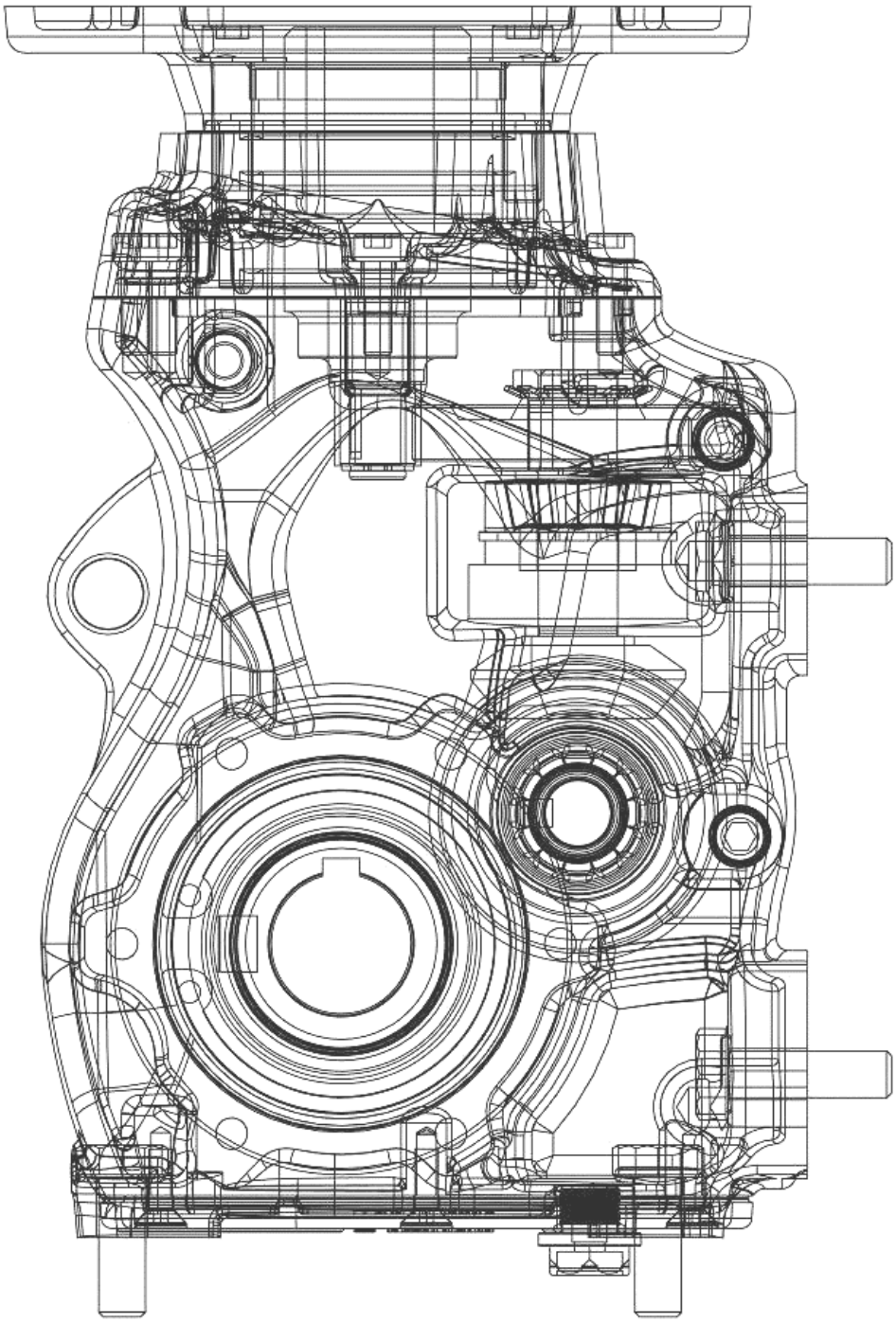
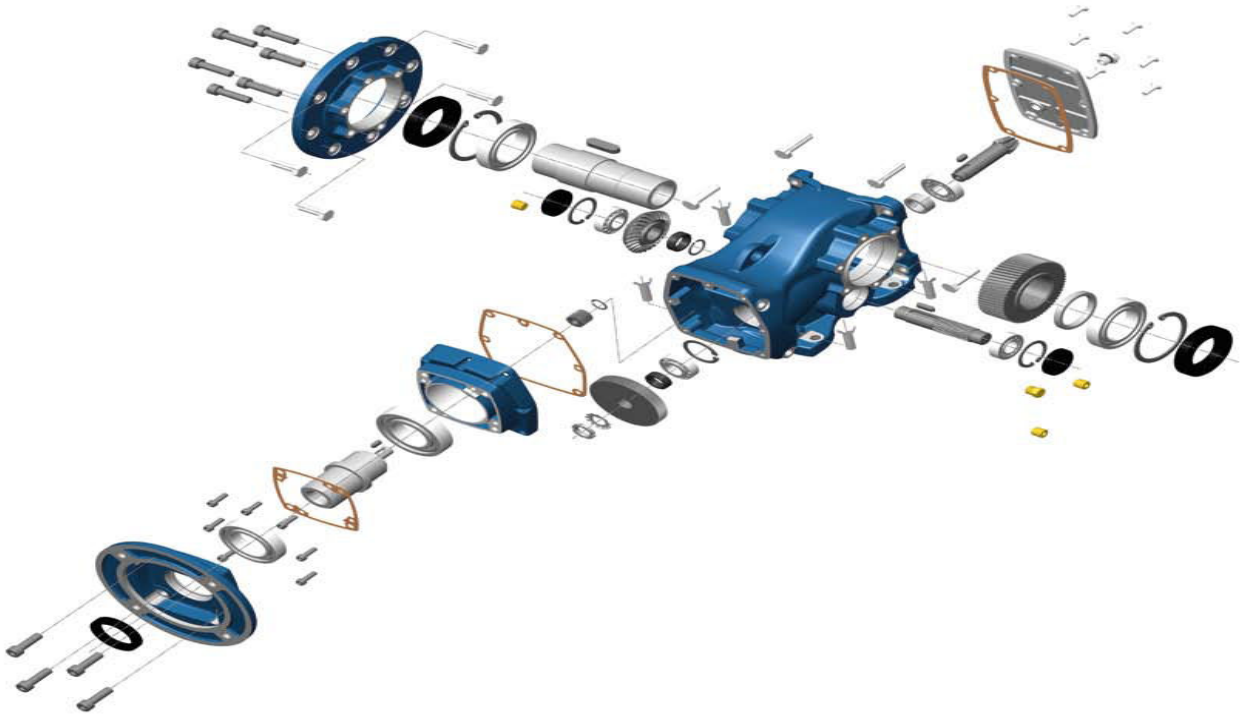
ENDURO

shaft mounted gearboxes

operation and maintenance manual



COMPONENTS LIST



LIST OF COMPONENTS ENDURO

	ENDURO 3			ENDURO4			ENDURO 5		
item	code	description	q.ty	code	description	q.ty	code	description	q.ty
1	HOU EN3	housing	1	HOU EN4	housing	1	HOU EN5	housing	1
2	ISH	input shaft... RB021	1	ISH	input shaft...RB030	1	ISH	input shaft...RB060	1
3	OSH	output shaft	1	OSH	output shaft	1	OSH	output shaft	1
4	ICV	input cover	1	ICV	input cover	1	ICV	input cover	1
5	TCV	-	1	TCV	-	1	TCV	-	1
6	IFL	input flange 63B5 input flange 71B5 input flange 80/90B5 input flange 100/112B5	1	IFL	input flange 71B5 input flange 80/90B5 input flange 100/112B5	1	IFL	input flange 71B5 input flange 80/90B5 input flange 100/112B5	1
7	P1	pinion 1	1	P1	pinion 1	1	P1	pinion 1	1
8	G2	Gear 1	1	G2	Gear 1	1	G2	Gear 1	1
9	P2	pinion 2	1	P2	pinion 2	1	P2	pinion 2	1
10	G2	Gear 2	1	G2	Gear 2	1	G2	Gear 2	1
11	P3	pinion 3	1	P3	pinion 3	1	P3	pinion 3	1
12	G3	Gear 3	1	G3	Gear 3	1	G3	Gear 3	1
13	OFL	output flange 160	1	OFL	output flange 200	1	OFL	output flange 250	1
14	BEA	bearing 6008ZZ	1	BEA	bearing 6009ZZ	1	BEA	bearing 6009ZZ	1
16	BEA	bearing 6008ZZ	1	BEA	bearing 6009ZZ	1	BEA	bearing 6009ZZ	1
15	BEA	bearing 6009ZZ	2	BEA	bearing 6010ZZ	2	BEA	bearing 6011ZZ	2
17a	BEA	bearing 30303	1	BEA	Bearing 30204	1	BEA	Bearing 30205	1
17b	BEA	bearing 30203	1	BEA	Bearing 32004	1	BEA	Bearing 32005	1
18	BEA	bearing 30202	2	BEA	Bearing 32004	2	BEA	Bearing 30204	2
19	COV	plug	2	COV	plug	2	COV	plug	2
20	SNR	snap ring	1	SNR	snap ring	1	SNR	snap ring	1
21a	SNR	snap ring	1	SNR	snap ring	1	SNR	snap ring	1
21b				SNR	snap ring	1	SNR	snap ring	1
22	SNR	snap ring	2	SNR	snap ring	2	SNR	snap ring	2
23	SNR	snap ring	2	SNR	snap ring	2	SNR	snap ring	2
24	SNR	snap ring	1	SNR	snap ring	1	SNR	snap ring	1
25	SP	spacer	1	SP	spacer	1	SP	spacer	1
26	SP	spacer	1	SP	spacer	1	SP	spacer	1
27	SP	spacer	1	SP	spacer	1	SP	spacer	1
28	SP			SP	spacer	1	SP	spacer	1
29	G	gear GHIM 17x1	1	G	gear GHIM 17x1	1	G	gear GHIM 20x1	1
30	SW	safety washer WSH2982M17	1	SW	safety washer WSH2982M17	1	SW	safety washer WSH2982M20	1
31	OS	oil seal 40x55x8	1	OS	oil seal 45x60x9	1	OS	oil seal 40x55x8	1
32	OS	oil seal 45x75x8	2	OS	oil seal 450x80x12	2	OS	oil seal 45x75x8	2
33	BPL	breather plug	1	BPL	breather plug	1	BPL	breather plug	1
34	FPL	filler plug	3	FPL	filler plug	3	FPL	filler plug	3
35	LPL	level plug	1	LPL	level plug	1	LPL	level plug	1
36	KEY	key	1	KEY	key	1	KEY	key	1
37	KEY	key	1	KEY	key	1	KEY	key	1
38	KEY	key	1	KEY	key	1	KEY	key	1
39	KEY	key	1	KEY	key	1	KEY	key	1
40	SCR	screw	7	SCR	screw	7	SCR	screw	7
41	SCR	screw	4	SCR	screw	4	SCR	screw	4
42	SCR	screw	6	SCR	screw	6	SCR	screw	6
43	SCR	screw	4	SCR	screw	4	SCR	screw	4
44	GK44	gasket	1	GK44	gasket	1	GK44	gasket	1
45	GK45	gasket	1	GK45	gasket	1	GK45	gasket	1
46a	SCR	screw	4	SCR	screw	4	SCR	screw	4
46b	SCR	screw	4	SCR	screw	4	SCR	screw	4
47	SCR	screw	6	SCR	screw	6	SCR	screw	6

STORAGE

- Do not store outdoors, in areas exposed to weather or with excessive humidity.
- For storage periods longer than 60 days, all machined and unpainted surfaces such as flanges, bases, and shafts must be protected with a suitable anti-oxidation product
- Oil seals must be touched by the oil. Before putting them into operation restore correct quantity and type of oil.
- At intervals of 4 to 5 months, the output shaft should be rotated

INSTALLATION

- Make sure that the ENDURO unit is correctly secured to avoid vibrations.
- If shocks or overloads are expected, install hydraulic couplings, clutches, electronic torque limiters, control units,etc.
- For a satisfactory gearbox performance, it is essential to align correctly the motor and the driven machine.
- Whenever possible, we suggest to interpose flexible couplings
- Align with precision the eventual outboard bearing, because any misalignment would cause high overloads, with a subsequent rupture of a bearing or the shaft
- Before starting up the machine, make sure that the oil level is conform to the mounting position specified for the STON unit by checking the level plug
- For outdoors installation provide adequate guards in order to protect the drive from rainfalls as well as direct sun radiation.
- It is recommended to clean and lubricate the connection shafts with grease having a copper base (example Castrol Optimol Paste HT) in order to avoid fretting corrosion and seizure. Copper, in fact, being very malleable, is like a barrier against the direct contact between two similar metals. In alternative, you can use a grease having high viscosity base oil which remains particularly adhesive (example Mobilgrease XTC)
- Whenever there are outer loads, it is recommended to use pins and positive stops
- Self-locking adhesives should be used on the bolts and joining surfaces of the machine frame to prevent gearbox and driven machine to get loose
- It is recommended to avoid to fit cantilever pinions. If this is not possible, minimize the distance between pinion and output shaft to avoid excessive radial loads
- He pre-loading of belts and chains to the minimum
- Never use the hammer for mounting/dismantling of the jeyed parts, but use the tapped holes provided on the head of the shafts
- For a smooth and silent working, it is recommended the use of Motive motors

ROUTINE CHECKS

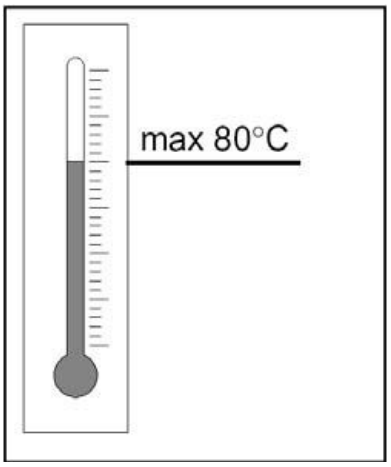
- Periodically check that the outer surfaces of the ENDURO unit and the cooling air passages are clean.
- Verify that the breather plug hole is clean.
- Regularly make sure that there are no lubricant leaks.
- Using the level plug window, verify periodically the correct quantity of lubricant

OPERATING TEMPERATURE

The operating temperature depends on a number of factior such as the type of power transmission, the quantity of lubricant, the speed and power applied and the environment in which the gearbox is operating. With a standard helical gearbox, the maximum allowable inside temperature is 80°C.
In case of control, it is important to check that the operating temperature

when the gearbox runs at normal speed is constant; this indicates that the gearbox is running in a trouble-free manner

-If we use a 2 poles motor (n1 about 2800RPM), a few potential problems, like the temperature inside the gearbox,vibrations or noise, can grow.
As a general rule, we recommend the use of worm gearboxes with 2 poles motors only in applications having a relatively low service factor (1.25 max.) and a very low degree of intermittent.
- during the first 4 hours, you may assist to a gradual decrease of the inner temperature due to the gearbox components settling.



MAINTENANCE

Maintenance is essentially limited to the requests reported in the charter “lubrication” and to an accurate external cleaning, usually carried out with bland solvents in order to not to damage the paint

When it is necessary to fill the oil but there is no compatibility of the new oil with the one inside the gearbox, we suggest to empty the gearbox from its oil and wash it before putting the new oil

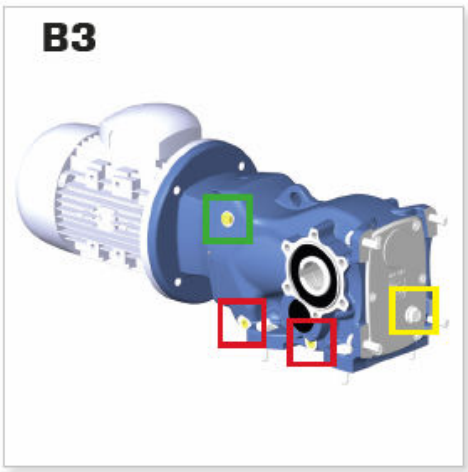
LUBRICATION

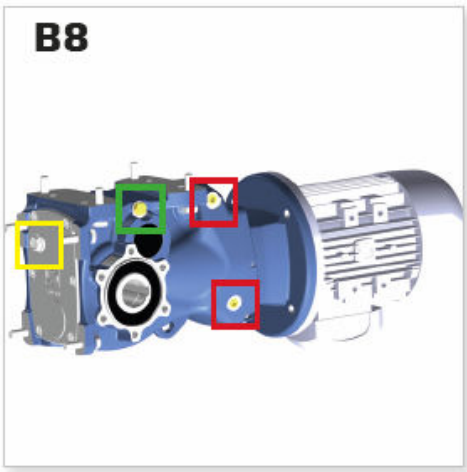
ENDURO	oil (lt)						ISO	temp.	oil type	
	B3	B6	B7	B8	V5	V6				
EN3	0,37	1,23	1,23	1,35	1,31	0,9	VG 220	-25 +80°C	Mobil Glygoyle 30	Shell tivela S220
EN4	0,41	1,38	1,38	1,51	1,47	1				
EN5	0,48	1,61	1,61	1,76	1,72	1,17				

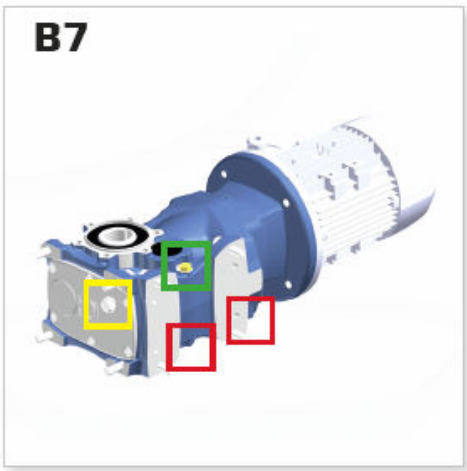
Unless otherwise specified, each ENDURO is supplied long-life synthetic oil (quantity as per position B3). You must replace the oil each 20.000 working hours and anyway every 5 years at least After an eventual oil addition, each STON can be mounted in any mounting position, thus giving big advantages in the stock management and lead time All units are supplied with plugs for loading, discharging and checking the level of the oil. Furthermore, they are accompanied by a breather plug. Before start-up, we suggest to re-place the filler plug in the upper side of the unit with the breather plug .

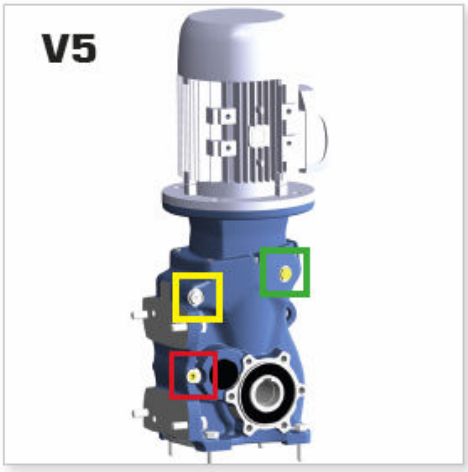
Level plugs, correctly positioned as per following tablechart, are a useful reference for the verification of the correct oil quantity

Mounting positions





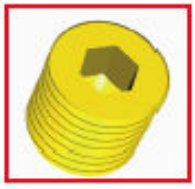




breather plug

level plug

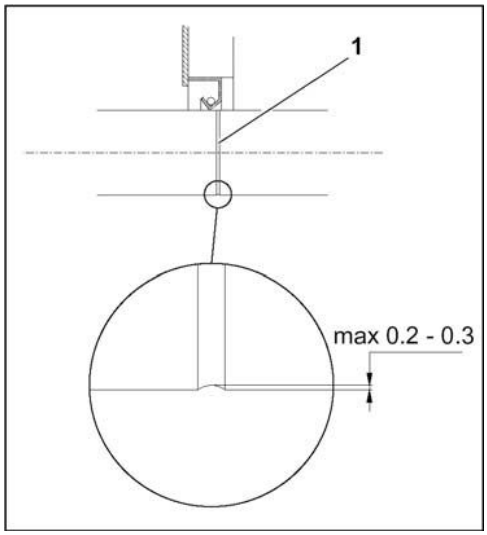
filler plug



OIL SEALS REPLACEMENT

When a shaft seal doesn't work properly, it must be replaced rapidly, in order to avoid that the oil leakage goes further on, and that the damage extends to some other components.

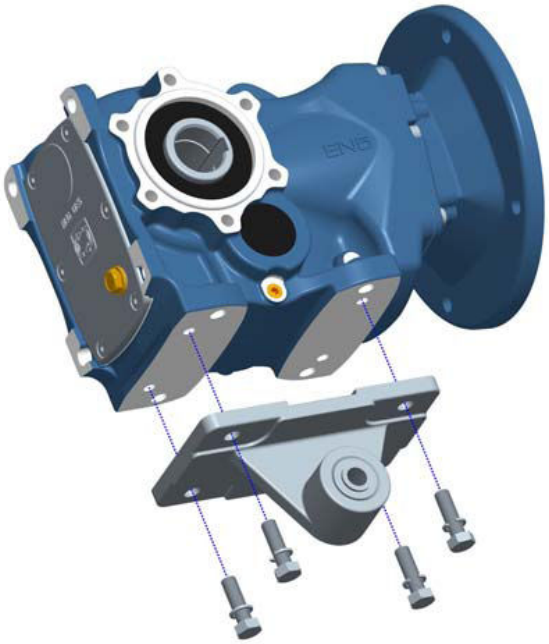
When fitting a new seal, the following precautions are required:

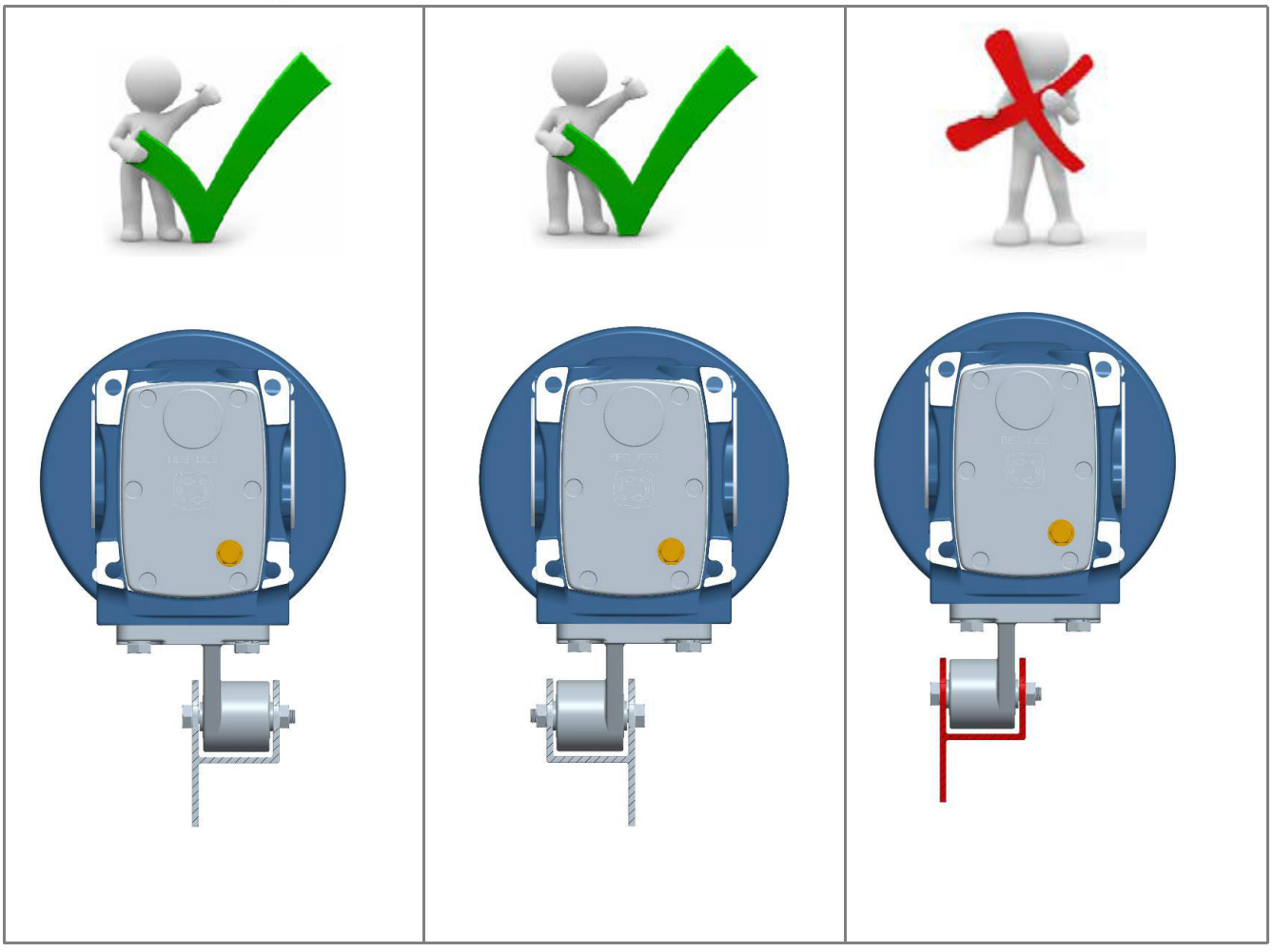


- take particular care in handling, and make sure that the seal is in good conditions, particularly if long times of stocking could have caused a premature ware, especially in presence of excessive humidity
- always check that the shaft seal seat is in good conditions, free of surface defects. If the area where the ring seal comes into contact with the shaft has worn down by more than 0,2-0,3mm, do not install a new seal
- care to prevent the new seal lip from working exactly on the same trace left by the previous one
- fit the shaft seal perpendicularly to the axis, with the lips wholly free, not curled under or pinched
- install the ring seal so that the lip faces the oil that must be kept in or the side from where the pressure is exerted
- for ring seals without a dust-tight lip, coat the outside of the lip with grease
- for ring seals provided with a dust-tight lip, fill the gap between the seal lip and dust-tight lip with grease
- lubricate the seal seat on the shaft
- do not use sealants because if they get on the seal lip or shaft surface they can cause rapid wear
- when installing the seal, press down as near as possible the outside edge
- do not block the ring seal axially or apply too much load
- always use suitable tools to avoid damaging the seal lip with threads, grooves, sharp edges or key ways
- always cover the seal lip and the seat on the shaft when repainting the gearbox
- use oil seals of the type indicated in table 1

Torque Arm

The dimensions in mm are written in the catalogue. The lever is not supplied in the kit, due to its variable length

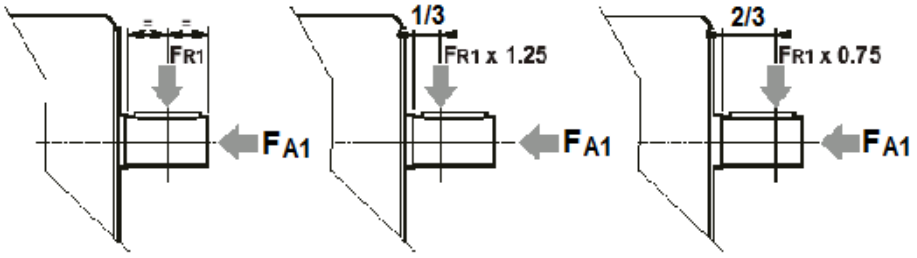




Max FR1 (at 0Kg FA1) – ENDURO-MF

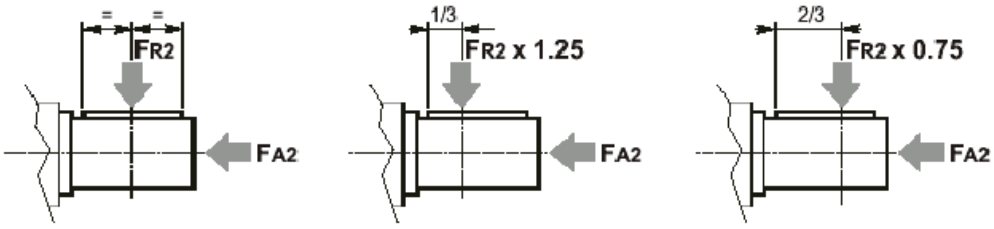
ENDURO-3 (kg)	ENDURO-4 (kg)	ENDURO-5 (kg)
64	71	75

input



EN- 3 i:	FR2 max (kg)	FA2 max (kg)	EN-4 i:	FR2 max (kg)	FA2 max (kg)	EN-5 i:	FR2 max (kg)	FA2 max (kg)
4,73	214,0	42,8	4,73	197,0	39,4	4,21	318,0	63,6
5,76	222,0	44,4	5,85	224,0	44,8	5,20	326,0	65,2
8,86	258,0	51,6	7,11	229,0	45,8	8,32	330,0	66,0
11,09	340,0	68,0	9,95	266,0	53,2	11,00	319,0	63,8
13,53	366,0	73,2	13,13	271,0	54,2	12,75	308,0	61,6
17,24	380,0	76,0	14,25	313,0	62,6	16,50	351,0	70,2
20,56	357,0	71,4	16,22	310,0	62,0	18,73	339,0	67,8
26,04	415,0	83,0	18,36	392,0	78,4	21,04	323,0	64,6
31,00	385,0	77,0	20,65	380,0	76,0	22,24	430,0	86,0
32,19	417,0	83,4	26,30	453,0	90,6	23,18	414,0	82,8
33,18	486,0	97,2	29,93	459,0	91,8	25,76	511,0	102,2
39,27	465,0	93,0	37,50	463,0	92,6	27,82	498,0	99,6
50,05	465,0	93,0	41,36	441,0	88,2	32,22	493,0	98,6
55,18	540,0	108,0	47,08	437,0	87,4	33,35	506,0	101,2
59,67	575,0	115,0	53,29	455,0	91,0	37,85	615,0	123,0
75,58	585,0	117,0	58,99	537,0	107,4	41,71	605,0	121,0
92,84	685,0	137,0	71,78	561,0	112,2	42,53	618,0	123,6
96,33	694,0	138,8	76,33	561,0	112,2	46,84	619,0	123,8
106,21	700,0	140,0	86,89	650,0	130,0	47,35	604,0	120,8
115,07	705,0	141,0	96,90	652,0	130,4	56,22	615,0	123,0
			108,86	761,0	152,2	58,59	703,0	140,6
			116,81	769,0	153,8	65,13	722,0	144,4
						84,31	721,0	144,2
						95,70	865,0	173,0
						102,35	868,0	173,6
						108,29	871,0	174,2
						118,43	873,0	174,6

output



TORQUE LIMITERS

Torque limiters standard series with torque adjustment

SAFEGUARD-SYNCHRON-SAFELIFTING-ROTA FREE

During normal operations the torque limiter transmits the torque from the moving part (2) to the flange (3) through balls (4a - SAFEGUARD) or rollers (4b - SYNCHRON, SAFE LIFTING, ROTA FREE, SAFEGUARD-R) pressed by the disc springs (6) into the indentations on both halves (2) and (3).
In case of overload, when the torque demand exceeds the preset value, both halves (2) and (3) are disengaged and they transmit only a small residual torque. The balls or rollers are pressed out of the indentations, thus pushing the moving part (2) axially against the force of the disc springs (6), and activating a switch (9) to begin the emergency stop of the motor. The re-engagement is automatic at the pre-set torque when the torque demand drops.
The SYNCHRON type re-engages (at slow speed) once per revolutions at a reference point and keep the two halves (2) and (3) of the torque limiter synchronised. In the SAFE LIFTING type the rollers (4b) are not allowed to go out completely from the indentations, so that the moving part (2) can activitate the switch, but the torque transmission within the two halves (2) and (3) is not interrupted.
In a high speed application, at the moment of overload, the ROTA FREE type will disconnect driven from driver shaft by the complete disengagement of part (2) from part (3), while ring (2) will slow down, idle, up to a stop. Re-engagement must be done manually, lightly taping the part (2) with a soft mallet.

Transmissible torque	Min.	2.5 Nm	Hole diameters available	Min.	7 mm
	Max.	8200 Nm		Max.	100mm

ZBC-NBC Zero backlash torque limiters

the torque from the hub (1) to the flange (3) through a ball crown (4) forced by the pressure of the disc springs (6) on the moving flange (2) into the seats on the two parts (1) and (3). In case of overload, when the torque demand exceeds the pre-set value, both the parts (1) and (3) are disengaged and they transmit only a small residual torque: the balls are pressed out of the indentations of the flange (3), thus pushing the moving part (2) axially against the force of the disc springs (6), and activating the emergency stop switch of the motor (9). The re-engangement is automatic at the pre-set torque when the torque demand drops.
The SYNCHRON type re-engages during stoppage or at low speed once per revolution at a reference point and keep the hub (1) and the flange (3) of the torque limiter synchronised. The disc springs are working only in the negative area of their characteristics (fig.1), so the adjustment nut (7), when tightened anticlockwise, provides an increasing axial load to the disc springs (6) and a higher disengaging torque: when the pre-set torque level is reached the nut (7) is locked in position by means of the locking screw (8). ZBC holds 8 fixing threaded holes and a heavy duty bearing, NBC 6 fixing threaded holes and a light duty bearing.

Transmissible torque	Min.	0.65 Nm	Hole diameters available	Min.	6 mm
	Max.	3100 Nm		Max.	80mm

SECUREX Friction torque limiters with torque adjustment

The torque limiter Securex acts as an overload protection in machine drives using sprockets or pulleys. These devices are extremely simple to use and offer complete operating security for applications involving occasional overloads at low speed.
The torque limiter protects mechanical parts and machines which may be subjected to overloading of various kinds, by slipping when the torque demand exceeds a preset value. It maintains re-engagement at pre-set torque when the overload torque has passed; no resetting is required. Slip torque is presetted by adjustment of the spring force on the pressure plate and friction surfaces.

Transmissible torque	Min.	2 Nm	Hole diameters available	Min.	5 mm
	Max.	10000 Nm		Max.	120mm

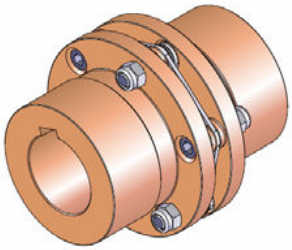
COUPLNGS

FLEXSTEEL-Lamellar couplings

Flexsteel is a zero backlash coupling which uses a disc pack made of stainless spring steel as a drive element, torsionally stiff, but axially and angulary flexible, to compensate shafts misalignments. Two metal hubs are connected to the discs pack by micrometric precision bushings and highly resistant screws.

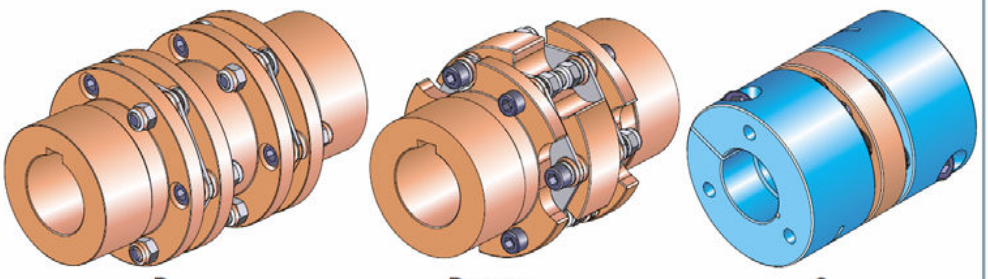
Transmissible torque	Min.	18 Nm	Hole diameters available	Min.	7 mm
	Max.	46000 Nm		Max.	180mm

Fig. 1A Pacco singolo



Forma base A

Fig. 1B Pacco doppio

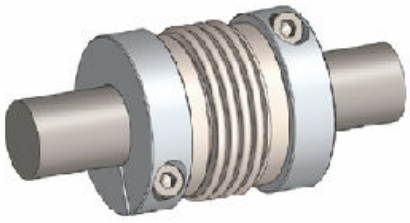


B B Hmin S

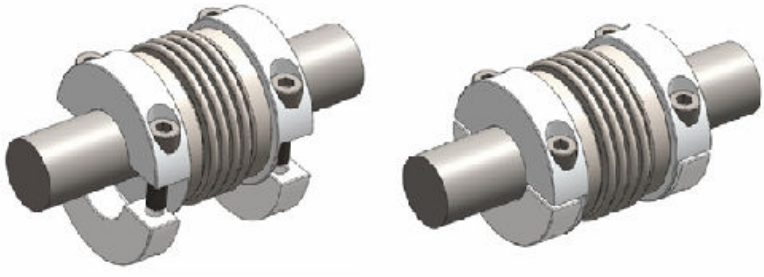
METALFLEX-Bellow couplings

MeTalflex is an innovative coupling for high performance applications requiring repeatability, accuracy in positioning, motion and synchronization control at high speed.
MeTalflex is an assembly of two aluminium clamping hubs and a thin walled stainless steel bellow, which remains rigid under torsional load, but it is axially, radially and angularly flexible in order to compensate misalignments within the connecting shafts: the result is a zero backlash high torsional stiffness low inertia coupling.
The advantage of Me Talflex against other zero backlash couplings on the market, as beam or curved jaw couplings, is a higher torsional stiffness, key factor for the precision in positioning: a higher torsional stiffness means more accuracy in the motion transmission from the motor to the driven component.

Type A *Clamping hubs*



Type B *Split hubs*

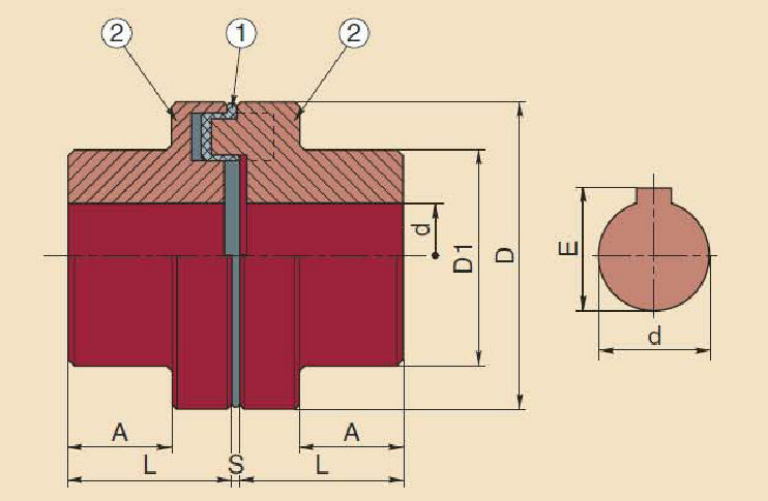


Before Mounting After Mounting

Transmissible torque	Min.	1.1 Nm	Hole diameters available	Min.	3 mm
	Max.	500 Nm		Max.	70mm

COMPOLASTIC-Elastic couplings

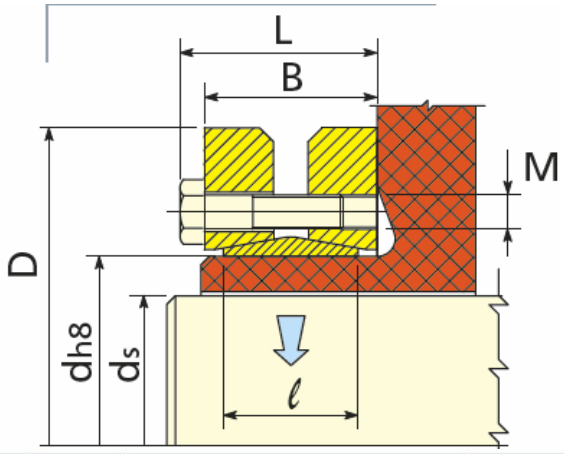
COMPOLASTIC is a series of coupling consisting of two toothed hubs in G25 cast iron, precision machined, whose teeth work only at compression against an elastic element. The special new design of the elastic element guarantees silent drive transmission and maximum durability for the category that is unequalled by any other system. COMPOLASTIC ensures a fail safe drive under all conditions, it absorbs torsional vibrations and compensates for important axial, angular and radial misalignments of the shafts to be connected.COMPOLASTIC can be used at a temperature range of -30°C to +80°C



Transmissible torque	Min.	19 Nm	Hole diameters available	Min.	8 mm
	Max.	2000 Nm		Max.	100mm

SHRINK DISCS

CONEX SD-SHRINK DISC
Standard duty
External coupling
Excellent concentricity



d mm	ds mm	D mm	L mm	B mm	ℓ mm	M mm	T_s Nm	T Nm	F kN
14	10 - 11 - 12	38	14,5	11	9	M 5	3,5	28 - 38 - 50	5 - 7 - 9
16	12 - 13 - 14	41	18,5	15	11	M 5	4	50 - 70 - 90	9 - 10 - 13
18	14 - 15 - 16	44	18,5	15	12	M 5	4	85 - 100 - 130	16 - 18 - 20
20	15 - 16 - 18	50	22,5	19	14	M 5	4	130 - 150 - 200	20 - 22 - 25
24	19 - 20 - 21	50	22,5	19	14	M 5	5	180 - 210 - 250	26 - 27 - 29
30	24 - 25 - 26	60	24,5	21	16	M 5	6	310 - 340 - 380	26 - 27 - 28
36	28 - 30 - 31	72	27	23	18	M 6	12	460 - 590 - 630	50 - 54 - 58
44	32 - 35 - 36	80	29	25	20	M 6	12	630 - 780 - 860	65 - 74 - 77
50	38 - 40 - 42	90	31	27	22	M 6	12	940 - 1100 - 1300	79 - 85 - 90
55	42 - 45 - 48	100	34	30	23	M 6	12	1200 - 1500 - 1900	80 - 90 - 100
62	48 - 50 - 52	110	34	30	23	M 6	12	1800 - 2200 - 2400	100 - 110 - 120
68	50 - 55 - 60	115	34	30	23	M 6	12	2000 - 2500 - 3100	100 - 110 - 120
75	55 - 60 - 65	138	37,5	32	25	M 8	30	2500 - 3200 - 3900	120 - 140 - 150
80	60 - 65 - 70	145	37,5	32	25	M 8	30	3200 - 3900 - 4600	120 - 140 - 160
90	65 - 70 - 75	155	44,5	39	30	M 8	30	4700 - 6000 - 7200	170 - 190 - 210
100	70 - 75 - 80	170	49,5	44	34	M 8	30	6900 - 7500 - 9000	180 - 220 - 240
110	75 - 80 - 85	185	56,5	50	39	M 10	59	7200 - 9000 - 11000	230 - 250 - 260
115	80 - 85 - 90	188	56,5	50	39	M 10	59	8500 - 10000 - 12000	210 - 240 - 270
120	80 - 85 - 90	215	58,5	52	42	M 10	59	10500 - 13200 - 14400	280 - 300 - 330
125	85 - 90 - 95	215	58,5	52	42	M 10	59	11000 - 13000 - 15000	300 - 320 - 350
130	90 - 95 - 100	215	58,5	52	42	M 10	59	13700 - 15800 - 18200	300 - 330 - 360
140	95 - 100 - 105	230	67,5	60	46	M 12	100	15000 - 17000 - 20000	360 - 400 - 420
155	105 - 110 - 115	265	71,5	64	50	M 12	100	20000 - 23000 - 26000	390 - 420 - 450
160	110 - 115 - 120	265	71,5	64	50	M 12	100	22500 - 25500 - 28600	410 - 440 - 470
165	115 - 120 - 125	290	81	71	56	M 16	250	36000 - 39000 - 44000	630 - 660 - 700
170	120 - 125 - 130	290	81	71	56	M 16	250	31700 - 35800 - 40000	600 - 630 - 660
175	125 - 130 - 135	300	81	71	56	M 16	250	40000 - 44000 - 49000	650 - 680 - 720
180	130 - 135 - 140	300	81	71	56	M 16	250	36800 - 42000 - 46000	560 - 620 - 650
185	135 - 140 - 145	330	96	86	71	M 16	250	55000 - 60000 - 65000	815 - 875 - 896
190	140 - 145 - 150	330	96	86	71	M 16	250	53300 - 58500 - 63500	790 - 830 - 870
195	140 - 150 - 155	350	96	86	71	M 16	250	66000 - 76000 - 82000	950 - 1000 - 1100
200	150 - 155 - 160	350	96	86	71	M 16	250	73700 - 79800 - 85800	980 - 1000 - 1070
220	160 - 165 - 170	370	114	104	88	M 16	250	95000 - 102000 - 110000	1200 - 1300 - 1300
240	170 - 180 - 190	405	121,5	109	92	M 20	490	120000 - 140000 - 160000	1500 - 1600 - 1700
250	180 - 190 - 200	405	120,5	108	92	M 20	490	160000 - 180000 - 200000	1600 - 1700 - 1800
260	190 - 200 - 210	430	132,5	120	103	M 20	490	165000 - 185000 - 204000	1760 - 1878 - 2008
280	210 - 220 - 230	460	146,5	134	114	M 20	490	216000 - 245000 - 270000	2085 - 2220 - 2350
300	230 - 240 - 245	485	154,5	142	122	M 20	490	274000 - 296000 - 316000	2430 - 2560 - 2630
320	240 - 250 - 260	520	154,5	142	122	M 20	490	311000 - 340000 - 375000	2640 - 2780 - 2900
330	250 - 260 - 270	520	154,5	142	122	M 20	490	352000 - 385000 - 420000	2800 - 2900 - 3100
340	250 - 260 - 270	570	168,5	156	134	M 20	490	389000 - 422000 - 459000	3115 - 3245 - 3400
350	270 - 280 - 285	580	174,5	162	140	M 20	490	443000 - 480000 - 500000	3275 - 3430 - 3500
360	280 - 290 - 300	590	174,5	162	140	M 20	490	462000 - 500000 - 530000	3300 - 3460 - 3600
380	290 - 300 - 310	645	183	168	144	M 24	840	570000 - 610000 - 660000	3900 - 4070 - 4260
390	300 - 310 - 320	660	183	168	144	M 24	840	625000 - 670000 - 720000	4170 - 4325 - 4500
400	315 - 320 - 330	680	183	168	144	M 24	840	671000 - 695000 - 745000	4270 - 4340 - 4500
420	330 - 340 - 350	690	203	188	164	M 24	840	782000 - 841000 - 902000	4460 - 5000 - 5200
440	340 - 350 - 360	750	217	202	177	M 24	840	805000 - 861000 - 920000	4760 - 4930 - 5120
460	360 - 370 - 380	770	217	202	177	M 24	840	1000000 - 1073000 - 1141000	5560 - 5820 - 6020
480	380 - 390 - 400	800	228	213	188	M 24	840	1175000 - 1250000 - 1312000	6200 - 6450 - 6580
500	400 - 410 - 420	850	230	213	188	M 27	1250	1314000 - 1382000 - 1460000	6570 - 6740 - 7000

CAUSE			
PROBLEM	POSSIBLE CAUSES	REMEDY (1)	REMEDY (2)
the motor doesn't start	a)problems in the power supply. b)faulty electrical wiring. c) faulty motor. d)wrong size of the motor	check the connections and the power supply	replace the motor.
the current absorption of the electric motor is too high	a) wrong motor size. b) motor faulty.	check the installation/application	replace the motor and eventually also the gearbox
the temperature of the motor frame is too high	a)wrong motor size. b)motor faulty. c) Wrong evaluation of the surface temperature	check the installation/application	replace the motor and eventually also the gearbox
the temperature of the gearbox housing is too high	a)Wrong gearbox size. b)Wrong mounting position. c) Not enough lubricant d)Defective bearing	check the installation/application	correct the mounting position or the lubricant level replace the bearing
output speed is different from expected	a)wrong reduction ratio. b)wrong motor polarity.	a)verify the reduction ratio. b)verify the motor polarity	replace the gearbox and/or the electric motor
oil leaks from the shafts	a)defective seals. b)seal seats on the shafts	a)replace the seals. b)replace the seals and install them in a very slightly different position or replace the shafts.	send the unit to Rotomotive
oil leaks from the seals	a)flanges are not tightened properly. b)defective seals or damaged during the transport	a)tighten the flanges. b)replace the seals, verifying that the seals seats are perfectly worked.	send the unit to Rotomotive
the output shaft turns in the wrong sense	wrong electric motor wiring	invert the position of the 2 phases of the electrical motor power supply	send the unit to Rotomotive if the noise is important in the specific application
cyclical noise in the gearbox	damaged gears	no practical problem if the noise is not important in the specific application.	send the unit to Rotomotive if the noise is important in the specific application
not cyclical noise inside the gearbox	dirty inside the gearbox	no practical problem if the noise is not important in the specific application, or if it disappears after 3 working hours	send the unit to Rotomotive if the noise is important in the specific application
a whistling noise is coming from the gearbox	a)defective bearings or not correctly assembled. b)defective gears. c) not enough lubricant	a) reassemble or replace the bearings b) replace the gears c) put the correct quantity of lubricant	send the unit to Rotomotive
vibrations of the electric motor	coupling geometrical errors	a)check the geometrical tolerances of the electric motor flange. Eventually replace b)check geometry and tolerances of the electric motor shaft key. Eventually replace c) Check the motor vibration	replace the motor with a Rotomotive one.

ALL INFORMATION AND DATA PRESENTED IN THIS INSTRUCTION MANUAL HAS BEEN CHECKED WITH MAXIMUM CARE. WE HOWEVER DO NOT ASSUME RESPONSIBILITY FOR ANY UNINTENDED ERRORS AND OMMISSIONS.

ROTOMOTIVE RESERVES THE RIGHT TO CHANGE THE SPECIFICATIONS OF ITS PRODUCTS AT ANY TIME.

rotomotive
powerdrives

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