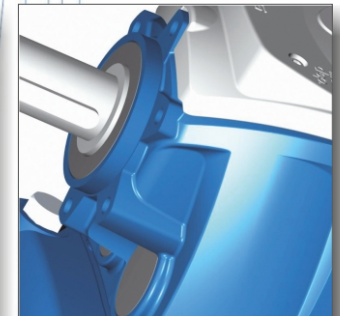
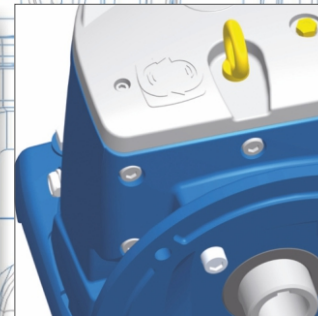
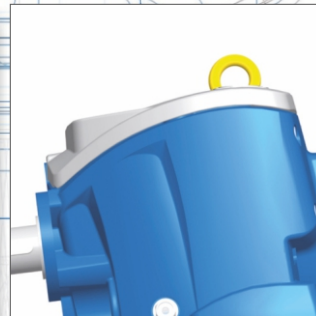
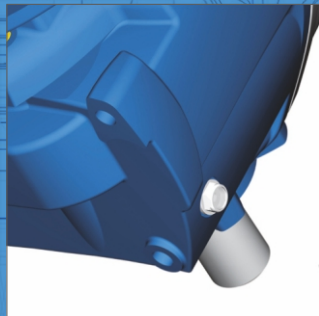


# ROBUS IN-LINE HELICAL GEARBOX



**rotomotive**  
*looks good. performs better.*





Rotomotive Powerdrives India Ltd is an Italian joint venture company operating in India since 2006. It has access to European technology and know-how from Motive srl, one of the joint venture partners and sources parts and components from Indian suppliers. We have a modern manufacturing facility in Gujarat, India. Rotomotive has the capacity to design, prototype and manufacture custom motors for various applications.

Our modern manufacturing plant has advanced machinery for automatic winding, trickle and vacuum pressure impregnation, precise balancing, conveyORIZED assembly, enclosed painting lines, automatic testing facilities with all components bar coded for traceability, consistent quality and low production time.

We also have an advanced testing facility for type testing motors and gearboxes which enables us to plot accurate speed torque curves and carry out temperature rise tests and other type tests as per IEC 60034/IS: 12615.

Our Manufacturing facility in India



Gearbox machining



Assembly Line



Testing Line



Hardness Testing



CMM for mechanical inspection



Shop Floor

# INDEX

Technical characteristics	pag. 2-3
Higher service factor in compact size	pag. 4
Calculation of performance parameters	pag. 5
Lubrication	pag. 6
Selection guide KW / SIZE / RATIO	pag. 7
Performance table 12-21	pag. 8
Performance table 30-60	pag. 9
Performance table 85-150	pag. 10
Performance table 300	pag. 11
Dimensions	pag. 12-13
List of components ROBUS	pag. 14-15
Weights	pag. 16



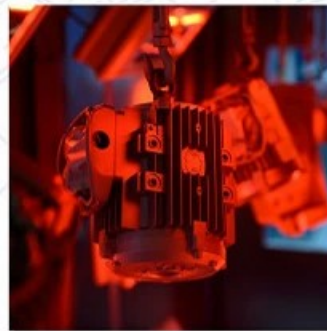
Our Manufacturing facility in Italy



A



B



C



D

# RB12-RB300 TECHNICAL CHARACTERISTICS



Uniquely contoured, rigid, precise, monobloc, cast iron Body, Base and Flange ensure extreme robustness.  
In Robus 12, the main body comprises of a single piece aluminium casting with an optimum balance between weight, rigidity and precision.



Except Robus 12, all Robus sizes have a screw-on lifting eyebolt



## ROBUST

A large top cover in light weight aluminium alloy facilitates the inspection

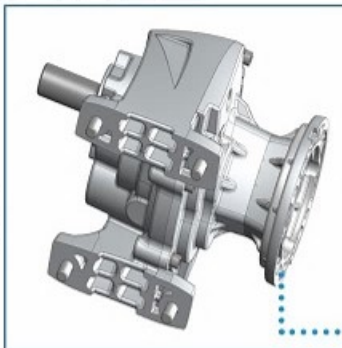


\*Modular design with detachable output flange and foot base allows easy and quick conversion between foot and flange mounting

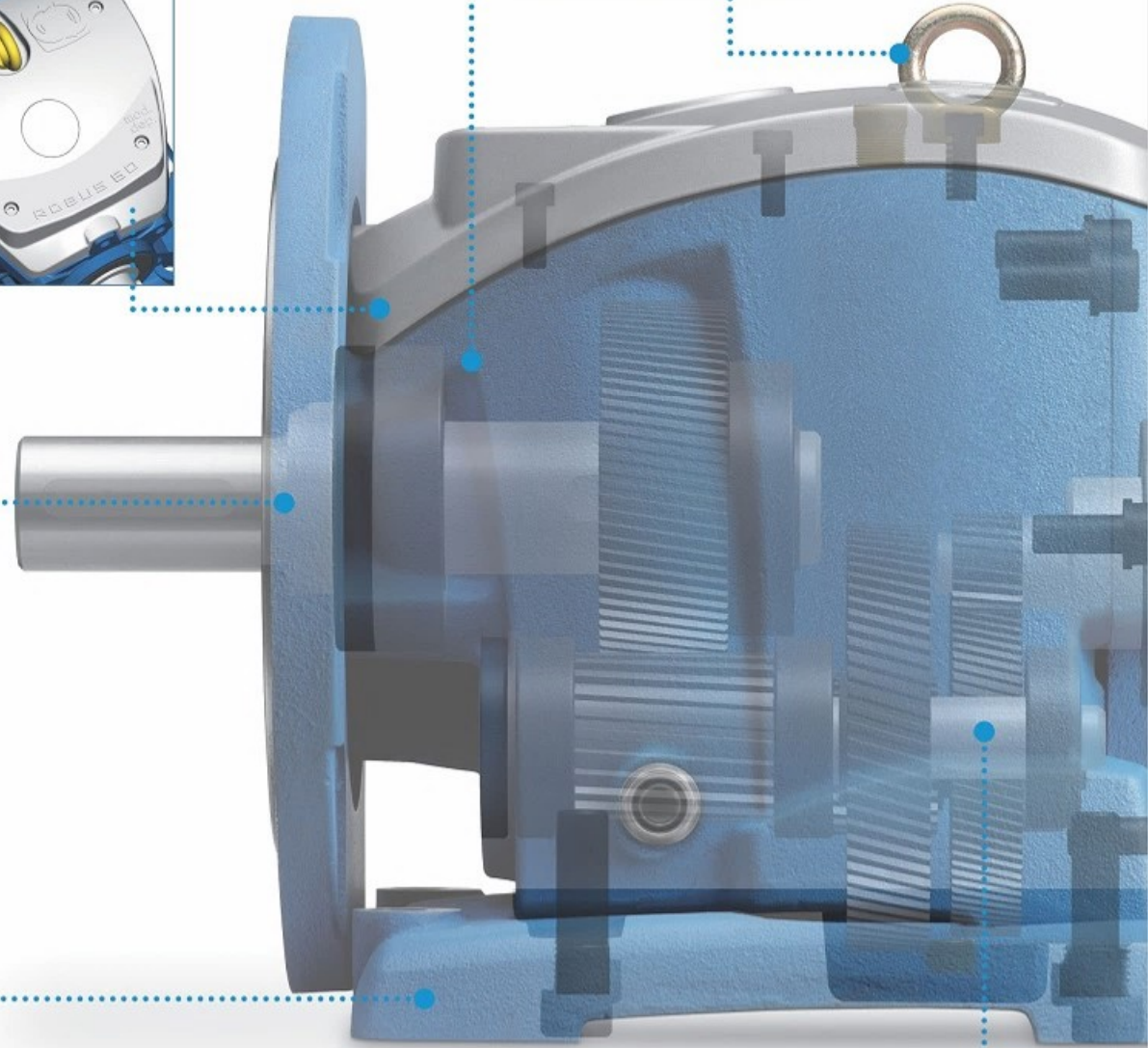


## VERSATILE

A removable base enables easy conversion of foot mounted Robus 12 to flange mounting or universal mounting.



\*These features available in Robus 12 only.





Easy to examine and maintain

Minimum maintenance requirement.  
All sizes are supplied with long-life synthetic oil.



IEC flange and hollow shaft.

Choice of hollow input flanges permits direct mounting of any standard motor



Unique construction of Robus makes it possible to mount any size in any position.  
This flexibility is achieved by:

+ ZZ shielded pre-lubricated bearings on input and output shaft



+ 6 interchangeable plugs, including one breather plug and a level plug please note that the vent plug also allows you to reduce the internal pressure on seals, and thus increases the efficiency of the gearbox



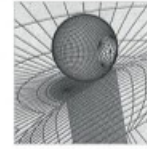
+ mechanical parts locked in their positions by snap rings and spacers. This also ensures better absorption of axial thrust and prolongs the life of bearings

FLEXIBLE MOUNTING

ENGINEERED FOR HIGHER RELIABILITY



Use of high strength steels like 15CrMo4 and case hardening to 58 +2 HRC reduce the wear rate in wheels. All wheels are profile ground to Din 3962 class 6 accuracy for low noise and high efficiency.



The surface is exposed to a bombardment of micro-spheres that induces compression and increases further the fatigue resistance.



Shafts are made from 42CrMo4 steel and tempered to reach a hardness of 23-35 HRC, thus increasing their capacity to withstand shearing stresses.



If the mechanical robustness and the service factor of a helical gearbox are mainly influenced by the centre distance of the last stage, Robus confirms to be very robust (see "X2" at page 13).



Single stages ratios between 2 and 6, together with proper gears sizes, result mathematically in higher teeth number and size (module) of each wheel and a better fractioned load among the reduction stages. That influences both durability and torque transmission capability.



Dual bearing support on the input shaft assures precise alignment of the first stage gears and reduces vibrations and consequent gear wear.



Intermediate shaft is rigidly supported by 3 bearings, with no overhang wheel, thus imparting greater flexural strength and better meshing. This increases the overloading capacity and takes to lower noise.



Smaller overhang distance of output shaft from supporting bearing in order to withstand higher radial loads.



Oversized bearings size (page 15), in order to withstand higher loads.

## HIGHER SERVICE FACTOR IN COMPACT SIZE

### Offered service factor

Which features determine the service factor offered by a helical gearbox ?

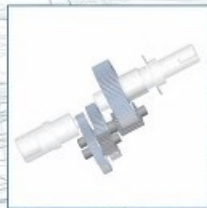
The service factor of a gearbox is its capacity to withstand operating load and overloads, a certain number of starts, the duration of operating time, mechanical shocks and vibrations. Thus, higher the service factor, greater is the possibility of trouble free operation and increased life. Without aiming to be completely exhaustive, we list here the main features that influence the service factor:



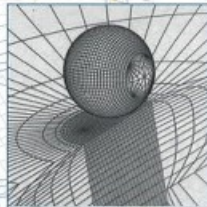
Amongst all parts, the last stage gears are subjected to highest mechanical stresses. Higher centre distance which in turn results in higher module considerably increases the service factor. ROBUS excels in the area (see measures at last page)



Compared to fractioned or Aluminium body, the monobloc cast-iron body of ROBUS provides higher rigidity and mechanical robustness. At the same time a one-piece body like that of ROBUS-12 is more rigid and reliable than a body composed of several parts.



Use of high strength steels like 15CrMo4 and case hardening to 58 +2 HRC reduce the wear rate in wheels. All wheels are profile ground to Din 3962 class 6 accuracy for low noise and high efficiency.



The surface is exposed to a bombardment of micro-spheres that induces compression and increases further the fatigue resistance.



Shafts are made from 42CrMo4 steel and tempered to reach hardness of 23-35 HRC, thus increasing their capacity to withstand shearing stresses and torsion effect.



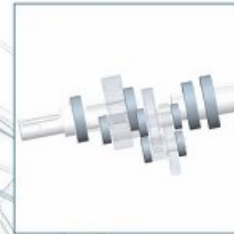
Optimal ratios (between 2 and 6) in the several stages, together with appropriate centre distances, result in higher number of teeth and size (module) of each wheel and better torque transmission fractioning through various stages. This improves the overall durability.



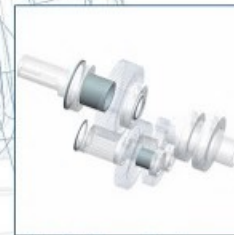
Dual bearing support on the input shaft ensures precise alignment of the first stage gears and reduces vibrations and consequent gear wear



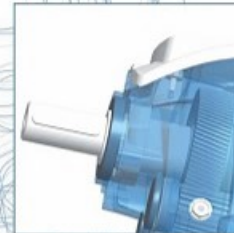
An intermediate shaft rigidly supported by 3 bearings instead of 2, with no overhang wheel, imparts greater flexural strength and smoother meshing



Oversized bearings (see ROBUS bearing list), allow the gearbox to withstand higher operating loads



Mechanical parts locked in their position by snap rings and spacers. This ensures better absorption of axial thrust and prolongs the life of bearings



Smaller overhang of output shaft from supporting bearing in order to withstand higher radial loads

# CALCULATION OF PERFORMANCE PARAMETERS

## Rated output torque $M_{n2}$ (Nm)

Torque output transmissible under uniform loading and referred to the input speed  $n_1$  and the corresponding output speed  $n_2$ . The output torque can be calculated with the following formula:

$$M_{n2} = \frac{P_{n1} [\text{kW}] \cdot 9550}{n_2} \cdot \eta$$

## Torque demand $M_{r2}$ (Nm)

Torque calculated based on application requirements. It must be  $< M_{n2}$  of the chosen ROBUS unit.

## Input power $P_{n1}$ (kW)

This is the power value of the motor applied to the input shaft and corresponding to a certain input speed  $n_1$ , a service factor  $f_s = 1$  and a duty service  $S_1$ .

It is even possible to calculate the motor size necessary by using the formula:

$$P_{n1} [\text{kW}] = \frac{M_{r2} \cdot n_2}{9550 \cdot \eta}$$

Since the value calculated in this way could not really correspond to an input power actually available in the IEC standardised motors, it will be necessary to choose, among the input powers available, the one which is immediately higher, checking this in the Rotomotive catalogue of the motors.

## Efficiency $\eta$ (%)

An inherent factor in the selection helical gear boxes is the efficiency  $\eta$ , defined as the ratio between the mechanical power coming out from the output shaft, and the power in the input shaft:

$$\eta = \frac{P_{n2}}{P_{n1}}$$

The efficiency in helical gearboxes is mainly determined by the gearing and

bearing friction.

The efficiency of ROBUS varies with the nr of stages: it's 94% when the reduction stages are 3, 96% when the stages are 2. The starting efficiency is always less than the efficiency at rated speed.

## Gear ratio $i$

It is the relationship of the input speed  $n_1$  and the output speed  $n_2$

$$i = \frac{n_1}{n_2}$$

In the combined, the total ratio is the result of the product of the ratio of the two single gearboxes.

## Input speed $n_1$ (rpm)

It is the speed the ROBUS unit is driven at.

## Output speed $n_2$ (rpm)

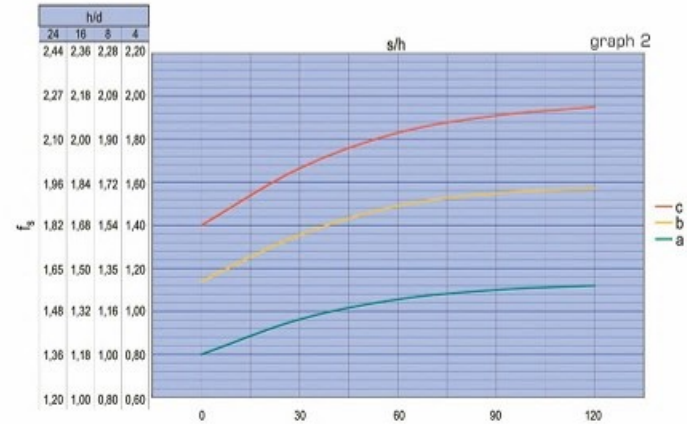
It is the rotation speed of the output shaft.

## Service factor $f_s$

It is a numeric value describing the ROBUS unit service duty. With unavoidable approximation, it takes into consideration:

- The daily working hours **h/d**
- The load classification (see table 2), and then the moment of inertia of the driven masses.
- The number of starts per hour **s/h**
- The presence of brake motors, for which it is necessary to multiply for 1.12 the service factor value deducted by the graph 2.
- The significance of the application in terms of safety, for example lifting of parts.

In the graph 2, the service factor  $f_{sr}$  required by a certain application can be attained, after having selected the proper "daily working hours" (h/d) column, by intersecting the number of starts per hour (s/h) and one of the a, b or c curves. The curves a, b and c are linked with the load classification described in the table 2.



tab. 2

load Classification	Application
<b>c</b> uneven operation, heavy loads, larger masses to be accelerated	conveyors with violent jerks; compressors ad alternate pumps with 1 or more cylinders; machinery for bricks, tiles and clay; kneaders; milling machines; lifting winches with buckets; roting furnaces; heavy fans or mining purposes; mixers for heavy materials; machine-tools; planing kinds; alternating saws; shears; tumbling barrels; vibrators; shredders; turntables
<b>b</b> starting with moderate loads, uneven operating conditions, medium size masses to be accelerated	belt conveyors with varied load with transfer of bridge trucks for light duty; levelling machines; shakers and mixed for liquid with variable density and viscosity; machines for the food industry (kneading troughs, mincing machines, slicing machines, etc); sifting machines for sand gravel; textile industry machines; cranes, hoists, goodstifts; fertilizer scrapers; concrete mixers; folding machines; winches; crane mechanisms
<b>a</b> easy starting, smooth operation, small masses be accelerated	belt conveyors for light material; centrifugal pumps; rotary gear pumps; screw feeders for light materials; lifts; bottling machines; auxiliary controls of tool machines; fans; power generators; fillers; small mixers

If, after the selection of the right  $M_{r2}$  and  $n_2$  in the following performance tables, you don't find a ROBUS unit whose service factor  $f_s$  is  $>$  of the requested one  $f_{sr}$ , you can choose a ROBUS unit in which  $M_{n2} > M_{r2}$ .

In fact, in order to satisfy  $f_{sr}$ , you can choose another ROBUS unit whose output torque is  $> M_{c2}$  output torque, where:

$$M_{c2} = M_{r2} \cdot f_{sr}$$

Note: This rule is valid only if the new ROBUS unit that has been selected in this way has a service factor  $f_s > 1$  in the performance tables.

From another point of view, the value of  $f_s$  in the performance tables refers to a case

in which the effective torque requested by the application  $M_{r2}$  matches perfectly with the one appearing on the catalogue  $M_{n2}$ .

Whenever the torque indicated in the performance table is higher than the requested one, the offered service factor of the performance table can be increased according to the formula:

$$f_{s \text{ real}} = \frac{f_s \text{ on the table} \cdot M_{n2} \text{ on the table}}{M_{r2}}$$

The value of  $f_s$  calculated in this way must be  $\geq f_{sr}$ .

# LUBRICATION

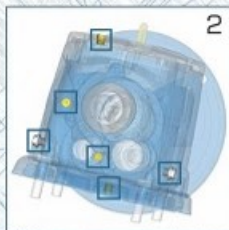
Each Robus is supplied with long-life synthetic oil and do not require any maintenance. The oil quantity is suitable for B3 mounting position

ROBUS	Oil (lt)						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			

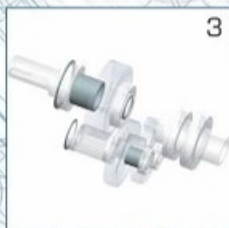
After adapting the oil quantity, each Robus, can be mounted in ANY position, thus giving big advantages in the inventory reduction and interchangeability due to the following 3 characteristics:



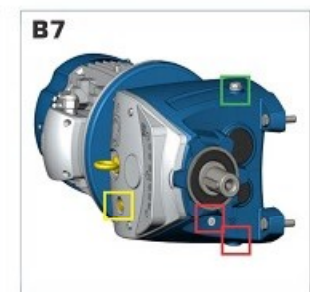
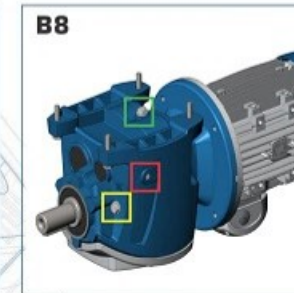
ZZ shielded pre-lubricated bearings on input and output shaft



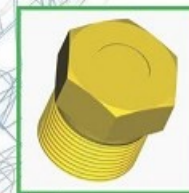
6 interchangeable plugs, including one breather plug and a level plug. Level and breather plug must be positioned according to this chart



Mechanical parts locked in their positions by circlips and spacers. This also ensures better absorption of axial thrust and prolongs the life of bearings



**B5, V1 & V3 positions are for flange mounted**



breather plug



level plug



filler plug

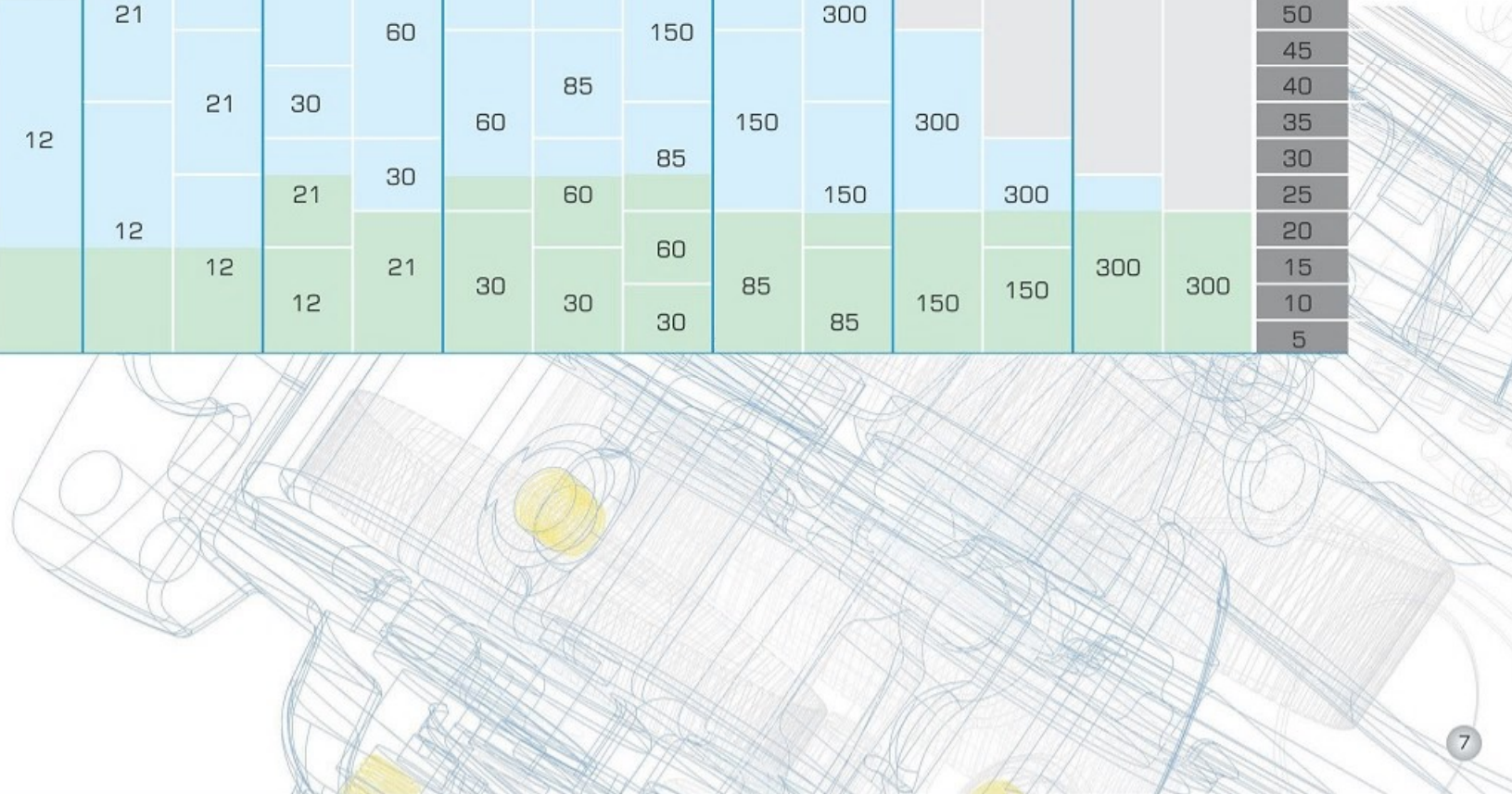
\*Robus 12 is supplied ONLY with a solid plug and with Synthetic grease of NLGI 00 viscosity grade. The plug can be used for evacuating or topping up the grease.

# SELECTION GUIDE KW / SIZE / RATIO

service factor  $f_s = 1.5$

input PAM	63		71		80		90		100/112			132		160		180	
	11 mm		14 mm		19 mm		24 mm		28 mm			38 mm		42 mm		48 mm	
$P_{n1}$ KW	0.12	0.18	0.25	0.37	0.55	0.75	1.1	1.5	2.2	3	3.7	5.5	7.5	11	15	18.5	22
$P_{n1}$ HP	0.18	0.25	0.35	0.5	0.75	1	1.5	2	3	4	5	7.5	10	15	20	25	30
120																	
110				30	60		85	150		300							
100						60			150		300						
90																	
80					30		85										
70				21													
60						30		60		150		300					
55							30		85								
50					21		60				150		300				
45	12	12	12														
40						21				85							
35							21	30				150		300			
30				12					60		85						
25							21	30		60		150			300		
20					12												
15						12		21			60					300	300
10							12		30	30		85		150	150		
5										30			85				

= 3 stages  
 = 2 stages



PERFORMANCE TABLE 12-21

Service factor fs=1.5 @ 1440 RPM

ROBUS 12		Peak Torque = 120 Nm																									
		Rated Ratio	3	5	8	10	13	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	100	110	120	
Input: 63, 71, 80	Real Ratio	2.93	5.03	7.58	9.97	12.75	15.02	19.86	24.7	30.12	35.26	39.33	46.05	50.21	55.15	59.43	64.26	69.59	75.68	81.22	85.05	92.5	99.54	109.43	119		
	Stage	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3		
	Robus 12 with 2 Pole / 2880 RPM motors																										
	KW   Frame																										
	Speed		982.9	572.6	379.9	288.9	225.9	191.7	145.0	116.6	95.6	81.7	73.2	62.5	57.4	52.2	48.5	44.8	41.4	38.1	35.5	33.9	31.1	28.9	26.3	24.2	
	0.18	63A	1.6	2.8	4.2	5.6	7.1	8.4	11.1	13.8	15.9	18.7	20.8	24.4	26.6	29.2	31.5	34.0	36.8	40.0	43.0	45.0	49.0	52.7	57.9	63.0	
	0.25	63B	2.3	3.9	5.9	7.7	9.9	11.7	15.4	19.2	22.1	25.9	28.9	33.8	36.9	40.5	43.7	47.2	51.1	55.6	59.7	62.5	68.0	73.2	80.4	87.5	
	0.37	71A	3.4	5.8	8.7	11.4	14.6	17.2	22.8	28.4	32.8	38.4	42.8	50.1	54.6	60.0	64.6	69.9	75.7	82.3	88.4	92.5	101	Robus 21			
	0.55	71B	5.0	8.6	12.9	17.0	21.8	25.6	33.9	42.2	48.7	57.0	63.6	74.5	81.2	89.2	96.1	104	Robus 21			Robus 30					
	0.75	80A	6.8	11.7	17.6	23.2	29.7	35.0	46.2	57.5	66.4	77.7	86.7	102	Robus 21			Robus 30			Robus 60						
1.1	80B	10.0	17.2	25.9	34.0	43.5	51.3	67.8	84.3	97.4	Robus 21			Robus 30			Robus 60										
Output: 56B5	Robus 12 with 4 Pole / 1440 RPM motors																										
	Speed		491.5	286.3	190.0	144.4	112.9	95.9	72.5	58.3	47.8	40.8	36.6	31.3	28.7	26.1	24.2	22.4	20.7	19.0	17.7	16.9	15.6	14.5	13.0	12.1	
	0.12	63A	2.2	3.7	5.6	7.4	9.5	11.2	14.8	18.4	21.3	24.9	27.8	32.5	35.4	38.9	41.9	45.3	49.1	53.4	57.3	60.0	65.3	70.2	77.2	84.0	
	0.18	63B	3.3	5.6	8.5	11.1	14.2	16.8	22.2	27.6	31.9	37.3	41.6	48.7	53.1	58.4	62.9	68.0	73.7	80.1	86.0	90.0	97.9	105	Robus 21		
	0.25	71A	4.5	7.8	11.8	15.5	19.8	23.3	30.8	38.3	44.3	51.8	57.8	67.7	73.8	81.1	87.4	94.5	102	Robus 21			Robus 30				
	0.37	71B	6.7	11.6	17.4	22.9	29.3	34.5	45.6	56.7	65.5	76.7	85.6	100	Robus 21			Robus 30			Robus 60						
	0.55	80A	10.0	17.2	25.9	34.0	43.5	51.3	67.8	84.3	97.4	Robus 21			Robus 30			Robus 60									
	0.75	80B	13.6	23.4	35.3	46.4	59.4	69.9	92.4	Robus 21			Robus 30			Robus 60											
	Shaft: 20, 25	Robus 12 with 6 Pole / 960 RPM motors																									
		Speed		327.6	190.9	126.6	96.3	75.3	63.9	48.3	38.9	31.9	27.2	24.4	20.8	19.1	17.4	16.2	14.9	13.8	12.7	11.8	11.3	10.4	9.6	8.8	8.1
0.18		71A	4.9	8.4	12.7	16.7	21.4	25.2	31.5	41.4	47.8	56.0	62.4	73.1	79.7	87.6	94.4	102	Robus 21			Robus 30					
0.25		71B	6.8	11.7	17.6	23.2	29.7	35.0	43.8	57.5	66.4	77.7	86.7	102	Robus 21			Robus 30			Robus 60						
0.37		80A	10.1	17.3	26.1	34.3	43.9	51.7	64.8	85.1	98.3	Robus 21			Robus 30			Robus 60									
0.55		80B	14.2	24.4	36.8	48.4	61.9	72.9	96.3	Robus 21			Robus 30			Robus 60											

Service factor fs=1.5 @ 1440 RPM

ROBUS 21		Peak Torque = 210 Nm																									
		Rated Ratio	4	5	7	10	13	15	20	25	30	35	40	45	50	55	60	70	80	90	100	110	120				
Input: 71, 80, 90	Real Ratio	4	4.88	6.84	10.42	12.68	15.75	19.95	24.5	30.18	32.51	39.27	46.07	49.28	57.2	59.94	69.57	79.29	91.47	99.12	106.18	119.93					
	Stage	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3					
	Robus 21 with 2 Pole / 2880 RPM motors																										
	KW   Frame																										
	Speed		720.0	590.0	421.1	276.4	227.1	182.9	144.4	117.6	95.4	88.6	73.3	62.5	58.4	50.3	48.0	41.4	36.3	31.5	29.1	27.1	24.0				
	0.55	71B	Robus 12															112	128	148	160	172	Robus30				
	0.75	80A	Robus 12															109	126	132	153	175	Robus 30				
	1.1	80B	Robus 12															105	127	149	159	185	Robus 30	Robus 60			
	1.5	90S	18.6	22.7	31.8	48.5	59.0	73.3	92.9	114	133	143	173	Robus 30			Robus 60			Robus 85							
	2.2	90L	27.3	33.3	46.7	71.1	86.6	107	136	167	Robus 30			Robus 60			Robus 85			Robus150							
Output: 71B5, 80/90B5	Robus 21 with 4 Pole / 1440 RPM motors																										
	Speed		360.0	295.1	210.5	138.2	113.6	91.4	72.2	58.8	47.7	44.3	36.7	31.3	29.2	25.2	24.0	20.7	18.2	15.7	14.5	13.6	12.0				
	0.37	71B	Robus 12															107	124	130	151	173	Robus 30				
	0.55	80A	Robus 12															105	127	149	159	185	Robus 30	Robus 60			
	0.75	80B	Robus 12															114	133	143	173	Robus 30			Robus 60		
	1.1	90S	27.3	33.3	46.7	71.1	86.6	108	136	167	Robus 30			Robus 60			Robus 85			Robus150							
	1.5	90L	37.2	45.4	63.7	97.0	118	147	Robus 30			Robus 60			Robus 85	Robus 150											
	Shaft: 25, 30	Robus 21 with 6 Pole / 960 RPM motors																									
		Speed		240.0	196.7	140.4	92.1	75.7	61.0	48.1	39.2	31.8	29.5	24.4	20.8	19.5	16.8	16.0	13.8	12.1	10.5	9.7	9.0	8.0			
		0.18	71A	Robus 12															110	126	145	157	169	Robus30			
0.25		71B	Robus 12															109	126	132	153	175	Robus 30				
0.37		80A	Robus 12															106	128	150	161	187	Robus 30	Robus 60			
0.55		80B	Robus 12															125	146	158	Robus 30			Robus 60			
0.75		90S	27.9	34.1	47.8	72.8	88.5	110	139	171	Robus 30			Robus 60			Robus 85			Robus150							
1.1		90L	41.0	50.0	70.0	107	130	161	Robus 30			Robus 60			Robus 85			Robus 150									

PERFORMANCE TABLE 30-60

Service factor fs = 1.5 @ 1440 RPM

ROBUS 30																						Peak Torque = 300 Nm					
Input: 71, 80, 90*, 100*, 112*	Rated Ratio	4	5	7	10	15	18	20	23	25	30	35	40	45	50	55	60	70	80	90	100	110	120				
	Real Ratio	4.05	5.66	6.79	9.96	14.27	18.37	20.36	23.02	25.38	30.44	35.46	39.26	47.66	49.45	55.56	60.16	72.29	84.26	91.24	102.47	106.3	120.2				
	Stage	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
	Robus 30 with 2 Pole / 2880 RPM motors																										
	KW	Frame	Torque (Nm)																								
	Speed		711.1	508.8	424.2	289.2	201.8	156.8	141.5	125.1	113.5	94.6	81.2	73.4	60.4	58.2	51.8	47.9	39.8	34.2	31.6	28.1	27.1	24.0			
	0.75	80A	Robus 12										Robus 21														
	1.1	80B	Robus 12										Robus 21														
	1.5	90S	Robus 21										Robus 21														
	2.2	90L	Robus 21										197	229	254	Robus 60					Robus 85					Robus 150	
3.7	100LB	46.5	65.0	78.0	114	164	211	234	264	Robus 60					Robus 85					Robus 150							
Output: 71B5, 80/90B5	Robus 30 with 4 Pole / 1440 RPM motors																										
	Speed		355.6	254.4	212.1	144.6	100.9	78.4	70.7	62.6	56.7	47.3	40.6	36.7	30.2	29.1	25.9	23.9	19.9	17.1	15.8	14.1	13.5	12.0			
	0.37	71B	Robus 12										Robus 21														
	0.55	80A	Robus 12										Robus 21														
	0.75	80B	Robus 12										Robus 21														
	1.1	90S	Robus 21										197	229	254	Robus 60					Robus 85					Robus 150	
	1.5	90L	Robus 21										162	180	203	224	Robus 60					Robus 85					Robus 150
	2.2	100L	55.3	77.3	92.7	136	195	251	Robus 60					Robus 85					Robus 150					Robus 300			
	3.7	112MB	93.0	130	156	229	Robus 60					Robus 85					Robus 150					Robus 300					
	Shaft: 30, 35	Robus 30 with 6 Pole / 960 RPM motors																									
Speed			237.0	169.6	141.4	96.4	67.3	52.3	47.2	41.7	37.8	31.5	27.1	24.5	20.1	19.4	17.3	16.0	13.3	11.4	10.5	9.4	9.0	8.0			
0.25		71B	Robus 12										Robus 21														
0.37		80A	Robus 12										Robus 21														
0.55		80B	Robus 21										Robus 21														
0.75		90S	Robus 21										201	235	260	Robus 60					Robus 85					Robus 150	
1.1		90L	Robus 21										188	209	235	246	Robus 60					Robus 85					Robus 150
1.5		100L	56.6	79.0	94.8	139	199	257	Robus 60					Robus 85					Robus 150					Robus 300			
2.2		112M	83.0	116	139	204	Robus 60					Robus 85					Robus 150					Robus 300					

\*For ROBUS 30 : Input 90 available upto 60 ratio • Input 100/112 available upto 40 ratio

Service factor fs = 1.5 @ 1440 RPM

ROBUS 60																						Peak Torque = 600 Nm					
Input: 80, 90*, 100*, 112*	Rated Ratio	4	5	8	10	13	15	20	25	30	35	40	45	50	55	60	70	80	90	100	110	120					
	Real Ratio	3.96	5.23	7.46	10.05	12.53	15.07	18.79	26.4	30.17	34.25	41.29	46.13	50.82	55.61	59.29	68.44	79.85	84.7	98.82	105.6	123.2					
	Stage	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3				
	Robus 60 with 2 Pole / 2880 RPM motors																										
	KW	Frame	Torque (Nm)																								
	Speed		727.3	550.7	386.1	286.6	229.8	191.1	153.3	109.1	95.5	84.1	69.8	62.4	56.7	51.8	48.6	42.1	36.1	34.0	29.1	27.3	23.4				
	1.1	80B	Robus 12										Robus 21														
	1.5	90S	Robus 21										Robus 30														
	2.2	90L	Robus 21										Robus 30														
	3.7	100LB	Robus 30										287	328	373	449	502	Robus 85					Robus 150				
Output: 80/90B5, 100/112B5	Robus 60 with 4 Pole / 1440 RPM motors																										
	Speed		363.6	275.3	193.0	143.3	114.9	95.6	76.6	54.5	47.7	42.0	34.9	31.2	28.3	25.9	24.3	21.0	18.0	17.0	14.6	13.6	11.7				
	0.55	80A	Robus 12										Robus 21														
	0.75	80B	Robus 12										Robus 21														
	1.1	90S	Robus 21										Robus 30														
	1.5	90L	Robus 21										Robus 30														
	2.2	100L	Robus 30										257	390	443	Robus 85					Robus 150						
	3.7	112MB	Robus 30										288	346	432	Robus 85					Robus 150						
	Shaft: 35, 40	Robus 60 with 6 Pole / 960 RPM motors																									
		Speed		242.4	183.6	128.7	95.5	76.6	63.7	51.1	36.4	31.8	28.0	23.3	20.8	18.9	17.3	16.2	14.0	12.0	11.3	9.7	9.1	7.8			
0.37		80A	Robus 12										Robus 21														
0.55		80B	Robus 12										Robus 21														
0.75		90S	Robus 21										Robus 30														
1.1		90L	Robus 21										Robus 30														
1.5		100L	Robus 30										293	332	401	448	493	Robus 85					Robus 150				
2.2		112M	Robus 30										262	399	453	Robus 85					Robus 150						

\*For ROBUS 60 : Input 90 available upto 20 (2 stage) ratio & 15 to 90 (3 stage) ratio • Input 100/112 available upto 20 (2 stage) ratio & 15 to 60 (3 stage) ratio

## PERFORMANCE TABLE 85-150

Service factor fs = 1.5 @ 1440 RPM

<b>ROBUS 85</b>		Peak Torque = 850 Nm																								
Rated Ratio		4	5	7	10	13	15	20	23	25	30	35	40	45	50	55	60	70	80	90	100	110	120			
Input: 90, 100*, 112*, 132*	Real Ratio	4.03	4.78	6.65	9.96	13.54	14.83	21.27	23.31	24.05	31.94	33.98	40.81	44.46	50.25	52.92	63.05	70.75	79.23	92.4	101.24	105.99	116.13			
	Stage	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3			
	Robus 85 with 2 Pole / 2880 RPM motors																									
	Torque (Nm)																									
	KW	Frame																								
	Speed		714.6	602.5	433.1	289.2	212.7	194.2	135.4	123.6	119.8	90.2	84.8	70.6	64.8	57.3	54.4	45.7	40.7	36.3	31.2	28.4	27.2	24.8		
	2.2	90L	Robus 21										Robus 30					Robus 60					598	655	686	Robus 150
	3.7	100LB	Robus 30										Robus 60					Robus 150					Robus 300			
	5.5	132S	68.8	81.6	114	170	231	/	/	/	/	516	Robus 150					Robus 300								
	7.5	132M	93.8	111	155	232	315	/	/	/	/	704	Robus 150					Robus 300								
Robus 85 with 4 Pole / 1440 RPM motors																										
Torque (Nm)																										
Speed		357.3	301.3	216.5	144.6	106.4	97.1	67.7	61.8	59.9	45.1	42.4	35.3	32.4	28.7	27.2	22.8	20.4	18.2	15.6	14.2	13.6	12.4			
1.1	90S	Robus 21										Robus 30					Robus 60					598	655	686	Robus 150	
1.5	90L	Robus 21										Robus 30					Robus 60					624	699	Robus 150		
2.2	100L	Robus 30										Robus 60					Robus 150					Robus 300				
3.7	112MB	Robus 30										Robus 60					Robus 150					Robus 300				
5.5	132S	138	163	227	340	462	/	/	/	/	535	552	695	739	Robus 150					Robus 300						
7.5	132M	188	223	310	464	630	/	/	/	/	Robus 150					Robus 300										
Robus 85 with 6 Pole / 960 RPM motors																										
Torque (Nm)																										
Speed		238.2	200.8	144.4	96.4	70.9	64.7	45.1	41.2	39.9	30.1	28.3	23.5	21.6	19.1	18.1	15.2	13.6	12.1	10.4	9.5	9.1	8.3			
0.75	90S	Robus 21										Robus 30					Robus 60					524	611	670	701	Robus 150
1.1	90L	Robus 21										Robus 30					Robus 60					Robus 150				
1.5	100L	Robus 30										Robus 60					Robus 150					Robus 300				
2.2	112M	Robus 30										Robus 60					Robus 150					Robus 300				
3.7	132MA	139	165	229	343	466	/	/	/	/	452	467	620	659	Robus 150					Robus 300						
5.5	132MB	206	245	341	510	693	/	/	/	/	Robus 150					Robus 300										

\*For ROBUS 85 : Input 100/112 available upto 70 ratio    • Input 132 available upto 13 (2 stage) ratio & 15 to 30 (3 stage) ratio

Service factor fs = 1.5 @ 1440 RPM

<b>ROBUS 150</b>		Peak Torque = 1550 Nm																										
Rated Ratio		4	5	8	10	15	18	20	23	25	30	35	40	45	50	55	60	70	80	90	100	110	120					
Input: 90,100,112 132*, 160*	Real Ratio	4.06	5.02	8.03	10.37	15.29	18.15	19.83	22.83	27.5	29.9	34.47	38.78	45.12	50.35	57.74	61.99	72.13	80.06	92.13	100.7	107.2	117.17					
	Stage	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3					
	Robus 150 with 2 Pole / 2880 RPM motors																											
	Torque (Nm)																											
	KW	Frame																										
	Speed		709.4	573.7	358.7	277.7	188.4	158.7	145.2	126.1	104.7	96.3	83.6	74.3	63.8	57.2	49.9	46.5	39.9	36.0	31.3	28.6	26.9	24.6				
	3.7	100LB	Robus 30										Robus 60					Robus 85					785	871	1002	1095	1166	1275
	5.5	132SA	Robus 85										Robus 85					557	627	730	814	934	1002	1166	1295	Robus 300		
	7.5	132SB	Robus 85										Robus 85					760	855	995	1110	1273	Robus 300					
	11	160MB	139	171	274	354	522	Robus 300																				
15	160MC	189	234	374	483	712	Robus 300																					
18.5	160L	233	288	461	595	878	Robus 300																					
Robus 150 with 4 Pole / 1440 RPM motors																												
Torque (Nm)																												
Speed		354.7	286.9	179.3	138.9	94.2	79.3	72.6	63.1	52.4	48.2	41.8	37.1	31.9	28.6	24.9	23.2	20.0	18.0	15.6	14.3	13.4	12.3					
1.5	90L	Robus 21										Robus 30					Robus 60					Robus 85						
2.2	100L	Robus 30										Robus 60					Robus 85					Robus 300						
3.7	112MB	Robus 30										Robus 60					Robus 85					Robus 300						
5.5	132S	Robus 85										Robus 85					844	982	1095	1256	1349	Robus 300						
7.5	132M	Robus 85										Robus 85					712	845	923	1213	1319	Robus 300						
11	160M	277	343	548	708	1044	Robus 300																					
15	160L	378	467	748	965	Robus 300																						
Robus 150 with 6 Pole / 960 RPM motors																												
Torque (Nm)																												
Speed		236.5	191.2	119.6	92.6	62.8	52.9	48.4	42.0	34.9	32.1	27.9	24.8	21.3	19.1	16.6	15.5	13.3	12.0	10.4	9.5	9.0	8.2					
1.1	90L	Robus 21										Robus 30					Robus 60					Robus 85						
1.5	100L	Robus 30										Robus 60					Robus 85					820	954	1059	1219	1332	Robus 300	
2.2	112M	Robus 30										Robus 60					Robus 85					Robus 300						
3.7	132MA	Robus 85										Robus 85					527	625	663	897	976	1125	1266	Robus 300				
5.5	132MB	Robus 85										Robus 85					738	929	1015	1334	Robus 300							
7.5	160M	284	351	561	724	1068	Robus 300																					
11	160L	416	514	822	1062	Robus 300																						

\*For ROBUS 150 : Input 132 available upto 20 (2 stage) ratio & 20 to 30 (3 stage) ratio    • Input 160 available upto 15 ratio

# PERFORMANCE TABLE 300

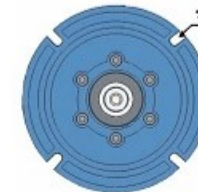
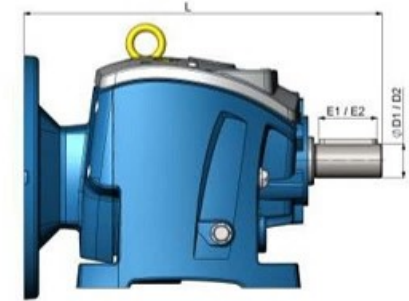
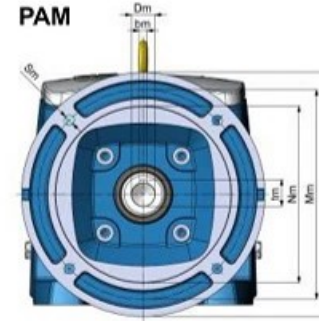
ROBUS 300		Peak Torque = 3000 Nm																											
Service factor fs= 1.5 @ 1440 RPM	Input:	Rated Ratio	4	5	7	10	13	15	17	20	23	25	30	35	40	45	50	55	60	70	80	90	100	110	120				
	Real Ratio	4	5.42	7.34	9.74	13.38	15.26	16.75	20.92	22.96	24.63	28.33	35.72	38.36	44.72	48.03	55.42	60.82	69.95	81.51	89.28	101.79	111.72	115.43					
	Stage	2	2	2	2	2	2	2	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3				
	Robus 300 with 2 Pole / 2880 RPM motors																												
	KW		Torque (Nm)																										
	Speed		720.0	531.4	392.4	295.7	215.2	188.7	171.9	137.7	125.4	116.9	101.7	80.6	75.1	64.4	60.0	52.0	47.4	41.2	35.3	32.3	28.3	25.8	25.0				
	5.5	132SA	Robus 85										Robus 150										1444	1646	1807	1867			
	7.5	132SB	Robus 85										Robus 150										1341	1542	1797	1969	2245	2463	2545
	11	160MB	Robus 150						572	/	/	797	916	1155	1241	1446	1553	1792											
	15	160MC	Robus 150						780	/	/	1086	1249	1575	1692	1972	2118	2444											
	18.5	160L	Robus 150						962	/	/	1340	1541	1943	2086	2432	2612												
	22	180M	273	370	501	665	914	1042	/	/	/	1593	1832	2310	2481														
	Robus 300 with 4 Pole / 1440 RPM motors																												
	Speed		360.0	265.7	196.2	147.8	107.6	94.4	86.0	68.8	62.7	58.5	50.8	40.3	37.5	32.2	30.0	26.0	23.7	20.6	17.7	16.1	14.1	12.9	12.5				
	3	112MA	Robus 30					Robus 60					Robus 85					Robus 150					1438	1575	1796	1971	2036		
	3.7	112MB	Robus 30					Robus 60					Robus 85					Robus 150					1522	1773	1942	2215	2431	2511	
	5.5	132S	Robus 85					Robus 150										1446	1553	1792	1967	2262	2636						
	7.5	132M	Robus 85					Robus 150										1575	1692	1972	2118	2444	2682						
	11	160M	Robus 150						1144	/	/	1593	1832	2310	2481														
	15	160L	Robus 150						1246	1421	1559	/	/	2172	2499														
	18.5	180M	459	622	843	1118	1536	1752	/	/	/	2679																	
	22	180L	546	740	1002	1330	1827	2084																					
Robus 300 with 6 Pole / 960 RPM motors																													
Speed		240.0	177.1	130.8	98.6	71.7	62.9	57.3	45.9	41.8	39.0	33.9	26.9	25.0	21.5	20.0	17.3	15.8	13.7	11.8	10.8	9.4	8.6	8.3					
1.5	100L	Robus 30					Robus 60					Robus 85					Robus 150					1478	1527						
2.2	112M	Robus 30					Robus 60					Robus 85					Robus 150					1357	1582	1732	1975	2168	2240		
3	132S	Robus 85										Robus 150										1466	1609	1851	2157	2362	2693		
3.7	132MA	Robus 85					Robus 150										1459	1567	1809	1985	2283	2660							
5.5	132MB	Robus 85					Robus 150										1374	1733	1861	2169	2330	2688							
7.5	160M	Robus 150						1066	1170	/	/	1629	1874	2363	2538														
11	160L	Robus 150						1370	1563	1715	/	/	2390																
15	180L	559	757	1025	1360	1869	2131																						

\*For ROBUS 300 : Input 160 available upto 17 (2 stage) ratio & 15 to 55 (3 stage) ratio • Input 180 available upto 15 (2 stage) ratio & 15 to 40 (3 stage) ratio

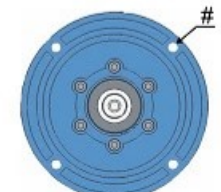
**Note:** Efficiency is computed considering the frictional losses of output seals, bearing frictional losses and lubrication losses. Torque increases by 3% in 2 stage gearboxes and 5% in 3 stage gearboxes if these losses are not considered.

# DIMENSIONS

ROBUS	MOTOR TYPE		Nm	Mm	Pm	Sm	Dm	tm	bm	L (PAM)	
										D1	D2
12	63	B14	60	75	90	∅6	11	12.8	4	204.5	214.5
	71	B14	70	85	105	∅7	14	16.3	5	211.5	221.5
	80	B14	80	100	120	∅7	19	21.8	6	231.5	241.5
21	71	B5	110	130	160	∅9	14	16.3	5	273.0	283.0
	71	B14	70	85	105	∅7	14	16.3	5	273.0	283.0
	80	B5	130	165	200	∅11	19	21.8	6	274.0	284.0
	80	B14	80	100	120	∅7	19	21.8	6	274.0	284.0
	90S	B5	130	165	200	∅11	24	27.3	8	274.0	284.0
90L	B14	95	115	140	∅9	24	27.3	8	274.0	284.0	
30	71	B5	110	130	160	∅9	14	16.3	5	317.6	327.6
	80	B5	130	165	200	∅11	19	21.8	6	317.6	327.6
	90 *a	B5	130	165	200	∅11	24	27.3	8	326.6	336.6
	100/112 *b	B5	180	215	250	∅13	28	31.3	8	327.6	337.6
100/112 *b	B14	110	130	160	∅9	28	31.3	8	327.6	337.6	
60	80	B5	130	165	200	M10	19	21.8	6	366.0	376.0
	90 *c	B5	130	165	200	M10	24	27.3	8	366.0	376.0
	100/112 *d	B5	180	215	250	∅13	28	31.3	8	367.0	377.0
85	90	B5	130	165	200	M10	24	27.3	8	396.5	416.5
	100 /112*e	B5	180	215	250	M12	28	31.3	8	398.5	418.5
	132 *f	B5	230	265	300	M12	38	41.3	12	413.5	433.5
150	90	B5	130	165	200	M10	24	27.3	8	447.0	467.0
	100/112	B5	180	215	250	M12	28	31.3	8	450.0	470.0
	132 *g	B5	230	265	300	M12	38	41.3	12	450.0	470.0
300	160 *h	B5	250	300	350	M16	42	45.3	12	520.0	540.0
	110/112	B5	180	215	250	M12	28	31.3	8	567.5	587.5
	132	B5	230	265	300	M12	38	41.3	12	567.5	587.5
	160 *i	B5	250	300	350	M16	42	45.3	12	585.6	605.6
180 *j	B5	250	300	350	M16	48	51.8	14	585.6	605.6	



Output Flange with Slot



Output Flange with Hole

\*a : Upto ratio 60 only

\*b : Upto ratio 40 only

\*c : In 2 stages upto ratio 20 only

In 3 stages upto ratio 90 only

\*d : In 2 stages upto ratio 20 only

In 3 stages upto ratio 60 only

\*e : Upto ratio 70 only

\*f : In 2 stages upto ratio 13 only

In 3 stages upto ratio 30 only

\*g : In 2 stages upto ratio 20 only

In 3 stages upto ratio 60 only

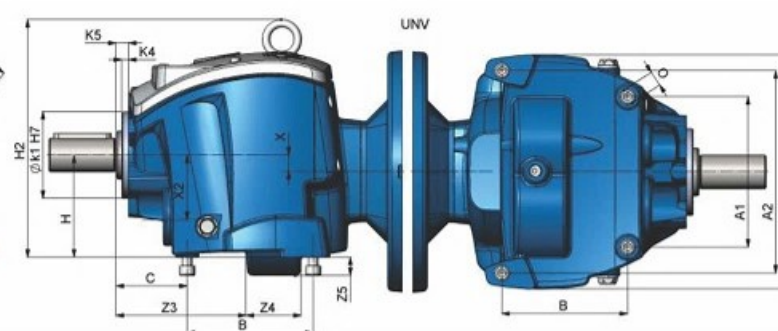
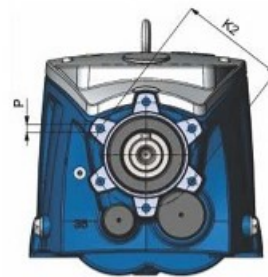
\*h : Upto ratio 15 only

"i" : In 2 stages upto ratio 15 only

In 3 stages upto ratio 55 only

"j" : In 2 stages upto ratio 15 only

In 3 stages upto ratio 40 only

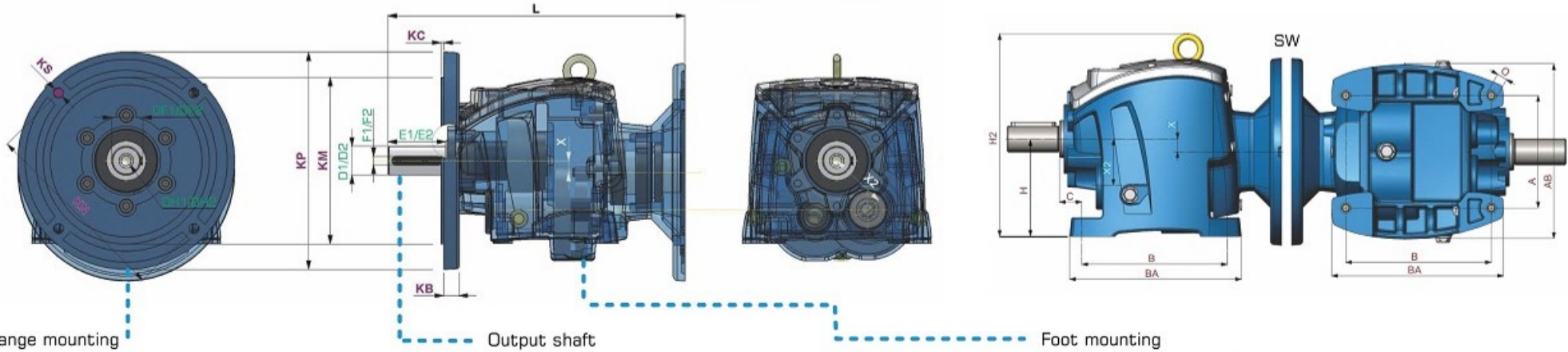


ROBUS	X	X2
21	11	52.5
30	13.5	66
60	17	72
85	16	80
150	18	103
300	20	120

X	X2
11	52.5
13.5	66
17	72
16	80
18	103
20	120

B	A1	A2	AB	O	H	H2	C	P	K1	K2	K4	K5	Z3	Z4	Z5	Z6
90.6	108	145.2	170	M8	73.5	180	54.5	M6	68	80	6.5	9.5	95	53	16.5	128
115.8	138	185.6	215	M12	94	215	64	M8	80	94	6.5	10	116	54	20	155
131	156	210	243	M12	106	235	74	M10	90	110	7	13	135	58	20	168
141	168	226	262	M16	114	262	81.5	M12	95	125	10.5	16	143	70	25	190
181.3	216	290.6	336	M16	148	313	91.5	M14	132	155	11.5	16	170	94	30	250
217.6	259.2	348.7	405	M16	176	381	103	M14	154	180	14	18	185	120	39	295

# DIMENSIONS

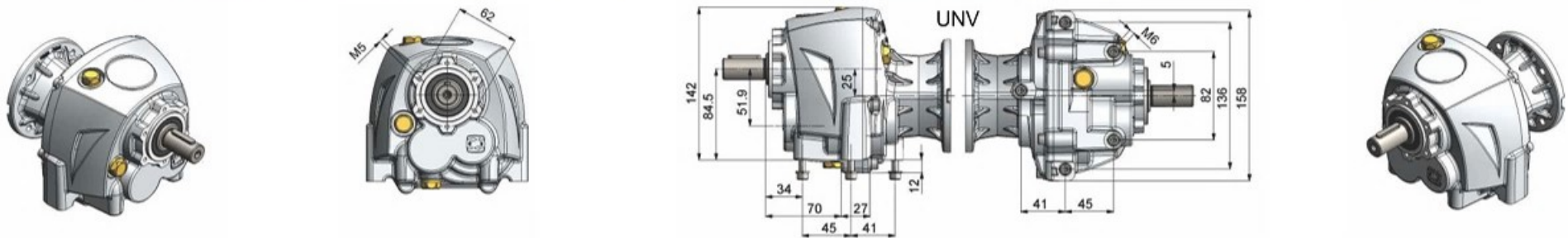


Flange mounting

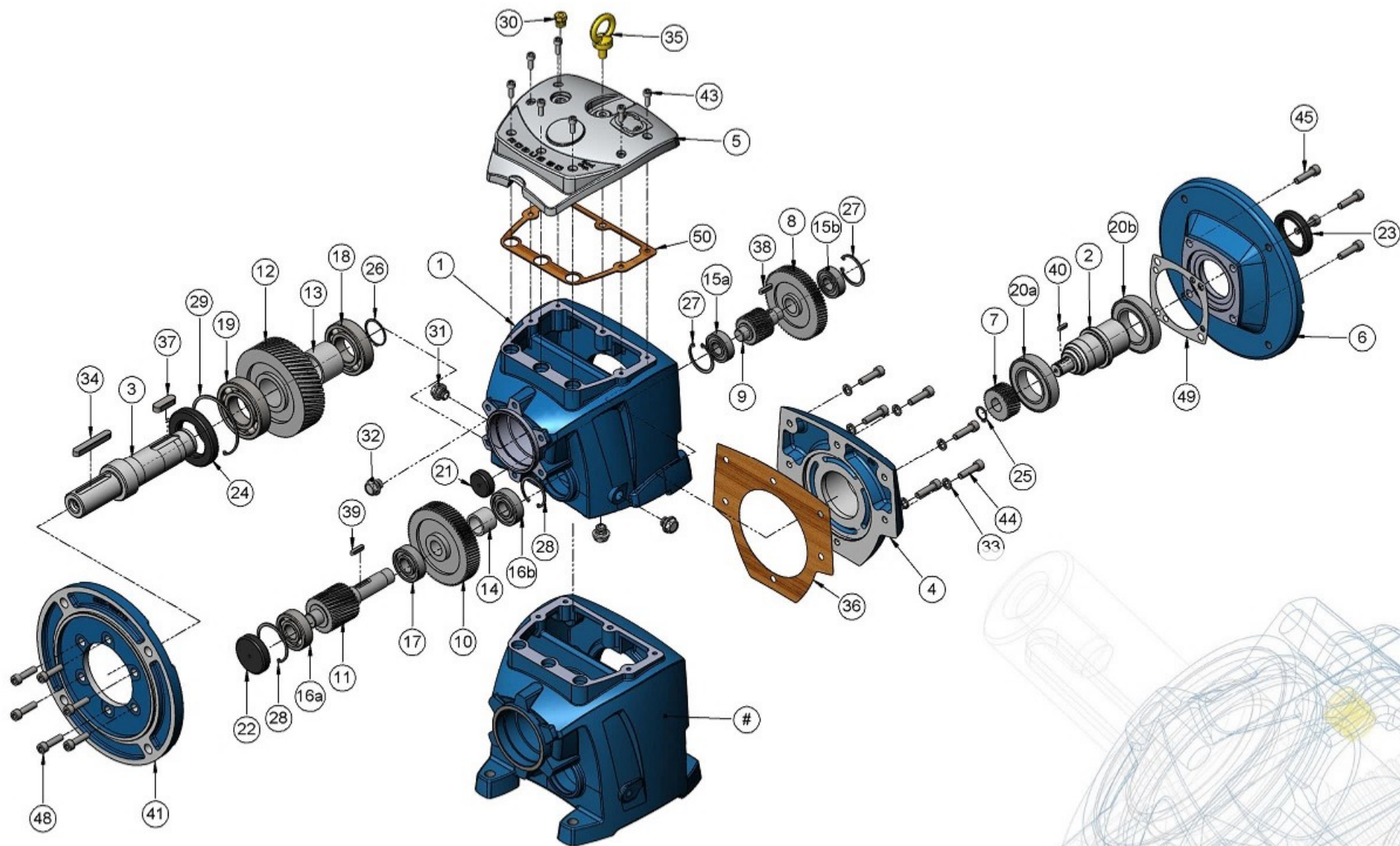
Output shaft

Foot mounting

ROBUS	IEC	KP	KM	KN	KS	KC	KB	D1/D2	E1/E2	F1/F2	DF1/DF2	DH1/DH2	X	X2	type	B	BA	A	AB	O	H	H2	C
12	63B5#	140	95	115	10	3	9	20 (k6)/ 25 (k6)	40/ 50	6/ 8	23/ 28	M5x12,5/ M10x20	25	51.9	SW	90	118	130	160	9	105	162	18
21	80/90B5#	200	130	165	11	3,5	12	25 (k6)/	50/	8/	28/	M10x20/	11	52,5	SW	130	160	110	160	9	100	194	25
	71B5*	160	110	130	9	3,5	10	30 (k6)	60	8	33	M10x20											
30	80/90B5#	200	130	165	11	3,5	12	30 (k6)/	60/	8/	33/	M10x20/	13,5	66	SW	165	201	135	205	14	115	239	30
	71B5*	160	110	130	9	3,5	10	35 (k6)	70	10	38	M12x24											
60	100/112B5#	250	180	215	14	4	15	35 (k6)/	70/	10/	38/	M12x24/	17	72	SW	195	230	150	235	14	130	264	30
	80/90B5*	200	130	165	11	4	12	40 (k6)	80	12	43	M16x32											
85	132B5#	300	230	265	14	4	21	40 (k6)/	80/	12/	43/	M16x32/	16	80	SW	205	248	170	241	18	140	287	35
	100/112B5*	250	180	215	14	4	19	50 (k6)	100	14	53,5	M16x32											
150	160/180B5#	350	250	300	18	5	21	50 (k6)/	100/	14/	53,5/	M16x32/	18	103	SW	260	306	215	307	18	180	357	40
	132B5*	300	230	265	14	4	19	60 (m6)	120	18	64	M20x40											
300	225B5#	450	350	400	18	5	25	60 (m6)/	120/	18/	64/	M20x40/	20	120	SW	310	374	250	364	22	225	428	40
	160/180B5*	350	250	300	18	5	21	70 (m6)	140	20	74.5	M20x40											



# LIST OF COMPONENTS ROBUS (3 REDUCTION STAGES)



LIST OF COMPONENTS ROBUS (3 REDUCTION STAGES)

		ROBUS12-3		ROBUS21-3		ROBUS30-3		ROBUS60-3		ROBUS85-3		ROBUS150-3		ROBUS300-3	
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	-	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
		63B14		71B5, 71B14		71B5		80B5		80B5		80B5		100/112B5	
		71B14		80B5, 80B14		80B5		90B5		90B5		100/112B5		132B5	
		80B14		90B5, 90B14		90B5		100/112B5		100/112B5		132B5		160B5	
						100/112B5		100/112B5		132B5		160B5		180B5	
						100/112B14									
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	snap ring	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 6002*	2	bearing 6003*	2	bearing 6203*	2	bearing 6204*	2	bearing 6206*	2	bearing 6207*	2
16a	BEA	bearing 6202	1	bearing 6202*	1	bearing 6302*	1	bearing 6304*	1	bearing 6304*	1	bearing 6306*	1	bearing 6307*	1
16b	BEA	bearing 6202	1	bearing 6202ZZ*	1	bearing 6203ZZ*	1	bearing 6204ZZ*	1	bearing 6204ZZ*	1	bearing 6306ZZ*	1	bearing 6307ZZ*	1
16a	BEA			bearing 7202	1	bearing 7302	1	bearing 7304	1	bearing 7304	1	bearing 7306	1	bearing 7307	1
16b	BEA			bearing 7202	1	bearing 7203	1	bearing 7204	1	bearing 7204	1	bearing 7306	1	bearing 7307	1
17	BEA	-		bearing 6003	1	bearing 6004	1	bearing 6205	1	bearing 6205	1	bearing 6207	1	bearing 6208	1
18	BEA	bearing NKIA5903	1	bearing 6205	1	bearing 6206	1	bearing 6207	1	bearing 6208	1	bearing 6210	1	bearing 6212	1
19	BEA	bearing 6206ZZ	1	bearing 6206ZZ	1	bearing 6207ZZ	1	bearing 6208ZZ	1	bearing 6209ZZ	1	bearing 6311ZZ	1	bearing 6313ZZ	1
20a	BEA	bearing 6003ZZ	1							bearing 6210ZZ	1	bearing 6212ZZ	1	bearing 6215ZZ	1
20b	BEA	bearing 6005ZZ	1							bearing 6211ZZ	1	bearing 6213ZZ	1	bearing 6216ZZ	1
20	BEA			bearing 6008ZZ	2	bearing 6009ZZ	2	bearing 6009ZZ	2			bearing 6009ZZ***	2		
21	COV	-		plug seal D25	1	plug seal D30	1	plug seal D35	1	plug seal D35	1	plug seal D42	1	plug seal D52	1
22	COV	-		plug seal D35	1	plug seal D42	1	plug seal D52	1	plug seal D52	1	plug seal D72	1	plug seal D80	1
23	OS	oil seal 17x25x4	1	oil seal 40x55x8	1	oil seal 45x60x9	1	oil seal 45x60x9	1	oil seal 55x80x10	1	oil seal 65x90x12	1	oil seal 80x105x13	1
24	OS	oil seal 30x42x12	1	oil seal 35x62x11	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
26	SNR	snap ring		snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1
27	SNR	snap ring extrn. (G1)		snap ring*	2	snap ring*	2	snap ring*	2	snap ring*	2	snap ring*	2	snap ring*	1
28	SNR	-		snap ring	2	snap ring	2	snap ring	2	snap ring	2	snap ring	2	snap ring	2
29	SNR	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1	snap ring	1
30	BPL	filler plug (FPL)	1	breather plug	1	breather plug	1	breather plug	1	breather plug	1	breather plug	1	breather plug	1
31	FPL	-		filler plug	6	filler plug	6	filler plug	6	filler plug	6	filler plug	6	filler plug	6
32	LPL	-		level plug	1	level plug	1	level plug	1	level plug	1	level plug	1	level plug	1
33	WSH														
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, M10	1	eye-bolt, M10	1	eye-bolt, M12	1
36	GK36	'O' ring	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
41	OFL	output flange	1	output flange	1	output flange	1	output flange	1	output flange	1	output flange	1	output flange	1
		140		200, 160		200, 160		250, 200		300, 250		350, 300		450, 350	
43	SCR	-		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
50	GK50			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

# WEIGHTS



			Weights including oil in Kg														
			ROBUS12		ROBUS21		ROBUS30		ROBUS60		ROBUS85		ROBUS150		ROBUS300		
input			2	3	2	3	2	3	2	3	2	3	2	3	2	3	
63	B14	UNV	5,1	5,9	-	-	-	-	-	-	-	-	-	-	-	-	
71	B14		5,2	6,0	-	-	-	-	-	-	-	-	-	-	-	-	
80	B14		5,4	6,2	-	-	-	-	-	-	-	-	-	-	-	-	
63/71	B5		-	-	12,8	13,4	22,2	23,4	32,0	33,5	-	-	-	-	-	-	
80/90	B5		-	-	13,7	14,3	23,4	24,2	32,5	34,2	39,4	41,7	74,0	78,6	-	-	
100/112	B5		-	-	-	-	24,7	25,7	34,2	35,7	40,9	43,1	75,1	82,9	135,8	141,2	
132	B5	-	-	-	-	-	-	-	-	47,3	49,6	87,5	92,0	136,9	142,3		
160	B5	-	-	-	-	-	-	-	-	-	-	89,9	-	139,3	144,3		
180	B5	-	-	-	-	-	-	-	-	-	-	-	-	139,0	144,4		
63	B14	FSW	5,8	6,6	-	-	-	-	-	-	-	-	-	-	-	-	
71	B14		5,9	6,7	-	-	-	-	-	-	-	-	-	-	-	-	
80	B14		6,2	6,9	-	-	-	-	-	-	-	-	-	-	-	-	
63/71	B5		-	-	15,9	16,6	26,9	28,1	37,2	38,7	-	-	-	-	-	-	
80/90	B5		-	-	16,9	17,5	28,1	28,9	37,7	39,4	45,9	48,2	88,0	92,6	-	-	
100/112	B5		-	-	-	-	29,4	30,4	39,4	40,9	47,4	49,6	89,1	96,9	164,8	170,2	
132	B5	-	-	-	-	-	-	-	-	53,8	56,1	101,5	106,0	165,9	171,3		
160	B5	-	-	-	-	-	-	-	-	-	-	103,9	-	168,3	173,3		
180	B5	-	-	-	-	-	-	-	-	-	-	-	-	168,0	173,4		
140	6385	OFL	=UNV+0,25														
160	71B5				=UNV+0,9		=UNV+0,9										
200	80/90B5				=UNV+1,7		=UNV+1,7		=UNV+1,8								
250	100/112B5								=UNV+3,8								
300	132B5										=UNV+4,1						
350	160/180B5										=UNV+7,2				=UNV+5,8		
450	200B5													=UNV+9,8	=UNV+8,9	=UNV+19,9	



Co-ordinate Measuring Machine



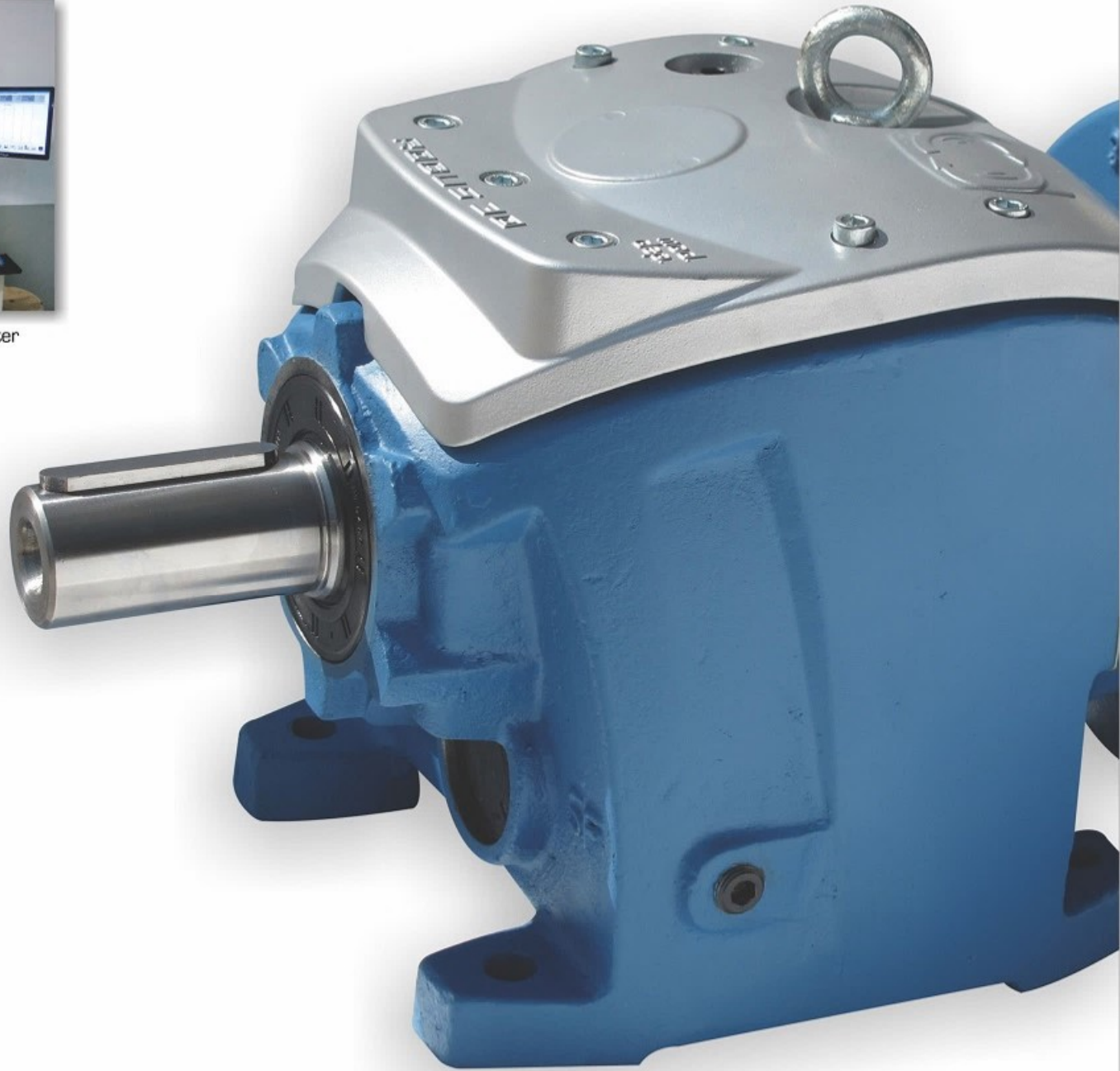
Gear Lead & Profile Tester



KARDEX for Gear Storage



Magnifying Glass To Check Gear



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