schon in seiner endgültigen Einbaulage befinden).

22.6 - Lubrification

Lubrification réducteurs Série S

Les réducteurs du type S101 au type S401 compris sont fournis avec lubrification permanente à l' huile synthétique et n'ont besoin d'aucun entretien.
Le type S501 sont prédisposé pour la lubrification à l'huile et par conséquent dotée de bouchons de remplissage, niveau et vidange d'huile (tableau D03); l'utilisateur devra introduire le lubrifiant en se conformant aux quantités (litres) indiqués sur le tableau (D02).
Ces quantités sont toutefois indicatives et le niveau exact devra être contrôlé par le voyant spécial (avec le réducteur déjà installé dans la position correcte de montage).

Quantità di lubrificante [l] *Oil quantity [l]* Schmiermittelmenge [l] *Quantité de lubrifiant [l]*

(D02)

	Posizioni di montaggio / *Mounting positions* / Einbaulagen / *Positions de montage*											
	P						F					
	B3	B6	B7	B8	V5	V6	B5	B51	B52	B53	V1	V3
S101	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
S201	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45
S301	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.63	0.63
S401	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.4	1.4
S501	1.7	2.2	2.2	3.0	3.0	2.0	1.7	1.7	1.7	1.7	3.1	2.0

Lubrificazione permanente *Life lubricated* Dauerschmierung *Lubrification permanente*

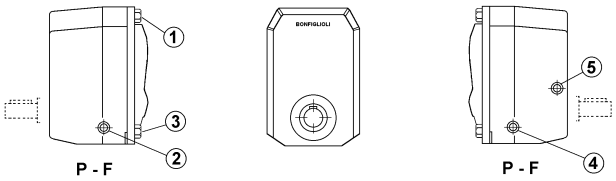
Dimensioni e collocazione dei tappi di carico, scarico e livello olio.

Positions of oil filling, level and drain plugs.

Anordnung des Einfüllv, Ölstands- und Ölablaßschrauben.

Position des bouchons de remplissage, niveau et vidange d'huile.

(D03)



Legenda:

C Tappo di carico/sfiato
L Tappo di livello
S Tappo di scarico
T Tappo chiuso

Key:

C *Filling/breather plug*
L *Level plug*
S *Drain plug*
T *Closed plug*

Zeichenerklärung:

C Einfüll- und Ablaßschrauber
L Ölstandsschraube
S Ölablaßschraube
T geschlossene Schraube

Légende:

C *Bouchon de remplissage/évent*
L *Bouchon de niveau*
S *Bouchon de vidange*
T *Bouchon fermé*

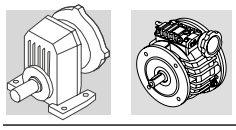
	Posizioni di montaggio / *Mounting positions* / Einbaulagen / *Positions de montage*																							
	P												F											
	•	B3	•	B6	•	B7	•	B8	•	V5	•	V6	•	B5	•	B51	•	B52	•	B53	•	V1	•	V3
S101	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")
S201	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")
S301	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")
S401	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")	**3**	**T** (1/4")
S501	**1**	**C** (3/8")	**2**	**S** (3/8")	**2**	**C** (3/8")	**1**	**S** (3/8")	**1**	**C** (3/8")	**1**	**S** (3/8")	**1**	**C** (3/8")	**2**	**S** (3/8")	**1**	**C** (3/8")	**2**	**S** (3/8")	**1**	**C** (3/8")	**1**	**S** (3/8")
	3	**S** (3/8")	**3**	**L** (3/8")	**3**	**L** (3/8")	**5**	**L** (3/8")	**4**	**L** (3/8")	**4**	**L** (3/8")	**3**	**S** (3/8")	**3**	**L** (3/8")	**5**	**L** (3/8")	**3**	**L** (3/8")	**4**	**L** (3/8")	**4**	**L** (3/8")
	2	**L** (3/8")	**4**	**C** (3/8")	**4**	**S** (3/8")	**3**	**C** (3/8")	**5**	**S** (3/8")	**5**	**C** (3/8")	**2**	**L** (3/8")	**4**	**C** (3/8")	**3**	**S** (3/8")	**4**	**C** (3/8")	**5**	**S** (3/8")	**5**	**C** (3/8")

• Numero di riferimento delle posizioni dei tappi di carico, scarico e livello olio.

• *Reference number for positions of oil filling, level and drain plugs.*

• Bezugsnummer der Positionen des Einfüll Ölstands-und Ölablaßschrauben.

• *Numéro de référence des positions des bouchons de remplissage, vidange et niveau.*



22.7 - Lubrificazione variatori

V, VD

La lubrificazione dei variatori V e VD avviene per sbattimento dell'olio. Prima della messa in funzione dei variatori accertarsi della presenza di olio al loro interno assicurandosi che esso compaia nella spia di livello. I variatori/motovariatori, se non diversamente specificato in fase di ordine, vengono forniti con il quantitativo di olio per la specifica posizione di montaggio come indicato nelle tabelle (D04) e (D05).

Si consiglia di specificare sempre in fase di ordine la posizione di montaggio desiderata.

VD

Tutti i variatori con differenziale VD completi di motore vengono forniti con carico di olio.
Tutti i variatori con differenziale VD in configurazione P... (IEC), vengono forniti privi di olio.
In questo caso l'utente dovrà provvedere al riempimento immettendo le quantità di olio indicate nelle tabelle (D04-D05) e dovrà utilizzare motori elettrici con l'anello di tenuta lato albero e la flangia di accoppiamento al variatore a tenuta di olio.

Benchè i variatori siano abbinabili a qualsiasi motore normalizzato IEC, BONFIGLIOLI raccomanda che siano utilizzati solo motori originali, provvisti di anelli di tenuta per l'olio.

I variatori V 0.25 e V 0.5 vengono forniti completi di olio lubrificante "long life" sintetico **Shell Donax TX**.
Eventuali sostituzioni o rabbocchi dovranno essere effettuati utilizzando lo stesso tipo di prodotto.

22.7 - Lubrication of variators

V and VD

Variators V and VD are splash-lubricated. Before putting the variator into operation make sure the oil is up to the sight glass level. Unless otherwise specified in the order, the variators are factory filled with an oil quantity suitable for the B3 mounting position.

To avoid further manipulation it is strongly recommended that the actual mounting position is specified in the ordering code.

VD

Motorized VD variators featuring the differential unit are factory filled with oil unlike VD variators with the IEC motor adapter (P...) which are supplied unlubricated and must be filled with oil prior to be put into operation.
Proper oil quantity is shown in table (D04-D05) and relates to actual mounting position.

Although speed variators can match any IEC motors, BONFIGLIOLI recommends the use of genuine motors only, complete with shaft oil seals.

*Variator units V 0.25 and V 0.5 are factory filled with "long life" synthetic oil **Shell Donax TX**.*
Use same oil when topping up or refilling.

22.7 - Schmierung der Verstellgetriebe

V, VD

Die Schmierung der Verstellgetriebe V und VD erfolgt durch Tauchschmierung im Ölbad. Vor der Inbetriebnahme der Verstellgetriebe muß geprüft werden, ob sie bis zur Ölstandskontrolle mit Öl gefüllt sind.
Falls im Auftrag nicht anderweitig angegeben, werden die Verstellge- triebe mit der für die Einbaulage B3 vorgeschriebenen Ölmenge geliefert.

Es wird in jedem Fall geraten, bei der Bestellung immer die gewünschte Einbaulage anzugeben.

VD

Alle Verstellgetriebe mit Differen- tial VD und Motor, sind bei Lieferung mit Öl gefüllt.
Alle Verstellgetriebe mit Differential V-D für den Anbau eines IEC-Motors werden ohne Öl geliefert.
Wenn der Kunde die Getrieb selbst mit Öl füllt, müssen die in Tabelle (D04-D05) angegebenen Ölmengen verwenden werden. Die zu verwendenden Motoren müssen einen Dichtring auf der Seite der Welle haben und der Flansch zur Kopplung an das Verstellgetriebe muß öldicht sein.

Es wird empfohlen, die Verstellgetriebe mit Differential mit öldichten BONFIGLIOLI RIDUTTORI Motoren zu kaufen.

Die Verstellgetriebe V 0.25 und V 0.5 werden mit Schmieröl **Shell Donax TX** geliefert.
Eventuelle Ölwechsel oder Nachfüllungen müssen unter Anwendung des gleichen Produkttyps erfolgen.

22.7 - Lubrification variateurs

V, VD

La lubrification des variateurs V et VD s'effectue par barbota- ge de l'huile. Avant la mise en service des variateurs/motovariateurs, vérifier la présence d'huile à l'intérieur en contrôlant que celle-ci apparaisse dans le témoin de niveau.
Les variateurs/motovariateurs, sauf spécification contraire au moment de la commande, sont fournis avec une quantité d'huile relative à la position de montage B3.

Dans tous les cas, il est conseillé de toujours spécifier la position de montage désirée au moment de la commande.

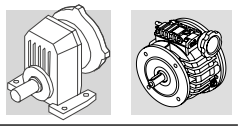
VD

Tous les variateurs avec différentiel VD avec moteur sont fournis avec le plein d'huile.
Tous les variateurs avec différentiel VD en configuration P... (IEC) sont fournis sans huile.
Dans ce cas, l'utilisateur doit effec- tuer le remplissage en versant la quantité d'huile indiquée dans le tableau (D04-D05) et doit utiliser des moteurs électriques avec bague d'étanchéité côté arbre et bride d'accouplement au variateur étanche à l'huile.

Dans tous les cas, il est conseillé d'acquérir des variateurs avec différentiel avec moteurs avec étanchéité à l'huile BONFIGLIOLI RIDUTTORI.

*Les variateurs V 0.25 et V 0.5 sont fournis avec de l'huile lubrifiante "long life" **Shell Donax TX**.*
Utiliser le même type d'huile pour les éventuels vidanges ou remplissages.

Shell Donax TX (Caratteristiche indicative / *Indicative features* / Anhaltswerte / *Caractéristiques indicatives*)			
Massa volumica / *Density* / Volumenmasse / *Masse volumique*	ISO 3675	kg/dm^3	0.852
Viscosità cinematica a 40°C/ *Kinematic viscosity at 40°C* / Kinematische Viskosität bei 40°C *Viscosité cinématique à 40°C*	ISO 3104	cSt	34
Viscosità cinematica a 100°C/ *Kinematic viscosity at 100°C* / Kinematische Viskosität bei 100°C *Viscosité cinématique à 100°C*	ISO 3104	cSt	7.4
Indice di viscosità / *Viscosity index* / Viskositätsindex / *Indice de viscosité*	ISO 2909	-	196
Punto di infiammabilità / *Flash point* / Entflammpunkt / *Point d'inflammabilité*	ISO 2592	°C	198
Punto di scorrimento / *Pour point* / Stockpunkt / *Point de glissement*	ISO 3016	°C	-48



I variatori V 1...V 10 vengono forniti completi di olio lubrificante minerale **Shell Donax TA**.
Eventuali sostituzioni o rabbocchi potranno essere effettuati utilizzando lubrificanti compatibili.

*Variator units V 1 through V 10 are factory filled with mineral oil **Shell Donax TA** .*
Use same type of oil when topping up or refilling.

Die Verstellgetriebe V 1...V 10 werden mit dem Schmieröl **Shell Donax TA** geliefert.
Ein eventueller Wechsel oder ein etwaiges Auffüllen sollte unter Verwendung der Schmiermittel erfolgen.

*Les variateurs V 1...V 10 sont fournis avec de l'huile lubrifiante **Shell Donax TA**.*
Utiliser le même type d'huiles pour les éventuels vidanges ou remplissages.

Shell Donax TA (Caratteristiche indicative / *Indicative features* / Anhaltswerte / *Caractéristiques indicatives*)			
Massa volumica / *Density* / Volumenmasse / *Masse volumique*	ISO 3675	kg/dm^3	0.873
Viscosità cinematica a 40°C/ *Kinematic viscosity at 40°C* / Kinematische Viskosität bei 40°C *Viscosité cinématique à 40°C*	ISO 3104	cSt	37.3
Viscosità cinematica a 100°C/ *Kinematic viscosity at 100°C* / Kinematische Viskosität bei 100°C *Viscosité cinématique à 100°C*	ISO 3104	cSt	7.0
Indice di viscosità / *Viscosity index* / Viskositätsindex / *Indice de viscosité*	ISO 2909	-	151
Punto di infiammabilità / *Flash point* / Entflammpunkt / *Point d'inflammabilité*	ISO 2592	°C	196
Punto di scorrimento / *Pour point* / Stockpunkt / *Point de glissement*	ISO 3016	°C	-42

Riduzione **R** lubrificata "a vita" con grasso **Shell TVX Compound B.**

Tutti i variatori sono forniti con carica di lubrificante, ad eccezione dei tipi **VD_P(IEC).**

Il tappo di sfiato, fornito a corredo, va posizionato come indicato nelle tabelle (D04 - D05).

*Helical reduction **R** is grease lubed "for life" with **Shell TVX Compound B**.*

*All speed variators are factory filled with lubricant, with the only exception of units type **VD_P(IEC)**.*

The breather plug, supplied along with every unit, shall be located as per the schemes (D04) and (D05).

Die Vorstufe **R** ist mit Fett Typ **Shell TVX Compound B** gefüllt.

Alle Verstellgetriebe sind ab Werk mit Öl gefüllt, außer dem Typ **VD_P(IEC)**.

Der Entlüftungsstopfen, der jedem Getriebe beiligt, muss entsprechend der obige Skizze montiert werden.

*Réduction **R** avec lubrification permanente au moyen de graisse **Shell TVX Compound B**.*

*Tous les variateurs sont fournis avec le lubrifiant, à l'exception des les models **VD_P (IEC)**.*

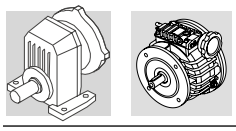
Le bouchon d'évent, fourni avec chaque variateur, doit être positionné comme indiqué dans les schémas (D04 - D05).

Non mescolare olii di natura diversa.

Do not mix synthetic oil with mineral oil.

Auf keinen Fall darf synthetisches Öl mit mineralischem gemischt werden !

Ne pas mélanger huiles de nature différente.

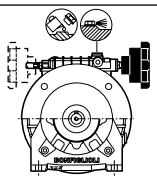


Posizioni di montaggio | *Mounting positions* | Einbaulagen | *Positions de montage*

(D04)

V 0.25 - V 0.5

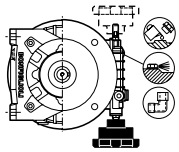
B3



V 0.25 F **V 0.5 F**	0.14 0.18	[I]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

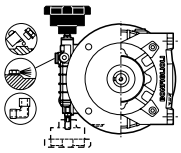
B6



V 0.25 F **V 0.5 F**	0.14 0.18	[I]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

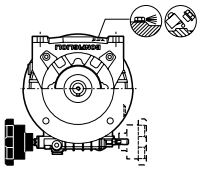
B7



V 0.25 F **V 0.5 F**	0.14 0.18	[I]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

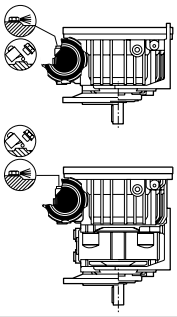
B8



V 0.25 F **V 0.5 F**	0.14 0.18	[I]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

V5



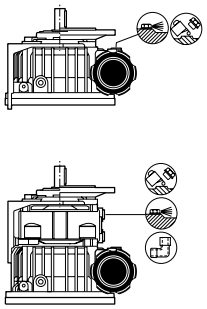
V 0.25 F **V 0.5 F**	0.28 0.30	[I]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.22 0.27	

Oil Donax TX (for life)

VD 0.5 U_ / VRD 0.5	0.70	[I]

Oil Donax TX (for life)

V6



V 0.25 F **V 0.5 F**	0.14 0.18	[I]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	

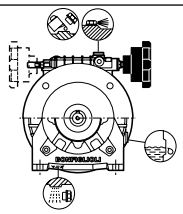
Oil Donax TX (for life)

VD 0.5 U_ / VRD 0.5	0.40	[I]

Oil Donax TX (for life)

V 1 - V 2

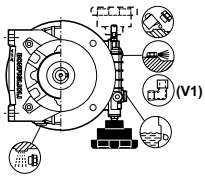
B3



V 1 F **V 2 F**	0.30 0.40	[I]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

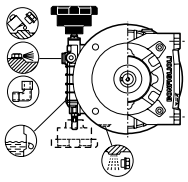
B6



V 1 F **V 2 F**	0.30 0.40	[I]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

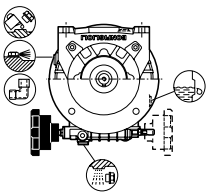
B7



V 1 F **V 2 F**	0.30 0.40	[I]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

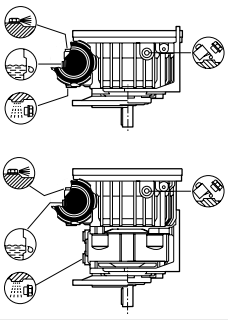
B8



V 1 F **V 2 F**	0.30 0.40	[I]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

V5



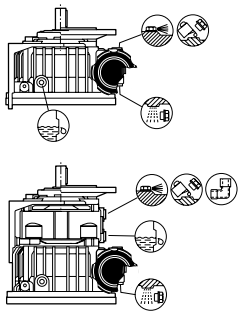
V 1 F **V 2 F**	0.58 0.78	[I]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.40 0.54	

Oil Donax TA (2000-3000 hrs.)

VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	1.00 1.5	[I]

Oil Donax TA (for life)

V6



V 1 F **V 2 F**	0.30 0.40	[I]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	

Oil Donax TA (2000-3000 hrs.)

VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.50 0.70	[I]

Oil Donax TA (for life)

Tappo di sfiato
Breather plug
Entlüftungsstopfen
Bouchon d'évent

Tappo di carico
Filler plug
Einfüllstopfen
Bouchon de remplissage

Tappo di scarico
Drain plug
Ablassstopfen
Bouchon de vidange

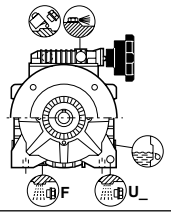
Tappo di livello
Level plug
Ölstandsstopfen
Bouchon de niveau

Raccordo orientabile
90° elbow
90° Winkel
Raccord coudé

(D05)

V 3 - V 5.5

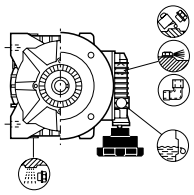
B3



V 3 F - V 5.5 F_	0.70	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	1.0	
VD 3 F_ **VD 5.5 F**	1.3	
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	1.6	

Oil Donax TA (2000-3000 hrs.)

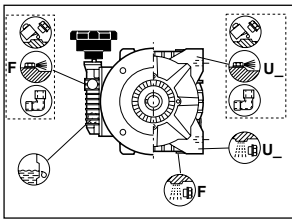
B6



V 3 F - V 5.5 F_	0.90	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	1.0	
VD 3 F_ **VD 5.5 F**	1.3	
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	1.6	

Oil Donax TA (2000-3000 hrs.)

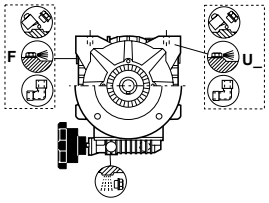
B7



V 3 F - V 5.5 F_	0.90	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	1.0	
VD 3 F_ **VD 5.5 F**	1.3	
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	1.6	

Oil Donax TA (2000-3000 hrs.)

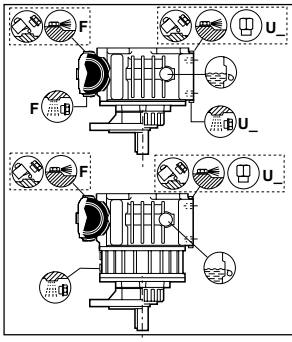
B8



V 3 F - V 5.5 F_	1.0	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	1.3	
VD 3 F_ **VD 5.5 F**	1.6	
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	1.9	

Oil Donax TA (2000-3000 hrs.)

V5



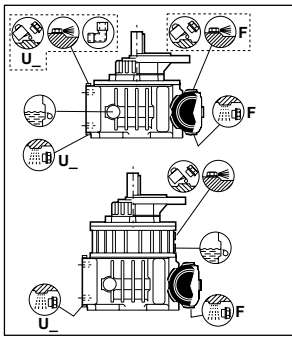
V 3 F - V 5.5 F_	2.1	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	2.0	

Oil Donax TA (2000-3000 hrs.)

VD 3 F_ **VD 5.5 F**	4.5	[l]
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	4.8	

Oil Donax TA (2000-3000 hrs.)

V6



V 3 F - V 5.5 F_	1.0	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	1.3	

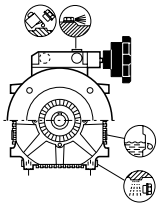
Oil Donax TA (2000-3000 hrs.)

VD 3 F_ **VD 5.5 F**	2.8	[l]
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	3.0	

Oil Donax TA (2000-3000 hrs.)

V 10

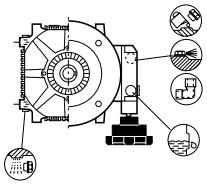
B3



V 10 F **V 10 U_ / VR 10**	1.8	[l]
VD 10 F **VD 10 U_ / VRD 10 U_**	2.0	

Oil Donax TA (2000-3000 hrs.)

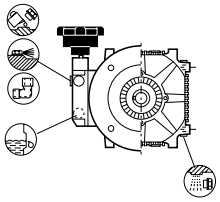
B6



V 10 F **V 10 U_ / VR 10**	1.8	[l]
VD 10 F **VD 10 U_ / VRD 10 U_**	2.0	

Oil Donax TA (2000-3000 hrs.)

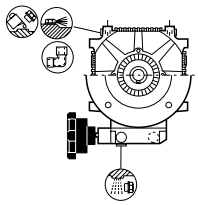
B7



V 10 F **V 10 U_ / VR 10**	1.8	[l]
VD 10 F **VD 10 U_ / VRD 10 U_**	2.0	

Oil Donax TA (2000-3000 hrs.)

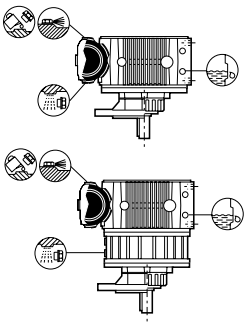
B8



V 10 F **V 10 U_ / VR 10**	2.1	[l]
VD 10 F **VD 10 U_ / VRD 10 U_**	2.1	

Oil Donax TA (2000-3000 hrs.)

V5



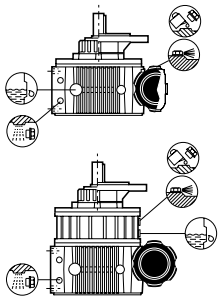
V 10 F **V 10 U_ / VR 10**	3.2	[l]

Oil Donax TA (2000-3000 hrs.)

VD 10 F **VD 10 U_ / VRD 10**	8.5	[l]

Oil Donax TA (2000-3000 hrs.)

V6

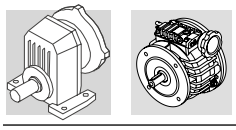


V 10 F **V 10 U_ / VR 10**	2.8	[l]

Oil Donax TA (2000-3000 hrs.)

VD 10 F **VD 10 U_ / VRD 10**	7.0	[l]

Oil Donax TA (2000-3000 hrs.)



22.8 - Posizioni di montaggio e orientamento morsettiera

Le tabelle (D07-D08-D09) evidenziano le posizioni che può assumere il variatore rispetto alla posizione di montaggio del riduttore.
In fase di ordine è necessario specificare oltre alla posizione di montaggio del riduttore anche la posizione del variatore e l'orientamento della morsettiera (W,N,E,S) scegliendo fra le alternative illustrate nelle tabelle.

La tabella (D06) facilita l'interpretazione delle varie posizioni di montaggio riportate.

22.8 - Mounting position and terminal box angular position

Tables (D07-D08-D09) show the mounting positions of the variator based on reducer mounting position.
Reducer mounting position and variator arrangement must be specified on order, as well as terminal box arrangement (W, N, E, S). Choose from the options shown in the tables.

Table (D06) provides examples of the various mounting positions for clarity.

22.8 - Einbaulagen und lage des klemmenkastens

Die Tabellen (D07-D08-D09) stellen die Positionen dar, die das Verstellgetriebe den Einbaulagen des Getriebes gegenüber einnehmen kann.
In der Auftragsphase muß daher über die Montageposition des Getriebes hinaus, auch die Lage des Verstellgetriebes und die Ausrichtung der Klemmenleiste (W, N, E, S) angegeben werden, die unter den in der Tabelle angegebenen Möglichkeiten ausgewählt werden können.

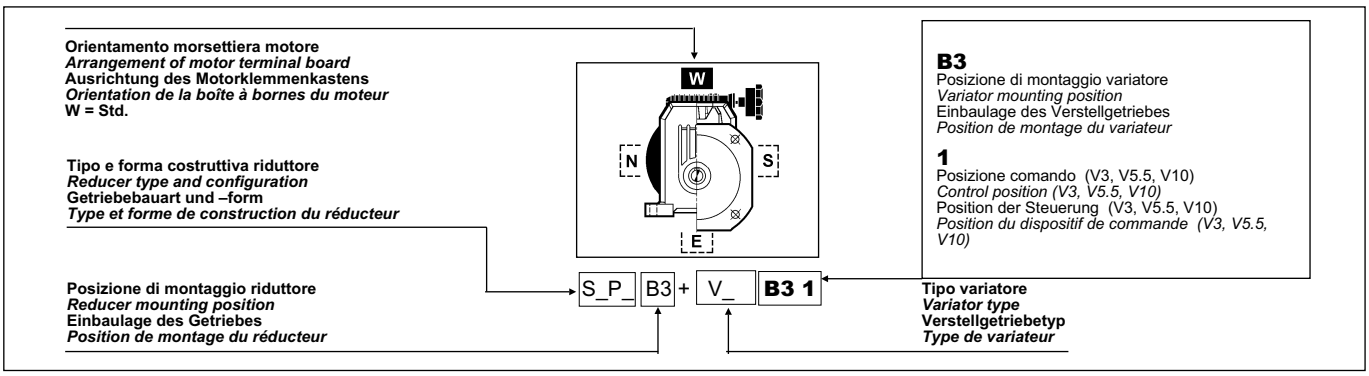
Die Tabelle (D06) erleichtert die Auslegung der verschiedenen, dargestellten Einbaulagen.

22.8 - Positions de montage et orientation boite a borne

Les tableaux (D07-D08-D09) indiquent les positions possibles du variateur par rapport à la position de montage du réducteur.
Au moment de la commande, il est nécessaire de préciser la position de montage du réducteur ainsi que la position du variateur et l'orientation de la boîte à bornes (W,N,E,S), en choisissant parmi les alternatives indiquées dans les tableaux.

Le tableau (D06) facilite l'interprétation des différentes positions de montage indiquées.

(D06)



Relativamente ai riduttori tipo S501 è opportuno precisare che dalle posizioni standard B3 e B5 è possibile ottenere le altre (B6,B7,B8,V5 e V1) disponendo i tappi come indicato nella tabella (D03).

Fanno eccezione a questa regola le posizioni V3 e V6 (solo per i tipi S501) le quali dovranno obbligatoriamente essere richieste nella corretta configurazione alla BONFIGLIOLI RIDUTTORI in quanto è indispensabile schermare alcune parti interne.

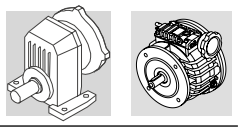
Note that gearboxes S501 and feature two standard configurations intended for mounting positions B3 and B5, and all other positions (B6, B7, B8, V5 and V1) are obtained by repositioning the plugs as shown in table (D03)

Positions V3 and V6 (for size S501) are an exception to this rule. These must be ordered to BONFIGLIOLI RIDUTTORI in their actual configuration as some internal parts require specific lubrication arrangements.

Was die Getriebe des Typs S501 anbelangt, ist zu berücksichtigen, daß es über die Standardanordnungen B3 und B5, gemäß Tabelle (D03) durch ein entsprechendes Ausrichten der Verschlüsse möglich ist, andere Lagen (B6, B7, B8, V5 und V1) zu erhalten.
Von dieser Regel ausgenommen sind die Anordnungen V3 und V6 (für die Typen S501), die obligatorisch mit der gewünschten Konfiguration bei BONFIGLIOLI RIDUTTORI bestellt werden müssen, da einige innere Bauteile zusätzlich abgeschirmt werden müssen.

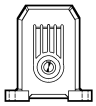
En ce qui concerne les réducteurs type S501, il convient de préciser qu'à partir des positons standards B3 et B5, il est possible d'obtenir d'autres positions (B6, B7, B8, V5 et V1) en disposant les bouchons comme indiqué dans le tableau (D03).

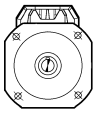
Les positions V3 et V6 (pour les type S501) ne suivent pas cette règle. Elles devront obligatoirement être demandées dans la configuration correcte à BONFIGLIOLI RIDUTTORI étant donné qu'il est indispensable de proteger certaines parties intérieures.

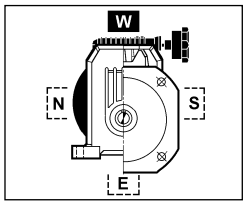


(D07)

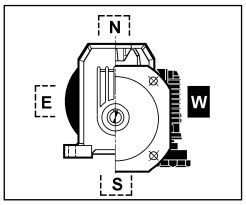
B3 **B5**



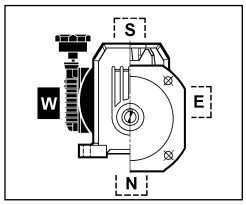




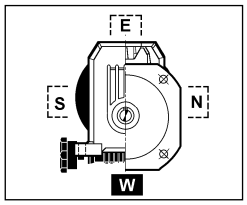
S_ P B3
S_ F B5 + V_ **B3 1**



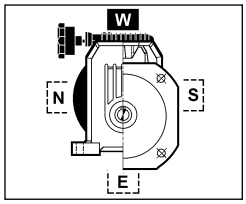
S_ P B3
S_ F B5 + V_ **B6 1**



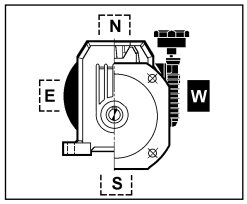
S_ P B3
S_ F B5 + V_ **B7 1**



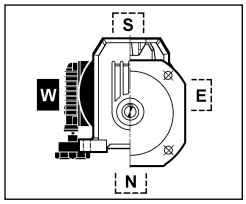
S_ P B3
S_ F B5 + V_ **B8 1**



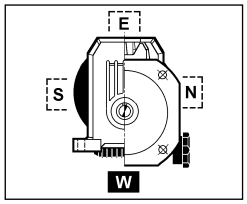
S_ P B3
S_ F B5 + V_ **B3 2**



S_ P B3
S_ F B5 + V_ **B6 2**

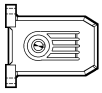


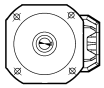
S_ P B3
S_ F B5 + V_ **B7 2**

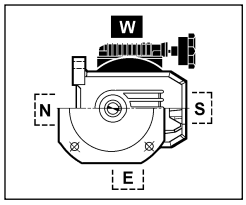


S_ P B3
S_ F B5 + V_ **B8 2**

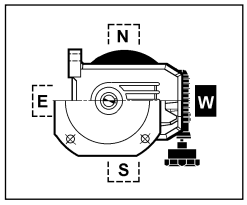
B6 **B51**



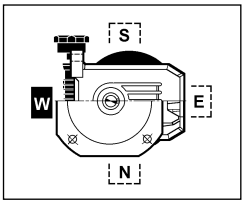




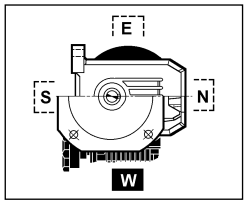
S_ P B6
S_ F B51 + V **B3 1**



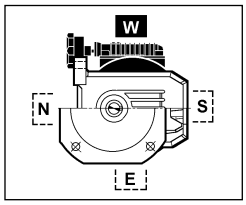
S_ P B6
S_ F B51 + V_ **B6 1**



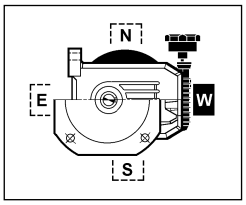
S_ P B6
S_ F B51 + V_ **B7 1**



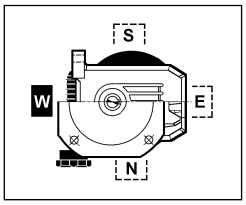
S_ P B6
S_ F B51 + V_ **B8 1**



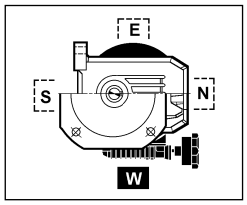
S_ P B6
S_ F B51 + V_ **B3 2**



S_ P B6
S_ F B51 + V_ **B6 2**

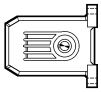


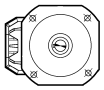
S_ P B6
S_ F B51 + V_ **B7 2**

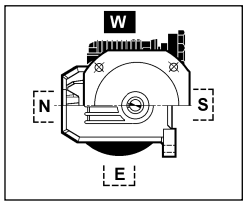


S_ P B6
S_ F B51 + V_ **B8 2**

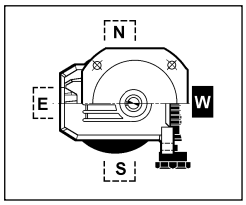
B7 **B53**



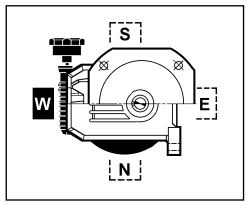




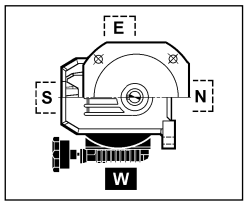
S_ P B7
S_ F B53 + V **B3 1**



S_ P B7
S_ F B53 + V_ **B6 1**



S_ P B7
S_ F B53 + V_ **B7 1**



S_ P B7
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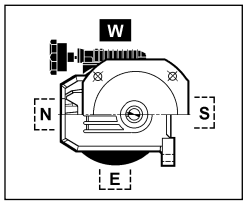

S_ P B7
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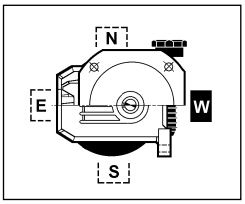

S_ P B7
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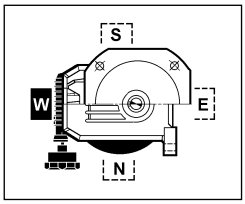
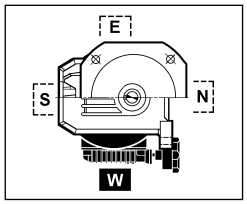
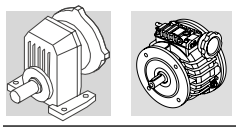


S_ P B7
S_ F B53 + V_ **B7 2**

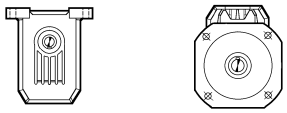


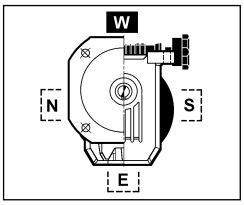
S_ P B7
S_ F B53 + V_ **B8 2**



(D08)

B8 **B52**





S_ P B8
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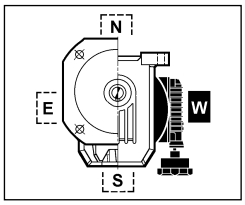
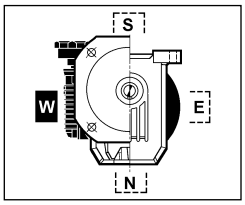
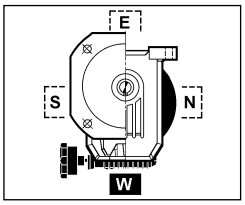


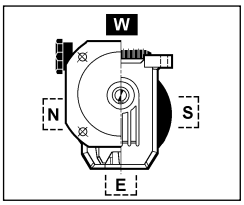
S_ P B8
S_ F B52 + V_ **B6 1**



S_ P B8
S_ F B52 + V_ **B7 1**



S_ P B8
S_ F B52 + V_ **B8 1**



S_ P B8
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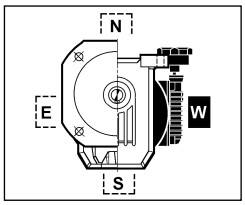
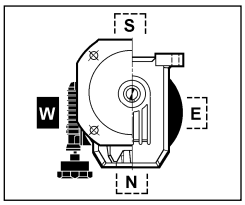
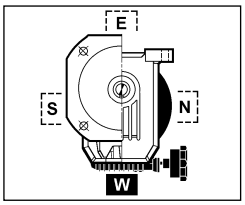


S_ P B8
S_ F B52 + V_ **B6 2**

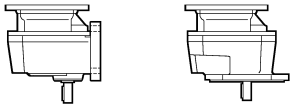


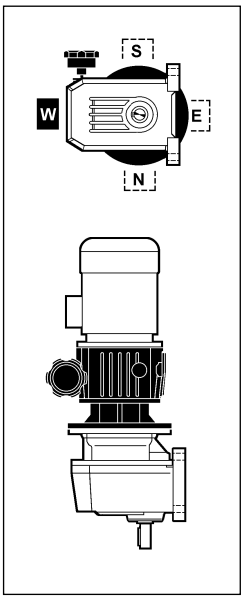
S_ P B8
S_ F B52 + V_ **B7 2**



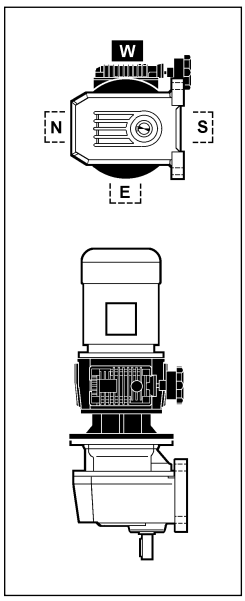
S_ P B8
S_ F B52 + V_ **B8 2**

V5 **V1**

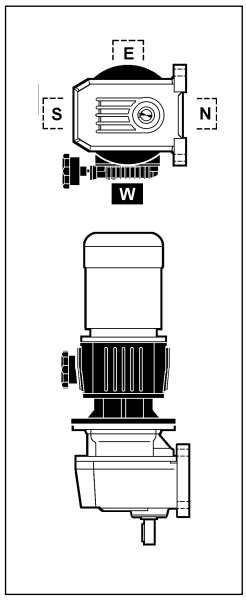




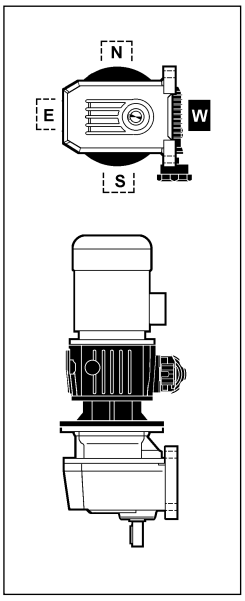
S_ P V5
S_ F V1 + V_ **V5 1**



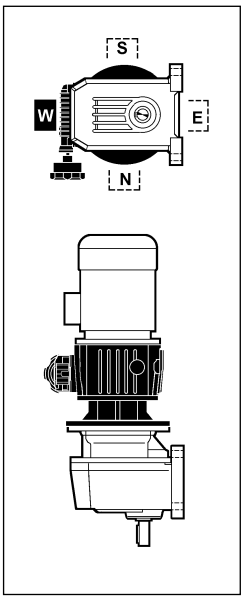
S_ P V5
S_ F V1 + V_ **V51 1**



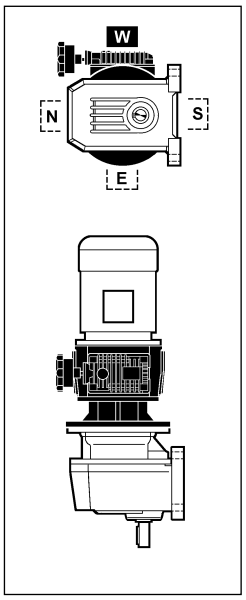
S_ P V5
S_ F V1 + V_ **V53 1**



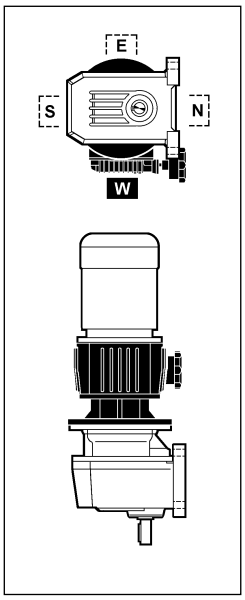
S_ P V5
S_ F V1 + V_ **V52 1**



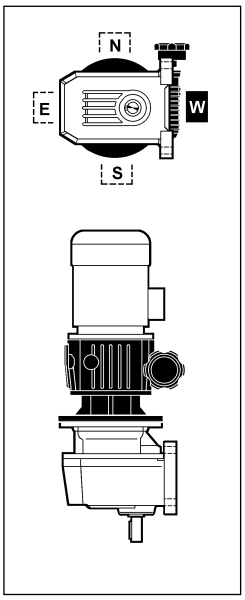
S_ P V5
S_ F V1 + V_ **V5 2**



S_ P V5
S_ F V1 + V_ **V51 2**



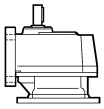
S_ P V5
S_ F V1 + V_ **V53 2**



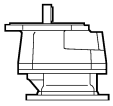
S_ P V5
S_ F V1 + V_ **V52 2**

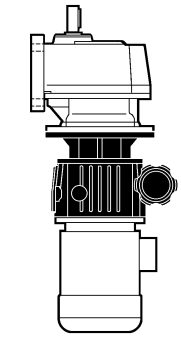
(D09)

V6

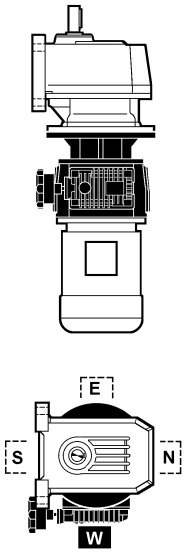


V3

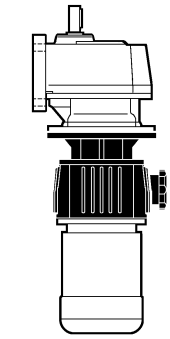




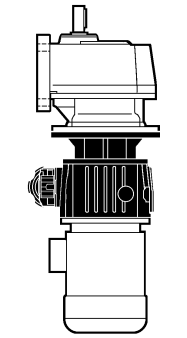
S_ P V6
S_ F V3 + V_ **V6 1**



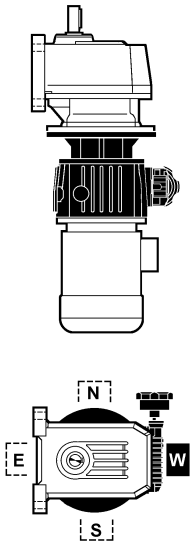
S_ P V6
S_ F V3 + V_ **V611**



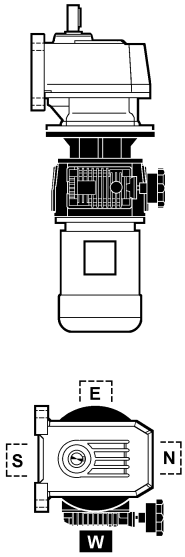
S_ P V6
S_ F V3 + V_ **V631**



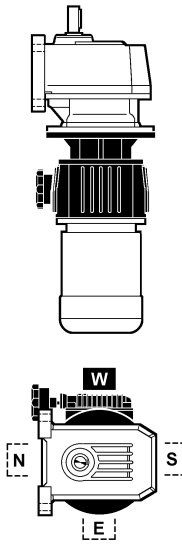
S_ P V6
S_ F B5 + V_ **V621**



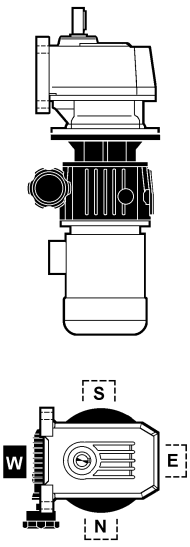
S_ P V6
S_ F V3 + V_ **V6 2**



S_ P V6
S_ F V3 + V_ **V612**



S_ P V6
S_ F V3 + V_ **V632**



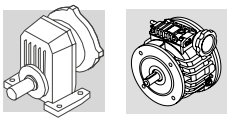
S_ P V6
S_ F V3 + V_ **V622**

0.12 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
59	**12.1**	14.1	37	2.5	1.1	10.3	2400	**S301_10.3**	— P63	— V 0.25 F	**P63**	**BN63B6**	128-129
68	**14.0**	12.2	32	2.9	1.3	8.9	2400	**S301_8.9**	— P63	— V 0.25 F	**P63**	**BN63B6**	128-129
71	**14.7**	11.7	31	1.7	0.8	8.5	1500	**S201_8.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	126-127
84	**17.4**	9.9	26	3.0	1.4	7.2	1500	**S201_7.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	126-127
88	**18.1**	9.5	25	1.8	0.8	6.9	1110	**S101_6.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	124-125
99	**20.5**	8.4	22	2.0	0.9	6.1	1080	**S101_6.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	124-125
104	**21.6**	8.0	21	3.8	1.8	5.8	1500	**S201_5.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	126-127
126	**26.0**	6.6	17.4	4.6	2.1	4.8	1500	**S201_4.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	126-127
129	**26.6**	6.4	17.0	2.2	1.0	4.7	1000	**S101_4.7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	124-125
159	**33**	5.2	13.8	2.7	1.2	3.8	940	**S101_3.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	124-125
189	**39**	4.4	11.6	3.2	1.5	3.2	890	**S101_3.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	124-125
242	**50**	3.4	9.1	3.5	1.5	2.5	830	**S101_2.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	124-125
318	**66**	2.6	6.9	4.6	2.0	1.9	760	**S101_1.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	124-125
431	**89**	1.9	5.1	6.2	2.8	1.4	690	**S101_1.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	124-125

0.18 kW

59	**12.1**	20	40	1.7	1.0	10.3	2400	**S301_10.3**	— P63	— V 0.25 F	**P63**	**BN71A6R**	128-129
68	**14.0**	17.4	35	2.0	1.2	8.9	2400	**S301_8.9**	— P63	— V 0.25 F	**P63**	**BN71A6R**	128-129
84	**17.4**	14.1	28	2.1	1.3	7.2	1500	**S201_7.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	126-127
88	**18.1**	13.5	27	1.3	0.8	6.9	1060	**S101_6.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	124-125
88	**18.4**	15.1	40	2.3	1.0	10.3	2400	**S301_10.3**	— P63	— V 0.25 F	**P63**	**BN63B4**	128-129
99	**20.5**	12.0	24	1.4	0.9	6.1	1030	**S101_6.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	124-125
102	**21.3**	13.1	35	2.7	1.2	8.9	2400	**S301_8.9**	— P63	— V 0.25 F	**P63**	**BN63B4**	128-129
126	**26.4**	10.6	28	2.8	1.3	7.2	1500	**S201_7.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	126-127
129	**26.6**	9.2	18	1.5	0.9	4.7	960	**S101_4.7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	124-125
132	**27.5**	10.0	27	1.7	0.8	6.9	940	**S101_6.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	104-105
149	**31**	9.0	24	1.9	0.9	6.1	920	**S101_6.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	124-125
157	**33**	8.5	23	3.5	1.6	5.8	1500	**S201_5.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	126-127
190	**40**	7.1	18.8	4.3	2.0	4.8	1500	**S201_4.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	126-127
194	**40**	6.9	18.4	2.0	0.9	4.7	850	**S101_4.7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	124-125



0.18 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
233	**49**	5.7	15.3	5.2	2.4	3.9	1480	**S201_3.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	126-127
239	**50**	5.6	14.9	2.5	1.1	3.8	810	**S101_3.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	124-125
242	**50**	4.9	9.8	2.4	1.4	2.5	810	**S101_2.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	124-125
284	**59**	4.7	12.5	3.0	1.4	3.2	770	**S101_3.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	124-125
318	**66**	3.7	7.4	3.2	1.9	1.9	740	**S101_1.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	124-125
364	**76**	3.7	9.8	3.3	1.4	2.5	710	**S101_2.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	124-125
431	**89**	2.7	5.5	4.4	2.6	1.4	680	**S101_1.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	124-125
479	**100**	2.8	7.4	4.3	1.9	1.9	650	**S101_1.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	124-125
650	**136**	2.1	5.5	5.8	2.6	1.4	600	**S101_1.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	124-125

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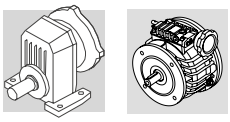
62	**11.7**	31	84	1.8	0.8	10.7	3800	**S401_10.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	130-131
77	**14.5**	25	67	2.8	1.3	8.6	3800	**S401_8.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	130-131
88	**18.4**	18	40	1.9	1.0	10.3	2400	**S301_10.3**	**—** P63	**—** V 0.25 F	**P63**	**BN63C4**	128-129
92	**17.4**	21	56	1.4	0.7	7.2	1500	**S201_7.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	126-127
93	**17.6**	21	56	2.8	1.1	7.1	2400	**S301_7.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	128-129
93	**17.8**	21	52	2.8	1.3	10.7	3800	**S401_10.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	130-131
102	**21.3**	15.7	35	2.2	1.2	8.9	2400	**S301_8.9**	**—** P63	**—** V 0.25 F	**P63**	**BN63C4**	128-129
112	**21.3**	17.4	44	2.0	1.0	8.9	2400	**S301_8.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	128-129
114	**21.6**	17.1	45	1.8	0.8	5.8	1500	**S201_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	126-127
116	**22.1**	16.9	42	4.2	2.0	8.6	3800	**S401_8.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	130-131
126	**26.4**	12.7	28	2.4	1.3	7.2	1500	**S201_7.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	126-127
132	**27.5**	12.2	27	1.4	0.8	6.9	920	**S101_6.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	124-125
139	**26.4**	14.1	35	2.1	1.0	7.2	1500	**S201_7.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	126-127
141	**26.8**	13.9	35	4.2	1.8	7.1	2290	**S301_7.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	128-129
147	**31**	12.2	32	1.1	0.8	12.4	1500	**S201_12.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	126-127
149	**31**	10.8	24	1.6	0.9	6.1	900	**S101_6.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	124-125
157	**33**	10.2	23	2.9	1.6	5.8	1500	**S201_5.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	126-127
169	**35**	10.8	28	1.2	0.9	10.8	1500	**S201_10.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	126-127
170	**32**	11.5	31	2.6	1.2	3.9	1500	**S201_3.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	126-127
172	**33**	11.4	28	2.6	1.3	5.8	1500	**S201_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	126-127



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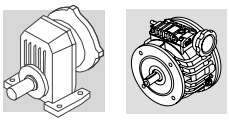
172	**33**	11.4	28	5.1	2.5	5.8	2160	**S301_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	128-129
190	**40**	8.5	19	3.5	2.0	4.8	1500	**S201_4.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	126-127
194	**40**	8.3	18	1.7	0.9	4.7	840	**S101_4.7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	124-125
204	**43**	8.7	23	0.9	0.6	8.9	810	**S101_8.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	124-125
208	**40**	9.4	24	3.2	1.6	4.8	1500	**S201_4.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	126-127
214	**45**	8.3	22	1.6	1.1	8.5	1500	**S201_8.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	126-127
233	**49**	6.9	15.3	4.4	2.4	3.9	1470	**S201_3.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	126-127
239	**50**	6.7	14.9	2.1	1.1	3.8	790	**S101_3.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	124-125
256	**49**	7.6	19.1	3.9	1.9	3.9	1410	**S201_3.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	126-127
264	**55**	6.8	17.6	1.8	1.2	6.9	760	**S101_6.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	124-125
276	**52**	7.1	18.8	4.3	2.0	2.4	1380	**S201_2.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	126-127
284	**59**	5.6	12.5	2.5	1.4	3.2	750	**S101_3.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	124-125
298	**62**	6.0	15.5	2.0	1.4	6.1	740	**S101_6.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	124-125
323	**61**	6.1	15.2	4.9	2.4	3.1	1320	**S201_3.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	126-127
349	**66**	5.6	14.9	3.6	1.6	1.9	1280	**S201_1.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	126-127
364	**76**	4.4	9.8	2.7	1.4	2.5	700	**S101_2.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	124-125
387	**81**	4.6	12.0	2.2	1.4	4.7	690	**S101_4.7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	124-125
400	**76**	4.9	12.3	2.4	1.1	2.5	670	**S101_2.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	124-125
417	**79**	4.7	11.8	6.4	3.1	2.4	1220	**S201_2.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	126-127
474	**89**	4.1	11.0	2.9	1.3	1.4	640	**S101_1.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	124-125
479	**100**	3.7	9.7	2.7	1.8	3.8	650	**S101_3.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	124-125
479	**100**	3.4	7.4	3.6	1.9	1.9	650	**S101_1.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	124-125
526	**100**	3.7	9.3	5.4	2.6	1.9	1130	**S201_1.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	126-127
569	**119**	3.1	8.2	3.2	2.1	3.2	620	**S101_3.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	124-125
650	**136**	2.5	5.5	4.9	2.6	1.4	590	**S101_1.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	124-125
714	**136**	2.7	6.9	4.4	2.0	1.4	600	**S101_1.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	124-125
728	**152**	2.5	6.4	3.3	2.2	2.5	570	**S101_2.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	124-125
958	**200**	1.9	4.8	4.3	2.9	1.9	520	**S101_1.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	124-125
1300	**271**	1.4	3.8	5.8	3.9	1.4	480	**S101_1.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	124-125



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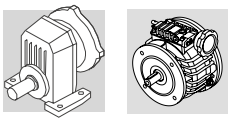
62	**11.7**	42	84	1.4	0.8	10.7	3800	**S401_10.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	130-131
77	**14.5**	34	67	2.1	1.3	8.6	3800	**S401_8.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	130-131
92	**17.4**	28	56	1.1	0.7	7.2	1500	**S201_7.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	126-127
93	**17.6**	28	56	2.1	1.1	7.1	2400	**S301_7.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	128-129
93	**17.8**	31	84	1.8	0.8	10.7	3800	**S401_10.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	130-131
114	**21.6**	23	45	1.3	0.8	5.8	1500	**S201_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	126-127
114	**21.6**	23	45	2.6	1.5	5.8	2390	**S301_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	128-129
116	**22.1**	25	67	2.8	1.3	8.6	3800	**S401_8.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	130-131
139	**26.4**	21	56	1.4	0.7	7.2	1500	**S201_7.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	126-127
139	**26.4**	21	56	4.3	1.6	7.2	3770	**S401_7.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	130-131
141	**26.8**	21	56	2.8	1.1	7.1	2230	**S301_7.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	128-129
164	**31**	17.9	48	5.9	2.3	6.1	3600	**S401_6.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	130-131
172	**33**	17.1	45	1.8	0.8	5.8	1500	**S201_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	126-127
172	**33**	17.1	45	3.4	1.5	5.8	2110	**S301_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	128-129
177	**37**	15.1	40	1.6	1.0	10.3	2110	**S301_10.3**	**—** P63	**—** V 0.25 F	**P63**	**BN63C2**	128-129
204	**39**	14.4	38	4.0	1.8	4.9	2010	**S301_4.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	128-129
208	**40**	14.1	38	2.1	1.0	4.8	1450	**S201_4.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	126-127
253	**53**	10.6	28	2.0	1.3	7.2	1390	**S201_7.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	126-127
256	**49**	11.5	31	2.6	1.2	3.9	1370	**S201_3.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	126-127
264	**55**	10.1	27	1.2	0.8	6.9	720	**S101_6.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	124-125
298	**62**	9.0	24	1.3	0.9	6.1	710	**S101_6.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	124-125
323	**61**	9.1	24	3.3	1.5	3.1	1280	**S201_3.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	126-127
387	**81**	6.9	18.4	1.4	0.9	4.7	660	**S101_4.7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	124-125
417	**79**	7.1	18.8	4.3	2.0	2.4	1200	**S201_2.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	126-127
467	**97**	5.7	15.3	3.7	2.4	3.9	1160	**S201_3.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	126-127
479	**100**	5.6	14.9	1.8	1.1	3.8	630	**S101_3.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	124-125
526	**100**	5.6	14.9	3.6	1.6	1.9	1110	**S201_1.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	126-127
569	**119**	4.7	12.5	2.1	1.4	3.2	600	**S101_3.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	124-125
714	**136**	4.1	11.0	2.9	1.3	1.4	550	**S101_1.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	124-125
728	**152**	3.7	9.8	2.2	1.4	2.5	560	**S101_2.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	124-125
958	**200**	2.8	7.4	2.9	1.9	1.9	510	**S101_1.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	124-125
1300	**271**	2.1	5.5	3.9	2.6	1.4	470	**S101_1.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	124-125



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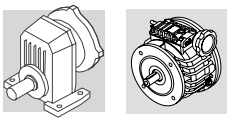
75	**14.2**	52	138	2.4	0.9	8.8	6260	**S501_8.8**	**—** P80	**—** V 1 F	**P80**	**BN80B6**	132-133
77	**14.5**	51	67	1.4	1.3	8.6	3800	**S401_8.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	130-131
77	**14.5**	51	135	1.4	0.6	8.6	3800	**S401_8.6**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	130-131
92	**17.4**	42	56	2.1	1.6	7.2	3800	**S401_7.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	130-131
92	**17.4**	42	113	2.1	0.8	7.2	3800	**S401_7.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	130-131
93	**17.6**	42	56	1.4	1.1	7.1	2400	**S301_7.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	128-129
93	**17.6**	42	111	1.4	0.6	7.1	2400	**S301_7.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	128-129
109	**20.5**	36	48	2.9	2.3	6.1	3800	**S401_6.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	130-131
109	**20.5**	36	96	2.9	1.2	6.1	3800	**S401_6.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	130-131
114	**21.6**	34	45	1.7	1.5	5.8	2300	**S301_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	128-129
114	**21.6**	34	91	1.7	0.8	5.8	2300	**S301_5.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	128-129
116	**22.1**	38	67	1.8	1.3	8.6	3800	**S401_8.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	130-131
116	**22.1**	38	101	1.8	0.8	8.6	3800	**S401_8.6**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	130-131
135	**25.5**	29	38	2.0	1.8	4.9	2200	**S301_4.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	128-129
135	**25.5**	29	77	2.0	0.9	4.9	2200	**S301_4.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	128-129
139	**26.4**	32	56	2.8	1.6	7.2	3720	**S401_7.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	130-131
139	**26.4**	32	85	2.8	1.1	7.2	3720	**S401_7.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	130-131
141	**26.8**	31	56	1.9	1.1	7.1	2400	**S301_7.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	128-129
164	**31**	27	48	3.9	2.3	6.1	3530	**S401_6.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	130-131
164	**31**	27	72	3.9	1.5	6.1	3530	**S401_6.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	130-131
172	**33**	26	45	2.3	1.5	5.8	2040	**S301_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	128-129
172	**33**	26	68	2.3	1.0	5.8	2040	**S301_5.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	128-129
187	**36**	21	52	1.9	1.3	10.7	3410	**S401_10.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	130-131
194	**37**	20	50	1.2	0.8	10.3	2000	**S301_10.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	128-129
204	**39**	22	38	2.7	1.8	4.9	1950	**S301_4.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	128-129
204	**39**	22	58	2.7	1.2	4.9	1950	**S301_4.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	128-129
225	**43**	17.4	44	1.4	1.0	8.9	1910	**S301_8.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	128-129
256	**49**	17.2	46	3.4	1.5	3.9	1830	**S301_3.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	128-129
278	**53**	14.1	35	1.5	1.0	7.2	1310	**S201_7.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	126-127
282	**54**	13.9	35	2.9	1.8	7.1	1790	**S301_7.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	128-129
323	**61**	13.7	36	4.2	1.9	3.1	1170	**S301_3.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	128-129
345	**66**	11.4	28	1.8	1.3	5.8	1240	**S201_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	126-127
417	**79**	10.6	19	2.8	2.0	2.4	1160	**S201_2.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	126-127
417	**79**	10.6	28	5.5	2.5	2.4	1580	**S301_2.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	128-129
474	**89**	8.2	11.0	1.5	1.3	1.4	570	**S101_1.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	124-125
474	**89**	8.2	22	4.3	1.9	1.4	1520	**S301_1.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	128-129
513	**97**	7.6	19.1	2.7	1.9	3.9	1110	**S201_3.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	126-127
526	**100**	8.4	14.9	1.4	0.9	1.9	550	**S101_1.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	124-125



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556	**106**	7.9	21	4.4	2.0	1.8	1450	**S301_1.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	128-129
625	**119**	6.3	15.7	1.6	1.1	3.2	550	**S101_3.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	124-125
645	**123**	6.1	15.2	3.5	2.4	3.1	1030	**S201_3.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	126-127
714	**136**	6.2	11.0	1.9	1.3	1.4	520	**S101_1.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	124-125
714	**136**	6.2	16.5	3.2	1.5	1.4	980	**S201_1.4**	— P80	— V 1 F	**P80**	**BN80A4**	126-127
714	**136**	6.2	16.5	5.7	2.6	1.4	1340	**S301_1.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	128-129
800	**152**	4.9	12.3	1.6	1.1	2.5	520	**S101_2.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	124-125
833	**158**	4.7	11.8	4.5	3.1	2.4	960	**S201_2.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	126-127
1053	**200**	3.7	9.3	2.1	1.5	1.9	480	**S101_1.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	124-125
1053	**200**	3.7	9.3	3.5	2.6	1.9	890	**S201_1.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	126-127
1429	**271**	2.7	6.9	2.9	2.0	1.4	440	**S101_1.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	124-125

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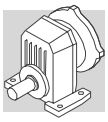
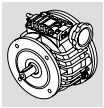
63	**11.9**	82	165	1.4	0.7	10.5	6520	**S501_10.5**	— P80	— V 1 F	**P80**	**BN80C6**	132-133
75	**14.2**	69	138	1.8	0.9	8.8	6190	**S501_8.8**	— P80	— V 1 F	**P80**	**BN80C6**	132-133
92	**17.4**	56	113	1.6	0.8	7.2	3800	**S401_7.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	130-131
93	**17.6**	56	111	1.0	0.6	7.1	2310	**S301_7.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	128-129
95	**18.1**	62	165	1.9	0.7	10.5	5730	**S501_10.5**	— P80	— V 1 F	**P80**	**BN80B4**	132-133
109	**20.5**	48	96	2.2	1.2	6.1	3800	**S401_6.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	130-131
114	**21.6**	45	91	1.3	0.8	5.8	2210	**S301_5.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	128-129
135	**25.5**	38	77	1.5	0.9	4.9	2130	**S301_4.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	128-129
139	**26.4**	42	113	2.1	0.8	7.2	3660	**S401_7.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	130-131
141	**26.8**	42	111	1.4	0.6	7.1	2070	**S301_7.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	128-129
164	**31**	36	96	2.9	1.2	6.1	3480	**S401_6.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	130-131
170	**32**	31	61	1.9	1.1	3.9	2010	**S301_3.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	128-129
172	**33**	34	91	1.7	0.8	5.8	1980	**S301_5.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	128-129
187	**36**	31	84	1.3	0.8	10.7	3350	**S401_10.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	130-131
204	**39**	29	77	2.0	0.9	4.9	1890	**S301_4.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	128-129
208	**40**	28	38	1.1	1.0	4.8	1310	**S201_4.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	126-127
208	**40**	28	75	3.7	1.7	4.8	3250	**S401_4.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	130-131
214	**40**	24	49	2.4	1.4	3.1	1880	**S301_3.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	128-129
256	**49**	23	31	1.3	1.2	3.9	1250	**S201_3.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	126-127
256	**49**	23	61	2.5	1.1	3.9	1780	**S301_3.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	128-129





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263	**50**	22	60	4.7	2.1	3.8	3020	**S401_3.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	130-131
278	**53**	21	56	3.0	1.6	7.2	2970	**S401_7.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	130-131
282	**54**	21	56	1.9	1.1	7.1	1740	**S301_7.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	128-129
323	**61**	18.2	24	1.6	1.5	3.1	1180	**S201_3.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	126-127
323	**61**	18.2	49	3.2	1.4	3.1	1660	**S301_3.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	128-129
345	**66**	17.1	45	1.2	0.8	5.8	1180	**S201_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	126-127
368	**69**	14.1	28	2.5	1.5	1.8	1620	**S301_1.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	128-129
417	**79**	14.1	38	1.5	1.0	4.8	1120	**S201_4.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	126-127
417	**79**	14.1	18.8	2.1	2.0	2.4	1120	**S201_2.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	126-127
417	**79**	14.1	38	4.1	1.9	2.4	1550	**S301_2.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	128-129
474	**89**	11.0	22	3.2	1.9	1.4	1500	**S301_1.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	128-129
513	**97**	11.5	31	1.8	1.2	3.9	1060	**S201_3.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	126-127
513	**97**	11.5	31	3.5	2.3	3.9	1470	**S301_3.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	128-129
526	**100**	11.2	14.9	1.8	1.6	1.9	1050	**S201_1.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	126-127
556	**106**	10.6	28	3.3	1.5	1.8	1430	**S301_1.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	128-129
645	**123**	9.1	24	2.3	1.5	3.1	1000	**S201_3.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	126-127
714	**136**	8.2	11.0	2.4	2.2	1.4	960	**S201_1.4**	**V05** —	**V 0.5 C** —	**P80**	**BN80B4**	126-127
714	**136**	8.2	22	4.3	1.9	1.4	1320	**S301_1.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	128-129
833	**158**	7.1	18.8	3.0	2.0	2.4	930	**S201_2.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	126-127
1053	**200**	5.6	14.9	2.3	1.6	1.9	870	**S201_1.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	126-127
1429	**271**	4.1	11.0	1.9	1.3	1.4	420	**S101_1.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	124-125

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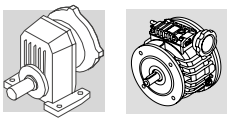
57	**11.9**	123	165	0.9	0.7	10.5	6330	**S501_10.5**	**—** P80	**—** V 1 F	**P90**	**BN90L6**	132-133
68	**14.2**	103	138	1.2	0.9	8.8	6030	**S501_8.8**	**—** P80	**—** V 1 F	**P90**	**BN90L6**	132-133
81	**16.9**	87	116	1.6	1.2	7.4	5740	**S501_7.4**	**—** P80	**—** V 1 F	**P90**	**BN90L6**	132-133
90	**16.9**	87	232	1.6	0.6	7.4	5740	**S501_7.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	132-133
102	**21.6**	78	138	1.6	0.9	8.8	5320	**S501_8.8**	**—** P80	**—** V 1 F	**P90**	**BN90S4**	132-133
109	**20.5**	72	191	1.5	0.6	6.1	3800	**S401_6.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	130-131
109	**20.5**	72	191	2.1	0.8	6.1	5420	**S501_6.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	132-133
135	**25.7**	65	174	2.1	0.8	7.4	5050	**S501_7.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	132-133
138	**26.0**	56	151	1.9	0.8	4.8	2590	**S401_4.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	130-131



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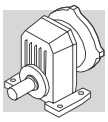
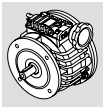
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N					IEC	
164	**31**	54	143	2.0	0.8	6.1	3380	**S401_6.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	130-131
164	**31**	54	143	2.8	1.0	6.1	4760	**S501_6.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	132-133
184	**39**	44	77	1.3	0.9	4.9	1780	**S301_4.9**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	128-129
190	**36**	46	123	1.8	0.9	10.5	4560	**S501_10.5**	— P80	— V 1 F	**P80**	**BN80B2**	132-133
208	**40**	42	113	2.5	1.1	4.8	3170	**S401_4.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	130-131
208	**40**	42	113	4.1	1.6	4.8	4420	**S501_4.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	132-133
227	**43**	39	103	2.2	1.2	8.8	4320	**S501_8.8**	— P80	— V 1 F	**P80**	**BN80B2**	132-133
233	**44**	38	101	1.3	0.8	8.6	3080	**S401_8.6**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	130-131
263	**50**	34	89	3.1	1.4	3.8	2960	**S401_3.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	130-131
263	**50**	34	89	5.2	2.2	3.8	4140	**S501_3.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	132-133
282	**54**	31	83	1.3	0.7	7.1	1660	**S301_7.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	128-129
323	**61**	27	73	3.8	1.7	3.1	2770	**S401_3.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	130-131
328	**62**	27	72	2.6	1.5	6.1	2770	**S401_6.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	130-131
345	**66**	26	68	1.6	1.0	5.8	1580	**S301_5.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	128-129
349	**66**	22	60	3.1	1.4	1.9	2700	**S401_1.9**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	130-131
408	**78**	22	58	1.9	1.2	4.9	1510	**S301_4.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	128-129
474	**89**	16.5	44	2.1	1.0	1.4	1450	**S301_1.4**	— P90	— V 2 F	**P90**	**BN90L6**	128-129
474	**89**	16.5	44	4.3	1.9	1.4	2440	**S401_1.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	130-131
513	**97**	17.2	46	2.3	1.5	3.9	1420	**S301_3.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	128-129
526	**100**	16.8	45	4.2	1.9	1.9	2370	**S401_1.9**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	130-131
645	**123**	13.7	36	1.5	1.0	3.1	950	**S201_3.1**	— P80	— V 1 F	**P80**	**BN80B2**	126-127
645	**123**	13.7	24	1.5	1.5	3.1	950	**S201_3.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B2**	126-127
645	**123**	13.7	36	2.9	1.9	3.1	1320	**S301_3.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	128-129
714	**136**	12.3	33	5.7	2.6	1.4	2160	**S401_1.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	130-131
833	**158**	10.6	28	2.0	1.3	2.4	890	**S201_2.4**	— P80	— V 1 F	**P80**	**BN80B2**	126-127
833	**158**	10.6	28	3.8	2.5	2.4	1240	**S301_2.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	128-129
1053	**200**	8.4	22	1.6	1.1	1.9	840	**S201_1.9**	— P80	— V 1 F	**P80**	**BN80B2**	126-127
1111	**211**	7.9	21	3.0	2.0	1.8	1140	**S301_1.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	128-129
1429	**271**	6.2	16.5	2.1	1.5	1.4	770	**S201_1.4**	— P80	— V 1 F	**P80**	**BN80B2**	126-127
1429	**271**	6.2	16.5	3.9	2.6	1.4	1050	**S301_1.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	128-129





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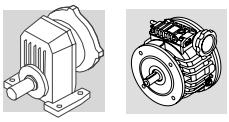
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
90	**16.9**	116	254	1.2	0.6	7.4	5610	**S501_7.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	132-133
109	**20.5**	96	209	1.1	0.5	6.1	3630	**S401_6.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	130-131
109	**20.5**	96	209	1.6	0.7	6.1	5310	**S501_6.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	132-133
138	**26.0**	75	165	1.4	0.8	4.8	3480	**S401_4.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	130-131
138	**26.0**	75	165	2.3	1.1	4.8	4940	**S501_4.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	132-133
164	**31**	72	191	1.5	0.6	6.1	3280	**S401_6.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	130-131
164	**31**	72	191	2.1	0.8	6.1	4680	**S501_6.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	132-133
174	**33**	60	130	1.8	1.0	3.8	3270	**S401_3.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	130-131
208	**40**	56	151	1.9	0.8	4.8	3090	**S401_4.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	130-131
208	**40**	56	151	3.1	1.2	4.8	4350	**S501_4.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	132-133
227	**43**	52	138	1.6	0.9	8.8	4260	**S501_8.8**	**—** P80	**—** V 1 F	**P80**	**BN80C2**	132-133
231	**49**	46	61	1.3	1.1	3.9	1590	**S301_3.9**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90LA4**	128-129
237	**50**	45	60	2.3	2.1	3.8	2890	**S401_3.8**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90LA4**	130-131
263	**50**	45	119	2.3	1.0	3.8	2890	**S401_3.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	130-131
263	**50**	45	119	3.9	1.7	3.8	4090	**S501_3.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	132-133
276	**52**	38	82	2.8	1.5	2.4	2870	**S401_2.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	130-131
282	**54**	42	56	1.0	1.1	7.1	1580	**S301_7.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80C2**	128-129
323	**61**	36	97	2.9	1.3	3.1	2710	**S401_3.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	130-131
345	**66**	34	45	1.2	1.5	5.8	1510	**S301_5.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80C2**	128-129
349	**66**	30	65	2.3	1.3	1.9	2660	**S401_1.9**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	130-131
408	**78**	29	77	1.4	0.9	4.9	1450	**S301_4.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	128-129
408	**78**	29	38	1.4	1.8	4.9	1450	**S301_4.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80C2**	128-129
417	**79**	28	75	3.7	1.7	2.4	2530	**S401_2.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	130-131
474	**89**	22	48	1.6	0.9	1.4	1390	**S301_1.4**	**—** P90	**—** V 2 F	**P90**	**BN100LA6R**	128-129
474	**89**	22	48	3.2	1.8	1.4	2430	**S401_1.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	130-131
513	**97**	23	61	1.7	1.1	3.9	1380	**S301_3.9**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	128-129
526	**100**	22	60	3.1	1.4	1.9	2340	**S401_1.9**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	130-131
645	**123**	18.2	49	2.2	1.4	3.1	1290	**S301_3.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	128-129
714	**136**	16.5	44	2.1	1.0	1.4	1240	**S301_1.4**	**—** P90	**—** V 2 F	**P90**	**BN90LA4**	128-129
714	**136**	16.5	44	4.3	1.9	1.4	2130	**S401_1.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	130-131
833	**158**	14.1	38	2.8	1.9	2.4	1210	**S301_2.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	128-129



1.5 kW

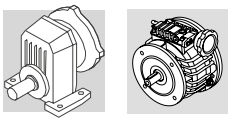
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N					IEC	
1111	**211**	10.6	28	2.3	1.5	1.8	1110	**S301_1.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	128-129
1429	**271**	8.2	22	2.9	1.9	1.4	1030	**S301_1.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	128-129
1429	**271**	8.2	22	1.6	1.1	1.4	740	**S201_1.4**	— P80	— V 1 F	**P80**	**BN80C2**	126-127

1.85 kW

135	**25.7**	102	254	1.4	0.6	7.4	4890	**S501_7.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	132-133
164	**31**	84	209	1.3	0.5	6.1	3220	**S401_6.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	130-131
164	**31**	84	209	1.8	0.7	6.1	4630	**S501_6.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	132-133
208	**40**	66	165	1.6	0.8	4.8	3030	**S401_4.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	130-131
208	**40**	66	165	2.7	1.1	4.8	4310	**S501_4.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	132-133
263	**50**	52	130	2.0	1.0	3.8	2850	**S401_3.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	130-131
263	**50**	52	130	3.4	1.5	3.8	4050	**S501_3.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	132-133
323	**61**	43	106	2.5	1.2	3.1	2680	**S401_3.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	130-131
333	**63**	41	103	3.9	1.9	3.0	3780	**S501_3**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	132-133
417	**79**	33	82	3.2	1.5	2.4	2500	**S401_2.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	130-131
526	**100**	26	65	2.7	1.3	1.9	2320	**S401_1.9**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	130-131
714	**136**	19.2	48	1.8	0.9	1.4	1220	**S301_1.4**	— P90	— V 2 F	**P90**	**BN90LB4**	128-129
714	**136**	19.2	48	3.6	1.8	1.4	2110	**S401_1.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	130-131

2.2 kW

109	**20.5**	143	335	1.0	0.4	6.1	5090	**S501_6.1**	**V3** P100	**V 3 C** V 3 F	**P112**	**BN112M6**	132-133
135	**25.7**	116	290	1.2	0.5	7.4	4820	**S501_7.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	132-133
164	**31**	96	239	1.6	0.6	6.1	4570	**S501_6.1**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	132-133
174	**33**	89	209	2.0	1.0	3.8	4500	**S501_3.8**	**V3** P100	**V 3 C** V 3 F	**P112**	**BN112M6**	132-133
208	**40**	75	188	1.4	0.7	4.8	2975	**S401_4.8**	— P100	— V 3 F	**P100**	**BN100LA4**	130-131
208	**40**	75	188	2.3	1.0	4.8	4270	**S501_4.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	132-133
221	**42**	71	165	2.3	1.2	3.0	4220	**S501_3**	**V3** P100	**V 3 C** V 3 F	**P112**	**BN112M6**	132-133
263	**50**	60	149	2.9	1.3	3.8	4010	**S501_3.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	132-133
323	**61**	49	122	2.2	1.0	3.1	2640	**S401_3.1**	— P100	— V 3 F	**P100**	**BN100LA4**	130-131
333	**63**	47	118	3.4	1.7	3.0	3750	**S501_3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	132-133



2.2 kW

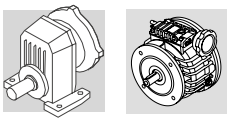
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						IEC	
368	**69**	42	99	3.0	1.6	1.8	3600	**S501_1.8**	**V3** P100	**V 3 C** V 3 F	**P112**	**BN112M6**	132-133
417	**79**	38	94	4.0	1.9	2.4	3490	**S501_2.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	132-133
474	**89**	33	77	3.8	2.0	1.4	3360	**S501_1.4**	**V3** P100	**V 3 C** V 3 F	**P112**	**BN112M6**	132-133
526	**100**	30	74	2.3	1.1	1.9	2290	**S401_1.9**	— P100	— V 3 F	**P100**	**BN100LA4**	130-131
556	**106**	28	71	4.4	2.2	1.8	3190	**S501_1.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	132-133
714	**136**	22	55	1.6	0.8	1.4	1190	**S301_1.4**	— P100	— V 3 F	**P100**	**BN100LA4**	128-129
714	**136**	22	55	3.2	1.5	1.4	2090	**S401_1.4**	— P100	— V 3 F	**P100**	**BN100LA4**	130-131
714	**136**	22	55	5.7	2.8	1.4	2970	**S501_1.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	132-133

3 kW

164	**31**	143	335	1.0	0.4	6.1	4360	**S501_6.1**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	132-133
208	**40**	113	263	1.6	0.7	4.8	4090	**S501_4.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	132-133
263	**50**	89	209	2.0	1.0	3.8	3870	**S501_3.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	132-133
323	**61**	73	170	1.4	0.7	3.1	2500	**S401_3.1**	— P100	— V 3 F	**P100**	**BN100LB4**	130-131
333	**63**	71	165	2.3	1.2	3.0	3640	**S501_3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	132-133
417	**79**	56	132	2.7	1.4	2.4	3400	**S501_2.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	132-133
526	**100**	45	104	1.6	0.8	1.9	2200	**S401_1.9**	— P100	— V 3 F	**P100**	**BN100LB4**	130-131
556	**106**	42	99	3.0	**1.6**	1.8	3110	**S501_1.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	132-133
714	**136**	33	77	2.1	1.1	1.4	2100	**S401_1.4**	— P100	— V 3 F	**P100**	**BN100LB4**	130-131
714	**136**	33	77	3.8	2.0	1.4	2900	**S501_1.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	132-133

4 kW

164	**31**	191	430	0.8	0.3	6.1	4160	**S501_6.1**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	132-133
208	**40**	151	339	1.2	0.5	4.8	3910	**S501_4.8**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	132-133
263	**50**	119	268	1.5	0.7	3.8	3720	**S501_3.8**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	132-133
276	**52**	148	273	1.0	0.7	2.4	3710	**S501_2.4**	— P132	— V 10 F	**P132**	**BN132MA6**	132-133
333	**63**	94	212	1.7	0.9	3.0	3520	**S501_3**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	132-133
368	**69**	111	205	1.1	0.8	1.8	3430	**S501_1.8**	— P132	— V 10 F	**P132**	**BN132MA6**	132-133
417	**79**	75	169	2.0	1.1	2.4	3300	**S501_2.4**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	132-133
474	**89**	86	159	1.4	1.0	1.4	3210	**S501_1.4**	— P132	— V 10 F	**P132**	**BN132MA6**	132-133



4 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
556	**106**	56	127	2.2	1.2	1.8	3040	**S501_1.8**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	132-133
714	**136**	44	99	1.6	0.9	1.4	1950	**S401_1.4**	— P112	— V 5.5 F	**P112**	**BN112M4**	130-131
714	**136**	44	99	2.8	1.6	1.4	2840	**S501_1.4**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	132-133

5.5 kW

263	**50**	160	320	1.1	0.6	3.8	3520	**S501_3.8**	— P132	— V 10 F	**P132**	**BN132S4**	132-133
333	**63**	126	253	1.3	0.8	3.0	3360	**S501_3**	— P132	— V 10 F	**P132**	**BN132S4**	132-133
417	**79**	101	202	1.5	0.9	2.4	3170	**S501_2.4**	— P132	— V 10 F	**P132**	**BN132S4**	132-133
474	**89**	86	159	1.4	1.0	1.4	3060	**S501_1.4**	— P132	— V 10 F	**P132**	**BN132MB6**	132-133
556	**106**	76	152	1.6	1.0	1.8	2940	**S501_1.8**	— P132	— V 10 F	**P132**	**BN132S4**	132-133
714	**136**	59	118	1.2	0.7	1.4	1850	**S401_1.4**	— P132	— V 10 F	**P132**	**BN132S4**	130-131
714	**136**	59	118	2.1	1.3	1.4	2760	**S501_1.4**	— P132	— V 10 F	**P132**	**BN132S4**	132-133

7.5 kW

417	**79**	136	273	1.1	0.7	2.4	2990	**S501_2.4**	— P132	— V 10 F	**P132**	**BN132MA4**	132-133
556	**106**	102	205	1.2	0.8	1.8	2800	**S501_1.8**	— P132	— V 10 F	**P132**	**BN132MA4**	132-133
714	**136**	80	159	1.6	1.0	1.4	2640	**S501_1.4**	— P132	— V 10 F	**P132**	**BN132MA4**	132-133

9.2 kW

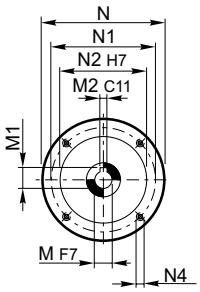
556	**106**	127	254	1.0	0.6	1.8	2660	**S501_1.8**	— P132	— V 10 F	**P132**	**BN132MB4**	132-133
714	**136**	99	198	1.3	0.8	1.4	2530	**S501_1.4**	— P132	— V 10 F	**P132**	**BN132MB4**	132-133

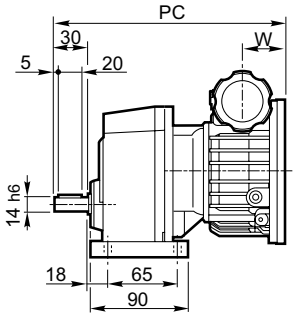
22.10 - Dimensioni serie S + V

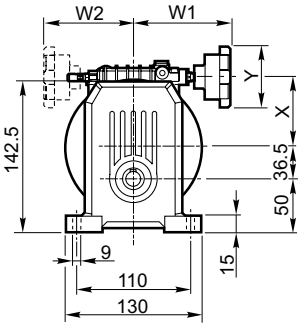
22.10 - Dimensions series S + V

22.10 - Abmessungen - serie S + V

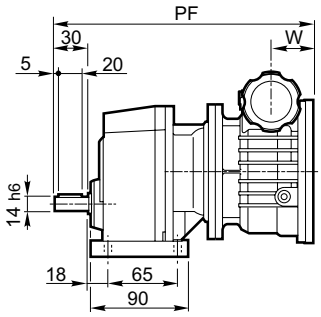
22.10 - Dimensions series S + V

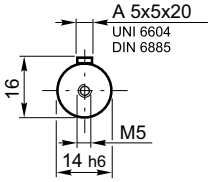






S 101 P + V_P (IEC)





		IEC	V_C - V_F												S 101P + V_C		S 101P + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
S 101P	V 0.25	P63	140	115	95	M8x20	11	12.8	4	45	115	110	70	83	216	7.1	298	9.5
	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	218	10.2	300	12.6
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	78	83	222	10.2	304	12.6

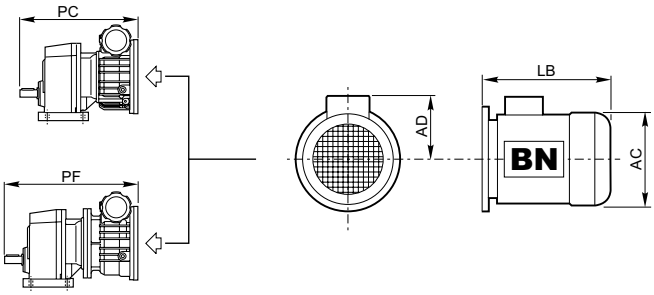
** Utilizzare linguetta ribassata 6x5x30 "A"

** *Use lowered key 6x5x30 "A"*

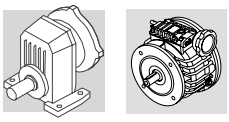
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

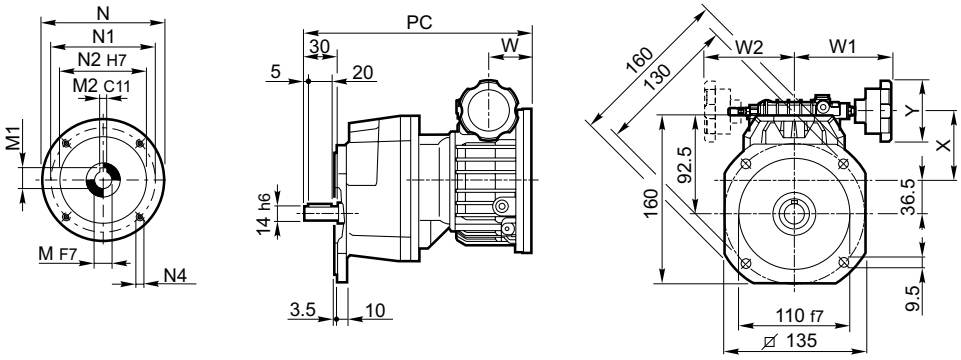
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

S 101 P + V_P + BN

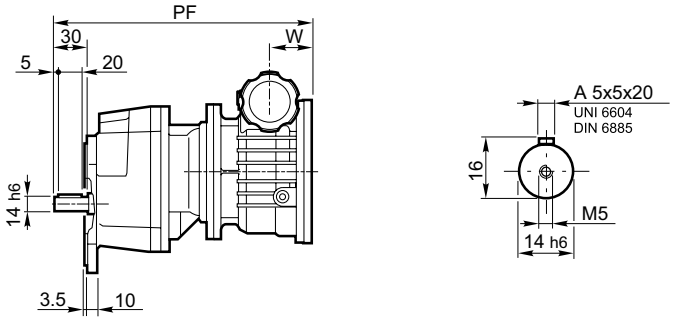


		IEC	BN			S 101P + V_C		S 101P + V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
S 101P	V 0.25	63	121	95	184	400	11.0	481.5	13.4
	V 0.25	71R	138	108	219	435	12.5	516.5	14.9
	V 0.5	71	138	108	219	437	16.1	519	18.5
	V 0.5	80	156	119	234	456	20.1	538	22.5





S 101 F_ + V_P (IEC)



		IEC	V_C - V_F												S 101F + V_C		S 101F + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
S 101F	V 0.25	P63	140	115	95	M8x20	11	12.8	4	45	115	110	70	83	216	7.2	298	9.6
	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	218	10.3	300	12.7
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	78	83	222	10.3	304	12.7

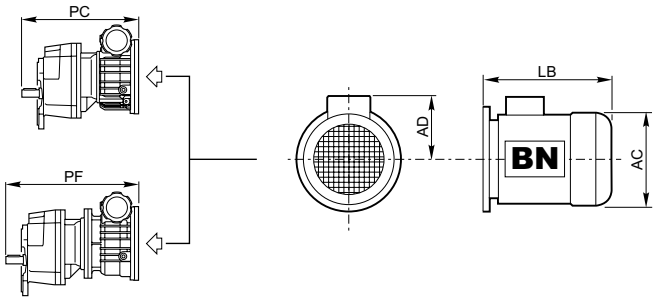
** Utilizzare linguetta ribassata 6x5x30 "A"

** *Use lowered key 6x5x30 "A"*

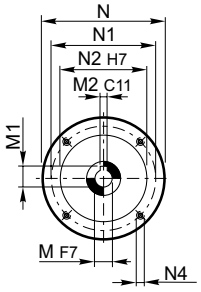
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

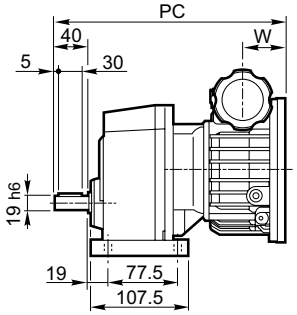
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

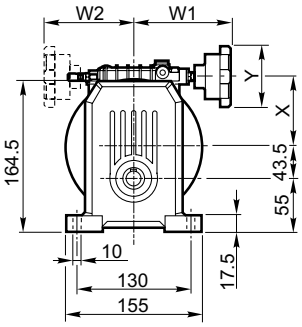
S 101 F + V_P + BN



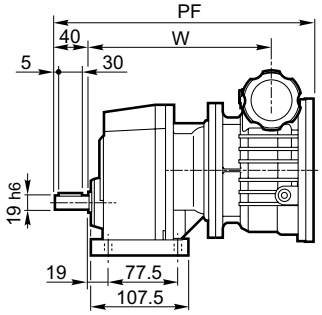
		IEC	BN			S 101F + V_C		S 101F + V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
S 101F	V 0.25	63	121	95	184	400	11.1	482	13.5
	V 0.25	71R	138	108	219	435	12.6	517	15.0
	V 0.5	71	138	108	219	437	16.2	519	18.6
	V 0.5	80	156	119	234	456	20.2	538	22.6

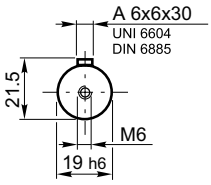






S 201 P_ + V_P (IEC)





		IEC	V_C - V_F												S 201P+ V_C		S 201P+ V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
S 201P	V 0.25	P63	140	115	95	M8x20	11	12.8	4	45	115	110	70	83	241	8.3	316	10.5
	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	244	10.9	318	13.7
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	78	83	248	10.9	322	13.7
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	—	—	364	21.1
	V 1	P90	200	165	130	M10x20	24	26.3*	8	59	133	124	97	83	—	—	364	21.1

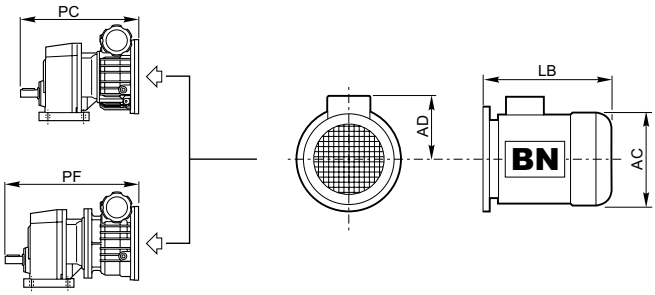
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

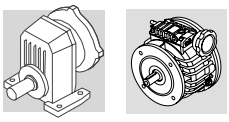
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

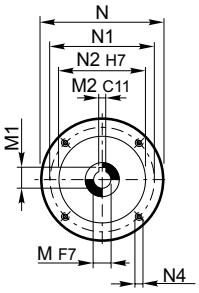
* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

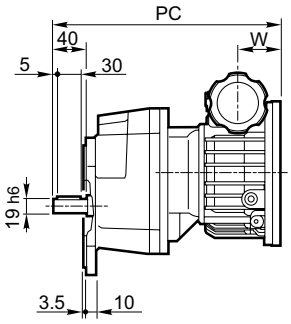
S 201 P + V_P + BN

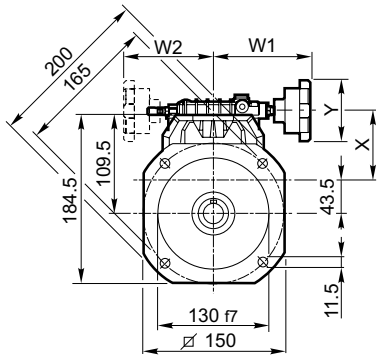


		IEC	BN			S 201P + V_C		S 201P + V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
S 201P	V 0.25	63	121	95	184	425	12.2	500	14.4
	V 0.25	71R	138	108	219	460	13.7	535	15.9
	V 0.5	71	138	108	219	463	16.8	537	19.6
	V 0.5	80	156	119	234	482	20.8	556	23.6
	V 1	80	156	119	234	—	—	598	31
	V 1	90S	176	133	276	—	—	640	33.4
	V 1	90L	176	133	276	—	—	640	35.4

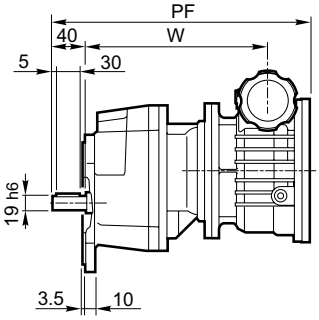


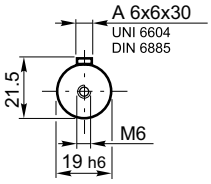






S 201 F_ + V_P (IEC)





		IEC	V_C - V_F												S 201F+ V_C		S 201F + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
S 201F	V 0.25	P63	140	115	95	M8X20	11	12.8	4	45	115	110	70	83	241	8.5	316	10.7
	V 0.5	P71	160	130	110	M8X20	14	16.3	5	47.5	115	110	78	83	244	11	318	13.8
	V 0.5	P80	200	165	130	M10X20	19	20.8**	6	51.5	115	110	78	83	248	11	322	13.8
	V 1	P80	200	165	130	M10X20	19	21.8	6	59	133	124	97	83	—	—	364	21.3
	V 1	P90	200	165	130	M10X20	24	26.3*	8	59	133	124	97	83	—	—	364	21.3

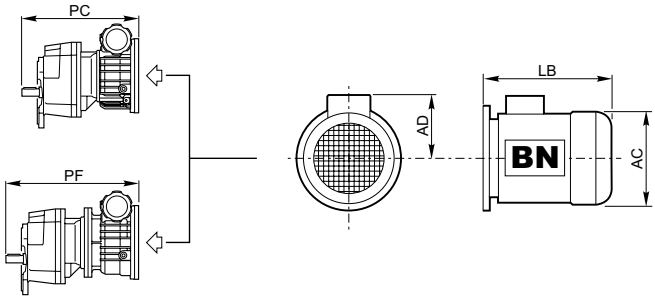
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

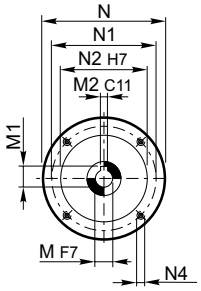
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

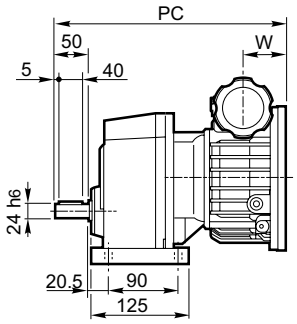
* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

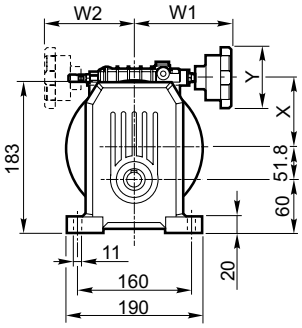
S 201 F + V_P + BN



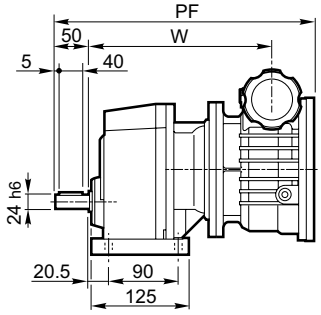
		IEC	BN			S 201F + V_C		S 201F + V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
S 201F	V 0.25	63	121	95	425	425	12.4	500	14.6
	V 0.25	71R	138	108	460	460	13.9	535	16.1
	V 0.5	71	138	108	463	463	16.9	537	19.7
	V 0.5	80	156	119	482	482	20.9	556	23.7
	V 1	80	156	119	—	—	—	598	31
	V 1	90S	176	133	—	—	—	640	34
	V 1	90L	176	133	—	—	—	640	36

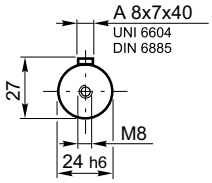






S 301 P + V_P (IEC)





		IEC	V_C - V_F												S 301P+ V_C		S 301P+ V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
S 301P	V 0.25	P 63	140	115	95	M8X20	11	12.8	4	45	115	110	70	83	—	—	341	12.4
	V 0.5	P 71	160	130	110	M8X20	14	16.3	5	47.5	115	110	78	83	269	13.1	343	15.6
	V 0.5	P 80	200	165	130	M10X20	19	20.8**	6	51.5	115	110	78	83	273	13.1	347	15.6
	V 1	P 80	200	165	130	M10X20	19	21.8	6	59	133	124	97	83	305	19.1	389	23.1
	V 1	P 90	200	165	130	M10X20	24	26.3*	8	59	133	124	97	83	305	19.1	389	23.1
	V 2	P 90	200	165	130	M10X15	24	27.3	8	74.1	137	120	113	83	—	—	413	27.8

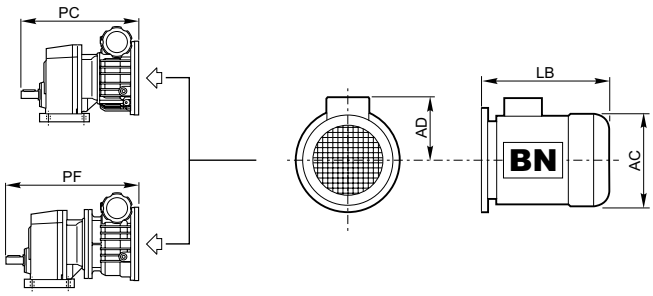
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

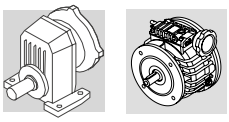
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

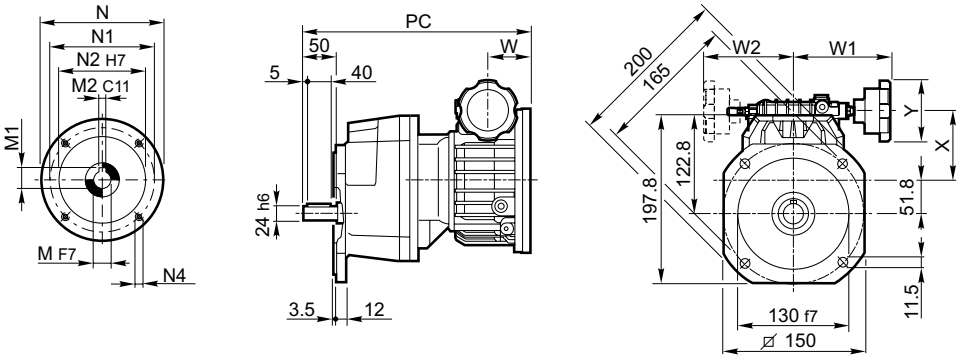
* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

S 301 P + V_P + BN

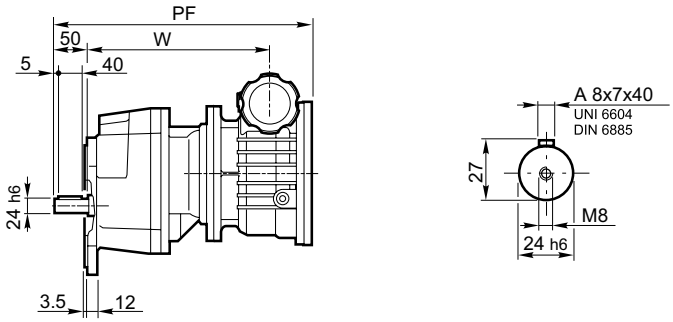


		IEC	BN			S 301P + V_C		S 301P + V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
S 301P	V 0.25	63	121	95	184	—	—	525	16.3
	V 0.25	71R	138	108	219	—	—	560	17.8
	V 0.5	71	138	108	219	488	19.0	562	21.5
	V 0.5	80	156	119	234	507	23.0	581	25.5
	V 1	80	156	119	234	539	29.0	623	33
	V 1	90S	176	133	276	581	31	665	35
	V 1	90L	176	133	276	581	33	665	37
	V 2	90S	176	133	276	—	—	689	40
	V 2	90L	176	133	276	—	—	689	42
	V 2	100R	195	142	307	—	—	720	50





S 301 F + V_P (IEC)



		IEC	V_C - V_F												S 301F+ V_C		S 301F+ V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
S 301F	V 0.25	P63	140	115	95	M8X20	11	12.8	4	45	115	110	70	83	—	—	341	12.7
	V 0.5	P71	160	130	110	M8X20	14	16.3	5	47.5	115	110	78	83	269	13.4	343	15.9
	V 0.5	P80	200	165	130	M10X20	19	20.8**	6	51.5	115	110	78	83	273	13.4	347	15.9
	V 1	P80	200	165	130	M10X20	19	21.8	6	59	133	124	97	83	305	19.4	389	23.4
	V 1	P90	200	165	130	M10X20	24	26.3*	8	59	133	124	97	83	305	19.4	389	23.4
	V 2	P90	200	165	130	M10X15	24	27.3	8	74.1	137	120	113	83	—	—	413	28.1

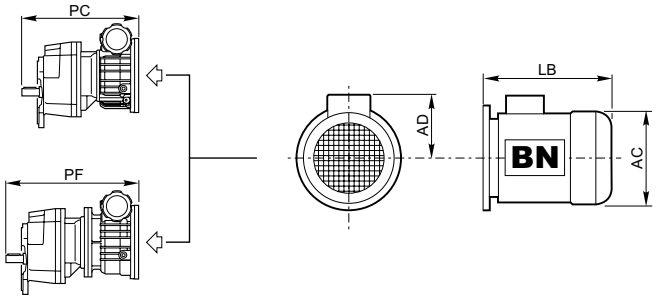
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

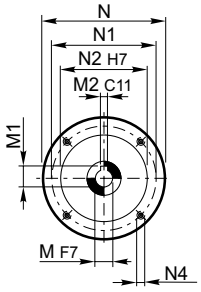
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

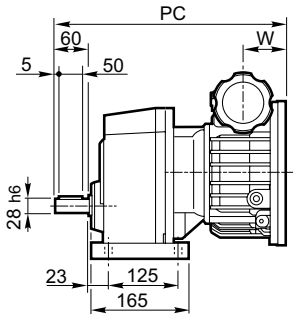
* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

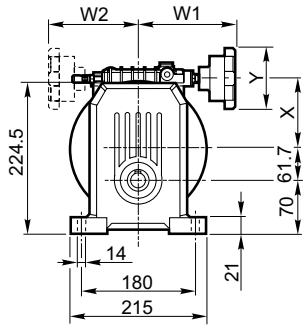
S 301 F + V_P + BN



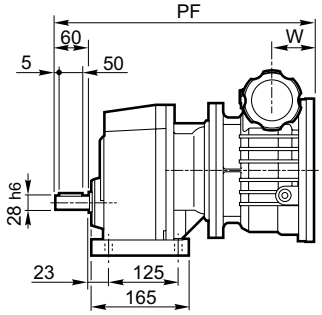
		IEC	BN			S 301F+ V_C		S 301F+ V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
S 301F	V 0.25	63	121	95	184	—	—	525	16.6
	V 0.25	71R	138	108	219	—	—	560	18.1
	V 0.5	71	138	108	219	488	19.3	562	21.8
	V 0.5	80	156	119	234	507	23.3	581	25.8
	V 1	80	156	119	234	539	29.3	523	33
	V 1	90S	176	133	276	581	32	665	36
	V 1	90L	176	133	276	581	34	665	38
	V 2	90S	176	133	276	—	—	689	40
	V 2	90L	176	133	276	—	—	689	42
	V 2	100R	195	142	307	—	—	720	50

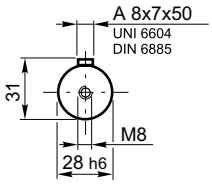






S 401 P + V_P (IEC)





		IEC	V_C - V_F												S 401P+ V_C		S 401P+ V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
S 401P	V 0.5	P71	160	130	110	M8X20	14	16.3	5	47.5	115	110	78	83	318	25.6	385	30
	V 0.5	P80	200	165	130	M10X20	19	20.8**	6	51.5	115	110	78	83	322	25.6	389	30
	V 1	P80	200	165	130	M10X20	19	21.8	6	59	133	124	97	83	347	32	431	38
	V 1	P90	200	165	130	M10X20	24	26.3*	8	59	133	124	97	83	347	32	431	38
	V 2	P90	200	165	130	M10X15	24	27.3	8	74.1	137	120	113	83	370	37	455	43
	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	—	—	519	67
	V 5.5	P112	250	215	180	M12	28	31.3	8	108	172.5	—	150.5	109	—	—	519	67

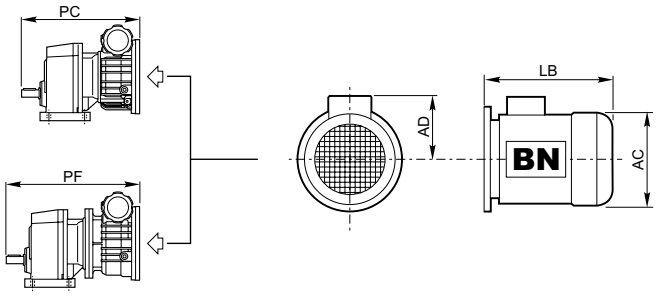
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

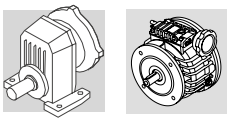
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

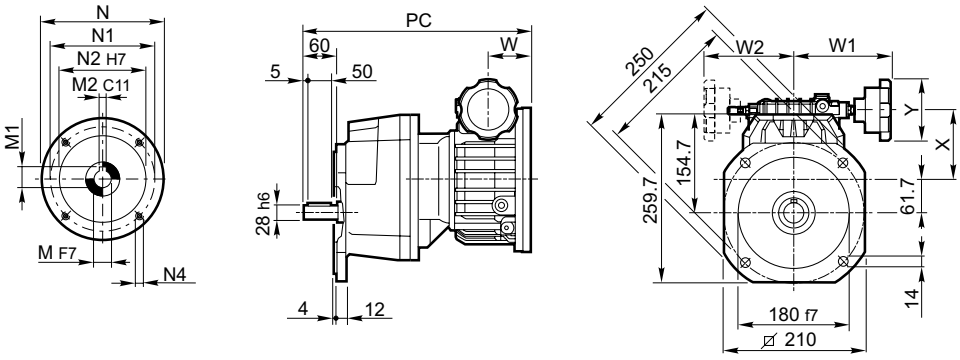
* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

S 401 P + V_P + BN

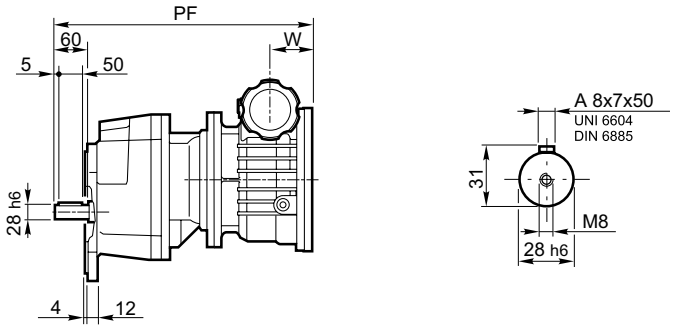


		IEC	BN			S 401P + V_C		S 401P + V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
S 401P	V 0.5	71	138	108	219	537	32	604	36
	V 0.5	80	156	119	234	556	36	623	40
	V 1	80	156	119	234	581	42	665	48
	V 1	90S	176	133	276	623	44	707	51
	V 1	90L	176	133	276	623	46	707	53
	V 2	90S	176	133	276	646	49	731	55
	V 2	90L	176	133	276	646	51	731	57
	V 2	100R	195	142	307	677	59	762	65
	V 3	100	195	135	306	—	—	825	89
	V 3	112	219	150	325	—	—	844	97
	V 5.5	112	219	150	325	—	—	844	97





S 401 F + V_P (IEC)



		IEC	V_C - V_F												S 401F+ V_C		S 401F+ V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
S 401F	V 0.5	P71	160	130	110	M8X20	14	16.3	5	47.5	115	110	78	83	318	27.4	385	32
	V 0.5	P80	200	165	130	M10X20	19	20.8**	6	51.5	115	110	78	83	322	27.4	389	32
	V 1	P80	200	165	130	M10X20	19	21.8	6	59	133	124	97	83	347	34	431	40
	V 1	P90	200	165	130	M10X20	24	26.3*	8	59	133	124	97	83	347	34	431	40
	V 2	P90	200	165	130	M10X15	24	27.3	8	74.1	137	120	113	83	370	38	455	45
	V 3	P100	250	215	180	M12	28	31.3	8	—	172.5	—	150.5	109	—	—	519	69
	V 5.5	P112	250	215	180	M12	28	31.3	8	—	172	—	150.5	109	—	—	519	69

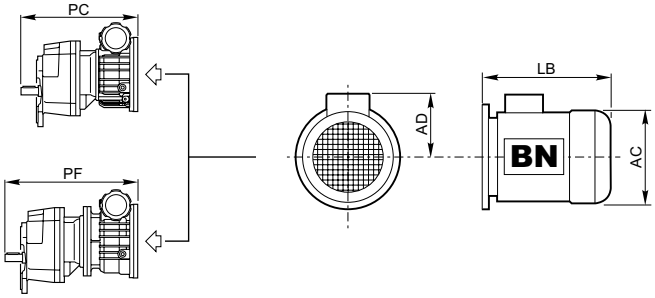
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

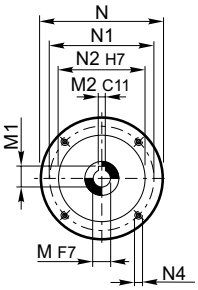
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

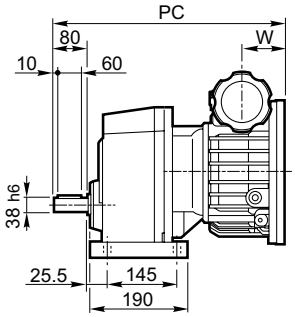
* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

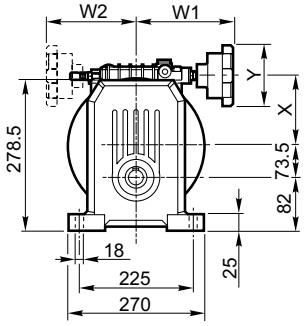
S 401 F + V_P + BN



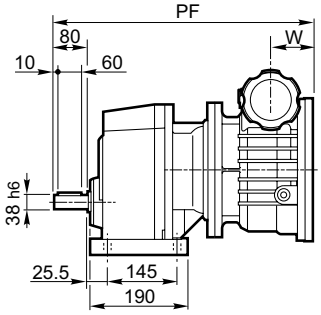
		IEC	BN			S 401F + V_C		S 401F + V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
S 401F	V 0.5	71	138	108	219	537	33	604	38
	V 0.5	80	156	119	234	556	37	623	42
	V 1	80	156	119	234	581	44	665	50
	V 1	90S	176	133	276	623	46	707	52
	V 1	90L	176	133	276	623	48	707	54
	V 2	90S	176	133	276	646	51	731	57
	V 2	90L	176	133	276	646	53	731	59
	V 2	100R	195	142	307	677	61	762	67
	V 3	100	195	135	306	—	—	825	91
	V 3	112	219	150	325	—	—	844	99
	V 5.5	112	219	150	325	—	—	844	99

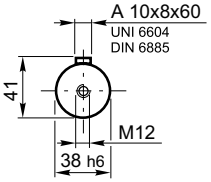






S 501 P + V_P (IEC)





		IEC	V_C - V_F												S 501P+ V_C		S 501P+ V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
S 501P	V 1	P80	200	165	130	M10X20	19	21.8	6	59	133	124	97	83	—	—	451	49
	V 1	P90	200	165	130	M10X20	24	26.3*	8	59	133	124	97	83	—	—	451	49
	V 2	P90	200	165	130	M10X15	24	27.3	8	74.1	137	120	113	83	410	46	495	54
	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	452	66	559	78
	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	452	67	559	80
	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	—	206.5	109	—	—	636	138

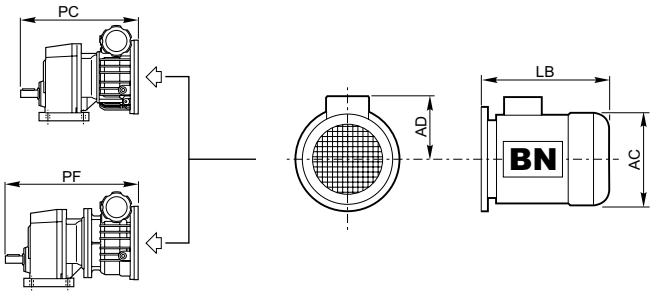
* Utilizzare linguetta ribassata 8x6x35 "A"

* *Use lowered key 8x6x35 "A"*

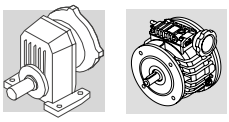
* Den abgeflachten Federkeil 8x6x35 "A" verwenden

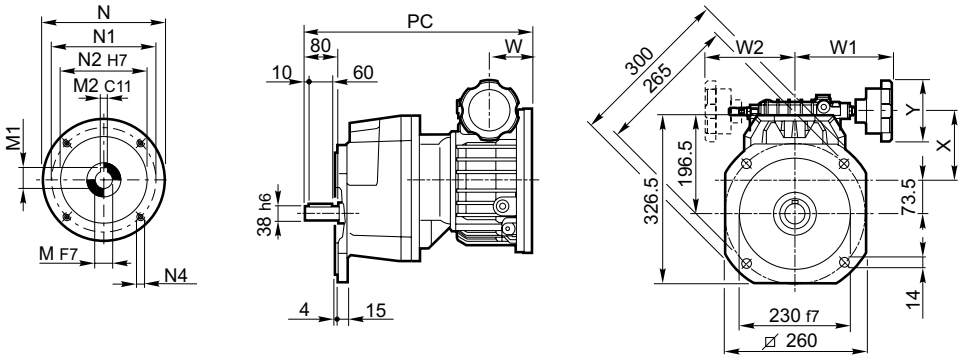
* *Utiliser une languette rabaissée taille 8x6x35* "A"

S 501 P + V_P + BN

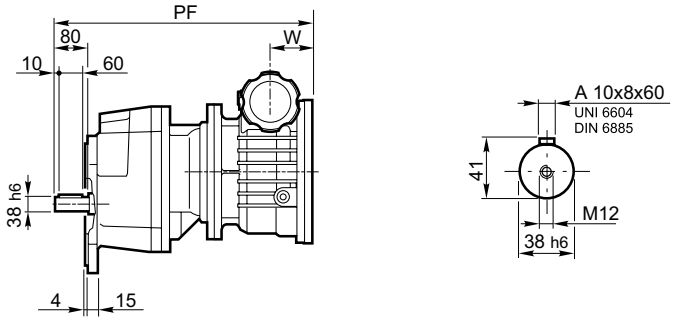


		IEC	BN			S 501P + V_C		S 501P + V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
S 501P	V 1	80	156	119	234	—	—	685	59
	V 1	90S	176	133	276	—	—	727	61
	V 1	90L	176	133	276	—	—	727	63
	V 2	90S	176	133	276	686	58	771	66
	V 2	90L	176	133	276	686	60	771	68
	V 2	100R	195	135	307	717	68	802	76
	V 3	100	195	135	306	758	88	865	100
	V 3	112	219	150	325	777	96	884	108
	V 5.5	112	219	150	325	777	97	884	110
	V 10	132S	258	193	375	—	—	1011	181
	V 10	132M	258	193	413	—	—	1049	196





S 501 F + V_P (IEC)



		IEC	V_C - V_F												S 501F+ V_C		S 501F+ V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
S 501F	V 1	P80	200	165	130	M10X20	19	21.8	6	59	133	124	97	83	—	—	451	51
	V 1	P90	200	165	130	M10X20	24	26.3*	8	59	133	124	97	83	—	—	451	51
	V 2	P90	200	165	130	M10X15	24	27.3	8	74.1	137	120	113	83	410	48	495	56
	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	451.5	69	559	81
	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	451.5	70	559	83
	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	—	206.5	109	—	—	636	141

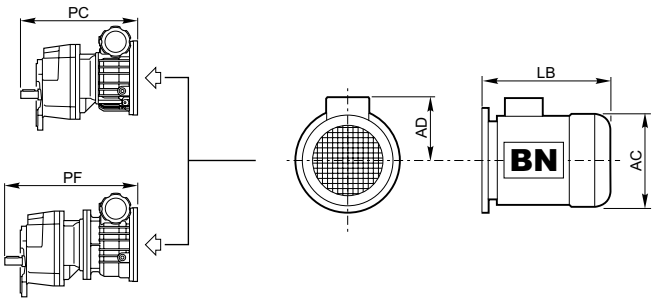
* Utilizzare linguetta ribassata 8x6x35 "A"

* *Use lowered key 8x6x35 "A"*

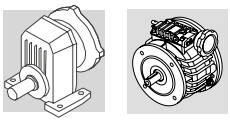
* Den abgeflachten Federkeil 8x6x35 "A" verwenden

* *Utiliser une languette rabaissée taille 8x6x35* "A"

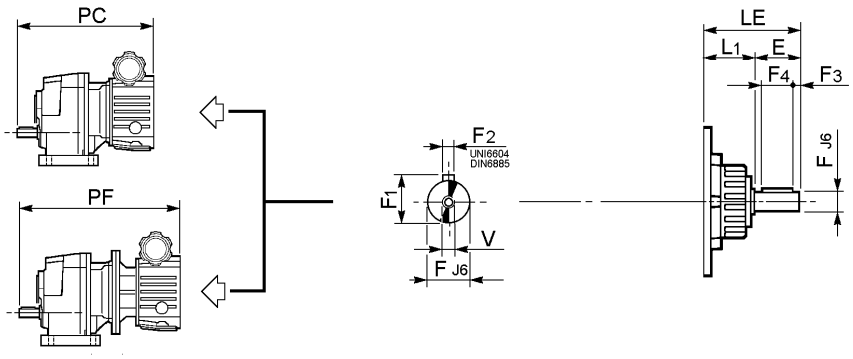
S 501 F + V_P + BN



		IEC	BN			S 501F + V_C		S 501F + V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
S 501F	V 1	80	156	119	234	—	—	685	61
	V 1	90S	176	133	276	—	—	727	63
	V 1	90L	176	133	276	—	—	727	65
	V 2	90S	176	133	276	686	60	771	68
	V 2	90L	176	133	276	686	62	771	70
	V 2	100R	195	142	307	717	70	802	78
	V 3	100	195	135	306	758	91	865	103
	V 3	112	219	150	325	777	99	884	111
	V 5.5	112	219	150	325	777	100	884	113
	V 10	132S	258	193	375	—	—	1011	184
	V 10	132M	258	193	413	—	—	1049	199



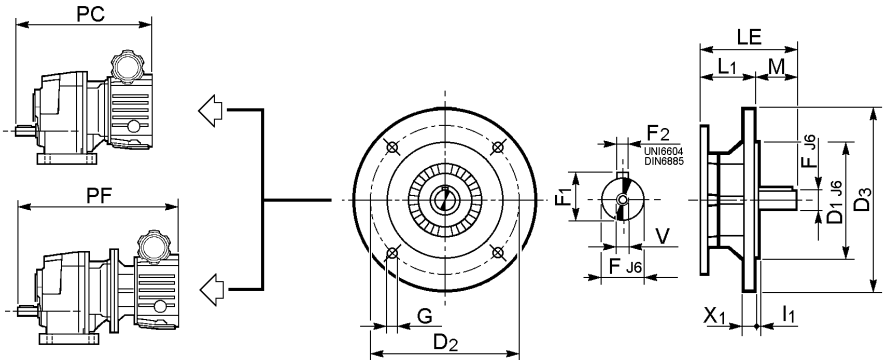
S_ + V_



HS

	E	F	F1	F2	F3	F4	LE	L1	V	Kg
V 0.25	23	11	12.5	4	2	20	58.5	35.5	M4	1.1
V 0.5	30	14	16	5	2.5	25	67	37	M5	1.6
V 1	40	19	21.5	6	5	30	88.5	48.5	M6	2.8
V 2	50	24	27	8	5	40	103.5	53.5	M8	4.0
V 3	60	28	31	8	5	50	121.5	61.5	M10	7.0
V 5.5	60	28	31	8	5	50	121.5	61.5	M10	7.0
V 10	80	38	41	10	5	70	160.5	80.5	M12	11.0

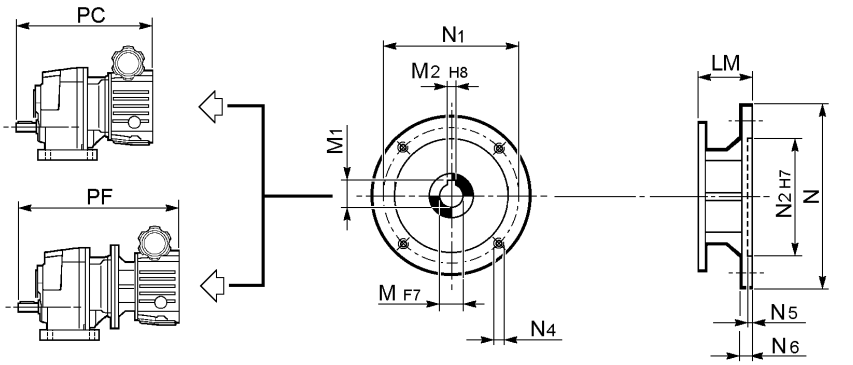
S_ + V_



HSF

	D1	D2	D3	F	F1	F2	G	I1	LE	L1	M	V	X1	Kg
V 0.25	95	115	140	11	12.5	4	8.5	3	58.5	37.5	21	M4	8	1.6
V 0.5	110	130	160	14	16	5	8.5	3.5	67	37	30	M5	8	2.5
V 1	130	165	200	19	21.5	6	11.5	3.5	88.5	48.5	40	M6	12	4.5
V 2	130	165	200	24	27	8	11.5	3.5	103.5	53.5	50	M8	12	5.9
V 3	180	215	250	28	31	8	14	4	121.5	61.5	60	M10	14	11.0
V 5.5	180	215	250	28	31	8	14	4	121.5	61.5	60	M10	14	11.0
V 10	230	265	300	38	41	10	14	5	160.5	80.5	80	M12	16	20

S_ + V_



G

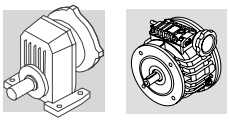
	LM	M	M1	M2	N	N1	N2	N4	N5	N6	Kg
V 0.25_G71	42	14	16.3	5	160	130	110	M8	4.5	11	1.8
V 0.5_G80	54	19	21.8	6	200	165	130	M10	4.5	11.5	2.8
V 1_G90	59	24	27.3	8	200	165	130	M10	4.5	11.5	5.0
V 2_G112	67	28	31.3	8	250	215	180	M12	5	14	6.8
V 3_G132	88.5	38	41.3	10	300	265	230	M12	5	15	12.0
V 5.5_G132	88.5	38	41.3	10	300	265	230	M12	5	15	12.0
V 10_G160	120	42	45.3	12	350	300	250	M16	6	18	22

N.B. I pesi riportati in questa pagina si riferiscono alle sole entrate.

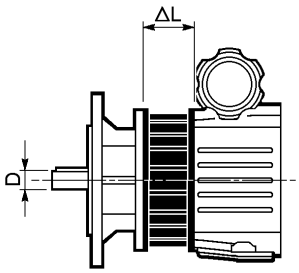
NOTE: Weights charted in this page apply to the additional input parts only.

HINWEIS: Die in dieser Tabelle angegebenen Gewichte beziehen sich nur auf den Antrieb.

N.B. : Les poids indiqués à cette page se réfèrent uniquement aux entrées.



VD_P (IEC)



N.B. Le dimensioni mancanti sono riportate nelle pagine 124-133.

N.B.: missing dimensions are listed on pages 124-133.

ACHTUNG: Die fehlenden Maße werden auf den Seiten 124-133 angegeben.

N.B. : Les dimensions manquantes sont indiquées pages 124-133.

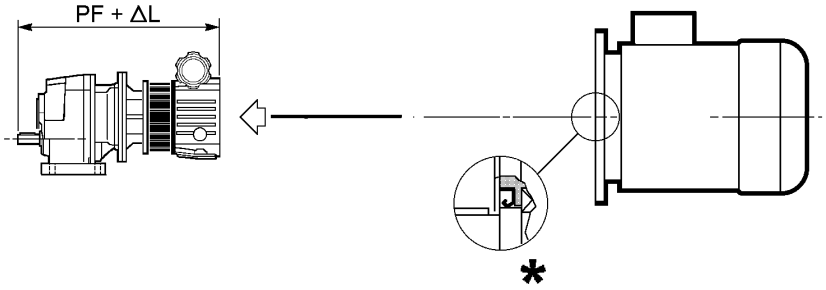
	D	L	Kg
VD 0.5_P_	14	69	3.1
VD 1_P_	19	80.5	4.7
VD 2_P_	24	89.5	7.7
VD 3_P_	28	100.4	16.3
VD 5.5_P_	28	100.4	16.3
VD 10_P_	38	119.2	27.7

N.B. Il differenziale è applicabile esclusivamente ai variatori nella forma costruttiva UF.
I pesi riportati in tabella si riferiscono al solo differenziale.

N.B.: Differential will only fit UF type variators.
Weight refer to differential only.

HINWEIS: Das Differential kann ausschließlich nur an den Verstellgetrieben der Bauform UF appliziert werden.
Die in dieser Tabelle angegebenen Gewichte beziehen sich nur auf das Differential.

N.B. : Le différentiel est applicable uniquement aux variateurs dans la forme de construction UF.
Les poids indiqués à cette page se réfèrent uniquement au différentiel.



* Nei variatori con differenziale, quando il motore elettrico è installato dall'utente, è necessario verificare che esso sia dotato di un anello di tenuta olio sull'albero montato secondo lo schema e che la flangia sia stagna.
La tenuta olio fra la flangia motore e la flangia variatore è assicurata da una guarnizione fornita di serie sul variatore stesso.

N.B. Le dimensioni e i pesi dei motori elettrici sono riportati nelle pag. 340-358.

** On fitting the electric motor onto variators featuring the differential unit make sure that the electric motor itself is oiltight and an oil seal is provided on drive end shaft.*
Sealing between flange of motor and variator is ensured by a gasket provided with the variator unit.

N.B. Dimensions and weights of electric motors are listed at page 340-358.

* Wenn der Elektromotor vom Kunden angebaut wird, ist es bei den Verstellgetrieben mit Differential erforderlich, die Motorwelle mit einem öldichten Wellendichtring auszustatten.
Die Abdichtung zwischen Motor- und Verstellgetriebeflansch wird durch eine Dichtung gewährleistet, die beim Verstellgetriebe serienmäßig mitgeliefert wird.

ACHTUNG: Die Maße und Gewichte der Elektromotoren werden auf den Seiten 340-358 aufgeführt.

** Sur les variateurs avec différentiel, lorsque le moteur électrique est installé par l'utilisateur, il est nécessaire de vérifier qu'il soit doté d'une bague d'étanchéité sur l'arbre monté selon le schéma.*
L'étanchéité à l'huile entre la bride moteur et la bride variateur est assurée par un joint fourni de série et présent sur le variateur.

N.B. : Les dimensions et les poids des moteurs électriques sont indiqués à pages 340-358.

Accessori:

- CGY
- KITCGY
- ENTHS
- ENTG
- ENTN
- INDGRAV

Vedi pag. 90-97

Accessories:

- *CGY*
- *KITCGY*
- *ENTHS*
- *ENTG*
- *ENTN*
- *INDGRAV*

See page 90-97

Zubehör:

- CGY
- KITCGY
- ENTHS
- ENTG
- ENTN
- INDGRAV

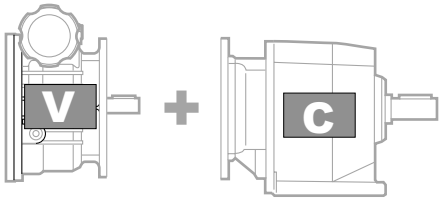
Siehe Seite 90-97

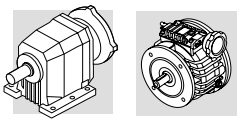
Accessoires:

- *CGY*
- *KITCGY*
- *ENTHS*
- *ENTG*
- *ENTN*
- *INDGRAV*

Voir page 90-97

23.0 - MOTOVARIARIDUTTORI
MOTOVARIATOR-GEARBOX UNITS
VERSTELLGETRIEBEMOTOREN
MOTOVARIAREDUCTEURS





C 11 2 P 55.2 V05 B3 .....

OPZIONI / *OPTIONS*
OPTIONEN / *OPTIONS*

POS. DI MONTAGGIO / *MOUNTING POSITION*
EINBAULAGEN / *POS. DE MONTAGE*

B3 (Standard)**, B5** (Standard)**, B51, B52, B53, B6, B7, B8, V1, V3, V5, V6**

156

DESIGNAZIONE INGRESSO / *INPUT DESIGNATION*
BEZEICHNUNG DER ANTRIEBSSEITE / *DESIGNATION ENTREE*

V + grandezza variatore = Predisposto per variatore compatto
V + *variator size* = *suitable to fit compact variator*
V + Verstellgetriebegröße = für kompaktes Verstellgetriebe geeignet
V + *grandeur variateur* = *prédisposé pour variateur compact*

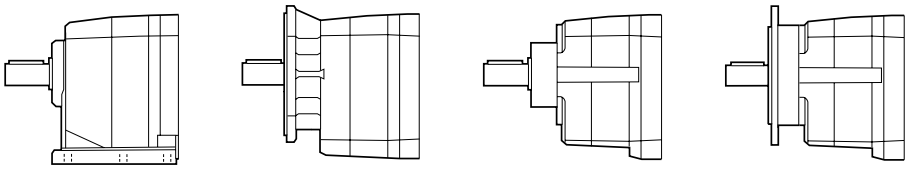
V025	V05	V1	V2	V3	V55	V10
V 0.25	V 0.5	V 1	V 2	V 3	V 5.5	V 10

P + grandezza motore = Predisposto per variatore flangiato
P + *motor size* = *suitable to fit flanged output variator*
P + Motorgrösse = für geflanschtes Verstellgetriebe geeignet
P + *taille moteur* = *prédisposé pour variateur avec bride*

P63	P71	P80	P90	P100	P112	P132
V 0.25	V 0.5	V 0.5 V 1	V 1 V 2	V 3	V 5.5	V 10

RAPPORTO DI RIDUZIONE / *GEAR RATIO*
ÜBERSETZUNG / *RAPPORT DE REDUCTION*

FORMA COSTRUTTIVA / *VERSION* / BAUFORM / *FORME DE CONSTRUCTION*



P (C11…C100) | **F** (C05…C31) (C70...C100) | **U** (C11…C61) | **UFA UFB UFC** (C11…C61)

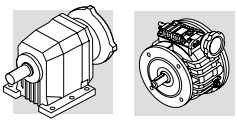
N° STADI DI RIDUZIONE / *N° OF REDUCTION STAGES*
ANZAHL DER GETRIEBESTUFEN / *N.bre ETAGES DE REDUCTION*

2, 3, 4

GRANDEZZA RIDUTTORE / *GEARBOX SIZE* / GETRIEBEBAUGRÖSSE / *TAILLE REDUCTEUR*

11, 21, 31, 35, 41, 51, 61, 70, 80, 90, 100

TIPO RIDUTTORE: **C** = coassiale *GEARBOX TYPE:* **C** = *helical in-line*
GETRIEBETYP: **C** = Stirnradgetriebe *TYP DU REDUCTEUR:* **C** = *coaxial*



23.2 - Designazione variatore | ***23.2 - Designation of variator*** | **23.2 - Bezeichnung für Drehzahlwandler** | ***23.2 - Désignation variateur***

V □ 0.5 C □ □ P71 B3 1 PDN SCT ....

OPZIONI / *OPTIONS*
OPTIONEN / *OPTIONS*

TIPO DI COMANDO / *REMOTE CONTROL TYPE*
VERSTELLEINRICHTUNG / *TYPE DE COMMANDE*
A, VG, VA, VAG, SCT (3∅), TC (1∅)

SONDA RILEVATRICE / *SPEED SENSOR*
MEßSONDE / *SONDE DE DETECTION*
PDN, PDNA, PDP

POSIZIONE DISPOSITIVO DI COMANDO / *SPEED KNOB POSITION*
EINBAULAGE DER VERSTELLEINRICHTUNG / *POSITION COMMANDE*
1 (default), **2** (V 3...V 10)

POSIZIONE DI MONTAGGIO / *MOUNTING POSITION*
MOTOR BAUFORM / *FORME DE CONSTRUCTION DU MOTEUR*
B3 (default)**, B6, B7, B8, V5, V51, V52,V53, V6, V61, V62, V63**

156

CONFIGURAZIONE INGRESSO /*INPUT CONFIGURATION*
BEZEICHNUNG DER ANTRIEBSSEITE /*DESIGNATION ENTREE*

P (IEC) - predisposizione IEC / *Provided with IEC motor adaptor*
vorbereitet für den Anbau eines IEC-Motors / *prédisposé IEC*
HS - albero cilindrico / *solid input shaft* / freier Antriebswelle / *arbre rapide sortant*
HSF - albero cilindrico e flangia riportata / *solid input shaft and bolt-on flange*
freier Antriebswelle und Flansch / *arbre rapide sortant et adjonction de bride*
N (NEMA) - predisposizione motore NEMA / *provided with Nema motor adaptor*
vorbereitet für den Anschluß eines NEMA-Motors / *prédisposé moteur NEMA*
G (IEC) - flangia IEC maggiorata / *provided with IEC extended adaptor*
mit zusätzlicher Baueinheit für IEC-Motore / *avec module supplémentaire prédisposé IEC*

DIAMETRO ALBERO LENTO / *OUTPUT SHAFT BORE*
ABTRIEBSWELLE DURCHMESSER / *DIAMETRE ARBRE LENT*

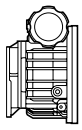
D + diametro in mm / *diameter in mm*
Durchmesser in mm / *diamètre en mm* **(11,14,...)**

D11	D14	D19	D24	D28	D28	D38
(V 0.25)	(V 0.5)	(V 1)	(V 2)	(V 3)	(V 5.5)	(V 10)

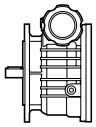
IMP albero in pollici / *inch series shaft* / Nema-Welle / *arbre NEMA*

TIPO DI FISSAGGIO (per gruppi tipo U) / *OUTPUT CONFIGURATION (only for U version)*
MONTAGEMÖGLICHKEIT (ausschließlich für die Bauform U) / *TIPE DE FIXATION (pour forme de costruction U)*
F (IEC) - flangia IEC riportata / *bolt-on IEC flange* / Flansch IEC / *adjonction de bride IEC*
F (NEMA) - flangia NEMA / *NEMA flange mounted*/ NEMA Flansch / *bride Nema*

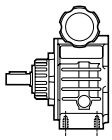
FORMA COSTRUTTIVA / *VERSION* / BAUFORM / *VERSION*



C



F



U

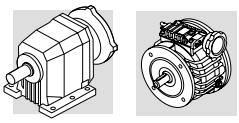
GRANDEZZA VARIATORE / *VARIATOR SIZE* / BAUGRÖSSE / *TAILLE VARIATEUR*
0.25, 0.5, 1, 2, 3, 5.5, 10

DIFFERENZIALE / *DIFFERENTIAL* / DIFFERENTIAL / *DIFFERENTIEL*
D

VARIATORE / *VARIATOR TYPE* / VERSTELLGETRIEBETYP / *TYPE VARIATEUR*
V

22.3 - Designazione motore | ***22.3 - Motor designation*** | **22.3 - Motor bezeichnung** | ***22.3 - Désignation moteur***

27 27 27 27



23.4 - Opzioni riduttori

SO
I riduttori C11, C21, C31, C35, C41, solitamente forniti con lubrificante dalla BONFIGLIOLI RIDUTTORI, sono forniti privi di lubrificante.

LO
I riduttori C51, C61, C70, C80, C90, C100 solitamente sprovvisti di lubrificante, sono richiesti con olio sintetico del tipo correntemente utilizzato dalla BONFIGLIOLI RIDUTTORI e riempiti in accordo alla posizione di montaggio richiesta.

DL
L'albero lento è dotato di doppio anello di tenuta.

VV
Anello di tenuta in Viton sull'albero veloce.

PV
Tutti gli anelli di tenuta in Viton.

23.4 - Gearbox options

SO
Gearboxes C11, C21, C31, C35, C41, supplied without oil.

LO
Gearboxes C51, C61, C70, C80, C90, C100 usually supplied without oil, to be supplied with synthetic oil currently used by BONFIGLIOLI RIDUTTORI and filled according to requested mounting position.

DL
The low speed shaft accommodates a dual oil seal.

VV
Viton oil seal on input shaft.

PV
All oil seals in Viton.

23.4 - Getriebe Optionen

SO
Bei Lieferung ohne Schmierstoff (nur bei C11, C21, C31, C35 und C41).

LO
Für Getriebe C51, C61, C70, C80, C90, C100 die gewöhnlich ohne Schmiermittel geliefert werden, in Übereinstimmung mit der Einbaulage gefüllt mit dem normalerweise von BONFIGLIOLI RIDUTTORI verwendeten synthetischen Schmierstoff.

DL
Die Abtriebswelle ist mit Doppeldichtring geliefert.

VV
Wellendichtringe aus Viton auf der eintreibenden Welle.

PV
Alle Wellendichtringe aus Viton.

23.4 - Options réducteurs

SO
Les réducteurs C11, C21, C31, C35, C41, habituellement fourni avec lubrifiant par la société BONFIGLIOLI RIDUTTORI, sont demandés sans lubrifiant.

LO
Les réducteurs C51, C61, C70, C80, C90, C100 habituellement dépourvus de lubrifiants, sont demandés avec huile synthétique du type couramment utilisé par BONFIGLIOLI RIDUTTORI et remplis conformément à la position de montage demandée.

DL
L'arbre lent est equipé avec double ioint d'étanchéité.

VV
Bague d'étanchéité en Viton sur l'arbre rapide.

PV
Toutes les bagues d'étanchéité en Viton.

23.5 - Opzioni variatori

CU
Cassa universale con piano di appoggio spianato e relativi fori di fissaggio (pag. 30).

FL
Cassa universale con fianchi laterali spianati e relativi fori di fissaggio (pag. 30).

PDN
Predisposizione al rilevamento di giri digitale incorporato all'interno del variatore con sonda rilevatrice di tipo NPN.

PDP
Predisposizione al rilevamento di giri digitale incorporato all'interno del variatore con sonda rilevatrice di tipo PNP.

La tabella (E01) riporta le possibilità di applicazione e le dimensioni delle sonde NPN e PNP utilizzate.

23.5 - Variator options

CU
Universal casing featuring machined supporting surface with drilled and tapped holes (page 30).

FL
Universal casing featuring machined sides with drilled and tapped holes (page 30).

PDN
Configured for digital speed detection by NPN sensor incorporated into variator.

PDP
Configured for digital speed detection by PNP sensor incorporated into variator.

Table (E01) shows which units support which options and provides the (plug thread) dimensions of the various NPN and PNP sensors used.

23.5 - Optionen – Verstellgetriebemotor

CU
Universalgehäuse mit plangeschliffener Auflagefläche und entsprechenden Befestigungsbohrungen (Seite 30).

FL
Universalgehäuse mit plangeschliffenen Seitenflanken und entsprechenden Befestigungsbohrungen (Seite 30).

PDN
Vorbereitet für im Verstellgetriebe eingebaute digitale Vorrichtung für die Drehzahlerhebung über eine NPN-Sonde.

PDP
Vorbereitet für im Verstellgetriebe eingebaute digitale Vorrichtung für die Drehzahlerhebung über eine PNP-Sonde.

In der Tabelle (E01) werden die möglichen Applikationsmöglichkeiten der verwendeten NPN- und PNP-Sonden aufgeführt.

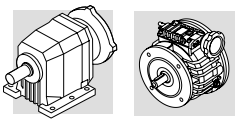
23.5 - Options variateurs

CU
Caisse universelle avec plan d'appui aplati et orifices de fixation correspondants (page 30).

FL
Caisse universelle avec flancs latéraux aplatis et orifices de fixation correspondants (page 30)

PDN
Prédisposition pour le dispositif de mesure du nombre de tours digital incorporé à l'intérieur du variateur avec sonde de détection de type NPN.

PDP
Prédisposition pour le dispositif de mesure du nombre de tours digital incorporé à l'intérieur du variateur avec sonde de détection de type PNP .
Le tableau (E01) indique les différentes possibilités d'application ainsi que les dimensions des sondes NPN et PNP utilisées.



(E01)

Riduttore *Gearbox* Getriebe *Réducteur*	Sonda *Plug thread* Sonde *Sonde* (NPN/PNP)	Variatore *Variator* Verstellgetriebe *Variateur*	Forme costruttive / *Versions* Bauformen / *Formes de construction*		
			V_		V_D
			C	F-UF	UF
C 112	M8x1	V 0.25	#		
	M8x1	V 0.5	#		
C 212	M8x1	V 0.25	#		
	M8x1	V 0.5	#		
	M10x1	V 1	#		
C 312	M8x1	V 0.25	#		
	M8x1	V 0.5	#		
	M10x1	V 1	#		
		V 2	#		
C 313	M8x1	V 0.25	#		
C 352 **C 353**	M8x1	V 0.25	#		
	M8x1	V 0.5	#		
	M10x1	V 1	#		
	M10x1	V 2	#		
	M12x1	V 3	#		
C 354	M8x1	V 0.25	#		
	M8x1	V 0.5	#		
	M10x1	V 1	#		
C 412 **C 413**	M8x1	V 0.5	#		
	M10x1	V 1	#		
		V 2	#		
	M12x1	V 3	#		
C 414	M8x1	V 0.25	#		
	M8x1	V 0.5	#		
	M10x1	V 1	#		
C 512 **C 513**	M10x1	V 1	#		
		V 2	#		
	M12x1	V 3/5.5			

Riduttore *Gearbox* Getriebe *Réducteur*	Sonda *Plug thread* Sonde *Sonde* (NPN/PNP)	Variatore *Variator* Verstellgetriebe *Variateur*	Forme costruttive / *Versions* Bauformen / *Formes de construction*		
			V_		V_D
			C	F-UF	UF
C 514	M8x1	V 0.5	#		
	M10x1	V 1	#		
C 612 **C 613**	M10x1	V 1	#		
		V 2	#		
	M12x1	V 3/5.5			
		V 10			
C 614	M8x1	V 0.5	#		
	M10x1	V 1	#		
		V 2	#		
C 702	M12x1	V 3/5.5			
		V 10	—		
C 703	M10x1	V 1	#		
		V 2	#		
	M12x1	V 3/5.5			
		V 10	—		
C 802	M12x1	V 5.5	—		
		V 10	—		
C 803	M10x1	V 2	#		
	M12x1	V 3/5.5	—		
		V 10	—		
C 902	M12x1	V 10	—		
C 903	M12x1	V 3/5.5	—		
		V 10	—		
C 1003	M12x1	V 10	—		

Applicazioni disponibili

Applicazione disponibile per le posizioni di montaggio B3, a richiesta (come esecuzione speciale) per le altre posizioni di montaggio.

Option availability

 # The option is available for units in the B3 mounting position. For other positions, please enquire with Bonfiglioli.

Zur Verfügung stehende Anwendungen

Anwendung auch für die Montagepositionen B3 erhältlich; auf Anfrage (als Sonderausführung) auch für die anderen Montagepositionen.

Applications disponibles

 # Application disponible pour les positions de montage B3, sur demande (exécution spéciale) pour les autres positions de montage.

PV

Anelli di tenuta in Viton.

SO

I variatori V 0.25 - V 10 solitamente forniti con lubrificante dalla Bonfiglioli Riduttori sono forniti privi di lubrificante. Questa opzione non è prevista per i variatori con differenziale V 0.5D - V 10D con ingresso P.. in quanto normalmente forniti privi di lubrificante.

PV

Viton seals

SO

The V 0.25 – V 10 variators – normally factory-filled with oil – are supplied dry. This option is not available on the V 0.5D – V 10D variators with differential unit and P input, that are normally supplied dry.

PV

Dichtringe in Viton.

SO

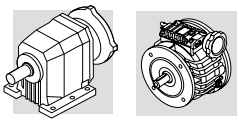
Die üblicherweise von der Bonfiglioli Riduttori mit Schmiermittel gelieferten Verstellgetriebe V 0.25 – V 10 werden bei dieser Ausführungsart ohne Schmiermittel geliefert. Diese Option ist bei den Verstellgetrieben mit Antrieb P.. VBG 0.5D – VBG 10D mit Differential nicht gegeben, da diese normalerweise ohne Schmiermittel geliefert werden.

PV

Bagues d'étanchéité en Viton

SO

Les variateurs V 0.25-V 10 généralement fournis avec du lubrifiant par Bonfiglioli Riduttori sont fournis sans lubrifiant. Cette option n'est pas prévue pour les variateurs avec différentiel V 0.5D – V 10D avec entrée P.. dans la mesure où il sont normalement fournis sans lubrifiant.



23.6 - Lubrificazione

Lubrificazione riduttori serie C

Gli organi interni dei riduttori Bonfiglioli sono lubrificati con un sistema misto di immersione e sbattimento dell'olio.
I gruppi C05, C11, C21, C31, C35 e C41 sono normalmente consegnati con carica di lubrificante dalla fabbrica, o dalla rete di vendita ufficiale.
Per questi stessi gruppi, nell'esecuzione predisposta per motorizzazione normalizzata IEC, un tappo di sfiato é fornito a corredo e dovrà essere installato a cura dell'utilizzatore, prima della messa in esercizio del riduttore.
I gruppi di grandezza C51 e superiori sono normalmente forniti privi di lubrificante, e sarà cura dell'utilizzatore riempirli di olio prima della messa in servizio.
Le tavole che seguono sono da riferimento nell'interpretazione delle posizioni di montaggio, della collocazione dei tappi di servizio e delle quantità di lubrificante.
Queste ultime sono indicative, e per il corretto riempimento si dovrà fare riferimento alla mezzeria del tappo, o dell'astina di livello, se presente.
Rispetto a questa condizione la quantità di lubrificante riportata in tabella può presentare scostamenti, occasionalmente anche rilevanti.
Il lubrificante "long life" fornito di serie è di natura sintetica e, a meno di contaminazione dall'esterno, non richiede sostituzioni periodiche per tutto l'arco di vita del riduttore.
Lo stesso lubrificante consente inoltre funzionamenti a temperature ambiente $0 < t_a < 50$ °C.

Per funzionamento a temperature inferiori consultare il ns. Servizio Tecnico.

23.6 - Lubrication

Lubrication of C gearboxes

The inner parts of Bonfiglioli gear units are oil-bath and splash lubricated.
Frame sizes C05, C11, C21, C31, C35 and C41 are supplied by the factory, or by the authorized dealers, already filled with oil.
For same units configured with the IEC-normalized motor mounting flange a breather plug is also supplied. This must replace the closed plug supplied for transportation purposes, at the customer care, prior to putting the gear unit into operation.
Unless otherwise specified, units size C51 and larger are usually supplied unlubricated at it will be the customer care to fill them with oil prior to putting them into operation.
The charts here after must be referred to as for the mounting position pattern and the corresponding oil plugs, if applicable, and related lubricant quantity.
Values for the oil quantity are indicative with the proper filling always represented by the center of the sight glass, or the dipstick, when this is supplied.
In some cases, discrepancies, occasionally also substancial, versus the oil quantities listed in the chart may be noticed.
The "long life" poliglycol-based lubricant supplied by the factory, in the absence of contamination, does not require periodical oil changes throughout the lifetime of the gear unit.
Operation at an ambient temperature $0 < t_a < 50$ °C is allowed.

Should the gear unit operate at temperature below 0 °C, please consult Bonfiglioli Technical Service Dept. for advise.

23.6 - Schmierung

Schmierung der Getriebe der Serie C

Die Schmierung der Getriebe von Bonfiglioli erfolgt durch eine Kombination aus Ölbad- und Tauchschmierung.
Die Getriebegrößen C05, C11, C21, C31, C35 und C 41 sind ab Werk mit einer Lebensdauerschmierung versehen.
Wenn diese Größen mit einem IEC-Eingang ausgeliefert werden, dann befindet sich ein Lüfter am Motorflansch, der für den Transport mit einem Stopfen verschlossen wird. Vor dem Einsatz des Getriebes muss dieser Stopfen durch einen Lüfter ersetzt werden.
Die Getriebe ab der Größe C51 werden ohne Ölfüllung ausgeliefert. Vor der Inbetriebnahme muss deshalb auf das Einfüllen der richtigen Ölfüllmenge geachtet werden!
Bitte beachten Sie dazu auch die nachfolgenden Kapitel über die Positionen der Stopfen und Ölschaugläser und den entsprechenden Ölfüllmengen.
Die im Katalog angegeben Ölfüllmengen sind Anhaltswerte! Maßgebend ist, das der Ölstand bis Mitte des Ölschauglas für die entsprechende Einbaulage aufgefüllt wird.
Auf Abweichungen gegenüber den in der Tabelle angegebenen Ölmengen, gelegentlich nicht unwesentliche, wird hingewiesen.
Die mit Lebensdauerschmierung gelieferten Serien sind mit synthetischem Öl auf Polyglykolbasis gefüllt. Falls dieses Öl nicht verunreinigt wird, ist während der Lebensdauer des Getriebes kein Ölwechsel nötig.
Die zulässige Umgebungs-temperatur für den Betriebe liegt im Bereich von $0 < t_a < 50$°C.
Falls ein Antrieb bei Temperaturen unterhalb von 0° betrieben werden soll, kontaktieren sie bitte unseren technischen Service für weitere Anweisungen.

23.6 - Lubrification

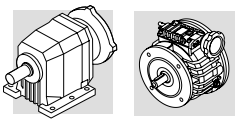
Lubrification réducteurs Série C

Les organes internes des réducteurs Bonfiglioli sont lubrifiés avec un système mixte d'immersion et de battement de l'huile.
Les groupes C05, C11, C21, C31, C35 et C41 sont normalement livré avec charge de lubrifiant de l'usine, ou du réseau de vente officielle.
Pour ces mêmes groupes, dans l'exécution prevue pour motorisation normalisée IEC, un bouchon de reniflard est fourni, et devra être installé par l'utilisateur, avant la mise en service du réducteur.
Les groupes de grandeur C51 et supérieur sont normalement fournis sans lubrifiant, et sera par l'utilisateur le remplissage d'huile avant la mise en service.
Les tables suivantes sont de référence dans l'interpretation des positions de montage, du placement des bouchons de service et de la quantité de lubrifiant.
Ces dernières sont indicatives, et pour le correct remplissage il faut faire référence au bouchon de niveau ou à la jauge à huile, si présent.
Par rapport à cette condition la quantité de lubrifiant indiqué dans le tableau peut présenter des écartement, occasionnellement considérables.

Le lubrifiant "long life" ; fourni de série est de nature synthétique et, à moins de contamination par l'extérieur, il ne demande pas des remplacements périodiques pour tout l'arc de vie du réducteur.
Le même lubrifiant permet fonctionnements à des températures ambient $0 < t_a < 50$ °C.
Pour fonctionnement à des températures inférieures consulter notre Service Technique.

(E02)

Tipo di carico / *Type of duty* Art der Belastung / *Type de charge*	**ta** 0 °C - 20 °C		**ta** 20 °C - 40 °C	
	Olio minerale *Mineral oil* Mineralöl *Huile minérale* **ISO VG**	Olio sintetico *Synthetic oil* Syntheseöl *Huile synthétique* **ISO VG**	Olio minerale *Mineral oil* Mineralöl *Huile minérale* **ISO VG**	Olio sintetico *Synthetic oil* Syntheseöl *Huile synthétique* **ISO VG**
Carico leggero / *Light duty* / Leicht / *Charge légère*	150	150	220	220
Carico medio / *Medium duty* / Normal / *Charge moyenne*	150	150	320	220
Carico pesante / *Heavy duty* / Schwer / *Charge lourde*	200	200	460	320

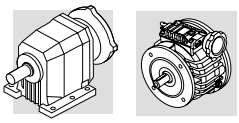


Quantità di lubrificante [l] *Oil quantity [l]* Schmiermittelmenge [l] *Quantité de lubrifiant [l]*

(E03)

	[l]																	
	P						F						U - UF					
	B3	B6		B8	V5		B5	B51		B52	V1		B5	B51		B52	V1	
C 11 2	0.45	0.45	0.45	0.45	0.50	0.60	0.40	0.40	0.50	0.50	0.50	0.60	0.40	0.40	0.50	0.50	0.50	0.60
C 21 2	0.80	0.80	0.80	0.80	0.85	1.1	0.75	0.75	0.75	0.75	0.80	1.00	0.75	0.75	0.75	0.75	0.80	1.00
C 21 3	1.2	1.2	1.2	1.2	1.3	1.4	1.2	1.2	1.2	1.2	1.3	1.4	1.2	1.2	1.2	1.2	1.3	1.4
C 31 2	1.4	1.4	1.4	1.4	1.5	1.5	1.3	1.3	1.3	1.3	1.5	1.5	1.3	1.3	1.3	1.3	1.5	1.5
C 31 3	1.6	1.6	1.6	1.6	1.8	1.8	1.6	1.6	1.6	1.6	1.8	1.8	1.6	1.6	1.6	1.6	1.8	1.8
C 35 2	1.6	1.5	1.5	1.3	2.1	2.4	-	-	-	-	-	-	1.6	1.5	1.5	1.3	2.1	2.4
C 35 3	1.5	1.4	1.5	1.3	2.0	2.3	-	-	-	-	-	-	1.5	1.4	1.5	1.3	2.0	2.3
C 35 4	2.3	2.1	2.3	2.1	2.7	3.1	-	-	-	-	-	-	2.3	2.1	2.3	2.1	2.7	3.1
C 41 2	2.2	2.0	2.1	1.9	2.7	3.4	-	-	-	-	-	-	2.2	2.0	2.1	1.9	2.7	3.4
C 41 3	2.1	1.9	2.1	1.9	2.6	3.2	-	-	-	-	-	-	2.1	1.9	2.1	1.9	2.6	3.2
C 41 4	2.8	2.6	2.8	2.6	3.5	3.9	-	-	-	-	-	-	2.8	2.6	2.8	2.6	3.5	3.9
C 51 2	3.1	3.0	3.1	3.0	4.3	5.0	-	-	-	-	-	-	3.1	3.0	3.1	3.0	4.3	5.0
C 51 3	3.0	2.8	3.1	3.0	4.1	4.9	-	-	-	-	-	-	3.0	2.8	3.1	3.0	4.1	4.9
C 51 4	4.3	4.1	4.4	4.2	5.4	6.1	-	-	-	-	-	-	4.3	4.1	4.4	4.2	5.4	6.1
C 61 2	4.2	4.0	4.2	4.1	6.0	6.7	-	-	-	-	-	-	4.2	4.0	4.2	4.1	6.0	6.7
C 61 3	4.2	4.0	4.2	4.1	6.0	6.7	-	-	-	-	-	-	4.2	4.0	4.2	4.1	6.0	6.7
C 61 4	6.1	5.9	6.1	6.0	7.9	8.6	-	-	-	-	-	-	6.1	5.9	6.1	6.0	7.9	8.6
C 70 2	6.5	8.5	8.5	7.5	11	7.5	6.5	8.5	8.5	7.5	11	7.5	-	-	-	-	-	-
C 70 3	6.5	8.5	8.5	7.5	11	7.5	6.5	8.5	8.5	7.5	11	7.5	-	-	-	-	-	-
C 70 4	6.5	8.5	8.5	7.5	11	8	6.5	8.5	8.5	7.5	11	7.5	-	-	-	-	-	-
C 80 2	11	14	14	13	18	13	11	14	14	13	18	13	-	-	-	-	-	-
C 80 3	11	14	14	13	18	13	11	14	14	13	18	13	-	-	-	-	-	-
C 80 4	11	14	14	13	18	13	11	14	14	13	18	13	-	-	-	-	-	-
C 90 2	19	25	25	22	31	22	19	25	25	22	31	22	-	-	-	-	-	-
C 90 3	19	25	25	22	31	22	19	25	25	22	31	22	-	-	-	-	-	-
C 90 4	19	25	25	22	31	22	19	25	25	22	31	22	-	-	-	-	-	-
C 100 2	27	37	37	33	45	33	27	37	37	33	45	33	-	-	-	-	-	-
C 100 3	27	37	37	33	45	33	27	37	37	33	45	33	-	-	-	-	-	-
C 100 4	27	37	37	33	45	33	27	37	37	33	45	33	-	-	-	-	-	-

Lubrificazione permanente / *Life lubricated* / Dauerschmierung / *Lubrification permanente* SHELL Tivela OIL SC 320 (for life)



23.7 - POSIZIONI DI MONTAGGIO E ORIENTAMENTO MORSETTIERA

Gli orientamenti delle morsettiere dei motori sono identificati osservando il motore dal lato ventola; l'orientamento standard è evidenziato in nero (W).

Posizione angolare leva di sblocco freno.
Nei motori autofrenanti, la leva di sblocco freno (se richiesta) ha l'orientamento standard a 90° rispetto alla morsettiera (posizione AB); specificare con relative opzioni qualora l'orientamento desiderato sia diverso.

23.7 - MOUNTING POSITION AND TERMINAL BOX ORIENTATION

Location of motor terminal box can be specified by viewing the motor from the fan side; standard location is shown in black (W).

Angular position of the brake release lever.
Unless otherwise specified, brake motors have the manual device side located, 90° apart from terminal box. Different angles can be specified through the relevant options available.

23.7 - EINBAULAGEN UND LAGE DES KLEMMENKASTENS

Die Angaben zur Lage des Klemmenkastens beziehen sich auf das von der Lüfterseite her betrachtete Getriebe. Die Standardorientierung ist schwarz hervorgehoben (W).

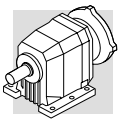
Winkellage des Handlüfterhebels.
Bei Bremsmotoren wird der Handlüfterhebel (auf Anfrage) standardmäßig auf 90° gegenüber des Klemmkastens (AB-Anordnung) geliefert; wird eine andere Anordnung verlangt, muß dies bei der Bestellung durch das geeignete Option angegeben werden.

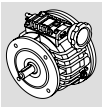
23.7 - POSITIONS DE MONTAGE ET ORIENTATION BOITE A BORNE

Les orientations des boîtes à bornes des moteurs sont définies en regardant le moteur du côté ventilateur. L'orientation standard est indiquée en noir (W).

Position angulaire levier déblocage frein.
Dans les moteurs freins, ce levier (si requis) aura l'orientation standard de 90° par rapport à la boîte à bornes (position AB); spécifier avec options relatives si l'orientation desirée est différente.

	Legenda:	*Key:*	Zeichenerklärung:	*Légende:*
	Tappo di sfiato / carico	*Filling / breather plug*	Einfüll / Ablaßschraube	*Bouchon de event / remplissage*
	Tappo di livello	*Level plug*	Ölstandsschraube	*Bouchon de niveau*
	Tappo di scarico	*Drain plug*	Ölablaßschraube	*Bouchon de vidange*



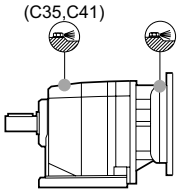


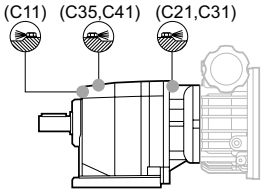
(E04)

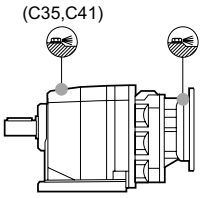
C_P

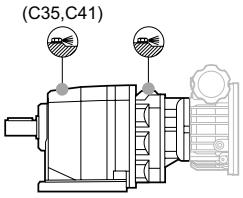
P (IEC)	V	P (IEC)	V

B3

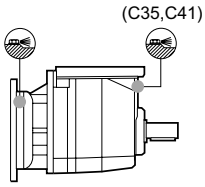


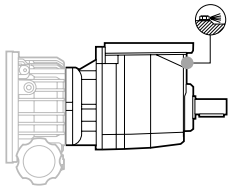


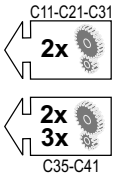


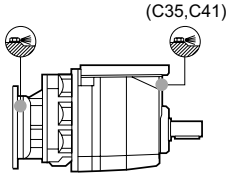


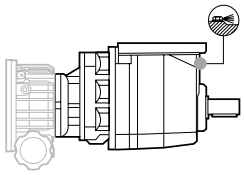
B8

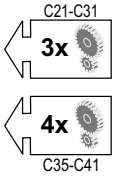




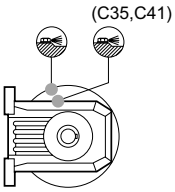


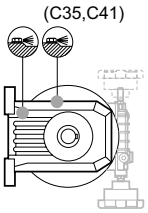


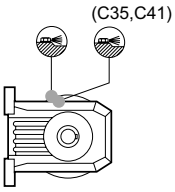


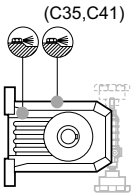


B6

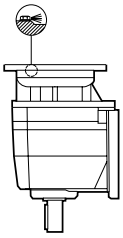


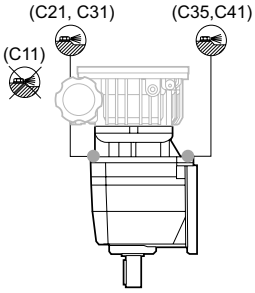


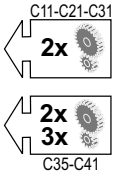


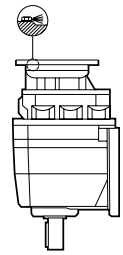


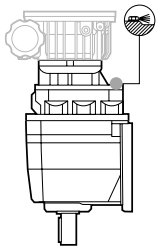
V5

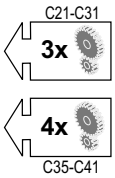












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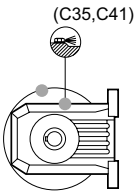
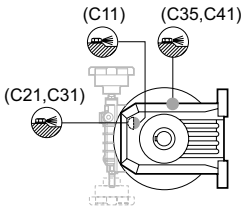
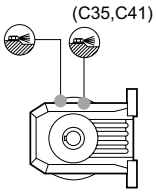
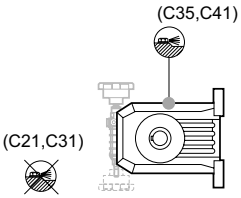
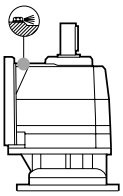


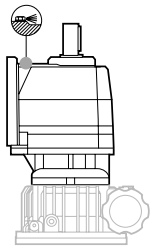


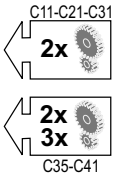


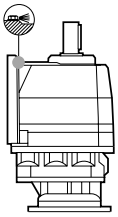


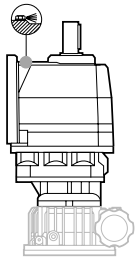
V6

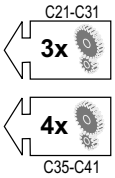


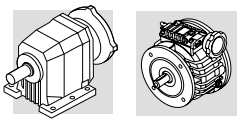












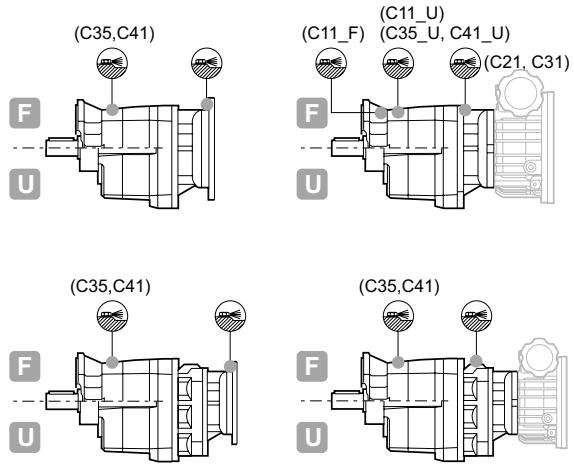
C 11...C41

(E05)

C_U	C_F

P (IEC)	V	P (IEC)	V

B5



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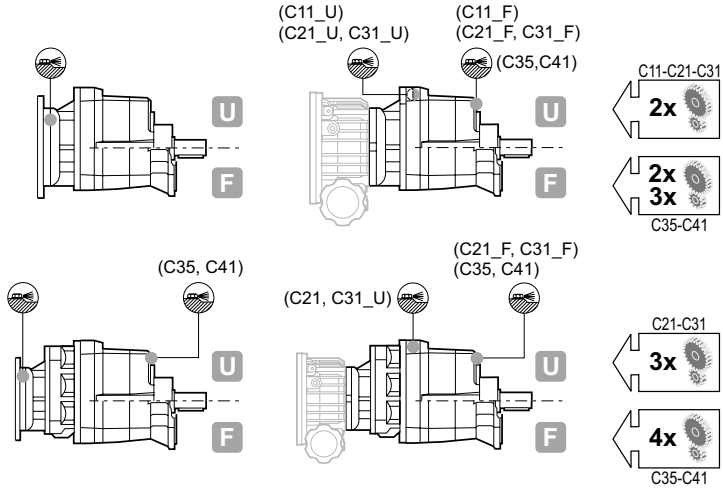

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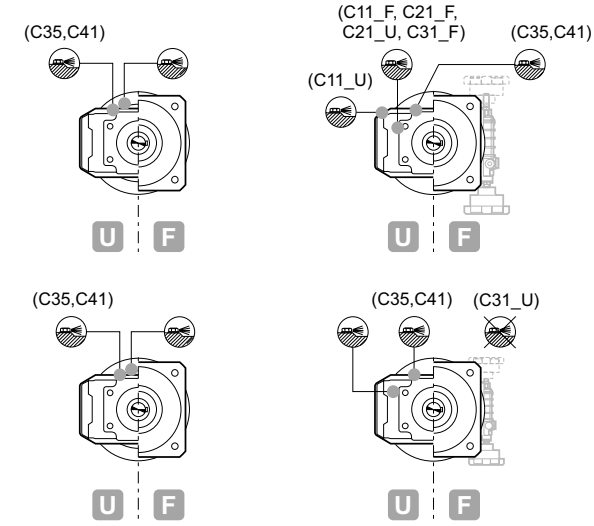
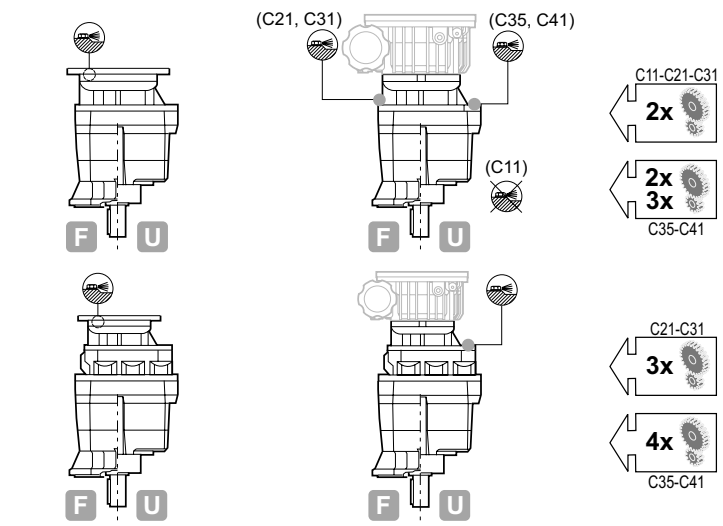


V1



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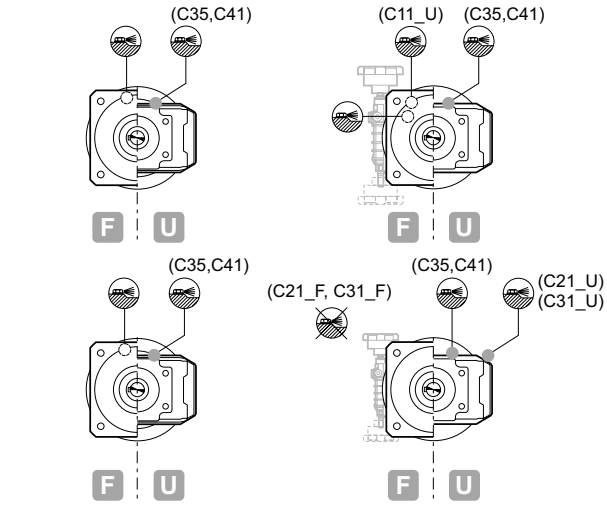
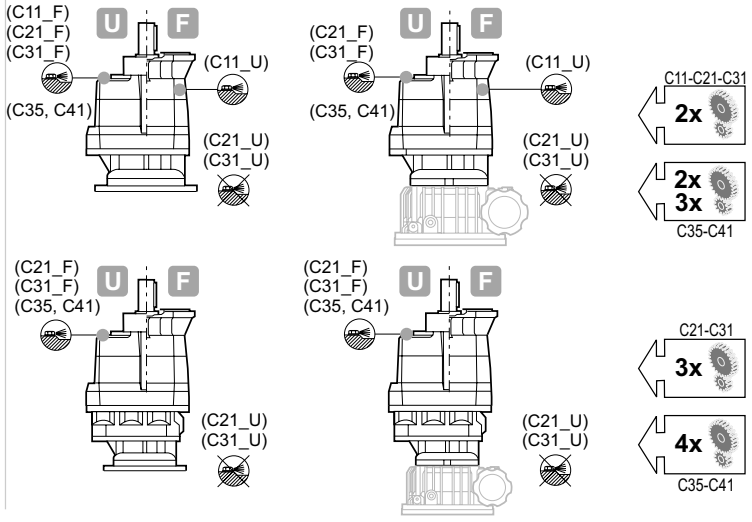
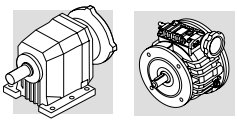


V3



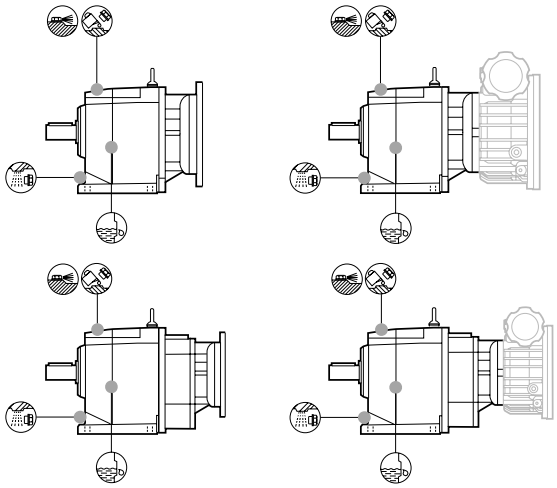


(E06)

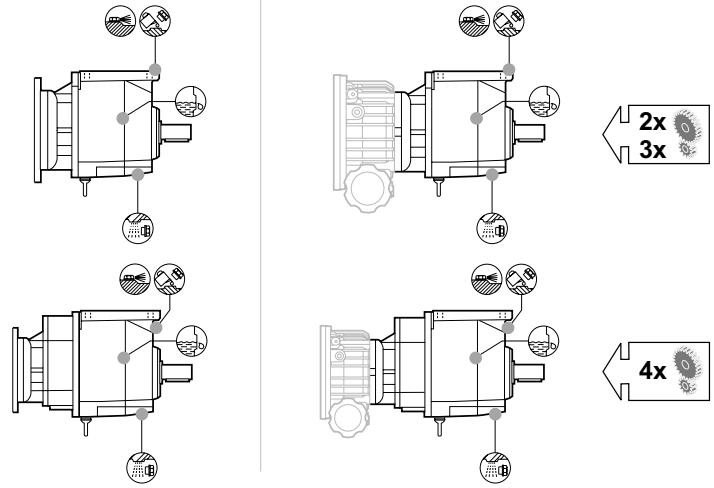
C_P

P (IEC)	V	P (IEC)	V

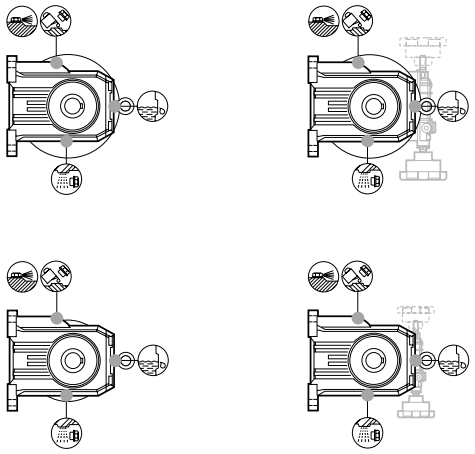
B3



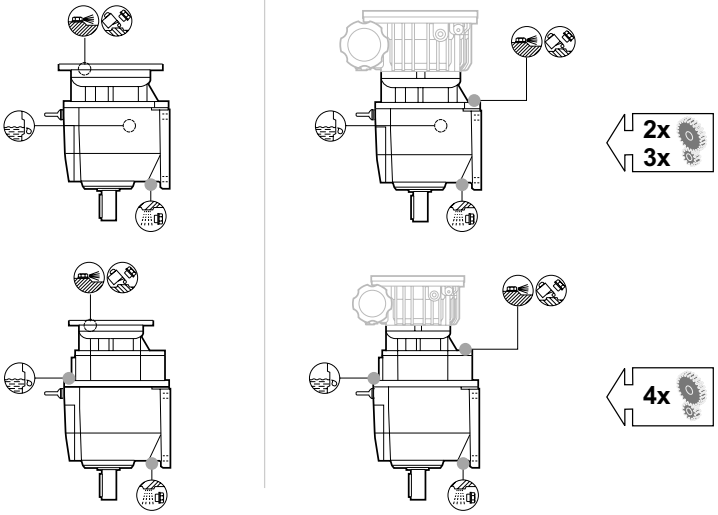
B8



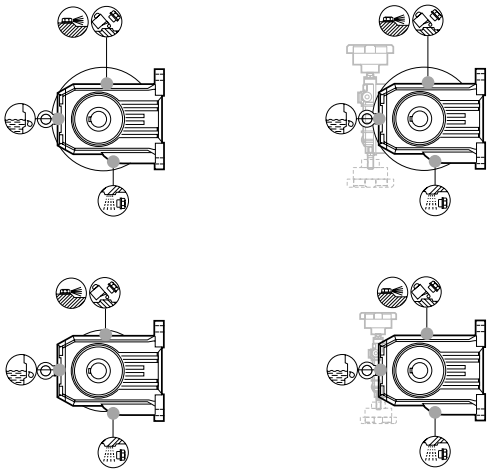
B6



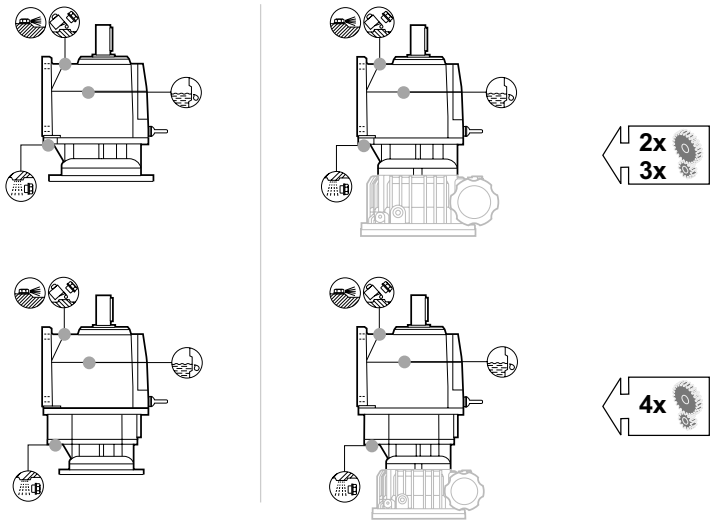
V5



B7



V6

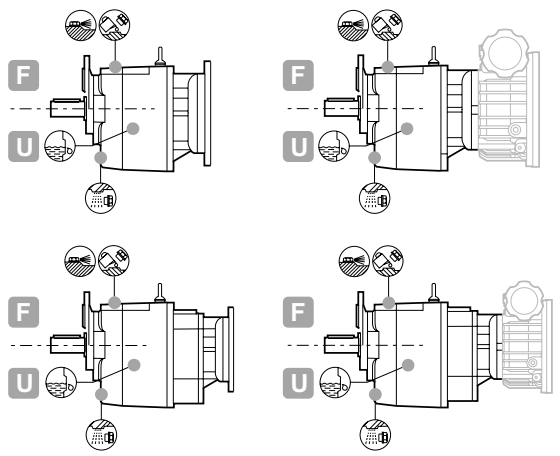


(E07)

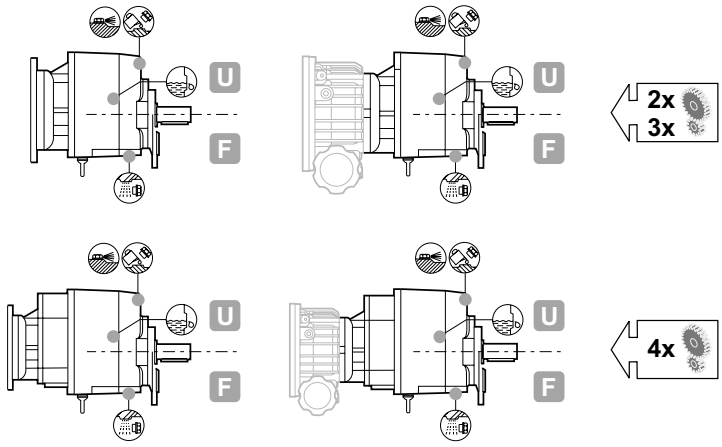
C_U	C_F

P (IEC)	V	P (IEC)	V

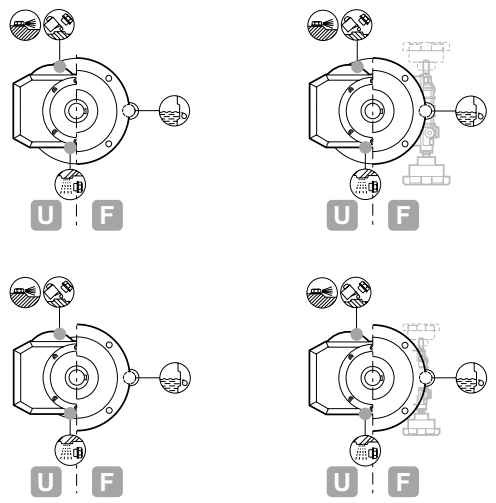
B5



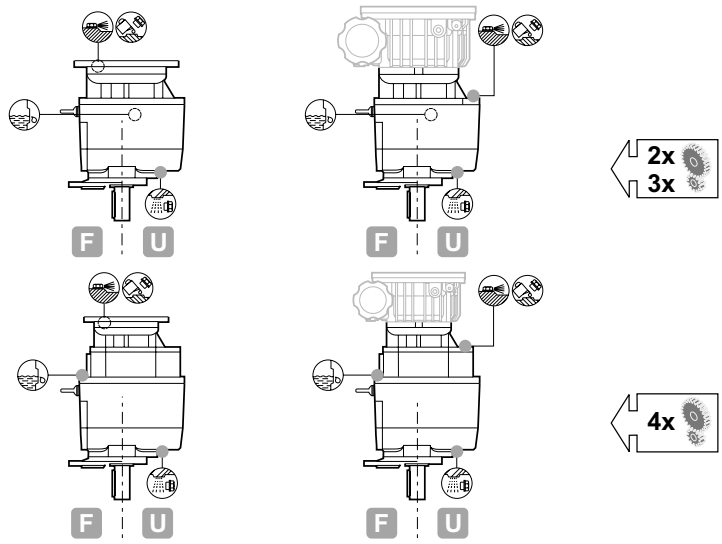
B52



B51



V1



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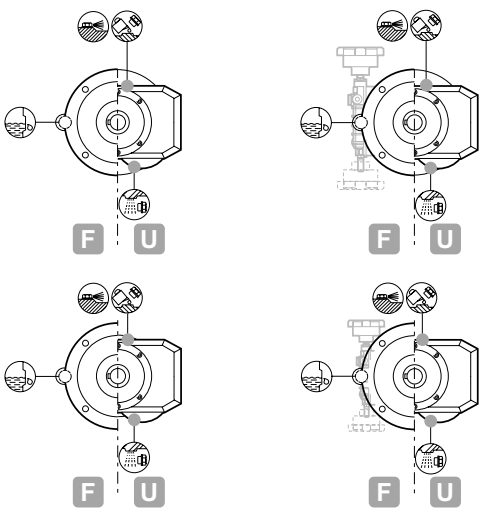
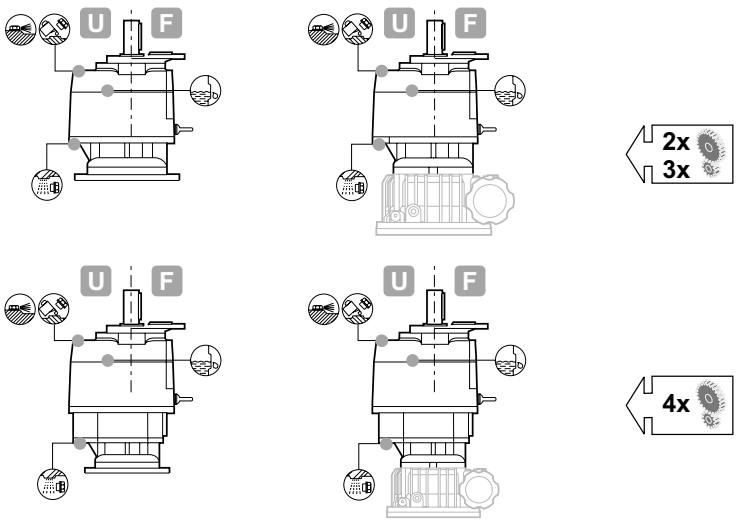
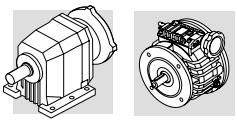


V3



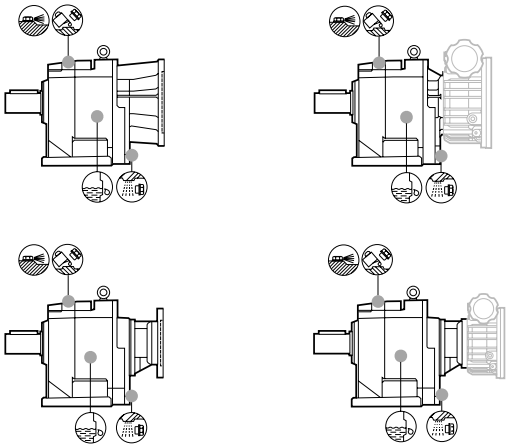


(E08)

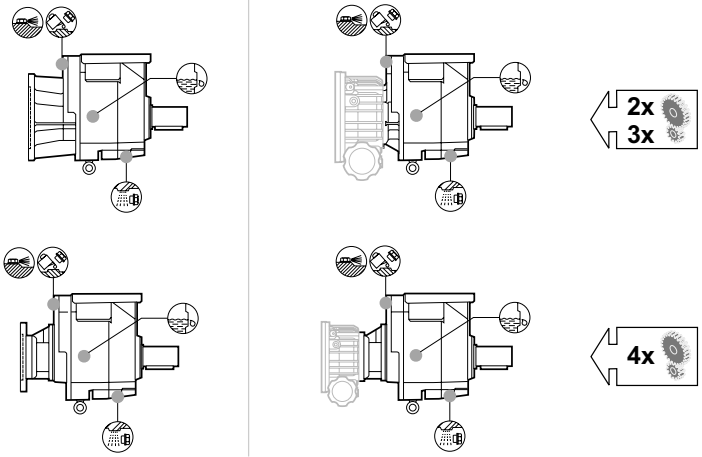
C_P

P (IEC)	V	P (IEC)	V

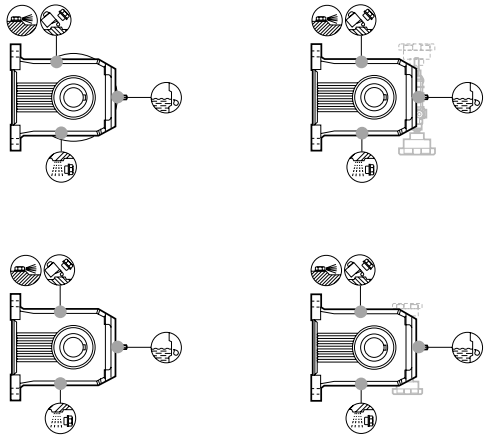
B3



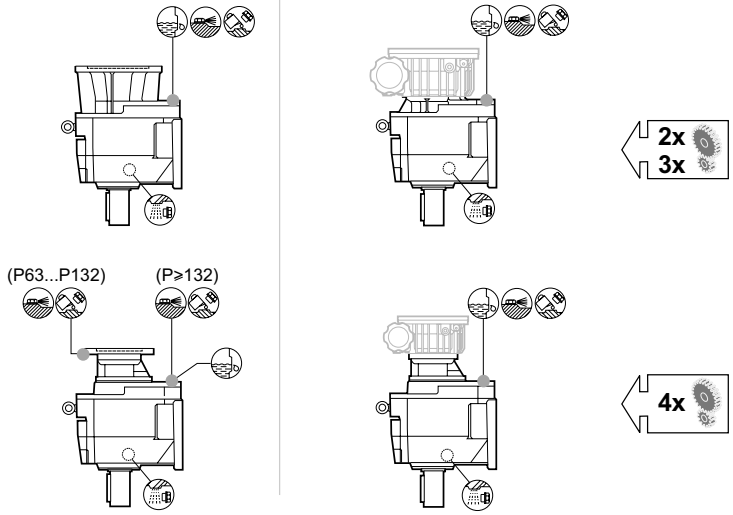
B8



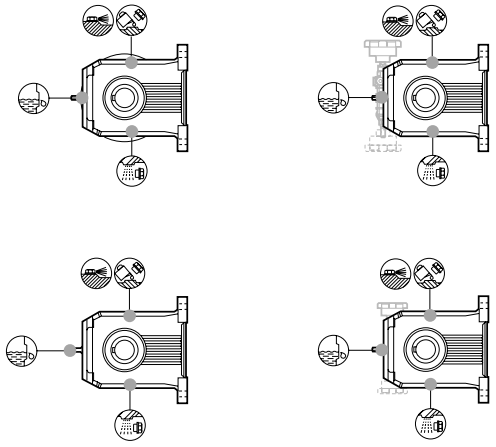
B6



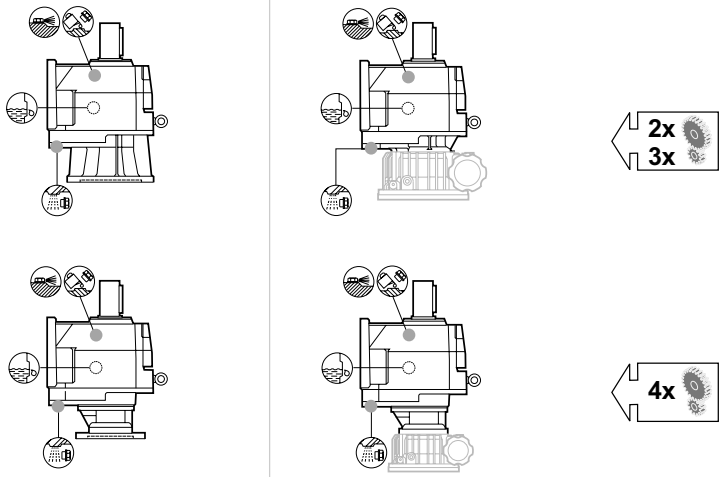
V5

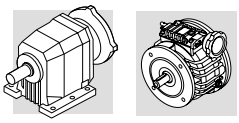


B7



V6





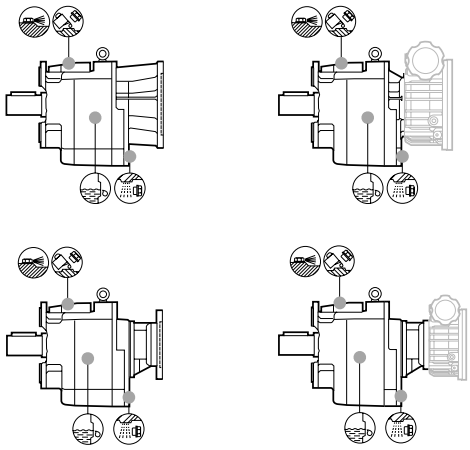
C 70...C 100

(E09)

C_F

P (IEC)	V	P (IEC)	V

B5



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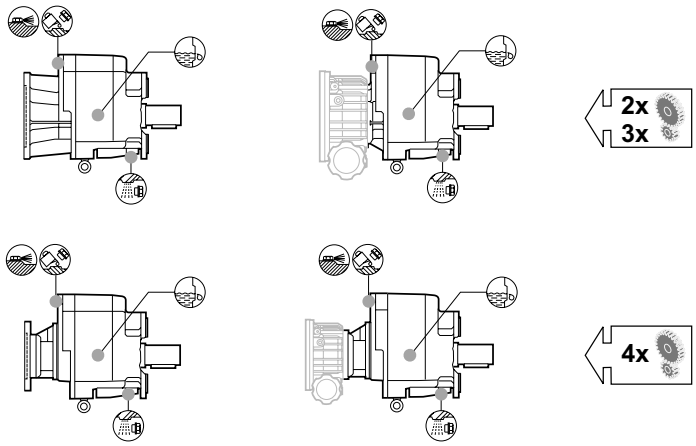
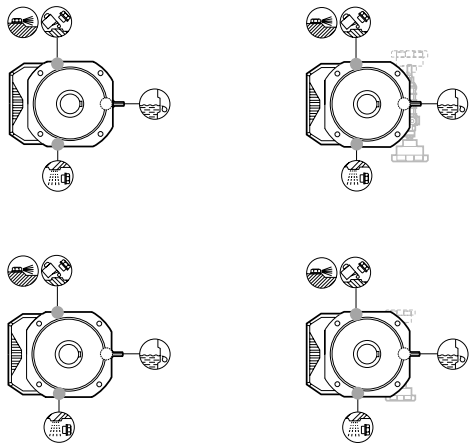
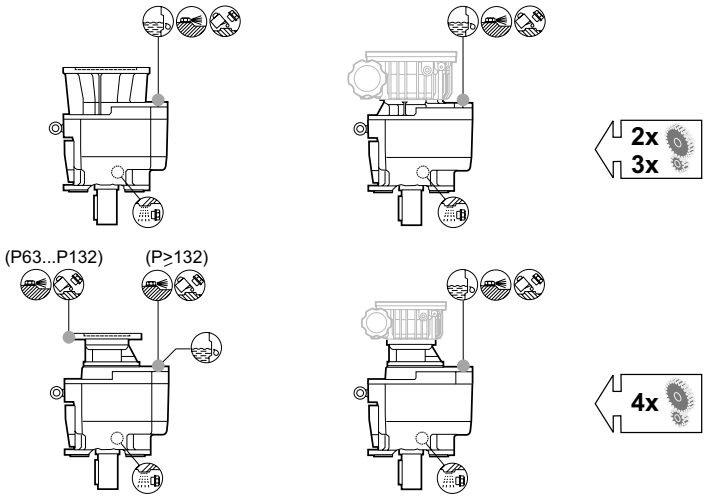


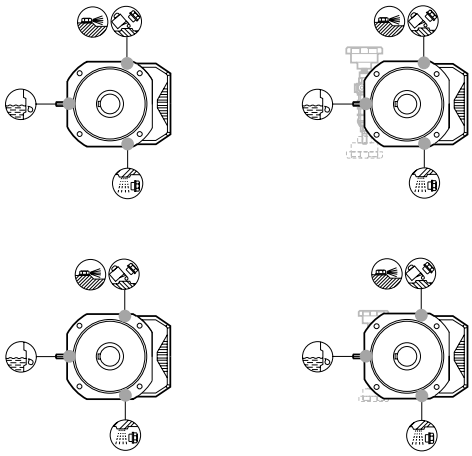
B51



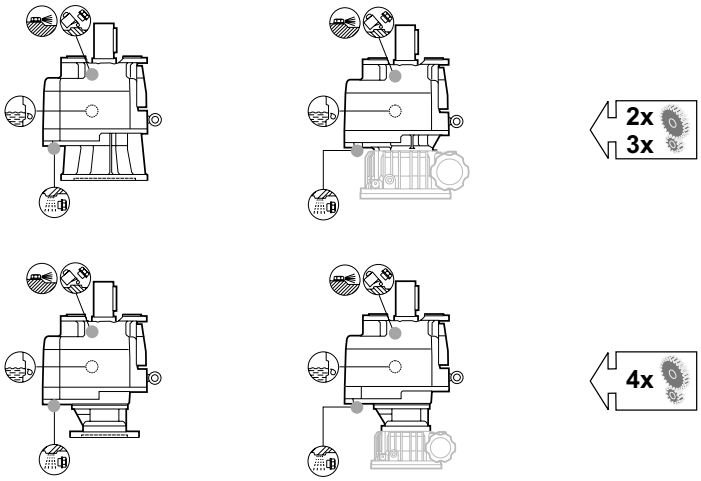
V1



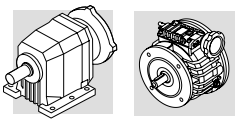
B53



V3



BONFIGLIOLI RIDUTTORI



Lubrificazione variatori

V, VD

La lubrificazione dei variatori V e VD avviene per sbattimento dell'olio. Prima della messa in funzione dei variatori accertarsi della presenza di olio al loro interno assicurandosi che esso compaia nella spia di livello. I variatori/motovariatori, se non diversamente specificato in fase di ordine, vengono forniti con il quantitativo di olio per la posizione di montaggio B3.

Si consiglia di specificare sempre in fase di ordine la posizione di montaggio desiderata.

VD

Tutti i variatori con differenziale VD completi di motore vengono forniti con carico di olio.
Tutti i variatori con differenziale VD in configurazione P... (IEC), vengono forniti privi di olio.
In questo caso l'utente dovrà provvedere al riempimento immettendo le quantità di olio indicate nelle tabelle (E10-E11) e dovrà utilizzare motori elettrici con l'anello di tenuta lato albero e la flangia di accoppiamento al variatore a tenuta di olio.

Benchè i variatori siano abbinabili a qualsiasi motore normalizzato IEC, BONFIGLIOLI raccomanda che siano utilizzati solo motori originali, provvisti di anelli di tenuta per l'olio.

Lubrication of variators

V and VD

Variators V and VD are splash-lubricated. Before putting the variator into operation make sure there is oil inside up to the sight glass level. Unless otherwise specified in the order, the variators are filled with an oil quantity suitable for B3 mounting position.

To avoid further manipulation it is strongly recommended that the actual mounting position is specified in the ordering code.

VD

Motorized VD variators featuring the differential unit are factory filled with oil unlike VD variators with the IEC motor adapter (P...) which are supplied unlubricated and must be filled with oil prior to be put into operation.
Proper oil quantity is shown in table (E10-E11) for each mounting position.

Although speed variators can match any IEC motors, BONFIGLIOLI recommends the use of genuine motors only, complete with oil seals.

Schmierung der Verstellgetriebe

V, VD

Die Schmierung der Verstellgetriebe V und VD erfolgt durch Tauchschmierung im Ölbad. Vor der Inbetriebnahme der Verstellgetriebe muß geprüft werden, ob sie bis zur Ölstandskontrolle mit Öl gefüllt sind.
Falls im Auftrag nicht anderweitig angegeben, werden die Verstellgetriebe mit der für die Einbaulage B3 vorgeschriebenen Ölmenge geliefert.

Es wird in jedem Fall geraten, bei der Bestellung immer die gewün- schte Einbaulage anzugeben.

VD

Alle Verstellgetriebe mit Differential VD und Motor, sind bei Lieferung mit Öl gefüllt.
Alle Verstellgetriebe mit Differential V-D für den Anbau eines IEC-Motors werden ohne Öl geliefert.
Wenn der Kunde die Getrieb selbst mit Öl füllt, müssen die in Tabelle (E10-E11) angegebenen Ölmengen verwenden werden. Die zu verwendenden Motoren müssen einen Dichtring auf der Seite der Welle haben und der Flansch zur Kopplung an das Verstellgetriebe muß öldicht sein.

Es wird empfohlen, die Verstellgetriebe mit Differential mit öldichten BONFIGLIOLI RIDUTTORI Motoren zu kaufen.

Lubrification variateurs

V, VD

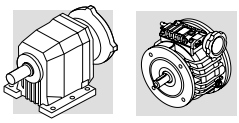
La lubrification des variateurs V et VD s'effectue par barbotage de l'huile. Avant la mise en service des variateurs/motovariateurs, vérifier la présence d'huile à l'intérieur en contrôlant que celle-ci apparaisse dans le témoin de niveau.
Les variateurs/motovariateurs, sauf spécification contraire au moment de la commande, sont fournis avec une quantité d'huile relative à la position de montage B3.

Dans tous les cas, il est conseillé de toujours spécifier la position de montage désirée au moment de la commande.

VD

Tous les variateurs avec différen- tiel VD avec moteur sont fournis avec le plein d'huile.
Tous les variateurs avec différen- tiel VD en configuration P... (IEC) sont fournis sans huile.
Dans ce cas, l'utilisateur doit effectuer le remplissage en versant la quantité d'huile indiquée dans le tableau (E10-E11) et doit utiliser des moteurs électriques avec bague d'étanchéité côté arbre et bride d'accouplement au variateur étanche à l'huile.

Dans tous les cas, il est conseillé d'acquérir des variateurs avec différentiel avec moteurs avec étanchéité à l'huile BONFIGLIOLI RIDUTTORI.



I variatori V 0.25 e V 0.5 vengono forniti completi di olio lubrificante “long life” sintetico **Shell Donax TX**.
Eventuali sostituzioni o rabbocchi dovranno essere effettuati utilizzando lo stesso tipo di prodotto.

*Variator units V 0.25 and V 0.5 are factory filled with “long life” synthetic oil **Shell Donax TX**.*
Use same oil when topping up or refilling.

Die Verstellgetriebe V 0.25 und V 0.5 werden mit Schmieröl **Shell Donax TX** geliefert.
Eventuelle Ölwechsel oder Nachfüllungen müssen unter Anwendung des gleichen Produkttyps erfolgen.

*Les variateurs V 0.25 et V 0.5 sont fournis avec de l’huile lubrifiante “long life” **Shell Donax TX**.*
Utiliser le même type d’huile pour les éventuels vidanges ou remplissages.

Shell Donax TX (Caratteristiche indicative / *indicative features* / Anhaltswerte / *Caractéristiques indicatives*)			
Massa volumica / *density* / Volumenmasse / *Masse volumique*	ISO 3675	kg/dm^3	0.852
Viscosità cinematica a 40°C / *kinematic viscosity at 40°C* / Kinematische Viskosität bei 40°C / *Viscosité cinématique à 40°C*	ISO 3104	cSt	34
Viscosità cinematica a 100°C / *kinematic viscosity at 100°C* / Kinematische Viskosität bei 100°C / *Viscosité cinématique à 100°C*	ISO 3104	cSt	7.4
Indice di viscosità / *viscosity index* / Viskositätsindex / *Indice de viscosité*	ISO 2909	-	196
Punto di infiammabilità / *flash point* / Entflammpunkt / *Point d’inflammabilité*	ISO 2592	°C	198
Punto di scorrimento / *pour point* / Stockpunkt / *Point de glissement*	ISO 3016	°C	-48

I variatori V 1...V 10 vengono forniti completi di olio lubrificante minerale **Shell Donax TA**.
Eventuali sostituzioni o rabbocchi potranno essere effettuati utilizzando lubrificanti compatibili.

*Variator units V 1 through V 10 are factory filled with mineral oil **Shell Donax TA** .*
Use same type of oil when topping up or refilling.

Die Verstellgetriebe V 1...V 10 werden mit dem Schmieröl **Shell Donax TA** geliefert.
Ein eventueller Wechsel oder ein etwaiges Auffüllen sollte unter Verwendung der Schmiermittel erfolgen.

*Les variateurs V 1...V 10 sont fournis avec de l’huile lubrifiante **Shell Donax TA**.*
Utiliser le même type d’huiles pour les éventuels vidanges ou remplissages.

Shell Donax TA (Caratteristiche indicative / *indicative features* / Anhaltswerte / *Caractéristiques indicatives*)			
Massa volumica / *density* / Volumenmasse / *Masse volumique*	ISO 3675	kg/dm^3	0.873
Viscosità cinematica a 40°C / *kinematic viscosity at 40°C* / Kinematische Viskosität bei 40°C / *Viscosité cinématique à 40°C*	ISO 3104	cSt	37.3
Viscosità cinematica a 100°C / *kinematic viscosity at 100°C /* Kinematische Viskosität bei 100°C / *Viscosité cinématique à 100°C*	ISO 3104	cSt	7.0
Indice di viscosità / *viscosity index* / Viskositätsindex / *Indice de viscosité*	ISO 2909	-	151
Punto di infiammabilità / *flash point* / Entflammpunkt / *Point d’inflammabilité*	ISO 2592	°C	196
Punto di scorrimento / *pour point* / Stockpunkt / *Point de glissement*	ISO 3016	°C	-42

Riduzione **R** lubrificata “a vita” con grasso **Shell TVX Compound B.**

Tutti i variatori sono forniti con carica di lubrificante, ad eccezione dei tipi **VD_P(IEC).**

Il tappo di sfiato, fornito a corredo, va posizionato come indicato nelle tabelle (E10 - E11).

*Helical reduction **R** is grease lubed "for life" with **Shell TVX Compound B**.*

*All speed variators are factory filled with lubricant, with the only exception of units type **VD_P(IEC)**.*

The breather plug, supplied along with every unit, shall be located as per the schemes (E10) and (E11).

Die Vorstufe **R** ist mit Fett Typ **Shell TVX Compound B** gefüllt.

Alle Verstellgetriebe sind ab Werk mit Öl gefüllt, außer dem Typ **VD_P(IEC)**.

Der Entlüftungsstopfen, der jedem Getriebe beiligt, muss entsprechend der obige Skizze montiert werden.

*Réduction **R** avec lubrification permanente au moyen de graisse **Shell TVX Compound B**.*

*Tous les variateurs sont fournis avec le lubrifiant, à l’exception des les models **VD_P (IEC)**.*

Le bouchon d’évent, fourni avec chaque variateur, doit être positionné comme indiqué dans les schémas (E10 - E11).

Non mescolare olii di natura diversa.

Do not mix synthetic oil with mineral oil.

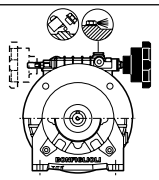
Auf keinen Fall darf synthetisches Öl mit mineralischem gemischt werden !

Ne pas mélanger huiles de nature différente.

(E10)

V 0.25 - V 0.5

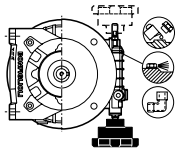
B3



V 0.25 F **V 0.5 F**	0.14 0.18	oil [l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

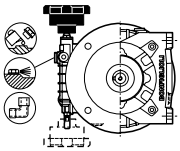
B6



V 0.25 F **V 0.5 F**	0.14 0.18	oil [l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

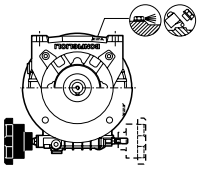
B7



V 0.25 F **V 0.5 F**	0.14 0.18	oil [l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

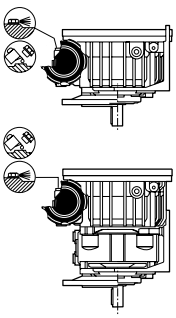
B8



V 0.25 F **V 0.5 F**	0.14 0.18	oil [l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

V5



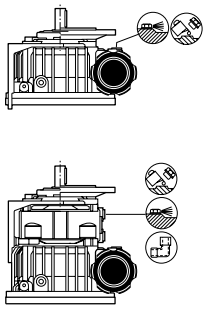
V 0.25 F **V 0.5 F**	0.28 0.30	oil [l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.22 0.27	

Oil Donax TX (for life)

VD 0.5 U_ / VRD 0.5	0.70	oil [l]

Oil Donax TX (for life)

V6



V 0.25 F **V 0.5 F**	0.14 0.18	oil [l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	

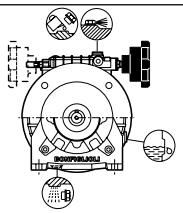
Oil Donax TX (for life)

VD 0.5 U_ / VRD 0.5	0.40	oil [l]

Oil Donax TX (for life)

V 1 - V 2

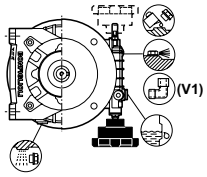
B3



V 1 F **V 2 F**	0.30 0.40	oil [l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

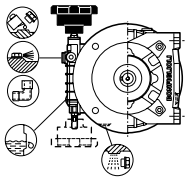
B6



V 1 F **V 2 F**	0.30 0.40	oil [l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

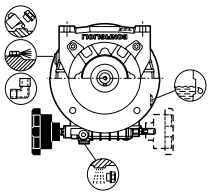
B7



V 1 F **V 2 F**	0.30 0.40	oil [l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

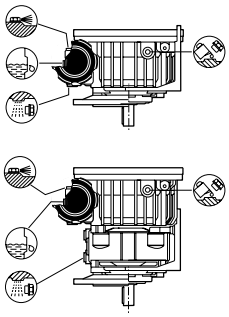
B8



V 1 F **V 2 F**	0.30 0.40	oil [l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

V5



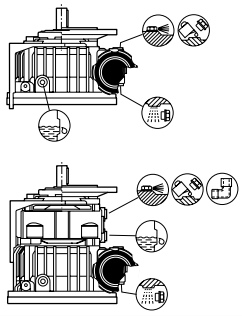
V 1 F **V 2 F**	0.58 0.78	oil [l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.40 0.54	

Oil Donax TA (2000-3000 hrs.)

VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	1.00 1.5	oil [l]

Oil Donax TA (for life)

V6



V 1 F **V 2 F**	0.30 0.40	oil [l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	

Oil Donax TA (2000-3000 hrs.)

VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.50 0.70	oil [l]

Oil Donax TA (for life)

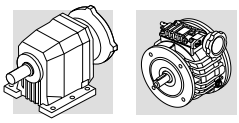
Tappo di sfiato
Breather plug
Entlüftungsstopfen
Bouchon d'évent

Tappo di carico
Filler plug
Einfüllstopfen
Bouchon de remplissage

Tappo di scarico
Drain plug
Ablassstopfen
Bouchon de vidange

Tappo di livello
Level plug
Ölstandsstopfen
Bouchon de niveau

Raccordo orientabile
90° elbow
90° Winkel
Raccord coudé

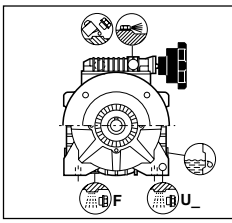


Posizioni di montaggio | *Mounting positions* | Einbaulagen | *Positions de montage*

(E11)

V 3 - V 5.5

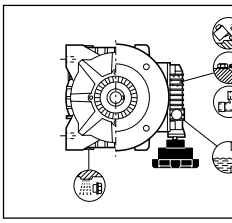
B3



V 3 F - V 5.5 F_	0.70	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	1.0	
VD 3 F_ **VD 5.5 F**	1.3	
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	1.6	

Oil Donax TA (2000-3000 hrs.)

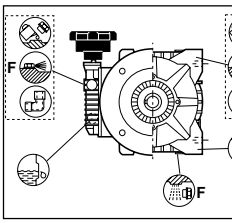
B6



V 3 F - V 5.5 F_	0.90	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	1.0	
VD 3 F_ **VD 5.5 F**	1.3	
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	1.6	

Oil Donax TA (2000-3000 hrs.)

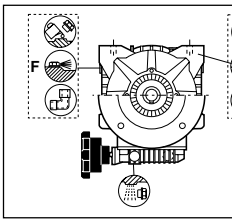
B7



V 3 F - V 5.5 F_	0.90	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	1.0	
VD 3 F_ **VD 5.5 F**	1.3	
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	1.6	

Oil Donax TA (2000-3000 hrs.)

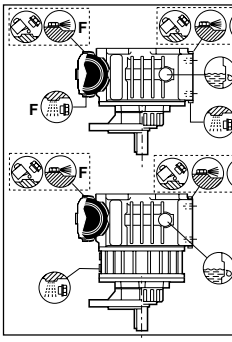
B8



V 3 F - V 5.5 F_	1.0	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	1.3	
VD 3 F_ **VD 5.5 F**	1.6	
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	1.9	

Oil Donax TA (2000-3000 hrs.)

V5



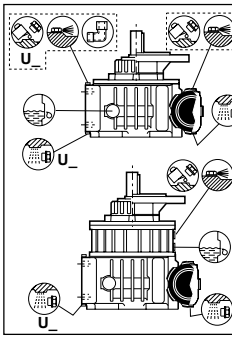
V 3 F - V 5.5 F_	2.1	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	2.0	

Oil Donax TA (2000-3000 hrs.)

VD 3 F_ **VD 5.5 F**	4.5	[l]
VD 3 U_ / VRD 3 U_ **VD 5.5 U / VRD 5.5 U_**	4.8	

Oil Donax TA (2000-3000 hrs.)

V6



V 3 F - V 5.5 F_	1.0	[l]
V 3 U_ / VR 3 **V 5.5 U / VR 5.5**	1.3	

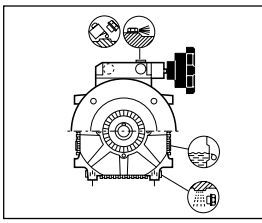
Oil Donax TA (2000-3000 hrs.)

VD 3 F_ **VD 5.5 F**	2.8	[l]
VD 3 U_ / VRD 3 U **VD 5.5 U / VRD 5.5 U_**	3.0	

Oil Donax TA (2000-3000 hrs.)

V 10

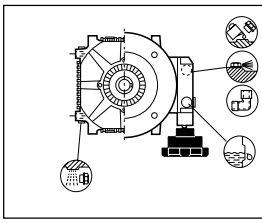
B3



V 10 F **V 10 U_ / VR 10**	1.8	[l]
VD 10 F **VD 10 U_ / VRD 10 U_**	2.0	

Oil Donax TA (2000-3000 hrs.)

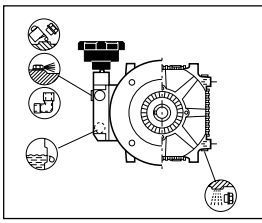
B6



V 10 F **V 10 U_ / VR 10**	1.8	[l]
VD 10 F **VD 10 U_ / VRD 10 U_**	2.0	

Oil Donax TA (2000-3000 hrs.)

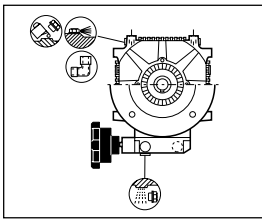
B7



V 10 F **V 10 U_ / VR 10**	1.8	[l]
VD 10 F **VD 10 U_ / VRD 10 U_**	2.0	

Oil Donax TA (2000-3000 hrs.)

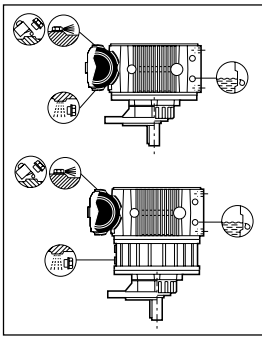
B8



V 10 F **V 10 U_ / VR 10**	2.1	[l]
VD 10 F **VD 10 U_ / VRD 10 U_**	2.1	

Oil Donax TA (2000-3000 hrs.)

V5



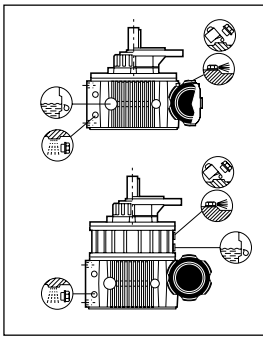
V 10 F **V 10 U_ / VR 10**	3.2	[l]

Oil Donax TA (2000-3000 hrs.)

VD 10 F **VD 10 U_ / VRD 10**	8.5	[l]

Oil Donax TA (2000-3000 hrs.)

V6

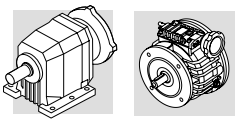


V 10 F **V 10 U_ / VR 10**	2.8	[l]

Oil Donax TA (2000-3000 hrs.)

VD 10 F **VD 10 U_ / VRD 10**	7.0	[l]

Oil Donax TA (2000-3000 hrs.)



23.8 - Posizioni di montaggio e orientamento morsettiera

Le tabelle (E13-E14-E15) evidenziano le posizioni che può assumere il variatore rispetto alla posizione di montaggio del riduttore.
In fase di ordine è necessario specificare oltre alla posizione di montaggio del riduttore anche la posizione del variatore e l'orientamento della morsettiera (W,N,E,S) scegliendo fra le alternative illustrate nelle tabelle.
La tabella (E12) facilita l'interpretazione delle varie posizioni di montaggio riportate.

23.8 - Mounting position and terminal box angular position

Tables (E13-E14-E15) show the mounting positions of the variator depending on reducer mounting position.
Reducer mounting position and variator arrangement must be specified on order, as well as terminal board arrangement (W, N, E, S). Choose from the options shown in the tables.

Table (E12) provides examples of the various mounting positions for better understanding.

23.8 - Einbaulagen und lage des klemmenkastens

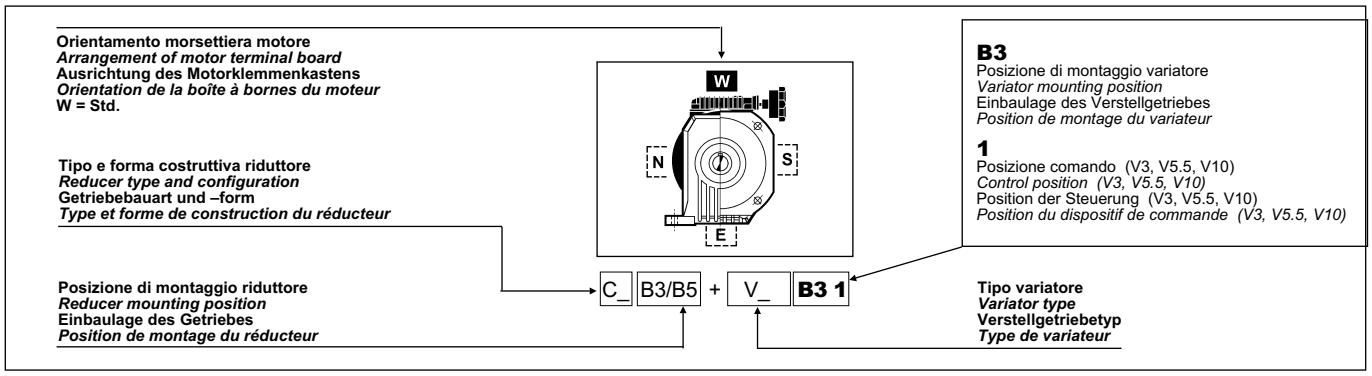
Die Tabellen (E13-E14-E15) stellen die Positionen dar, die das Verstellgetriebe den Einbaulagen des Getriebes gegenüber einnehmen kann.
In der Auftragsphase muß daher über die Montageposition des Getriebes hinaus, auch die Lage des Verstellgetriebes und die Ausrichtung der Klemmenleiste (W, N, E, S) angegeben werden, die unter den in der Tabelle angegebenen Möglichkeiten ausgewählt werden können.
Die Tabelle (E12) erleichtert die Auslegung der verschiedenen, dargestellten Einbaulagen.

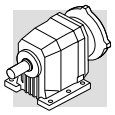
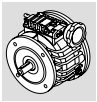
23.8 - Positions de montage et orientation boite a borne

Les tableaux (E13-E14-E15) indiquent les positions possibles du variateur par rapport à la position de montage du réducteur.
Au moment de la commande, il est nécessaire de préciser la position de montage du réducteur ainsi que la position du variateur et l'orientation de la boîte à bornes (W,N,E,S), en choisissant parmi les alternatives indiquées dans les tableaux.

Le tableau (E12) facilite l'interprétation des différentes positions de montage indiquées.

(E12)



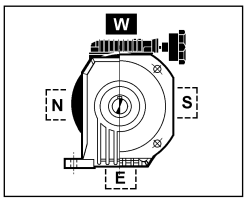



(E13)

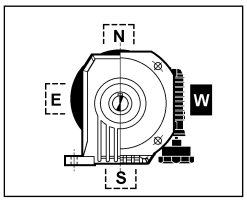
B3 / B5

C_P_B3

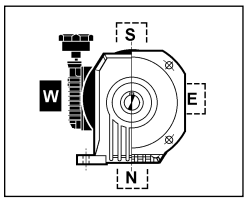
C_F_B5
C_U_B5
C_UF_B5



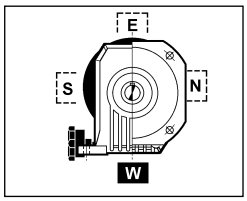
C_ B3/B5 + V_ **B3 1**



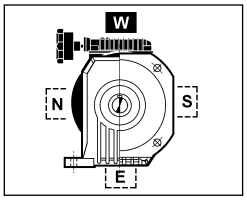
C_ B3/B5 + V_ **B6 1**



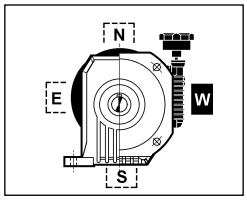
C_ B3/B5 + V_ **B7 1**



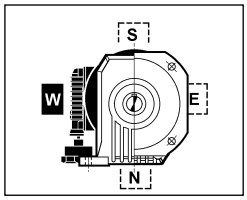
C_ B3/B5 + V_ **B8 1**



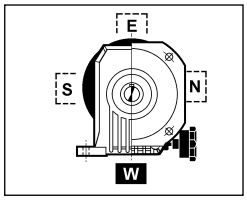
C_ B3/B5 + V_ **B3 2**



C_ B3/B5 + V_ **B6 2**

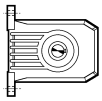
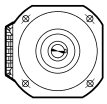


C_ B3/B5 + V_ **B7 2**



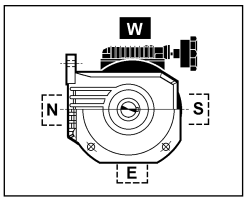
C_ B3/B5 + V_ **B8 2**

B6 / B51

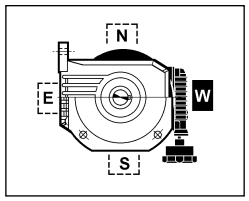



C_P_B6

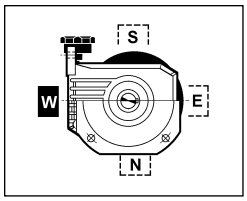
C_F_B51
C_U_B51
C_UF_B51



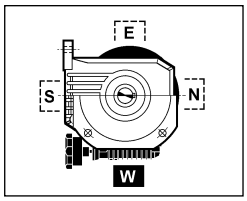
C_ B6/B51 + V_ **B3 1**



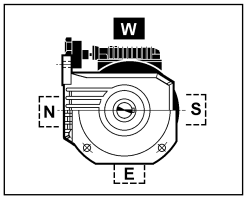
C_ B6/B51 + V_ **B6 1**



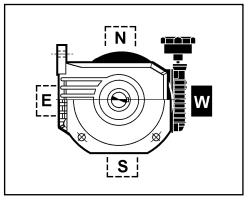
C_ B6/B51 + V_ **B7 1**



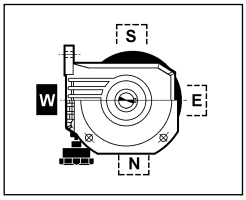
C_ B6/B51 + V_ **B8 1**



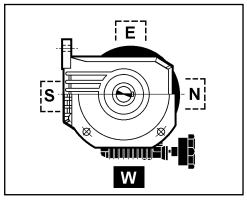
C_ B6/B51 + V_ **B3 2**



C_ B6/B51 + V_ **B6 2**

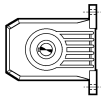
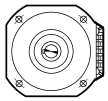


C_ B6/B51 + V_ **B7 2**



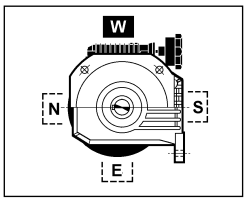
C_ B6/B51 + V_ **B8 2**

B7 / B53

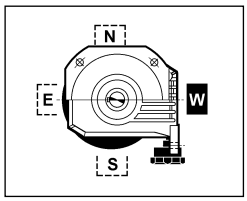



C_P_B7

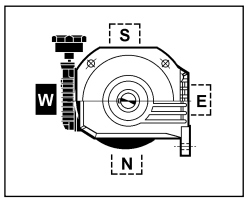
C_F_B53
C_U_B53
C_UF_B53



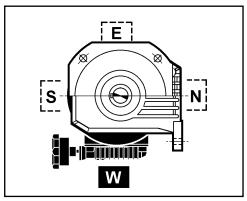
C_ B7/B53 + V_ **B3 1**



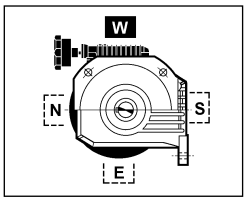
C_ B7/B53 + V_ **B6 1**



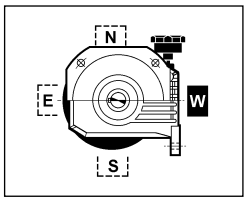
C_ B7/B53 + V_ **B7 1**



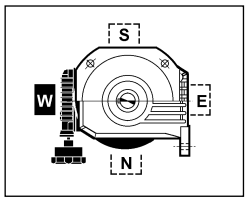
C_ B7/B53 + V_ **B8 1**



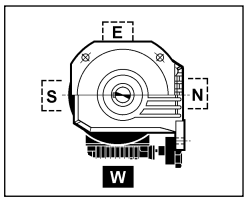
C_ B7/B53 + V_ **B3 2**



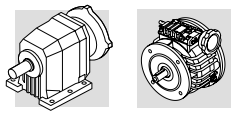
C_ B7/B53 + V_ **B6 2**



C_ B7/B53 + V_ **B7 2**



C_ B7/B53 + V_ **B8 2**

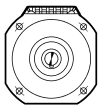


(E14)

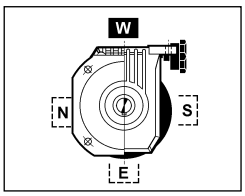
B8

C_P_B8

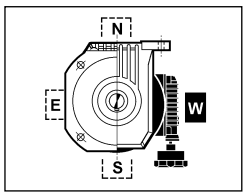
B52



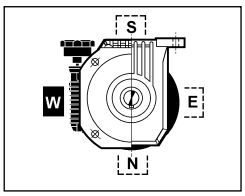
C_F_B52
C_U_B52
C_UF_B52



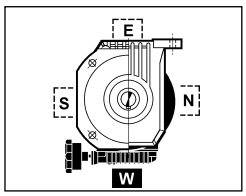
C_ B8/B52 + V_ **B3 1**



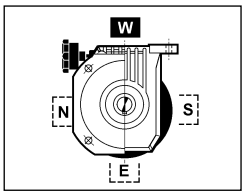
C_ B8/B52+ V_ **B6 1**



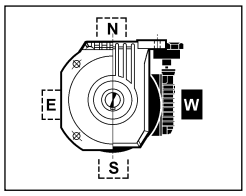
C_ B8/B52+ V_ **B7 1**



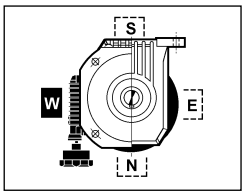
C_ B8/B52+ V_ **B8 1**



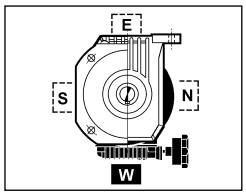
C_ B8/B52+ V_ **B3 2**



C_ B8/B52+ V_ **B6 2**

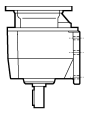


C_ B8/B52+ V_ **B7 2**



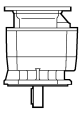
C_ B8/B52+ V_ **B8 2**

V5

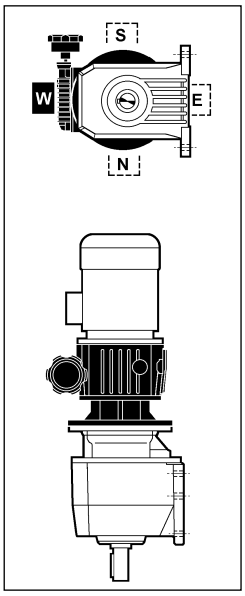


C_P_V5

V1



C_F_V1
C_U_V1
C_UF_V1



C_ P V5
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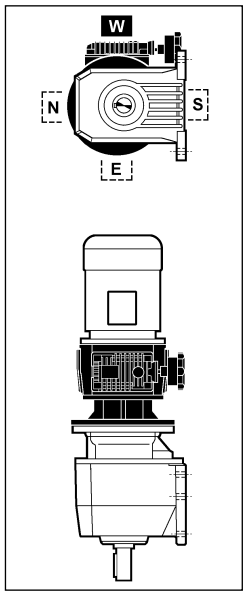

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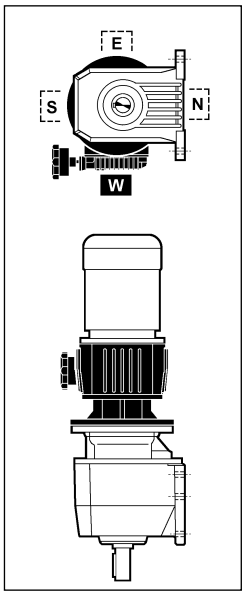

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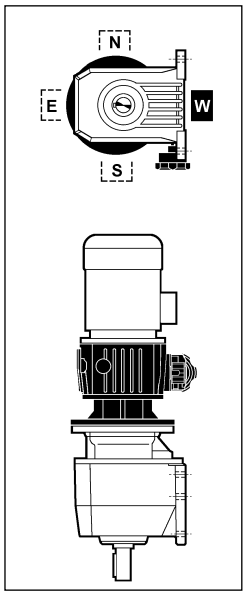

C_ P V5
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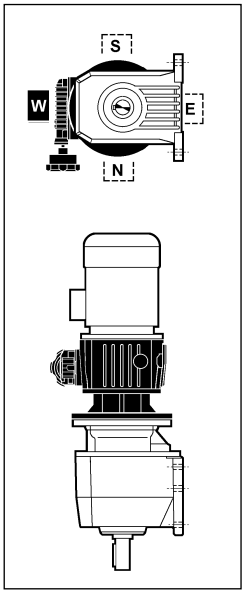

C_ P V5
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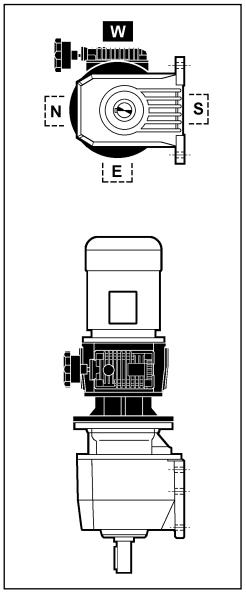

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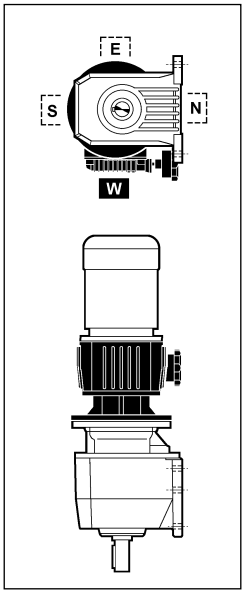

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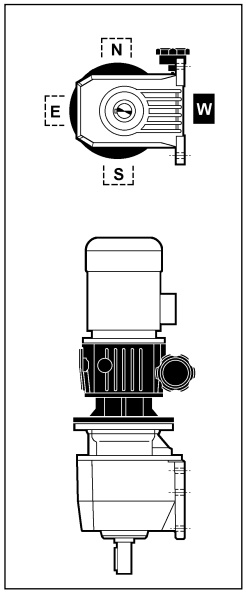

C_ P V5
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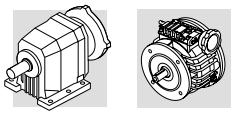

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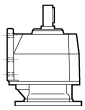
V6



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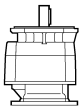
V3



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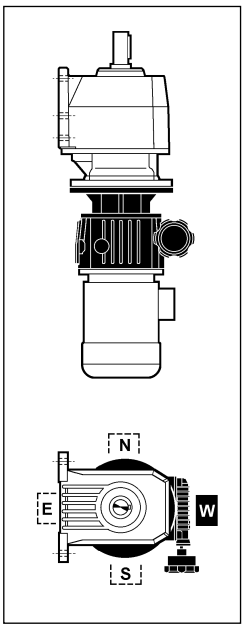
C_U_V3
C_UF_V3



C_ P V6
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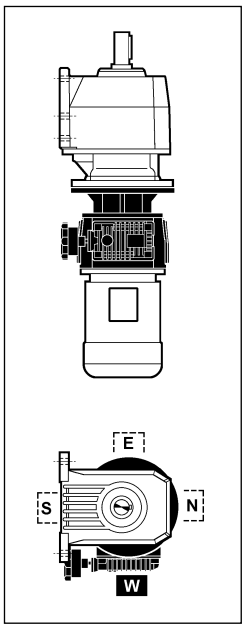

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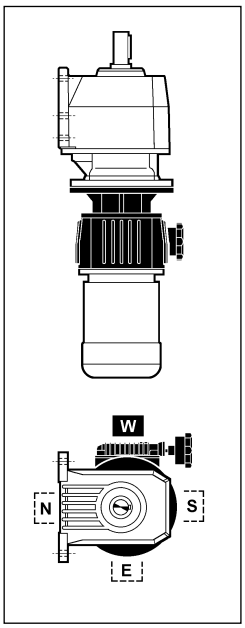
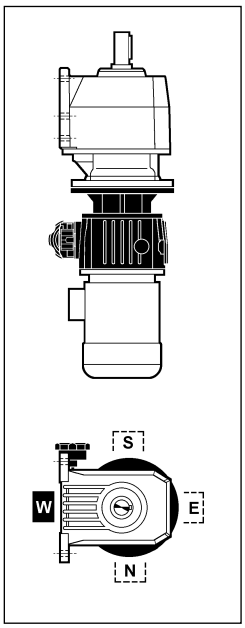
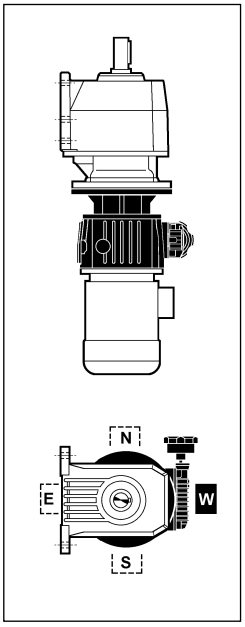


C_ P V6
C_ F V3 + V_ **V63 1**



C_ P V6
C_ F B5 + V_ **V62 1**



C_ P V6
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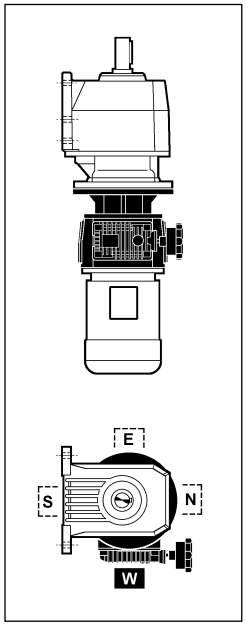

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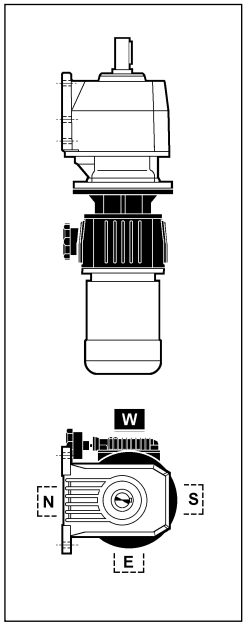
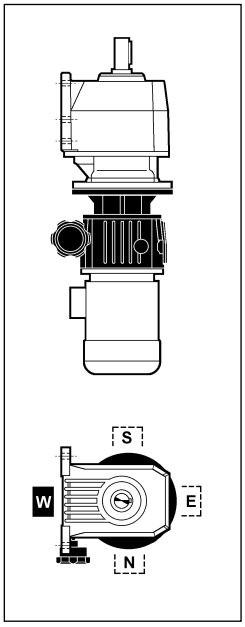


C_ P V6
C_ F V3 + V_ **V63 2**



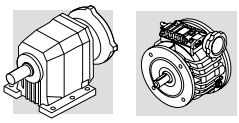
C_ P V6
C_ F V3 + V_ **V62 2**

0.12 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
2.0	**0.41**	388	1024	1.5	0.6	304.2	7000	**C414_304.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	198-199
2.6	**0.54**	296	782	1.5	0.6	232.3	6500	**C354_232.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	196-197
3.7	**0.77**	211	557	2.1	0.8	162.0	6500	**C353_162.0**	— P63	— V 0.25 F	**P63**	**BN63B6**	196-197
4.9	**1.0**	159	421	1.9	0.7	122.4	5500	**C313_122.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	194-195
5.8	**1.2**	134	356	2.2	0.8	103.3	5500	**C313_103.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	194-195
7.3	**1.5**	108	284	2.8	1.1	82.6	5500	**C313_82.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	194-195
9.5	**2.0**	84	223	1.6	0.6	63.3	5000	**C212_63.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	192-193
11.0	**2.3**	73	192	2.2	0.9	54.7	5000	**C212_54.7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	192-193
13.9	**2.9**	58	152	3.3	1.2	43.3	5000	**C212_43.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	192-193
16.3	**3.4**	49	130	1.8	0.7	37.0	2000	**C112_37.0**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
16.4	**3.4**	49	129	4.1	1.5	36.8	5000	**C212_36.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	192-193
18.4	**3.8**	44	115	2.1	0.8	32.8	2000	**C112_32.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
20.4	**4.2**	39	104	5.1	1.9	29.6	5000	**C212_29.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	192-193
20.5	**4.2**	39	104	2.5	1.0	29.5	2000	**C112_29.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
23.8	**4.9**	34	89	2.6	1.0	25.4	2000	**C112_25.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
26.4	**5.5**	31	81	3.3	1.2	22.9	2000	**C112_22.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
29.3	**6.1**	27	72	3.2	1.2	20.6	2000	**C112_20.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
35	**7.3**	23	60	3.8	1.5	17.2	2000	**C112_17.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
39	**8.1**	21	54	4.2	1.8	15.5	2000	**C112_15.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
45	**9.3**	18	47	4.5	1.9	13.4	2000	**C112_13.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
60	**12.4**	13	36	5.4	2.5	10.1	2000	**C112_10.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
79	**16.4**	10	27	6.4	3.0	7.6	2000	**C112_7.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
97	**20.2**	8	22	7.4	3.2	6.2	2000	**C112_6.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191
123	**25.5**	7	17	8.4	3.9	4.9	2000	**C112_4.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	190-191

0.18 kW

2.5	**0.52**	437	873	1.4	0.7	239.9	7000	**C414_239.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	198-199
3.5	**0.72**	359	957	1.7	0.6	263.0	7000	**C414_263.0**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	198-199
3.8	**0.79**	327	873	1.8	0.7	239.9	7000	**C414_239.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	198-199
4.4	**0.92**	288	768	1.6	0.6	206.4	6500	**C353_206.4**	— P63	— V 0.25 F	**P63**	**BN63B4**	196-197
5.8	**1.2**	192	384	1.6	0.8	103.3	5500	**C313_103.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	194-195



0.18 kW

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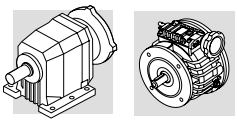
6.5	**1.3**	173	346	1.7	0.9	93.0	5500	**C313_93.0**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	194-195
7.1	**1.5**	178	474	2.5	1.0	127.3	6500	**C353_127.3**	— P63	— V 0.25 F	**P63**	**BN63B4**	196-197
7.3	**1.5**	154	307	2.0	1.0	82.6	5500	**C313_82.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	194-195
8.2	**1.7**	156	415	2.9	1.1	111.5	6500	**C353_111.5**	— P63	— V 0.25 F	**P63**	**BN63B4**	196-197
8.8	**1.8**	144	384	2.1	0.8	103.3	5500	**C313_103.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	194-195
9.0	**1.9**	142	378	3.2	1.2	101.6	6500	**C353_101.6**	— P63	— V 0.25 F	**P63**	**BN63B4**	196-197
9.0	**1.9**	127	254	1.7	0.9	66.8	5500	**C312_66.8**	— P63	— V 0.25 F	**P63**	**BN71A6R**	194-195
11.0	**2.3**	115	307	2.6	1.0	82.6	5500	**C313_82.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	194-195
11.5	**2.4**	100	199	3.0	1.5	52.4	5500	**C312_52.4**	— P63	— V 0.25 F	**P63**	**BN71A6R**	194-195
13.3	**2.8**	86	172	3.5	1.7	45.3	5500	**C312_45.3**	— P63	— V 0.25 F	**P63**	**BN71A6R**	194-195
13.6	**2.8**	95	254	2.3	0.9	66.8	5500	**C312_66.8**	— P63	— V 0.25 F	**P63**	**BN63B4**	194-195
13.9	**2.9**	82	165	2.3	1.2	43.3	5000	**C212_43.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	192-193
16.4	**3.4**	70	140	2.9	1.4	36.8	5000	**C212_36.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	192-193
17.4	**3.6**	75	199	4.0	1.5	52.4	5500	**C312_52.4**	— P63	— V 0.25 F	**P63**	**BN63B4**	194-195
20.1	**4.2**	65	172	4.6	1.7	45.3	5500	**C312_45.3**	— P63	— V 0.25 F	**P63**	**BN63B4**	194-195
20.4	**4.2**	56	113	3.6	1.8	29.6	5000	**C212_29.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	192-193
21.0	**4.4**	62	165	3.1	1.2	43.3	5000	**C212_43.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	192-193
23.8	**4.9**	48	97	1.8	0.9	25.4	2000	**C112_25.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	190-191
24.7	**5.2**	52	140	3.8	1.4	36.8	5000	**C212_36.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	192-193
24.9	**5.1**	46	92	4.3	2.2	24.3	5000	**C212_24.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	192-193
27.7	**5.8**	47	125	1.9	0.7	32.8	2000	**C112_32.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	190-191
29.3	**6.1**	39	78	2.3	1.1	20.6	2000	**C112_20.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	190-191
30	**6.3**	38	76	5.3	2.6	20.0	5000	**C212_20.0**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	192-193
31	**6.4**	42	112	2.4	0.9	29.5	2000	**C112_29.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	190-191
35	**7.3**	33	65	2.7	1.4	17.2	2000	**C112_17.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	190-191
36	**7.5**	36	97	2.5	0.9	25.4	2000	**C112_25.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	190-191
37	**7.8**	35	92	5.8	2.2	24.3	4760	**C212_24.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	192-193
44	**9.2**	29	78	3.0	1.1	20.6	2000	**C112_20.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	190-191
45	**9.3**	25	51	3.2	1.8	13.4	2000	**C112_13.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	190-191
53	**11.0**	25	65	3.6	1.4	17.2	2000	**C112_17.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	190-191
58	**12.0**	23	60	8.9	3.3	15.8	4160	**C212_15.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	192-193
60	**12.4**	19	38	3.8	2.3	10.1	2000	**C112_10.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	190-191
68	**14.2**	19	51	4.2	1.8	13.4	2000	**C112_13.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	190-191
79	**16.4**	14	29	4.5	2.7	7.6	2000	**C112_7.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	190-191
90	**18.8**	14	38	5.0	2.3	10.1	2000	**C112_10.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	190-191
97	**20.2**	12	24	5.2	3.0	6.2	2000	**C112_6.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	190-191



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120	**25.0**	11	29	6.0	2.7	7.6	2000	**C112_7.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	190-191
123	**25.5**	9	19	5.9	3.6	4.9	2000	**C112_4.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	190-191
147	**31**	9	24	6.9	3.0	6.2	1950	**C112_6.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	190-191
186	**39**	7	19	7.9	3.6	4.9	1800	**C112_4.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	190-191

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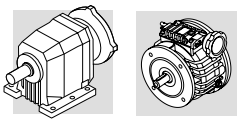
2.2	**0.41**	841	2102	1.9	0.8	462.0	7000	**C614_462.0**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	202-203
3.0	**0.56**	615	1537	2.6	1.0	337.7	16000	**C614_337.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	202-203
3.8	**0.72**	480	1200	2.1	0.8	263.8	10000	**C514_263.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	200-201
4.2	**0.79**	438	1096	2.3	0.9	240.9	10000	**C514_240.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	200-201
4.2	**0.80**	434	1084	3.7	1.5	238.3	16000	**C614_238.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	202-203
5.2	**1.0**	355	887	1.7	0.7	190.8	7000	**C413_190.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	198-199
6.1	**1.2**	305	763	2.0	0.8	164.1	7000	**C413_164.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	198-199
6.2	**1.2**	301	753	1.5	0.6	162.0	6500	**C353_162.0**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	196-197
6.8	**1.3**	275	686	1.6	0.7	147.6	6500	**C353_147.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	196-197
7.1	**1.5**	213	474	2.1	1.0	127.3	6500	**C353_127.3**	— P63	— V 0.25 F	**P63**	**BN63C4**	196-197
7.2	**1.4**	260	650	1.7	0.7	139.8	6500	**C353_139.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	196-197
8.2	**1.7**	187	415	2.4	1.1	111.5	6500	**C353_111.5**	— P63	— V 0.25 F	**P63**	**BN63C4**	196-197
8.3	**1.6**	224	561	2.7	1.1	120.6	7000	**C413_120.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	198-199
9.0	**1.9**	170	378	2.6	1.2	101.6	6500	**C353_101.6**	— P63	— V 0.25 F	**P63**	**BN63C4**	196-197
9.0	**1.7**	207	518	2.2	0.9	111.5	6500	**C353_111.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	196-197
9.9	**2.1**	154	342	2.9	1.3	91.9	6500	**C353_91.9**	— P63	— V 0.25 F	**P63**	**BN63C4**	196-197
10.9	**2.1**	171	427	2.6	1.1	91.9	6500	**C353_91.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	196-197
11.0	**2.3**	138	307	2.2	1.0	82.6	5500	**C313_82.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	194-195
11.7	**2.4**	130	289	3.5	1.6	77.6	6500	**C353_77.6**	— P63	— V 0.25 F	**P63**	**BN63C4**	196-197
11.9	**2.3**	156	390	2.9	1.2	83.8	6500	**C353_83.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	196-197
14.1	**2.7**	132	329	3.4	1.4	70.7	6500	**C353_70.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	196-197
14.7	**3.1**	104	231	4.3	2.0	62.0	6500	**C353_62.0**	— P63	— V 0.25 F	**P63**	**BN63C4**	196-197
16.6	**3.5**	94	208	1.7	0.8	54.7	5000	**C212_54.7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	192-193
17.4	**3.6**	90	199	3.3	1.5	52.4	5500	**C312_52.4**	— P63	— V 0.25 F	**P63**	**BN63C4**	194-195
17.7	**3.4**	105	263	4.3	1.7	56.5	6500	**C353_56.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	196-197
19.1	**3.6**	100	249	3.0	1.2	52.4	5500	**C312_52.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	194-195
20.1	**4.2**	78	172	3.9	1.7	45.3	5500	**C312_45.3**	— P63	— V 0.25 F	**P63**	**BN63C4**	194-195
21.0	**4.4**	74	165	2.6	1.2	43.3	5000	**C212_43.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	192-193



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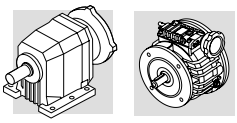
21.2	**4.0**	90	224	3.3	1.3	47.2	5500	**C312_47.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	194-195
22.1	**4.2**	86	215	3.5	1.4	45.3	5500	**C312_45.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	194-195
24.7	**5.2**	63	140	3.2	1.4	36.8	5000	**C212_36.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	192-193
26.4	**5.0**	72	191	4.2	1.6	25.1	5500	**C312_25.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	194-195
27.2	**5.7**	57	127	1.8	0.8	33.4	2000	**C112_33.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
27.2	**5.2**	70	175	2.9	1.1	36.8	5000	**C212_36.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	192-193
30	**5.7**	63	157	3.2	1.3	33.1	4910	**C212_33.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	192-193
31	**6.4**	50	112	2.0	0.9	29.5	2000	**C112_29.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
31	**6.4**	51	112	4.0	1.8	29.6	4970	**C212_29.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	192-193
34	**6.4**	56	140	1.8	0.7	29.5	2000	**C112_29.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	190-191
34	**6.4**	56	141	3.6	1.4	29.6	4770	**C212_29.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	192-193
37	**7.1**	51	127	3.9	1.6	26.7	4620	**C212_26.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	192-193
37	**7.8**	42	92	4.8	2.2	24.3	4690	**C212_24.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	192-193
38	**8.0**	45	118	1.9	0.8	47.6	2000	**C112_47.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
40	**8.3**	39	87	2.5	1.1	22.9	2000	**C112_22.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
41	**7.8**	46	115	4.3	1.7	24.3	4500	**C212_24.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	192-193
42	**8.9**	41	106	2.1	0.9	42.9	2000	**C112_42.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
42	**8.8**	41	107	4.5	1.8	43.3	4500	**C212_43.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	192-193
44	**9.2**	35	78	2.5	1.1	20.6	2000	**C112_20.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
49	**10.3**	35	91	2.2	1.0	37.0	2000	**C112_37.0**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
50	**9.5**	38	95	5.3	2.1	20.0	4250	**C212_20.0**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	192-193
53	**11.0**	29	65	3.0	1.4	17.2	2000	**C112_17.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
55	**11.6**	31	81	2.4	1.1	32.8	2000	**C112_32.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
58	**11.0**	33	82	2.7	1.1	17.2	2000	**C112_17.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	190-191
62	**12.9**	28	73	2.6	1.4	29.5	2000	**C112_29.5**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
65	**12.3**	29	74	2.9	1.3	15.5	2000	**C112_15.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	190-191
68	**14.2**	23	51	3.5	1.8	13.4	2000	**C112_13.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
72	**15.0**	24	63	2.9	1.4	25.4	2000	**C112_25.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
75	**15.7**	21	46	3.8	2.1	12.1	2000	**C112_12.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
79	**16.6**	22	57	3.1	1.8	22.9	2000	**C112_22.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
83	**15.7**	23	57	3.4	1.7	12.1	2000	**C112_12.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	190-191
87	**16.4**	22	58	3.0	1.4	7.6	2000	**C112_7.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	190-191
88	**18.4**	20	51	3.3	1.7	20.6	2000	**C112_20.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
90	**18.8**	17	38	4.2	2.3	10.1	2000	**C112_10.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
99	**18.8**	19	48	3.8	1.8	10.1	2000	**C112_10.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	190-191
106	**22.1**	16	42	3.7	2.1	17.2	2000	**C112_17.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191



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109	**20.5**	17	46	6.3	2.5	6.1	3330	**C212_6.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	192-193
120	**25.0**	13	29	5.0	2.7	7.6	2000	**C112_7.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
132	**25.0**	14	36	4.5	2.2	7.6	2000	**C112_7.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	190-191
136	**28.4**	13	33	4.3	2.7	13.4	2000	**C112_13.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
138	**26.0**	14	36	7.7	2.9	4.8	3080	**C212_4.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	192-193
147	**31**	11	24	5.8	3.0	6.2	1940	**C112_6.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
161	**31**	12	29	5.2	2.4	6.2	1870	**C112_6.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	190-191
164	**31**	12	29	9.5	4.0	6.1	2900	**C212_6.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	192-193
180	**38**	10	25	5.1	3.5	10.1	1830	**C112_10.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
186	**39**	8	19	6.6	3.6	4.9	1790	**C112_4.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	190-191
204	**39**	9	23	5.9	2.9	4.9	1730	**C112_4.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	190-191
239	**50**	7	19	6.2	4.2	7.6	1680	**C112_7.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
294	**61**	6	15	7.1	4.6	6.2	1550	**C112_6.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191
371	**78**	5	12	8.2	5.5	4.9	1430	**C112_4.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	190-191

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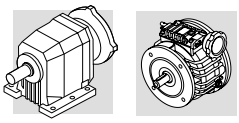
3.6	**0.69**	752	2004	2.1	0.8	275.3	16000	**C614_275.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	202-203
4.6	**0.87**	594	1583	2.7	1.0	217.4	16000	**C614_217.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	202-203
5.5	**1.0**	449	897	1.3	0.7	120.6	7000	**C413_120.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	198-199
6.5	**1.2**	381	761	1.6	0.8	102.3	7000	**C413_102.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	198-199
8.3	**1.6**	336	897	1.8	0.7	120.6	7000	**C413_120.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199
9.1	**1.7**	307	819	2.0	0.7	110.1	7000	**C413_110.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199
9.8	**1.9**	285	761	2.1	0.8	102.3	7000	**C413_102.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199
11.9	**2.3**	234	623	1.9	0.7	83.8	6500	**C353_83.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	196-197
12.3	**2.3**	227	606	2.6	1.0	81.5	7000	**C413_81.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199
13.4	**2.6**	208	554	2.9	1.1	74.4	7000	**C413_74.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199
14.6	**2.8**	172	344	1.7	0.9	45.3	5500	**C312_45.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	194-195
15.6	**3.0**	179	478	3.3	1.3	64.3	7000	**C413_64.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199
17.7	**3.4**	158	420	2.9	1.1	56.5	6500	**C353_56.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	196-197
19.4	**3.7**	144	383	4.2	1.6	51.5	7000	**C413_51.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199
22.1	**4.2**	129	344	2.3	0.9	45.3	5500	**C312_45.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	194-195
22.3	**4.2**	128	340	3.9	1.5	44.8	7000	**C412_44.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199
27.0	**5.1**	106	282	4.7	1.8	37.1	7000	**C412_37.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199



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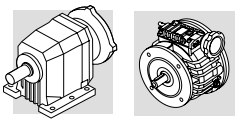
27.2	**5.7**	95	254	2.2	0.9	66.8	5500	**C312_66.8**	**—** P63	**—** V 0.25 F	**P63**	**BN63C2**	194-195
27.7	**5.3**	103	274	2.9	1.1	36.1	5500	**C312_36.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	194-195
32	**6.1**	89	239	5.6	2.1	31.4	7000	**C412_31.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199
33	**6.3**	76	152	2.6	1.3	20.0	4670	**C212_20.0**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	192-193
34	**6.4**	84	225	2.4	0.9	29.6	4580	**C212_29.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	192-193
40	**7.6**	71	190	7.0	2.6	25.0	7000	**C412_25.0**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	198-199
41	**7.8**	69	185	2.9	1.1	24.3	4350	**C212_24.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	192-193
41	**8.7**	61	163	7.0	2.8	43.9	6500	**C353_43.9**	**—** P63	**—** V 0.25 F	**P63**	**BN63C2**	196-197
42	**8.8**	62	165	3.0	1.2	43.3	4370	**C212_43.3**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	192-193
50	**9.5**	57	152	3.5	1.3	20.0	4130	**C212_20.0**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	192-193
50	**10.5**	51	137	5.4	2.2	36.1	5500	**C312_36.1**	**—** P63	**—** V 0.25 F	**P63**	**BN63C2**	194-195
61	**12.8**	42	112	4.1	1.8	29.6	3930	**C212_29.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	192-193
63	**12.0**	45	120	4.4	1.7	15.8	3870	**C212_15.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	192-193
66	**12.4**	38	77	1.9	1.1	10.1	2000	**C112_10.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	190-191
68	**12.9**	37	74	4.6	2.7	9.7	3810	**C212_9.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	192-193
75	**14.2**	38	102	2.1	0.9	13.4	2000	**C112_13.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	190-191
81	**15.3**	35	94	5.2	2.1	12.4	3610	**C212_12.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	192-193
83	**15.7**	34	92	2.3	1.0	12.1	2000	**C112_12.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	190-191
88	**18.4**	29	78	2.2	1.1	20.6	2000	**C112_20.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	190-191
91	**19.0**	29	76	5.3	2.6	20.0	3500	**C212_20.0**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	192-193
99	**18.8**	29	77	2.5	1.1	10.1	2000	**C112_10.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	190-191
103	**19.6**	28	74	6.1	2.7	9.7	3350	**C212_9.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	192-193
106	**22.1**	25	65	2.4	1.4	17.2	2000	**C112_17.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	190-191
109	**20.5**	23	46	4.7	2.5	6.1	3300	**C212_6.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	192-193
117	**24.5**	22	59	2.6	1.7	15.5	2000	**C112_15.5**	**V05** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	190-191
132	**25.0**	22	58	3.0	1.4	7.6	1970	**C112_7.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	190-191
136	**28.4**	19	51	2.9	1.8	13.4	1960	**C112_13.4**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	190-191
161	**31**	18	47	3.5	1.5	6.2	1830	**C112_6.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	190-191
164	**31**	17	46	6.3	2.5	6.1	2870	**C212_6.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	192-193
180	**38**	14	38	3.4	2.3	10.1	1800	**C112_10.1**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	190-191
204	**39**	14	37	3.9	1.8	4.9	1700	**C112_4.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	190-191
239	**50**	11	29	4.2	2.7	7.6	1660	**C112_7.6**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	190-191
270	**51**	11	28	4.6	2.1	3.7	1560	**C112_3.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	190-191
294	**61**	9	24	4.8	3.0	6.2	1530	**C112_6.2**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	190-191
371	**78**	7	19	5.4	3.6	4.9	1420	**C112_4.9**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	190-191



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492	**103**	5	14	6.4	4.3	3.7	1300	**C112_3.7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	190-191
650	**136**	4	11	7.5	5.0	2.8	1190	**C112_2.8**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	190-191

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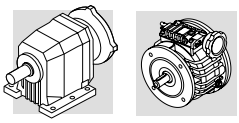
3.4	**0.60**	1083	2888	2.1	0.8	194.1	25000	**C703_194.1**	— P80	— V 1 F	**P80**	**BN80B6**	204-205
3.6	**0.69**	1127	2004	1.4	0.8	275.3	16000	**C614_275.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	202-203
3.7	**0.70**	1000	2666	2.3	0.9	179.2	25000	**C703_179.2**	— P80	— V 1 F	**P80**	**BN80B6**	204-205
4.2	**0.80**	976	1735	1.6	0.9	238.3	16000	**C614_238.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	202-203
4.2	**0.80**	1001	2671	2.3	0.9	239.3	25000	**C703_239.3**	— P80	— V 1 F	**P80**	**BN80A4**	204-205
4.5	**0.90**	924	2465	2.4	0.9	220.9	25000	**C703_220.9**	— P80	— V 1 F	**P80**	**BN80A4**	204-205
4.6	**0.87**	890	1583	1.8	1.0	217.4	16000	**C614_217.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	202-203
4.8	**0.90**	767	2045	3.0	1.1	137.4	25000	**C703_137.4**	— P80	— V 1 F	**P80**	**BN80B6**	204-205
5.1	**0.97**	819	2185	2.0	0.7	195.8	16000	**C613_195.8**	— P80	— V 1 F	**P80**	**BN80A4**	202-203
5.2	**1.0**	812	2166	2.8	1.1	194.1	25000	**C703_194.1**	— P80	— V 1 F	**P80**	**BN80A4**	204-205
5.6	**1.1**	747	1993	2.1	0.8	178.6	16000	**C613_178.6**	— P80	— V 1 F	**P80**	**BN80A4**	202-203
5.6	**1.1**	750	2000	3.1	1.2	179.2	25000	**C703_179.2**	— P80	— V 1 F	**P80**	**BN80A4**	204-205
6.1	**1.2**	681	1817	3.4	1.3	162.8	25000	**C703_162.8**	— P80	— V 1 F	**P80**	**BN80A4**	204-205
6.4	**1.2**	578	1542	2.8	1.0	103.6	16000	**C613_103.6**	— P80	— V 1 F	**P80**	**BN80B6**	202-203
6.5	**1.2**	571	761	1.1	0.8	102.3	7000	**C413_102.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	198-199
7.1	**1.3**	521	694	1.2	0.9	93.3	7000	**C413_93.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	198-199
7.4	**1.4**	563	1502	1.8	0.7	134.6	10000	**C513_134.6**	— P80	— V 1 F	**P80**	**BN80A4**	200-201
7.8	**1.5**	536	1430	3.0	1.1	128.1	16000	**C613_128.1**	— P80	— V 1 F	**P80**	**BN80A4**	202-203
7.9	**1.5**	531	1415	4.3	1.6	126.8	25000	**C703_126.8**	— P80	— V 1 F	**P80**	**BN80A4**	204-205
8.0	**1.5**	463	1235	3.5	1.3	83.0	16000	**C613_83.0**	— P80	— V 1 F	**P80**	**BN80B6**	202-203
8.8	**1.7**	475	1268	2.1	0.8	113.6	10000	**C513_113.6**	— P80	— V 1 F	**P80**	**BN80A4**	200-201
8.8	**1.7**	475	1268	3.4	1.3	113.6	16000	**C613_113.6**	— P80	— V 1 F	**P80**	**BN80A4**	202-203
8.9	**1.7**	415	554	1.4	1.1	74.4	7000	**C413_74.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	198-199
9.7	**1.8**	434	1156	3.7	1.4	103.6	16000	**C613_103.6**	— P80	— V 1 F	**P80**	**BN80A4**	202-203
9.8	**1.9**	426	1136	2.3	0.9	101.8	10000	**C513_101.8**	— P80	— V 1 F	**P80**	**BN80A4**	200-201
10.3	**1.9**	359	478	1.7	1.3	64.3	7000	**C413_64.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	198-199
11.6	**2.2**	325	866	2.4	0.9	57.0	10000	**C512_57.0**	— P80	— V 1 F	**P80**	**BN80B6**	200-201
11.7	**2.2**	315	420	1.4	1.1	56.5	6500	**C353_56.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	196-197
12.3	**2.3**	341	606	1.8	1.0	81.5	7000	**C413_81.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	198-199
12.3	**2.3**	341	910	1.8	0.7	81.5	7000	**C413_81.5**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	198-199



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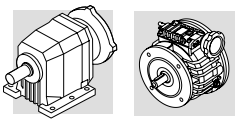
12.5	**2.4**	334	892	3.0	1.1	79.9	10000	**C513_79.9**	**—** P80	**—** V 1 F	**P80**	**BN80A4**	200-201
13.4	**2.6**	311	554	1.9	1.1	74.4	7000	**C413_74.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	198-199
13.4	**2.6**	311	830	1.9	0.7	74.4	7000	**C413_74.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	198-199
13.9	**2.6**	266	708	6.0	2.3	47.6	16000	**C613_47.6**	**—** P80	**—** V 1 F	**P80**	**BN80B6**	202-203
14.1	**2.7**	262	699	2.3	0.9	47.0	7000	**C413_47.0**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	198-199
14.1	**2.7**	296	526	1.5	0.9	70.7	6500	**C353_70.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	196-197
15.5	**2.9**	270	721	3.7	1.4	64.6	10000	**C513_64.6**	**—** P80	**—** V 1 F	**P80**	**BN80A4**	200-201
15.6	**3.0**	269	478	2.2	1.3	64.3	7000	**C413_64.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	198-199
15.6	**3.0**	269	718	2.2	0.8	64.3	7000	**C413_64.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	198-199
17.5	**3.3**	244	650	3.3	1.2	57.0	10000	**C512_57.0**	**—** P80	**—** V 1 F	**P80**	**BN80A4**	200-201
17.7	**3.4**	236	420	1.9	1.1	56.5	6500	**C353_56.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	196-197
17.9	**3.4**	211	564	2.4	0.9	37.1	7000	**C412_37.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	198-199
19.5	**3.7**	214	571	4.7	1.8	51.2	10000	**C513_51.2**	**—** P80	**—** V 1 F	**P80**	**BN80A4**	200-201
19.7	**3.7**	189	472	2.4	1.0	101.6	6500	**C353_101.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	196-197
19.9	**3.7**	190	508	2.6	1.0	33.4	7000	**C412_33.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	198-199
22.2	**4.2**	170	453	4.7	1.8	29.8	10000	**C512_29.8**	**—** P80	**—** V 1 F	**P80**	**BN80B6**	200-201
22.3	**4.2**	192	340	2.6	1.5	44.8	7000	**C412_44.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	198-199
22.3	**4.2**	192	511	2.6	1.0	44.8	7000	**C412_44.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	198-199
26.2	**5.0**	159	283	2.8	1.6	38.1	6500	**C353_38.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	196-197
26.2	**5.0**	159	425	2.8	1.1	38.1	6500	**C353_38.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	196-197
27.0	**5.1**	159	423	3.2	1.2	37.1	7000	**C412_37.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	198-199
32	**6.1**	131	232	4.6	2.6	31.2	7000	**C413_31.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	198-199
32	**6.1**	131	348	4.6	1.7	31.2	7000	**C413_31.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	198-199
35	**6.6**	120	214	3.7	2.1	28.7	6500	**C353_28.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	196-197
35	**6.6**	120	320	3.7	1.4	28.7	6500	**C353_28.7**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	196-197
38	**7.3**	100	249	3.0	1.2	52.4	5500	**C312_52.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	194-195
38	**7.3**	110	195	4.1	2.3	26.2	6500	**C353_26.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	196-197
38	**7.3**	110	292	4.1	1.5	26.2	6500	**C353_26.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	196-197
40	**7.6**	107	286	2.8	1.0	25.1	5500	**C312_25.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	194-195
40	**7.6**	107	285	4.7	1.8	25.0	7000	**C412_25.0**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	198-199
44	**8.4**	86	215	3.5	1.4	45.3	5500	**C312_45.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	194-195
45	**8.6**	92	164	4.9	2.7	22.1	6500	**C353_22.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	196-197
45	**8.6**	92	247	4.9	1.8	22.1	6500	**C353_22.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	196-197
50	**9.5**	86	228	2.3	0.9	20.0	3940	**C212_20.0**	**—** P80	**—** V 1 F	**P80**	**BN80A4**	192-193
53	**10.0**	81	217	4.7	1.8	19.0	6500	**C352_19.0**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	196-197



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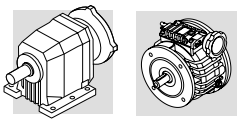
54	**10.3**	70	175	2.6	1.1	36.8	3920	**C212_36.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	192-193
56	**10.6**	77	137	2.6	1.5	18.0	3840	**C212_18.0**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	192-193
63	**12.0**	68	180	3.0	1.1	15.8	3720	**C212_15.8**	— P80	— V 1 F	**P80**	**BN80A4**	192-193
63	**12.0**	68	120	3.0	1.7	15.8	3720	**C212_15.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	192-193
68	**12.8**	56	141	3.1	1.4	29.6	3710	**C212_29.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	192-193
75	**14.2**	57	102	1.4	0.9	13.4	2000	**C112_13.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	190-191
81	**15.3**	53	141	3.5	1.4	12.4	3500	**C212_12.4**	— P80	— V 1 F	**P80**	**BN80A4**	192-193
82	**15.6**	46	115	3.5	1.7	24.3	3510	**C212_24.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	192-193
83	**15.7**	52	92	1.5	1.0	12.1	2000	**C112_12.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	190-191
93	**17.6**	40	108	3.7	1.7	7.1	3390	**C212_7.1**	— P80	— V 1 F	**P80**	**BN80B6**	192-193
96	**18.1**	39	52	1.6	1.4	6.9	2000	**C112_6.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B6**	190-191
100	**19.0**	38	95	3.9	2.1	20.0	3330	**C212_20.0**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	192-193
103	**19.6**	41	111	4.1	1.8	9.7	3260	**C212_9.7**	— P80	— V 1 F	**P80**	**BN80A4**	192-193
103	**19.6**	41	74	4.1	2.7	9.7	3260	**C212_9.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	192-193
110	**20.9**	39	69	1.8	1.2	9.1	1990	**C112_9.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	190-191
116	**22.1**	33	82	1.8	1.1	17.2	1990	**C112_17.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	190-191
129	**24.5**	29	74	2.0	1.3	15.5	1930	**C112_15.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	190-191
139	**26.4**	31	82	7.6	3.5	7.2	4460	**C312_7.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	194-195
141	**26.8**	30	81	4.9	2.2	7.1	2990	**C212_7.1**	— P80	— V 1 F	**P80**	**BN80A4**	192-193
149	**28.4**	25	64	2.2	1.4	13.4	1860	**C112_13.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	190-191
159	**30**	27	72	6.6	2.8	6.3	4120	**C312_6.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	194-195
161	**31**	24	59	5.3	3.4	12.4	2910	**C212_12.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	192-193
164	**31**	26	70	4.2	1.7	6.1	2820	**C212_6.1**	— P80	— V 1 F	**P80**	**BN80A4**	192-193
198	**38**	19	48	2.6	1.8	10.1	1720	**C112_10.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	190-191
204	**39**	21	37	2.6	1.8	4.9	1650	**C112_4.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	190-191
206	**39**	18	46	6.2	4.3	9.7	2670	**C212_9.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	192-193
208	**40**	21	55	5.1	1.9	4.8	2630	**C212_4.8**	— P80	— V 1 F	**P80**	**BN80A4**	192-193
263	**50**	14	36	3.1	2.2	7.6	1580	**C112_7.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	190-191
323	**61**	12	29	3.6	2.4	6.2	1460	**C112_6.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	190-191
357	**68**	12	21	3.6	2.5	2.8	1400	**C112_2.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	190-191
408	**78**	9	23	4.1	2.9	4.9	1360	**C112_4.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	190-191
541	**103**	7	18	4.8	3.4	3.7	1240	**C112_3.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	190-191
714	**136**	5	13	5.6	4.0	2.8	1140	**C112_2.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	190-191



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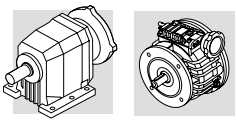
3.0	**0.60**	1643	3287	1.4	0.7	220.9	25000	**C703_220.9**	— P80	— V 1 F	**P80**	**BN80C6**	204-205
3.4	**0.60**	1444	2888	1.6	0.8	194.1	25000	**C703_194.1**	— P80	— V 1 F	**P80**	**BN80C6**	204-205
3.6	**0.69**	1503	2004	1.1	0.8	275.3	16000	**C614_275.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	202-203
3.7	**0.70**	1333	2666	1.7	0.9	179.2	25000	**C703_179.2**	— P80	— V 1 F	**P80**	**BN80C6**	204-205
4.2	**0.80**	1335	3561	1.7	0.6	239.3	25000	**C703_239.3**	— P80	— V 1 F	**P80**	**BN80B4**	204-205
4.4	**0.83**	1116	2232	1.4	0.7	150.0	16000	**C613_150.0**	— P80	— V 1 F	**P80**	**BN80C6**	202-203
4.5	**0.90**	1233	3287	1.8	0.7	220.9	25000	**C703_220.9**	— P80	— V 1 F	**P80**	**BN80B4**	204-205
4.8	**0.90**	1022	2045	2.2	1.1	137.4	25000	**C703_137.4**	— P80	— V 1 F	**P80**	**BN80C6**	204-205
5.2	**0.98**	953	1906	1.7	0.8	128.1	16000	**C613_128.1**	— P80	— V 1 F	**P80**	**BN80C6**	202-203
5.2	**1.0**	1083	2888	2.1	0.8	194.1	25000	**C703_194.1**	— P80	— V 1 F	**P80**	**BN80B4**	204-205
5.6	**1.1**	1000	2666	2.3	0.9	179.2	25000	**C703_179.2**	— P80	— V 1 F	**P80**	**BN80B4**	204-205
5.8	**1.1**	845	1690	1.9	0.9	113.6	16000	**C613_113.6**	— P80	— V 1 F	**P80**	**BN80C6**	202-203
6.1	**1.2**	908	2422	2.5	0.9	162.8	25000	**C703_162.8**	— P80	— V 1 F	**P80**	**BN80B4**	204-205
6.4	**1.2**	771	1542	2.1	1.0	103.6	16000	**C613_103.6**	— P80	— V 1 F	**P80**	**BN80C6**	202-203
6.7	**1.3**	837	2232	1.9	0.7	150.0	16000	**C613_150.0**	— P80	— V 1 F	**P80**	**BN80B4**	202-203
6.7	**1.3**	839	2236	2.7	1.0	150.3	25000	**C703_150.3**	— P80	— V 1 F	**P80**	**BN80B4**	204-205
7.3	**1.4**	677	1354	2.4	1.2	91.0	16000	**C613_91.0**	— P80	— V 1 F	**P80**	**BN80C6**	202-203
7.3	**1.4**	767	2045	3.0	1.1	137.4	25000	**C703_137.4**	— P80	— V 1 F	**P80**	**BN80B4**	204-205
7.9	**1.5**	708	1887	3.3	1.2	126.8	25000	**C703_126.8**	— P80	— V 1 F	**P80**	**BN80B4**	204-205
8.0	**1.5**	618	1235	2.6	1.3	83.0	16000	**C613_83.0**	— P80	— V 1 F	**P80**	**BN80C6**	202-203
8.3	**1.6**	594	1189	1.7	0.8	79.9	10000	**C513_79.9**	— P80	— V 1 F	**P80**	**BN80C6**	200-201
8.8	**1.7**	634	1690	2.5	0.9	113.6	16000	**C613_113.6**	— P80	— V 1 F	**P80**	**BN80B4**	202-203
8.9	**1.7**	627	1673	3.7	1.4	112.4	25000	**C703_112.4**	— P80	— V 1 F	**P80**	**BN80B4**	204-205
9.7	**1.8**	578	1542	2.8	1.0	103.6	16000	**C613_103.6**	— P80	— V 1 F	**P80**	**BN80B4**	202-203
9.8	**1.9**	571	761	1.1	0.8	102.3	7000	**C413_102.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	198-199
9.8	**1.9**	568	1515	1.8	0.7	101.8	10000	**C513_101.8**	— P80	— V 1 F	**P80**	**BN80B4**	200-201
11.0	**2.1**	508	1354	3.2	1.2	91.0	16000	**C613_91.0**	— P80	— V 1 F	**P80**	**BN80B4**	202-203
11.9	**2.3**	468	623	1.0	0.7	83.8	6500	**C353_83.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	196-197
12.3	**2.3**	455	606	1.3	1.0	81.5	7000	**C413_81.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	198-199
13.7	**2.6**	407	1085	2.5	0.9	72.9	10000	**C513_72.9**	— P80	— V 1 F	**P80**	**BN80B4**	200-201
14.1	**2.7**	350	699	1.7	0.9	47.0	7000	**C413_47.0**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	198-199
14.1	**2.7**	395	526	1.1	0.9	70.7	6500	**C353_70.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	196-197
16.9	**3.2**	329	878	3.0	1.1	59.0	10000	**C513_59.0**	— P80	— V 1 F	**P80**	**BN80B4**	200-201
17.0	**3.2**	328	437	1.8	1.4	58.7	7000	**C413_58.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	198-199
17.0	**3.2**	328	873	1.8	0.7	58.7	7000	**C413_58.7**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	198-199
19.4	**3.7**	287	383	2.1	1.6	51.5	7000	**C413_51.5**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	198-199



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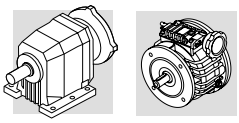
19.4	**3.7**	287	766	2.1	0.8	51.5	7000	**C413_51.5**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	198-199
21.3	**4.0**	262	350	2.3	1.7	47.0	7000	**C413_47.0**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	198-199
21.3	**4.0**	262	699	2.3	0.9	47.0	7000	**C413_47.0**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	198-199
24.8	**4.7**	225	600	2.7	1.0	40.3	7000	**C413_40.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	198-199
26.2	**5.0**	213	283	2.1	1.6	38.1	6500	**C353_38.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	196-197
28.8	**5.5**	194	258	2.3	1.7	34.7	6500	**C353_34.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	196-197
28.8	**5.5**	194	516	2.3	0.9	34.7	6500	**C353_34.7**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	196-197
35	**6.6**	160	214	2.8	2.1	28.7	6500	**C353_28.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	196-197
35	**6.6**	160	427	2.8	1.1	28.7	6500	**C353_28.7**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	196-197
37	**7.1**	153	407	2.0	0.7	26.8	5500	**C312_26.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	194-195
38	**7.3**	146	195	3.1	2.3	26.2	6500	**C353_26.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	196-197
38	**7.3**	146	390	3.1	1.2	26.2	6500	**C353_26.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	196-197
43	**8.0**	119	237	2.5	1.3	15.6	5500	**C312_15.6**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	194-195
45	**8.6**	123	329	3.6	1.4	22.1	6500	**C353_22.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	196-197
50	**9.5**	114	304	1.8	0.7	20.0	3760	**C212_20.0**	— P80	— V 1 F	**P80**	**BN80B4**	192-193
54	**10.3**	105	280	1.8	0.7	36.8	3690	**C212_36.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	192-193
55	**10.5**	103	274	2.7	1.1	36.1	5500	**C312_36.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	194-195
64	**12.2**	89	237	3.4	1.3	15.6	5350	**C312_15.6**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	194-195
68	**12.8**	84	225	2.1	0.9	29.6	3520	**C212_29.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	192-193
71	**13.6**	80	213	3.8	1.4	14.0	5190	**C312_14.0**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	194-195
80	**15.1**	72	191	3.5	1.6	25.1	5030	**C312_25.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	194-195
81	**15.3**	71	94	2.6	2.1	12.4	3380	**C212_12.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	192-193
81	**15.4**	70	187	4.1	1.6	12.3	5010	**C312_12.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	194-195
92	**17.4**	55	109	4.3	2.6	7.2	4860	**C312_7.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	194-195
97	**18.4**	59	157	1.1	0.6	20.6	1960	**C112_20.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	190-191
100	**19.0**	57	152	2.6	1.3	20.0	3200	**C212_20.0**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	192-193
103	**19.6**	55	147	3.1	1.4	9.7	3170	**C212_9.7**	— P80	— V 1 F	**P80**	**BN80B4**	192-193
108	**20.4**	53	141	4.9	2.1	9.3	4620	**C312_9.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	194-195
115	**21.8**	50	132	3.3	1.5	8.7	3080	**C212_8.7**	— P80	— V 1 F	**P80**	**BN80B4**	192-193
127	**24.1**	45	120	3.1	1.7	15.8	3010	**C212_15.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	192-193
140	**26.6**	41	109	3.3	1.8	14.3	2920	**C212_14.3**	**V05** P71	**V 0.5 C** V 0.5 F	**P715**	**BN71C2**	192-193
141	**26.8**	40	108	3.7	1.7	7.1	2920	**C212_7.1**	— P80	— V 1 F	**P80**	**BN80B4**	192-193
149	**28.4**	38	102	1.4	0.9	13.4	1780	**C112_13.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	190-191
161	**31**	35	94	3.5	2.1	12.4	2820	**C212_12.4**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	192-193
164	**31**	35	93	3.2	1.3	6.1	2840	**C212_6.1**	— P80	— V 1 F	**P80**	**BN80B4**	192-193
165	**31**	34	92	1.5	1.0	12.1	1730	**C112_12.1**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	190-191



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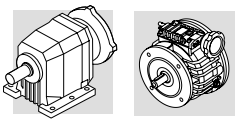
200	**38**	29	76	5.7	2.6	5.0	3820	**C312_5.0**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	194-195
206	**39**	28	74	4.2	2.7	9.7	2620	**C212_9.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	192-193
208	**40**	27	36	3.8	2.9	4.8	2590	**C212_4.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	192-193
263	**50**	22	58	2.1	1.4	7.6	1550	**C112_7.6**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	190-191
323	**61**	18	47	2.4	1.5	6.2	1430	**C112_6.2**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	190-191
357	**68**	16	21	2.7	2.5	2.8	1380	**C112_2.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	190-191
408	**78**	14	37	2.7	1.8	4.9	1330	**C112_4.9**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	190-191
541	**103**	11	28	3.2	2.1	3.7	1220	**C112_3.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	190-191
714	**136**	8	21	3.8	2.5	2.8	1130	**C112_2.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	190-191

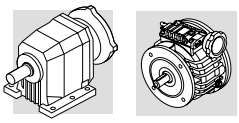
1.1 kW

3.6	**0.70**	2058	5488	1.9	0.7	184.4	35000	**C803_184.4**	— P90	— V 2 F	**P90**	**BN90L6**	206
3.9	**0.70**	1886	5029	2.1	0.8	169.0	35000	**C803_169.0**	— P90	— V 2 F	**P90**	**BN90L6**	206
4.4	**0.80**	1664	4437	2.4	0.9	149.1	35000	**C803_149.1**	— P90	— V 2 F	**P90**	**BN90L6**	206
4.6	**0.90**	1807	4819	2.2	0.8	215.9	35000	**C803_215.9**	— P90	— V 2 F	**P90**	**BN90S4**	206
4.7	**0.98**	1430	1906	1.1	0.8	128.1	16000	**C613_128.1**	— P80	— V 1 F	**P90**	**BN90L6**	202-203
4.9	**0.90**	1526	4068	2.6	1.0	136.7	35000	**C803_136.7**	— P90	— V 2 F	**P90**	**BN90L6**	206
5.1	**1.0**	1656	4417	2.3	0.9	197.9	35000	**C803_197.9**	— P90	— V 2 F	**P90**	**BN90S4**	206
5.2	**1.1**	1268	1690	1.3	0.9	113.6	16000	**C613_113.6**	— P80	— V 1 F	**P90**	**BN90L6**	202-203
5.4	**1.0**	1543	4116	2.6	1.0	184.4	35000	**C803_184.4**	— P90	— V 2 F	**P90**	**BN90S4**	206
5.8	**1.2**	1156	1542	1.4	1.0	103.6	16000	**C613_103.6**	— P80	— V 1 F	**P90**	**BN90L6**	202-203
5.9	**1.1**	1415	3772	2.8	1.1	169.0	35000	**C803_169.0**	— P90	— V 2 F	**P90**	**BN90S4**	206
6.7	**1.3**	1248	3328	3.2	1.2	149.1	35000	**C803_149.1**	— P90	— V 2 F	**P90**	**BN90S4**	206
7.0	**1.5**	1084	1906	1.5	0.8	128.1	16000	**C613_128.1**	— P80	— V 1 F	**P90**	**BN90S4**	202-203
7.3	**1.4**	1144	3051	3.5	1.3	136.7	35000	**C803_136.7**	— P90	— V 2 F	**P90**	**BN90S4**	206
7.5	**1.6**	892	1189	1.1	0.8	79.9	10000	**C513_79.9**	— P80	— V 1 F	**P90**	**BN90L6**	200-201
7.5	**1.4**	984	2625	2.3	0.9	88.2	25000	**C703_88.2**	— P90	— V 2 F	**P90**	**BN90L6**	204-205
7.9	**1.5**	1061	2830	2.2	0.8	126.8	25000	**C703_126.8**	— P90	— V 2 F	**P90**	**BN90S4**	204-205
7.9	**1.7**	961	1690	1.7	0.9	113.6	16000	**C613_113.6**	— P80	— V 1 F	**P90**	**BN90S4**	202-203
8.4	**1.6**	1000	2667	4.0	1.5	119.5	25000	**C803_119.5**	— P90	— V 2 F	**P90**	**BN90S4**	206
8.7	**1.8**	877	1542	1.8	1.0	103.6	16000	**C613_103.6**	— P80	— V 1 F	**P90**	**BN90S4**	202-203
8.9	**1.7**	941	2509	2.4	0.9	112.4	25000	**C703_112.4**	— P90	— V 2 F	**P90**	**BN90S4**	204-205
9.1	**1.7**	917	2444	4.4	1.6	109.5	35000	**C803_109.5**	— P90	— V 2 F	**P90**	**BN90S4**	206
9.6	**1.8**	869	2317	2.6	1.0	103.8	25000	**C703_103.8**	— P90	— V 2 F	**P90**	**BN90S4**	204-205



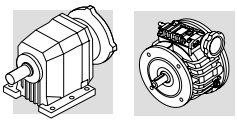
1.1 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
9.7	**1.8**	867	2312	1.8	0.7	103.6	16000	**C613_103.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	202-203
9.9	**2.1**	770	1354	2.1	1.2	91.0	16000	**C613_91.0**	— P80	— V 1 F	**P90**	**BN90S4**	202-203
10.1	**1.9**	735	1961	3.1	1.2	65.9	25000	**C703_65.9**	— P90	— V 2 F	**P90**	**BN90L6**	204-205
11.0	**2.1**	762	2031	2.1	0.8	91.0	16000	**C613_91.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	202-203
11.2	**2.1**	750	2000	3.1	1.2	179.2	25000	**C703_179.2**	— P80	— V 1 F	**P80**	**BN80B2**	204-205
11.3	**2.4**	676	1189	1.5	0.8	79.9	10000	**C513_79.9**	— P80	— V 1 F	**P90**	**BN90S4**	200-201
11.3	**2.2**	738	1969	3.1	1.2	88.2	25000	**C703_88.2**	— P90	— V 2 F	**P90**	**BN90S4**	204-205
12.3	**2.3**	681	1817	3.4	1.3	81.4	25000	**C703_81.4**	— P90	— V 2 F	**P90**	**BN90S4**	204-205
12.3	**2.6**	617	1085	1.6	0.9	72.9	10000	**C513_72.9**	— P80	— V 1 F	**P90**	**BN90S4**	200-201
12.4	**2.3**	597	1592	2.7	1.0	53.5	16000	**C613_53.5**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	202-203
12.9	**2.4**	571	1524	1.8	0.7	51.2	10000	**C513_51.2**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	200-201
13.3	**2.8**	511	681	1.0	0.7	44.8	7000	**C412_44.8**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90L6**	198-199
13.5	**2.6**	621	1656	2.6	1.0	74.2	16000	**C613_74.2**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	202-203
15.3	**3.2**	499	878	2.0	1.1	59.0	10000	**C513_59.0**	— P80	— V 1 F	**P90**	**BN90S4**	200-201
15.3	**3.2**	497	873	1.2	0.7	58.7	7000	**C413_58.7**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	198-199
15.5	**2.9**	541	1442	1.8	0.7	64.6	10000	**C513_64.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	200-201
16.9	**3.2**	494	1317	2.0	0.8	59.0	10000	**C513_59.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	200-201
17.1	**3.2**	490	1308	3.3	1.2	58.6	16000	**C613_58.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	202-203
17.5	**3.7**	436	766	1.4	0.8	51.5	7000	**C413_51.5**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	198-199
18.7	**3.6**	448	1194	3.6	1.3	53.5	16000	**C613_53.5**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	202-203
19.0	**4.0**	358	477	1.4	1.0	31.4	7000	**C412_31.4**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90L6**	198-199
19.3	**4.1**	395	695	2.5	1.4	46.7	10000	**C513_46.7**	— P80	— V 1 F	**P90**	**BN90S4**	200-201
21.4	**4.1**	391	1042	2.6	1.0	46.7	10000	**C513_46.7**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	200-201
21.8	**4.6**	306	408	3.3	2.5	27.4	10000	**C513_27.4**	— P80	— V 1 F	**P90**	**BN90L6**	200-201
23.2	**4.4**	369	983	2.2	0.8	43.1	10000	**C512_43.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	200-201
23.3	**4.4**	318	848	1.9	0.7	28.5	7000	**C413_28.5**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	198-199
24.8	**4.7**	345	921	2.3	0.9	40.4	10000	**C512_40.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	200-201
25.9	**5.5**	294	516	1.5	0.9	34.7	6500	**C353_34.7**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	196-197
26.3	**5.0**	325	866	4.2	1.6	38.0	16000	**C612_38.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	202-203
26.5	**5.0**	285	760	1.8	0.7	25.0	7000	**C412_25.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	198-199
30	**5.8**	282	752	2.8	1.1	33.0	10000	**C512_33.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	200-201
31	**5.9**	269	718	2.1	0.8	64.3	7000	**C413_64.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	198-199
32	**6.1**	268	716	1.9	0.7	31.4	7000	**C412_31.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
35	**6.7**	242	645	2.1	0.8	28.3	7000	**C412_28.3**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
39	**7.3**	221	591	3.6	1.4	25.9	10000	**C512_25.9**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	200-201



1.1 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
40	**7.6**	214	570	2.3	0.9	25.0	7000	**C412_25.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
41	**8.6**	187	329	2.4	1.4	22.1	6430	**C353_22.1**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	196-197
42	**7.9**	180	480	2.8	1.0	15.8	7000	**C412_15.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	198-199
43	**8.1**	200	534	4.0	1.5	23.4	10000	**C512_23.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	200-201
45	**8.4**	169	450	2.3	0.8	14.8	6500	**C352_14.8**	— P90	— V 2 F	**P90**	**BN90L6**	196-197
48	**9.0**	180	479	4.5	1.7	21.0	10000	**C512_21.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	200-201
50	**9.4**	169	451	2.7	1.0	20.2	6270	**C353_20.2**	— P90	— V 2 F	**P90**	**BN90S4**	196-197
51	**9.6**	169	451	3.0	1.1	19.8	7000	**C412_19.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
53	**10.1**	141	377	3.5	1.3	12.4	7000	**C412_12.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	198-199
54	**10.2**	159	423	3.0	1.2	37.1	7000	**C412_37.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	198-199
60	**11.4**	142	378	5.6	2.1	16.6	10000	**C512_16.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	200-201
63	**11.9**	120	319	3.2	1.2	10.5	5970	**C352_10.5**	— P90	— V 2 F	**P90**	**BN90L6**	196-197
63	**12.0**	135	360	3.7	1.4	15.8	6900	**C412_15.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
67	**12.8**	127	340	2.1	0.9	29.8	5060	**C312_29.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	194-195
70	**13.4**	121	324	4.1	1.5	14.2	6700	**C412_14.2**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
71	**13.4**	106	283	2.5	1.1	9.3	5060	**C312_9.3**	— P90	— V 2 F	**P90**	**BN90L6**	194-195
80	**15.1**	107	286	2.3	1.0	25.1	4850	**C312_25.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	194-195
81	**15.3**	106	283	4.7	1.8	12.4	6700	**C412_12.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
93	**17.6**	81	216	5.1	2.3	7.1	6240	**C412_7.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	198-199
100	**18.9**	86	229	2.7	1.3	20.1	4570	**C312_20.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	194-195
101	**19.2**	85	226	4.5	2.2	19.8	6050	**C412_19.8**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	198-199
104	**19.8**	82	219	5.5	2.3	9.6	6000	**C412_9.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
108	**20.4**	80	212	3.3	1.4	9.3	4480	**C312_9.3**	— P90	— V 2 F	**P90**	**BN90S4**	194-195
111	**20.8**	68	182	3.8	1.4	6.0	5800	**C412_6.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	198-199
127	**24.1**	68	180	2.1	1.1	15.8	2860	**C212_15.8**	— P80	— V 1 F	**P80**	**BN80B2**	192-193
128	**24.4**	67	178	3.2	1.7	15.6	4270	**C312_15.6**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	194-195
139	**26.4**	62	164	3.8	1.7	7.2	4170	**C312_7.2**	— P90	— V 2 F	**P90**	**BN90S4**	194-195
140	**26.6**	61	163	2.2	1.2	14.3	2790	**C212_14.3**	— P80	— V 1 F	**P80**	**BN80B2**	192-193
141	**26.8**	61	162	6.8	3.1	7.1	5500	**C412_7.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
159	**30**	54	144	3.3	1.4	6.3	3950	**C312_6.3**	— P90	— V 2 F	**P90**	**BN90S4**	194-195
161	**31**	53	141	2.4	1.4	12.4	2700	**C212_12.4**	— P80	— V 1 F	**P80**	**BN80B2**	192-193
163	**31**	53	140	3.7	2.1	12.3	3990	**C312_12.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	194-195
167	**32**	51	137	5.1	1.9	6.0	5200	**C412_6.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
200	**38**	43	114	3.8	1.7	5.0	3700	**C312_5**	— P90	— V 2 F	**P90**	**BN90S4**	194-195
206	**39**	41	111	2.8	1.8	9.7	2530	**C212_9.7**	— P80	— V 1 F	**P80**	**BN80B2**	192-193

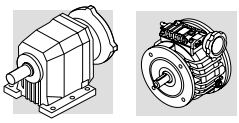


1.1 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
213	**40**	40	107	6.5	2.4	4.7	5000	**C412_4.7**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	198-199
215	**41**	40	106	4.4	2.8	9.3	3670	**C312_9.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	194-195
278	**53**	31	82	5.2	3.5	7.2	3400	**C312_7.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	194-195
282	**54**	30	81	3.5	2.2	7.1	2330	**C212_7.1**	— P80	— V 1 F	**P80**	**BN80B2**	192-193
317	**60**	27	72	5.6	2.8	6.3	3230	**C312_6.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	194-195
328	**62**	26	70	3.3	1.7	6.1	2210	**C212_6.1**	— P80	— V 1 F	**P80**	**BN80B2**	192-193
400	**76**	21	57	6.3	3.5	5.0	3020	**C312_5.0**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	194-195
417	**79**	21	55	3.9	1.9	4.8	2060	**C212_4.8**	— P80	— V 1 F	**P80**	**BN80B2**	192-193
541	**103**	16	28	2.1	2.1	3.7	1190	**C112_3.7**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B2**	190-191
541	**103**	16	42	7.6	4.1	3.7	2760	**C312_3.7**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	194-195
714	**136**	12	21	2.5	2.5	2.8	1100	**C112_2.8**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B2**	190-191
741	**141**	12	31	5.6	3.2	2.7	1750	**C212_2.7**	— P80	— V 1 F	**P80**	**BN80B2**	192-193

1.5 kW

3.1	**0.60**	3213	7028	1.2	0.6	215.9	35000	**C803_215.9**	— P90	— V 2 F	**P90**	**BN100LA6R**	206
3.4	**0.60**	2945	6442	1.3	0.6	197.9	35000	**C803_197.9**	— P90	— V 2 F	**P90**	**BN100LA6R**	206
3.6	**0.70**	2744	6002	1.5	0.7	184.4	35000	**C803_184.4**	— P90	— V 2 F	**P90**	**BN100LA6R**	206
3.9	**0.70**	2515	5501	1.6	0.7	169.0	35000	**C803_169.0**	— P90	— V 2 F	**P90**	**BN100LA6R**	206
4.4	**0.80**	2219	4853	1.8	0.8	149.1	35000	**C803_149.1**	— P90	— V 2 F	**P90**	**BN100LA6R**	206
4.9	**0.90**	2034	4450	2.0	0.9	136.7	35000	**C803_136.7**	— P90	— V 2 F	**P90**	**BN100LA6R**	206
5.4	**1.0**	2058	5488	1.9	0.7	184.4	35000	**C803_184.4**	— P90	— V 2 F	**P90**	**BN90LA4**	206
5.9	**1.1**	1886	5029	2.1	0.8	169.0	35000	**C803_169.0**	— P90	— V 2 F	**P90**	**BN90LA4**	206
6.0	**1.3**	1674	2232	1.0	0.7	150.0	16000	**C613_150.0**	— P80	— V 1 F	**P90**	**BN90LA4**	202-203
6.1	**1.1**	1629	3564	2.5	1.1	109.5	35000	**C803_109.5**	— P90	— V 2 F	**P90**	**BN100LA6R**	206
6.7	**1.3**	1664	4437	2.4	0.9	149.1	35000	**C803_149.1**	— P90	— V 2 F	**P90**	**BN90LA4**	206
6.8	**1.3**	1449	3170	2.8	1.3	97.4	35000	**C803_97.4**	— P90	— V 2 F	**P90**	**BN100LA6R**	206
7.3	**1.4**	1526	4068	2.6	1.0	136.7	35000	**C803_136.7**	— P90	— V 2 F	**P90**	**BN90LA4**	206
8.0	**1.5**	1235	2702	1.3	0.6	83.0	16000	**C613_83.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	202-203
8.4	**1.6**	1335	3561	1.7	0.6	239.3	25000	**C703_239.3**	— P80	— V 1 F	**P80**	**BN80C2**	204-205
8.4	**1.6**	1334	3556	3.0	1.1	119.5	35000	**C803_119.5**	— P90	— V 2 F	**P90**	**BN90LA4**	206
9.1	**1.7**	1233	3287	1.8	0.7	220.9	25000	**C703_220.9**	— P80	— V 1 F	**P80**	**BN80C2**	204-205
9.1	**1.7**	1222	3259	3.3	1.2	109.5	35000	**C803_109.5**	— P90	— V 2 F	**P90**	**BN90LA4**	206
9.3	**1.8**	1061	2321	2.2	1.0	71.3	25000	**C703_71.3**	— P90	— V 2 F	**P90**	**BN100LA6R**	204-205



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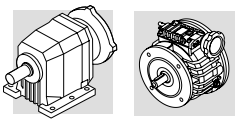
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
9.8	**1.8**	1007	2204	1.6	0.7	67.7	16000	**C613_67.7**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	202-203
10.3	**2.0**	1083	2888	2.1	0.8	194.1	25000	**C703_194.1**	— P80	— V 1 F	**P80**	**BN80C2**	204-205
10.3	**2.0**	1087	2899	3.7	1.4	97.4	35000	**C803_97.4**	— P90	— V 2 F	**P90**	**BN90LA4**	206
11.2	**2.1**	997	2658	4.0	1.5	89.3	35000	**C803_89.3**	— P90	— V 2 F	**P90**	**BN90LA4**	206
11.3	**2.2**	984	2625	2.3	0.9	88.2	25000	**C703_88.2**	— P90	— V 2 F	**P90**	**BN90LA4**	204-205
11.7	**2.2**	841	1839	2.7	1.3	56.5	25000	**C703_56.5**	— P90	— V 2 F	**P90**	**BN100LA6R**	204-205
12.1	**2.6**	828	1104	1.9	1.4	74.2	16000	**C613_74.2**	— P80	— V 1 F	**P90**	**BN90LA4**	202-203
12.3	**2.3**	908	2422	2.5	0.9	81.4	25000	**C703_81.4**	— P90	— V 2 F	**P90**	**BN90LA4**	204-205
12.4	**2.3**	796	1741	2.0	0.9	53.5	16000	**C613_53.5**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	202-203
13.0	**2.5**	858	2289	4.7	1.7	76.9	35000	**C803_76.9**	— P90	— V 2 F	**P90**	**BN90LA4**	206
13.3	**2.5**	839	2236	2.7	1.0	150.3	25000	**C703_150.3**	— P80	— V 1 F	**P80**	**BN80C2**	204-205
13.9	**2.6**	708	1549	2.3	1.0	47.6	16000	**C613_47.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	202-203
14.0	**2.7**	796	2122	2.9	1.1	71.3	25000	**C703_71.3**	— P90	— V 2 F	**P90**	**BN90LA4**	204-205
14.2	**2.7**	787	2098	5.1	1.9	70.5	35000	**C803_70.5**	— P90	— V 2 F	**P90**	**BN90LA4**	206
15.2	**2.9**	735	1961	3.1	1.2	65.9	25000	**C703_65.9**	— P90	— V 2 F	**P90**	**BN90LA4**	204-205
16.0	**3.0**	698	1860	5.7	2.2	62.5	35000	**C803_62.5**	— P90	— V 2 F	**P90**	**BN90LA4**	206
17.1	**3.2**	654	1744	2.4	0.9	58.6	16000	**C613_58.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	202-203
17.7	**3.4**	631	1681	3.6	1.4	56.5	25000	**C703_56.5**	— P90	— V 2 F	**P90**	**BN90LA4**	204-205
18.7	**3.6**	597	1592	2.7	1.0	53.5	16000	**C613_53.5**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	202-203
19.1	**4.0**	525	699	1.1	0.9	47.0	7000	**C413_47.0**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90LA4**	198-199
19.2	**3.6**	583	1553	3.9	1.5	52.2	25000	**C703_52.2**	— P90	— V 2 F	**P90**	**BN90LA4**	204-205
20.1	**4.2**	511	681	1.0	0.7	44.8	7000	**C412_44.8**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90LA4**	198-199
21.0	**4.0**	531	1417	3.0	1.1	47.6	16000	**C613_47.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	202-203
22.4	**4.3**	499	1330	4.6	1.7	44.7	25000	**C703_44.7**	— P90	— V 2 F	**P90**	**BN90LA4**	204-205
23.0	**4.4**	484	1292	3.3	1.2	43.4	16000	**C613_43.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	202-203
23.2	**4.4**	491	1310	1.6	0.6	43.1	10000	**C512_43.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	200-201
24.2	**4.6**	461	1229	5.0	1.9	41.3	25000	**C703_41.3**	— P90	— V 2 F	**P90**	**BN90LA4**	204-205
24.5	**4.7**	455	1213	1.3	0.5	81.5	10000	**C413_81.5**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	198-199
25.6	**4.8**	394	861	2.0	0.9	25.9	10000	**C512_25.9**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	200-201
26.3	**5.0**	433	1155	3.1	1.2	38.0	16000	**C612_38.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	202-203
26.7	**5.0**	377	825	3.6	1.6	24.8	16000	**C612_24.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	202-203
27.4	**5.2**	407	1085	2.5	0.9	72.9	10000	**C513_72.9**	— P80	— V 1 F	**P80**	**BN80C2**	200-201
30	**5.8**	376	1003	2.1	0.8	33.0	10000	**C512_33.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	200-201
32	**6.0**	319	698	2.5	1.1	21.0	10000	**C512_21.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	200-201
33	**6.3**	347	924	3.9	1.5	30.4	16000	**C612_30.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	202-203
35	**6.7**	318	848	1.9	0.7	28.5	7000	**C413_28.5**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	198-199



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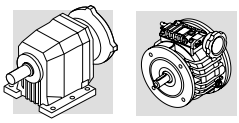
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
35	**6.7**	325	866	2.3	0.9	57.0	10000	**C512_57.0**	— P80	— V 1 F	**P80**	**BN80C2**	200-201
39	**7.3**	295	787	2.7	1.0	25.9	10000	**C512_25.9**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	200-201
40	**7.7**	283	754	4.8	1.8	24.8	16000	**C612_24.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	202-203
42	**7.9**	240	525	2.1	1.0	15.8	7000	**C412_15.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	198-199
48	**9.0**	239	638	3.3	1.3	21.0	10000	**C512_21.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	200-201
51	**9.6**	226	602	2.2	0.8	19.8	7000	**C412_19.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	198-199
51	**9.5**	199	436	4.0	1.8	13.1	10000	**C512_13.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	200-201
51	**9.7**	223	596	6.0	2.3	19.6	16000	**C612_19.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	202-203
54	**10.2**	211	564	2.2	0.9	37.1	6930	**C412_37.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	198-199
60	**11.4**	189	505	4.2	1.6	16.6	10000	**C512_16.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	200-201
61	**11.5**	188	502	4.1	1.6	33.0	10000	**C512_33.0**	— P80	— V 1 F	**P80**	**BN80C2**	200-201
63	**12.0**	180	480	2.8	1.0	15.8	6670	**C412_15.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	198-199
64	**12.1**	179	477	2.5	1.0	31.4	6660	**C412_31.4**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	198-199
67	**12.7**	171	456	4.7	1.8	15.0	10000	**C512_15.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	200-201
68	**12.8**	169	450	2.3	0.8	14.8	5590	**C352_14.8**	— P90	— V 2 F	**P90**	**BN90LA4**	196-197
70	**13.4**	162	432	3.1	1.2	14.2	6490	**C412_14.2**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	198-199
76	**14.5**	149	398	5.4	2.0	13.1	10000	**C512_13.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	200-201
80	**15.1**	143	382	1.7	0.8	25.1	4670	**C312_25.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	194-195
81	**15.3**	141	377	3.5	1.3	12.4	6270	**C412_12.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	198-199
93	**17.6**	108	236	3.8	2.1	7.1	6100	**C412_7.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	198-199
95	**18.1**	120	319	3.2	1.2	10.5	5130	**C352_10.5**	— P90	— V 2 F	**P90**	**BN90LA4**	196-197
100	**18.9**	115	306	2.1	1.0	20.1	4430	**C312_20.1**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	194-195
104	**19.8**	109	292	4.1	1.7	9.6	5860	**C412_9.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	198-199
105	**20.0**	108	289	3.5	1.3	19.0	5100	**C352_19.0**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	196-197
108	**20.4**	106	283	2.5	1.1	9.3	4340	**C312_9.3**	— P90	— V 2 F	**P90**	**BN90LA4**	194-195
127	**24.1**	90	240	1.6	0.8	15.8	2710	**C212_15.8**	— P80	— V 1 F	**P80**	**BN80C2**	192-193
128	**24.4**	89	237	2.4	1.3	15.6	4150	**C312_15.6**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	194-195
139	**26.4**	82	219	2.9	1.3	7.2	4060	**C312_7.2**	— P90	— V 2 F	**P90**	**BN90LA4**	194-195
141	**26.8**	81	216	5.1	2.3	7.1	5500	**C412_7.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	198-199
159	**30**	72	192	2.5	1.0	6.3	3840	**C312_6.3**	— P90	— V 2 F	**P90**	**BN90LA4**	194-195
163	**31**	70	187	2.8	1.6	12.3	3900	**C312_12.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	194-195
167	**32**	68	182	3.8	1.4	6.0	5000	**C412_6.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	198-199
200	**38**	57	152	2.8	1.3	5.0	3610	**C312_5.0**	— P90	— V 2 F	**P90**	**BN90LA4**	194-195
206	**39**	55	147	2.1	1.4	9.7	2440	**C212_9.7**	— P80	— V 1 F	**P80**	**BN80C2**	192-193
213	**40**	54	143	4.9	1.8	4.7	4670	**C412_4.7**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	198-199
215	**41**	53	141	3.3	2.1	9.3	3610	**C312_9.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	194-195



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278	**53**	41	109	3.9	2.6	7.2	3340	**C312_7.2**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	194-195
282	**54**	40	108	2.6	1.7	7.1	2270	**C212_7.1**	— P80	— V 1 F	**P80**	**BN80C2**	192-193
317	**60**	36	96	4.2	2.1	6.3	3240	**C312_6.3**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	194-195
328	**62**	35	93	2.4	1.3	6.1	2140	**C212_6.1**	— P80	— V 1 F	**P80**	**BN80C2**	192-193
417	**79**	27	73	2.9	1.4	4.8	2010	**C212_4.8**	— P80	— V 1 F	**P80**	**BN80C2**	192-193
541	**103**	21	56	3.3	1.9	3.7	1880	**C212_3.7**	— P80	— V 1 F	**P80**	**BN80C2**	192-193

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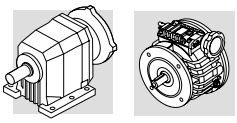
5.1	**1.0**	2577	6442	1.5	0.6	197.9	35000	**C803_197.9**	— P90	— V 2 F	**P90**	**BN90LB4**	206
5.4	**1.0**	2401	6002	1.7	0.7	184.4	35000	**C803_184.4**	— P90	— V 2 F	**P90**	**BN90LB4**	206
5.9	**1.1**	2200	5501	1.8	0.7	169.0	35000	**C803_169.0**	— P90	— V 2 F	**P90**	**BN90LB4**	206
6.7	**1.3**	1941	4853	2.1	0.8	149.1	35000	**C803_149.1**	— P90	— V 2 F	**P90**	**BN90LB4**	206
7.3	**1.4**	1780	4450	2.2	0.9	136.7	35000	**C803_136.7**	— P90	— V 2 F	**P90**	**BN90LB4**	206
8.4	**1.6**	1556	3890	2.6	1.0	119.5	35000	**C803_119.5**	— P90	— V 2 F	**P90**	**BN90LB4**	206
9.1	**1.7**	1426	3564	2.8	1.1	109.5	35000	**C803_109.5**	— P90	— V 2 F	**P90**	**BN90LB4**	206
10.3	**2.0**	1268	3170	3.2	1.3	97.4	35000	**C803_97.4**	— P90	— V 2 F	**P90**	**BN90LB4**	206
11.2	**2.1**	1163	2907	3.4	1.4	89.3	35000	**C803_89.3**	— P90	— V 2 F	**P90**	**BN90LB4**	206
12.3	**2.3**	1060	2650	2.2	0.9	81.4	25000	**C703_81.4**	— P90	— V 2 F	**P90**	**BN90LB4**	204-205
14.0	**2.7**	928	2321	2.5	1.0	71.3	25000	**C703_71.3**	— P90	— V 2 F	**P90**	**BN90LB4**	204-205
14.2	**2.7**	918	2295	4.4	1.7	70.5	35000	**C803_70.5**	— P90	— V 2 F	**P90**	**BN90LB4**	206
15.2	**2.9**	858	2145	2.7	1.1	65.9	25000	**C703_65.9**	— P90	— V 2 F	**P90**	**BN90LB4**	204-205
16.0	**3.0**	814	2034	4.9	2.0	62.5	35000	**C803_62.5**	— P90	— V 2 F	**P90**	**BN90LB4**	206
17.5	**3.3**	746	1865	5.4	2.1	57.3	35000	**C803_57.3**	— P90	— V 2 F	**P90**	**BN90LB4**	206
17.7	**3.4**	736	1839	3.1	1.3	56.5	25000	**C703_56.5**	— P90	— V 2 F	**P90**	**BN90LB4**	204-205
18.7	**3.6**	697	1741	2.3	0.9	53.5	16000	**C613_53.5**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	202-203
21.0	**4.0**	620	1549	2.6	1.0	47.6	16000	**C613_47.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	202-203
22.4	**4.3**	582	1455	4.0	1.6	44.7	25000	**C703_44.7**	— P90	— V 2 F	**P90**	**BN90LB4**	204-205
24.2	**4.6**	538	1344	4.3	1.7	41.3	25000	**C703_41.3**	— P90	— V 2 F	**P90**	**BN90LB4**	204-205
26.3	**5.0**	505	1264	2.7	1.1	38.0	16000	**C612_38.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	202-203
33	**6.3**	404	1011	3.3	1.3	30.4	16000	**C612_30.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	202-203
39	**7.3**	344	861	2.3	0.9	25.9	10000	**C512_25.9**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	200-201

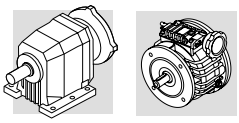


1.85 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
40	**7.7**	330	825	4.1	1.6	24.8	16000	**C612_24.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	202-203
48	**9.0**	279	698	2.9	1.1	21.0	10000	**C512_21.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	200-201
51	**9.6**	263	658	1.9	0.8	19.8	6840	**C412_19.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	198-199
51	**9.7**	261	652	5.2	2.1	19.6	16000	**C612_19.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	202-203
60	**11.4**	221	552	3.6	1.4	16.6	10000	**C512_16.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	200-201
63	**11.9**	211	529	6.4	2.6	15.9	16000	**C612_15.9**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	202-203
63	**12.0**	210	525	2.4	1.0	15.8	6520	**C412_15.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	198-199
76	**14.5**	174	436	4.6	1.8	13.1	10000	**C512_13.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	200-201
81	**15.3**	165	412	3.0	1.2	12.4	6160	**C412_12.4**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	198-199
102	**19.4**	130	326	6.1	2.5	9.8	10000	**C512_9.8**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	200-201
104	**19.8**	128	319	3.5	1.6	9.6	5770	**C412_9.6**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	198-199
108	**20.4**	124	309	2.1	1.0	9.3	4250	**C312_9.3**	— P90	— V 2 F	**P90**	**BN90LB4**	194-195
139	**26.4**	96	239	2.5	1.2	7.2	3990	**C312_7.2**	— P90	— V 2 F	**P90**	**BN90LB4**	194-195
141	**26.8**	94	236	4.4	2.1	7.1	5320	**C412_7.1**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	198-199
159	**30**	84	209	2.1	1.0	6.3	3770	**C312_6.3**	— P90	— V 2 F	**P90**	**BN90LB4**	194-195
167	**32**	80	200	3.3	1.3	6.0	4920	**C412_6.0**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	198-199
200	**38**	67	166	2.4	1.2	5.0	3550	**C312_5.0**	— P90	— V 2 F	**P90**	**BN90LB4**	194-195
213	**40**	63	156	4.2	1.7	4.7	4610	**C412_4.7**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	198-199
270	**51**	49	123	3.1	1.4	3.7	3300	**C312_3.7**	— P90	— V 2 F	**P90**	**BN90LB4**	194-195
345	**66**	39	96	3.9	1.6	2.9	3070	**C312_2.9**	— P90	— V 2 F	**P90**	**BN90LB4**	194-195

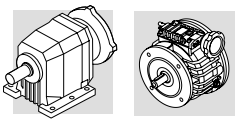
2.2 kW

3.9	**0.70**	3841	8963	1.9	0.8	172.1	60000	**C903_172.1**	— P100	— V 3 F	**P100**	**BN112M6**	207
4.2	**0.80**	3522	8218	2.0	0.9	157.8	60000	**C903_157.8**	— P100	— V 3 F	**P100**	**BN112M6**	207
4.9	**0.90**	3051	7119	1.3	0.6	136.7	35000	**C803_136.7**	— P100	— V 3 F	**P100**	**BN112M6**	206
4.9	**0.90**	2993	6984	2.4	1.0	134.1	60000	**C903_134.1**	— P100	— V 3 F	**P100**	**BN112M6**	207
5.5	**1.0**	2667	6224	1.5	0.6	119.5	35000	**C803_119.5**	— P100	— V 3 F	**P100**	**BN112M6**	206
5.8	**1.1**	2561	6402	2.8	1.1	172.1	60000	**C903_172.1**	— P100	— V 3 F	**P100**	**BN100LA4**	207
6.1	**1.1**	2444	5703	1.6	0.7	109.5	35000	**C803_109.5**	— P100	— V 3 F	**P100**	**BN112M6**	206
6.3	**1.2**	2348	5870	3.0	1.2	157.8	60000	**C903_157.8**	— P100	— V 3 F	**P100**	**BN100LA4**	207
6.8	**1.3**	2174	5073	1.8	0.8	97.4	35000	**C803_97.4**	— P100	— V 3 F	**P100**	**BN112M6**	206
6.8	**1.3**	2201	5442	3.3	1.3	146.3	60000	**C903_146.3**	— P100	— V 3 F	**P100**	**BN100LA4**	207
7.3	**1.4**	2034	5085	2.0	0.8	136.7	35000	**C803_136.7**	— P100	— V 3 F	**P100**	**BN100LA4**	206



2.2 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N							
7.4	**1.4**	1993	4651	2.0	0.9	89.3	35000	**C803_89.3**	**—** P100	**—** V 3 F	**P100**	**BN112M6**	206
7.5	**1.4**	1995	4989	3.6	1.4	134.1	60000	**C903_134.1**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	207
8.1	**1.5**	1817	4239	1.3	0.5	81.4	25000	**C703_81.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN112M6**	204-205
8.4	**1.6**	1778	4445	2.2	0.9	119.5	35000	**C803_119.5**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	206
8.6	**1.6**	1716	4005	2.3	1.0	76.9	35000	**C803_76.9**	**—** P100	**—** V 3 F	**P100**	**BN112M6**	206
9.1	**1.7**	1629	4073	2.5	1.0	109.5	35000	**C803_109.5**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	206
9.3	**1.8**	1591	3713	1.4	0.6	71.3	25000	**C703_71.3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN112M6**	204-205
9.3	**1.8**	1592	3980	4.5	1.8	107.0	60000	**C903_107.0**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	207
10.1	**1.9**	1471	3432	1.6	0.7	65.9	25000	**C703_65.9**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN112M6**	204-205
10.3	**2.0**	1449	3623	2.8	1.1	97.4	35000	**C803_97.4**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	206
10.4	**2.0**	1431	3579	5.0	2.0	96.2	60000	**C903_96.2**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	207
11.2	**2.1**	1329	3322	3.0	1.2	89.3	35000	**C803_89.3**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	206
11.3	**2.2**	1312	3281	1.8	0.7	88.2	25000	**C703_88.2**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	204-205
11.7	**2.2**	1261	2943	1.8	0.8	56.5	25000	**C703_56.5**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN112M6**	204-205
12.3	**2.3**	1211	3028	1.9	0.8	81.4	25000	**C703_81.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	204-205
12.7	**2.4**	1165	2719	2.0	0.8	52.2	25000	**C703_52.2**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN112M6**	204-205
13.0	**2.5**	1144	2861	3.5	1.4	76.9	35000	**C803_76.9**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	206
14.0	**2.7**	1061	2652	2.2	0.9	71.3	25000	**C703_71.3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	204-205
14.2	**2.7**	1049	2623	3.8	1.5	70.5	35000	**C803_70.5**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	206
14.8	**2.8**	998	2328	2.3	1.0	44.7	25000	**C703_44.7**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN112M6**	204-205
15.2	**2.9**	981	2451	2.3	0.9	65.9	25000	**C703_65.9**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	204-205
16.0	**3.0**	930	2325	4.3	1.7	62.5	35000	**C803_62.5**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	206
16.1	**3.0**	922	2151	2.5	1.1	41.3	25000	**C703_41.3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN112M6**	204-205
17.1	**3.2**	872	2180	1.8	0.7	58.6	16000	**C613_58.6**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	202-203
17.5	**3.3**	853	2132	4.7	1.9	57.3	35000	**C803_57.3**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	206
17.7	**3.4**	841	2102	2.7	1.1	56.5	25000	**C703_56.5**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	204-205
19.1	**3.6**	791	1846	2.7	1.1	34.7	25000	**C702_34.7**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN112M6**	204-205
19.2	**3.6**	777	1942	3.0	1.2	52.2	25000	**C703_52.2**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	204-205
21.0	**4.0**	708	177	2.3	0.9	47.6	16000	**C613_47.6**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	202-203
21.1	**4.0**	705	2003	5.7	2.3	47.4	35000	**C803_47.4**	**—** P100	**—** V 3 F	**P100**	**BN100LA4**	206
22.4	**4.3**	665	1663	3.5	1.4	44.7	25000	**C703_44.7**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	204-205
23.9	**4.5**	632	1474	3.3	1.4	27.7	25000	**C702_27.7**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN112M6**	204-205
24.2	**4.6**	615	1536	3.7	1.5	41.3	25000	**C703_41.3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	204-205
26.3	**5.0**	578	1444	2.3	0.9	38.0	16000	**C612_38.0**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	202-203



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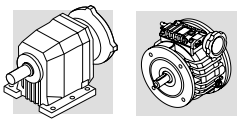
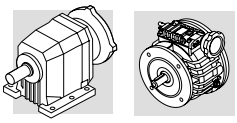
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
27.0	**5.1**	551	1376	1.8	0.7	37.0	10000	**C513_37.0**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
28.8	**5.5**	527	1319	4.0	1.6	34.7	25000	**C702_34.7**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	204-205
29.2	**5.6**	520	1300	2.4	1.0	34.2	16000	**C612_34.2**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	202-203
32	**6.0**	479	1117	1.7	0.7	21.0	10000	**C512_21.0**	**V3** P100	**V 3 C** V 3 F	**P112**	**BN112M6**	200-201
33	**6.3**	462	1155	2.9	1.2	30.4	16000	**C612_30.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	202-203
33	**6.3**	448	1120	2.2	0.9	30.1	10000	**C513_30.1**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
36	**6.9**	421	1053	5.0	2.0	27.7	25000	**C702_27.7**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	204-205
36	**6.9**	408	1019	2.5	1.0	27.4	10000	**C513_27.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
40	**7.7**	377	942	3.6	1.4	24.8	16000	**C612_24.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	202-203
43	**8.1**	356	889	2.2	0.9	23.4	10000	**C512_23.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
51	**9.7**	298	745	4.5	1.8	19.6	16000	**C612_19.6**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	202-203
53	**10.1**	287	718	2.8	1.1	18.9	10000	**C512_18.9**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
56	**10.7**	271	676	1.8	0.7	17.8	6500	**C412_17.8**	— P100	— V 3 F	**P100**	**BN100LA4**	198-199
60	**11.4**	252	631	3.2	1.3	16.6	10000	**C512_16.6**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
63	**12.0**	240	600	2.1	0.8	15.8	6370	**C412_15.8**	— P100	— V 3 F	**P100**	**BN100LA4**	198-199
76	**14.5**	199	498	4.0	1.6	13.1	10000	**C512_13.1**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
81	**15.3**	188	471	2.6	1.1	12.4	6040	**C412_12.4**	— P100	— V 3 F	**P100**	**BN100LA4**	198-199
89	**17.0**	170	426	2.9	1.2	11.2	5880	**C412_11.2**	— P100	— V 3 F	**P100**	**BN100LA4**	198-199
95	**18.1**	160	399	2.4	1.0	10.5	4930	**C352_10.5**	— P100	— V 3 F	**P100**	**BN100LA4**	196-197
102	**19.4**	149	372	5.4	2.1	9.8	10000	**C512_9.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
114	**21.6**	134	334	2.8	1.1	8.8	4740	**C352_8.8**	— P100	— V 3 F	**P100**	**BN100LA4**	196-197
127	**24.1**	120	300	3.2	1.3	7.9	4610	**C352_7.9**	— P100	— V 3 F	**P100**	**BN100LA4**	196-197
128	**24.4**	119	296	6.2	2.7	7.8	10000	**C512_7.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
141	**26.8**	108	270	3.8	1.9	7.1	5250	**C412_7.1**	— P100	— V 3 F	**P100**	**BN100LA4**	198-199
156	**29.7**	97	243	4.1	2.0	6.4	5100	**C412_6.4**	— P100	— V 3 F	**P100**	**BN100LA4**	198-199
164	**31**	93	232	4.1	1.6	6.1	4310	**C352_6.1**	— P100	— V 3 F	**P100**	**BN100LA4**	196-197
179	**34**	85	213	5.1	2.0	5.6	10000	**C512_5.6**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
213	**40**	71	179	3.6	1.5	4.7	4550	**C412_4.7**	— P100	— V 3 F	**P100**	**BN100LA4**	198-199
217	**41**	70	175	2.9	1.1	4.6	3930	**C352_4.6**	— P100	— V 3 F	**P100**	**BN100LA4**	196-197
278	**53**	55	137	4.7	1.9	3.6	4250	**C412_3.6**	— P100	— V 3 F	**P100**	**BN100LA4**	198-199
303	**58**	50	125	8.4	3.3	3.3	10000	**C512_3.3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	200-201
370	**70**	41	103	4.6	1.9	2.7	3390	**C352_2.7**	— P100	— V 3 F	**P100**	**BN100LA4**	196-197



3 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N					IEC	
5.8	**1.1**	3841	8963	1.9	0.8	172.1	60000	**C903_172.1**	— P100	— V 3 F	**P100**	**BN100LB4**	207
6.3	**1.2**	3522	8218	2.0	0.9	157.8	60000	**C903_157.8**	— P100	— V 3 F	**P100**	**BN100LB4**	207
6.8	**1.3**	3265	7619	2.2	0.9	146.3	60000	**C903_146.3**	— P100	— V 3 F	**P100**	**BN100LB4**	207
7.5	**1.4**	2993	6984	2.4	1.0	134.1	60000	**C903_134.1**	— P100	— V 3 F	**P100**	**BN100LB4**	207
8.6	**1.6**	2605	6078	2.8	1.2	116.7	60000	**C903_116.7**	— P100	— V 3 F	**P100**	**BN100LB4**	207
9.1	**1.7**	2444	5703	1.6	0.7	109.5	35000	**C803_109.5**	— P100	— V 3 F	**P100**	**BN100LB4**	206
9.3	**1.8**	2388	5573	3.0	1.3	107.0	60000	**C903_107.0**	— P100	— V 3 F	**P100**	**BN100LB4**	207
10.4	**2.0**	2147	5010	3.4	1.4	96.2	60000	**C903_96.2**	— P100	— V 3 F	**P100**	**BN100LB4**	207
11.2	**2.1**	1993	4651	2.0	0.9	89.3	35000	**C803_89.3**	— P100	— V 3 F	**P100**	**BN100LB4**	206
11.3	**2.2**	1969	4593	3.6	1.5	88.2	60000	**C903_88.2**	— P100	— V 3 F	**P100**	**BN100LB4**	207
12.3	**2.3**	1817	4239	1.3	0.5	81.4	25000	**C703_81.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
13.0	**2.5**	1716	4005	2.3	1.0	76.9	35000	**C803_76.9**	— P100	— V 3 F	**P100**	**BN100LB4**	206
14.0	**2.7**	1591	3713	1.4	0.6	71.3	25000	**C703_71.3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
14.2	**2.7**	1574	3672	2.5	1.1	70.5	35000	**C803_70.5**	— P100	— V 3 F	**P100**	**BN100LB4**	206
15.2	**2.9**	1471	3432	1.6	0.7	65.9	25000	**C703_65.9**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
16.0	**3.0**	1395	3255	2.9	1.2	62.5	35000	**C803_62.5**	— P100	— V 3 F	**P100**	**BN100LB4**	206
17.7	**3.4**	1261	2943	1.8	0.8	56.5	25000	**C703_56.5**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
19.2	**3.6**	1165	2719	2.0	0.8	52.2	25000	**C703_52.2**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
21.1	**4.0**	1058	2469	3.8	1.6	47.4	35000	**C803_47.4**	— P100	— V 3 F	**P100**	**BN100LB4**	206
22.4	**4.3**	998	2328	2.3	1.0	44.7	25000	**C703_44.7**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
24.2	**4.6**	922	2151	2.5	1.1	41.3	25000	**C703_41.3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
26.3	**5.0**	866	2022	1.6	0.7	38.0	16000	**C612_38.0**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	202-203
28.8	**5.5**	791	1846	2.7	1.1	34.7	25000	**C702_34.7**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
29.2	**5.6**	780	1819	1.6	0.7	34.2	16000	**C612_34.2**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	202-203
33	**6.3**	693	1617	1.9	0.8	30.4	16000	**C612_30.4**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	202-203
36	**6.9**	632	1474	3.3	1.4	27.7	25000	**C702_27.7**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
40	**7.7**	565	1319	2.4	1.0	24.8	16000	**C612_24.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	202-203
44	**8.3**	522	1218	4.0	1.7	22.9	25000	**C702_22.9**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
48	**9.0**	479	1117	1.7	0.7	21.0	10000	**C512_21.0**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	200-201
51	**9.7**	447	1043	3.0	1.3	19.6	15800	**C612_19.6**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	202-203
52	**9.8**	440	1027	4.8	2.0	19.3	25000	**C702_19.3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	204-205
60	**11.4**	378	883	2.1	0.9	16.6	10000	**C512_16.6**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	200-201
63	**11.9**	363	846	3.7	1.6	15.9	14900	**C612_15.9**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	202-203
63	**12.0**	360	841	1.4	0.6	15.8	5770	**C412_15.8**	— P100	— V 3 F	**P100**	**BN100LB4**	198-199
76	**14.5**	299	697	2.7	1.1	13.1	10000	**C512_13.1**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	200-201



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n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N					IEC	
81	**15.3**	283	660	1.8	0.8	12.4	5570	**C412_12.4**	— P100	— V 3 F	**P100**	**BN100LB4**	198-199
85	**16.2**	267	622	1.4	0.6	11.7	4630	**C352_11.7**	— P100	— V 3 F	**P100**	**BN100LB4**	196-197
102	**19.4**	223	521	3.6	1.5	9.8	9460	**C512_9.8**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	200-201
104	**19.8**	219	511	2.1	1.0	9.6	5320	**C412_9.6**	— P100	— V 3 F	**P100**	**BN100LB4**	198-199
114	**21.6**	201	468	1.9	0.8	8.8	4410	**C352_8.8**	— P100	— V 3 F	**P100**	**BN100LB4**	196-197
141	**26.8**	162	378	2.6	1.3	7.1	4980	**C412_7.1**	— P100	— V 3 F	**P100**	**BN100LB4**	198-199
143	**27.1**	160	372	4.6	2.1	7.0	8610	**C512_7.0**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	200-201
147	**27.9**	155	362	2.5	1.1	6.8	4190	**C352_6.8**	— P100	— V 3 F	**P100**	**BN100LB4**	196-197
167	**32**	137	319	1.9	0.8	6.0	4530	**C412_6.0**	— P100	— V 3 F	**P100**	**BN100LB4**	198-199
179	**34**	128	298	3.4	1.5	5.6	7980	**C512_5.6**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	200-201
213	**40**	107	250	2.4	1.0	4.7	4310	**C412_4.7**	— P100	— V 3 F	**P100**	**BN100LB4**	198-199
217	**41**	105	245	1.9	0.8	4.6	3720	**C352_4.6**	— P100	— V 3 F	**P100**	**BN100LB4**	196-197
222	**42**	103	239	4.2	1.8	4.5	7450	**C512_4.5**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	200-201
278	**53**	82	192	3.1	1.3	3.6	4060	**C412_3.6**	— P100	— V 3 F	**P100**	**BN100LB4**	198-199
286	**54**	80	186	2.5	1.1	3.5	3480	**C352_3.5**	— P100	— V 3 F	**P100**	**BN100LB4**	196-197
303	**58**	75	176	5.6	2.4	3.3	7000	**C512_3.3**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	200-201
370	**70**	62	144	3.1	1.4	2.7	3260	**C352_2.7**	— P100	— V 3 F	**P100**	**BN100LB4**	196-197

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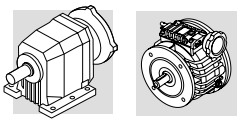
3.9	**0.70**	6882	13765	1.0	0.5	172.1	60000	**C903_172.1**	— P132	— V 10 F	**P132**	**BN132MA6**	207
4.2	**0.80**	6310	12621	1.1	0.6	157.8	60000	**C903_157.8**	— P132	— V 10 F	**P132**	**BN132MA6**	207
4.5	**0.90**	5851	11701	1.2	0.6	146.3	60000	**C903_146.3**	— P132	— V 10 F	**P132**	**BN132MA6**	207
4.9	**0.90**	5363	10725	1.3	0.7	134.1	60000	**C903_134.1**	— P132	— V 10 F	**P132**	**BN132MA6**	207
5.8	**1.1**	5122	11524	1.4	0.6	172.1	60000	**C903_172.1**	— P112	— V 5.5 F	**P112**	**BN112M4**	207
6.2	**1.2**	4279	8558	1.7	0.8	107.0	60000	**C903_107.0**	— P132	— V 10 F	**P132**	**BN132MA6**	207
6.3	**1.2**	4696	10566	1.5	0.7	157.8	60000	**C903_157.8**	— P112	— V 5.5 F	**P112**	**BN112M4**	207
6.8	**1.3**	4354	9796	1.7	0.7	146.3	60000	**C903_146.3**	— P112	— V 5.5 F	**P112**	**BN112M4**	207
7.5	**1.4**	3991	8979	1.8	0.8	134.1	60000	**C903_134.1**	— P112	— V 5.5 F	**P112**	**BN112M4**	207
7.5	**1.4**	3527	7054	2.0	1.0	88.2	60000	**C903_88.2**	— P132	— V 10 F	**P132**	**BN132MA6**	207
8.2	**1.5**	3247	6494	2.2	1.1	81.2	60000	**C903_81.2**	— P132	— V 10 F	**P132**	**BN132MA6**	207
8.4	**1.6**	3556	8002	1.1	0.5	119.5	35000	**C803_119.5**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
8.6	**1.6**	3473	7814	2.1	0.9	116.7	60000	**C903_116.7**	— P112	— V 5.5 F	**P112**	**BN112M4**	207
9.1	**1.7**	3259	7332	1.2	0.5	109.5	35000	**C803_109.5**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
9.3	**1.8**	3184	7165	2.2	1.0	107.0	60000	**C903_107.0**	— P112	— V 5.5 F	**P112**	**BN112M4**	207



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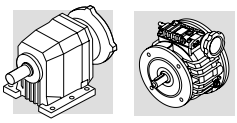
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
9.4	**1.8**	2819	5639	1.4	0.7	70.5	35000	**C803_70.5**	— P132	— V 10 F	**P132**	**BN132MA6**	206
10.3	**2.0**	2899	6522	1.4	0.6	97.4	35000	**C803_97.4**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
10.4	**2.0**	2863	6442	2.5	1.1	96.2	60000	**C903_96.2**	— P112	— V 5.5 F	**P112**	**BN112M4**	207
10.6	**2.0**	2499	4999	1.6	0.8	62.5	35000	**C803_62.5**	— P132	— V 10 F	**P132**	**BN132MA6**	206
11.2	**2.1**	2658	5980	1.5	0.7	89.3	35000	**C803_89.3**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
11.3	**2.2**	2625	5906	2.7	1.2	88.2	60000	**C903_88.2**	— P112	— V 5.5 F	**P112**	**BN112M4**	207
11.6	**2.2**	2291	4583	1.7	0.9	57.3	35000	**C803_57.3**	— P132	— V 10 F	**P132**	**BN132MA6**	206
12.3	**2.3**	2417	5437	3.0	1.3	81.2	60000	**C903_81.2**	— P112	— V 5.5 F	**P112**	**BN112M4**	207
13.0	**2.5**	2289	5149	1.7	0.8	76.9	35000	**C803_76.9**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
13.4	**2.6**	2214	4982	3.2	1.4	74.4	60000	**C903_74.4**	— P112	— V 5.5 F	**P112**	**BN112M4**	207
14.0	**2.7**	2122	4774	1.1	0.5	71.3	25000	**C703_71.3**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	204-205
14.2	**2.7**	2098	4721	1.9	0.8	70.5	35000	**C803_70.5**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
15.2	**2.9**	1961	4413	1.2	0.5	65.9	25000	**C703_65.9**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	204-205
16.0	**3.0**	1860	4185	2.2	1.0	62.5	35000	**C803_62.5**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
16.1	**3.0**	1652	3303	1.4	0.7	41.3	25000	**C703_41.3**	— P132	— V 10 F	**P132**	**BN132MA6**	204-205
17.0	**3.2**	1597	3194	2.0	1.0	39.1	35000	**C802_39.1**	— P132	— V 10 F	**P132**	**BN132MA6**	206
17.5	**3.3**	1705	3837	2.3	1.0	57.3	35000	**C803_57.3**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
17.7	**3.4**	1681	3783	1.4	0.6	56.5	25000	**C703_56.5**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	204-205
19.1	**3.6**	1417	2835	1.5	0.7	34.7	25000	**C702_34.7**	— P132	— V 10 F	**P132**	**BN132MA6**	204-205
19.2	**3.6**	1553	3495	1.5	0.7	52.2	25000	**C703_52.2**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	204-205
21.1	**4.0**	1411	3174	2.8	1.3	47.4	35000	**C803_47.4**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
22.4	**4.3**	1330	2993	1.7	0.8	44.7	25000	**C703_44.7**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	204-205
23.0	**4.4**	1295	2913	3.1	1.4	43.5	35000	**C803_43.5**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
23.9	**4.5**	1132	2263	1.9	0.9	27.7	25000	**C702_27.7**	— P132	— V 10 F	**P132**	**BN132MA6**	204-205
24.2	**4.6**	1229	2765	1.9	0.8	41.3	25000	**C703_41.3**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	204-205
25.6	**4.9**	1189	2674	2.7	1.2	39.1	35000	**C802_39.1**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
27.6	**5.2**	980	1961	3.6	1.8	24.0	35000	**C802_24.0**	— P132	— V 10 F	**P132**	**BN132MA6**	206
28.8	**5.5**	1055	2373	2.0	0.9	34.7	25000	**C702_34.7**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	204-205
29.0	**5.5**	935	1871	2.2	1.1	22.9	25000	**C702_22.9**	— P132	— V 10 F	**P132**	**BN132MA6**	204-205
32	**6.1**	952	2141	3.9	1.7	31.3	35000	**C802_31.3**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
34	**6.4**	1173	2160	1.2	0.6	19.6	16000	**C612_19.6**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MA6**	202-203
34	**6.5**	788	1577	2.7	1.3	19.3	25000	**C702_19.3**	— P132	— V 10 F	**P132**	**BN132MA6**	204-205
36	**6.9**	842	1895	2.5	1.1	27.7	25000	**C702_27.7**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	204-205
39	**7.3**	787	1772	4.7	2.1	25.9	35000	**C802_25.9**	— P112	— V 5.5 F	**P112**	**BN112M4**	206
42	**7.9**	952	1752	1.4	0.8	15.9	16000	**C612_15.9**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MA6**	202-203



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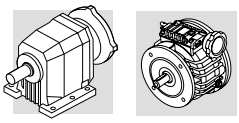
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
43	**8.2**	625	1250	3.4	1.7	15.3	25000	**C702_15.3**	**—** P132	**—** V 10 F	**P132**	**BN132MA6**	204-205
44	**8.3**	696	1566	3.0	1.3	22.9	25000	**C702_22.9**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	204-205
47	**8.9**	576	1152	3.7	1.9	14.1	25000	**C702_14.1**	**—** P132	**—** V 10 F	**P132**	**BN132MA6**	204-205
51	**9.7**	596	134	2.3	1.0	19.6	15300	**C612_19.6**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	202-203
52	**9.8**	587	1320	3.6	1.6	19.3	25000	**C702_19.3**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	204-205
55	**10.3**	724	1333	1.9	1.0	12.1	15200	**C612_12.1**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MA6**	202-203
60	**11.4**	505	1135	1.6	0.7	16.6	10000	**C512_16.6**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	200-201
61	**11.5**	652	1201	2.1	1.1	10.9	14800	**C612_10.9**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MA6**	202-203
68	**12.8**	587	1080	2.3	1.3	9.8	14400	**C612_9.8**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MA6**	202-203
75	**14.2**	527	970	2.6	1.4	8.8	13900	**C612_8.8**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MA6**	202-203
76	**14.5**	398	896	2.0	0.9	13.1	9900	**C512_13.1**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	200-201
88	**16.7**	449	827	3.0	1.6	7.5	13300	**C612_7.5**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MA6**	202-203
99	**18.7**	401	738	3.4	1.8	6.7	12900	**C612_6.7**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MA6**	202-203
102	**19.4**	298	670	2.7	1.2	9.8	9200	**C512_9.8**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	200-201
114	**21.6**	268	602	3.0	1.3	8.8	8960	**C512_8.8**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	200-201
128	**24.4**	237	534	3.1	1.5	7.8	8660	**C512_7.8**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	200-201
143	**27.1**	213	479	3.4	1.7	7.0	8420	**C512_7.0**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	200-201
179	**34**	170	383	2.6	1.1	5.6	7790	**C512_5.6**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	200-201
179	**34**	221	408	2.8	1.6	3.7	10700	**C612_3.7**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MA6**	202-203
222	**42**	137	308	3.2	1.4	4.5	7310	**C512_4.5**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	200-201
237	**45**	168	309	3.4	2.2	2.8	10000	**C612_2.8**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MA6**	202-203
270	**51**	112	253	5.6	2.6	3.7	9500	**C612_3.7**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	202-203
303	**58**	100	226	4.2	1.9	3.3	6710	**C512_3.3**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	200-201
357	**68**	85	192	6.6	3.5	2.8	9000	**C612_2.8**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	202-203
385	**73**	79	178	5.1	2.2	2.6	6280	**C512_2.6**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	200-201

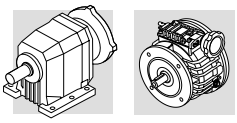
5.5 kW

5.7	**1.1**	6837	12590	1.1	0.6	116.7	60000	**C903_116.7**	**—** P132	**—** V 10 F	**P132**	**BN132MB6**	207
5.8	**1.1**	6882	13765	1.0	0.5	172.1	60000	**C903_172.1**	**—** P132	**—** V 10 F	**P132**	**BN132S4**	207
6.3	**1.2**	6310	12621	1.1	0.6	157.8	60000	**C903_157.8**	**—** P132	**—** V 10 F	**P132**	**BN132S4**	207
6.8	**1.3**	5851	11701	1.2	0.6	146.3	60000	**C903_146.3**	**—** P132	**—** V 10 F	**P132**	**BN132S4**	207
6.9	**1.3**	5636	10378	1.3	0.7	96.2	60000	**C903_96.2**	**—** P132	**—** V 10 F	**P132**	**BN132MB6**	207
7.5	**1.4**	5363	10725	1.3	0.7	134.1	60000	**C903_134.1**	**—** P132	**—** V 10 F	**P132**	**BN132S4**	207
8.6	**1.6**	4667	9334	1.5	0.8	116.7	60000	**C903_116.7**	**—** P132	**—** V 10 F	**P132**	**BN132S4**	207



5.5 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						IEC	
9.3	**1.8**	4279	8558	1.7	0.8	107.0	60000	**C903_107.0**	— P132	— V 10 F	**P132**	**BN132S4**	201
9.4	**1.8**	4131	7606	1.0	0.5	70.5	35000	**C803_70.5**	— P132	— V 10 F	**P132**	**BN132MB6**	206
10.3	**2.0**	3895	7790	1.0	0.5	97.4	35000	**C803_97.4**	— P132	— V 10 F	**P132**	**BN132S4**	206
10.4	**2.0**	3847	7694	1.9	0.9	96.2	60000	**C903_96.2**	— P132	— V 10 F	**P132**	**BN132S4**	207
10.6	**2.0**	3662	6743	1.1	0.6	62.5	35000	**C803_62.5**	— P132	— V 10 F	**P132**	**BN132MB6**	206
11.2	**2.1**	3571	7142	1.1	0.6	89.3	35000	**C803_89.3**	— P132	— V 10 F	**P132**	**BN132S4**	206
11.2	**2.1**	3469	6386	2.0	1.1	59.2	60000	**C903_59.2**	— P132	— V 10 F	**P132**	**BN132MB6**	207
11.3	**2.2**	3527	7054	2.0	1.0	88.2	60000	**C903_88.2**	— P132	— V 10 F	**P132**	**BN132S4**	207
12.3	**2.3**	3247	6494	2.2	1.1	81.2	60000	**C903_81.2**	— P132	— V 10 F	**P132**	**BN132S4**	207
13.0	**2.5**	3075	6150	1.3	0.7	76.9	35000	**C803_76.9**	— P132	— V 10 F	**P132**	**BN132S4**	206
13.4	**2.6**	2975	5951	2.4	1.2	74.4	60000	**C903_74.4**	— P132	— V 10 F	**P132**	**BN132S4**	207
14.2	**2.7**	2819	5639	1.4	0.7	70.5	35000	**C803_70.5**	— P132	— V 10 F	**P132**	**BN132S4**	206
15.5	**2.9**	2583	5167	2.8	1.4	64.6	60000	**C903_64.6**	— P132	— V 10 F	**P132**	**BN132S4**	207
16.0	**3.0**	2499	4999	1.6	0.8	62.5	35000	**C803_62.5**	— P132	— V 10 F	**P132**	**BN132S4**	206
16.1	**3.0**	2420	4455	1.0	0.5	41.3	25000	**C703_41.3**	— P132	— V 10 F	**P132**	**BN132MB6**	204-205
16.9	**3.2**	2367	4735	3.0	1.5	59.2	60000	**C903_59.2**	— P132	— V 10 F	**P132**	**BN132S4**	207
17.0	**3.2**	2340	4309	1.4	0.7	39.1	35000	**C802_39.1**	— P132	— V 10 F	**P132**	**BN132MB6**	206
17.5	**3.3**	2291	4583	1.7	0.9	57.3	35000	**C803_57.3**	— P132	— V 10 F	**P132**	**BN132S4**	206
18.2	**3.5**	2195	4391	3.3	1.6	54.9	60000	**C903_54.9**	— P132	— V 10 F	**P132**	**BN132S4**	207
18.9	**3.6**	2101	3868	2.6	1.4	35.1	35000	**C902_35.1**	— P132	— V 10 F	**P132**	**BN132MB6**	207
19.1	**3.6**	2077	3824	1.0	0.5	34.7	25000	**C702_34.7**	— P132	— V 10 F	**P132**	**BN132MB6**	204-205
21.1	**4.0**	1896	3791	2.1	1.1	47.4	35000	**C803_47.4**	— P132	— V 10 F	**P132**	**BN132S4**	206
23.0	**4.4**	1740	3479	2.3	1.1	43.5	35000	**C803_43.5**	— P132	— V 10 F	**P132**	**BN132S4**	206
23.3	**4.4**	1720	3439	4.2	2.1	43.0	57000	**C903_43.0**	— P132	— V 10 F	**P132**	**BN132S4**	207
23.9	**4.5**	1658	3053	1.3	0.7	27.7	25000	**C702_27.7**	— P132	— V 10 F	**P132**	**BN132MB6**	204-205
24.2	**4.6**	1652	3303	1.4	0.7	41.3	25000	**C703_41.3**	— P132	— V 10 F	**P132**	**BN132S4**	204-205
25.4	**4.8**	1576	3151	4.5	2.3	39.4	55900	**C903_39.4**	— P132	— V 10 F	**P132**	**BN132S4**	207
25.6	**4.9**	1597	3194	2.0	1.0	39.1	35000	**C802_39.1**	— P132	— V 10 F	**P132**	**BN132S4**	206
27.6	**5.2**	1436	2645	2.5	1.3	24.0	35000	**C802_24.0**	— P132	— V 10 F	**P132**	**BN132MB6**	206
28.8	**5.5**	1417	2835	1.5	0.7	34.7	25000	**C702_34.7**	— P132	— V 10 F	**P132**	**BN132S4**	204-205
29.0	**5.5**	1371	2524	1.5	0.8	22.9	25000	**C702_22.9**	— P132	— V 10 F	**P132**	**BN132MB6**	204-205
32	**6.1**	1279	2557	2.9	1.4	31.3	35000	**C802_31.3**	— P132	— V 10 F	**P132**	**BN132S4**	206
34	**6.5**	1155	2127	1.8	1.0	19.3	25000	**C702_19.3**	— P132	— V 10 F	**P132**	**BN132MB6**	204-205
34	**6.5**	1176	2351	1.4	0.7	29.4	15800	**C613_29.4**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
36	**6.9**	1132	2263	1.9	0.9	27.7	25000	**C702_27..7**	— P132	— V 10 F	**P132**	**BN132S4**	204-205
37	**6.9**	1083	1995	3.4	1.9	18.1	35000	**C802_18.1**	— P132	— V 10 F	**P132**	**BN132MB6**	206

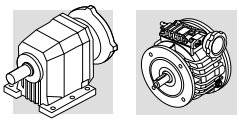


5.5 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						IEC	
39	**7.3**	1058	2116	3.5	1.7	25.9	35000	**C802_25.9**	— P132	— V 10 F	**P132**	**BN132S4**	206
40	**7.5**	999	1840	2.1	1.1	16.7	25000	**C702_16.7**	— P132	— V 10 F	**P132**	**BN132MB6**	204-205
40	**7.7**	1013	2026	1.3	0.7	24.8	15300	**C612_24.8**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
42	**7.9**	980	1961	3.6	1.8	24.0	35000	**C802_24.0**	— P132	— V 10 F	**P132**	**BN132S4**	206
44	**8.3**	935	1871	2.2	1.1	22.9	25000	**C702_22.9**	— P132	— V 10 F	**P132**	**BN132S4**	204-205
45	**8.6**	907	1814	4.1	2.0	22.2	35000	**C802_22.2**	— P132	— V 10 F	**P132**	**BN132S4**	206
46	**8.7**	856	1576	1.6	0.9	14.3	14900	**C612_14.3**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB6**	202-203
47	**8.9**	844	1554	2.5	1.4	14.1	25000	**C702_14.1**	— P132	— V 10 F	**P132**	**BN132MB6**	204-205
52	**9.8**	788	1577	2.7	1.3	19.3	25000	**C702_19.3**	— P132	— V 10 F	**P132**	**BN132S4**	204-205
56	**10.7**	723	1446	1.9	0.9	17.7	14200	**C612_17.7**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
63	**11.9**	650	1299	2.1	1.0	15.9	13900	**C612_15.9**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
65	**12.4**	625	1250	3.4	1.7	15.3	23750	**C702_15.3**	— P132	— V 10 F	**P132**	**BN132S4**	204-205
71	**13.5**	576	1152	3.7	1.9	14.1	23550	**C702_14.1**	— P132	— V 10 F	**P132**	**BN132S4**	204-205
77	**14.6**	531	1062	4.0	2.0	13.0	22560	**C702_13.0**	— P132	— V 10 F	**P132**	**BN132S4**	204-205
83	**15.7**	494	989	2.7	1.4	12.1	13000	**C612_12.1**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
89	**17.0**	458	915	4.7	2.3	11.2	22100	**C702_11.2**	— P132	— V 10 F	**P132**	**BN132S4**	204-205
102	**19.4**	400	801	3.4	1.7	9.8	12400	**C612_9.8**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
114	**21.6**	359	719	3.8	1.9	8.8	12000	**C612_8.8**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
133	**25.3**	306	613	4.4	2.2	7.5	11500	**C612_7.5**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
144	**27.2**	275	507	2.4	1.3	4.6	11100	**C612_4.6**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB6**	202-203
149	**28.4**	274	547	4.9	2.5	6.7	11100	**C612_6.7**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
167	**32**	245	490	2.7	1.4	6.0	10600	**C612_6.0**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
217	**41**	188	376	3.5	1.8	4.6	9800	**C612_4.6**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
270	**51**	151	302	4.1	2.2	3.7	9300	**C612_3.7**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203
357	**68**	114	229	4.9	2.9	2.8	8800	**C612_2.8**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132S4**	202-203

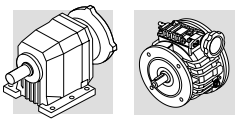
7.5 kW

6.6	**1.3**	8113	16225	1.5	0.7	150.4	85000	**C1003_150.4**	— P132	— V 10 F	**P132**	**BN132MA4**	208
7.2	**1.4**	7535	15071	1.5	0.7	139.7	85000	**C1003_139.7**	— P132	— V 10 F	**P132**	**BN132MA4**	208
8.3	**1.6**	6500	13000	1.8	0.9	120.5	85000	**C1003_120.5**	— P132	— V 10 F	**P132**	**BN132MA4**	208
8.9	**1.7**	6036	12072	2.0	1.0	111.9	85000	**C1003_111.9**	— P132	— V 10 F	**P132**	**BN132MA4**	208
9.3	**1.8**	5772	11543	1.2	0.6	107.0	60000	**C903_107.0**	— P132	— V 10 F	**P132**	**BN132MA4**	207
10.0	**1.9**	5383	10766	2.2	1.1	99.8	85000	**C1003_99.8**	— P132	— V 10 F	**P132**	**BN132MA4**	208
10.4	**2.0**	5189	10378	1.4	0.7	96.2	60000	**C903_96.2**	— P132	— V 10 F	**P132**	**BN132MA4**	207



7.5 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
10.8	**2.0**	5000	10000	2.4	1.2	92.7	85000	**C1003_92.7**	— P132	— V 10 F	**P132**	**BN132MA4**	208
11.3	**2.2**	4758	9515	1.5	0.7	88.2	60000	**C903_88.2**	— P132	— V 10 F	**P132**	**BN132MA4**	207
12.3	**2.3**	4380	8760	1.6	0.8	81.2	60000	**C903_81.2**	— P132	— V 10 F	**P132**	**BN132MA4**	207
13.0	**2.5**	4148	8296	1.0	0.5	76.9	35000	**C803_76.9**	— P132	— V 10 F	**P132**	**BN132MA4**	206
13.4	**2.6**	4013	8026	1.8	0.9	74.4	60000	**C903_74.4**	— P132	— V 10 F	**P132**	**BN132MA4**	207
14.2	**2.7**	3803	7606	1.1	0.5	70.5	35000	**C803_70.5**	— P132	— V 10 F	**P132**	**BN132MA4**	206
14.4	**2.7**	3743	7487	3.2	1.6	69.4	85000	**C1003_69.4**	— P132	— V 10 F	**P132**	**BN132MA4**	208
15.5	**2.9**	3485	6969	2.1	1.0	64.6	59510	**C903_64.6**	— P132	— V 10 F	**P132**	**BN132MA4**	207
15.5	**2.9**	3479	6958	3.4	1.7	64.5	85000	**C1003_64.5**	— P132	— V 10 F	**P132**	**BN132MA4**	208
16.0	**3.0**	3371	6743	1.2	0.6	62.5	35000	**C803_62.5**	— P132	— V 10 F	**P132**	**BN132MA4**	206
16.9	**3.2**	3193	6386	2.2	1.1	59.2	58610	**C903_59.2**	— P132	— V 10 F	**P132**	**BN132MA4**	207
17.4	**3.3**	3096	6192	3.9	1.9	57.4	85000	**C1003_57.4**	— P132	— V 10 F	**P132**	**BN132MA4**	208
17.5	**3.3**	3091	6182	1.3	0.6	57.3	35000	**C803_57.3**	— P132	— V 10 F	**P132**	**BN132MA4**	207
18.2	**3.5**	2961	5923	2.4	1.2	54.9	57800	**C903_54.9**	— P132	— V 10 F	**P132**	**BN132MA4**	207
18.8	**3.6**	2875	5750	4.2	2.1	53.3	85000	**C1003_53.3**	— P132	— V 10 F	**P132**	**BN132MA4**	208
19.9	**3.8**	2713	5426	2.6	1.3	50.3	56840	**C903_50.3**	— P132	— V 10 F	**P132**	**BN132MA4**	207
21.1	**4.0**	2557	5114	1.6	0.8	47.4	35000	**C803_47.4**	— P132	— V 10 F	**P132**	**BN132MA4**	206
23.0	**4.4**	2346	4693	1.7	0.9	43.5	35000	**C803_43.5**	— P132	— V 10 F	**P132**	**BN132MA4**	206
24.2	**4.6**	2228	4455	1.0	0.5	41.3	25000	**C703_41.3**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
25.6	**4.9**	2154	4309	1.5	0.7	39.1	35000	**C802_39.1**	— P132	— V 10 F	**P132**	**BN132MA4**	206
28.5	**5.4**	1934	3868	2.8	1.4	35.1	52610	**C902_35.1**	— P132	— V 10 F	**P132**	**BN132MA4**	207
28.8	**5.5**	1912	3824	1.1	0.5	34.7	25000	**C702_34.7**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
32	**6.1**	1725	3449	2.1	1.1	31.3	35000	**C802_31.3**	— P132	— V 10 F	**P132**	**BN132MA4**	206
34	**6.5**	1620	3240	3.6	1.8	29.4	50570	**C902_29.4**	— P132	— V 10 F	**P132**	**BN132MA4**	207
36	**6.9**	1526	3053	1.4	0.7	27.7	25000	**C702_27.7**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
37	**7.0**	1499	2997	3.7	1.8	27.2	49680	**C902_27.2**	— P132	— V 10 F	**P132**	**BN132MA4**	207
39	**7.3**	1427	2854	2.6	1.3	25.9	35000	**C802_25.9**	— P132	— V 10 F	**P132**	**BN132MA4**	206
42	**7.9**	1322	2645	2.7	1.3	24.0	35000	**C802_24.0**	— P132	— V 10 F	**P132**	**BN132MA4**	206
44	**8.3**	1262	2524	1.7	0.8	22.9	25000	**C702_22.9**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
45	**8.6**	1223	2446	3.0	1.5	22.2	35000	**C802_22.2**	— P132	— V 10 F	**P132**	**BN132MA4**	206
49	**9.3**	1130	2259	3.1	1.6	20.5	35000	**C802_20.5**	— P132	— V 10 F	**P132**	**BN132MA4**	206
52	**9.8**	1063	2127	2.0	1.0	19.3	25000	**C702_19.3**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
55	**10.5**	997	1995	3.7	1.9	18.1	35000	**C802_18.1**	— P132	— V 10 F	**P132**	**BN132MA4**	206
56	**10.7**	975	1951	1.4	0.7	17.7	14000	**C612_17.7**	V10 P132	V 10 C V 10 F	**P132**	**BN132MA4**	202-203
63	**11.9**	876	1752	1.5	0.8	15.9	13900	**C612_15.9**	V10 P132	V 10 C V 10 F	**P132**	**BN132MA4**	202-203

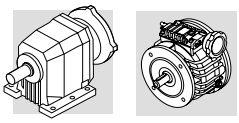


7.5 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						IEC	
65	**12.4**	843	1686	2.5	1.2	15.3	23930	**C702_15.3**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
67	**12.8**	821	1642	4.5	2.3	14.9	35000	**C802_14.9**	— P132	— V 10 F	**P132**	**BN132MA4**	206
71	**13.5**	777	1554	2.8	1.4	14.1	23380	**C702_14.1**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
77	**14.6**	716	1433	2.9	1.5	13.0	22720	**C702_13.0**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
89	**17.0**	617	1234	3.5	1.7	11.2	21720	**C702_11.2**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
92	**17.4**	601	12010	2.2	1.1	10.9	13100	**C612_10.9**	V10 P132	V 10 C V 10 F	**P132**	**BN132MA4**	202-203
98	**18.6**	562	1124	3.7	1.9	10.2	21030	**C702_10.2**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
105	**20.0**	523	1047	4.1	2.1	9.5	21000	**C702_9.5**	— P132	— V 10 F	**P132**	**BN132MA4**	204-205
114	**21.6**	485	970	2.8	1.4	8.8	12600	**C612_8.8**	V10 P132	V 10 C V 10 F	**P132**	**BN132MA4**	202-203
133	**25.3**	413	827	3.3	1.6	7.5	12200	**C612_7.5**	V10 P132	V 10 C V 10 F	**P132**	**BN132MA4**	202-203
149	**28.4**	369	738	3.7	1.8	6.7	11900	**C612_6.7**	V10 P132	V 10 C V 10 F	**P132**	**BN132MA4**	202-203
167	**32**	331	661	2.0	1.0	6.0	10300	**C612_6.0**	V10 P132	V 10 C V 10 F	**P132**	**BN132MA4**	202-203
217	**41**	253	507	2.6	1.3	4.6	9600	**C612_4.6**	V10 P132	V 10 C V 10 F	**P132**	**BN132MA4**	202-203
270	**51**	204	408	3.1	1.6	3.7	9100	**C612_3.7**	V10 P132	V 10 C V 10 F	**P132**	**BN132MA4**	202-203
357	**68**	154	309	3.7	2.2	2.8	8400	**C612_2.8**	V10 P132	V 10 C V 10 F	**P132**	**BN132MA4**	202-203

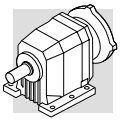
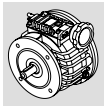
9.2 kW

6.6	**1.3**	10071	20142	1.2	0.6	150.4	85000	**C1003_150.4**	— P132	— V 10 F	**P132**	**BN132MB4**	208
7.2	**1.4**	9354	18709	1.2	0.6	139.7	85000	**C1003_139.7**	— P132	— V 10 F	**P132**	**BN132MB4**	208
8.3	**1.6**	8069	16137	1.5	0.7	120.5	85000	**C1003_120.5**	— P132	— V 10 F	**P132**	**BN132MB4**	208
8.9	**1.7**	7493	14986	1.6	0.8	111.9	85000	**C1003_111.9**	— P132	— V 10 F	**P132**	**BN132MB4**	208
10.0	**1.9**	6683	13365	1.8	0.9	99.8	85000	**C1003_99.8**	— P132	— V 10 F	**P132**	**BN132MB4**	208
10.8	**2.0**	6207	12414	1.9	1.0	92.7	85000	**C1003_92.7**	— P132	— V 10 F	**P132**	**BN132MB4**	208
11.7	**2.2**	5732	11464	2.1	1.0	85.6	85000	**C1003_85.6**	— P132	— V 10 F	**P132**	**BN132MB4**	208
12.6	**2.4**	5317	10633	2.3	1.1	79.4	85000	**C1003_79.4**	— P132	— V 10 F	**P132**	**BN132MB4**	208
14.4	**2.7**	4647	9294	2.6	1.3	69.4	85000	**C1003_69.4**	— P132	— V 10 F	**P132**	**BN132MB4**	208
15.5	**2.9**	4326	8651	1.7	0.8	64.6	56870	**C903_64.6**	— P132	— V 10 F	**P132**	**BN132MB4**	207
16.0	**3.0**	4185	8370	1.0	0.5	62.5	35000	**C803_62.5**	— P132	— V 10 F	**P132**	**BN132MB4**	206
17.5	**3.3**	3837	7674	1.0	0.5	57.3	35000	**C803_57.3**	— P132	— V 10 F	**P132**	**BN132MB4**	206
18.2	**3.5**	3676	7352	2.0	1.0	54.9	55550	**C903_54.9**	— P132	— V 10 F	**P132**	**BN132MB4**	207
19.9	**3.8**	3368	6736	2.1	1.1	50.3	54780	**C903_50.3**	— P132	— V 10 F	**P132**	**BN132MB4**	207
21.1	**4.0**	3174	6348	1.3	0.6	47.4	35000	**C803_47.4**	— P132	— V 10 F	**P132**	**BN132MB4**	206
23.0	**4.4**	2913	5826	1.4	0.7	43.5	35000	**C803_43.5**	— P132	— V 10 F	**P132**	**BN132MB4**	206



9.2 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						IEC	
23.3	**4.4**	2879	5759	2.5	1.3	43.0	53310	**C903_43.0**	— P132	— V 10 F	**P132**	**BN132MB4**	207
25.4	**4.8**	2638	5276	2.7	1.3	39.4	52460	**C903_39.4**	— P132	— V 10 F	**P132**	**BN132MB4**	207
25.6	**4.9**	2674	5349	1.2	0.6	39.1	35000	**C802_39.1**	— P132	— V 10 F	**P132**	**BN132MB4**	206
28.5	**5.4**	2401	4802	2.2	1.1	35.1	51140	**C902_35.1**	— P132	— V 10 F	**P132**	**BN132MB4**	207
32	**6.1**	2141	4282	1.7	0.9	31.3	35000	**C802_31.3**	— P132	— V 10 F	**P132**	**BN132MB4**	206
34	**6.5**	2011	4022	2.9	1.5	29.4	49340	**C902_29.4**	— P132	— V 10 F	**P132**	**BN132MB4**	207
36	**6.9**	1895	3789	1.1	0.6	27.7	24630	**C702_27.7**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
37	**7.0**	1860	3721	3.0	1.5	27.2	48560	**C902_27.2**	— P132	— V 10 F	**P132**	**BN132MB4**	207
39	**7.3**	1772	3543	2.1	1.0	25.9	35000	**C802_25.9**	— P132	— V 10 F	**P132**	**BN132MB4**	206
42	**7.9**	1642	3283	2.2	1.1	24.0	35000	**C802_24.0**	— P132	— V 10 F	**P132**	**BN132MB4**	206
44	**8.3**	1566	3133	1.3	0.7	22.9	24680	**C702_22.9**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
44	**8.3**	1566	3133	4.0	2.0	22.9	46760	**C902_22.9**	— P132	— V 10 F	**P132**	**BN132MB4**	207
49	**9.3**	1402	2804	2.5	1.3	20.5	35000	**C802_20.5**	— P132	— V 10 F	**P132**	**BN132MB4**	206
52	**9.8**	1320	2640	1.6	0.8	19.3	24500	**C702_19.3**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
60	**11.4**	1142	2285	1.8	0.9	16.7	24100	**C702_16.7**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
60	**11.4**	1142	2285	3.1	1.5	16.7	35000	**C802_16.7**	— P132	— V 10 F	**P132**	**BN132MB4**	206
63	**11.9**	1088	2175	1.2	0.6	15.9	12500	**C612_15.9**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203
65	**12.4**	1047	2093	2.0	1.0	15.3	24080	**C702_15.3**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
67	**12.8**	1019	2038	3.6	1.8	14.9	33900	**C802_14.9**	— P132	— V 10 F	**P132**	**BN132MB4**	206
70	**13.3**	978	1956	1.4	0.7	14.3	12200	**C612_14.3**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203
71	**13.5**	964	1929	2.2	1.1	14.1	23530	**C702_14.1**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
72	**13.8**	944	1888	3.7	1.9	13.8	33200	**C802_13.8**	— P132	— V 10 F	**P132**	**BN132MB4**	206
77	**14.6**	889	1778	2.4	1.2	13.0	22860	**C702_13.0**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
83	**15.7**	828	1655	1.6	0.8	12.1	11900	**C612_12.1**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203
83	**15.8**	821	1642	4.5	2.3	12.0	31700	**C802_12.0**	— P132	— V 10 F	**P132**	**BN132MB4**	206
89	**17.0**	766	1532	2.8	1.4	11.2	21860	**C702_11.2**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
98	**18.6**	698	1395	3.0	1.5	10.2	21140	**C702_10.2**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
102	**19.4**	670	1341	2.0	1.0	9.8	11500	**C612_9.8**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203
105	**20.0**	650	1300	3.3	1.7	9.5	24750	**C702_9.5**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
114	**21.6**	602	1204	2.2	1.1	8.8	11200	**C612_8.8**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203
133	**25.3**	513	1026	4.1	2.1	7.5	19520	**C702_7.5**	— P132	— V 10 F	**P132**	**BN132MB4**	204-205
133	**25.3**	513	1026	2.6	1.3	7.5	10800	**C612_7.5**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203
149	**28.4**	458	917	2.9	1.5	6.7	10500	**C612_6.7**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203
167	**32**	410	821	1.6	0.8	6.0	10000	**C612_6.0**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203

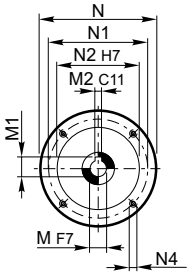



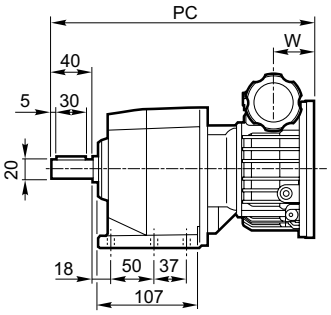
9.2 kW

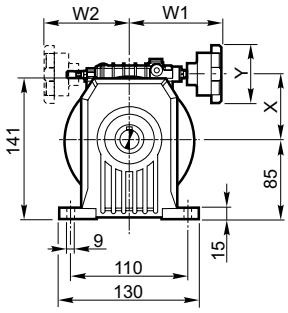
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N						
217	**41**	315	629	2.1	1.1	4.6	9370	**C612_4.6**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203
270	**51**	253	506	2.5	1.3	3.7	8890	**C612_3.7**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203
357	**68**	192	383	3.0	1.7	2.8	8270	**C612_2.8**	**V10** P132	**V 10 C** V 10 F	**P132**	**BN132MB4**	202-203

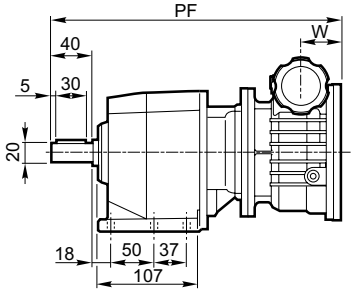
23.10 - Dimensioni *23.10 - Dimensions* **23.10 - Abmessungen** *23.10 - Dimensions*

C 112_P + V_P(IEC)

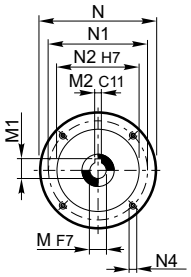


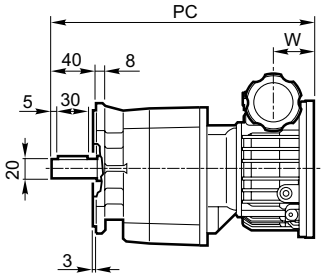


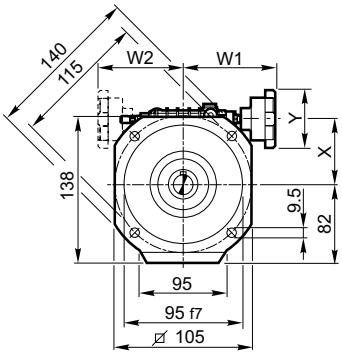


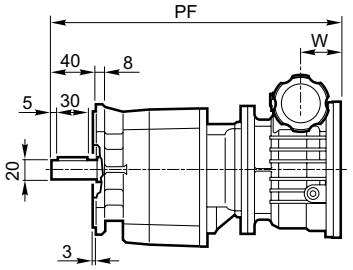


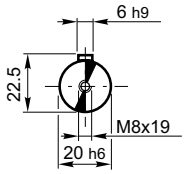
C 112_F + V_P(IEC)











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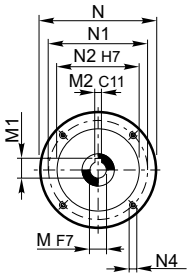

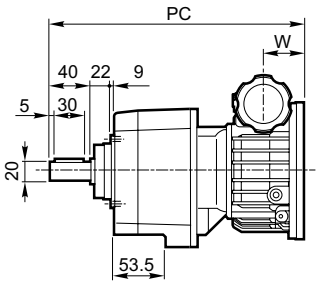

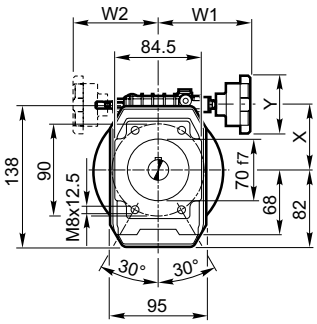

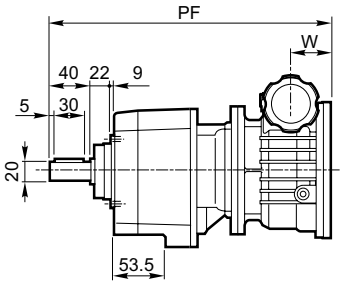

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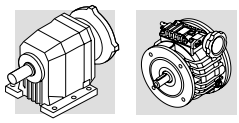
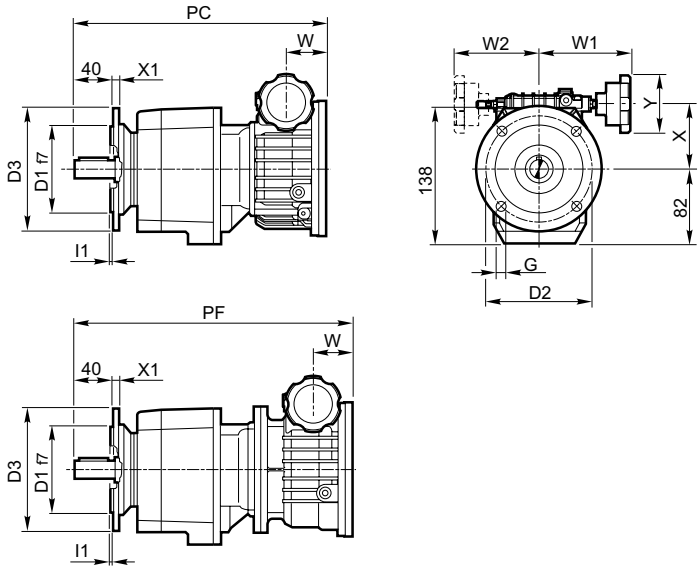


C112_UF + V_P(IEC)



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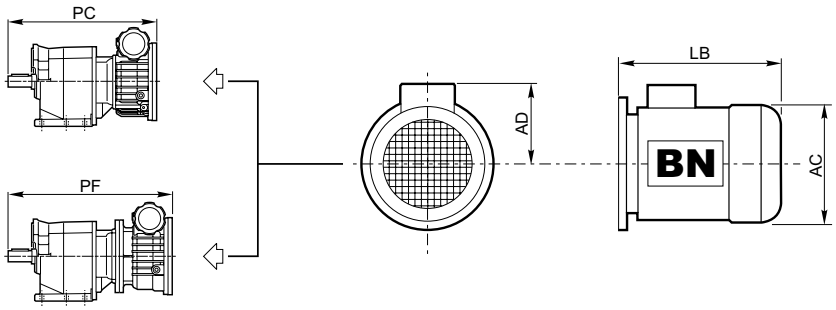
C 112_UFA	80	100	120	7	2.5	9
C 112_UFB	95	115	140	9	3	10
C 112_UFC	110	130	160	9	3	10

			V_C - V_F												C 11 _ + V_C				C 11_ + V_F			
		IEC	N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg P	Kg F	Kg U	PF	Kg P	Kg F	Kg U
C 112_	V 0.25	P63	140	115	95	M8x20	11	12.8	4	45	115	110	70	83	271	7.9	7.6	7.4	353	9.9	9.6	9.4
	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	274	11.1	10.7	10.6	355	13.1	12.7	12.6
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	78	83	278	11.1	10.7	10.6	359	13.1	12.7	12.6

C 112 + V_P + BN



			BN			C 11_ + V_C + BN				C 11_ + V_F + BN			
		IEC	AC	AD	LB	PC+LB	Kg P	Kg F	Kg U	PF+LB	Kg P	Kg F	Kg U
C 112_	V 0.25	63	121	95	184	455	11.8	11.5	11.3	537	13.8	13.5	13.3
	V 0.25	71R	138	108	219	490	13.3	13.0	12.8	572	15.3	15.0	14.8
	V 0.5	71	138	108	219	493	17.0	16.6	16.5	574	19.0	18.6	18.5
	V 0.5	80	156	119	234	512	21.0	20.6	20.5	593	13.0	22.6	22.5

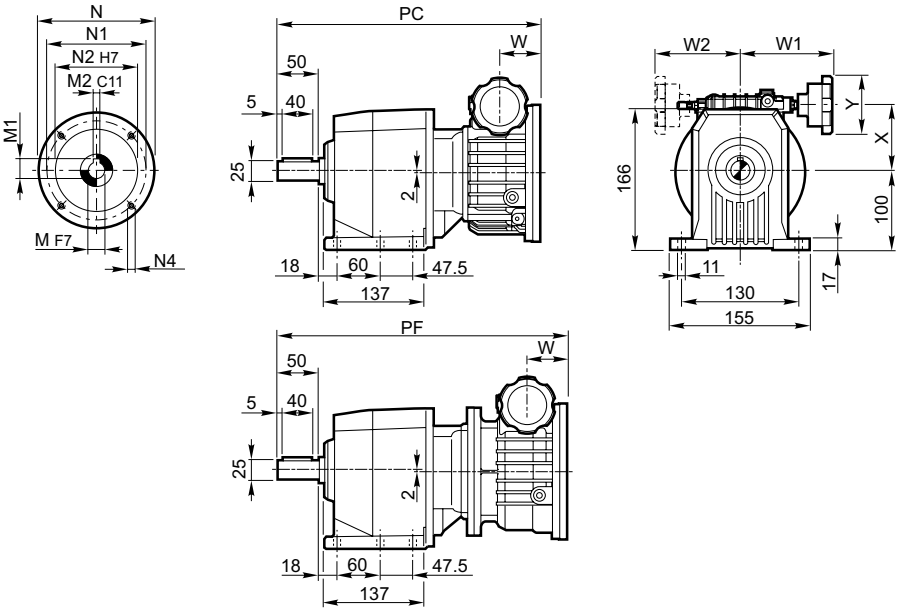
** Utilizzare linguetta ribassata 6x5x30 "A"

** *Use lowered key 6x5x30 "A"*

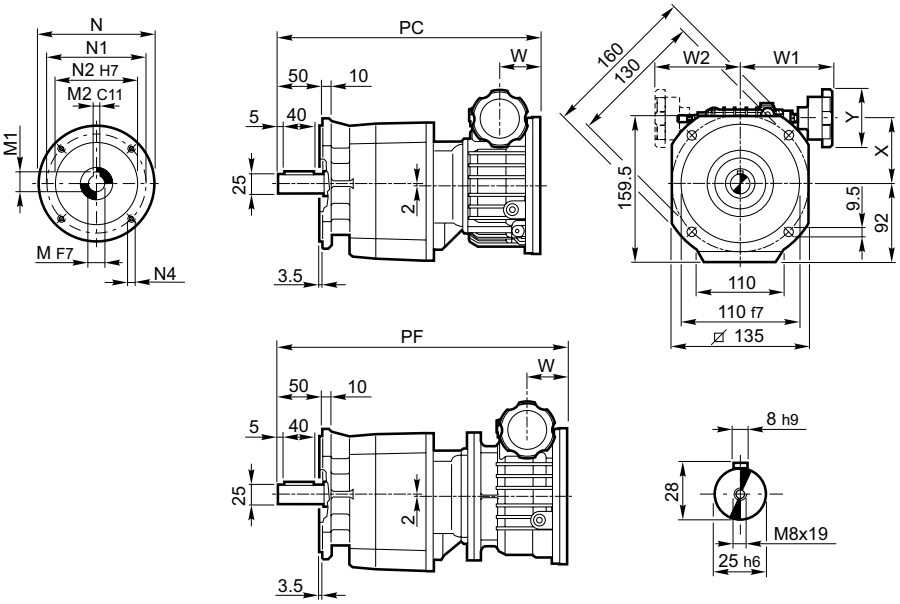
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

** *Utiliser une languette rabaissée taille 6x5x30 "A"*

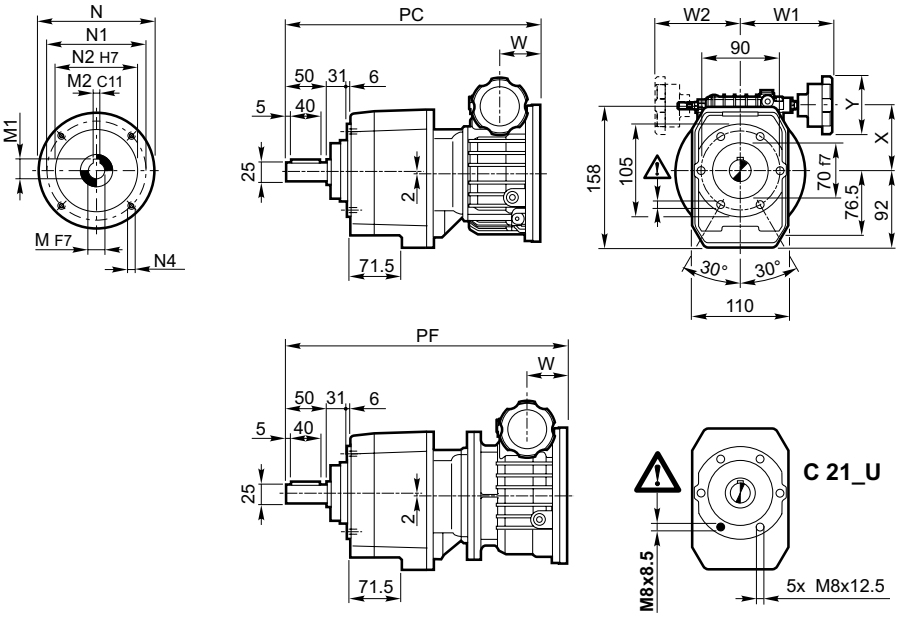
C 21_P + V_P(IEC)

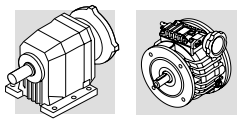


C 21_F + V_P(IEC)

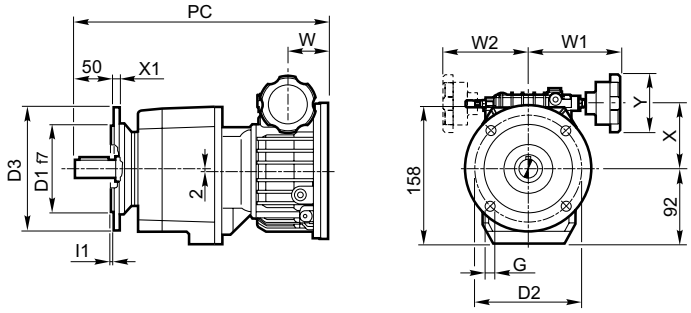


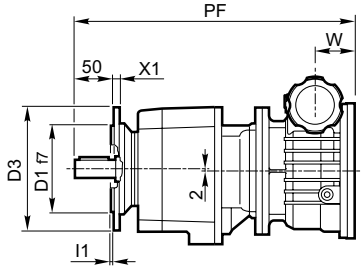
C 21_U + V_P(IEC)





C 21_UF + V_P(IEC)

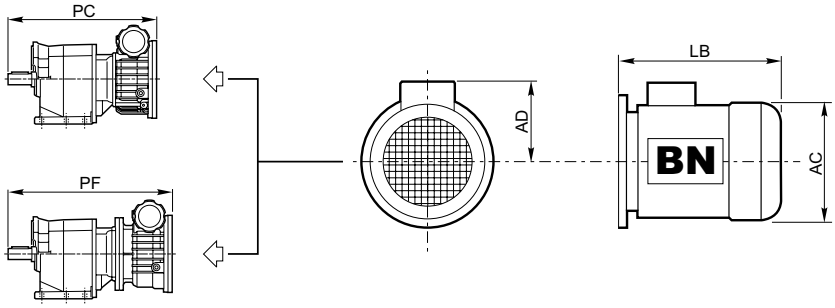




UF	D_1	D_2	D_3	G	l_1	X_1
C 212_UFA	95	115	140	9	3	10
C 212_UFB	110	130	160	9	3	10
C 212_UFC	130	165	200	11	3.5	11

			V_C - V_F												C 21_ + V_C				C 21_ + V_F			
		IEC	N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg P	Kg F	Kg U	PF	Kg P	Kg F	Kg U
C 212_	V 0.25	P63	140	115	95	M8x20	11	12.8	4	45	115	110	68	83	307	9.2	8.9	9.0	382	11.7	11.4	11.2
	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	76	83	309	12.0	11.7	12.3	384	14.8	14.5	14.3
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	76	83	313	12.0	11.7	12.3	388	14.8	14.5	14.3
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	95	83	—	—	—	—	429	22.3	22.0	21.8
	V 1	P90	200	165	130	M10x20	24	26.3*	8	59	133	124	95	83	—	—	—	—	429	22.3	22.0	21.8

C 21_ + V_P + BN



			BN			C 21_ + V_C				C 21_ + V_F			
		IEC	AC	AD	LB	PC+LB	Kg P	Kg F	Kg U	PF+LB	Kg P	Kg F	Kg U
C 212_	V 0.25	63	124	95	184	491	13.1	12.8	12.9	566	15.6	15.3	15.1
	V 0.25	71R	138	108	219	526	14.6	14.3	14.4	601	17.1	16.8	16.6
	V 0.5	71	138	108	219	528	17.9	17.6	18.2	603	20.7	20.4	20.2
	V 0.5	80	156	119	234	547	21.9	21.6	22.2	622	24.7	24.4	24.2
	V 1	80	156	119	234	—	—	—	—	663	32.2	31.9	31.7
	V 1	90S	176	133	276	—	—	—	—	705	34.6	34.3	34.1
	V 1	90L	176	133	276	—	—	—	—	705	36.6	36.3	36.1

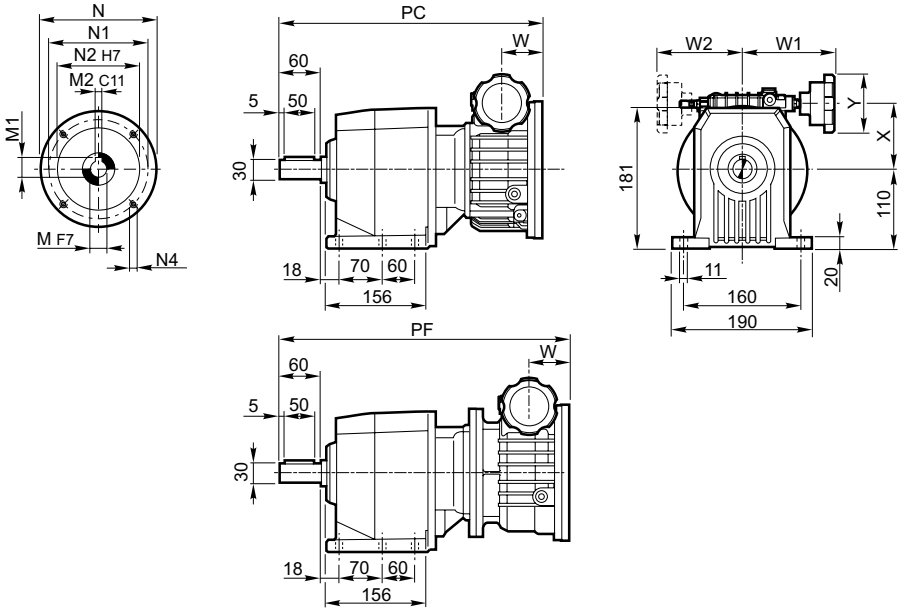
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

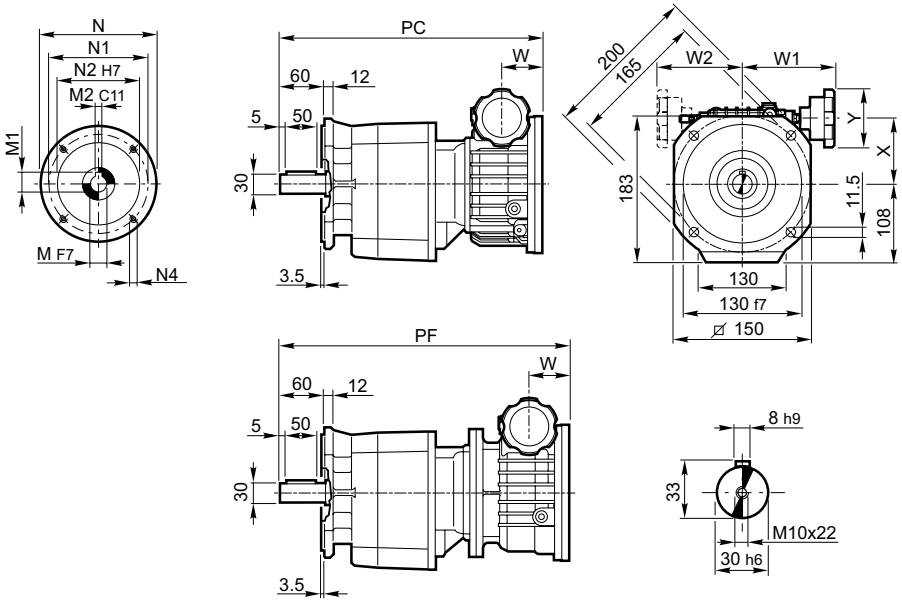
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

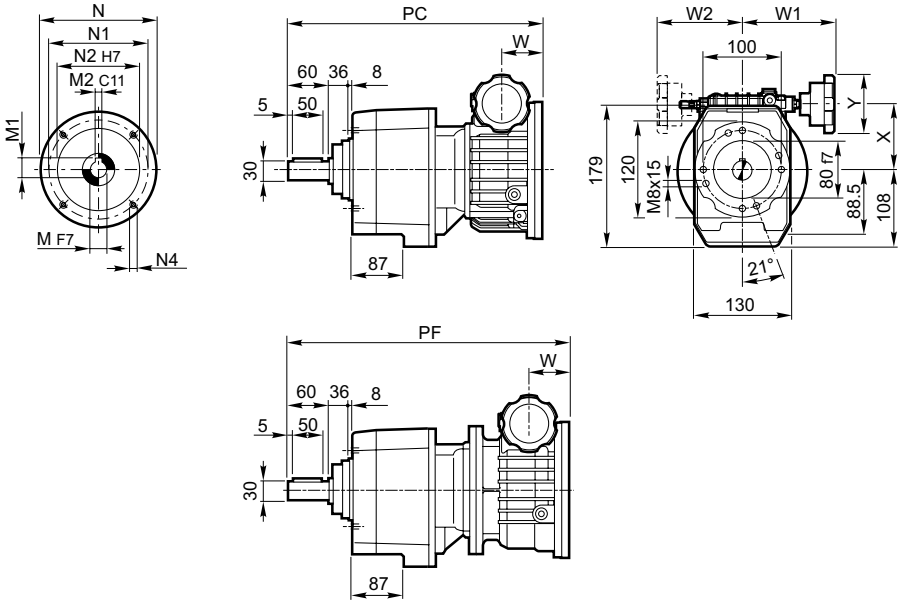
C 31_P + V_P(IEC)



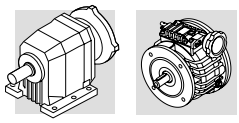
C 31_F + V_P(IEC)



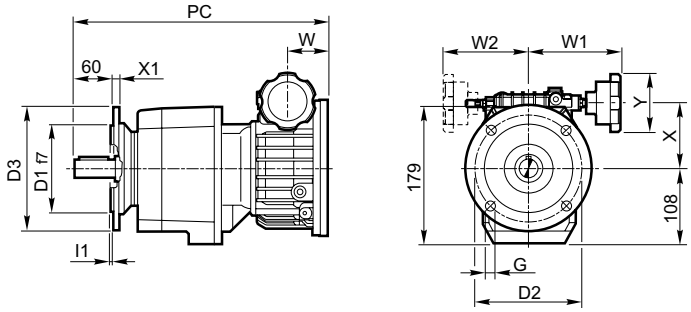
C 31_U + V_P(IEC)

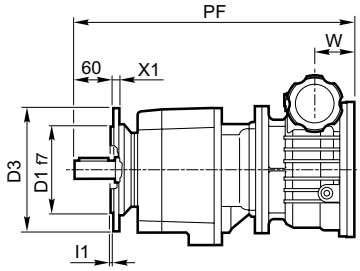


BONFIGLIOLI RIDUTTORI



C 31_UF + V_P(IEC)

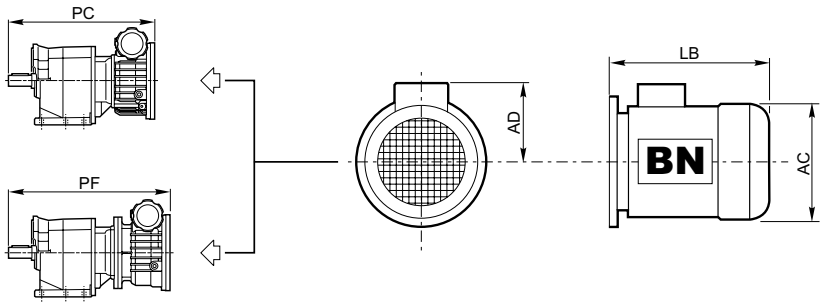




UF		D_1	D_2	D_3	G	I_1	X_1
C 312_UFA	C 313_UFA	110	130	160	9	3	10
C 312_UFB	C 313_UFB	130	165	200	11	3.5	11
C 312_UFC	C 313_UFC	180	215	250	14	4	13

			V_C - V_F												C 31_ + V_C				C 31_ + V_F			
		IEC	N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg P	Kg F	Kg U	PF	Kg P	Kg F	Kg U
C 312_	V 0.25	P63	140	115	95	M8x20	11	12.8	4	45	115	110	70	83	—	—	—	—	416	14.5	14.2	13.9
	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	344	14.7	14.9	14.6	418	17.7	17.4	17.1
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	78	83	348	14.7	14.9	14.6	422	17.7	17.4	17.1
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	380	22.2	22.4	22.1	464	25.2	24.9	24.6
	V 1	P90	200	165	130	M10x20	24	26.3*	8	59	133	124	97	83	380	22.2	22.4	22.1	464	25.2	24.9	24.6
	V 2	P90	200	165	130	M10x15	24	27.3	8	74.1	137	120	113	83	—	—	—	—	488	29.8	29.5	29.2
C 313_	V 0.25	P63	140	115	95	M8x20	11	12.8	4	45	115	110	70	83	392	13.2	12.9	12.9	473	15.7	15.4	15.1

C 31_ + V_P + BN



			BN			C 31_ + V_C				C 31_ + V_F			
		IEC	AC	AD	LB	PC+LB	Kg P	Kg F	Kg U	PF+LB	Kg P	Kg F	Kg U
C 312_	V 0.25	63	121	95	184	—	—	—	—	600	18.4	18.1	17.8
	V 0.25	71R	138	108	219	—	—	—	—	635	19.9	19.6	19.3
	V 0.5	71	138	108	219	563	20.6	20.8	20.5	637	23.6	23.3	23.0
	V 0.5	80	156	119	234	582	24.6	24.8	24.5	656	27.6	27.3	27
	V 1	80	156	119	234	614	32	32	32	698	35	35	35
	V 1	90S	176	133	276	656	35	35	34	740	38	37	37
	V 1	90L	176	133	276	656	37	37	36	740	40	39	39
	V 2	90S	176	133	276	—	—	—	—	764	42	42	42
	V 2	90L	176	133	276	—	—	—	—	764	44	44	44
	V 2	100R	195	142	307	—	—	—	—	795	52	52	52
C 313_	V 0.25	63	121	95	184	576	17.1	16.8	16.8	657	19.6	19.3	19.0
	V 0.25	71R	138	108	219	611	18.6	18.3	18.3	692	21.1	20.8	20.5

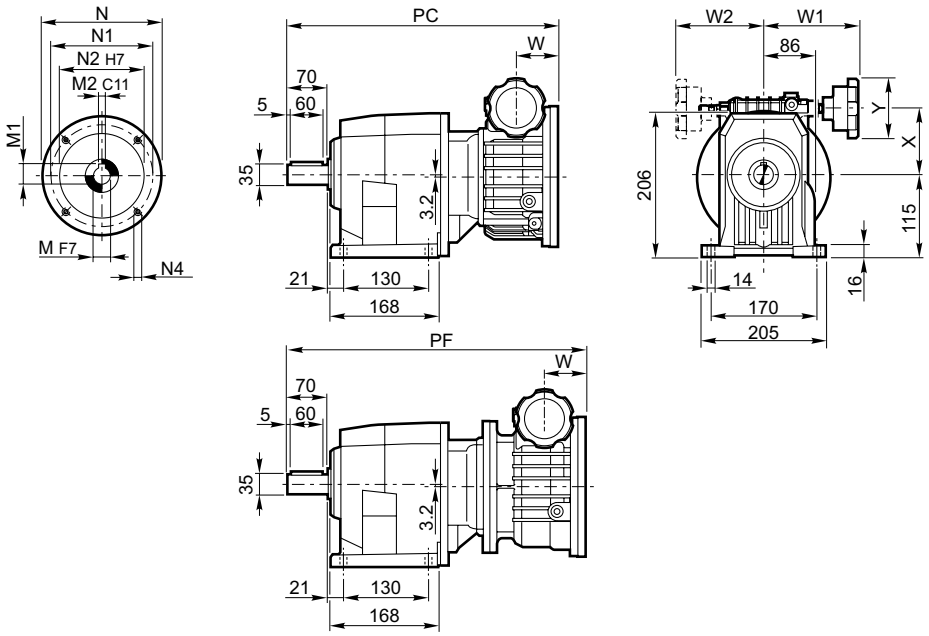
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

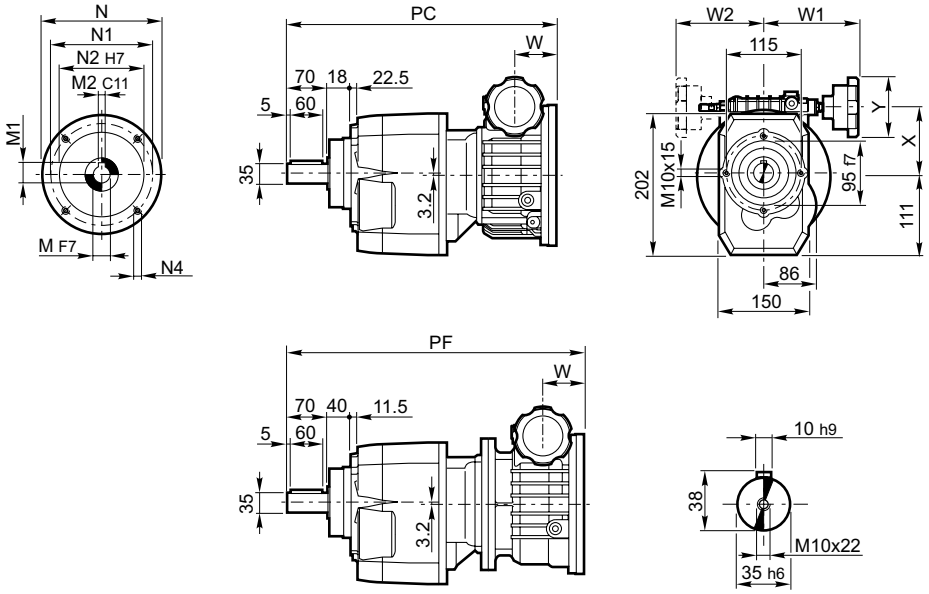
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

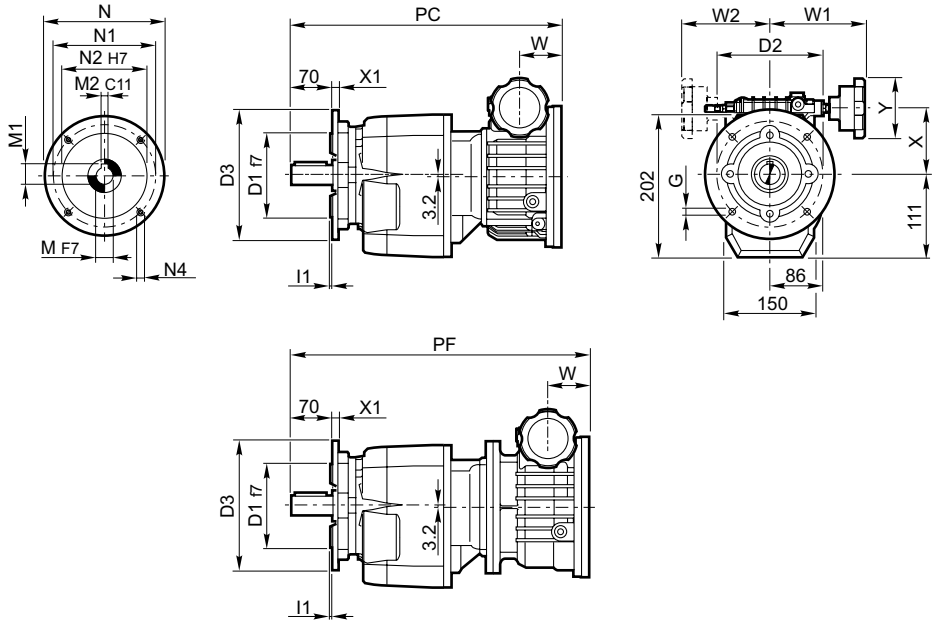
C 35_P + V_P(IEC)

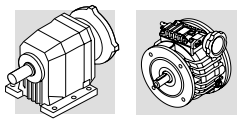


C 35_U + V_P(IEC)



C 35_UF + V_P(IEC)

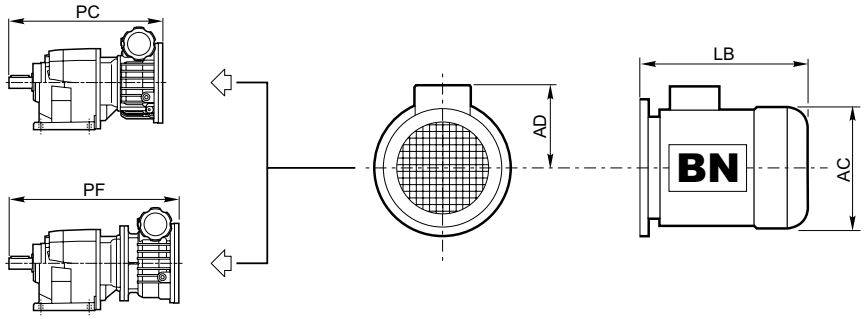




UF			D_1	D_2	D_3	G	I_1	X_1
C 352_UFA	C 353_UFA	C 354_UFA	130	165	200	11	3.5	11
C 352_UFB	C 353_UFB	C 354_UFB	180	215	250	14	4	14

			V_C - V_F												C 35_ + V_C			C 35_ + V_F		
		IEC	N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg P	Kg U	PF	Kg P	Kg U
C 352_	0.25	P63	140	115	95	M8x20	11	12.8	4	45	115	110	66.8	83	—	—	—	435	20.8	17.8
C 353_	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	74.8	83	360	22.0	21.2	437	24.0	21.0
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	74.8	83	364	22.0	21.2	441	24.0	21.0
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	93.8	83	396	30	29.2	468	32	28.5
	V 1	P90	200	165	130	M10x20	24	26.3*	8	59	133	124	93.8	83	396	30	29.2	468	32	28.5
	V 2	P90	200	165	130	M10x15	24	27.3	8	74.1	137	120	109.8	83	—	—	—	492	36	33
	V3	P100	250	215	180	M12x23	28	31.3	8	91	173	—	147.2	109	—	—	—	556	60	58
	V3	P112	250	215	180	M12x23	28	31.3	8	91	173	—	147.2	109	—	—	—	556	60	58
C 354_	V 0.25	P63	140	115	95	M8x20	11	12.8	4	45	115	110	66.8	83	408	20.0	19.2	492	24.5	19.3
	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	74.8	83	410	26.0	25.2	494	27.5	22.5
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	74.8	83	414	26.0	25.2	498	27.5	22.5
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	93.8	83	—	—	—	540	35	30

C 35_ + V_P + BN



			BN			C 35_ + V_C			C 35_ + V_F		
		IEC	AC	AD	LB	PC+LB	Kg P	Kg U	PF+LB	Kg P	Kg U
C 352_	V 0.25	63	121	95	184	—	—	—	618.5	24.7	21.7
C 353_	V 0.25	71R	138	108	219	—	—	—	653.5	26.2	23.2
	V 0.5	71	138	108	219	578.5	27.9	27.1	656	29.9	26.9
	V 0.5	80	156	119	234	597.5	31.9	31.1	675	34	31
	V 1	80	156	119	234	629.5	39.9	39.1	701.5	41	38
	V 1	90S	176	133	276	671.5	42.3	41.5	743.5	43.8	40.8
	V 1	90L	176	133	276	671.5	44.3	43.5	743.5	45.8	42.8
	V 2	90S	176	133	276	—	—	—	767.5	48.1	45.6
	V 2	90L	176	133	276	—	—	—	767.5	50.1	47.6
	V 2	100R	195	142	307	—	—	—	798.5	58.1	55.6
	V 3	100	195	135	306	—	—	—	861.5	80.3	77.8
	V 3	112	219	150	325	—	—	—	880.5	90.3	87.8
C 354_	V 0.25	63	121	95	184	591.5	23.9	23.1	675.5	28.4	23.2
	V 0.25	71R	138	108	219	626.5	25.4	24.6	710.5	29.9	24.7
	V 0.5	71	138	108	219	629	31.9	31.1	713	33.4	28.4
	V 0.5	80	156	119	234	648	35.9	35.1	732	37.4	32.4
	V 1	80	156	119	234	—	—	—	773.5	45	39.9

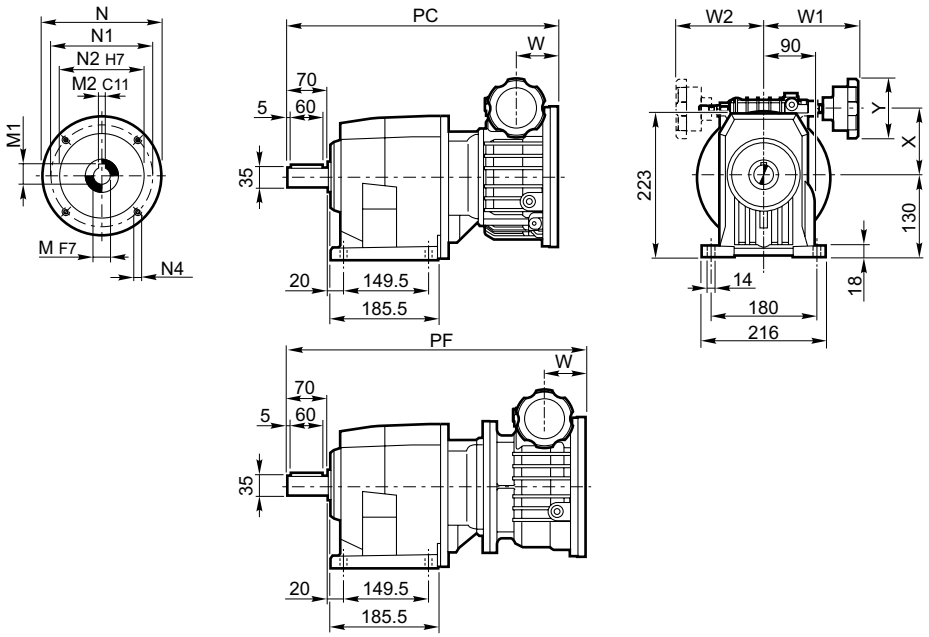
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

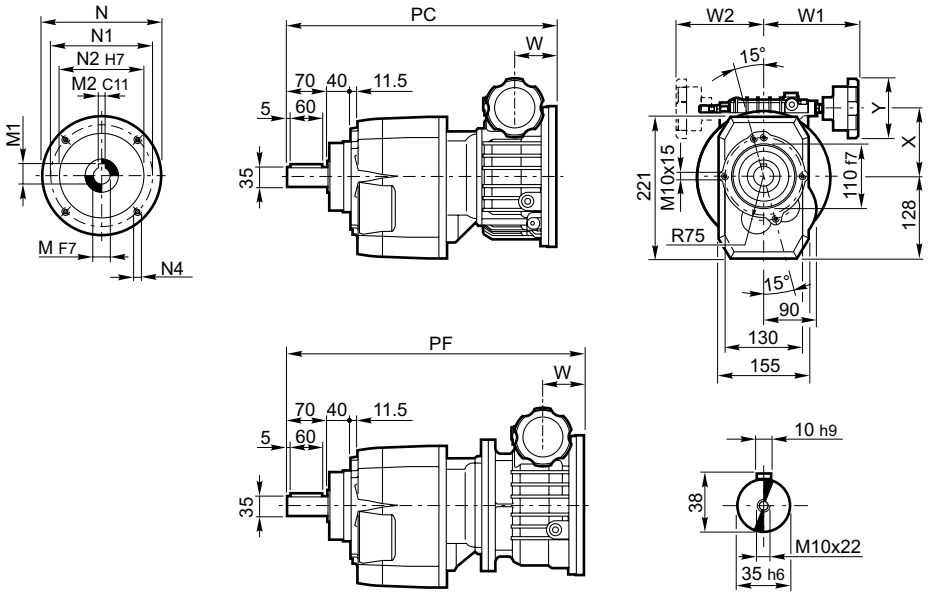
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

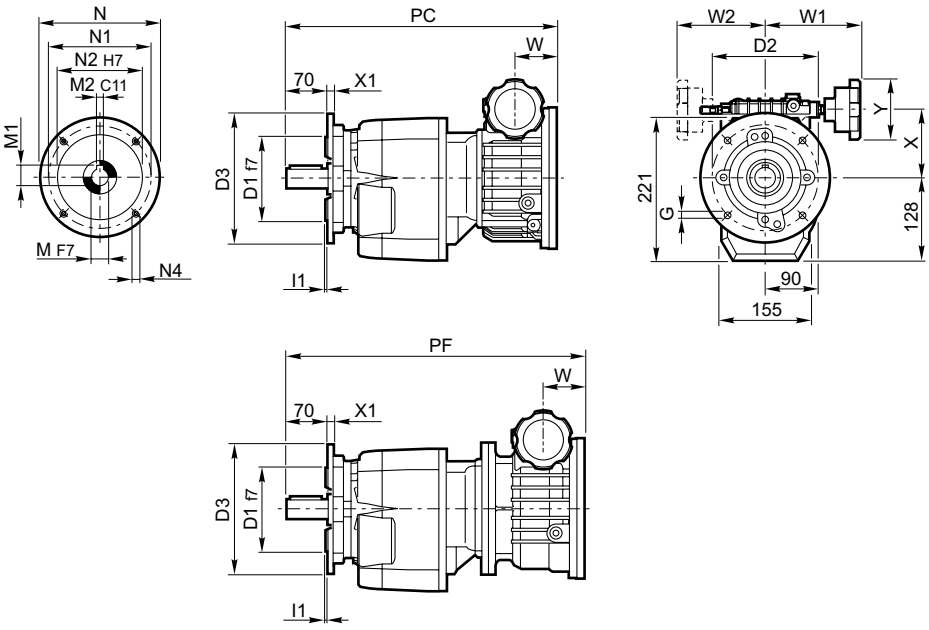
C 41_P + V_P(IEC)

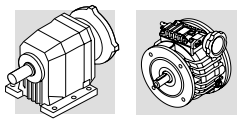


C 41_U + V_P(IEC)



C 41_UF + V_P(IEC)

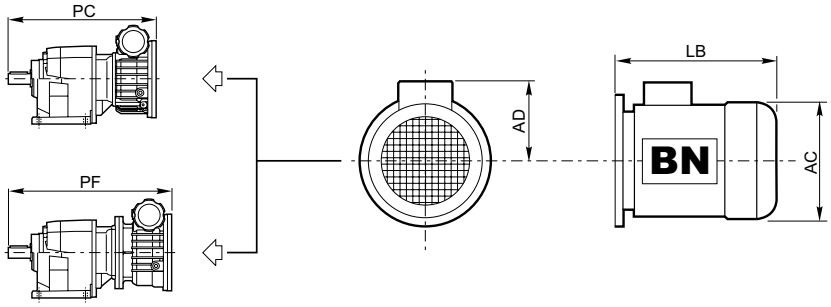




UF			D_1	D_2	D_3	G	I_1	X_1
C 412_UFA	C 413_UFA	C 414_UFA	130	165	200	11	3.5	11
C 412_UFB	C 413_UFB	C 414_UFB	180	215	250	14	4	13

			V_C - V_F												C 41_ + V_C			C 41- + V_F		
		IEC	N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg P	Kg U	PF	Kg P	Kg U
C 412	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	381	29.5	25.9	448	35	29.9
C 413	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	78	83	385	29.5	25.9	452	35	29.9
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	409	37	34	494	42	38
	V 1	P90	200	165	130	M10x20	24	26.3*	8	59	133	124	97	83	409	37	34	494	42	38
	V 2	P90	200	165	130	M10x15	24	27.3	8	74.1	137	120	113	83	432	41	36	518	47	42
	V 3	P100	250	215	180	M12x23	28	31.3	8	91	173	—	147.2	109	—	—	—	572	70	66
	V 3	P112	250	215	180	M12x23	28	31.3	8	91	173	—	147.2	109	—	—	—	572	70	66
C 414_	V 0.25	P63	140	115	95	M8x20	11	12.8	4	45	115	110	70	83	432	28.5	26.0	517	33	29.8
	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	435	32	29.2	519	36	33
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	78	83	439	32	29.2	523	36	33
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	—	—	—	565	43	41
	V 1	P90	200	165	130	M10x20	24	26.3*	8	59	133	124	97	83	—	—	—	565	43	41

C 41_ + V_P + BN



			BN			C 41_ + V_C			C 41- + V_F		
		IEC	AC	AD	LB	PC+LB	Kg P	Kg U	PF+LB	Kg P	Kg U
C 412_	V 0.5	71	138	108	219	599.5	35.4	32.4	667	40.4	35.8
C 413_	V 0.5	80	156	119	234	618.5	39.4	36.4	686	44.4	39.8
	V 1	80	156	119	234	643	47	45	727.5	52	47.4
	V 1	90S	176	133	276	685	49.4	47.4	769.5	54.4	49.8
	V 1	90L	176	133	276	685	51.4	49.4	769.5	56.4	51.8
	V 2	90S	176	133	276	708	53.1	50.1	793.5	59.1	54.5
	V 2	90L	176	133	276	708	55.1	52.1	793.5	61.1	56.5
	V 2	100R	195	142	307	739	63.1	60.1	824.5	69.1	64.5
	V 3	100	195	135	306	—	—	—	877.5	90	86.4
	V 3	112	219	150	325	—	—	—	896.5	110	96.4
C 414_	V 0.25	63	121	95	184	616	32.4	29.6	700.5	36.4	33.7
	V 0.25	71R	138	108	219	651	33.9	31.1	735.5	37.9	35.2
	V 0.5	71	138	108	219	653.5	37.4	34.6	738	41.4	38.9
	V 0.5	80	156	119	234	672.5	41.4	38.6	757	45.4	42.9
	V 1	80	156	119	234	—	—	—	798.5	53	50.5
	V 1	90S	176	133	276	—	—	—	840.5	55.4	52.9
	V 1	90L	176	133	276	—	—	—	840.5	57.4	54.9

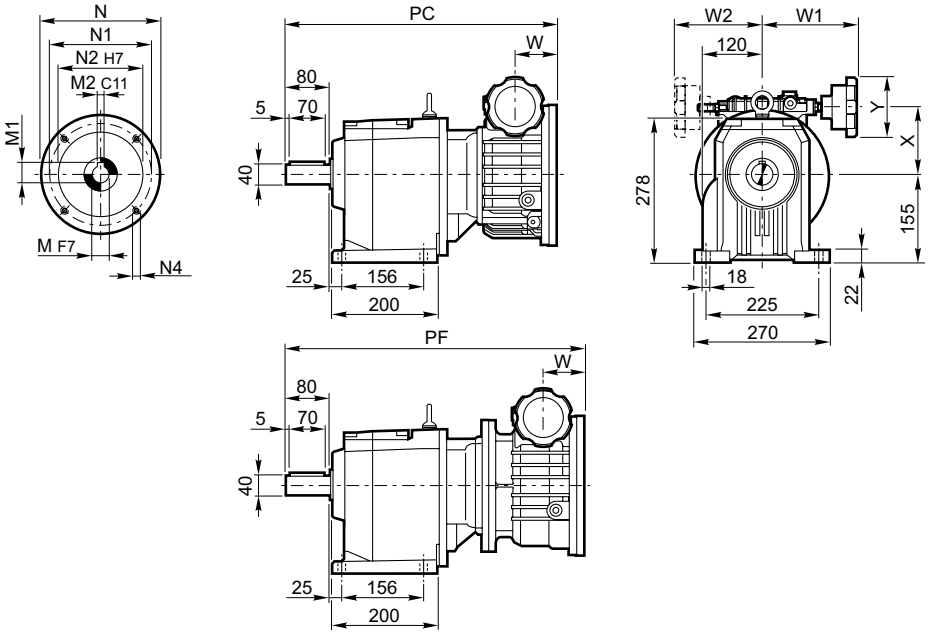
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

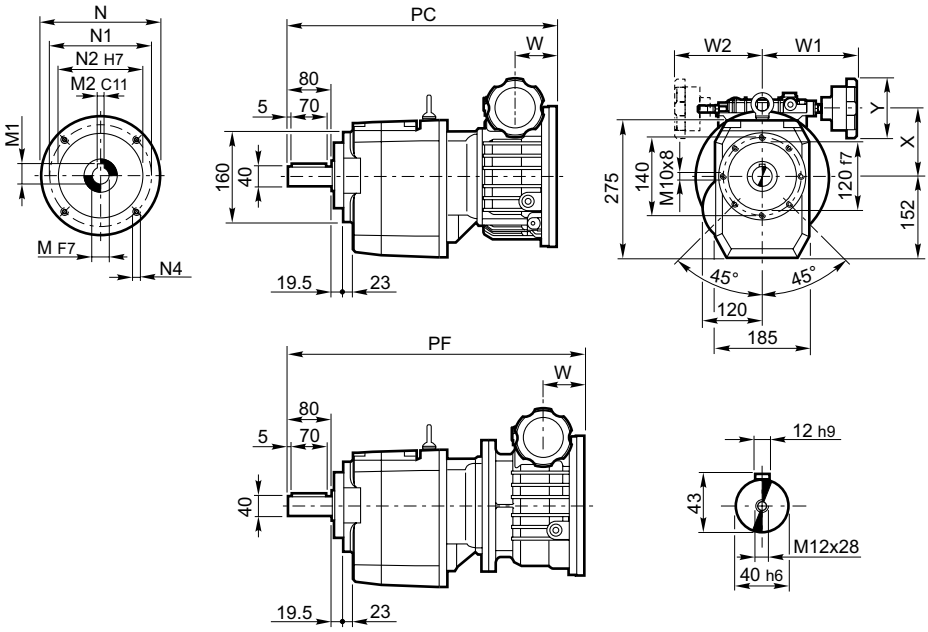
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

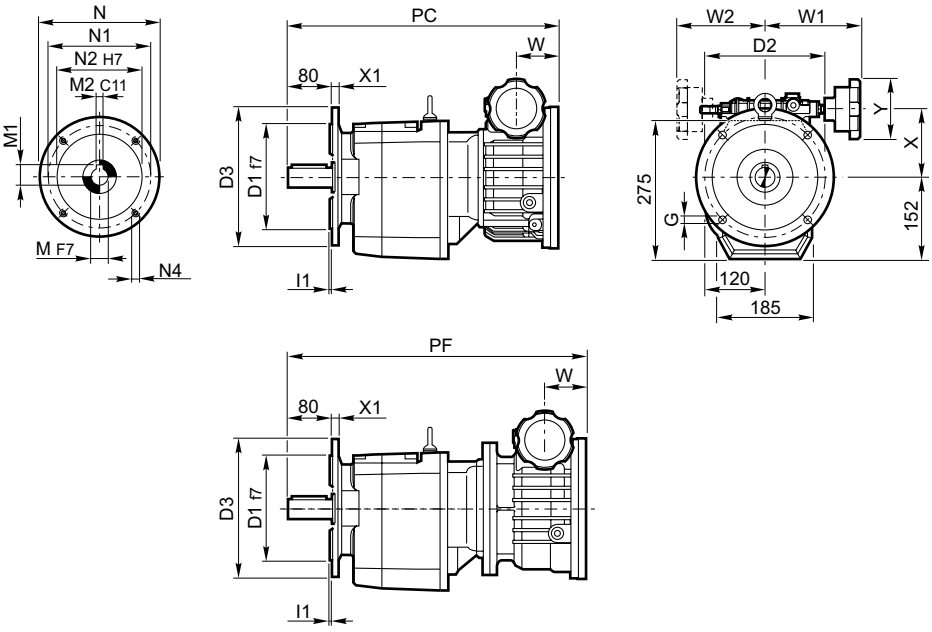
C 51_P + V_P(IEC)

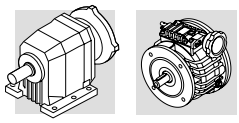


C 51_U + V_P(IEC)



C 51_UF + V_P(IEC)

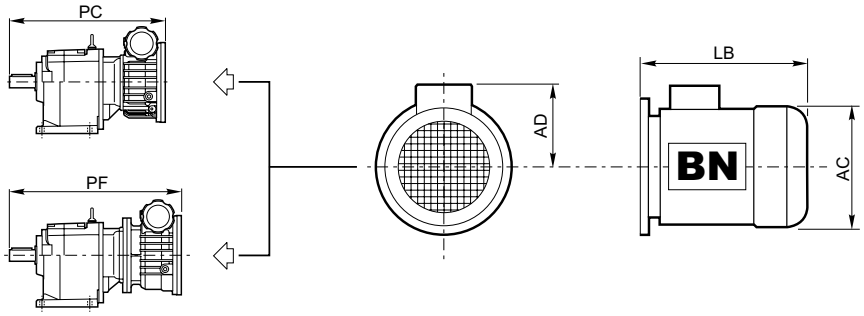




UF			D_1	D_2	D_3	G	I_1	X_1
C 512_UFA	C 513_UFA	C 514_UFA	180	215	250	14	4	13
C 512_UFB	C 513_UFB	C 514_UFB	230	265	300	14	4	16

		IEC	V_C - V_F												C 51_ + V_C			C 51_ + V_F		
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg P	Kg U	PF	Kg P	Kg U
C 512_	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	—	—	—	519	58	53
C 513_	V 1	P90	200	165	130	M10x20	24	26.3*	8	59	133	124	97	83	—	—	—	519	58	53
	V 2	P90	200	165	130	M10x15	24	27.3	8	74.1	137	120	113	83	458	58	53	543	63	58
	V 3	P100	250	215	180	M12x23	28	31.3	8	91	172.5	—	150.5	109	500	72	69	607	87	82
	V 3	P112	250	215	180	M12x23	28	31.3	8	91	172.5	—	150.5	109	500	72	69	607	87	82
	V 5.5	P112	250	215	180	M12x23	28	31.3	8	91	172.5	—	150.5	109	500	72	69	607	88	83
C 514_	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	470	45	42	544	55	51
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	78	83	474	45	42	548	55	51
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	506	60	52	590	63	59
	V 1	P90	200	165	130	M10x20	24	26.3*	8	59	133	124	97	83	506	60	52	590	63	59

C 51_ + V_P + BN



		IEC	BN			C 51_ + V_C			C 51_ + V_F		
			AC	AD	LB	PC+LB	Kg P	Kg U	PF+LB	Kg P	Kg U
C 512_	V 1	80	156	119	234	—	—	—	753	68	63
C 513_	V 1	90S	176	133	276	—	—	—	795	70.4	65.4
	V 1	90L	176	133	276	—	—	—	795	72.4	67.4
	V 2	90S	176	133	276	733.5	65.1	62.1	819	75.1	70.1
	V 2	90L	176	133	276	733.5	67.1	64.1	819	77.1	72.1
	V 2	100R	195	142	307	764.5	75.1	72.1	850	85.1	80.1
	V 3	100	195	135	306	806	92	89	913	107	102
	V 3	112	219	150	325	825	102	99	932	117	112
	V 5.5	112	219	150	325	825	102	99	932	118	113
C 514_	V 0.5	71	138	108	219	698	50.9	47.9	763	60.4	56.4
	V 0.5	80	156	119	234	708	54.9	51.9	782	64.4	60.4
	V 1	80	156	119	234	740	65	61.9	824	73	69
	V 1	90S	176	133	276	782	67.4	64.3	866	75.4	71.4
	V 1	90L	176	133	276	782	69.4	66.3	866	77.4	73.4

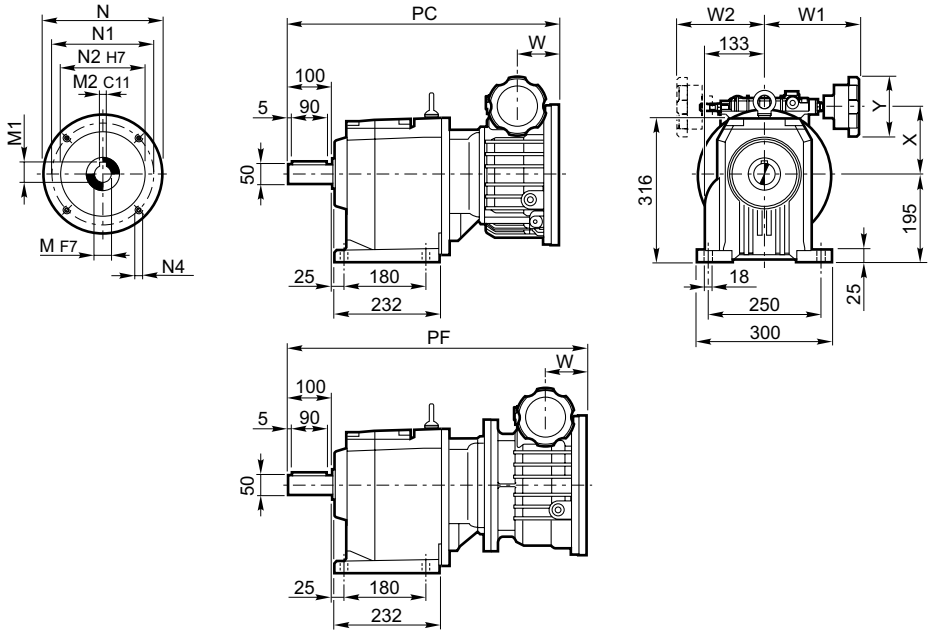
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

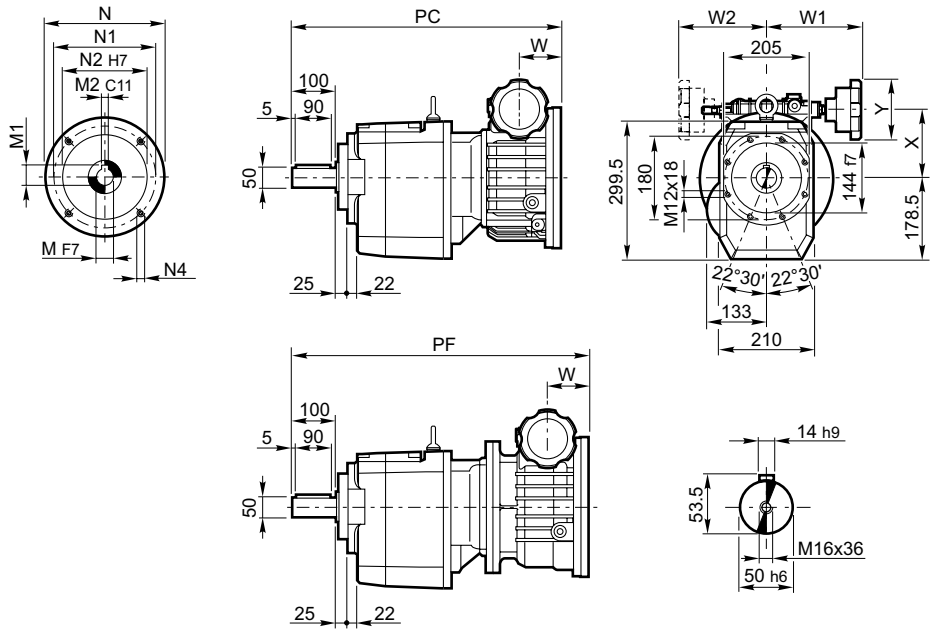
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

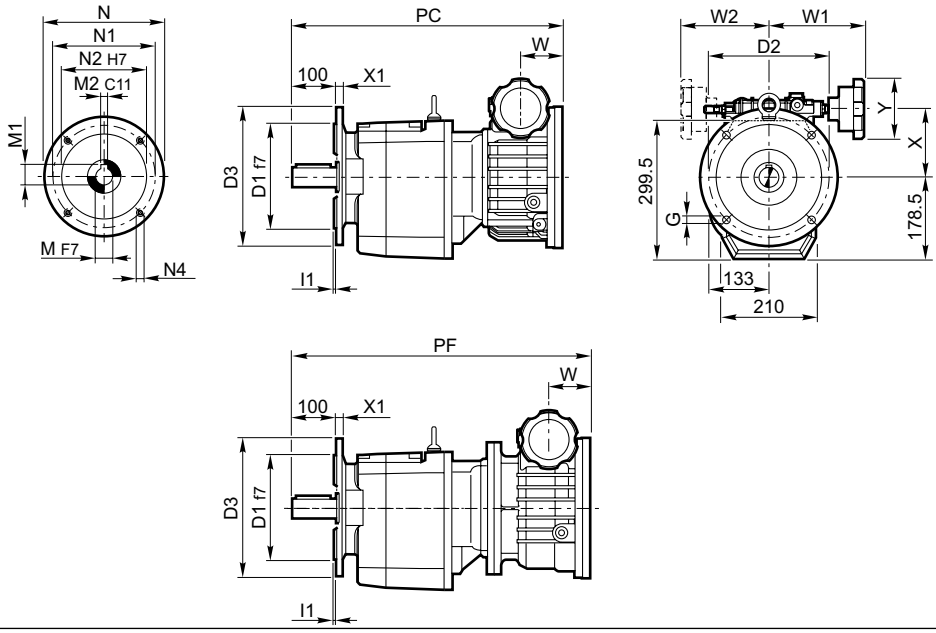
C 61_P + V_P(IEC)

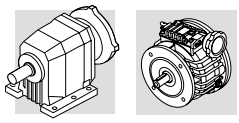


C 61_U + V_P(IEC)



C 61_UF + V_P(IEC)

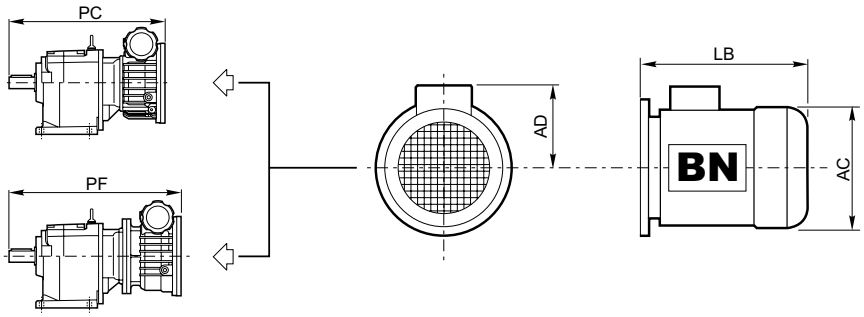




UF			D_1	D_2	D_3	G	I_1	X_1
C 612_UFA	C 613_UFA	C 614_UFA	230	265	300	14	4	16
C 612_UFB	C 613_UFB	C 614_UFB	250	300	350	18	5	18

			V_C - V_F												C 61_ + V_C			C 61_ + V_F		
		IEC	N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg P	Kg U	PF	Kg P	Kg U
C 612_	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	—	—	—	574	72	67
C 613_	V 1	P90	200	165	130	M10x20	24	26.3*	8	59	133	124	97	83	—	—	—	574	72	67
	V 2	P90	200	165	130	M10x15	24	27.3	8	74.1	137	120	113	83	519	71	66	598	77	72
	V 3	P100	250	215	180	M12x23	28	31.3	8	91	172.5	—	150.5	109	555	93	85	675	101	96
	V 3	P112	250	215	180	M12x23	28	31.3	8	91	172.5	—	150.5	109	555	93	85	675	101	96
	V 5.5	P112	250	215	180	M12x23	28	31.3	8	91	172.5	—	150.5	109	555	94	86	675	102	97
	V 10	P132	300	265	230	M12x25	38	41.3	10	108	193.5	—	206.5	109	581	149	141	739	162	157
C 614_	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	532	75	67	598	71	63
	V 0.5	P80	200	165	130	M10x20	19	20.8**	6	51.5	115	110	78	83	536	75	67	602	71	63
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	560	82	74	644	81	73
	V 1	P90	200	165	130	M10x20	24	26.3*	8	59	133	124	97	83	560	82	74	644	81	73
	V 2	P90	200	165	130	M10x15	24	27.3	8	74.1	137	120	113	83	583	86	78	668	86	78

C 61_ + V_P + BN



			BN			C 61_ + V_C			C 61_ + V_F		
		IEC	AC	AD	LB	PC+LB	Kg P	Kg U	PF+LB	Kg P	Kg U
C 612_	V 1	80	156	119	234	—	—	—	808	82	77
C 613_	V 1	90S	176	133	276	—	—	—	850	84.4	79.4
	V 1	90L	176	133	276	—	—	—	850	86.4	81.4
	V 2	90S	176	133	276	794.5	83.1	75.1	874	89.1	84.1
	V 2	90L	176	133	276	794.5	85.1	77.1	874	91.1	86.1
	V 2	100R	195	142	307	825.5	93.1	85.1	905	99.1	94.1
	V 3	100	195	135	306	861	113	105	981	121	116
	V 3	112	219	150	325	880	123	115	1000	131	126
	V 5.5	112	219	150	325	880	124	116	1000	132	127
	V 10	132S	258	193	375	956	192	184	1113.5	205	200
	V 10	132M	258	193	413	994	202	194	1151.5	215	210
C 614_	V 0.5	71	138	108	219	750.5	80.9	72.9	817	76.4	68.4
	V 0.5	80	156	119	234	769.5	84.9	76.9	836	80.4	72.4
	V 1	80	156	119	234	794	91.9	83.9	878	91	83
	V 1	90S	176	133	276	836	94.3	86.3	920	93.4	85.4
	V 1	90L	176	133	276	836	96.3	88.3	920	95.4	87.4
	V 2	90S	176	133	276	859	98.3	90.3	944	98.1	90.1
	V 2	90L	176	133	276	859	100.3	92.3	944	100.1	92.1
	V 2	100R	195	142	307	890	108.3	100.3	975	108.1	100.1

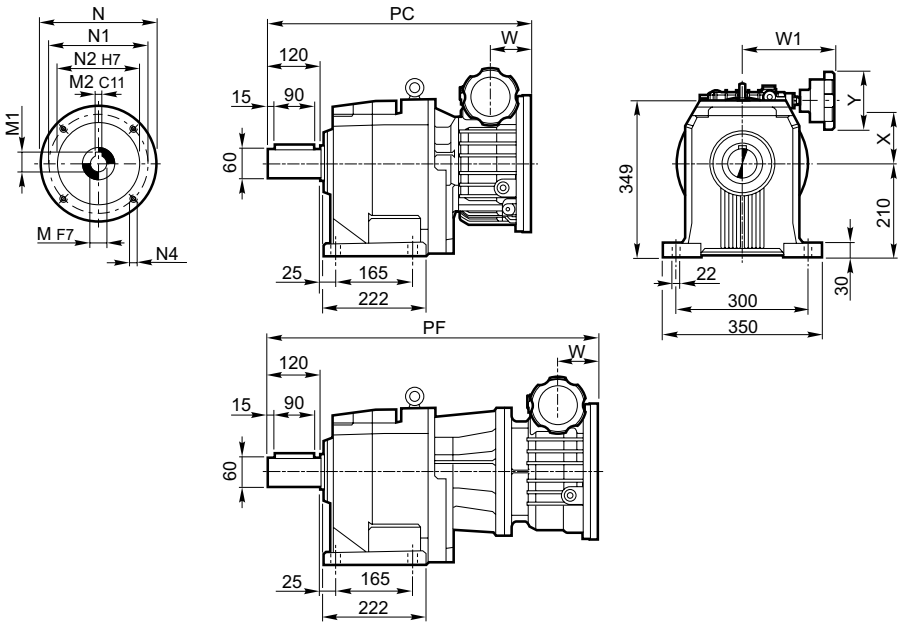
* Utilizzare linguetta ribassata 8x6x35 "A"
** Utilizzare linguetta ribassata 6x5x30 "A"

* *Use lowered key 8x6x35 "A"*
** *Use lowered key 6x5x30 "A"*

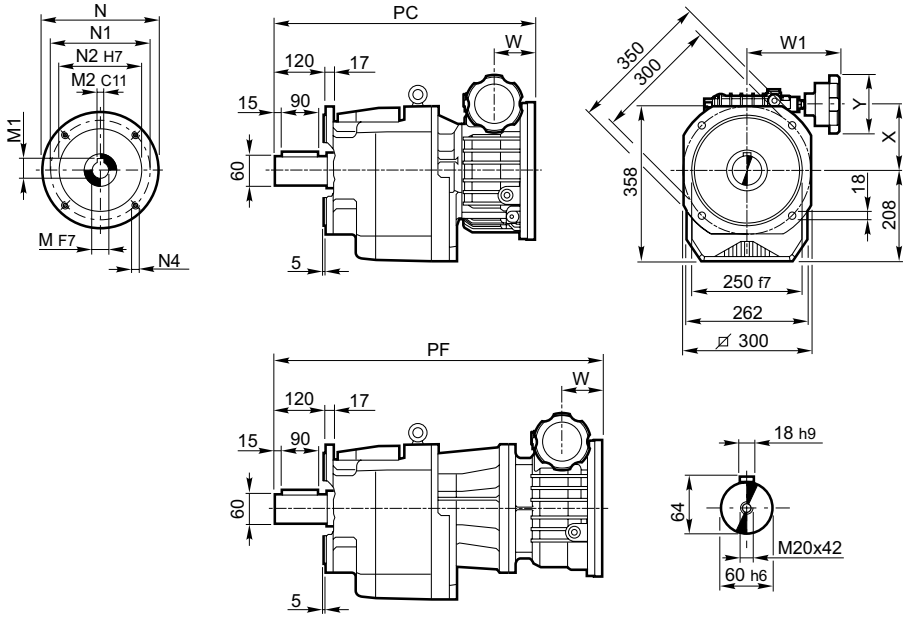
* Den abgeflachten Federkeil 8x6x35 "A" verwenden
** Den abgeflachten Federkeil 6x5x30 "A" verwenden

* *Utiliser une languette rabaissée taille 8x6x35* "A"
** *Utiliser une languette rabaissée taille 6x5x30 "A"*

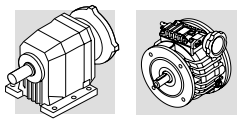
C 70_P + V_P(IEC)



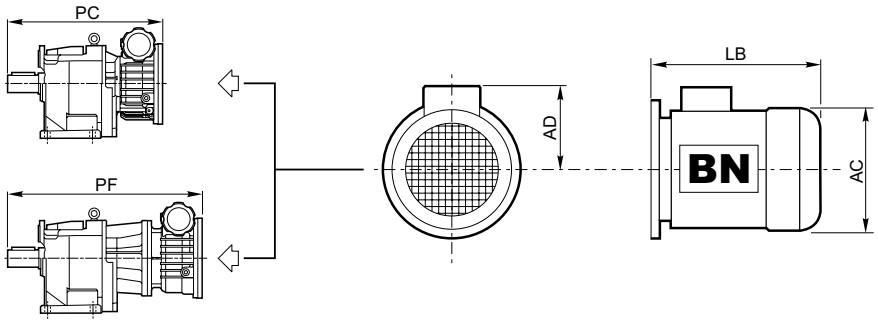
C 70_F + V_P(IEC)



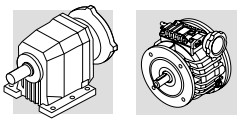
		IEC	V_C - V_F												C 70_ + V_C			C 70_ + V_F		
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg P	Kg F	PF	Kg P	Kg F
C 702_	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	604	115	115	707	131	131
	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	604	116	116	707	132	132
	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	—	206.5	109	—	—	—	776	192	192
C 703_	V 2	P90	200	165	130	M10x15	24	27.3	8	74.1	137	120	113	83	—	—	—	634	107	107
	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	604	116	116	707	131	131
	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	604	117	117	707	132	132
	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	—	206.5	109	—	—	—	776	192	192



C 70_ + V_P + BN

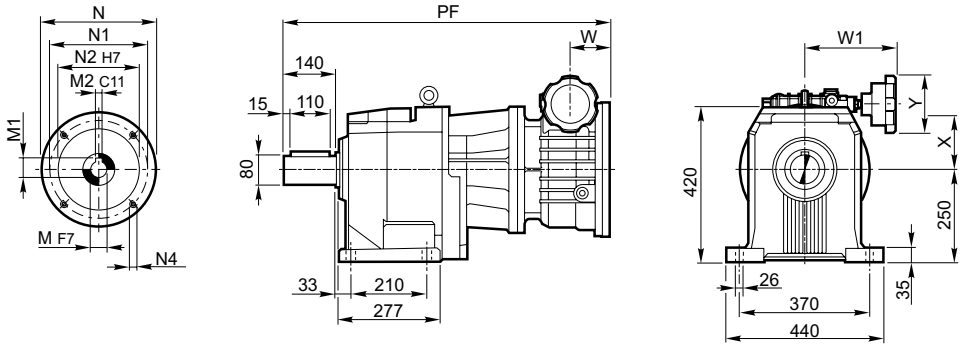


		IEC	BN			C 70_ + V_C			C 70_ + V_F		
			AC	AD	LB	PC+LB	Kg P	Kg F	PF+LB	Kg P	Kg F
C 702_	V 3	100	195	135	306	910	142	142	1013	158	158
	V 3	112	219	150	325	929	153	153	1032	169	169
	V 5.5	112	219	150	325	929	154	154	1032	170	170
	V 10	132S	258	193	375	—	—	—	1151	244	244
	V 10	132M	258	193	413	—	—	—	1189	262	262
C 703_	V 2	90S	176	133	276	—	—	—	910	119	119
	V 2	90L	176	133	276	—	—	—	910	121	121
	V 2	100R	195	142	307	—	—	—	941	129	129
	V 3	100	195	135	306	910	143	143	1013	158	158
	V 3	112	219	150	325	929	154	154	1032	169	169
	V 5.5	112	219	150	325	929	155	155	1032	170	170
	V 10	132S	258	193	375	—	—	—	1151	244	244
	V 10	132M	258	193	413	—	—	—	1189	262	262

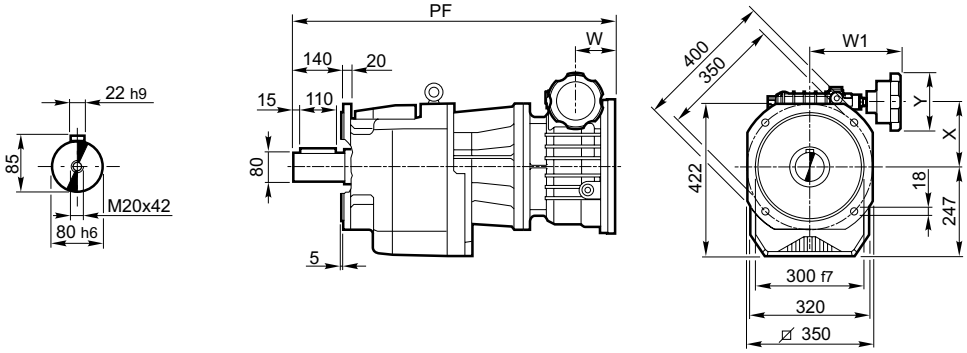


C 80

C 80_P + V_P(IEC)

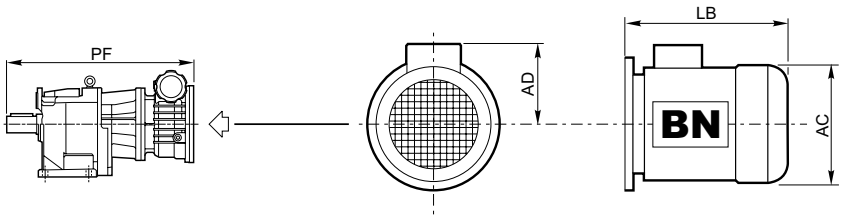


C 80_F + V_P(IEC)



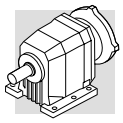
		IEC	V_C - V_F												C 80_ + V_C			C 80_ + V_F		
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg P	Kg F	PF	Kg P	Kg F
C 802_	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	—	—	—	768	179	177
	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	—	206.5	109	—	—	—	837	238	236
C 803_	V 2	P90	200	165	130	M10	24	27.3	8	74.1	137	120	113	83	—	—	—	695	157	155
	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	—	—	—	768	178	176
	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	—	—	—	768	179	177
	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	—	206.5	109	—	—	—	837	238	236

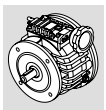
C 80_ + V_P + BN



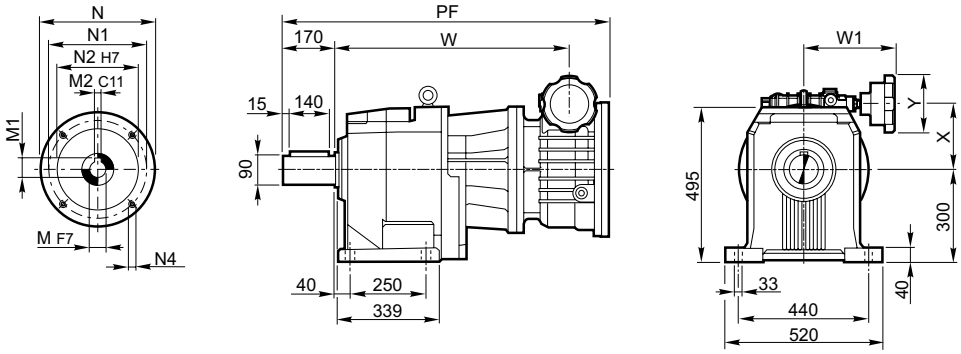
		IEC	BN			C 80_ + V_C			C 80_ + V_F		
			AC	AD	LB	PC+LB	Kg P	Kg F	PF+LB	Kg P	Kg F
C 802_	V 5.5	112	219	150	325	—	—	—	1093	217	215
	V 10	132S	258	193	375	—	—	—	1212	290	288
	V 10	132M	258	193	413	—	—	—	1250	308	306
C 803_	V 2	90S	176	126	252	—	—	—	947	172	170
	V 2	90L	176	126	276	—	—	—	971	177	175
	V 2	100R	195	135	306	—	—	—	1001	184	182
	V 3	100	195	135	306	—	—	—	1074	205	203
	V 3	112	219	150	325	—	—	—	1093	216	214
	V 5.5	112	219	150	325	—	—	—	1093	217	215
	V 10	132S	258	193	375	—	—	—	1212	290	288
	V 10	132M	258	193	413	—	—	—	1250	308	306

BONFIGLIOLI RIDUTTORI

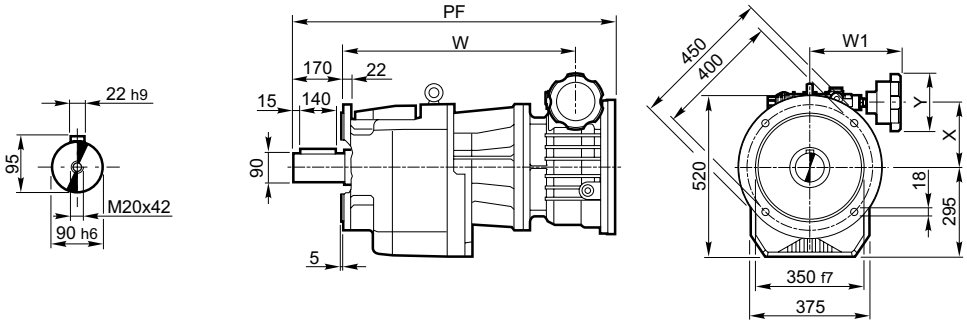




C 90_P + V_P(IEC)

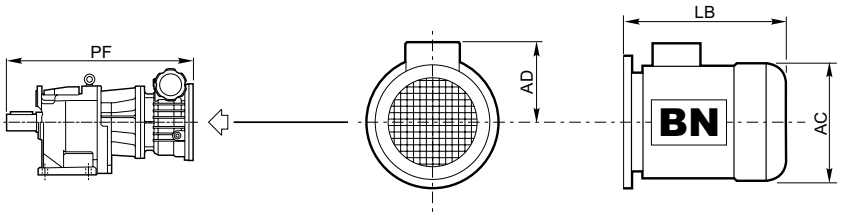


C 90_F + V_P(IEC)

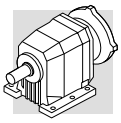


		IEC	V_C - V_F											C 90_ + V_C			C 90_ + V_F		
			N	N1	N2	N4	M	M1	M2	W	W1	X	Y	PC	Kg P	Kg F	PF	Kg P	Kg F
C 902_	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	206.5	109	—	—	—	947	333	325
C 903_	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	150.5	109	—	—	—	878	273	264
	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	150.5	109	—	—	—	878	274	265
	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	206.5	109	—	—	—	947	333	325

C 90_ + V_P + BN

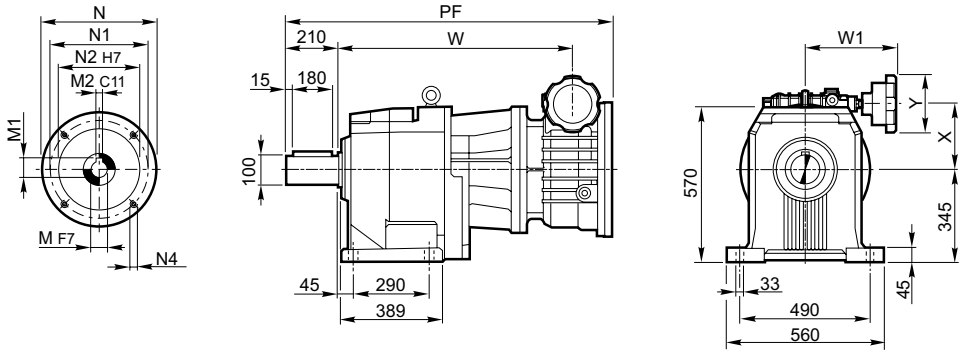


		IEC	BN			C 90_ + V_C			C 90_ + V_F		
			AC	AD	LB	PC+LB	Kg P	Kg F	PF+LB	Kg P	Kg F
C 902_	V 10	132S	258	193	375	—	—	—	1322	385	377
	V 10	132M	258	193	413	—	—	—	1360	403	395
C 903_	V 3	100	195	135	306	—	—	—	1184	300	291
	V 3	112	219	150	325	—	—	—	1203	311	302
	V 5.5	112	219	150	325	—	—	—	1203	312	303
	V 10	132S	258	193	375	—	—	—	1322	385	377
	V 10	132M	258	193	413	—	—	—	1360	403	395

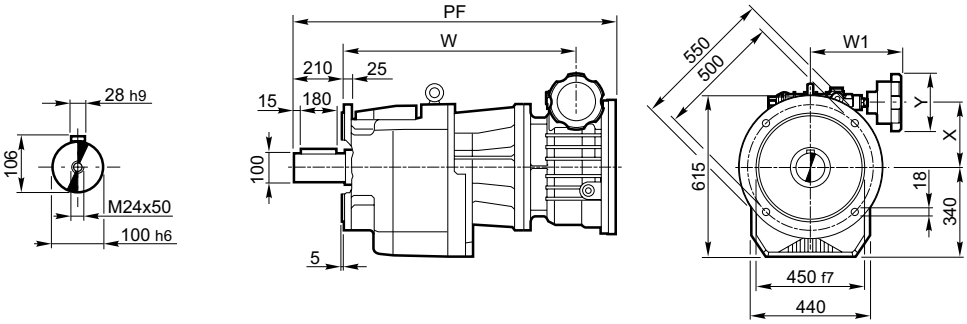


C 100

C 100_P + V_P(IEC)

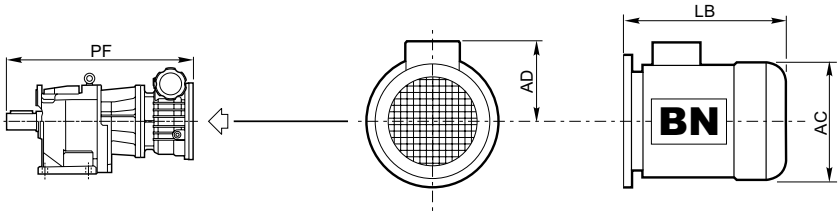


C 100_F + V_P(IEC)

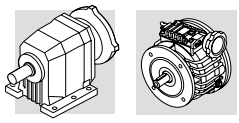


	IEC	V_C - V_F											C 100_ + V_C			C 100_ + V_F		
		N	N1	N2	N4	M	M1	M2	W	W1	X	Y	PC	Kg P	Kg F	PF	Kg P	Kg F
C1003_ V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	206.5	109	—	—	—	1042	464	458

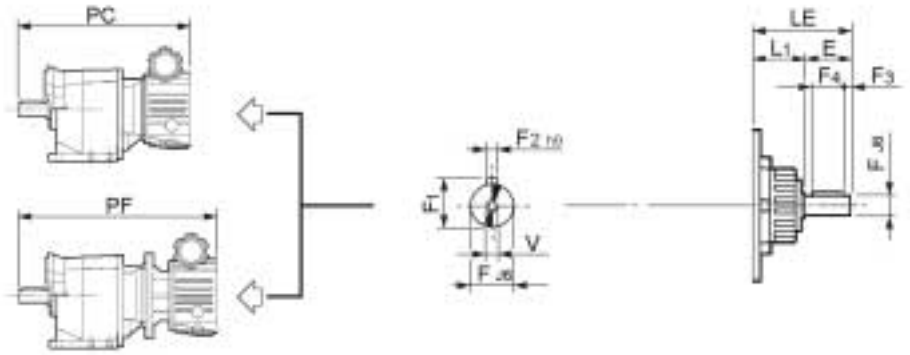
C 100_ + V_P + BN



	IEC	BN			C 100_ + V_C			C 100_ + V_F		
		AC	AD	LB	PC+LB	Kg P	Kg F	PF+LB	Kg P	Kg F
C1003_ V 10	132S	258	193	375	—	—	—	1417	516	510
V 10	132M	258	193	413	—	—	—	1455	534	528



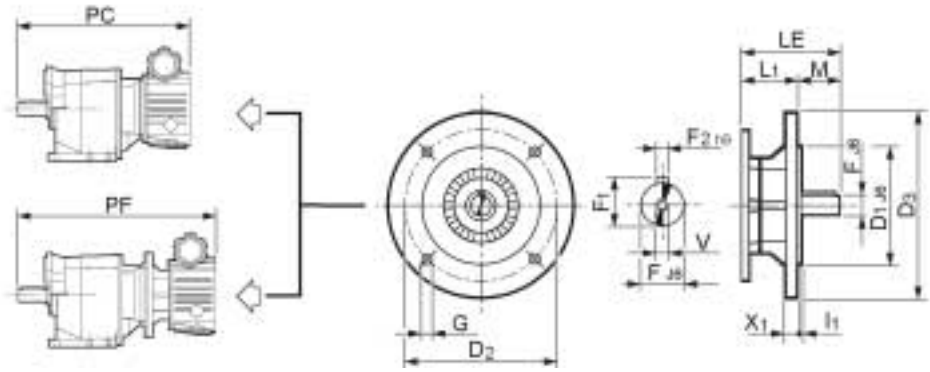
C_ + V_



HS

	E	F	F1	F2	F3	F4	LE	L1	V	Kg
V 0.25	23	11	12.5	4	2	20	58.5	35.5	M4	1.1
V 0.5	30	14	16	5	2.5	25	67	37	M5	1.6
V 1	40	19	21.5	6	5	30	88.5	48.5	M6	2.8
V 2	50	24	27	8	5	40	103.5	53.5	M8	4.0
V 3	60	28	31	8	5	50	121.5	61.5	M10	7.0
V 5.5	60	28	31	8	5	50	121.5	61.5	M10	7.0
V 10	80	38	41	10	5	70	160.5	80.5	M12	11.0

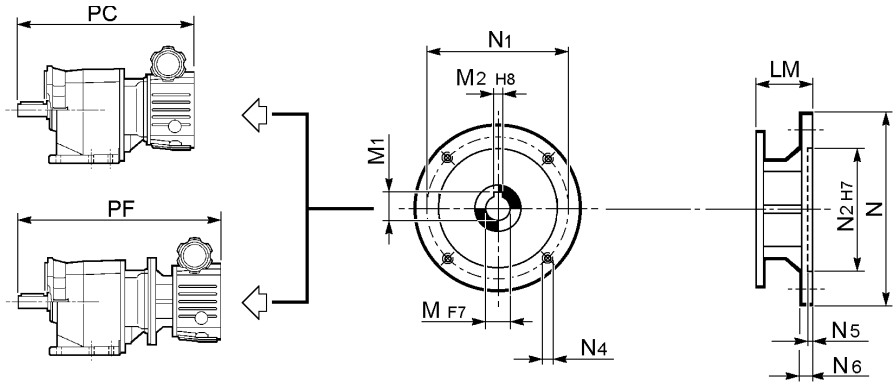
C_ + V_



HSF

	D1	D2	D3	F	F1	F2	G	l1	LE	L1	M	V	X1	Kg
V 0.25	95	115	140	11	12.5	4	8.5	3	58.5	37.5	21	M4	8	1.6
V 0.5	110	130	160	14	16	5	8.5	3.5	67	37	30	M5	8	2.5
V 1	130	165	200	19	21.5	6	11.5	3.5	88.5	48.5	40	M6	12	4.5
V 2	130	165	200	24	27	8	11.5	3.5	103.5	53.5	50	M8	12	5.9
V 3	180	215	250	28	31	8	14	4	121.5	61.5	60	M10	14	11.0
V 5.5	180	215	250	28	31	8	14	4	121.5	61.5	60	M10	14	11.0
V 10	230	265	300	38	41	10	14	5	160.5	80.5	80	M12	16	20

C_ + V_



G

	LM	M	M1	M2	N	N1	N2	N4	N5	N6	Kg
V 0.25_G71	42	14	16.3	5	160	130	110	M8	4.5	11	1.8
V 0.5_G80	54	19	21.8	6	200	165	130	M10	4.5	11.5	2.8
V 1_G90	59	24	27.3	8	200	165	130	M10	4.5	11.5	5.0
V 2_G112	67	28	31.3	8	250	215	180	M12	5	14	6.8
V 3_G132	88.5	38	41.3	10	300	265	230	M12	5	15	12.0
V 5.5_G132	88.5	38	41.3	10	300	265	230	M12	5	15	12.0
V 10_G160	120	42	45.3	12	350	300	250	M16	6	18	22

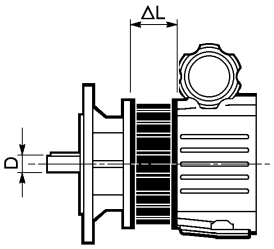
N.B. I pesi riportati in questa pagina si riferiscono alle sole entrate.

NOTE: Weights reported in this page refer to input module.

HINWEIS: Die in dieser Tabelle angegebenen Gewichte beziehen sich nur auf den Antrieb.

N.B. : Les poids indiqués à cette page se réfèrent uniquement aux entrées.

VD_F_P(IEC)



N.B. Le dimensioni mancanti sono riportate nelle pagine 190-209.

Note: missing dimensions are indicated on pages 190-209.

ACHTUNG: Die fehlenden Maße werden auf den Seiten 190-209 angegeben.

N.B. : Les dimensions manquantes sont indiquées pages 190-209.

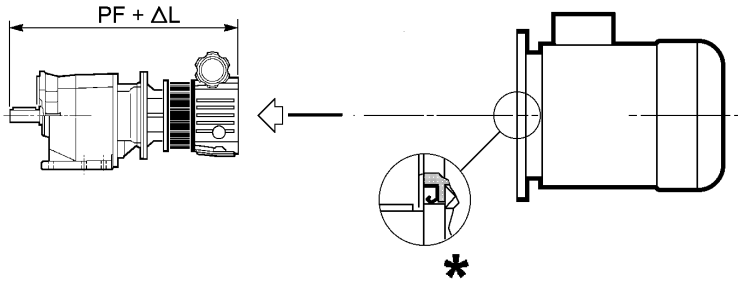
	D	ΔL	Kg
VD 0.5_P_	14	69	3.1
VD 1_P_	19	80.5	4.7
VD 2_P_	24	89.5	7.7
VD 3_P_	28	100.4	16.3
VD 5.5_P_	28	100.4	16.3
VD 10_P_	38	119.2	27.7

N.B. Il differenziale è applicabile esclusivamente ai variatori nella forma costruttiva UF.
I pesi riportati in tabella si riferiscono al solo differenziale.

NOTE: Differential will only fit UF type variators.
Weights refer to differential only.

HINWEIS: Das Differential kann ausschließlich nur an den Verstellgetrieben der Bauform UF appliziert werden.
Die in dieser Tabelle angegebenen Gewichte beziehen sich nur auf das Differential.

N.B. : Le différentiel est applicable uniquement aux variateurs dans la forme de construction UF.
Les poids indiqués à cette page se réfèrent uniquement au différentiel.



* Nei variatori con differenziale, quando il motore elettrico è installato dall'utente, è necessario verificare che esso sia dotato di un anello di tenuta olio sull'albero montato secondo lo schema e che la flangia sia stagna.
La tenuta olio fra la flangia motore e la flangia variatore è assicurata da una guarnizione fornita di serie sul variatore stesso.

N.B. Le dimensioni e i pesi dei motori elettrici sono riportati nelle pag. 340-358.

** On fitting the electric motor onto variators featuring the differential unit make sure that the electric motor itself is oiltight and an oil seal is provided on drive end shaft.*
Sealing between flange of motor and variator is ensured by a gasket provided with the variator unit.

N.B. Dimensions and weights of electric motors are listed at page 340-358.

* Wenn der Elektromotor vom Kunden angebaut wird, ist es bei den Verstellgetrieben mit Differential erforderlich, die Motorwelle mit einem öldichten Wellendich- tring auszustatten.
Die Abdichtung zwischen Motor- und Verstellgetriebeflansch wird durch eine Dichtung gewährleistet, die beim Verstellgetriebe serien- mäßig mitgeliefert wird.

ACHTUNG: Die Maße und Gewich- te der Elektromotoren werden auf den Seiten 340-358 aufgeführt.

** Sur les variateurs avec différentiel, lorsque le moteur électrique est installé par l'utilisateur, il est nécessaire de vérifier qu'il soit doté d'une bague d'étanchéité sur l'arbre monté selon le schéma.*
L'étanchéité à l'huile entre la bride moteur et la bride variateur est assurée par un joint fourni de série et présent sur le variateur.

N.B. : Les dimensions et les poids des moteurs électriques sont indiqués à pages 340-358.

Accessori:

- CGY
- KITCGY
- ENTHS
- ENTG
- ENTN
- INDGRAV

Vedi pag. 90-97

Accessories:

- *CGY*
- *KITCGY*
- *ENTHS*
- *ENTG*
- *ENTN*
- *INDGRAV*

See page 90-97

Zubehör:

- CGY
- KITCGY
- ENTHS
- ENTG
- ENTN
- INDGRAV

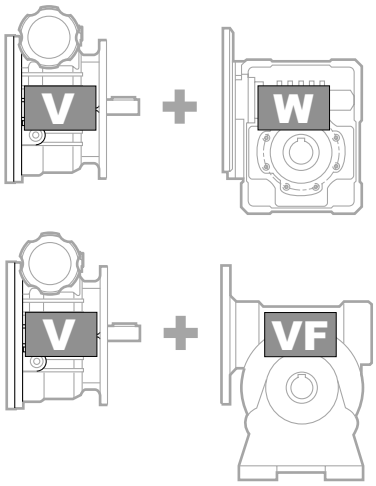
Siehe Seite 90-97

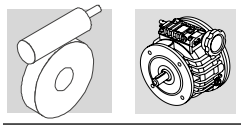
Accessoires:

- *CGY*
- *KITCGY*
- *ENTHS*
- *ENTG*
- *ENTN*
- *INDGRAV*

Voir page 90-97

24.0 - MOTOVARIARIDUTTORI
GEARED MOTOVARIATORS
VERSTELLGETRIEBEMOTOREN
MOTOVARIAREDUCTEURS





24.1 - Designazione riduttore | ***24.1 - Gearbox designation*** | 24.1 **- Getriebe-bezeichnung** | ***24.1 - Désignation réducteur***

VF 49 L1 F1 □ 28 V B3 .....

OPZIONI / *OPTIONS*
OPTIONEN / *OPTIONS*

POSIZIONE DI MONTAGGIO / *MOUNTING POSITION*
EINBAULAGEN / *POSITION DE MONTAGE*
B3 (Standard), **B6, B7, B8, V5, V6**

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DESIGNAZIONE INGRESSO / *INPUT DESIGNATION*
BEZEICHNUNG DER ANTRIEBSSEITE / *DESIGNATION ENTREE*
V + grandezza variatore = Predisposto per variatore compatto
V + *variator size* = *suitable to fit compact variator*
V + Verstellgetriebegröße = für kompaktes Verstellgetriebe geeignet
V + *grandeur variateur* = *prédisposé pour variateur compact*

V025	V05	V1	V2	V3	V55	V10
V 0.25	V 0.5	V 1	V 2	V 3	V 5.5	V 10

P + grandezza motore = Predisposto per variatore flangiato
P + *motor size* = *suitable to fit flanged output variator*
P + Motorgrösse = für geflanschtes Verstellgetriebe geeignet
P + *taille moteur* = *prédisposé pour variateur avec bride*

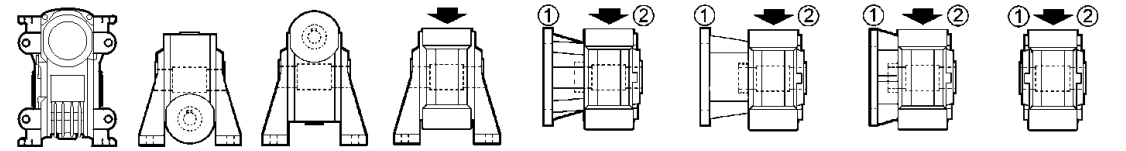
P63	P71	P80	P90	P100	P112	P132
V 0.25	V 0.5	V 0.5 V 1	V 1 V 2	V 3	V 5.5	V 10

RAPPORTO DI RIDUZIONE / *GEAR RATIO*
ÜBERSETZUNG / *RAPPORT DE REDUCTION*

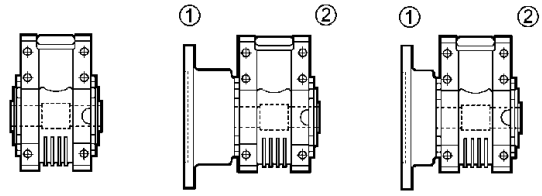
DIAMETRO ALBERO LENTO / *OUTPUT SHAFT DIAMETER*
DURCHMESSER DER ABTRIEBSWELLE / *DIAMETRE ARBRE LENT*

Solo per *Only for* Nur für *Seulement pour*	W 75	**D30**	di serie default
		D28	opzione option

FORMA COSTRUTTIVA / *VERSION* / BAUFORM / *FORME DE CONSTRUCTION*



U (VF44...VF49) | **N** (VF44...VF250) | **A** (VF44...VF250) | **V** (VF44...VF250) | **F (1,2)** (VF44...VF250) | **FA (1,2)** (VF44...VF49) | **FC (1,2)** (VF110...VF185) | **FR (1,2)** (VF110...VF185) | **P (1)** (VF44,VF49, VF210, VF250) | **P (1,2)** (VF110...VF185)



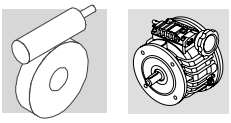
U (W63...W110) | **UF1 - UF2** (W63...W110) | **UFC1 - UFC2** (W63...W110) | **UFCR1 - UFCR2** (W75)

① - ② Lato fissaggio flangia / *Flange mounting side*
Flansch Fixierungsseite / *Position de la bride*

LIMITATORE DI COPPIA / *TORQUE LIMITER* / DREHMOMENTBEGRENZER / *LIMITEUR DE COUPLE*
L1, L2

GRANDEZZA RIDUTTORE / *GEARBOX SIZE*
GETRIEBEBAUGRÖSSE / *TAILLE REDUCTEUR*
44, 49, 130, 150, 185, 210, 250 (VF)
63, 75, 86, 110 (W)

TIPO RIDUTTORE / *GEARBOX TYPE* / GETRIEBETYP / *TYPE DE REDUCTEUR:*
VF, W = Riduttore a vite senza fine / *Worm gearbox* / Schneckengetriebe / *Réducteur a vis sans fin*



24.2 - Designazione variatore | ***24.2 - Designation of variator*** | **24.2 - Bezeichnung für Drehzahlwandler** | ***24.2 - Désignation variateur***

V □ 0.5 C □ □ P71 B3 1 PDN SCT ....

OPZIONI / *OPTIONS*
OPTIONEN / *OPTIONS*

TIPO DI COMANDO / *REMOTE CONTROL TYPE*
VERSTELLEINRICHTUNG / *TYPE DE COMMANDE*
A, VG, VA, VAG, SCT (3∅), TC (1∅)

SONDA RILEVATRICE / *SPEED SENSOR*
MEßSONDE / *SONDE DE DETECTION*
PDN, PDNA, PDP

POSIZIONE DISPOSITIVO DI COMANDO / *SPEED KNOB POSITION*
EINBAULAGE DER VERSTELLEINRICHTUNG / *POSITION COMMANDE*
1 (default), **2** (V 3...V 10)

POSIZIONE DI MONTAGGIO / *MOUNTING POSITION*
MOTOR BAUFORM / *FORME DE CONSTRUCTION DU MOTEUR*
B3 (default)**, B6, B7, B8, V5, V51, V52,V53, V6, V61, V62, V63**

223
224

CONFIGURAZIONE INGRESSO /*INPUT CONFIGURATION*
BEZEICHNUNG DER ANTRIEBSSEITE /*DESIGNATION ENTREE*

P (IEC) - predisposizione IEC / *Provided with IEC motor adaptor*
vorbereitet für den Anbau eines IEC-Motors / *prédisposé IEC*

HS - albero cilindrico / *solid input shaft* / freier Antriebswelle / *arbre rapide sortant*

HSF - albero cilindrico e flangia riportata / *solid input shaft and bolt-on flange*
freier Antriebswelle und Flansch / *arbre rapide sortant et adjonction de bride*

N (NEMA) - predisposizione motore NEMA / *provided with Nema motor adaptor*
vorbereitet für den Anschluß eines NEMA-Motors / *prédisposé moteur NEMA*

G (IEC) - flangia IEC maggiorata / *provided with IEC extended adaptor*
mit zusätzlicher Baueinheit für IEC-Motore / *avec module supplémentaire prédisposé IEC*

DIAMETRO ALBERO LENTO / *OUTPUT SHAFT BORE*
ABTRIEBSWELLE DURCHMESSER / *DIAMETRE ARBRE LENT*

D + diametro in mm / *diameter in mm*
Durchmesser in mm / *diamètre en mm* **(11,14,...)**

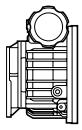
D11	D14	D19	D24	D28	D28	D38
(V 0.25)	(V 0.5)	(V 1)	(V 2)	(V 3)	(V 5.5)	(V 10)

IMP albero in pollici / *inch series shaft* / Nema-Welle / *arbre NEMA*

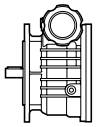
TIPO DI FISSAGGIO (per gruppi tipo U) / *OUTPUT CONFIGURATION (only for U version)*
MONTAGEMÖGLICHKEIT (ausschließlich für die Bauform U) / *TIPE DE FIXATION (pour forme de costruction U)*

F (IEC) - flangia IEC riportata / *bolt-on IEC flange* / Flansch IEC / *adjonction de bride IEC*
F (NEMA) - flangia NEMA / *NEMA flange mounted*/ NEMA Flansch / *bride Nema*

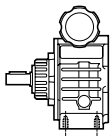
FORMA COSTRUTTIVA / *VERSION* / BAUFORM / *VERSION*



C



F



U

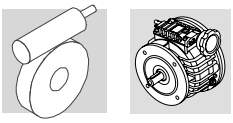
GRANDEZZA VARIATORE / *VARIATOR SIZE* / BAUGRÖSSE / *TAILLE VARIATEUR*
0.25, 0.5, 1, 2, 3, 5.5, 10

DIFFERENZIALE / *DIFFERENTIAL* / DIFFERENTIAL / *DIFFERENTIEL*
D

VARIATORE / *VARIATOR TYPE* / VERSTELLGETRIEBETYP / *TYPE VARIATEUR*
V

22.3 - Designazione motore | ***22.3 - Motor designation*** | **22.3 - Motor bezeichnung** | ***22.3 - Désignation moteur***

27 27 27 27



24.4 - Opzioni riduttori

SO
I riduttori tipo VF 44, VF 49 e W 63, W75, W86, solitamente completi di lubrificante, sono forniti privi di olio e dotati di un semplice tappo di carico.

LO
I riduttori VF 130...VF 250 e W 110 (**escluso per le posizioni di montaggio B3, V5 e V6**), di regola forniti privi di lubrificante, sono riempiti con olio sintetico del tipo "long life". Quantità in funzione della posizione di montaggio dichiarata.
L'opzione LO è inoltre disponibile per i riduttori tipo W 63, W 75, e W 86, purchè in associazione all'opzione DH e alla conseguente fornitura di tappi di servizio.

RB
Vite sporgente su lato opposto comando.

PV
Tutti gli anelli di tenuta in Viton®.

KA
Kit piedi èer intercambiabilità con gruppo equivalente tipo VF/A.

KV
Kit piedi per intercambiabilità con gruppo equivalente tipo VF/A.
Non disponibile sui riduttori con opzione RB.

24.4 - Gearbox options

SO
Gear units type VF 44, VF 49 and W 63, W75, W86,usually lubricated "for life" are supplied without oil and complete with a fill plug.

LO
*Gear units type VF 130...VF 250 e W 110 (**except those designated for mounting positions B3, V5 and V6**), usually supplied unlubricated, are factory filled with "long life" synthetic oil. Quantity as per mounting position specified on order.*
The LO option is also available for models W63, W75 and W86, however only along with the DH option and the consequent supply of fill, level and drain plugs.

RB
Extended wormshaft at non-drive end

PV
All oil seals are from Viton®

KA
VF/A interchangeability kit.

KV
VF/V interchangeability kit.
Not available on speed reducers with option RB.

24.4 - Getriebe Optionen

SO
Die Getriebe des Typs VF 44, VF 49 und W 63, W75, W86, die normalerweise geschmiert sind, werden ohne Öl und mit Ablaßschraube ausgeliefert.

LO
Die Getriebe Typ VF 130...VF 250 e W 110 **(nicht für die Einbaulagen B3, V5 und V6),** die normalerweise ohne Schmiermittel ausgeliefert werden, sind mit synthetischem Öl des Typs "long life" eingefüllt. Die Menge entspricht der angegebenen Einbaulage. Die Option LO ist auch für die Getriebe Typ W63, W75 und W86 verfügbar, aber zusammen mit der Option DH und der entsprechen Lieferung der Öleinfüll-, Stands-, und Ölablaßschrauben.

RB
Hervorragende Schraube auf die Antriebsgegenseite.

PV
Alle Viton®-Dichtringe

KA
Fuß-Kit zur Austauschbarkeit mit dem entsprechenden Typ VF/A.

KV
Fuß-Kit zur Austauschbarkeit mit dem entsprechenden Typ VF/V. **Nicht für die Getriebe mit Option RB verfügbar.**

24.4 - Options réducteurs

SO
Les réducteurs type VF 44, VF 49 et W 63, W75, W86, habituellement remplis de lubrifiant, sont fournis sans huile et sont dotés de bouchon de remplissage.

LO
*Les réducteurs type VF 130...VF 250 e W 110 **(à l'exclusion des positions de montage B3, V5 et V6)**, généralement fournis sans lubrifiant, sont remplis avec de l'huile synthétique type "long life". Quantité en fonction de la position de montage choisi. L'option LO est disponible pour **les** réducteurs type W63, W75 et W86, á condition que soit associée á l'option DH et la consequent forniture des bouchons reniflard, remplissage et niveau.*

RB
Arbre rapide sortante du côté opposé commande.

PV
Toutes les bagues d'étanchéité sont en Viton®

KA
Kit pieds pour interchangeabilité avec groupe équivalent type VF/A.

KV
*Kit pieds pour interchangeabilité avec groupe équivalent type VF/V. **Non disponible pour les réducteurs avec option RB.***

24.5 - Opzioni variatori

CU
Cassa universale con piano di appoggio spianato e relativi fori di fissaggio (pag. 30).

FL
Cassa universale con fianchi laterali spianati e relativi fori di fissaggio (pag. 30).

PDN
Predisposizione al rilevamento di giri digitale incorporato all'interno del variatore con sonda rilevatrice di tipo NPN.

PDP
Predisposizione al rilevamento di giri digitale incorporato all'interno del variatore con sonda rilevatrice di tipo PNP .

La tabella (F01) riporta le possibilità di applicazione e le dimensioni delle sonde NPN e PNP utilizzate.

24.5 - Variator options

CU
Universal casing featuring machined supporting surface with drilled and tapped holes (page 30).

FL
Universal casing featuring machined sides with drilled and tapped holes (page 30).

PDN
Configured for digital speed detection by NPN sensor incorporated into variator.

PDP
Configured for digital speed detection by PNP sensor incorporated into variator.

Table (F01) shows which units support which options and provides the (plug thread) dimensions of the various NPN and PNP sensors used.

24.5 - Optionen – Verstellgetriebemotor

CU
Universalgehäuse mit plangeschliffener Auflagefläche und entsprechenden Befestigungsbohrungen (Seite 30).

FL
Universalgehäuse mit plangeschliffenen Seitenflanken und entsprechenden Befestigungsbohrungen (Seite 30).

PDN
Vorbereitet für im Verstellgetriebe eingebaute digitale Vorrichtung für die Drehzahlerhebung über eine NPN-Sonde.

PDP
Vorbereitet für im Verstellgetriebe eingebaute digitale Vorrichtung für die Drehzahlerhebung über eine PNP-Sonde.

In der Tabelle (F01) werden die möglichen Applikationsmöglichkeiten der verwendeten NPN- und PNP-Sonden aufgeführt.

24.5 - Options variateurs

CU
Caisse universelle avec plan d'appui aplati et orifices de fixation correspondants (page 30).

FL
Caisse universelle avec flancs latéraux aplatis et orifices de fixation correspondants (page 30).

PDN
Prédisposition pour le dispositif de mesure du nombre de tours digital incorporé à l'intérieur du variateur avec sonde de détection de type NPN.

PDP
Prédisposition pour le dispositif de mesure du nombre de tours digital incorporé à l'intérieur du variateur avec sonde de détection de type PNP.

Le tableau (F01) indique les différentes possibilités d'application ainsi que les dimensions des sondes NPN et PNP utilisées.

(F01)

Riduttore *Gearbox* Getriebe *Réducteur*	Sonda *Plug thread* Sonde *Sonde* (NPN/PNP)	Variatore *Variator* Verstellgetriebe *Variateur*	Forme costruttive / *Versions* Bauformen / *Formes de construction* V_ C	V_ F-UF	V_D UF
VF 44	M8x1	V 0.25	#		—
VF 49	M8x1	V 0.25	#		—
	M8x1	V 0.5	#		
W 63	M8x1	V 0.5	#		
	M10x1	V 1	#		
W 75	M8x1	V 0.5	#		
	M10x1	V 1	#		
		V 2	#		
W 86	M8x1	V 0.5	#		
	M10x1	V 1	#		
		V 2	#		

Riduttore *Gearbox* Getriebe *Réducteur*	Sonda *Plug thread* Sonde *Sonde* (NPN/PNP)	Variatore *Variator* Verstellgetriebe *Variateur*	Forme costruttive / *Versions* Bauformen / *Formes de construction* V_ C	V_ F-UF	V_D UF
W 110	M10x1	V 1	#		
		V 2	#		
	M12x1	V 3/5.5	—		
VF 130	M10x1	V 2	#		
	M12x1	V 3/5.5			
		V 10	—		
VF 150	M12x1	V 3/5.5			
		V 10	—		
VF 185	M12x1	V 3/5.5			
		V 10	—		
VF 210	M12x1	V 10	—		
VF 250	M12x1	V 10	—		

Applicazioni disponibili

Applicazione disponibile per le posizioni di montaggio B3, a richiesta (come esecuzione speciale) per le altre posizioni di montaggio.

Option availability

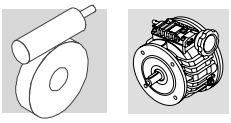
 # The provision is available for variator in the B3 mounting position alone. Enquire with Bonfiglioli for different requirements.

Zur Verfügung stehende Anwendungen

Anwendung auch für die Montagepositionen B3 erhältlich; auf Anfrage (als Sonderausführung) auch für die anderen Montagepositionen.

Applications disponibles

 # Application disponible pour les positions de montage B3, sur demande (exécution spéciale) pour les autres positions de montage.



PV
Anelli di tenuta in Viton.

SO
I variatori V 0.25 - V 15 solitamente forniti con lubrificante dalla Bonfiglioli Riduttori sono forniti privi di lubrificante. Questa opzione non è prevista per i variatori con differenziale V 0.5D - V 10D con ingresso P.. in quanto normalmente forniti privi di lubrificante.

PV
Viton seals.

SO
The V 0.25 – V 15 variators – normally factory-filled with oil – are supplied dry. This option is not available on the V 0.5D – V 10D variators with differential unit and P input, that are normally supplied unlubricated.

PV
Dichtringe in Viton.

SO
Die üblicherweise von der Bonfiglioli Riduttori mit Schmiermittel gelieferten Verstellgetriebe V 0.25 – V 15 werden bei dieser Ausführungsart ohne Schmiermittel geliefert. Diese Option ist bei den Verstellgetrieben mit Antrieb P.. V 0.5D – V 10D mit Differential nicht gegeben, da diese normalerweise ohne Schmiermittel geliefert werden.

PV
Bagues d'étanchéité en Viton.

SO
Les variateurs V 0.25-V 15 généralement fournis avec du lubrifiant par Bonfiglioli Riduttori sont fournis sans lubrifiant. Cette option n'est pas prévue pour les variateurs avec différentiel V 0.5D – V 10D avec entrée P.. dans la mesure où il sont normalement fournis sans lubrifiant.

24.6 - Lubrificazione

Lubrificazione riduttori serie VF e W

Un sistema misto bagno d'olio-sbattimento garantisce di regola la lubrificazione dei riduttori.
Il primo riempimento è effettuato da tutti gli stabilimenti Bonfiglioli esclusivamente con lubrificanti sintetici di marca SHELL.

Funzionamenti a temperature ambiente t_a comprese fra -15 °C e +50 °C sono in questo caso ammessi, tenendo presente che l'avviamento a temperature estremamente basse dovrà essere seguito da una fase di riscaldamento a carico molto ridotto. Per temperature inferiori a -15 °C consigliamo di consultare il ns. Servizio Tecnico.

A garanzia di un funzionamento ottimale Bonfiglioli consiglia di eseguire il primo ed i successivi riempimenti ricorrendo sempre alle elevate prestazioni dei lubrificanti SHELL.
Confezioni da 4 l di Shell Tivela Oil SC 320 sono disponibili e possono essere ordinate presso la rete di vendita Bonfiglioli.
La tabella (A20) che segue costituisce il riferimento per la scelta del lubrificante in rapporto alla tipologia di prodotto.

24.6 - Lubrication

Lubrication of VF and W gearboxes

Inner parts of gear units are normally lubed by the combine effect of oil bath and splash lubrication.
Gear units that are factory filled exploit exclusively SHELL synthetic lubricants.

Operation under ambient temperature ranging from –15 °C to +50 °C is so allowed, although warming up and progressive loading is recommended in extremely cold environments.
For operation at temperatures below –15 °C please consult Bonfiglioli Technical Service.

For best operational conditions and extended lifetime Bonfiglioli recommends that the gear units be filled exclusively with the approved, high performance, SHELL lubricants.
Shell Tivela oil SC 320 in the 4 l package is available from the Bonfiglioli sales network.
Refer to the chart below when selecting the type of lubricant.

24.6 - Schmierung

Schmierung der Getriebe der Serie VF und W

Ein kombiniertes System aus Ölbad-und Spritzschmierung gewährleistet den Getrieben üblicherweise die erforderliche Schmierung.
Die Erstfüllung erfolgt in allen Werken der Bonfiglioli ausschließlich nur unter Anwendung von synthetischen Schmiermitteln der Marke SHELL.

Ein Betrieb bei Raumtemperaturen zwischen –15° und + 50° ist in diesem Fall zulässig, wobei zu berücksichtigen ist, dass dem Anlass bei extrem niedrigen Temperaturen eine Aufwärmphase bei besonders niedriger Belastung folgen muss. Bei Temperaturen unter –15°C empfehlen wir Ihnen, sich mit dem Technischen Kundendienst in Verbindung zu setzen.

Im Hinblick auf einen optimalen Betrieb empfiehlt die Bonfiglioli sich bei den ersten und den nachfolgenden Füllungen der Getriebe immer der hohen Eigenschaften der Schmiermittel der Firma SHELL zu bedienen. Die Flaschen mit 4 Litern Shell Tivela Oil SC 320 sind verfügbar und können über das Verkaufsnetz der Bonfiglioli bestellt werden.
Die nachstehende Tabelle (A20) gibt einen Bezug im Hinblick auf die Wahl der korrekten Viskosität in Abhängigkeit zum jeweiligen Produkttyp.

24.6 - Lubrification

Lubrification réducteurs Série VF et W

Un système mixte bain d'huile-barbotage garantit généralement la lubrification des réducteurs.
Dans tous les établissements Bonfiglioli, le premier remplissage est effectué exclusivement avec des lubrifiants synthétiques de marque SHELL.

Dans ce cas, des fonctionnements à températures ambiantes comprises entre –15°C et 50°C sont admis en tenant compte du fait que le démarrage à des températures extrêmement basses doit être suivi d'une phase de chauffage à charge très réduite. En cas de températures inférieures à –15°C, il est conseillé de contacter notre Service Technique.

A fin de garantir un fonctionnement optimal, Bonfiglioli recommande d'effectuer le premier remplissage ainsi que les remplissages successifs avec les lubrifiants SHELL, aux performances élevées. Des bidons de 4 l de Shell Tivela Oil SC 320 sont disponibles et peuvent être commandés au réseau de vente Bonfiglioli.
Le tableau (A20) suivant constitue la référence pour le choix de la viscosité adaptée en fonction de la typologie du produit.

(F02)

Lubrificante di fornitura originale Bonfiglioli Riduttori / *Original lubricant supplied by Bonfiglioli Riduttori* Schmiermittel – Lieferzustand der Bonfiglioli Getriebe / *Lubrifiant fourni à l'origine par Bonfiglioli Riduttori*	
Riduttori a vite senza fine / *Worm reducers* Schneckengetriebe / *Réducteurs à vis dans fin*	**SHELL Tivela Oil SC 320**
Riduttori a vite s/fine con limitatore di coppia / *Worm reducers with torque limiter* Schneckengetriebe mit Drehzahlbegrenzer / *Réducteurs à vis sans fin avec limiteur de couple*	**SHELL Tivela Oil SD 460**

Bonfiglioli infine raccomanda che, qualora il lubrificante sia scelto al di fuori del tipo SHELL consigliato, questo sia di composizione equivalente in merito alla natura sintetica e alla viscosità, inoltre sia dotato degli opportuni additivi con funzione antischiuma.

Bonfiglioli finally recommends that, should a lubricant other than the approved Shell type be used, this be equivalent viscosity-wise and of the synthetic type.
Lubricant must also have the necessary EP and anti-foaming additives.

Bonfiglioli weist Sie letztendlich darauf hin, dass man in dem Fall, bei dem die Wahl der Schmiermittel nicht auf die empfohlene Marke SHELL trifft, ein in Bezug auf Viskosität und von der synthetischen Natur her gesehen gleichwertiges Schmiermittel verwenden sollte, das darüber hinaus mit den geeigneten Zusatzmittel ausgestattet ist, die eine Schaumbildung verhindern.

En fin, si le lubrifiant choisi n'est pas du type SHELL conseillé, Bonfiglioli recommande qu'il soit de composition équivalente en ce qui concerne la nature synthétique et la viscosité, de plus, il doit comprendre les additifs antimousse adaptés.

Nei gruppi tipo VF 44, VF 49 e W 63...W 86 il particolare lubrificante adottato di serie, del tipo “long life”, non richiede alcuna sostituzione per tutto l’arco di vita del riduttore stesso.

Speed reducers type VF 44, VF 49 e W 63...W 86 use a special long-life lubricant that need not be changed throughout the whole life of the reducer.

In den Baugruppen VF 44, VF 49 e W 63...W 86 erfordert das Getriebe, dank des besonderen serienmäßigen Schmiermittels vom Typ „long life“ über seine gesamte Lebensdauer des Getriebes keinerlei Austausch.

Pour les groupes type VF 44, VF 49 e W 63...W 86, le lubrifiant particulier adopté de série, du type “long life”, ne nécessite aucune vidange au cours de la durée de vie du réducteur.

I gruppi tipo W 110, VF 130...VF 250 sono forniti privi di lubrificante e sarà pertanto cura dell’utilizzatore riempirli di olio prima della messa in opera per mezzo dei tappi di carico, scarico e livello, disposti in funzione della posizione di montaggio specificata in fase di ordinativo.

Speed reducers type W 110, VF 130...VF 250 are supplied unlubricated. Before start-up, the User will have to fill oil through the fill, drain and level plugs placed in the suitable positions according to the mounting position specified on order.

Die Baugruppen vom Typ W 110, VF 130...VF 250 werden ohne Schmiermittel geliefert, daher muss der Anwender sie vor der Inbetriebnahme über die jeweiligen Einfüll- Ablass- und Ölstandschrauben, die der im Auftrag angegebenen Einbaulage gemäß angeordnet sind, mit Öl füllen.

Les groupes W 110, VF 130...VF 250 sont fournis sans lubrifiant, par conséquent, l’utilisateur doit se charger de les remplir en huile avant la mise en service au moyen des bouchons de remplissage, vidange et niveau, disposés en fonction de la position de montage spécifiée au moment de la commande.

Su richiesta, i riduttori VF 44, VF 49 e W 63...W 86 possono essere forniti privi di lubrificante, specificando per questi l’opzione **SO**.

*On request, reducer types VF 44, VF 49 e W 63...W 86 can be supplied unlubricated. In that case, **SO** option should be specified on order.*

Auf Anfrage, indem man die Option **SO** spezifiziert, können die Getriebe VF 44, VF 49 e W 63...W 86 ohne Schmiermittel geliefert werden.

*Sur demande, les réducteurs VF 44, VF 49 e W 63...W 86 peuvent être fournis sans lubrifiant, dans ce cas, spécifier l’option **SO**.*

Per i gruppi W 110, VF 130...VF 250 è disponibile, viceversa, l’opzione **LO** che, qualora specificata in fase di ordinativo, garantisce il primo riempimento di lubrificante in fabbrica.

*Option **LO** is also available on units W 110, VF 130...VF 250 . When this option is specified on order, the speed reducer is factory filled with oil.*

Bei den Baugruppen W 110, VF 130...VF 250 wird dagegen, im Fall der Angabe der Option **LO** im Auftrag, das Getriebe mit einer ersten, im Werk erfolgten Schmiermittelfüllung geliefert.

*Vice versa, l’option **LO** est disponible pour les groupe W 110, VF 130...VF 250, à condition qu’elle soit précisée à la commande, elle garantit le premier remplissage de lubrifiant en usine.*

I gruppi W 63, W 75 e W 86 sono forniti di un coperchio di chiusura laterale orientabile e dotato di tappo di sfiato (nella fase di spedizione è presente al suo posto un tappo cieco).

Units W 63, W 75 and W 86 come with a side cover that has several mounting positions and is fitted with a breather plug (a blind plug is fitted for transportation purposes).

Die Baugruppen W 63, W 75 und W 86 werden mit einem seitlich verstellbaren Abschlussdeckel geliefert und sind mit einer Entlüftungsschraube ausgerüstet (beim Versand ist an dieser Stelle ein Blindstopfen vorhanden).

Les groupes W 63, W 75 et W 86 sont équipés d’un couvercle latéral de fermeture orientable et sont dotés de bouchon de purge (remplacé par un bouchon borgne durant la phase d’expédition).

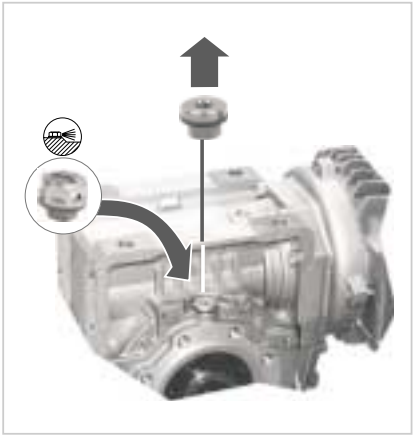
Prima della messa in servizio rimuovere il tappo cieco e sostituirlo con il tappo dotato di sfiato, come indicato in figura.

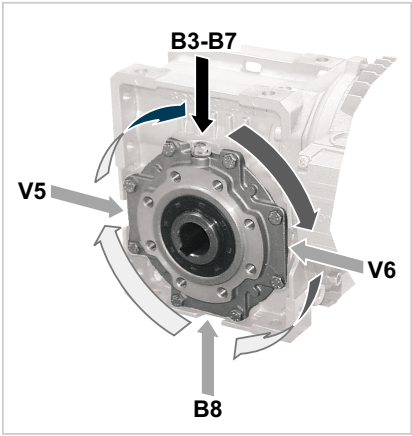
Prior to start-up make sure that the blind plug is replaced by the vented plug, as shown in the figure below.

Vor der Inbetriebnahme, den Angaben in der Abbildung gemäß, Blindstopfen entfernen und durch die Entlüftungsschraube ersetzen.

Avant la mise en service, enlever le bouchon borne et le remplacer par le bouchon de purge, comme indiqué sur la figure.

(F03)





Quantità di lubrificante [l] *Oil quantity [l]* Schmiermittelmenge [l] *Quantité de lubrifiant [l]*

(F04)

	i	Forma costruttiva *Version* Bauform *Forme de construction*	**Posizioni di montaggio / *Mounting positions* / Einbaulagen *Positions de montage***					
			B3	**B6**	**B7**	**B8**	**V5**	**V6**
VF 44	—	U-N-A-V-F-FA-P	0.075	0.075	0.075	0.075	0.075	0.075
VF 49	—	U-N-A-V-F-FA-P	0.12	0.12	0.12	0.12	0.12	0.12
W 63	7, 10, 12, 15	U-UF-UFC	0.31	0.31	0.31	0.31	0.31	0.31
	19, 24, 30, 38, 45, 64, 80, 100	U-UF-UFC	0.38	0.38	0.38	0.38	0.38	0.38
W 75	7, 10, 15	U-UF-UFC-UFCR	0.48	0.48	0.48	0.48	0.48	0.48
	30, 40	U-UF-UFC-UFCR	0.52	0.52	0.52	0.52	0.52	0.52
	20, 20, 50, 60, 80, 100	U-UF-UFC-UFCR	0.56	0.56	0.56	0.56	0.56	0.56
W 86	7, 10, 15	U-UF-UFC	0.64	0.64	0.64	0.64	0.64	0.64
	30	U-UF-UFC	0.73	0.73	0.73	0.73	0.73	0.73
	20, 23, 40, 46, 56, 64, 80, 100	U-UF-UFC	0.90	0.90	0.90	0.90	0.90	0.90
W 110	—	U-UF-UFC	1.5	1.7	1.7	1.9	1.7	1.6
VF 130	—	N	2.3	2.5	2.5	3.0	3.2	3.4
		A-F-FC-FR-P	3.0	2.5	2.5	2.3	3.3	3.3
		V	3.4	2.5	2.5	3.1	3.0	2.5
VF 150	—	N	3.0	3.5	3.5	4.3	3.8	4.0
		A-F-FC-FR-P	4.3	3.5	3.5	3.0	3.9	3.9
		V	4.0	3.5	3.5	3.6	4.3	3.0
VF 185	—	N	5.0	5.5	5.5	7.8	6.6	6.8
		A-F-FC-FR-P	7.8	5.5	5.5	5.0	6.7	6.7
		V	6.8	5.5	5.5	6.4	7.8	5.4
VF 210	—	N	7.5	9.5	9.5	7.3	9.2	9
		A-P	11	9.5	9.5	7.5	9.4	8.9
		V	8.9	9.5	9.5	7.3	11	8
VF 250	—	N	11	17	17	11	17	17
		A-P	23	17	17	11	18	17
		V	17	17	17	11	23	11

Lubrificazione permanente *Life lubricated* Dauerschmierung *Lubrification permanente*

I valori delle quantità di olio riportati in tabella sono da ritenersi indicativi; se si rende necessario un nuovo riempimento dei gruppi riferirsi sempre al livello visualizzato dalla mezzeria del tappo di livello.

The quantities of lubricant specified in the table are only indicative. Correct level is at mid point of the level plug.

Bei den oben angegebenen Werten handelt es sich um Richtwerte. Sollte eine neue Füllung der Baugruppen erforderlich sein, muss man immer Bezug auf den an der Mittellinie der Ölstandsschraube angezeigten Pegel nehmen.

Les valeurs des quantités d'huile indiquées dans le tableau sont indicatives ; en cas de nécessité d'effectuer un nouveau remplissage, toujours se référer au niveau visualisé à la moitié du bouchon de niveau.

Collocazione dei tappi di carico, scarico e livello olio.

Positions of oil fill, level and drain plugs.

Anordnung des Einfüllv, Ölstands- und Ölablaßschrauben .

Position des bouchons de remplissage, niveau et vidange d'huile.

Tappo di sfiato
Breather plug
Entlüftungsstopfen
Bouchon d'évent

Tappo di carico
Filler plug
Einfüllstopfen
Bouchon de remplissage

Tappo di scarico
Drain plug
Ablassstopfen
Bouchon de vidange

Tappo di livello
Level plug
Ölstandsstopfen
Bouchon de niveau

Raccordo orientabile
90° elbow
90° Winkel
Raccord coudé

Le pagine che seguono sono da riferimento per la collocazione dei tappi in relazione alla posizione di montaggio e ad altre variabili.

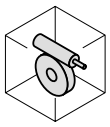
The following pages refer to plug position depending on reducer mounting position and other variables.

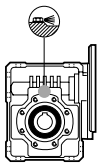
Die nachstehenden Seiten geben einen Hinweis in Bezug auf die Anordnung der jeweiligen Serviceschrauben und die von der Einbaulage und anderen Variablen abhängige Schmiermittelmenge.

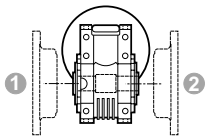
Les pages suivantes servent de référence pour le positionnement des bouchons de service en fonction de la position de montage et d'autres variables.

(F05)

B3

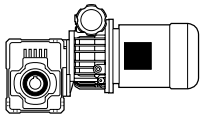






	i	[l]
W 63	7, 10, 12, 15	0.31
	19, 24, 30, 38, 45, 64, 80, 100	0.38
W 75	7, 10, 15	0.48
	30, 40	0.52
	20, 25, 50, 60, 80, 100	0.56
W 86	7, 10, 15	0.64
	30	0.73
	20, 23, 40, 46, 56, 64, 80, 100	0.90

SHELL Tivela Oil SC 320 (for life)



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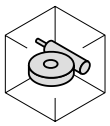

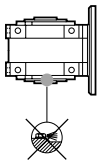

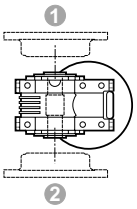

	i	[l]
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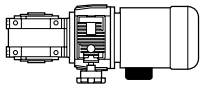
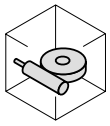
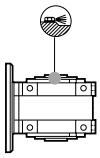
	19, 24, 30, 38, 45, 64, 80, 100	0.38
W 75	7, 10, 15	0.48
	30, 40	0.52
	20, 25, 50, 60, 80, 100	0.56
W 86	7, 10, 15	0.64
	30	0.73
	20, 23, 40, 46, 56, 64, 80, 100	0.90

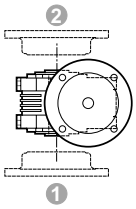
SHELL Tivela Oil SC 320 (for life)



B7







	i	[l]
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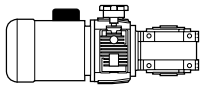
	19, 24, 30, 38, 45, 64, 80, 100	0.38
W 75	7, 10, 15	0.48
	30, 40	0.52
	20, 25, 50, 60, 80, 100	0.56
W 86	7, 10, 15	0.64
	30	0.73
	20, 23, 40, 46, 56, 64, 80, 100	0.90

SHELL Tivela Oil SC 320 (for life)



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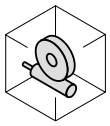

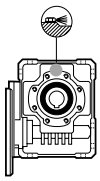

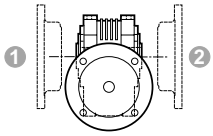

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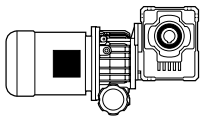
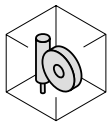
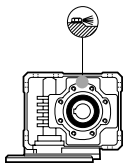
	19, 24, 30, 38, 45, 64, 80, 100	0.38
W 75	7, 10, 15	0.48
	30, 40	0.52
	20, 25, 50, 60, 80, 100	0.56
W 86	7, 10, 15	0.64
	30	0.73
	20, 23, 40, 46, 56, 64, 80, 100	0.90

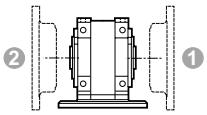
SHELL Tivela Oil SC 320 (for life)



V5







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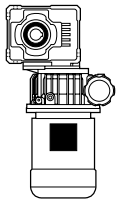
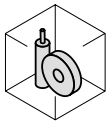
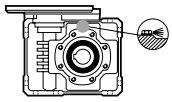
W 75	7, 10, 15	0.48
	30, 40	0.52
	20, 25, 50, 60, 80, 100	0.56
W 86	7, 10, 15	0.64
	30	0.73
	20, 23, 40, 46, 56, 64, 80, 100	0.90

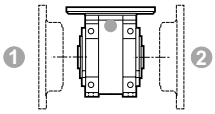
SHELL Tivela Oil SC 320 (for life)



V6







	i	[l]
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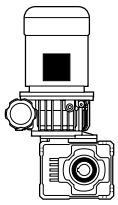
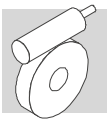
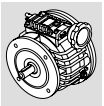
W 75	7, 10, 15	0.48
	30, 40	0.52
	20, 25, 50, 60, 80, 100	0.56
W 86	7, 10, 15	0.64
	30	0.73
	20, 23, 40, 46, 56, 64, 80, 100	0.90

SHELL Tivela Oil SC 320 (for life)



(F06)

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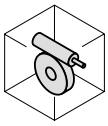
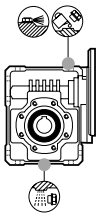
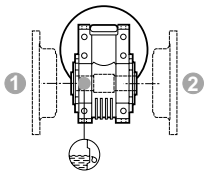
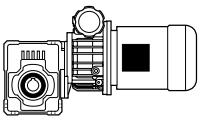






	P80...P132	1.50
	V	1.50

SHELL Tivela Oil SC 320



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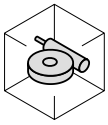
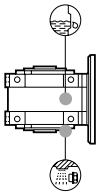
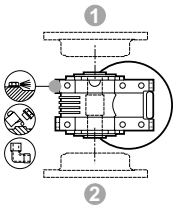
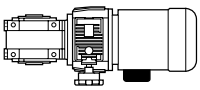




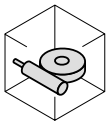


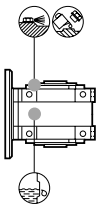
	P80...P132	1.65
	V	1.65

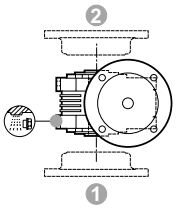
SHELL Tivela Oil SC 320



B7

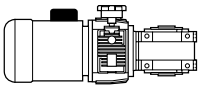




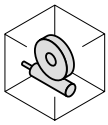


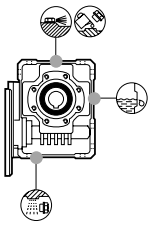
	P80...P132	1.65
	V	1.65

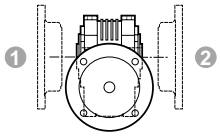
SHELL Tivela Oil SC 320



B8

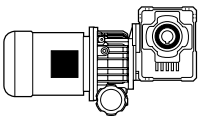




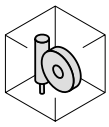


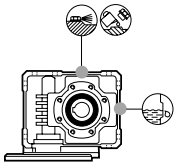
	P80...P132	1.90
	V	1.90

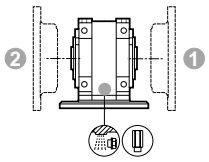
SHELL Tivela Oil SC 320



V5

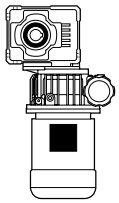




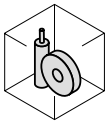


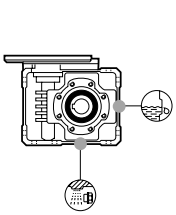
	P80...P132	1.70
	V	1.70

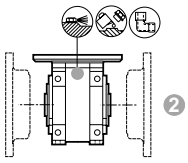
SHELL Tivela Oil SC 320



V6

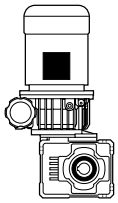




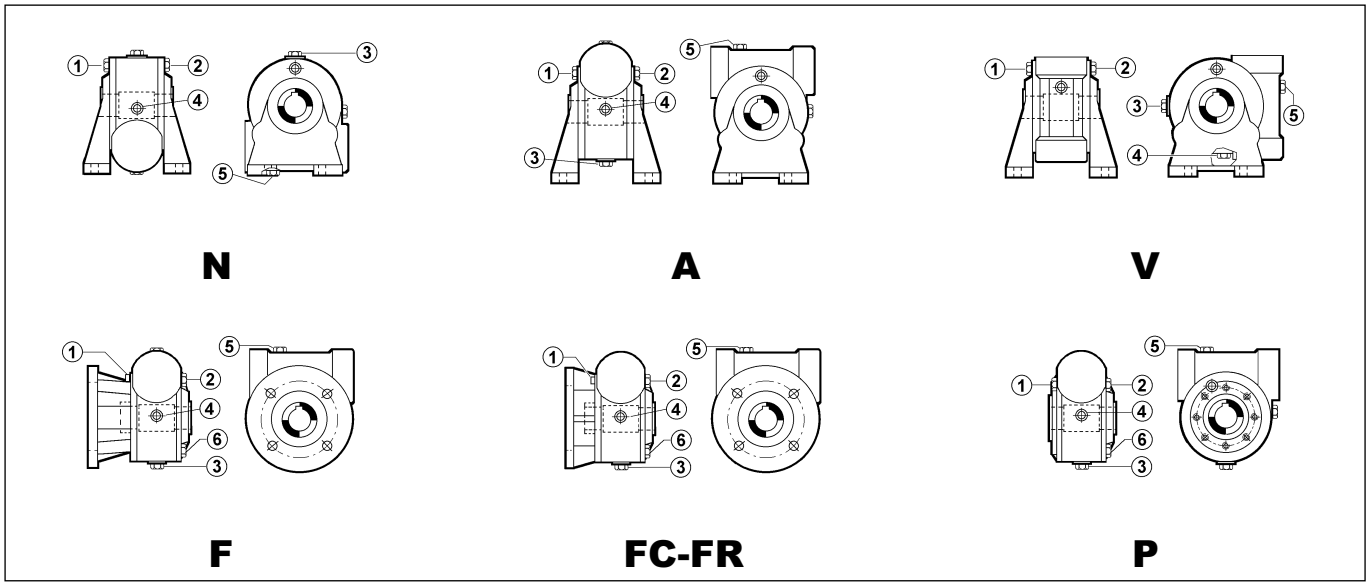


	P80...P132	1.60
	V	1.60

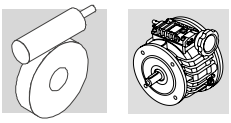
SHELL Tivela Oil SC 320



(F07)



VF	Forma costruttiva *Version* Bauform *Forme de const.*	Posizioni di montaggio / *Mounting positions* / Einbaulagen / *Positions de montage*					
		• B3	• B6	• B7	• B8	• V5	• V6
130-150-185	N	1 **C** (1/2") 2 **L** (1/2") 3 **S** (1/2")	4 **C** (1/2") 2 **L** (1/2") 5 **S** (1/2")	5 **C** (1/2") 2 **L** (1/2") 4 **S** (1/2")	3 **C** (1/2") 2 **L** (1/2") 1 **S** (1/2")	2 **C** (1/2") 1 **L** (1/2") 3 **S** (1/2")	3 **C** (1/2") 1 **L** (1/2") 2 **S** (1/2")
	A	3 **C** (1/2") 2 **L** (1/2") 1 **S** (1/2")	5 **C** (1/2") 2 **L** (1/2") 4 **S** (1/2")	4 **C** (1/2") 2 **L** (1/2") 5 **S** (1/2")	1 **C** (1/2") 2 **L** (1/2") 3 **S** (1/2")	2 **C** (1/2") 4 **L** (1/2") 3 **S** (1/2")	3 **C** (1/2") 4 **L** (1/2") 2 **S** (1/2")
	V	3 **C** (1/2") 1 **L** (1/2") 2 **S** (1/2")	5 **C** (1/2") 1 **L** (1/2") 4 **S** (1/2")	4 **C** (1/2") 1 **L** (1/2") 5 **S** (1/2")	2 **C** (1/2") 1 **L** (1/2") 3 **S** (1/2")	3 **C** (1/2") 2 **L** (1/2") 1 **S** (1/2")	1 **C** (1/2") 4 **L** (1/2") 3 **S** (1/2")
	F-FC-FR-P	3 **C** (1/2") 2 **L** (1/2") 1 **S** (1/2")	4 **C** (1/2") 2 **L** (1/2") 5 **S** (1/2")	5 **C** (1/2") 2 **L** (1/2") 4 **S** (1/2")	1 **C** (1/2") 2 **L** (1/2") 3 **S** (1/2")	2 **C** (1/2") 4 **L** (1/2") 3 **S** (1/2")	3 **C** (1/2") 4 **L** (1/2") 2 **S** (1/2")
210	N	1 **C** (1/2") 2 **L** (1/2") 3 **S** (1/2")	4 **C** (1/2") 2 **L** (1/2") 5 **S** (1/2")	5 **C** (1/2") 2 **L** (1/2") 4 **S** (1/2")	3 **C** (1/2") 2 **L** (1/2") 1 **S** (1/2")	2 **C** (1/2") 4 **L** (1/2") 3 **S** (1/2")	3 **C** (1/2") 4 **L** (1/2") 2 **S** (1/2")
	A	3 **C** (1/2") 2 **L** (1/2") 1 **S** (1/2"	5 **C** (1/2") 2 **L** (1/2") 4 **S** (1/2")	4 **C** (1/2") 2 **L** (1/2") 5 **S** (1/2")	1 **C** (1/2") 2 **L** (1/2") 3 **S** (1/2")	2 **C** (1/2") 4 **L** (1/2") 3 **S** (1/2")	3 **C** (1/2") 4 **L** (1/2") 2 **S** (1/2")
	V	3 **C** (1/2") 1 **L** (1/2") 2 **S** (1/2")	5 **C** (1/2") 2 **L** (1/2") 4 **S** (1/2")	4 **C** (1/2") 2 **L** (1/2") 5 **S** (1/2")	2 **C** (1/2") 1 **L** (1/2") 3 **S** (1/2")	3 **C** (1/2") 2 **L** (1/2") 1 **S** (1/2")	1 **C** (1/2") 2 **L** (1/2") 3 **S** (1/2")
	P	3 **C** (1/2") 2 **L** (1/2") 1 **S** (1/2")	4 **C** (1/2") 2 **L** (1/2") 5 **S** (1/2")	5 **C** (1/2") 2 **L** (1/2") 4 **S** (1/2")	1 **C** (1/2") 2 **L** (1/2") 3 **S** (1/2")	2 **C** (1/2") 4 **L** (1/2") 3 **S** (1/2")	3 **C** (1/2") 4 **L** (1/2") 2 **S** (1/2")
250	N	1 **C** (1") 2 **L** (1") 3 **S** (1")	4 **C** (1") 2 **L** (1") 5 **S** (1")	5 **C** (1") 2 **L** (1") 4 **S** (1")	3 **C** (1") 2 **L** (1") 1 **S** (1")	2 **C** (1") 4 **L** (1") 3 **S** (1")	3 **C** (1") 4 **L** (1") 2 **S** (1")
	A	3 **C** (1") 2 **L** (1") 1 **S** (1")	5 **C** (1") 2 **L** (1") 4 **S** (1")	4 **C** (1") 2 **L** (1") 5 **S** (1")	1 **C** (1") 2 **L** (1") 3 **S** (1")	2 **C** (1") 4 **L** (1") 3 **S** (1")	3 **C** (1") 4 **L** (1") 2 **S** (1")
	V	3 **C** (1") 1 **L** (1") 2 **S** (1")	5 **C** (1") 2 **L** (1") 4 **S** (1")	4 **C** (1") 2 **L** (1") 5 **S** (1")	2 **C** (1") 1 **L** (1") 3 **S** (1")	3 **C** (1") 2 **L** (1") 1 **S** (1")	1 **C** (1") 2 **L** (1") 3 **S** (1")
	P	3 **C** (1") 2 **L** (1") 1 **S** (1")	4 **C** (1") 2 **L** (1") 5 **S** (1")	5 **C** (1") 2 **L** (1") 4 **S** (1")	1 **C** (1") 2 **L** (1") 3 **S** (1")	2 **C** (1") 4 **L** (1") 3 **S** (1")	3 **C** (1") 4 **L** (1") 2 **S** (1")



Legenda:

C Tappo di carico/sfiato
L Tappo di livello
S Tappo di scarico

• Numero di riferimento delle posizioni dei tappi di carico, scarico e livello olio.

Key:

C *Filling/breather plug*
L *Level plug*
S *Drain plug*

• *Reference number for position of oil fill, level and drain plugs.*

Zeichenerklärung:

C Einfüll- und Ablaßschrauber
L Ölstandsschraube
S Ölablaßschraube

• Bezugsnummer der Positionen des Einfüll Ölstands-und Ölablaß-schrauben.

Légende:

C *Bouchon de remplissage/évent*
L *Bouchon de niveau*
S *Bouchon de vidange*

• *Numéro de référence des positions des bouchons de remplissage, vidange et niveau d'huile.*

Lubrificazione variatori

V, VD

La lubrificazione dei variatori V e VD avviene per sbattimento dell'olio. Prima della messa in funzione dei variatori accertarsi della presenza di olio al loro interno assicurandosi che esso compaia nella spia di livello. I variatori/motovariatori, se non diversamente specificato in fase di ordine, vengono forniti con il quantitativo di olio per la posizione di montaggio B3.

Si consiglia di specificare sempre in fase di ordine la posizione di montaggio desiderata.

VD

Tutti i variatori con differenziale VD completi di motore vengono forniti con carico di olio.
Tutti i variatori con differenziale VD in configurazione P... (IEC), vengono forniti privi di olio.
In questo caso l'utente dovrà provvedere al riempimento immettendo le quantità di olio indicate nelle tabelle (C05-C06) e dovrà utilizzare motori elettrici con l'anello di tenuta lato albero e la flangia di accoppiamento al variatore a tenuta di olio.

Benchè i variatori siano abbinabili a qualsiasi motore normalizzato IEC, BONFIGLIOLI raccomanda che siano utilizzati solo motori originali, provvisti di anelli di tenuta per l'olio.

Lubrication of variators

V and VD

Variators V and VD are splash-lubricated. Before putting the variator into operation make sure there is oil inside up to the sight glass level. Unless otherwise specified in the order, the variators are filled with an oil quantity suitable for B3 mounting position.

To avoid further manipulation it is strongly recommended that the actual mounting position is specified in the ordering code.

VD

Motorized VD variators featuring the differential unit are factory filled with oil unlike VD variators with the IEC motor adapter (P...) which are supplied dry and must be filled with oil prior to be put into operation.

Proper oil quantity is shown in table (C05-C06) and relates to actual mounting position.

Although speed variators can match any IEC motors, BONFIGLIOLI recommends the use of genuine motors only, complete with shaft oil seals.

Schmierung der Verstellgetriebe

V, VD

Die Schmierung der Verstellgetriebe V und VD erfolgt durch Tauchschmierung im Ölbad. Vor der Inbetriebnahme der Verstellgetriebe muß geprüft werden, ob sie bis zur Ölstandskontrolle mit Öl gefüllt sind.
Falls im Auftrag nicht anderweitig angegeben, werden die Verstellgetriebe mit der für die Einbaulage B3 vorgeschriebenen Ölmenge geliefert.

Es wird in jedem Fall geraten, bei der Bestellung immer die gewünschte Einbaulage anzugeben.

VD

Alle Verstellgetriebe mit Differential VD und Motor, sind bei Lieferung mit Öl gefüllt.
Alle Verstellgetriebe mit Differential V-D für den Anbau eines IEC-Motors werden ohne Öl geliefert.
Wenn der Kunde die Getrieb selbst mit Öl füllt, müssen die in Tabelle (C05-C06) angegebenen Ölmengen verwenden werden. Die zu verwendenden Motoren müssen einen Dichtring auf der Seite der Welle haben und der Flansch zur Kopplung an das Verstellgetriebe muß öldicht sein.

Es wird empfohlen, die Verstellgetriebe mit Differential mit öldichten BONFIGLIOLI RIDUTTORI Motoren zu kaufen.

Lubrification variateurs

V, VD

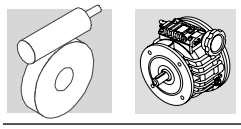
La lubrification des variateurs V et VD s'effectue par barbota- ge de l'huile. Avant la mise en service des variateurs/motovariateurs, vérifier la présence d'huile à l'intérieur en contrôlant que celle-ci apparaisse dans le témoin de niveau.
Les variateurs/motovariateurs, sauf spécification contraire au moment de la commande, sont fournis avec une quantité d'huile relative à la position de montage B3.

Dans tous les cas, il est conseillé de toujours spécifier la position de montage désirée au moment de la commande.

VD

Tous les variateurs avec différentiel VD avec moteur sont fournis avec le plein d'huile.
Tous les variateurs avec différentiel VD en configuration P... (IEC) sont fournis sans huile.
Dans ce cas, l'utilisateur doit effectuer le remplissage en versant la quantité d'huile indiquée dans le tableau (C05-C06) et doit utiliser des moteurs électriques avec bague d'étanchéité côté arbre et bride d'accouplement au variateur étanche à l'huile.

Dans tous les cas, il est conseillé d'acquérir des variateurs avec différentiel avec moteurs avec étanchéité à l'huile BONFIGLIOLI RIDUTTORI.



I variatori V 0.25 e V 0.5 vengono forniti completi di olio lubrificante “long life” sintetico **Shell Donax TX**.
Eventuali sostituzioni o rabbocchi dovranno essere effettuati utilizzando lo stesso tipo di prodotto.

*Variator units V 0.25 and V 0.5 are factory filled with “long life” synthetic oil **Shell Donax TX**.*
Use same oil when topping up or refilling.

Die Verstellgetriebe V 0.25 und V 0.5 werden mit Schmieröl **Shell Donax TX** geliefert.
Eventuelle Ölwechsel oder Nachfüllungen müssen unter Anwendung des gleichen Produkttyps erfolgen.

*Les variateurs V 0.25 et V 0.5 sont fournis avec de l’huile lubrifiante “long life” **Shell Donax TX**.*
Utiliser le même type d’huile pour les éventuels vidanges ou remplissages.

Shell Donax TX (Caratteristiche indicative / *indicative features* / Anhaltswerte / *Caractéristiques indicatives*)			
Massa volumica / *density* / Volumenmasse / *Masse volumique*	ISO 3675	kg/dm^3	0.852
Viscosità cinematica a 40°C / *kinematic viscosity at 40°C* / Kinematische Viskosität bei 40°C *Viscosité cinématique à 40°C*	ISO 3104	cSt	34
Viscosità cinematica a 100°C / *kinematic viscosity at 100°C* / Kinematische Viskosität bei 100°C *Viscosité cinématique à 100°C*	ISO 3104	cSt	7.4
Indice di viscosità / *viscosity index* / Viskositätsindex / *Indice de viscosité*	ISO 2909	-	196
Punto di infiammabilità / *flash point* / Entflammpunkt / *Point d’inflammabilité*	ISO 2592	°C	198
Punto di scorrimento / *pour point* / Stockpunkt / *Point de glissement*	ISO 3016	°C	-48

I variatori V 1...V 10 vengono forniti completi di olio lubrificante minerale **Shell Donax TA**.
Eventuali sostituzioni o rabbocchi potranno essere effettuati utilizzando lubrificanti compatibili.

*Variator units V 1 through V 10 are factory filled with mineral oil **Shell Donax TA** .*
Use same type of oil when topping up or refilling.

Die Verstellgetriebe V 1...V 10 werden mit dem Schmieröl **Shell Donax TA** geliefert.
Ein eventueller Wechsel oder ein etwaiges Auffüllen sollte unter Verwendung der Schmiermittel erfolgen.

*Les variateurs V 1...V 10 sont fournis avec de l’huile lubrifiante **Shell Donax TA**.*
Utiliser le même type d’huiles pour les éventuels vidanges ou remplissages.

Shell Donax TA (Caratteristiche indicative / *indicative features* / Anhaltswerte / *Caractéristiques indicatives*)			
Massa volumica / *density* / Volumenmasse / *Masse volumique*	ISO 3675	kg/dm^3	0.873
Viscosità cinematica a 40°C / *kinematic viscosity at 40°C* / Kinematische Viskosität bei 40°C *Viscosité cinématique à 40°C*	ISO 3104	cSt	37.3
Viscosità cinematica a 100°C / *kinematic viscosity at 100°C* / Kinematische Viskosität bei 100°C *Viscosité cinématique à 100°C*	ISO 3104	cSt	7.0
Indice di viscosità / *viscosity index* / Viskositätsindex / *Indice de viscosité*	ISO 2909	-	151
Punto di infiammabilità / *flash point* / Entflammpunkt / *Point d’inflammabilité*	ISO 2592	°C	196
Punto di scorrimento / *pour point* / Stockpunkt / *Point de glissement*	ISO 3016	°C	-42

Riduzione **R** lubrificata “a vita” con grasso **Shell TVX Compound B.**

Tutti i variatori sono forniti con carica di lubrificante, ad eccezione dei tipi **VD_P(IEC).**

Il tappo di sfiato, fornito a corredo, va posizionato come indicato nelle tabelle (F08 - F09).

*Helical reduction **R** is grease lubed "for life" with **Shell TVX Compound B**.*

*All speed variators are factory filled with lubricant, with the only exception of units type **VD_P(IEC)**.*

The breather plug, supplied along with every unit, shall be located as per the schemes (F08) and (F09).

Die Vorstufe **R** ist mit Fett Typ **Shell TVX Compound B** gefüllt.

Alle Verstellgetriebe sind ab Werk mit Öl gefüllt, außer dem Typ **VD_P(IEC)**.

Der Entlüftungsstopfen, der jedem Getriebe beiligt, muss entsprechend der obige Skizze montiert werden.

*Réduction **R** avec lubrification permanente au moyen de graisse **Shell TVX Compound B**.*

*Tous les variateurs sont fournis avec le lubrifiant, à l’exception des les models **VD_P (IEC)**.*

Le bouchon d’évent, fourni avec chaque variateur, doit être positionné comme indiqué dans les schémas (F08 - F09).

Non mescolare olii di natura diversa.

Do not mix synthetic oil with mineral oil.

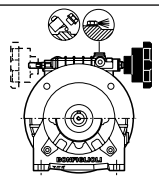
Auf keinen Fall darf synthetisches Öl mit mineralischem gemischt werden !

Ne pas mélanger huiles de nature différente.

(F08)

V 0.25 - V 0.5

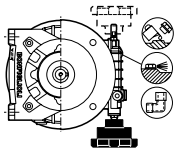
B3



V 0.25 F **V 0.5 F**	0.14 0.18	[l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

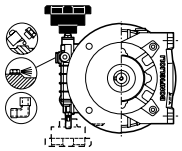
B6



V 0.25 F **V 0.5 F**	0.14 0.18	[l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

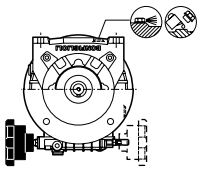
B7



V 0.25 F **V 0.5 F**	0.14 0.18	[l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

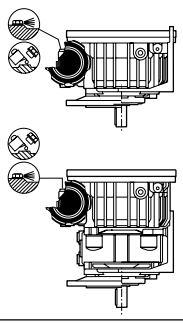
B8



V 0.25 F **V 0.5 F**	0.14 0.18	[l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	
VD 0.5 U_ / VRD 0.5	0.30	

Oil Donax TX (for life)

V5



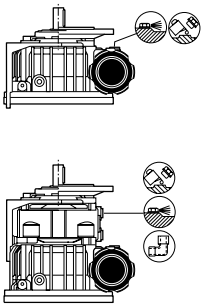
V 0.25 F **V 0.5 F**	0.28 0.30	[l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.22 0.27	

Oil Donax TX (for life)

VD 0.5 U_ / VRD 0.5	0.70	[l]

Oil Donax TX (for life)

V6



V 0.25 F **V 0.5 F**	0.14 0.18	[l]
V 0.25 U_ / VR 0.25_ **V 0.5 U_ / VR 0.5_**	0.12 0.15	

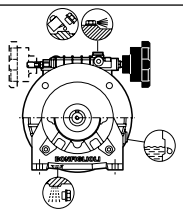
Oil Donax TX (for life)

VD 0.5 U_ / VRD 0.5	0.40	[l]

Oil Donax TX (for life)

V 1 - V 2

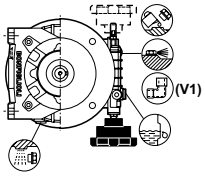
B3



V 1 F **V 2 F**	0.30 0.40	[l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

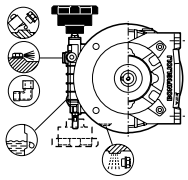
B6



V 1 F **V 2 F**	0.30 0.40	[l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

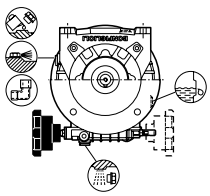
B7



V 1 F **V 2 F**	0.30 0.40	[l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

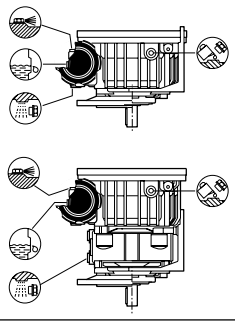
B8



V 1 F **V 2 F**	0.30 0.40	[l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	
VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.35 0.46	

Oil Donax TA (2000-3000 hrs.)

V5



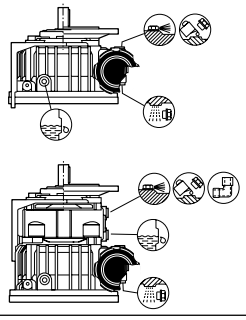
V 1 F **V 2 F**	0.58 0.78	[l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.40 0.54	

Oil Donax TA (2000-3000 hrs.)

VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	1.00 1.5	[l]

Oil Donax TA (for life)

V6



V 1 F **V 2 F**	0.30 0.40	[l]
V 1 U_ / VR 1_ **V 2 U_ / VR 2_**	0.25 0.32	

Oil Donax TA (2000-3000 hrs.)

VD 1 U_ / VRD 1 **VD 2 U_ / VRD 2**	0.50 0.70	[l]

Oil Donax TA (for life)

Tappo di sfiato
Breather plug
Entlüftungsstopfen
Bouchon d'évent

Tappo di carico
Filler plug
Einfüllstopfen
Bouchon de remplissage

Tappo di scarico
Drain plug
Ablassstopfen
Bouchon de vidange

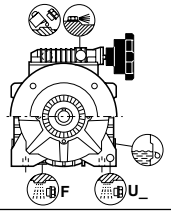
Tappo di livello
Level plug
Ölstandsstopfen
Bouchon de niveau

Raccordo orientabile
90° elbow
90° Winkel
Raccord coudé

(F09)

V 3 - V 5.5

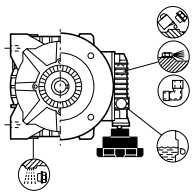
B3



V 3 F - V 5.5 F_	0.70	[l]
V 3 U_ / VR 3 V 5.5 U / VR 5.5	1.0	
VD 3 F_ VD 5.5 F	1.3	
VD 3 U_ / VRD 3 U_ VD 5.5 U / VRD 5.5 U_	1.6	

Oil Donax TA (2000-3000 hrs.)

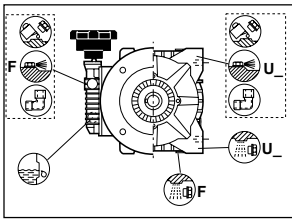
B6



V 3 F - V 5.5 F_	0.90	[l]
V 3 U_ / VR 3 V 5.5 U / VR 5.5	1.0	
VD 3 F_ VD 5.5 F	1.3	
VD 3 U_ / VRD 3 U_ VD 5.5 U / VRD 5.5 U_	1.6	

Oil Donax TA (2000-3000 hrs.)

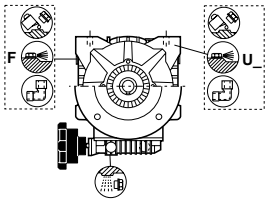
B7



V 3 F - V 5.5 F_	0.90	[l]
V 3 U_ / VR 3 V 5.5 U / VR 5.5	1.0	
VD 3 F_ VD 5.5 F	1.3	
VD 3 U_ / VRD 3 U_ VD 5.5 U / VRD 5.5 U_	1.6	

Oil Donax TA (2000-3000 hrs.)

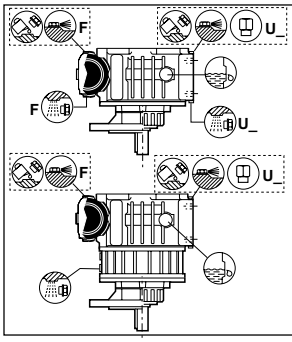
B8



V 3 F - V 5.5 F_	1.0	[l]
V 3 U_ / VR 3 V 5.5 U / VR 5.5	1.3	
VD 3 F_ VD 5.5 F	1.6	
VD 3 U_ / VRD 3 U_ VD 5.5 U / VRD 5.5 U_	1.9	

Oil Donax TA (2000-3000 hrs.)

V5



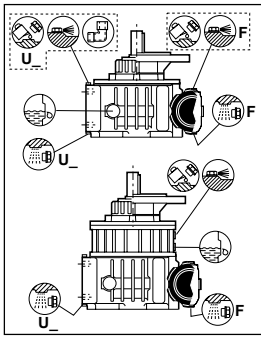
V 3 F - V 5.5 F_	2.1	[l]
V 3 U_ / VR 3 V 5.5 U / VR 5.5	2.0	

Oil Donax TA (2000-3000 hrs.)

VD 3 F_ VD 5.5 F	4.5	[l]
VD 3 U_ / VRD 3 U_ VD 5.5 U / VRD 5.5 U_	4.8	

Oil Donax TA (2000-3000 hrs.)

V6



V 3 F - V 5.5 F_	1.0	[l]
V 3 U_ / VR 3 V 5.5 U / VR 5.5	1.3	

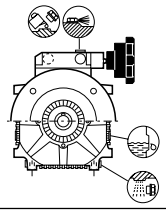
Oil Donax TA (2000-3000 hrs.)

VD 3 F_ VD 5.5 F	2.8	[l]
VD 3 U_ / VRD 3 U_ VD 5.5 U / VRD 5.5 U_	3.0	

Oil Donax TA (2000-3000 hrs.)

V 10

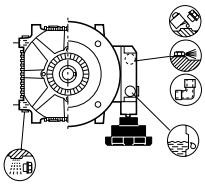
B3



V 10 F V 10 U_ / VR 10	1.8	[l]
VD 10 F VD 10 U_ / VRD 10 U_	2.0	

Oil Donax TA (2000-3000 hrs.)

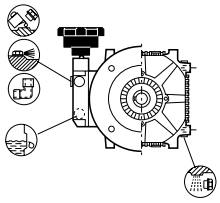
B6



V 10 F V 10 U_ / VR 10	1.8	[l]
VD 10 F VD 10 U_ / VRD 10 U_	2.0	

Oil Donax TA (2000-3000 hrs.)

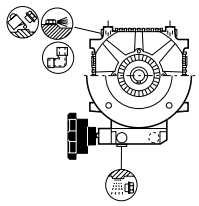
B7



V 10 F V 10 U_ / VR 10	1.8	[l]
VD 10 F VD 10 U_ / VRD 10 U_	2.0	

Oil Donax TA (2000-3000 hrs.)

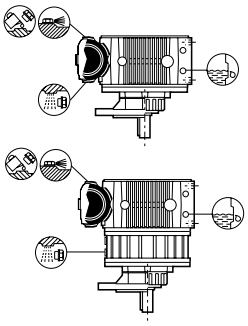
B8



V 10 F V 10 U_ / VR 10	2.1	[l]
VD 10 F VD 10 U_ / VRD 10 U_	2.1	

Oil Donax TA (2000-3000 hrs.)

V5



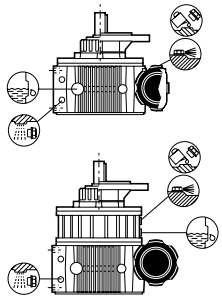
V 10 F V 10 U_ / VR 10	3.2	[l]

Oil Donax TA (2000-3000 hrs.)

VD 10 F VD 10 U_ / VRD 10	8.5	[l]

Oil Donax TA (2000-3000 hrs.)

V6

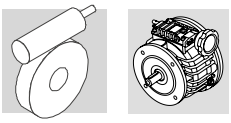


V 10 F V 10 U_ / VR 10	2.8	[l]

Oil Donax TA (2000-3000 hrs.)

VD 10 F VD 10 U_ / VRD 10	7.0	[l]

Oil Donax TA (2000-3000 hrs.)



24.7 - Posizioni di montaggio e orientamento morsettiera

Le tabelle seguenti evidenziano le posizioni che può assumere il variatore rispetto alla posizione di montaggio del riduttore.
In fase di ordine è necessario specificare oltre alla posizione di montaggio del riduttore anche la posizione del variatore e l'orientamento della morsettiera (W,N,E,S) scegliendo fra le alternative illustrate nelle tabelle.

La tabella (F10) facilita l'interpretazione delle varie posizioni di montaggio riportate.

24.7 - Mounting position and terminal box angular location

The following tables show the mounting positions of the variator depending on reducer mounting position.
Reducer mounting position and variator arrangement must be specified on order, as well as terminal board arrangement (W, N, E, S). Choose from the options shown in the tables.

Table (F10) provides examples of the various mounting positions for better clarity.

24.7 - Einbaulagen und lage des klemmenkastens

Die Tabellen stellen die Positionen dar, die das Verstellgetriebe den Einbaulagen des Getriebes gegenüber einnehmen kann.
In der Auftragsphase muß daher über die Montageposition des Getriebes hinaus, auch die Lage des Verstellgetriebes und die Ausrichtung der Klemmenleiste (W, N, E, S) angegeben werden, die unter den in der Tabelle angegebenen Möglichkeiten ausgewählt werden können.

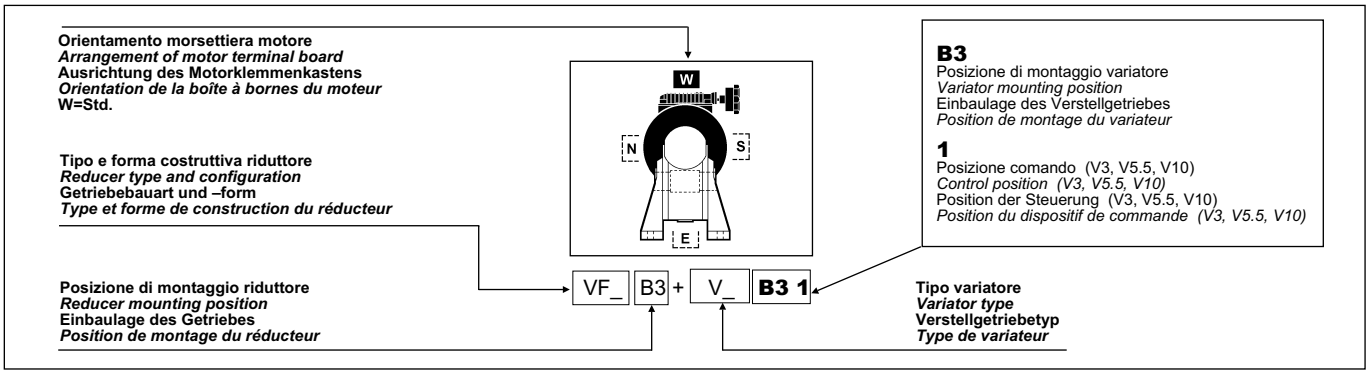
Die Tabelle (F10) erleichtert die Auslegung der verschiedenen, dargestellten Einbaulagen.

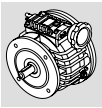
24.7 - Positions de montage et orientation boite a borne

Les tableaux suivantes indiquent les positions possibles du variateur par rapport à la position de montage du réducteur.
Au moment de la commande, il est nécessaire de préciser la position de montage du réducteur ainsi que la position du variateur et l'orientation de la boîte à bornes (W,N,E,S), en choisissant parmi les alternatives indiquées dans les tableaux.

Le tableau (F10) facilite l'interprétation des différentes positions de montage indiquées.

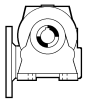
(F10)

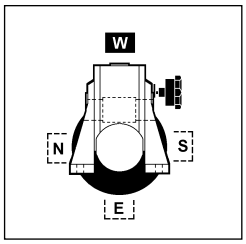




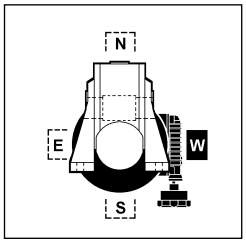
(F10)

VF_N **B3**

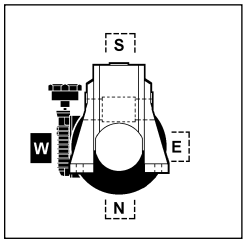




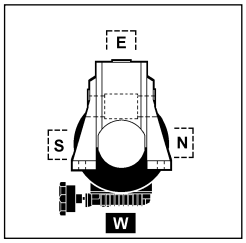
VF_ B3 + V_ **B3 1**



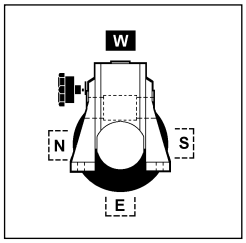
VF_ B3 + V_ **B6 1**



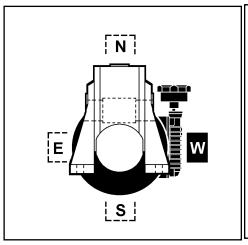
VF_ B3 + V_ **B7 1**



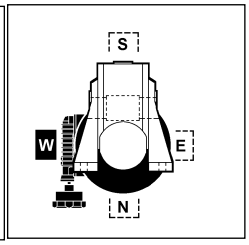
VF_ B3 + V_ **B8 1**



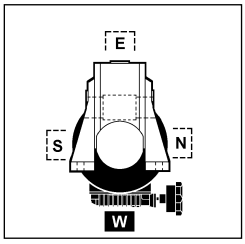
VF_ B3 + V_ **B3 2**



VF_ B3 + V_ **B6 2**

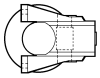


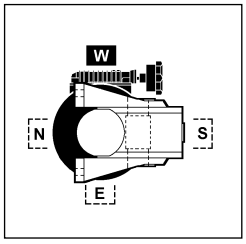
VF_ B3 + V_ **B7 2**



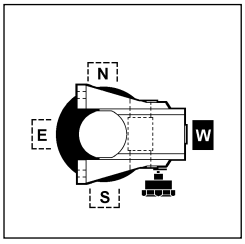
VF_ B3 + V_ **B8 2**

VF_N **B6**

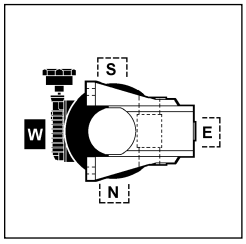




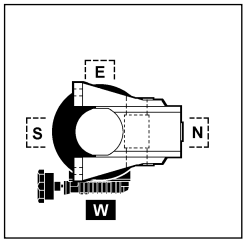
VF_ B6 + V_ **B3 1**



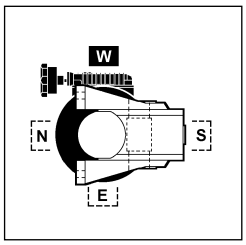
VF_ B6 + V_ **B6 1**



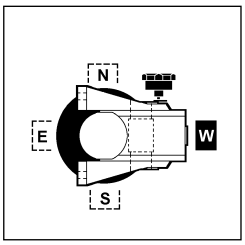
VF_ B6 + V_ **B7 1**



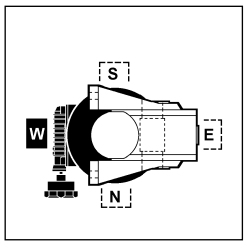
VF_ B6 + V_ **B8 1**



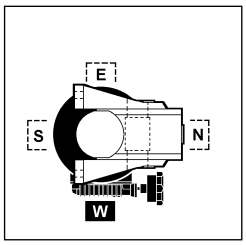
VF_ B6 + V_ **B3 2**



VF_ B6 + V_ **B6 2**

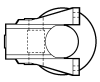


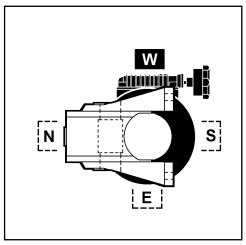
VF_ B6 + V_ **B7 2**



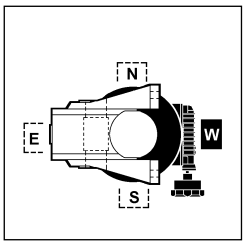
VF_ B6 + V_ **B8 2**

VF_N **B7**

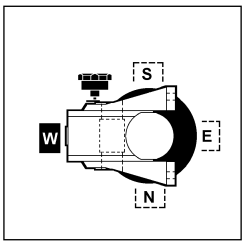




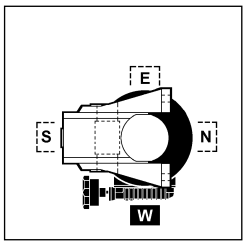
VF_ B7 + V_ **B3 1**



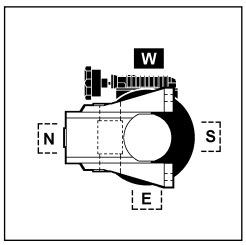
VF_ B7 + V_ **B6 1**



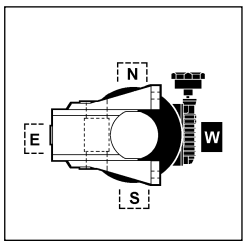
VF_ B7 + V_ **B7 1**



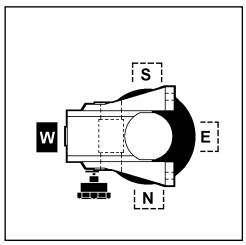
VF_ B7 + V_ **B8 1**



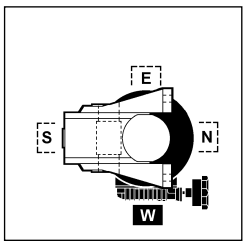
VF_ B7 + V_ **B3 2**



VF_ B7 + V_ **B6 2**



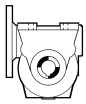
VF_ B7 + V_ **B7 2**

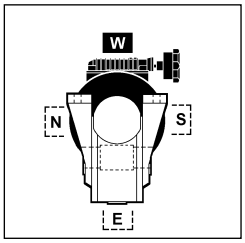


VF_ B7 + V_ **B8 2**

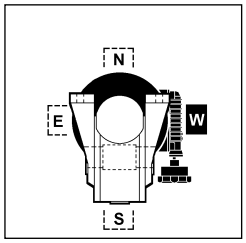
(F11)

VF_N B8

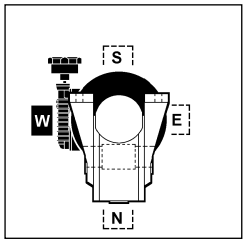




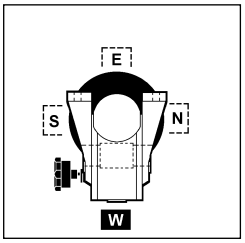
VF_ B8 + V_ **B3 1**



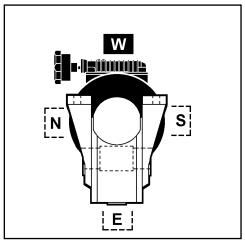
VF_ B8 + V_ **B6 1**



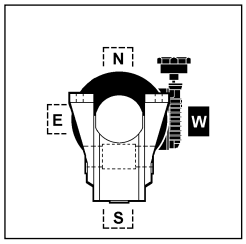
VF_ B8 + V_ **B7 1**



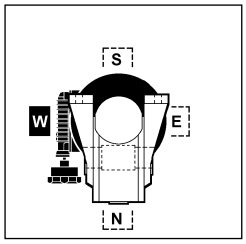
VF_ B8 + V_ **B8 1**



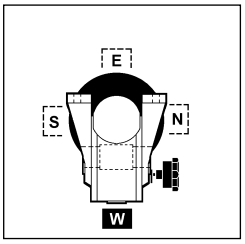
VF_ B8 + V_ **B3 2**



VF_ B8 + V_ **B6 2**

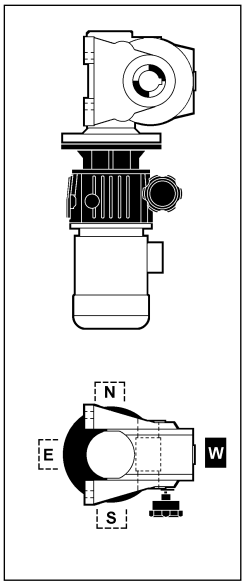


VF_ B8 + V_ **B7 2**

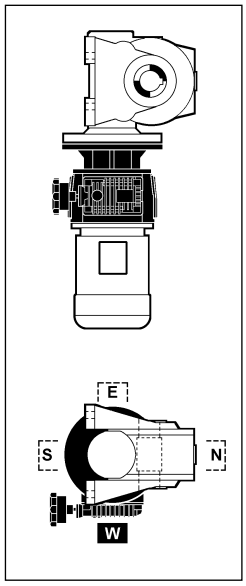


VF_ B8 + V_ **B8 2**

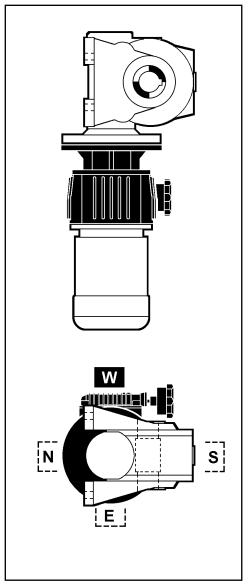
VF_N V5



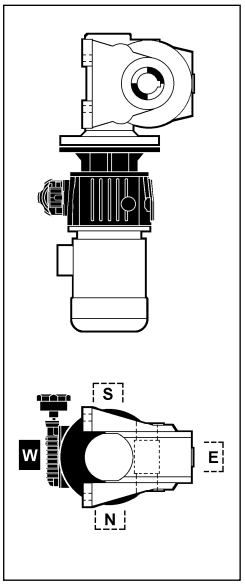
VF_ V5 + V_ **V6 1**



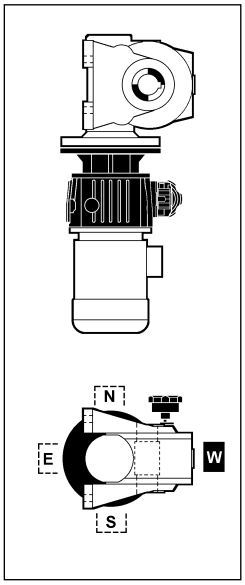
VF_ V5 + V_ **V61 1**



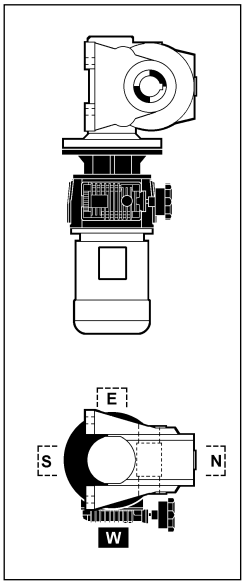
VF_ V5 + V_ **V63 1**



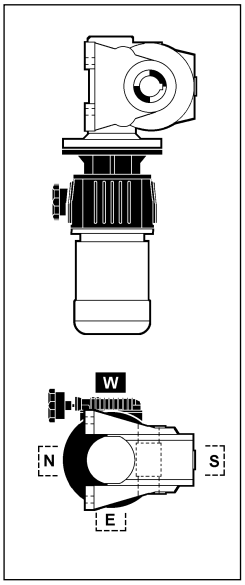
VF_ V5 + V_ **V62 1**



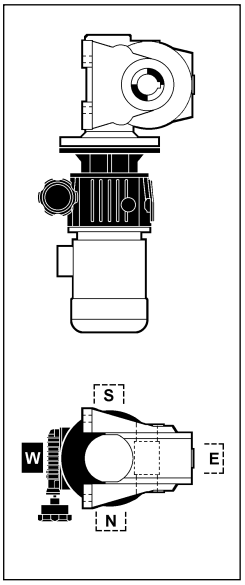
VF_ V5 + V_ **V6 2**



VF_ V5 + V_ **V61 2**



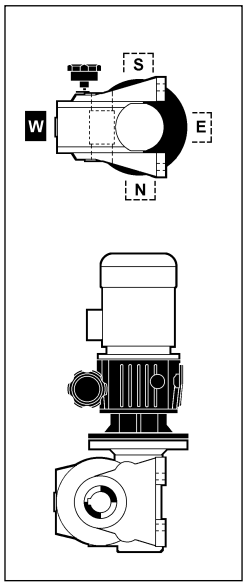
VF_ V5 + V_ **V63 2**



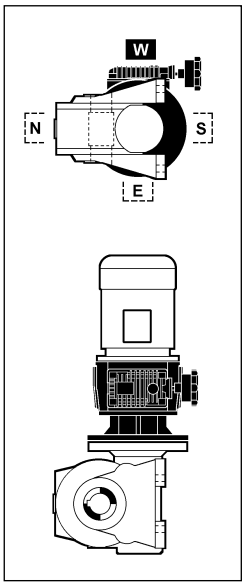
VF_ V5 + V_ **V62 2**

(F12)

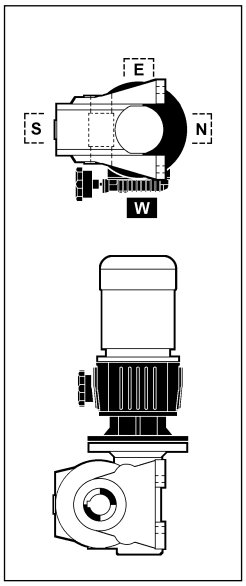
VF_N **V6**



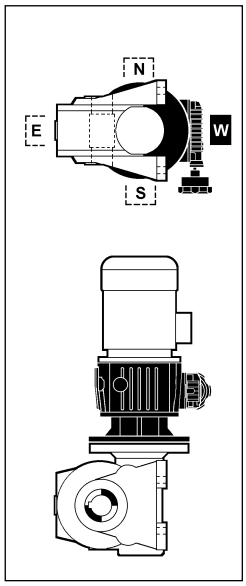
VF_ V6 + V_ **V5 1**



VF_ V6 + V_ **V51 1**



VF_ V6 + V_ **V53 1**



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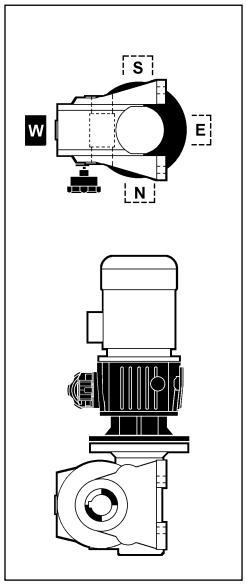
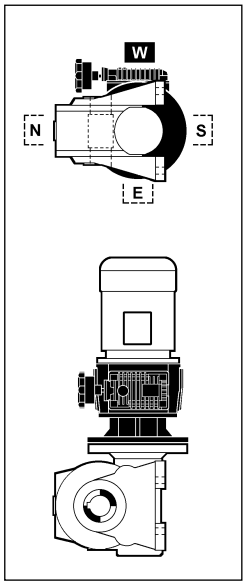
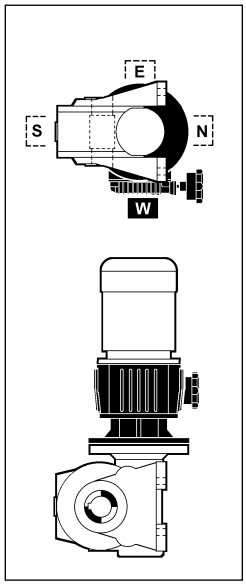


VF_ V6 + V_ **V5 2**



VF_ V6 + V_ **V51 2**



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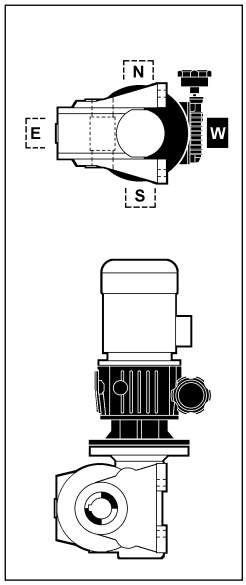
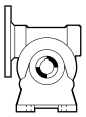
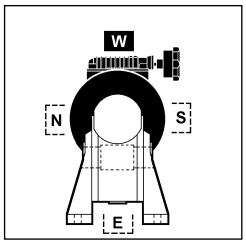


VF_ V6 + V_ **V52 2**

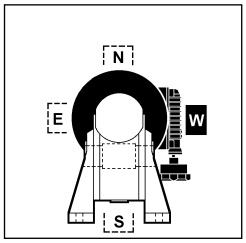
(F13)

VF_A **VF_U** **B3**

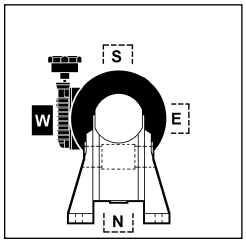




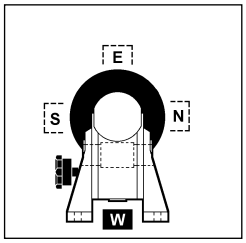
VF_ B3 + V_ **B3 1**



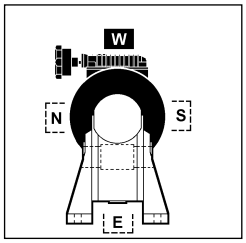
VF_ B3 + V_ **B6 1**



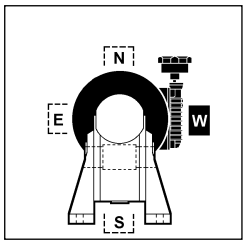
VF_ B3 + V_ **B7 1**



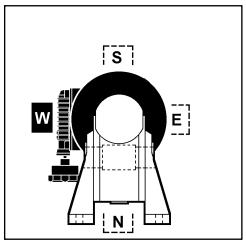
VF_ B3 + V_ **B8 1**



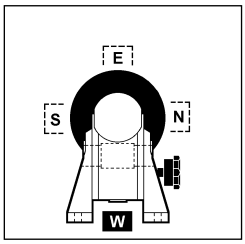
VF_ B3 + V_ **B3 2**



VF_ B3 + V_ **B6 2**

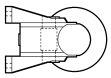


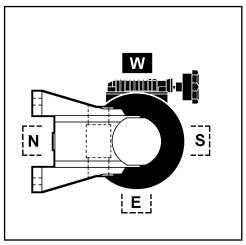
VF_ B3 + V_ **B7 2**



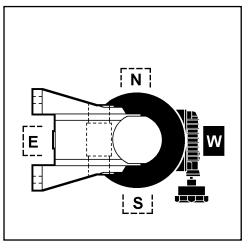
VF_ B3 + V_ **B8 2**

VF_A **VF_U** **B6**





VF_ B6 + V_ **B3 1**



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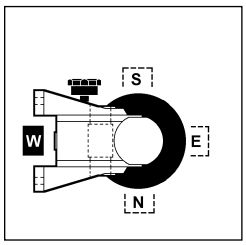

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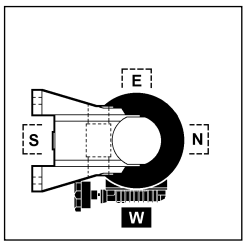
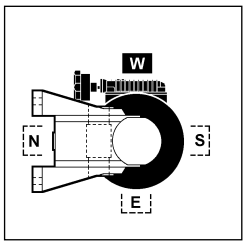
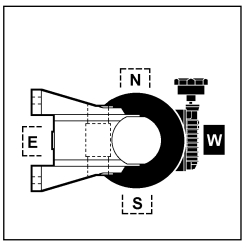


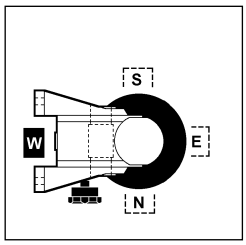
VF_ B6 + V_ **B8 1**



VF_ B6 + V_ **B3 2**



VF_ B6 + VG_ **B6 2**



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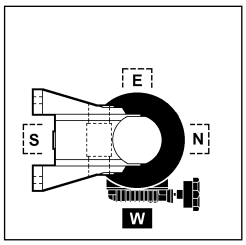
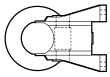
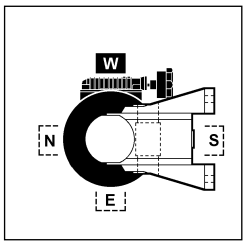


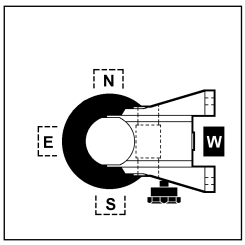
VF_ B6 + V_ **B8 2**

VF_A **VF_U** **B7**

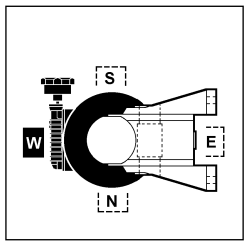




VF_ B7 + V_ **B3 1**



VF_ B7 + V_ **B6 1**



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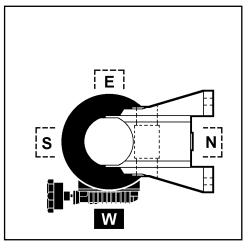

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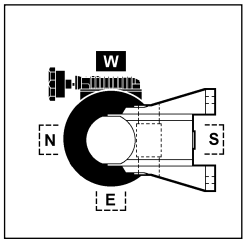
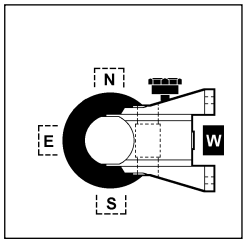


VF_ B7 + V_ **B3 2**



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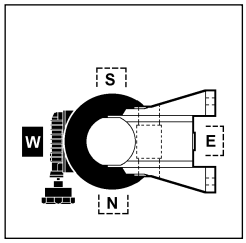
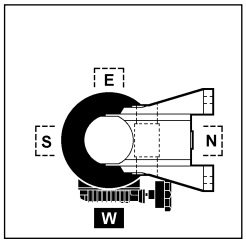


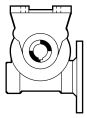
VF_ B7 + V_ **B7 2**

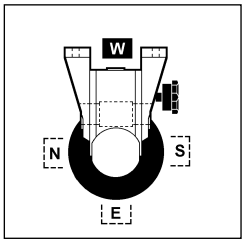


VF_ B7 + V_ **B8 2**

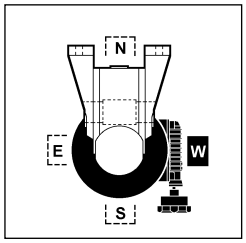
(F14)

VF_A **VF_U** **B8**





VF_ B8 + V_ **B3 1**



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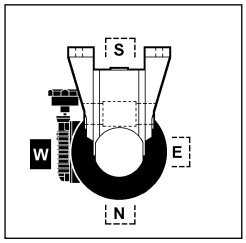
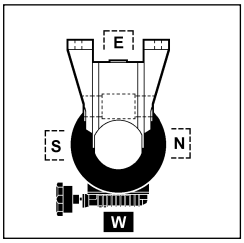


VF_ B8 + V_ **B7 1**



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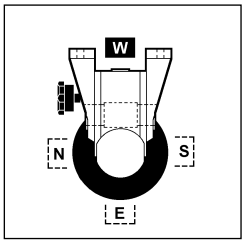
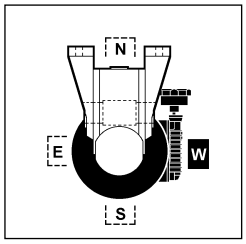


VF_ B8 + V_ **B3 2**



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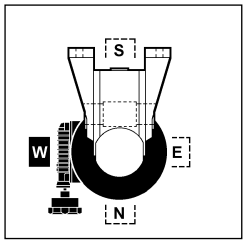

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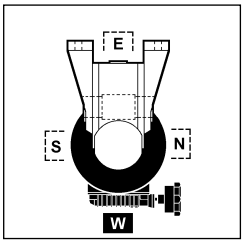
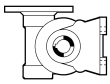
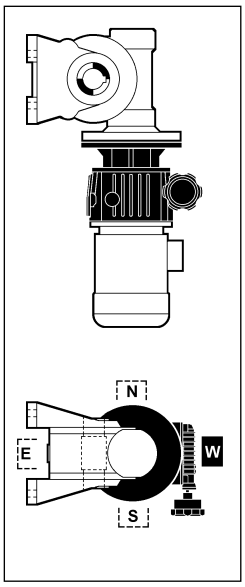


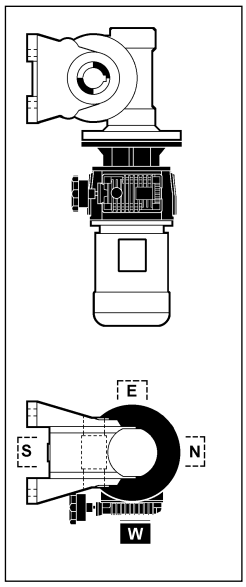
VF_ B8 + V_ **B8 2**

VF_A **VF_U** **V5**

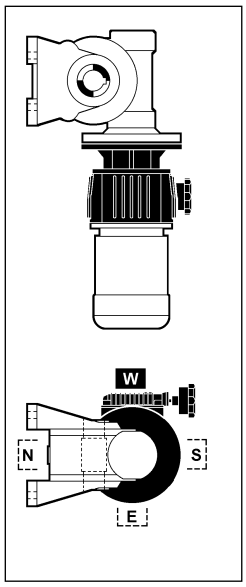




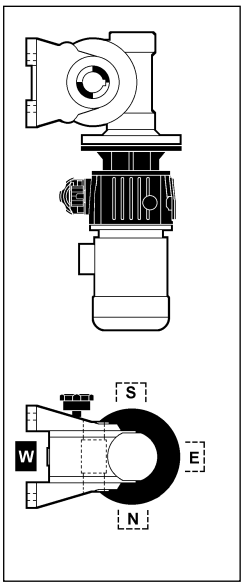
VF_ V5 + V_ **V6 1**



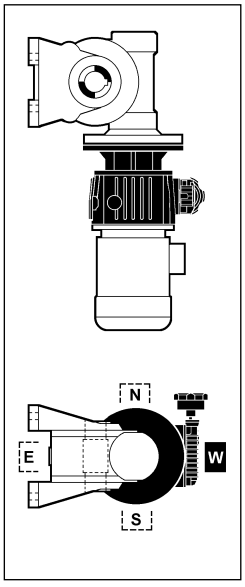
VF_ V5 + V_ **V61 1**



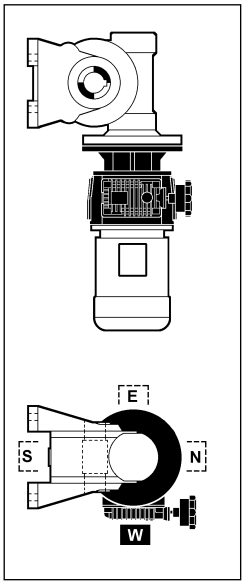
VF_ V5 + V_ **V63 1**



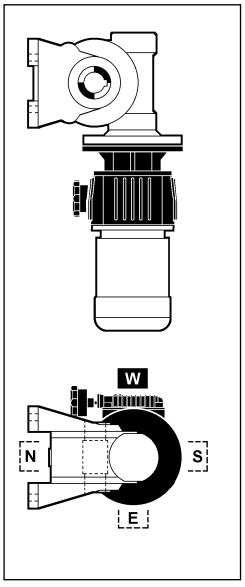
VF_ V5 + V_ **V62 1**



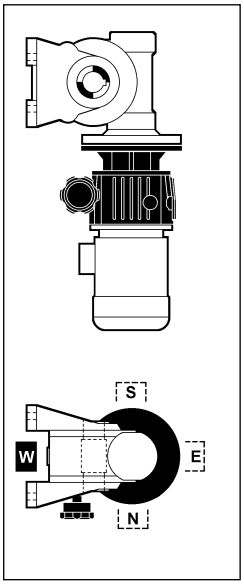
VF_ V5 + V_ **V6 2**



VF_ V5 + V_ **V61 2**



VF_ V5 + V_ **V63 2**



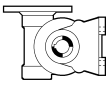
VF_ V5 + V_ **V62 2**

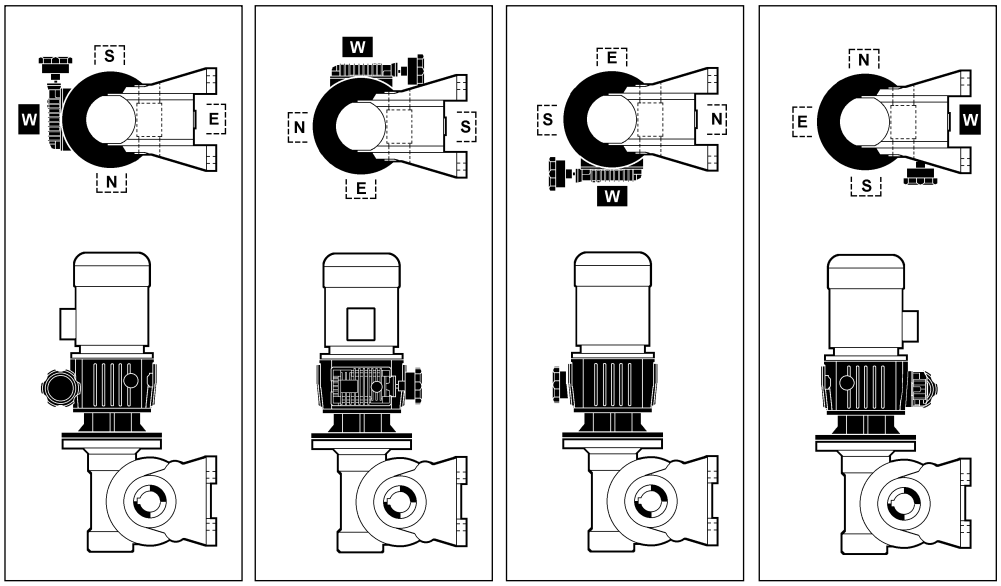
(F15)

VF_A

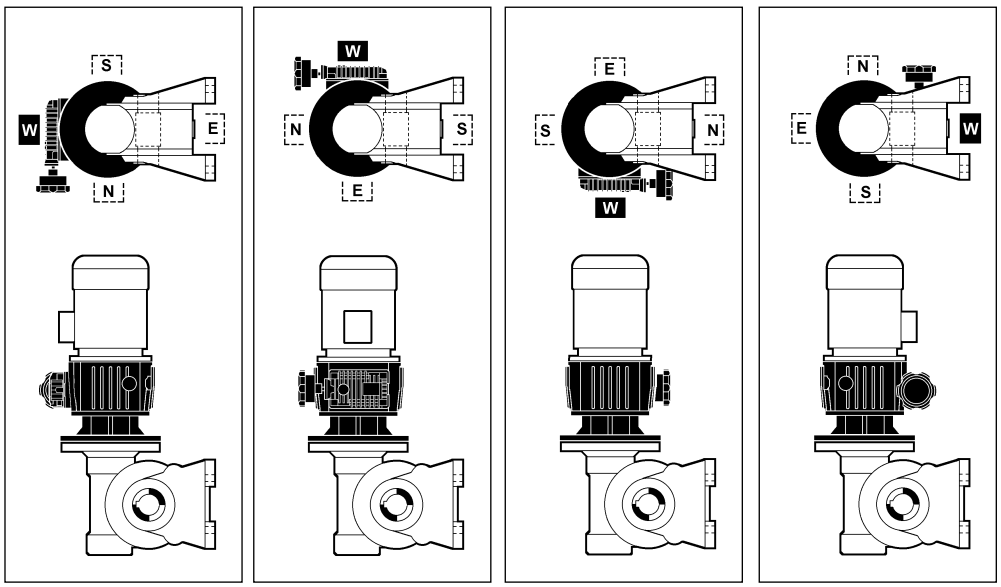
VF_U

V6





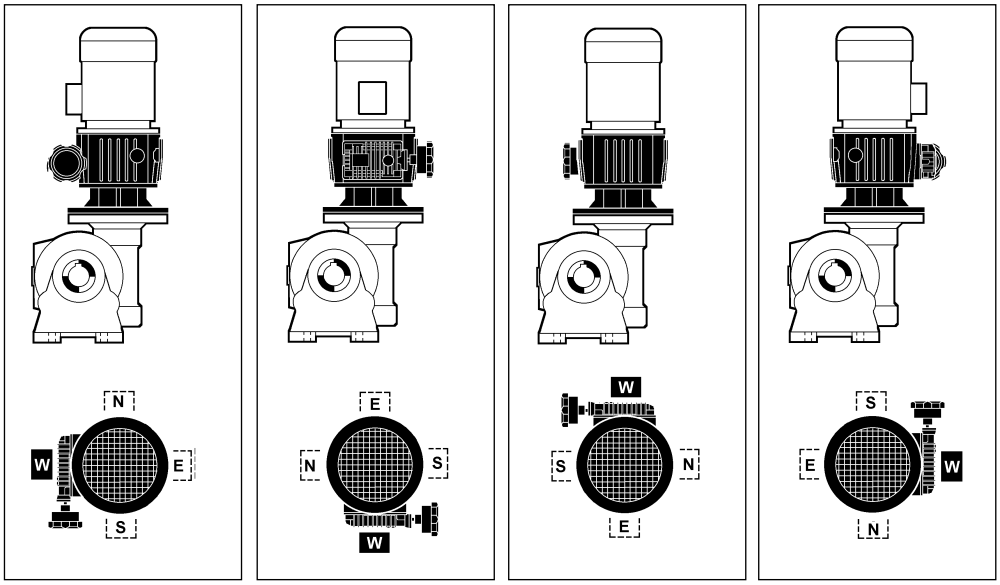
VF_ V6 + V_ **V5 1** | VF_ V6 + V_ **V51 1** | VF_ V6 + V_ **V53 1** | VF_ V6 + V_ **V52 1**



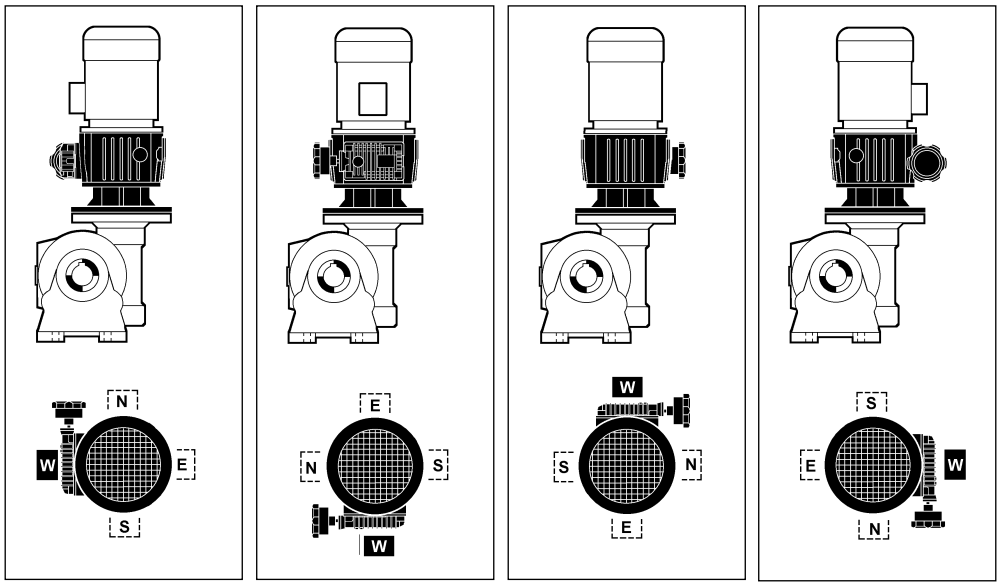
VF_ V6 + V_ **V5 2** | VF_ V6 + V_ **V51 2** | VF_ V6 + V_ **V53 2** | VF_ V6 + V_ **V52 2**

(F16)

VF_V **B3**



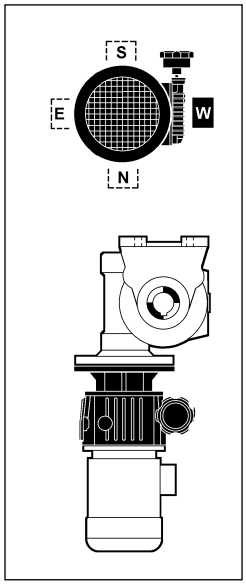
VF_ B3 + V_ **V5 1** VF_ B3 + V_ **V51 1** VF_ B3 + V_ **V53 1** VF_ B3 + V_ **V52 1**



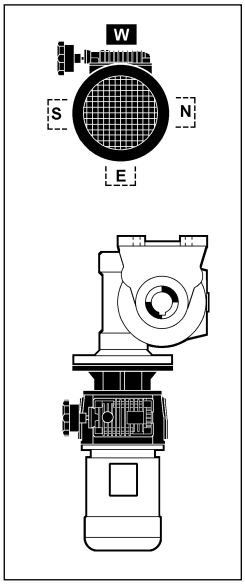
VF_ B3 + V_ **V5 2** VF_ B3 + G_ **V51 2** VF_ B3 + V_ **V53 2** VF_ B3 + V_ **V52 2**

(F17)

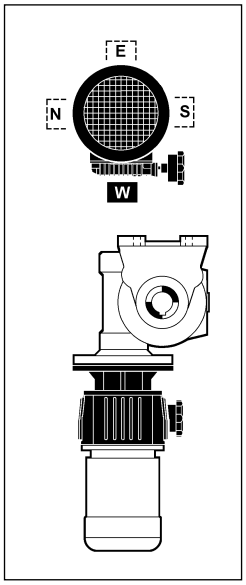
VF_V **B8**



VF_ B8 + V_ **V6 1**



VF_ B8 + V_ **V61 1**



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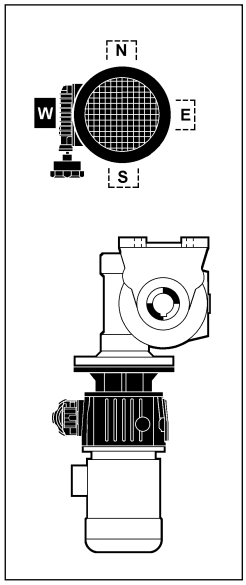
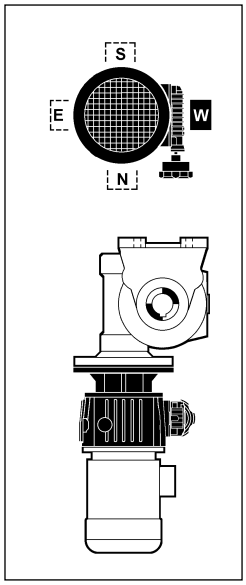
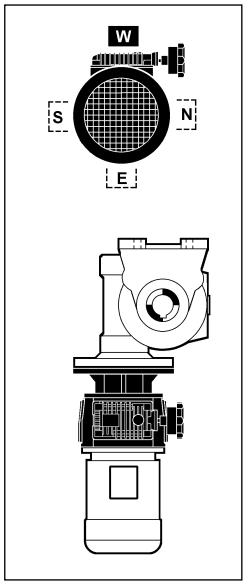


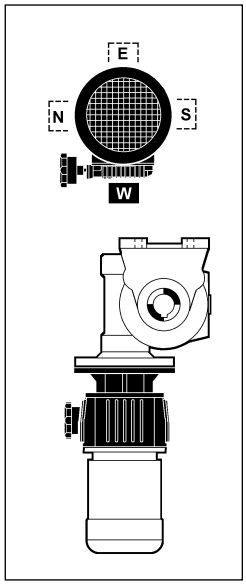
VF_ B8 + V_ **V62 1**



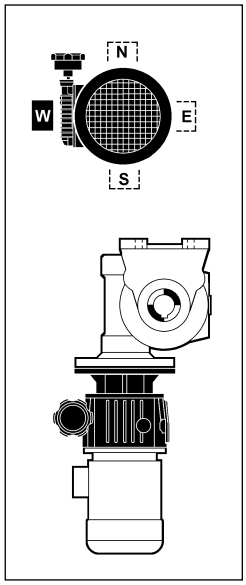
VF_ B8 + V_ **V6 2**



VF_ B8 + V_ **V61 2**



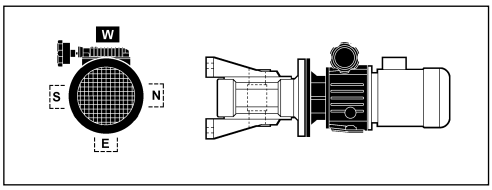
VF_ B8 + V_ **V63 2**



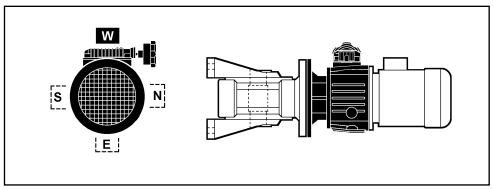
VF_ B8 + V_ **V62 2**

(F18)

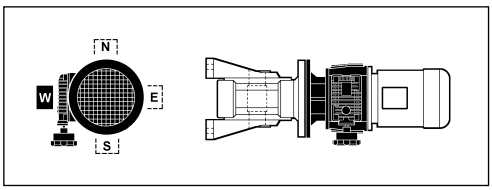
VF_V **B6**



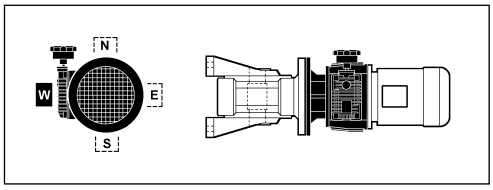
VF_ B6 + V_ **B3 1**



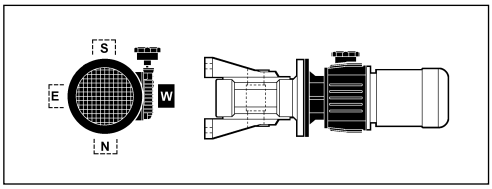
VF_ B6 + V_ **B3 2**



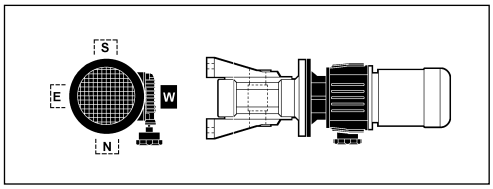
VF_ B6 + V_ **B6 1**



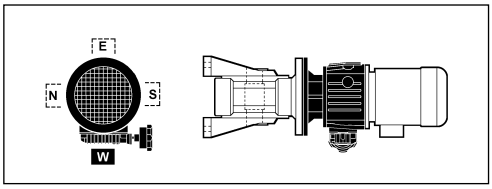
VF_ B6 + V_ **B6 2**



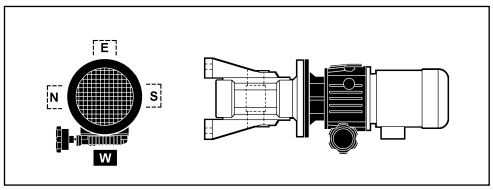
VF_ B6 + V_ **B7 1**



VF_ B6 + V_ **B7 2**

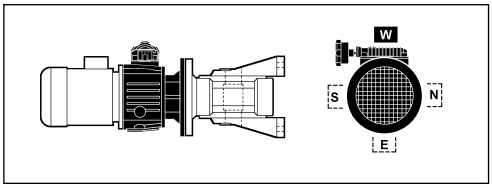


VF_ B6 + V_ **B8 1**

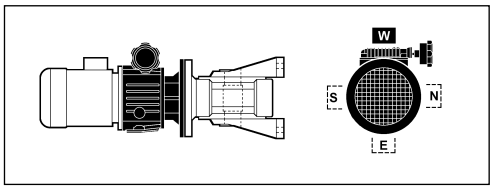


VF_ B6 + V_ **B8 2**

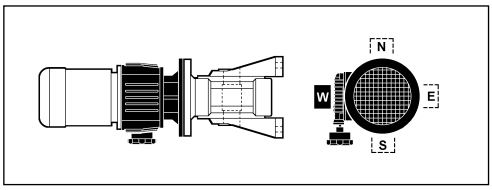
VF_V **B7**



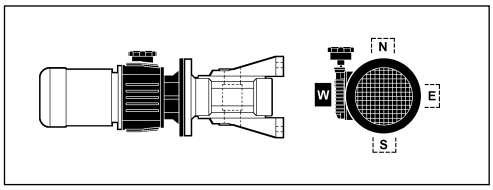
VF_ B7 + V_ **B3 1**



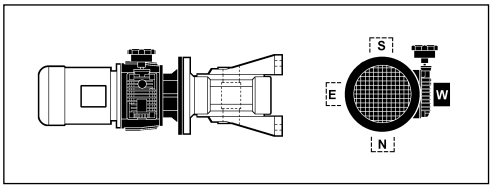
VF_ B7 + V_ **B3 2**



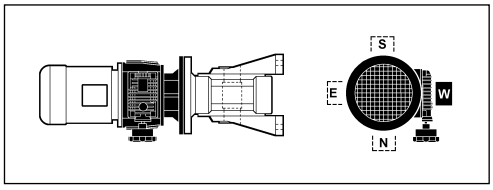
VF_ B7 + V_ **B6 1**



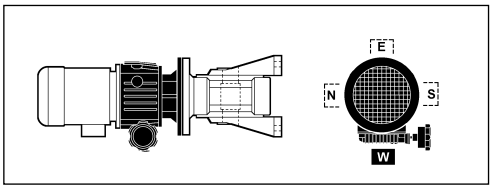
VF_ B7 + V_ **B6 2**



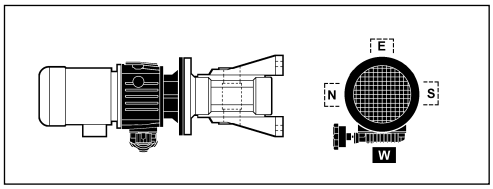
VF_ B7 + V_ **B7 1**



VF_ B7 + V_ **B7 2**



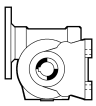
VF_ B7 + V_ **B8 1**

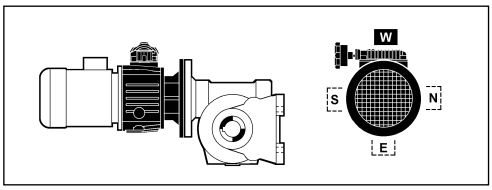


VF_ B7 + V_ **B8 2**

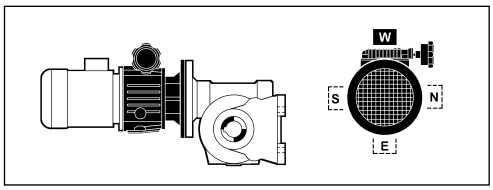
(F19)

VF_V **V5**

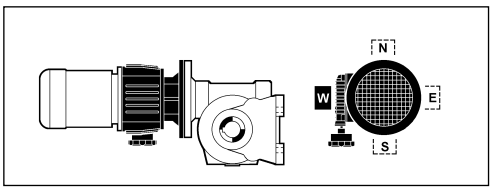




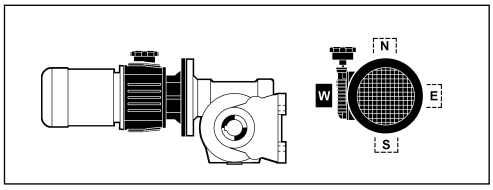
VF_ V5 + V_ **B3 1**



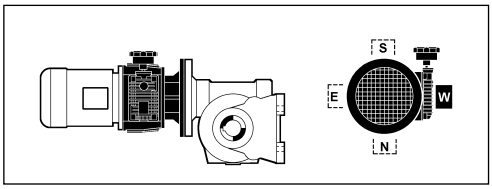
VF_ V5 + V_ **B3 2**



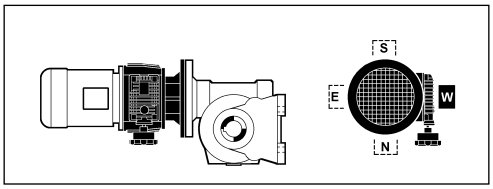
VF_ V5 + V_ **B6 1**



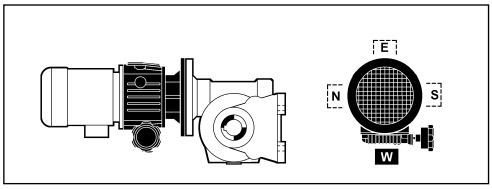
VF_ V5 + V_ **B6 2**



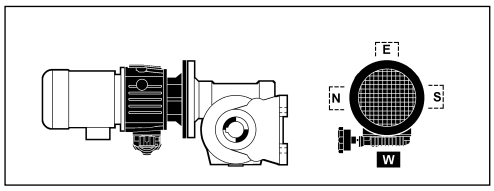
VF_ V5 + V_ **B7 1**



VF_ V5 + V_ **B7 2**

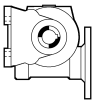


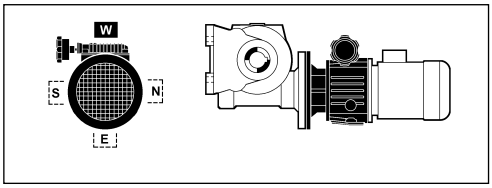
VF_ V5 + V_ **B8 1**



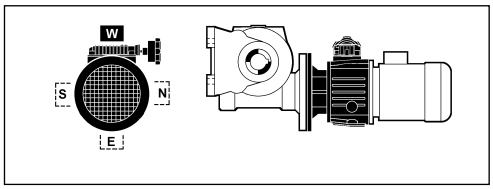
VF_ V5 + V_ **B8 2**

VF_V **V6**

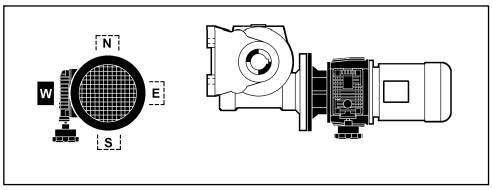




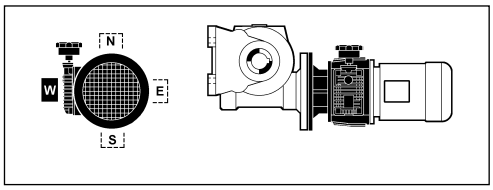
VF_ V6 + V_ **B3 1**



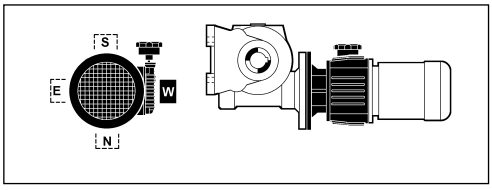
VF_ V6 + V_ **B3 2**



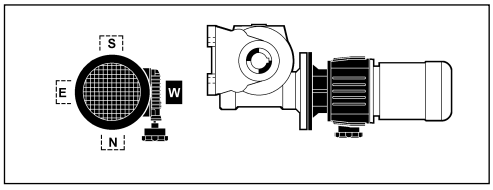
VF_ V6 + V_ **B6 1**



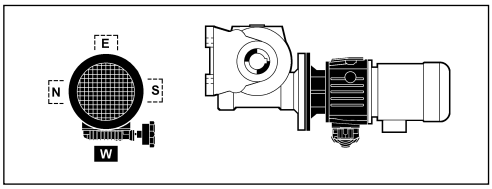
VF_ V6 + V_ **B6 2**



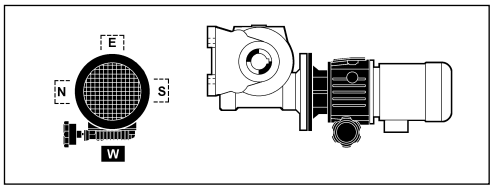
VF_ V6 + V_ **B7 1**



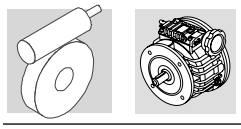
VF_ V6 + V_ **B7 2**



VF_ V6 + V_ **B8 1**



VF_ V6 + V_ **B8 2**



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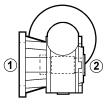
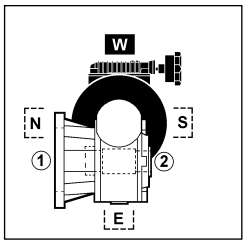
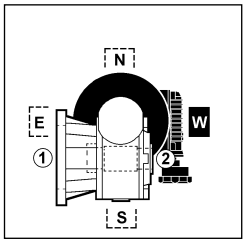
VF_F **B3**

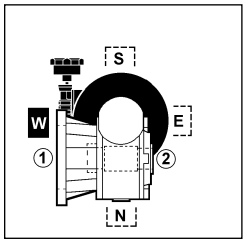




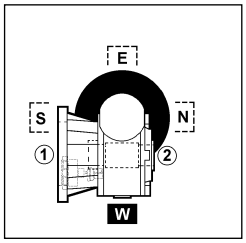
VF_ B3 + V_ **B3 1**



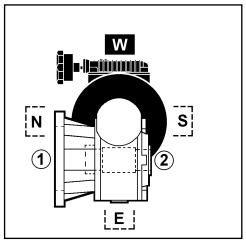
VF_ B3 + V_ **B6 1**



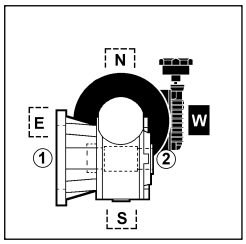
VF_ B3 + V_ **B7 1**



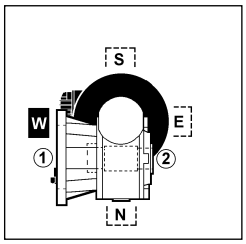
VF_ B3 + V_ **B8 1**



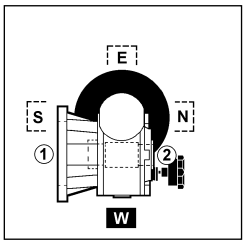
VF_ B3 + V_ **B3 2**



VF_ B3 + V_ **B6 2**

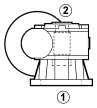


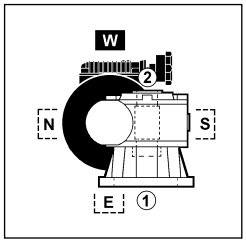
VF_ B3 + V_ **B7 2**



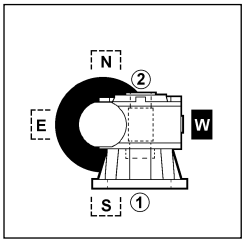
VF_ B3 + V_ **B8 2**

VF_F **B6**

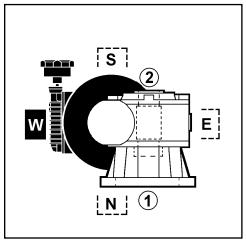




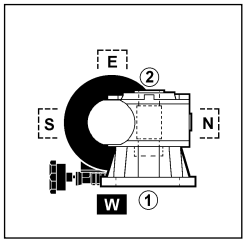
VF_ B6 + V_ **B3 1**



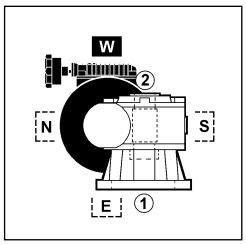
VF_ B6 + V_ **B6 1**



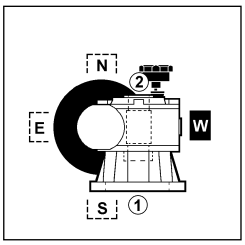
VF_ B6 + V_ **B7 1**



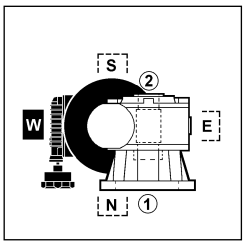
VF_ B6 + V_ **B8 1**



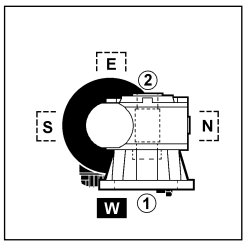
VF_ B6 + V_ **B3 2**



VF_ B6 + V_ **B6 2**

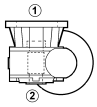


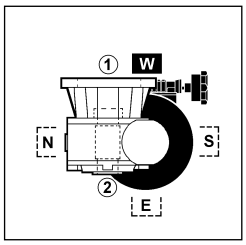
VF_ B6 + V_ **B7 2**



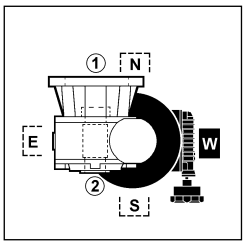
VF_ B6 + V_ **B8 2**

VF_F **B7**

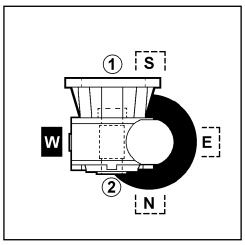




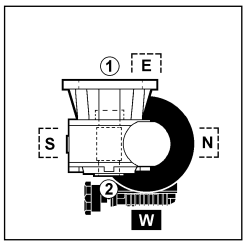
VF_ B7 + V_ **B3 1**



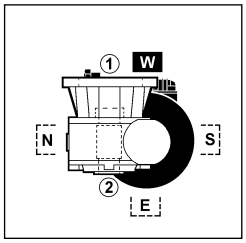
VF_ B7 + V_ **B6 1**



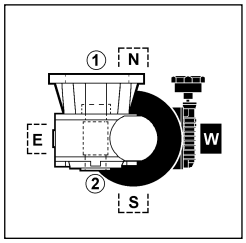
VF_ B7 + V_ **B7 1**



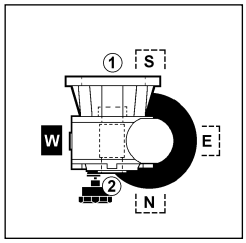
VF_ B7 + V_ **B8 1**



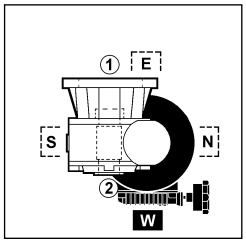
VF_ B7 + V_ **B3 2**



VF_ B7 + V_ **B6 2**



VF_ B7 + V_ **B7 2**

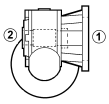


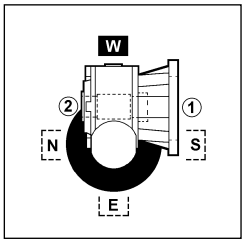
VF_ B7 + V_ **B8 2**

① ② Posizione flangia / *Flange position* / Flanschlage / *Position bride*

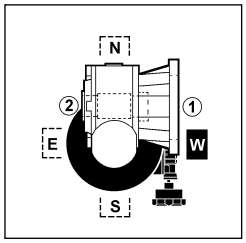
(F21)

VF_F **B8**

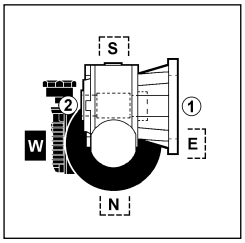




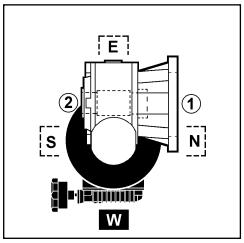
VF_ B8 + V_ **B3 1**



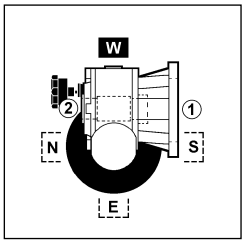
VF_ B8 + V_ **B6 1**



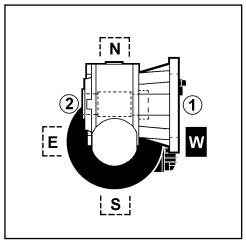
VF_ B8 + V_ **B7 1**



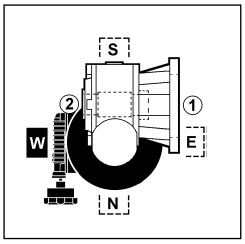
VF_ B8 + V_ **B8 1**



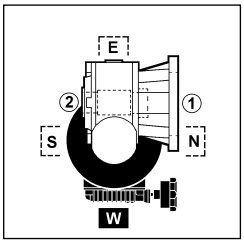
VF_ B8 + V_ **B3 2**



VF_ B8 + V_ **B6 2**

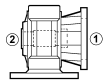


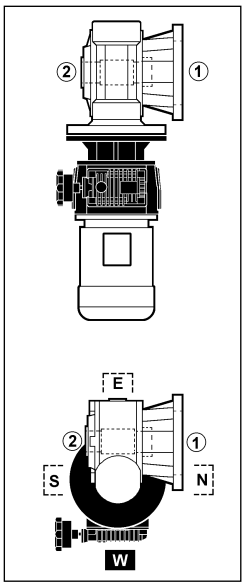
VF_ B8 + V_ **B7 2**



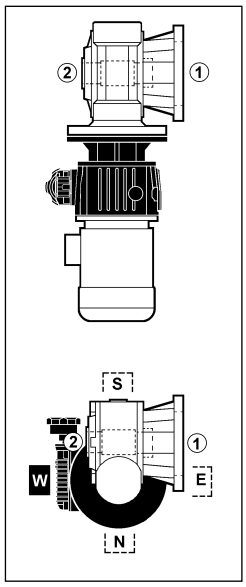
VF_ B8 + V_ **B8 2**

VF_F **V5**

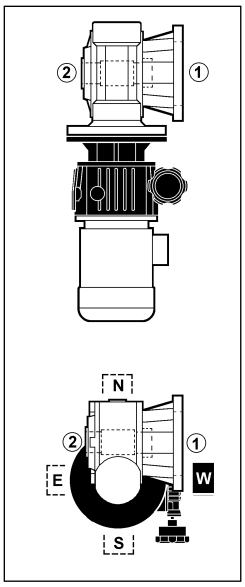




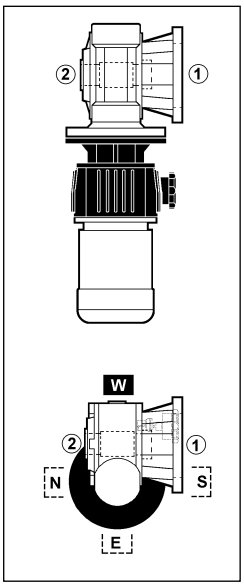
VF_ V5 + V_ **V6 1**



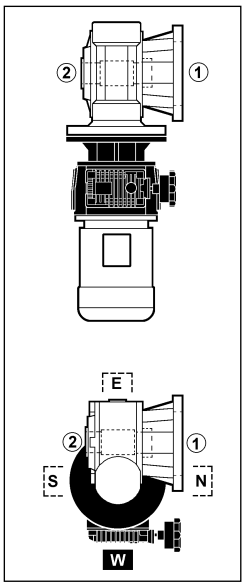
VF_ V5 + V_ **V61 1**



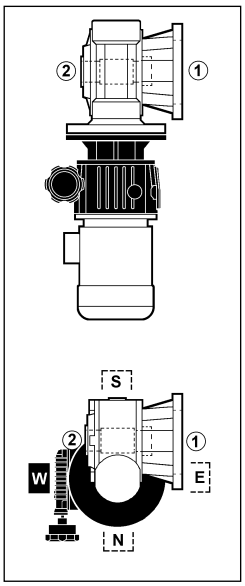
VF_ V5 + V_ **V63 1**



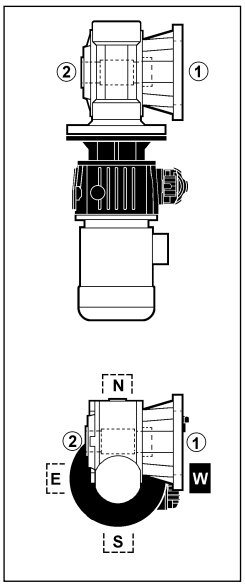
VF_ V5 + V_ **V62 1**



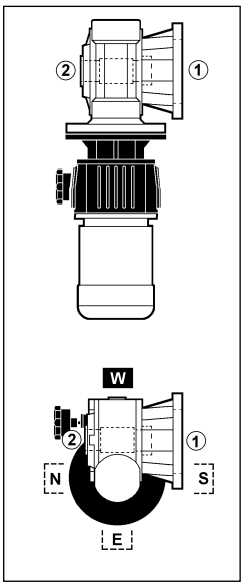
VF_ V5 + V_ **V6 2**



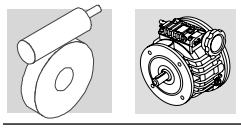
VF_ V5 + V_ **V61 2**



VF_ V5 + V_ **V63 2**

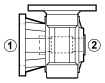


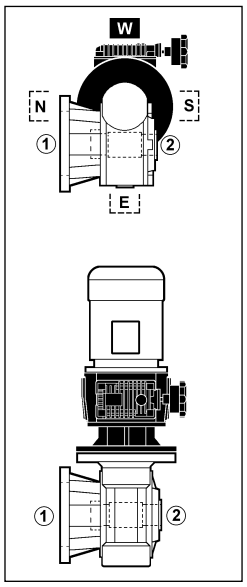
VF_ V5 + V_ **V62 2**



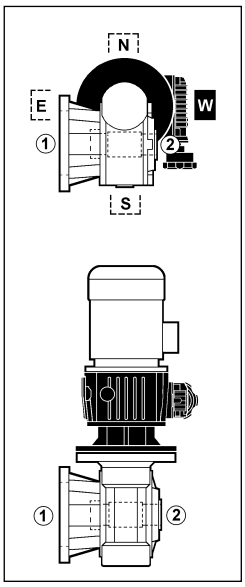
(F22)

VF_F **V6**

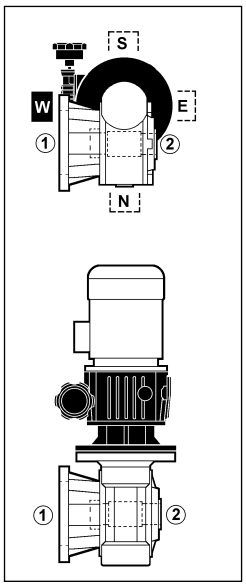




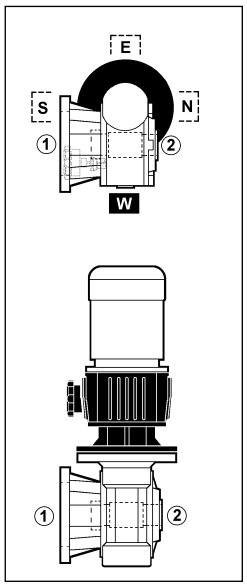
VF_ V6 + V_ **V5 1**



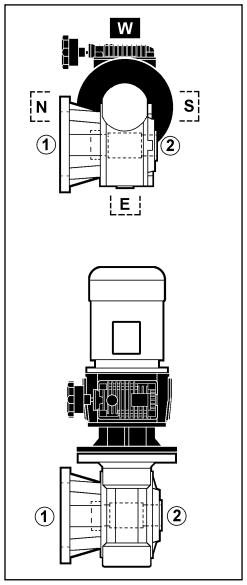
VF_ V6 + V_ **V51 1**



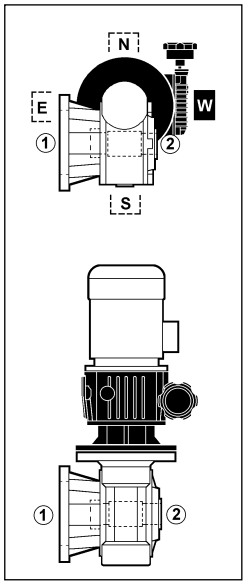
VF_ V6 + V_ **V53 1**



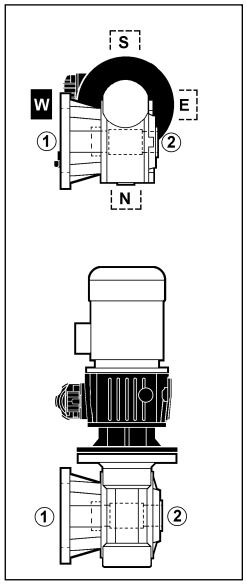
VF_ V6 + V_ **V52 1**



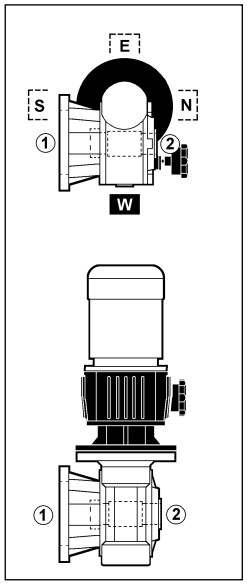
VF_ V6 + V_ **V5 2**



VF_ V6 + V_ **V51 2**



VF_ V6 + V_ **V53 2**

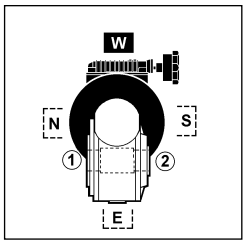


VF_ V6 + V_ **V52 2**

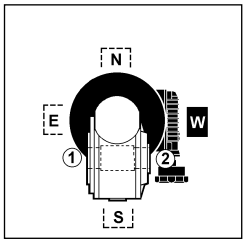
① ② Posizione flangia / *Flange position* / Flanschlage / *Position bride*

(F23)

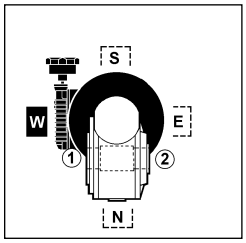
VF_P B3



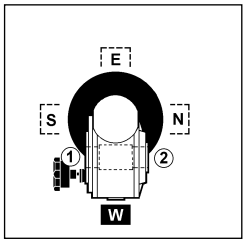
VF_ B3 + V_ **B3 1**



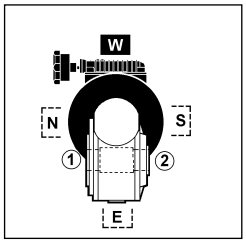
VF_ B3 + V_ **B6 1**



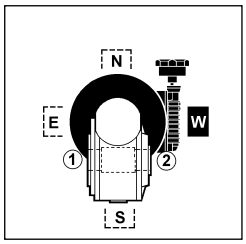
VF_ B3 + V_ **B7 1**



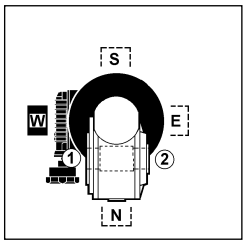
VF_ B3 + V_ **B8 1**



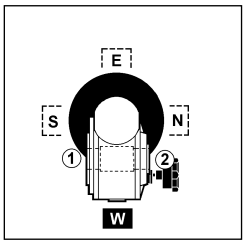
VF_ B3 + V_ **B3 2**



VF_ B3 + V_ **B6 2**

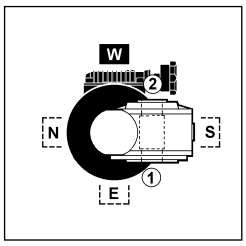


VF_ B3 + V_ **B7 2**

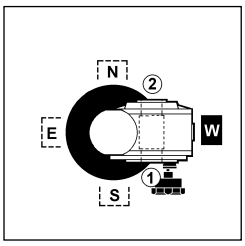


VF_ B3 + V_ **B8 2**

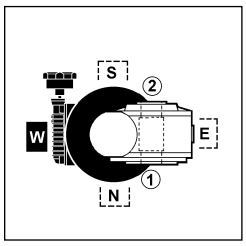
VF_P B6



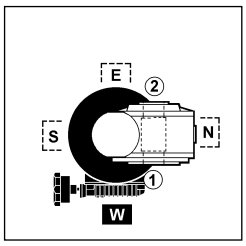
VF_ B6 + V_ **B3 1**



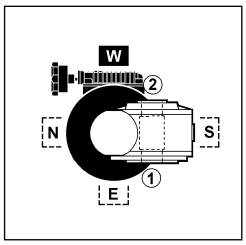
VF_ B6 + V_ **B6 1**



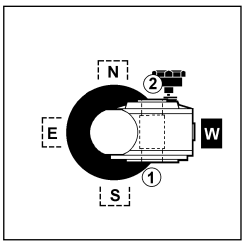
VF_ B6 + V_ **B7 1**



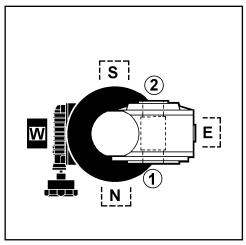
VF_ B6 + V_ **B8 1**



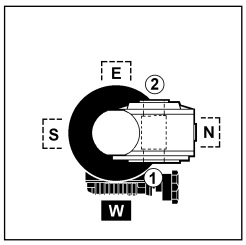
VF_ B6 + V_ **B3 2**



VF_ B6 + V_ **B6 2**

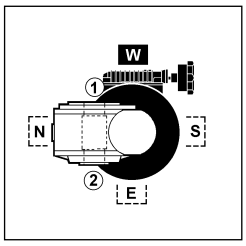


VF_ B6 + V_ **B7 2**

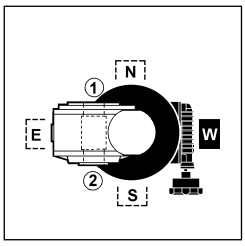


VF_ B6 + V_ **B8 2**

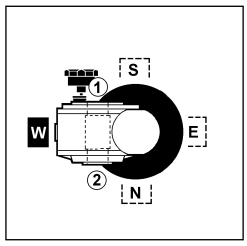
VF_P B7



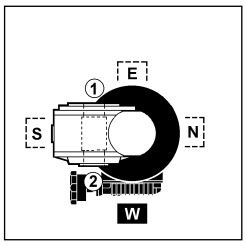
VF_ B7 + V_ **B3 1**



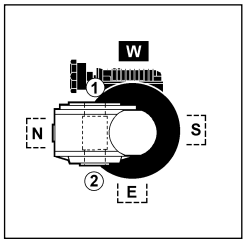
VF_ B7 + V_ **B6 1**



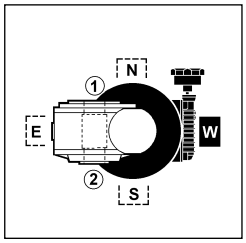
VF_ B7 + V_ **B7 1**



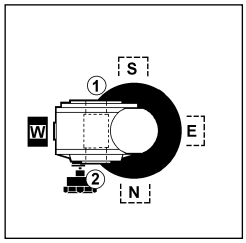
VF_ B7 + V_ **B8 1**



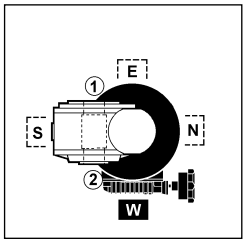
VF_ B7 + V_ **B3 2**



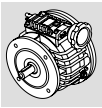
VF_ B7 + V_ **B6 2**



VF_ B7 + V_ **B7 2**

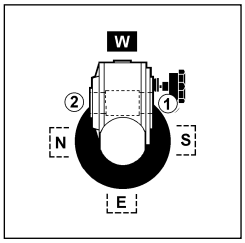


VF_ B7 + V_ **B8 2**

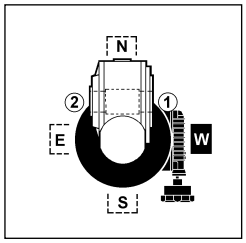


(F24)

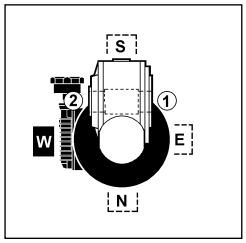
VF_P **B8**



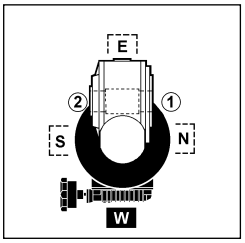
VF_ B8 + V_ **B3 1**



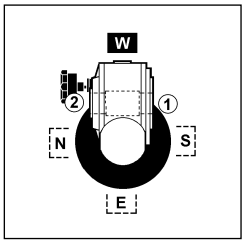
VF_ B8 + V_ **B6 1**



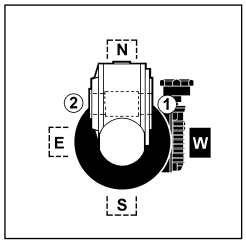
VF_ B8 + V_ **B7 1**



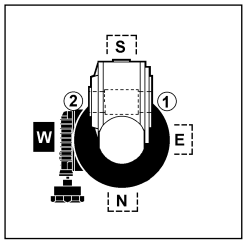
VF_ B8 + V_ **B8 1**



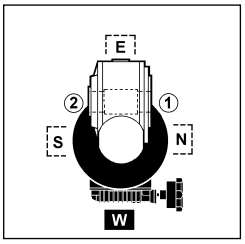
VF_ B8 + V_ **B3 2**



VF_ B8 + V_ **B6 2**

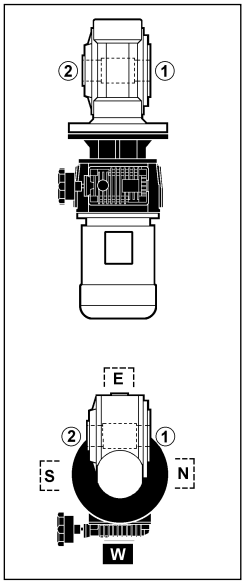


VF_ B8 + V_ **B7 2**

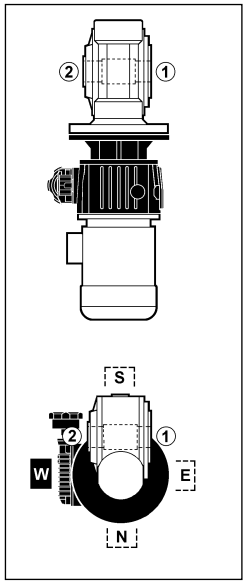


VF_ B8 + V_ **B8 2**

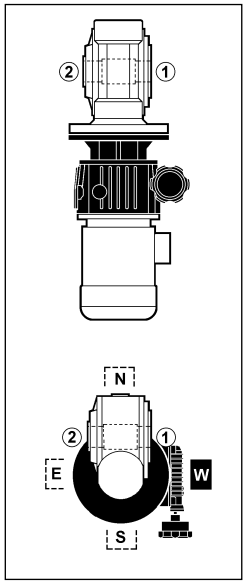
VF_P **V5**



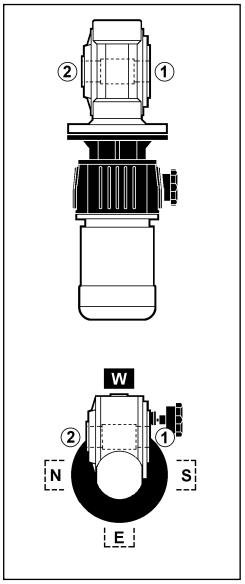
VF_ V5 + V_ **V6 1**



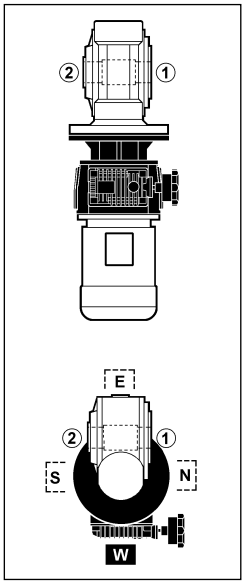
VF_ V5 + V_ **V61 1**



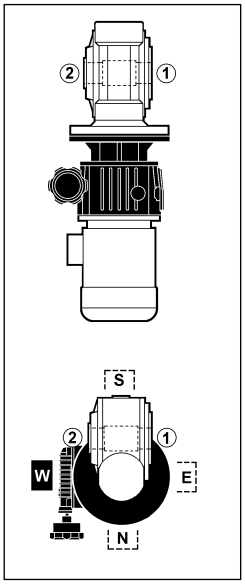
VF_ V5 + V_ **V63 1**



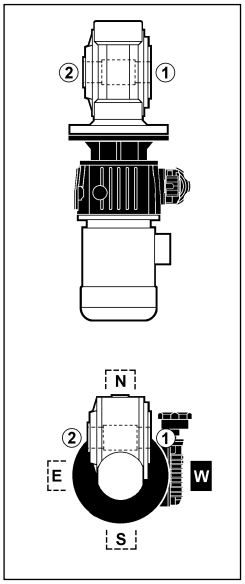
VF_ V5 + V_ **V62 1**



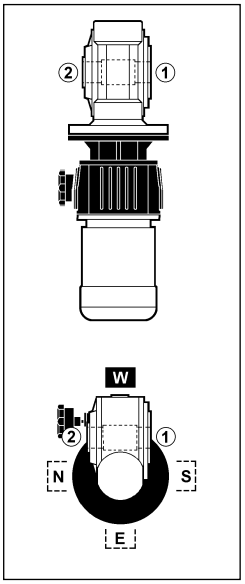
VF_ V5 + V_ **V6 2**



VF_ V5 + V_ **V61 2**



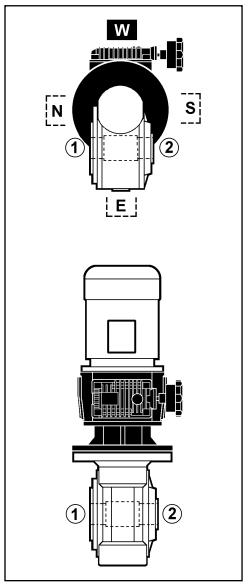
VF_ V5 + V_ **V63 2**



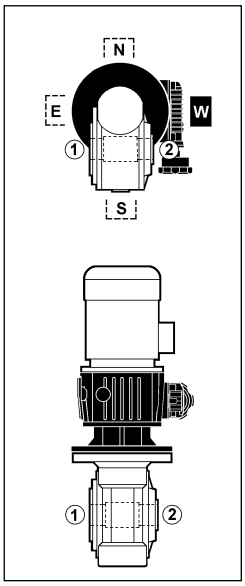
VF_ V5 + V_ **V62 2**

(F25)

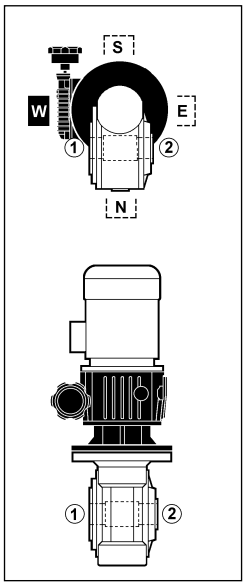
VF_P **V6**



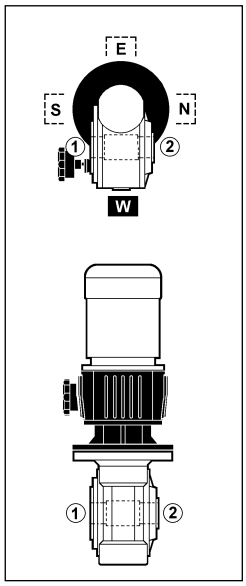
VF_ V6 + V_ **V5 1**



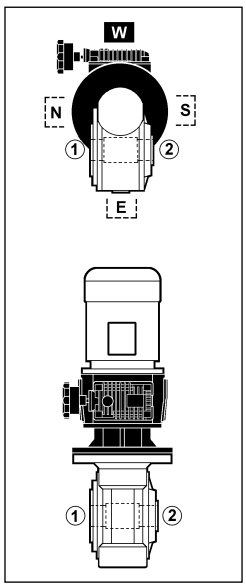
VF_ V6 + V_ **V51 1**



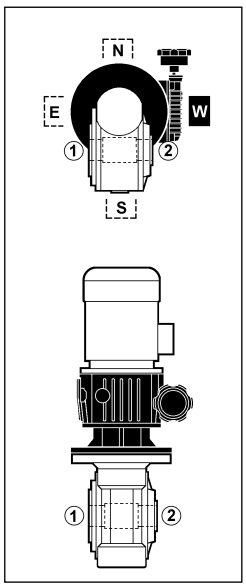
VF_ V6 + V_ **V53 1**



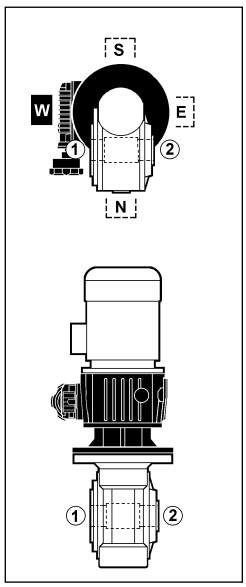
VF_ V6 + V_ **V52 1**



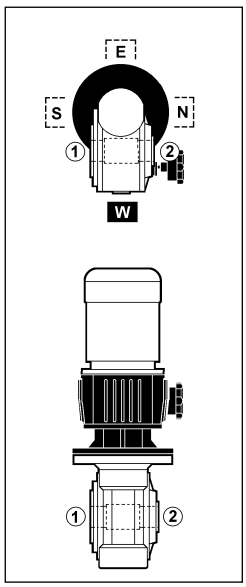
VF_ V6 + V_ **V5 2**



VF_ V6 + V_ **V51 2**

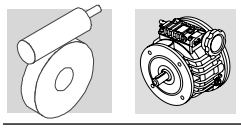


VF_ V6 + V_ **V53 2**



VF_ V6 + V_ **V52 2**

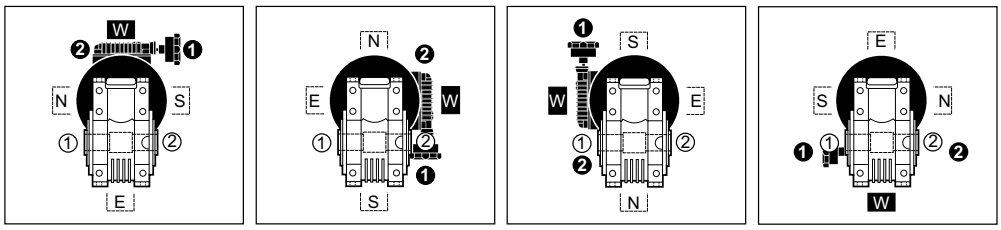
① ② Posizione flangia / *Flange position* / Flanschlage / *Position bride*



(F26)

W_U **B3**

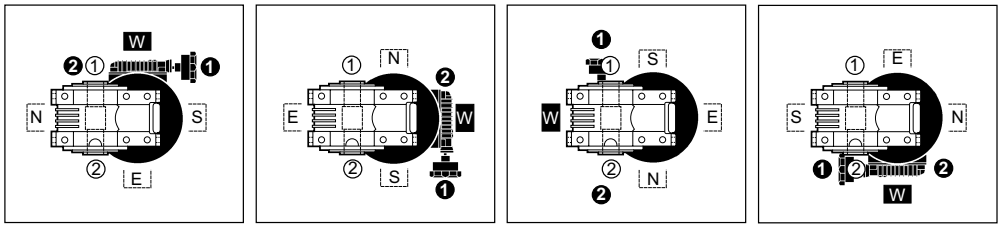
W_U_B3
W_UF_B3
W_UFC_B3



W_ B3 + V_ **B3 ❶-❷** W_ B3 + V_ **B6 ❶-❷** W_ B3 + V_ **B7 ❶-❷** W_ B3 + V_ **B8 ❶-❷**

W_U **B6**

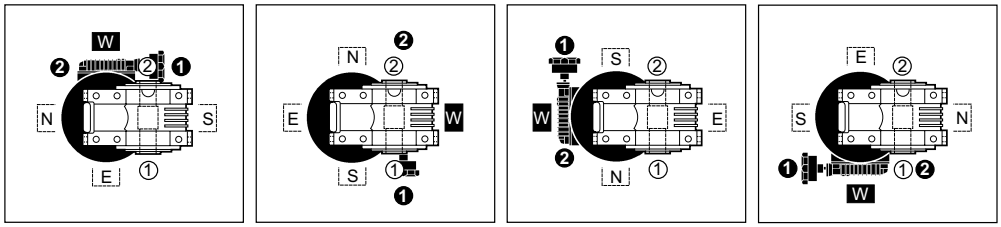
W_U_B6
W_UF_B6
W_UFC_B6



W_ B6 + V_ **B3 ❶-❷** W_ B6+ V_ **B6 ❶-❷** W_ B6+ V_ **B7 ❶-❷** W_ B6+ V_ **B8 ❶-❷**

W_U **B7**

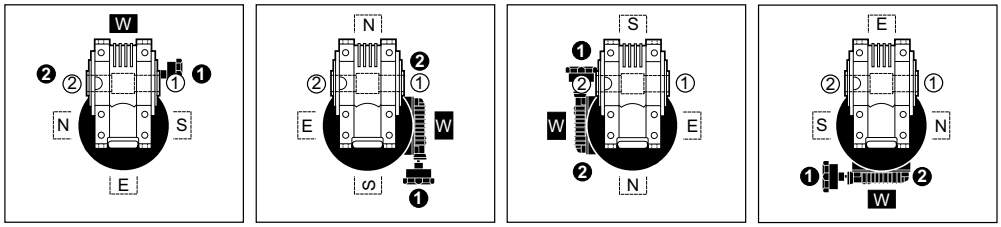
W_U_B7
W_UF_B7
W_UFC_B7



W_ B7 + V_ **B3 ❶-❷** W_ B7 + V_ **B6 ❶-❷** W_ B7 + V_ **B7 ❶-❷** W_ B7 + V_ **B8 ❶-❷**

W_U **B8**

W_U_B8
W_UF_B8
W_UFC_B8



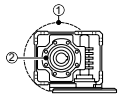
W_ B8 + V_ **B3 ❶-❷** W_ B8 + V_ **B6 ❶-❷** W_ B8 + V_ **B7 ❶-❷** W_ B8 + V_ **B8 ❶-❷**

❶ ❷ Posizione dispositivo di comando / *Speed knob position* / Eibaulage der Verstelleinrichtung / *Position commande* : **1** default, **2** (V 3...V 10)

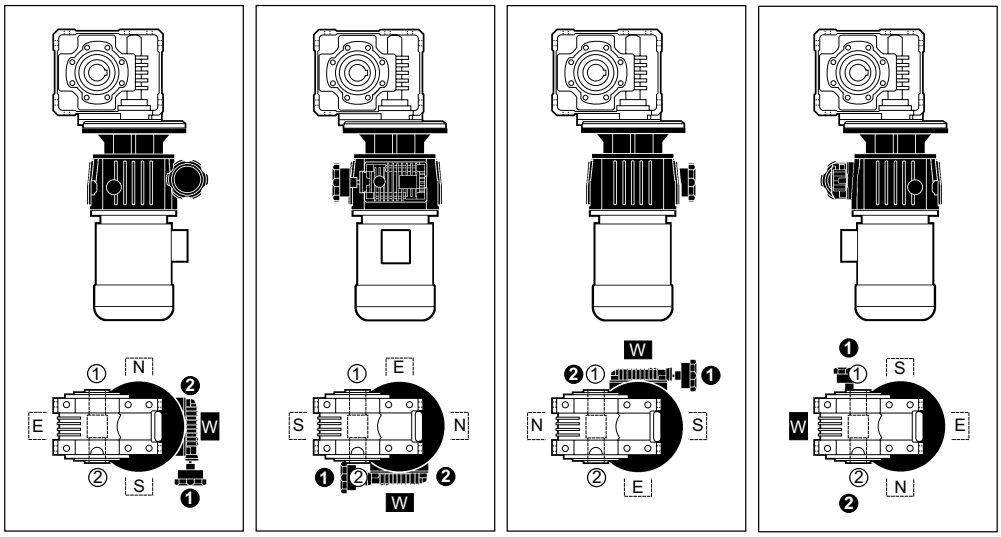
① ② Posizione flangia / *Flange position* / Flanschlage / *Position bride*

(F27)

W_U **V5**

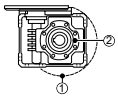


W_U_V5
W_UF_V5
W_UFC_V5

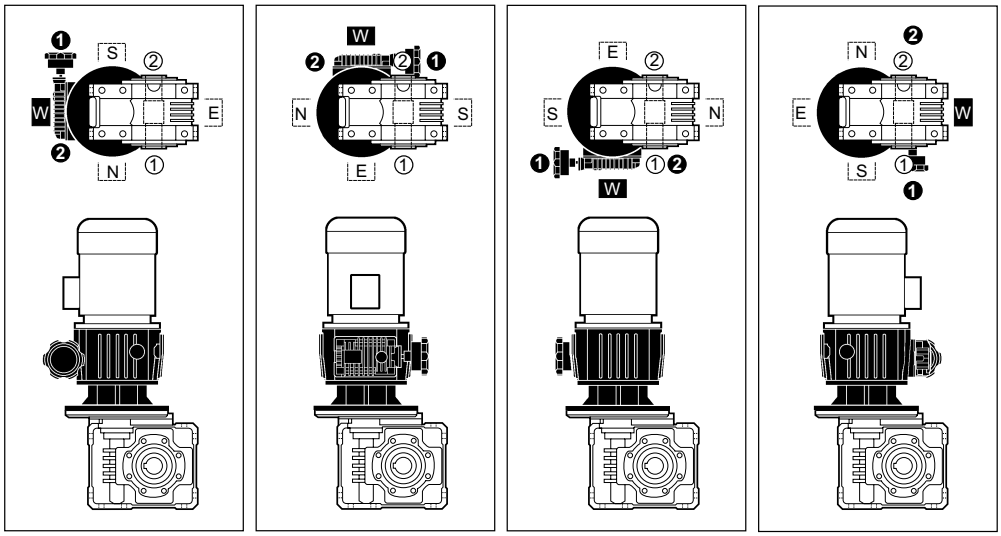


W_ V5 + V_ **V6 ❶-❷** W_ V5 + V_ **V61 ❶-❷** W_ V5 + V_ **V63 ❶-❷** W_ V5 + V_ **62 ❶-❷**

W_U **V6**



W_U_V6
W_UF_V6
W_UFC_V6



W_ V6 + V_ **V5 ❶-❷** W_ V6 + V_ **V51 ❶-❷** W_ V6 + V_ **V53 ❶-❷** W_ V6 + V_ **V52 ❶-❷**

0.12 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
7.6	**1.6**	50	127	1.2	0.5	80	3450	**VF 49_80**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	266-267
8.6	**1.8**	47	119	1.4	0.6	70	3450	**VF 49_70**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	266-267
10.1	**2.1**	43	109	1.5	0.6	60	3450	**VF 49_60**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	266-267
10.1	**2.1**	44	111	1.1	0.5	60	2500	**VF 44_60**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	264-265
13.1	**2.7**	37	94	1.3	0.5	46	2500	**VF 44_46**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	264-265
13.4	**2.8**	36	92	2.1	0.9	45	3450	**VF 49_45**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	266-267
16.8	**3.5**	31	79	2.5	1.0	36	3450	**VF 49_36**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	266-267
17.3	**3.6**	30	78	1.7	0.7	35	2500	**VF 44_35**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	264-265
21.6	**4.5**	25	65	3.3	1.3	28	3390	**VF 49_28**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	266-267
21.6	**4.5**	26	66	2.0	0.8	28	2500	**VF 44_28**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	264-265
25.2	**5.2**	24	60	3.0	1.2	24	3230	**VF 49_24**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	266-267
30	**6.3**	20	53	2.3	0.9	20	2500	**VF 44_20**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	264-265
34	**6.9**	19.0	48	3.8	1.5	18	2940	**VF 49_18**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	266-267
43	**8.9**	15.0	39	4.9	2.0	14	2720	**VF 49_14**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	266-267
43	**8.9**	15.0	39	3.1	1.3	14	2420	**VF 44_14**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	264-265
60	**12.5**	11.0	30	3.7	1.5	10	2170	**VF 44_10**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	264-265
86	**17.9**	8.0	21	5.1	2.1	7	1930	**VF 44_7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B6**	264-265

0.18 kW

8.6	**1.8**	67	129	1.0	0.5	70	3450	**VF 49_70**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	266-267
10.1	**2.1**	61	118	1.1	0.6	60	3450	**VF 49_60**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	266-267
11.4	**2.4**	56	138	1.0	0.4	80	3300	**VF 49_80**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	266-267
13.0	**2.7**	53	129	1.1	0.5	70	3300	**VF 49_70**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	266-267
15.2	**3.2**	48	118	1.3	0.6	60	3300	**VF 49_60**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	266-267
16.8	**3.5**	44	85	1.8	0.9	36	3450	**VF 49_36**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	266-267
19.8	**4.1**	41	101	1.2	0.5	46	1300	**VF 44_46**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	264-265
20.2	**4.2**	40	99	1.8	0.8	45	3300	**VF 49_45**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	266-267
21.6	**4.5**	36	71	2.3	1.2	28	3300	**VF 49_28**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	266-267
25.3	**5.3**	34	85	2.2	0.9	36	3150	**VF 49_36**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	266-267
26.0	**5.4**	34	84	1.5	0.7	35	1300	**VF 44_35**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	264-265

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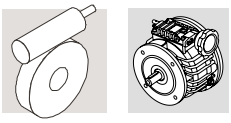
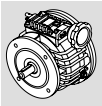


0.18 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
30	**6.3**	29	58	1.6	0.9	20	2500	**VF 44_20**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	264-265
33	**6.8**	28	71	2.9	1.2	28	2910	**VF 49_28**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	266-267
33	**6.8**	28	72	1.7	0.8	28	1300	**VF 44_28**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	264-265
38	**7.9**	26	65	2.7	1.1	24	2780	**VF 49_24**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	266-267
43	**8.9**	22	43	2.2	1.2	14	2360	**VF 44_14**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	264-265
46	**9.5**	22	58	2.0	0.9	20	1300	**VF 44_20**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	264-265
51	**10.6**	20	52	3.4	1.4	18	2450	**VF 49_18**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	266-267
60	**12.5**	16.0	32	2.6	1.4	10	2120	**VF 44_10**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	264-265
65	**13.6**	16.0	42	4.3	1.9	14	2350	**VF 49_14**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	266-267
65	**13.6**	16.0	43	2.4	1.2	14	2080	**VF 44_14**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	264-265
86	**17.9**	12.0	23	3.6	1.9	7	1890	**VF 44_7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN71A6R**	264-265
91	**19.0**	12.0	32	5.2	2.3	10	2110	**VF 49_10**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	266-267
91	**19.0**	12.0	32	3.2	1.4	10	1870	**VF 44_10**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	264-265
130	**27.1**	9.0	23	4.4	1.9	7	1660	**VF 44_7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B4**	264-265

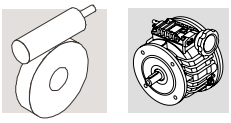
0.25 kW

6.6	**1.3**	150	352	1.1	0.5	100	6200	**W 75_100**	— P71	— V 0.5 F	**P71**	**BN71B6**	269
8.3	**1.6**	130	314	1.5	0.7	80	6200	**W 75_80**	— P71	— V 0.5 F	**P71**	**BN71B6**	269
8.3	**1.6**	125	294	1.0	0.5	80	5000	**W 63_80**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	268
10.0	**1.9**	100	220	1.6	0.8	100	6200	**W 75_100**	— P71	— V 0.5 F	**P71**	**BN71A4**	269
10.0	**1.9**	92	205	1.3	0.6	100	5000	**W 63_100**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	268
11.1	**2.1**	108	264	2.0	0.9	60	6200	**W 75_60**	— P71	— V 0.5 F	**P71**	**BN71B6**	269
12.5	**2.4**	86	196	2.3	1.1	80	6200	**W 75_80**	— P71	— **V 0.5 F**	**P71**	**BN71A4**	269
12.5	**2.4**	83	184	1.5	0.7	80	5000	**W 63_80**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	268
13.0	**2.7**	63	129	1.0	0.5	70	3300	**VF 49_70**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	266-267
14.7	**2.8**	85	209	1.8	0.8	45	5000	**W 63_45**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	268
15.2	**3.2**	57	118	1.1	0.6	60	3300	**VF 49_60**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	266-267
15.6	**3.0**	81	186	3.7	1.8	64	7000	**W 86_64**	— P71	— V 0.5 F	**P71**	**BN71A4**	270
16.7	**3.2**	72	165	3.0	1.4	60	6200	**W 75_60**	— P71	— V 0.5 F	**P71**	**BN71A4**	269
18.4	**3.5**	66	170	1.2	0.5	36	3270	**VF 49_36**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B6**	266-267
19.8	**4.1**	49	101	1.0	0.5	46	2300	**VF 44_46**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	264-265
20.0	**3.8**	63	145	3.7	1.8	50	6200	**W 75_50**	— P71	— V 0.5 F	**P71**	**BN71A4**	269
20.2	**4.2**	48	99	1.5	0.8	45	3300	**VF 49_45**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C4**	266-267



0.25 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
22.2	**4.2**	53	124	1.3	0.6	45	3150	**VF 49_45**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	266-267
22.2	**4.2**	57	131	2.7	1.3	45	5000	**W 63_45**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	268
23.7	**4.5**	55	141	1.6	0.6	28	3040	**VF 49_28**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71B6**	266-267
25.3	**5.3**	41	85	1.8	0.9	36	3100	**VF 49_36**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C4**	266-267
26.0	**5.4**	40	84	1.2	0.7	35	2300	**VF 44_35**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C4**	264-265
26.3	**5.0**	50	116	3.3	1.6	38	4790	**W 63_38**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	268
27.8	**5.3**	45	106	1.7	0.8	36	2960	**VF 49_36**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	266-267
30	**6.3**	38	76	1.1	0.9	60	2970	**VF 49_60**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63B2**	266-267
33	**6.8**	34	71	2.4	1.2	28	2870	**VF 49_28**	**V025** P63	**V 0.25 C** V0.25 F		**P63**	**BN63C4**	266-267
33	**6.8**	34	72	1.5	0.8	28	2300	**VF 44_28**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C4**	264-265
33	**6.3**	42	96	4.0	2.0	30	4460	**W 63_30**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	268
35	**6.6**	44	111	3.6	1.6	19	4360	**W 63_19**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71B6**	268
36	**6.8**	38	88	2.2	1.0	28	2740	**VF 49_28**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	266-267
38	**7.9**	31	65	2.2	1.1	24	2740	**VF 49_24**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C4**	266-267
40	**8.4**	31	64	1.6	1.2	45	2710	**VF 49_45**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63B2**	266-267
42	**7.9**	36	84	4.6	2.2	24	4160	**W 63_24**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	268
42	**7.9**	34	82	2.0	0.9	24	2620	**VF 49_24**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	266-267
44	**8.3**	36	91	4.4	2.0	15	4060	**W 63_15**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71B6**	268
46	**9.5**	27	58	1.7	0.9	20	2290	**VF 44_20**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C4**	264-265
47	**8.9**	32	84	2.3	0.9	14	2490	**VF 49_14**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71B6**	266-267
51	**10.6**	24	52	2.8	1.4	18	2510	**VF 49_18**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C4**	266-267
52	**10.9**	26	55	1.1	1.0	35	2230	**VF 44_35**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63B2**	264-265
53	**10.0**	30	69	5.4	2.6	19	3870	**W 63_19**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	268
56	**10.6**	27	65	2.5	1.1	18	2400	**VF 49_18**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	266-267
65	**13.6**	21	46	2.7	1.9	28	2340	**VF 49_28**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63B2**	266-267
65	**13.6**	20	42	3.6	1.9	14	2320	**VF 49_14**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C4**	266-267
65	**13.6**	21	47	1.4	1.2	28	2080	**VF 44_28**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63B2**	264-265
65	**13.6**	20	43	2.0	1.2	14	2050	**VF 44_14**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C4**	264-265
71	**13.6**	22	53	3.3	1.5	14	2230	**VF 49_14**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	266-267
76	**15.8**	19.0	42	2.5	1.7	24	2230	**VF 49_24**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63B2**	266-267
91	**19.0**	16.0	37	1.8	1.3	20	1870	**VF 44_20**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63B2**	264-265
91	**19.0**	15.0	32	4.3	2.3	10	2090	**VF 49_10**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C4**	266-267
91	**19.0**	15.0	32	2.6	1.4	10	1840	**VF 44_10**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C4**	264-265
100	**19.0**	16.0	40	3.9	1.9	10	2000	**VF 49_10**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71A4**	266-267
101	**21.1**	15.0	34	3.0	2.2	18	2040	**VF 49_18**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63B2**	266-267



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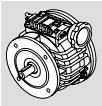
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
130	**27.1**	12.0	28	1.9	1.8	14	1670	**VF 44_14**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	264-265
130	**27.1**	11.0	23	3.6	1.9	7	1640	**VF 44_7**	**V025** P63	**V 0.25 C** VBG 0.25 F	**P63**	**BN63C4**	264-265
143	**27.1**	12.0	29	5.1	2.5	7	1790	**VF 49_7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71A4**	266-267
182	**38**	9.0	21	2.5	2.2	10	1500	**VF 44_10**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	264-265
260	**54**	6.0	15.0	3.6	3.0	7	1330	**VF 44_7**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63B2**	264-265

0.37 kW

8.3	**1.6**	173	314	1.1	0.7	80	6200	**W 75_80**	— P71	— V 0.5 F	**P71**	**BN71C6**	269
10.0	**1.9**	150	352	1.1	0.5	100	6200	**W 75_100**	— P71	— V 0.5 F	**P71**	**BN71B4**	269
10.4	**2.0**	143	261	0.9	0.6	64	5000	**W 63_64**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	268
12.5	**2.4**	130	314	1.5	0.7	80	6200	**W 75_80**	— P71	— V 0.5 F	**P71**	**BN71B4**	269
12.5	**2.4**	125	294	1.0	0.5	80	5000	**W 63_80**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	268
14.7	**2.8**	113	209	1.4	0.8	45	5000	**W 63_45**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	268
15.6	**3.0**	108	261	1.3	0.6	64	5000	**W 63_64**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	268
16.7	**3.2**	108	264	2.0	0.9	60	6200	**W 75_60**	— P71	— V 0.5 F	**P71**	**BN71B4**	269
17.4	**3.3**	100	185	1.6	1.0	38	5000	**W 63_38**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	268
20.0	**3.8**	95	232	2.5	1.1	50	6200	**W 75_50**	— P71	— V 0.5 F	**P71**	**BN71B4**	269
22.2	**4.2**	85	209	1.8	0.8	45	4850	**W 63_45**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	268
23.7	**4.5**	73	141	1.2	0.6	28	2900	**VF 49_28**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	266-267
26.3	**5.0**	75	185	2.2	1.0	38	4620	**W 63_38**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	268
27.6	**5.2**	72	134	2.3	1.4	24	4550	**W 63_24**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	268
27.8	**5.3**	68	170	1.1	0.5	36	2790	**VF 49_36**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	266-267
33	**6.3**	63	154	2.7	1.2	30	4310	**W 63_30**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	268
35	**6.6**	59	111	2.7	1.6	19	4250	**W 63_19**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	268
36	**6.8**	56	141	1.5	0.6	28	2600	**VF 49_28**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	266-267
40	**8.4**	47	99	1.1	0.8	45	2610	**VF 49_45**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	266-267
42	**7.9**	54	134	3.1	1.4	24	4030	**W 63_24**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	268
42	**7.9**	51	131	1.3	0.6	24	2490	**VF 49_24**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	266-267
44	**8.3**	48	91	3.3	2.0	15	3970	**W 63_15**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C6**	268
51	**10.6**	39	85	1.3	0.9	36	2450	**VF 49_36**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	266-267
53	**10.0**	44	111	3.6	1.6	19	3760	**W 63_19**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	268
56	**10.6**	41	104	1.7	0.7	18	2290	**VF 49_18**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B4**	266-267
65	**13.6**	32	71	1.8	1.2	28	2270	**VF 49_28**	**V025** P63	**V 0.25 C** V 0.25 F	**P63**	**BN63C2**	266-267



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n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N		V_	P(IEC)	C	F	IEC	
67	**12.7**	36	91	4.4	2.0	15	3500	**W 63_15**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71B4**	268
71	**13.6**	33	84	2.2	0.9	14	2140	**VF 49_14**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71B4**	266-267
76	**15.8**	28	65	1.7	1.1	24	2160	**VF 49_24**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C2**	266-267
91	**19.0**	24	58	1.2	0.9	20	1810	**VF 44_20**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C2**	264-265
95	**17.9**	24	46	2.8	1.6	7	1950	**VF 49_7**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71C6**	266-267
100	**19.0**	25	65	6.0	2.5	10	5000	**W 63_10**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71B4**	268
100	**19.0**	25	64	2.6	1.2	10	1930	**VF 49_10**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71B4**	266-267
101	**21.1**	22	52	2.0	1.4	18	1980	**VF 49_18**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C2**	266-267
130	**27.1**	18.0	42	2.8	1.9	14	1840	**VF 49_14**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C2**	266-267
130	**27.1**	18.0	43	1.2	1.2	14	1620	**VF 44_14**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C2**	264-265
143	**27.1**	18.0	46	3.4	1.6	7	1730	**VF 49_7**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71B4**	266-267
182	**38**	13.0	32	3.4	2.3	10	1650	**VF 49_10**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C2**	266-267
260	**54**	9.0	23	2.4	1.9	7	1300	**VF 44_7**	**V025** P63	**V 0.25 C** V 0.25 F		**P63**	**BN63C2**	264-265

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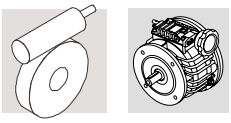
6.6	**1.3**	342	816	1.4	0.7	100	8000	**W 110_100**	— P80	— V 1 F		**P80**	**BN80B6**	271
8.3	**1.6**	293	717	1.7	0.8	80	8000	**W 110_80**	— P80	— V 1 F		**P80**	**BN80B6**	271
8.3	**1.6**	283	678	1.0	0.4	80	7000	**W 86_80**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B6**	270
10.0	**1.9**	257	612	1.9	0.9	100	8000	**W 110_100**	— P80	— V 1 F		**P80**	**BN80A4**	271
10.0	**1.9**	248	392	1.0	0.7	100	7000	**W 86_100**	— P71	— V 0.5 F		**P80**	**BN80A4**	270
10.4	**2.0**	250	614	2.3	1.0	64	8000	**W 110_64**	— P80	— V 1 F		**P80**	**BN80B6**	271
10.4	**2.0**	242	594	1.2	0.6	64	7000	**W 86_64**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B6**	270
11.8	**2.2**	228	564	2.8	1.3	56	8000	**W 110_56**	— P80	— V 1 F		**P80**	**BN80B6**	271
11.8	**2.2**	222	269	1.5	1.3	56	7000	**W 86_56**	— P71	— V 0.5 F		**P80**	**BN80B6**	270
12.5	**2.4**	212	509	1.3	0.6	80	7000	**W 86_80**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80A4**	270
12.5	**2.4**	194	470	1.0	0.5	80	6200	**W 75_80**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80A4**	269
14.4	**2.7**	196	486	3.3	1.5	46	8000	**W 110_46**	— P80	— V 1 F		**P80**	**BN80B6**	271
15.6	**3.0**	181	445	1.7	0.7	64	7000	**W 86_64**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80A4**	270
16.6	**3.1**	163	403	1.7	0.8	40	6200	**W 75_40**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B6**	269
16.7	**3.2**	162	396	1.3	0.6	60	6200	**W 75_60**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80A4**	269
17.9	**3.4**	166	403	2.0	0.9	56	7000	**W 86_56**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80A4**	270
20.0	**3.8**	142	348	1.7	0.7	50	6200	**W 75_50**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80A4**	269



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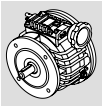
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N		V_	P(IEC)	C	F	IEC	
21.7	**4.1**	143	348	2.6	1.2	46	7000	**W 86_46**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	270
22.1	**4.2**	133	331	2.2	1.0	30	6200	**W 75_30**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	269
22.2	**4.2**	128	209	1.2	0.8	45	5000	**W 63_45**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	268
22.2	**4.2**	128	313	1.2	0.5	45	5000	**W 63_45**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	268
25.0	**4.8**	128	317	2.8	1.2	40	7000	**W 86_40**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	270
25.0	**4.8**	122	302	2.2	1.0	40	6200	**W 75_40**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	269
25.0	**4.8**	104	196	1.5	1.1	80	6200	**W 75_80**	— P71	— V 0.5 F	**P71**	**BN71B2**	269
26.3	**5.0**	113	185	1.5	1.0	38	4360	**W 63_38**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	268
26.3	**5.0**	113	278	1.5	0.7	38	4360	**W 63_38**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	268
27.6	**5.2**	108	269	1.5	0.7	24	4300	**W 63_24**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	268
31	**5.9**	86	163	1.3	0.9	64	4360	**W 63_64**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	268
33	**6.3**	100	248	2.9	1.3	30	5700	**W 75_30**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	269
33	**6.3**	95	154	1.8	1.2	30	4080	**W 63_30**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	268
33	**6.3**	95	230	1.8	0.8	30	4080	**W 63_30**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	268
35	**6.6**	89	222	1.8	0.8	19	4040	**W 63_19**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	268
40	**7.6**	87	219	3.1	1.3	25	5400	**W 75_25**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	269
40	**7.6**	73	145	2.7	1.8	50	5530	**W 75_50**	— P71	— V 0.5 F	**P71**	**BN71B2**	269
42	**7.9**	81	134	2.0	1.4	24	38470	**W 63_24**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	268
42	**7.9**	81	202	2.0	0.9	24	5000	**W 63_24**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	268
44	**8.3**	74	187	4.8	2.1	15	7000	**W 86_15**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	270
44	**8.4**	66	131	2.0	1.3	45	3930	**W 63_45**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	268
50	**9.5**	72	185	3.8	1.6	20	5050	**W 75_20**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	269
53	**10.0**	67	111	2.4	1.6	19	3600	**W 63_19**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	268
53	**10.0**	67	166	2.4	1.1	19	3600	**W 63_19**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	268
56	**10.6**	52	106	1.0	0.8	36	2280	**VF 49_36**	**V05** P71	**V 0.5 C** V 0,5 F	**P71**	**BN71B2**	266-267
66	**12.5**	50	130	3.0	1.3	10	3370	**W 63_10**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	268
67	**12.7**	54	91	3.0	2.0	15	3370	**W 63_15**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	268
67	**12.7**	54	137	3.0	1.3	15	3370	**W 63_15**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	268
71	**13.6**	42	88	1.3	1.0	28	2120	**VF 49_28**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	266-267
83	**15.8**	38	82	1.2	0.9	24	2020	**VF 49_24**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	266-267
83	**15.8**	44	76	3.4	2.2	12	3150	**W 63_12**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	268
95	**17.9**	37	94	3.6	1.5	7	3030	**W 63_7**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B6**	268
100	**19.0**	38	65	4.0	2.5	10	2990	**W 63_10**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	268



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n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
100	**19.0**	38	97	4.0	1.7	10	2990	**W 63_10**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	268
105	**20.0**	32	69	4.1	2.6	19	3030	**W 63_19**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	268
111	**21.1**	30	65	1.5	1.1	18	1860	**VF 49_18**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	266-267
143	**27.1**	27	47	4.7	3.0	7	2680	**W 63_7**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80A4**	268
143	**27.1**	27	71	4.7	2.0	7	2680	**W 63_7**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80A4**	268
143	**27.1**	24	53	2.1	1.5	14	1730	**VF 49_14**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	266-267
200	**38**	17.0	40	2.6	1.9	10	1560	**VF 49_10**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	266-267
286	**54**	12.0	29	3.3	2.5	7	1400	**VF 49_7**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71B2**	266-267

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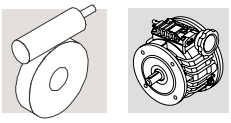
6.6	**1.3**	456	816	1.1	0.7	100	8000	**W 110_100**	**—** P80	**—** V 1 F	**P80**	**BN80C6**	271
8.3	**1.6**	390	717	1.3	0.8	80	8000	**W 110_80**	**—** P80	**—** **V 1 F**	**P80**	**BN80C6**	271
10.0	**1.9**	342	816	1.4	0.7	100	8000	**W 110_100**	**—** P80	**—** V 1 F	**P80**	**BN80B4**	271
10.4	**2.0**	323	594	0.9	0.6	64	7000	**W 86_64**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	270
11.8	**2.2**	305	564	2.1	1.3	56	8000	**W 110_56**	**—** P80	**—** V 1 F	**P80**	**BN80C6**	271
11.8	**2.2**	296	538	1.1	0.7	56	7000	**W 86_56**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	270
12.5	**2.4**	293	717	1.7	0.8	80	8000	**W 110_80**	**—** P80	**—** V 1 F	**P80**	**BN80B4**	271
12.5	**2.4**	283	678	1.0	0.4	80	7000	**W 86_80**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	270
14.4	**2.7**	254	464	1.4	0.9	46	7000	**W 86_46**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	270
15.6	**3.0**	250	614	2.3	1.0	64	8000	**W 110_64**	**—** P80	**—** V 1 F	**P80**	**BN80B4**	271
15.6	**3.0**	242	594	1.2	0.6	64	7000	**W 86_64**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	270
16.6	**3.1**	218	403	1.3	0.8	40	6200	**W 75_40**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	269
17.4	**3.3**	201	371	0.8	0.5	38	4200	**W 63_38**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	268
17.9	**3.4**	228	564	2.8	1.3	56	8000	**W 110_56**	**—** P80	**—** V 1 F	**P80**	**BN80B4**	271
17.9	**3.4**	222	538	1.5	0.7	56	7000	**W 86_56**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	270
20.0	**3.8**	189	464	1.2	0.6	50	6200	**W 75_50**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	269
21.7	**4.1**	196	486	3.3	1.5	46	8000	**W 110_46**	**—** P80	**—** V 1 F	**P80**	**BN80B4**	271
21.7	**4.1**	190	464	1.9	0.9	46	7000	**W 86_46**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	270
25.0	**4.8**	175	435	4.1	1.8	40	8000	**W 110_40**	**—** P80	**—** V 1 F	**P80**	**BN80B4**	271
25.0	**4.8**	170	422	2.1	0.9	40	7000	**W 86_40**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	270
25.0	**4.8**	163	403	1.7	0.8	40	5960	**W 75_40**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	269
26.3	**5.0**	150	185	1.1	1.0	38	4090	**W 63_38**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	268



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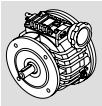
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
26.5	**5.0**	154	292	1.8	1.0	25	5860	**W 75_25**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	269
27.6	**5.2**	144	269	1.1	0.7	24	4040	**W 63_24**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	268
33	**6.3**	128	246	2.1	1.2	20	5500	**W 75_20**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	269
33	**6.3**	126	264	1.4	0.9	60	5630	**W 75_60**	**—** P71	**—** V 0.5 F	**P71**	**BN71C2**	269
33	**6.3**	126	154	1.3	1.2	30	3860	**W 63_30**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	268
33	**6.3**	126	307	1.3	0.6	30	3860	**W 63_30**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	268
35	**6.6**	119	222	1.3	0.8	19	3820	**W 63_19**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	268
40	**7.6**	116	292	2.3	1.0	25	5220	**W 75_25**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	269
40	**7.6**	110	232	1.8	1.1	50	5340	**W 75_50**	**—** P71	**—** V 0.5 F	**P71**	**BN71C2**	269
42	**7.9**	108	134	1.5	1.4	24	3650	**W 63_24**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	268
42	**7.9**	108	269	1.5	0.7	24	3650	**W 63_24**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	268
44	**8.3**	100	192	2.7	1.5	15	5080	**W 75_15**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	269
44	**8.3**	96	182	1.7	1.0	15	3600	**W 63_15**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	268
44	**8.4**	99	209	1.3	0.8	45	3730	**W 63_45**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	268
50	**9.5**	96	246	2.8	1.2	20	4900	**W 75_20**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	269
53	**10.0**	89	111	1.8	1.6	19	3440	**W 63_19**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	268
53	**10.0**	89	222	1.8	0.8	19	3440	**W 63_19**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	268
53	**10.0**	86	185	1.5	1.0	38	3560	**W 63_38**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	268
66	**12.5**	67	130	2.2	1.3	10	3240	**W 63_10**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	268
67	**12.7**	75	192	3.6	1.5	15	4510	**W 75_15**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	269
67	**12.7**	72	91	2.2	2.0	15	3230	**W 63_15**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	268
67	**12.7**	72	182	2.2	1.0	15	3230	**W 63_15**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	268
67	**12.7**	70	154	1.8	1.2	30	3330	**W 63_30**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	268
83	**15.8**	59	76	2.5	2.2	12	3040	**W 63_12**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	268
83	**15.8**	59	134	2.2	1.4	24	3120	**W 63_24**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	268
95	**17.9**	49	94	2.7	1.5	7	2920	**W 63_7**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C6**	268
100	**19.0**	52	134	4.8	2.0	10	4100	**W 75_10**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	269
100	**19.0**	50	65	3.0	2.5	10	2890	**W 63_10**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	268
100	**19.0**	50	130	3.0	1.3	10	2890	**W 63_10**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B4**	268
105	**20.0**	48	111	2.7	1.6	19	2920	**W 63_19**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	268
111	**21.1**	44	104	1.0	0.7	18	1750	**VF 49_18**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	266-267
133	**25.3**	39	91	3.2	2.0	15	2720	**W 63_15**	**V05** P71	**V 0.5 C** V 0.5 F	**P71**	**BN71C2**	268
143	**27.1**	37	47	3.6	3.0	7	2600	**W 63_7**	**V05** P71	**V 0.5 C** V 0.5 F	**P80**	**BN80B4**	268



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n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N		V_	P(IEC)	C	F	IEC	
143	**27.1**	37	94	3.6	1.5	7	2600	**W 63_7**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B4**	268
143	**27.1**	35	84	1.4	0.9	14	1640	**VF 49_14**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71C2**	266-267
200	**38**	26	65	4.7	2.5	10	2410	**W 63_10**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71C2**	268
200	**38**	26	64	1.7	1.2	10	1490	**VF 49_10**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71C2**	266-267
286	**54**	18.0	46	2.2	1.6	7	1340	**VF 49_7**	**V05** P71	**V 0.5 C** V 0.5 F		**P71**	**BN71C2**	266-267

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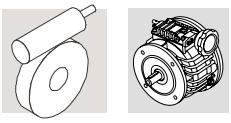
6.6	**1.3**	684	1728	1.2	0.5	100	13800	**VF 130_100**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90L6**	272-273
8.3	**1.6**	586	1485	1.8	0.8	80	13800	**VF 130_80**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90L6**	272-273
10.0	**1.9**	531	1296	1.5	0.7	100	13200	**VF 130_100**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	272-273
10.4	**2.0**	499	1229	1.1	0.5	64	8000	**W 110_64**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90L6**	271
10.6	**2.2**	457	564	1.4	1.3	56	8000	**W 110_56**	— P80	— V 1 F		**P90**	**BN90L6**	271
11.8	**2.2**	457	1165	2.5	1.0	56	13800	**VF 130_56**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90L6**	272-273
12.5	**2.4**	461	1114	2.1	1.0	80	13200	**VF 130_80**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	272-273
12.5	**2.4**	439	1075	1.1	0.5	80	8000	**W 110_80**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	271
14.4	**2.7**	392	972	1.6	0.7	46	8000	**W 110_46**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90L6**	271
15.6	**3.0**	392	952	2.7	1.3	64	13200	**VF 130_64**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	272-273
15.6	**3.0**	374	922	1.5	0.7	64	8000	**W 110_64**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	271
16.1	**3.4**	336	538	1.0	0.7	56	7000	**W 86_56**	**V1** P80	**V 1 C** V 1 F		**P90**	**BN90S4**	270
16.6	**3.1**	341	845	1.0	0.5	40	7000	**W 86_40**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90L6**	270
17.9	**3.4**	343	847	1.9	0.8	56	8000	**W 110_56**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	271
17.9	**3.4**	353	874	3.1	1.4	56	13200	**VF 130_56**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	272-273
19.6	**4.1**	289	464	1.3	0.9	46	7000	**W 86_46**	**V1** P80	**V 1 C** V 1 F		**P90**	**BN90S4**	270
20.0	**3.8**	302	612	1.4	0.9	100	8000	**W 110_100**	— P80	— V 1 F		**P80**	**BN80B2**	271
21.7	**4.1**	302	751	3.8	1.8	46	7700	**VF 130_46**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	272-273
21.7	**4.1**	294	729	2.2	1.0	46	8000	**W 110_46**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	271
21.7	**4.1**	286	696	1.3	0.6	46	7000	**W 86_46**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	270
22.5	**4.8**	258	422	1.4	0.9	40	7000	**W 86_40**	**V1** P80	**V 1 C** V 1 F		**P90**	**BN90S4**	270
22.5	**4.8**	248	403	1.1	0.8	40	5480	**W 75_40**	**V1** P80	**V 1 C** V 1 F		**P90**	**BN90S4**	269
25.0	**4.8**	263	653	2.7	1.2	40	8000	**W 110_40**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	271
25.0	**4.8**	256	538	1.6	1.0	80	8000	**W 110_80**	— P80	— V 1 F		**P80**	**BN80B2**	271
25.0	**4.8**	256	634	1.4	0.6	40	7000	**W 86_40**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	270



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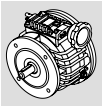
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
28.8	**5.4**	221	552	1.6	0.7	23	7000	**W 86_23**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	270
30	**6.3**	199	322	2.0	1.4	30	7000	**W 86_30**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	270
30	**6.3**	202	331	1.4	1.0	30	5110	**W 75_30**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	269
31	**5.9**	210	297	1.2	1.1	64	7000	**W 86_64**	— P71	— V 0.5 F	**P80**	**BN80B2**	270
33	**6.3**	192	493	1.4	0.6	20	5100	**W 75_20**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	269
33	**6.3**	200	504	3.8	1.6	30	8000	**W 110_30**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	271
33	**6.3**	197	482	2.0	0.9	30	7000	**W 86_30**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	270
36	**6.8**	192	423	2.8	1.7	56	8000	**W 110_56**	— P80	— V 1 F	**P80**	**BN80B2**	271
36	**6.8**	189	403	1.4	0.9	56	7000	**W 86_56**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	270
36	**7.6**	175	292	1.5	1.0	25	4870	**W 75_25**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	269
38	**7.9**	164	269	1.0	0.7	24	3270	**W 63_24**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	268
43	**8.3**	168	425	3.5	1.5	23	8000	**W 110_23**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	271
43	**8.3**	166	414	2.1	0.9	23	7000	**W 86_23**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	270
43	**8.3**	159	348	1.9	1.2	46	7000	**W 86_46**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	270
44	**8.3**	148	374	2.4	1.0	15	7000	**W 86_15**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	270
44	**8.3**	149	384	1.8	0.8	15	4750	**W 75_15**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	269
45	**9.5**	147	246	2.3	1.5	20	7000	**W 86_20**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	270
45	**9.5**	146	246	1.9	1.2	20	4600	**W 75_20**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	269
47	**10.0**	135	222	1.2	0.8	19	3110	**W 63_19**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	268
50	**9.5**	148	379	4.2	1.8	20	8000	**W 110_20**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	271
50	**9.5**	146	370	2.4	1.0	20	7000	**W 86_20**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	270
50	**9.5**	144	370	1.9	0.8	20	4600	**W 75_20**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	269
50	**9.5**	139	302	1.6	1.0	40	4770	**W 75_40**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	269
60	**12.7**	113	192	2.4	1.5	15	4500	**W 75_15**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	269
60	**12.7**	109	182	1.5	1.0	15	2960	**W 63_15**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	268
66	**12.5**	103	269	2.4	1.0	10	4240	**W 75_10**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90L6**	269
67	**12.7**	112	288	5.8	2.5	15	8000	**W 110_15**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	271
67	**12.7**	111	281	3.2	1.4	15	7000	**W 86_15**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	270
67	**12.7**	112	288	2.4	1.0	15	4260	**W 75_15**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90S4**	269
67	**12.7**	105	230	1.2	0.8	30	2960	**W 63_30**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	268
75	**15.8**	90	152	1.7	1.1	12	2810	**W 63_12**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90S4**	268
80	**15.2**	93	219	2.4	1.3	25	4180	**W 75_25**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	269
83	**15.8**	89	202	1.5	0.9	24	2930	**W 63_24**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80B2**	268



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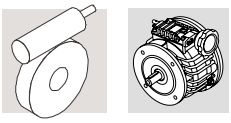
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N		V_	P(IEC)	C	F	IEC	
87	**16.5**	88	207	3.2	1.8	23	7000	**W 86_23**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B2**	270
90	**19.0**	78	134	3.2	2.0	10	3790	**W 75_10**	**V1** P80	**V 1 C** V 1 F		**P90**	**BN90S4**	269
90	**19.0**	76	130	2.0	1.3	10	6780	**W 63_10**	**V1** P80	**V 1 C** V 1 F		**P90**	**BN90S4**	268
100	**19.0**	77	190	6.6	3.6	20	8000	**W 110_20**	— P80	— V 1 F		**P80**	**BN80B2**	271
100	**19.0**	77	202	3.2	1.4	10	3790	**W 75_10**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	269
100	**19.0**	77	185	2.9	1.6	20	3910	**W 75_20**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B2**	269
105	**20.0**	72	166	1.8	1.1	19	2760	**W 63_19**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B2**	268
129	**27.1**	56	96	3.7	2.3	7	3400	**W 75_7**	**V1** P80	**V 1 C** V 1 F		**P90**	**BN90S4**	269
129	**27.1**	55	94	2.3	1.5	7	2440	**W 63_7**	**V1** P80	**V 1 C** V 1 F		**P90**	**BN90S4**	268
133	**25.3**	59	144	3.8	2.0	15	3600	**W 75_15**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B2**	269
133	**25.3**	58	137	2.2	1.3	15	2590	**W 63_15**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B2**	268
143	**27.1**	55	144	9.7	4.1	7	8000	**W 110_7**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	271
143	**27.1**	55	144	3.7	1.6	7	3400	**W 75_7**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90S4**	269
200	**38**	40	97	3.2	1.7	10	2310	**W 63_10**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B2**	268
286	**54**	28	71	3.7	2.0	7	2080	**W 63_7**	**V1** P80	**V 1 C** V 1 F		**P80**	**BN80B2**	268

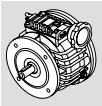
1.5 kW

8.3	**1.6**	781	1624	1.3	0.7	80	13800	**VF 130_80**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN100LA6R**	272-273
10.0	**1.9**	708	1728	1.1	0.5	100	13200	**VF 130_100**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90LA4**	272-273
10.4	**2.0**	666	1389	1.7	0.9	64	13800	**VF 130_64**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN100LA6R**	272-273
11.8	**2.2**	609	1235	1.1	0.6	56	8000	**W 110_56**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN100LA6R**	271
12.5	**2.4**	614	1485	1.5	0.8	80	13200	**VF 130_80**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90LA4**	272-273
14.4	**2.7**	523	1063	1.2	0.7	46	8000	**W 110_46**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN100LA6R**	271
15.6	**3.0**	522	1270	2.0	0.9	64	13200	**VF 130_64**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90LA4**	272-273
16.6	**3.1**	467	952	1.5	0.8	40	8000	**W 110_40**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN100LA6R**	271
17.9	**3.4**	457	1129	1.4	0.6	56	8000	**W 110_56**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90LA4**	271
17.9	**3.4**	470	1165	2.3	1.0	56	13200	**VF 130_56**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90LA4**	272-273
19.6	**4.1**	381	464	1.0	0.9	46	7000	**W 86_46**	**V1** P80	**V 1 C** V 1 F		**P90**	**BN90LA4**	270
21.7	**4.1**	403	1001	2.9	1.3	46	13200	**VF 130_46**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90LA4**	272-273
21.7	**4.1**	392	972	1.6	0.7	46	8000	**W 110_46**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN90LA4**	271
22.1	**4.2**	350	704	1.1	0.6	30	7000	**W 86_30**	**V2** P90	**V 2 C** V 2 F		**P90**	**BN100LA6R**	270
22.5	**4.8**	341	422	1.0	0.9	40	7000	**W 86_40**	**V1** P80	**V 1 C** V 1 F		**P90**	**BN90LA4**	270
25.0	**4.8**	350	870	3.4	1.6	40	13200	**VF 130_40**	**V2** —	**V 2 C** —		**P90**	**BN90LA4**	272-273



1.5 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N		V_	P(IEC)	C	F	IEC	
25.0	**4.8**	350	870	2.1	0.9	40	8000	**W 110_40**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	271
25.0	**4.8**	341	845	1.0	0.5	40	7000	**W 86_40**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	270
28.8	**5.4**	298	620	1.9	1.0	23	8000	**W 110_23**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN100LA6R**	271
28.8	**5.4**	294	604	1.2	0.6	23	7000	**W 86_23**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN100LA6R**	270
30	**6.3**	263	322	1.5	1.4	30	7000	**W 86_30**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	270
30	**6.3**	266	331	1.1	1.0	30	4710	**W 75_30**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	269
31	**5.9**	284	614	1.7	1.0	64	8000	**W 110_64**	— P80	— V 1 F	**P80**		**BN80C2**	271
33	**6.3**	277	691	4.5	2.2	30	13200	**VF 130_30**	**V2** —	**V 2 C** —	**P90**		**BN90LA4**	272-273
33	**6.3**	266	672	2.8	1.2	30	8000	**W 110_30**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	271
33	**6.3**	263	643	1.5	0.7	30	7000	**W 86_30**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	270
36	**6.8**	255	564	2.1	1.3	56	8000	**W 110_56**	— P80	— V 1 F	**P80**		**BN80C2**	271
36	**7.6**	231	292	1.2	1.0	25	4530	**W 75_25**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	269
39	**8.3**	221	276	1.6	1.4	23	7000	**W 86_23**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	270
43	**8.3**	224	567	2.6	1.1	23	8000	**W 110_23**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	271
43	**8.3**	218	486	2.5	1.5	46	8000	**W 110_46**	— P80	— V 1 F	**P80**		**BN80C2**	271
43	**8.3**	221	552	1.6	0.7	23	7000	**W 86_23**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	270
43	**8.3**	213	464	1.4	0.9	46	7000	**W 86_46**	**V1** P80	**V 1 C** V 1 F	**P80**		**BN80C2**	270
45	**9.5**	194	246	1.8	1.5	20	7000	**W 86_20**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	270
45	**9.5**	192	246	1.4	1.2	20	4300	**W 75_20**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	269
50	**9.5**	197	506	3.1	1.3	20	8000	**W 110_20**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	271
50	**9.5**	194	493	1.8	0.8	20	7000	**W 86_20**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	270
50	**9.5**	190	422	1.6	0.9	40	7000	**W 86_40**	**V1** P80	**V 1 C** V 1 F	**P80**		**BN80C2**	270
50	**9.5**	192	493	1.4	0.6	20	4300	**W 75_20**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	269
60	**12.7**	148	187	2.4	2.1	15	7000	**W 86_15**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	270
60	**12.7**	149	192	1.8	1.5	15	4020	**W 75_15**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	269
60	**12.7**	144	182	1.1	1.0	15	2690	**W 63_15**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	268
67	**12.7**	149	384	4.3	1.8	15	2960	**W 110_15**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	271
67	**12.7**	148	374	2.4	1.0	15	8000	**W 86_15**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	270
67	**12.7**	149	384	1.8	0.8	15	7000	**W 75_15**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LA4**	269
67	**12.7**	146	331	1.6	1.0	30	4200	**W 75_30**	**V1** P80	**V 1 C** V 1 F	**P80**		**BN80C2**	269
75	**15.8**	118	152	1.3	1.1	12	2570	**W 63_12**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	268
80	**15.2**	125	292	1.8	1.0	25	4000	**W 75_25**	**V1** P80	**V 1 C** V 1 F	**P80**		**BN80C2**	269
87	**16.5**	117	276	2.4	1.4	23	6940	**W 86_23**	**V1** P80	**V 1 C** V 1 F	**P80**		**BN80C2**	270
90	**19.0**	103	134	2.4	2.0	10	3600	**W 75_10**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	269
90	**19.0**	101	130	1.5	1.3	10	2480	**W 63_10**	**V1** P80	**V 1 C** V 1 F	**P90**		**BN90LA4**	268

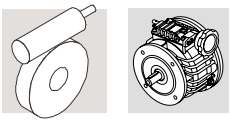


1.5 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
95	**17.9**	99	211	2.1	1.1	7	3590	**W 75_7**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN100LA6R**	269
100	**19.0**	103	262	3.0	1.3	10	6530	**W 86_10**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	270
100	**19.0**	103	269	2.4	1.0	10	3600	**W 75_10**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	269
100	**19.0**	103	246	2.2	1.2	20	3760	**W 75_20**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	269
105	**20.0**	96	222	1.4	0.8	19	2590	**W 63_19**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	268
129	**27.1**	74	96	2.8	2.3	7	2270	**W 75_7**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90LA4**	269
129	**27.1**	73	94	1.8	1.5	7	2270	**W 63_7**	**V1** P80	**V 1 C** V 1 F	**P90**	**BN90LA4**	268
133	**25.3**	79	192	2.8	1.5	15	3480	**W 75_15**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	269
133	**25.3**	77	182	1.6	1.0	15	2540	**W 63_15**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	268
143	**27.1**	74	190	3.7	1.5	7	5850	**W 86_7**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	270
143	**27.1**	74	193	2.8	1.2	7	3240	**W 75_7**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LA4**	269
200	**38**	54	134	3.8	2.0	10	3080	**W 75_10**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	269
200	**38**	53	130	2.4	1.3	10	2210	**W 63_10**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	268
286	**54**	38	94	2.8	1.5	7	2000	**W 63_7**	**V1** P80	**V 1 C** V 1 F	**P80**	**BN80C2**	268

1.8 kW

10.0	**1.9**	826	1890	1.0	0.5	100	13200	**VF 130_100**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	272-273
12.5	**2.4**	717	1624	1.3	0.7	80	13200	**VF 130_80**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	272-273
15.6	**3.0**	609	1389	1.7	0.9	64	13200	**VF 130_64**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	272-273
17.9	**3.4**	533	1235	1.2	0.6	56	8000	**W 110_56**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	271
17.9	**3.4**	549	1274	2.0	0.9	56	13200	**VF 130_56**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	272-273
21.7	**4.1**	470	1095	2.4	1.2	46	13200	**VF 130_46**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	272-273
21.7	**4.1**	457	1063	1.4	0.7	46	8000	**W 110_46**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	271
25.0	**4.8**	409	952	2.9	1.5	40	13200	**VF 130_40**	**V2** —	**V 2 C** —	**P90**	**BN90LB4**	272-273
25.0	**4.8**	409	952	1.8	0.8	40	8000	**W 110_40**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	271
33	**6.3**	323	756	3.9	2.0	30	13200	**VF 130_30**	**V2** —	**V 2 C** —	**P90**	**BN90LB4**	272-273
33	**6.3**	311	735	2.4	1.1	30	8000	**W 110_30**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	271
33	**6.3**	307	704	1.3	0.6	30	7000	**W 86_30**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	270
43	**8.3**	261	620	2.2	1.0	23	8000	**W 110_23**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	271
43	**8.3**	258	604	1.3	0.6	23	7000	**W 86_23**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	270
50	**9.5**	230	553	2.7	1.2	20	8000	**W 110_20**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	271
50	**9.5**	227	539	1.5	0.7	20	7000	**W 86_20**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	270
67	**12.7**	174	420	3.7	1.7	15	8000	**W 110_15**	**V2** P90	**V 2 C** V 2 F	**P90**	**BN90LB4**	271

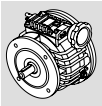


1.8 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N		V_	P(IEC)	C	F	IEC	
67	**12.7**	172	410	2.1	1.0	15	7000	**W 86_15**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LB4**	270
67	**12.7**	174	420	1.5	0.7	15	3860	**W 75_15**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LB4**	269
100	**19.0**	120	287	2.6	1.2	10	6420	**W 86_10**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LB4**	270
100	**19.0**	120	294	2.1	0.9	10	3470	**W 75_10**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LB4**	269
143	**27.1**	86	208	3.1	1.4	7	5760	**W 86_7**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LB4**	270
143	**27.1**	86	211	2.4	1.1	7	3130	**W 75_7**	**V2** P90	**V 2 C** V 2 F	**P90**		**BN90LB4**	269

2.2 kW

6.6	**1.3**	1440	3136	1.4	0.7	100	19500	**VF 185_100**	**V3** P100	**V 3 C** V 3 F	**P112**		**BN112M6**	276-277
8.3	**1.6**	1229	2688	2.1	1.0	80	19500	**VF 185_80**	**V3** P100	**V 3 C** V 3 F	**P112**		**BN112M6**	276-277
8.3	**1.6**	1210	2643	1.2	0.6	80	16000	**VF 150_80**	**V3** P100	**V 3 C** V 3 F	**P112**		**BN112M6**	274-275
10.0	**1.9**	976	2200	1.2	0.6	100	15000	**VF 150_100**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	274-275
10.4	**2.0**	998	2222	1.1	0.5	64	13800	**VF 130_64**	**V3** P100	**V 3 C** V 3 F	**P112**		**BN112M6**	272-273
11.8	**2.2**	927	2070	1.8	0.8	56	16000	**VF 150_56**	**V3** P100	**V 3 C** V 3 F	**P112**		**BN112M6**	274-275
11.8	**2.2**	914	2038	1.2	0.6	56	13800	**VF 130_56**	**V3** P100	**V 3 C** V 3 F	**P112**		**BN112M6**	272-273
12.5	**2.4**	832	1888	1.6	0.8	80	15500	**VF 150_80**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	274-275
12.5	**2.4**	819	1856	1.2	0.6	80	13200	**VF 130_80**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	272-273
14.4	**2.7**	795	1777	2.4	1.1	46	16000	**VF 150_46**	**V3** P100	**V 3 C** V 3 F	**P112**		**BN112M6**	274-275
14.4	**2.7**	784	1752	1.6	0.8	46	13800	**VF 130_46**	**V3** P100	**V 3 C** V 3 F	**P112**		**BN112M6**	272-273
15.6	**3.0**	707	1613	2.1	1.1	64	15500	**VF 150_64**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	274-275
15.6	**3.0**	696	1587	1.5	0.8	64	13200	**VF 130_64**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	272-273
16.6	**3.1**	701	1523	1.0	0.5	40	8000	**W 110_40**	— P100	— V 3 F	**P112**		**BN112M6**	271
17.9	**3.4**	636	1478	2.4	1.2	56	15500	**VF 150_56**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	274-275
17.9	**3.4**	627	1456	1.7	0.8	56	13200	**VF 130_56**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	272-273
21.7	**4.1**	545	1270	3.2	1.6	46	15500	**VF 150_46**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	274-275
21.7	**4.1**	537	1251	2.1	1.1	46	13200	**VF 130_46**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	272-273
21.7	**4.1**	523	1214	1.2	0.6	46	8000	**W 110_46**	— P100	— V 3 F	**P100**		**BN100LA4**	271
25.0	**4.8**	474	1104	3.7	1.8	40	15500	**VF 150_40**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	274-275
25.0	**4.8**	467	1088	2.6	1.3	40	13200	**VF 130_40**	**V3** P100	**V 3 C** V 3 F	**P100**		**BN100LA4**	272-273
25.0	**4.8**	467	1088	1.5	0.7	40	8000	**W 110_40**	— P100	— V 3 F	**P100**		**BN100LA4**	271
28.8	**5.4**	436	992	2.7	1.3	23	13800	**VF 130_23**	**V3** P100	**V 3 C** V 3 F	**P112**		**BN112M6**	272-273
28.8	**5.4**	447	992	1.3	0.6	23	8000	**W 110_23**	— P100	— V 3 F	**P112**		**BN112M6**	271

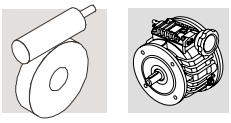


2.2 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
33	**6.3**	370	876	4.3	2.2	30	15500	**VF 150_30**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	274-275
33	**6.3**	370	864	3.4	1.7	30	13200	**VF 130_30**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	272-273
33	**6.3**	355	840	2.1	1.0	30	8000	**W 110_30**	— P100	— V 3 F	**P100**	**BN100LA4**	271
43	**8.3**	298	708	3.5	1.8	23	13200	**VF 130_23**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	272-273
43	**8.3**	298	708	1.9	0.9	23	8000	**W 110_23**	— P100	— V 3 F	**P100**	**BN100LA4**	271
50	**9.5**	262	632	4.0	2.1	20	13200	**VF 130_20**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LA4**	272-273
50	**9.5**	262	632	2.3	1.1	20	8000	**W 110_20**	— P100	— V 3 F	**P100**	**BN100LA4**	271
67	**12.7**	199	480	3.2	1.5	15	8000	**W 110_15**	— P100	— V 3 F	**P100**	**BN100LA4**	271
95	**17.9**	148	337	3.7	1.8	7	8000	**W 110_7**	— P100	— V 3 F	**P112**	**BN112M6**	271
95	**17.9**	148	333	1.8	0.9	7	6250	**W 86_7**	— P100	— V 3 F	**P112**	**BN112M6**	270
100	**19.0**	138	336	4.3	1.9	10	8000	**W 110_10**	— P100	— V 3 F	**P100**	**BN100LA4**	271
143	**27.1**	99	241	5.5	2.5	7	8000	**W 110_7**	— P100	— V 3 F	**P100**	**BN100LA4**	271

3.0 kW

10.0	**1.9**	1488	3136	1.3	0.7	100	19000	**VF 185_100**	— P100	— V 3 F	**P100**	**BN100LB4**	276-277
12.5	**2.4**	1267	2688	1.9	1.0	80	19000	**VF 185_80**	— P100	— V 3 F	**P100**	**BN100LB4**	276-277
12.5	**2.4**	1248	2643	1.1	0.6	80	15500	**VF 150_80**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	274-275
15.6	**3.0**	1060	2258	1.4	0.8	64	15500	**VF 150_64**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	274-275
15.6	**3.0**	1044	2222	1.0	0.5	64	13200	**VF 130_64**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	272-273
16.7	**3.2**	1022	2218	2.5	1.4	60	19000	**VF 185_60**	— P100	— V 3 F	**P100**	**BN100LB4**	276-277
17.9	**3.4**	954	2070	1.6	0.8	56	15500	**VF 150_56**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	274-275
17.9	**3.4**	941	2038	1.1	0.6	56	13200	**VF 130_56**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	272-273
20.0	**3.8**	876	1904	3.3	1.7	50	19000	**VF 185_50**	— P100	— V 3 F	**P100**	**BN100LB4**	276-277
21.7	**4.1**	817	1777	2.1	1.1	46	15500	**VF 150_46**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	274-275
21.7	**4.1**	806	1752	1.4	0.8	46	13200	**VF 130_46**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	272-273
25.0	**4.8**	710	1546	2.5	1.3	40	15500	**VF 150_40**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	274-275
25.0	**4.8**	701	1523	1.7	0.9	40	13200	**VF 130_40**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	272-273
33	**6.3**	554	1226	2.9	1.6	30	15500	**VF 150_30**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	274-275
33	**6.3**	554	1210	2.3	1.2	30	13200	**VF 130_30**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	272-273
33	**6.3**	533	1176	1.4	0.7	30	8000	**W 110_30**	— P100	— V 3 F	**P100**	**BN100LB4**	271
43	**8.3**	453	1005	3.3	1.8	23	15500	**VF 150_23**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	274-275
43	**8.3**	447	992	2.3	1.3	23	13200	**VF 130_23**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	272-273

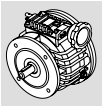


3.0 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
43	**8.3**	447	992	1.3	0.6	23	8000	**W 110_23**	— P100	— V 3 F	**P100**	**BN100LB4**	271
50	**9.5**	394	885	2.7	1.5	20	13200	**VF 130_20**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	272-273
50	**9.5**	394	885	1.6	0.8	20	8000	**W 110_20**	— P100	— V 3 F	**P100**	**BN100LB4**	271
67	**12.7**	299	672	2.2	1.1	15	8000	**W 110_15**	— P100	— V 3 F	**P100**	**BN100LB4**	271
67	**12.7**	302	680	3.6	2.0	15	13130	**VF 130_15**	**V3** P100	**V 3 C** V 3 F	**P100**	**BN100LB4**	272-273
100	**19.0**	206	470	2.9	1.4	10	8000	**W 110_10**	— P100	— V 3 F	**P100**	**BN100LB4**	271
143	**27.1**	148	337	3.7	1.8	7	8000	**W 110_7**	— P100	— V 3 F	**P100**	**BN100LB4**	271

4.0 kW

6.6	**1.3**	2666	4988	2.0	1.0	100	52000	**VF 250_100**	— P132	— V 10 F	**P132**	**BN132MA6**	279
6.6	**1.3**	2537	4816	1.3	0.7	100	34500	**VF 210_100**	— P132	— V 10 F	**P132**	**BN132MA6**	278
8.3	**1.6**	2167	4128	1.7	0.9	80	34500	**VF 210_80**	— P132	— V 10 F	**P132**	**BN132MA6**	278
8.3	**1.6**	2202	4128	1.2	0.7	80	19500	**VF 185_80**	— P132	— V 10 F	**P132**	**BN132MA6**	276-277
10.0	**1.9**	1984	4032	1.0	0.6	100	19000	**VF 185_100**	— P100	— V 5.5 F	**P112**	**BN112M4**	276-277
11.1	**2.1**	1754	3354	2.3	1.3	60	34500	**VF 210_60**	— P132	— V 10 F	**P132**	**BN132MA6**	278
11.1	**2.1**	1780	3406	1.6	0.9	60	19500	**VF 185_60**	— P132	— V 10 F	**P132**	**BN132MA6**	276-277
12.5	**2.4**	1690	3456	1.4	0.8	80	19000	**VF 185_80**	— P100	— V 5.5 F	**P112**	**BN112M4**	276-277
13.3	**2.5**	1527	2924	2.8	1.5	50	34500	**VF 210_50**	— P132	— V 10 F	**P132**	**BN132MA6**	278
13.3	**2.5**	1527	2924	2.0	1.1	50	19500	**VF 185_50**	— P132	— V 10 F	**P132**	**BN132MA6**	276-277
14.4	**2.7**	1424	2730	1.3	0.7	46	16000	**VF 150_46**	— P132	— V 10 F	**P132**	**BN132MA6**	274-275
15.6	**3.0**	1413	2903	1.0	0.6	64	15500	**VF 150_64**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	274-275
16.7	**3.2**	1363	2851	1.9	1.1	60	19000	**VF 185_60**	— P100	— V 5.5 F	**P112**	**BN112M4**	276-277
17.9	**3.4**	1272	2661	1.2	0.7	56	15500	**VF 150_56**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	274-275
20.0	**3.8**	1168	2448	2.5	1.3	50	19000	**VF 185_50**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	276-277
21.7	**4.1**	1089	2285	1.6	0.9	46	15500	**VF 150_46**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	274-275
21.7	**4.1**	1075	2252	1.1	0.6	46	13200	**VF 130_46**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	272-273
25.0	**4.8**	947	1987	1.8	1.0	40	15500	**VF 150_40**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	274-275
25.0	**4.8**	934	1958	1.3	0.7	40	13200	**VF 130_40**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	272-273
28.8	**5.4**	781	1523	1.5	0.9	23	13800	**VF 130_23**	— P132	— V 10 F	**P132**	**BN132MA6**	272-273
33	**6.3**	739	1577	2.2	1.2	30	15500	**VF 150_30**	**V55** P112	**V 5.5 C** V 5.5 F	**P112**	**BN112M4**	274-275
33	**6.3**	739	1555	1.7	1.0	30	13200	**VF 130_30**	V55 P112	V 5.5 C V 5.5 F	**P112**	**BN112M4**	272-273

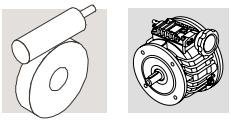


4.0 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N		V_	P(IEC)	C	F		IEC	
33	**6.3**	710	1512	1.1	0.5	30	8000	**W 110_30**	—	P112	—	V 5.5 F	**P112**	**BN112M4**	271
43	**8.3**	604	1292	2.5	1.4	23	15500	**VF 150_23**	**V55**	P112	**V 5.5 C**	V 5.5 F	**P112**	**BN112M4**	274-275
43	**8.3**	596	1275	1.8	1.0	23	13200	**VF 130_23**	**V55**	P112	**V 5.5 C**	V 5.5 F	**P112**	**BN112M4**	272-273
43	**8.3**	596	1275	1.0	0.5	23	8000	**W 110_23**	—	P112	—	V 5.5 F	**P112**	**BN112M4**	271
50	**9.5**	531	1152	2.8	1.6	20	15500	**VF 150_20**	**V55**	—	**V 5.5 C**	—	**P112**	**BN112M4**	274-275
50	**9.5**	525	1138	2.0	1.2	20	13200	**VF 130_20**	**V55**	P112	**V 5.5 C**	V 5.5 F	**P112**	**BN112M4**	272-273
67	**12.7**	398	864	1.6	0.8	15	8000	**W 110_15**	—	P112	—	V 5.5 F	**P112**	**BN112M4**	271
67	**12.7**	408	896	3.3	1.9	15	14420	**VF 150_15**	**V55**	—	**V 5.5 C**	—	**P112**	**BN112M4**	274-275
67	**12.7**	403	875	2.7	1.5	15	12720	**VF 130_15**	**V55**	P112	**V 5.5 C**	V 5.5 F	**P112**	**BN112M4**	272-273
95	**17.9**	265	518	3.5	1.9	7	11350	**VF 130_7**	—	P132	—	V 10 F	**P132**	**BN132MA6**	272-273
100	**19.0**	278	612	4.3	2.5	10	12770	**VF 150_10**	**V55**	—	**V 5.5 C**	—	**P112**	**BN112M4**	274-275
100	**19.0**	278	605	3.2	1.8	10	11290	**VF 130_10**	**V55**	P112	**V 5.5 C**	V 5.5 F	**P112**	**BN112M4**	272-273
100	**19.0**	275	605	2.1	1.1	10	8000	**W 110_10**	—	P112	—	V 5.5 F	**P112**	**BN112M4**	271
143	**27.1**	199	438	5.8	3.2	7	11370	**VF 150_7**	**V55**	P112	**V 5.5 C**	V 5.5 F	**P112**	**BN112M4**	274-275
143	**27.1**	197	433	2.7	1.4	7	7810	**W 110_7**	—	P100	—	V 5.5 F	**P112**	**BN112M4**	271

5.5 kW

8.3	**1.6**	3175	5568	1.1	0.7	80	34500	**VF 210_80**	—	P132	—	V 10 F	**P132**	**BN132MB6**	278
10.0	**1.9**	2623	4816	1.1	0.7	100	33000	**VF 210_100**	—	P132	—	V 10 F	**P132**	**BN132S4**	278
11.1	**2.1**	2570	4524	1.6	1.0	60	34500	**VF 210_60**	—	P132	—	V 10 F	**P132**	**BN132MB6**	278
11.1	**2.1**	2608	4594	1.1	0.7	60	33000	**VF 185_60**	—	P132	—	V 10 F	**P132**	**BN132MB6**	276-277
12.5	**2.4**	2236	4128	1.5	0.9	80	33000	**VF 210_80**	—	P132	—	V 10 F	**P132**	**BN132S4**	278
12.5	**2.4**	2270	4128	1.1	0.7	80	19000	**VF 185_80**	—	P132	—	V 10 F	**P132**	**BN132S4**	276-277
16.6	**3.1**	1814	3202	1.0	0.6	40	16000	**VF 150_40**	—	P132	—	V 10 F	**P132**	**BN132MB6**	274-275
16.7	**3.2**	1806	3354	2.1	1.3	60	33000	**VF 210_60**	—	P132	—	V 10 F	**P132**	**BN132S4**	278
16.7	**3.2**	1832	3406	1.4	0.9	60	19000	**VF 185_60**	—	P132	—	V 10 F	**P132**	**BN132S4**	276-277
20.0	**3.8**	1548	2924	2.6	1.5	50	33000	**VF 210_50**	—	P132	—	V 10 F	**P132**	**BN132S4**	278
20.0	**3.8**	1570	2924	1.8	1.1	50	19000	**VF 185_50**	—	P132	—	V 10 F	**P132**	**BN132S4**	276-277
21.7	**4.1**	1464	2730	1.2	0.7	46	15500	**VF 150_46**	—	P132	—	V 10 F	**P132**	**BN132S4**	274-275
22.1	**4.2**	1493	2680	1.7	1.0	30	19500	**VF 185_30**	—	P132	—	V 10 F	**P132**	**BN132MB6**	276-277
22.1	**4.2**	1436	2540	1.2	0.8	30	16000	**VF 150_30**	—	P132	—	V 10 F	**P132**	**BN132MB6**	274-275
25.0	**4.8**	1307	2442	2.4	1.5	40	19000	**VF 185_40**	—	P132	—	V 10 F	**P132**	**BN132S4**	276-277
25.0	**4.8**	1273	2374	1.4	0.8	40	15500	**VF 150_40**	—	P132	—	V 10 F	**P132**	**BN132S4**	274-275

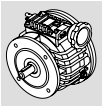


5.5 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
28.8	**5.4**	1159	2081	1.4	0.9	23	16000	**VF 150_23**	— P132	— V 10 F	**P132**	**BN132MB6**	274-275
28.8	**5.4**	1145	2054	1.0	0.6	23	13800	**VF 130_23**	— P132	— V 10 F	**P132**	**BN132MB6**	272-273
33	**6.3**	1045	1987	2.3	1.4	30	19000	**VF 185_30**	— P132	— V 10 F	**P132**	**BN132S4**	276-277
33	**6.3**	993	1883	1.6	1.0	30	15500	**VF 150_30**	— P132	— V 10 F	**P132**	**BN132S4**	274-275
33	**6.3**	993	1858	1.3	0.8	30	13200	**VF 130_30**	— P132	— V 10 F	**P132**	**BN132S4**	272-273
43	**8.3**	811	1543	1.8	1.2	23	15500	**VF 150_23**	— P132	— V 10 F	**P132**	**BN132S4**	274-275
43	**8.3**	801	1523	1.3	0.9	23	13200	**VF 130_23**	— P132	— V 10 F	**P132**	**BN132S4**	272-273
50	**9.5**	714	1376	2.1	1.4	20	15120	**VF 150_20**	— P132	— V 10 F	**P132**	**BN132S4**	274-275
50	**9.5**	705	1359	1.5	1.0	20	13080	**VF 130_20**	— P132	— V 10 F	**P132**	**BN132S4**	272-273
66	**12.5**	542	974	1.8	1.1	10	11900	**VF 130_10**	— P132	— V 10 F	**P132**	**BN132MB6**	272-273
67	**12.7**	548	1071	2.5	1.6	15	13890	**VF 150_15**	— P132	— V 10 F	**P132**	**BN132S4**	274-275
67	**12.7**	542	1045	2.0	1.3	15	12140	**VF 130_15**	— P132	— V 10 F	**P132**	**BN132S4**	272-273
95	**17.9**	388	698	2.4	1.4	7	10680	**VF 130_7**	— P132	— V 10 F	**P132**	**BN132MB6**	272-273
100	**19.0**	374	731	3.2	2.1	10	12370	**VF 150_10**	— P132	— V 10 F	**P132**	**BN132S4**	274-275
100	**19.0**	374	722	2.4	1.5	10	10850	**VF 130_10**	— P132	— V 10 F	**P132**	**BN132S4**	272-273
143	**27.1**	265	518	3.2	1.9	7	9710	**VF 130_7**	— P132	— V 10 F	**P132**	**BN132S4**	272-273

7.5 kW

8.3	**1.7**	4680	8928	1.2	0.6	80	52000	**VF 250_80**	— P160	— V 15 UF	**P160**	**BN160M6**	279
10.0	**1.9**	3654	6728	1.3	0.7	100	50000	**VF 250_100**	— P132	— V 10 F	**P132**	**BN132MA4**	279
11.1	**2.2**	3834	7344	1.6	0.9	60	52000	**VF 250_60**	— P160	— V 15 UF	**P160**	**BN160M6**	279
11.1	**2.2**	3672	7020	1.1	0.6	60	34500	**VF 210_60**	— P160	— V 15 UF	**P160**	**BN160M6**	278
12.5	**2.4**	3109	5754	1.7	0.9	80	50000	**VF 250_80**	— P132	— V 10 F	**P132**	**BN132MA4**	279
12.5	**2.4**	3016	5568	1.1	0.7	80	33000	**VF 210_80**	— P132	— V 10 F	**P132**	**BN132MA4**	278
13.3	**2.6**	3195	6120	1.3	0.7	50	34500	**VF 210_50**	— P160	— V 15 UF	**P160**	**BN160M6**	278
16.7	**3.2**	2506	4733	2.2	1.3	60	50000	**VF 250_60**	— P132	— V 10 F	**P132**	**BN132MA4**	279
16.7	**3.2**	2436	4524	1.5	1.0	60	33000	**VF 210_60**	— P132	— V 10 F	**P132**	**BN132MA4**	278
16.7	**3.2**	2471	4594	1.1	0.7	60	19000	**VF 185_60**	— P132	— V 10 F	**P132**	**BN132MA4**	276-277
20.0	**3.8**	2088	3944	1.9	1.1	50	33000	**VF 210_50**	— P132	— V 10 F	**P132**	**BN132MA4**	278
20.0	**3.8**	2117	3944	1.4	0.8	50	19000	**VF 185_50**	— P132	— V 10 F	**P132**	**BN132MA4**	276-277
22.1	**4.4**	2133	4158	1.7	1.0	30	34500	**VF 210_30**	— P160	— V 15 UF	**P160**	**BN160M6**	278
22.1	**4.4**	2133	4158	1.2	0.7	30	19500	**VF 185_30**	— P160	— V 15 UF	**P160**	**BN160M6**	276-277
25.0	**4.8**	1740	3294	2.5	1.5	40	33000	**VF 210_40**	— P132	— V 10 F	**P132**	**BN132MA4**	278

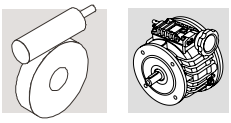


7.5 kW

n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
25.0	**4.8**	1763	3294	1.8	1.1	40	19000	**VF 185_40**	— P132	— V 10 F		**P132**	**BN132MA4**	276-277
25.0	**4.8**	1717	3202	1.0	0.6	40	15500	**VF 150_40**	— P132	— V 10 F		**P132**	**BN132MA4**	274-275
33	**6.3**	1392	2680	2.4	1.5	30	33000	**VF 210_30**	— P132	— V 10 F		**P132**	**BN132MA4**	278
33	**6.3**	1409	2680	1.7	1.0	30	19000	**VF 185_30**	— P132	— V 10 F		**P132**	**BN132MA4**	276-277
33	**6.3**	1340	2540	1.2	0.8	30	15500	**VF 150_30**	— P132	— V 10 F		**P132**	**BN132MA4**	274-275
43	**8.3**	1094	2081	1.4	0.9	23	14770	**VF 150_23**	— P132	— V 10 F		**P132**	**BN132MA4**	274-275
43	**8.3**	1081	2054	1.0	0.6	23	12500	**VF 130_23**	— P132	— V 10 F		**P132**	**BN132MA4**	272-273
44	**8.8**	1134	2241	1.3	0.8	15	13980	**VF 150_15**	— P160	— V 15 UF		**P160**	**BN160M6**	274-275
50	**9.5**	963	1856	1.6	1.0	20	14270	**VF 150_20**	— P132	— V 10 F		**P132**	**BN132MA4**	274-275
50	**9.5**	951	1833	1.1	0.7	20	12130	**VF 130_20**	— P132	— V 10 F		**P132**	**BN132MA4**	272-273
67	**12.7**	740	1444	1.8	1.2	15	13170	**VF 150_15**	— P132	— V 10 F		**P132**	**BN132MA4**	274-275
67	**12.7**	731	1409	1.5	1.0	15	11370	**VF 130_15**	— P132	— V 10 F		**P132**	**BN132MA4**	272-273
95	**18.9**	554	1096	2.3	1.3	7	11370	**VF 150_7**	— P160	— V 15 UF		**P160**	**BN160M6**	274-275
100	**19.0**	505	986	2.4	1.5	10	11820	**VF 150_10**	— P132	— V 10 F		**P132**	**BN132MA4**	274-275
100	**19.0**	505	974	1.8	1.1	10	10260	**VF 130_10**	— P132	— V 10 F		**P132**	**BN132MA4**	272-273
143	**27.1**	357	698	2.4	1.4	7	9210	**VF 130_7**	— P132	— V 10 F		**P132**	**BN132MA4**	272-273

9.2 kW

10.0	**1.9**	4536	8352	1.1	0.6	100	50000	**VF 250_100**	— P132	— V 10 F		**P132**	**BN132MB4**	279
12.5	**2.4**	3859	7142	1.3	0.8	80	50000	**VF 250_80**	— P132	— V 10 F		**P132**	**BN132MB4**	279
16.7	**3.2**	3110	5875	1.8	1.1	60	50000	**VF 250_60**	— P132	— V 10 F		**P132**	**BN132MB4**	279
16.7	**3.2**	3024	5616	1.2	0.8	60	33000	**VF 210_60**	— P132	— V 10 F		**P132**	**BN132MB4**	278
20.0	**3.8**	2628	4896	2.4	1.3	50	50000	**VF 250_50**	— P132	— V 10 F		**P132**	**BN132MB4**	279
20.0	**3.8**	2592	4896	1.5	0.9	50	33000	**VF 210_50**	— P132	— V 10 F		**P132**	**BN132MB4**	278
20.0	**3.8**	2628	4896	1.1	0.7	50	19000	**VF 185_50**	— P132	— V 10 F		**P132**	**BN132MB4**	276-277
25.0	**4.8**	2189	4147	3.0	1.7	40	50000	**VF 250_40**	— P132	— V 10 F		**P132**	**BN132MB4**	279
25.0	**4.8**	2160	4090	2.0	1.2	40	33000	**VF 210_40**	— P132	— V 10 F		**P132**	**BN132MB4**	278
25.0	**4.8**	2189	4090	1.4	0.9	40	19000	**VF 185_40**	— P132	— V 10 F		**P132**	**BN132MB4**	276-277
33	**6.3**	1750	3413	3.1	1.8	30	48950	**VF 250_30**	— P132	— V 10 F		**P132**	**BN132MB4**	279
33	**6.3**	1728	3326	2.0	1.2	30	33000	**VF 210_30**	— P132	— V 10 F		**P132**	**BN132MB4**	278
33	**6.3**	1750	3326	1.4	0.8	30	19000	**VF 185_30**	— P132	— V 10 F		**P132**	**BN132MB4**	276-277
33	**6.3**	1663	3154	1.0	0.6	30	14820	**VF 150_30**	— P132	— V 10 F		**P132**	**BN132MB4**	274-275
43	**8.3**	1358	2583	1.1	0.7	23	13900	**VF 150_23**	— P132	— V 10 F		**P132**	**BN132MB4**	274-275

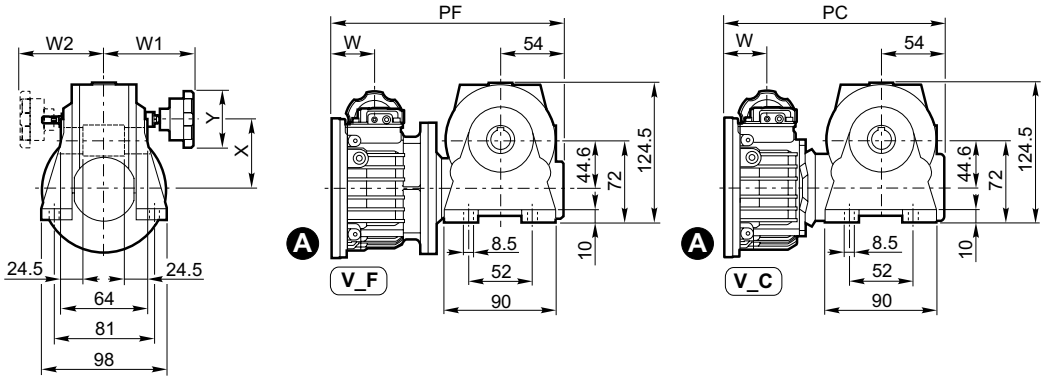


9.2 kW

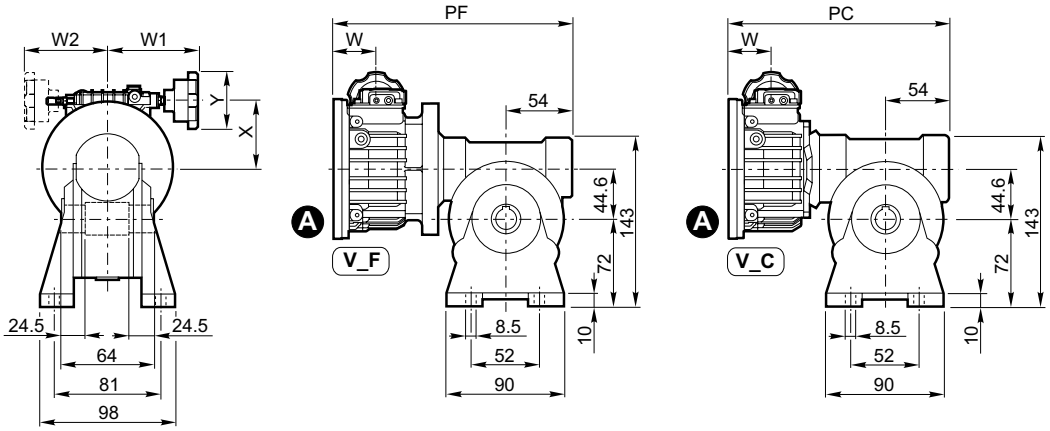
n_2 min^{-1}	n_2' min^{-1}	M_2 Nm	M_2' Nm	S	S'	i	R_{n2} N	V_	P(IEC)	C	F	IEC	
50	**9.5**	1195	2333	3.2	2.0	20	33000	**VF 210_20**	— P132	— V 10 F	**P132**	**BN132MB4**	278
50	**9.5**	1195	2304	1.3	0.8	20	13480	**VF 150_20**	— P132	— V 10 F	**P132**	**BN132MB4**	274-275
67	**12.7**	918	1793	1.5	0.9	15	12500	**VF 150_15**	— P132	— V 10 F	**P132**	**BN132MB4**	274-275
67	**12.7**	907	1750	1.2	0.8	15	10640	**VF 130_15**	— P132	— V 10 F	**P132**	**BN132MB4**	272-273
100	**19.0**	626	1224	1.9	1.2	10	11320	**VF 150_10**	— P132	— V 10 F	**P132**	**BN132MB4**	274-275
100	**19.0**	626	1210	1.4	0.9	10	9700	**VF 130_10**	— P132	— V 10 F	**P132**	**BN132MB4**	272-273
143	**27.1**	449	877	2.6	1.6	7	10120	**VF 150_7**	— P132	— V 10 F	**P132**	**BN132MB4**	274-275
143	**27.1**	444	867	1.9	1.2	7	8740	**VF 130_7**	— P132	— V 10 F	**P132**	**BN132MB4**	272-273

24.9 - Dimensioni | ***24.9 - Dimensions*** | **24.9 - Abmessungen** | ***24.9 - Dimensions***

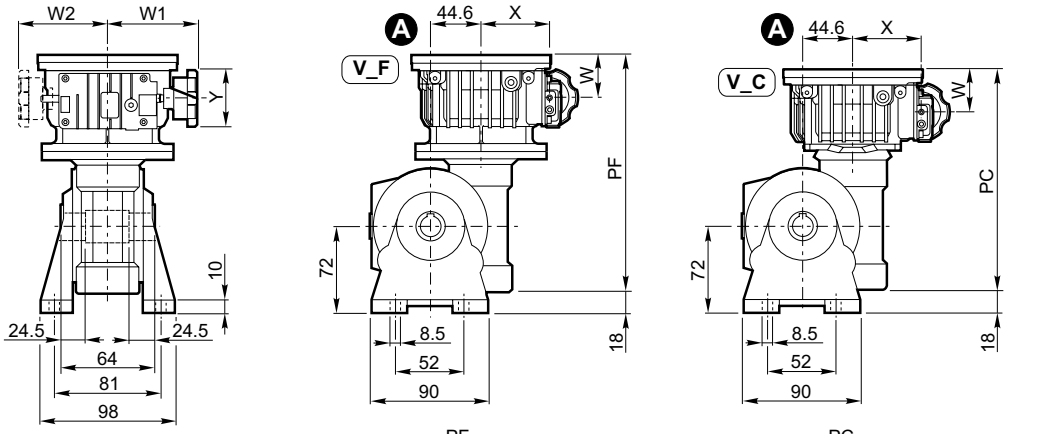
VF 44 N + V_P(IEC)



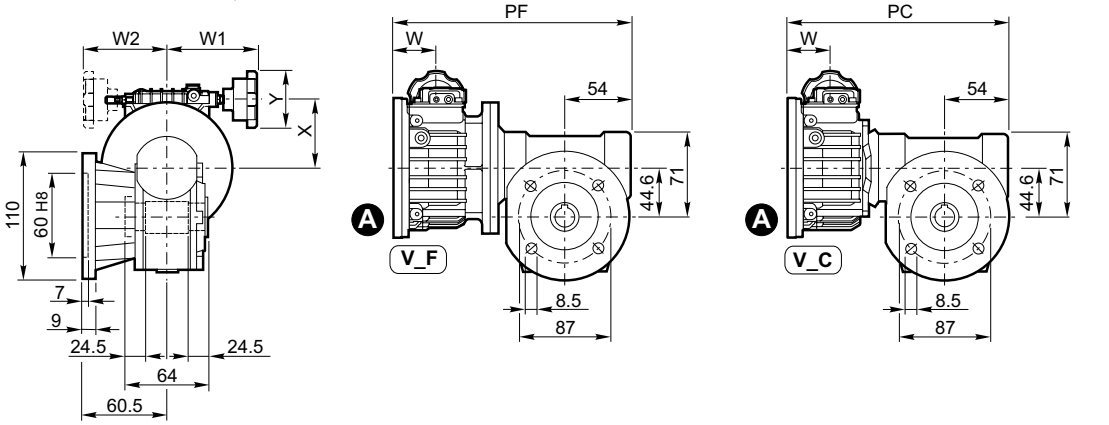
VF 44 A + V_P(IEC)

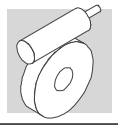
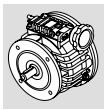


VF 44 V + V_P(IEC)

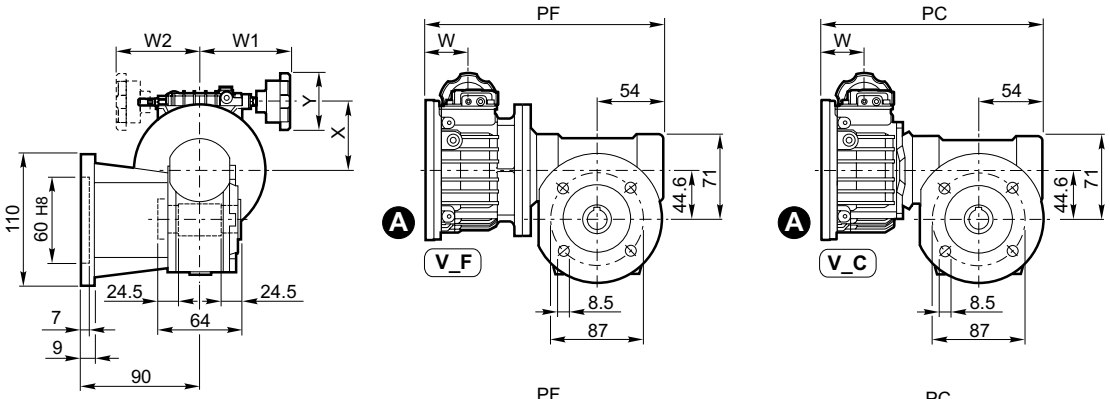


VF 44 F + V_P(IEC)

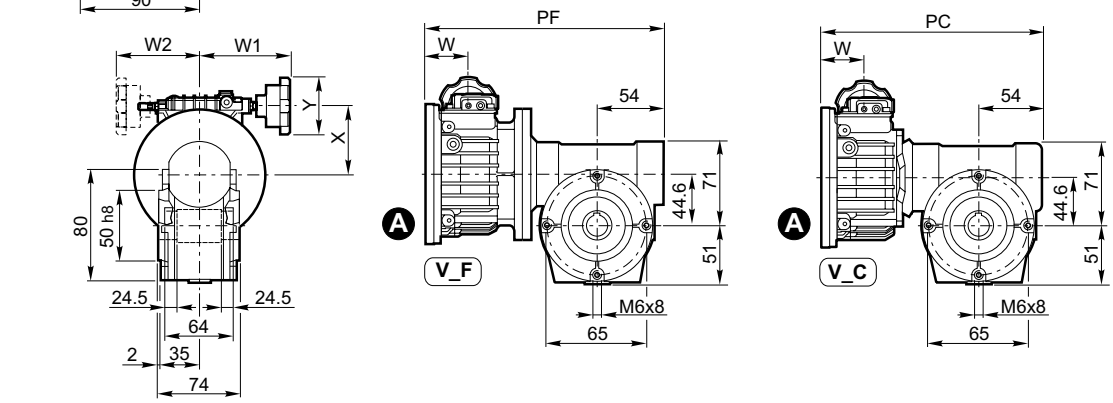


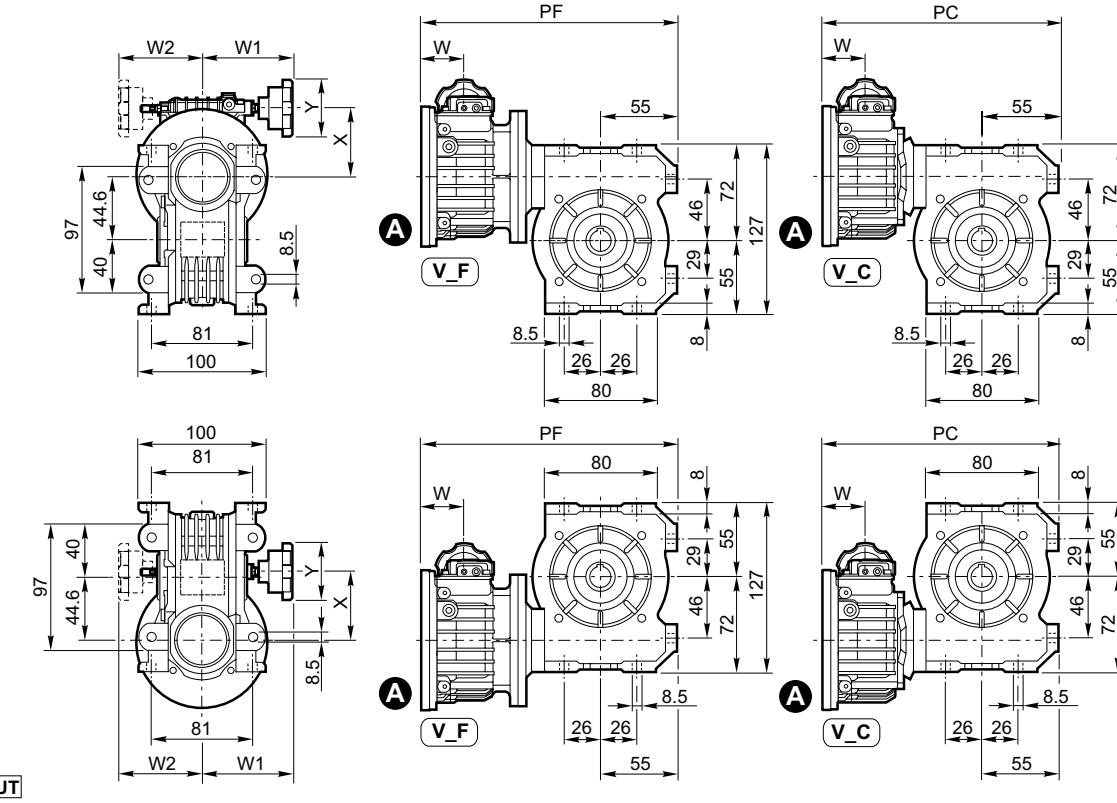
VF 44 FA + V_P(IEC)

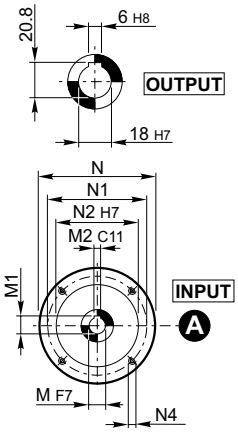


VF 44 P + V_P(IEC)



VF 44 U + V_P(IEC)

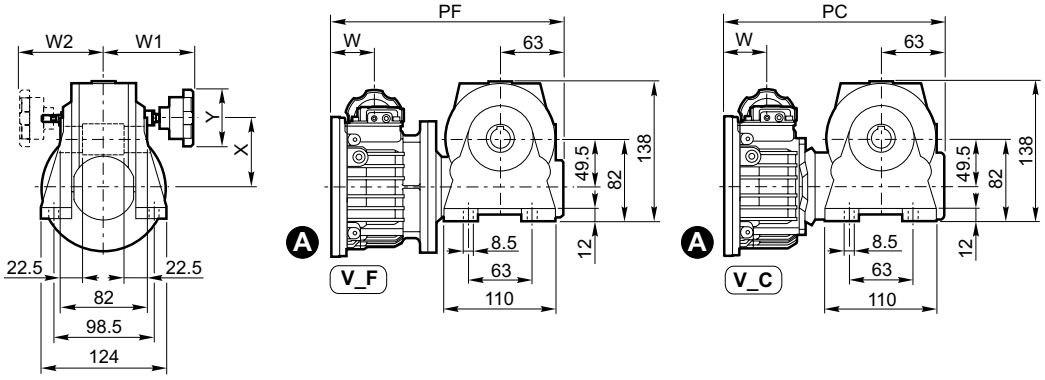




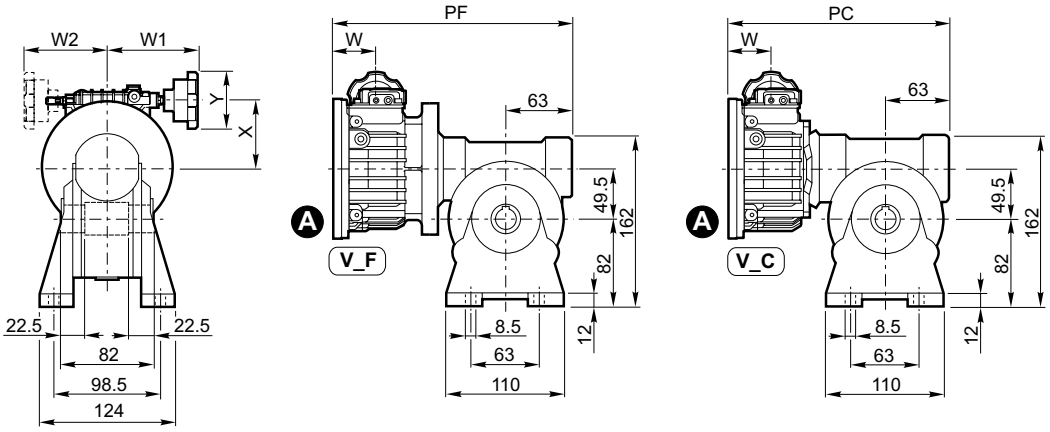
	IEC	V_C - V_F												VF44 _ + V_C		VF44_ + V_F	
		N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
VF 44_ V 0.25	P63	140	115	95	M8x20	11	12.8	4	45.0	115	110	70	83	203[1)] 204[2)]	6.3	228[1)] 229[2)]	6.5

[1)] N - A - V - F - FA - P
[2)] U

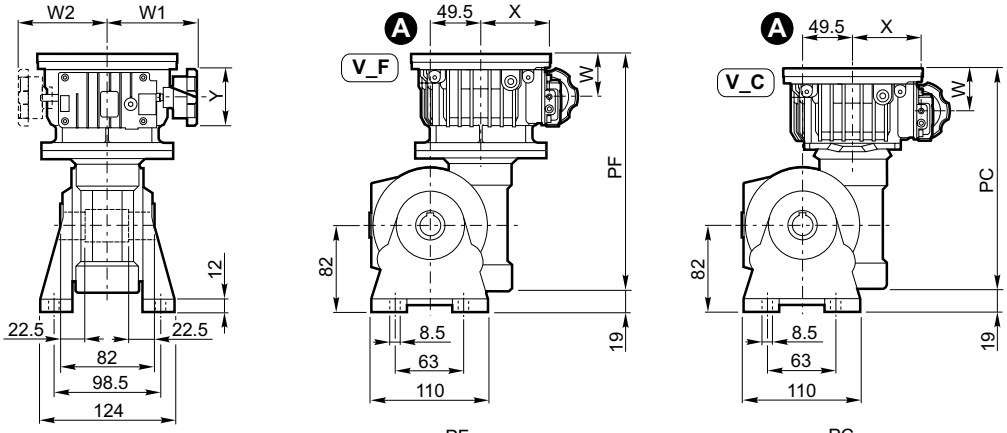
VF 49 N + V_P(IEC)



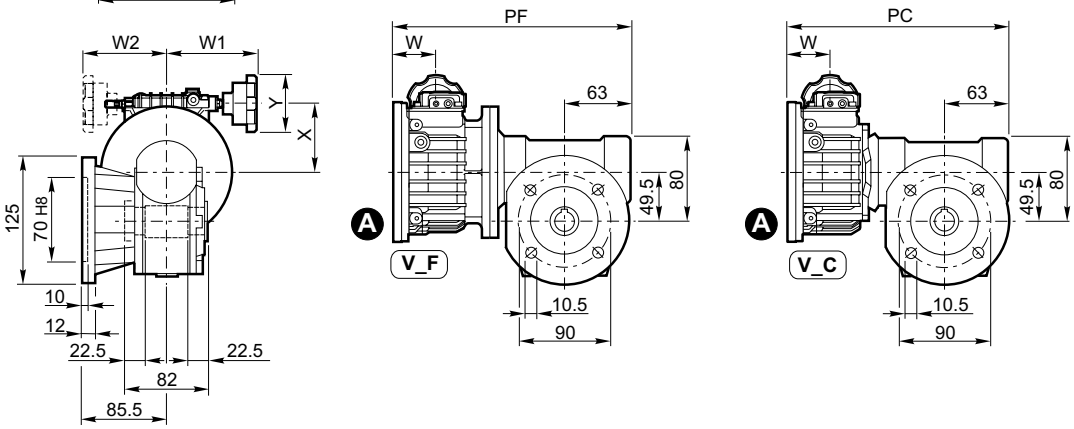
VF 49 A + V_P(IEC)

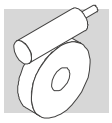


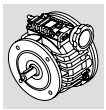
VF 49 V + V_P(IEC)



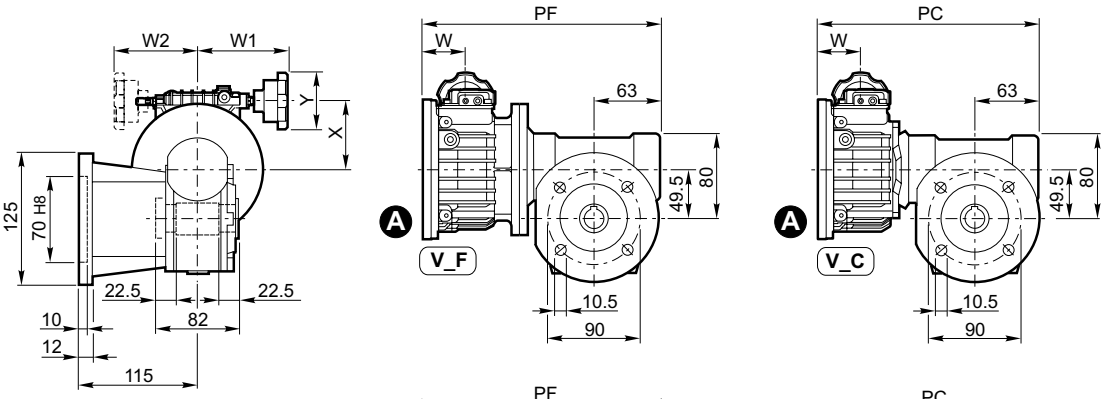
VF 49 F + V_P(IEC)



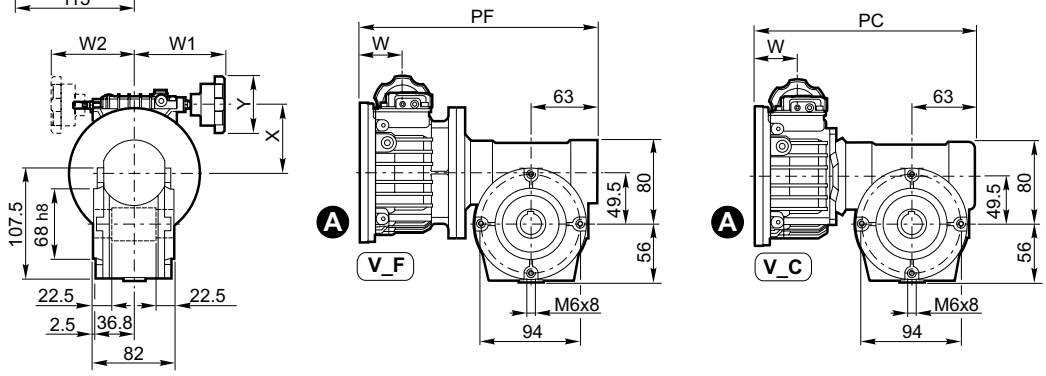




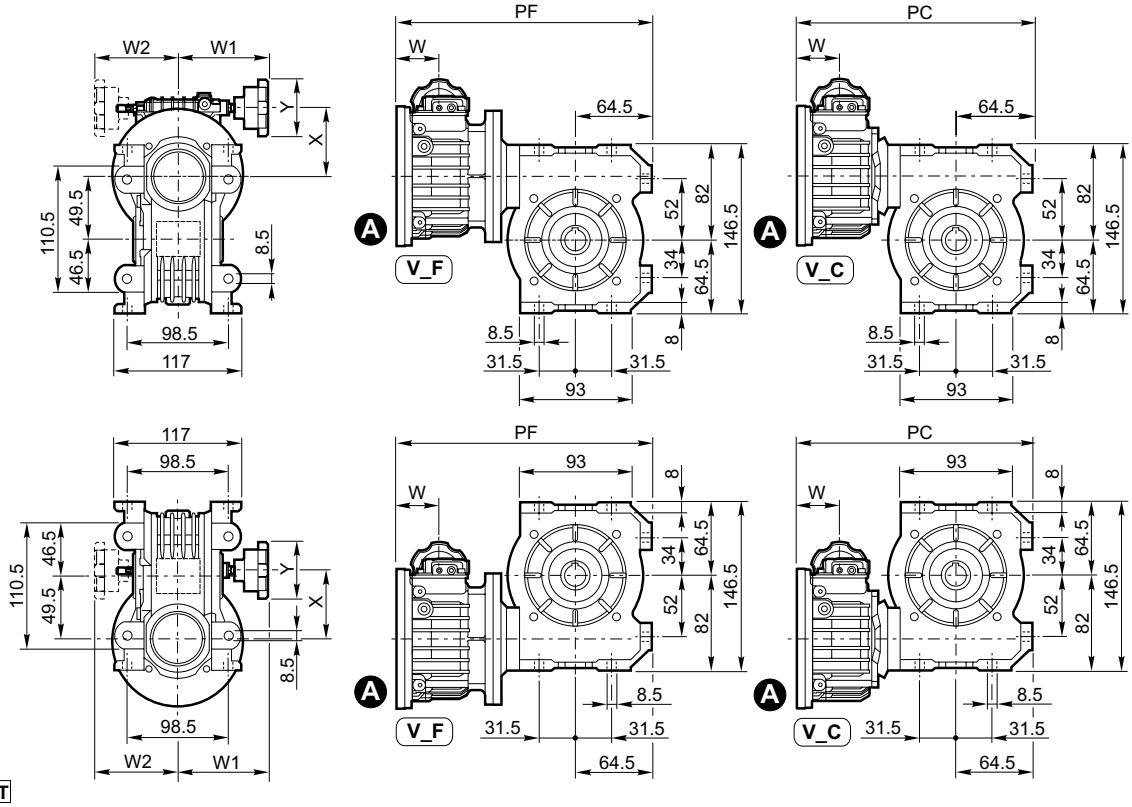
VF 49 FA + V_P(IEC)

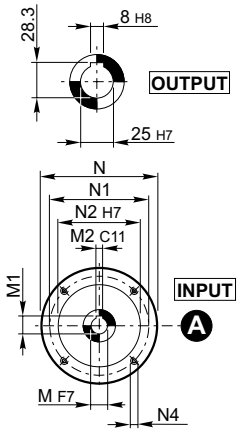


VF 49 P + V_P(IEC)



VF 49 U + V_P(IEC)

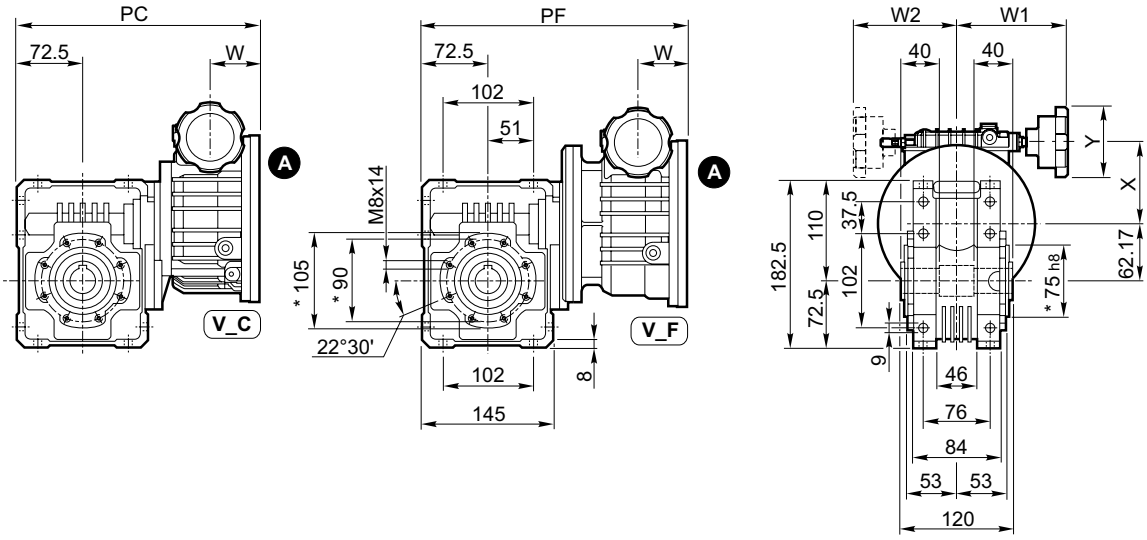




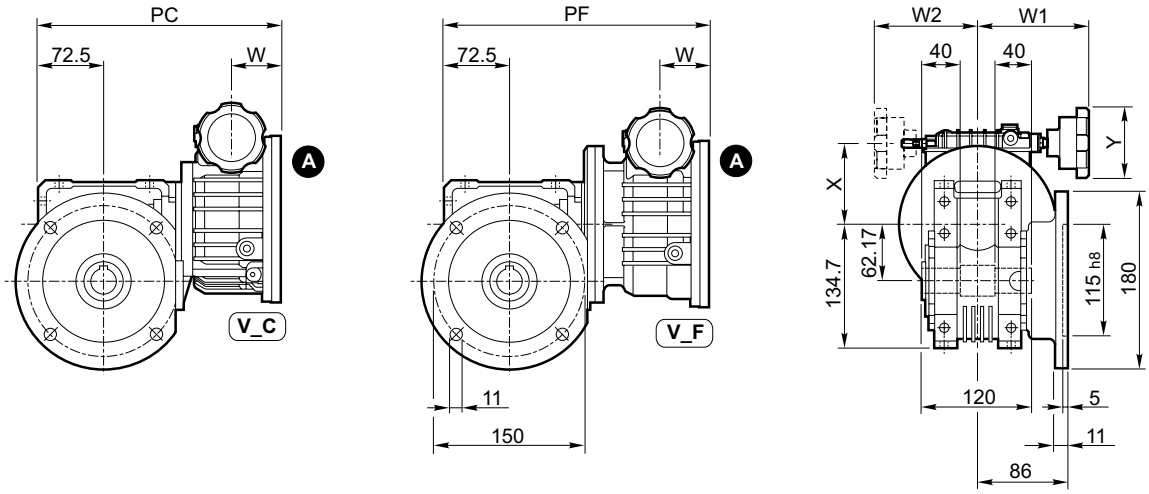
		IEC	V_C - V_F												VF49_ + V_C		VF49_ + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
VF 49_	V 0.25	P63	140	115	95	M8x20	11	12.8	4	45.0	115	110	70	83	222[1)]/223[2)]	7.2	242[1)]/243[2)]	7.5
	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	224[1)]/225[2)]	9.9	244[1)]/245[2)]	10.5
	V 0.5	P80	200	165	130	M10x20	19	20.8*	6	51.5	115	110	78	83	228[1)]/229[2)]	9.9	248[1)]/248[2)]	10.5
	V 1	P80	200	165	130	M10x20	19	21.8	6	59.0	133	124	97	83	—	—	270[1)]/271[2)]	17.1
	V 1	P90	200	165	130	M10x20	24	26.8**	8	59.0	133	124	97	83	—	—	270[1)]/271[2)]	17.1

1) N - A - V - F - FA - P
2) U

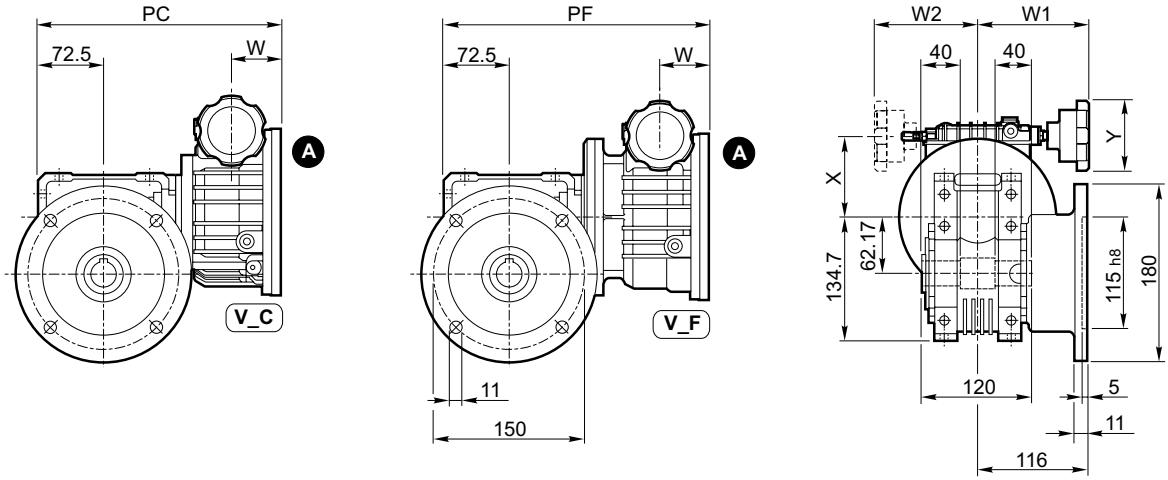
W 63 U + V_P(IEC)

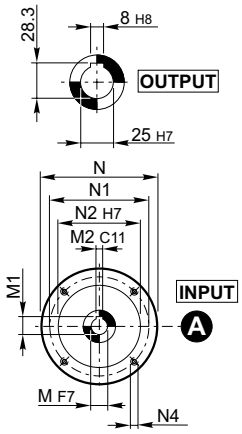


W 63 UFC + V_P(IEC)

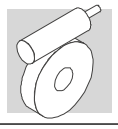
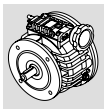


W 63 UF + V_P(IEC)

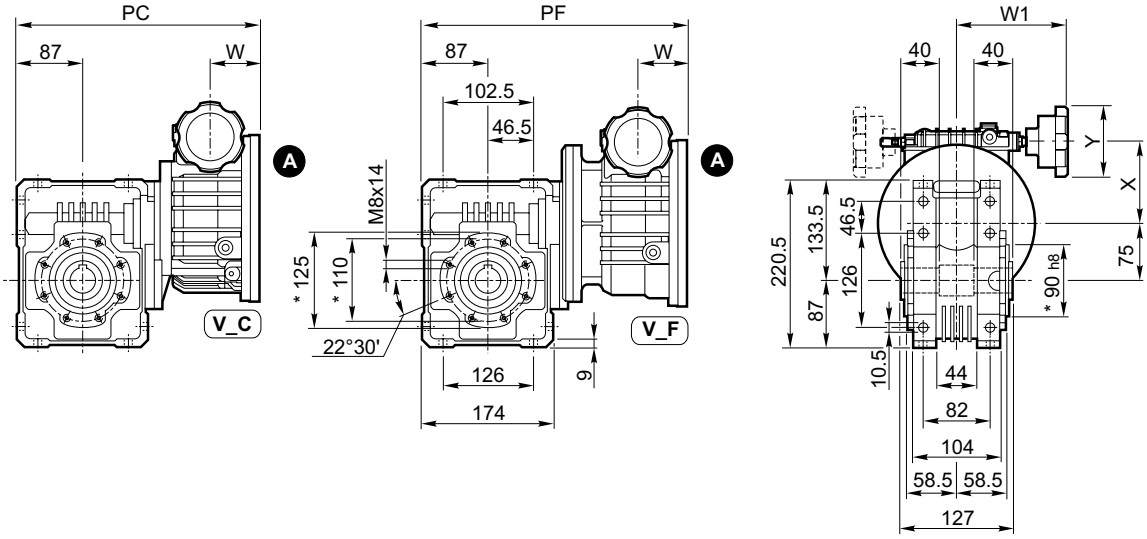




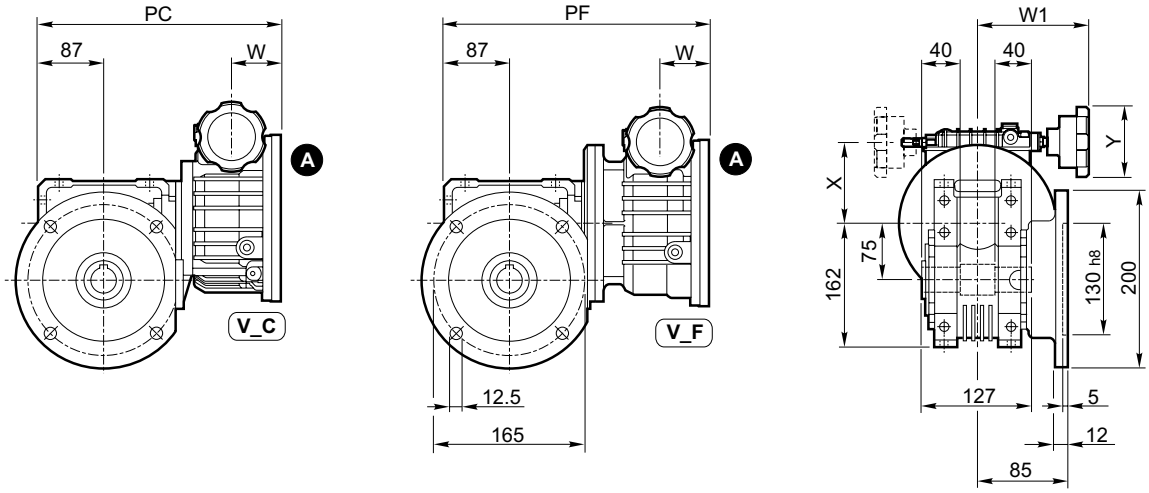
		IEC	V_C - V_F												W63_ + V_C		W63_ + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
W 63_	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	255	13.2	279	13.8
	V 0.5	P80	200	165	130	M10x20	19	20.8*	6	51.5	115	110	78	83	259	13.2	283	13.8
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	274	19.6	312	21
	V 1	P90	200	165	130	M10x20	24	26.3**	8	59	133	124	97	83	274	19.6	312	21

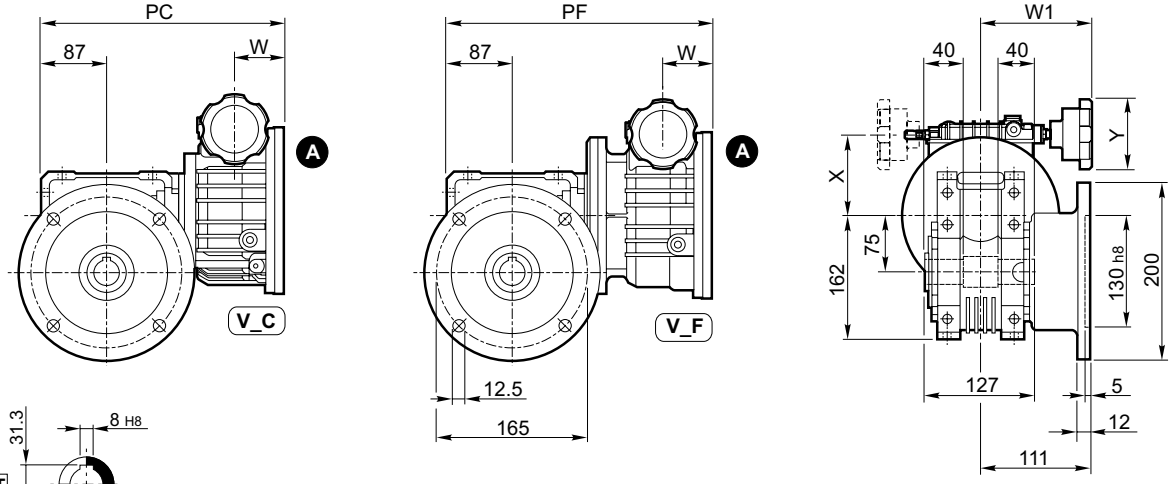
W 75 U + V_P(IEC)

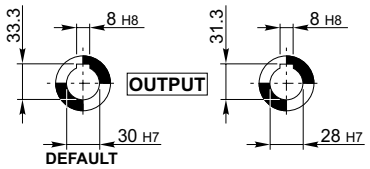


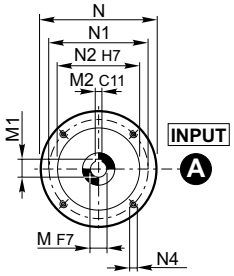
W 75 UFC + V_P(IEC)



W 75 UF + V_P(IEC)

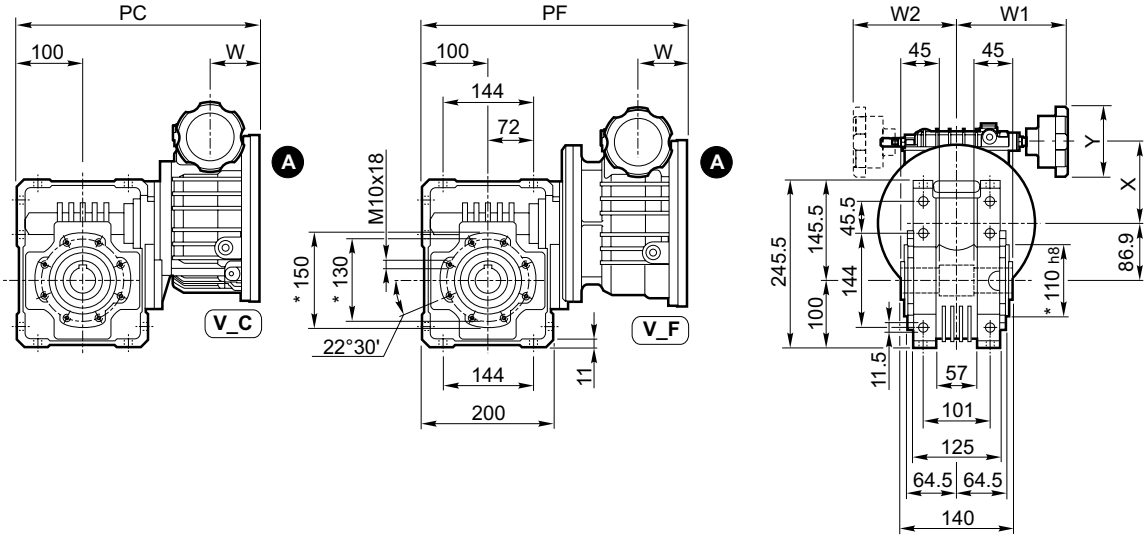




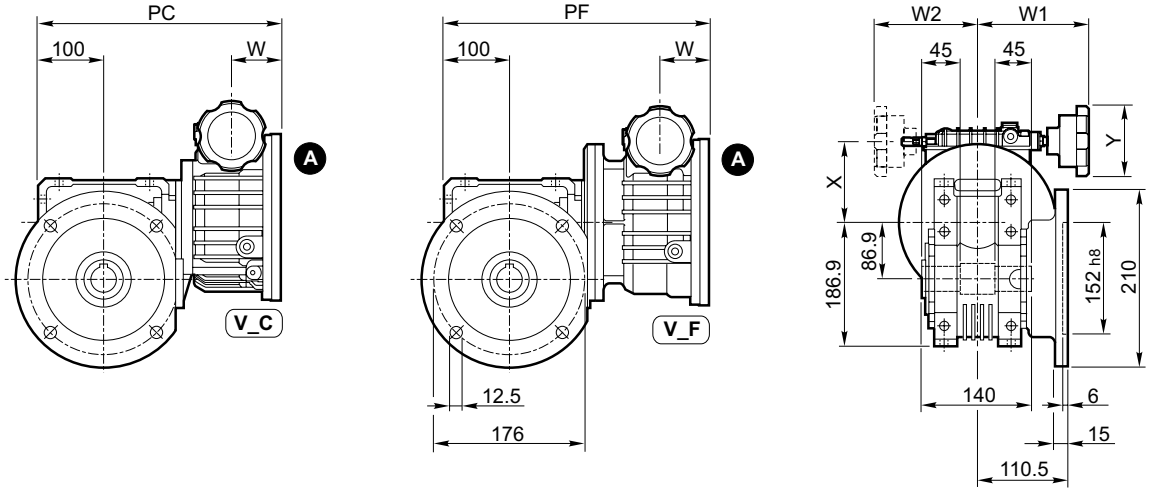


		IEC	V_C - V_F												W75_ + V_C		W75_ + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
W 75_	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	—	—	310	17.1
	V 0.5	P80	200	165	130	M10x20	19	20.8*	6	51.5	115	110	78	83	—	—	314	17.0
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	307	23	336	24
	V 1	P90	200	165	130	M10x20	24	26.3**	8	59	133	124	97	83	307	23	336	24
	V 2	P90	200	165	130	M10x15	24	27.3	8	74.1	137	120	113	83	333	27	360	28

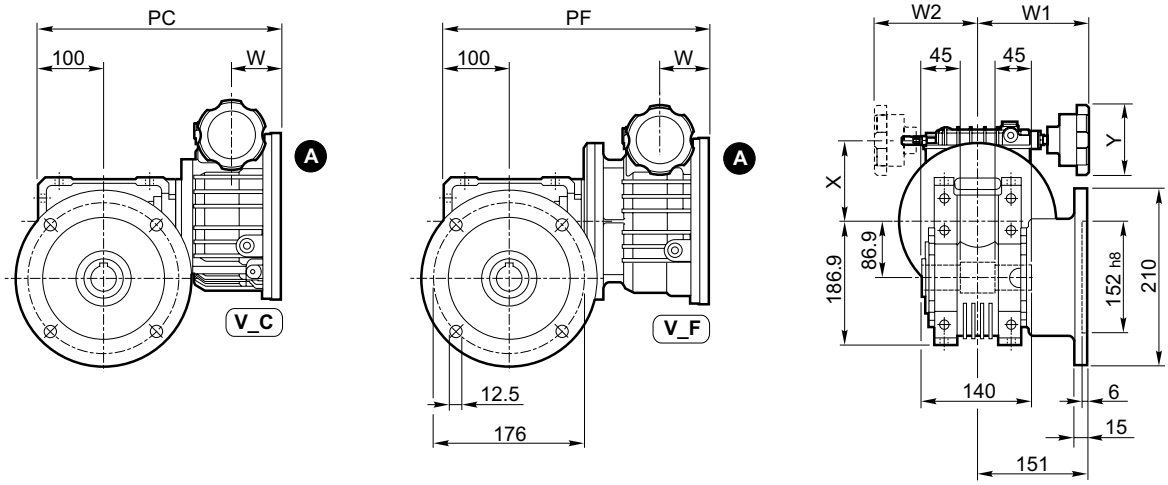
W 86 U + V_P(IEC)

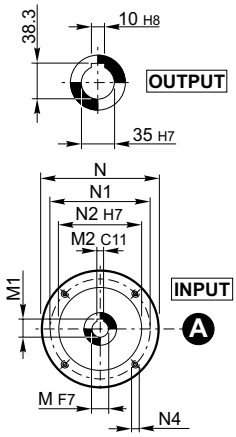


W 86 UFC + V_P(IEC)

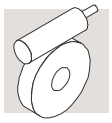
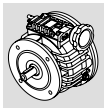


W 86 UF + V_P(IEC)

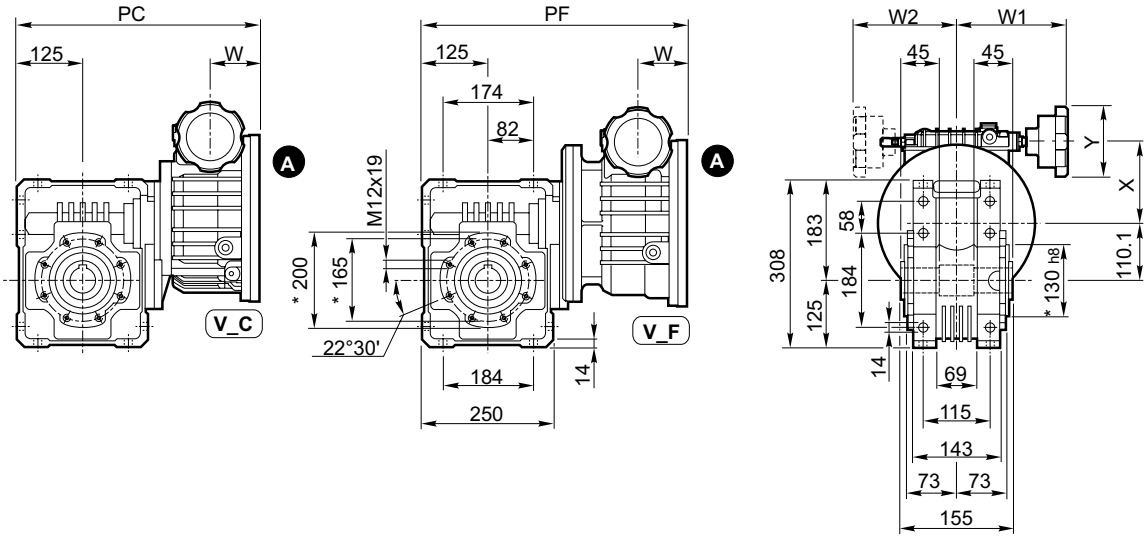




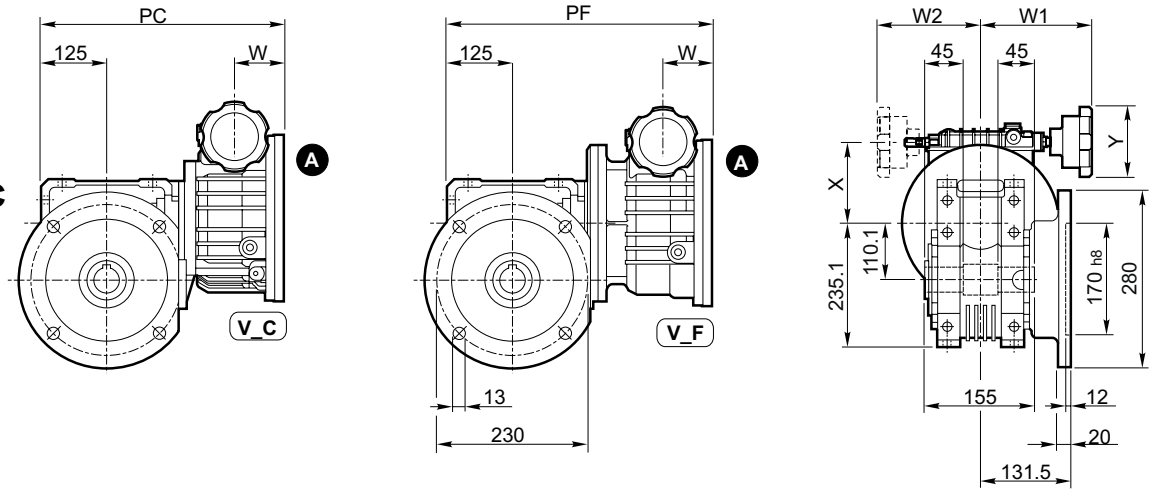
		IEC	V_C - V_F												W86_ + V_C		W86_ + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
W 86_	V 0.5	P71	160	130	110	M8x20	14	16.3	5	47.5	115	110	78	83	—	—	339	21
	V 0.5	P80	200	165	130	M10x20	19	20.8*	6	51.5	115	110	78	83	—	—	343	21
	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	336	32	365	28
	V 1	P90	200	165	130	M10x20	24	26.3**	8	59	133	124	97	83	336		365	28
	V 2	P90	200	165	130	M10X15	24	27.3	8	74.1	137	120	113	83	362	37	389	33

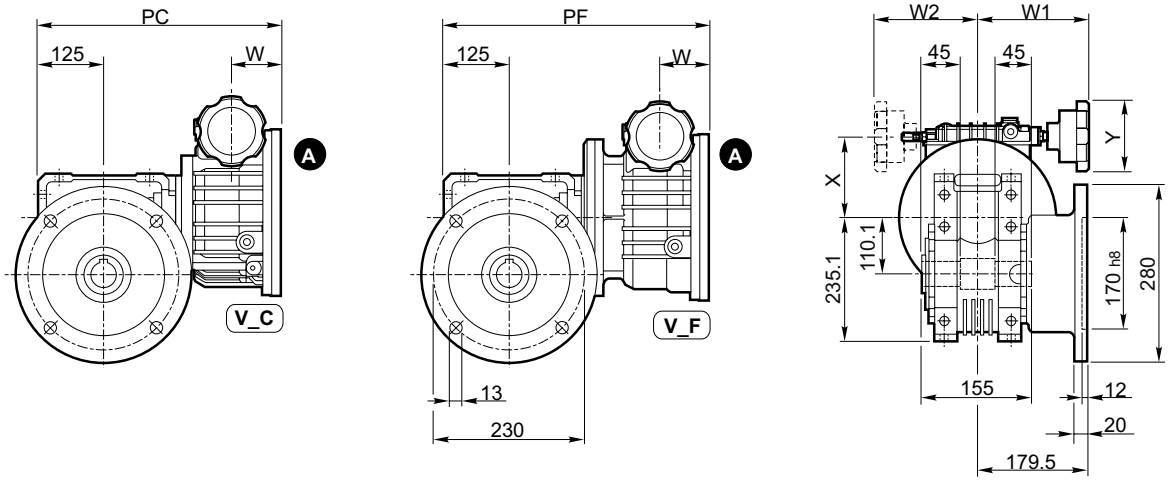
W 110 U + V_P(IEC)

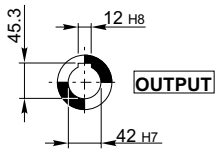


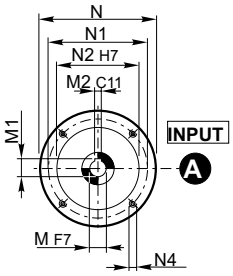
W 110 UFC + V_P(IEC)



W 110 UF + V_P(IEC)

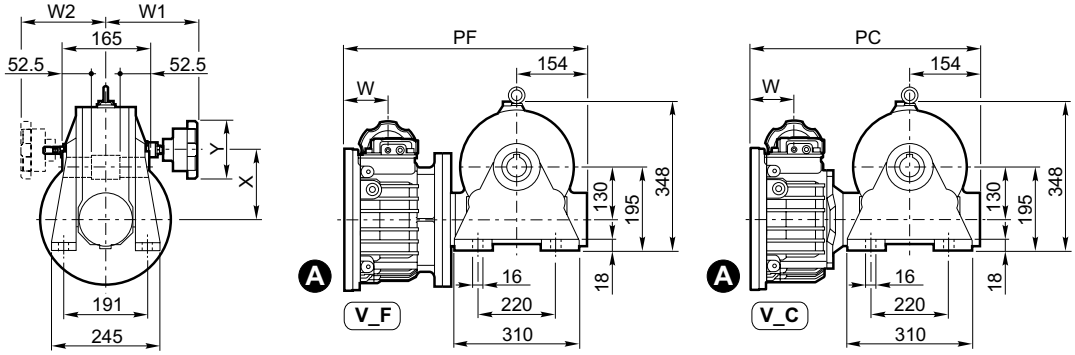




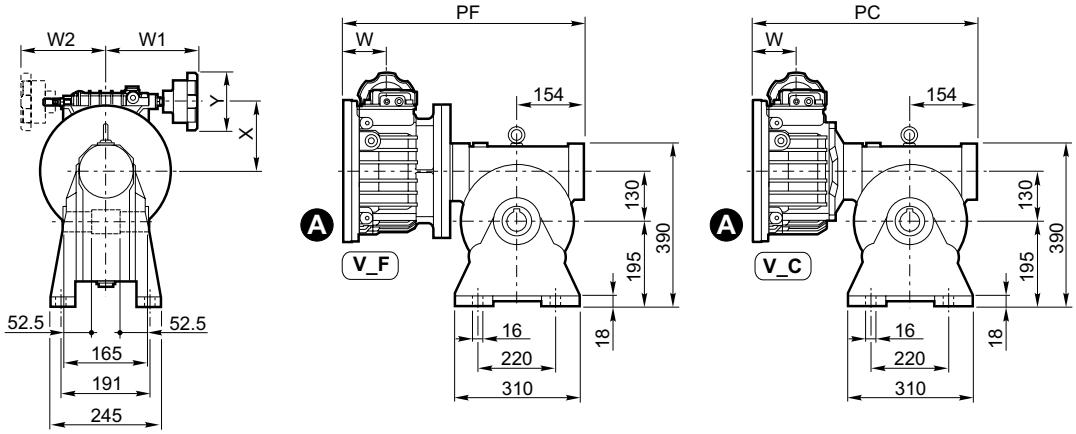


		IEC	V_C - V_F												W110_ + V_C		W110_ + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
W 110_	V 1	P80	200	165	130	M10x20	19	21.8	6	59	133	124	97	83	—	—	280	52
	V 1	P90	200	165	130	M10x20	24	26.3**	8	59	133	124	97	83	—	—	280	52
	V 2	P90	200	165	130	M10x15	24	27.3	8	70	137	120	113	83	277	54	304	57
	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	—	—	506	72
	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	—	—	506	73

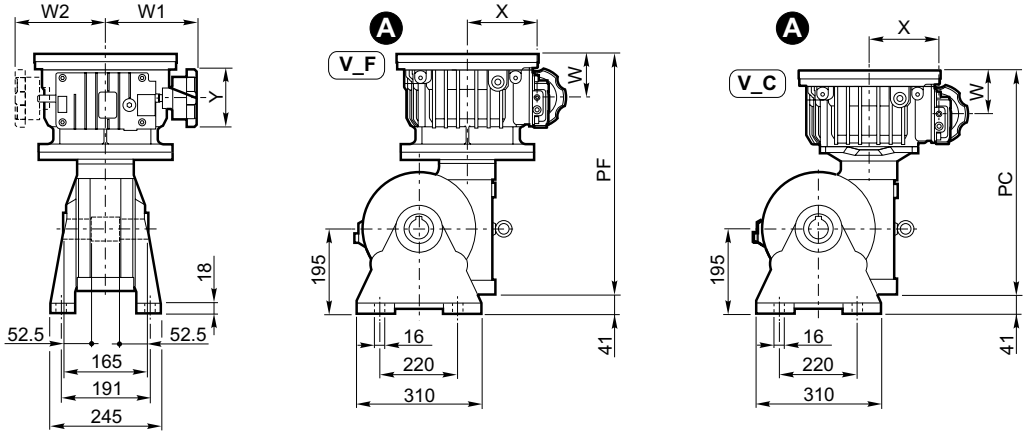
VF 130 N + V_P(IEC)



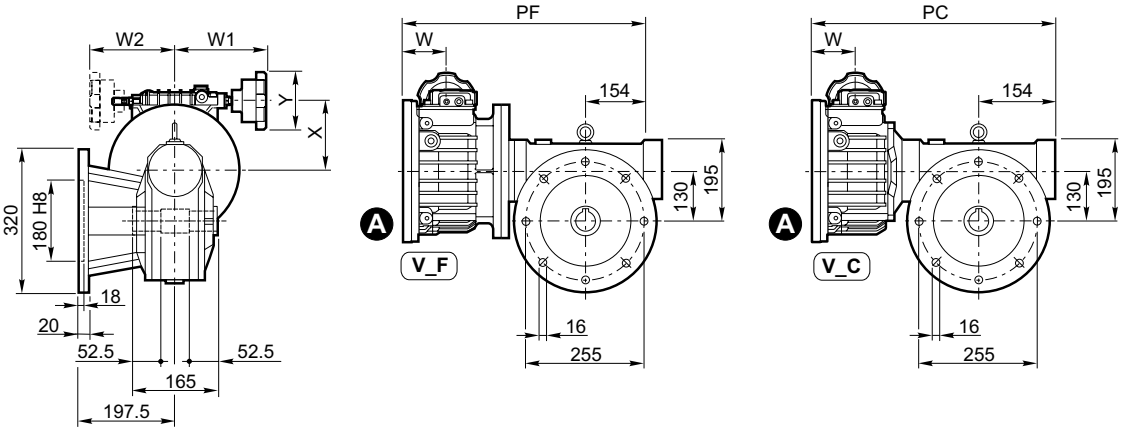
VF 130 A + V_P(IEC)

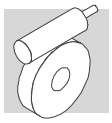


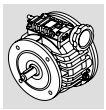
VF 130 V + V_P(IEC)



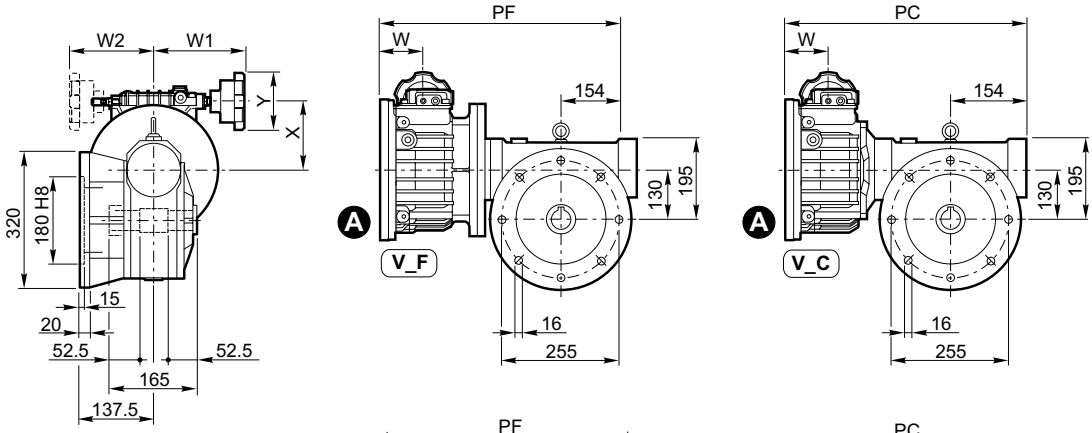
VF 130 F + V_P(IEC)



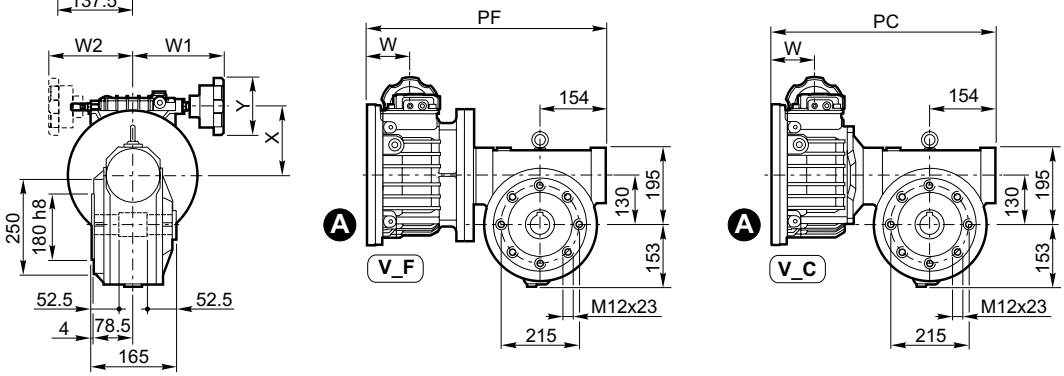


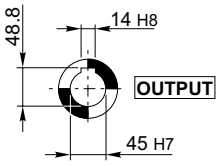


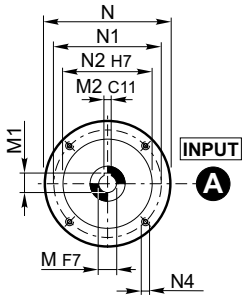
VF 130 FC/FR + V_P(IEC)



VF 130 P + V_P(IEC)

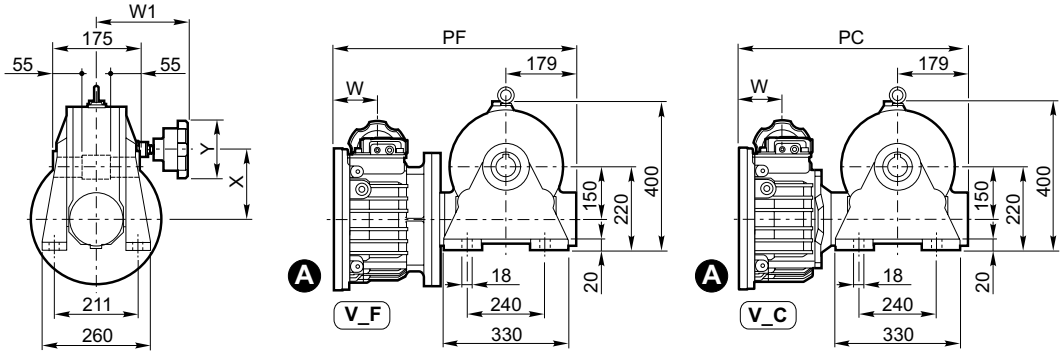




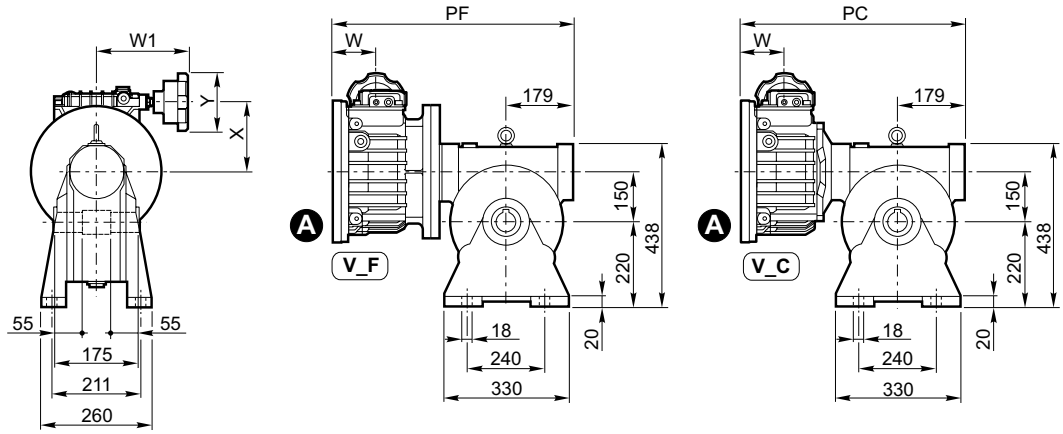


		IEC	V_C - V_F												VF130_ + V_C		VF130_ + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	W2	X	Y	PC	Kg	PF	Kg
VF 130_	V 2	P90	200	165	130	M10x15	24	27.3	8	74.1	137	120	113	83	453	66	500	68
	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	479	86	554	88
	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	—	150.5	109	479	87	554	89
	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	—	206.5	109	—	—	594.5	146

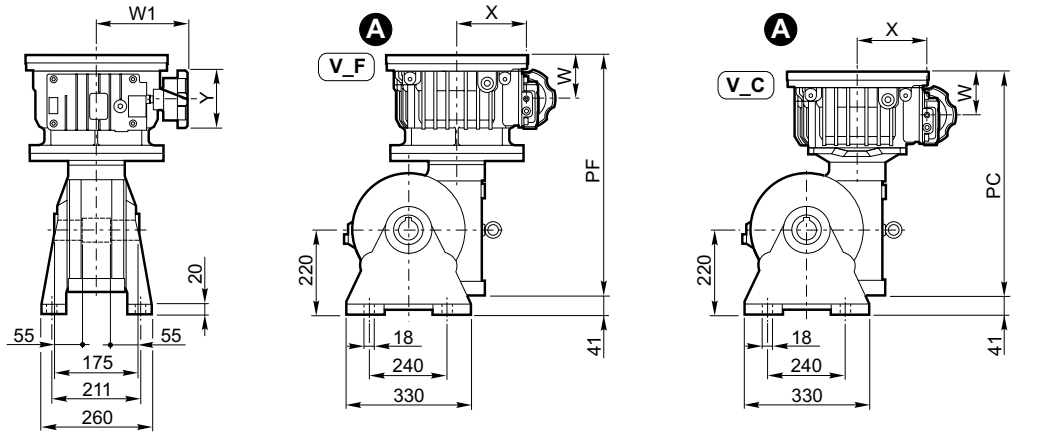
VF 150 N + V_P(IEC)



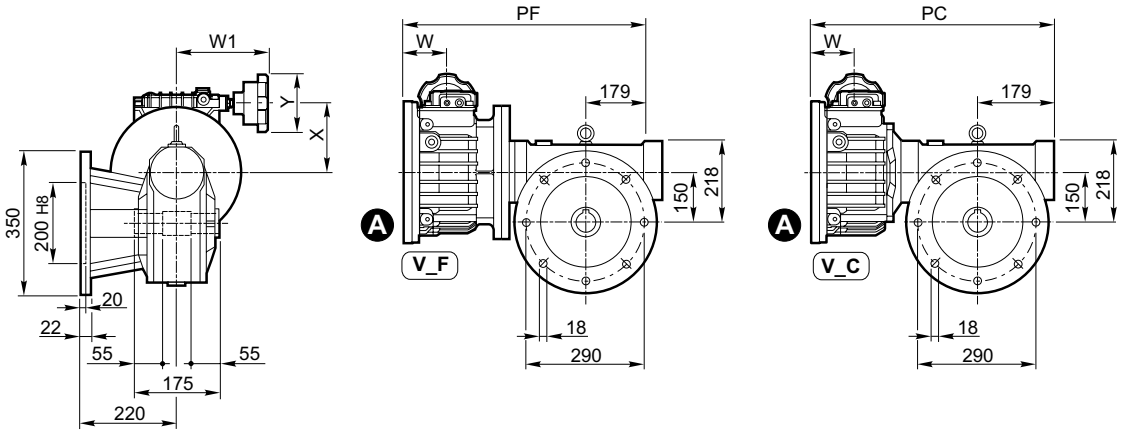
VF 150 A + V_P(IEC)

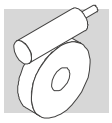


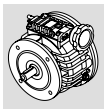
VF 150 V + V_P(IEC)



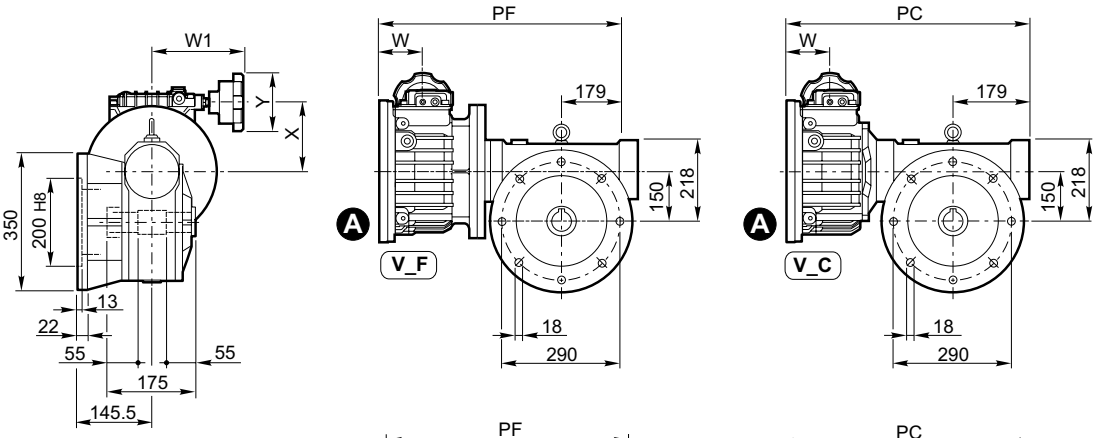
VF 150 F + V_P(IEC)



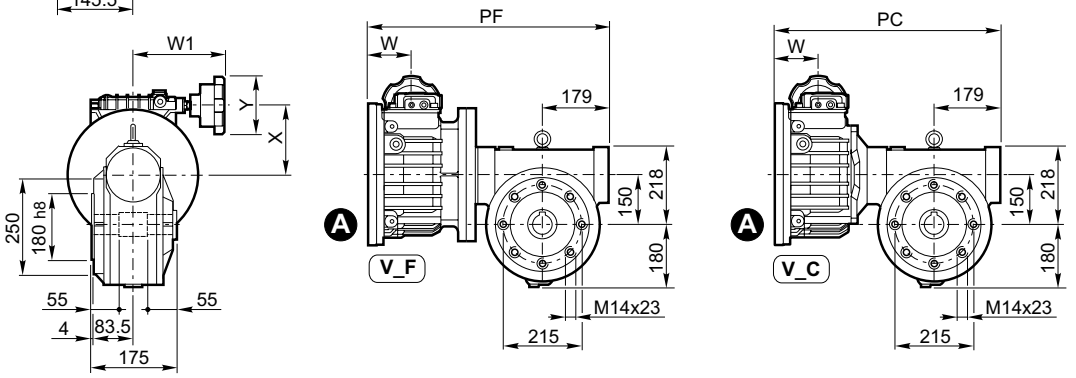


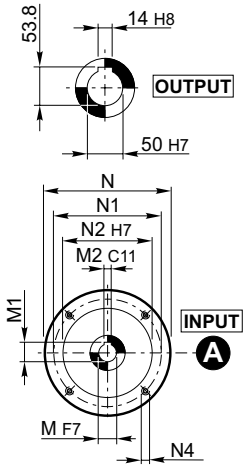


VF 150 FC/FR + V_P(IEC)



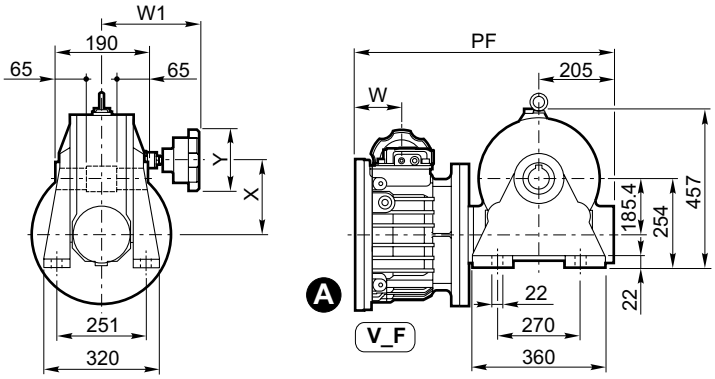
VF 150 P + V_P(IEC)



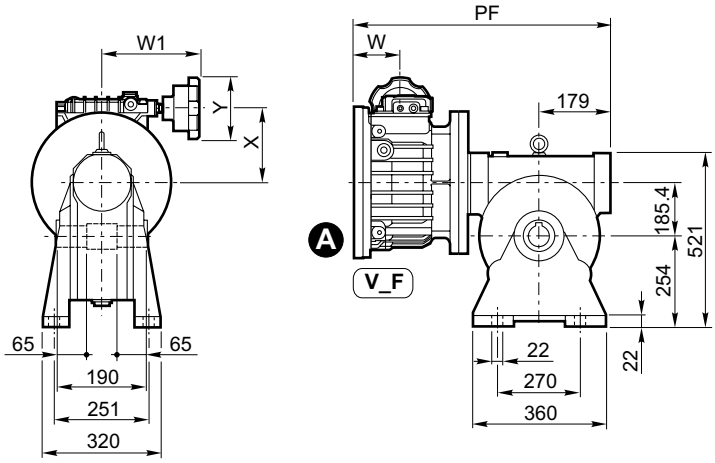


		IEC	V_C - V_F											VF150_ + V_C		VF150_ + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	X	Y	PC	Kg	PF	Kg
VF 150_	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	150.5	109	534	97	584	99
	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	150.5	109	534	98	584	100
	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	206.5	109	—	—	624.5	157

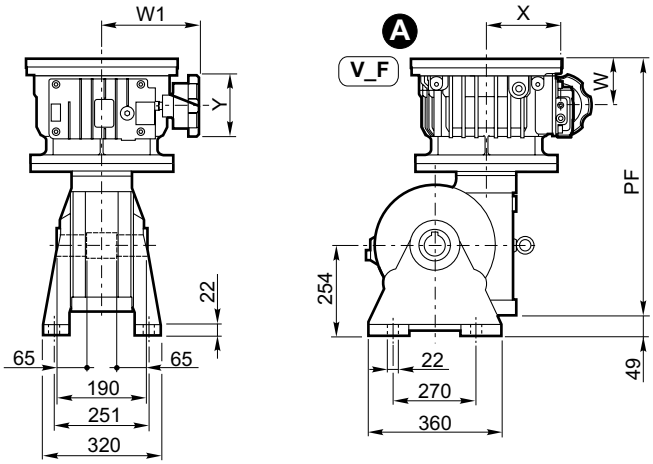
VF 185 N + V_P(IEC)



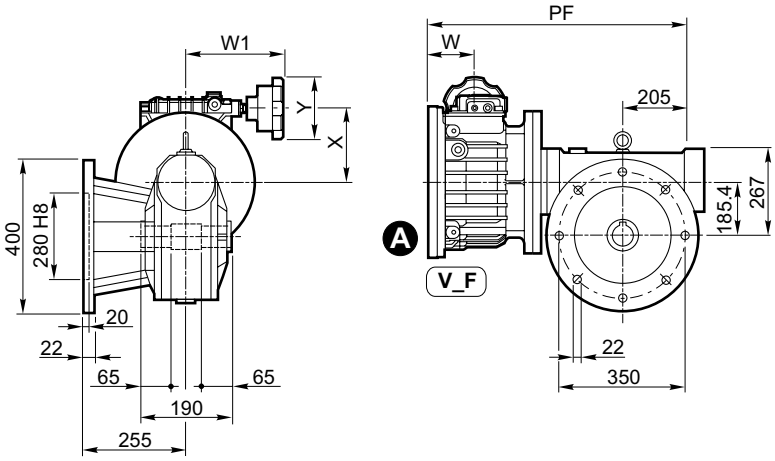
VF 185 A + V_P(IEC)

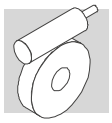


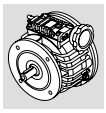
VF 185 V + V_P(IEC)



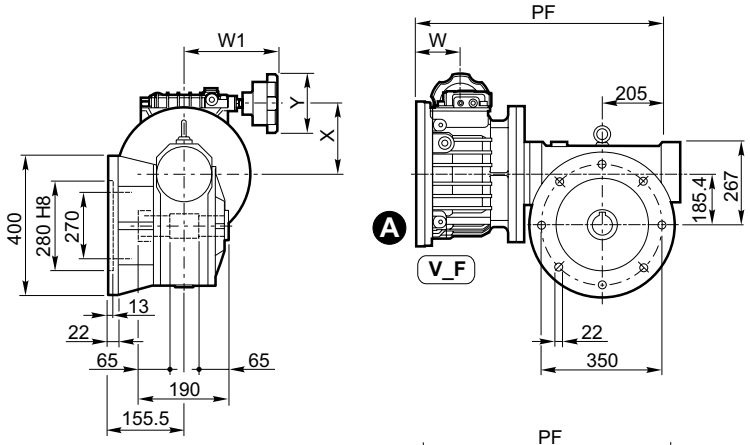
VF 185 F + V_P(IEC)



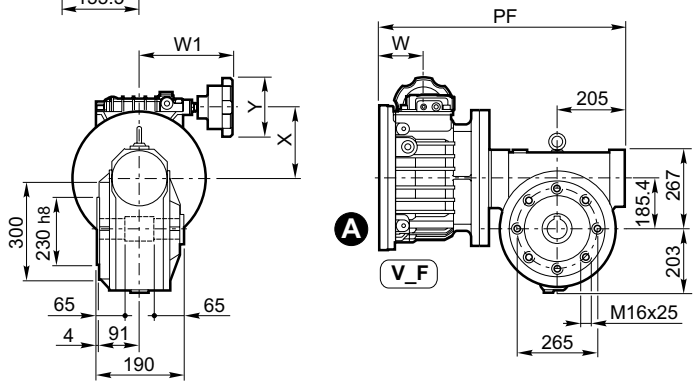


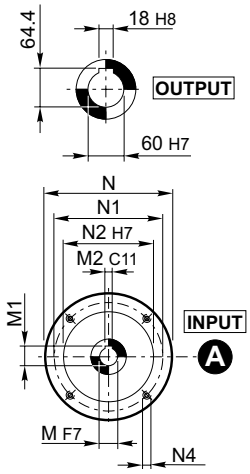


VF 185 FC/FR + V_P(IEC)



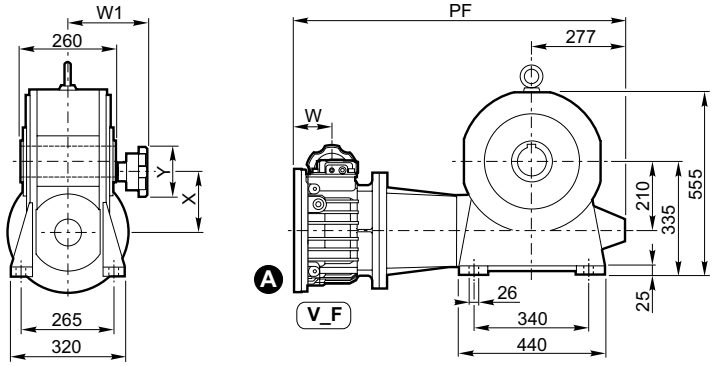
VF 185 P + V_P(IEC)



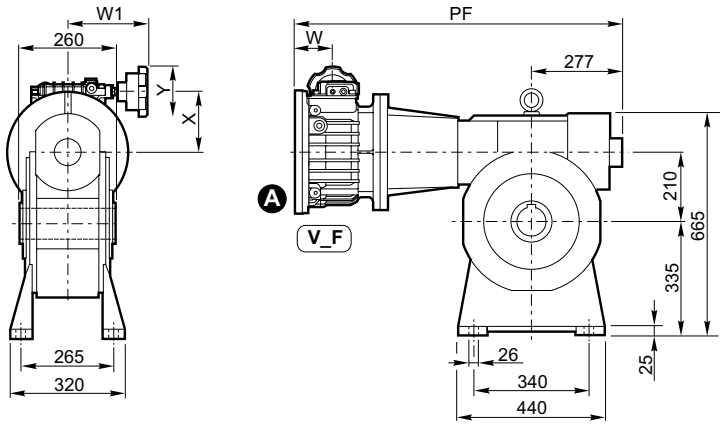


		IEC	V_C - V_F											VF185_ + V_C		VF185_ + V_F	
			N	N1	N2	N4	M	M1	M2	W	W1	X	Y	PC	Kg	PF	Kg
VF 185_	V 3	P100	250	215	180	M12	28	31.3	8	91	172.5	150.5	109	—	—	637	133
	V 5.5	P112	250	215	180	M12	28	31.3	8	91	172.5	150.5	109	—	—	637	134
	V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	206.5	109	—	—	678	191

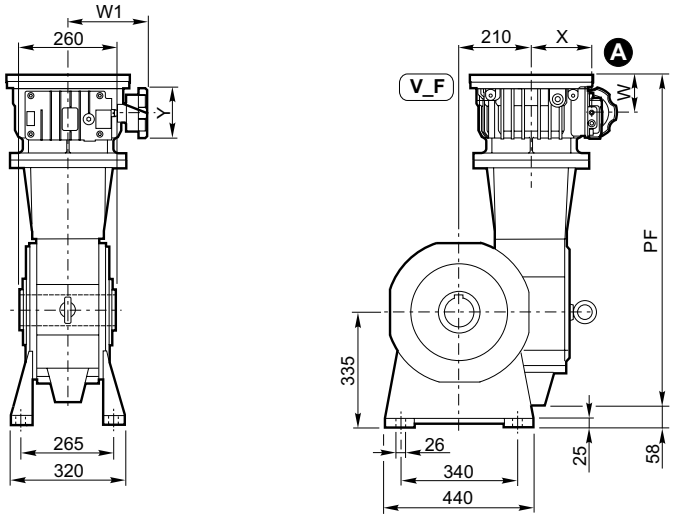
VF 210 N + V_P(IEC)

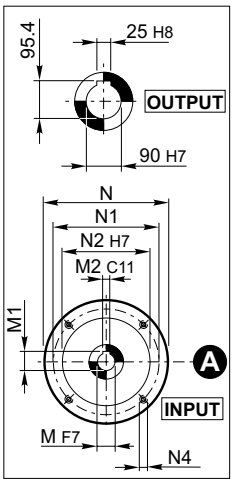


VF 210 A + V_P(IEC)

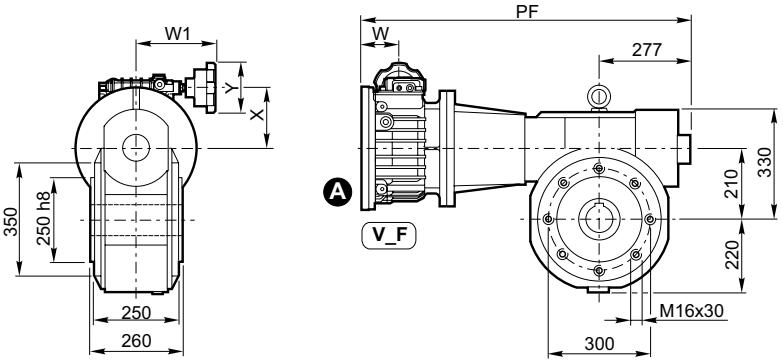


VF 210 V + V_P(IEC)

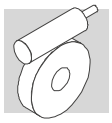


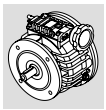


VF 210 P + V_P(IEC)

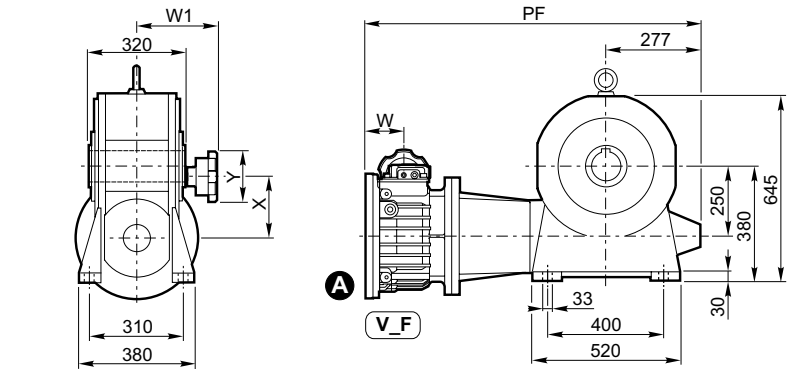


	IEC	V_C - V_F											VF210_ + V_C		VF210_ + V_F	
		N	N1	N2	N4	M	M1	M2	W	W1	X	Y	PC	Kg	PF	Kg
VF 210_ V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	206.5	109	—	—	1018	307

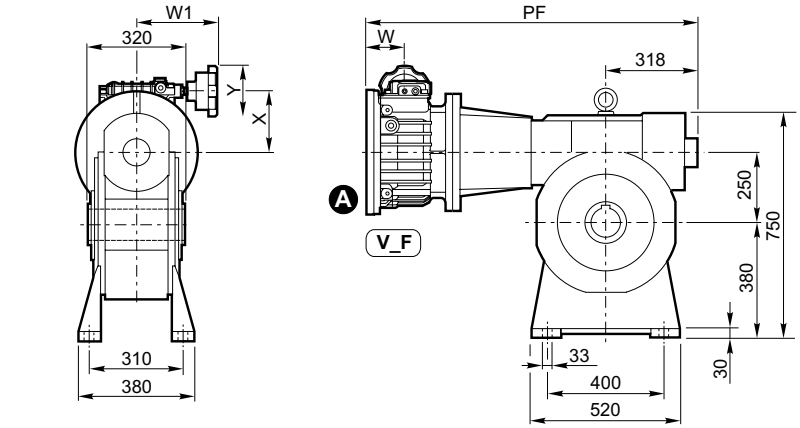




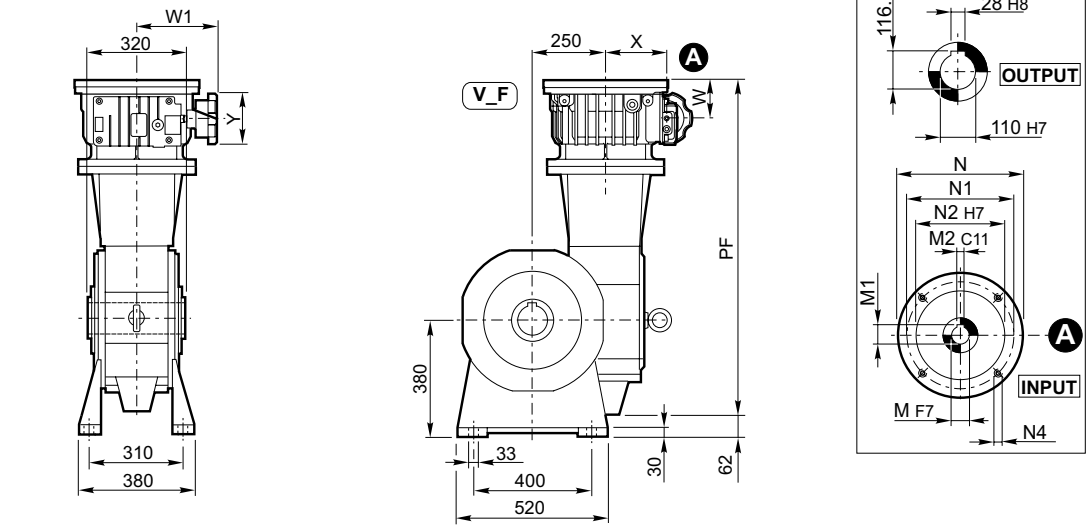
VF 250 N + V_P(IEC)



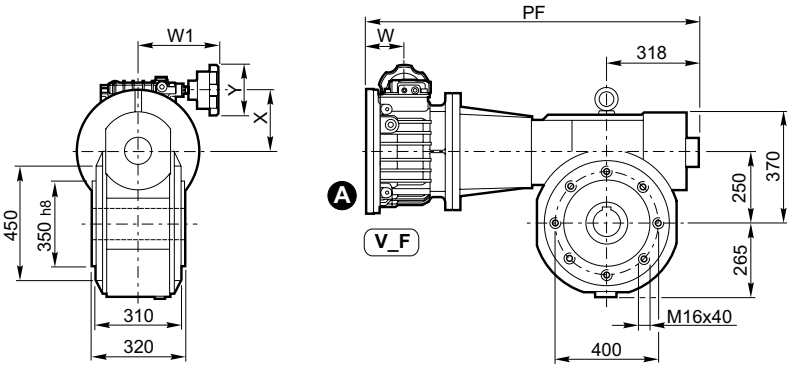
VF 250 A + V_P(IEC)



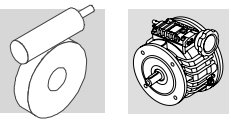
VF 250 V + V_P(IEC)



VF 250 P + V_P(IEC)

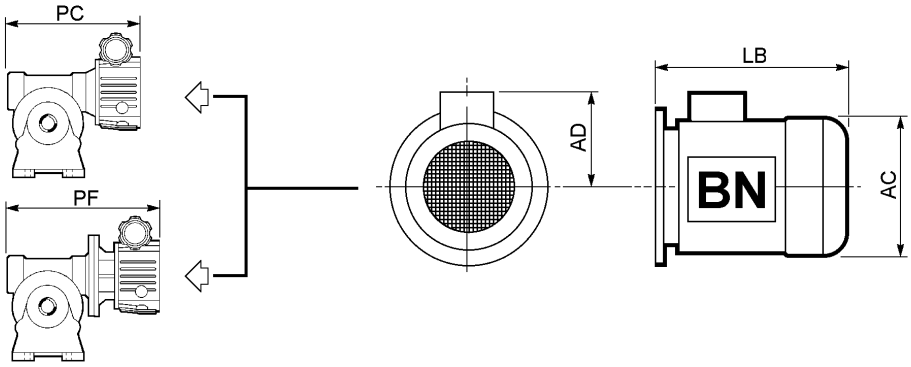


	IEC	V_C - V_F											VF250_ + V_C		VF250_ + V_F	
		N	N1	N2	N4	M	M1	M2	W	W1	X	Y	PC	Kg	PF	Kg
VF 250_ V 10	P132	300	265	230	M12	38	41.3	10	108	193.5	206.5	109	—	—	1105	407

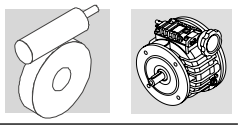


VF_ + V_P + BN

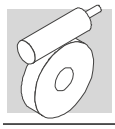
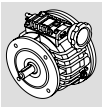
W_ + V_P + BN



		IEC	BN			V_C		V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
VF 44_	V 0.25	63	121	95	184	387.3	10.2	411.5	10.4
	V 0.25	71R	138	108	219	387.3	11.7	411.5	11.9
VF 49_	V 0.25	63	121	95	184	405.8	11.1	425.5	11.4
	V 0.25	71R	138	108	219	405.8	12.6	425.5	12.9
	V 0.5	71	138	108	219	408.3	19.8	428	16.4
	V 0.5	80	156	119	234	412.3	19.8	432	20
	V 1	80	156	119	234	—	—	454	27
	V 1	90S	176	133	276	—	—	454	29
	V 1	90L	176	133	276	—	—	454	31
W 63_	V 0.5	71	138	108	219	474	19.1	462.5	19.7
	V 0.5	80	156	119	234	493	23	466.5	24
	V 1	80	156	119	234	508	30	495.5	31
	V 1	90S	176	133	276	550	32	495.5	33
	V 1	90L	176	133	276	550	34	495.5	35
W 75_	V 0.5	71	138	108	219	—	—	494	23
	V 0.5	80	156	119	234	—	—	498	27
	V 1	80	156	119	234	541	33	520	34
	V 1	90S	176	133	276	583	35	520	36
	V 1	90L	176	133	276	583	37	520	38
	V 2	90S	176	133	276	609	39	544	41
	V 2	90L	176	133	276	609	41	544	43
	V 2	100R	195	142	307	516.5	49	544	51
W 86_	V 0.5	71	138	108	219	—	—	523	27
	V 0.5	80	156	119	234	—	—	527	31
	V 1	80	156	119	234	570	37	548	38
	V 1	90S	176	133	276	612	39	548	40
	V 1	90L	176	133	276	612	41	548	42
	V 2	90S	176	133	276	638	43	573	45
	V 2	90L	176	133	276	638	45	573	47
	V 2	100R	195	142	307	545.5	53	573	55

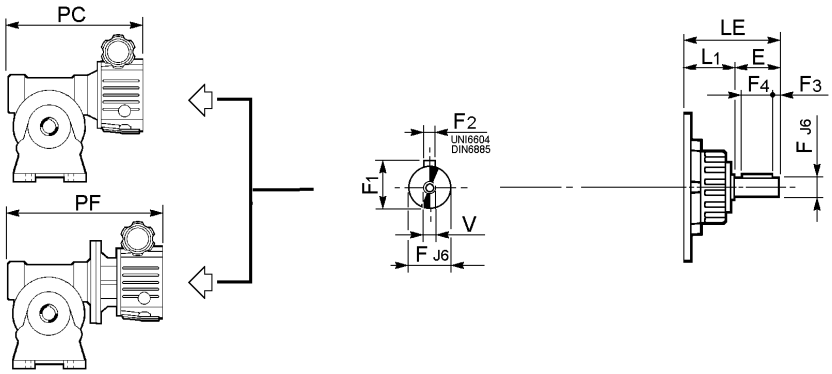


		IEC	BN			V_C		V_F	
			AC	AD	LB	PC+LB	Kg	PF+LB	Kg
W 110_	**V 1**	**80**	156	119	234	—	—	589	62
	V 1	**90**	176	133	276	—	—	589	64.4
	V 1	**90**	176	133	276	—	—	589	66.4
	V 2	**90S**	176	133	276	585.5	66.2	613	69.1
	V 2	**90L**	176	133	276	585.5	68.2	613	71.1
	V 2	**100R**	195	142	307	585.5	76.2	613	79.1
	V 3	**100**	195	135	306	747	92	812	94
	V 3	**112**	219	150	325	766	100	831	102
	V 5.5	**112**	219	150	325	766	101	831	103
VF 130_	**V 2**	**90S**	176	133	276	636.5	78.1	684	80.1
	V 2	**90L**	176	133	276	636.5	80.1	684	82.1
	V 2	**100R**	195	142	307	636.5	88.1	684	90.1
	V 3	**100**	195	135	306	785	108	860	110
	V 3	**112**	219	150	325	804	116	879	118
	V 5.5	**112**	219	150	325	804	117	879	119
	V 10	**132S**	258	193	375	—	—	970	189
	V 10	**132M**	258	193	413	—	—	1008	204
VF 150_	**V 3**	**100**	195	135	306	840	119	890	121
	V 3	**112**	219	150	325	859	126	909	129
	V 5.5	**112**	219	150	325	859	127	909	130
	V 10	**132S**	258	193	375	—	—	1000	200
	V 10	**132M**	258	193	413	—	—	1038	215
VF 185_	**V 3**	**100**	195	135	306	—	—	943	155
	V 3	**112**	219	150	325	—	—	962	163
	V 5.5	**112**	219	150	325	—	—	962	164
	V 10	**132S**	258	193	375	—	—	1053	234
	V 10	**132M**	258	193	413	—	—	1091	249
VF 210_	**V 10**	**132S**	258	193	375	—	—	1061	350
	V 10	**132M**	258	193	413	—	—	1431	365
VF 250_	**V 10**	**132S**	258	193	375	—	—	1148	450
	V 10	**132M**	258	193	413	—	—	1518	465

VF_ + V_

W_ + V_

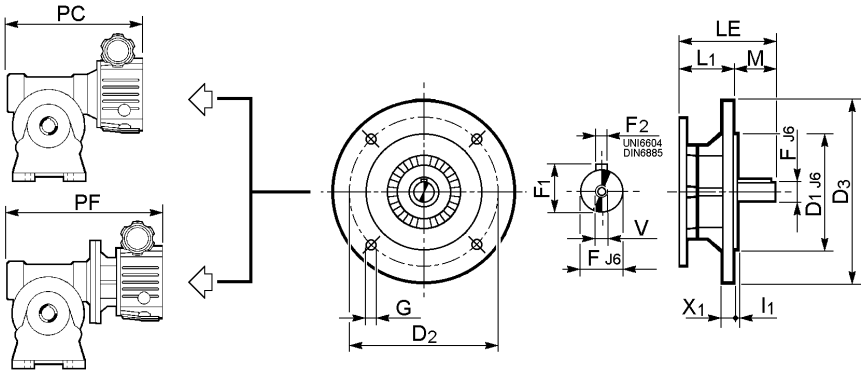


HS

	E	F	F1	F2	F3	F4	LE	L1	V	Kg
V 0.25	23	11	12.5	4	2	20	58.5	35.5	M4	1.1
V 0.5	30	14	16	5	2.5	25	67	37	M5	1.6
V 1	40	19	21.5	6	5	30	88.5	48.5	M6	2.8
V 2	50	24	27	8	5	40	103.5	53.5	M8	4.0
V 3	60	28	31	8	5	50	121.5	61.5	M10	7.0
V 5.5	60	28	31	8	5	50	121.5	61.5	M10	7.0
V 10	80	38	41	10	5	70	160.5	80.5	M12	11.0

VF_ + V_

W_ + V_

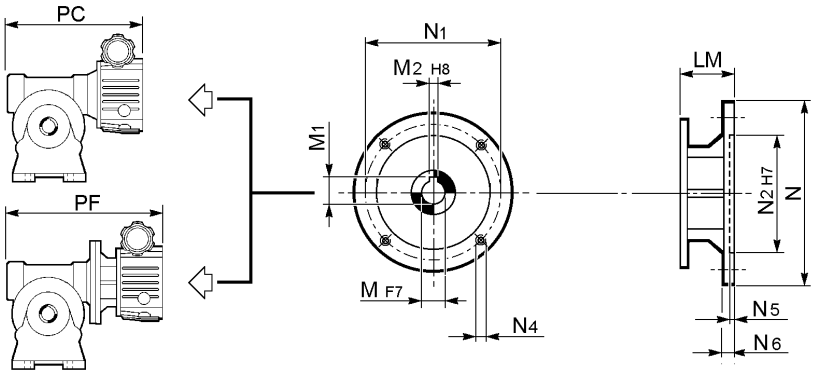


HSF

	D1	D2	D3	F	F1	F2	G	I1	LE	L1	M	V	X1	Kg
V 0.25	95	115	140	11	12.5	4	8.5	3	58.5	37.5	21	M4	8	1.6
V 0.5	110	130	160	14	16	5	8.5	3.5	67	37	30	M5	8	2.5
V 1	130	165	200	19	21.5	6	11.5	3.5	88.5	48.5	40	M6	12	4.5
V 2	130	165	200	24	27	8	11.5	3.5	103.5	53.5	50	M8	12	5.9
V 3	180	215	250	28	31	8	14	4	121.5	61.5	60	M10	14	11.0
V 5.5	180	215	250	28	31	8	14	4	121.5	61.5	60	M10	14	11.0
V 10	230	265	300	38	41	10	14	5	160.5	80.5	80	M12	16	20

VF_ + V_

W_ + V_



G

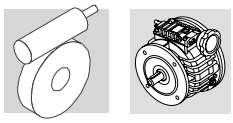
	LM	M	M1	M2	N	N1	N2	N4	N5	N6	Kg
V 0.25_G71	42	14	16.3	5	160	130	110	M8	4.5	11	1.8
V 0.5_G80	54	19	21.8	6	200	165	130	M10	4.5	11.5	2.8
V 1_G90	59	24	27.3	8	200	165	130	M10	4.5	11.5	5.0
V 2_G112	67	28	31.3	8	250	215	180	M12	5	14	6.8
V 3_G132	88.5	38	41.3	10	300	265	230	M12	5	15	12.0
V 5.5_G132	88.5	38	41.3	10	300	265	230	M12	5	15	12.0
V 10_G160	120	42	45.3	12	350	300	250	M16	6	18	22

N.B. I pesi riportati in questa pagina si riferiscono alle sole entrate.

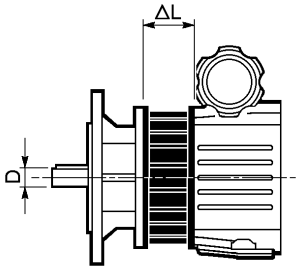
NOTE: Weights reported in this page refer to input module.

HINWEIS: Die in dieser Tabelle angegebenen Gewichte beziehen sich nur auf den Antrieb.

N.B. : Les poids indiqués à cette page se réfèrent uniquement aux entrées.



VD_F_P(IEC)



N.B. Le dimensioni mancanti sono riportate nelle pagine 264-279.

Note: missing dimensions are indicated on pages 264-279.

ACHTUNG: Die fehlenden Maße werden auf den Seiten 264-279 angegeben.

N.B. : Les dimensions manquantes sont indiquées pages 264-279.

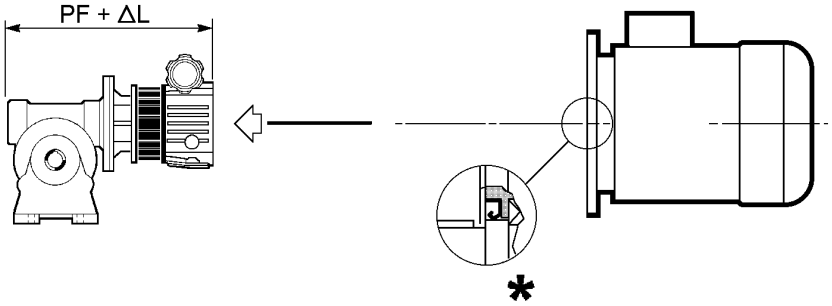
	D	ΔL	Kg
VD 0.5_P_	14	69	3.1
VD 1_P_	19	80.5	4.7
VD 2_P_	24	89.5	7.7
VD 3_P_	28	100.4	16.3
VD 5.5_P_	28	100.4	16.3
VD 10_P_	38	119.2	27.7

N.B. Il differenziale è applicabile esclusivamente ai variatori nella forma costruttiva UF.
I pesi riportati in tabella si riferiscono al solo differenziale.

NOTE: Differential will only fit UF variators.
Weights refer to differential alone.

HINWEIS: Das Differential kann ausschließlich nur an den Verstellgetrieben der Bauform UF appliziert werden.
Die in dieser Tabelle angegebenen Gewichte beziehen sich nur auf das Differential.

N.B. : Le différentiel est applicable uniquement aux variateurs dans la forme de construction UF.
Les poids indiqués à cette page se réfèrent uniquement au différentiel.



* Nei variatori con differenziale, quando il motore elettrico è installato dall'utente, è necessario verificare che esso sia dotato di un anello di tenuta olio sull'albero montato secondo lo schema e che la flangia sia stagna.
La tenuta olio fra la flangia motore e la flangia variatore è assicurata da una guarnizione fornita di serie sul variatore stesso.

N.B. Le dimensioni e i pesi dei motori elettrici sono riportati nelle pag. 340-358.

** On fitting the electric motor onto variators featuring the differential unit make sure that the electric motor itself is oiltight and an oil seal is provided on drive end shaft.*
Sealing between flange of motor and variator is ensured by a gasket provided with the variator unit.

N.B. Dimensions and weights of electric motors are listed at page 340-358.

* Wenn der Elektromotor vom Kunden angebaut wird, ist es bei den Verstellgetrieben mit Differential erforderlich, die Motorwelle mit einem öldichten Wellendichtring auszustatten.
Die Abdichtung zwischen Motor- und Verstellgetriebeflansch wird durch eine Dichtung gewährleistet, die beim Verstellgetriebe serienmäßig mitgeliefert wird.

ACHTUNG: Die Maße und Gewichte der Elektromotoren werden auf den Seiten 340-358 aufgeführt.

** Sur les variateurs avec différentiel, lorsque le moteur électrique est installé par l'utilisateur, il est nécessaire de vérifier qu'il soit doté d'une bague d'étanchéité sur l'arbre monté selon le schéma.*
L'étanchéité à l'huile entre la bride moteur et la bride variateur est assurée par un joint fourni de série et présent sur le variateur.

N.B. : Les dimensions et les poids des moteurs électriques sont indiqués à pages 340-358.

Accessori:
- CGY
- KITCGY
- ENTHS
- ENTG
- ENTN
- INDGRAV

Vedi pag. 90-97

Accessories:
- *CGY*
- *KITCGY*
- *ENTHS*
- *ENTG*
- *ENTN*
- *INDGRAV*

See page 90-97

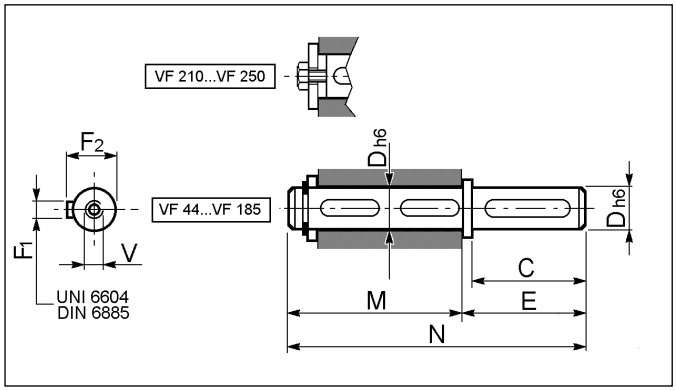
Zubehör:
- CGY
- KITCGY
- ENTHS
- ENTG
- ENTN
- INDGRAV

Siehe Seite 90-97

Accessoires:
- *CGY*
- *KITCGY*
- *ENTHS*
- *ENTG*
- *ENTN*
- *INDGRAV*

Voir page 90-97

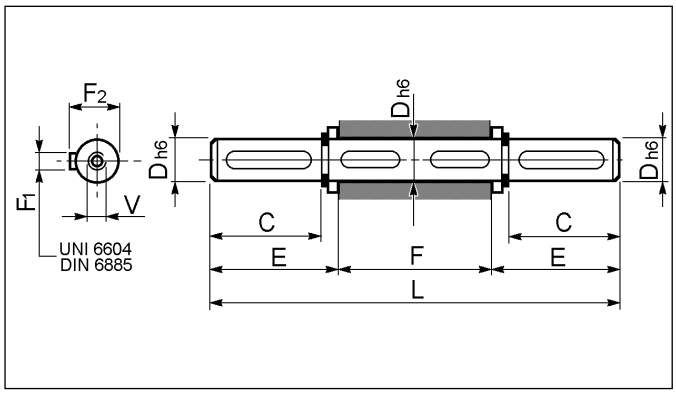
Albero lento semplice — *Single ext. output shaft*



Ein freies Wellenende — *Arbre lent unilateral*

	C	D	E	F1	F2	M	N	V
VF 44	40	18	45	6	20.5	70	115	M6x16
VF 49	60	25	65	8	28	89	154	M8x20
W 63	60	25	65	8	28	127	192	M8x20
W 75	60	28	70	8	31	126	196	M8x20
W 75	60	30	70	8	33	126	196	M8x20
W 86	60	35	65	10	38	149	214	M10x25
W 110	75	42	80	12	45	164	244	M12x32
VF 130	80	45	85	14	48.5	176	261	M12x32
VF 150	85	50	93	14	53.5	185	278	M16x40
VF 185	100	60	110	18	64	200	310	M16x40
VF 210	130	90	140	25	95	255	395	M20x50
VF 250	165	110	175	28	116	315	490	M24x64

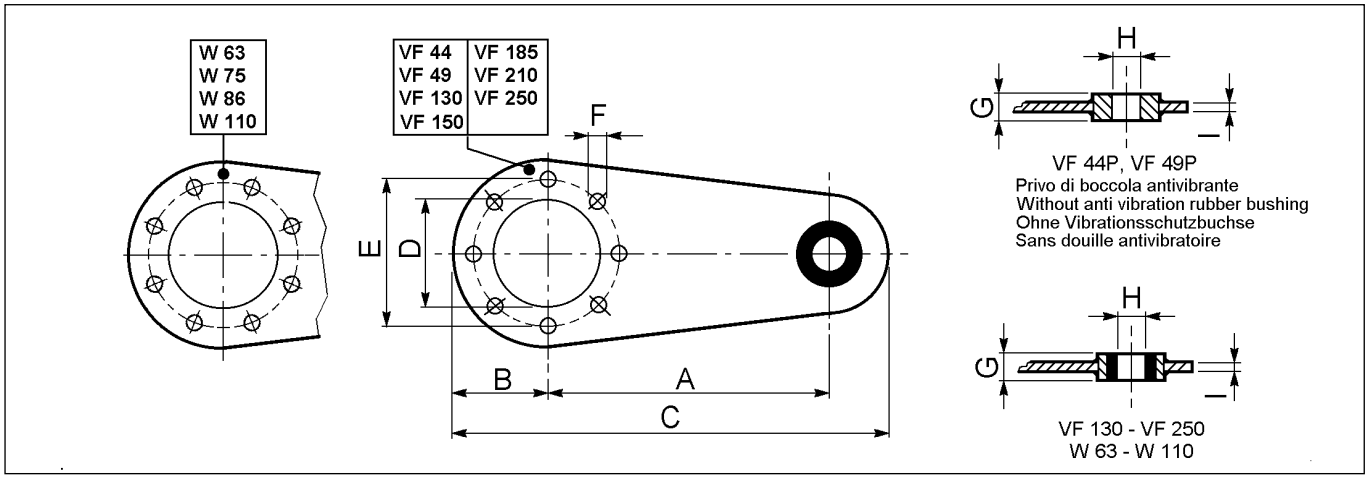
Albero lento doppio — *Double ext. output shaft*



Zwei freie Wellenende — *Arbre lent bilateral*

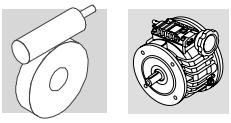
	C	D	E	F	F1	F2	L	V
VF 44	40	18	42.7	64	6	20.5	149.4	M6x16
VF 49	60	25	63.2	82	8	28	208.4	M8x20
W 63	60	25	63.2	120	8	28	246.4	M8x20
W 75	60	28	63.5	120	8	31	247	M8x20
W 75	60	30	63.5	120	8	33	247	M8x20
W 86	60	35	64	140	10	38	268	M10x25
W 110	75	42	79.25	155	12	45	313.5	M12x32
VF 130	80	45	84.75	165	14	48.5	334.5	M12x32
VF 150	85	50	90	175	14	53.5	355	M16x40
VF 185	100	60	105	190	18	64	400	M16x40
VF 210	130	90	140	260	25	95	540	M20x50
VF 250	165	110	175	320	28	116	670	M24x64

Braccio di reazione — *Torque arm*

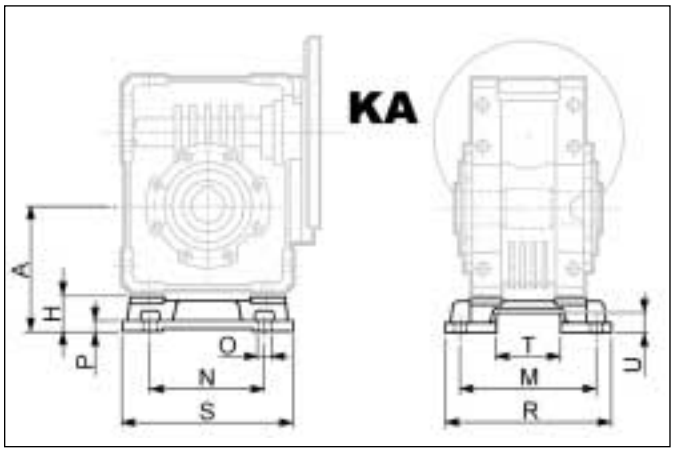


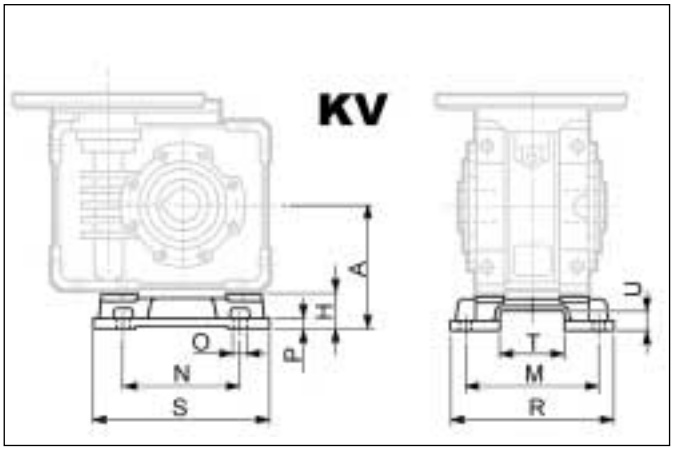
Drehmomentstütze — *Bras de réaction*

	A	B	C	D	E	F	G	H	I
VF 44P	100	40	157.5	50	65	7	14	8	4
VF 49P	100	55	172.5	68	94	7	14	8	4
W 63P	150	55	233	75	90	9	20	10	6
W 75P	200	63	300	90	110	9	25	20	6
W 86P	200	80	318	110	130	11	25	20	6
W 110P	250	100	388	130	165	13	25	20	6
VF 130P	300	125	470	180	215	13	30	25	6
VF 150P	300	125	470	180	215	15	30	25	6
VF 185P	350	150	545	230	265	17	30	25	6
VF 210P	350	175	625	250	300	19	60	50	8
VF 250P	400	225	725	350	400	19	60	50	10



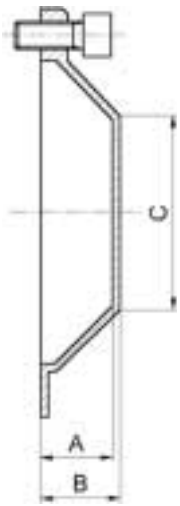
Kit piedi KA, KV | ***VF-interchangeable foot Kits KA, KV*** | **Satz – Stützfüße KA, KV** | ***Kit pieds KA, KV***



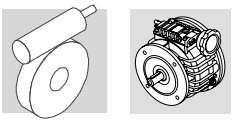


	A	H	M	N	O	P	R	S	T	U
W 63	100	27.5	111	95	11	8	135	145	56.5	15.5
W 75	115	28	115	120	11	9	139	174	56.5	15.5
W 86	142	42	146	140	11	11	170	200	69	20
W 110	170	45	181	200	13	14	210	250	69	20

Cappellotto di protezione | ***Safety cover*** | **Schutzdeckel** | ***Capuchon de protection***



	A	B	C
W 63	26.5	29	Ø35
W 75	24.5	27	Ø54
W 86	26.5	29	Ø71
W 110	27.5	30	Ø89



24.11 - Perno macchina

Nel realizzare l'albero condotto che si accoppierà con il riduttore consigliamo di utilizzare acciaio di buona qualità e di realizzare le dimensioni come suggerito nello schema seguente.
Suggeriamo inoltre di completare il montaggio con un dispositivo che realizza il bloccaggio assiale dell'albero (non illustrato).
Il numero e la dimensione del/i relativi fori filettati all'estremità dell'albero saranno determinati dalle diverse esigenze applicative.

24.11 - Customer' shaft

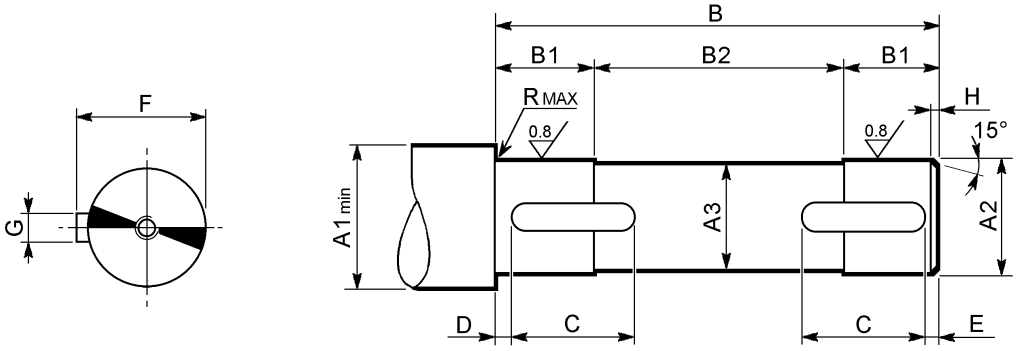
Pivot of driven equipment should be made from high grade alloy steel.
Table below shows recommended dimensions for the Customer to consider when designing mating shaft.
A device retaining the shaft axially is also recommended (not shown).
The number and size of relative tapped holes at shaft end depend on application requirements.

24.11 - Maschinachse

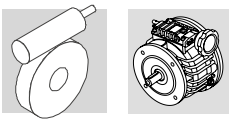
Für die mit dem Getriebe verbundene Antriebswelle, wird empfohlen, hochwertigen Stahl zu verwenden und die im folgenden Schema enthaltenen Abmessungen zu beachten.
Es wird außerdem empfohlen, die Montage mit Hilfe einer Vorrichtung, die die Welle axial blockiert (nicht abgebildet), vorzunehmen.
Die Anzahl und die Abmessung des/der Gewindebohrungen an den Wellenenden werden den Einsatzbedingungen gemäß festgelegt.

24.11 - Arbre machine

Pour la réalisation de l'arbre mené d'accouplement avec le réducteur, nous conseillons d'utiliser de l'acier de bonne qualité et de respecter les dimensions indiquées sur le schéma suivant.
Il est recommandé de compléter le montage par un dispositif de blocage axial de l'arbre (non illustré).
Le nombre et les dimensions de(s) l'orifice (s) fileté (s) correspondant (s) à l'extrémité de l'arbre sont déterminés par les différentes exigences d'application.



	A1	A2	A3	B	B1	B2	C	D	E	F	G	H	R	Linguetta / *Key* Einlegekeil / *Clavette*
VF 44	23	18 f7	17	62	22.5	17	50	6	6	20.5	6	1.5	0.5	6x6x50 A UNI 6604
VF 49	30	25 f7	24	80	20.5	39	20	2	2	28	8	1.5	1	8x7x20 A UNI 6604
W 63	30	25 f7	24	118	38	42	35	2	2	28	8	1.5	1	5x6x35 A UNI 6604
W 75_D28	35	28 f7	27	125	38	49	40	2	2	31	8	1.5	1	8x7x40 A UNI 6604
W 75_D30	35	30 f7	29	125	38	49	40	2	2	33	8	1.5	1	8x7x40 A UNI 6604
W 86	42	35 f7	34	138	43	52	40	2	2	38	10	1.5	1.5	10x8x40 A UNI 6604
W 110	48	42 f7	41	153	43	67	50	2.5	2.5	45	12	2	1.5	12x8x50 A UNI 6604
VF 130	52	45 f7	44	163	50.5	62	60	2.5	2.5	49.5	14	2	2.5	14x9x60 A UNI 6604
VF 150	57	50 f7	49	173	53	67	70	2.5	2.5	53.5	14	2	2.5	14x9x70 A UNI 6604
VF 185	68	60 f7	59	188	63	62	80	2.5	2.5	64	18	2	2.5	18x11x80 A UNI 6604
VF 210	99	90 f7	89	258	83	92	80	3	3	95	25	2.5	2.5	25x14x80 A UNI 6604
VF 250	121	110 h7	109	318	83	152	80	3	3	116	28	2.5	2.5	28x16x80 A UNI 6604



24.12 - Limitatore di coppia

Le forme costruttive A-N-V-F-FA-P (VF) e U-UF-UFC (W) si possono fornire nelle esecuzioni L1 e L2 come indicato nella tabella seguente.

24.12 - Torque limiter

The A-N-V-F- FA-P (VF) and U-UF-UFC (W) designs are also available in the L1 and L2 configurations as shown in the following table.

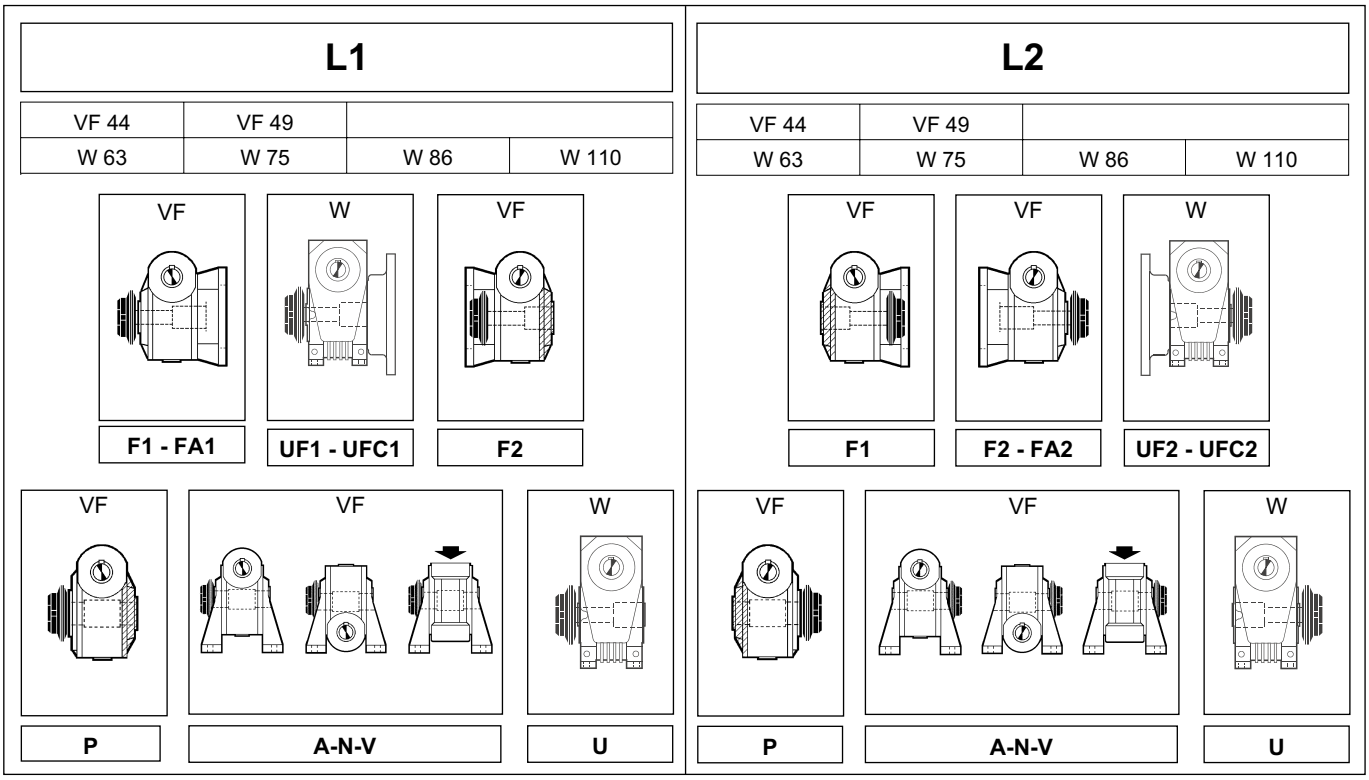
24.12 - Rutschkupplung

Die baumodelle A-N-V-F- FA-P (VF) und U-UF-UFC (W) können, wie in der Tabelle angegeben, in den ausführungen L1 und L2 geliefert werden.

24.12 - Limiteur de couple

Les projets A-N-V-F-FA-P (VF) et U-UF-UFC (W) sont aussi disponibles dans les configurations L1 et L2, come montre le tableau suivante.

Coperchio per fissaggio pendolare / *Shaft-mount side cover* / Deckel für Aufsteckmontage / *Couvercle pour fixation pendulaire*

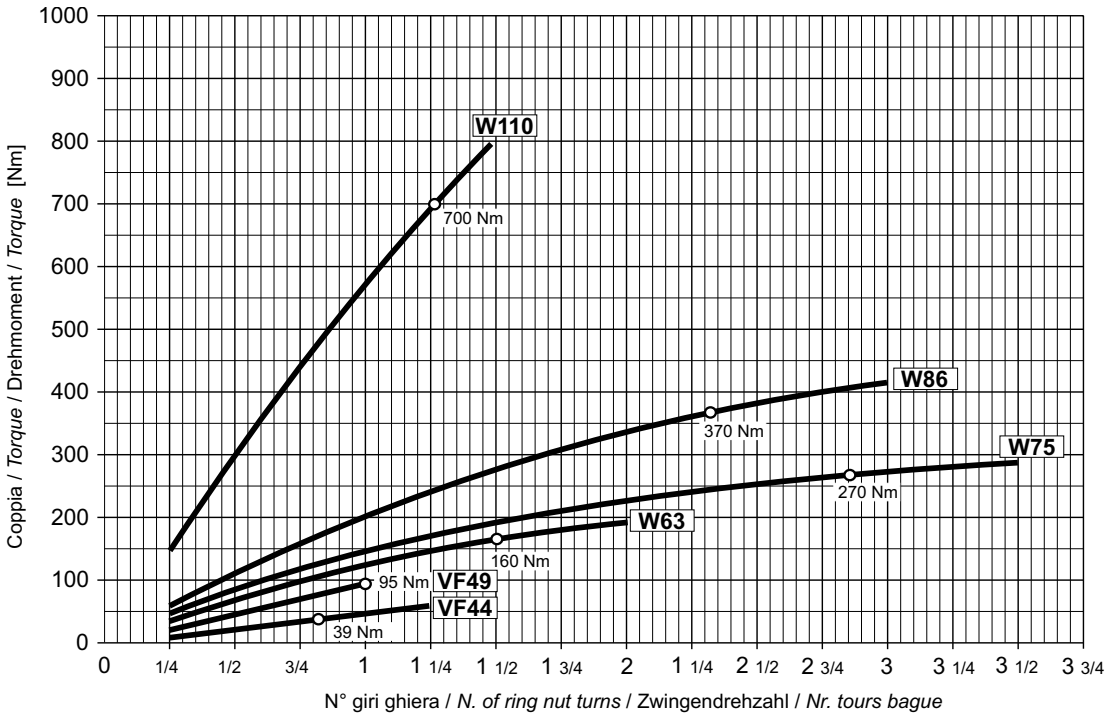


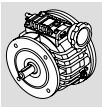
Se non preventivamente specificato, i riduttori VF_L, W_L verranno forniti con la ghiera a sinistra (L1) guardando il motore elettrico in posizione di montaggio B3.

Unless otherwise specified VF_L, W_L gear units are supplied with ring nut on the left hand side (L1), viewing from the electric motor and gearbox in the B3 mounting position.

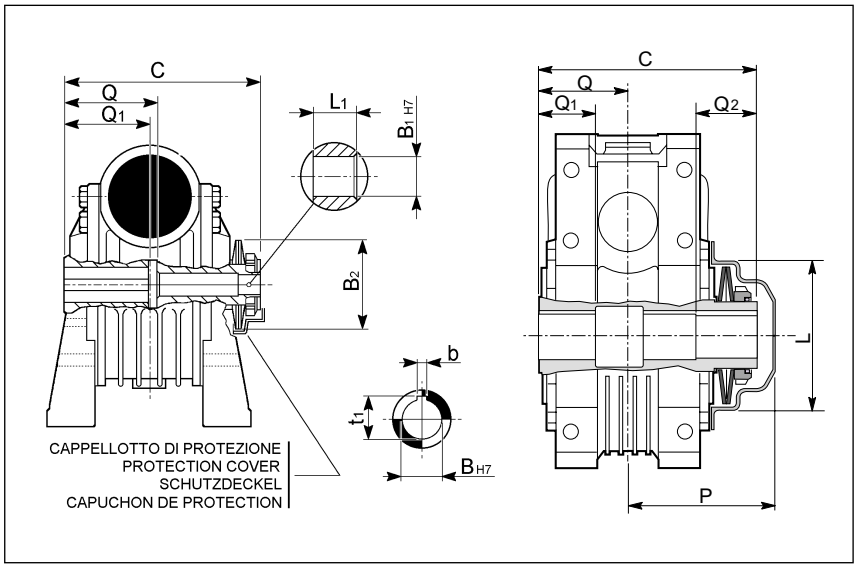
Wenn nicht anders angegeben, werden die Getriebe VF_L, W_L geliefert mit der Verstellmutter links (L1), mit Sicht auf den E-Motor.

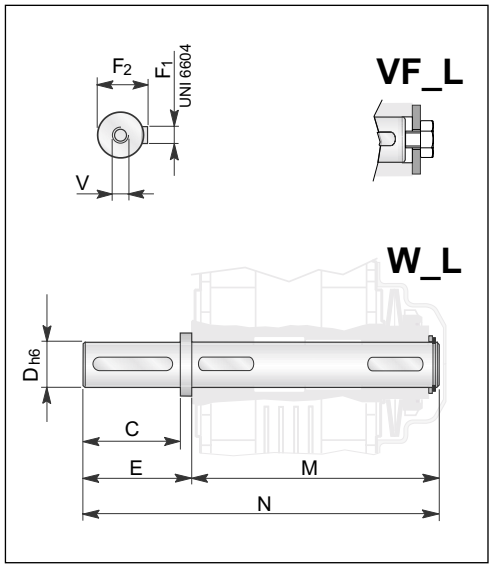
En standard et en l'absence d'information précise, les réducteurs VF_L, W_L seront livrés avec le système de décrabotage à gauche (L1), vue se plaçant du côté du moteur électrique.





Dimensioni ***Dimensions*** **Abmessungen** ***Dimensions***





	Limitatore di coppia / *Torque limiter* Rutschkupplung / *Limiteur de couple*											Albero lento semplice / *Single output shaft* Ein freies Wellenende / *Arbre lent unilateral*							
	C	**Q**	**Q_1**	**Q_2**	**P**	**B_{H7}**	**B_{1H7}**	**t_1**	**b**	**L_1**	**L**	**C**	**D_{h6}**	**E**	**F_1**	**F_2**	**M**	**N**	**V**
V F 44L	79	32	32	—	—	18	11	20.8	6	12	—	40	18	45	6	20.5	86	131	M6x16
VF 49L	105	51	41	—	—	25	14	28.3	8	15	—	60	25	65	8	28	114.5	179.5	M8x19
W 63L	145	60	40	40	100	25	26	28.3	8	100	78	60	25	65	8	28	152	217	M8x18
W 75L_D30	154.5	63.5	40	40	104	30	31	33.3	8	104	100	60	30	65	8	33	161.5	226.5	M10x22
W 86L	170	70	45	50	113	35	36	38.3	10	113	120	60	35	65	10	38	179	244	M10x22
W 110L	191	77.5	45	55	133	42	42.5	45.3	12	133	135	75	42	80	12	45	200	280	M12x28

Lubrificazione

Nei riduttori con limitatore di coppia incorporato viene adottata la lubrificazione permanente con olio sintetico, questo permette l'installazione in tutte le posizioni di montaggio.
Il giusto riempimento viene eseguito all'atto del montaggio. Nella tabella seguente vengono indicate le quantità di lubrificante contenute nei riduttori serie VF..L e W..L. Dopo lunghe e severe prove effettuate presso la ns. Sala Esperienze abbiamo verificato che la lubrificazione a grasso dei gruppi con limitatore di coppia non è consigliata. I migliori risultati e prestazioni si ottengono utilizzando olio sintetico:
SHELL: TIVELA OIL SD 460
Questo lubrificante può essere impiegato per temperatura ambiente da -15 °C a +50°C.

Lubrication

Gear units featuring the torque-limiter device are factory lubed "for life" with synthetic oil. Units are factory filled with the appropriate quantity of oil, allowing installation in any mounting position. See following table for reference.
Notice: Thorough testing conducted by the R & D Dept. demonstrates that lubrication requirements of the torque limiter device are not fulfilled by grease.
Best results are achieved by the synthetic-base oil:
SHELL - TIVELA OIL SD 460
Above lubricant allows operation within an ambient temperature range of -15°C — +50°C.

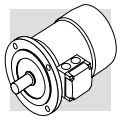
Schmierung

In Schneckengetrieben mit Rutschkupplung erfolgt eine Dauerschmierung mit synthetischem Öl.
Alle Einbaulagen sind möglich. Die Füllung mit der richtigen Menge erfolgt während der Montage. Die folgende Tabelle stellt die erforderlichen Schmiermittelmengen, der Serie VF..L und W..L, dar. Langere und gründliche Untersuchungen unserer Entwicklungsabteilung haben ergeben, dass eine Fettschmierung der Getriebe mit Rutschkupplung nicht ratsam ist. Die besten Ergebnisse wurden von uns mit dem synthetischen Öl:
SHELL: TIVELA OIL SD 460 erzielt. Dieses Schmiermittel kann bei Umgebungstemperaturen von -15 °C bis + 50° C verwendet werden.

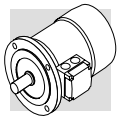
Lubrification

Dans les réducteurs à limiteur de couple incorporé, la lubrification à vie à l'huile synthétique à été adoptée. Ceci permet l'insta lation du groupe dans toutes les positions de montage. Le remplissage avec la bonne quantité de huile est effectué au moment du montage du réducteur. Dans le tableau suivante sont indiqueés les quantités de lubrifiant prévues dans le réducteur VF..L et W..L. Après de longs et sévères essais effectués auprès de notre département recherche et développement nous avons vérifié que la lubrification à la graisse des groupes avec limiteur de couple n'est pas la plus adaptée. Les meilleurs résultats et prestations s'obtiennent en utilisant une huile synthétique
SHELL: TIVELA OIL SD 460. Ce lubrifiant peut etre employé pour des températures ambiantes de -15 °C a + 50°C.

Lubrificazione a olio (litri) *Oil lubrication (litres)* Öl-Schmierung (liter) *Lubrification à l'huile (litres)*	**VF 44L**	**VF 49L**	**W 63L**	**W 75L**	**W 86L**	**W 110L**
	0.075	0.12	0.31	0.48	0.64	1.5

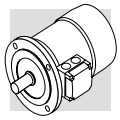


MOTORI ELETTRICI
ELECTRIC MOTORS
ELEKTROMOTOREN
MOTEURS ELECTRIQUES



SIMBOLOGIA E UNITÀ DI MISURA	*SYMBOLS AND UNITS OF MEAUSURE*	SYMBOLE UND MAßEINHEITEN	*SYMBOLES ET UNITES DE MISURE*

Simb. Symb.	U.m. Einheit	Descrizione	*Description*	Beschreibung	*Description*
cosφ	–	Fattore di potenza	*Power factor*	Leistungsfaktor	*Facteur de puissance*
η	–	Rendimento	*Efficiency*	Wirkungsgrad	*Rendement*
f_m	–	Fattore correttivo della potenza	*Power adjusting factor*	Leistungskorrekturfaktor	*Facteur de correction de la puissance*
I	–	Rapporto di intermittenza	*Cyclic duration factor*	Relative Einschaltdauer	*Rapport d'intermittence*
I_N	[A]	Corrente nominale	*Rated current*	Nennstrom	*Courant nominal*
I_S	[A]	Corrente di spunto	*Locked rotor current*	Kurzschlußstrom	*Courant de démarrage*
J_C	[Kgm^2]	Momento di inerzia del carico	*Load moment of inertia*	Massenträgheitsmoment der externen Massen	*Moment d'inertie de la charge*
J_M	[Kgm^2]	Momento di inerzia motore	*Moment of inertia*	Trägheitsmoment	*Moment d'inertie du moteur*
K_c	–	Fattore di coppia	*Torque factor*	Drehmomentfaktor	*Facteur de couple*
K_d	–	Fattore di carico	*Load factor*	Lastfaktor	*Facteur de charge*
K_J	–	Fattore di inerzia	*Inertia factor*	Trägheitsfaktor	*Facteur d'inertie*
M_A	[Nm]	Coppia accelerante media	*Mean breakaway torque*	Losbrechmoment	*Couple d'accélération moyen*
M_B	[Nm]	Coppia frenante	*Brake torque*	Bremsemoment	*Couple du frein*
M_N	[Nm]	Coppia nominale	*Rated torque*	Nennmoment	*Couple nominal*
M_L	[Nm]	Coppia resistente media	*Counter-torque during acceleration*	Lastmoment	*Couple résistant moyen*
M_S	[Nm]	Coppia di spunto	*Starting torque*	Startmoment	*Couple de démarrage*
n	[min^{-1}]	Velocità nominale	*Rated speed*	Nenndrehzahl	*Vitesse nominale*
P_B	[W]	Potenza assorbita dal freno a 20°C	*Power drawn by the brake at 20°C*	Leistungsaufnahme der Bremse bei 20°C	*Puissance absorbée par le frein à 20°C*
P_n	[kW]	Potenza nominale	*Motor rated power*	Nennleistung	*Puissance nominale*
P_r	[kW]	Potenza richiesta	*Required power*	Benötigte Leistung	*Puissance nécessaire*
t_1	[ms]	Ritardo di sblocco del freno con alimentatore a semionda	*Brake response time with one-way rectifier*	Ansprechzeit Bremse mit Einweg-Gleichrichter	*Temps de déblocage du frein avec alimentation à demi-onde*
t_{1s}	[ms]	Tempo di sblocco del freno con alimentatore a controllo elettronico	*Brake response time with electronic-controlled rectifier*	Ansprechzeit Bremse mit elektronisch gesteuertem Gleichrichter	*Temps de déblocage du frein avec alimentation à contrôle électronique*
t_2	[ms]	Ritardo di frenatura con disgiunzione lato c.a.	*Brake reaction time with a.c. disconnect*	Einfallzeit Bremse bei Unterbrechung der Stromversorgung WS	*Retard de freinage avec coupure coté c.a.*
t_{2c}	[ms]	Ritardo di frenatura con disgiunzione circuito c.a. e c.c.	*Brake reaction time with a.c. and d.c. disconnect*	Einfallzeit Bremse bei Unterbrechung der Strom-versorgung WS und GS	*Retard de freinage avec coupure coté c.a. et c.c.*
t_a	[°C]	Temperatura ambiente	*Ambient temperature*	Umgebungstemperatur	*Température ambiante*
t_f	[min]	Tempo di funzionamento a carico costante	*Work time at constant load*	Betriebsdauer unter Nennbelastung	*Temps de fonctionnement à charge constante*
t_r	[min]	Tempo di riposo	*Rest time*	Aussetzzeit	*Temps de repos*
W	[J]	Lavoro di frenatura accumulato tra due regolazioni del traferro	*Braking work between service*	Bremsenergie zwichen zwei Einstellungen	*Energie de freinage accumulée entre deux réglages de l'entrefer*
W_{max}	[J]	Energia massima per singola frenatura	*Maximum brake work for each braking*	Max. Bremsarbeit pro Bremsvorgang	*Energie maxi par freinage*
Z	[1/h]	N° di avviamenti ammissibili, a carico	*Permissible starting frequency, loaded*	Schalthäufigkeit Nennbetrieb	*Nombre de démarrages admissibles en charge*
Z_0	[1/h]	N° di avviamenti ammissibili a vuoto (I = 50%)	*Max. permissible no-load starting frequency (I = 50%)*	Max. Schalthäufigkeit im Leerlauf (relative Einschaltdauer I = 50%)	*Nombre de démarrages admissible à vide (I = 50%)*



M1 - PROGRAMMA DI PRODUZIONE

Questo catalogo descrive i motori asincroni trifase in bassa tensione di produzione BONFIGLIOLI RIDUTTORI.
I motori sono del tipo chiuso con ventilazione esterna e rotore a gabbia per l'utilizzo in ambienti industriali.

M1 - PRODUCTION PLANNING

This catalogue discusses low-voltage three-phase asynchronous motors manufactured by BONFIGLIOLI RIDUTTORI.
Motors are the enclosed type with outer fan and cage-type rotor for use in industrial environments.

M1 - PRODUKTIONSPROGRAMM

In diesem Katalog werden die unter Niederspannung arbeitenden asynchronen Drehstrommotoren der Produktion von BONFIGLIOLI RIDUTTORI näher beschrieben. Hierbei handelt es sich um geschlossene Motoren mit Eigenbelüftung und einem Käfigrotor für den industriellen Einsatz.

M1 - PROGRAMME DE PRODUCTION

Ce catalogue décrit les moteurs asynchrones triphasés en basse tension produits par BONFIGLIOLI RIDUTTORI.
Les moteurs sont du type fermé avec ventilation extérieure et rotor à cage pour l'utilisation dans des milieux industriels.

M2 - NORMATIVE

I motori sono costruiti in accordo alle Norme CEI/EN ed IEC applicabili, riportate in tabella.

M2 - REFERENCE STANDARDS

Motors are manufactured in accordance with applicable CEI /EN and IEC standards, listed in the table.

M2 - NORMEN

Die Motoren wurden in entsprechend der Normen CEI /EN und IEC, die in der nachstehenden Tabelle angegeben sind, gefertigt:

M2 - NORMES

Les moteurs sont fabriqués dans le respect des Normes CEI /EN et IEC applicables indiquées dans le tableau.

(01)

Titolo / *Title* / Titel / *Titre*	**CEI**	**IEC**
Prescrizioni generali per macchine elettriche rotanti *General requirements for rotating electrical machines* Allgemeine Vorschriften für umlaufende elektrische Maschinen *Prescriptions générales pour machines électriques tournantes*	**CEI EN 60034-1**	**IEC 60034-1**
Marcatura dei terminali e senso di rotazione per macchine elettriche rotanti *Terminal markings and direction of rotation of rotating machines* Kennzeichnung der Anschlußklemmen und Drehrichtung von umlaufenden elektrischen Maschinen *Définitions des bornes et sens de rotation pour machines électriques tournantes*	**CEI 2-8**	**IEC 60034-8**
Metodi di raffreddamento delle macchine elettriche *Methods of cooling for electrical machines* Verfahren zur Kühlung von elektrischen Maschinen *Méthodes de refroidissement des machines électriques*	**CEI EN 60034-6**	**IEC 60034-6**
Dimensioni e potenze nominali per macchine elettriche rotanti *Dimensions and output ratings for rotating electrical machines* Auslegung der Nennleistung von umlaufenden elektrischen Maschinen *Dimensions, puissances nominales pour machines électriques tournantes*	**EN 50347**	**IEC 60072**
Classificazione dei gradi di protezione delle macchine elettriche rotanti *Classification of degree of protection provided by enclosures for rotating machines* Klassifizierung der Schutzart von umlaufenden elektrischen Maschinen *Classification des degrés de protection des machines électriques tournantes*	**CEI EN 60034-5**	**IEC 60034-5**
Limiti di rumorosità *Noise limits* Geräuschgrenzwerte *Limites de bruit*	**CEI EN 60034-9**	**IEC 60034-9**
Sigle di designazione delle forme costruttive e dei tipi di installazione *Classification of type of construction and mounting arrangements* Abkürzungen zur Kennzeichnung der Bauform und der Einbaulagen *Sigles de dénomination des formes de construction et des types d'installation*	**CEI EN 60034-7**	**IEC 60034-7**
Tensione nominale per i sistemi di distribuzione pubblica dell'energia elettrica a bassa tensione *Rated voltage for low voltage mains power* Nennspannung für öffentliche NS-Stromverteilungssysteme *Tension nominale pour les systèmes de distribution publique de l'énergie électrique en basse tension*	**CEI 8-6**	**IEC 60038**
Grado di vibrazione delle macchine elettriche *Vibration level of electric machines* Schwingstärke bei elektrischen Maschinen *Degré de vibration des machines électriques*	**CEI EN 60034-14**	**IEC 60034-14**

I motori corrispondono inoltre alle Norme straniere elencate qui di seguito:

Motors are also in compliance with the national Standards listed below:

Die Motoren entsprechen darüber hinaus den nachstehend aufgelisteten ausländischen Normen:

Les moteurs correspondent aussi aux Normes étrangères suivantes :

(02)

DIN VDE 0530	Germania	*Germany*	Deutschland	*Allemagne*
BS5000 / BS4999	Gran Bretagna	*Great Britain*	Großbritannien	*Grande Bretagne*
AS 1359	Australia	*Australia*	Australien	*Australie*
NBNC 51-101	Belgio	*Belgium*	Belgien	*Belgique*
NEK - IEC 60034-1	Norvegia	*Norway*	Norwegen	*Norvège*
NF C 51	Francia	*France*	Frankreich	*France*
OEVE M 10	Austria	*Austria*	Österreich	*Autriche*
SEV 3009	Svizzera	*Switzerland*	Schweiz	*Suisse*
NEN 3173	Paesi Bassi	*Netherlands*	Niederlande	*Pays Bas*
SS 426 01 01	Svezia	*Sweden*	Schweden	*Suède*

Direttive CEE 73/23 (LVD) e CEE 89/336 (EMC)

I motori della serie BN sono conformi ai requisiti delle Direttive CEE 73/23 (Direttiva Bassa Tensione) e CEE 89/336 (Direttiva Compatibilità Eletromagnetica), e riportano in targa la marcatura CE. Per quanto riguarda la Direttiva EMC, la costruzione è in accordo alle Norme CEI EN 60034-1 sez. 12, EN 50081, EN 50082.

I motori con freno FD, se corredati dell'opportuno filtro capacitivo in ingresso al raddrizzatore (variante **CF**), rientrano nei limiti di emissione previsti dalla Norma EN 50081- "Compatibilità elettromagnetica - Norma Generica sull'emissione - Parte 1: Ambienti residenziali, commerciali e dell'industria leggera".

I motori soddisfano inoltre le prescrizioni della Norma CEI EN 60204-1 "Equipaggiamento elettrico delle macchine".

È responsabilità del costruttore o dell'assemblatore dell'apparecchiatura che incorpora i motori come componenti garantire la sicurezza e la conformità alle direttive del prodotto finale.

Directives 73/23/ EEC (LVD) and 89/336/ EEC (EMC)

BN motors meet the requirements of Directives 73/23/EEC (Low Voltage Directive) and 89/336/EEC (Electromagnetic Compatibility Directive) and their name plates bear the CE mark. As for the EMC Directive, construction is in accordance with standards CEI EN 60034-1 Sect. 12, EN 50081, EN 50082.

*Motors with FD brakes, when fitted with the suitable capacitive filter at rectifier input (option **CF**), meet the emission limits required by Standard EN 50081-1 "Electromagnetic compatibility - Generic Emission Standard - Part 1: Residential, commercial and light industrial environment".*

Motors also meet the requirements of standard CEI EN 60204-1 "Electrical equipment of machines".

The responsibility for final product safety and compliance with applicable directives rests with the manufacturer or the assembler who incorporate the motors as component parts.

Richtlinien EWG 73/23 (LVD) und EWG 89/336 (EMC)

Die Motoren der Serie BN entsprechen den Anforderungen der Richtlinien EWG 73/23 (Richtlinie - Niederspannung) und CEE 89/336 (Richtlinie – elektromagnetische Kompatibilität) und sind mit dem CE-Zeichen ausgestattet. Im Hinblick auf die Richtlinie EMC entspricht die Konstruktion den Normen CEI EN 60034-1, Abschn. 12, EN 50081, EN 50082.

Die Motoren mit dem Bremstyp FD fallen, falls mit dem entsprechenden kapazitiven Filter am Eingang des Gleichrichters ausgestattet (Option **CF**), unter die Emissionsgrenzwerte, die von der Norm EN 50081-1 " Elektromagnetische Kompatibilität – Allgemeine Norm für Emissionen – Teil 1: Wohngebiete, Handels- und Leichtindustriezonen" vorgesehen werden".

Die Motoren entsprechen darüber hinaus den von der Norm CEI EN 60204-1 "Elektrische Maschinenausstattung" gegebenen Vorschriften.

Es liegt in der Verantwortung des Herstellers oder des Monteurs der Anlage, in der die Motoren als Komponenten montiert werden, die Sicherheit und die Übereinstimmung mit den Richtlinien des Endprodukts zu gewährleisten.

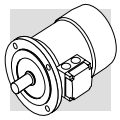
Directives CEE 73/23 (LVD) e CEE 89/336 (EMC)

Les moteurs de la série BN sont conformes aux conditions requises par les Directives CEE 73/23 (Directive Basse Tension) et CEE 89/336 (Directive Compatibilité Electromagnétique), et le marquage CE est indiqué sur la plaquette signalétique. En ce qui concerne la Directive EMC, la fabrication répond aux Normes CEI EN 60034-1 Sect. 12, EN 50081, EN 50082.

*Les moteurs avec frein FD, s'ils sont équipés du frein capacitif approprié en entrée du redresseur (option **CF**), rentrent dans les limites d'émission prévues par la Norme EN 50081-1 "Compatibilité électromagnétique - Norme Générique sur l'émission – Partie 1: Milieux résidentiels, commerciaux et de l'industrie légère".*

Les moteurs répondent aussi aux prescriptions de la Norme CEI EN 60204-1 "Equipement électrique des machines".

Le fabricant ou le monteur de la machine qui comprend les moteurs comme composant est responsable et doit se charger de garantir la sécurité et la conformité aux directives du produit final.



Rendimento – Accordo CEMEP

Con l'obbiettivo di ridurre significativamente il consumo europeo di energia elettrica mediante la sensibilizzazione degli utenti all'uso di motori maggiormente efficienti, la Commissione Europea per l'Energia e il CEMEP hanno concordato le condizioni ricorrenti per la classificazione dei motori elettrici in classi di rendimento denominate, in senso decrescente, **eff1**, **eff2** ed **eff3**.
Oggetto di questo accordo sono solamente i motori trifase standard in c.a. a 2 e 4 poli, costruzione chiusa con rotore a gabbia di scoiattolo, ventilazione esterna e potenza all'albero compresa fra 1,1 e 90 kW, alimentazione a 400V - 50 Hz in servizio continuo S1.
È facoltà dei costruttori di motori elettrici decidere di classificare volontariamente i propri prodotti in una delle tre classi di rendimento sopra citate. In questo caso essi devono apporre sulla targa il marchio relativo alla classe di rendimento applicabile ed inserire, fra i dati tecnici, i valori di rendimento a pieno carico ed a ¾ del carico nominale.
I motori Bonfiglioli ricompresi nell'oggetto di questo accordo sono conformi alla classe di rendimento **eff2** e sono pertanto chiaramente identificati in targa tramite il logo sotto riportato:

Efficiency – the CEMEP agreement

*CEMEP, the European Committee of Manufacturers of Electrical Machines and Power Electronics hopes to reduce electrical energy consumption in Europe by informing users of the efficiency of electrical motors. As a contribution in this direction, CEMEP has recently published an agreement stating the specifications for electric motor energy efficiency classes **eff1**, **eff2** and **eff3** (listed in order of decreasing efficiency).*
The CEMEP agreement covers only standard, 2 and 4 pole, three phase, AC motors, of closed rotor and squirrel cage construction, with external ventilation and rated power at the output shaft of 1.1 to 90 kW, for use with a 400V - 50 Hz power supply under S1 continuous duty conditions.
It is left up to individual electric motor manufacturers to classify their products in one of the three above classes. If they decide to do so, they must apply the relevant efficiency mark to the motor and include, together with all the other relevant technical specifications, the measured efficiency figures for full rated load and ¾ rated load.
*Under the terms of this agreement, Bonfiglioli's electric motors conform to efficiency class **eff2** and are clearly identified as such by the following mark on the data plate:*

Wirkungsgrad - die CEMEP Vereinbarung

CEMEP, der europäische Herstellerverband von elektrischen Maschinen und Leistungs-Elektronik hofft, den elektrischen Energieverbrauch in Europa, durch Informationen über die Wirkungsgrade von elektrischen Motoren an die Benutzer, zu reduzieren.
Als Beitrag in dieser Richtung, hat die CEMEP vor kurzem eine Vereinbarung veröffentlicht, die die Energie-Effizienz-Klassen **eff1**, **eff2** und **eff3** für Elektromotoren spezifiziert. (Aufgelistet nach abnehmendem Wirkungsgrad).
Die CEMEP Vereinbarung beinhaltet nur 2 und 4 polige Drehstrommotoren mit geschlossenem Rotor als Kurzschlussläufer, integriertem Lüfter, Nennleistungen an der Abtriebswelle von 1.1 - 90 kW, mit einer Energieversorgung von 400V - 50Hz und der Betriebsart S1 (Dauerbetrieb).
Es bleibt den einzelnen Elektromotoren Herstellern überlassen, ihre Produkte nach einer der drei oben benannten Effizienz-Klassen zu klassifizieren. Wenn sie sich dazu entscheiden, müssen sie die relevante Markierung auf dem Motor anbringen und zusammen mit all den anderen relevanten technischen Einzelheiten, die gemessenen Wirkungsgradangaben bei Voll- und Dreiviertellast ausweisen.
Unter den Bedingungen dieser Vereinbarung entsprechen die elektrischen Motoren von Bonfiglioli der Effizienz-Klasse **eff2** und werden als solche durch die folgende Markierung auf dem Typenschild deutlich gekennzeichnet:

Rendement – L'accord CEMEP

*La Commission Européenne sur l'Energie et le CEMEP (European Committee of Manufacturers of Electrical Machines and Power Electronics), espère réduire de façon sensible la consommation européenne d'énergie électrique à travers l'information sur l'efficience des moteurs électriques. Pour ce faire, ils ont fixés une classification des moteurs électriques en « classes de rendement » appelée, en sens décroissant d'efficience : **eff1**, **eff2** et **eff3**.*
Font partie de cet accord seulement les moteurs triphasés standard en c.a. à 2 et 4 pôles, de type fermé et rotor à cage, ventilation extérieure et puissance à l'arbre comprise entre 1,1 et 90 KW, alimentation à 400V- 50 Hz en service continue S1.
C'est au choix de chaque constructeur de moteurs électriques de décider de classifier ces produits dans une des trois classes de rendement ci-dessus. Dans ce cas, le constructeur doit faire apparaître le logo de la classe de rendement sur la plaque marque et introduire, dans les caractéristiques techniques, les valeurs de rendement à pleine charge et à ¾ de la charge nominale.
*Le moteurs Bonfiglioli concernées dans cet accord, sont conformes à la classe de rendement **eff2** et de conséquence ils présentent, sur la plaque marque, le logo suivant :*

EFF 2

M3 - TOLLERANZE

Secondo le Norme CEI EN 60034-1 sono ammesse le tolleranze qui indicate per le grandezze garantite:

M3 - TOLERANCES

Allowed tolerances for guaranteed parameters in accordance with standards CEI EN 60034-1 are indicated in the table below:

M3 - TOLERANZEN

Den Normen CEI EN 60034-1 entsprechend sind für die angegebenen Werte folgende Toleranzen zulässig:

M3 - TOLERANCES

Selon les Normes CEI EN 60034-1 les tolérances indiquées ci-dessous sont admises pour les tailles garanties :

$-0.15\ (1 - \eta)$ $P \leq 50$ kW	Rendimento	*Efficiency*	Wirkungsgrad	*Rendement*
$-(1 - \cos\varphi)/6$ min 0.02 max 0.07	Fattore di potenza	*Power factor*	Leistungsfaktor	*Facteur de puissance*
± 20% (*)	Scorrimento	*Slip*	Schlupf	*Glissement*
+ 20%	Corrente a rotore bloccato	*Locked rotor current*	Strom bei blockiertem Läufer	*Courant à rotor bloqué*
-15% + 25%	Coppia a rotore bloccato	*Locked rotor torque*	Drehmoment bei blockiertem Läufer	*Couple à rotor bloqué*
-10%	Coppia max	*Max. torque*	Max. Drehmoment	*Couple max*

(*) ± 30% per motori con P_n < 1 kW *(*) ± 30% for motors with P_n < 1 kW* (*) ± 30% für Motoren mit P_n < 1 kW *(*) ± 30% pour moteurs avec P_n < 1 kW*

M3.1 - TOLLERANZE GEOMETRICHE

L'estremità d'albero, la linguetta e la flangia hanno dimensioni e tolleranze secondo EN 50347, IEC 60072-1, CEI-UNEL 13501.
Le estremità d'albero sono previste di foro filettato in testa secondo UNI 9321, DIN 332.
I motori sono sempre forniti con linguetta inserita nella sede.
La tabella seguente riporta le tolleranze previste per le diverse parti:

M3.1 - GEOMETRIC TOLERANCES

Dimensions and tolerances of shaft end, key and flange are in accordance with EN 50347, IEC 60072-1, CEI-UNEL 13501.
Shaft ends feature an axial threaded hole in accordance with UNI 3221, DIN 332 and a key inserted in the suitable keyway.
The following table reports the tolerances for the different parts:

M3.1 - GEOMETRISCHE TOLERANZEN

Die Wellenenden, der Federkeil und der Flansch entsprechen im Hinblick auf ihre Maße und Toleranzen den NormenrEN 50347, IEC 60072-1 und CEI-UNEL 13501. Die Wellenenden sind an ihrer Stirnseite mit einer Gewindebohrung gemäß UNI 3221, DIN 332 versehen und werden mit einem in seinen Sitz eingefügten Federkeil geliefert. In der nachstehenden Tabelle werden für die verschiedenen Teile die entsprechenden Toleranzen angegeben:

M3.1 - *TOLERANCES GEOMETRIQUES*

L'extrémité de l'arbre, la clavette et la bride présentent des dimensions et tolérances selon EN 50347, IEC 60072-1, CEI-UNEL 13501. Les extrémités d'arbre sont dotées d'orifice fileté en tête, selon UNI 3221, DIN 332 ainsi que la clavette introduite dans le logement. Le tableau suivant indique les tolérances prévues pour les différentes pièces :

(03)

Componente / *Component* **Komponente / *Composant***	Dimensioni / *Dimensions* Abmessungen / *Dimensions*		Tolleranza / *Tolerance* Toleranz / *Tolérance*
Estremità albero / *Shaft end* Wellenende / *Extrémité arbre*	**D - DA**	∅ 11 - 28	**j6**
		∅ 38 - 48	**k6**
		∅ ≥ 55	**m6**
Linguetta / *Key* Federkeil / *Clavette*	**F - FA**		**h9**
Flangia / *Flange* Flansch */ Bride*	**N**	∅ < 250	**j6**
		∅ ≥ 250	**h6**

M3.2 - RUMOROSITÀ

I valori di rumorosità, rilevati secondo il metodo indicato dalle Norme ISO 1680, sono contenuti entro i livelli massimi previsti dalle Norme CEI EN 60034-9.

M3.2 - NOISE LEVEL

Noise levels measured using the method specified by standard ISO 1680 are within the maximum limits required by standards CEI EN 60034-9.

M3.2 - GERÄUSCHPEGEL

Der Geräuschpegel wurde entsprechend der in der Norm ISO 1680 angegeben Methode gemessen und liegt innerhalb der max. Werte, die von der Norm CEI EN 60034-9 vorgeschrieben werden.

M3.2 - NIVEAU DE BRUIT

Les valeurs du niveau de bruit, mesurées selon la méthode indiquées par les Normes ISO 1680 sont contenues dans les limites maximums prévues par les Normes CEI EN 60034-9.

M4 - SENSO DI ROTAZIONE

È possibile il funzionamento dei motori in entrambi i versi di rotazione. Con collegamento dei morsetti U1, V1, W1 alle fasi di linea L1, L2, L3 si ottiene la rotazione oraria, osservando l'albero dal lato accoppiamento. La marcia antioraria si ottiene scambiando fra loro due fasi.

M4 - *DIRECTION OF ROTATION*

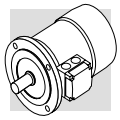
Motors may operate in both directions of rotation. When the terminals U1, V1, W1 are connected to the line phases L1, L2, L3, the motor will run in a clockwise direction as viewed from the coupling end. Counter clockwise rotation is obtained by swapping two phases.

M4 - DREHRICHTUNG

Die Motoenr können in beiden Drehrichtungen betrieben werden. Schließt man die Klemmen U1, V1, W1 an die Phasen L1, L2, L3 an, dreht sich der Motor, mit Sicht auf die Motorwelle her betrachtet, im Uhrzeigersinn. Eine Drehrichtungsumkehr gegen den Uhrzeigersinn erhält man durch das Wechseln von zwei Phasen.

M4 - SENS DE ROTATION

Le fonctionnement des moteurs dans les deux sens de rotation est possible. Avec raccordement des bornes U1, V1, W1 aux phases de ligne L1, L2, L3 on obtient la rotation dans le sens des aiguilles d'une montre, en observant l'arbre côté accouplement. Intervertir deux des phases pour obtenir la rotation dans le sens inverse des aiguilles d'une montre.



M5 - CUSCINETTI

I cuscinetti previsti sono del tipo radiale a sfere, precaricati assialmente, e dotati di carica di grasso per lubrificazione permanente.
La durata nominale a fatica L_{10h} in assenza di carichi esterni applicati all'albero e montaggio orizzontale è superiore a 40.000 ore.
I tipi utilizzati sono indicati nella tabella seguente:

M5 - BEARINGS

Axially pre-loaded radial ball bearings, lubricated for life with the grease.
Nominal fatigue life L_{10h} ~ 40,000 hours assuming no overhung load on the shaft, and mounting position horizontal.
The types of bearings in use are listed in the table below:

M5 - LAGER

Bei den verwendeten Lagern handelt es sich um axial vorgespannte Radialkugellager mit einer für die Dauerschmierung ausgelegten Fettfüllung.
Der Nennwert der Ermüdungsdauer L_{10h} ohne auf die Welle einwirkenden Kräften und bei horizontaler Montage liegt bei über 40.000 Stunden:

M5 - ROULEMENTS

Les roulements prévus sont du type radial à billes, préchargés du point de vue axial et remplis de graisse pour une lubrification permanente.
La durée nominale à la fatigue L_{10h}, en l'absence de charges externes appliquées à l'arbre et avec un montage horizontal, est supérieure à 40.000 heures :

(04)

	DE	NDE	
	Tutti i motori / *All motors* Alle Motoren / *Tous les moteurs*		BN_FD; BN_FA
BN 56	6201 2Z C3	6201 2Z C3	—
BN 63	6201 2Z C3	6201 2Z C3	6201 2RS C3
BN 71	6202 2Z C3	6202 2Z C3	6202 2RS C3
BN 80	6204 2Z C3	6204 2Z C3	6204 2RS C3
BN 90	6205 2Z C3	6205 2Z C3	6205 2RS C3
BN 100	6206 2Z C3	6206 2Z C3	6206 2RS C3
BN 112	6306 2Z C3	6306 2Z C3	6306 2RS C3
BN 132	6308 2Z C3	6308 2Z C3	6308 2RS C3
BN 160MR	6309 2Z C3	6308 2Z C3	6308 2RS C3
BN 160M/L	6309 2Z C3	6309 2Z C3	6309 2RS C3
BN 180M	6310 2Z C3	6309 2Z C3	6309 2RS C3
BN 180L	6310 2Z C3	6310 2Z C3	6310 2RS C3
BN 200L	6312 2Z C3	6310 2Z C3	6310 2RS C3

DE = lato comando
NDE = lato opposto comando

***DE** = drive end*
***NDE** = non drive end*

DE = Wellenseite
NDE = Lüfterseite

***DE** = sortie arbre*
***NDE** = côté ventilateur*

M6 - OPERATIVITÀ STANDARD

M6.1 - TENSIONE

I motori a singola polarità sono previsti, nell'esecuzione standard, per tensione nominale 230/400V Δ/Y (o 400/690 V Δ/Y per le grandezze da BN160 e BN 200) 50 Hz con tolleranza ± 10% (Eurotensione).

M6 - STANDARD OPERATION

M6.1 - VOLTAGE

Standard single-speed motors are designed to operate from a rated voltage 230/400V Δ/Y (or 400/690V Δ/Y for frame sizes BN 160 through BN 200) 50 Hz, with ± 10% tolerance (Euro-voltage).

M6 - STANDARDVERSORGUNG

M6.1 - SPANNUNG

Die einpoligen Motoren sind in der Standardausführung für eine Nennspannung von 230/400V Δ/Y (oder 400/690V Δ/Y für die Baugrößen von BN 160 bis BN 200) 50 Hz, mit einer Toleranz ± 10% (Euro-Spannung) ausgelegt. Die-

M6 - CONDITIONES OPERATIVES

M6.1 - TENSION

Les moteurs à simple polarité sont prévus, dans l'exécution standard, pour une tension nominale de 230/400V Δ/Y (ou 400/690V Δ/Y pour les tailles de BN 160 à BN 200) 50 Hz, avec une tolérance de ± 10% (Euroten-

I motori sono idonei per funzionamento sulla rete di distribuzione europea con tensione in accordo alla pubblicazione IEC 60038.
In targa sono indicati oltre alla tensione nominale, i campi di funzionamento consentiti, p.e. 220-240V Δ /380-415V Y, 50 Hz.
In accordo alla Norma CEI EN 60034-1, i motori possono funzionare alle tensioni sopra indicate con tolleranza del ± 5% (Zona A).
Per funzionamento ai limiti della tolleranza la temperatura può superare di 10 K il limite previsto dalla classe di isolamento adottata.

Motors are suitable for operation with European power mains with voltage in accordance with publication IEC 60038.
Besides rated voltage, the name plate reports allowed operating ranges, e.g. 220-240V Δ /380-415V Y, 50Hz. In accordance with standard CEI EN 60034-1, motors may operate at the above mentioned voltages with ± 5% tolerance (Zone A).
In operation at tolerance limits, temperature may exceed the temperature limit required by the adopted insulation class by 10 K.

se Motoren eignen sich für einen Betrieb im Europäischen Versorgungsnetz mit einer Spannung, die den in der Veröffentlichung IEC 60038 angegebenen Werten entspricht. Auf dem Typenschild werden über die Nennspannung hinaus, auch die zulässigen Toleranzbereiche angegeben, z.B. 220-240V Δ/380-415V Y, 50 Hz.
In Übereinstimmung mit der Norm CEI EN 60034-1 können die Motoren unter den o.g. Spannungswerten mit einer Toleranz von ± 5% (Bereich A) arbeiten. Bei einem Betrieb an den Toleranzgrenzen kann die Temperatur die vorgesehene Isolationsklasse um 10 K überschreiten.

sion). Les moteurs sont adaptés pour fonctionner sur le réseau de distribution européen avec une tension correspondant aux indications de la norme CEI 60038.
Sur la plaque signalétique sont indiquées, outre la tension nominale, les plages de fonctionnement autorisées, par ex. 220-240V Δ/380-415V Y, 50 Hz. En accord avec la norme CEI EN 60034-1, les moteurs peuvent fonctionner aux tensions susmentionnées avec une tolérance de ± 5% (Zone A). Pour un fonctionnement aux limites de la tolérance, la température peut dépasser de 10 K la limite prévue pour la classe d'isolation adoptée.

(05)

	V_{mot} ± 10% 3 ~		Esecuzione *Configuration* Ausführung *Execution*
BN 56 ... BN 132	230/400 V Δ /Y 460 V Y	50 Hz 60 Hz	Standard
BN 160 ... BN 200	400/690 V Δ /Y 460 V Δ	50 Hz 60 Hz	Standard
BN 100 ... BN 132	400/690 V Δ /Y 460 V Δ	50 Hz 60 Hz	A richiesta, senza sovrapprezzo *At request, carries no extra charge* Auf Anfrage, ohne Aufpreis *Sur demande, sans majoration de prix*

I motori a doppia polartà sono previsti per alimentazione standard 400V / 50 Hz; tolleranze applicabili secondo CEI EN 60034-1.
Nella tabella (06) sono indicati i collegamenti previsti in funzione della polarità:

Switch-pole motors are designed to operate from 400V - 50 Hz standard power supply. Applicable tolerances are in accordance with standard CEI EN 60034-1. The table (06) reports the required connections depending on the number of poles:

Die polumschaltbaren Motoren sind für eine Standardversorgung von 400V – 50 Hz ausgelegt; Toleranzen gelten gemäß CEI EN 60034-1. In der Tabelle (06) werden in Abhängigkeit von den jeweiligen Polzahlen die Wicklungsanschlüsse angegeben:

Les moteurs à double polarité sont prévus pour une alimentation standard 400V – 50 Hz ; tolérances applicables selon la norme CEI EN 60034-1. Les branchements prévus en fonction de la polarité sont indiqués sur le tableau (06) :

(06)

	Poli *Number of poles* Polzahl *Nombre de poles*	Collegamento avvolgimento *Winding connection* Wicklungsanschluß *Connexion du bobinage*
BN 63 … BN 200	2,4,6,8	Δ /Y
	2/4, 4/8	Δ / YY (Dahlander)
	2/6, 2/8, 2/12, 4/6	Y / Y (due avvolgimenti *Two windings* Zwei wicklungen *Deux bobinage*)

M6.2 - FREQUENZA

I motori della serie BN sono previsti per essere normalmente utilizzati su reti a 50 Hz o 60 Hz.

M6.2 - FREQUENCY

The motors of the BN series may operate under 50 or 60 Hz supply.

M6.2 - FREQUENZ

Die Motoren der Serie BN können mit 50 Hz oder 60 Hz betrieben werden.

M6.2 - FREQUENCE

Les moteurs de la série BN peuvent être normalement utilisés sur des réseaux en 50 Hz ou 60 Hz.

M6.3 - TEMPERATURA AMBIENTE

Le tabelle dati tecnici del catalogo riportano le caratteristiche funzionali a 50Hz, per le condizioni di installazione previste dalle Norme CEI EN 60034-1 (temperatura compresa tra -15 °C e +40 °C ed altitudine ≤ 1000 m s.l.m.).
I motori possono essere impiegati con temperature comprese tra 40 °C e 60 °C applicando i declassamenti di potenza indicati nella tabella (07):

M6.3 - AMBIENT TEMPERATURE

Catalog rating charts report operating characteristics at 50 Hz, under installation conditions as specified by standards CEI EN 60034-1 (temperature between -15 °C and + 40 °C and altitude above sea level ≤ 1000 m).
Motors may be used at ambient temperatures between 40°C and 60°C as long as the derating factors listed in the table (07) are applied:

M6.3 - UMGEBUNGSTEMPERATUR

Die im Katalog enthaltenen Tabellen geben die Betriebsdaten bei 50 Hz für die Einbaubedingungen gemäß den Normen CEI EN 60034-1 (Temperatur zwischen -15 °C und + 40 °C und Höhe ≤ 1000 m ü. M.) an.
Die Motoren können auch bei Temperaturen zwischen 40°C und 60°C eingesetzt werden, in diesem Fall müssen jedoch die in der Tabelle (07) angegebenen Leistungsreduzierungen beachtet werden:

M6.3 - TEMPERATURE AMBIANTE

Les tableaux des caractéristiques techniques du catalogue indiquent les caractéristiques de fonctionnement à 50 Hz, pour les conditions d'installation prévues par les normes CEI EN 60034-1 (température comprise entre -15 °C et + 40 °C à une altitude de ≤ 1000 m). Les moteurs peuvent être utilisés à des températures comprises entre 40°C et 60°C en appliquant les déclassements de puissance indiqués dans le tableau (07) :

(07)

Temperatura ambiente / *Ambient temperature* Umgebungstemperatur / *Température ambiante* [°C]	40°	45°	50°	55°	60°
Potenza ammissibile in % della potenza nominale *Permitted power as a % of rated power* Zulässige Leistung in % der Nennleistung *Puissance admissible en % de la puissance nominale*	100%	95%	90%	85%	80%

Quando è richiesto un declassamento del motore superiore al 15%, contattare il ns. Servizio Tecnico.

When the applicable derating factor for the motor exceeds 15%, please contact our Technical Service Dept.

Ist eine Rückstufung des Motors von mehr als 15% erforderlich, setzen sie sich bitte mit unserem Technischen Kundendienst in Verbindung.

En cas de nécessité d'un déclassement du moteur supérieur à 15%, contacter notre Service Technique.

M7 - FUNZIONAMENTO A 60 Hz

I motori della serie BN possono essere normalmente utilizzati anche su reti a 60 Hz.
Ad esclusione dei motori autofrenanti in c.c., tipo BN_FD, nella targa dei motori, oltre alle tensioni a 50 Hz, sono riportati i valori corrispondenti al funzionamento a 460 V - 60Hz, ed il relativo campo di tensione 440-480V.

In corrispondenza dell' alimentazione 460V-60 Hz la targa del motore riporta valori di potenza aumentata di circa il 20% (non applicabile ai motori autofrenanti con freno in c.c., tipo BN_FD).

M7 - 60 Hz OPERATION

BN motors may also operate with 60 Hz power mains.
Except for DC brake motors type BN_FD, motor name plate reports 50 Hz voltage ratings, as well as the values for operation at 460 V - 60Hz and the corresponding voltage range 440-480V.

For 460V-60 Hz power supply, the power ratings reported in the motor name plate are about 20% higher (does not apply to DC brake motors type BN_FD).
Name plate rated power for op-

M7 - BETRIEB BEI A 60 Hz

Die Motoren der Serie BN können normalerweise auch in Stromnetzen mit 60 Hz Frequenz eingesetzt werden.
Mit Ausnahme der Bremsmotoren mit Gleichstromes vom Typ BN_FD, werden auf dem Typenschild der Motoren über die Angabe der Spannungen bei 50 Hz auch die Werte angegeben, die einem Betrieb bei 460 V - 60Hz entsprechen. Darüber hinaus kann man diesem Schild den entsprechenden Spannungsbereich 440-480V entnehmen.

Bei einer Spannungsversorgung mit 460V-60 Hz werden auf dem Typenschild etwa 20% höhere Leistungswerte angegeben (gilt nicht für die Bremsmotoren mit Gleichstrombremse

M7 - FONCTIONNEMENT A 60 Hz

Les moteurs de la série BN peuvent aussi être normalement utilisés sur des réseaux à 60 Hz.
A l'exception des moteurs frein en c.c., type BN_FD, sur la plaque signalétique des moteurs, outre la tension à 50 Hz, sont indiqués les valeurs correspondant au fonctionnement à 460 V - 60Hz ainsi que la plage de tension relative 440-480V.

En face de l'alimentation 460V-60 Hz la plaque signalétique du moteur indiquent les valeurs de puissance majorée d'environ 20% (non applicable aux moteurs frein avec frein en

La potenza nominale di targa, a 60 Hz, è quella riportata nella tabella (08) seguente:

eration with 60 Hz power mains is as reported in the table below (08):

vom Typ BN_FD). Der nachstehenden Tabelle (08) können Sie die auf dem Typenschild angegebene Nennleistung bei 60 Hz entnehmen:

c.c., type BN_FD).
La puissance nominale indiquée sur la plaque, à 60 Hz, est celle figurant dans le tableau (08) suivant :

(08)

	Pn [kW]			
	2p	4p	6p	8p
56A	—	0.07	—	—
56B	—	0.10	—	—
63A	0.21	0.14	0.10	—
63B	0.30	0.21	0.14	—
63C	0.45	0.30	—	—
71A	0.45	0.30	0.21	0.10
71B	0.65	0.45	0.30	0.14
71C	0.90	0.65	0.45	—
80A	0.90	0.65	0.45	0.21
80B	1.30	0.90	0.65	0.30
80C	1.80	1.3	0.90	—
90S	—	1.3	0.90	0.45
90SA	1.8	—	—	—
90SB	2.2	—	—	—
90L	2.5	—	1.3	0.65
90LA	—	1.8	—	—
90LB	—	2.2	—	—
100L	3.5	—	—	—
100LA	—	2.5	1.8	0.85
100LB	4.7	3.5	2.2	1.3
112M	4.7	4.7	2.5	1.8
132S	—	6.5	3.5	2.5
132SA	6.5	—	—	—
132SB	8.7	—	—	—
132M	11	—	—	3.5
132MA	—	8.7	4.6	—
132MB	—	11	6.5	—
160MR	12.5	12.5	—	—
160MB	17.5	—	—	—
160M	—	—	8.6	—
160L	21.5	17.5	12.6	—
180M	24.5	21.5	—	—
180L	—	25.3	17.5	—
200L	34	34	22	—

Per i motori a doppia polarità con frequenza di alimentazione 60Hz l'incremento di potenza previsto, rispetto a quanto riportato nelle tabelle dati tecnici a 50 Hz, è circa del 15%.
I motori ad una velocità con avvolgimento standard, se utilizzati su reti a 60 Hz e tensioni come riportato in tabella (09), presentano variazioni delle grandezze principali come nel seguito descritto:

For switch-pole motors operating with 60 Hz input frequency, the power increase factor over 50 Hz ratings is in the order of 15%.
Key parameter variations for single-pole motors with standard winding operating with 60 Hz power mains at the voltage ratings reported in the table (09) are reported below (variations expressed as percentages):

Für die polumschaltbaren Motoren mit einer Spannungsversorgung von 60 Hz beträgt die Leistungserhöhung im Vergleich zu den Angaben in der Tabelle der sich auf 50 Hz beziehenden technischen Daten ungefähr 15%.
Für die einpoligen Motoren mit Standardwicklung die in Versorgungsnetzen mit 60 Hz und mit Spannungen gemäß Tabelle (09) eingesetzt werden, gelten die folgenden Werte:

Pour les moteurs à double polarité avec fréquence d'alimentation 60 Hz l'augmentation de puissance prévue, par rapport aux indications des tableaux des caractéristiques techniques à 50 Hz, est d'environ 15%.
Les moteurs à une vitesse avec bobinage standard, lorsqu'ils sont utilisés sur des réseaux à 60 Hz et des tensions comme indiqué dans le tableau (09), présentent des variations des valeurs principales en pourcentage comme indiqué ci-dessous :

(09)

50 Hz	**60 Hz**			
V	**V**	**Pn**	**Mn, Ma/Mn**	**n [min^{-1}]**
230/400 Δ /Y	220 - 240 Δ 380 - 415 Y	1	0.83	1.2
400/690 V Δ /Y	380 - 415 Δ			
230/400 V Δ /Y	265 - 280 Δ 440 - 480 Y	1.15	1	1.2
400/690 V Δ /Y	440 - 480 Δ			
230/400 V Δ /Y	265 - 280 Δ 440 - 480 Y	1.15	1	1.2
400/690 V Δ /Y	440 - 480 Δ			

I freni, se presenti, dovranno sempre essere alimentati come riportato in targa.

Brakes, if fitted, must always be supplied as specified on the name plate.

Die Bremsen, falls vorhanden, müssen immer wie gezeicht auf dem Typenschild versorgt werden.

Si présents, les freins doivent toujours être alimentés indiquée sur la plaque signalétique.

PN

L'opzione consente di avere sulla targa del motore il valore di potenza normalizzata a 50 Hz, anche quando è specificata l'alimentazione a 60 Hz.

With this option, motor name plate includes 50 Hz normalized power information even when motor is designated for operation with 60 Hz power mains.

Diese Option ermöglicht es auf dem Typenschild des Motors den Wert der auf 50 Hz genormten Leistung angeben zu können, auch wenn eine Spannungsversorgung bei 60 Hz erfolgt.

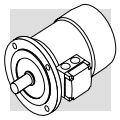
L'option permet d'avoir sur la plaque signalétique du moteur la valeur de puissance normalisée à 50 Hz, même lorsque l'alimentation à 60 Hz est spécifiée.

Per alimentazioni a 60 Hz con le tensioni 230/460V e 575V l'opzione PN viene applicata di default.

For 60 Hz supplies along with voltages 230/460V and 575V the PN option is applied by default.

Die Option PN ist immer dabei mit 60 Hz und Spannungsversorgung 230/460V und 575V 60 Hz.

Pour alimentations à 60 Hz avec tensions 230/460V et 575V l'option PN est appliqué de default.



M7.1 - MOTORI PER USA E CANADA

M7.1 - MOTORS FOR USA AND CANADA

M7.1 - MOTOREN FÜR DIE USA UND KANADA

M7.1 - MOTEURS POUR ETATS-UNIS ET CANADA

CUS

I motori da BN 56 a BN 200 sono disponibili in esecuzione NEMA Design C (per le caratteristiche elettriche), certificata in conformità alle norme CSA (Canadian Standard) C22.2 N°100 e UL (Underwriters Laboratory) UL 1004 con targhetta riportante entrambi i marchi sotto illustrati:

BN motor's sizes 56 through 200, are available in NEMA Design C configuration (concerning electrical characteristics), certified to CSA (Canadian Standard) C22.2 No. 100 and UL (Underwriters Laboratory) UL 1004. By specifying the option CUS the name plate is marked with both symbols shown here below:

Die Motoren BN 56 bis BN 200 sind in der Ausführung NEMA, Design C erhältlich (hinsichtlich der elektrischen Eigenschaften). Zertifiziert nach den Normen CSA (Canadian Standard) C22.2 Nr. 100 und UL (Underwriters Laboratory) UL 1004. Durch Spezifizieren der Option CUS wird das Typenschild mit den nachstehend aufgeführten Symbolen gekennzeichnet:

Les moteurs BN 56...BN 200 sont disponibles en exécution NEMA Design C (pour les caractéristiques électriques), certifiée conforme aux normes CSA (Canadian Standard) C22.2 N°100 et UL (Underwriters Laboratory) UL 1004 avec une plaque signalétique indiquant chacun des symboles ci-dessous :

C US

(tensione ≤ 600V).

(voltage ≤ 600V)

Zeichen (Spannung ≤ 600V) versehen.

(tension ≤ 600V).

Le tensioni delle reti di distribuzione americane e le corrispondenti tensioni nominali da specificare per il motore sono indicate nella tabella seguente:

US power mains voltages and the corresponding rated voltages to be specified for the motor are indicated in the following table:

Die Spannungen der amerikanischen Verteilernetze und die entsprechenden Nennspannungen, die bei der Bestellung der Motore angegeben werden müssen, können der folgenden Tabelle entnommen werden:

Les tensions des réseaux de distribution américains ainsi que les tensions nominales à spécifier pour le moteur sont indiquées dans le tableau suivant :

(10)

Frequenza *Frequency* Frequenz *Fréquence*	Tensione di rete *Mains voltage* Netzspannung *Tension de réseau*	Tensione nominale motore *Motor rated voltage* Nennspannung des Motors *Tension nominale moteur*
60 Hz	208 V	**200 V**
	240 V	**230 V**
	480 V	**460 V**
	600 V	**575 V**

I motori dotati di collegamento YY/Y (es. 230/460-60; 220/440-60) presentano di serie una morsettiera a 9 terminali.
Per le stesse esecuzioni, e inoltre per l'alimentazione 575V-60Hz, la potenza di targa corrisponde a quella normalizzata a 50Hz.
Per i motori autofrenanti con freno in c.c. tipo BN_FD l'alimentazione del raddrizzatore è da morsettiera motore con tensione 230V a.c. monofase.

Motors with YY/Y connection (e.g. 230/460-60; 220/440-60) feature, as standard, a 9-stud terminal board. For same executions, as well as for 575V-60Hz supply, the nominal rating is coincident with the correspondent 50Hz rating.
For DC brake motors type BN_FD, the rectifier is connected to a single-phase 230 VAC supply voltage in the motor terminal box.

Motoren mit YY/Y-Anschluss (z.B. 230/460-60; 220/440-60) sind standardmäßig mit 9 Pins auf dem Klemmbrett ausgeführt. Für gleiche Ausführungen, ebenso wie für 575V-60Hz, die Nennleistung ist gleich mit der entsprechenden 50 Hz-Leistung.Für Bremsmotoren mit Gleichstrombremse vom Typ BN_FD erfolgt die Versorgung des Gleichrichters über den Motorklemmenkasten mit einer

Les moteurs avec connexion YY/Y (ex. 230/460-60; 220/440-60) presentent, en standard, une plaque à borne avec 9 bornes. Pour les memes executions, et aussi pour l'alimentation 575V-60Hz, la puissance de plaque corresponde à celle normalisé à 50Hz.
Pour les moteurs frein avec frein en c.c. type BN_FD , l'alimentation du redresseur provient de la boîte à bornes moteur avec une tension 230V c.a. monophasée.

Per i motori autofrenanti **l'alimentazione del freno** è così predisposta:

Brake power supply *for brake motors is as follows:*

Spannung von 230V (einphasiger Wechselstrom). Bei Bremsmotoren stellt sich die **Versorgung der Bremse** wie folgt dar:

Pour les moteurs frein ***l'alimentation du frein*** *est la suivante :*

(11)

BN_FD		**BN_FA ; BN_BA**	Specificare: *Power supply:* Bitte angeben: *Spécifier* :
Da morsettiera motore *Connected to terminal box* Vom Motorklemmenkasten *Depuis boîte à bornes moteur*		Alimentazione separata *Separate power supply* *Fremdversorgung* *Alimentation séparée* 230 V Δ - 60 Hz	**230SA**
1~ 230 V a.c.		Alimentazione separata *Separate power supply* Fremdversorgung *Alimentation séparée* 460 V Y - 60 Hz	**460SA**

L'opzione CUS non è applicabile ai motori dotati di servoventilazione.

The option CUS does not apply to servo-ventilated motors.

Die CUS-Option ist für die Fremdlüftermotoren nicht anwendbar

L'option CUS n'est pas applicable aux moteurs doués de ventilation forcée.

M8 - ALIMENTAZIONE DA INVERTER

I motori elettrici della serie BN possono essere utilizzati con alimentazione da inverter PWM e tensione nominale all'ingresso del convertitore fino a 500 V.
Il sistema isolante adottato sui motori di serie prevede l'isolamento di fase con separatori, l'utilizzo di filo smaltato in grado 2 e resine d'impregnazione in classe H (limite di tenuta all'impulso di tensione 1600V picco-picco e fronte di salita t_s > 0.1 µs ai morsetti motore).
Le caratteristiche tipiche coppia/velocità in servizio S1 per motore con frequenza base f_b = 50 Hz sono riportate nella tabella seguente.
Per frequenze di funzionamento inferiori a circa 30 Hz, a causa della diminuzione della ventilazione, i motori standard autoventilati (IC 411) devono essere opportunamente declassati in coppia o, in alternativa, devono essere provvisti di ventilatore con alimentazione separata (vedi par. M12).
Per frequenze maggiori alla frequenza base, raggiunto il valore massimo di tensione di uscita dell'inverter, il motore lavora in un campo di funzionamento a

M8 - INVERTER CONTROL

The BN type electric motors are suitable for PWM inverter control with rated voltage at transformer input up to 500 V.
The insulating system adopted on standard motors uses phase insulation with separators, grade 2 enamelled wire and impregnation resins in class H (maximum voltage pulse 1600 V peak-to-peak and rise edge t_s > 0.1 µs at motor terminals).
Typical torque/speed characteristics for S1 duty for motors operating with basic frequency f_b= 50 Hz is are reported in the table below.
Operating at the frequencies below 30 Hz impair ventilation efficiency, standard motors with incorporated fan (IC 411) require either a corresponding torque reduction or, alternately, a fan with separate power supply. (See par M12)
For frequencies greater than basic frequency, once inverter maximum output voltage has been reached, the motor will be working in a steady power operation range, with shaft torque decreasing approximately with ratio (f/f_b).
As motor maximum torque de-

M8 - FREQUENZUMRICHTER-BETRIEB

Die Elektromotoren der Serie BN können mit einem Frequenzumrichter und einer Nennspannung am Eingang des Umrichters bis zu 500 V versorgt werden.
Die Motoren haben eine Phasentrennung über Wicklungstrenner, Emaildraht der Klasse 2 mit Imprägnierharzen der Klasse H vor (Widerstandsgrenze gegen einen Spannungsimpuls von 1600 V und Anstiegsrampe t_s > 0.1 µs an den Motorklemmen).
Die typischen Merkmale Drehmoment/Drehzahl in der Betriebsart S1 für Motoren mit einer Eckfrequenz von f_b= 50 Hz werden in der nachstehenden Tabelle angegeben. Bei Frequenzen von unter 30 Hz liegenden Betriebsfrequenzen müssen die eigenbelüfteten Standardmotoren (IC 411) aufgrund ihrer geringeren Kühlwirkung in ihrem Drehmoment zurückgestuft oder, alternativ, mit einem Fremdlüfter ausgestattet werden (siehe Par. M12).
Wenn der Motor oberhalb der Eckfrequenz betrieben wird, arbeitet er im Feldschwächebereich. In diesem Bereich kon-

M8 - ALIMENTATION PAR VARIATEUR

Les moteurs électriques de la série BN peuvent être utilisés avec alimentation par variateur PWM, et tension nominale en entrée du convertisseur jusqu'à 500V. Le système isolant adopté sur les moteurs de série prévoit l'isolation de phase avec séparateurs, l'utilisation de fil émaillé niveau 2 et résines d'imprégnation de classe H (limite de maintien à l'impulsion de tension 1600V pic-pic et front de montée t_s > 0.1µs aux bornes moteur).
Les caractéristiques typiques couple/vitesse en service S1 pour moteur avec fréquence de base f_b = 50 Hz sont indiquées dans le tableau suivant. Pour des fréquences de fonctionnement inférieures à environ 30 Hz, à cause de la diminution de la ventilation, les moteurs standards autoventilés (IC411) doivent être opportunément déclassés au niveau du couple ou, en alternative, doivent être équipés de ventilateur avec alimentation séparée (voir paragraphe M12).
Pour des fréquences supérieures à la fréquence de base, une fois la valeur maximale de tension de sortie du variateur atteinte, le moteur fonctionne dans une plage

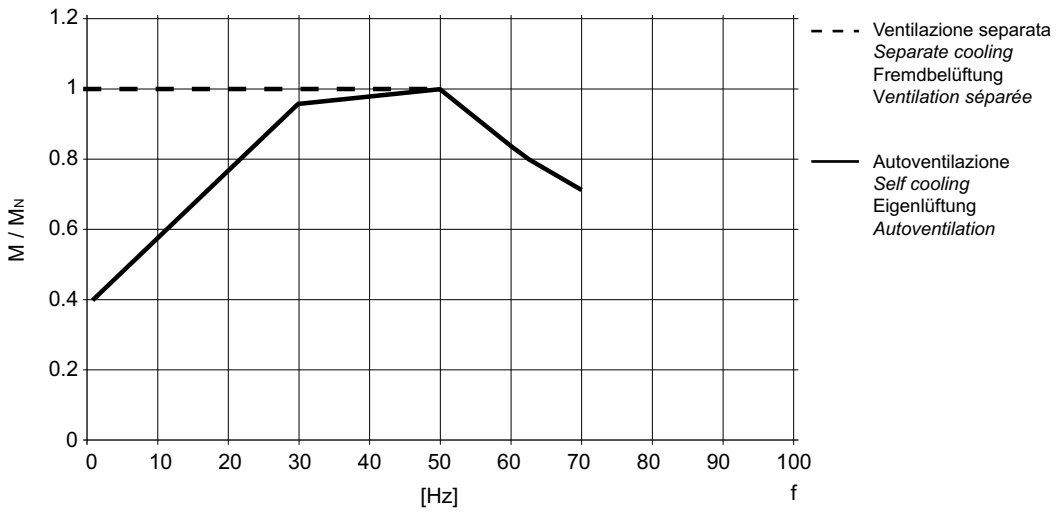
potenza costante, con coppia all'albero che si riduce ca. con il rapporto (f/f_b).
Poiché la coppia massima del motore decresce ca. con $(f/f_b)^2$, il margine di sovraccarico ammesso dovrà essere progressivamente ridotto.

creases approximately with $(f/f_b)^2$, the permitted overload reserve will have to be reduced gradually.

stanter Leistung fällt das Drehmoment des Motors ungefähr um das Verhältnis (f/f_b) ab. Da die maximale Motordrehzahl sich mit ungefähr $(f/_{fb})^2$ verringert, muss die zulässige Belastungsgrenze in progressiv reduziert werden.

de fonctionnement à puissance constante, avec un couple à l'arbre qui se réduit approximativement dans le rapport ($f/_{fb}$). Etant donné que le couple maximum du moteur diminue approximativement en relation avec $(f/_{fb})^2$, la marge de surcharge admise devra être progressivement réduite.

(12)



Per funzionamento oltre la frequenza nominale, la velocità limite meccanica dei motori è riportata nella tabella qui di seguito:

The following table reports the mechanical speed limit for motors operating above rated frequency:

Für Anwendungen, bei denen der Motor oberhalb der Eckfrequenz betrieben wird, finden sie die mechanische Drehzahlgrenzen in der folgenden Tabelle:

En cas de fonctionnement au-delà de la fréquence nominale, la vitesse limite mécanique des moteurs est indiquée dans le tableau suivant :

(13)

	n [min^{-1}]		
	2P	**4P**	**6P/8P**
BN 56...BN 100	5200	4000	3000
BN 112	5200	4000	3000
BN 132...BN 160MR	4500	4000	3000
BN 160M...BN 180M	4500	4000	3000
BN 180L...BN 200L	4500	3600	3000

A velocità superiori alla nominale i motori presentano maggiori vibrazioni meccaniche e rumorosità di ventilazione; è consigliabile, per queste applicazioni,

Motors operating above rated speed show an increased tendency for mechanical vibration and fan noise. When this is the case, rotor balancing in grade R

Bei Drehzahlen oberhalb der Nenndrehzahlen weisen die Motoren stärkere mechanische Schwingungen und Llüftungergeräusche auf: In diesen Fällen

A des vitesses supérieures à la vitesse nominale, les moteurs présentent plus de vibrations mécaniques et de bruit de ventilation ; pour ces applications, il

un bilanciamento del rotore in grado R - opzione **RV** - ed eventualmente il ventilatore con alimentazione separata - opzioni **U1** o **U2**.
Sia il servoventilatore, sia il freno elettromagnetico, devono sempre essere alimentati direttamente dalla rete.

*- option **RV** - and possibly a fan with separate power supply - options **U1** or **U2** - should be specified.*
Both servo-fan and electromagnetic brake require direct connection to mains power supply.

wird das Auswuchten des Rotors im Grad R – Option **RV** – und eventuell die Installation eines Fremdlüfters– Option **U1** oder **U2** - empfohlen. Sowohl der Fremdlüfter als auch die elektromagnetische Bremse müssen bei Frequenzumrichterbetrieb auf Grund der abfallenden Versorgungsspannung immer direkt über das Stromnetz versorgt werden.

*est conseillé d'effectuer un équilibrage du rotor en niveau R - option **RV** - et de monter éventuellement un ventilateur avec alimentation séparée – options **U1** ou **U2**.*
Le servoventilateur ainsi que le frein électromagnétique doivent toujours être alimentés directement par le réseau.

M9 - TIPO DI SERVIZIO

Se non indicato diversamente, la potenza dei motori riportata a catalogo si riferisce al servizio continuo S1.
Per i motori utilizzati in condizioni diverse da S1 sarà necessario identificare il tipo di servizio previsto con riferimento alle Norme CEI EN 60034-1.
In particolare per servizi S2 ed S3 è possibile ottenere una maggiorazione della potenza rispetto a quella prevista per il servizio continuo secondo quanto indicato nella tabella che segue, valida per i motori a singola polarità.
Per le maggiorazioni applicabili a motori a doppia polarità consultare preferibilmente il Servizio Tecnico Bonfiglioli.

M9 - TYPE OF DUTY

Unless otherwise specified, catalogue motor power refers to continuous duty S1.
Any operating conditions other than S1 duty must be identified in accordance with duty cycle definitions laid down in standards CEI EN 60034-1.
For duty cycles S2 and S3, the power increase co-efficient reported in the following table may be used. Please note that the table provided below applies to single-speed motors.
Please contact Bonfiglioli Engineering for the power increase coefficients applicable to switch-pole motors.

M9 - BETRIEBSARTEN

Sofern nicht anderweitig angegeben, beziehen sich die im Katalog angegebene Motorleistungen auf den Dauerbetrieb S1. Bei Motoren, die unter Bedingungen eingesetzt werden, die nicht mit S1 übereinstimmen, muss die entsprechende Betriebsart unter Bezugnahme auf die Normen CEI EN 60034-1 festgelegt werden. Insbesondere kann man, für die Betriebsarten S2 und S3, durch Anwendung der in der nachstehenden Tabelle angeführten Koeffizienten der für den Dauerbetrieb vorgesehenen Leistung gegenüber eine Leistungssteigerung erzielen. Diese Tabelle gilt für einpolige Motoren. Für die polumschaltbaren Motoren sollte man sich im Hinblick auf den Leistungssteigerung, mit unserem Technischen Kundendienst in Verbindung setzen.

M9 - TYPE DE SERVICE

Sauf indication contraire, la puissance des moteurs indiquée dans le catalogue se réfère au service continu type S1.
Pour les moteurs utilisés dans des conditions différentes de S1, il est nécessaire d'identifier le type de service en se référant aux Normes CEI EN 60034-1.
Plus particulièrement, pour les types de service S2 et S3 il est possible d'obtenir une majoration de la puissance par rapport à celle prévue pour le service continu, en appliquant les coefficients indiqués dans le tableau suivant, valable pour les moteurs à simple polarité. En ce qui concerne les majorations applicables aux moteurs à double polarité, il est préférable de contacter le Service Technique Bonfiglioli.

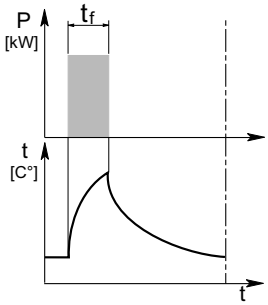
S2

Funzionamento a carico costante per un periodo di tempo limitato, inferiore a quello richiesto per raggiungere l'equilibrio termico, seguito da un periodo di riposo di durata sufficiente a ristabilire nel motore la temperatura ambiente.

Operation under steady loading for a limited period of time (less than the time taken to achieve thermal balance), followed by a period of time at rest long enough for engine to cool down to ambient temperature.

Betrieb mit konstanter Last für eine begrenzte Dauer, die unter der Zeit liegt, die für das Erreichen des thermischen Gleichgewichts erforderlich ist, gefolgt von einer Aussetzzeit mit einer Dauer, die für das erneute Erreichen der Umgebungstemperatur im Motor erforderlich ist.

Fonctionnement à charge constante pendant une période de temps limitée, inférieure à celle nécessaire pour atteindre l'équilibre thermique, suivie par une période de repos de durée suffisante pour rétablir la température ambiante dans le moteur.



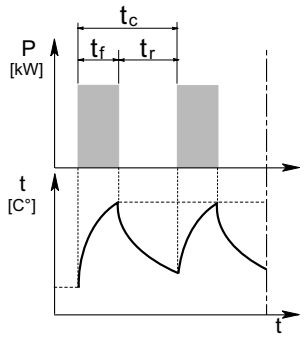
S3

Sequenza di cicli di funzionamento identici, ciascuno comprendente un periodo di funzionamento a carico costante ed un periodo di riposo.
In questo tipo di servizio la corrente d'avviamento non influenza la sovratemperatura in modo significativo.

A sequence of identical operation cycles, each including operation under steady loading followed by some time at rest. In this type of duty, starting current has no significant effect on overtemperature.

Betriebsweise mit identischen Betriebszyklen, von denen jeder Zyklus eine Betriebsdauer mit konstanter Last und eine Aussetzzeit einschliesst. Bei dieser Betriebsart beeinflußt der Anlaufstrom die Übertemperatur in keinerlei ausschlaggebender Weise.

Séquence de cycles de fonctionnement identiques, comprenant chacun une période de fonctionnement à charge constante et une période de repos. Dans ce type de service, le courant de démarrage n'influence pas l'excès de température de façon significative.



(14)

Tipo di Servizio *Type of duty* Betriebsart *Type de service*		Potenza ammissibile in p.u. della potenza in S1 *Permitted power in p.u. of S1 power* Zulässige Leistung in % der Leistung bei S1 *Puissance admissible en p.u. de la puissance en S1*
	Durata / *Duration* / Dauer / *Durée*	
S2	10 min	1.35
	30 min	1.15
	60 min	1.05
	Rapporto di intermittenza *Intermittence* / Schaltverhältnis *Rapport d'intermittence* (**I**)	
S3	25 %	1.25
	40 %	1.15
	60 %	1.10
S4 … S9	Interpellarci / *Contact us / Setzen Sie sich mit uns in Verbindung / Nous contacter*	

$$I = \frac{t_f}{t_f + t_r} \cdot 100$$

t_f = tempo di funzionamento sotto carico
t_r = tempo di riposo

La durata del ciclo dovrà essere ≤ 10 min. Per durate superiori interpellarci.

t_f = work time under constant load
t_r = rest time

Cycle duration must be up to 10 min. Please contact us when cycle duration exceeds this limit.

t_f = Betriebszeit mit konstanter Last
t_r = Aussetzzeit

Die Zyklusdauer muss ≤ 10 min. betragen. Falls der Zyklus länger sein sollte, setzen Sie sich bitte mit unserem Kundendienst in Verbindung.

t_f = temps de fonctionnement à charge constante
t_r = temps de repos

La durée du cycle devra être ≤ 10 min. Pour des durées supérieures, nous contacter.

M10 - MORSETTIERA MOTORE

La morsettiera principale è a 6 morsetti per collegamento con capicorda (esecuzione a 9 morsetti per tensioni americane "dual voltage" - vedi par. M7.1).
All'interno della scatola copri-

M10 - TERMINAL BOX

The main terminal box has 6 terminals for connection to lead-in wires (9-terminal version is supplied for "dual voltage" US voltage ratings - see M7.1)
The ground terminal for earth

M10 - MOTORKLEMMENKASTEN

Der Klemmenkasten hat ein Klemmbrett mit 6 Klemmen für einen Anschluss über Kabelschuhe (für die amerikanischen Spannungswerte "dual voltage" sind 9 Klemmen vorgesehen – siehe

M10 - BORNIER MOTEUR

Le bornier principal est de type à 6 bornes pour raccordement avec cosses (exécution à 9 bornes pour les tensions américaines "dual voltage" – voir M7.1).
A l'intérieur du couvercle du

BONFIGLIOLI RIDUTTORI

morsetti è previsto il morsetto di terra per il collegamento del conduttore di protezione.
Le dimensioni dei terminali sono riportati nella tabella (15).
Per l'alimentazione del freno vedi par. M25 (freno FD), M26 + M27 (freno FA e BA).
Nei motori in forma costruttiva IM B3 la scatola coprimorsetti è posta in alto (posizione opposta ai piedi).
Eseguire i collegamenti elettrici secondo gli schemi riportati all'interno della scatola coprimorsettiera o nei manuali d'uso.

lead connection is housed in the terminal box.
Terminal sizes are listed in the table (15).
For brake power supply, please read par. M25 (brake FD), M26 + M27 (brake FA and BA).
In motor design IM B3, the terminal box is top mounted (side opposite to feet).
Please refer to the wiring diagrams reported inside the terminal box, or in the operating instructions, for correct wiring.

M7.1. Im Inneren des Klemmenkastens ist ein Erdungsanschluß für den Anschluss des Schutzleiters vorgesehen. Die Abmessungen der Anschlüsse werden in der Tabelle (15) angegeben. Für Informationen über die Bremsversorgung verweisen wir an dieser Stelle auf den Par. M25 (Bremstyp FD), M26 + M27 (Bremstyp FA und BA). Bei Motoren in der Bauform IM B3 ist der Klemmenkasten oben angeordnet (den Füßen entgegengesetzt).
Die elektrischen Anschlüsse müssen entsprechend den Schaltplänen, die sich im Inneren des Klemmenkästen befinden oder in den Betriebsanleitungen zu finden sind, vorgenommen werden.

bornier se trouve la borne de terre pour le raccordement du conducteur de protection.
Les dimensions des bornes sont indiquées dans le tableau (15). Pour l'alimentation du frein, voir par. M25 (frein FD), M26 + M27 (frein FA et BA).
Sur les moteurs de forme de construction IM B3 la boîte à bornes est située en haut (à l'opposé des pieds).
Effectuer les branchements électriques selon les schémas indiqués à l'intérieur du couvercle de la boîte à bornes ou dans les manuels d'instructions.

(15)

	N° terminali *No. of terminals* *Klemmen* *N° bornes*	Filettatura terminali *Terminal threads* Gewinde *Filetage bornes*	Sezione max. del conduttore mm^2 *Wire max cross section area sq mm^2* Max. leiter-querschnitt mm^2 *Section max du conducteur mm^2*
BN 56 ... BN 90	6	M4	2.5
BN 100 ... BN 160MR	6	M5	6
BN 160M ... BN 180M	6	M6	16
BN 180L ... BN 200L	6	M8	25

M10.1 - INGRESSO CAVI

Nell'esecuzione standard l'ingresso dei cavi di alimentazione è previsto per pressacavo metrici in accordo alla Norma CEI EN 50262. Dimensioni e disposizioni come indicato nelle tabelle che seguono.

M10.1 - CABLE GLAND HOLES

Standard cable gland holes accommodate metric-size cable glands in accordance with standard CEI EN 50262. Dimensions and locations are as shown in the following tables.

M10.1 - KABELDURCHFÜHRUNG

In der Standardversion ist die Ein- bzw. Durchführung der Kabel in Übereinstimmung mit der Norm CEI EN 50262 über metrische Kabelführungen vorgesehen. Maße und Anordnung werden in den folgenden Tabellen angegeben.

M10.1 - ENTREE CABLES

Dans l'exécution standard, l'entrée des câbles d'alimentation est prévue pour des serre-câbles métriques, en accord avec la Norme CEI EN 50262. Dimensions et dispositions comme indiqué dans les tab. suivantes.

(16)

Motori flangiati (IM B5, IM B14) / *Flanged motors (IM B5, IM B14)* Flanschmotoren (IM B5, IM B14) / *Moteurs à bride (IM B5, IM B14)*			
	N° ingresso cavi e dimensione *No. & size of cable gland holes* Kabeleingänge und masse *Nb entrees câbles et dimensions*		∅ Max. cavo [mm] *Wire max ∅ [mm]* Max. ∅ kabel [mm] *∅ Max câble [mm]*
BN 56 ... BN 63	2 x M 20 x 1.5	1 foro per lato *1 Hole on each side* 1 Bohrung pro Seite *1 Orifice par côté*	13
BN 71 ... BN 90	2 x M 25 x 1.5		17
BN 100	2 x M 32 x 1.5 2 x M 25 x 1.5	2 fori per lato *2 Holes on each side* 2 Bohrungen pro Seite *2 Orifices par côté*	21 17
BN 112	2 x M 32 x 1.5 2 x M 25 x 1.5		17
BN 132 ... BN 160MR	4 x M 32 x 1.5		21
BN 160M ... BN 200L	2 x M 40 x 1.5	Orientabili 4 x 90° *Pivoting, 4 x 90°* Orientierbar 4 x 90° *Orientables 4 x 90°*	28

(17)

Motori con piedi (IM B3 e derivati) / *Footed motors (IM B3 and derived designs)* Motoren in Fußausführung (IM B3 und davon abgeleitete Versionen) *Moteurs avec pieds (IM B3 et dérivés)*			
	N° ingresso cavi e dimensione *no. & size of cable gland holes* Kabeleingänge und masse *nb entrees câbles et dimensions*		Diametro max. cavo [mm] *max wire diametre ∅ [mm]* Max. ∅ kabel [mm] *∅ max câble [mm]*
BN 63	2 x M 16 x 1.5	1 foro per lato *1 hole on each side* 1 Bohrung pro Seite *1 orifice par côté*	10
BN 71 ... BN 80	2 x M 20 x 1.5		13
BN 90	2 x M 25 x 1.5		17
BN 100 ... BN 112	4 x M 25 x 1.5	2 fori per lato *2 holes on each side* 2 Bohrungen pro Seite *2 orifices par côté*	17
BN 132	4 x M 32 x 1.5		21

M11 - FORME COSTRUTTIVE

I motori sono previsti nelle forme costruttive IM B3, IM B5, IM B14 e derivate in accordo alla Norma CEI EN 60034-7, come indicato nella tabella seguente.

M11 - DESIGN VERSIONS

Motors are available in the design versions IM B3, IM B5, IM B14 and derived versions in accordance with standard CEI EN 60034-7, as outlined in the table below.

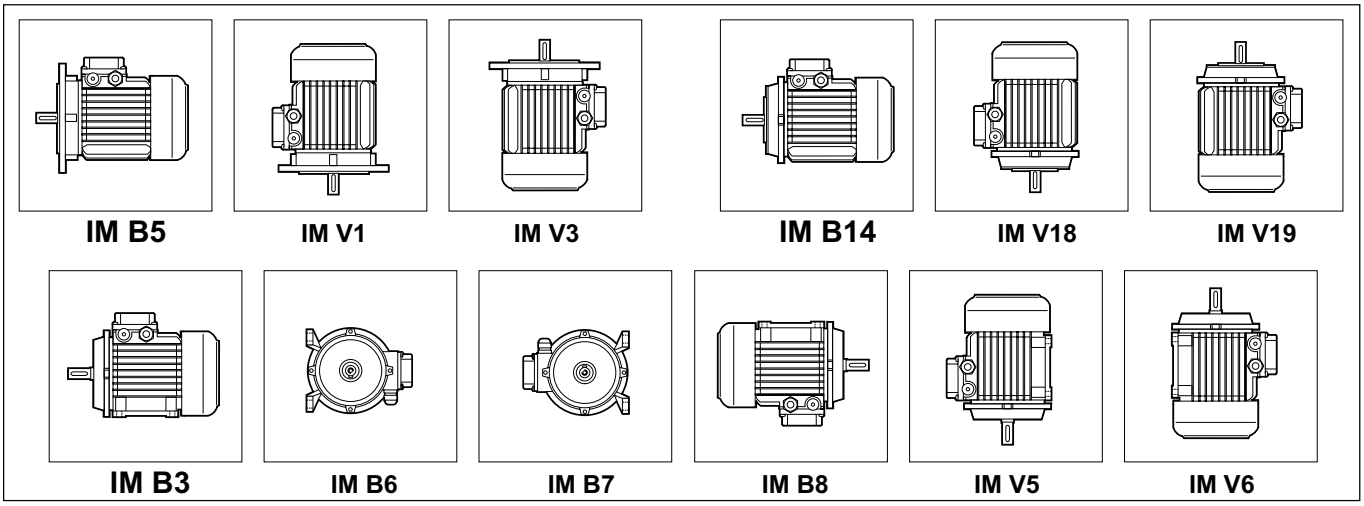
M11 - BAUFORMEN

Die Motoren sind in den Bauformen IM B3, IM B5, IM B14 und abgeleitete Versionen erhältlich und wurden in Übereinstimmung mit der Norm CEI EN 60034-7, entsprechend den Angaben in der nachstehenden Tabelle, realisiert.

M11 - FORMES DE CONSTRUCTION

Les moteurs sont disponibles dans les formes de construction IM B3, IM B5, IM B14 et dérivées, en accord avec la Norme CEI EN 60034-7, comme indiqué dans le tableau suivant.

(18)



I motori, targati esclusivamente nella forma costruttiva base, possono essere installati anche nelle forme costruttive derivate, come illustrato nella tabella seguente:

Motors in the derived design versions may also be installed as outlined in the table below. however, note that motor name plate will report the corresponding basic design version:

Die Motoren werden auf dem Typenschild in der Einbaulage B3 angegeben, sie können aber auch in den anderen, in der nachfolgenden Tabelle angegebenen Bauformen montiert werden:

Les moteurs, marqués exclusivement dans la forme de construction de base, peuvent aussi être installés dans les formes de construction dérivées, comme indiqué dans le tableau suivant :

(19)

Forma costruttiva base ***Basic design version*** **Gundbauform** ***Forme de construction de base***	**Forma costruttiva derivata / *Derived design version*** **Andere Einbaulagen / Forme de construction dérivée**				
IM B3	IM B6	IM B7	IM B8	IM V5	IM V6
IM B5	IM V1	IM V3			
IM B14	IM V18	IM V19			

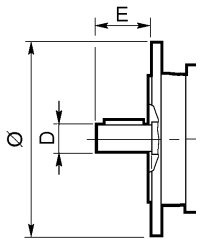
Nelle installazioni con l'albero rivolto verso il basso è consigliabile specificare l'opzione **RC** - tettuccio parapioggia, vedi par. M23 in particolar modo nel caso di motore autofrenante.
I motori in forma flangiata possono essere forniti con dimensioni di accoppiamento ridotte, corrispondenti alle forme costruttive B5R o B14R, con dimensioni dettagliate nella tabella seguente:

*If motor is to be installed with the shaft pointing downwards, the rain canopy option **RC** – see par. M23 is recommended, especially where a brake motor is used.*
Flange output motors are also available with reduced coupling dimensions corresponding to design versions B5R or B14R. Dimensions are indicated in the table below:

Bei Anwendungen mit senkrecht unten zeigender Welle, wird empfohlen, den Motor mit der Option **RC** – Schutzdach, siehe M23 zu bestellen, insbesondere dann, wenn es sich um einen Bremsmotor handelt. Die Motoren mit Flansch können mit reduzierten Wellen- und Flanschmaßen geliefert werden, die den Bauformen B5R oder B14R entsprechen und folgende Maße aufweisen:

*En ce qui concerne les installations avec arbre dirigé vers le bas, il est conseillé de spécifier l'option **RC** – capot antipluie, voir par. M23 plus particulièrement en cas de moteur frein. Les moteurs avec bride peuvent être fournis avec des dimensions d'accouplement réduites, correspondant aux formes de construction B5R ou B14R, avec les dimensions détaillées dans le tableau suivant :*

(20)



	BN 71	BN 80	BN 90	BN 100	BN 112	BN 132
	DxE - ∅					
B5R (1)	11x23 - 140	14x30 - 160	19x40 - 200	24x50 - 200	24x50 - 200	28x60 - 250
B14R (2)	11x23 - 90	14x30 - 105	19x40 - 120	24x50 - 140	—	—

(1) Flangia con fori passanti
(2) Flangia con fori filettati

(1) Flange with through holes
(2) Flange with tapped holes

(1) Flanschen mit durchgehenden Bohrungeni
(2) Flansch mit Gewindebohrungen

(1) Bride avec orifices passants
(2) Bride avec orifices filetés

M12 - VENTILAZIONE

I motori sono raffreddati mediante ventilazione esterna (IC 411 secondo CEI EN 60034-6) e sono provvisti di ventola radiale in plastica, funzionante in entrambi i versi di rotazione.
L'installazione dovrà assicurare una distanza minima della calotta copriventola dalla parete più vicina, in modo da non creare impedimento alla circolazione dell'aria, oltre che permettere l'esecuzione della manutenzione ordinaria del motore e, se presente, del freno.
Su richiesta, a partire dalla grandezza BN 71, i motori possono essere forniti con ventilazione forzata ad alimentazione indipendente. Il raffreddamento è realizzato per mezzo di un ventilatore assiale con alimentazione indipendente, montato sulla calotta copriventola (metodo di raffreddamento IC 416).

M12 - VENTILATION

Motors are cooled by external ventilation systems (IC 411 in accordance with CEI EN 60034-6) and are equipped with a plastic radial fan running in both directions of rotation.
Installation must take into account a minimum distance of the fan cover from the nearest wall so as to ensure unobstructed air circulation. This also facilitates routine maintenance operations for motor and brake (if fitted).
At request, motor frame sizes BN 71 and larger may be equipped with forced ventilation with independent power supply. Motor is cooled by an axial ventilator mounted on the fan cover using an independent power supply (cooling method IC 416).

M12 - KÜHLUNG

Die Motoren werden mittels Eigenbelüftung gekühlt (IC 411 gemäß CEI EN 60034-6) und sind mit einem Radiallüfterrad aus Kunststoff ausgestattet, das in beide Richtungen drehen kann. Bei der Montage des Motors muss darauf geachtet werden, das zwischen Lüfterhaube und dem nächsten Bauteil eine Mindestabstand einzuhalten, damit die Luftzirkulation nicht beeinträchtigt werden kann. Dieser Abstand ist ebenso für die regelmäßige Instandhaltung des Motors und, falls vorhanden, der Bremse erforderlich. Ab der Baugröße BN 71 können die Motoren auf Anfrage mit einem unabhängig gespeisten Fremdlüfter geliefert werden. Die Kühlung erfolgt hier durch einen Axialventilator, der an Stelle der Standardlüfterhaube (Kühlmethode IC 416) montiert wird.

M12 - VENTILATION

Les moteurs sont refroidis par ventilation externe (IC 411 selon CEI EN 60034-6) et sont équipés de ventilateur radial en plastique fonctionnant dans les deux sens de rotation.
L'installation doit garantir une distance minimum du capot cache-ventilateur par rapport au mur le plus proche de façon à ne pas créer d'empêchement à la circulation de l'air ainsi que pour permettre les interventions d'entretien ordinaire du moteur et, si présent, du frein. Sur demande, à partir de la taille BN 71, les moteurs peuvent être fournis avec ventilation forcée à alimentation indépendante. Le refroidissement est réalisé au moyen d'un ventilateur axial avec alimentation indépendante monté sur le capot cache-ventilateur (méthode de refroidissement IC 416).

Questa esecuzione è utilizzata in caso di alimentazione del motore tramite inverter allo scopo di estendere il campo di funzionamento a coppia costante anche a bassa velocità, o quando per lo stesso sono richieste elevate frequenze di avviamento.
Da questa opzione sono esclusi i motori autofrenanti tipo BN_BA e motori con doppia sporgenza d'albero (opzione PS).

This design is adopted on inverter-controlled motors in order to extend torque-control operating range to include low speeds, or when the motor is to perform a large number of starts per hour.
This option is not compatible with brake motors type BN_BA and motors with double-extended shaft (option PS).

Diese Ausführung sollte eingestzt werden, falls der Motor über einen Frequenzumrichterbetrieben wird, so dass der Motor bei konstantem Drehmoment auch bei niedrige Drehzahlen oder bei hohen Anlauffrequenzen. eingesetzt werden kann.
Von dieser Option ausgeschlossen sind die Bremsmotoren BN_BA und Motoren mit zweitem Wellenende (Option PS).

Cette exécution est utilisée en cas d'alimentation du moteur par variateur dans le but d'étendre aussi la plage de fonctionnement à couple constant aux faibles vitesses ou lorsque des fréquences de démarrage élevées sont nécessaire à celui-ci.
Les moteurs frein type BN_BA et les moteurs avec arbre sortant des deux côtés (option PS) sont exclus de cette option.

Tabella dati di alimentazione elettrica

Power supply chart

Tabelle – Daten der Stromversorgung

Tableau caractéristiques de l'alimentation électrique

(21)

BN U1	**V a.c.** ± 10%	**Hz**	**P** [W]	**I** [A]
BN 71	1 ~ 230	50 / 60	22	0.14
BN 80			22	0.14
BN 90			40	0.25
BN 100			50	0.25
BN 112	3 ~ 230Δ / 400Y		50	0.26 / 0.15
BN 132 ... BN 160MR			110	0.38 / 0.22
BN 160M ... BN 180M		50	180	1.25 / 0.72
BN 180L ... BN 200L			250	1.51 / 0.87

(22)

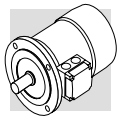
BN U2	**V a.c.** ± 10%	**Hz**	**P** [W]	**I** [A]
BN 71	1 ~ 230	50 / 60	22	0.14
BN 80			22	0.14
BN 90			40	0.25
BN 100	3 ~ 230Δ / 400Y		40	0.24 / 0.14
BN 112			50	0.26 / 0.15
BN 132 ... BN 160MR			110	0.38 / 0.22

Per la variante sono disponibili due esecuzioni alternative, denominate **U1** e **U2**, aventi lo stesso ingombro in senso longitudinale. Per entrambe le esecuzioni, la maggiore lunghezza della calotta copriventola (Δ **L**) è riportata nella tabella che segue. Dimensioni complessive ricavabili dalle tavole dimensionali dei motori.

*Variant is available in two alternative executions named **U1** and **U2**, featuring the same overall length. The largest length of fan cover (Δ **L**) for each configuration is reported in the following table. For overall dimensions, please see the dimension tables of motors.*

Für diese Optionsind als Alternative zwei Ausführungen verfügbar: **U1** und **U2** mit dem gleichen Längsmaßen. Für beide Ausführungen wird die Verlängerung der Lüfterhaube (Δ **L**) in der nachstehenden Tabelle wiedergegeben. Die Gesamtmaße der Motoren können den Tabellen mit den Motormaßen entnommen werden.

*Pour la variante sont disponibles deux exécutions alternatives, dénommées **U1** et **U2**, ayant le même encombrement dans le sens longitudinal. Pour les deux exécutions, la majoration de la longueur du capot cache-ventilateur (Δ **L**) est indiquée dans le tableau suivant. Dimensions totales à calculer d'après les planches de dimensions des moteurs.*



Lunghezza aggiuntiva per motori con ventilazione indipendente

Extra length for motors with independent cooling

Zusätzliche Länge für Motoren mit unabhängiger Luftkühlung

Majoration longueur pour moteurs avec ventilation forcée à alimentation indèpendante

(23)

	ΔL_1 [mm]	ΔL_2 [mm]
BN 71	93	32
BN 80	127	55
BN 90	131	48
BN 100	119	28
BN 112	130	31
BN 132 ... BN 160MR	161	51
BN 160M ... BN 180M	184	184
BN 180L ... BN 200L	184	184

Δ L_1 = variazione dimensionale rispetto alla lunghezza LB del motore standard corrispondente.

Δ L_2 = variazione dimensionale rispetto alla lunghezza LB del motore autofrenante corrispondente.

Δ L_1 = dimension variation compared to length LB of the corresponding standard motor.

Δ L_2 = dimension variation compared to length LB of the corresponding brake motor.

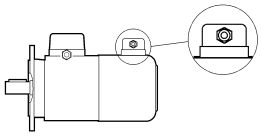
Δ L_1 = = Maßänderung gegenüber Maß LB des entsprechenden Standardmotors.

Δ L_2 = Maßänderung gegenüber Maß LB des entsprechenden Bremsmotors.

Δ L_1 = variation de dimension par rapport à la cote LB du moteur standard correspondant.

Δ L_2 = variation de dimension par rapport à la cote LB du moteur frein correspondant.

U1



Terminali di alimentazione del ventilatore in scatola morsetti separata. Nei motori autofrenanti grandezza BN 71...BN 160MR, con variante **U1**, la leva di sblocco non è collocabile nella posizione AA (vedi par. M24.1).

L'opzione non è disponibile per i motori conformi alle norme CSA e UL (opzione CUS).

Terminals of the independent fan motor are housed in a separate terminal box. The hand release cannot be located in the AA position for brake motors size BN71...BN160MR that feature the U1 type forced cooling, as described at section M24.1.

The option is not applicable to motors compliant with the CSA and UL norms (option CUS).

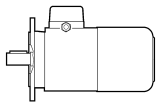
Versorgungsanschlüsse des Ventilators im Zusatzklemmenkasten. Bei den Bremsmotoren in der Baugröße BN 71...BN 160MR, mit Variante **U1** kann der Bremslüfthebel nicht in der Position AA (siehe Par. M24.1) angeordnet werden.

Die Option ist nicht anwendbar für die Motoren entsprechend den Normen CSA und UL (Option CUS).

*Bornes d'alimentation du ventilateur dans une boîte à bornes séparée. Pour les moteurs frein taille BN 71...BN 160MR, avec variante **U1**, le levier de déblocage ne peut être installé en position AA (voir par. M24.1).*

L'option n'est pas disponible pour les moteurs conformes aux normes CSA et UL (option CUS)

U2



Terminali di alimentazione del ventilatore nella scatola morsettiera principale del motore.

L'opzione U2 non è applicabile ai motori BN160M...BN200L e ai motori con l'opzione CUS (conformi alle norme CSA e UL).

Terminals of the fan motor are located in the main terminal box.

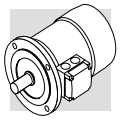
The U2 option is not applicable to motors BN160M... BN200L and to motors with option CUS (compliant to norms CSA and UL).

Versorgungsanschlüsse des Ventilators im Hauptklemmenkasten des Motors.

Die Option U2 ist nicht anwendbar bei den Motoren BN160M...BN200L und bei den Motoren mit der CUS-Option (entsprechend den Normen CSA und UL).

Bornes d'alimentation du ventilateur dans la boîte à bornes principale du moteur.

L'option U2 n'est pas applicable aux moteurs BN160M... BN200L et aux moteurs avec l'option CUS (conforme aux normes CSA et UL).



M13 - DESIGNAZIONE MOTORE | ***M13 - MOTOR DESIGNATION*** | **M13 - MOTORBEZEICHNUNG** | ***M13 - DESIGNATION MOTEUR***

MOTORE / *MOTOR*
MOTOR / *MOTEUR*

FRENO / *BRAKE*
BREMSE / *FREIN*

BN 63B 4 230/400-50 IP55 CLF **B5** **FD** 3.5 R NB 220SA ...

OPZIONI
OPTIONS
OPTIONEN
OPTIONS
311

ALIMENTAZIONE FRENO
BRAKE SUPPLY
BREMSVERSORGUNG
ALIMENTATION FREIN
324

TIPO RADDRIZZATORE AC/DC
RECTIFIER TYPE
GLEICHRICHTERTYP
TYPE ALIMENTATEUR
329

LEVA DI SBLOCCO FRENO
BRAKE HAND RELEASE
BREMSENTHANDLÜFTUNG
LEVIER DE DEBLOCAGE FREIN
322

COPPIA FRENANTE/ *BRAKE TORQUE*
BREMSMOMENT / *COUPLE FREIN*
331 335 339

TIPO FRENO / *BRAKE TYPE* / BREMSENTYP / *TYPE DE FREIN*
327 333 337

FORMA COSTRUTTIVA / *MOTOR EXECUTION*
BAUFORM / FORME DE CONSTRUCTION
306

CLASSE ISOLAMENTO / *INSULATION CLASS*
ISOLIERUNGSKLASSE / *CLASSE ISOLATION*
314

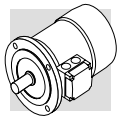
GRADO DI PROTEZIONE / *DEGREE OF PROTECTION*
SCHUTZART / *DEGRE DE PROTECTION*
312

TENSIONE-FREQUENZA / *VOLTAGE-FREQUENCY*
SPANNUNG-FREQUENZ / *TENSION-FREQUENCE*
295

NUMERO DI POLI / *NUMBER OF POLES* / POLZAHL / *N.bre POLES*
2, 4, 6, 8, 2/4, 2/6, 2/8, 2/12, 4/6, 4/8
341

GRANDEZZA MOTORE / *MOTOR SIZE* / MOTOR-BAUGROSSE / *TAILLE MOTEUR*
56 - 200L
341

BN



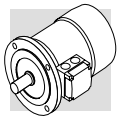
M14 - VARIANTI E OPZIONI ***M14 - VARIANTS AND OPTIONS*** **M14 - OPTIONEN** ***M14 - VARIANTES ET OPTIONS***

VARIANTI ***VARIANTS*** **OPTIONEN** ***VARIANTES***

Descrizione *Description* Beschreibung *Description*		Default *Default* Standard *Par défaut*	Opzione *Option* Option *Option*		
Tensione-frequenza *Voltage-frequency* Spannung-Frequenz *Tension-fréquence*		230/400-50			295
Grado di protezione *Protection class* Schutzart *Degré de protection*	**BN**	IP 55	IP 56		312
	BN_FD **BN_FA**	IP 54	IP 55		
	BN_BA	IP 55	-		
Classe di isolamento *Insulation class* Isolierstoffklasse *Classe d'isolation*		CL F	CLH		314
Forma costruttiva *Design version* Bauform *Forme de construction*		**B5**	**B14**	**B3**	306

OPZIONI ***OPTIONS*** **OPTIONEN** ***OPTIONS***

Descrizione / *Description* Beschreibung / *Description*	Valori / *Catalogue numbers* Werte / *Valeurs*			
Protezioni termiche *Thermal protective devices* Thermische Wicklungsschutz *Protections thermiques*	**D3**	**E3**		315
Potenza normalizzata a 50 Hz *50 Hz normalized power* Auf 50 Hz genormte Leistung *Puissance normalisée à 50 Hz*	**PN**			299
Dispositivi di retroazione *Feedback devices* Signalrückführungen (Drehgeber) *Dispositifs de rétroaction*	**EN1**	**EN2**	**EN3**	317
Riscaldatori anticondensa *Anti-condensate heaters* Wicklungsheizung *Réchauffeurs anticondensation*	**H1**			318
Tropicalizzazione avvolgimenti *Tropicalized windings* Tropenschutz der Motorwicklungen *Tropicalisation bobinages*	**TP**			318
Doppia estremità d'albero *Double-extended shaft* Zweites Wellenende *Arbre à double extrémité*	**PS**			318
Equilibratura rotore in grado R *Rotor balancing grade R* Rotorauswuchtung mit Grad R *Equilibrage rotor en degré R*	**RV**			319
Protezioni meccaniche esterne *External mechanical protections* Schutzdächer *Protections mécaniques extérieures*	**RC**	**TC**		320
Ventilazione forzata *Forced ventilation* Fremdlüfter *Ventilation forcée*	**U1**	**U2**		309
Esecuzione certificata *Certification* Zertifizierte Ausführung *Exécution certifiée*	**CUS**			300



OPZIONI COLLEGATE AL FRENO | ***BRAKE-RELATED OPTIONS*** | **BREMSEOPTIONEN** | ***OPTIONS CONCERNANT LE FREIN***

Descrizione *Description* Beschreibung / *Description*	Valori / *Catalogue numbers* *Werte / Valeurs*				Pagina
Coppia frenante *Brake torque* Bremsmoment *Couple de freinage*	Riferirsi al particolare tipo di freno *Refer to brake type* Bezug auf den entsprechenden Bremstyp nehmen *Se référer au type de frein particulier*				331 335 339
Leva di sblocco manuale *Manual release lever* Manueller Bremslüfthebel *Clevier de déblocage manuel*	**R**	**RM**			322
Orientamento leva di sblocco *Release lever orientation* Orientierungdes Bremslösehebel *Orientation levier de déblocage*	**AB**	**AA**	**AC**	**AD**	
Alimentatore freno d.c. *DC brake rectifier* Stromversorgung der Bremse *Disp. d'alimentation c.c.*	**NB**	**NBR**	**SB**	**SBR**	329
Volano per avviamento *progressivo* *Soft-start flywheel* Schwungrad für Sanftanlauf *Volant pour démarrage progressif*	**F1**				326
Filtro capacitivo *Capacitive filter* Kapazitiver Filter *Filtre capacitif*	**CF**				326
Alimentazione freno separata (*) *Brake separate power supply (*)* Separate Bremsversorgung (*) *Alimentation frein séparée (*)*	**...SA**	**...SD**			324

(*) Completare con il valore di tensione.

(*) Specify voltage.

(*) Spannungswert eintragen.

(*) Compléter avec la valeur de tension.

Valori pre-impostati di default.

Default values.

Standardwerte bei Lieferung falls nicht anders spezifiziert.

Valeurs prédéfinies par défaut.

M15 - GRADO DI PROTEZIONE | ***M15 - DEGREE OF PROTECTION*** | **M15 - SCHUTZART** | ***M15 - DEGRE DE PROTECTION***

IP...

Nella loro esecuzione standard (non autofrenante) i motori tipo BN sono caratterizzati dal grado di protezione IP55, a richiesta è disponibile la protezione aumentata IP56.
I motori autofrenanti tipo BN_FD e BN_FA sono protetti in grado IP54 e, opzionalmente, in IP55.
La tabella sottostante riassume la disponibilità dei vari gradi di protezione.
Indipendentemente dal grado di protezione specificato, per installazione all'aperto i motori devono essere protetti dall' irraggiamento diretto e, nel caso di installazione con l'albero rivolto verso il basso, è necessario specificare ulteriormente il tettuccio di protezione contro l'ingresso di acqua e di corpi solidi (opzione **RC**).

Standard BN motors (where standard means other than brake motors) are manufactured in protection class IP55. A higher protection class IP56 is available at request. Brake motors type BN_FD and BN_FA are in protection class IP54 or IP55 (at request).
Brake motors BN_BA are only available in protection class IP55. The following table provides an overview of available protection classes.
*Regardless of the protection class specified on order, motors to be installed outdoors require protection against direct sunlight and in addition – when they are to be installed with the shaft pointing downwards – a rain canopy to keep out water and solid bodies (option **RC**).*

In der Standardausführung (ohne Bremse) werden die Motoren vom Typ BN in Schutzart IP55 ausgeliefert. Auf Anfrage können sie mit einer auf IP56 erhöhten Schutzart geliefert werden. Die Bremsmotoren vom Typ BN_FD und BN_FA verfügen über die Schutzart IP54 und können Optional in IP55 geliefert werden. Die Bremsmotoren vom Typ BN_BA sind nur in der Schutzart IP55 lieferbar. In der nachstehenden Tabelle werden die jeweiligs zur Verfügung stehenden Schutzarten zusammengefasst. Unabhängig von der spezifischen Schutzart müssen die im Freien installierten Motoren vor direkten Strahlungen geschützt werden. Im Fall einer senkrechten Montage, in der die Welle nach unten gerichtet ist, sollte darüber hinaus das Schutzdach bestellt werden, das vor dem Eindringen von Wasser und festen Fremdkörpern schützt (Option **RC**).

*Dans l'exécution standard (non frein), les moteurs type BN sont caractérisés par le degré de protection IP55. Sur demande, la protection majorée IP56 est aussi disponible. Les moteurs frein type BN_FD et BN_FA sont protégés en degré IP54 et, en option, en IP55. Les moteurs frein type BN_BA sont disponibles uniquement avec degré de protection IP55. Le tableau ci-dessous résume la disponibilité des différents degrés de protection. Indépendamment du degré de protection spécifié, en cas d'installation en plein air, les moteurs doivent être protégés des rayons directs du soleil et, en cas d'installation avec arbre dirigé vers le bas, il est nécessaire de spécifier ultérieurement le capot de protection contre la pénétration de l'eau et des corps solides (option **RC**).*

(24)

	IP 54	IP 55	IP 56
BN	⊖	standard	
BN_FD **BN_FA**	standard		⊖
BN_BA	⊖	standard	⊖

IP	5	5

0		Non protetto *Noi protected* Nicht geschützt *Non protégé*
1	Ø 50 mm	Protetto contro corpi solidi estranei di $\phi \geq 50$ mm *Protected against extraneous solid bodies having* f ≥ *50 mm* Geschützt gegen feste Fremdkörper mit f ≥ 50 mm *Protégé contre les corps solides étrangers de* f ≥ *50 mm*
2	Ø 12 mm	Protetto contro corpi solidi estranei di f ≥ 12.5 mm *Protected against extraneous solid bodies having* f ≥ *12.5 mm* Geschützt gegen feste Fremdkörper mit f ≥ 12,5 mm *Protégé contre les corps solides étrangers de* f ≥ *12.5 mm*
3	Ø 2.5 mm	Protetto contro corpi solidi estranei di f ≥ 2.5 mm *Protected against extraneous solid bodies having* f ≥ *2.5 mm* Geschützt gegen feste Fremdkörper mit f ≥ 2,5 mm *Protégé contre les corps solides étrangers de* f ≥ *2.5 mm*
4	Ø 1 mm	Protetto contro corpi solidi estranei di f ≥ 1.0 mm *Protected against extraneous solid bodies having* $\phi \geq$ *1.0 mm* Geschützt gegen feste Fremdkörper mit f ≥1,0 mm *Protégé contre les corps solides étrangers de* f ≥ *1.0 mm*
5		Protetto contro la polvere *Protected against dust* Staubgeschützt *Protégé contre la poussière*
6		Nessun ingresso di polvere *No dust ingress* Kein Staubeintritt *Protection absolue contre la poussière*

0		Non protetto *Not protected* Nicht geschützt *Non protégé*
1		Protetto contro la caduta verticale di gocce d'acqua *Protected against vertical water drips* Geschützt gegen senkrecht einfallendes Tropfwasser *Protégé contre la chute verticale de gouttes d'eau*
2	15°	Protetto contro la caduta verticale di gocce d'acqua con un'inclinazione fino a 15° Protected against vertical water drips inclined up to 15° Geschützt gegen senkrecht einfallendes Tropfwasser bei Neigung bis 15° *Protégé contre la chute verticale de gouttes d'eau avec inclinaison jusqu'à 15°*
3	60°	Protetto contro la pioggia *Protected against rain* Regenwassergeschützt *Protégé contre la pluie*
4		Protetto contro gli spruzzi d'acqua da tutte le direzioni *Protected against water splashes* Spritzwassergeschützt *Protégé contre les éclaboussures d'eau*
5		Protetto contro i getti d'acqua *Protected against jets of water* Wasserstrahigeschützt *Protégé contre les jets d'eau*
6		Protetto contro getti d'acqua a pressione *Protected against powerful jets of water* Gegen starke Wasserstrahien geschützt *Protégé contre les jets d'eau puissants*
7	0.15 m 1 m	Protetto contro gli effetti dell'immersione temporanea *Protected against the effects of temporary immersion* Kurzzeitig wasserdicht *Protégé contre les effets de l'immersion temporaire*
8	...m	Protetto contro gli effetti dell'immersione continua *Protected against the effects of continuous immersion* Nachhaltig wasserdicht *Protégé contre les effets de l'immersion continue*

CLF

I motori di produzione Bonfiglioli impiegano, di serie, materiali isolanti (filo smaltato, isolanti, resine d'impregnazione) in classe **F**.

*Bonfiglioli motors use class **F** insulating materials (enamelled wire, insulators, impregnation resins) as compare to the standard motor.*

Die Motoren von Bonfiglioli sind serienmäßig mit Isolierstoffen (Emaildraht, Isolierstoffen, Imprägnierharzen) der Klasse **F** ausgestattet.

*De série, les moteurs fabriqués par Bonfiglioli utilisent des matériaux isolants (fil émaillé, isolants, résines d'imprégnation) en classe **F**.*

In genere, per i motori in esecuzione standard la sovratemperatura dell'avvolgimento statore è contenuta entro il limite di 80 K, corrispondente alla sovratemperatura di classe B.
L'accurata scelta dei componenti del sistema isolante consente l'impiego dei motori anche in climi tropicali ed in presenza di vibrazioni normali.

In standard motors, stator windings over temperature normally stays below the 80 K limit corresponding to class B over temperature.
A careful selection of insulating components makes the motors compatible with tropical climates and normal vibration.

Allgemein hält sich die Übertemperatur der Motoren in der Standardausführung innerhalb des Grenzwerts von 80 K, der einer Übertemperatur der Klasse B entspricht. Die sorgfältig Wahl der Komponenten des Isoliersystem gestatten den Einsatz dieser Motoren auch unter tropischen Klimabedingungen und bei Vorliegen normaler Schwingungen.

En général, pour les moteurs en exécution standard, l'échauffement de l'enroulement du stator se situe dans la limite de 80 K, correspondant à un échauffement de classe B.
Le choix soigné des composants du système d'isolation permet d'utiliser également les moteurs dans des climats tropicaux et en présence de vibrations normales.

Per applicazioni in presenza di sostanze chimiche aggressive o di elevata umidità, è consigliabile contattare il Servizio Tecnico Bonfiglioli per la selezione del prodotto più idoneo.

For applications involving the presence of aggressive chemicals or high humidity, contact Bonfiglioli Engineering for assistance with product selection.

Für den Einsatz in in der Nähe aggressiv wirkenden chemischen Substanzen oder bei hoher Luftfeuchtigkeit, wird empfohlen sich zur Wahl eines passendes Produktes mit unserem Technischen Kundendienst in Verbindung zu setzen.

Pour des applications en présence de substances chimiques agressives, ou d'humidité élevée, il est conseillé de contacter le Service Technique Bonfiglioli pour sélectionner le produit le plus adapté.

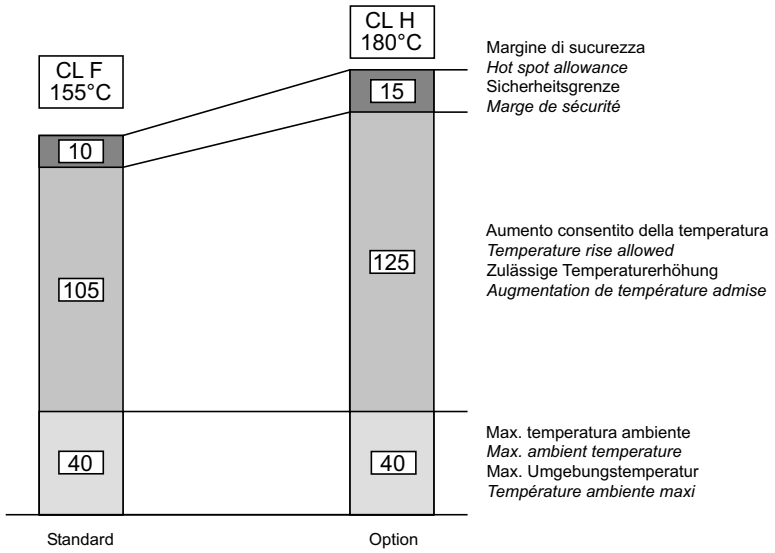
CLH

Su richiesta può venire specificata la classe di isolamento **H**.

*Motors manufactured in insulation class **H** are available at request.*

Auf Anfrage können sie auch in der Klasse **H** geliefert werden.

Sur demande, la classe d'isolation H peut être spécifiée.



M17- PROTEZIONI TERMICHE

Oltre alla protezione garantita dall'interruttore magnetotermico, i motori possono essere provvisti di sonde termiche incorporate per proteggere l'avvolgimento da eccessivo riscaldamento dovuto alla scarsa ventilazione o servizio intermittente. Una protezione aggiuntiva di questo tipo dovrebbe sempre essere specificata per i motori dotati di ventilazione separata. Le varianti a disposizione sono:

M17- THERMAL PROTECTIVE DEVICES

The standard thermal cut out fitted to motors may be supplemented by incorporating thermistors or thermostats to protect winding from overheating due to poor ventilation or intermittent duty.
Such additional protection is highly recommended for motors with separate ventilation. Available variants are as follows:

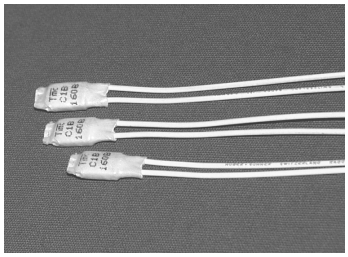
M17- THERMISCHE WICKLUNGSSCHUTZEINRICHTUNGEN

Abgesehen vom durch den Magnetwärmeschalter garantierten Schutz können die Motoren mit integrierten. Temperaturfühler ausgestattet werden, die die Wicklung vor Überhitzung aufgrund einer unzureichenden Lüftung oder eines Aussetzbetriebs sichern. Ein solcher zusätzlicher Schutz sollte bei Motoren mit Fremdlüftung immer verwendet werden. Die verfügbaren Optionen sind:

M17- PROTECTIONS THERMIQUES

Outre la protection garantie par le thermocontact moteur, les moteurs peuvent être équipés de sondes thermiques incorporées pour protéger le bobinage contre une surchauffe excessive due à une faible ventilation ou un service intermittent.
Ce type de protection supplémentaire devrait toujours être prévue pour les moteurs dotés de ventilation séparée. Les variantes à disposition sont les suivantes :

D3



n° 3 sonde bimetalliche negli avvolgimenti con temperatura 150 °C
3 Bi-metallic thermostats in the windings, 150 °C temperature
3 Bimetallfühler in den Wicklungen mit einer Ansprechtemperatur von 150 °C
n° 3 sondes bimétalliques dans les bobinages avec température de 150 °C

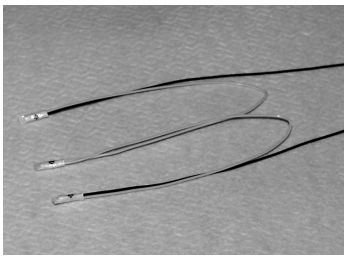
I protettori di questo tipo contengono all'interno di un involucro un disco bimetallico che, raggiunta la temperatura nominale di intervento (150 °C), commuta i contatti dalla posizione di riposo.
Con la diminuzione della temperatura, il disco e i contatti riprendono automaticamente la posizione di riposo.
Normalmente si impiegano tre sonde bimetalliche in serie con contatti normalmente chiusi e terminali disponibili in una morsettiera ausiliaria.

Bimetallic thermostats consist of a bimetallic disc mounted inside a casing. Upon reaching the preset operating temperature (150 °C), the disc operates the contacts causing them to disengage from the rest position.
As temperature decreases, disc and contacts return to the rest position.
Normally, three bimetallic thermostats connected in series with normally closed contacts and an auxiliary terminal board are used.

Diese Schutzeinrichtungen enthalten in einer Kaspel eine Bimetallscheibe, die bei Erreichen der Nennansprechtemperatur (150 °C) die Kontakte aus ihrer Ruhestellung heraus schaltet. Bei abnehmender Temperatur nehmen die Scheibe und die Kontakte automatisch wieder ihre Ruhestellung ein. Normalerweise werden diese drei Bimetallfühler bei normal geschlossenen Kontakten und auf einer Hilfsklemmenleiste verfügbaren Anschlüsse in Reihe geschaltet.

Les protecteurs de ce type contiennent, dans une enveloppe interne, un disque bimétallique qui, lorsque la température nominale d'intervention (150 °C) est atteinte, commute les contacts de la position de repos.
Avec la diminution de la température, le disque et les contacts reprennent automatiquement la position de repos.
Normalement, on utilise trois sondes bimétalliques en série avec contacts normalement fermés et extrémités disponibles dans une boîte à bornes auxiliaire.

E3



n° 3 termistori PTC negli avvolgimenti, con temperatura 150 °C
3 PTC thermistors in the windings, 150 °C temperature
3 PTC-Thermistoren in den Wicklungen mit einer Ansprechtemperatur 150 °C
3 thermistors PTC dans les bobinages, avec température de 150 °C

I termistori sono semiconduttori che presentano una rapida variazione di resistenza in prossimità della temperatura nominale d'intervento (150 °C). In genere sono impiegati termistori a coefficiente di temperatura positivo, anche conosciuti con la sigla PTC.

Thermistors are semiconductors that exhibit a rapid resistance change when approaching a preset switch temperature (150 °C). Normally, positive temperature coefficient (PTC) thermistors are used.

Bei diesen Thermistoren handelt es sich um Halbleiter, die eine schnelle Änderung des Widerstands kurz vor der Nennansprechtemperatur (150 °C) aufweisen. Im allgemeinen werden Thermistoren mit positivem Temperaturkoeffizienten verwendet, die auch unter der Bezeichnung PTC bekannt sind.

Les thermistors sont des semi-conducteurs qui présentent une variation rapide de résistance à proximité de la température nominale d'intervention (150 °C). En général, on utilise des thermistors à coefficient de température positif, connus aussi sous le sigle PTC.

Questi sensori presentano il vantaggio di avere ingombri ridotti, un tempo di risposta molto contenuto e la totale assenza di usura. A differenza delle sonde termiche bimetalliche i termistori non possono comandare direttamente i relais e devono pertanto essere collegati ad una particolare apparecchiatura di sgancio.
I terminali di 3 PTC collegati in serie, sono disponibili in una morsettiera ausiliaria.

These sensors offer such advantages as a compact, space-efficient design, very low response time and totally wear-free operation.
Unlike bi-metallic thermostats, thermistors do not operate the relays directly and need to be connected to a special release device for this purpose.
The terminals for three PTC thermistors connected in series are available in an auxiliary terminal board.

Diese Sensoren haben den Vorteil kleiner Abmessungen, einer stark eingehaltenen Ansprechzeit und weisen keinerlei Verschleißerscheinungen auf.
Im Unterschied zu Bimetall-Temperaturfühlern können diese Thermistoren die Relais nicht direkt schalten und müssen daher an ein spezielles Auslösegerät angeschlossen werden.
Die Anschlüsse der 3 in Reihe geschalteten PTC-Thermistoren sind an einer Zusatzklemmleiste verfügbar.

Ces capteurs présentent l'avantage d'être de dimensions réduites, leur temps de réponse est très limité et l'absence d'usure est totale.
A la différence des sondes thermiques bimétalliques, les thermistors ne peuvent pas commander directement les relais, par conséquent, ils doivent être branchés à un appareil de déclenchement particulier.
Les extrémités de 3 PTC reliés en série sont disponibles dans une boîte à bornes auxiliaire.

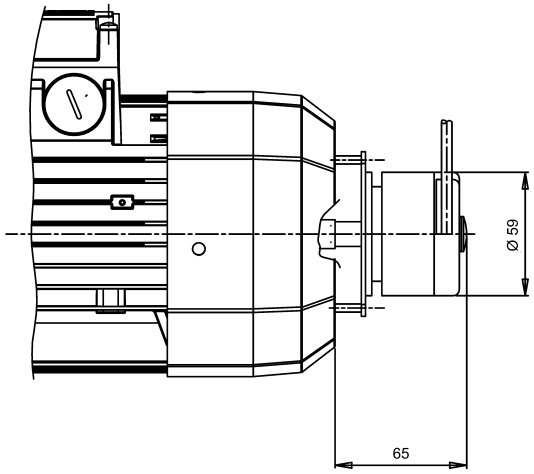
M18 - DISPOSITIVI DI RETROAZIONE

M18 - FEEDBACK UNITS

M18 - ENCODER / INKREMENTALGEBER

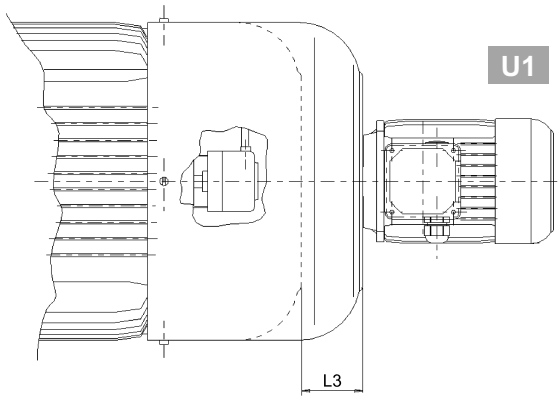
M18 - DISPOSITIFS DE RETROACTION

EN1, EN2, EN3



BN 63...BN 200L
BN 63_FD...BN 200L_FD
BN 63_FA...BN 200L_FA

EN_ + U1



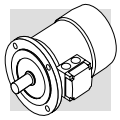
	L3
BN 160M...BN 180M	72
BN 180L...BN 200L	82
BN 160M_FD...BN 180M_FD	35
BN 180L_FD...BN 200L_FD	41

Se l'opzione EN_ è richiesta per motori di grandezza BN71...BN160MR, contemporaneamente all'opzione U1/U2, le variazioni dimensionali coincidono con quelle dell'opzione U1/U2.

If the encoder device (options EN1, EN2, EN3) is specified on motors BN71...BN160MR, along with the independent fan cooling (options U1, U2), the extra length of motor is coincident with that of the correspondent U1 and U2 execution.

Wenn der Encoder (Optionen EN1, EN2, EN3) für Motoren der Baugrößen BN71...BN160MR zusammen mit Fremdlüftung (Optionen U1, U2) ausgelegt ist, stimmen die Maßänderungen des Motors mit jenen der entsprechenden Ausführungen U1 und U2 überein.

Si un codeur (option EN1, EN2, EN3) est nécessaire sur les moteurs de tailles BN71…BN160MR, en association avec la ventilation forcée (options U1, U2), la variation de dimensions du moteur coïncide avec celle des exécutions U1 et U2 correspondantes.



EN1

Encoder incrementale, V_{IN}= 5 V, uscita line-driver RS 422.

Incremental encoder, V_{IN}= 5 V, line-driver output RS 422.

Inkremental-Encoder, V_{IN}= 5 V, Ausgang "line-driver" RS 422.

Codeur incrémental, V_{IN}= 5 V, sortie line-driver RS 422.

EN2

Encoder incrementale, V_{IN}=10-30 V, uscita line driver RS 422.

Incremental encoder, V_{IN}= 10-30 V, line-driver output RS 422.

Inkremental-Encoder, V_{IN}=10-30 V, Ausgang "line-driver" RS 422.

Codeur incrémental, V_{IN}=10-30 V, sortie line-driver RS 422.

EN3

Encoder incrementale, V_{IN}=12-30 V, uscita push-pull 12-30 V.

Incremental encoder, V_{IN}= 12-30 V, push-pull output 12-30 V.

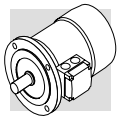
Inkremental-Encoder, V_{IN}=12-30 V, Ausgang "push-pull" 12-30 V.

Codeur incrémental, V_{IN}=12-30 V, sortie push-pull 12-30 V.

Tabella dati tecnici | ***Specifications*** | **Technische Daten** | ***Tableau des caractéristiques techniques***

(25)

		EN1	EN2	EN3
Interfaccia *Interface* Schnittstelle *Interface*		RS 422	RS 422	push-pull
Tensione alimentazione *Power supply voltage* Versorgungsspannung *Tension d'alimentation*	[V]	4...6	10...30	12...30
Tensione di uscita *Output voltage* Ausgangsspannung *Tension de sortie*	[V]	5	5	12...30
Corrente di esercizio senza carico *No-load operating current* Betriebsstrom ohne Belastung *Courant d'utilisation sans charge*	[mA]	120	100	100
N° impulsi per giro *No. of pulses per revolution* Impulse pro Drehung *Nobre d'impulsions par tour*		1024		
n° segnali *No. of signals* Signale *Nobre de signaux*		6 (A,B,C + Segnali invertiti / + *Inverted signals* Invertierte Signale / Signaux inversés)		
Max. frequenza di uscita *Max. output frequency* Max. Ausgangsfrequenz *Fréquence max. de sortie*	[kHz]	300	300	200
Max. velocità *Max. speed* Max. Drehzahl *Vitesse max.*	[min^{-1}]	6000 (9000 min^{-1} per 10 s) *6000 (9000 rpm for 10 s)* 6000 (9000 min^{-1} pour 10 s) *6000 (9000 min^{-1} für 10 Sek.)*		
Campo di temperatura *Temperature range* Temperaturbereich *Plage de température*	[°C]	-20 ... +70		
Grado di protezione *Protection class* Schutzgrad *Degré de protection*		IP 65		



M19 - RISCALDATORI ANTICONDENSA

I motori funzionanti in ambienti molto umidi e/o in presenza di forti escursioni termiche, possono essere equipaggiati con una resistenza anticondensa. L'alimentazione monofase è prevista da morsettiera ausiliaria posta nella scatola principale.

M19 - ANTI-CONDENSATION HEATERS

Where an application involves high humidity or extreme temperature fluctuation, motors may be equipped with an anti-condensate heater. A single-phase power supply is available in the auxiliary terminal board inside the main terminal box.

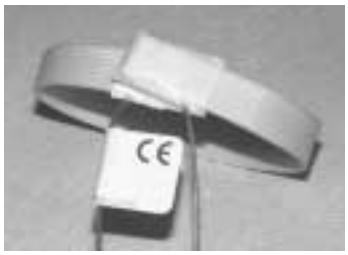
M19 - WICKLUNGSHEIZUNG

Die Motoren, die in besonders feuchten Umgebungen und/oder unter starken Temperaturschwankungen eingesetzt werden, können mit einem Heizelement als Kondenwasserschutz ausgestattet werden. Die einphasige Versorgung erfolgt über eine Zusatzklemmenleiste, die sich im Klemmenkasten befindet.

M19 - RECHAUFFEURS ANTICONDENSATION

Les moteurs fonctionnants dans des milieux très humides et/ou en présence de fortes plages thermiques peuvent être équipés d'une résistance anticondensation. L'alimentation monophasée est prévue par l'intermédiaire d'une boîte à bornes auxiliaire située dans la boîte principale.

H1



	H1 1~ 230V ± 10% **P [W]**
BN 56 … BN 80	10
BN 90 … BN 160MR	25
BN 160M … BN 180M	50
BN 180L … BN 200L	65

Durante il funzionamento del motore la resistenza anticondensa non deve mai essere alimentata.

Always remove power supply to the anti-condensate heater before operating the motor.

Während des Motorbetriebs darf die Wicklungsheizung nie gespeist werden.

Durant le fonctionnement du moteur, la résistance anticondensation ne doit jamais être alimentée.

M20 - TROPICALIZZAZIONE

TP

Su richiesta, mediante la specifica dell'opzione **TP**, gli avvolgimenti del motore ottengono una protezione aggiuntiva che li rende idonei al funzionamento in condizioni di elevata temperatura e umidità.

M20 - TROPICALIZATION

*When option **TP** is specified, motor windings receive additional protection for operation in high humidity and temperature conditions.*

M20 - TROPENSCHUTZ

Wird die Option **TP** bestellt, wird die Motorwicklung mit einem zusätzlichen Schutz ausgestattet, der ihren Einsatz unter hohen Temperaturen und starker Feuchtigkeit ermöglicht.

M20 - TROPICALISATION

*Sur demande, en spécifiant l'option **TP**, les bobinages du moteur obtiennent une protection supplémentaire qui les rend apte au fonctionnement dans des conditions de température et d'humidité élevées.*

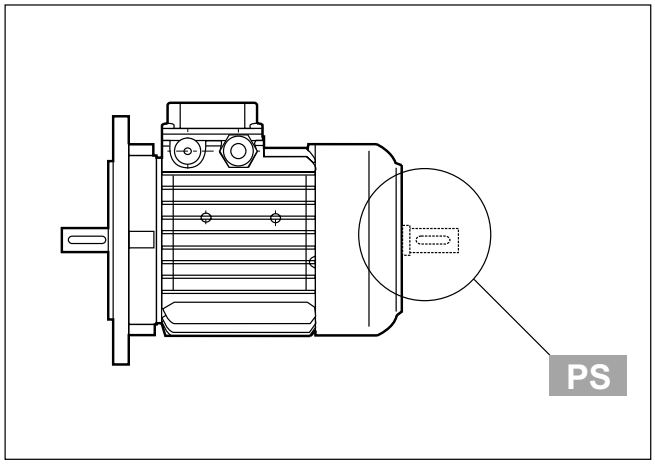
M21 - ESECUZIONI ALBERO

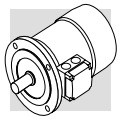
PS

M21 - ROTOR SHAFT CONFIGURATIONS

M21 - OPTIONEN DER ROTORWELLE

M21 - EXECUTIONS ARBRE ROTOR





Seconda estremità d'albero

L'opzione esclude le varianti RC, TC, U1, U2, EN1, EN2, EN3 – non applicabile ai motori con freno tipo BA.
Le dimensioni sono reperibili nelle tavole dimensionali dei motori.

Second shaft extension

This option is not compatible with variants RC, TC, U1, U2, EN1, EN2, EN3 – and is not feasible on motors equipped with BA brake.
For shaft dimensions please see motor dimensions tables.

Zweites Wellenende

Diese Option schließt die Optionen RC, TC, U1, U2, EN1, EN2, EN3 aus – sie kann nicht außerdem nicht an Motoren, die mit einer Bremse vom Typ BA ausgestattet sind, angebaut werden.
Die entsprechenden Maße können den Maßtabellen der Motoren entnommen werden.

Arbre à double extrémité

L'option exclut les variantes RC, TC, U1, U2, EN1, EN2, EN3 – non applicables aux moteurs avec frein type BA.
Les dimensions figurent sur les planches de dimensions des moteurs.

M22 - EQUILIBRATURA ROTORE

I motori sono equilibrati dinamicamente con mezza linguetta e rientrano nel grado di vibrazione **N**, secondo la Norma CEI EN 60034-14.

M22 - ROTOR BALANCING

*Motors are dynamically balanced with a half key and fall within vibration class **N** in accordance with standard CEI EN 60034-14.*

M22 - ROTORAUSWUCHTUNG

Die Motoren werden dynamisch durch das Einsetzen eines halben Federkeils ausgewuchtet und fallen der Norm CEI EN 60034-14 gemäß unter die Einstufung **N** des Schwingungsgrads.

M22 - *EQUILIBRAGE DU ROTOR*

*Les moteurs sont équilibrés du point de vue dynamique avec une demi-clavette et rentrent dans le degré de vibration **N**, selon la norme CEI EN 60034-14.*

RV

Per esigenze di particolare silenziosità è disponibile l'esecuzione opzionale **RV** che garantisce vibrazioni ridotte, secondo il grado **R**.
La tabella sottostante riporta i valori della velocità efficace di vibrazione per equilibratura normale (N) e in grado R.

*Where low noise is a priority requirement, the option **RV** ensures reduced vibration in accordance with vibration class **R**.*
The table below reports effective velocity of vibration for normal (N) and R grade balancing.

Sollte eine besondere Laufruhe gefordert werden, steht als Option **RV** eine Ausführung mit reduziertem Schwingverhalten nach Grad **R**, zur Verfügung.
Die folgende Tabelle gibt die Werte der effektive Schwingungen für das normale Auswuchten (N) und im Grad R an.

*En cas d'exigence particulière de faible niveau de bruit, l'exécution **RV** est disponible en option, elle garantit des vibrations réduites, de degré **R**.*
Le tableau ci-dessous indique les valeurs de la vitesse efficace de vibration pour un équilibrage normal (N) et en degré R.

(26)

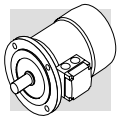
Grado di vibrazione *Vibration class* Schwingungsklasse *Degrée de vibration*	Velocità di rotazione *Synchronous speed* Drehungsgeschwindikeit *Viitesse de rotation* n [min^{-1}]	Limiti della velocità di vibrazione *Limits of the vibration velocity* Grenzen der Schwingungsgeschwindikeit *Limites de la vitesse de vibration* (mm/s)	
		$63 < H \leq 132$	**$132 < H \leq 200$**
N	600 < n < 3600	1.8	2.8
R	600 < n < 1800	0.71	1.12
	1800 < n < 3600	1.12	1.8

I valori si riferiscono a misure con motore liberatamente sospeso e funzionamento a vuoto; tolleranza ±10%.

Values are obtained from measurements on freely suspended motor during no-load operation; tolerance ± 10%.

Diese Werte beziehen sich auf einem frei hängenden und sich im Leerbetrieb befindlichen Motor; Toleranz ± 10%.

Les valeurs se réfèrent à des mesures avec moteur librement suspendu et fonctionnement à vide, tolérance ± 10%.



M23 - PROTEZIONI MECCANICHE ESTERNE

M23 - EXTERNAL MECHANICAL PROTECTIONS

M23 - MECHANISCHE SCHUTZVORRICHTUNGEN

M23 - PROTECTIONS MECANIQUES EXTERIEURES

RC

Il dispositivo parapioggia, che è raccomandato quando il motore è montato verticalmente con l'albero verso il basso, serve a proteggere il motore stesso dall'ingresso di corpi solidi e dallo stillicidio. Le dimensioni aggiuntive sono indicate nella tabella (27).
Il tettuccio esclude le varianti PS, EN1, EN2, EN3 e non è applicabile ai motori con freno tipo BA.

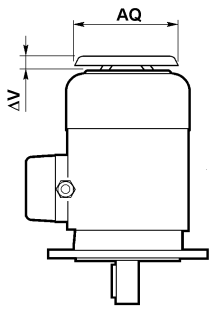
The rain canopy protects the motor from dripping and avoids the ingress of solid matter. It is recommended when motor is installed in a vertical position with the shaft pointing downwards.
Relevant dimensions are indicated in the table (27).
The rain canopy is not compatible with variants PS, EN1, EN2, EN3 and will not fit motors equipped with a BA brake.

Ein Regenschutzdach, dessen Montage empfohlen wird, wenn der Motor senkrecht mit einer nach unten gerichteten Welle montiert wird. Es dient dem Schutz des Motors vor dem Eindringen von festen Fremdkörpern und Tropfwasser. Die Dimensionen werden in der Tabelle (27) angegeben. Das Schutzdach schließt die Möglichkeit der Optionen PS, EN1, EN2, EN3 aus und kann bei Bremsmotoren vom Typ BN_BA nicht montiert werden.

Le capot de protection antipluie est recommandé lorsque le moteur est monté verticalement avec l'arbre vers le bas, il sert à protéger le moteur contre l'introduction de corps solides et le suintement. Les dimensions à ajouter sont indiquées dans le tableau (27).
Le capot antipluie exclue les variantes PS, EN1, EN2, EN3 et n'est pas applicable aux moteurs avec frein type BA.

(27)

	AQ	Δ V
BN 63	118	24
BN 71	134	27
BN 80	152	25
BN 90	168	30
BN 100	190	28
BN 112	211	32
BN 132 ... BN 160MR	254	32
BN 160M ... BN 180M	302	36
BN 180L ... BN 200L	340	36



TC

La variante del tettuccio tipo TC è da specificare quando il motore è installato in ambienti dell'industria tessile, dove sono presenti filamenti che potrebbero ostruire la griglia del copriventola, impedendo il regolare flusso dell'aria di raffreddamento.
L'opzione esclude le varianti EN1, EN2, EN3 e non è applicabile ai motori con freno tipo BA.

L'ingombro complessivo è lo stesso del tettuccio tipo RC.

Option TC is a rain canopy variant for textile industry environments, where lint may obstruct the fan grid and prevent a regular flow of cooling air.
This option is not compatible with variants EN1, EN2, EN3 and will not fit motors equipped with a BA brake.

Overall dimensions are the same as rain canopy type RC.

Bei dieser Option handelt es sich um ein Schutzdachs mit einem Textilnetz, dessen Einsatz empfohlen wird wenn der Motor in Bereichen der Textilindustrie installiert wird, in denen Stofffusseln das Lüfterradgitter verstopfen und so einen ausreichenden Kühlluftfluss verhindern könnten. Diese Option schließt die Möglichkeit der Optionen EN1, EN2, EN3 aus und kann bei Bremsemotoren vom Typ BN_BA nicht montiert werden.

Die Gesamtmaße entsprechen denen des Schutzdachs vom Typ RC.

La variante du capot type TC est à spécifier lorsque le moteur est installé dans des sites de l'industrie textile, où sont présents des filaments qui pourraient obstruer la grille du cache-ventilateur et empêcher le flux régulier de l'air de refroidissement. L'option exclue les variantes EN1, EN2, EN3 et n'est pas applicable aux moteurs avec frein type BA.

L'encombrement total est identique à celui du capot type RC.

M24 - MOTORI ASINCRONI AUTOFRENANTI

Funzionamento

L'esecuzione autofrenante prevede l'impiego di freni a pressione di molle alimentati in c.c. (tipo FD) o in c.a. (tipo FA, BA).
Tutti i freni funzionano secondo il principio di sicurezza, ossia intervengono in seguito alla pressione esercitata dalle molle, in mancanza di alimentazione.

M24 - ASYNCHRONOUS BRAKE MOTORS

Operation

Versions with incorporated brake use spring-applied DC (FD option) or AC (FA, BA options) brakes.
All brakes are designed to provide fail-safe operation, meaning that they are applied by spring-action in the event of power failure.

M24 - DREHSTROMBREMS-MOTOREN

Betriebsweise

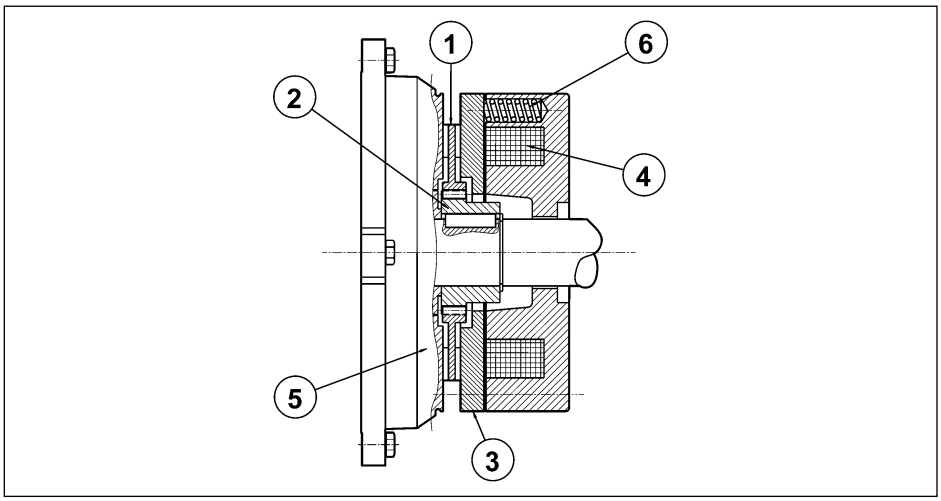
Die selbstbremsende Ausführung der Motoren sieht den Einsatz von Federdruckbremsen vor, die mit Gleichstrom (Typ FD) oder mit Wechselstrom (Typ FA, BA) gespeist werden. Alle Bremsen arbeiten gemäß dem Sicherheitsprinzip, d.h. sie greifen, im Fall eines Stromausfalls in Folge eines auf die Feder ausgeübten Drucks ein.

M24 - MOTEURS FREIN ASYNCHRONES

Fonctionnement

L'exécution avec frein prévoit l'utilisation de freins à pression de ressorts alimentés en c.c. (type FD) ou en c.a. (type FA, BA). Tous les freins fonctionnent selon le principe de sécurité, c'est-à-dire qu'ils interviennent suite à la pression exercée par les ressorts, en cas de coupure d'alimentation.

(28)



Legenda:
① disco
② mozzo
③ áncora mobile
④ bobina
⑤ scudo NDE motore
⑥ molle

Key:
① *brake disc*
② *disc carrier*
③ *pressure plate*
④ *brake coil*
⑤ *motor NDE shield*
⑥ *brake springs*

Zeichenerklärung:
① Brems scheibe
② Nabe
③ Bewgliher Anker
④ Ringspule
⑤ Motorschild
⑥ Schußfedern

Légende:
① *disque*
② *moyeu d'entraînement*
③ *disque de freinage*
④ *flasque-frein*
⑤ *flasque arrière*
⑥ *ressort de frein*

In mancanza di tensione, l'ancora mobile spinta dalle molle di pressione blocca il disco freno tra la superficie dell'ancora stessa e lo scudo motore impedendo la rotazione dell'albero. Quando la bobina viene eccitata, l'attrazione magnetica esercitata sull'ancora mobile vince la reazione elastica delle molle e libera il disco freno, e conseguentemente l'albero motore con esso solidale.

When voltage is interrupted, pressure springs push the armature plate against the brake disc. The disc becomes trapped between the armature plate and motor shield and stops the shaft from rotation. When the coil is energized, a magnetic field strong enough to overcome spring action attracts the armature plate, so that the brake disc – which is integral with the motor shaft – is released.

Wenn die Spannungsversorgung abfällt, sorgt der bewegliche, von den Druckfedern geschobene Anker für die Blockierung der Bremsscheibe zwischen der Ankerfläche und dem Motorschild und blockiert damit den Rotor Wird die Spule erregt, kommt es durch den magnetischen auf den beweglichen Anker wirkenden Anzug zur Überwindung der elastischen Federkraft und zum Lösen der Bremsscheibe, wodurch der rotor wieder freigegeben wird.

En cas de coupure de courant, l'armature mobile, poussée par les ressorts, bloque le disque de frein entre la surface de l'armature et le bouclier moteur en empêchant la rotation de l'arbre. Lorsque la bobine est excitée, l'attraction magnétique exercée sur l'armature mobile annule la réaction élastique des ressorts et libère le disque de frein, et par conséquent l'arbre moteur, qui est solidaire.

Caratteristiche generali:

- Coppie frenanti elevate (generalmente $M_b \cong 2\ M_n$) e regolabili
- Disco freno con anima in acciaio a doppia guarnizione d'attrito (materiale a bassa usura, senza amianto)
- Cava esagonale sull'albero motore, lato ventola (N.D.E.), per rotazione manuale (non prevista quando sono presenti le opzioni PS, RC, TC, U1, U2, EN1, EN2, EN3)
- Sblocco meccanico manuale (opzioni **R** e **RM** per BN_FD, BN_FA).
- Trattamento anticorrosivo di tutte la superfici del freno
- Isolamento in classe F

Most significant features:

- *High braking torques (normally $M_b \cong 2\ M_n$) braking torque adjustment*
- *Steel brake disc with double friction lining (low-wear, asbestos-free lining)*
- *Hexagonal seat on motor shaft fan end (N.D.E.) for manual rotation (not compatible with options PS, RC, TC, U1, U2, EN1, EN2, EN3)*
- *Manual release lever (options **R** and **RM** for BN_FD, BN_FA).*
- *Corrosion-proof treatment on all brake surfaces*
- *Insulation class F*

Allgemeine Eigenschaften:

- Hohe und regulierbare Bremsmomente (allgemein $M_b \cong 2\ M_n$).
- Bremsscheibe mit Stahlkern und doppeltem Bremsbelag (Material mit geringem Verschleiß, asbestfrei).
- Sechskant hinten an der Motorwelle, auf Lüfterradseite (N.D.E.), für eine manuelle Drehung des Rotors mit einem Inbusschlüssel. (nicht lieferbar, wenn die Optionen PS, RC, TC, U1, U2, EN1, EN2, EN3) bestellt wurden.
- Manuell zu betätigende, mechanische Bremslüftvorrichtung (Optionen **R** und **RM** für BN_FD, BN_FA).
- Korrionsschutzbehandlung an allen Flächen der Bremse.
- Isolierung in Klasse F.

Caractéristiques générales:

- *Couples de freinage élevés (généralement $M_b \cong 2\ M_n$) et réglables.*
- *Disque de frein avec structure en acier à double garniture de frottement (matière à faible usure, sans amiante).*
- *Empreinte hexagonale sur l'arbre moteur, côté ventilateur (N.D.E.), pour la rotation manuelle (non prévue en cas de présence des options PS, RC, TC, U1, U2, EN1, EN2, EN3).*
- *Déblocage mécanique manuel (options **R** et **RM** pour BN_FD, BN_FA).*
- *Traitement anticorrosion sur toute la surface du frein.*
- *Isolation en classe F.*

M24.1 - LEVA SBLOCCO FRENO

I freni a pressione di molle tipo **FD** e **FA** possono essere dotati opzionalmente di dispositivi per lo sblocco manuale del freno, normalmente utilizzati per condurre interventi di manutenzione sulle parti di macchina, o dell'impianto, comandate dal motore.

M24.1 - BRAKE RELEASE SYSTEMS

*Spring-applied brakes type **FD** and **FA** may be equipped with optional manual release devices. These are typically used for manually releasing the brake before servicing any machine or plant parts operated by the motor.*

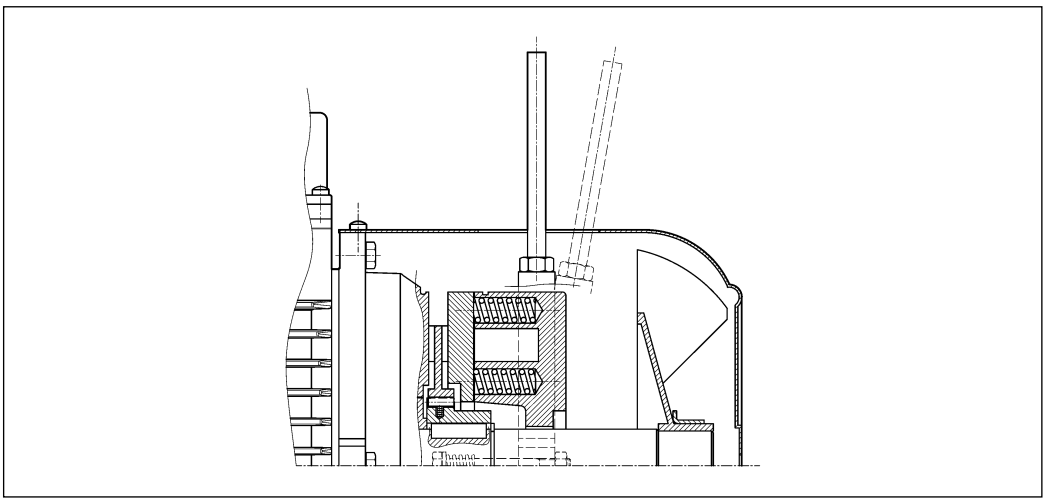
M24.1 - BREMSLÜFTHEBEL

Die Federdruckbremsen vom Typ **FD** und **FA** können Optional mit Bremslüfthebeln geliefert werden, die ein manuelles Lüften der Bremse ermöglichen. Diese Lüftungseinrichtungen können bei Instandhaltungsarbeiten an vom Motor betriebenen Maschinen- oder Anlagenteilen verwendet werden.

M24.1 - SYSTEMES DE DEBLOCAGE FREIN

*Les freins à pression de ressorts type **FD** et **FA** peuvent, en option, être dotés de dispositifs de déblocage manuel du frein, normalement utilisés pour effectuer des interventions d'entretien sur les composants de la machine, ou de l'installation commandée par le moteur.*

R

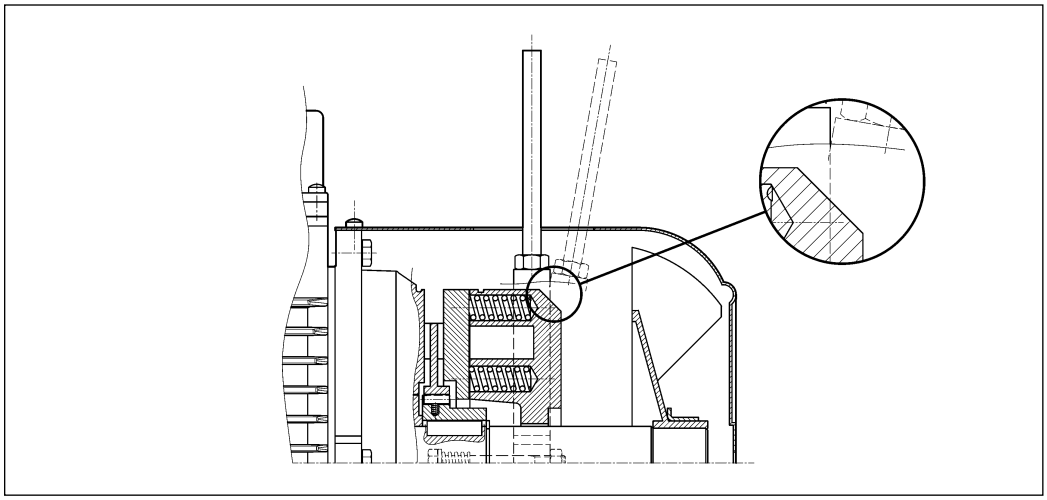


La leva di sblocco è dotata di ritorno automatico, tramite dispositivo a molla.

A return spring brings the release lever back in the original position.

Bremslüfthebel mit automatischer Rückstellung durch Federkraft.

Le levier de déblocage est doté de retour automatique, au moyen d'un dispositif à ressort.



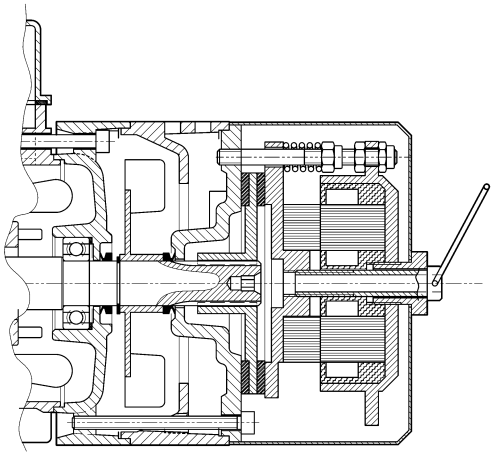
La leva di sblocco può essere temporaneamente bloccata in posizione di rilascio del freno, avvitando la stessa fino ad impegnarne l'estremità in un risalto del corpo del freno. La disponibilità dei sistemi di sblocco freno è diversa per i vari tipi di motore, ed è descritta dalla tabella seguente:

The release lever may be locked in the "release" position by tightening the lever until lever end becomes engaged with a brake housing projection. There are different brake release systems available for the various types of motors as indicated in the table below:

Der Bremslüfthebel kann zeitweise in der Bremslüftposition arretiert werden, indem man ihn so lange einschraubt, bis die Bremse arretiert ist. Für die unterschiedlichen Motortypen sind ebenso verschiedene Bremslüftsysteme verfügbar, die Sie der folgenden Tabelle entnehmen können:

Le levier de déblocage peut être temporairement bloqué en position de déblocage du frein en le vissant jusqu'à engager l'extrémité dans une saillie du corps du frein. La disponibilité des systèmes de déblocage du frein est différente en fonction des types de moteur et figure dans le tableau suivant :

(29)

	R	RM
BN_FD	63 ≤ H ≤ 200	**2p** 63A2 ≤ H ≤ 132M2 **4p** 63A4 ≤ H ≤ 132MA4 **6p** 63A6 ≤ H ≤ 132MA6
BN_FA	63 ≤ H ≤ 132	⊖
BN_BA	 di serie *std. supply* serienmäßig *de série*	

Orientamento della leva di sblocco

Per entrambe le opzioni **R** e **RM**, la leva di sblocco del freno viene collocata, se non diversamente specificato, con orientamento di 90° in senso orario, rispetto alla posizione della morsettiera - riferimento [AB] nel disegno sottostante.
Orientamenti alternativi, tipo [**AA**], [**AC**] e [**AD**] possono essere richiesti citandone la relativa specifica:

Release lever orientation

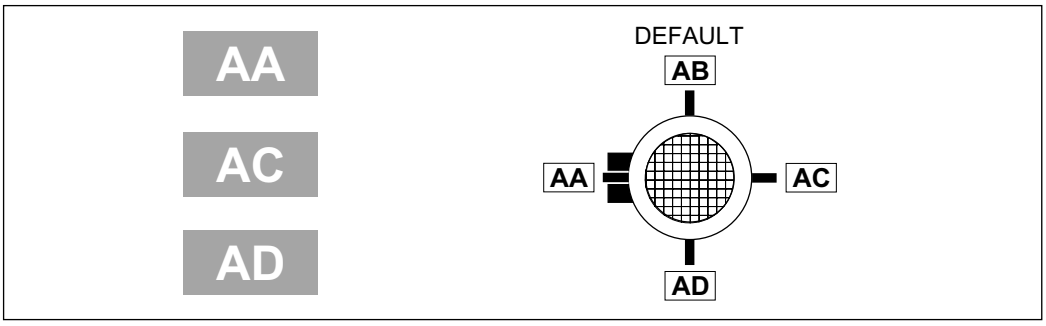
*Unless otherwise specified, the release lever is located 90° away from the terminal box – identified by letters [AB] in the diagram below – in a clockwise direction on both options **R** and **RM**.*
*Alternative lever positions [**AA**], [**AC**] and [**AD**] are also possible when the corresponding option is specified:*

Ausrichtung des Bremslüfthebels

Bei beiden Optionen, **R** und **RM**, wird der Bremslüfthebel, falls nicht anderweitig festgelegt, um 90° im Uhrzeigersinn zur Position des Klemmenkastens montiert (Position [AB] in der nachfolgenden Zeichnung).
Andere Positionen: **AA** (0° zum Klemmenkasten), **AC** (180° zum Klemmenkasten) oder **AD** (270° zum Klemmenkasten, im Uhrzeigersinn vom Lüfter aus gesehen) können unter Angabe der entsprechenden Spezifikation bestellt werden:

Orientation du levier de déblocage

*Pour les deux options **R** et **RM**, le levier de déblocage du frein est positionné, sauf spécification contraire, avec une orientation de 90° dans le sens des aiguilles d'une montre par rapport à la position de la boîte à bornes - référence [AB] sur le dessin ci-dessous.*
*Des orientations différentes, type [**AA**], [**AC**] et [**AD**] peuvent être demandées à condition de préciser la position correspondante :*



M24.2 - ALIMENTAZIONE SEPARATA DEL FRENO

M24.2 - SEPARATE BRAKE SUPPLY

M24.2 - BREMSE MIT SEPARATER SPANNUNGSVERSORGUNG

M24.2 - ALIMENTATION FREIN SEPAREE

...SA

La bobina del freno è alimentata da linea separata e indipendente dall'alimentazione del motore.
Il valore di tensione alla bobina deve essere specificato, es. 230SA.
L'opzione è applicabile ai motori con freno tipo FD, FA e BA.

The brake coil is directly fed through an independent line, separately from the motor.
In this case the rated voltage for the coil must be specified, e.g. 230SA.
The option is applicable to all motors with brake type FD, FA and BA.

Die Bremsspule wird, unabhaengig vom Motor, durch einen separaten Anschluss gespeist.
In diesem Fall muss Betriebsspannung fuer die spule spezifiziert werden, z.b. 230SA.
Die Option ist verfuegbar für alle Motoren mit Bremstyp FD, FA und BA.

La bobine du frein est alimentée par une ligne séparée et indépendante de l'alimentation du moteur.
La valeur de tension à la bobine doit être spécifiée, ex. 230SA.
L'option est applicable aux moteurs avec frein type FD, FA et BA.

...SD

La bobina del freno tipo FD è alimentata direttamente con corrente continua e l'alimentatore NON è fornito.
Il valore di tensione alla bobina deve essere specificato, es. 24SD.

The brake coil is directly fed with DC current and the rectifier is out of the scope for supply.
The rated voltage for the coil must be specified, e.g. 24SD.

Die Bremsspule wird direkt mit Gleichspannung gespeist. Der Gleichrichter ist nicht im Lieferimfang enthalten.
Die Betriebsspannung für die Spule muss spezifiziert werden, z.b. 24SD.

La bobine du frein type FD est alimentée directement avec courant continu et l'alimentateur n'est pas fourni.
La valeur de tension à la bobine doit être spécifiée, es. 24SD.

M24.3 - FREQUENZA MASSIMA D'AVVIAMENTO

Nelle tabelle dei dati tecnici, per ogni tipo di freno, è indicata la massima frequenza di inserzione a vuoto Z_0, con intermittenza I = 50%.
Questo valore definisce il nume-

M24.3 - MAXIMUM STARTS PER HOUR

For all types of Brakes the rating charts reports the maximum number of starts per hour under no-load conditions Z_o with cyclic duration factor I = 50 % .
This parameter gives the num-

M24.3 - MAX. SCHALTHÄUFIGKEIT

In den Tabellen, in denen die technischen Daten enthalten sind, wird für jeden Bremstyp die maximal Schalthäufigkeit im Leerbetrieb Z_o mit einer Einschaltdauer I = 50 % angege-

M24.3 - FREQUENCE MAXIMUM DE DEMARRAGE

Les tableaux des caractéristiques techniques indiquent, pour chaque type de frein, la fréquence maximum d'enclenchement à vide Z_o, avec intermittence I = 50 %. Cette valeur dé-

ro di avviamenti orari a vuoto che il motore può sopportare senza superare la temperatura ammessa dalla classe di isolamento F.
Nel caso pratico di motore accoppiato ad un carico esterno con potenza assorbita P_r, massa inerziale J_c e coppia resistente media durante l'avviamento M_L, il numero di avviamenti ammissibile si può calcolare con la seguente formula:

ber of starts per hour under no-load conditions a motor can withstand without exceeding the temperature limit permitted for insulation class F.
Assuming an application involving an overhung load applied to the motor with absorbed power P_r, inertial mass J_C and starting mean load torque M_L, the number of starts allowed is calculated by the following formula:

ben. Dieser Wert legt die Anzahl der Schaltungen im Leerbetrieb pro Stunde fest, denen der Motor standhalten kann, ohne dabei die von der Isolierstoffklasse F zulässige Temperatur zu überschreiten. Im praktischen Fall eines an eine externe Last gekoppelten Motors mit einer Leistungsaufnahme P_r, Trägheitsmasse J_C und einem durchschnittlichen Gegendrehmoment während des Anlaufs M_L, kann die Anzahl der zulässigen Schaltungen anhand der nachstehenden Formel berechnet werden:

finit le nombre de démarrages horaires à vide que le moteur peut supporter sans dépasser la température admise par la classe d'isolation F.
Dans le cas pratique d'un moteur accouplé à une charge extérieure avec puissance absorbée P_r, masse inertielle J_C et couple résistant moyen durant le démarrage M_L, il est possible de calculer le nombre de démarrages admissibles avec la formule suivante :

$$Z = \frac{Z_0 \cdot K_c \cdot K_d}{K_J}$$

dove:

$K_J = \frac{J_m + J_c}{J_m}$ = fattore di inerzia

$K_c = \frac{M_a - M_L}{M_a}$ = fattore di coppia

K_d = fattore di carico vedi tabella:

where

$K_J = \frac{J_m + J_c}{J_m}$ = *inertia factor*

$K_c = \frac{M_a - M_L}{M_a}$ = *torque factor*

K_d = load factor see table:

wobei gilt:

$K_J = \frac{J_m + J_c}{J_m}$ = Trägheitsfaktor

$K_c = \frac{M_a - M_L}{M_a}$ = Drehmomentsfaktor

K_d = Lastfaktor siehe Tabelle:

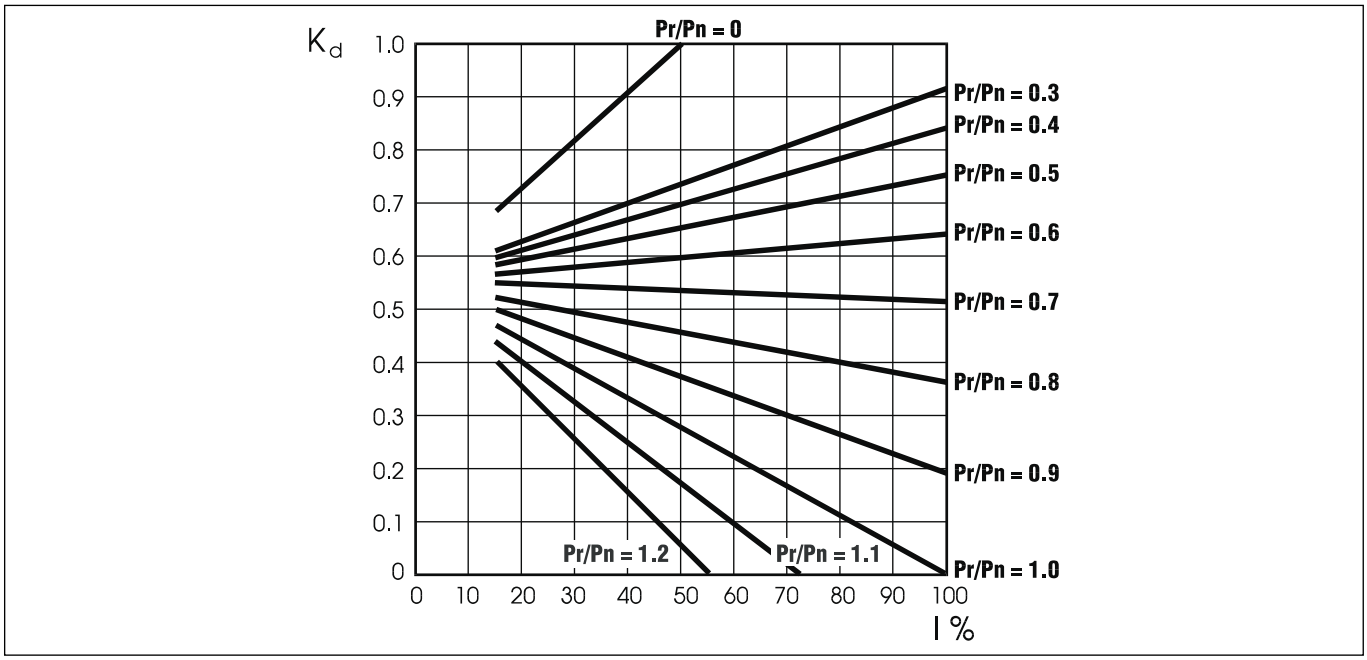
où

$K_J = \frac{J_m + J_c}{J_m}$ = *facteur d'inertie*

$K_c = \frac{M_a - M_L}{M_a}$ = *facteur de couple*

K_d = facteur de charge voir tableau

(30)



Con il numero di avviamenti così ottenuto si dovrà in seguito verificare che il massimo lavoro di frenatura sia compatibile con la capacità termica del freno W_{max}.

The resulting number of starts must be double-checked against maximum braking effort, which must be compatible with brake thermal capacity W_{max}.

Auf Grundlage der berechneten Anzahl der Schaltungen muss man prüfen, ob die maximale Bremsleistung mit der angegebenen thermischen Leistung der Bremse W_{max} übereinstimmt.

Avec le nombre de démarrages ainsi obtenu, il est ensuite nécessaire de vérifier que l'action maximum de freinage est compatible avec la capacité thermique du frein W_{max}.

M24.4 - AVVIAMENTO PROGRESSIVO

M24.4 - SOFT-START / STOP

M24.4 - SANFTANLAUF / STOP

M24.4 - DEMARRAGE/ARRET PROGRESSIF

F1

Per applicazioni che richiedono progressività nelle fasi di avvio e di arresto è disponibile un volano – opzione **F1** – la cui inerzia aggiuntiva assorbe energia cinetica durante l'avviamento e la restituisce in frenatura, rendendo i transitori più progressivi e graduali.
Il volano è disponibile per i motori autofrenanti del tipo BN_FD, con caratteristiche specifiche dettagliate nella tabella che segue:

*An optional flywheel – option **F1** – is available for applications requiring soft starting or stopping. The flywheel's added inertia uses up kinetic energy during starting and returns it back during braking, thus catering for more progressive and gradual shock loads.*
The optional flywheel is available for brake motors type BN_FD, with specific characteristics as detailed in the table below:

Für Anwendungen, bei denen einer sanfte Anlauf- und Stop erforderlich ist, steht als – Option **F1** – ein Schwungrad zur Verfügung, dessen zusätzliches Trägheitsmoment während der Anlaufphase kinetische Energie aufnimmt, die in der Abbremsphase wieder abgegeben wird. Dadurch erfolgen die Übergangsphasen progressiver und sanfter. Das Schwungrad ist für die Bremsmotoren vom Typ BN_FD in den nachstehend aufgeführten spezifischen Details verfügbar:

*Pour les applications nécessitant une progressivité au cours des phases de démarrage et d'arrêt, un volant – option **F1** – est disponible ; son inertie supplémentaire absorbe l'énergie cinétique durant le démarrage et la restitue au moment du freinage, rendant ainsi les phases transitoires plus progressives et graduelles: Le volant est disponible pour les moteurs frein du type BN_FD, ses caractéristiques spécifiques détaillées sont indiquées dans le tableau suivant :*

(31)

Volano per avviamento progressivo / *Flywheel for soft starting* / Schwungräder für Sanftanlauf *Volant pour demarrage/arret progressif*		
BN_FD	Peso del volano *Flywheel weight* Gewicht Schwungrad *Poids du volant* [Kg]	Inerzia volano *Flywheel inertia* Trägheitsmoment des Schwungrad *Inertie du volant* J_v [Kg m^2]
BN 63	0.69	0.00063
BN 71	1.13	0.00135
BN 80	1.67	0.00270
BN 90	2.51	0.00530
BN 100	3.48	0.00840
BN 112	4.82	0.01483
BN 132	6.19	0.02580

Per le esigenze di particolari applicazioni, ad es. traslazioni, che richiedano regolazioni micrometriche della coppia frenante è disponibile una serie di motori autofrenanti, denominata BN_FM, dettagliata nel catalogo cod. 1134 R1, sviluppato per le motorizzazioni dei carriponte. Consultare per questo il Servizio Tecnico Bonfiglioli.

For special applications that require a fine adjustment of braking torque, as is the case with track drives, a specific brake motor type BN_FM is available. This type of product has been developed for bridge crane drives and is described in detail in catalogue no. 1134 R1. Please contact Bonfiglioli Engineering for more details.

Für besondere Anwendungen, z.B. Transfers, die fein abgestufte Einstellungen des Bremsmoments erfordern, ist eine Reihe an Bremsmotoren verfügbar (BN_FM) und die detailliert im Katalog Art.-Nr. 1134 R1 beschrieben werden. Dieser Katalog ist für die Antriebe von Laufkränen entwickelt wurde. Wenden Sie sich diesbezüglich bitte an unseren Technischen Kundendienst.

En cas d'exigences d'applications particulières, par ex. translations, qui nécessitent des réglages micrométriques du couple de freinage, une série de moteurs frein est disponible, dénommée BN_FM, détaillée dans le catalogue réf. 1134 R1, conçue pour les motorisations des ponts roulants. Dans ce cas, consulter le Service Bonfiglioli.

M24.5 - FILTRO CAPACITIVO

M24.5 - CAPACITIVE FILTER

M24.5 - KAPAZITIVER FILTER

M24.5 - FILTRE CAPACITIF

CF

Per i soli motori autofrenanti in corrente continua, tipo BN_FD, è disponibile in opzione il filtro capacitivo. Se corredati dell'opportuno filtro capacitivo a monte del raddrizzatore (opzione CF) i motori rientrano nelimiti di emissione previsti dalla Norma EN 50081-1 "Compatibilità elettromagnetica - Norma Generica sull'emissione – Parte 1: Ambienti residenziali, commerciali e dell'industria leggera".

An optional capacitive filter is available for DC brake motors type BN_FD only.
When the suitable capacitive filter is installed upstream of the rectifier (option CF), motors comply with the emission limits required by standard EN 50081-1 "Electromagnetic Compatibility – Generic Emission Standard – Part 1: Residential, commercial and light industrial environment".

Nur bei den Bremsmotoren mit Gleichstrombremse vom Typ BN_FD, ist die Option eines kapazitiven Filters vorgesehen. Wird dieser Filter vor dem Gleichrichter (Option CF) installiert, fallen die Motoren in die von der Norm EN 50081-1 "Elektromagnetische Kompatibilität – Allgemeine Norm zur Emission – Teil 1: Wohngebiete, Handels- und Leichtindustriezonen " vorgesehenen Emissionsgrenzen.

Un filtre capacitif en option est disponible uniquement pour les moteurs frein en courant continu type BN_FD. S'ils sont équipés du filtre capacitif approprié en amont du redresseur (option CF), les moteurs rentrent dans les limites d'émission prévues par la Norme EN 50081-1 "Compatibilité électromagnétique - Norme Générique sur l'émission – Partie 1: Milieux résidentiels, commerciaux et de l'industrie légère".

M25 - MOTORI AUTOFRENANTI IN C.C.,TIPO BN_ FD

M25 - DC BRAKE MOTORS TYPE BN_ FD

M25 - WECHSELSTROMBREMS-MOTOREN MIT G.S.– BREMSE TYP BN_ FD

M25 - MOTEURS FREIN EN C.C.,TYPE BN_ FD

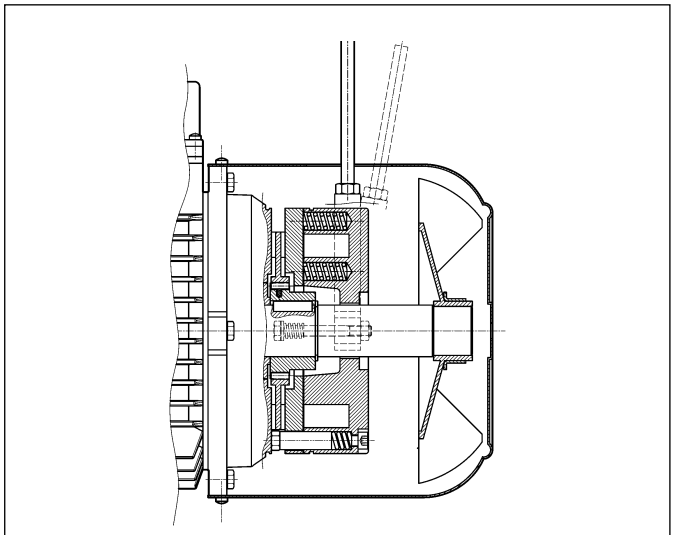
- Grandezze: BN 63 ... BN200L

***- Frame sizes**: BN 63 ... BN200L*

- Baugrößen: BN 63 ... BN 200L

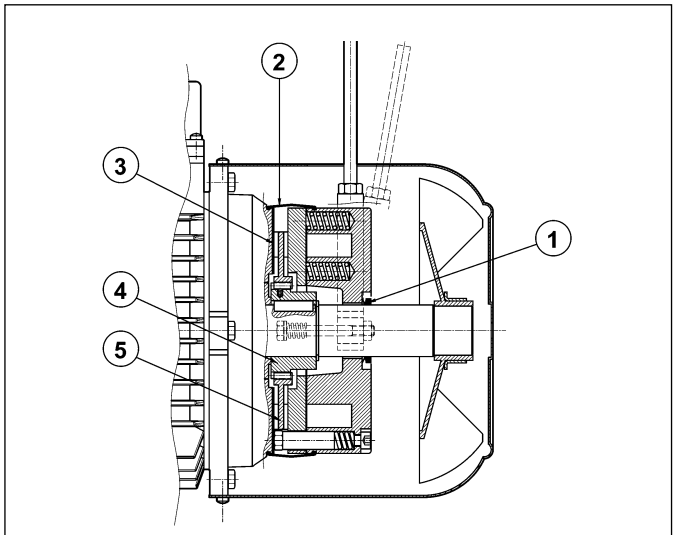
***- Tailles** : BN 63 ... BN200L*

(32)



IP 54

(33)



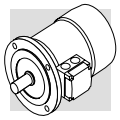
IP 55

Freno elettromagnetico con bobina toroidale in corrente continua fissato con viti allo scudo motore; le molle di precarico realizzano il posizionamento assiale del corpo magnete. Il disco freno è scorrevole sul mozzo trascinatore in acciaio calettato sull'albero e previsto di molla antivibrazione. I motori sono forniti con freno tarato in fabbrica al valore di coppia riportato nelle tabelle dati tecnici; la coppia frenante può essere regolata modificando il tipo e/o il numero delle molle. A richiesta, i motori possono essere previsti di leva per lo sblocco manuale con ritorno automatico (**R**) o con mantenimento della posizione di rilascio freno (**RM**); per la posizione angolare della leva di sblocco vedi descrizione della relativa variante alla pag. 322. Il freno FD garantisce elevate prestazioni dinamiche e bassa rumorosità; le caratteristiche d'intervento del freno in corrente continua possono essere ottimizzate in funzione dell'applicazione, utilizzando i vari tipi di alimentatore disponibili e/o realizzando l'opportuno cablaggio.

Direct current toroidal-coil electromagnetic brake bolted onto motor shield. Preloading springs provide axial positioning of magnet body.
Brake disc slides axially on steel hub shrunk onto motor shaft with anti-vibration spring.
Brake torque factory setting is indicated in the corresponding motor rating charts. Braking torque may be modified by changing the type and/or number of springs.
*At request, motors may be equipped with manual release lever with automatic return (**R**) or system for holding brake in the released position (**RM**).*
See variant at page 322 for available release lever locations.
FD brakes ensure excellent dynamic performance with low noise. DC brake operating characteristics may be optimized to meet application requirements by choosing from the various rectifier/power supply and wiring connection options available.

Elektromagnetische Bremse mit Ringwicklungsspule für Gleichstromspannung, die mittels Schrauben am hinteren Motorschild befestigt ist. Die Federn sorgen für die axiale Ausrichtung des Magnetkörpers. Die Bremsscheibe gleitet axial auf der Mitnehmernabe aus Stahl, die über eine Paßfeder mit der Motorwelle verbunden und mit einer Schwingungsdämpfung ausgestattet ist. Die Motoren werden vom Hersteller auf den in der Tabelle der technischen Daten angegebenen Bremsmoment eingestellt; das Bremsmoment kann durch das Ändern des Typs und/oder der Anzahl der Federn reguliert werden. Auf Anfrage können die Motoren mit einem Bremslüfthebel für die manuelle Lüftung der Bremse mit selbstständiger Rückstellung (**R**) ohne Arretierung oder mit arretierbarem Lüfterhebel (**RM**) geliefert werden. Die Fesstlegung der Position des Bremslüfthebel in Abhängigkeit von der Klemmkastenlage erfolgt durch die Option auf Seite 322.
Die Bremse vom Typ FD garantiert hohe dynamische Leistungen und niedrige Laufgeräusche. Die Ansprecheigenschaften der Bremse unter Gleichstrom können in Abhängigkeit zur jeweiligen Anwendung durch den Einsatz der verschiedenen verfügbaren Gleichrichter oder durch eine entsprechenden Anschluß der Bremse optimiert werden.

*Frein électromagnétique avec bobine toroïdale en courant continu, fixé avec des vis au bouclier moteur ; les ressorts de précharge réalisent le positionnement axial de la bobine. Le disque frein coulisse de façon axiale sur le moyeu d'entraînement en acier calé sur l'arbre et doté de ressort antivibration. Les moteurs sont fournis avec frein préréglé en usine à la valeur de couple indiquée dans les tableaux des caractéristiques techniques ; le couple de freinage peut être réglé en modifiant le type et/ou le nombre de ressorts. Sur demande, les moteurs peuvent être équipés de levier pour le déblocage manuel avec retour automatique (**R**) ou avec maintien de la position de déblocage frein (**RM**); pour la position angulaire du levier de déblocage, voir description de la variante correspondante à la page 322.*
Le frein FD garantit des performances dynamiques élevées et un faible niveau de bruit ; les caractéristiques d'intervention du frein en courant continu peuvent être optimisées en fonction de l'application en utilisant les différents types de dispositifs d'alimentation disponibles et/ou en réalisant un câblage approprié.



- Grado di protezione

L'esecuzione standard prevede il grado di protezione IP54.
In opzione il motore autofrenante tipo FD viene fornito con grado di protezione **IP 55**, prevedendo le seguenti varianti costruttive:

① anello V-ring posizionato sull'albero motore N.D.E.
② fascia di protezione in gomma
③ anello in acciaio inox interposto tra scudo motore e disco freno
④ mozzo trascinatore in acciaio inox
⑤ disco freno in acciaio inox

- Degree of protection

Standard protection is IP54.
*Brake motor FD is also available in protection **IP 55**, which mandates the following variants:*

① *V-ring at N.D.E. of motor shaft*
② *dust and water-proof rubber boot*
③ *stainless steel ring placed between motor shield and brake disc*
④ *stainless steel hub*
⑤ *stainless steel brake disc*

- Schutzart

Die Standardausführung ist Schutzart IP54 vor.
Optional kann der Bremsmotor vom Typ FD in der Schutzart **IP 55** geliefert werden, wobei sind folgende Komponenten eingesetzt werden:

① V-Ring an der Motorwelle N.D.E.
② Schutzring aus Gummi
③ Ring aus rostfreiem Stah zwischen Motorschild und Bremsscheibe
④ Mitnehmernabe aus rostfreiem Stahl
⑤ Bremsscheibe aus rostfreiem ahl

- Degré de protection

L'exécution standard prévoit le degré de protection IP54.
En option, le moteur frein type FD est fourni avec degré de protection IP 55, en prévoyant les variantes de construction suivantes :

① *bague V-ring positionnées sur l'arbre moteur N.D.E.*
② *bande de protection en caotchouc*
③ *bague en acier inox interposée entre le bouclier moteur et le disque de frein*
④ *moyeu d'entraînement en acier inox*
⑤ *disque frein en acier inox*

- Alimentazione freno FD

L'alimentazione della bobina freno in c.c. è prevista per mezzo di opportuno raddrizzatore montato all'interno della scatola coprimorsetti e già cablato alla bobina del freno.
Per motori a singola polarità è inoltre previsto di serie il collegamento del raddrizzatore alla morsettiera motore.
Indipendentemente dalla frequenza di rete, la tensione standard di alimentazione del raddrizzatore V_B ha il valore indicato nella tabella qui di seguito:

- FD brake power supply

A rectifier accommodated inside the terminal box feeds the DC brake coil. Wiring- connection across rectifier and brake coil is performed at the factory.
On all single-pole motors, rectifier is connected to the motor terminal board.
Rectifier standard power supply voltage V_B is as indicated in the following table, regardless of mains frequency:

- Spannungsversorgung der Bremse FD

Die Versorgung der Gleichstrombremsspule erfolgt über einen Gleichrichter im Klemmenkasten der bei Lieferung, wenn nicht anders bestellt, bereits mit der Bremsspule verkabelt ist.
Bei den einpoligen Motoren ist serienmäßig der Anschluss des Gleichrichters an die Motorsspannung vorgesehen. Unabhängig von der Netzfrequenz erfolgt die Versorgung des Gleichrichters V_B über die in der nachstehenden Tabelle angegebenen Standardspannung:

- Alimentation frein FD

L'alimentation de la bobine de frein en c.c. est prévue au moyen d'un redresseur approprié monté à l'intérieur de la boîte à bornes et déjà câblé à la bobine de frein.
De plus, pour les moteurs à simple polarité, le raccordement du redresseur au bornier moteur est prévu de série.
Indépendamment de la fréquence du réseau, la tension standard d'alimentation du redresseur V_B correspond à la valeur indiquée dans le tableau ci-dessous :

(34)

2, 4, 6 P				**1 speed**
	BN_FD V_{mot} ± 10% 3 ~	V_B ± 10% 1 ~	alimentazione freno da morsettiera *brake connected to terminal board power supply* Bremsversorgung über die Motorspannung *Alimentation frein depuis boîte à bornes*	alimentazione separata *separate power supply* Separate Versorgung *Alimentation séparée*
BN 63…BN 132	230/400 V – 50 Hz	230 V	standard	specificare **V_B SA** o **V_B SD** *specify **V_B SA** or **V_B SD*** **V_B SA** oder **V_B SD** angeben *spécifier **V_B SA** ou **V_B SD***
BN 160…BN 200	400/690 V – 50 Hz	400 V	standard	specificare **V_B SA** o **V_B SD** *specify **V_B SA** or **V_B SD*** **V_B SA** oder **V_B SD** angeben *spécifier **V_B SA** ou **V_B SD***

Per i motori a doppia polarità l'alimentazione standard del freno è da linea separata con tensione d'ingresso al raddrizzatore V_B come indicato in tabella:

Switch-pole motors feature a separate power supply line for the brake with rectifier input voltage V_B as indicated in the table:

Die polumschaltbaren Motoren müssen immer mit separater Bremsversorgungsspannung betrieben werden, deshalb erfolgt die Lieferung standardmäßig ohne Anschluß der Bremse an die Motorspannung, da diese mit einer am Eingang des Gleichrichters V_B anliegenden Spannung versorgt werden muß, entsprechend Werte in der nachstehenden Tabelle:

Pour les moteurs à double polarité, l'alimentation standard du frein dérive d'une ligne séparée avec tension d'entrée aredresseur V_B comme indiqué dans le tableau :

(35)

2/4, 2/6, 2/8, 2/12, 4/6, 4/8 P				**2 speed**
	BN_FD		alimentazione freno da morsettiera *brake powered via terminal board* Bremsversorgung über die Motorspannung *Alimentation frein depuis boîte à bornes*	alimentazione separata *separate power supply* Separate Versorging *Alimentation séparée*
	V_{mot} ± 10% 3 ~	V_B ± 10% 1 ~		
BN 63…BN 132	400 V – 50 Hz	230 V	⊖	specificare **V_B SA** o **V_B SD** *specify **V_B SA** or **V_B SD*** **V_B SA** oder **V_B SD** angeben *spécifier **V_B SA** ou **V_B SD***

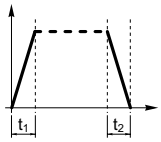
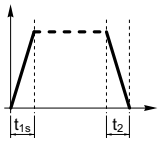
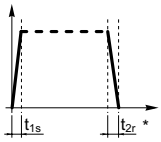
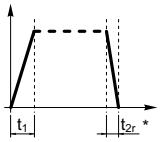
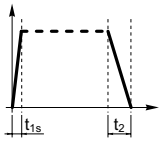
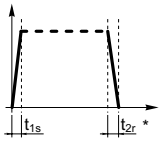
Il raddrizzatore è del tipo a diodi a semionda (Vc.c ≈ 0,45 x Vc.a.) ed è disponibile nelle versioni **NB**, **SB**, **NBR** e **SBR**, come dettagliato nella tabella seguente:

*The diode half-wave rectifier (VDC ≈ 0,45 x VAC) is available in versions **NB**, **SB**, **NBR** e **SBR**, as detailed in the table below:*

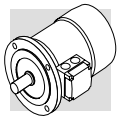
Bei dem Gleichrichter handelt es sich um einen Typ mit Halbwellendioden (Vc.c ≈ 0,45 Vc.a.). Er ist in den Versionen **NB**, **SB**, **NBR** und **SBR**, gemäß den Details in der nachstehenden Tabelle, verfügbar:

*Le redresseur est du type à diodes à demi-onde (Vc.c ≈ 0,45 x Vc.a.) et il est disponible dans les versions **NB**, **SB**, **NBR** et **SBR**, comme indiqué de façon détaillée dans le tableau suivant :*

(36)

	Freno *Brake* Bremse Ffrein	**Raddrizzatore / *Rectifier*** **Gleichrichter / *Redresseur***	
		standard	A richiesta / *At request* Auf Anfrage / *Sur demande*
BN 63	FD 02	**NB** 	**SB** 
BN 71	FD 03 FD 53		
BN 80	FD 04		**SBR** 
BN 90S	FD 14		
BN 90L	FD 05		**NBR** 
BN 100	FD 15		
BN 112	FD 06S	**SB** 	**SBR** 
BN 132 - 160MR	FD 56 FD 06 FD 07		
BN 160L - BN 180M	FD 08		
BN 180L - BN 200M	FD 09		

(*) $t_{2c} < t_{2r} < t_2$



I raddrizzatore **SB** a controllo elettronico dell'eccitazione, riduce i tempi di sblocco del freno sovreccitando l'elettromagnete nei primi istanti d'inserzione, per passare poi al normale funzionamento a semionda a distacco del freno avvenuto.

*Rectifier **SB** with electronic energizing control over-energizes the electromagnet upon power-up to cut brake release response time and then switches to normal half-wave operation once the brake has been released.*

Der Gleichrichter **SB** mit elektronischer Kontrolle der Erregung reduziert die Bremslösezeiten, indem er die Bremsspule in den ersten Momenten der Einschaltung übermäig erregt, um dann, nach erfolgter Bremslösung, in die normale Halbwellenfunktion umzuschalten.

*Le redresseur **SB** à contrôle électronique de l'excitation réduit les temps de déblocage du frein en surexcitant l'électro-aimant durant les premiers instants d'enclenchement pour passer ensuite au fonctionnement normal à demi-onde une fois le frein désactivé.*

L'impiego del raddrizzatore tipo **SB** è sempre da prevedere nei casi di:

- elevato numero di interventi orari
- tempi di sblocco freno ridotti
- elevate sollecitazioni termiche del freno.

*Use of the **SB** rectifier is mandatory in the event of:*

- *high number of operations per hour*
- *reduced brake release response time*
- *brake is exposed to extreme thermal stress.*

Der Einsatz eines Gleichrichters vom Typ **SB** wird in folgenden Fällen empfohlen:

- hohe Anzahl von Schaltungen pro Stunde
- schnelle Bremsansprechzeiten
- starke thermische Beanspruchungen der Bremse.

*L'utilisation du redresseur type **SB** doit toujours être prévue dans les cas suivants:*

- *nombre d'interventions horaires élevé*
- *temps de déblocage frein réduits*
- *sollicitations thermiques du frein élevées.*

Per applicazioni dove è richiesto un rapido rilascio del freno sono disponibili a richiesta i raddrizzatori **NBR** o **SBR**.
Questi raddrizzatori completano i tipi **NB** e **SB**, integrando nel circuito elettronico un interrutore statico che interviene diseccitando rapidamente il freno in caso di mancanza di tensione.
Questa soluzione consente di ridurre i tempi di rilascio del freno evitando ulteriori cablaggi e contatti esterni.
Per il migliore utilizzo dei raddrizzatori **NBR** e **SBR** è richiesta l'alimentazione separata del freno.
Tensioni disponibili: 230V ± 10%, 400V ± 10%, 50/60 Hz.

*Rectifiers **NBR** or **SBR** are available for applications requiring quick brake release response.*
*These rectifiers complement the **NB** and **SB** types as their electronic circuit incorporates a static switch that de-energizes the brake quickly in the event voltage is missing.*
This arrangement ensures short brake release response time with no need for additional external wiring and contacts.
*Optimum performance of rectifiers **NBR** and **SBR** is achieved with separate brake power supply.*
Available voltages: 230V ± 10%, 400V ± 10%, 50/60 Hz.

Für die Anwendungen, bei denen eine schnelle Ansprechzeit der Bremse gefordert wird, können auf Anfrage die Gleichrichter **NBR** oder **SBR** geliefert werden. Diese Gleichrichter erweitern die Funktion der Typen **NB** und **SB**, indem in dem elektronischen Schaltkreis ein statischen Schalter integriert ist, durch dessen Auslösen die Bremse im Fall eines Spannungsausfalls schnell abgeregt wird. Diese Lösung ermöglicht eine Verringerung der Ansprechzeiten der Bremse, wodurch weitere Schaltungen und externe Sensoren vermieden werden können. Im Hinblick auf einen besseren Einsatz der Gleichrichter **NBR** und **SBR** ist bei der Bremse eine separate Versorgung erforderlich. Verfügbare Spannungen: 230V ± 10%, 400V ± 10%, 50/60 Hz.

*Pour les applications nécessitant un déblocage rapide du frein, sur demande les redresseurs **NBR** ou **SBR** sont disponibles.*
*Ces redresseurs complètent les types **NB** et **SB**, en intégrant dans le circuit électronique un interrupteur statique qui intervient en désexcitant rapidement le frein en cas de coupure de tension.*
Cette solution permet de réduire les temps de déblocage du frein en évitant d'autres câblages et contacts extérieurs.
*Pour une meilleure utilisation des redresseurs **NBR** et **SBR** l'alimentation séparée du frein est nécessaire.*
Tensions disponibles : 230V ± 10%, 400V ± 10%, 50/60 Hz.

- Dati tecnici freni FD

Nella tabella sottostante sono riportati i dati tecnici dei freni in c.c. tipo FD.

- FD brake technical specifications

The table below reports the technical specifications of DC brakes FD.

- Technische Daten - Bremstyp FD

In der nachstehenden Tabelle werden die technischen Daten der Gleichstrombremsen vom Typ FD angegeben.

- Caractéristiques techniques freins FD

Le tableau suivant indique les caractéristiques techniques des freins en c.c. type FD.

(37)

Freno *Brake* Bremse *Frein*	Coppia frenante M_b *Brake torque M_b* Bremsmoment M_b *Couple de freinage M_b* [Nm] n° molle / *no. of springs* Feder / *ressorts*			Rilascio *Release* Ansprechzeit *Déblocage*		Frenatura *Braking* Bremszeit *Freinage*		Wmax per frenata *Wmax per brake operation* Wmax pro Bremsung *Wmax par freinage* [J]			W	P
	6	**4**	**2**	t_1 [ms]	t_{1s} [ms]	t_2 [ms]	t_{2c} [ms]	10 c/h	100 c/h	1000 c/h	[MJ]	[W]
FD 02	—	3.5	1.75	30	15	80	9	4500	1400	180	15	17
FD 03	5	3.5	1.75	50	20	100	12	7000	1900	230	25	24
FD 53	7.5	5	2.5	60	30	100	12					
FD 04	15	10	5	80	35	140	15	10000	3100	350	30	33
FD 14												
FD 05	40	26	13	150	65	170	20	18000	4500	500	50	45
FD 15	40	26	13	150	65	170	20					
FD 55	55	37	18	—	65	170	20					
FD 06S	60	40	20	—	80	220	25	20000	4800	550	70	55
FD 56	—	75	37	—	90	150	20	29000	7400	800	80	65
FD 06	—	100	50	—	100	150	20					
FD 07	150	100	50	—	120	200	25	40000	9300	1000	130	65
FD 08 *	250	200	170	—	140	350	30	60000	14000	1500	230	100
FD 09 **	400	300	200	—	200	450	40	70000	15000	1700	230	120

* valori di coppia frenante ottenuti con n° 9,7,6 molle rispettivamente

** valori di coppia frenante ottenuti con n° 12,9,6 molle rispettivamente

* *brake torque values obtained with 9, 7 and 6 springs, respectively*

** brake torque values obtained with 12, 9 and 6 springs, respectively

* Werte, der durch den Einsatz von jeweils 9, 7, 6 Federn erreichten Bremsmomente

** Werte, der durch den Einsatz von jeweils 12, 9, 6 Federn erreichten Bremsmomente

* *valeurs de couple de freinage obtenues respectivement avec n° 9, 7, 6 ressorts*

** *valeurs de couple de freinage obtenues respectivement avec n° 12, 9, 6 ressorts*

Legenda:

t_1 = tempo di rilascio del freno con alimentatore a semionda

t_{1s} = tempo di rilascio del freno con alimentatore con sovraeccitaz.

t_2 = ritardo di frenatura con interruzione lato c.a. e alimentazione separata

t_{2c} = ritardo di frenatura con interruzione lato c.a. e c.c. I valori di t_1, t_{1s}, t_2, t_{2c}, indicati nella tabella (37) sono riferiti al freno tarato alla coppia massima, traferro medio e tensione nominale.

W_{max} = energia max per frenata

W = energia di frenatura tra due regolazioni successive

P_b = potenza assorbita dal freno a 20°C

M_b = coppia frenante statica (± 15%)

c/h = avviamenti orari

Key:

t_1 = *brake release time with half-wave rectifier*

t_{1s} = *brake release time with over-energizing rectifier*

t_2 = *brake engagement time with AC line interruption and separate power supply*

t_{2c} = *brake engagement time with AC and DC line interruption – Values for t_1, t_{1s}, t_2, t_{2c} indicated in the tab. (37) are referred to brake set at maximum torque, medium air gap and rated voltage*

W_{max} = *max energy per brake operation*

W = *braking energy between two successive air gap adjustments*

P_b = brake power absorption at 20 °C

M_b = *static braking torque (± 15%)*

c/h = *starts per hour*

Legende:

t_1 = Ansprechzeit der Bremse mit Halbwellengleichrichter

t_{1s} = Ansprechzeit der Bremse mit elektronisch gesteuerten Erregungsgleichrichter

t_2 = Bremsverzögerung mit Unterbrechung auf Wechselstromseite und Fremdversorgung

t_{2c} = Bremsverzögerung mit Unterbrechung auf Wechselstrom- und Gleichstromseite – Die in der Tab. (37) angegebenen Werte t_1, t_{1s}, t_2, t_{2c}, beziehen sich auf eine auf das max. Bremsmoment geeichte Bremse, mit mittlerem Luftspalt und Nennspannung.

W_{max} = max. Energie pro Bremsung

W = Bremsenergie zwischen zwei Einstellungen des Luftspalts

P_b = bei 20° C von der Bremse aufgenommene Leistung (50 Hz)

M_b = statisches Bremsmoment (± 15%)

c/h = Schaltungen pro stunde

Légende:

t_1 = *temps de déblocage du frein avec dispositif d'alimentation à demi-onde*

t_{1s} = *temps de déblocage du frein avec dispositif d'alimentation à contrôle électronique de l'excitation*

t_2 = *retard de freinage avec interruption côté c.a. et alimentation séparée*

t_{2c} = *retard de freinage avec interruption côté c.c.Les valeurs de t_1, t_{1s}, t_2, t_{2c}, indiquées dans le tab. (37) se réfèrent au frein étalonné au couple maximal, entrefer moyen et tension nominale.*

W_{max} = *énergie max. par freinage*

W = *énergie de freinage entre deux réglages successifs de l'entrefer*

P_b = *puissance absorbée par le frein à 20 °C*

M_b = *couple de freinage statique (± 15%)*

c/h = *démarrages horaires*

- Collegamenti freno FD

I motori standard ad una velocità sono forniti con il collegamento del raddrizzatore alla morsettiera motore già realizzato in fabbrica.

Per motori a 2 velocità, e dove è richiesta l'alimentazione del freno separata, prevedere il collegamento al raddrizzatore in ac-

- FD brake connections

On standard single-pole motors, the rectifier is connected to the motor terminal board at the factory.

For switch-pole motors and where a separate brake power supply is required, connection to rectifier must comply with brake voltage V_B stated in mo-

- Anschlüsse - Bremstyp FD

Die einpoligen Motoren werden vom Werk ab mit an die Motorspannung angeschlossenem Gleichrichters geliefert. Für die polumschaltbaren Motoren, und Bremse mit separater Versorgung, wird in Übereinstimmung mit der auf dem Typenschild des Motors angegebenen Brems-

- Raccordements frein FD

Les moteurs standard à une vitesse sont fournis avec le raccordement du redresseur au bornier moteur déjà réalisé en usine.

Pour les moteurs à 2 vitesses, et lorsqu'une alimentation séparée du frein est requise, prévoir le raccordement au redresseur conformément à la tension

cordo alla tensione freno V_B indicata nella targhetta del motore.

Data la natura induttiva del carico, per il comando del freno e per l'interruzione lato corrente continua devono essere utilizzati contatti con categoria d'impiego AC-3 secondo IEC 60947-4-1.

tor name plate.

Because the load is of the inductive type, brake control and DC line interruption must use contacts from the usage class AC-3 to IEC 60947-4-1.

spannung V_B der Anschluss an den Gleichrichter vorgesehen.

Da es sich bei der Bremsleistung um eine induktive Kraft handelt, müssen gemäß IEC 60947-4-1 für die Steuerung der Bremse und die Unterbrechung der Gleichstromseite Kontakte der Kategorie AC-3 verwendet werden.

frein V_B indiquée sur la plaque signalétique du moteur.

Etant donné la nature inductive de la charge, pour la commande du frein et l'interruption côté courant continu, il est nécessaire d'utiliser des contacts avec catégorie d'utilisation AC-3 selon la norme IEC 60947-4-1.

Tabella (38) - Alimentazione freno dai morsetti motore ed interruzione lato a.c.
Tempo di arresto t_2 ritardato e funzione delle costanti di tempo del motore.
Da prevedere quando sono richiesti avviamenti/arresti progressivi.

Tabella (39) – Bobina freno con alimentazione separata ed interruzione lato c.a.
Tempo di arresto normale ed indipendente dal motore.

Tabella (40) – Bobina freno con alimentazione dai morsetti motore ed interruzione lato c.a. e c.c.
Arresto rapido con i tempi d'intervento t_{2c}.

Tabella (41) – Bobina freno con alimentazione separata ed interruzione lato c.a. e c.c.
Tempo di arresto ridotto secondo i valori t_{2c}.

Table (38) – Brake power supply from motor terminals and AC line interruption.
Delayed stop time t_2 and function of motor time constants.
Mandatory when soft-start/stops are required.

Table (39) – Brake coil with separate power supply and AC line interruption
Normal stop time independent of motor.

Table (40) – Brake coil power supply from motor terminals and AC/DC line interruption.
Quick stop with operation times t_{2c}.

Table (41) – Brake coil with separate power supply and AC/DC line interruption.
Stop time decreases by values t_{2c}.

Tabelle (38) – Bremsversorgung über die Motorspannung und Unterbrechung der Wechselstromseite. Verzögerter und von den Zeitkonstanten des Motors abhängige Haltezeit t_2.
Vorzusehen, wenn progressive Starts/Stopps erforderlich sind.

Tabelle (39) – Bremsspule mit separater Spannungsversorgung und Unterbrechung der Wechselstromseite. Normale und vom Motor unabhängige Stoppzeiten.

Tabelle (40) – Bremsspule mit Versorgung über die Motorspannung und Unterbrechung der Gleich- und der Wechselstromseite. Schneller Stopp mit angegebenen Ansprechzeiten t_{2c}.

Tabelle (41) – Bremsspule mit separater Spannungsvversorgung und Unterbrechung der Gleich- und der Wechselstromseite.
Reduzierte Stoppzeiten angegebenen Werte t_{2c}.

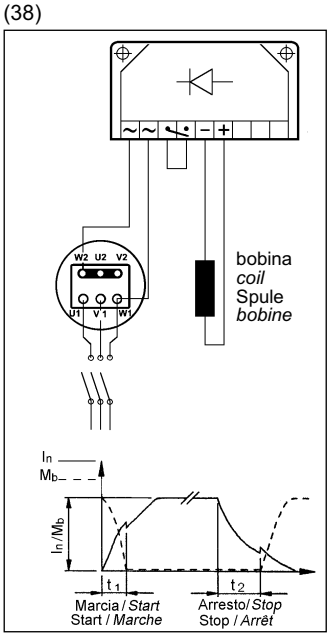
Tableau (38) - Alimentation frein depuis bornes moteur et interruption côté c.a.
Temps d'arrêt t_2 retardé et fonction des constantes de temps du moteur.
A prévoir lorsque des démarrages/arrêts progressifs sont requis.

Tableau (39) - Bobine de frein avec alimentation séparée et interrupteur côté c.a.
Temps d'arrêt normal et indépendant du moteur.

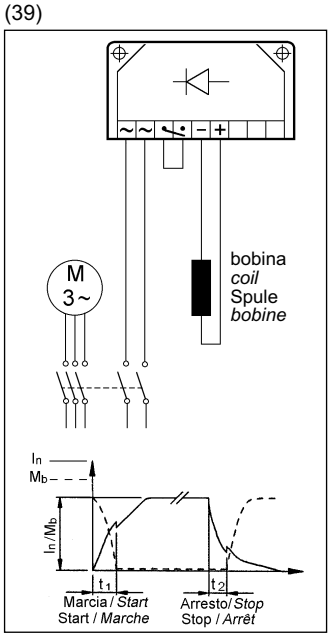
Tableau (40) - Bobine de frein avec alimentation depuis les bornes moteur et interruption côté c.a. et c.c.
Arrêt rapide avec les temps d'intervention t_{2c}.

Tableau (41) - Bobine de frein avec alimentation séparée et interruption côté c.a. et c.c.
Temps d'arrêt réduit selon les valeurs t_{2c}.

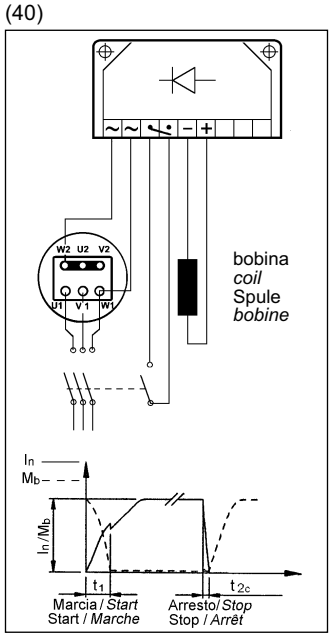
(38)



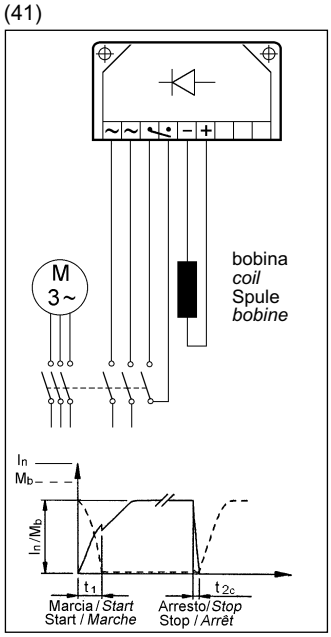
(39)



(40)



(41)



Le tabelle da (38) a (41) riportano gli schemi tipici di collegamento per alimentazione 400 V, motori 230/400V collegati a stella e freno 230 V.

Tables (38) through (41) show the typical connection diagrams for 400 V power supply, star-connected 230/400V motors and 230 V brake.

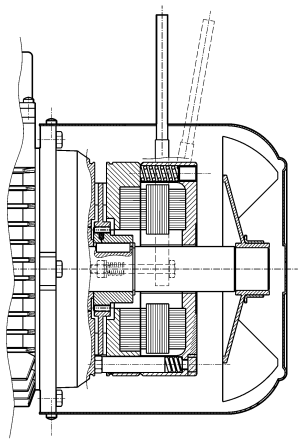
In den Tabellen (38) bis (41) werden die typischen Schaltungen für Versorgung mit 400 V, Motoren 230/400V mit Sternschaltung und einer Bremsspannung von 230 V wiedergegeben.

Les tableaux de (38) à (41) indiquent les schémas typiques de branchement pour une alimentation de 400 V, moteurs 230/400V raccordés en étoile et frein 230 V.

M26 - MOTORI AUTOFRENANTI IN C.A. TIPO BN_ FA

- Grandezze: BN 63 ... BN 180M

(42)



IP 54

Freno elettromagnetico con alimentazione in **corrente alternata** trifase, fissato con viti allo scudo motore; le molle di precarico realizzano il posizionamento assiale del corpo magnete.
Il disco freno è scorrevole assialmente sul mozzo trascinatore in acciaio calettato sull'albero e previsto di molla antivibrazione.
La coppia frenante è preimpostata in fabbrica su valori che sono indicati nelle tabelle dati tecnici dei relativi motori.
L'azione del freno è inoltre modulabile, regolando con continuità la coppia frenante, tramite le viti che realizzano il precarico delle molle; il campo di regolazione della coppia è: 30% $M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} è il momento frenante max riportato in tab. (46).
Il freno tipo FA presenta dinamiche molto elevate che lo rendono idoneo in applicazioni dove sono richieste frequenze di avviamento elevate con tempi d'intervento molto rapidi.
A richiesta, i motori possono essere previsti di leva per lo sblocco manuale con ritorno automatico (R). Per la specifica della posizione angolare della leva vedi relativa variante alla pag. 324.

M26 - AC BRAKE MOTORS TYPE BN_FA

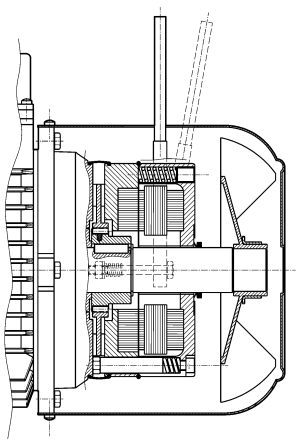
- Frame sizes: BN 63 ... BN 180M

*Electromagnetic brake operates from three-phase **alternated current** power supply and is bolted onto conveyor shield. Preloading springs provide axial positioning of magnet body.*
Steel brake disc slides axially on steel hub shrunk onto motor shaft with anti-vibration spring.
Brake torque factory setting is indicated in the corresponding motor rating charts.
Spring preloading screws provide stepless braking torque adjustment. Torque adjustment range is 30% $M_{bMAX} < Mb < M_{bMAX}$ (where M_{bMAX} is maximum braking torque as shown in tab. (46).
Thanks to their high dynamic characteristics, FA brakes are ideal for heavy-duty applications as well as applications requiring frequent stop/starts and very fast response time.
Motors may be equipped with manual release lever with automatic return (R) at request. See variants at page 324 for available lever locations.

M26 - WECHSELSTROMBREMS-MOTOREN MIT W.S.–BREMSE TYP BN_ FA

- Baugrößen: BN 63 ... BN 180M

(43)



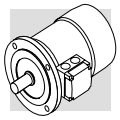
IP 55

Elektomagnetische Bremse mit **Drehstromversorgung**, die mittels Schrauben am hinteren Motorschild befestigt ist. Die Federn sorgen dabei für die axiale Ausrichtung des Magnetkörpers. Die Bremsscheibe (Stahl) gleitet axial auf dem sich auf dem Rotor befindlichen Mitnehmer, der über eine Paßfeder mit Motorwelle verbunden und mit einer Schwingungsdämpffeder ausgestattet ist. as Bremsmoment wird auf das entsprechende Motormoment eingestellt (siehe Tabelle der technischen Daten der entsprechenden Motoren). Das Bremsmoment ist stufenlos durch über die Schrauben die die Federvorspannung einstellbar. Der Einstellbereich beträgt 30% $Mb_{MAX} < Mb < Mb_{MAX}$ (Mb_{MAX} steht für den max. Bremsmoment, der in der Tab (46) angegeben wird). Die Bremse vom Typ FA zeichnet sich durch ihre hohen Dynamik aus, weshalb sie für Anwendungen geeignet sind, in denen hohe Schaltfrequenzen und schnelle Ansprechzeiten gefordert werden. Auf Anfrage können die Motoren mit einem Lüfterhebel für die manuelle Lüftung der Bremse mit automatischer Rückstellung (R) geliefert werden. Die Angabe der Montageposition erfolgt über die Angabe der Option auf Seite 324.

M26 - MOTEURS FREIN EN C.A. TYPE BN_FA

***Tailles**: BN 63 ... BN 180M*

*Frein électromagnétique avec alimentation en **courant alternatif** triphasé, fixé avec des vis au bouclier ; les ressorts de précharge réalisent le positionnement axial de la bobine.*
Le disque frein coulisse de façon axiale sur le moyeu d'entraînement en acier, calé sur l'arbre et doté de ressort antivibration.
Le couple de freinage est préréglé en usine aux valeurs qui sont indiquées dans les tableaux des caractéristiques techniques des moteurs correspondants. De plus, l'action du frein est modulable, en réglant le couple de freinage en continu au moyen des vis qui réalisent la précharge des ressorts ; la plage de réglage du couple est de 30% $M_{bMAX} < Mb < M_{bMAX}$ (M_{bMAX} est le couple de freinage maximum indiqué dans le tab. (46).
Le frein type FA présente des caractéristiques dynamiques très élevées, il est donc adapté pour des applications nécessitant des fréquences de démarrage élevées et des temps d'intervention très rapides.
Sur demande, les moteurs peuvent être prévus avec levier pour le déblocage manuel avec retour automatique (R). Pour la spécification de la position angulaire du levier, voir variante page 324.



- Grado di protezione

L'esecuzione standard prevede il grado di protezione IP54.

In opzione, il motore autofrenante BN_FA viene fornito con grado di protezione **IP 55** prevedendo le seguenti varianti costruttive:

- anello V-ring posizionato sull'albero motore N.D.E.
- fascia di protezione in gomma
- anello o-ring

- Degree of protection

Standard protection is IP54.

*Brake motor BN_FA is also available in protection **IP 55**, which mandates the following variants:*

- V-ring at N.D.E. of motor shaft

- rubber boot

- O-ring

- Schutzart

Die Standardausführung ist Schutzart IP54 vor.

Optional kann der Bremsmotor BN_FA auch in der Schutzart IP 55 geliefert werden, was durch die folgenden zusätzlichen Bauteile erreicht wird:

- V-Ring an der Motorwelle N.D.E.
- Schutzring aus Gummi
- O-Ring

- Degré de protection

L'exécution standard prévoit le degré de protection IP54.
*En option, le moteur frein BN_FA est fourni avec degré de protection **IP 55**, les variations de construction suivantes sont prévues :*

- bague V-ring positionné sur l'arbre moteur N.D.E.

- bande de protection en caoutchouc

- joint torique

- Alimentazione freno FA

Nei motori a singola polarità l'alimentazione della bobina freno è derivata direttamente dalla morsettiera motore e la tensione del freno quindi coincide con la tensione del motore. In questo caso la tensione del freno può essere omessa dalla designazione.

Per i motori a doppia polarità, e per i motori con alimentazione separata del freno, è presente una morsettiera ausiliaria con 6 terminali per il collegamento alla linea del freno. In entrambi i casi il valore di tensione del freno dovrà essere specificato in designazione.
Nella tabella seguente sono riportate le condizioni di alimentazione standard del freno in c.a. per i motori a singola e doppia polarità:

- FA brake power supply

In single-pole motors, power supply is brought to the brake coil direct from the motor terminal box. As a result, brake voltage and motor voltage are the same. In this case, brake voltage indication may be omitted in the designation.

Switch-pole motors and motors with separate brake power supply feature an auxiliary terminal board with 6 terminals for connection to brake line. In both cases, brake voltage indication in the designation is mandatory.
The following table reports standard AC brake power supply ratings for single- and switch-pole motors:

- Stromversorgung - Bremstyp FA

Bei den einpoligen Motoren wird die Versorgung der Bremsspule direkt vom Motorklemmenkasten abgenommen, das bedeutet, dass die Spannung der Bremse mit der Motorspannung übereinstimmt. In diesem Fall braucht die Bremsenspannung nicht extra angegeben werden.

Für die polumschaltbaren Motoren und für eine separate Bremsversorgung ist eine Hilfsklemmenleiste mit 6 Anschlüssen vorgesehen, die einen Anschluß der Bremse ermöglichen. In beiden Fällen muss die Bremspannung in der Bestellung angegeben werden.
In der nachstehenden Tabelle werden für die einpoligen und die polumschaltbaren Motoren die Standardspannungen der Wechselstrombremsen angegeben:

- Alimentation frein FA

Sur les moteurs à simple polarité, l'alimentation de la bobine frein dérive directement du bornier moteur, par conséquent, la tension du frein coïncide avec la tension du moteur. Dans ce cas, la tension du frein peut être omise de la désignation.

Pour les moteurs à double polarité et les moteurs avec alimentation séparée du frein, une boîte à bornes auxiliaire avec 6 bornes pour le raccordement à la ligne du frein, est présente. Dans les deux cas, la valeur de tension du frein doit être spécifiée dans la désignation.
Le tableau suivant indique les conditions d'alimentation standard du frein en c.a. pour les moteurs à simple et double polarité :

(44)

	BN 63 ... BN 132	BN 160 ... BN 180 M
Motori a singola polarità ***Single-speed motors*** **Einpolige Motoren** ***Moteurs à simple polarité***	230Δ / 400Y V ±10% – 50 Hz	400Δ / 690Y V ±10% – 50 Hz
	265Δ / 460Y V ±10% - 60 Hz	460Δ V – 60 Hz

(45)

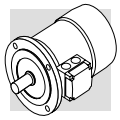
	BN 63 ... BN 132
Motori a doppia polarità (alimentazione da linea separata) ***Switch-speed motors*** *(separate power supply line*) **Polumschaltbare Motoren** (separate Versorgung) ***Moteurs à double polarité*** *(alimentation depuis ligne séparée)*	230Δ / 400Y V ±10% – 50 Hz
	460Y V – 60 Hz

Su richiesta, sono disponibili tensioni speciali, nel campo 24…690 V, 50... 60 Hz.

Special voltages in the 24…690 V, 50... 60 Hz range are available at request.

Auf Anfrage können Sonderspannungen von 24…690 V, 50... 60 Hz geliefert werden.

Sur demande, des tensions spéciales sont disponibles dans la plage 24…690 V, 50... 60 Hz.



- Dati tecnici freni FA | ***- FA brake technical specifications*** | **- Technische Daten der Bremsen vom Typ FA** | ***- Caractéristiques techniques freins FA***

(46)

Freno *Brake* Bremse *Frein*	Coppia frenante M_b *Brake torque M_b* Bremsmoment M_b *Couple de freinage M_b* [Nm]	Rilascio *Release* Ansprechzeit *Déblocage* t_1 [ms]	Frenatura *Braking* Bremszeit *Freinage* t_2 [ms]	W max [J] 10 c/h	100 c/h	1000 c/h	W [MJ]	Pb [VA]
FA 02	3.5	4	20	4500	1400	180	15	60
FA 03	7.5	4	40	7000	1900	230	25	80
FA 04 **FA 14**	15	6	60	10000	3100	350	30	110
FA 05 **FA 15**	40	8	90	18000	4500	500	50	250
FA 06S	60	16	120	20000	4800	550	70	470
FA 06	75	16	140	29000	7400	800	80	550
FA 07	150	16	180	40000	9300	1000	130	600
FA 08	250	20	200	60000	14000	1500	230	1200

Legenda:

- M_b = max coppia frenante statica (± 15%)
- t_1 = tempo di rilascio del freno
- t_2 = ritardo di frenatura
- W_{max} = energia max per frenata (capacità termica del freno)
- W = energia di frenatura tra due regolazioni successive del traferro
- P_b = potenza assorbita dal freno a 20°C (50 Hz)
- c/h = avviamenti orari

Key:

- M_b = *max static braking torque (15%)*
- t_1 = *brake release time*
- t_2 = *brake engagement time*
- W_{max} = *max energy per brake operation (brake thermal capacity)*
- W = *braking energy between two successive air gap adjustments*
- P_b = *brake power absorption at 20° (50 Hz)*
- c/h = *starts per hour*

Legende:

- M_b = statisches max. Bremsmoment (± 15%)
- t_1 = Bremsenansprechzeit
- t_2 = Bremsverzögerung
- W_{max} = max. Energie pro Bremsung (Wärmeleistung der Bremse)
- W = Bremsenergie zwischen zwei Einstellungen des Luftspalts
- P_b = bei 20° von der Bremse aufgenommene Leistung (50 Hz)
- c/h = Schaltungen pro stunde

Légende:

- *M_b = couple de freinage statique max (15%)*
- *t_1 = temps de déblocage frein*
- *t_2 = retard de freinage*
- *W_{max} = énergie max par freinage (capacité thermique du frein)*
- *W = énergie de freinage entre deux réglages successifs de l'entrefer*
- *P_b = puissance absorbée par le frein à 20° (50 Hz)*
- c/h = *démarrages horaires*

N.B.

I valori di t_1 e t_2 riportati in tabella sono riferiti al freno tarato alla coppia nominale, traferro medio e tensione nominale.

NOTE

Values t_1 and t_2 in the table refer to a brake set at rated torque, medium air gap and rated voltage.

HINWEIS:

Die in der Tabelle angegebenen Werte t_1 und t_2 beziehen sich auf eine Bremse, die auf das Nenndrehmoment, einen mittleren Luftspalt und die Standardspannung eingestellt ist.

N.B.

Les valeurs de t_1 et t_2 indiquées dans le tableau se réfèrent au frein étalonné au couple nominal, entrefer moyen et tension nominale.

- Collegamenti freno FA

Per i motori con alimentazione del freno derivata direttamente dall'alimentazione motore i collegamenti alla morsettiera corrispondono a quanto riportato nello schema (47):

- FA brake connections

The diagram (47) shows the required connections to terminal box when brake is to be connected directly to motor power supply:

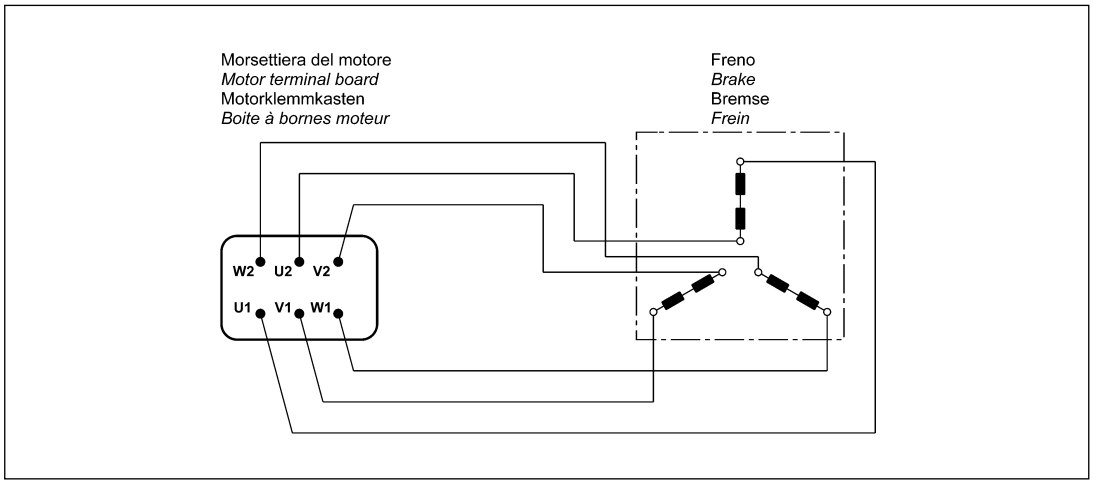
- Abschlüsse - Bremstyp FA

Bei den Motoren mit direkter Bremsspannungsversorgung müssen die Anschlüsse im Klemmenkasten entsprechend den Angaben im Schema (47) angeschlossen werden:

- Raccordements frein FA

Pour les moteurs avec alimentation du frein dérivant directement de l'alimentation moteur, les raccordements à la boîte à bornes correspondent aux indications du schéma (47) :

(47)



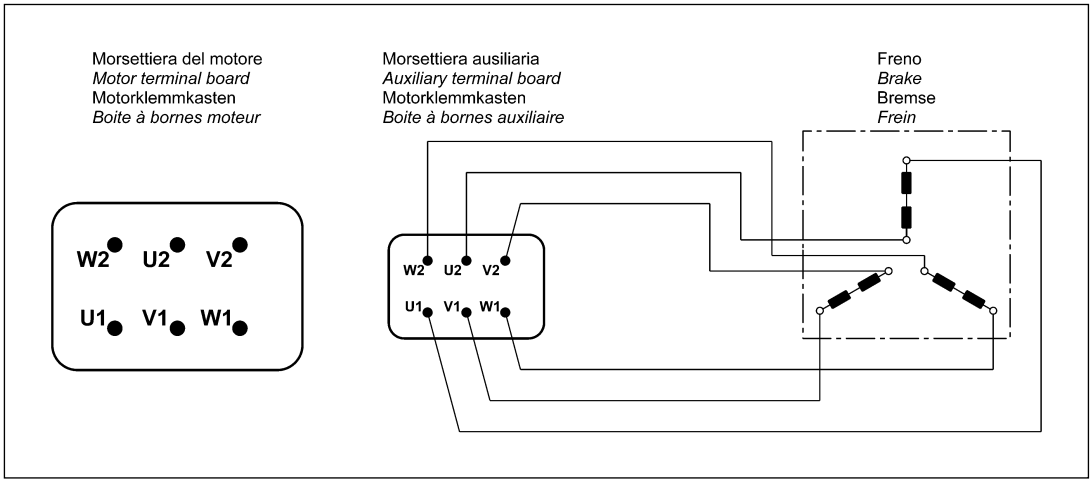
Per i motori a doppia polarità e, quando richiesto, per i motori ad una velocità con alimentazione da linea separata è prevista una morsettiera ausiliaria a 6 morsetti per il collegamento del freno; in questa esecuzione i motori prevedono la scatola coprimorsetti maggiorata. Vedi schema (48):

Switch-pole motors and, at request, single-pole motors with separate power supply line are equipped with an auxiliary terminal board with 6 terminals for brake connection. In this version, motors feature a larger terminal box. See diagram (48):

Bei den polumschaltbaren Motoren und, auf Anfrage, auch bei den einpoligen Motoren mit separater Bremsversorgung ist für den Anschluss der Bremse ein Hilfsklemmenkasten mit 6 Klemmen vorgesehen. In diesen Ausführungen haben die Motoren einen größeren Klemmenkasten. Siehe Schema (48):

Pour les moteurs à double polarité et, lorsque cela est requis, pour les moteurs à une vitesse avec alimentation depuis ligne séparée, une boîte à bornes auxiliaire à 6 bornes est prévue pour le raccordement du frein ; dans cette exécution les moteurs prévoient un couvercle bornier majoré. Voir schéma (48) :

(48)



M27 - MOTORI AUTOFRENANTI IN C.A. TIPO BN_ BA

- Grandezze: BN 63 ... BN 132M

M27 - AC BRAKE MOTORS TYPE BN_BA

***- Frame sizes**: BN 63 ... BN 132*M

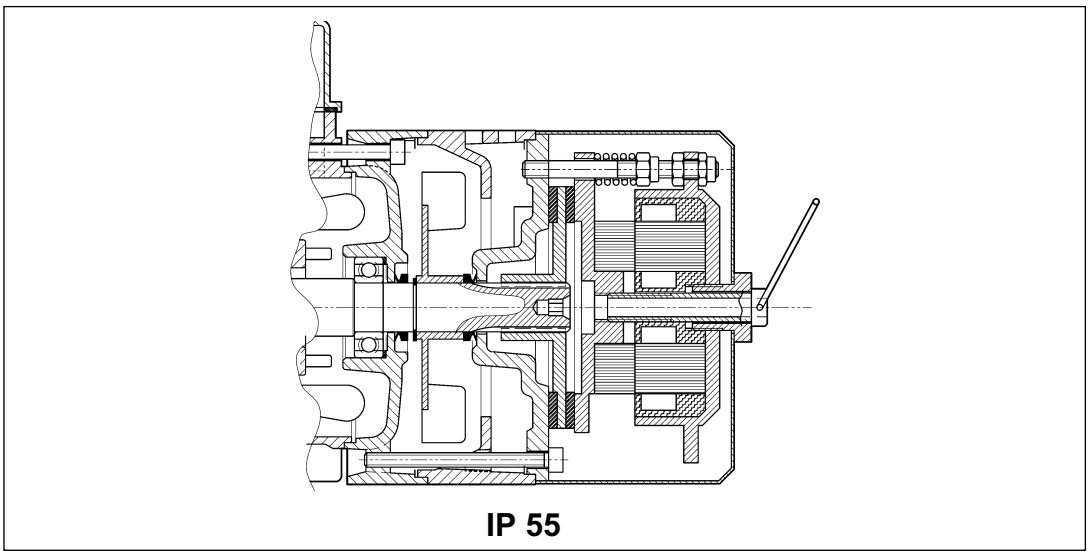
M27 - WECHSELSTROMBREMS-MOTOREN MIT W.S.–BREMSE TYP BN_ BA

- Baugrößen: BN 63 ... BN 132M

M27 - MOTEURS FREIN EN C.A. TYPE BN_BA

***- Tailles** : BN 63 ... BN 132M*

(49)



Freno elettromagnetico con alimentazione in **corrente alternata** trifase, fissato con viti allo scudo convogliatore.
Disco freno in acciaio scorrevole assialmente sull'albero motore scanalato (mozzo trascinatore in acciaio calettato sull'albero per grandezza 132).
I motori sono forniti con freno tarato alla massima coppia. La coppia freno è regolabile con continuità agendo sulle viti di compressione delle molle; il campo di regolazione consentito è 30% $M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} è il momento frenante max riportato in tab. (52).
Di serie i motori sono forniti completi di vite per lo sblocco manuale del freno, con mantenimento della posizione di rilascio per consentire la rotazione dell'albero motore.
La vite di sblocco deve essere smontata dopo l'utilizzo per assicurare il corretto funzionamento del freno ed evitare situazioni potenzialmente pericolose.
Il freno BA, oltre alle elevate caratteristiche dinamiche tipiche dei freni in corrente alternata, presenta una costruzione robusta con energia di frenatura aumentata che lo rendono particolarmente idoneo a servizi pesanti oltre che in applicazioni dove sono richieste frequenze di manovra elevate e tempi d'intervento molto rapidi.

*Electromagnetic brake operates from three-phase **alternated current** power supply and is bolted onto conveyor shield.*
Steel brake disc slides axially on splined motor shaft (steel drive hub is shrunk onto shaft on frame size 132).
Factory setting is maximum brake torque.
Step less braking torque adjustment by screws which compress the brake springs. Allowed adjustment range is 30% $M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} is maximum braking torque as shown in tab. (52).
Motors are supplied complete with manual brake release screw as standard. Screw may be locked in the release position to allow for motor shaft rotation.
The brake release screw must be removed after use to ensure proper brake operation and avoid potentially dangerous conditions.
In addition to the high dynamic characteristics typical of AC brakes, a sturdy design and increased braking energy make the BA brake ideal for heavy-duty applications as well as applications requiring frequent stop/starts and very fast response time.

Elektomagnetische Bremse mit Drehstromversorgung, die mittels Schrauben am Motorschild des Motors befestigt ist. Die Bremsscheibe (Stahl) gleitet axial auf der Rotorwelle (bei Baugröße 132 über einem auf die Welle aufgezogenem Mitnehmer aus Stahl). Die Motoren werden mit einer auf das maximale Drehmoment des Motors eingestellten Bremse geliefert. Das Bremsdrehmoment ist durch Betätigen der Federdruckschrauben stufenlos regelbar. Der zulässige Einstellbereich beträgt 30% $M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} steht für den max. Bremsmoment, das in der Tab. (52) angegeben wird.
Die Motoren werden serienmäßig mit einer Schraube zur manuelle Bremslüftung geliefert; die arretierbar ist, um ein Drehen der Motorwelle zu ermöglichen.
Diese Schraube muss im Betrieb des Motors wieder abmontiert werden, damit die korrekte Funktion der Bremse gesichert ist Die Bremse vom Typ BA zeichnet sich durch ihre dynamischen Eigenschaften und die robuste Bauweise aus, durch die sie eine erhöhte Bremsenergie abzugeben kann. Diese Bremstypen eignen sich besonders für einen Einsatz unter harten Bedingungen und überall dort, wo häufige Schaltfrequenzen und schnelle Ansprechzeiten gefordert werden.

*Frein électromagnétique avec alimentation en **courant alternatif** triphasé, fixé avec des vis au bouclier.*
Disque frein en acier coulissant de façon axiale sur l'arbre moteur rainuré (moyeu d'entraînement en acier calé sur l'arbre pour la taille 132).
Les moteurs sont fournis avec frein étalonné au couple maximal. Le couple de freinage est réglable en continu en intervenant sur les vis de compression des ressorts ; la plage de réglage autorisé est de 30% $M_{bMAX} < M_b < M_{bMAX}$ (M_{bMAX} étant le couple de freinage maximum indiqué dans le tab. (52).
De série, les moteurs sont fournis avec vis de déblocage manuel du frein, avec maintien de la position de relâchement afin de permettre la rotation de l'arbre moteur.
La vis de déblocage doit être démontée après utilisation afin de garantir le fonctionnement correct du frein et d'éviter les situations potentiellement dangereuses. Le frein BA, outre les caractéristiques dynamiques élevées typiques des freins en courant alternatif, est de fabrication robuste avec énergie de freinage majorée, ce qui le rend particulièrement adapté pour les services difficiles ainsi que pour les applications nécessitant des fréquences de manœuvre élevées et des temps d'intervention très rapides.

- Grado di protezione

È disponibile un'unica esecuzione, con grado di protezione IP55.

- Degree of protection

Only available with degree of protection IP55.

- Schutzart

Es ist eine nur die Ausführung in Schutzklasse IP55 verfügbar.

- Degré de protection

Il est disponible en une exécution unique, avec degré de protection IP55.

- Alimentazione freno BA

Nei motori a singola polarità l'alimentazione della bobina freno è derivata direttamente dalla morsettiera motore e la tensione del freno quindi coincide con la tensione del motore. In questo caso la tensione del freno può essere omessa dalla designazione.
Per i motori a doppia polarità, e per i motori con alimentazione separata del freno, è presente una morsettiera ausiliaria con 6 terminali per il collegamento alla linea del freno. In entrambi i casi il valore di tensione del freno dovrà essere specificato in designazione.
Nella tabella seguente sono riportate le condizioni di alimentazione standard del freno in c.a. per i motori a singola e doppia polarità:

- BA brake power supply

In single-pole motors, power supply is brought to the brake coil direct from the motor terminal box. As a result, brake voltage and motor voltage are the same. In this case, brake voltage indication may be omitted in the designation.
Switch-pole motors and motors with separate brake power supply feature an auxiliary terminal board with 6 terminals for connection to brake line. In both cases, brake voltage indication in the designation is mandatory.
The following table reports standard AC brake power supply ratings for single- and switch-pole motors:

- Stromversorgung - Bremstyp BA

Bei den einpoligen Motoren wird die Versorgung der Bremsspule direkt vom Motorklemmenkasten abgezweigt, das bedeutet also, dass die Spannung der Bremse mit der Motorspannung übereinstimmt. In diesem Fall braucht die Bremsenspannung nicht extra angegeben werden. Für polumschaltbaren Motoren und für eine separate Bremsversorgung ist eine Hilfsklemmenleiste mit 6 Anschlüssen vorgesehen, die einen Anschluss der Bremse ermöglichen. In beiden Fällen muss die Bremsspannung bei der Bestellung angegeben werden.
In der nachstehenden Tabelle werden für die einpoligen und die polumschaltbaren Motoren die Standardversorgung der Wechselstrombremsen angegeben.

- Alimentation frein BA

Sur les moteurs à simple polarité, l'alimentation de la bobine frein dérive directement du bornier moteur, par conséquent, la tension du frein coïncide avec la tension du moteur. Dans ce cas, la tension du frein peut être omise de la désignation.
Pour les moteurs à double polarité et les moteurs avec alimentation séparée du frein, un boîte à bornes auxiliaire avec 6 bornes pour le raccordement au réseau du frein, est présente. Dans les deux cas, la valeur de tension du frein doit être spécifiée dans la désignation.
Le tableau suivant indique les conditions d'alimentation standard du frein en c.a. pour les moteurs à simple et double polarité :

(50)

Motori a singola polarità ***Single-speed motors*** **Einpolige Motoren** ***Moteurs à simple polarité***	**BN 63 ... BN 132**
	230Δ / 400Y V ± 10% – 50 Hz
	265Δ / 460Y ± 10% - 60 Hz

(51)

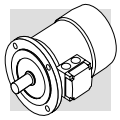
Motori a doppia polarità (alimentazione da linea separata) ***Switch-pole motors*** *(separate power supply line)* **Polumschaltbare Motoren** (separate Versorgung) ***Moteurs à double polarité*** *(alimentation depuis ligne séparée)*	**BN 63 ... BN 132**
	230Δ / 400Y V ± 10% – 50 Hz
	460Y – 60 Hz

Se non diversamente specificato, l'alimentazione standard del freno è 230Δ /400Y V - 50 Hz.
Su richiesta, sono disponibili tensioni speciali, nel campo 24…690 V, 50... 60 Hz.

Unless otherwise specified, standard brake power supply is 230Δ /400Y V - 50 Hz.
Special voltages in the 24…690 V, 50... 60 Hz range are available at request.

Falls nicht anderweitig angegeben, beträgt die Standardversorgung der Bremse 230Δ /400Y V - 50 Hz.
Auf Anfrage können Sonderspannungen von 24…690 V, 50... 60 Hz geliefert werden.

Sauf spécification contraire, l'alimentation standard du frein est 230Δ /400Y V - 50 Hz.
Sur demande, des tensions spéciales sont disponibles dans la plage 24…690 V, 50... 60 Hz.



- Dati tecnici freni BA

Nella tabella sottostante sono riportati i dati tecnici dei freni in c.a., tipo BA.

- BA brake technical specifications

The table below reports the technical specifications for AC brakes type BA.

- Technische Daten der Bremsen vom Typ BA

In der nachstehenden Tabelle werden die technischen Daten der Wechselstrombremsen vom Typ BA angegeben:

- Caractéristiques techniques freins BA

Le tableau ci-dessous indique les caractéristiques techniques des freins en c.a., type BA.

(52)

Freno *Brake* Bremse *Frein*	Coppia frenante M_b *Brake torque M_b* Bremsmoment M_b *Couple de freinage M_b* [Nm]	Rilascio *Release* Ansprechzeit *Déblocage* t_1 [ms]	Frenatura *Braking* Bremszeit *Freinage* t_2 [ms]	W max [J] 10 c/h	100 c/h	1000 c/h	W [MJ]	Pb [VA]
BA 60	5	5	20	4000	1500	180	30	60
BA 70	8	6	25	7000	2700	300	60	75
BA 80	18	6	25	10000	3100	350	80	110
BA 90	35	8	35	13000	3600	400	88	185
BA 100	50	8	35	18000	4500	500	112	225
BA 110	75	8	35	28000	6800	750	132	270
BA 140	150	15	60	60000	14000	1500	240	530

Legenda:

- M_b = max coppia frenante statica (± 15%)
- t_1 = tempo di rilascio del freno
- t_2 = ritardo di frenatura
- W_{max} = energia max per frenata (capacità termica del freno)
- W = energia di frenatura tra due regolazioni successive del traferro
- P_b = potenza assorbita dal freno a 20°C (50 Hz)
- c/h = avviamenti orari

Legenda:

- M_b = *max static braking torque (15%)*
- t_1 = *brake release response time*
- t_2 = *brake engagement time*
- W_{max} = *max energy per brake operation (brake thermal capacity)*
- W = *braking energy between two successive air gap adjustments*
- P_b = *brake power absorption at 20° (50 Hz)*
- c/h = *starts per hour*

Legende:

- M_b = statisches max. Bremsmoment (± 15%)
- t_1 = Bremsenansprechzeit
- t_2 = Bremsverzögerung
- W_{max} = max. Energie pro Bremsung (Wärmeleistung der Bremse)
- W = Bremsenergie zwischen zwei Einstellungen des Luftspalts
- P_b = bei 20° von der Bremse aufgenommene Leistung (50 Hz)
- c/h = Schaltungen pro stunde

Légende:

- *M_b = couple de freinage statique max (15%)*
- *t_1 = temps de déblocage frein*
- *t_2 = retard de freinage*
- *W_{max} = énergie max par freinage (capacité thermique du frein)*
- *W = énergie de freinage entre deux réglages successifs de l'entrefer*
- *P_b = puissance absorbée par le frein à 20° (50 Hz)*
- c/h = *démarrages horaires*

N.B.

I valori di t_1 e t_2 riportati in tabella sono riferiti al freno tarato alla coppia nominale, traferro medio e tensione nominale.

NOTE :

Values t_1 and t_2 in the table refer to a brake set at rated torque, medium air gap and rated voltage.

HINWEIS:

Die in der Tabelle angegebenen Werte t_1 und t_2 beziehen sich auf eine Bremse, die auf das Nenndrehmoment, einen mittleren Luftspalt und die Standardspannung eingestellt ist.

N.B.

Les valeurs de t_1 et t_2 indiquées dans le tableau se réfèrent au frein étalonné au couple nominal, entrefer moyen et tension nominale.

- Collegamenti freno BA

Per i motori con alimentazione del freno derivata direttamente dall'alimentazione motore i collegamenti alla morsettiera corrispondono a quanto riportato nello schema (53):

- BA brake connections

The diagram (53) shows the required connections to terminal box when brake is to be connected directly to motor power supply:

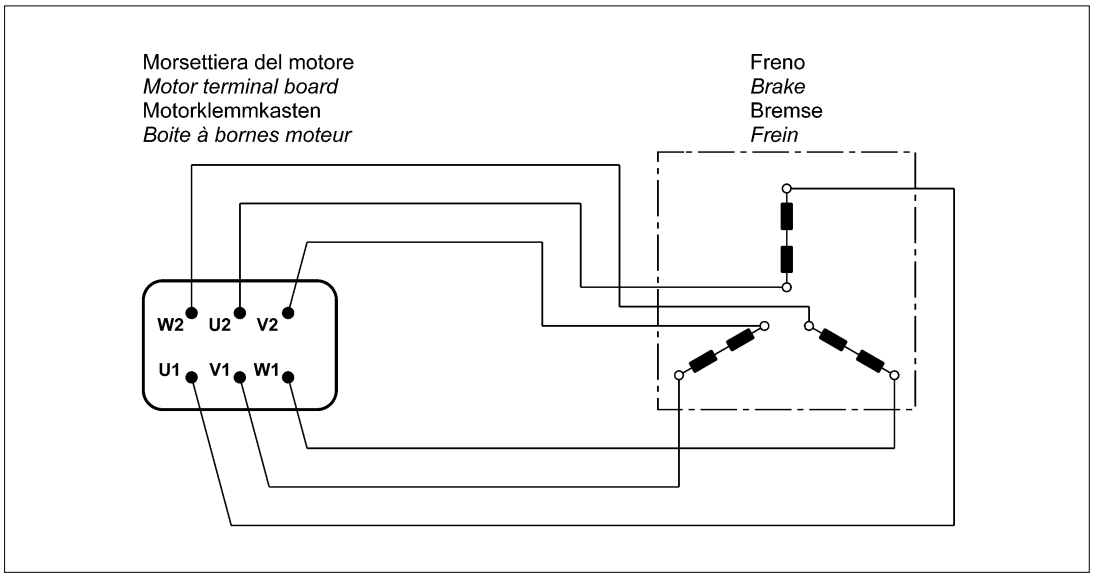
- Anschlüsse - Bremstyp BA

Bei den Motoren mit einer direkt von der Motorspannung gespeisten Bremsversorgung müssen die Bremsen entsprechend der Angaben im Schema (53) angeschlossen werden:

- Raccordements frein BA

Pour les moteurs avec alimentation du frein dérivant directement de l'alimentation moteur, les raccordements à la boîte à bornes correspondent aux indications du schéma (53) :

(53)



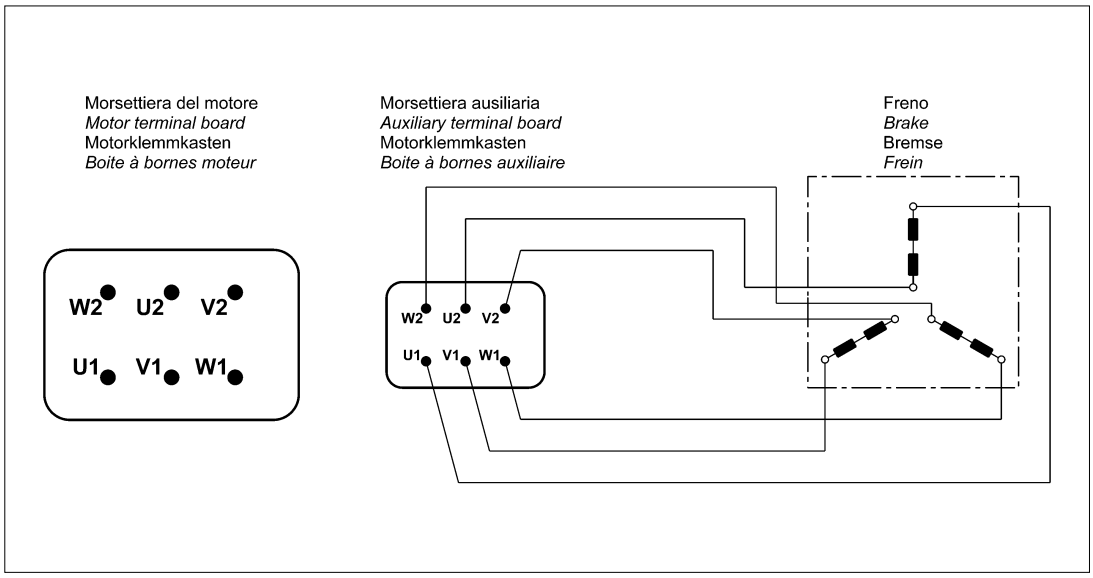
Per i motori a doppia polarità e, quando richiesto, per i motori ad una velocità con alimentazione da linea separata è prevista una morsettiera ausiliaria a 6 morsetti per il collegamento del freno; in questa esecuzione i motori prevedono la scatola coprimorsetti maggiorata. Vedi schema (54):

Switch-pole motors and, at request, single-pole motors with separate power supply line are equipped with an auxiliary terminal board with 6 terminals for brake connection. In this version, motors feature a larger terminal box. See diagram (54):

Bei den polumschaltbaren Motoren und, auf Anfrage, auch bei den eintpoligen Motoren mit separater Bremsversorgung ist für den Anschluss der Bremse ein Hilfsklemmenkasten mit 6 Klemmen vorgesehen. In dieser Ausführungen haben die Motoren einen größeren Klemmenkasten. Siehe Schema (54):

Pour les moteurs à double polarité et, lorsque cela est requis, pour les moteurs à une vitesse avec alimentation depuis ligne séparée, une boîte à bornes auxiliaire à 6 bornes est prévue pour le raccordement du frein ; dans cette exécution les moteurs prévoient un couvercle bornier majoré. Voir schéma (54) :

(54)

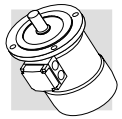


2 P — 3000 min^{-1} - S1 — 50 Hz

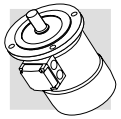
Pn kW		n min^{-1}	Mn Nm	EFF 2	η (100%) %	η (75%) %	cos φ	In [400V] A	Is/In	Ms/Mn	Ma/Mn	Jm x 10^{-4} kgm^2	IM B5 Kg	freno c.c. / *d.c. brake* G.S.-bremse / *frein c.c.* FD Mod.	Mb Nm	Zo 1/h NB	Zo 1/h SB	Jm x 10^{-4} Kgm^2	IM B5 Kg	freno c.a. / *a.c. brake* W.S.-bremse / *frein c.a.* FA Mod.	Mb Nm	Zo 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg	BA Mod.	Mb max Nm	Zo 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg
0.18	**BN 63A 2**	2730	0.63		59.9	56.9	0.77	0.56	3.0	2.1	2	2.0	3.5	**FD 02**	1.75	3900	4800	2.6	5.2	**FA 02**	1.75	4800	2.6	5.0	**BA 60**	5	3500	4.0	5.8
0.25	**BN 63B 2**	2740	0.87		66.0	64.8	0.76	0.72	3.3	2.3	2.3	2.3	3.9	**FD 02**	1.75	3900	4800	3.0	5.6	**FA 02**	1.75	4800	3.0	5.4	**BA 60**	5	3600	4.3	6.2
0.37	**BN 63C 2**	2800	1.26		69.1	66.8	0.78	0.99	3.9	2.6	2.6	3.3	5.1	**FD 02**	3.5	3600	4500	3.9	6.8	**FA 02**	3.5	4500	3.9	6.6	**BA 60**	5	3500	5.3	7.4
0.37	**BN 71A 2**	2820	1.25		73.8	73.0	0.76	0.95	4.8	2.8	2.6	3.5	5.4	**FD 03**	3.5	3000	4100	4.6	8.1	**FA 03**	3.5	4200	4.6	7.8	**BA 70**	8	3500	5.5	9.3
0.55	**BN 71B 2**	2820	1.86		76.0	75.8	0.76	1.37	5.0	2.9	2.8	4.1	6.2	**FD 03**	5	2900	4200	5.3	8.9	**FA 03**	5	4200	5.3	8.6	**BA 70**	8	3600	6.1	10.1
0.75	**BN 71C 2**	2810	2.6		76.6	76.2	0.76	1.86	5.1	3.1	2.8	5.0	7.3	**FD 03**	5	1900	3300	6.1	10	**FA 03**	5	3600	6.1	9.7	**BA 70**	8	3200	7.0	11.2
0.75	**BN 80A 2**	2810	2.6		76.2	75.5	0.81	1.75	4.8	2.6	2.2	7.8	8.6	**FD 04**	5	1700	3200	9.4	12.5	**FA 04**	5	3200	9.4	12.4	**BA 80**	18	2800	10.8	13.9
1.1	**BN 80B 2**	2800	3.8	EFF 2	76.4	76.2	0.81	2.57	4.8	2.8	2.4	9.0	9.5	**FD 04**	10	1500	3000	10.6	13.4	**FA 04**	10	3000	10.6	13.3	**BA 80**	18	2700	12.0	14.8
1.5	**BN 80C 2**	2800	5.1	EFF 2	79.1	79.5	0.81	3.4	4.9	2.7	2.4	11.4	11.3	**FD 04**	15	1300	2600	13.0	15.2	**FA 04**	15	2600	13.0	15.1	**BA 80**	18	2400	14.4	16.6
1.5	**BN 90SA 2**	2870	5.0	EFF 2	82.0	81.5	0.80	3.3	5.9	2.7	2.6	12.5	12.3	**FD 14**	15	900	2200	14.1	16.5	**FA 14**	15	2200	14.1	16.4	**BA 90**	35	1600	19.5	19.6
1.85	**BN 90SB 2**	2880	6.1	EFF 2	82.5	82.0	0.80	4.0	6.2	2.9	2.6	16.7	14	**FD 14**	15	900	2200	18.3	18.2	**FA 14**	15	2200	18.3	18.1	**BA 90**	35	1700	23.7	21.3
2.2	**BN 90L 2**	2880	7.3	EFF 2	82.7	82.1	0.80	4.8	6.3	2.9	2.7	16.7	14	**FD 05**	26	900	2200	21	20	**FA 05**	26	2200	21	20.7	**BA 90**	35	1700	24	21.3
3	**BN 100L 2**	2860	10.0	EFF 2	82.8	82.6	0.79	6.6	5.7	2.6	2.2	31	20	**FD 15**	26	700	1600	35	26	**FA 15**	26	1600	35	27	**BA 100**	50	1300	43	30
4	**BN 100LB 2**	2870	13.3	EFF 2	84.3	84.4	0.80	8.6	5.9	2.7	2.5	39	23	**FD 15**	40	450	900	43	29	**FA 15**	40	1000	43	30	**BA 100**	50	850	51	33
4	**BN 112M 2**	2900	13.2	EFF 2	85.5	84.5	0.82	8.2	6.9	3	2.9	57	28	**FD 06S**	40	—	950	66	39	**FA 06S**	40	950	66	40	**BA 110**	75	850	73	41
5.5	**BN 132SA 2**	2890	18.2	EFF 2	86.1	85.7	0.84	11.0	6	2.6	2.2	101	35	**FD 06**	50	—	600	112	48	**FA 06**	50	600	112	49	**BA 140**	150	500	151	67
7.5	**BN 132SB 2**	2900	25	EFF 2	87.2	87.1	0.85	14.6	6.4	2.6	2.2	145	42	**FD 06**	50	—	550	154	55	**FA 06**	50	550	154	56	**BA 140**	150	450	195	74
9.2	**BN 132M 2**	2930	30	EFF 2	89.0	88.5	0.86	17.3	6.9	2.8	2.3	178	53	**FD 56**	75	—	430	189	66	**FA 06**	75	430	189	67	**BA 140**	150	400	228	85
11	**BN 160MR 2**	2920	36	EFF 2	89.1	88.9	0.88	20.2	7.0	2.9	2.5	210	65																
15	**BN 160MB 2**	2930	49	EFF 2	89.6	89.4	0.86	28.1	7.1	2.6	2.3	340	84																
18.5	**BN 160L 2**	2930	60	EFF 2	90.4	90.1	0.86	34	7.6	2.7	2.3	420	97																
22	**BN 180M 2**	2930	72	EFF 2	91.3	91.3	0.88	40	7.8	2.6	2.4	490	109																
30	**BN 200LA 2**	2930	98	EFF 2	91.9	91.4	0.89	53	7.9	2.7	2.9	770	140																

4 P — 1500 min^{-1} - S1 — 50 Hz

Pn kW		n min^{-1}	Mn Nm	EFF 2	η (100%) %	η (75%) %	cos φ	In [400V] A	Is/In	Ms/Mn	Ma/Mn	Jm x 10^{-4} kgm^2	IM B5 Kg	freno c.c. / *d.c. brake* G.S.-bremse / *frein c.c.* FD: Mod	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	Jm x 10^{-4} Kgm^2	IM B5 Kg	freno c.a. / *a.c. brake* W.S.-bremse / *frein c.a.* FA: Mod.	Mb Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg	BA: Mod.	Mb max Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg
0.06	**BN 56A 4**	1340	0.43		46.8	44.2	0.65	0.28	2.6	2.3	2.0	1.5	3.1																
0.09	**BN 56B 4**	1350	0.64		51.7	47.6	0.60	0.42	2.6	2.5	2.4	1.5	3.1																
0.12	**BN 63A 4**	1350	0.85		59.8	56.2	0.62	0.47	2.6	1.9	1.8	2.0	3.5	**FD 02**	1.75	10000	13000	2.6	5.2	**FA 02**	1.75	13000	2.6	5.0	**BA 60**	5	9000	4.0	5.8
0.18	**BN 63B 4**	1320	1.30		54.8	52.9	0.67	0.71	2.6	2.2	2.0	2.3	3.9	**FD 02**	3.5	10000	13000	3.0	5.6	**FA 02**	3.5	13000	3.0	5.4	**BA 60**	5	9000	4.3	6.2
0.25	**BN 63C 4**	1340	1.78		65.3	65.0	0.69	0.80	2.7	2.1	1.9	3.3	5.1	**FD 02**	3.5	7800	10000	3.9	6.8	**FA 02**	3.5	10000	3.9	6.6	**BA 60**	5	8500	5.3	7.4
0.25	**BN 71A 4**	1380	1.73		63.7	62.2	0.73	0.78	3.3	1.9	1.7	5.8	5.1	**FD 03**	3.5	7700	11000	6.9	7.8	**FA 03**	3.5	11000	6.9	7.5	**BA 70**	8	9700	7.8	9.0
0.37	**BN 71B 4**	1370	2.6		66.8	66.7	0.76	1.05	3.7	2.0	1.9	6.9	5.9	**FD 03**	5.0	6000	9400	8.0	8.6	**FA 03**	5.0	9400	8.0	8.3	**BA 70**	8	8500	8.9	9.8
0.55	**BN 71C 4**	1380	3.8		69.0	68.9	0.74	1.55	4.1	2.3	2.3	9.1	7.3	**FD 53**	7.5	4300	8700	10.2	10	**FA 03**	7.5	8700	10.2	9.7	**BA 70**	8	8000	11.1	11.2
0.55	**BN 80A 4**	1390	3.8		72.0	71.3	0.77	1.43	4.1	2.3	2.0	15	8.2	**FD 04**	10	4100	8000	16.6	12.1	**FA 04**	10	8000	16.6	12.0	**BA 80**	18	7400	18	13.5
0.75	**BN 80B 4**	1400	5.1		75.0	74.5	0.78	1.85	4.9	2.7	2.5	20	9.9	**FD 04**	15	4100	7800	22	13.8	**FA 04**	15	7800	22	13.7	**BA 80**	18	7400	23	15.2
1.1	**BN 80C 4**	1400	7.5	EFF 2	76.4	76.2	0.78	2.66	5.1	2.8	2.5	25	11.3	**FD 04**	15	2600	5300	27	15.2	**FA 04**	15	5300	27	15.1	**BA 80**	18	5100	28	16.6
1.1	**BN 90S 4**	1400	7.5	EFF 2	76.5	76.2	0.77	2.70	4.6	2.6	2.2	21	12.2	**FD 14**	15	4800	8000	23	16.4	**FA 14**	15	8000	23	16.3	**BA 90**	35	6500	28	19.5
1.5	**BN 90LA 4**	1390	10.3	EFF 2	78.7	78.5	0.77	3.6	5.3	2.8	2.4	28	13.6	**FD 05**	26	3400	6000	32	19.6	**FA 05**	26	6000	32	20.3	**BA 90**	35	5400	35	21
1.85	**BN 90LB 4**	1390	12.7	EFF 2	81.0	81.4	0.78	4.2	5.2	2.8	2.6	30	15.1	**FD 05**	26	3200	5900	34	21.1	**FA 05**	26	5900	34	21.8	**BA 90**	35	5400	37	22
2.2	**BN 100LA 4**	1410	14.9	EFF 2	81.1	81.4	0.75	5.2	4.5	2.2	2.0	40	18.3	**FD 15**	40	2600	4700	44	25	**FA 15**	40	4700	44	25	**BA 100**	50	4000	52	29
3	**BN 100LB 4**	1410	20	EFF 2	82.6	83.8	0.77	6.8	5	2.3	2.2	54	22	**FD 15**	40	2400	4400	58	28	**FA 15**	40	4400	58	29	**BA 100**	50	3800	66	32
4	**BN 112M 4**	1430	27	EFF 2	84.4	84.2	0.81	8.4	5.6	2.7	2.5	98	30	**FD 06S**	60	—	1400	107	40	**FA 06S**	60	2100	107	42	**BA 110**	75	2000	114	43
5.5	**BN 132S 4**	1440	36	EFF 2	86.3	86.4	0.80	11.5	5.5	2.3	2.2	213	44	**FD 56**	75	—	1050	223	57	**FA 06**	75	1200	223	58	**BA 140**	150	1200	263	76
7.5	**BN 132MA 4**	1440	50	EFF 2	87.0	87.1	0.80	15.6	5.7	2.5	2.4	270	53	**FD 06**	100	—	950	280	66	**FA 07**	100	1000	280	71	**BA 140**	150	1000	320	85
9.2	**BN 132MB 4**	1440	61	EFF 2	88.4	88.6	0.80	18.8	5.9	2.7	2.5	319	59	**FD 07**	150	—	900	342	75	**FA 07**	150	900	342	77	**BA 140**	150	900	369	91
11	**BN 160MR 4**	1440	73	EFF 2	88.4	88.8	0.81	22.2	5.9	2.7	2.5	360	70	**FD 07**	150	—	850	382	86	**FA 07**	150	850	382	88					
15	**BN 160L 4**	1460	98	EFF 2	89.9	89.4	0.81	29.7	5.9	2.3	2.1	650	99	**FD 08**	200	—	750	725	129	**FA 08**	200	750	710	128					
18.5	**BN 180M 4**	1460	121	EFF 2	90.0	90.1	0.81	37	6.2	2.6	2.5	790	115	**FD 08**	250	—	700	865	145	**FA 08**	250	700	850	144					
22	**BN 180L 4**	1460	144	EFF 2	90.7	91.1	0.81	43	6.5	2.5	2.5	1250	135	**FD 09**	300	—	400	1450	175										
30	**BN 200L 4**	1460	196	EFF 2	91.4	91.7	0.80	59	7.1	2.7	2.8	1650	157	**FD 09**	400	—	300	1850	197										



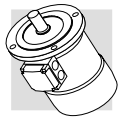
6 P — 1000 min^{-1} - S1 — 50 Hz



													freno c.c. / *d.c. brake* G.S.-bremse / *frein c.c.*						freno c.a. / *a.c. brake* W.S.-bremse / *frein c.a.*									
													FD						FA					BA				
Pn kW			n min^{-1}	Mn Nm	η %	cos φ	In [400V] A	Is/In	Ms/Mn	Ma/Mn	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb max Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg
0.09	**BN 63A**	**6**	880	0.98	41	0.53	0.60	2.1	2.1	1.8	3.4	4.6	**FD 02**	3.5	9000	14000	4.0	6.3	**FA 02**	3.5	14000	4.0	6.1	**BA 60**	5	12000	5.4	6.9
0.12	**BN 63B**	**6**	870	1.32	45	0.60	0.64	2.1	1.9	1.7	3.7	4.9	**FD 02**	3.5	9000	14000	4.3	6.6	**FA 02**	3.5	14000	4.3	6.4	**BA 60**	5	12000	5.7	7.2
0.18	**BN 71A**	**6**	900	1.91	56	0.69	0.67	2.6	1.9	1.7	8.4	5.5	**FD 03**	5.0	8100	13500	9.5	8.2	**FA 03**	5.0	13500	9.5	7.9	**BA 70**	8	12300	10.4	9.4
0.25	**BN 71B**	**6**	900	2.7	62	0.71	0.82	2.6	1.9	1.7	10.9	6.7	**FD 03**	5.0	7800	13000	12	9.4	**FA 03**	5.0	13000	12	9.1	**BA 70**	8	12000	12.9	10.6
0.37	**BN 71C**	**6**	910	3.9	66	0.69	1.17	3	2.4	2.0	12.9	7.7	**FD 53**	7.5	5100	9500	14	10.4	**FA 03**	7.5	9500	14	10.1	**BA 70**	8	8900	14.9	11.6
0.37	**BN 80A**	**6**	910	3.9	68	0.68	1.15	3.2	2.2	2.0	21	9.9	**FD 04**	10	5200	8500	23	13.8	**FA 04**	10	8500	23	13.7	**BA 80**	18	8000	24	15.2
0.55	**BN 80B**	**6**	920	5.7	70	0.69	1.64	3.9	2.6	2.2	25	11.3	**FD 04**	15	4800	7200	27	15.2	**FA 04**	15	7200	27	15.1	**BA 80**	18	6800	28	16.6
0.75	**BN 80C**	**6**	920	7.8	70	0.65	2.38	3.8	2.5	2.2	28	12.2	**FD 04**	15	3400	6400	30	16.1	**FA 04**	15	6400	30	16.0	**BA 80**	18	6100	31	17.5
0.75	**BN 90S**	**6**	920	7.8	69	0.68	2.31	3.8	2.4	2.2	26	12.6	**FD 14**	15	3400	6500	28	16.8	**FA 14**	15	6500	28	16.7	**BA 90**	35	5500	33	19.9
1.1	**BN 90L**	**6**	920	11.4	72	0.69	3.2	3.9	2.3	2.0	33	15	**FD 05**	26	2700	5000	37	21	**FA 05**	26	5000	37	22	**BA 90**	35	4600	40	22
1.5	**BN 100LA**	**6**	940	15.2	73	0.72	4.1	4	2.1	2.0	82	22	**FD 15**	40	1900	4100	86	28	**FA 15**	40	4100	86	29	**BA 100**	50	3800	94	32
1.85	**BN 100LB**	**6**	930	19.0	75	0.73	4.9	4.5	2.1	2.0	95	24	**FD 15**	40	1700	3600	99	30	**FA 15**	40	3600	99	31	**BA 100**	50	3400	107	34
2.2	**BN 112M**	**6**	940	22	78	0.73	5.6	4.8	2.2	2.0	168	32	**FD 06S**	60	—	2100	177	42	**FA 06S**	60	2100	177	44	**BA 110**	75	2000	184	45
3	**BN 132S**	**6**	940	30	76	0.76	7.5	4.8	1.9	1.8	216	36	**FD 56**	75	—	1400	226	49	**FA 06**	75	1400	226	50	**BA 140**	150	1200	266	68
4	**BN 132MA**	**6**	950	40	78	0.77	9.6	5.5	2.0	1.8	295	45	**FD 06**	100	—	1200	305	58	**FA 07**	100	1200	318	63	**BA 140**	150	1050	345	77
5.5	**BN 132MB**	**6**	945	56	80	0.78	12.7	5.9	2.1	1.9	383	56	**FD 07**	150	—	1050	406	72	**FA 07**	150	1050	406	74	**BA 140**	150	1000	433	88
7.5	**BN 160M**	**6**	955	75	84	0.81	15.9	5.9	2.2	2.0	740	83	**FD 08**	170	—	900	815	112	**FA 08**	170	900	815	113					
11	**BN 160L**	**6**	960	109	87	0.81	22.5	6.5	2.5	2.3	970	103	**FD 08**	200	—	800	1045	133	**FA 08**	200	800	1045	133					
15	**BN 180L**	**6**	970	148	88	0.82	30	6.2	2.0	2.4	1550	130	**FD 09**	300	—	600	1750	170										
18.5	**BN 200LA**	**6**	960	184	88	0.81	37	5.9	2.0	2.3	1700	145	**FD 09**	400	—	450	1900	185										

8 P — 750 min^{-1} - S1 — 50 Hz

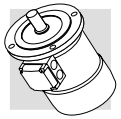
												freno c.c. / *d.c. brake* G.S.-bremse / *frein c.c.*						freno c.a. / *a.c. brake* W.S.-bremse / *frein c.a.*									
												FD						FA					BA				
Pn kW		n min^{-1}	Mn Nm	η %	cos φ	In [400V] A	Is/In	Ms/Mn	Ma/Mn	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb max Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg
0.09	**BN 71A 8**	680	1.26	47	0.59	0.47	2.3	2.4	2.3	10.9	6.7	**FD 03**	3.5	9000	16000	12.0	9.4	**FA 03**	3.5	16000	12.0	9.1	**BA 70**	8.0	14000	12.9	10.6
0.12	**BN 71B 8**	680	1.69	51	0.59	0.58	2.1	2.3	2.2	12.9	7.7	**FD 03**	5.0	9000	16000	14.0	10.4	**FA 03**	5.0	16000	14.0	10.1	**BA 70**	8.0	14000	14.9	11.6
0.18	**BN 80A 8**	690	2.49	51	0.60	0.85	2.4	2.2	2.2	15	8.2	**FD 04**	5.0	6500	11000	16.6	12.1	**FA 04**	5.0	11000	16.6	12.0	**BA 80**	18.0	10000	—	—
0.25	**BN 80B 8**	680	3.51	54	0.63	1.06	2.4	2.0	1.9	20	9.9	**FD 04**	10.0	6000	10000	22	13.8	**FA 04**	10.0	10000	23	13.7	**BA 80**	18.0	9500	24	15.2
0.37	**BN 90S 8**	675	5.2	58	0.60	1.53	2.6	2.3	2.1	26	12.6	**FD 14**	15.0	4800	7500	28	16.8	**FA 14**	15.0	7500	28	16.7	**BA 90**	35	6800	33	19.9
0.55	**BN 90L 8**	670	7.8	62	0.60	2.13	2.6	2.2	2.0	33	15	**FD 05**	26	4000	6400	37	21	**FA 05**	26	6400	37	22	**BA 90**	35	6000	40	22
0.75	**BN 100LA 8**	700	10.2	68	0.63	2.53	3.4	1.9	1.7	82	22	**FD 15**	26	2800	4800	86	28	**FA 15**	26	4800	86	29	**BA 100**	50	4500	94	32
1.1	**BN 100LB 8**	700	15.0	68	0.64	3.65	3.2	1.7	1.7	95	24	**FD 15**	40	2500	4000	99	30	**FA 15**	40	4000	99	31	**BA 100**	50	3700	107	34
1.5	**BN 112M 8**	710	20.2	71	0.66	4.6	3.7	1.8	1.9	168	32	**FD 06S**	60	—	3000	177	42	**FA 06S**	60	3000	177	44	**BA 110**	75	2700	184	45
2.2	**BN 132S 8**	710	29.6	75	0.66	6.4	3.8	1.8	2.0	295	45	**FD 56**	75	—	2300	305	58	**FA 06**	75	2300	305	56	**BA 140**	150	2000	345	77
3	**BN 132MA 8**	710	40.4	76	0.69	8.3	3.9	1.6	1.8	370	53	**FD 06**	100	—	1900	394	69	**FA 07**	100	1900	406	74	**BA 140**	150	1700	433	88



2/4 P

3000/1500 min^{-1} - S1

50 Hz



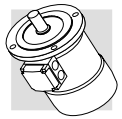
													freno c.c. / *d.c. brake* G.S.-bremse / *frein c.c.*						freno c.a. / *a.c. brake* W.S.-bremse / *frein c.a.*									
													FD						FA					BA				
Pn kW			n min^{-1}	Mn Nm	η %	cos φ	In [400V] A	Is/In	Ms/Mn	Ma/Mn	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb max Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg
0.20	**BN 63B**	**2**	2700	0.71	55	0.82	0.64	3.5	2.1	1.9	2.9	4.4	**FD 02**	3.5	2200	2600	3.5	6.1	**FA 02**	3.5	2600	3.5	5.9	**BA 60**	5	2000	4.9	6.7
0.15		**4**	1350	1.06	49	0.67	0.66	2.6	1.8	1.7					4000	5100					5100					4000		
0.28	**BN 71A**	**2**	2700	0.99	56	0.82	0.88	2.9	1.9	1.7	4.7	4.4	**FD 03**	3.5	2100	2400	5.8	7.1	**FA 03**	3.5	2400	5.8	6.8	**BA 70**	8	2100	5.6	8.3
0.20		**4**	1370	1.39	59	0.72	0.68	3.1	1.8	1.7					3800	4800					4800					4200		
0.37	**BN 71B**	**2**	2740	1.29	56	0.82	1.16	3.5	1.8	1.8	5.8	5.1	**FD 03**	5	1400	2100	6.9	7.8	**FA 03**	5	2100	6.9	7.5	**BA 70**	8	1800	7.8	9.0
0.25		**4**	1390	1.72	60	0.73	0.82	3.3	2.0	1.9					2900	4200					4200					3600		
0.45	**BN 71C**	**2**	2780	1.55	63	0.85	1.21	3.8	1.8	1.8	6.9	5.9	**FD 03**	5	1400	2100	8.0	8.6	**FA 03**	5	2100	8.0	8.3	**BA 70**	8	1800	8.9	9.8
0.30		**4**	1400	2.0	63	0.73	0.94	3.6	2.0	1.9					2900	4200					4200					3600		
0.55	**BN 80A**	**2**	2800	1.9	63	0.85	1.48	3.9	1.7	1.7	15	8.2	**FD 04**	5	1600	2300	16.6	12.1	**FA 04**	5	2300	16.6	12.0	**BA 80**	18	2100	18	13.5
0.37		**4**	1400	2.5	67	0.79	1.01	4.1	1.8	1.9					3000	4000					4000					3700		
0.75	**BN 80B**	**2**	2780	2.6	65	0.85	1.96	3.8	1.9	1.8	20	9.9	**FD 04**	10	1400	1600	22	13.8	**FA 04**	10	1600	22	13.7	**BA 80**	18	1500	22	15.2
0.55		**4**	1400	3.8	68	0.81	1.44	3.9	1.7	1.7					2700	3600					3600					3300		
1.1	**BN 90S**	**2**	2790	3.8	71	0.82	2.73	4.7	2.3	2.0	21	12.2	**FD 14**	10	1500	1600	23	16.4	**FA 14**	10	1600	23	16.3	**BA 90**	35	1300	28	19.5
0.75		**4**	1390	5.2	66	0.79	2.08	4.6	2.4	2.2					2300	2800					2800					2300		
1.5	**BN 90L**	**2**	2780	5.2	70	0.85	3.64	4.5	2.4	2.1	28	14.0	**FD 05**	26	1050	1200	32	20	**FA 05**	26	1200	32	21	**BA 90**	35	1100	35	21
1.1		**4**	1390	7.6	73	0.81	2.69	4.7	2.5	2.2					1600	2000					2000					1800		
2.2	**BN 100LA**	**2**	2800	7.5	72	0.85	5.2	4.5	2.0	1.9	40	18.3	**FD 15**	26	600	900	44	25	**FA 15**	26	900	44	25	**BA 100**	50	750	51	29
1.5		**4**	1410	10.2	73	0.79	3.8	4.7	2.0	2.0					1300	2300					2300					1900		
3.5	**BN 100LB**	**2**	2850	11.7	80	0.84	7.5	5.4	2.2	2.1	61	25	**FD 15**	40	500	900	65	31	**FA 15**	40	900	65	32	**BA 100**	50	750	72	35
2.5		**4**	1420	16.8	82	0.80	5.5	5.2	2.2	2.2					1000	2100					2100					1800		
4	**BN 112M**	**2**	2880	13.3	79	0.83	8.8	6.1	2.4	2.0	98	30	**FD 06S**	60	—	700	107	40	**FA 06S**	60	700	107	42	**BA 110**	75	600	114	43
3.3		**4**	1420	22.2	80	0.80	7.4	5.1	2.1	2.0					—	1200					1200					1100		
5.5	**BN 132S**	**2**	2890	18.2	80	0.87	11.4	5.9	2.4	2.0	213	44	**FD 56**	75	—	350	223	57	**FA 06**	75	350	223	58	**BA 140**	150	300	263	76
4.4		**4**	1440	29	82	0.84	9.2	5.3	2.2	2.0					—	900					900					750		
7.5	**BN 132MA**	**2**	2900	25	82	0.87	15.2	6.5	2.4	2.0	270	53	**FD 06**	100	—	350	280	66	**FA 07**	100	350	293	71	**BA 140**	150	300	320	85
6		**4**	1430	40	84	0.85	12.1	5.8	2.3	2.1					—	900					900					800		
9.2	**BN 132MB**	**2**	2920	30	83	0.86	18.6	6.0	2.6	2.2	319	59	**FD 07**	150	—	300	342	75	**FA 07**	150	300	342	77	**BA 140**	150	300	369	91
7.3		**4**	1440	48	85	0.85	14.6	5.5	2.3	2.1					—	800					800					750		

2/6 P

3000/1000 min^{-1} - S3 60/40%

50 Hz

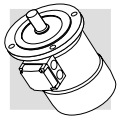
													freno c.c. / *d.c. brake* G.S.-bremse / *frein c.c.*						freno c.a. / *a.c. brake* W.S.-bremse / *frein c.a.*									
													FD						FA					BA				
Pn kW			n min^{-1}	Mn Nm	η %	cos φ	In [400V] A	Is/In	Ms/Mn	Ma/Mn	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb max Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg
0.25	**BN 71A**	**2**	2850	0.84	60	0.82	0.73	4.3	1.9	1.8	6.9	5.9	**FD 03**	1.75	1500	1700	8.0	8.6	**FA 03**	2.5	1700	8.0	8.3	**BA 70**	8	1500	8.9	9.8
0.08		**6**	910	0.84	43	0.70	0.38	2.1	1.4	1.5					10000	13000					13000					11000		
0.37	**BN 71B**	**2**	2880	1.23	62	0.80	1.08	4.4	1.9	1.8	9.1	7.3	**FD 03**	3.5	1000	1300	10.2	10.0	**FA 03**	3.5	1300	10.2	9.7	**BA 70**	8	1200	11.1	11.2
0.12		**6**	900	1.27	44	0.73	0.54	2.4	1.4	1.5					9000	11000					11000					10000		
0.55	**BN 80A**	**2**	2800	1.88	63	0.86	1.47	4.5	1.9	1.7	20	9.9	**FD 04**	5	1500	1800	22	13.8	**FA 04**	5	1800	22	13.7	**BA 80**	18	1700	23	15.2
0.18		**6**	930	1.85	52	0.65	0.77	3.3	2	1.9					4100	6300					6300					6000		
0.75	**BN 80B**	**2**	2800	2.6	66	0.87	1.89	4.3	1.8	1.6	25	11.3	**FD 04**	5	1700	1900	27	15.2	**FA 04**	5	1900	27	15.1	**BA 80**	18	1800	28	16.6
0.25		**6**	930	2.6	54	0.67	1.00	3.2	1.7	1.8					3800	6000					6000					5600		
1.1	**BN 90L**	**2**	2860	3.7	67	0.84	2.82	4.7	2.1	1.9	28	14.0	**FD 05**	13	1400	1600	32	20	**FA 05**	13	1600	32	21	**BA 90**	35	1500	35	21
0.37		**6**	920	3.8	59	0.71	1.27	3.3	1.6	1.6					3400	5200					5200					4700		
1.5	**BN 100LA**	**2**	2880	5.0	73	0.84	3.53	5.1	1.9	2.0	40	18.3	**FD 15**	13	1000	1200	44	24	**FA 15**	13	1200	44	25	**BA 100**	50	1050	51	29
0.55		**6**	940	5.6	64	0.67	1.85	3.5	1.7	1.8					2900	4000					4000					3500		
2.2	**BN 100LB**	**2**	2900	7.2	77	0.85	4.9	5.9	2.0	2.0	61	25	**FD 15**	26	700	900	65	31	**FA 15**	26	900	65	32	**BA 100**	50	800	72	36
0.75		**6**	950	7.5	67	0.64	2.5	3.3	1.9	1.8					2100	3000					3000					2700		
3	**BN 112M**	**2**	2900	9.9	78	0.87	6.4	6.3	2.0	2.1	98	30	**FD 06S**	40	—	1000	107	40	**FA 06S**	40	1000	107	32	**BA 110**	75	930	114	43
1.1		**6**	950	11.1	72	0.64	3.4	3.9	1.8	1.8					—	2600					2600					2400		
4.5	**BN 132S**	**2**	2910	14.8	78	0.84	9.9	5.8	1.9	1.8	213	44	**FD 56**	37	—	500	223	57	**FA 06**	37	500	223	58	**BA 140**	150	400	263	76
1.5		**6**	960	14.9	74	0.67	4.4	4.2	1.9	2.0					—	2100					2100					1700		
5.5	**BN 132M**	**2**	2920	18.0	78	0.87	11.7	6.2	2.1	1.9	270	53	**FD 56**	50	—	400	280	66	**FA 06**	50	400	280	67	**BA 140**	150	350	320	85
2.2		**6**	960	22	77	0.71	5.8	4.3	2.1	2.0					—	1900					1900					1600		



2/8 P

3000/750 min^{-1} - S3 60/40%

50 Hz



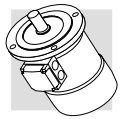
													freno c.c. / *d.c. brake* G.S.-bremse / *frein c.c.*						freno c.a. / *a.c. brake* W.S.-bremse / *frein c.a.*									
													FD						FA					BA				
Pn kW			n min^{-1}	Mn Nm	η %	cos φ	In [400V] A	Is/In	Ms/Mn	Ma/Mn	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb max Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg
0.25	**BN 71A**	**2**	2790	0.86	61	0.87	0.68	3.9	1.8	1.9	10.9	6.7	**FD 03**	1.75	1300	1400	12	9.4	**FA 03**	2.5	1400	12	9.1	**BA 70**	8	1300	12.9	10.6
0.06		**8**	680	0.84	31	0.61	0.46	2	1.8	1.9					10000	13000					13000					12000		
0.37	**BN 71B**	**2**	2800	1.26	63	0.86	0.99	3.9	1.8	1.9	12.9	7.7	**FD 03**	3.5	1200	1300	14	10.4	**FA 03**	3.5	1300	14	10.1	**BA 70**	8	1200	14.9	11.6
0.09		**8**	670	1.28	34	0.75	0.51	1.8	1.4	1.5					9500	13000					13000					12000		
0.55	**BN 80A**	**2**	2830	1.86	66	0.86	1.40	4.4	2.1	2.0	20	9.9	**FD 04**	5	1500	1800	22	13.8	**FA 04**	5	1800	22	13.7	**BA 80**	18	1700	23	15.2
0.13		**8**	690	1.80	41	0.64	0.72	2.3	1.6	1.7					5600	8000					8000					7500		
0.75	**BN 80B**	**2**	2800	2.6	68	0.88	1.81	4.6	2.1	2.0	25	11.3	**FD 04**	10	1700	1900	27	15.2	**FA 04**	10	1900	27	15.1	**BA 80**	18	1800	28	16.6
0.18		**8**	690	2.5	43	0.66	0.92	2.3	1.6	1.7					4800	7300					7300					7000		
1.1	**BN 90L**	**2**	2830	3.7	63	0.84	3.00	4.5	2.1	1.9	28	14	**FD 05**	13	1400	1600	32	20	**FA 05**	13	1600	32	21	**BA 90**	35	1400	35	21
0.28		**8**	690	3.9	48	0.63	1.34	2.4	1.8	1.9					3400	5100					5100					4500		
1.5	**BN 100LA**	**2**	2880	5.0	69	0.85	3.69	4.7	1.9	1.8	40	18.3	**FD 15**	13	1000	1200	44	25	**FA 15**	13	1200	44	25	**BA 100**	50	1000	52	29
0.37		**8**	690	5.1	46	0.63	1.84	2.1	1.6	1.6					3300	5000					5000					4200		
2.4	**BN 100LB**	**2**	2900	7.9	75	0.82	5.6	5.4	2.1	2.0	61	25	**FD 15**	26	550	700	65	31	**FA 15**	26	700	65	32	**BA 100**	50	600	72	36
0.55		**8**	700	7.5	54	0.58	2.5	2.6	1.8	1.8					2000	3500					3500					3100		
3	**BN 112M**	**2**	2900	9.9	76	0.87	6.5	6.3	2.1	1.9	98	30	**FD 06S**	40	—	900	107	40	**FA 06S**	40	900	107	42	**BA 110**	75	800	114	43
0.75		**8**	690	10.4	60	0.65	2.8	2.5	1.6	1.6					—	2900					2900					2700		
4	**BN 132S**	**2**	2870	13.3	73	0.84	9.4	5.6	2.3	2.4	213	44	**FD 56**	37	—	500	223	57	**FA 06**	37	500	223	58	**BA 140**	150	400	263	76
1		**8**	690	13.8	66	0.62	3.5	2.9	1.9	1.8					—	3500					3500					3000		
5.5	**BN 132M**	**2**	2870	18.3	75	0.84	12.6	6.1	2.4	2.5	270	53	**FD 06**	50	—	400	280	66	**FA 06**	50	400	280	67	**BA 140**	150	350	320	85
1.5		**8**	690	21	68	0.63	5.1	2.9	1.9	1.9					—	2400					2400					2100		

2/12 P

3000/500 min^{-1} - S3 60/40%

50 Hz

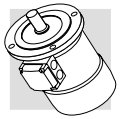
													freno c.c. / *d.c. brake* G.S.-bremse / *frein c.c.*						freno c.a. / *a.c. brake* W.S.-bremse / *frein c.a.*									
													FD						FA					BA				
Pn kW			n min^{-1}	Mn Nm	η %	cos φ	In [400V] A	Is/In	Ms/Mn	Ma/Mn	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb max Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg
0.55	**BN 80B**	**2**	2820	1.86	64	0.89	1.39	4.2	1.6	1.7	25	11.3	**FD 04**	5	1000	1300	27	15.2	**FA 04**	5	1300	27	15.1	**BA 80**	18	1200	28	16.6
0.09		**12**	430	2.0	30	0.63	0.69	1.8	1.9	1.8					8000	12000					12000					11000		
0.75	**BN 90L**	**2**	2790	2.6	56	0.89	2.17	4.2	1.8	1.7	26	12.6	**FD 05**	13	1000	1150	30	18.6	**FA 05**	13	1150	30	19.3	**BA 90**	35	1050	33	19.9
0.12		**12**	430	2.7	26	0.63	1.06	1.7	1.4	1.6					4600	6300					6300					5700		
1.1	**BN 100LA**	**2**	2850	3.7	65	0.85	2.87	4.5	1.6	1.8	40	18.3	**FD 15**	13	700	900	44	25	**FA 15**	13	900	44	25	**BA 100**	50	750	52	29
0.18		**12**	430	4.0	26	0.54	1.85	1.5	1.3	1.5					4000	6000					6000					5000		
1.5	**BN 100LB**	**2**	2900	4.9	67	0.86	3.76	5.6	1.9	1.9	54	22	**FD 15**	13	700	900	58	28	**FA 15**	13	900	58	29	**BA 100**	50	800	66	32
0.25		**12**	440	5.4	36	0.46	2.18	1.8	1.7	1.8					3800	5000					5000					4300		
2	**BN 112M**	**2**	2900	6.6	74	0.88	4.43	6.5	2.1	2	98	30	**FD 06S**	20	—	800	107	40	**FA 06S**	20	800	107	42	**BA 110**	75	750	114	43
0.3		**12**	460	6.2	46	0.43	2.19	2	2.1	2					—	3400					3400					3200		
3	**BN 132S**	**2**	2920	9.8	74	0.87	6.7	6.8	2.3	1.9	213	44	**FD 56**	37	—	450	223	57	**FA 06**	37	450	223	58	**BA 140**	150	380	263	76
0.5		**12**	470	10.2	51	0.43	3.3	2	1.7	1.6					—	3000					3000					2500		
4	**BN 132M**	**2**	2920	13.1	75	0.89	8.6	5.9	2.4	2.3	270	53	**FD 56**	37	—	400	280	66	**FA 06**	37	400	280	67	**BA 140**	150	350	320	85
0.7		**12**	460	14.5	53	0.44	4.3	1.9	1.7	1.6					—	2800					2800					2500		



4/6 P

1500/1000 min^{-1} - S1

50 Hz



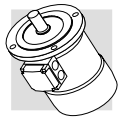
													freno c.c. / *d.c. brake* G.S.-bremse / *frein c.c.*						freno c.a. / *a.c. brake* W.S.-bremse / *frein c.a.*									
													FD						FA					BA				
Pn kW			n min^{-1}	Mn Nm	η %	cos φ	In [400V] A	Is/In	Ms/Mn	Ma/Mn	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h NB	Z_o 1/h SB	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg	Mod.	Mb max Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg
0.22	**BN 71B**	**4**	1410	1.5	64	0.74	0.67	3.9	1.8	1.9	9.1	7.3	**FD 03**	3.5	2500	3500	10.2	10	**FA 03**	3.5	3500	10.2	9.7	**BA 70**	8	3200	11.1	11.2
0.13		**6**	920	1.4	43	0.67	0.65	2.3	1.6	1.7					5000	9000					9000					8200		
0.30	**BN 80A**	**4**	1410	2.0	61	0.82	0.87	3.5	1.3	1.5	15	8.2	**FD 04**	5	2500	3100	16.6	12.1	**FA 04**	5	3100	16.6	12.0	**BA 80**	18	2800	18	13.5
0.20		**6**	930	2.1	54	0.66	0.81	3.2	1.9	2.0					4000	6000					6000					5500		
0.40	**BN 80B**	**4**	1430	2.7	63	0.75	1.22	3.9	1.8	1.8	20	9.9	**FD 04**	10	1800	2300	22	13.8	**FA 04**	10	2300	22	13.7	**BA 80**	18	2200	23	15.2
0.26		**6**	930	2.7	55	0.70	0.97	2.7	1.5	1.6					3600	5500					5500					5200		
0.55	**BN 90S**	**4**	1420	3.7	70	0.78	1.45	4.5	2.0	1.9	21	12.2	**FD 14**	10	1500	2100	23	16.1	**FA 14**	10	2100	23	16.3	**BA 90**	35	1700	28	19.5
0.33		**6**	930	3.4	62	0.70	1.10	3.7	2.3	2.0					2500	4100					4100					3300		
0.75	**BN 90L**	**4**	1420	5.0	74	0.78	1.88	4.3	1.9	1.8	28	14	**FD 05**	13	1400	2000	32	20	**FA 05**	13	2000	32	21	**BA 90**	35	1800	35	21
0.45		**6**	920	4.7	66	0.71	1.39	3.3	2.0	1.9					2300	3600					3600					3300		
1.1	**BN 100LA**	**4**	1450	7.2	74	0.79	2.72	5.0	1.7	1.9	82	22	**FD 15**	26	1400	2000	86	28	**FA 15**	26	2000	86	29	**BA 100**	50	1800	94	32
0.8		**6**	950	8.0	65	0.69	2.57	4.1	1.9	2.1					2100	3300					3300					3000		
1.5	**BN 100LB**	**4**	1450	9.9	75	0.79	3.65	5.1	1.7	1.9	95	25	**FD 15**	26	1300	1800	99	31	**FA 15**	26	1800	99	32	**BA 100**	50	1600	107	34
1.1		**6**	950	11.1	72	0.68	3.24	4.3	2.0	2.1					2000	3000					3000					2800		
2.3	**BN 112M**	**4**	1450	15.2	75	0.78	5.7	5.2	1.8	1.9	168	32	**FD 06S**	40	—	1600	177	42	**FA 06S**	40	1600	177	44	**BA 110**	75	1500	184	45
1.5		**6**	960	14.9	73	0.72	4.1	4.9	2.0	2.0					—	2400					2400					2300		
3.1	**BN 132S**	**4**	1460	20	83	0.83	6.5	5.9	2.1	2.0	213	44	**FD 56**	37	—	1200	223	57	**FA 06**	37	1200	223	58	**BA 140**	150	1000	263	76
2		**6**	960	20	77	0.75	4.9	4.5	2.1	2.1					—	1900					1900					1600		
4.2	**BN 132MA**	**4**	1460	27	84	0.82	8.8	5.9	2.1	2.2	270	53	**FD 06**	50	—	900	280	66	**FA 06**	50	900	280	67	**BA 140**	150	800	320	85
2.6		**6**	960	26	79	0.72	6.6	4.3	2.0	2.0					—	1500					1500					1300		

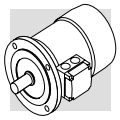
4/8 P

1500/750 min^{-1} - S1

50 Hz

Pn kW			n min^{-1}	Mn Nm	η %	cos φ	In [400V] A	Is/In	Ms/Mn	Ma/Mn	Jm x 10^{-4} kgm^2	IM B5 Kg	freno c.c. / *d.c. brake* G.S.-bremse / *frein c.c.* FD: Mod.	Mb Nm	Z_o 1/h		Jm x 10^{-4} kgm^2	IM B5 Kg	freno c.a. / *a.c. brake* W.S.-bremse / *frein c.a.* FA: Mod.	Mb Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg	BA: Mod.	Mb max Nm	Z_o 1/h	Jm x 10^{-4} kgm^2	IM B5 Kg
0.37	**BN 80A**	**4**	1400	2.5	63	0.82	1.03	3.3	1.4	1.4	15	8.2	**FD 04**	10	2300	3500	16.6	12.1	**FA 04**	10	3500	16.6	12.0	**BA 80**	18	3200	18	13.5
0.18		**8**	690	2.5	44	0.60	0.98	2.2	1.5	1.6					4500	7000					7000					6500		
0.55	**BN 80B**	**4**	1390	3.8	65	0.86	1.42	3.8	1.7	1.6	20	9.9	**FD 04**	10	2200	2900	22	13.8	**FA 04**	10	2900	22	13.7	**BA 80**	18	2500	23	15.2
0.30		**8**	670	4.3	49	0.65	1.36	2.3	1.7	1.8					4200	6500					6500					5600		
0.65	**BN 90S**	**4**	1390	4.5	73	0.85	1.51	4.0	1.9	1.9	28	13.6	**FD 14**	15	2300	2800	30	17.8	**FA 14**	15	2800	30	17.7	**BA 90**	35	2400	35	21
0.35		**8**	690	4.8	49	0.57	1.81	2.5	2.1	2.2					3500	6000					6000					5100		
0.9	**BN 90L**	**4**	1370	6.3	73	0.87	2.05	3.8	1.8	1.8	30	15.1	**FD 05**	26	1700	2100	34	21	**FA 05**	26	2100	34	22	**BA 90**	35	1900	37	22
0.5		**8**	670	7.1	57	0.62	2.04	2.4	2.1	2					2500	4200					4200					3800		
1.3	**BN 100LA**	**4**	1420	8.7	72	0.83	3.14	4.3	1.7	1.8	82	22	**FD 15**	40	1300	1700	86	28	**FA 15**	40	1700	86	29	**BA 100**	50	1500	94	32
0.7		**8**	700	9.6	58	0.64	2.72	2.8	1.8	1.8					2000	3400					3400					3100		
1.8	**BN 100LB**	**4**	1420	12.1	69	0.87	4.3	4.2	1.6	1.7	95	25	**FD 15**	40	1200	1700	99	31	**FA 15**	40	1700	99	32	**BA 100**	50	1500	107	34
0.9		**8**	700	12.3	62	0.63	3.3	3.2	1.7	1.8					1600	2600					2600					2400		
2.2	**BN 112M**	**4**	1440	14.6	77	0.85	4.9	5.3	1.8	1.8	168	32	**FD 06S**	60	—	1200	177	42	**FA 06S**	60	1200	177	43	**BA 110**	75	1100	184	45
1.2		**8**	710	16.1	70	0.63	3.9	3.3	1.9	1.8					—	2000					2000					1900		
3.6	**BN 132S**	**4**	1440	24	80	0.82	7.9	6.5	2.1	1.9	295	45	**FD 56**	75	—	1000	305	58	**FA 06**	75	1000	305	59	**BA 140**	150	900	345	77
1.8		**8**	720	24	72	0.55	6.6	4.6	1.9	2					—	1400					1400					1200		
4.6	**BN 132M**	**4**	1450	30	81	0.83	9.9	6.5	2.2	1.9	383	56	**FD 06**	100	—	1000	393	69	**FA 07**	100	1000	406	74	**BA 140**	150	900	433	88
2.3		**8**	720	31	73	0.54	8.4	4.4	2.3	2					—	1300					1300					1200		





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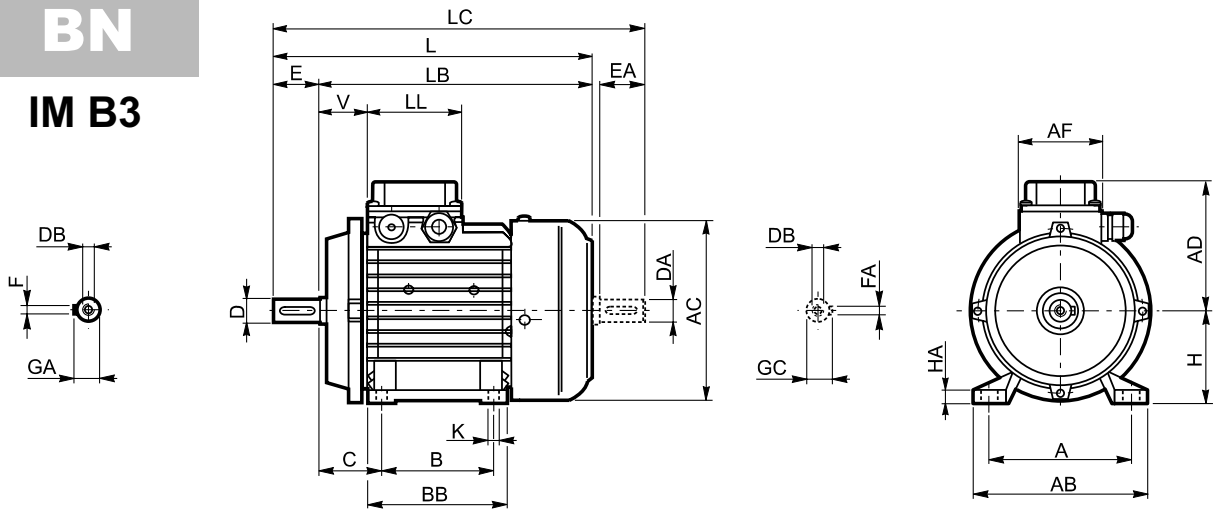
IM B3



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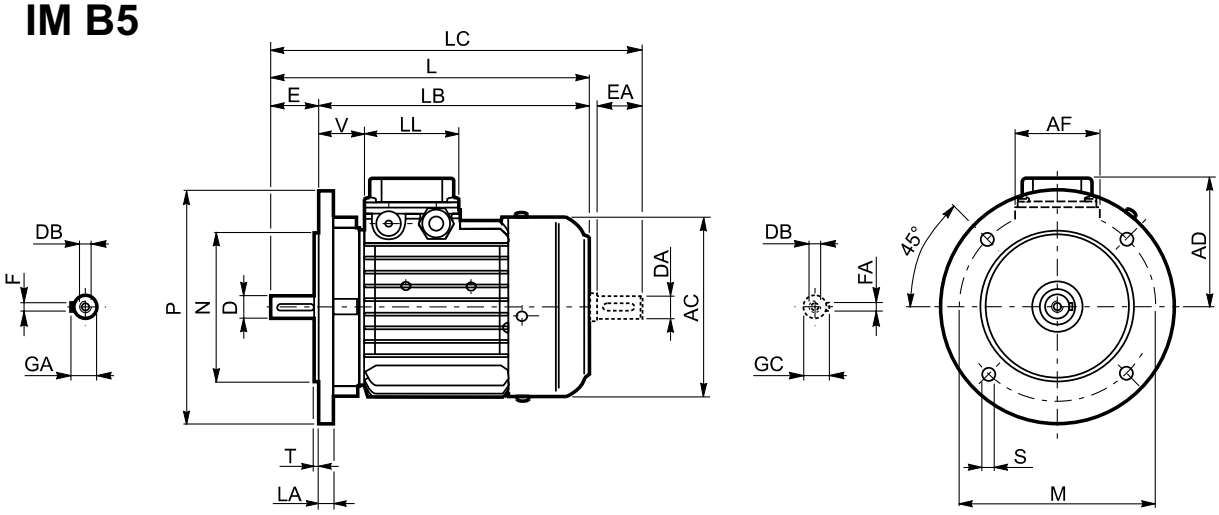

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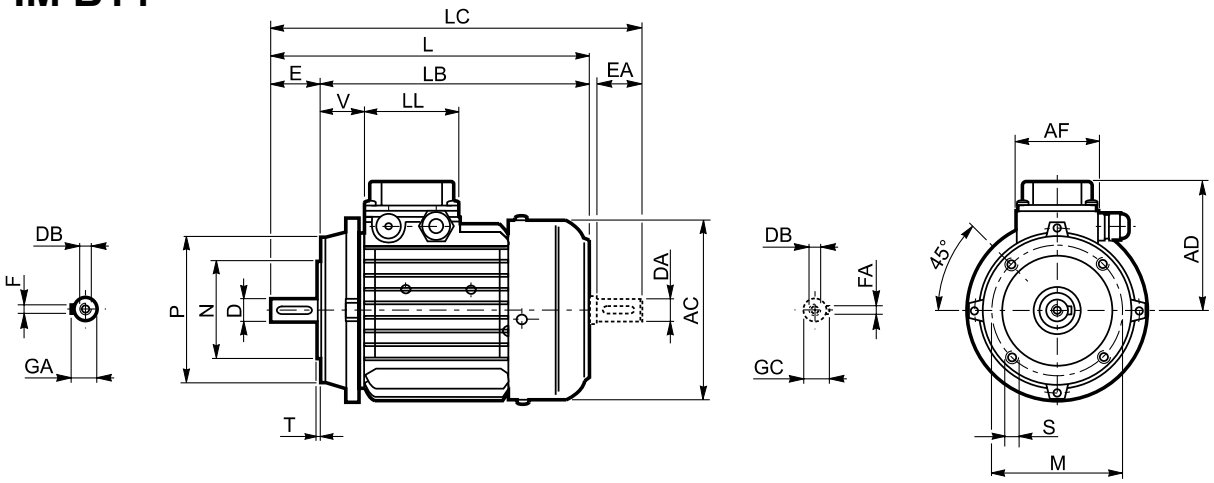
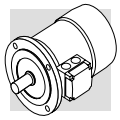




M29 - DIMENSIONI ***M29- DIMENSIONS*** **M29 - ABMESSUNGEN** ***M29 - DIMENSIONS***

BN (IM B3)	Albero / *Shaft* / Welle / *Arbre*					Cassa / *Frame* / Gehäuse / *Carcasse*						Motore / *Motor* / Motor / *Moteur*									
	D DA	E EA	DB	GA GC	F FA	B	A	HA	BB	AB	K	C	H	AC	L	LB	LC	AD	AF	LL	V
BN 63	11	23	M4	12.5	4	80	100	7	96	120	7	40	63	121	212	189	237	92	74	80	30
BN 71	14	30	M5	16	5	90	112	8	112	135	7	45	71	138	249	219	281	105	74	80	35
BN 80	19	40	M6	21.5	6	100	125	9.5	124	153	10	50	80	156	273	233	315	115	74	80	38
BN 90S	24	50	M8	27	8	100	140	13	130	174	10	56	90	176	302	252	354	133	98	98	44
BN 90L	24	50	M8	27	8	125	140	13	155	174	10	56	90	176	326	276	379	133	98	98	44
BN 100	28	60	M10	31	8	140	160	14	175	192	12	63	100	195	366	306	429	142	98	98	50
BN 112	28	60	M10	31	8	140	190	14	175	224	12	70	112	219	385	325	448	157	98	98	52
BN 132S	38	80	M12	41	10	140	216	16	180	260	12	89	132	258	455	375	538	193	118	118	58
BN 132M	38	80	M12	41	10	178	216	16	218	260	12	89	132	258	493	413	576	193	118	118	58

BN (IM B5)	Albero / *Shaft* / Welle / *Arbre*					Flangia / *Flange* / Flansch / *Bride*						Motore / *Motor* / Motor / *Moteur*							
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V
BN 56	9	20	M3	10.2	3	100	80	120	7	3	8	110	185	165	207	91	74	80	34
BN 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	207	184	232	95	74	80	26
BN 71	14	30	M5	16	5	130	110	160	9.5	3.5	10	138	249	219	281	108	74	80	37
BN 80	19	40	M6	21.5	6	165	130	200	11.5	3.5	11.5	156	274	234	315	119	74	80	38
BN 90	24	50	M8	27	8	165	130	200	11.5	3.5	11.5	176	326	276	378	133	98	98	44
BN 100	28	60	M10	31	8	215	180	250	14	4	14	195	367	307	429	142	98	98	50
BN 112	28	60	M10	31	8	215	180	250	14	4	15	219	385	325	448	157	98	98	52
BN 132	38	80	M12	41	10	265	230	300	14	4	20	258	493	413	576	193	118	118	58
BN 160 MR	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350	18.5	5	15	258	562	452	645	193	118	118	218
BN 160 M	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350	18.5	5	15	310	596	486	680	245	187	187	51
BN 160 L	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350	18.5	5	15	310	596	486	680	245	187	187	51
BN 180 M	48 38 (1)	110 80 (1)	M16 M12 (1)	51.5 41 (1)	14 10 (1)	300	250	350	18.5	5	15	310	640	530	724	245	187	187	51
BN 180 L	48 42 (1)	110 110 (1)	M16 M16 (1)	51.5 45 (1)	14 12 (1)	300	250	350	18.5	5	18	348	708	598	823	261	187	187	52
BN 200 L	55 42 (1)	110 110 (1)	M20 M16 (1)	59 45 (1)	16 12 (1)	350	300	400	18.5	5	18	348	722	612	837	261	187	187	66

BN (IM B14)	Albero / *Shaft* / Welle / *Arbre*					Flangia / *Flange* / Flansch / *Bride*					Motore / *Motor* / Motor / *Moteur*							
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	AC	L	LB	LC	AD	AF	LL	V
BN 56	9	20	M3	10.2	3	65	50	80	M5	2.5	110	185	165	207	91	74	80	34
BN 63	11	23	M4	12.5	4	75	60	90	M5	2.5	121	207	184	232	95	74	80	26
BN 71	14	30	M5	16	5	85	70	105	M6	2.5	138	249	219	281	108	74	80	37
BN 80	19	40	M6	21.5	6	100	80	120	M6	3	156	274	234	315	119	74	80	38
BN 90	24	50	M8	27	8	115	95	140	M8	3	176	326	276	378	133	98	98	44
BN 100	28	60	M10	31	8	130	110	160	M8	3.5	195	366	306	429	142	98	98	50
BN 112	28	60	M10	31	8	130	110	160	M8	3.5	219	385	325	448	157	98	98	52
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	493	413	576	193	118	118	58

N.B.:

1) Queste dimensioni sono riferi te alla seconda estremità d'albero

NOTE:

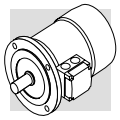
1) These values refer to the rear shaft end.

HINWEIS:

1) Diese Maße betreffen das zweite Wellenende.

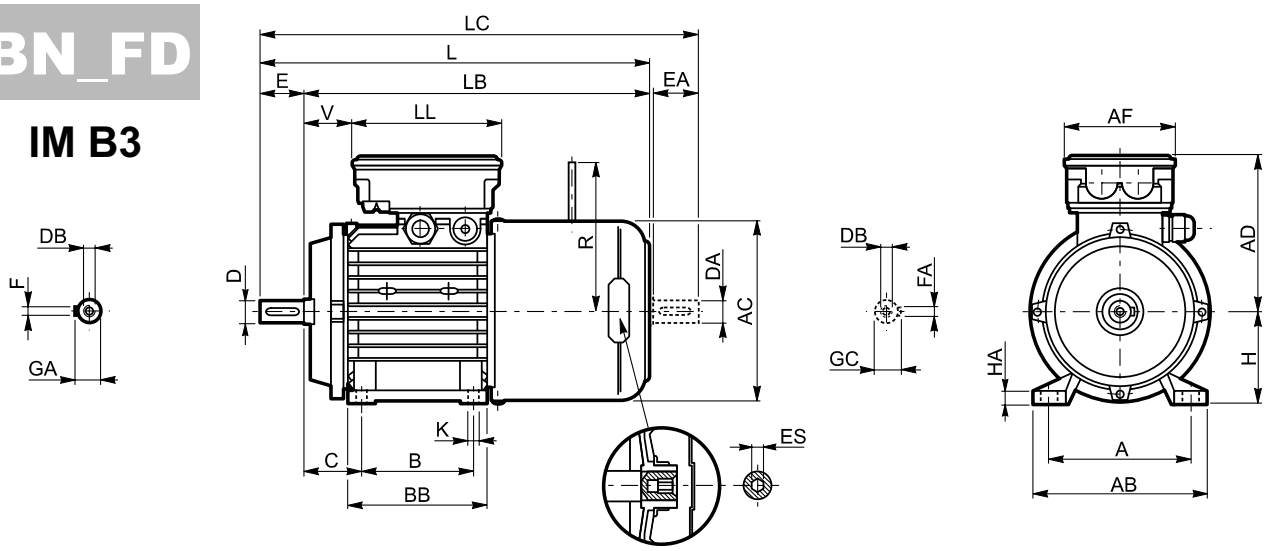
REMARQUE :

1) Ces dimensions se réfèrent à la deuxième extrémité de l'arbre.

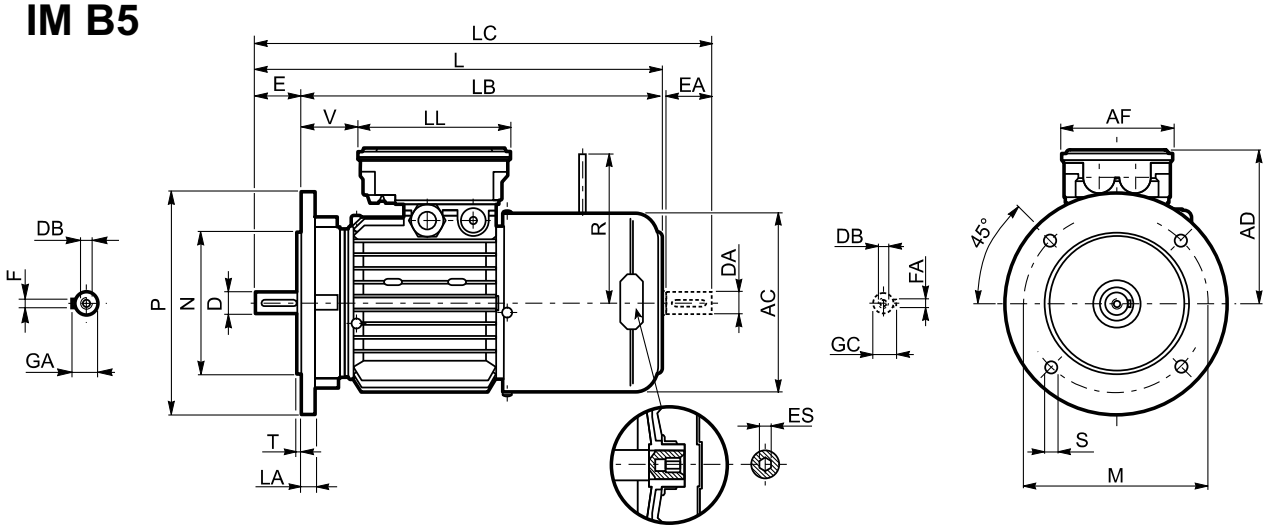


BN_FD

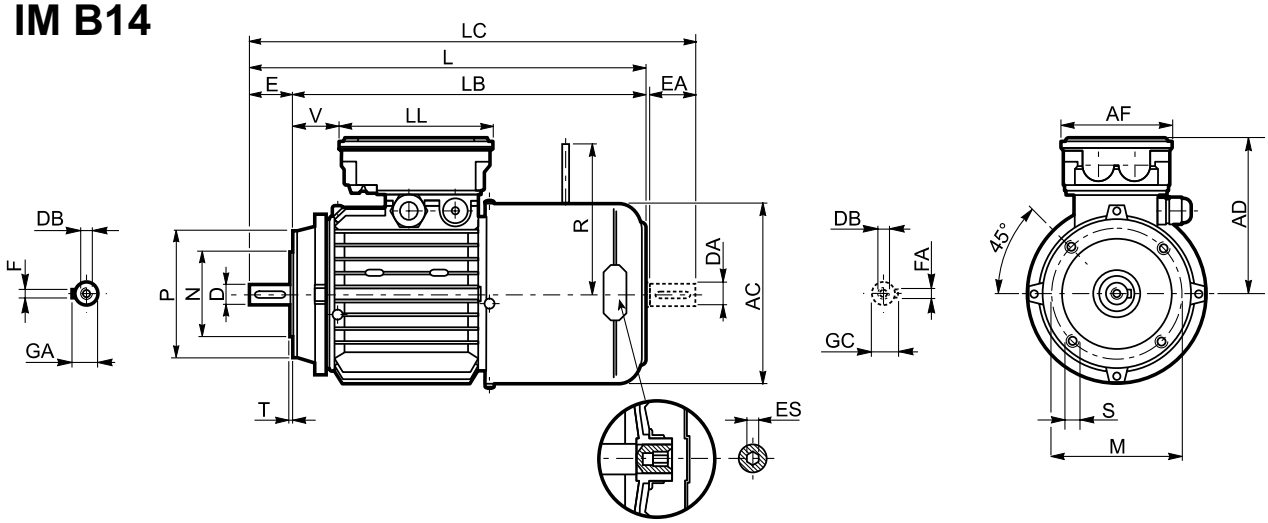
IM B3

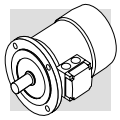


IM B5



IM B14





BN_FD (IM B3)	Albero / *Shaft* / Welle / *Arbre*					Cassa / *Frame* / Gehäuse / *Carcasse*						Motore / *Motor* / Motor / *Moteur*											
	D DA	E EA	DB	GA GC	F FA	B	A	HA	BB	AB	K	C	H	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	80	100	7	96	120	7	40	63	121	269	246	294	119	98	133	51	96	5
BN 71	14	30	M5	16	5	90	112	8	112	135	7	45	71	138	310	280	342	132	98	133	25	103	5
BN 80	19	40	M6	21.5	6	100	125	9.5	124	153	10	50	80	156	346	306	388	143	98	133	41	129	5
BN 90S	24	50	M8	27	8	100	140	13	130	174	10	56	90	176	385	335	437	146	110	165	15	129	6
BN 90L	24	50	M8	27	8	125	140	13	155	174	10	56	90	176	409	359	461	146	110	165	39	160	6
BN 100	28	60	M10	31	8	140	160	14	175	192	12	63	100	195	458	398	521	155	110	165	62	160	6
BN 112	28	60	M10	31	8	140	190	14	175	224	12	70	112	219	484	424	547	170	110	165	73	199	6
BN 132S	38	80	M12	41	10	140	216	16	180	260	12	89	132	258	565	485	648	193	118	118	142	204 (2)	6
BN 132M	38	80	M12	41	10	178	216	16	218	260	12	89	132	258	603	523	686	193	118	118	180	204 (2)	6

BN_FD (IM B5)	Albero / *Shaft* / Welle / *Arbre*					Flangia / *Flange* / Flansch / *Bride*						Motore / *Motor* / Motor / *Moteur*									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	272	249	297	119	98	133	14	96	5
BN 71	14	30	M5	16	5	130	110	160	9.5	3.5	10	138	310	280	342	132	98	133	25	103	5
BN 80	19	40	M6	21.5	6	165	130	200	11.5	3.5	11.5	156	346	306	388	143	98	133	41	129	5
BN 90	24	50	M8	27	8	165	130	200	11.5	3.5	11.5	176	409	359	461	146	110	165	39	160	6
BN 100	28	60	M10	31	8	215	180	250	14	4	14	195	458	398	521	155	110	165	62	160	6
BN 112	28	60	M10	31	8	215	180	250	14	4	15	219	484	424	547	170	110	165	73	199	6
BN 132	38	80	M12	41	10	265	230	300	14	4	16	258	603	523	686	193	118	118	180	204 (2)	6
BN 160 MR	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350	18.5	5	15	258	672	562	755	193	118	118	218	226	6
BN 160 M	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350	18.5	5	15	310	736	626	820	245	187	187	51	266	—
BN 160 L	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350	18.5	5	15	310	736	626	820	245	187	187	51	266	—
BN 180 M	48 38 (1)	110 80 (1)	M16 M12 (1)	51.5 41 (1)	14 10 (1)	300	250	350	18.5	5	15	310	780	670	864	245	187	187	51	266	—
BN 180 L	48 42 (1)	110 110 (1)	M16 M16 (1)	51.5 45 (1)	14 12 (1)	300	250	350	18.5	5	18	348	866	756	981	261	187	187	52	305	—
BN 200 L	55 42 (1)	110 110 (1)	M20 M16 (1)	59 45 (1)	16 12 (1)	350	300	400	18.5	5	18	348	878	768	993	261	187	187	64	305	—

BN_FD (IM B14)	Albero / *Shaft* / Welle / *Arbre*					Flangia / *Flange* / Flansch / *Bride*					Motore / *Motor* / Motor / *Moteur*									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	75	60	90	M5	2.5	121	272	249	297	119	98	133	14	96	5
BN 71	14	30	M5	16	5	85	70	105	M6	2.5	138	310	280	342	132	98	133	25	103	5
BN 80	19	40	M6	21.5	6	100	80	120	M6	3	156	346	306	388	143	98	133	41	129	5
BN 90	24	50	M8	27	8	115	95	140	M8	3	176	409	359	461	146	110	165	39	160	6
BN 100	28	60	M10	31	8	130	110	160	M8	3.5	195	458	398	521	155	110	165	62	160	6
BN 112	28	60	M10	31	8	130	110	160	M8	3.5	219	484	424	547	170	110	165	73	199	6
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	603	523	686	193	118	118	180	204 (2)	6

N.B.:

1) Queste dimensioni sono riferite alla seconda estremità d'albero.
2) Per freno FD07 quota R=226

L'esagono ES non è presente con l'opzione PS

NOTE:

1) These values refer to the rear shaft end.
2) For FD07 brake value R=226

ES hexagon is not supplied with PS option

HINWEIS:

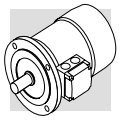
1) Diese Maße betreffen das zweite Wellenende
2) Für Bremse FD07, Maß R=226

Der Sechskant ES ist bei der Option PS nicht vorhanden.

REMARQUE :

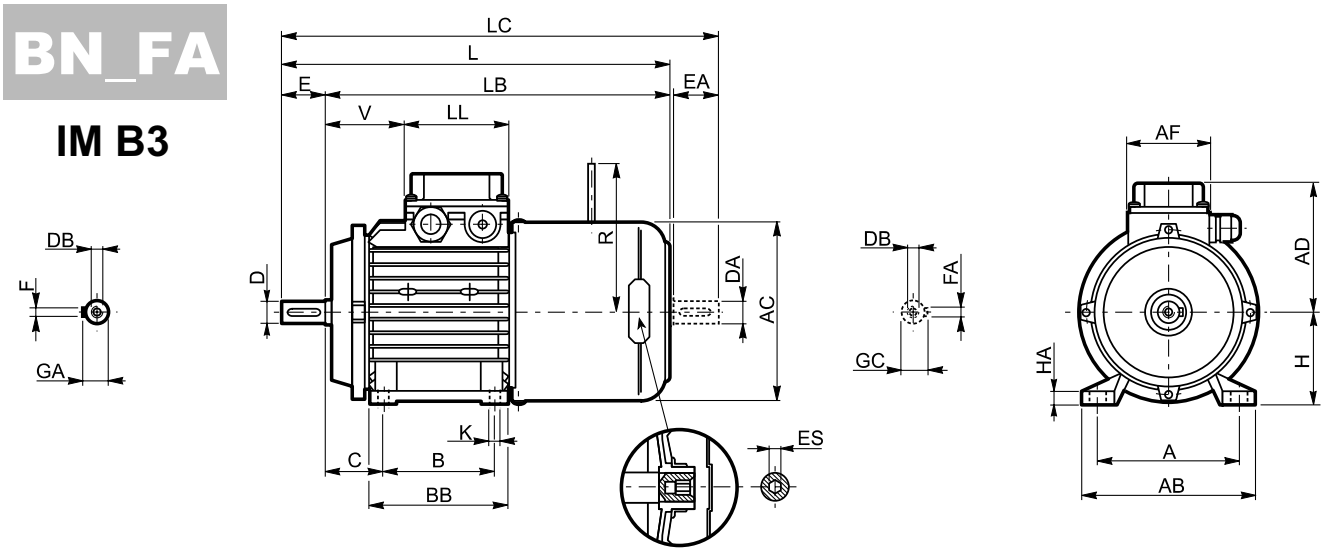
1) Ces dimensions se réfèrent à la deuxième extrémité de l'arbre
2) Pour frein FD07 valeur R=226

L'hexagone ES n'est pas disponible avec l'option PS

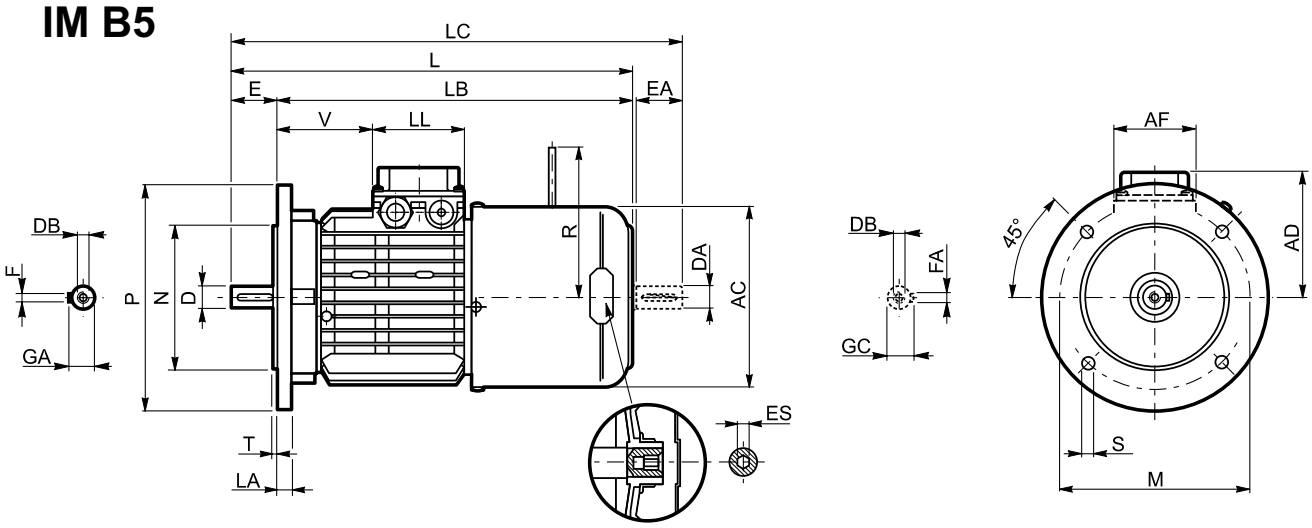


BN_FA

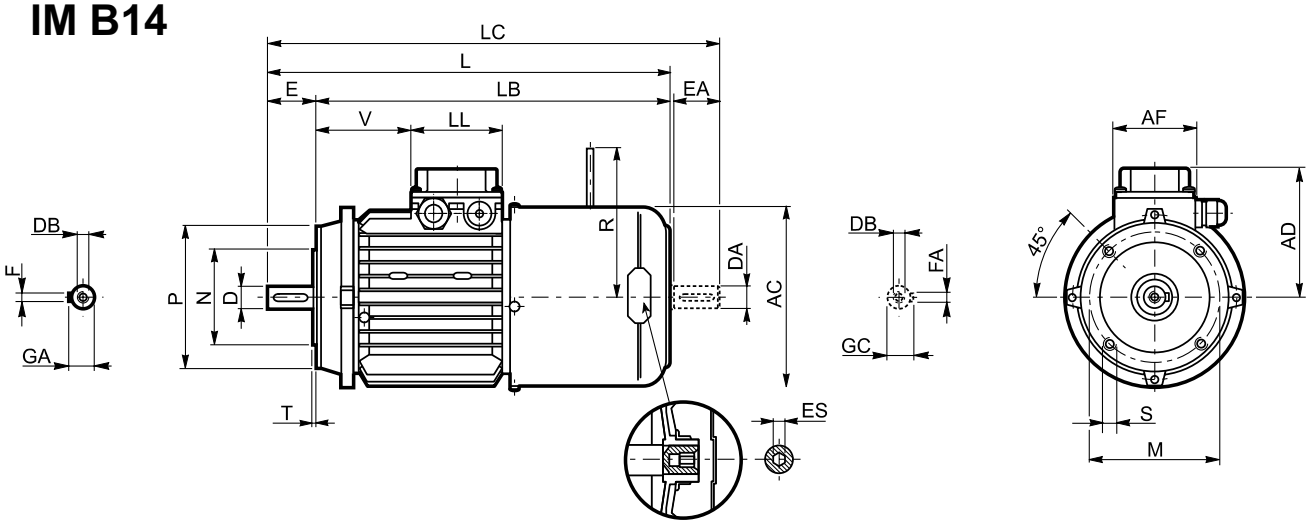
IM B3

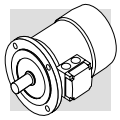


IM B5



IM B14





BN_FA (IM B3)	Albero / *Shaft* / Welle / *Arbre*					Cassa / *Frame* / Gehäuse / *Carcasse*						Motore / *Motor* / Motor / *Moteur*											
	D DA	E EA	DB	GA GC	F FA	B	A	HA	BB	AB	K	C	H	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	80	100	7	96	120	7	40	63	121	269	246	294	92	74	80	51	116	5
BN 71	14	30	M5	16	5	90	112	8	112	135	7	45	71	138	310	280	342	105	74	80	68	124	5
BN 80	19	40	M6	21.5	6	100	125	9.5	124	153	10	50	80	156	346	306	388	115	74	80	83	134	5
BN 90S	24	50	M8	27	8	100	140	13	130	174	10	56	90	176	385	335	437	133	98	98	71	134	6
BN 90L	24	50	M8	27	8	125	140	13	155	174	10	56	90	176	409	359	461	133	98	98	95	160	6
BN 100	28	60	M10	31	8	140	160	14	175	192	12	63	100	195	458	398	521	142	98	98	119	160	6
BN 112	28	60	M10	31	8	140	190	14	175	224	12	70	112	219	484	424	547	157	98	98	142	198	6
BN 132S	38	80	M12	41	10	140	216	16	180	260	12	89	132	258	565	485	648	193	118	118	180	200 (2)	6
BN 132M	38	80	M12	41	10	178	216	16	218	260	12	89	132	258	603	523	686	193	118	118	180	200 (2)	6

BN_FA (IM B5)	Albero / *Shaft* / Welle / *Arbre*					Flangia / *Flange* / Flansch / *Bride*						Motore / *Motor* / Motor / *Moteur*									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	115	95	140	9.5	3	10	121	272	249	297	95	74	80	26	116	5
BN 71	14	30	M5	16	5	130	110	160	9.5	3.5	10	138	310	280	342	108	74	80	68	124	5
BN 80	19	40	M6	21.5	6	165	130	200	11.5	3.5	11.5	156	346	306	388	119	74	80	83	134	5
BN 90	24	50	M8	27	8	165	130	200	11.5	3.5	11.5	176	409	359	461	133	98	98	95	160	6
BN 100	28	60	M10	31	8	215	180	250	14	4	14	195	458	398	521	142	98	98	119	160	6
BN 112	28	60	M10	31	8	215	180	250	14	4	15	219	484	424	547	157	98	98	128	198	6
BN 132	38	80	M12	41	10	265	230	300	14	4	16	258	603	523	686	193	118	118	180	200 (2)	6
BN 160 MR	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350	18.5	5	15	258	672	562	755	193	118	118	218	217	6
BN 160 M	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350	18.5	5	15	310	736	626	820	245	187	187	51	247	—
BN 160 L	42 38 (1)	110 80 (1)	M16 M12 (1)	45 41 (1)	12 10 (1)	300	250	350	18.5	5	15	310	736	626	820	245	187	187	51	247	—
BN 180 M	48 38 (1)	110 80 (1)	M16 M12 (1)	51.5 41 (1)	14 10 (1)	300	250	350	18.5	5	15	310	780	670	864	245	187	187	51	247	—

BN_FA (IM B14)	Albero / *Shaft* / Welle / *Arbre*					Flangia / *Flange* / Flansch / *Bride*					Motore / *Motor* / Motor / *Moteur*									
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	AC	L	LB	LC	AD	AF	LL	V	R	ES
BN 63	11	23	M4	12.5	4	75	60	90	M5	2.5	121	272	249	119	95	74	80	26	116	5
BN 71	14	30	M5	16	5	85	70	105	M6	2.5	138	310	280	342	108	74	80	68	124	5
BN 80	19	40	M6	21.5	6	100	80	120	M6	3	156	346	306	388	119	74	80	83	134	5
BN 90	24	50	M8	27	8	115	95	140	M8	3	176	409	359	461	133	98	98	95	160	6
BN 100	28	60	M10	31	8	130	110	160	M8	3.5	195	458	398	521	142	98	98	119	160	6
BN 112	28	60	M10	31	8	130	110	160	M8	3.5	219	484	424	547	157	98	98	128	198	6
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	603	523	686	193	118	118	180	200 (2)	6

N.B.:

1) Queste dimensioni sono riferite alla seconda estremità d'albero.

2) Per freno FD07 quota R=226

Le dimensioni AD, AF, LL e V relative alla scatola morsettiera dei motori BN...FA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori BN...FD di pari taglia.

L'esagono ES non è presente con l'opzione PS.

NOTE:

1) These values refer to the rear shaft end.

2) For FD07 brake value R=226

FDimensions AD, AF, LL and V, relevant to terminal box of motors BN…FA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size BN…FD motors.

ES hexagon is not supplied with PS option.

HINWEIS:

1) Diese Maße betreffen das zweite Wellenende

2) Für Bremse FD07, Maß R=226

Die Abmessungen des Klemmenkastens der Motoren BN ... FA AD, AF, LL und V in bezug auf die separate Spannungsversorgung (Option SA) stimmen mit den Abmessungen der entsprechenden Motoren BN...FD überein.

Der Sechskant ES ist bei der Option PS nicht vorhanden.

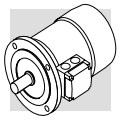
REMARQUE :

1) Ces dimensions se réfèrent à la deuxième extrémité de l'arbre

2) Pour frein FD07 valeur R=226

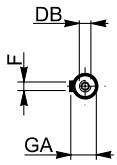
Les dimensions AD, AF, LL et V relatives à la boite à borne des moteurs BN…FA équipés d'alimentation séparée du frein (option SA) sont identiques à celles des moteurs BN…FD de la même taille.

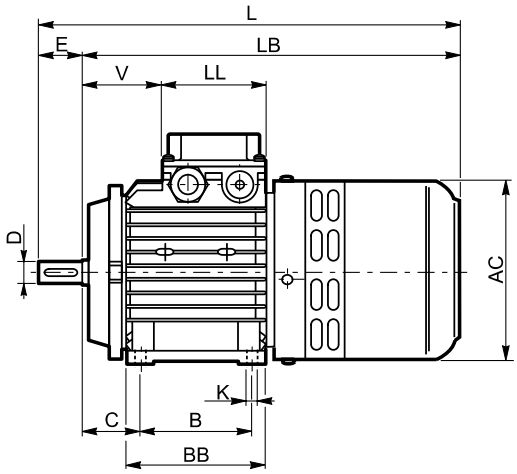
L'hexagone ES n'est pas disponible avec l'option PS.

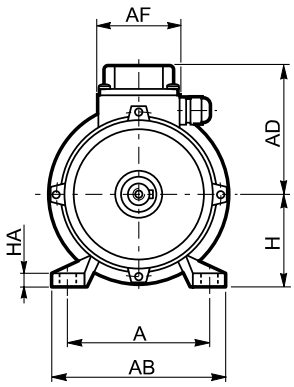


BN_BA

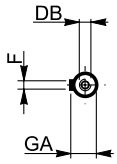
IM B3

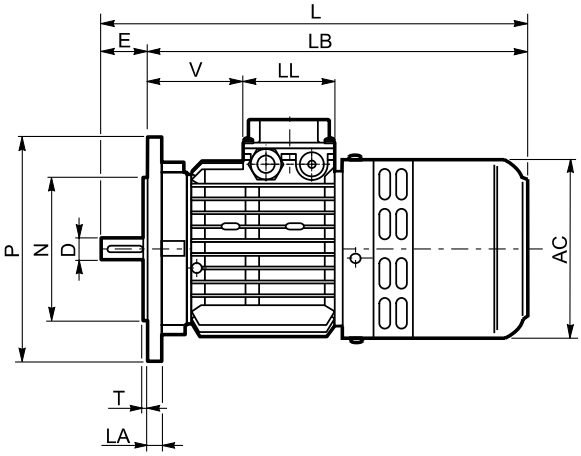


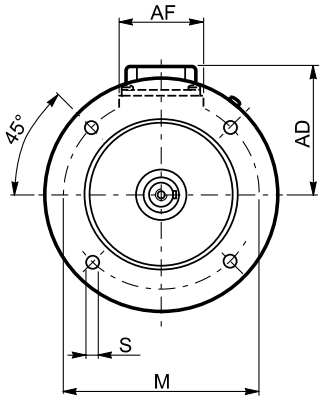




IM B5







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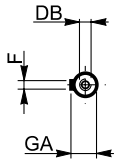
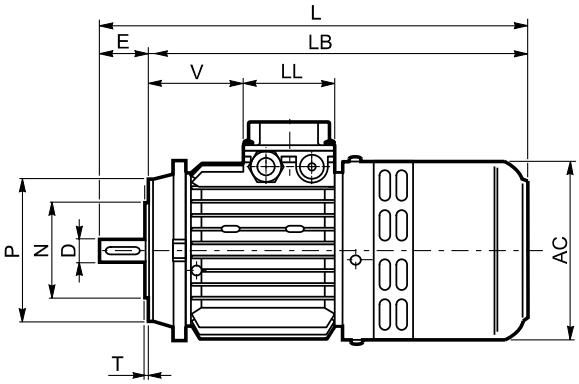
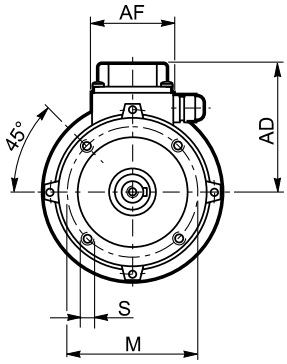
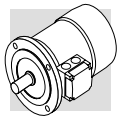








BN_BA (IM B3)	Albero / *Shaft* / Welle / *Arbre*					Cassa / *Frame* / Gehäuse / *Carcasse*						Motore / *Motor* / Motor / *Moteur*									
	D DA	E EA	DB	GA GC	F FA	B	A	HA	BB	AB	K	C	H	AC	L	LB	LC	AD	AF	LL	V
BN 71	14	30	M5	16	5	90	112	8	112	135	7	45	71	138	327	298	342	108	74	80	68
BN 80	19	40	M6	21.5	6	100	125	9.5	124	153	10	50	80	156	372	332	388	119	74	80	83
BN 90S	24	50	M8	27	8	100	140	13	130	174	10	56	90	176	400	350	437	133	98	98	71
BN 90L	24	50	M8	27	8	125	140	13	155	174	10	56	90	176	425	375	461	133	98	98	95
BN 100	28	60	M10	31	8	140	160	14	175	192	12	63	100	195	477	417	521	142	98	98	119
BN 112	28	60	M10	31	8	140	190	14	175	224	12	70	112	219	500	440	547	157	98	98	128
BN 132S	38	80	M12	41	10	140	216	16	180	260	12	89	132	258	600	520	648	193	118	118	142
BN 132M	38	80	M12	41	10	178	216	16	218	260	12	89	132	258	638	558	686	193	118	118	180

BN_BA (IM B5)	Albero / *Shaft* / Welle / *Arbre*					Flangia / *Flange* / Flansch / *Bride*						Motore / *Motor* / Motor / *Moteur*						
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	LA	AC	L	LB	AD	AF	LL	V
BN63	11	23	M4	12.5	4	115	95	140	9.5	3	10	124	298	275	95	74	80	28
BN 71	14	30	M5	16	5	130	110	160	9.5	3.5	10	138	327	297	108	74	80	68
BN 80	19	40	M6	21.5	6	165	130	200	11.5	3.5	11.5	156	372	332	119	74	80	83
BN 90	24	50	M8	27	8	165	130	200	11.5	3.5	11.5	176	425	375	133	98	98	95
BN 100	28	60	M10	31	8	215	180	250	14	4	14	195	477	417	142	98	98	119
BN 112	28	60	M10	31	8	215	180	250	14	4	15	219	500	440	157	98	98	128
BN 132	38	80	M12	41	10	265	230	300	14	4	16	258	638	558	193	118	118	180

BN_BA (IM B14)	Albero / *Shaft* / Welle / *Arbre*					Flangia / *Flange* / Flansch / *Bride*					Motore / *Motor* / Motor / *Moteur*						
	D DA	E EA	DB	GA GC	F FA	M	N	P	S	T	AC	L	LB	AD	AF	LL	V
BN 63	11	23	M4	12.5	4	75	60	90	M5	2.5	124	298	275	95	74	80	28
BN 71	14	30	M5	16	5	85	70	105	M6	2.5	138	327	297	108	74	80	68
BN 80	19	40	M6	21.5	6	100	80	120	M6	3	156	372	332	119	74	80	83
BN 90	24	50	M8	27	8	115	95	140	M8	3	176	425	375	133	98	98	95
BN 100	28	60	M10	31	8	130	110	160	M8	3.5	195	477	417	142	98	98	119
BN 112	28	60	M10	31	8	130	110	160	M8	3.5	219	500	440	157	98	98	128
BN 132	38	80	M12	41	10	165	130	200	M10	4	258	638	558	193	118	118	180

N.B.:

Le dimensioni AD, AF, LL e V relative alla scatola morsettiera dei motori BN...BA dotati di alimentazione separata del freno (opzione SA) coincidono con quelle dei motori BN...FD di pari taglia.

NOTE:

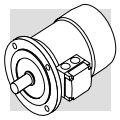
Dimensions AD, AF, LL and V, relevant to terminal box of motors BN…BA featuring the separate brake supply (option SA), are coincident with corresponding dimensions of same-size BN…FD motors

HINWEIS:

Die Abmessungen des Klemmenkastens der Motoren BN ... BA AD, AF, LL und V in bezug auf die separate Spannungsversorgung (Option SA) stimmen mit den Abmessungen der entsprechenden Motoren BN...FD überein.

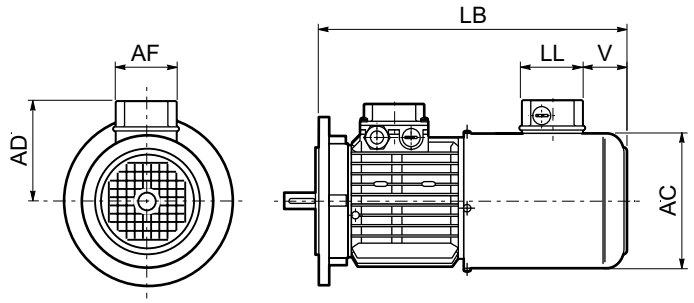
REMARQUE :

Les dimensions AD, AF, LL et V relatives à la boite à borne des moteurs BN…BA équipés d'alimentation séparée du frein (option SA) sont identiques à celles des moteurs BN…FD de la même taille.

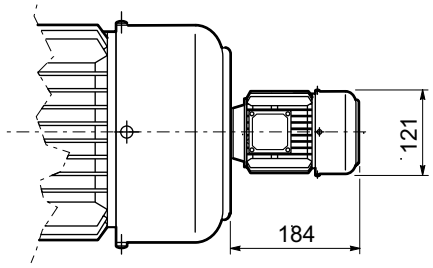


U1 BN, BN_FD, BN_FA

BN71…BN160MR



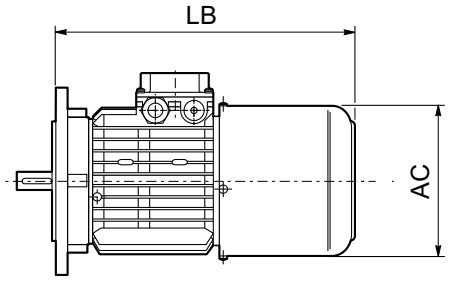
BN160…BN200L



	LB	AC	AD	AF	LL	V
BN71	312	138	112	70	70	36
BN80	361	156	120	70	70	40
BN90S / BN90L	407	176	131	70	70	45
BN100	426	195	145	90	90	40
BN112	455	219	155	70	70	55
BN132	574	258	174	70	70	87
BN160MR	613	258	174	70	70	87

U2 BN, BN_FD, BN_FA

BN71…BN160MR



	LB	AC
BN71	312	138
BN80	361	156
BN90S / BN90L	407	176
BN100	426	195
BN112	455	219
BN132	574	258
BN160MR	613	258

R6				
	Descrizione	***Description***	**Beschreibung**	***Description***
300	Aggiunta della Certificazione UL alla preesistente CSA - opzione CUS	*UL certification adds up to former CSA - option CUS*	UL Zertifikat zusätzlich zum bestehenden CSA Zertifikat - Option CUS	*Ajout de la certification UL à celle déjà existante (CSA) - Option CUS*
320	Aggiornate dimensioni tettuccio parapioggia - Opzione RC	*Dimension revised for rain canopy - option RC*	Abmessungen Schutzdach überarbeitet - Option RC	*Mise à jour des dimensions des capots de protection anti-pluie - Option RC*

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AUSTRIA BEST
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CHINA
BONFIGLIOLI DRIVES (SHANGHAI) CO. LTD.
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FRANCE
BONFIGLIOLI TRANSMISSIONS S.A.
14 Rue Eugène Pottier BP 19 - Zone Indust. de Moimont II - 95670 Marly la Ville
Tel. (+33) 1 34474510 - Fax (+33) 1 34688800
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GERMANY
BONFIGLIOLI DEUTSCHLAND GmbH
Hamburger Straße 18 - 41540 Dormagen
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GREAT BRITAIN
BONFIGLIOLI UK Ltd
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GREECE BEST
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HOLLAND BEST
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Tel. (+31) 252 219 123 - Fax (+31) 252 231 660
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2045 Törökbálint, Tö u.2. Hungary
Tel. +36 23 50 11 50 - Fax +36 23 50 11 59
www.agisys.hu - info@agisys.hu

INDIA
BONFIGLIOLI TRANSMISSIONS PVT Ltd.
PLOT AC7-AC11 Sidco Industrial Estate - Thirumudivakkam - Chennai 600 044
Tel. +91(0) 44 24781035 / 24781036 / 24781037
Fax +91(0) 44 24780091 / 24781904
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ITALY
BONFIGLIOLI ITALIA srl
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MICAR snc di Sandro Arminio e C. BEST
Via Rosso di S. Secondo, 15 - 20134 Milano
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MINETTI spa Filiale di Bergamo BEST
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Tel. 030 3582734 - Fax 030 3582760
www.minettigroup.com - minettibrescia@minettigroup.com

S.I.R.I. srl BEST
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SAROK DUE srl BEST
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Tel. 0331 423911 - Fax 0331 423942 - www.sarok.it - sarokdue@sarok.it

SOTEK srl BEST
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Tel. 0732 250823 - Fax 0732 22919 - www.sotek.it - info@sotek.it

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www.timmodena.com - timmodena@timmodena.com

TECHNOBI srl BEST
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Tel. 02 45712362 - Fax 02 45712219 - www.technobi.it - vendite@technobi.it

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www.tecnicaindustriale.it - info@tecnicaindustriale.it

TECNOFORNITURE srl BEST
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Tel. 0735 76171 - Fax 0735 655266
www.tecnoforniture.it - info@tecnoforniture.it

TRA - MEC snc BEST
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Tel. 0332 945860 - Fax 0332 967864 - www.tra-mec.it - info@tra-mec.it

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www.umbriatrasmissioni.it - info@umbriatrasmissioni.it

V.B. Moto Trasmissioni snc BEST
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Tel. 0547 630610 - Fax 0547 630615
www.vbmototrasmissioni.it - info@vbmototrasmissioni.it

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www.venetabearings.it - info@venetabearings.it

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Tel. 0048.56.6559235 - 6559236 - Fax 0048.56.6559238
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PORTUGAL BEST
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Tel. 00351 229759634/5/6 - Fax 00351 229752211
bonfitec@bonfitec.pt - www.bonfitec.pt

RUSSIA BEST
FAM
57, Maly prospekt, V.O. - 199048, St. Petersburg
Tel. +7 812 3319333 - Fax +7 812 3271454
www.fam-drive.ru - info@fam-drive.ru

SPAIN
TECNOTRANS BONFIGLIOLI S.A.
Pol. Ind. Zona Franca sector C, calle F, n°6 08040 Barcelona
Tel. (+34) 93 4478400 - Fax (+34) 93 3360402
www.tecnotrans.com - tecnotrans@tecnotrans.com

SOUTH AFRICA
BONFIGLIOLI POWER TRANSMISSION Pty Ltd.
55 Galaxy Avenue, Linbro Business Park - Sandton
Tel. (+27) 11 608 2030 OR - Fax (+27) 11 608 2631
www.bonfiglioli.co.za - bonfigsales@bonfiglioli.co.za

SWEDEN
BONFIGLIOLI SKANDINAVIEN AB
Koppargatan 8 - 234 35 Lomma, Sweden
Tel. +46 40418230 - Fax +46 40414508
www.bonfiglioli.se - info@bonfiglioli.se

THAILAND BEST
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Fax 0066.2.7112852/3811308/3814905
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TURKEY
BONFIGLIOLI TURKIYE
Atatürk Organize Sanayi Bölgesi, 10015 Sk. No: 17, Çiğli - Izmir
Tel. +90 (0) 232 328 22 77 (pbx) - Fax +90 (0) 232 328 04 14
www.bonfiglioli.com.tr - info@bonfiglioli.com.tr

USA
BONFIGLIOLI USA, INC.
3541 Hargrave Drive Hebron, Kentucky 41048
Tel. (+1) 859 334 3333 - Fax (+1) 859 334 8888
www.bonfiglioliusa.com
industrialsales@bonfiglioliusa.com - mobilesales@bonfiglioliusa.com

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La Urbina - Caracas 1070
Tel. 0058.212.2413570 / 2425268 / 2418263
Fax 0058.212.2424552 - Tlx 24780 Maica V - maica1@cantv.net

HEADQUARTERS
BONFIGLIOLI RIDUTTORI S.p.A.
Via Giovanni XXIII, 7/A
40012 Lippo di Calderara di Reno
Bologna (ITALY)
Tel. (+39) 051 6473111 - Fax (+39) 051 6473126
www.bonfiglioli.com - bonfiglioli@bonfiglioli.com

SPARE PARTS BONFIGLIOLI
B.R.T.
Via Castagnini, 2-4
Z.I. Bargellino - 40012
Calderara di Reno - Bologna (ITALY)
Tel. (+39) 051 727844 - Fax (+39) 051 727066
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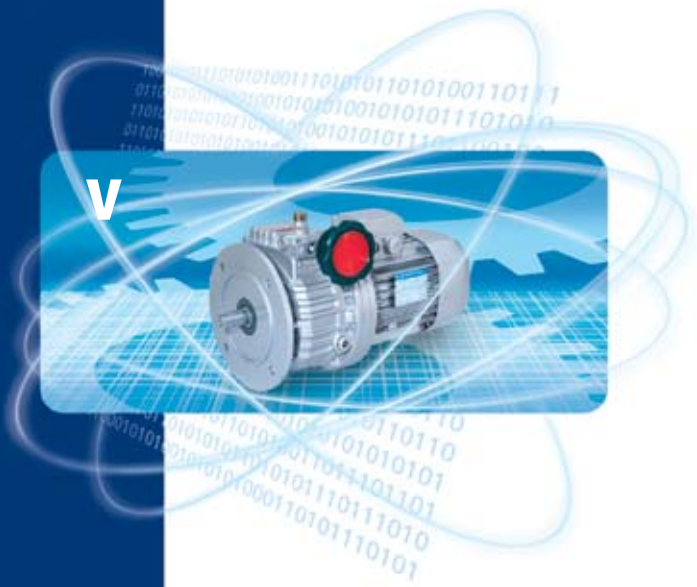

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