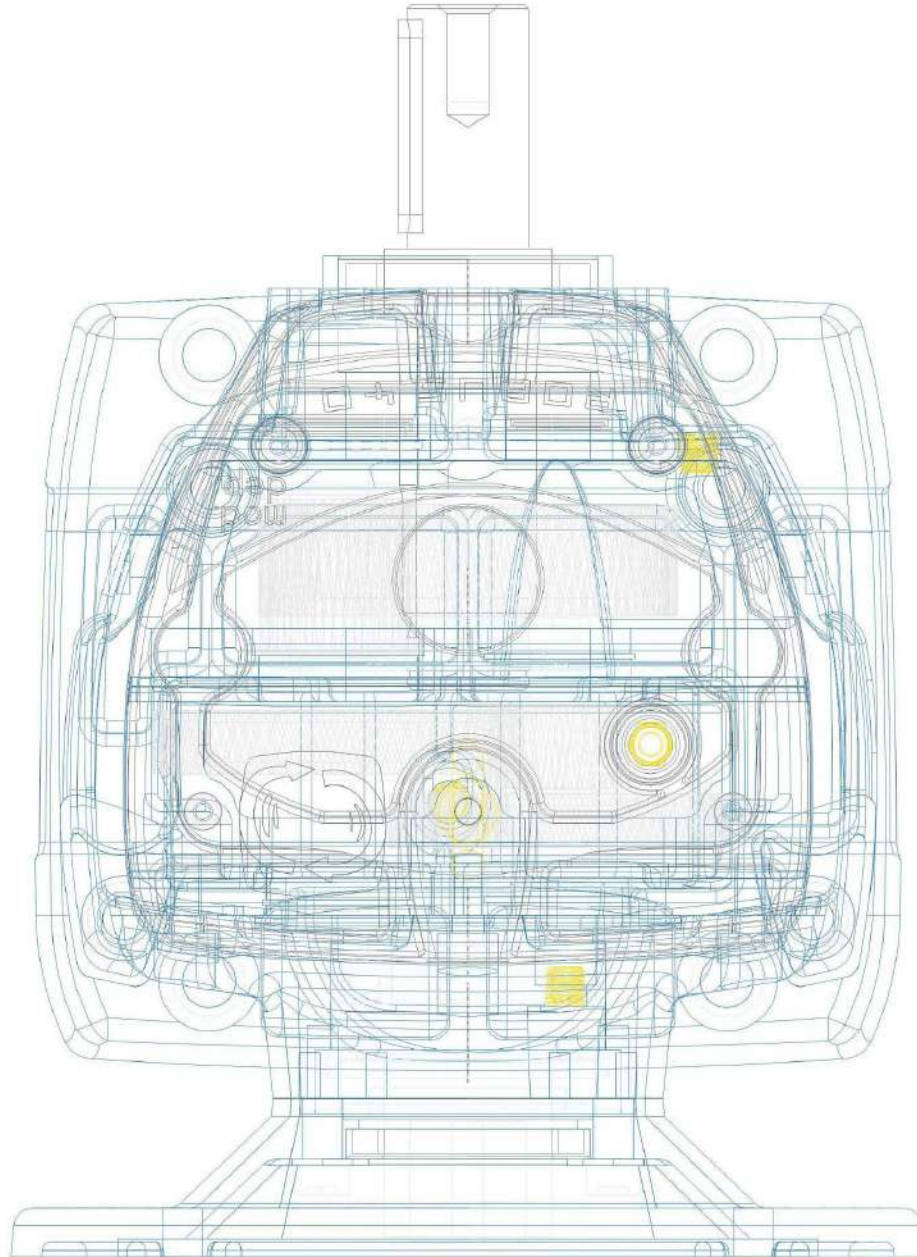


ROBUS

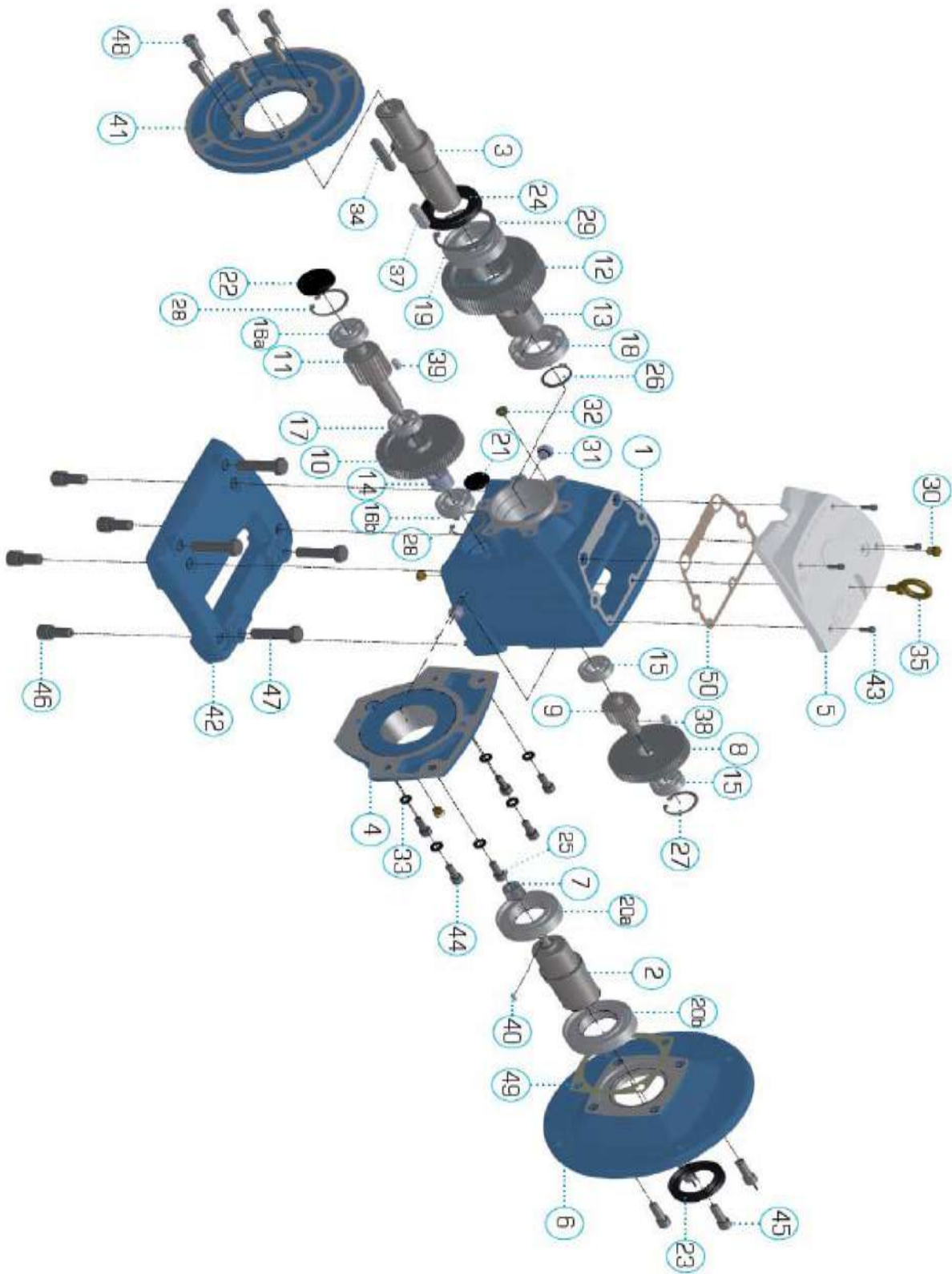
helical in-line gearboxes



operation and maintenance manual



COMPONENTS LIST



LIST OF COMPONENTS ROBUS (3 REDUCTION STAGES)

Item	code	description	q.ty	description	q.ty	description	q.ty	description	q.ty	description	q.ty	description	q.ty	description	q.ty
1	HOU#	housing	1	housing	1	housing	1	housing	1	housing	1	housing	1	housing	1
2	ISH	input shaft with P1	1	input shaft	1	input shaft	1	input shaft	1	input shaft	1	input shaft	1	input shaft	1
3	OSH	output shaft	1	output shaft	1	output shaft	1	output shaft	1	output shaft	1	output shaft	1	output shaft	1
4	ICV	input cover	1	input cover	1	input cover	1	input cover	1	input cover	1	input cover	1	input cover	1
5	TCV	top cover	1	top cover	1	top cover	1	top cover	1	top cover	1	top cover	1	top cover	1
6	IFL	input flange	1	input flange	1	input flange	1	input flange	1	input flange	1	input flange	1	input flange	1
		63814		7155 71814		7155		8085		8085		8085		100/1285	
		71814		8085 80814		9085		100/1285		100/1285		13285		16085	
		80814		9085 90814		100/1285		100/1285		13285		16085		18085	
		80814		9085 90814		100/1285		100/1285		13285		16085		18085	
7	P1	pinion 1	1	pinion 1	1	pinion 1	1	pinion 1	1	pinion 1	1	pinion 1	1	pinion 1	1
8	G1	gear 1*	1	gear 1*	1	gear 1*	1	gear 1*	1	gear 1*	1	gear 1*	1	gear 1*	1
9	P2	pinion 2*	1	pinion 2*	1	pinion 2*	1	pinion 2*	1	pinion 2*	1	pinion 2*	1	pinion 2*	1
10	G2	gear 2	1	gear 2	1	gear 2	1	gear 2	1	gear 2	1	gear 2	1	gear 2	1
11	P3	pinion 3	1	pinion 3	1	pinion 3	1	pinion 3	1	pinion 3	1	pinion 3	1	pinion 3	1
12	G3	gear 3	1	gear 3	1	gear 3	1	gear 3	1	gear 3	1	gear 3	1	gear 3	1
13	SP	spacer	1	spacer	1	spacer	1	spacer	1	spacer	1	spacer	1	spacer	1
14	SP	spacer	1	spacer	1	spacer	1	spacer	1	spacer	1	spacer	1	spacer	1
15	BEA	bearing 6202*	2	bearing 6202*	2	bearing 6203*	2	bearing 6204*	2	bearing 6206*	2	bearing 6207*	2	bearing 6207*	2
16a	BEA	bearing 6202	1	bearing 6202*	1	bearing 6304*	1	bearing 6304*	1	bearing 6306*	1	bearing 6307*	1	bearing 6307*	1
16b	BEA	bearing 6202	1	bearing 6202*	1	bearing 6204*	1	bearing 6204*	1	bearing 6306*	1	bearing 6307*	1	bearing 6307*	1
17	BEA	bearing 7202	1	bearing 7202	1	bearing 7302	1	bearing 7304	1	bearing 7306	1	bearing 7307	1	bearing 7307	1
18	BEA	bearing NK1A6903	1	bearing 6205	1	bearing 6206	1	bearing 6208	1	bearing 6208	1	bearing 6208	1	bearing 6208	1
19	BEA	bearing 6206ZZ	1	bearing 6206	1	bearing 6207	1	bearing 6210	1	bearing 6210	1	bearing 6210	1	bearing 6210	1
20a1	BEA	bearing 6003ZZ	1	bearing 6206ZZ	1	bearing 6207ZZ	1	bearing 6209ZZ	1	bearing 6211ZZ	1	bearing 6212ZZ	1	bearing 6212ZZ	1
20b1	BEA	bearing 6005ZZ	1	bearing 6207ZZ	1	bearing 6208ZZ	1	bearing 6210ZZ	1	bearing 6211ZZ	1	bearing 6212ZZ	1	bearing 6212ZZ	1
20	BEA	bearing 6005ZZ	1	bearing 6208ZZ	2	bearing 6009ZZ	2	bearing 6211ZZ	1	bearing 6009ZZ**	2	bearing 6215ZZ	1	bearing 6215ZZ	1
21	COV	plug seal D25	1	plug seal D25	1	plug seal D35	1	plug seal D42	1	plug seal D42	1	plug seal D52	1	plug seal D52	1
22	COV	oil seal 17x25x4	1	plug seal D35	1	plug seal D35	1	plug seal D35	1	plug seal D35	1	plug seal D35	1	plug seal D35	1
23	OS	oil seal 40x55x8	1	oil seal 40x55x8	1	oil seal 45x60x9	1	oil seal 45x60x9	1	oil seal 55x80x10	1	oil seal 55x80x10	1	oil seal 55x80x10	1
24	OS	oil seal 30x42x12	1	oil seal 35x52x11	1	oil seal 40x72x10	1	oil seal 50x80x12	1	oil seal 55x85x12	1	oil seal 65x120x15	1	oil seal 72x140x12	1
25	SNR	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1
26	SNR	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1
27	SNR	snap ring extr. (G1)	2	snap ring*	2	snap ring*	2	snap ring*	2	snap ring*	2	snap ring*	2	snap ring*	2
28	SNR	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1
29	SNR	breather plug	1	breather plug	1	breather plug	1	breather plug	1	breather plug	1	breather plug	1	breather plug	1
30	BPL	filler plug (FPU)	1	breather plug	1	breather plug	1	breather plug	1	breather plug	1	breather plug	1	breather plug	1
31	FPL	filler plug	1	filler plug	1	filler plug	1	filler plug	1	filler plug	1	filler plug	1	filler plug	1
32	LPL	level plug	1	level plug	1	level plug	1	level plug	1	level plug	1	level plug	1	level plug	1
33	WSH	key	1	level plug	1	level plug	1	level plug	1	level plug	1	level plug	1	level plug	1
34	KEY	key	1	key	1	key	1	key	1	key	1	key	1	key	1
35	EB	eye-bolt, M8	1	eye-bolt, M8	1	eye-bolt, M8	1	eye-bolt, M8	1	eye-bolt, M10	1	eye-bolt, M10	1	eye-bolt, M12	1
36	GK36	gasket	1	gasket	1	gasket	1	gasket	1	gasket	1	gasket	1	gasket	1
37	KEY	key	1	key	1	key	1	key	1	key	1	key	1	key	1
38	KEY	key*	1	key*	1	key*	1	key*	1	key*	1	key*	1	key*	1
39	KEY	key	1	key*	1	key	1	key	1	key	1	key	1	key	1
40	KEY	key	1	key	1	key	1	key	1	key	1	key	1	key	1
41	OFL	output flange	1	key	1	key	1	key	1	key	1	key	1	key	1
		140		output flange	1	output flange	1	output flange	1	output flange	1	output flange	1	output flange	1
		200, 180		200, 180		250, 200		300, 250		350, 300		450, 350		450, 350	
43	SCR	screw	4	screw	6	screw	6	screw	6	screw	6	screw	6	screw	6
44	SCR	screw	4	screw	6	screw	6	screw	6	screw	6	screw	6	screw	6
45	SCR	screw	4	screw	4	screw	4	screw	4	screw	4	screw	4	screw	4
48	SCR	screw	6	screw	6	screw	6	screw	6	screw	6	screw	6	screw	6
49	GK49	gasket	1	gasket	1	gasket	1	gasket	1	gasket	1	gasket	1	gasket	1
50	GK50	gasket	1	gasket	1	gasket	1	gasket	1	gasket	1	gasket	1	gasket	1

* In 3 stages only

** for input flange 132-160

*** for input flange 90-112

Only for Foot mounting

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 ROBUS 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

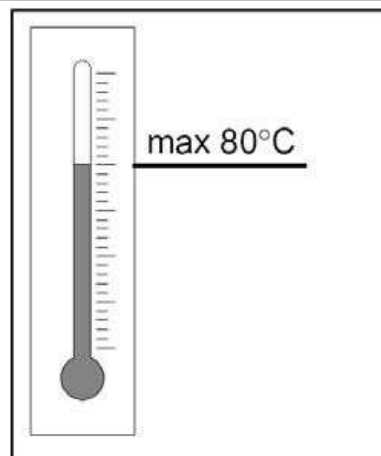
OPERATING TEMPERATURE

The operating temperature depends on a number of factor 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 intermittency.

- 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

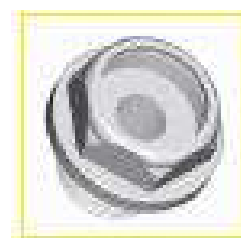
When it is necessary to fill the oil but there is no compatibility of the new oil with the one inside the gearbox, we suggest to empty the gearbox from its oil and wash it before putting the new oil

LUBRICATION



ROBUS	Oil (lit)						ISO	Temp.	Oil Type
	B3	B6	B7	B8	V5	V6			
12	0,35	0,55	0,65	0,6	0,6	0,55	-	-10 +80°C	CENTOPLEX GLP-200-00BH*
21	0,3	0,75	0,95	0,95	1,3	0,85	220	+80°C	Mobil SHC 630 Shell Tivela S220 Klubersynth GH6-220
30	0,7	1,5	1,5	1,5	2,6	1,6			
60	1,1	2,2	2,2	2	3,9	3,6			
85	1,2	2,5	3,4	3,4	4,75	3,8			
150	2,3	6,3	6,5	6,5	8,8	6,7			
300	4,6	11,3	11,7	11,7	15,3	11,7			

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 ROBUS 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 .

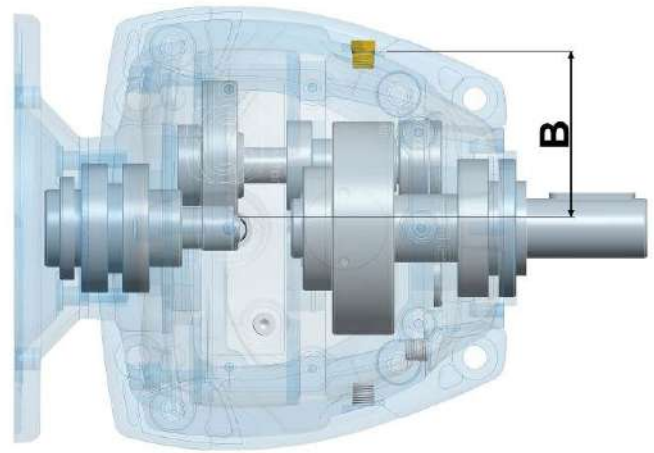
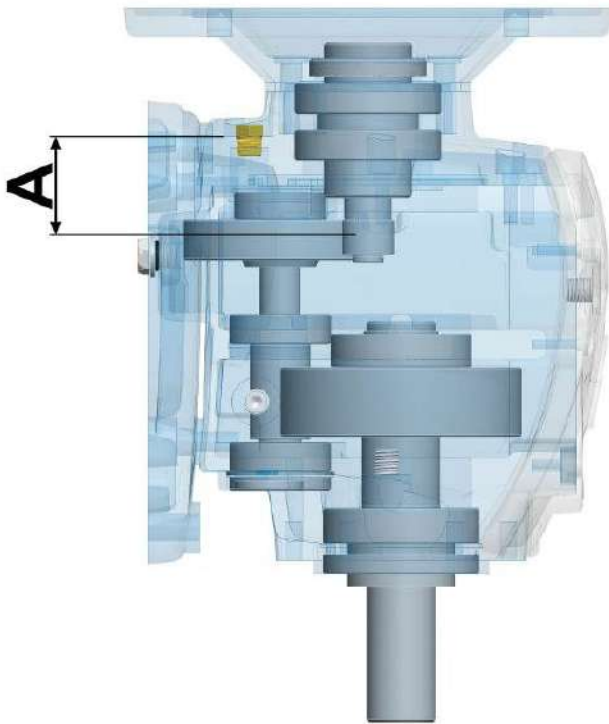


Level plugs, correctly positioned as per following tablechart, are a useful reference for the verification of the correct oil quantity



V5 / V1

B7



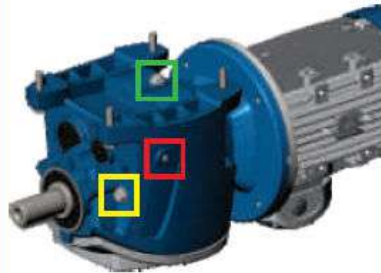
ROBUS	A (V5)	B (B7)
25	20	65
30	45	85
35	45	90
40	45	90
50 (PAM90-112)	47	115
50 (PAM132-160)	62	115
60	80	170

Mounting positions

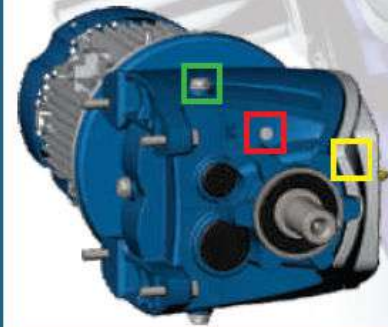
B3/B5



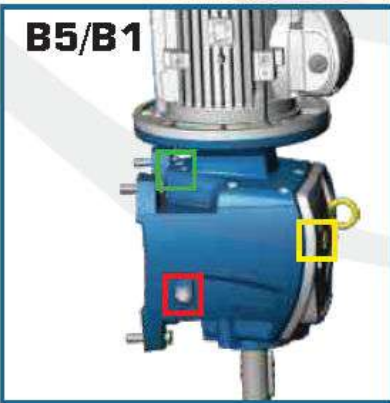
B38



B6



B5/B1



V6/V3



B7



breather plug



level plug



filler plug

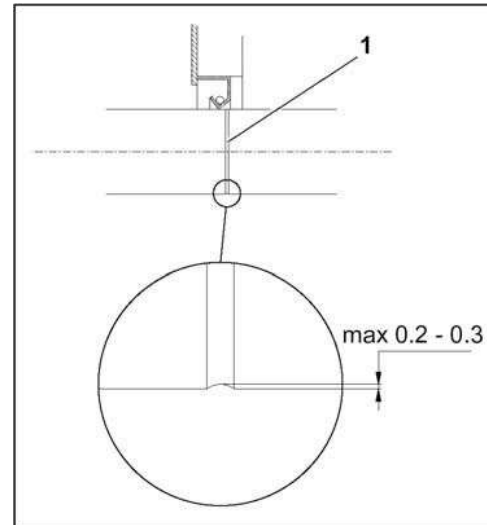


OIL SEALS REPLACEMENT

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 wear, 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 keyways
- 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



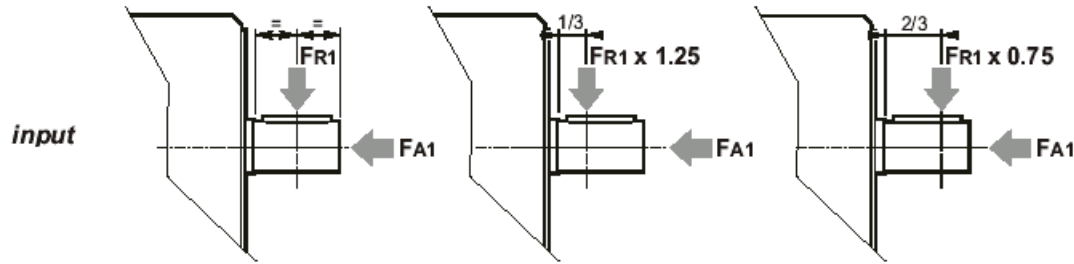
MF KIT

“MF KIT” is composed by all the needed parts to transform a standard flange motor-mounting BOX into a BOX+MF. In order to mount a KIT MF, you must request the specific instructions to Motive.

Only Motive authorized assembly centers and distributors are allowed to make these operations and the consequent final test.

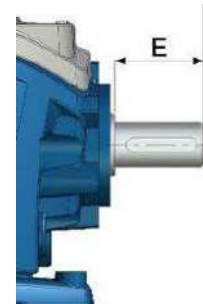
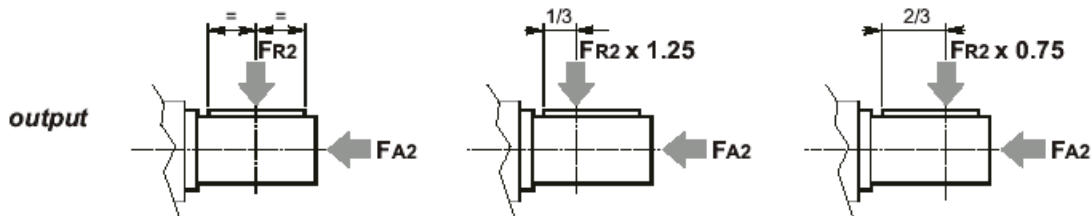


Max FR1 (at 0Kg FA1) - ROBUS-MF

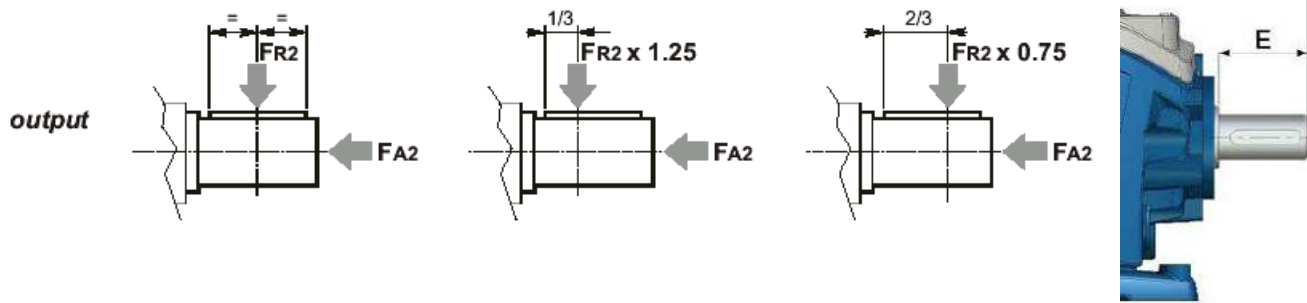


Max FA2 (at 0Kg FR2)

ROB-A2	FA2 max (kg)	ROB-25	FA2 max (kg)	ROB-30	FA2 max (kg)	ROB-35	FA2 max (kg)	ROB-40	FA2 max (kg)	ROB-50	FA2 max (kg)	ROB-60	FA2 max (kg)
i:	(kg)	i:	(kg)	i:	(kg)	i:	(kg)	i:	(kg)	i:	(kg)	i:	(kg)
2,93	31	4,00	40	4,05	66	3,96	80	4,03	80	4,06	40	4,00	169
5,03	31	4,88	37	5,66	62	5,23	85	4,78	83	5,02	16	5,42	129
7,58	31	6,84	31	6,79	58	7,46	94	6,65	72	8,03	10	7,34	97
9,97	31	10,42	34	9,96	49	10,05	100	9,96	38	10,37	10	7,89	107
12,75	31	12,68	29	14,27	51	12,53	105	13,54	33	15,29	10	9,74	48
15,02	43	15,75	19	18,37	110	16,34	54	14,83	124	18,15	69	13,38	107
19,86	43	20,99	10	22,30	10	15,07	91	21,27	129	21,56	10	15,32	10
24,70	43	19,95	47	20,36	115	19,71	26	23,31	116	19,83	58	15,26	148
30,12	43	24,81	27	23,02	119	18,79	115	24,05	152	22,83	185	16,75	226
35,26	43	25,42	57	25,38	11	25,51	10	14,95	10	27,50	10	19,69	10
39,33	55	30,18	16	30,44	86	26,40	148	20,32	10	29,90	10	20,92	416
46,05	55	32,51	10	35,46	62	30,17	36	25,97	18	34,47	10	22,96	427
50,21	55	39,27	25	39,26	58	34,25	96	31,94	10	38,78	10	24,63	20
55,15	55	46,07	10	47,66	106	41,29	67	33,94	95	45,12	10	28,33	10
59,43	55	49,28	10	49,45	152	46,13	166	40,81	18	50,35	40	35,72	10
64,21	55	57,20	10	55,56	90	50,82	118	44,45	29	57,74	10	38,36	10
69,59	55	59,94	58	60,16	131	55,61	158	50,24	122	61,99	10	44,72	10
75,68	55	69,57	45	72,29	177	59,29	91	52,82	79	71,34	10	48,03	10
81,22	55	80,69	74	84,26	182	68,44	188	62,71	194	83,01	10	55,42	20
85,05	67	91,47	62	91,24	186	79,85	185	70,62	205	92,13	10	60,82	49
92,50	67	99,12	101	102,47	198	84,70	206	79,22	223	100,70	10	69,95	10
99,54	67	106,18	95	106,30	204	98,82	212	92,40	233	107,20	10	81,51	20
109,43	67	119,37	135	120,20	210	105,60	236	101,24	245	117,17	10	89,28	306
119,00	67					123,20	245	105,80	248			101,79	228
134,18	67							115,92	252			111,72	192
												115,43	154



Max FR2 (at 0Kg FA2)



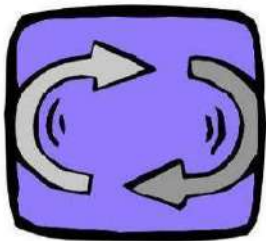
ROB-A2	FR2 max	ROB-25	FR2 max	ROB-30	FR2 max	ROB-35	FR2 max	ROB-40	FR2 max	ROB-50	FR2 max	ROB-60	FR2 max
l:	(kg)	l:	(kg)	l:	(kg)	l:	(kg)	l:	(kg)	l:	(kg)	l:	(kg)
2,93	156	4,00	200	4,05	329	3,96	398	4,03	402	4,06	201	4,00	846
5,03	156	4,88	185	5,66	310	5,23	425	4,78	417	5,02	78	5,42	646
7,58	156	6,84	157	6,79	291	7,46	468	6,65	362	8,03	50	7,34	485
9,97	156	10,42	172	9,96	243	10,05	500	9,96	192	10,37	50	7,89	537
12,75	156	12,68	144	14,27	253	12,53	525	13,54	167	15,29	50	9,74	242
15,02	216	15,75	97	18,37	551	16,34	270	14,83	618	18,15	345	13,38	537
19,86	216	20,99	50	22,30	50	15,07	456	21,27	647	21,56	50	15,32	50
24,70	216	19,95	234	20,36	576	19,71	132	23,31	582	19,83	292	15,26	742
30,12	216	24,81	136	23,02	596	18,79	574	24,05	762	22,83	924	16,75	1128
35,26	216	25,42	284	25,38	54	25,51	50	14,95	50	27,50	50	19,69	50
39,33	276	30,18	79	30,44	432	26,40	740	20,32	50	29,90	50	20,92	2079
46,05	276	32,51	50	35,46	312	30,17	180	25,97	90	34,47	50	22,96	2134
50,21	276	39,27	125	39,26	288	34,25	480	31,94	50	38,78	50	24,63	100
55,15	276	46,07	48	47,66	528	41,29	336	33,94	477	45,12	50	28,33	50
59,43	276	49,28	50	49,45	762	46,13	828	40,81	90	50,35	198	35,72	50
64,21	276	57,20	50	55,56	450	50,82	588	44,45	144	57,74	50	38,36	50
69,59	276	59,94	288	60,16	656	55,61	792	50,24	612	61,99	50	44,72	50
75,68	276	69,57	224	72,29	884	59,29	456	52,82	396	71,34	50	48,03	50
81,22	276	80,69	372	84,26	912	68,44	942	62,71	972	83,01	50	55,42	100
85,05	336	91,47	312	91,24	932	79,85	924	70,62	1026	92,13	50	60,82	248
92,50	336	99,12	504	102,47	992	84,70	1032	79,22	1116	100,70	50	69,95	50
99,54	336	106,18	477	106,30	1020	98,82	1062	92,40	1164	107,20	50	81,51	100
109,43	336	119,37	677	120,20	1050	105,60	1179	101,24	1224	117,17	50	89,28	1530
119,00	336					123,20	1224	105,80	1242			101,79	1140
134,18	336							115,92	1260			111,72	960
												115,43	770

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 OMISSIONS.

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



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