



Industrial gearboxes



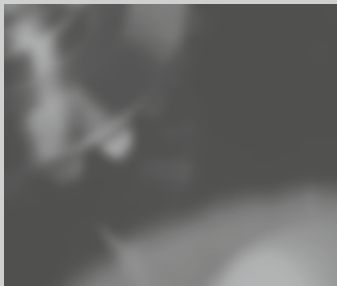
SERVO gears



MECHANICAL gears



INDUSTRIAL gears



W E L C O M E T O V O G E L A N T R I E B S T E C H N I K

We thank you for your interest in our low backlash gearboxes. VOGEL Antriebstechnik has been highly regarded for more than 70 years offering a wide variety of products to a broad range of business sectors with applications that require innovative, dependable gearbox manufacturing technology. We develop high quality products that are very convincing with their precision, long service life and a high power density. We take advantage of a continuous dialogue with our customers and of constant communication with research and scientific sources.

Our primary focus is to supply you, our customer and partner, with the most cost-effective and efficient product solutions for your needs, in order to safeguard your viability in future markets.

Allow our products and services to win you over.



Up-to-date + compact

All product information can be downloaded from
www.vogel-antriebe.de

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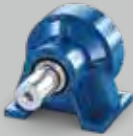



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PRODUCT MATRIX

				Coaxial gearboxes	
				Planetary gearboxes	
				P	MP
				PF	MPF
					
					
				from page 32	from page 50
		Symbol	Unit		
Gearbox figures	Ratios	i	[-]	3.4 to 245.0	3.4 to 245.0
	Max. permissible output torque	$T_{2maxzul}$	[Nm]	578 to 79900	578 to 79900
	Nominal torque on output	T_{2Nzul}	[Nm]	400 to 50000	400 to 50000
	Max. backlash	j	[arcmin]	10 to 20	10 to 20
	Max. input speed	$n_{1maxzul}$	[min ⁻¹]	up to 4000	up to 4000
Output variants	Foot plate design	-	[-]	●	●
	Output flange design	-	[-]	●	●
	Solid shaft with key	-	[-]	●	●
	Solid shaft without key	-	[-]	○	○
	Splined shaft DIN 5480	-	[-]	○	○
	Hollow shaft with keyway	-	[-]	-	-
	Hollow shaft with shrink disc	-	[-]	●	●
ATEX design	-	[-]	○	○	

Note on use in potentially explosive areas:

European Guideline 94/9/EC for equipment for use in potentially explosive areas (ATEX).

VOGEL spiral bevel gearboxes and VOGEL bevel helical gearboxes are available in an explosion-proof version

Zone Gas	Zone Dust
1	21
2	22

Covered by ATEX gearboxes of the category II 2GD c,k IIB T4 / 120 °C

- marks the standard design
- marks optionally available designs

Angular gearboxes

Bevel planetary gearboxes		Spiral bevel gearboxes		Bevel helical gearboxes	
LP	MLP	L	ML	KS	MKS
					
LPF	MLPF	H	MH	KSH	MKSH
					
from page 78	from page 88	from page 102	from page 114	from page 132	from page 144
60.0 to 210.0	60.0 to 210.0	1.0 to 6.0	1.0 to 6.0	6.0 to 48.0	6.0 to 48.0
1063 to 32470	1063 to 32470	3600 to 15300	3600 to 15300	6480 to 23040	6480 to 23040
800 to 23000	800 to 23000	1450 to 5700	1450 to 5700	3230 to 12520	3230 to 12520
20	20	10	10	10	10
up to 5250	up to 5250	up to 2500	up to 2500	up to 3000	up to 3000
●	●	-	-	-	-
●	●	-	-	●	●
●	●	●	●	●	●
○	○	○	○	○	○
○	○	○	○	○	○
-	-	●	●	●	●
●	●	○	○	●	●
○	○	○	○	○	○

● marks the standard design
○ marks optionally available designs



FUTURE IN MOTION

Continuity and development are mutually dependent cornerstones of our corporate tradition. For the past 60 years we have been constantly committed to products and markets with maximum quality consciousness. As a mid-sized, family owned company this sense of continuity is highly important to us; the executive management in its third generation accepts personal responsibility for this.



On the other hand we actively determine the future of gearbox manufacturing through our technological developments, thus ensuring market capability for our customers. Because the only valid constant is change.

PARTNERSHIP FOR TECHNOLOGY

Efficiency and safety from initial discussions of a project to the finished product and beyond – that is the target of our offensive with respect to quality and service management. We initially carry out a thorough, detailed consultation individually in accordance with the requirements of your application. Once the ideal solution is decided upon, we produce flexibly and on schedule, precisely in accordance with your requirements.

Our customers rightly expect smooth and uninterrupted manufacturing processes. You can count on an almost maintenance-free product over the entire life cycle when using VOGEL gearboxes.

Should you still require our support at some stage, there is a world-wide service network available to assist you as soon as possible with a replacement gearbox or an on-site repair. To keep your production line running!



COMPETENCE IN THE MARKET

VOGEL Antriebstechnik is found everywhere where machinery is built, in all sectors and at all sites. Wherever you manufacture, we will be at your side.

Internationally, our customers are looked after by our distribution and service partner Lenze. That means we have a presence in the important markets and you benefit globally from direct access to our expertise and product ranges.





INDUSTRY SOLUTIONS

With VOGEL you stay flexible. For example our modular gearbox system offers you the widest variety of combination possibilities. On the basis of these product standards we can also offer you the desired modifications needed for your field of activity. It goes without saying that such services are cost-

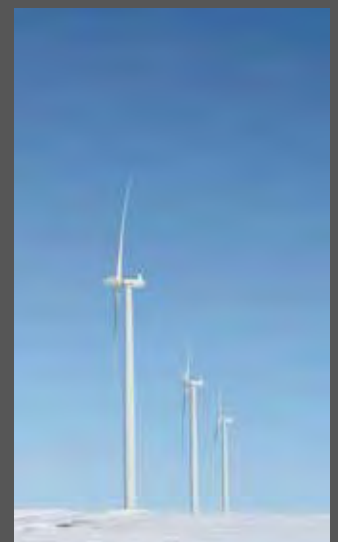
optimised and in accordance with your specifications. For unusual requirements we offer entirely individual solutions. In such cases we assess application conditions in cooperation with you, advise you reliably and construct special gearboxes for you, including gear manufacturing.

S U C C E S S F U L A P P L I C A T I O N S

Our gearboxes have a broad and constantly increasing range of applications.

- Drive and automation engineering
- Robotics and handling
- Packaging machinery
- Plastics and film processing machines
- Printing machinery
- Paper processing
- Machine tools
- The food and pharmaceutical industry

and many more



PRODUCT RANGE

The range of VOGEL Antriebstechnik offers nominal output torques of between 10 Nm and 26000 Nm. Our range of standard solutions extends from classic machinery gearboxes, through compact technology for coaxial and right-angle applications, to our own high-precision servo

products. Always in mind: dynamic development of all existing series with the aim of creating optimum drives for our customers, technologically and thus economically.



SERVO gears

- High speed
- Short cycle times
- Low backlash



Mechanical gears

- Universal application
- Efficient and reliable

All VOGEL gearboxes can be combined with each other. In this way you benefit from the advantages of various gearbox types.



Industrial gears

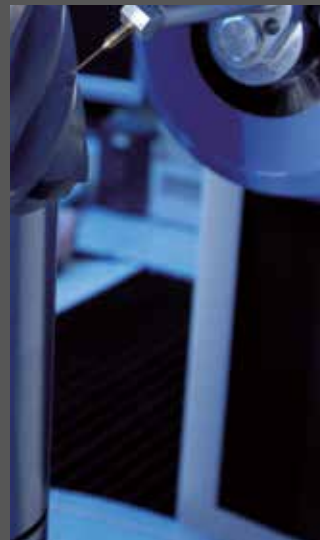
- High torques
- Long life time



Customer-specific solutions

- Special spiral bevel gearboxes
- Special solution for mobile drive technology
- Special planetary gearboxes for high-speed applications
- Gearing technology

and many more



Q U A L I T Y

Our internal high standards of quality often far exceed those commonly found in the industry. Because of this extensive and consistent quality control, we are in a position to offer you especially reliable, low-maintenance and durable gearboxes, a factor confirmed again and again in dialogue with our long-term customers.

Our extensive manufacturing expertise within development and production, guarantees noise- and torque-optimised gearing technology at the highest standards. Upon request we can also supply inspection reports or certification for any gearbox, e.g. with respect to run-out error or backlash.

In this way we ensure for you:

- Highest levels of precision and dynamics
- Long product life
- Maximum flexibility
- Maximum environmental compatibility
- Minimal effort for the complete life cycle
- Unbeatable efficiency
- Excellent energy efficiency



C O N S U L T A T I O N

In every phase of collaboration with VOGEL you benefit from our unique sector-specific expertise, gathered over decades in close cooperation with our national and international partners. We develop concepts together with you for the cost-effective solutions of your application. In this respect we initially analyse and determine the most important environmental parameters such as application conditions, loads, duration of operation, speeds, motion sequences etc. in order to find the best product solution.

S E R V I C E

Together with our service and distribution partners we make sure that we are there when you need us, whether for supply of parts, repairs and service or technical support, both on a national scale and internationally.



C O M M U N I C A T I O N

Up-to-date and comprehensive product information, service manuals, catalogues, technical documentation, contact data and quality documents are available to you in a variety of languages via our website. In addition we can provide you with the relevant information on CD-ROM. For technical data exchange we offer over 100 different interfaces and guarantee support for all globally current CAD software programmes, thus shortening development cycles.

T R A I N I N G

Upon request you can take advantage of individual product and service training as well as general educational courses on drive and automation technology. In addition, we are also always pleased to inform you of intelligent maintenance strategies that will optimise your manufacturing performance. Simply contact our service team.

S E R V I C E S

P R E C I S I O N

Maximum precision in every detail – that is what sets all VOGEL gearboxes apart. From optimised product geometry and highly precise, fine ground gear teeth to careful mounting. With improved design and minimised tolerances we achieve a remarkably high torsional and tilting rigidity with minimal noise emission and unbeatably quiet running.

F L E X I B I L I T Y

Thanks to their practical design and intelligent construction, our low backlash gearboxes can be used variably across a very wide spectrum of applications. With a large selection of motor adapters, multiple drive combinations are possible. A large ratio range with fine increments renders them absolute all-rounders for all sectors.

C O S T - E F F I C I E N C Y

A high level of efficiency for maximum cost-effectiveness. With optimised concentration on the smallest possible shaft diameter, we achieve efficient results without friction losses and therefore without loss of energy. Economically, VOGEL also convinces with extremely simple motor mounting – thus saving time, which in turn decisively aids your manufacturing processes.





D U R A B I L I T Y

We place particular emphasis on high quality for all materials, components and parts used. In doing so we are able to guarantee maintenance-free, reliable operation as well as maximum service life even under very high operational stress. Optimal lubrication of gearboxes is guaranteed.

C O M P A C T N E S S

A compact design, short overall lengths – VOGEL Antriebs-technik offers performance and efficiency on a highly compact scale. This is made possible in no small way by helical gear teeth, allowing greater torques with uniform and low-noise drive motion.

D Y N A M I C S

With strengthened bearings our gearboxes are able to withstand high forces – even with high speeds and in extreme cases when overloaded. This is possible by the implementation of full needle bearings. Low gearbox weight, combined with compact construction offers enhanced inertia values – further proof of the dynamics of our gearboxes.

D I M E N S I O N I N G A N D S E L E C T I O N

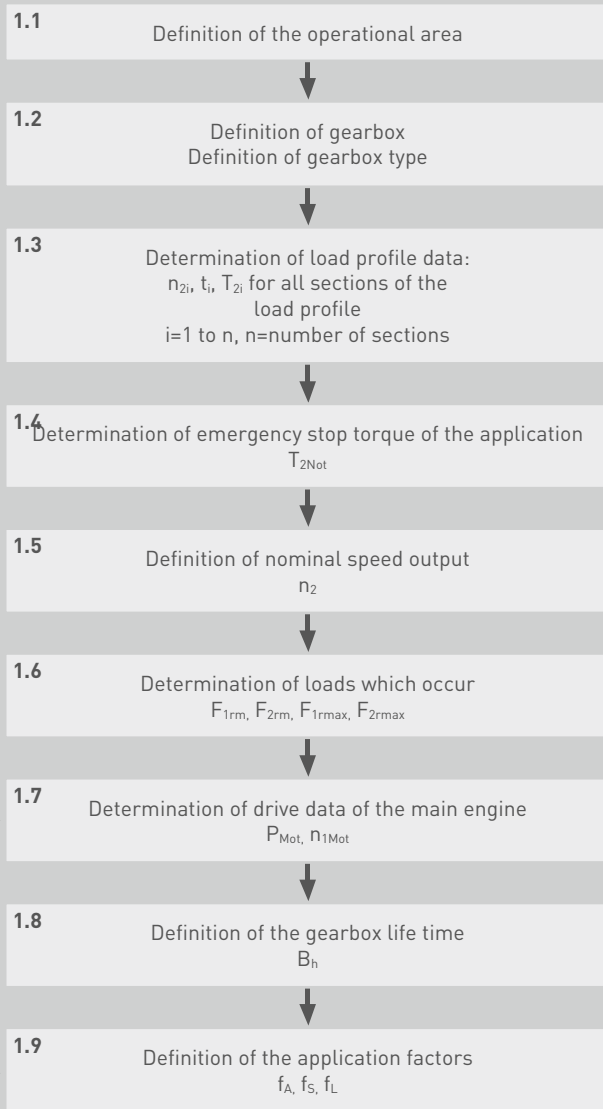
Formula symbols and indices

Designation	Unit	Symbol
Size	-	BG
Gearbox life time Σ cycle times	h	B _h
Torsional rigidity on output	Nm/arcmin	C
Radial load input	N	F _{1rm}
Maximum radial load input	N	F _{1rmax}
Maximum permissible radial load input	N	F _{1rmaxzul}
Permissible radial load input (at permissible average input speed)	N	F _{1rmzul}
Radial load output	N	F _{2rm}
Maximum radial load output	N	F _{2rmax}
Maximum permissible radial load output	N	F _{2rmaxzul}
Permissible radial load output (at permissible average input speed)	N	F _{2rmzul}
Application factor	-	f _A
Fatigue strength factor	-	f _D
Dynamics factor	-	f _k
Direction of load factor	-	f _L
Start-up factor	-	f _S
Ratio	-	i
Ratio required as per application data	-	i _{erf}
Max. backlash	arcmin	j
Inertia (with reference to input)	kgcm ²	J ₁
Running noise	dB(A)	L _{PA}
Revolutions under load Σ gearbox life time	-	L _u
Revolutions under load per cycle	1/Zyk	L _{uz}
Gearbox weight	kg	m

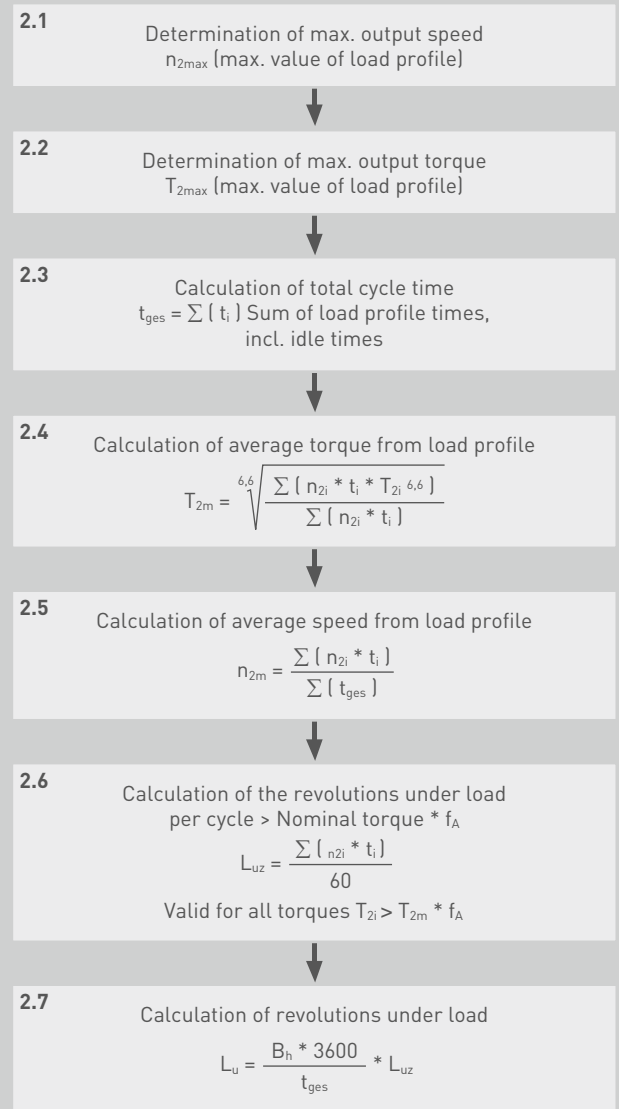
Designation	Unit	Symbol
Nominal input speed	min ⁻¹	n ₁
Average input speed	min ⁻¹	n _{1m}
Maximum input speed	min ⁻¹	n _{1max}
Max. input speed	min ⁻¹	n _{1maxzul}
Nominal speed main engine	min ⁻¹	n _{1Mot}
Permissible average input speed	min ⁻¹	n _{1mzul}
Nominal output speed	min ⁻¹	n ₂
Output speed	min ⁻¹	n _{2i}
Average output speed	min ⁻¹	n _{2m}
Maximum output speed	min ⁻¹	n _{2max}
Nominal power main engine	kW	P _{Mot}
Thermal limit power	kW	P _{thGrenz}
Output torque	Nm	T _{2i}
Average output torque	Nm	T _{2m}
Maximum output torque	Nm	T _{2max}
Maximum output torque through main engine	Nm	T _{2maxMot}
Maximum permissible output torque	Nm	T _{2maxzul}
Nominal output torque through main engine	Nm	T _{2NMot}
Emergency stop torque output	Nm	T _{2Not}
Emergency stop torque	Nm	T _{2Notzul}
Nominal torque on output	Nm	T _{2Nzul}
Required nominal torque on output	Nm	T _{2Nzulerf}
Total cycle time	s	t _{ges}
Time share	s	t _i
Ambient temperature	°C	t _u
Efficiency	-	η

DETAILED GEARBOX SELECTION

1 Application values

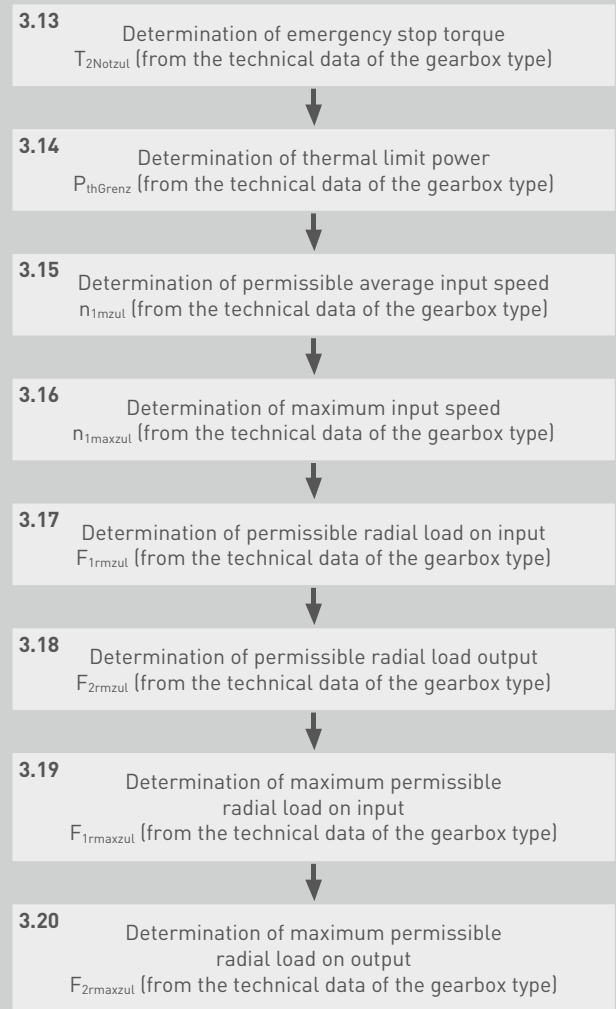
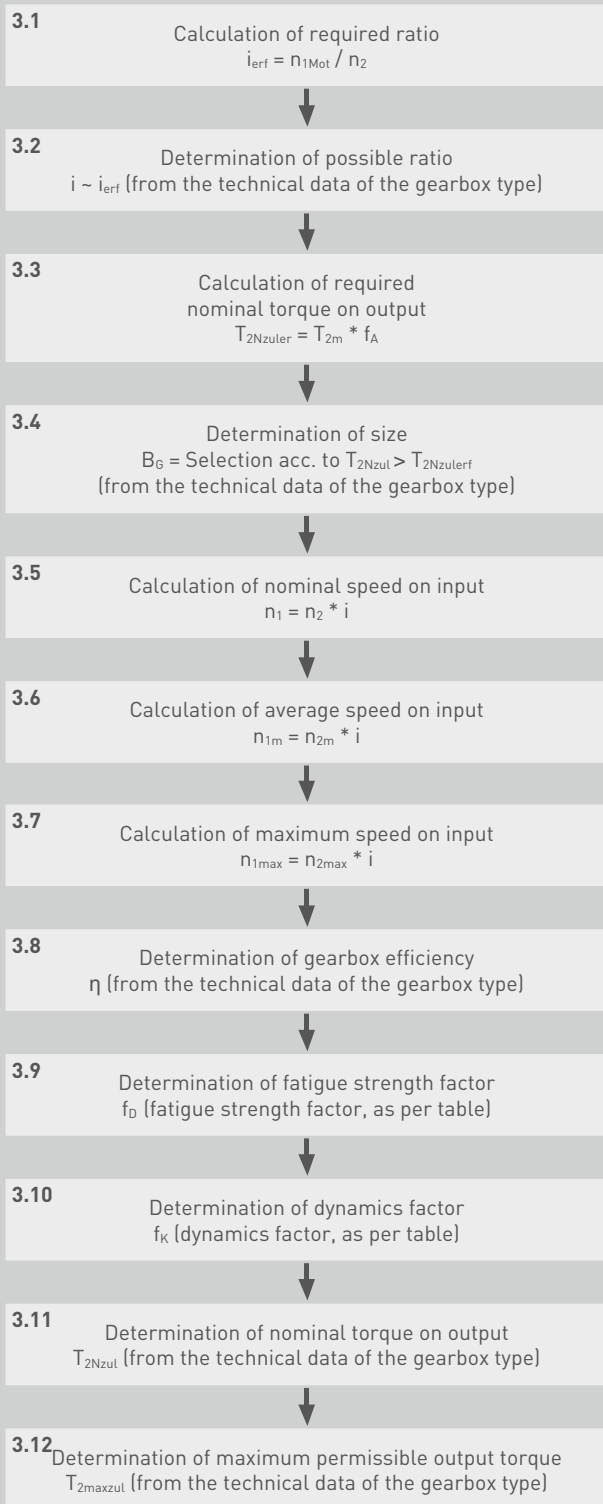


2 Calculation of application values



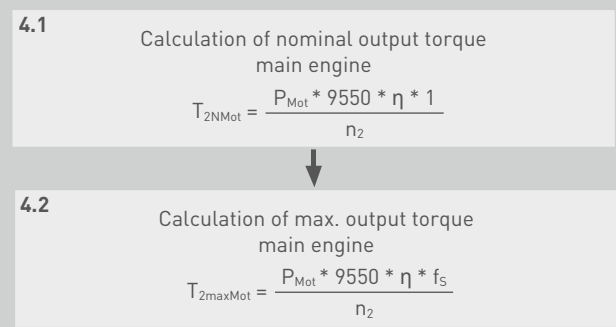
DETAILED GEARBOX SELECTION

3 Determination of gearbox values



4

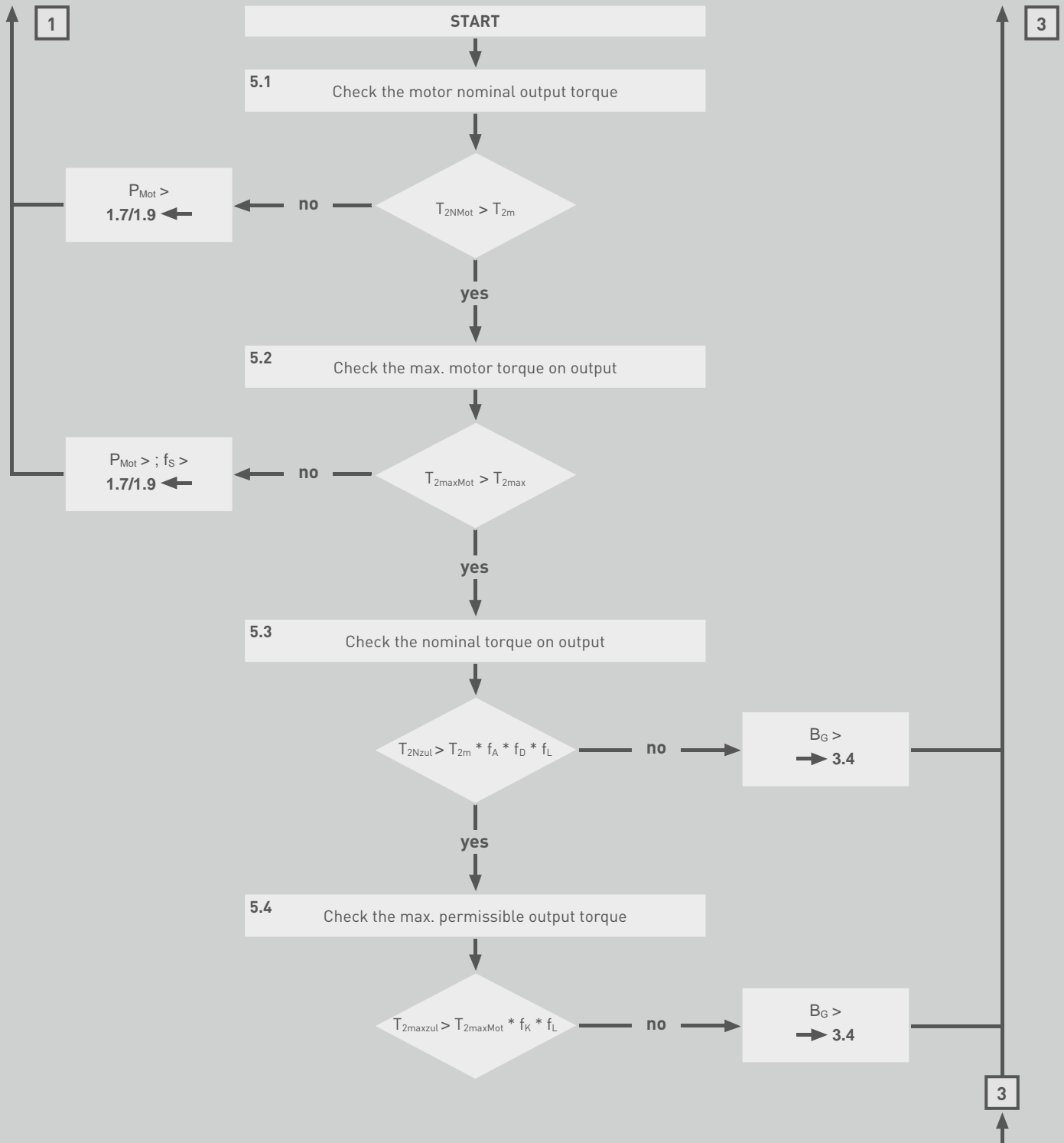
4 Determination of main engine



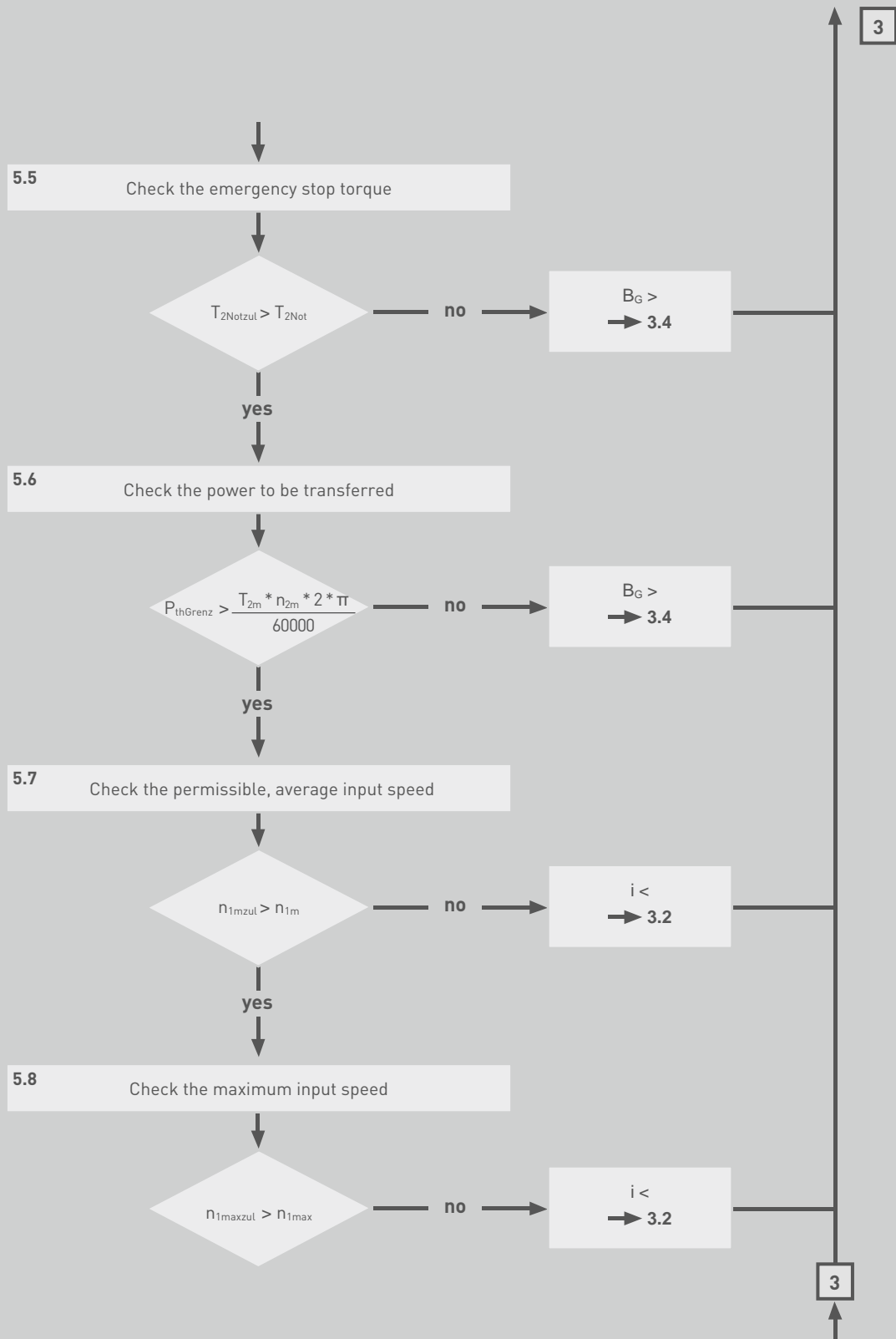
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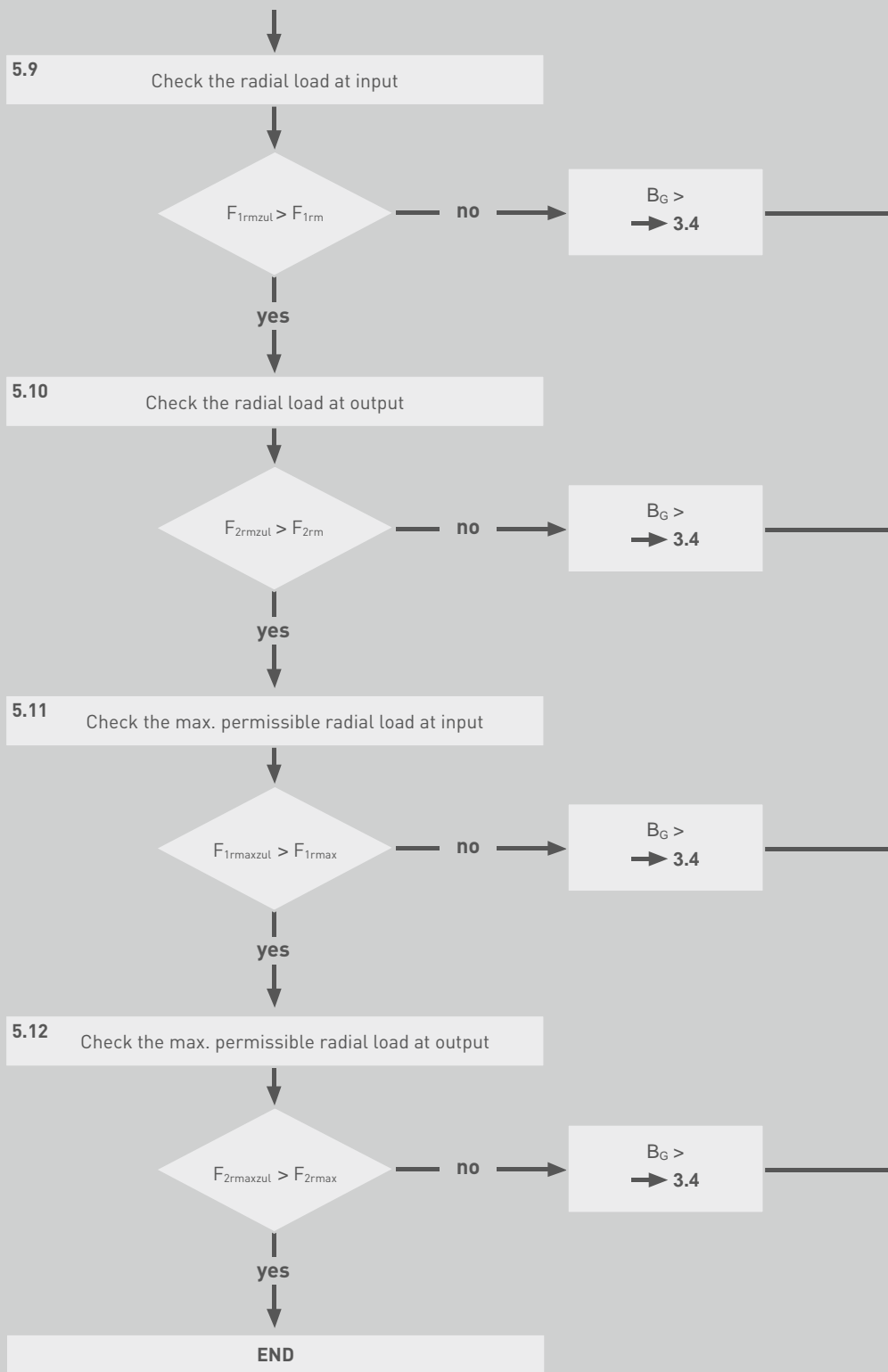
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5 Comparison of the gearbox with the application



DETAILED GEARBOX SELECTION





DYNAMICS FACTOR f_k

Gearbox type		P / PF / PFH / MP / MPF / MPFH							
i	Number of possible revolutions under load [Lu]*								
3.4 to 9	32385	45754	66098	97944	149428	235817	387231	666667	
13.60	8096	11438	16525	24486	37357	58954	96808	166667	
16.00	8096	11438	16525	24486	37357	58954	96808	166667	
20.00	8096	11438	16525	24486	37357	58954	96808	166667	
25.00	6477	9151	13220	19589	29886	47163	77446	133333	
35.00	6477	9151	13220	19589	29886	47163	77446	133333	
46.24	2381	3364	4860	7202	10987	17340	28473	49020	
68.00	1619	2288	3305	4897	7471	11791	19362	33333	
100.00	1619	2288	3305	4897	7471	11791	19362	33333	
125.00	1295	1830	2644	3918	5977	9433	15489	26667	
175.00	1295	1830	2644	3918	5977	9433	15489	26667	
245.00	925	1307	1889	2798	4269	6738	11064	19048	
f_k	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	

Gearbox type		LP / LPF / LPFH / MLP / MLPF / MLPFH							
i	Number of possible revolutions under load [Lu]*								
60.00	8096	11438	16525	24486	37357	58954	96808	166667	
80.00	8096	11438	16525	24486	37357	58954	96808	166667	
100.00	8096	11438	16525	24486	37357	58954	96808	166667	
125.00	6477	9151	13220	19589	29886	47163	77446	133333	
150.00	6477	9151	13220	19589	29886	47163	77446	133333	
210.00	6477	9151	13220	19589	29886	47163	77446	133333	
f_k	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	

Gearbox type		L / H / LV / ML / MH							
i	Number of possible revolutions under load [Lu]*								
1.00	1040000	1500000	2240000	3440000	5420000	8840000	15000000	26640000	50000000
1.50	700000	1000000	1500000	2300000	3600000	5900000	10000000	17760000	33340000
2.00	520000	760000	1120000	1720000	2720000	4420000	7500000	13320000	25000000
3.00	340000	500000	760000	1140000	1800000	2940000	5000000	8880000	16660000
4.00	260000	380000	560000	860000	1360000	2200000	3760000	6660000	12500000
5.00	200000	300000	460000	700000	1080000	1760000	3000000	5320000	10000000
6.00	180000	260000	380000	580000	900000	1480000	2500000	4440000	8340000
f_k	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80

* Sum of the revolutions under load for all torques which exceed the nominal torque / f_D . Dynamics factor f_k for gearbox type LS on request.

DYNAMICS FACTOR f_K / START-UP FACTOR f_s /
DIRECTION OF LOAD FACTOR f_L

Gearbox type		KS / KSH / KSHF / MKS / MKSH / MKSHF							
i	Number of possible revolutions under load [Lu]*								
6.00	172195	251105	374651	573610	904427	1475002	2501627	4442496	8333333
7.50	137756	200884	299721	458888	723542	1180002	2001301	3553997	6666667
9.60	107622	156941	234157	358506	565267	921876	1563517	2776560	5208333
12.00	86097	125553	187325	286805	452214	737501	1250813	2221248	4166667
14.40	71748	104627	156105	239004	376845	614584	1042345	1851040	3472222
16.80	61498	89680	133804	204861	323010	526786	893438	1586606	2976190
19.20	53811	78470	17078	179253	282634	460938	781758	1388280	2604167
21.60	47832	69751	104070	159336	251230	409723	694896	1234027	2314815
24.00	43049	62776	93663	143402	226107	368751	625407	1110624	2083333
26.40	39135	57069	85148	130366	205552	335228	568552	1009658	1893939
28.80	35874	52314	78052	119502	188422	307292	521172	925520	1736111
33.60	30749	44840	66902	102430	161505	263393	446719	793303	1488095
38.40	26905	39235	58539	89627	141317	230469	390879	694140	1302083
43.20	23916	34876	52035	79668	125615	204861	347448	617013	1157407
48.00	21524	31388	46831	71701	113053	184375	312703	555312	1041667
f_K	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80

Start-up factor f_s	
Start-up mode	f_s
Direct	1.8 to 3.0
Soft start	1.8
Frequency converter	1.5 to 2.0
Star / Delta	1.3
Fluid coupling	1.6 to 2.0
Hydraulic motor	1.5

Direction of load factor f_L	
Constant direction of load	1.00
Reversing direction of load	1,43

* Sum of the revolutions under load for all torques which exceed the nominal torque / f_D

APPLICATION FACTOR f_A

Application factor f_A										
		E-machines			Combustion engine ≤ 3 cylinders			Combustion engine > 3 cylinders and hydraulic motors		
Operating time per day		< 3h	3-10 h	> 10 h	< 3h	3-10 h	> 10 h	< 3h	3-10 h	> 10 h
Wastewater treatment	Rotary surface aerators	-	1.80	2.00	-	2.30	2.50	-	2.05	2.25
	Thickeners	1.15	1.25	1.50	1.65	1.75	2.00	1.40	1.50	1.75
	Vacuum filters	1.15	1.30	1.50	1.65	1.80	2.00	1.40	1.55	1.75
	Collectors	1.15	1.25	1.50	1.65	1.75	2.00	1.40	1.50	1.75
	Screw pumps	-	1.30	1.50	-	1.80	2.00	-	1.55	1.75
	Brush aerators	-	-	2.00	-	-	2.50	-	-	2.25
Mining	Crushers	1.55	1.75	2.00	2.05	2.25	2.50	1.80	2.00	2.25
	Vibrators and screens	1.55	1.75	2.00	2.05	2.25	2.50	1.80	2.00	2.25
	Swing gears	-	1.55	1.80	-	2.05	2.30	-	1.80	2.05
	Bucket wheel excavators	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
Power technology	Frequency converters	-	1.80	2.00	-	2.30	2.50	-	2.05	2.25
	Water wheels (50 to 200 rpm)	-	-	1.70	-	-	2.20	-	-	1.95
	Water turbines	-	-	a.)	-	-	a.)	-	-	a.)
Conveyor technology	Bucket conveyors	-	1.40	1.50	-	1.90	2.00	-	1.65	1.75
	Vertical conveyors, elevators	-	1.50	1.80	-	2.00	2.30	-	1.75	2.05
	Rubber belt conveyors	1.15	1.25	1.40	1.65	1.75	1.90	1.40	1.50	1.65
	Apron feeders	-	1.25	1.50	-	1.75	2.00	-	1.50	1.75
	Feed screws	1.15	1.25	1.50	1.65	1.75	2.00	1.40	1.50	1.75
	Vibrators and screens	1.55	1.75	2.00	2.05	2.25	2.50	1.80	2.00	2.25
	Moving staircases	1.25	1.25	1.50	1.75	1.75	2.00	1.50	1.50	1.75
	Passenger elevators	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
Elastomer, thermoset and thermoplastic technology	Extruders	-	1.40	1.60	-	1.90	2.10	-	1.65	1.85
	Drive shafts	1.55	1.75	2.00	2.05	2.25	2.50	1.80	2.00	2.25
	Calenders	-	1.65	1.65	-	2.15	2.15	-	1.90	1.90
	Mills	1.55	1.75	2.00	2.05	2.25	2.50	1.80	2.00	2.25
	Roll mills	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
	Slab rollers	1.55	1.75	2.00	2.05	2.25	2.50	1.80	2.00	2.25
	Refining rollers	1.55	1.75	2.00	2.05	2.25	2.50	1.80	2.00	2.25
	Tyre machines	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
Wood engineering	Wood industry	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
Hoisting technology	Cranes and hoists	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
Food industry	Crushers and mills	-	-	1.75	-	-	2.25	-	-	2
	Beet cutters	-	1.25	1.50	-	1.75	2.00	-	1.50	1.75
	Drying drums	-	1.25	1.50	-	1.75	2.00	-	1.50	1.75
Metal production and processing	Coilers	-	1.60	1.75	-	2.10	2.25	-	1.85	2.00
	Slitting rollers	1.55	1.75	2.00	2.05	2.25	2.50	1.80	2.00	2.25
	Table conveyors	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
	Wire drawing machines	1.35	1.50	1.75	1.85	2	2.25	1.60	1.75	2.00
	Rollers	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)

a.) : Consultation with Vogel necessary

APPLICATION FACTOR f_A

Application factor f_A										
		E-machines			Combustion engine ≤ 3 cylinders			Combustion engine > 3 cylinders and hydraulic motors		
		< 3h	3-10 h	> 10 h	< 3h	3-10 h	> 10 h	< 3h	3-10 h	> 10 h
Operating time per day		< 3h	3-10 h	> 10 h	< 3h	3-10 h	> 10 h	< 3h	3-10 h	> 10 h
Mills and drums, drying	Cooling drums, drying drums	-	1.50	1.60	-	2.00	2.10	-	1.75	1.85
	Rotating tubular kilns	-	-	2.00	-	-	2.50	-	-	2.25
	Ball mills	-	-	2.00	-	-	2.50	-	-	2.25
	Coal pulverisers	-	1.50	1.75	-	2.00	2.25	-	1.75	2.00
Pulp technology	Barking	1.55	1.80	-	2.05	2.30	-	1.80	2.05	-
	Rollers	-	1.80	2.00	-	2.30	2.50	-	2.05	2.25
	Drying cylinders	-	1.80	2.00	-	2.30	2.50	-	2.05	2.25
	Calenders	-	1.80	2.00	-	2.30	2.50	-	2.05	2.25
	Filters	-	1.80	2.00	-	2.30	2.50	-	2.05	2.25
	Choppers	1.55	1.75	2.00	2.05	2.25	2.50	1.80	2.00	2.25
	Jordan refiners	-	1.50	1.75	-	2	2.25	-	1.75	2.00
	Presses	-	-	1.75	-	-	2.25	-	-	2.00
	Reel winders	-	-	1.75	-	-	2.25	-	-	2.00
	Pulpers	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
	Washing filters	-	-	1.50	-	-	2.00	-	-	1.75
	Yankee cylinders (drying technology)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
Feed pumps	Centrifugal pumps	1.15	1.35	1.45	1.65	1.85	1.95	1.40	1.60	1.70
	Reciprocating pumps	1.35	1.50	1.80	1.85	2.00	2.30	1.60	1.75	2.05
	Reciprocating pumps (> 1 cylinder)	1.20	1.40	1.50	1.70	1.90	2.00	1.45	1.65	1.75
	Spiral pumps	-	1.25	1.50	-	1.75	2.00	-	1.50	1.75
	Gear pumps, vane pumps	-	-	1.25	-	-	1.75	-	-	1.50
Stirrer and mixing technology	Stirrers for liquids	1.00	1.25	1.50	1.50	1.75	2.00	1.25	1.50	1.75
	Stirrers for liquids (different density)	1.20	1.50	1.65	1.70	2.00	2.15	1.45	1.75	1.90
	Stirrers for solids (different size and density)	1.40	1.60	1.70	1.90	2.10	2.20	1.65	1.85	1.95
	Stirrers for solids (homogeneous)	-	1.35	1.40	-	1.85	1.90	-	1.60	1.65
	Concrete mixers	-	1.50	1.50	-	2.00	2.00	-	1.75	1.75
Haulage tracks	Material tracks	-	1.40	1.50	-	1.90	2.00	-	1.65	1.75
	Pendulum tracks	-	a.)	a.)	-	a.)	a.)	-	a.)	a.)
	T-bar lifts	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
	Continuous tracks	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
	Passenger cable cars	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)	a.)
Blowers and ventilators	Heat exchangers	1.50	1.50	1.50	2.00	2.00	2.00	1.75	1.75	1.75
	Dry cooling tower	-	-	2.00	-	-	2.50	-	-	2.25
	Wet cooling tower	2.00	2.00	2.00	2.50	2.50	2.50	2.25	2.25	2.25
	Blowers (axial, radial)	1.50	1.50	1.50	2.00	2.00	2.00	1.75	1.75	1.75
Compressor technology	Piston compressors	-	1.80	1.90	-	2.30	2.40	-	2.05	2.15
	Radial flow compressors	-	1.40	1.50	-	1.90	2.00	-	1.65	1.75
	Rotary screw compressors	-	1.50	1.75	-	2.00	2.25	-	1.75	2.00

a.) : Consultation with Vogel necessary

FATIGUE STRENGTH FACTOR f_D

Gearbox type		P / PF / PFH / MP / MPF / MPFH					
Gearbox size	08	16	32	64	128	256	512
i	f_D						
3,40	1,09	1,03	1,17	1,21	1,17	1,43	
4,00	1,12	1,02	1,00	1,01	1,00	1,00	
5,00	1,00	1,02	1,06	1,17	1,11	1,36	
7,00	1,06	1,20	1,28	1,35	1,33	1,00	
9,00	1,18	1,09	1,36	1,35	1,41	1,40	
13,60	1,34	1,04	1,09	1,40	1,00	1,05	1,06
16,00	1,12	1,02	1,28	1,19	1,00	1,00	1,06
20,00	1,12	1,02	1,19	1,06	1,00	1,02	1,06
25,00	1,00	1,02	1,06	1,17	1,11	1,36	1,03
35,00	0,98	1,16	1,19	1,41	1,23	1,35	1,03
46,24	1,28	1,04	1,55	1,17	1,20	1,17	1,06
68,00	1,00	1,00	1,22	1,17	1,38	1,36	1,03
100,00	1,12	0,89	1,19	1,06	1,00	1,02	1,06
125,00	1,00	1,00	1,06	1,17	1,11	1,36	1,03
175,00	1,00	1,00	1,03	1,17	1,03	1,36	1,03
245,00	1,12	1,16	1,06	1,20	1,23	1,35	1,03

Gearbox type		LP / LPF / LPFH / MLP / MLPF / MLPFH				
Gearbox size	08	16	32	64	128	256
i	f_D					
60,00	1,28	1,27	1,19	1,21	1,23	1,19
80,00	1,28	1,27	1,19	1,17	1,10	1,17
100,00	1,28	1,27	1,19	1,10	1,16	1,06
125,00	1,00	1,02	1,06	1,17	1,11	1,15
150,00	1,00	1,02	1,06	1,20	1,21	1,07
210,00	1,00	1,03	1,19	1,41	1,23	1,12

Fatigue strength factor f_D for gearbox type LS on request.

FATIGUE STRENGTH FACTOR f_D

Gearbox type		L / H / LV / ML / MH	
Gearbox size	n_1	500	600
i	f_D		
1,0	50	0,60	0,64
	250	0,77	0,85
	500	0,94	1,00
	1000	1,38	1,25
	1500	1,64	1,43
	2000		
	3000		
1,5	50	0,60	0,63
	250	0,73	0,78
	500	0,87	0,94
	1000	1,04	1,07
	1500	1,42	1,26
	2000	1,59	1,36
	3000		
2,0	50	0,57	0,61
	250	0,68	0,72
	500	0,78	0,85
	1000	0,94	1,00
	1500	1,10	1,11
	2000	1,39	1,25
	3000	1,65	1,43
3,0	50	0,49	0,54
	250	0,55	0,63
	500	0,64	0,73
	1000	0,79	0,87
	1500	0,93	1,00
	2000	1,08	1,10
	3000	1,21	1,31
4,0	50	0,62	0,67
	250	0,66	0,73
	500	0,74	0,81
	1000	0,88	0,93
	1500	0,97	1,00
	2000	1,03	1,14
	3000	1,16	1,33
5,0	50	0,52	0,60
	250	0,57	0,67
	500	0,69	0,74
	1000	0,87	0,86
	1500	0,97	1,00
	2000	1,03	1,13
	3000	1,27	1,34
6,0	50	0,69	0,65
	250	0,73	0,69
	500	0,81	0,77
	1000	0,85	0,87
	1500	0,97	1,00
	2000	1,04	1,05
	3000	1,32	1,25

Fatigue strength factor f_D for gearbox type LS on request.

FATIGUE STRENGTH FACTOR f_D

Gearbox type		KS / KSH / KSHF / MKS / MKSH / MKSHF		
Gearbox size	n1	64	128	
i	f_D			
6,0	50	0,90	0,93	
	500	0,92	0,95	
	1000	0,97	0,99	
	1500	1,01	1,02	
	2000	1,05	1,05	
	3000	1,08	1,08	
7,5	50	0,90	0,93	
	500	0,92	0,95	
	1000	0,96	0,98	
	1500	1,01	1,03	
	2000	1,08	1,06	
	3000	1,13	1,10	
9,6	50	0,81	0,95	
	500	0,92	0,97	
	1000	0,94	0,99	
	1500	1,02	1,02	
	2000	1,02	1,05	
	3000	1,13	1,08	
12,0	50	0,83	0,98	
	500	0,94	0,99	
	1000	0,96	0,99	
	1500	1,01	1,01	
	2000	1,09	1,04	
	3000	1,17	1,09	
14,4	50	0,77	0,91	
	500	0,87	0,94	
	1000	0,89	0,95	
	1500	0,93	0,99	
	2000	1,00	1,01	
	3000	1,08	1,05	
16,8	50	0,80	0,97	
	500	0,83	0,97	
	1000	0,86	0,98	
	1500	0,91	0,99	
	2000	1,00	1,01	
	3000	1,08	1,04	
19,2	50	0,81	0,97	
	500	0,85	0,98	
	1000	0,86	0,99	
	1500	0,92	1,00	
	2000	1,00	1,00	
	3000	1,07	1,02	
21,6	50	0,91	0,92	
	500	0,91	0,94	
	1000	0,96	0,97	
	1500	0,96	1,00	
	2000	1,00	1,01	
	3000	1,16	1,02	

FATIGUE STRENGTH FACTOR f_D

Gearbox type		KS / KSH / KSHF / MKS / MKSH / MKSHF		
Gearbox size	n1	64	128	
i	f_D			
24,0	50	0,82	0,95	
	500	0,83	0,96	
	1000	0,90	0,98	
	1500	0,90	0,99	
	2000	1,00	1,01	
	3000	1,13	1,03	
26,4	50	0,80	0,96	
	500	0,85	0,97	
	1000	0,86	0,98	
	1500	0,94	0,99	
	2000	1,00	1,01	
	3000	1,10	1,03	
28,8	50	0,81	0,95	
	500	0,84	0,96	
	1000	0,86	0,98	
	1500	0,90	0,99	
	2000	1,00	1,01	
	3000	1,08	1,03	
33,6	50	0,73	0,90	
	500	0,76	0,93	
	1000	0,80	0,96	
	1500	0,89	0,99	
	2000	1,00	1,01	
	3000	1,14	1,04	
38,4	50	0,73	0,90	
	500	0,75	0,91	
	1000	0,79	0,95	
	1500	0,89	0,99	
	2000	1,00	1,01	
	3000	1,11	1,05	
43,2	50	0,76	0,90	
	500	0,77	0,93	
	1000	0,79	0,96	
	1500	0,89	0,99	
	2000	1,00	1,01	
	3000	1,14	1,03	
48,0	50	0,70	0,90	
	500	0,75	0,92	
	1000	0,80	0,95	
	1500	0,89	0,99	
	2000	1,00	1,01	
	3000	1,14	1,03	

CALCULATION EXAMPLE FOR INDUSTRIAL GEARBOXES

1. Application values

= Customer parameters = Calculations

Application	Logistics system, conveyor belt operation
Gearbox	Spiral bevel gearbox
Gearbox type	MKSH

Profile	Description	Output speed [n_{2i}]* min ⁻¹	Time share [t_i] s	Output torque [t_{2i}] Nm
1	Start-up	75	2	4000
2	Transport	150	40	1500
3	Stop	75	2	4000
4	Idle	0	40	0
5				
6				
7				
8				
9				
10				

* Half the final speed or initial speed are used as a basis for acceleration and deceleration procedures.

Emergency stop torque output	T_{2Not}	Nm	6000
Nominal output speed	n_2	min ⁻¹	150
Radial load input	F_{1rm}	N	0
Radial load output	F_{2rm}	N	9000
Maximum radial load input	F_{1rmax}	N	0
Maximum radial load output	F_{2rmax}	N	22500
Nominal power main engine	P_{Mot}	kW	45.0
Nominal speed main engine	n_{1Mot}	min ⁻¹	1475
Gearbox life time	B_h	h	10000
Definition of application factor	f_A	-	1.20
Definition of start-up factor	f_s	-	1.80
Definition of direction of load factor	f_L	-	1.00

2. Calculation of application values

Determination of output speed max.	n_{1max}	min ⁻¹	150		1
Determination of output torque max.	T_{2max}	Nm	4000		1
Calculation of total cycle time	t_{ges}	s	84	$\sum (t_i)$	2
Calculation of average output torque from load profile	T_{2m}	Nm	2534	$\sqrt[6,6]{\frac{\sum (n_{2i} * t_i * T_{2i}^{6,6})}{\sum (n_{2i} * t_i)}}$	3
Calculation of average output speed from load profile	n_{2m}	min ⁻¹	75	$\frac{\sum (n_{2i} * t_i)}{\sum (t_{ges})}$	4
Calculation of revolutions under load per cycle $T_{2i} > T_{2m} * f_A$	L_{uz}	1 / Zyk	5.00	$\frac{\sum (n_{2i} * t_i)}{60}$	5
Calculation of revolutions under load	L_u	-	2142857	$\frac{B_h * 3600}{t_{ges} * L_{uz}}$	5

3. Determination of gearbox values

Calculation of ratio required	i_{erf}	-	9.833	$\frac{n_{1\text{Mot}}}{n_2}$	
Determination of possible ratio	i	-	9.6		6
Calculation of required nominal torque on output	$T_{2\text{Nzulerf}}$	Nm	3040	$T_{2m} * f_A$	
Determination of size	BG	-	64	Selection according to $T_{2\text{Nzul}} > T_{2\text{Nzulerf}}$	6
Calculation of nominal speed on input	n_1	min ⁻¹	1440	$n_2 * i$	
Calculation of average speed on input	n_{1m}	min ⁻¹	720	$n_{2m} * i$	
Calculation of maximum speed on input	$n_{1\text{max}}$	min ⁻¹	1440	$n_{2\text{max}} * i$	
Determination of gearbox efficiency	η	-	0.96		6
Determination of fatigue strength factor as per table	f_D	-	1.02		7
Determination of dynamic factor	f_K	-	1.65		8
Determination of nominal torque on output	$T_{2\text{Nzul}}$	Nm	4060		6
Determination of maximum permissible output torque	$T_{2\text{maxzul}}$	Nm	9000		6
Determination of emergency stop torque	$T_{2\text{Notzul}}$	Nm	10000		6
Determination of thermal limit power	P_{thGrenz}	kW	30		6
Determination of permissible, average input speed	$n_{1\text{mzul}}$	min ⁻¹	1400		6
Determination of maximum input speed	$n_{1\text{maxzul}}$	min ⁻¹	2800		6
Determination of permissible radial load at input	$F_{1\text{rmzul}}$	N	0		9
Determination of permissible radial load at output	$F_{2\text{rmzul}}$	N	39764		9
Determination of maximum permissible radial load at input	$F_{1\text{rmmaxzul}}$	N	0		6
Determination of maximum permissible radial load at output	$F_{2\text{rmmaxzul}}$	N	58000		6

4. Determination of motor values

Calculation of motor nominal output torque	$T_{2\text{NMot}}$	Nm	2750	$\frac{P_{\text{Mot}} * 9550 * \eta * 1}{n_2}$	
Calculation of max. motor torque on output	$T_{2\text{maxMot}}$	Nm	4951	$\frac{P_{\text{Mot}} * 9550 * \eta * f_5}{n_2}$	

5. Comparison of the gearbox with the application

Check the motor nominal output torque	$T_{2\text{NMot}}$	Nm	2750 > 2534	T_{2m}	
Check the max. motor torque on output	$T_{2\text{maxMot}}$	Nm	4951 > 4000	$T_{2\text{max}}$	
Check the nominal torque on output	$T_{2\text{Nzul}}$	Nm	4060 > 3101	$T_{2m} * f_A * f_D * f_L$	
Check the maximum permissible output torque	$T_{2\text{maxzul}}$	Nm	9000 > 8169	$T_{2\text{maxMot}} * f_K * f_L$	
Check the emergency stop torque	$T_{2\text{Notzul}}$	Nm	10000 > 6000	$T_{2\text{Not}}$	
Check the power to be transferred	P_{thGrenz}	kW	30 > 19.9	$\frac{T_{2m} * n_{2m} * 2 * \pi}{60000}$	
Check the permissible, average input speed	$n_{1\text{mzul}}$	min ⁻¹	1400 > 720	n_{1m}	
Check the maximum input speed	$n_{1\text{maxzul}}$	min ⁻¹	2800 > 1440	$n_{1\text{max}}$	
Check the radial load at input	$F_{1\text{rmzul}}$	N	0 > 0	$F_{1\text{rm}}$	
Check the radial load at output	$F_{2\text{rmzul}}$	N	39764 > 9000	$F_{2\text{rm}}$	
Check the maximum permissible radial load at input	$F_{1\text{rmmaxzul}}$	N	0 > 0	$F_{1\text{rmmax}}$	
Check the maximum permissible radial load at output	$F_{2\text{rmmaxzul}}$	N	58000 > 22500	$F_{2\text{rmmax}}$	

1 Max. value of load profile

2 Sum of times in the load profile, including idle time

3 Equivalent torque from load profile

4 Average speed from load profile

5 Valid for all torques $T_{2i} > T_{2m} * f_A$

6 From the technical data of the gearbox type

7 Fatigue strength factor as per table

8 Dynamics factor as per table

9 From the technical data of the gearbox type, at permissible average input speed

P / P F

T E C H N I C A L D A T A

Technical specifications on this page and in the tables on the following four pages are intended only for rough preselection.

Gear teeth:	Spur gear	Lubrication:	Oil lubrication
Direction of rotation:	Input and output in the same direction	Mounting position:	Any, specify when ordering
Life time:	20000 h L _{10h}	Surface protection:	Primer coat RAL 9005 Black
Permissible gearbox temperature at housing:	-10 °C to +80 °C (deviating temperature ranges on request)	Protection rating:	IP 54





P / P F

T E C H N I C A L D A T A

The following technical specifications in the table are intended only for rough preselection

P / P F			08																
Gear stage			1					2					3						
Ratio	i		3,4	4,0	5,0	7,0	9,0	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00	
Combination	i		-	-	-	-	-	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5	
Max. permissible output torque	T _{2maxzul}	Nm	935	1063	1360	799	578	1012	1063	1063	1360	1216	1063	1360	1063	1360	1190	1216	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	600	700	800	500	400	800	700	700	800	700	800	800	700	800	700	800	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	1100	1250	1600	940	680	1190	1250	1250	1600	1430	1250	1600	1250	1600	1400	1430	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	2380	2500	2500	2500	2500	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Max. input speed	n _{1maxzul}	min ⁻¹	3400	3500	3500	3500	3500	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	2768	2727	2727	2727	2727	2150	2150	2150	2150	2150	2150	2150	2150	2150	2150	2150	
Maximum permissible radial load input	F _{1rmazul}	N	7200					4000					4000						
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	5393	5582	5972	6614	7137	7653	8040	8602	9204	10192	11089	12464	14009	14989	16598	18380	
Max. permissible radial load output	F _{2rmazul}	N	19000					19000					19000						
Efficiency	η	-	0,97					0,96					0,95						
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	4,9					3,8					3,4						
Weight	m	kg	approx. 21					approx. 21					approx. 23						
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75					≤ 75					≤ 75						
Inertia (with reference to input)	D1	J ₁	kgcm ²	11,21	9,31	6,83	5,29	4,67	4,60	4,05	3,60	3,50	3,19	3,54	3,48	3,08	3,08	3,01	3,00

P / P F			16																
Gear stage			1					2					3						
Ratio	i		3,4	4,0	5,0	7,0	9,0	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00	
Combination	i		-	-	-	-	-	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5	
Max. permissible output torque	T _{2maxzul}	Nm	1819	2669	3009	1700	1088	2604	2669	2669	3009	2635	2604	3060	3060	3060	3060	2635	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	1100	1600	1800	1200	700	1600	1600	1600	1800	1800	1600	1800	1600	1800	1800	1800	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	2140	3140	3540	2000	1280	3064	3140	3140	3540	3100	3064	3600	3600	3600	3600	3100	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1851	2178	2250	2250	2250	2750	2750	2750	2750	2750	3000	3000	3000	3000	3000	3000	
Max. input speed	n _{1maxzul}	min ⁻¹	2644	3111	3250	3250	3250	3750	3750	3750	3750	3750	4000	4000	4000	4000	4000	4000	
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	3153	3002	2972	2972	2972	2318	2318	2318	2318	2318	2150	2150	2150	2150	2150	2150	
Maximum permissible radial load input	F _{1rmazul}	N	7600					6250					4000						
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	9215	9215	9763	10811	11667	12441	13069	13984	14962	16568	17558	19734	22181	23733	26280	29101	
Max. permissible radial load output	F _{2rmazul}	N	30000					30000					30000						
Efficiency	η	-	0,97					0,96					0,95						
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	7,5					6,2					5,3						
Weight	m	kg	approx. 35					approx. 38					approx. 45						
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75					≤ 75					≤ 75						
Inertia (with reference to input)	D1	J ₁	kgcm ²	29,74	22,81	17,47	13,28	11,62	7,19	5,85	4,76	4,55	3,77	3,71	3,56	3,12	3,11	3,02	3,01

* measured with 2 % nominal torque on output shaft

P / PF		32																	
Gear stage		1					2					3							
Ratio	i	3,4	4,0	5,0	7,0	9,0	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00		
Combination	i	-	-	-	-	-	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5		
Max. permissible output torque	T _{2maxzul}	Nm	5525	6460	6120	3315	1870	3740	4250	5440	6120	3995	3740	5313	5440	6120	6120	3995	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	3800	3800	3800	2500	1500	2400	3200	3800	3800	2800	3400	3800	3800	3800	3700	2500	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	6500	7600	7200	3900	2200	4400	5000	6400	7200	4700	4400	6250	6400	7200	7200	4700	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1515	1782	2000	2000	2000	2380	2500	2500	2500	2500	3000	3000	3000	3000	3000	3000	
Max. input speed	n _{1maxzul}	min ⁻¹	2164	2545	3000	3000	3000	3400	3500	3500	3500	3500	4000	4000	4000	4000	4000	4000	
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	5159	4911	4742	4742	4742	2768	2727	2727	2727	2727	2150	2150	2150	2150	2150	2150	
Maximum permissible radial load input	F _{1rmaxzul}	N	11600					7200					4000						
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	10824	10824	11183	12383	13363	14366	14868	15909	17022	18849	19406	21812	24516	26231	29047	32164	
Max. permissible radial load output	F _{2rmaxzul}	N	34000					34000					34000						
Efficiency	η	-	0,97					0,96					0,95						
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	10,2					8,3					6,7						
Weight	m	kg	approx. 55					approx. 70					approx. 78						
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75					≤ 75					≤ 75						
Inertia (with reference to input)	D1	J ₁	kgcm ²	86,65	65,08	48,35	35,25	29,99	13,70	11,11	7,98	7,31	5,53	4,13	3,76	3,21	3,19	3,06	3,03

P / PF		64																	
Gear stage		1					2					3							
Ratio	i	3,4	4,0	5,0	7,0	9,0	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00		
Combination	i	-	-	-	-	-	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5		
Max. permissible output torque	T _{2maxzul}	Nm	10540	12580	10880	5780	3145	7276	10676	12036	10880	5440	7276	10880	12036	10880	10880	8500	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	7500	7500	7500	4600	2500	6000	7500	7500	7500	4500	5000	7500	7500	7500	7500	6000	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	12400	14800	12800	6800	3700	8560	12560	14160	12800	6400	8560	12800	14160	12800	12800	10000	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1282	1508	1750	1750	1750	1851	2178	2250	2250	2250	2750	2750	2750	2750	2750	2750	
Max. input speed	n _{1maxzul}	min ⁻¹	1831	2154	2692	2750	2750	2644	3111	3250	3250	3250	3750	3750	3750	3750	3750	3750	
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	6632	6314	6035	6035	6035	3153	3002	2972	2972	2972	2318	2318	2318	2318	2318	2318	
Maximum permissible radial load input	F _{1rmaxzul}	N	14300					7600					6250						
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	17784	17784	18188	20140	21734	24215	24214	25654	27448	30395	31120	34978	39314	42065	46580	51580	
Max. permissible radial load output	F _{2rmaxzul}	N	54000					54000					54000						
Efficiency	η	-	0,97					0,96					0,95						
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	13,5					11,2					9,3						
Weight	m	kg	approx. 60					approx. 80					approx. 101						
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75					≤ 75					≤ 75						
Inertia (with reference to input)	D1	J ₁	kgcm ²	216,9	164,5	123,5	91,4	78,6	38,3	29,0	21,4	19,8	14,5	6,0	5,0	3,7	3,6	3,3	3,2

* measured with 2 % nominal torque on output shaft



P / P F

TECHNICAL DATA

The following technical specifications in the table are intended only for rough preselection

P / PF		128																	
Gear stage		1					2					3							
Ratio	i	3,4	4,0	5,0	7,0	9,0	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00		
Combination	i	-	-	-	-	-	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5		
Max. permissible output torque	T _{2maxzul}	Nm	18870	22100	19890	10200	5440	22100	22100	22100	19890	16575	12716	15980	22100	19890	19890	16575	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	13000	13000	13000	8000	4500	13000	13000	13000	13000	12000	9000	13000	13000	13000	12000	12000	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	22200	26000	23400	12000	6400	26000	26000	26000	23400	19500	14960	18800	26000	23400	23400	19500	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1041	1225	1500	1500	1500	1515	1782	2000	2000	2000	2380	2380	2500	2500	2500	2500	
Max. input speed	n _{1maxzul}	min ⁻¹	1488	1750	2188	2500	2500	2164	2545	3000	3000	3000	3400	3400	3500	3500	3500	3500	
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	on request					5159	4911	4742	4742	4742	2768	2768	2727	2727	2727	2727	
Maximum permissible radial load input	F _{1rmaxzul}	N	on request					11600					7200						
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	32335	32335	32538	36030	38881	43934	43934	45391	48566	53779	55510	62392	69089	73922	81857	90644	
Max. permissible radial load output	F _{2rmaxzul}	N	91000					91000					91000						
Efficiency	η	-	0,97					0,96					0,95						
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	19,8					16,3					13,6						
Weight	m	kg	approx. 195					approx. 206					approx. 220						
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75					≤ 75					≤ 75						
Inertia (with reference to input)	D1	J ₁	kgcm ²	509,6	375,6	269,3	184,6	151,6	104,2	77,8	56,5	52,2	37,2	11,2	8,5	5,3	5,2	4,4	4,1

P / PF		256												
Gear stage		2						3						
Ratio	i	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00		
Combination	i	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5		
Max. permissible output torque	T _{2maxzul}	Nm	42160	44200	43520	32470	28900	24738	32470	43520	32470	28900		
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	26000	26000	26000	26000	23000	17000	26000	26000	26000	23000		
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	49600	52000	51200	38200	34000	29104	38200	51200	38200	34000		
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1282	1508	1750	1750	1750	1851	1851	2250	2250	2250		
Max. input speed	n _{1maxzul}	min ⁻¹	1831	2154	2692	2750	2750	2644	2644	3250	3250	3250		
Max. backlash*	j	arcmin	≤ 15						≤ 20					
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	6632	6314	6035	6035	6035	3153	3153	2972	2972	2972		
Maximum permissible radial load input	F _{1rmaxzul}	N	14300						7600					
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	74275	74275	75962	81276	90000	96274	108209	114638	122658	135824		
Max. permissible radial load output	F _{2rmaxzul}	N	152000						152000					
Efficiency	η	-	0,96						0,95					
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	20,6						17,3					
Weight	m	kg	approx. 370						approx. 430					
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75						≤ 75					
Inertia (with reference to input)	D1	J ₁	kgcm ²	271,8	204,1	148,9	135,2	97,4	30,3	23,2	13,6	13,1	10,8	10,2

* measured with 2 % nominal torque on output shaft

P / P F

T E C H N I C A L D A T A

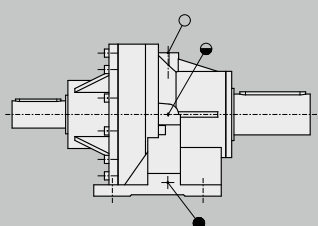
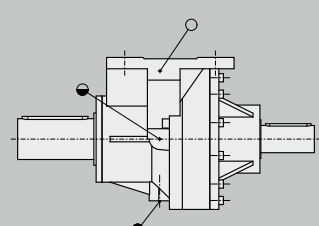
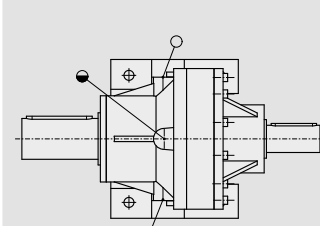
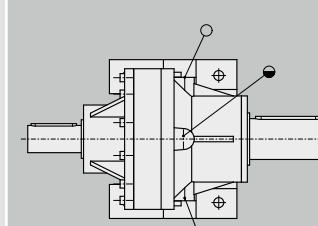
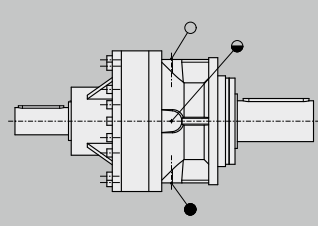
P / PF			512										
Gear stage			2				3						
Ratio	i		13,60	16,00	20,00	25,00	35,00	46,24	68,00	100,00	125,00	175,00	245,00
Combination	i		3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5
Max. permissible output torque	T _{2maxzul}	Nm	79900	79900	79900	66300	66300	79900	66300	79900	66300	66300	66300
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	50000	50000	50000	40000	40000	50000	40000	50000	40000	40000	40000
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	94000	94000	94000	78000	78000	94000	78000	94000	78000	78000	78000
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	833	980	1225	1250	1250	1282	1282	1750	1750	1750	1750
Max. input speed	n _{1maxzul}	min ⁻¹	1190	1400	1750	2250	2250	1831	1831	2692	2692	2750	2750
Max. backlash*	j	arcmin	≤ 15				≤ 20						
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	on request				6632	6632	6035	6035	6035	6035	6035
Maximum permissible radial load input	F _{1rmaxzul}	N	on request				14300						
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	170255	185764	182166	194910	205981	165000	185456	189688	202958	224744	248868
Max. permissible radial load output	F _{2rmaxzul}	N	250000				250000						
Efficiency	η	-	0,96				0,95						
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	37,5				30,7						
Weight	m	kg	approx. 850				approx. 1180						
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75				≤ 75						
Inertia (with reference to input)	D1 J ₁	kgcm ²	on request				on request						




* measured with 2 % nominal torque on output shaft



P / PF / PFH

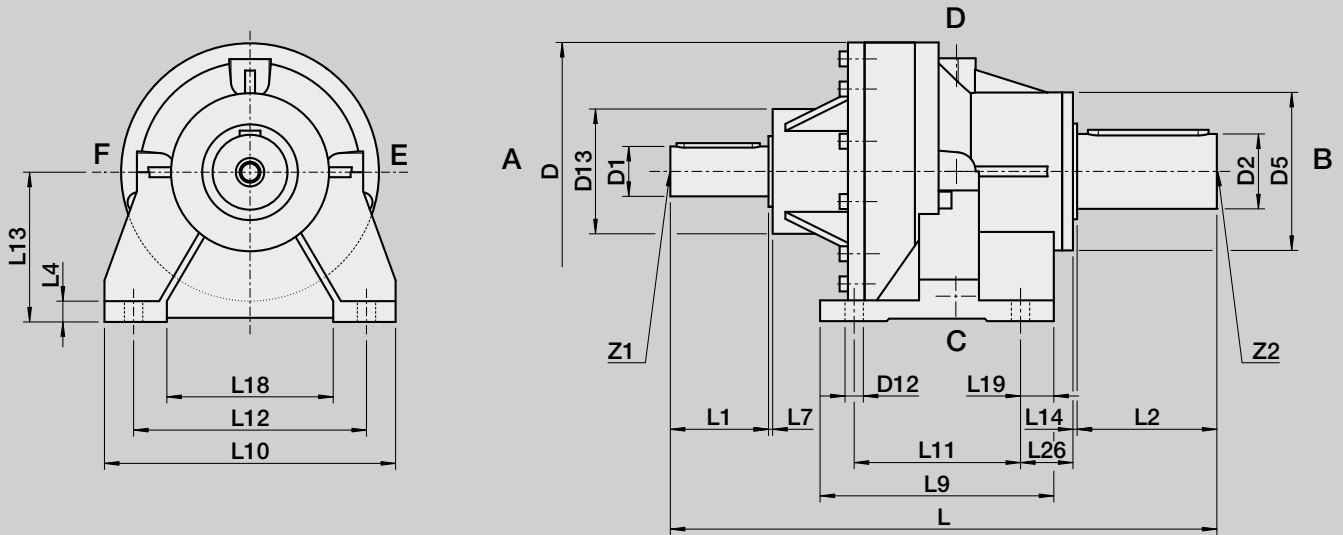
MOUNTING POSITION AND LUBRICATION

P			
Side view	on request	on request	
Mounting position (underside)	A	B	C
Side of oil fittings			D = Breather F = Sight glass F = Drainage
Side view			
Mounting position (underside)	D	E	F
Side of oil fittings	F = Breather F = Sight glass D = Drainage	F = Breather D = Sight glass E = Drainage	E = Breather D = Sight glass F = Drainage
PF / PFH			
Side view	on request	on request	
Mounting position (underside)	A	B	C
Side of oil fittings			D = Breather E = Sight glass C = Drainage

-  Breather
-  Sight glass
-  Drainage

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DIMENSIONS 1-STAGE



Size	Ratio	D	D1 x L1	D2 x L2	D5	D12	D13	L	L4	L7	L9	L10	L11	L12
			j6	j6										
08	3,4 - 9,0	175	32 x 60	50 x 100	108	11,0	90	390	12	1	150	205	120	170
16	3,4 - 9,0	220	40 x 80	60 x 120	130	17,5	105	470	16	1	180	260	140	215
32	3,4 - 9,0	265	50 x 100	70 x 140	150	17,5	120	550	22	2	230	310	170	255
64	3,4 - 9,0	310	60 x 120	90 x 170	190	22,0	150	655	22	2	281	350	200	280
128	3,4 - 9,0	380	70 x 140	110 x 210	240	26,0	170	780	25	2	290	420	220	340

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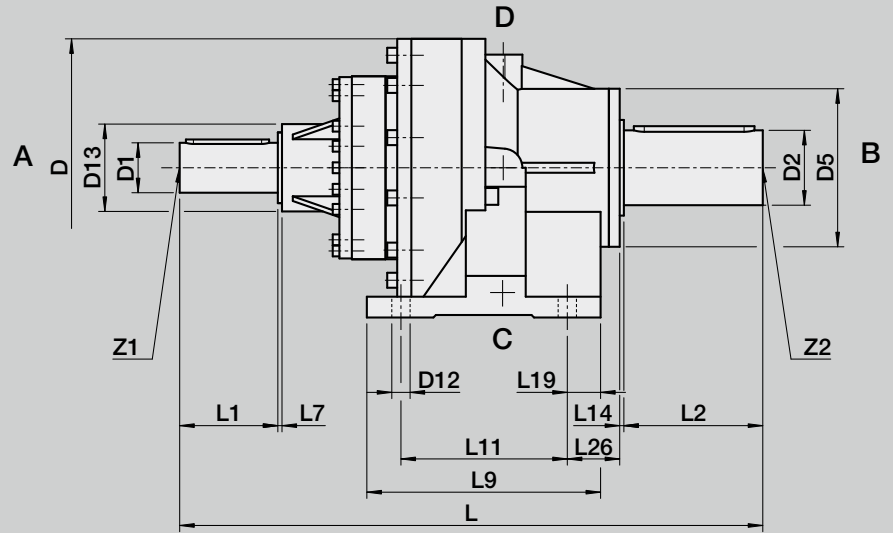
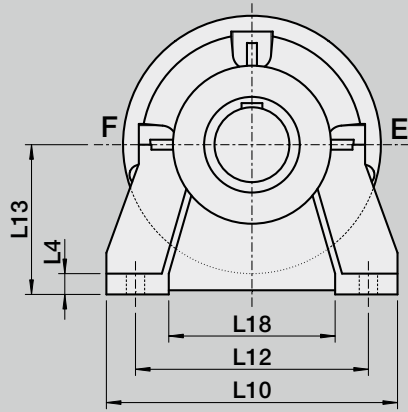
D I M E N S I O N S 1 - S T A G E



L13	L14	L18	L19	L26	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	Z1 DIN 332	Z2 DIN 332
100	1	135	15	15	A 10 x 8 x 50	A 14 x 9 x 90	D M12	D M16
130	1	170	20	26	A 12 x 8 x 70	A 18 x 11 x 100	D M16	D M20
160	2	200	30	37	A 14 x 9 x 90	A 20 x 12 x 120	D M16	D M20
180	2	200	40	63	A 18 x 11 x 100	A 25 x 14 x 145	D M20	D M24
210	3	260	35	62	A 20 x 12 x 120	A 28 x 16 x 180	D M20	D M24

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DIMENSIONS 2-STAGE



Size	Ratio	D	D1 x L1	D2 x L2	D5	D12	D13	L	L4	L7	L9	L10	L11	L12
			j6	j6										
08	13,6 - 35,0	175	20 x 45	50 x 100	108	11,0	75	415	12	1	150	205	120	170
16	13,6 - 35,0	220	25 x 45	60 x 120	130	17,5	75	476	16	1	180	260	140	215
32	13,6 - 35,0	265	32 x 60	70 x 140	150	17,5	90	548	22	1	230	310	170	255
64	13,6 - 35,0	310	40 x 80	90 x 170	190	22,0	105	659	25	1	281	350	200	280
128	13,6 - 35,0	380	50 x 100	110 x 210	240	26,0	120	804	25	2	290	420	220	340
256	13,6 - 35,0	455	60 x 120	140 x 220	300	33,0	150	950	35	2	370	500	300	390

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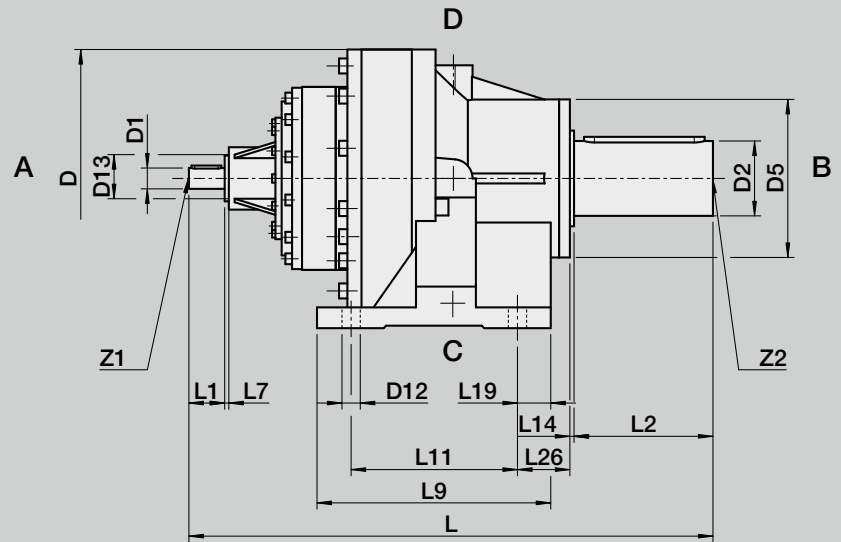
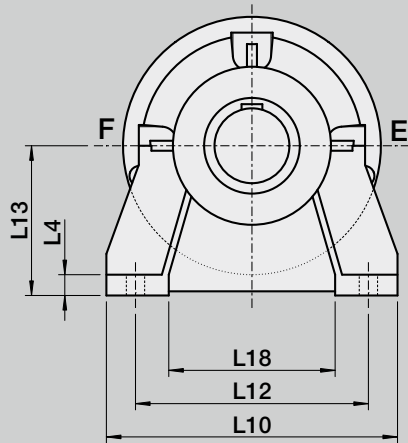
D I M E N S I O N S 2 - S T A G E



L13	L14	L18	L19	L26	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	Z1 DIN 332	Z2 DIN 332
100	1	135	15	15	A 10 x 8 x 50	A 14 x 9 x 90	D M12	D M16
130	1	170	20	26	A 12 x 8 x 70	A 18 x 11 x 100	D M16	D M20
160	2	200	30	37	A 10 x 8 x 50	A 20 x 12 x 120	D M12	D M20
180	2	200	40	63	A 12 x 8 x 70	A 25 x 14 x 145	D M16	D M24
210	3	260	35	62	A 14 x 9 x 90	A 28 x 16 x 180	D M16	D M24
270	4	280	35	46	A 18 x 11 x 100	A 36 x 20 x 200	D M20	D M24

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DIMENSIONS 3-STAGE



Size	Ratio	D	D1 x L1	D2 x L2	D5	D12	D13	L	L4	L7	L9	L10	L11	L12
			j6	j6										
08	46,24 - 245,00	175	20 x 45	50 x 100	108	11,0	75	461	12	1	150	205	120	170
16	46,24 - 245,00	220	20 x 45	60 x 120	130	17,5	75	519	16	1	180	260	140	215
32	46,24 - 245,00	265	20 x 45	70 x 140	150	17,5	75	573	22	1	230	310	170	255
64	46,24 - 245,00	310	25 x 45	90 x 170	190	22,0	75	665	22	1	281	350	200	280
128	46,24 - 245,00	380	32 x 60	110 x 210	240	26,0	90	802	25	1	290	420	220	340
256	46,24 - 245,00	455	40 x 80	140 x 220	300	33,0	105	954	35	1	370	500	300	390

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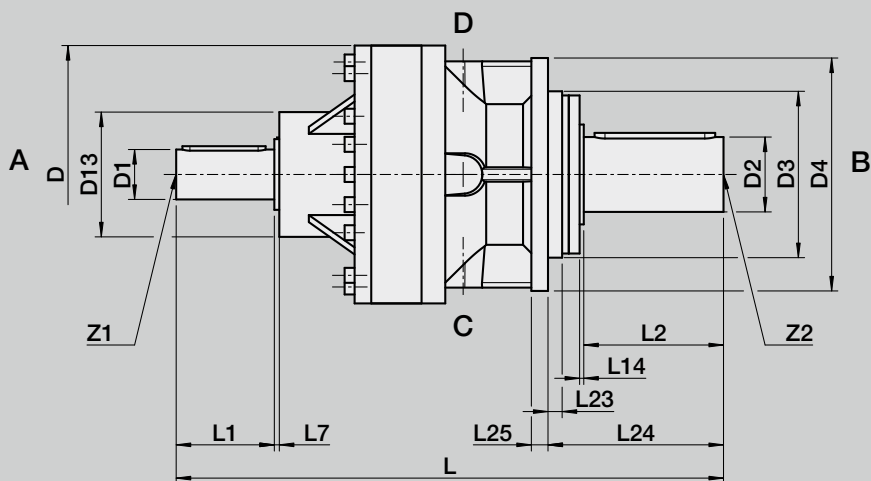
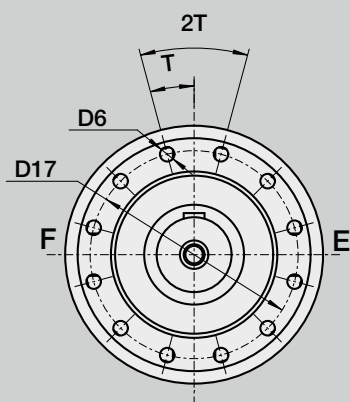
DIMENSIONS 3 - STAGE



L13	L14	L18	L19	L26	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	Z1 DIN 332	Z2 DIN 332
100	1	135	15	15	A 6 x 6 x 36	A 14 x 9 x 90	D M 6	D M16
130	1	170	20	26	A 6 x 6 x 36	A 18 x 11 x 100	D M 6	D M20
160	2	200	30	37	A 6 x 6 x 36	A 20 x 12 x 120	D M 6	D M20
180	2	200	40	63	A 8 x 7 x 36	A 25 x 14 x 145	D M10	D M24
210	3	260	35	62	A 10 x 8 x 50	A 28 x 16 x 180	D M12	D M24
270	4	280	35	46	A 12 x 8 x 70	A 36 x 20 x 200	D M16	D M24

PF 08 - PF 128

DIMENSIONS 1-STAGE



Size	Ratio	D	D1 x L1	D2 x L2	D3	D4	D6	D13	D17	L	L7	L14	L23	L24
			j6	j6	f7									
08	3,4 - 9,0	175	32 x 60	50 x 100	110	160	9,0	90	130	390	1	1	5	106
16	3,4 - 9,0	220	40 x 80	60 x 120	130	200	11,0	105	165	470	1	1	5	126
32	3,4 - 9,0	265	50 x 100	70 x 140	150	230	13,5	120	195	550	2	2	13	155
64	3,4 - 9,0	310	60 x 120	90 x 170	200	280	17,5	150	250	655	2	2	12	210
128	3,4 - 9,0	380	70 x 140	110 x 210	230	340	17,5	170	295	780	2	3	18	246



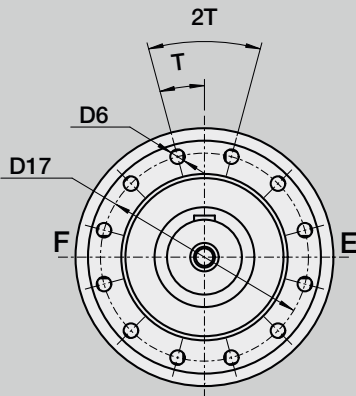
P F 0 8 - P F 1 2 8

D I M E N S I O N S 1 - S T A G E

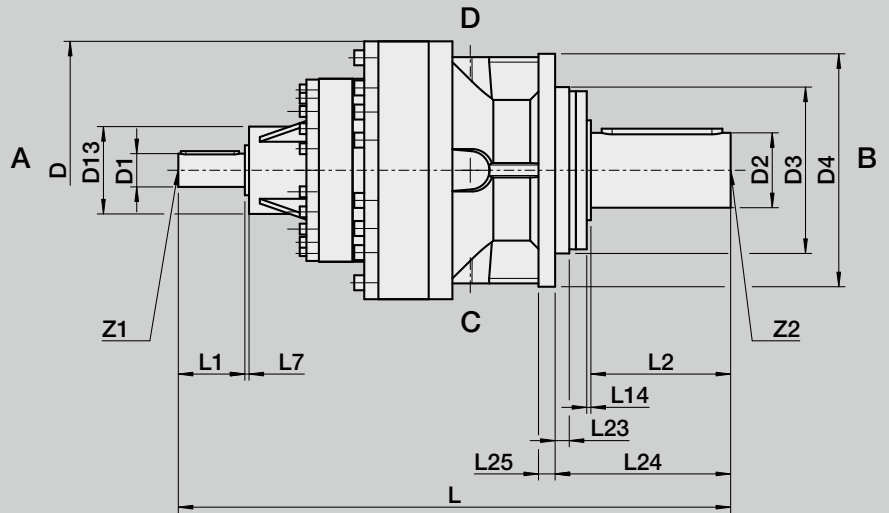
L25	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	T	2T	Z1 DIN 332	Z2 DIN 332
12	A 10 x 8 x 50	A 14 x 9 x 90	15°	12 x 30°	D M12	D M16
15	A 12 x 8 x 70	A 18 x 11 x 100	15°	12 x 30°	D M16	D M20
20	A 14 x 9 x 90	A 20 x 12 x 120	15°	12 x 30°	D M16	D M20
20	A 18 x 11 x 100	A 25 x 14 x 145	15°	12 x 30°	D M20	D M24
25	A 20 x 12 x 120	A 28 x 16 x 180	15°	12 x 30°	D M20	D M24

PF 08 - PF 512
DIMENSIONS 2-STAGE

PF 08 - PF 512



PF 08 - PF 128, PF 512

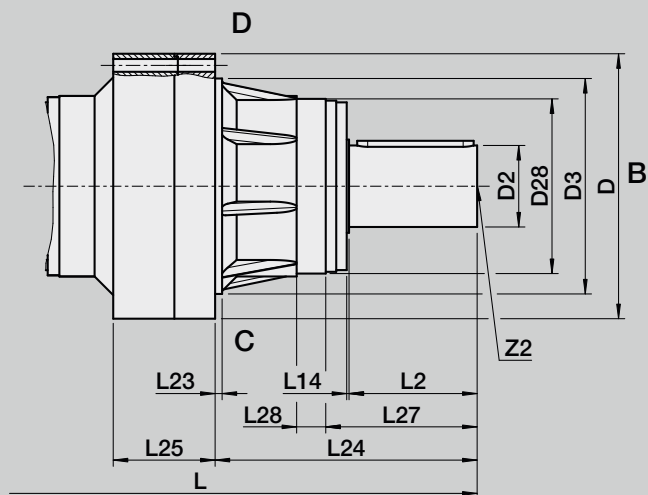


Size	Ratio	D	D1 x L1	D2 x L2	D3	D4	D6	D13	D17	D28	L	L7	L14	L23
			j6	j6	f7					f7				
08	13,6 - 35,0	175	20 x 45	50 x 100	110	160	9,0	75	130	-	415	1	1	5
16	13,6 - 35,0	220	25 x 45	60 x 120	130	200	11,0	75	165	-	476	1	1	5
32	13,6 - 35,0	265	32 x 60	70 x 140	150	230	13,5	90	195	-	548	1	2	13
64	13,6 - 35,0	310	40 x 80	90 x 170	200	280	17,5	105	250	-	659	1	2	12
128	13,6 - 35,0	380	50 x 100	110 x 210	230	340	22,0	120	295	-	804	2	3	18
256	13,6 - 35,0	455	60 x 120	140 x 220	370	-	22,0	150	415	300	950	2	4	12
512	13,6 - 35,0	550	90 x 170	180 x 280	450	550	26,0	195	505	-	1361	2	9	28



PF 08 - PF 512
DIMENSIONS 2-STAGE

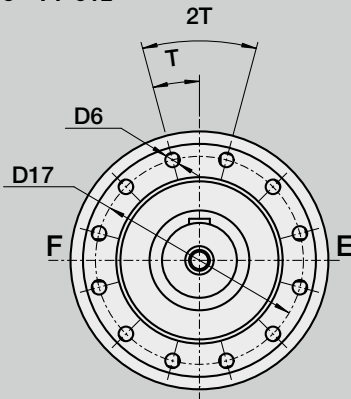
PF 256



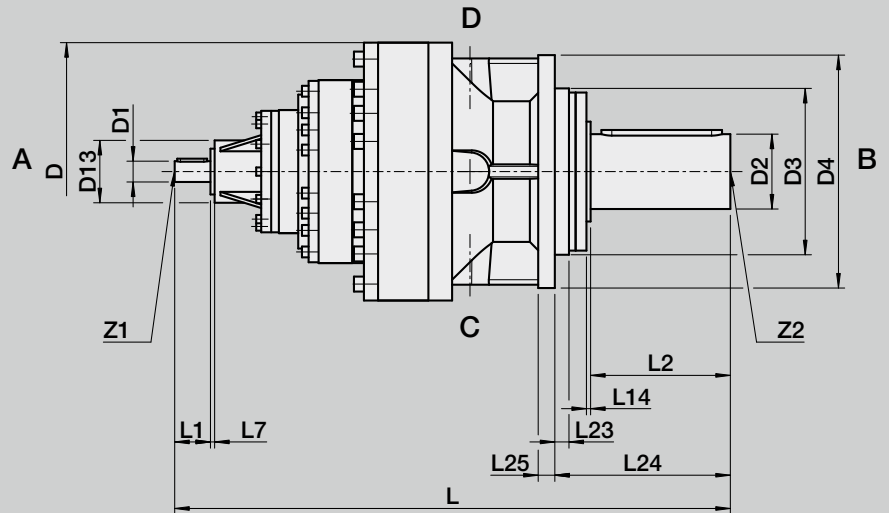
L24	L25	L27	L28	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	T	2T	Z1 DIN 332	Z2 DIN 332
106	12	-	-	A 10 x 8 x 50	A 14 x 9 x 90	15°	12 x 30°	D M12	D M16
126	15	-	-	A 12 x 8 x 70	A 18 x 11 x 100	15°	12 x 30°	D M16	D M20
155	20	-	-	A 10 x 8 x 50	A 20 x 12 x 120	15°	12 x 30°	D M12	D M20
210	20	-	-	A 12 x 8 x 70	A 25 x 14 x 145	15°	12 x 30°	D M16	D M24
246	25	-	-	A 14 x 9 x 90	A 28 x 16 x 180	15°	12 x 30°	D M16	D M24
450	175	260	50	A 18 x 11 x 100	A 36 x 20 x 200	9°	20 x 18°	D M20	D M24
366	60	-	-	A 25 x 14 x 145	A 45 x 22 x 250	0°	36 x 10°	D M24	D M24

PF 08 - PF 512
DIMENSIONS 3 - STAGE

PF 08 - PF 512



PF 08 - PF 128, PF 512

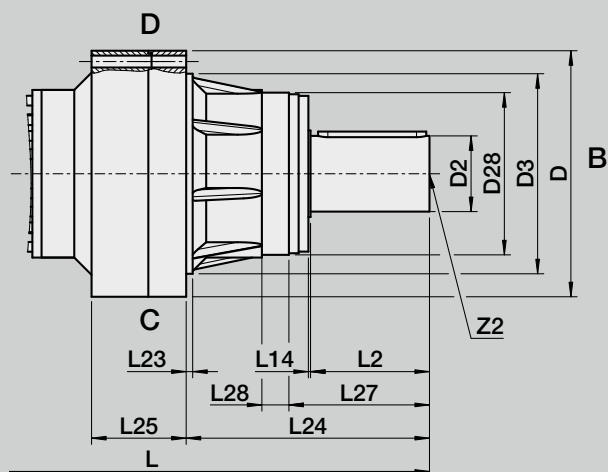


Size	Ratio	D	D1 x L1	D2 x L2	D3	D4	D6	D13	D17	D28	L	L7	L14	L23
			j6	j6	f7					f7				
08	46,24 - 245,00	175	20 x 45	50 x 100	110	160	9,0	75	130	-	461	1	1	5
16	46,24 - 245,00	220	20 x 45	60 x 120	130	200	11,0	75	165	-	519	1	1	5
32	46,24 - 245,00	265	20 x 45	70 x 140	150	230	13,5	75	195	-	573	1	2	13
64	46,24 - 245,00	310	25 x 45	90 x 170	200	280	17,5	75	250	-	665	1	2	12
128	46,24 - 245,00	380	32 x 60	110 x 210	230	340	22,0	90	295	-	802	1	3	18
256	46,24 - 245,00	455	40 x 80	140 x 220	370	-	22,0	105	415	300	954	1	4	12
512	46,24 - 245,00	550	60 x 120	180 x 280	450	550	26,0	150	505	-	1316	2	9	28



PF 08 - PF 512
DIMENSIONS 3 - STAGE

PF 256



L24	L25	L27	L28	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	T	2T	Z1 DIN 332	Z2 DIN 332
106	12	-	-	A 6 x 6 x 36	A 14 x 9 x 90	15°	12 x 30°	D M6	D M16
126	15	-	-	A 6 x 6 x 36	A 18 x 11 x 100	15°	12 x 30°	D M6	D M20
155	20	-	-	A 6 x 6 x 36	A 20 x 12 x 120	15°	12 x 30°	D M6	D M20
210	20	-	-	A 8 x 7 x 36	A 25 x 14 x 145	15°	12 x 30°	D M10	D M24
246	25	-	-	A 10 x 8 x 50	A 28 x 16 x 180	15°	12 x 30°	D M12	D M24
450	175	260	50	A 12 x 8 x 70	A 36 x 20 x 200	9°	20 x 18°	D M16	D M24
366	60	-	-	A 18 x 11 x 100	A 45 x 22 x 250	0°	36 x 10°	D M20	D M24

MP / MPF

TECHNICAL DATA

Technical specifications on this page and in the tables on the following seven pages are intended only for rough preselection.

Gear teeth:	Spur gear	Lubrication:	Oil lubrication
Direction of rotation:	Input and output in the same direction	Mounting position:	Any, specify when ordering
Life time:	20000 h L _{10h}	Surface protection:	Primer coat RAL 9005 Black
Permissible gearbox temperature at housing:	-10 °C to +80 °C (deviating temperature ranges on request)	Protection rating:	IP 54





MP / MPF

TECHNICAL DATA

The following technical specifications in the table are intended only for rough preselection

MP / MPF			08																
Gear stage		1					2					3							
Ratio	i	3,4	4,0	5,0	7,0	9,0	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00		
Combination	i	-	-	-	-	-	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5		
Maximum permissible output torque	T _{2maxzul}	Nm	935	1063	1360	799	578	1012	1063	1063	1360	1216	1063	1360	1063	1360	1190	1216	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	600	700	800	500	400	800	700	700	800	700	800	800	700	800	700	800	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	1100	1250	1600	940	680	1190	1250	1250	1600	1430	1250	1600	1250	1600	1400	1430	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	2380	2500	2500	2500	2500	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Max. input speed	n _{1maxzul}	min ⁻¹	3400	3500	3500	3500	3500	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000	
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	5393	5582	5972	6614	7137	7653	8040	8602	9204	10192	11089	12464	14009	14989	16598	18380	
Maximum permissible radial load output	F _{2rmaxzul}	N	19000					19000					19000						
Efficiency	η	-	0,97					0,96					0,95						
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	4,90					3,8					3,4						
Weight	m	kg	approx. 28					approx. 28					approx. 30						
Running noise (with n _{1mzul})	L _{PA}	db(A)	≤ 75					≤ 75					≤ 75						
Inertia (with reference to input)	∅ d 14	J ₁	kgcm ²	-	-	-	-	-	4,14	3,59	3,14	3,04	2,73	3,08	3,02	2,62	2,62	2,54	2,54
	∅ d 19	J ₁	kgcm ²	21,01	19,11	16,63	15,09	14,47	4,14	3,59	3,14	3,04	2,73	3,08	3,02	2,62	2,61	2,54	2,54
	∅ d 24	J ₁	kgcm ²	21,77	19,87	17,40	15,85	15,23	4,05	3,50	3,05	2,95	2,64	2,99	2,93	2,53	2,53	2,46	2,45
	∅ d 28	J ₁	kgcm ²	23,42	21,52	19,04	17,50	16,88	4,50	3,95	3,50	3,40	3,09	3,43	3,37	2,98	2,97	2,90	2,90
	∅ d 32	J ₁	kgcm ²	24,53	22,63	20,15	18,60	17,99	4,42	3,86	3,42	3,32	3,01	3,35	3,29	2,90	2,89	2,82	2,82
	∅ d 38	J ₁	kgcm ²	28,23	26,33	23,85	22,30	21,69	-	-	-	-	-	-	-	-	-	-	-

* measured with 2 % nominal torque on output shaft

MP / MPF

TECHNICAL DATA

MP / MPF			16																
Gear stage		1					2					3							
Ratio	i	3,4	4,0	5,0	7,0	9,0	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00		
Combination	i	-	-	-	-	-	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5		
Maximum permissible output torque	T _{2maxzul}	Nm	1819	2669	3009	1700	1088	2604	2669	2669	3009	2635	2604	3060	3060	3060	3060	2635	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	1100	1600	1800	1200	700	1600	1600	1600	1800	1800	1600	1800	1600	1800	1800	1800	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	2140	3140	3540	2000	1280	3064	3140	3140	3540	3100	3064	3600	3600	3600	3600	3100	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1851	2178	2250	2250	2250	2750	2750	2750	2750	2750	3000	3000	3000	3000	3000	3000	
Max. input speed	n _{1maxzul}	min ⁻¹	2644	3111	3250	3250	3250	3750	3750	3750	3750	3750	4000	4000	4000	4000	4000	4000	
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
Permissible radial load output (at permissible average input speed)	F _{zrmzul}	N	9215	9215	9763	10811	11667	12441	13069	13984	14962	16568	17558	19734	22181	23733	26280	29101	
Maximum permissible radial load output	F _{zrmaxzul}	N	30000					30000					30000						
Efficiency	η	-	0,97					0,96					0,95						
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	7,5					6,2					5,3						
Weight	m	kg	approx. 44					approx. 47					approx. 54						
Running noise (with n _{1mzul})	L _{PA}	db(A)	≤ 75					≤ 75					≤ 75						
Inertia (with reference to input)	∅ d 14	J ₁	kgcm ²	-	-	-	-	-	-	-	-	-	3,24	3,10	2,66	2,65	2,56	2,55	
	∅ d 19	J ₁	kgcm ²	-	-	-	-	-	10,10	8,76	7,67	7,46	6,68	3,24	3,10	2,66	2,65	2,56	2,55
	∅ d 24	J ₁	kgcm ²	-	-	-	-	-	10,01	8,67	7,58	7,37	6,59	3,16	3,01	2,57	2,56	2,48	2,46
	∅ d 28	J ₁	kgcm ²	52,63	45,70	40,36	36,17	34,50	11,22	9,89	8,80	8,58	7,81	3,60	3,46	3,02	3,01	2,92	2,90
	∅ d 32	J ₁	kgcm ²	55,16	48,22	42,88	38,70	37,03	11,09	9,75	8,66	8,45	7,67	3,52	3,38	2,94	2,93	2,84	2,82
	∅ d 38	J ₁	kgcm ²	57,51	50,57	45,23	41,04	39,38	11,50	10,17	9,08	8,86	8,09	-	-	-	-	-	-
	∅ d 42	J ₁	kgcm ²	67,34	60,40	55,06	50,87	49,21	-	-	-	-	-	-	-	-	-	-	-
	∅ d 48	J ₁	kgcm ²	77,20	70,27	64,93	60,74	59,08	-	-	-	-	-	-	-	-	-	-	-
	∅ d 55	J ₁	kgcm ²	80,80	73,86	68,52	64,33	62,67	-	-	-	-	-	-	-	-	-	-	-

* measured with 2 % nominal torque on output shaft



MP / MPF

TECHNICAL DATA

The following technical specifications in the table are intended only for rough preselection

MP / MPF			32																
Gear stage			1					2					3						
Ratio	i		3,4	4,0	5,0	7,0	9,0	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00	
Combination	i		-	-	-	-	-	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5	
Maximum permissible output torque	$T_{2maxzul}$	Nm	5525	6460	6120	3315	1870	3740	4250	5440	6120	3995	3740	5313	5440	6120	6120	3995	
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	3800	3800	3800	2500	1500	2400	3200	3800	3800	2800	3400	3800	3800	3800	3700	2500	
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	6500	7600	7200	3900	2200	4400	5000	6400	7200	4700	4400	6250	6400	7200	7200	4700	
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	1515	1782	2000	2000	2000	2380	2500	2500	2500	2500	3000	3000	3000	3000	3000	3000	
Max. input speed	$n_{1maxzul}$	min ⁻¹	2164	2545	3000	3000	3000	3400	3500	3500	3500	3500	4000	4000	4000	4000	4000	4000	
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	10824	10824	11183	12383	13363	14366	14868	15909	17022	18849	19406	21812	24516	26231	29047	32164	
Maximum permissible radial load output	$F_{2rmxzul}$	N	34000					34000					34000						
Efficiency	η	-	0,97					0,96					0,95						
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	10,2					8,3					6,7						
Weight	m	kg	approx. 75					approx. 90					approx. 98						
Running noise (with n_{1mzul})	L_{PA}	db(A)	≤ 75					≤ 75					≤ 75						
Inertia (with reference to input)	Ø d 19	J ₁	kgcm ²	-	-	-	-	-	23,50	20,91	17,78	17,11	15,33	3,67	3,30	2,75	2,72	2,60	2,57
	Ø d 24	J ₁	kgcm ²	-	-	-	-	-	24,26	21,67	18,55	17,88	16,09	3,58	3,22	2,67	2,64	2,52	2,48
	Ø d 28	J ₁	kgcm ²	106,03	84,46	67,73	54,63	49,37	25,91	23,32	20,19	19,52	17,74	4,02	3,66	3,11	3,08	2,96	2,92
	Ø d 32	J ₁	kgcm ²	108,56	86,99	70,26	57,16	51,89	27,02	24,43	21,30	20,63	18,85	3,94	3,58	3,03	3,00	2,88	2,84
	Ø d 38	J ₁	kgcm ²	110,91	89,34	72,61	59,51	54,24	30,72	28,13	25,00	24,33	22,55	-	-	-	-	-	-
	Ø d 42	J ₁	kgcm ²	120,74	99,17	82,44	69,34	64,07	-	-	-	-	-	-	-	-	-	-	-
	Ø d 48	J ₁	kgcm ²	130,61	109,04	92,31	79,20	73,94	-	-	-	-	-	-	-	-	-	-	-
	Ø d 55	J ₁	kgcm ²	134,84	113,27	96,54	83,44	78,18	-	-	-	-	-	-	-	-	-	-	-

* measured with 2 % nominal torque on output shaft

MP / MPF

TECHNICAL DATA

MP / MPF			64																
Gear stage			1					2					3						
Ratio	i		3,4	4,0	5,0	7,0	9,0	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00	
Combination	i		-	-	-	-	-	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5	
Maximum permissible output torque	$T_{2maxzul}$	Nm	10540	12580	10880	5780	3145	7276	10676	12036	10880	5440	7276	10880	12036	10880	10880	8500	
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	7500	7500	7500	4600	2500	6000	7500	7500	7500	4500	5000	7500	7500	7500	7500	6000	
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	12400	14800	12800	6800	3700	8560	12560	14160	12800	6400	8560	12800	14160	12800	12800	10000	
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	1282	1508	1750	1750	1750	1851	2178	2250	2250	2250	2750	2750	2750	2750	2750	2750	
Max. input speed	$n_{1maxzul}$	min ⁻¹	1831	2154	2692	2750	2750	2644	3111	3250	3250	3250	3750	3750	3750	3750	3750	3750	
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	17784	17784	18188	20140	21734	24215	24214	25654	27448	30395	31120	34978	39314	42065	46580	51580	
Maximum permissible radial load output	$F_{2rmaxzul}$	N	54000					54000					54000						
Efficiency	η	-	0,97					0,96					0,95						
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	13,5					11,2					9,3						
Weight	m	kg	approx. 90					approx. 110					approx. 131						
Running noise (with n_{1mzul})	L_{PA}	db(A)	≤ 75					≤ 75					≤ 75						
Inertia (with reference to input)	Ø d 19	J_1	kgcm ²	-	-	-	-	-	-	-	-	-	8,91	7,94	6,57	6,50	6,18	6,09	
	Ø d 24	J_1	kgcm ²	-	-	-	-	-	-	-	-	-	8,82	7,85	6,48	6,41	6,09	6,00	
	Ø d 28	J_1	kgcm ²	-	-	-	-	-	61,23	57,91	44,33	42,69	37,36	10,04	9,07	7,69	7,63	7,31	7,22
	Ø d 32	J_1	kgcm ²	-	-	-	-	-	63,76	54,44	46,86	45,22	39,89	9,90	8,93	7,56	7,49	7,18	7,08
	Ø d 38	J_1	kgcm ²	321,45	269,07	228,06	195,94	183,14	66,10	56,78	49,21	47,57	42,24	10,32	9,35	7,97	7,91	7,59	7,50
	Ø d 42	J_1	kgcm ²	320,92	268,53	227,52	195,40	182,60	75,93	66,61	59,04	57,40	52,07	-	-	-	-	-	-
	Ø d 48	J_1	kgcm ²	327,20	274,81	233,80	201,68	188,88	85,80	76,48	68,90	67,26	61,63	-	-	-	-	-	-
	Ø d 55	J_1	kgcm ²	345,14	292,75	251,74	219,62	206,82	89,39	80,07	72,50	70,86	65,53	-	-	-	-	-	-
Ø d 60	J_1	kgcm ²	343,11	290,73	249,72	217,60	204,80	-	-	-	-	-	-	-	-	-	-	-	

* measured with 2 % nominal torque on output shaft



MP / MPF

TECHNICAL DATA

The following technical specifications in the table are intended only for rough preselection

MP / MPF			128																
Gear stage		1					2					3							
Ratio	i	3,4	4,0	5,0	7,0	9,0	13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00		
Combination	i	-	-	-	-	-	3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5		
Maximum permissible output torque	T _{2maxzul}	Nm	18870	22100	19890	10200	5440	22100	22100	22100	19890	16575	12716	15980	22100	19890	19890	16575	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	13000	13000	13000	8000	4500	13000	13000	13000	13000	12000	9000	13000	13000	13000	12000	12000	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	22200	26000	23400	12000	6400	26000	26000	26000	23400	19500	14960	18800	26000	23400	23400	19500	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1041	1225	1500	1500	1500	1515	1782	2000	2000	2000	2380	2380	2500	2500	2500	2500	
Max. input speed	n _{1maxzul}	min ⁻¹	1488	1750	2188	2500	2500	2164	2545	3000	3000	3000	3400	3400	3500	3500	3500	3500	
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	32335	32335	32538	36030	38881	43934	43934	45391	48566	53779	55510	62392	69089	73922	81857	90644	
Maximum permissible radial load output	F _{2rmaxzul}	N	91000					91000					91000						
Efficiency	η	-	0,97					0,96					0,95						
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	19,8					16,3					13,6						
Weight	m	kg	approx. 206					approx. 217					approx. 231						
Running noise (with n _{1mzul})	L _{PA}	db(A)	≤ 75					≤ 75					≤ 75						
Inertia (with reference to input)	Ø d 19	J ₁	kgcm ²	-	-	-	-	-	-	-	-	-	20,96	18,30	15,14	14,97	14,19	13,93	
	Ø d 24	J ₁	kgcm ²	-	-	-	-	-	-	-	-	-	21,72	19,06	15,90	15,73	14,95	14,70	
	Ø d 28	J ₁	kgcm ²	-	-	-	-	-	123,57	97,14	75,84	71,59	56,60	23,37	20,71	17,55	17,38	16,60	16,34
	Ø d 32	J ₁	kgcm ²	-	-	-	-	-	126,10	99,66	78,37	74,12	59,13	24,48	21,82	18,66	18,49	17,71	17,45
	Ø d 38	J ₁	kgcm ²	577,99	443,96	337,65	252,99	219,98	128,45	102,01	80,72	76,47	61,48	28,18	25,52	22,36	22,19	21,41	21,15
	Ø d 42	J ₁	kgcm ²	577,46	443,42	337,12	252,45	219,45	138,28	111,84	90,55	86,30	71,31	-	-	-	-	-	-
	Ø d 48	J ₁	kgcm ²	585,28	451,25	344,94	260,28	227,27	148,15	121,71	100,42	96,16	81,17	-	-	-	-	-	-
	Ø d 55	J ₁	kgcm ²	601,67	467,64	361,34	276,67	243,66	152,38	125,94	104,65	100,40	85,41	-	-	-	-	-	-
	Ø d 60	J ₁	kgcm ²	599,65	465,62	359,31	274,65	241,64	-	-	-	-	-	-	-	-	-	-	-

* measured with 2 % nominal torque on output shaft

MP / MPF

TECHNICAL DATA

MP / MPF			256											
Gear stage			2					3						
Ratio	i		13,6	16,0	20,0	25,0	35,0	46,24	68,00	100,00	125,00	175,00	245,00	
Combination	i		3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5	
Maximum permissible output torque	T _{2maxzul}	Nm	42160	44200	43520	32470	28900	24738	32470	43520	32470	32470	28900	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	26000	26000	26000	26000	23000	17000	26000	26000	26000	26000	23000	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	49600	52000	51200	38200	34000	29104	38200	51200	38200	38200	34000	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1282	1508	1750	1750	1750	1851	1851	2250	2250	2250	2250	
Max. input speed	n _{1maxzul}	min ⁻¹	1831	2154	2692	2750	2750	2644	2644	3250	3250	3250	3250	
Max. backlash*	j	arcmin	≤ 15					≤ 20						
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	74275	74275	75962	81276	90000	96274	108209	114638	122658	135824	150404	
Maximum permissible radial load output	F _{2rmaxzul}	N	152000					152000						
Efficiency	η	-	0,96					0,95						
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	20,6					17,3						
Weight	m	kg	approx. 394					approx. 480						
Running noise (with n _{1mzul})	L _{PA}	db(A)	≤ 75					≤ 75						
Inertia (with reference to input)	Ø d 28	J ₁	kgcm ²	-	-	-	-	-	53,19	46,10	36,50	35,95	33,73	33,08
	Ø d 32	J ₁	kgcm ²	-	-	-	-	-	55,71	48,62	39,03	38,48	36,25	35,60
	Ø d 38	J ₁	kgcm ²	376,30	308,69	253,42	239,77	201,91	58,06	50,97	41,37	40,83	38,60	37,95
	Ø d 42	J ₁	kgcm ²	375,76	308,16	252,88	239,24	201,38	67,89	60,80	51,20	50,66	48,43	47,78
	Ø d 48	J ₁	kgcm ²	382,04	314,43	259,16	245,51	207,66	77,76	70,67	61,07	60,52	58,30	57,65
	Ø d 55	J ₁	kgcm ²	399,98	332,37	277,10	263,45	225,60	81,35	74,26	64,66	64,12	61,89	61,24
	Ø d 60	J ₁	kgcm ²	397,96	330,35	275,08	261,43	233,57	-	-	-	-	-	-

* measured with 2 % nominal torque on output shaft



MP / MPF

TECHNICAL DATA

The following technical specifications in the table are intended only for rough preselection

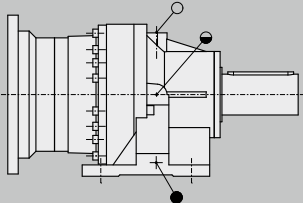
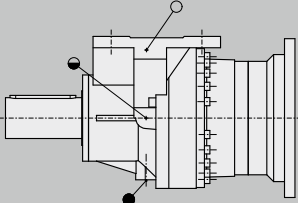
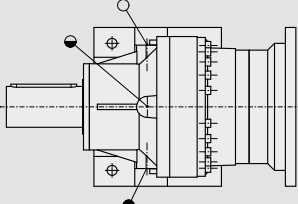
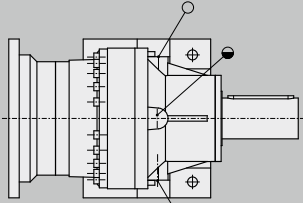
MP / MPF			512					
Gear stage			3					
Ratio	i		46,24	68,00	100,00	125,00	175,00	245,00
Combination	i		3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5
Maximum permissible output torque	T _{2maxzul}	Nm	79900	66300	79900	66300	66300	66300
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	50000	40000	50000	40000	40000	40000
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	94000	78000	94000	78000	78000	78000
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1282	1282	1750	1750	1750	1750
Max. input speed	n _{1maxzul}	min ⁻¹	1831	1831	2692	2692	2750	2750
Max. backlash*	j	arcmin	≤ 20					
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	165000	185456	189688	202958	224744	248868
Maximal zulässige Radialkraft Abtrieb	F _{2rmaxzul}	N	250000					
Efficiency	η	-	0,95					
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	30,7					
Weight	m	kg	on request					
Running noise (with n _{1mzul})	L _{PA}	db(A)	≤ 75					
Inertia (with reference to input)	Ø d	J _i	kgcm ²					
			on request					

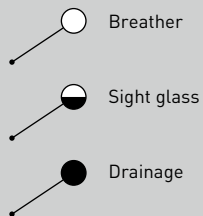
* measured with 2 % nominal torque on output shaft



M P

MOUNTING POSITION AND LUBRICATION

MP			
Side view	on request	on request	
Mounting position (underside)	A	B	C
Side of oil fittings			D = Breather F = Sight glass F = Drainage
Side view			
Mounting position (underside)	D	E	F
Side of oil fittings	F = Breather F = Sight glass D = Drainage	F = Breather D = Sight glass E = Drainage	E = Breather D = Sight glass F = Drainage





M P F

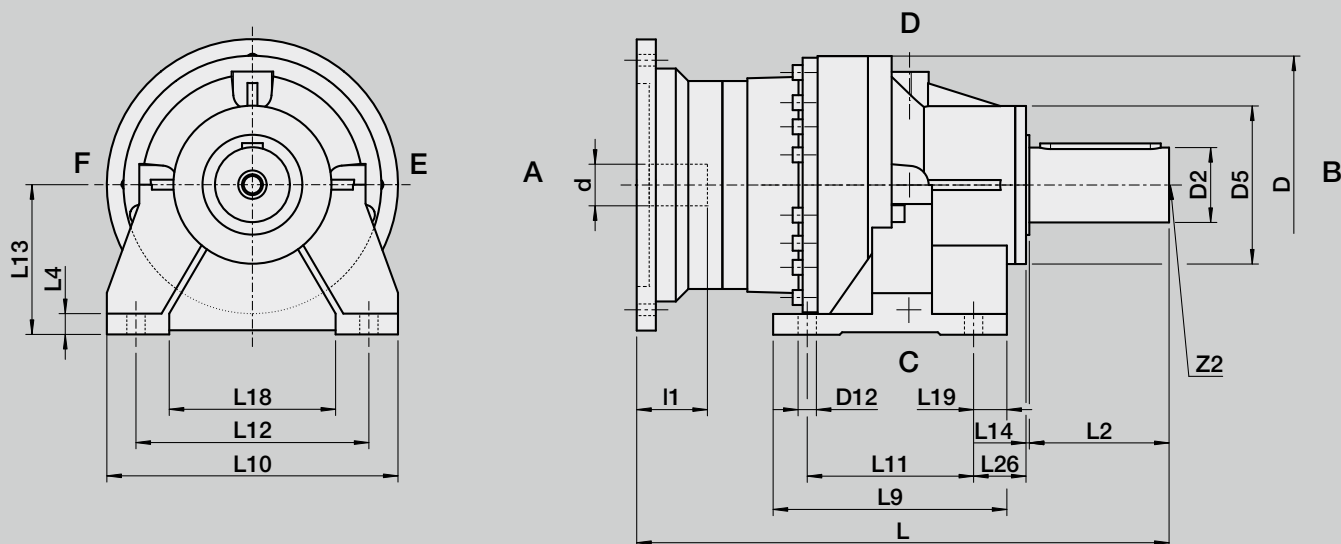
MOUNTING POSITION AND LUBRICATION

MPF			
Side view	on request	on request	
Mounting position (underside)	A	B	C
Side of oil fittings			D = Breather F = Sight glass C = Drainage

- Breather
- Sight glass
- Drainage

MP 08 - MP 128

DIMENSIONS 1-STAGE



Size	Ratio	d x l1	D	D2 x L2	D5	D12	L	L4	L9	L10	L11
		G7		j6							
08	3,4 - 9,0	19 x 40	175	50 x 100	108	11,0	383,5	12	150	205	120
		24 x 50									
		28 x 60									
		32 x 60									
16	3,4 - 9,0	38 x 80	220	60 x 120	130	17,5	403,5	16	180	260	140
		28 x 60									
		32 x 60									
		42 x 110									
32	3,4 - 9,0	48 x 110	265	70 x 140	150	17,5	509,0	22	230	310	170
		38 x 80									
		42 x 110									
		55 x 110									
64	3,4 - 9,0	55 x 110	310	90 x 170	190	22,0	634,0	25	281	350	200
		38 x 80									
		42 x 110									
		60 x 140									
128	3,4 - 9,0	60 x 140	380	110 x 210	240	26,0	730,0	25	290	420	220
		38 x 80									
		42 x 110									
		55 x 110									



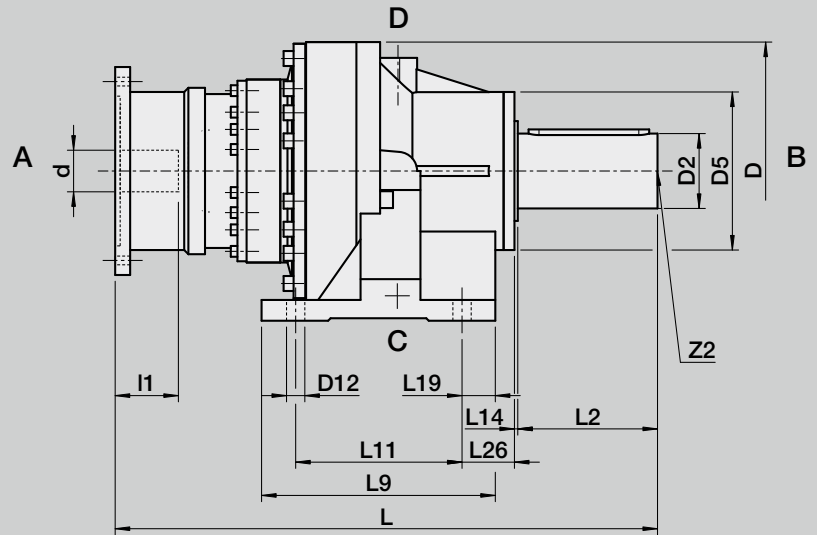
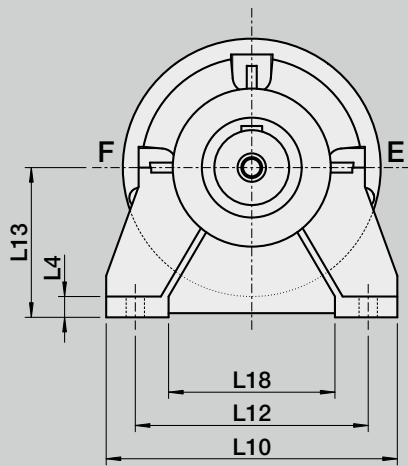
MP 08 - MP 128

DIMENSIONS 1-STAGE

L12	L13	L14	L18	L19	L26	Key D2 according to DIN 6885/1	Z2 DIN 332
170	100	1	135	15	15	A 14 x 9 x 90	D M16
215	130	1	170	20	26	A 18 x 11 x 100	D M20
255	160	2	200	30	37	A 20 x 12 x 120	D M20
280	180	2	200	40	63	A 25 x 14 x 145	D M24
340	210	3	260	35	62	A 28 x 16 x 180	D M24

MP 08 - MP 256

DIMENSIONS 2-STAGE



Size	Ratio	d x l1	D	D2 x L2	D5	D12	L	L4	L9	L10	L11
		G7		j6							
08	13,6 - 35,0	14 x 30	175	50 x 100	108	11,0	381,5	12	150	205	120
		19 x 40									
		24 x 50									
		28 x 60									
		32 x 60									
16	13,6 - 35,0	19 x 40	220	60 x 120	130	17,5	460,0	16	180	260	140
		24 x 50									
		28 x 60									
		32 x 60									
		38 x 80									
32	13,6 - 35,0	19 x 40	265	70 x 140	150	17,5	541,5	22	230	310	170
		24 x 50									
		28 x 60									
		32 x 60									
		38 x 80									
64	13,6 - 35,0	28 x 60	310	90 x 170	190	22,0	652,0	25	281	350	200
		32 x 60									
		38 x 80									
		42 x 110									
		48 x 110									
128	13,6 - 35,0	28 x 60	380	110 x 210	240	26,0	763,0	25	290	420	220
		32 x 60									
		38 x 80									
		42 x 110									
		48 x 110									
256	13,6 - 35,0	38 x 80	455	140 x 220	300	33,0	929,0	35	370	500	300
		42 x 110									
		48 x 110									
		55 x 110									
		60 x 140									



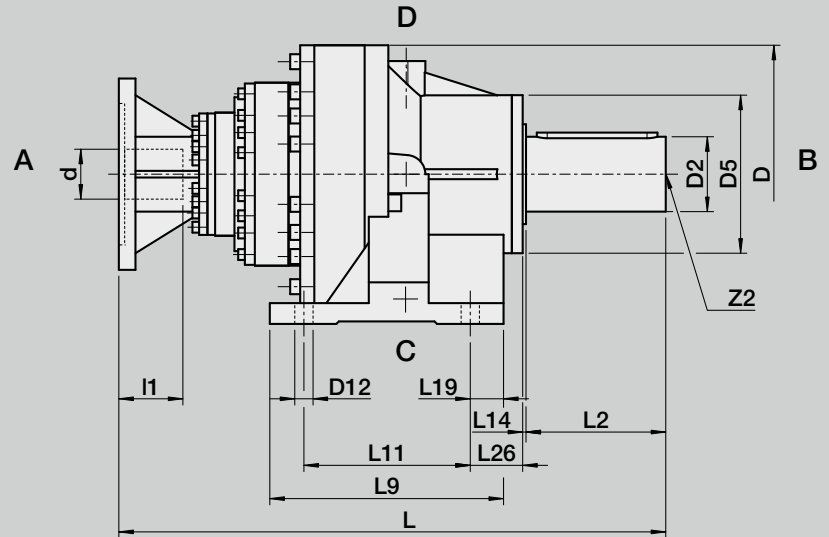
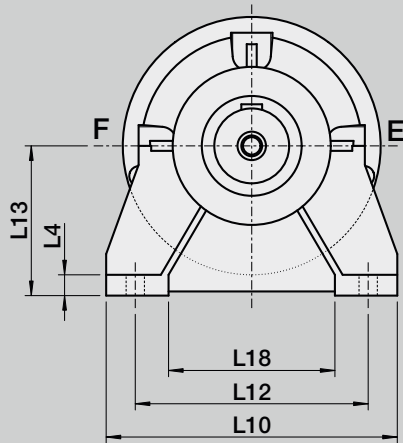
MP 08 - MP 256

DIMENSIONS 2 - STAGE

L12	L13	L14	L18	L19	L26	Key D2 according to DIN 6885/1	Z2
170	100	1	135	15	15	A 14 x 9 x 90	D M16
215	130	1	170	20	26	A 18 x 11 x 100	D M20
255	160	2	200	30	37	A 20 x 12 x 120	D M20
280	180	2	200	40	63	A 25 x 14 x 145	D M24
340	210	3	260	35	62	A 28 x 16 x 180	D M24
390	270	4	280	35	46	A 36 x 20 x 200	D M24

MP 08 - MP 256

DIMENSIONS 3-STAGE



Size	Ratio	d x l1	D	D2 x L2	D5	D12	L	L4	L9	L10	L11
		G7		j6							
08	46,24 - 245,00	14 x 30	175	50 x 100	108	11,0	427,5	12	150	205	120
		19 x 40									
		24 x 50									
		28 x 60									
16	46,24 - 245,00	14 x 30	220	60 x 120	130	17,5	485,5	16	180	260	140
		19 x 40									
		24 x 50									
		28 x 60									
32	46,24 - 245,00	14 x 30	265	70 x 140	150	17,5	539,5	22	230	310	170
		19 x 40									
		24 x 50									
		28 x 60									
64	46,24 - 245,00	19 x 40	310	90 x 170	190	22,0	649,0	25	281	350	200
		24 x 50									
		28 x 60									
		32 x 60									
128	46,24 - 245,00	19 x 40	380	110 x 210	240	26,0	795,5	25	290	420	220
		24 x 50									
		28 x 60									
		32 x 60									
256	46,24 - 245,00	38 x 80	455	140 x 220	300	33,0	815,5	35	370	500	300
		28 x 60									
		32 x 60									
		38 x 80									
		42 x 110									
		48 x 110									
55 x 110											
60 x 140	977,0										

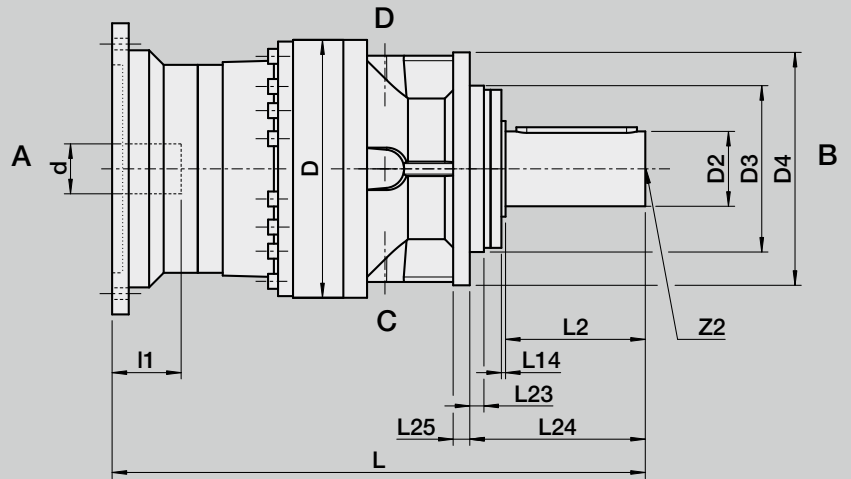
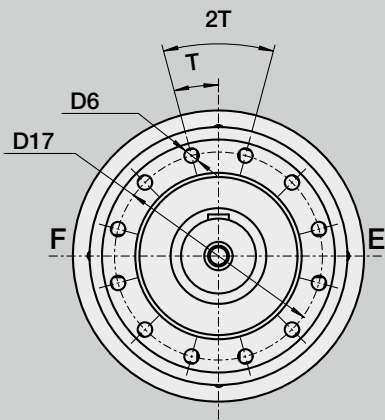


MP 08 - MP 256

DIMENSIONS 3 - STAGE

L12	L13	L14	L18	L19	L26	Key D2 according to DIN 6885/1	Z2
170	100	1	135	15	15	A 14 x 9 x 90	D M16
215	130	1	170	20	26	A 18 x 11 x 100	D M20
255	160	2	200	30	37	A 20 x 12 x 120	D M20
280	180	2	200	40	63	A 25 x 14 x 145	D M24
340	210	3	260	35	62	A 28 x 16 x 180	D M24
390	270	4	280	35	46	A 36 x 20 x 200	D M24

MPF 08 - MPF 128
DIMENSIONS 1-STAGE



Size	Ratio	d x l1	D	D2 x L2	D3	D4	D6	D17	L
		G7		j6	f7				
08	3,4 - 9,0	19 x 40	175	50 x 100	110	160	9,0	130	383,5
		24 x 50							
		28 x 60							
		32 x 60							
		38 x 80							403,5
16	3,4 - 9,0	28 x 60	220	60 x 120	130	200	11,0	165	463,0
		32 x 60							
		38 x 80							
		42 x 110							
		48 x 110							
		55 x 110							493,0
32	3,4 - 9,0	28 x 60	265	70 x 140	150	230	13,5	195	509,0
		32 x 60							
		38 x 80							
		42 x 110							
		48 x 110							
		55 x 110							539,0
64	3,4 - 9,0	38 x 80	310	90 x 170	200	280	17,5	250	634,0
		42 x 110							
		48 x 110							
		55 x 110							
		60 x 140							
128	3,4 - 9,0	38 x 80	380	110 x 210	230	340	22,0	295	730,0
		42 x 110							
		48 x 110							
		55 x 110							
		60 x 140							



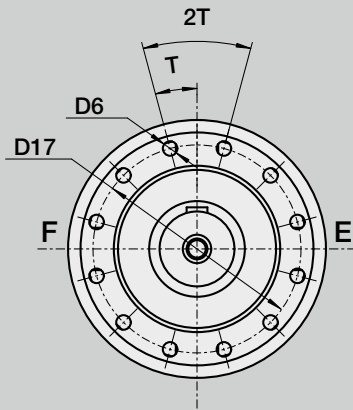
M P F 0 8 - M P F 1 2 8
D I M E N S I O N S 1 - S T A G E

L14	L23	L24	L25	Key D2 according to DIN 6885/1	T	2T	Z2
1	5	106	12	A 14 x 9 x 90	15°	12 x 30°	D M16
1	5	126	15	A 18 x 11 x 100	15°	12 x 30°	D M20
2	13	155	20	A 20 x 12 x 120	15°	12 x 30°	D M20
2	12	210	20	A 25 x 14 x 145	15°	12 x 30°	D M24
3	18	246	25	A 28 x 16 x 180	15°	12 x 30°	D M24

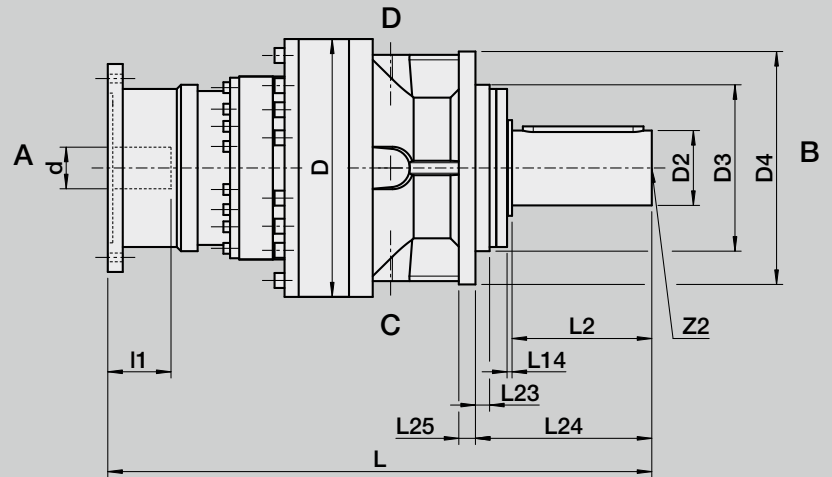
MPF 08 - MPF 256

DIMENSIONS 2-STAGE

MPF 08 - MPF 128



MPF 08 - MPF 128

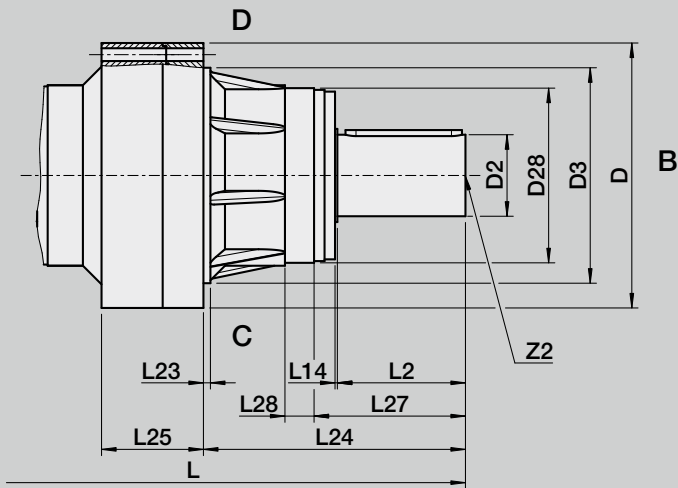


Size	Ratio	d x l1	D	D2 x L2	D3	D4	D6	D17	D28	L	L14
		G7		j6	f7				f7		
08	13,6 - 35,0	14 x 30	175	50 x 100	110	160	9,0	130	-	381,5	1
		19 x 40									
		24 x 50									
		28 x 60									
		32 x 60									
16	13,6 - 35,0	19 x 40	220	60 x 120	130	200	11,0	165	-	460,0	1
		24 x 50									
		28 x 60									
		32 x 60									
		38 x 80									
32	13,6 - 35,0	19 x 40	265	70 x 140	150	230	13,5	195	-	541,5	2
		24 x 50									
		28 x 60									
		32 x 60									
		38 x 80									
64	13,6 - 35,0	28 x 60	310	90 x 170	200	280	17,5	250	-	652,0	2
		32 x 60									
		38 x 80									
		42 x 110									
		48 x 110									
128	13,6 - 35,0	28 x 60	380	110 x 210	230	340	22,0	295	-	763,0	3
		32 x 60									
		38 x 80									
		42 x 110									
		48 x 110									
256	13,6 - 35,0	38 x 80	455	140 x 220	370	-	22,0	415	300	929,0	4
		42 x 110									
		48 x 110									
		55 x 110									
		60 x 140									



MPF 08 - MPF 256
DIMENSIONS 2-STAGE

MPF 256

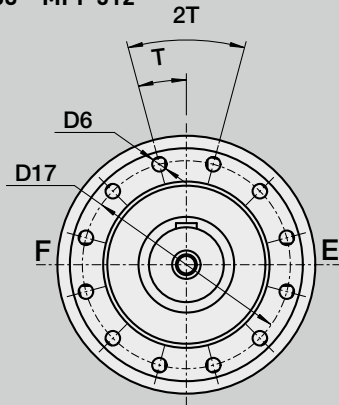


L23	L24	L25	L27	L28	Key D2 according to DIN 6885/1	T	2T	Z2
5	106	12	-	-	A 14 x 9 x 90	15°	12 x 30°	D M16
5	126	15	-	-	A 18 x 11 x 100	15°	12 x 30°	D M20
13	155	20	-	-	A 20 x 12 x 120	15°	12 x 30°	D M20
12	210	20	-	-	A 25 x 14 x 145	15°	12 x 30°	D M24
18	246	25	-	-	A 28 x 16 x 180	15°	12 x 30°	D M24
12	450	175	260	50	A 36 x 20 x 200	9°	20 x 18°	DM24

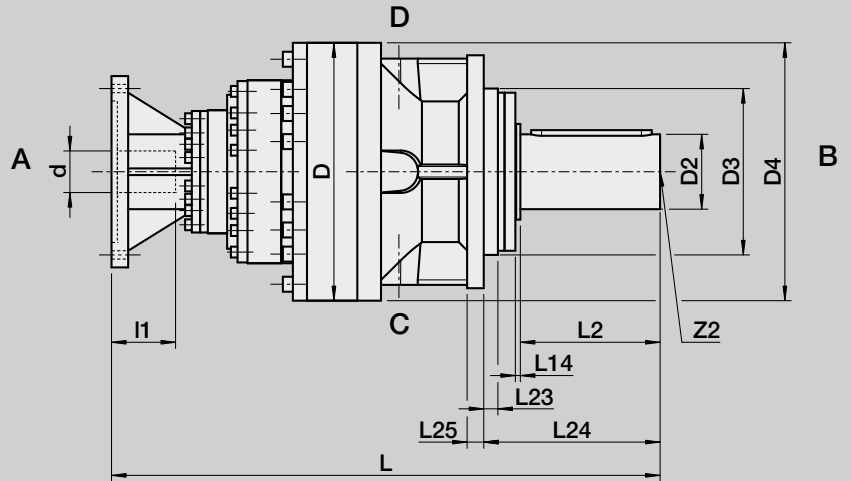
MPF 08 - MPF 512

DIMENSIONS 3-STAGE

MPF 08 - MPF 512



MPF 08 - MPF 128, PF 512

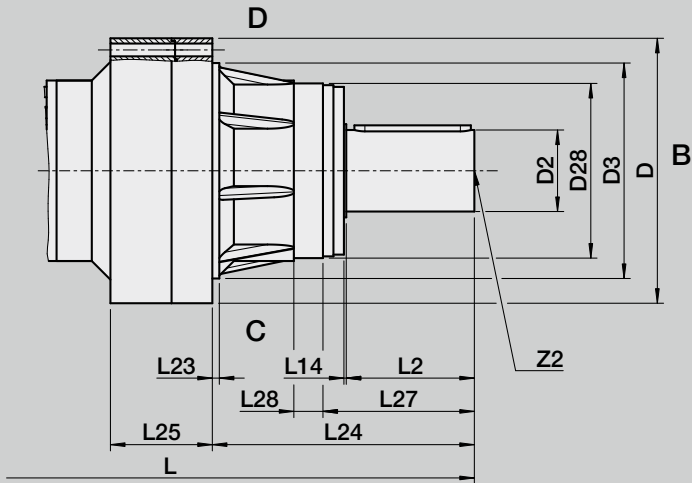


Size	Ratio	d x l1	D	D2 x L2	D3	D4	D6	D17	D28	L	L14
		G7		j6	f7				f7		
08	46,24 - 245,00	14 x 30	175	50 x 100	110	160	9,0	130	-	427,5	1
		19 x 40									
		24 x 50									
		28 x 60									
16	46,24 - 245,00	14 x 30	220	60 x 120	130	200	11,0	165	-	485,5	1
		19 x 40									
		24 x 50									
		28 x 60									
32	46,24 - 245,00	14 x 30	265	70 x 140	150	230	13,5	195	-	539,5	2
		19 x 40									
		24 x 50									
		28 x 60									
64	46,24 - 245,00	14 x 30	310	90 x 170	200	280	17,5	250	-	649,0	2
		19 x 40									
		24 x 50									
		28 x 60									
128	46,24 - 245,00	19 x 40	380	110 x 210	230	340	22,0	295	-	795,5	3
		24 x 50									
		28 x 60									
		32 x 60									
256	46,24 - 245,00	38 x 80	455	140 x 220	370	-	22,0	415	300	815,5	4
		28 x 60									
		32 x 60									
		38 x 80									
512	46,24 - 245,00	42 x 110	550	180 x 280	450	550	26,0	505	-	947,0	9
		48 x 110									
		55 x 110									
		60 x 140									
										977,0	



MPF 08 - MPF 512
DIMENSIONS 3 - STAGE

MPF 256



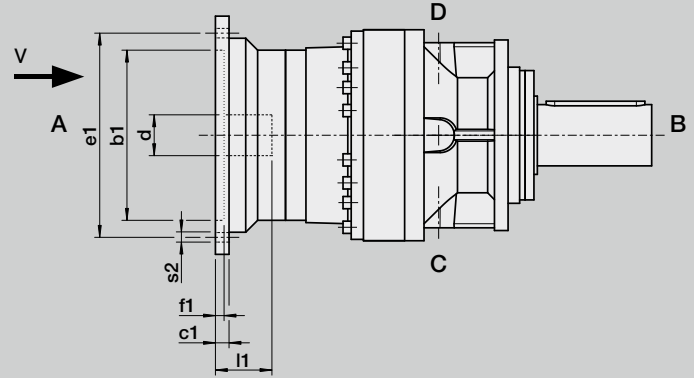
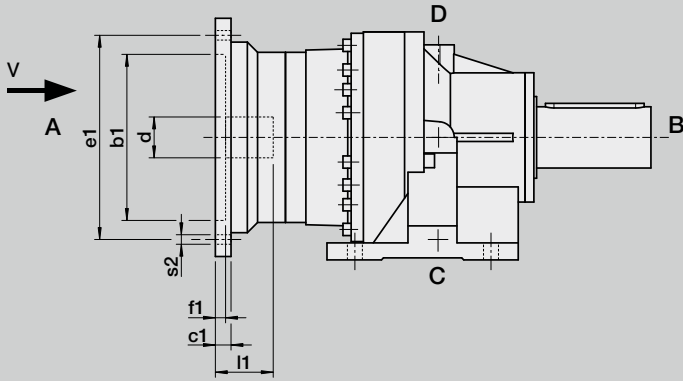
L23	L24	L25	L27	L28	Key D2 according to DIN 6885/1	T	2T	Z1	Z2
5	106	12	-	-	A 14 x 9 x 90	15°	12 x 30°		D M16
5	126	15	-	-	A 18 x 11 x 100	15°	12 x 30°		D M20
13	155	20	-	-	A 20 x 12 x 120	15°	12 x 30°		D M20
12	210	20	-	-	A 25 x 14 x 145	15°	12 x 30°		D M24
18	246	25	-	-	A 28 x 16 x 180	15°	12 x 30°		D M24
12	450	175	260	50	A 36 x 20 x 200	9°	20 x 18°		D M24
28	366	60	-	-	A 45 x 22 x 250	0°	36 x 10°		D M24

MP / MPF

DIMENSIONS MOTOR MOUNTING 1-STAGE

MP

MPF



Motor dimensions									
a1		145		145		200		242	
a2	145	160	160	190	200	250	250	300	300
b1	95	110	110	130	130	180	180	230	230
e1	115	130	130	165	165	215	215	265	265
s2*	4x M8 / Ø 9	4x M8 / Ø 9	4x M8 / Ø 9	4x M10 / Ø 11	4x M10 / Ø 11	4x M12	4x M12	4x M12	4x M12
c1	12	12	12	15	15	18	18	18	18
f1	5	5	5	5	5	5	5	5	5

Gearbox dimensions

d x l1	Size	Version										
19 x 40	08	A	x	x	x	x	x	x	x	x	x	x
24 x 50			x	x	x	x	x	x	x	x	x	x
28 x 60			x	x	x	x	x	x	x	x	x	x
32 x 60			x	x	x	x	x	x	x	x	x	x
38 x 80			x	x	x	x	x	x	x	x	x	x
28 x 60	16	A										
32 x 60												
38 x 80												
42 x 110												
48 x 110												
55 x 110												
28 x 60	32	A										
32 x 60												
38 x 80												
42 x 110												
48 x 110												
55 x 110												
38 x 80	64	B										
42 x 110												
48 x 110												
55 x 110												
60 x 140												
38 x 80	128	B										
42 x 110												
48 x 110												
55 x 110												
60 x 140												

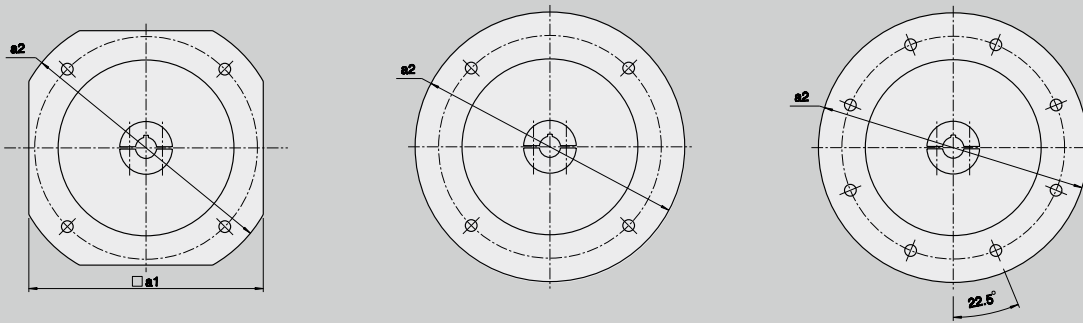
* Depth of thread: 2 x Ø or flange thickness



MP / MPF

DIMENSIONS MOTOR MOUNTING 1-STAGE

View V



200		242		260		345						
250	250	300	300	350	350	400	400	300	350	400	450	
180	180	230	230	250	250	300	300	230	250	300	350	
215	215	265	265	300	300	350	350	265	350	350	400	
4x M12	4x M12	4x M12	4x M12	4x M16	4x M16	4x M16	4x M16	4x M12	4x M16	4x M16	8x M16	
18	18	18	18	24	24	24	24	25	25	25	25	
5	5	5	5	6	6	6	6	7	7	7	7	
x	x	x	x	x	x	x	x					
x	x	x	x	x	x	x	x					
x	x	x	x	x	x	x	x					
x	x	x	x	x	x	x	x					
x	x	x	x	x	x	x	x					
x	x	x	x	x	x	x	x					
x	x	x	x	x	x	x	x					
x	x	x	x	x	x	x	x					
									x	x	x	x
									x	x	x	x
									x	x	x	x
									x	x	x	x
									x	x	x	x
									x	x	x	x
									x	x	x	x
									x	x	x	x
									x	x	x	x

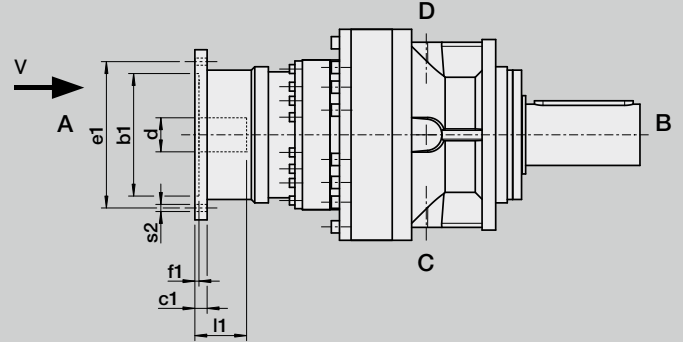
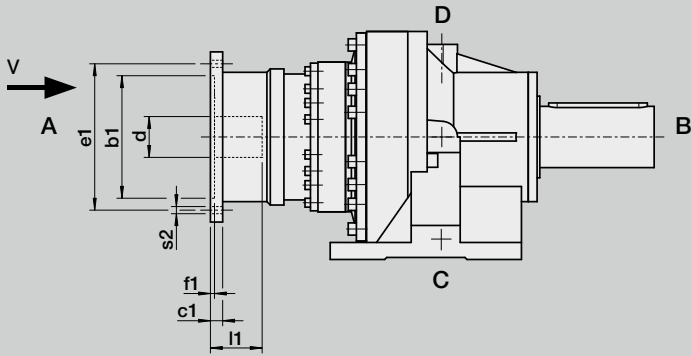
* Depth of thread: 2 x Ø or flange thickness

MP / MPF

DIMENSIONS MOTOR MOUNTING 2-STAGE

MP

MPF



Motor dimensions

a1	125	125	125	125	130	140	200	160	160	200		145
a2	140	140	140	140	160	190	250	180	190	250	145	160
b1	60	70	80	95	110	130	180	110	130	180	95	110
e1	75	85	100	115	130	165	215	130	165	215	115	130
s2*	4x M5	4x M6	4x M6	4x M8/Ø9	4x M8/Ø9	4x M10/Ø11	4x M12/Ø13	4x M8/Ø9	4x M10/Ø11	4x M12/Ø13	4x M8/Ø9	4x M8/Ø9
c1	25	25	25	25	25	25	25	30	30	30	12	12
f1	6	5	5	5	6	6	6	6	6	6	5	5

Gearbox dimensions

d x l1	Size	Version													
G7															
14 x 30	08	C	x	x	x	x	x	x	x						
19 x 40			x	x	x	x	x	x	x						
24 x 50			x	x	x	x	x	x	x	x					
28 x 60			x	x	x	x	x	x	x	x					
32 x 60			x	x	x	x	x	x	x	x					
19 x 40	16	C								x	x	x			
24 x 50										x	x	x			
28 x 60											x	x	x		
32 x 60											x	x	x		
38 x 80											x	x	x		
19 x 40	32	A											x	x	
24 x 50														x	x
28 x 60														x	x
32 x 60														x	x
38 x 80														x	x
28 x 60	64	A													
32 x 60															
38 x 80															
42 x 110															
48 x 110															
55 x 110															
28 x 60	128	B													
32 x 60															
38 x 80															
42 x 110															
48 x 110															
55 x 110															
38 x 80	256	B													
42 x 110															
48 x 110															
55 x 110															
60 x 140															

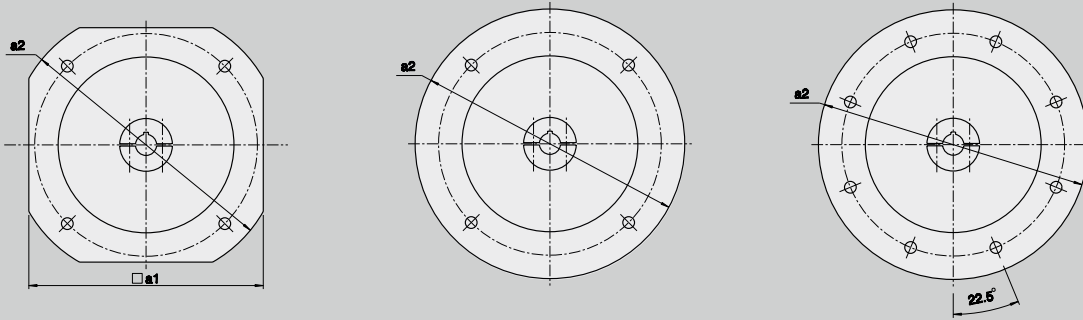
* Depth of thread: 2 x Ø or flange thickness



MP / MPF

DIMENSIONS MOTOR MOUNTING 2-STAGE

View V



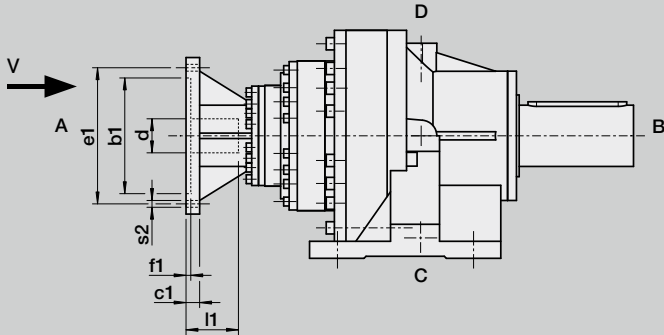
	145	200	242	200	242	260	345												
160	190	200	250	250	300	300	250	250	300	300	350	350	400	400	300	350	400	450	
110	130	130	180	180	230	230	180	180	230	230	250	250	300	300	230	250	300	350	
130	165	165	215	215	265	265	215	215	265	265	300	300	350	350	265	300	350	400	
4x M8 / Ø 9	4x M10/Ø11	4x M10/Ø11	4x M12	4x M12	4x M12	4x M12	4x M12	4x M12	4x M12	4x M12	4x M12	4x M16	4x M16	4x M16	4x M12	4x M16	4x M16	8x M16	
12	15	15	18	18	18	18	18	18	18	18	24	24	24	24	25	25	25	25	
5	5	5	5	5	5	5	5	5	5	5	6	6	6	6	7	7	7	7	
x	x	x	x	x	x	x													
x	x	x	x	x	x	x													
x	x	x	x	x	x	x													
x	x	x	x	x	x	x													
x	x	x	x	x	x	x													
							x	x	x	x	x	x	x	x					
							x	x	x	x	x	x	x	x					
							x	x	x	x	x	x	x	x					
							x	x	x	x	x	x	x	x					
							x	x	x	x	x	x	x	x					
							x	x	x	x	x	x	x	x					
															x	x	x	x	
															x	x	x	x	
															x	x	x	x	
															x	x	x	x	
															x	x	x	x	

* Depth of thread: 2 x Ø or flange thickness

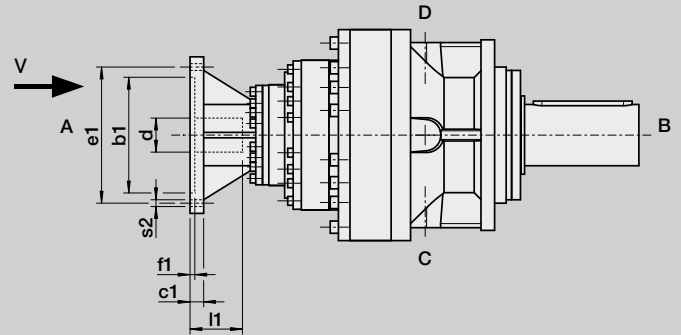
MP / MPF

DIMENSIONS MOTOR MOUNTING 3-STAGE

MP



MPF



Motor dimensions

a1	125	125	125	125	130	140	200	160	160	200	
a2	140	140	140	140	160	190	250	180	190	250	145
b1	60	70	80	95	110	130	180	110	130	180	95
e1	75	85	100	115	130	165	215	130	165	215	115
s2*	4x M5	4x M6	4x M6	4x M8 / Ø 9	4x M8 / Ø 9	4x M10 / Ø 11	4x M12 / Ø 13	4x M8 / Ø 9	4x M10 / Ø 11	4x M12 / Ø 13	4x M8 / Ø 9
c1	25	25	25	25	25	25	25	30	30	30	12
f1	6	5	5	5	6	6	6	6	6	6	5

Gearbox dimensions

d x l1	Size	Version											
G7													
14 x 30	08	C	x	x	x	x	x	x	x				
19 x 40			x	x	x	x	x	x	x				
24 x 50			x	x	x	x	x	x	x				
28 x 60			x	x	x	x	x	x	x				
32 x 60			x	x	x	x	x	x	x				
14 x 30	16	C	x	x	x	x	x	x	x				
19 x 40			x	x	x	x	x	x	x				
24 x 50			x	x	x	x	x	x	x				
28 x 60			x	x	x	x	x	x	x				
32 x 60			x	x	x	x	x	x	x				
14 x 30	32	C	x	x	x	x	x	x	x				
19 x 40			x	x	x	x	x	x	x				
24 x 50			x	x	x	x	x	x	x				
28 x 60			x	x	x	x	x	x	x				
32 x 60			x	x	x	x	x	x	x				
19 x 40	64	C								x	x	x	
24 x 50										x	x	x	
28 x 60										x	x	x	
32 x 60										x	x	x	
38 x 80										x	x	x	
19 x 40	128	A											x
24 x 50													x
28 x 60													x
32 x 60													x
38 x 80													x
28 x 60	256	A											
32 x 60													
38 x 80													
42 x 110													
48 x 110													
55 x 110													
38 x 80	MPF 512	B											
42 x 110													
48 x 110													
55 x 110													
60 x 110													

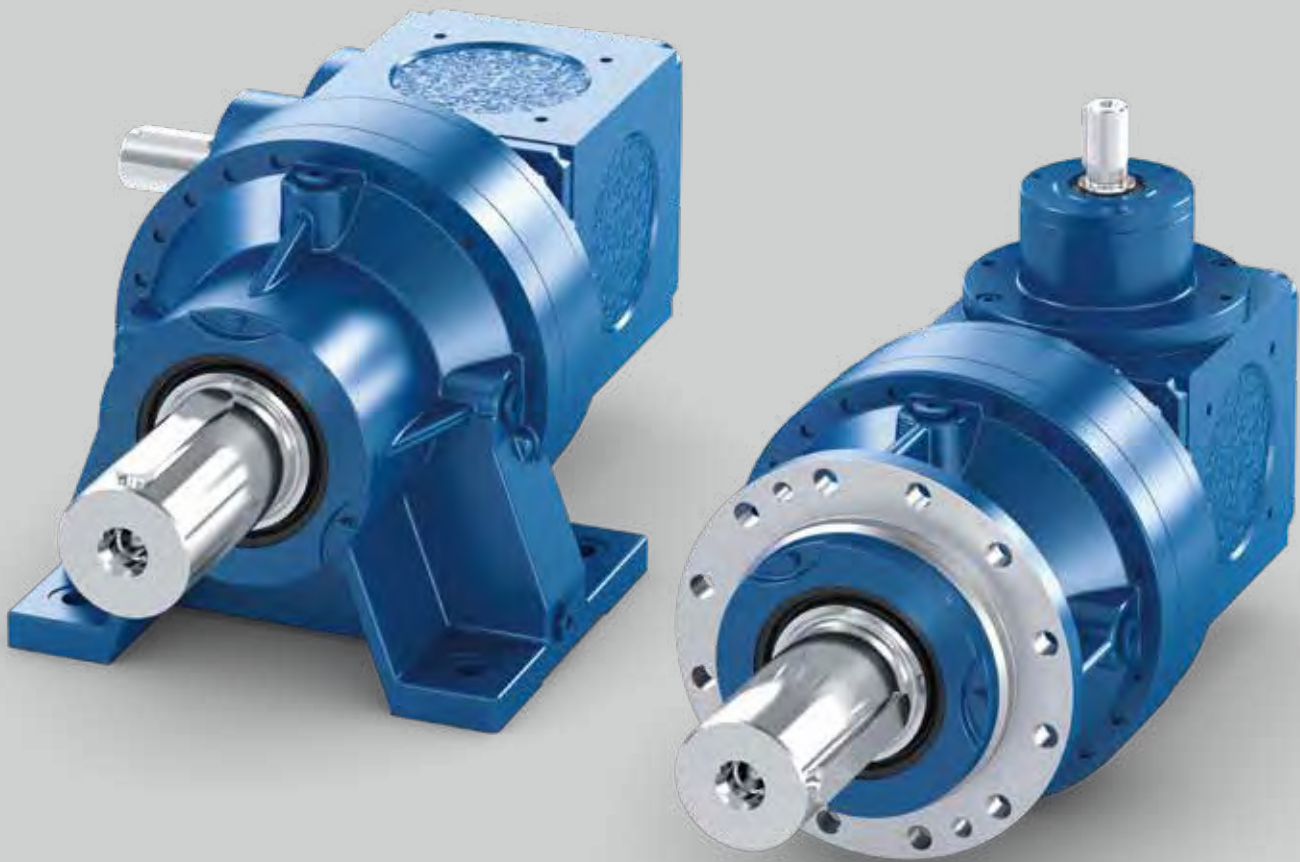
* Depth of thread: 2 x Ø or flange thickness

LP / LPF

TECHNICAL DATA

Technical specifications on this page and in the tables on the following three pages are intended only for rough preselection.

Gear teeth:	Spur gear	Lubrication:	Oil lubrication
Direction of rotation:	Input and output in the same direction	Mounting position:	Any, specify when ordering
Life time:	20000 h L _{10h}	Surface protection:	Primer coat RAL 9005 Black
Permissible gearbox temperature at housing:	-10 °C to +80 °C (deviating temperature ranges on request)	Protection rating:	IP 54





LP / LPF

TECHNICAL DATA

The following technical specifications in the table are intended only for rough preselection

LP / LPF		08					
Gear stage		3					
Ratio	i	60,00	80,00	100,00	125,00	150,00	210,00
Combination	i	3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	$T_{2maxzul}$	Nm	1063	1063	1063	1360	1190
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	800	800	800	800	700
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	1250	1250	1250	1600	1400
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	3000	3000	3500	3500	3500
Max. input speed	$n_{1maxzul}$	min ⁻¹	4500	4500	5250	5250	5250
Max. backlash*	j	arcmin	≤ 20				
Permissible radial load input (at permissible average input speed)	F_{1rmzul}	N	394	394	376	376	376
Maximum permissible radial load input	$F_{1rmxzul}$	N	1100				
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	12000	13093	13370	14305	15118
Max. permissible radial load output	$F_{2rmxzul}$	N	19000				
Efficiency	η	-	0,95				
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	3,4				
Weight	m	kg	approx. 27				
Running noise (with n_{1mzul})	L_{PA}	dB(A)	≤ 75				
Inertia (with reference to input)	D1	J_1	kgcm ²				
			on request				

LP / LPF		16					
Gear stage		3					
Ratio	i	60,00	80,00	100,00	125,00	150,00	210,00
Combination	i	3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	$T_{2maxzul}$	Nm	2669	2669	2669	3009	2635
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	2000	2000	2000	1800	1600
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	3140	3140	3140	3540	3100
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	2750	2750	3250	3250	3250
Max. input speed	$n_{1maxzul}$	min ⁻¹	4125	4125	4875	4875	4875
Max. backlash*	j	arcmin	≤ 20				
Permissible radial load input (at permissible average input speed)	F_{1rmzul}	N	626	626	595	595	595
Maximum permissible radial load input	$F_{1rmxzul}$	N	1700				
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	19508	21285	21649	23164	24480
Max. permissible radial load output	$F_{2rmxzul}$	N	30000				
Efficiency	η	-	0,95				
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	5,3				
Weight	m	kg	approx. 54				
Running noise (with n_{1mzul})	L_{PA}	dB(A)	≤ 75				
Inertia (with reference to input)	D1	J_1	kgcm ²				
			on request				

* measured with 2 % nominal torque on output shaft

LP / LPF

TECHNICAL DATA

LP / LPF			32					
Gear stage			3					
Ratio	i		60,00	80,00	100,00	125,00	150,00	210,00
Combination	i		3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	T _{2maxzul}	Nm	5440	5440	5440	6120	6120	3995
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	3800	3800	3800	3800	3800	2800
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	6400	6400	6400	7200	7200	4700
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	2500	2500	3000	3000	3000	3000
Max. input speed	n _{1maxzul}	min ⁻¹	3750	3750	4500	4500	4500	4500
Max. backlash*	j	arcmin	≤ 20					
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	1061	1061	1004	1004	1004	1004
Maximum permissible radial load input	F _{1rmazul}	N	2800					
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	22193	24214	24516	26231	27721	30696
Max. permissible radial load output	F _{2rmazul}	N	34000					
Efficiency	η	-	0,95					
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	6,7					
Weight	m	kg	approx. 90					
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75					
Inertia (with reference to input)	D1	J ₁	kgcm ² on request					

LP / LPF			64					
Gear stage			3					
Ratio	i		60,00	80,00	100,00	125,00	150,00	210,00
Combination	i		3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	T _{2maxzul}	Nm	10540	10880	11560	10880	10625	5440
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	7500	7500	7500	7500	7500	4500
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	12400	12800	13600	12800	12500	6400
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	2250	2250	2750	2750	2750	2750
Max. input speed	n _{1maxzul}	min ⁻¹	3375	3375	4125	4125	4125	4125
Max. backlash*	j	arcmin	≤ 20					
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	1877	1877	1766	1766	1766	1766
Maximum permissible radial load input	F _{1rmazul}	N	4800					
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	35788	39048	39314	42065	44454	49226
Max. permissible radial load output	F _{2rmazul}	N	54000					
Efficiency	η	-	0,95					
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	9,3					
Weight	m	kg	approx. 110					
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75					
Inertia (with reference to input)	D1	J ₁	kgcm ² on request					

* measured with 2 % nominal torque on output shaft



LP / LPF

TECHNICAL DATA

The following technical specifications in the table are intended only for rough preselection

LP / LPF			128					
Gear stage			3					
Ratio	i		60,00	80,00	100,00	125,00	150,00	210,00
Combination	i		3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	$T_{2maxzul}$	Nm	18020	20060	19040	19890	18275	16575
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	13000	13000	13000	13000	13000	12000
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	21200	23600	22400	23400	21500	19500
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	2000	2000	2500	2500	2500	2500
Max. input speed	$n_{1maxzul}$	min ⁻¹	3000	3000	3750	3750	3750	3750
Max. backlash*	j	arcmin	≤ 20					
Permissible radial load input (at permissible average input speed)	F_{1rmzul}	N	3647	3647	3409	3409	3409	3409
Maximum permissible radial load input	$F_{1rmazul}$	N	9000					
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	63321	69089	69089	73922	78121	86507
Max. permissible radial load output	$F_{2rmazul}$	N	91000					
Efficiency	η	-	0,95					
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	13,6					
Weight	m	kg	approx. 255					
Running noise (with n_{1mzul})	L_{PA}	dB(A)	≤ 75					
Inertia (with reference to input)	D1	J_1	kgcm ² on request					

LP / LPF			256					
Gear stage			3					
Ratio	i		60,00	80,00	100,00	125,00	150,00	210,00
Combination	i		3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	$T_{2maxzul}$	Nm	28560	33320	28900	32470	25500	28900
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	20000	23000	18000	22000	16000	19000
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	33600	39200	34000	38200	30000	34000
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	1750	1750	2250	2250	2250	2250
Max. input speed	$n_{1maxzul}$	min ⁻¹	2625	2625	3375	3375	3375	3375
Max. backlash*	j	arcmin	≤ 20					
Permissible radial load input (at permissible average input speed)	F_{1rmzul}	N	7174	7174	6648	6648	6648	6648
Maximum permissible radial load input	$F_{1rmazul}$	N	1700					
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	105969	115621	114638	122658	129626	143540
Max. permissible radial load output	$F_{2rmazul}$	N	152000					
Efficiency	η	-	0,95					
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	17,3					
Weight	m	kg	approx. 500					
Running noise (with n_{1mzul})	L_{PA}	dB(A)	≤ 75					
Inertia (with reference to input)	D1	J_1	kgcm ² on request					

* measured with 2 % nominal torque on output shaft



LP

MOUNTING POSITION AND LUBRICATION

LP			
Side view	on request	on request	
Mounting position (underside)	A	B	C
Side of oil fittings			D = Breather F = Sight glass C = Drainage
Side view			
Mounting position (underside)	D	E	F
Side of oil fittings	C = Breather E = Sight glass D = Drainage	F = Breather C = Sight glass E = Drainage	E = Breather D = Sight glass F = Drainage




- Breather
- Sight glass
- Drainage



L P F

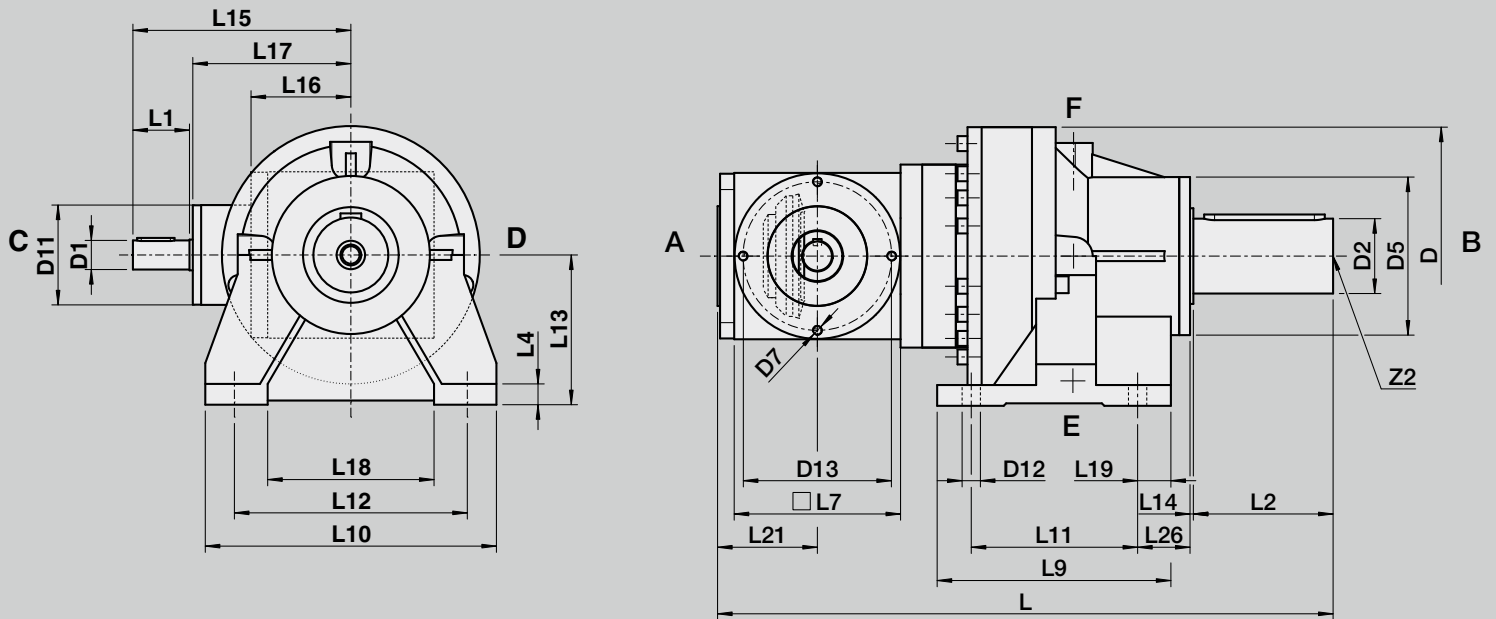
MOUNTING POSITION AND LUBRICATION

LPF			
Side view	on request	on request	
Mounting position (underside)	A	B	C
Side of oil fittings			D = Breather F = Sight glass C = Drainage
Side view			
Mounting position (underside)	D	E	F
Side of oil fittings	C = Breather E = Sight glass D = Drainage	F = Breather C = Sight glass E = Drainage	E = Breather D = Sight glass F = Drainage

-  Breather
-  Sight glass
-  Drainage

LP 08 - LP 256

DIMENSIONS 3-STAGE

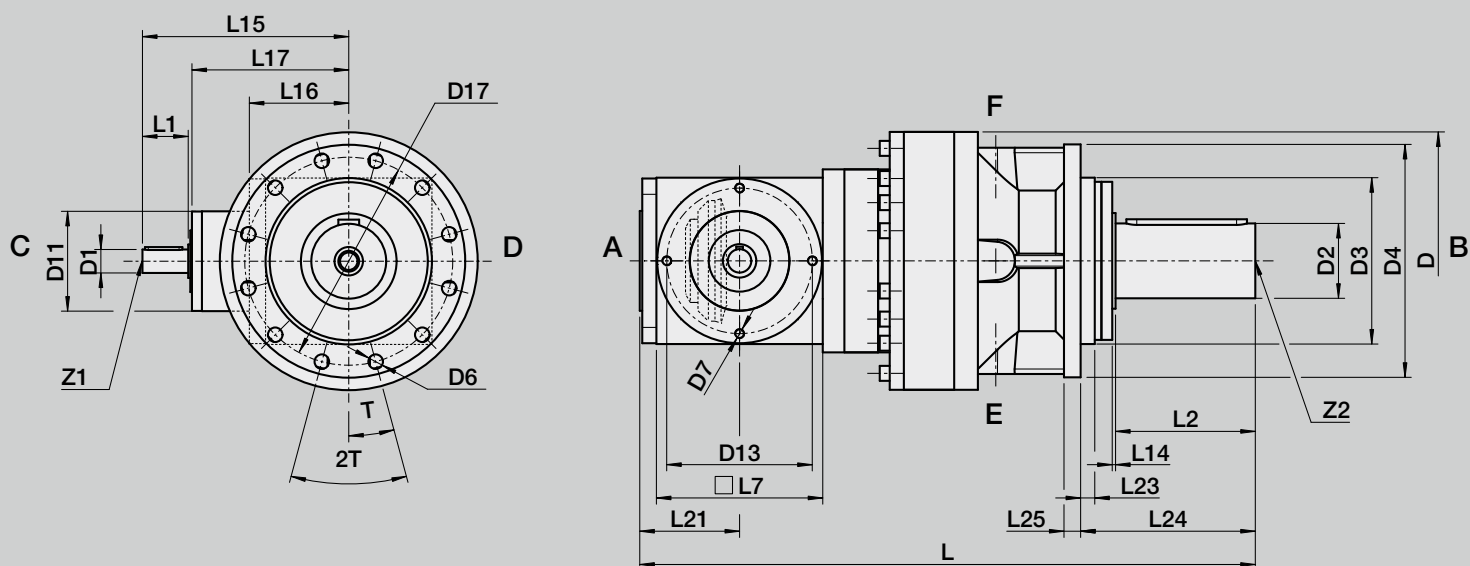


Size	Ratio	D	D1 x L1	D2 x L2	D5	D7	D11	D12	D13	L	L4	L7	L9	L10
			j6	j6										
08	60 - 80	175	20 x 40	50 x 100	108	M10	80	11,0	100	452	12	120	150	205
	100 - 210		15 x 30											
16	60 - 80	220	28 x 50	60 x 120	130	M10	95	17,5	115	531	16	140	180	260
	100 - 210		24 x 50											
32	60 - 80	265	28 x 55	70 x 140	150	M12	110	17,5	135	614	22	160	230	310
	100 - 210		24 x 50											
64	60 - 80	310	35 x 68	90 x 170	190	M12	120	22,0	175	741	25	200	281	350
	100 - 210		28 x 55											
128	60 - 80	380	40 x 80	110 x 210	240	M16	140	26,0	200	886	25	230	290	420
	100 - 210		35 x 70											
256	60 - 80	455	50 x 90	140 x 220	300	-	160	33,0	-	1072	35	260	370	500
	100 - 210		45 x 90											

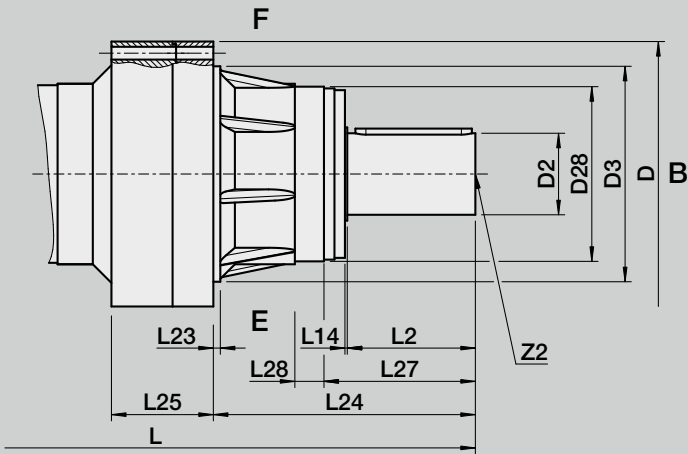


L11	L12	L13	L14	L15	L16	L17	L18	L19	L21	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	Z1	Z2
120	170	100	1	157 147	75	115	135	15	75	6 x 6 x 30 5 x 4 x 20	A 14 x 9 x 90	D M 6 D M 5	D M16
140	215	130	1	195	83	143	170	20	85	8 x 7 x 40 8 x 7 x 40	A 18 x 11 x 100	D M10 D M 8	D M20
170	255	160	2	227 222	95	170	200	30	98	8 x 7 x 40 8 x 7 x 40	A 20 x 12 x 120	D M10 D M 8	D M20
200	280	180	2	261 248	120	191	200	40	121	10 x 8 x 45 8 x 7 x 45	A 25 x 14 x 145	D M12 D M10	D M24
220	340	210	3	310 300	135	228	260	35	138	12 x 8 x 60 10 x 8 x 50	A 28 x 16 x 180	D M16 D M12	D M24
300	390	270	4	360	150	265	280	35	172	14 x 9 x 70 14 x 9 x 70	A 36 x 20 x 200	D M16 D M16	D M24

L P F 0 8 - L P F 2 5 6
D I M E N S I O N S 3 - S T A G E



Size	Ratio	D	D1 x L1	D2 x L2	D3	D4	D6	D7	D11	D13	D17	D28	L	L7	L14
			j6	j6	f7							f7			
08	60 - 80	175	20 x 40	50 x 100	110	160	9,0	M10	80	100	130	-	452	120	1
	100 - 210		15 x 30												
16	60 - 80	220	28 x 50	60 x 120	130	200	11,0	M10	95	115	165	-	531	140	1
	100 - 210		24 x 50												
32	60 - 80	265	28 x 55	70 x 140	150	230	13,5	M12	110	135	195	-	614	160	2
	100 - 210		24 x 50												
64	60 - 80	310	35 x 68	90 x 170	200	280	17,5	M12	120	175	250	-	741	200	2
	100 - 210		28 x 55												
128	60 - 80	380	40 x 80	110 x 210	230	340	22,0	M16	140	200	295	-	886	230	3
	100 - 210		35 x 70												
256	60 - 80	455	50 x 90	140 x 220	370	-	22,0	-	160	-	415	300	1072	260	4
	100 - 210		45 x 90												



L15	L16	L17	L21	L23	L24	L25	L27	L28	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	T	2T	Z1	Z2
157 147	75	115	75	5	106	12	-	-	6 x 6 x 30 5 x 4 x 20	A 14 x 9 x 90	15°	12 x 30°	D M 6 D M 5	D M16
195 195	83	143	85	5	126	15	-	-	8 x 7 x 40 8 x 7 x 40	A 18 x 11 x 100	15°	12 x 30°	D M10 D M 8	D M20
227 222	95	170	98	13	155	20	-	-	8 x 7 x 45 8 x 7 x 40	A 20 x 12 x 120	15°	12 x 30°	D M10 D M 8	D M20
261 248	120	191	121	12	210	20	-	-	10 x 8 x 45 8 x 7 x 45	A 25 x 14 x 145	15°	12 x 30°	D M12 D M10	D M24
310 300	135	228	138	18	246	25	-	-	12 x 8 x 60 10 x 8 x 50	A 28 x 16 x 180	15°	12 x 30°	D M16 D M12	D M24
360	150	265	172	12	450	175	260	50	14 x 9 x 70 14 x 9 x 70	A 36 x 20 x 200	9°	20 x 18°	D M16 D M16	D M24

MLP / MLPF

TECHNICAL DATA

Technical specifications on this page and in the tables on the following three pages are intended only for rough preselection.

Gear teeth: Spur gear

Direction of rotation: Input and output in the same direction

Life time: 20000 h L_{10h}

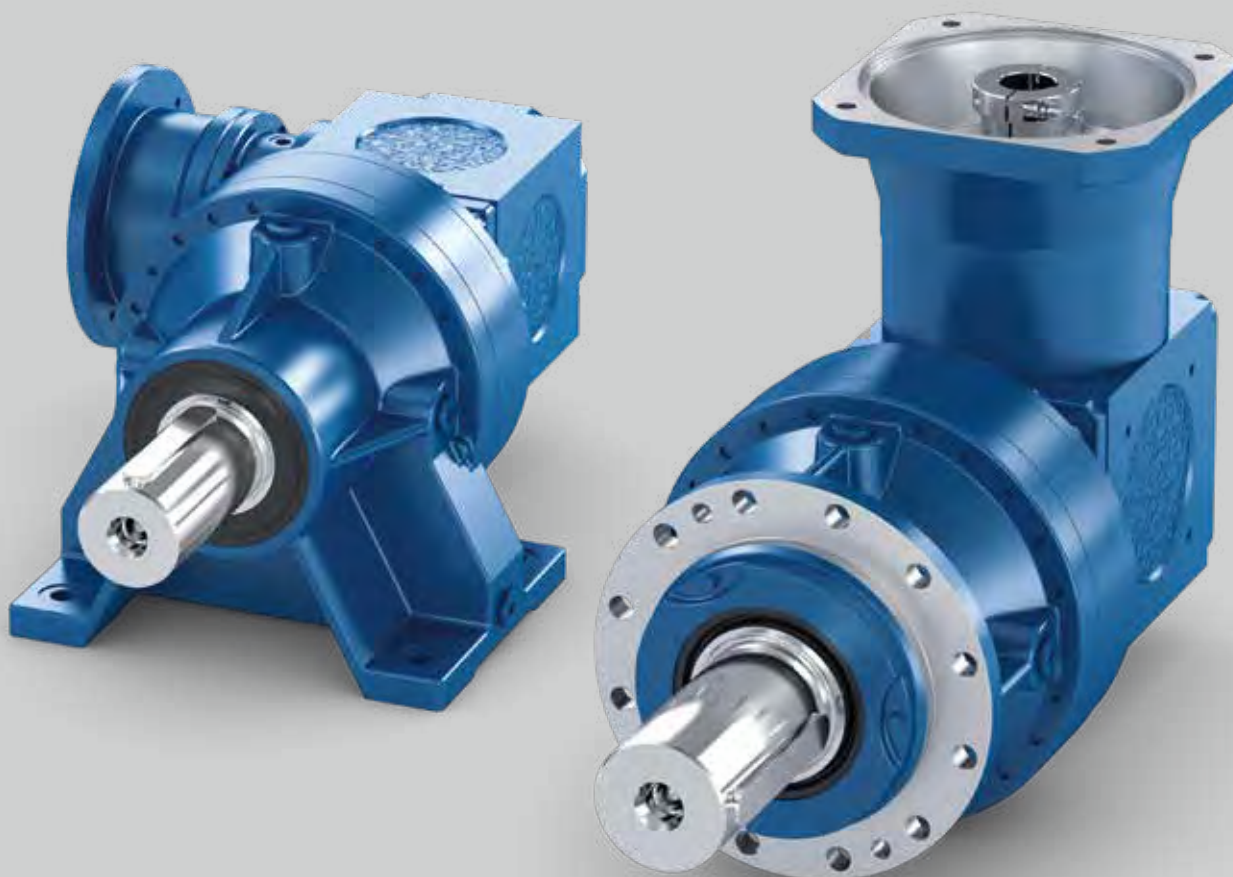
Permissible gearbox temperature at housing: -10 °C to +80 °C (deviating temperature ranges on request)

Lubrication: Oil lubrication

Mounting position: Any, specify when ordering

Surface protection: Primer coat RAL 9005 Black

Protection rating: IP 54





MLP / MLPF

TECHNICAL DATA

The following technical specifications in the table are intended only for rough preselection

MLP / MLPF		08					
Gear stage		3					
Ratio	i	60,00	80,00	100,00	125,00	150,00	210,00
Combination	i	3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	$T_{2maxzul}$	Nm	1063	1063	1063	1360	1190
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	800	800	800	800	700
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	1250	1250	1250	1600	1400
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	3000	3000	3500	3500	3500
Max. input speed	$n_{1maxzul}$	min ⁻¹	4500	4500	5250	5250	5250
Max. backlash*	j	arcmin	≤ 20				
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	12000	13093	13370	14305	15118
Max. permissible radial load output	$F_{2rmaxzul}$	N	19000				
Efficiency	η	-	0,95				
Thermal limit power ($T_u = 20^\circ$ C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	3,4				
Weight	m	kg	approx. 34				
Running noise (with n_{1mzul})	L_{PA}	dB(A)	≤ 75				
Inertia (with reference to input)	D1	J_1	kgcm ²				
			on request				

MLP / MLPF		16					
Gear stage		3					
Ratio	i	60,00	80,00	100,00	125,00	150,00	210,00
Combination	i	3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	$T_{2maxzul}$	Nm	2669	2669	2669	3009	2635
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	2000	2000	2000	1800	1600
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	3140	3140	3140	3540	3100
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	2750	2750	3250	3250	3250
Max. input speed	$n_{1maxzul}$	min ⁻¹	4125	4125	4875	4875	4875
Max. backlash*	j	arcmin	≤ 20				
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	19508	21285	21649	23164	24480
Max. permissible radial load output	$F_{2rmaxzul}$	N	30000				
Efficiency	η	-	0,95				
Thermal limit power ($T_u = 20^\circ$ C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	5,3				
Weight	m	kg	approx. 63				
Running noise (with n_{1mzul})	L_{PA}	dB(A)	≤ 75				
Inertia (with reference to input)	D1	J_1	kgcm ²				
			on request				

* measured with 2 % nominal torque on output shaft

MLP / MLPF

TECHNICAL DATA

MLP / MLPF			32					
Gear stage			3					
Ratio	i		60,00	80,00	100,00	125,00	150,00	210,00
Combination	i		3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	$T_{2maxzul}$	Nm	5440	5440	5440	6120	6120	3995
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	3800	3800	3800	3800	3800	2800
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	6400	6400	6400	7200	7200	4700
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	2500	2500	3000	3000	3000	3000
Max. input speed	$n_{1maxzul}$	min ⁻¹	3750	3750	4500	4500	4500	4500
Max. backlash*	j	arcmin	≤ 20					
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	22193	24214	24516	26231	27721	30696
Max. permissible radial load output	$F_{2rmazul}$	N	34000					
Efficiency	η	-	0,95					
Thermal limit power ($T_u = 20^\circ$ C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	6,7					
Weight	m	kg	approx. 110					
Running noise (with n_{1mzul})	L_{PA}	dB(A)	≤ 75					
Inertia (with reference to input)	D1	J_1	kgcm ² on request					

MLP / MLPF			64					
Gear stage			3					
Ratio	i		60,00	80,00	100,00	125,00	150,00	210,00
Combination	i		3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	$T_{2maxzul}$	Nm	10540	10880	11560	10880	10625	5440
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	7500	7500	7500	7500	7500	4500
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	12400	12800	13600	12800	12500	6400
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	2250	2250	2750	2750	2750	2750
Max. input speed	$n_{1maxzul}$	min ⁻¹	3375	3375	4125	4125	4125	4125
Max. backlash*	j	arcmin	≤ 20					
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	35788	39048	39314	42065	44454	49226
Max. permissible radial load output	$F_{2rmazul}$	N	54000					
Efficiency	η	-	0,95					
Thermal limit power ($T_u = 20^\circ$ C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	9,3					
Weight	m	kg	approx. 140					
Running noise (with n_{1mzul})	L_{PA}	dB(A)	≤ 75					
Inertia (with reference to input)	D1	J_1	kgcm ² on request					

* measured with 2 % nominal torque on output shaft



MLP / MLPF

TECHNICAL DATA

The following technical specifications in the table are intended only for rough preselection

MLP / MLPF		128					
Gear stage		3					
Ratio	i	60,00	80,00	100,00	125,00	150,00	210,00
Combination	i	3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	$T_{2maxzul}$	Nm	18020	20060	19040	19890	16575
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	13000	13000	13000	13000	12000
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	21200	23600	22400	23400	19500
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	2000	2000	2500	2500	2500
Max. input speed	$n_{1maxzul}$	min ⁻¹	3000	3000	3750	3750	3750
Max. backlash*	j	arcmin	≤ 20				
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	63321	69089	69089	73922	78121
Max. permissible radial load output	$F_{2rmaxzul}$	N	91000				
Efficiency	η	-	0,95				
Thermal limit power ($T_u = 20^\circ$ C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	13,6				
Weight	m	kg	approx. 266				
Running noise (with n_{1mzul})	L_{PA}	dB(A)	≤ 75				
Inertia (with reference to input)	D1	J_1	kgcm ² on request				

MLP / MLPF		256					
Gear stage		3					
Ratio	i	60,00	80,00	100,00	125,00	150,00	210,00
Combination	i	3x5x4	4x5x4	5x5x4	5x5x5	6x5x5	6x7x5
Max. permissible output torque	$T_{2maxzul}$	Nm	28560	33320	28900	32470	25500
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	20000	23000	18000	22000	16000
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	33600	39200	34000	38200	30000
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	1750	1750	2250	2250	2250
Max. input speed	$n_{1maxzul}$	min ⁻¹	2625	2625	3375	3375	3375
Max. backlash*	j	arcmin	≤ 20				
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	105969	115621	114638	122658	129626
Max. permissible radial load output	$F_{2rmaxzul}$	N	152000				
Efficiency	η	-	0,95				
Thermal limit power ($T_u = 20^\circ$ C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	17,3				
Weight	m	kg	approx. 500				
Running noise (with n_{1mzul})	L_{PA}	dB(A)	≤ 75				
Inertia (with reference to input)	D1	J_1	kgcm ² on request				

* measured with 2 % nominal torque on output shaft



MLP / MLP F

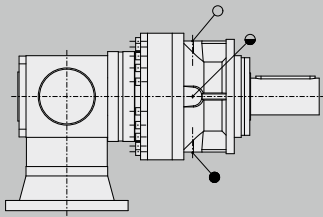
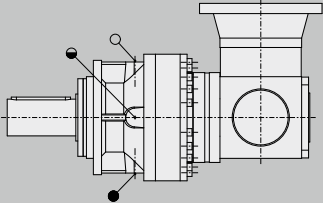
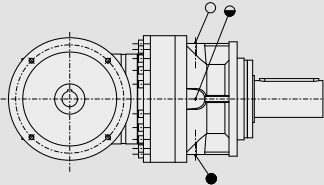
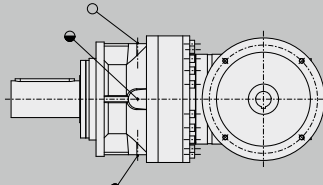
MOUNTING POSITION AND LUBRICATION




MLP			
Side view	on request	on request	
Mounting position (underside)	A	B	C
Side of oil fittings			D = Breather F = Sight glass C = Drainage
Side view			
Mounting position (underside)	D	E	F
Side of oil fittings	C = Breather F = Sight glass D = Drainage	F = Breather C = Sight glass C = Drainage	E = Breather C = Sight glass F = Drainage

- Breather
- Sight glass
- Drainage

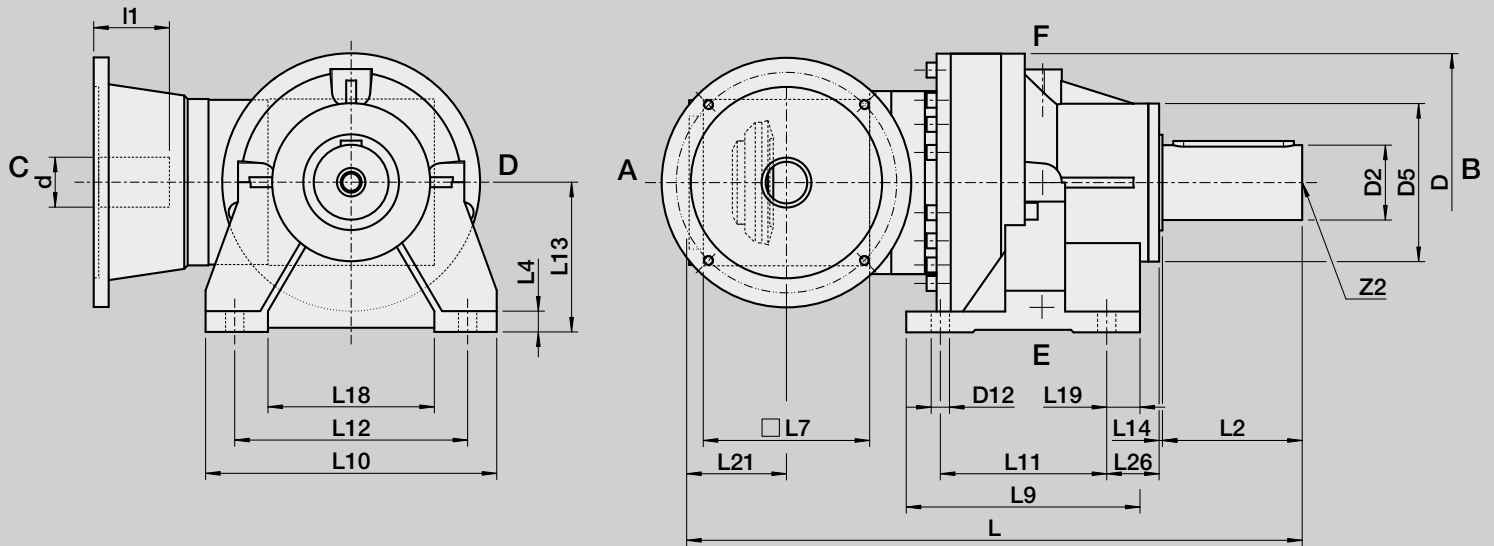


MLPF

Side view	on request	on request	
Mounting position (underside)	A	B	C
Side of oil fittings			D = Breather F = Sight glass C = Drainage
Side view			
Mounting position (underside)	D	E	F
Side of oil fittings	C = Breather F = Sight glass D = Drainage	F = Breather C = Sight glass E = Drainage	E = Breather C = Sight glass F = Drainage

-  Breather
-  Sight glass
-  Drainage

MLP 08 - MLP 256
DIMENSIONS 3-STAGE

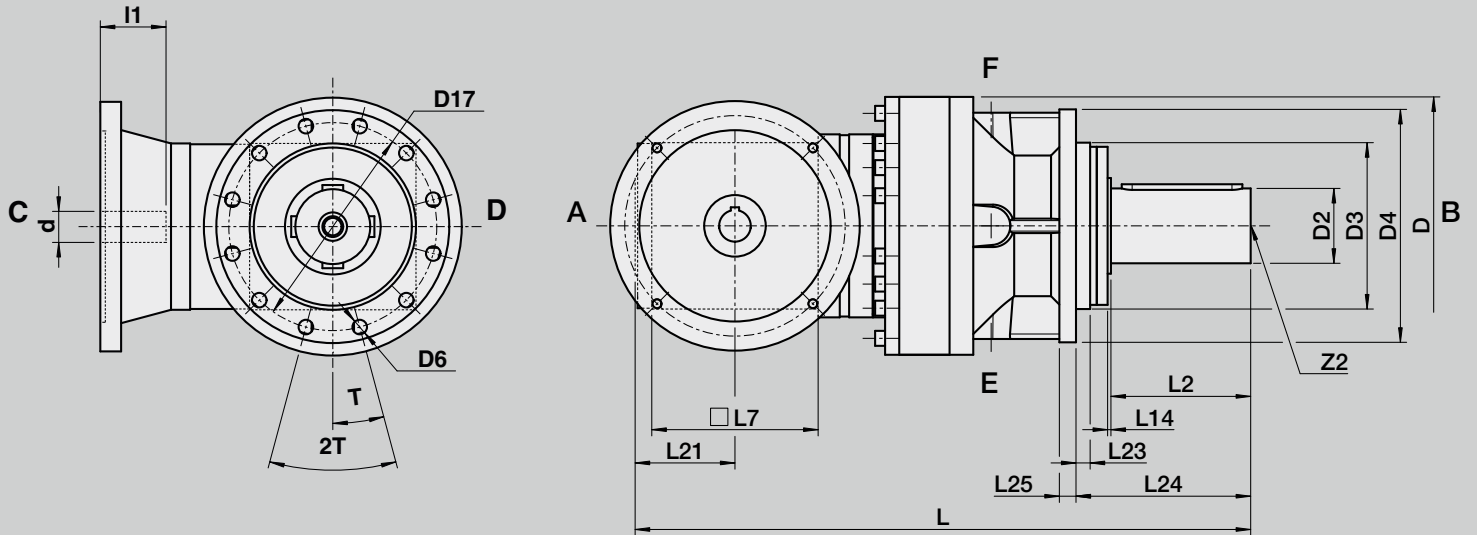


Size	Ratio	d x l1	D	D2 x L2	D5	D12	L	L4	L7	L9	L10
		G7		j6							
08	60 - 210	11 x 23	175	50 x 100	108	11,0	452	12	120	150	205
		14 x 30									
		19 x 40									
		24 x 50									
		28 x 60									
16	60 - 210	19 x 40	220	60 x 120	130	17,5	531	16	140	180	260
		24 x 50									
		28 x 60									
		32 x 60									
		38 x 80									
32	60 - 210	19 x 40	265	70 x 140	150	17,5	614	22	160	230	310
		24 x 50									
		28 x 60									
		32 x 60									
		38 x 80									
64	60 - 210	28 x 60	310	90 x 170	190	22,0	741	25	200	281	350
		32 x 60									
		38 x 80									
		42 x 110									
128	60 - 210	48 x 110	380	110 x 210	240	26,0	886	25	230	290	420
		55 x 110									
		38 x 80									
		42 x 110									
256	60 - 210	48 x 110	455	140 x 220	300	33,0	1072	35	260	370	500
		55 x 110									
		60 x 140									
		60 x 140									



L11	L12	L13	L14	L18	L19	L21	L26	Key D2 according to DIN 6885/1	Z2
120	170	100	1	135	15	75	15	A 14 x 9 x 90	D M16
140	215	130	1	170	20	85	26	A 18 x 11 x 100	D M20
170	255	160	2	200	30	98	37	A 20 x 12 x 120	D M20
200	280	180	2	200	40	121	63	A 25 x 14 x 145	D M24
220	340	210	3	260	35	138	62	A 28 x 16 x 180	D M24
300	390	270	4	280	35	172	46	A 36 x 20 x 200	D M24

MLPF 08 - MLPF 256
DIMENSIONS 3-STAGE



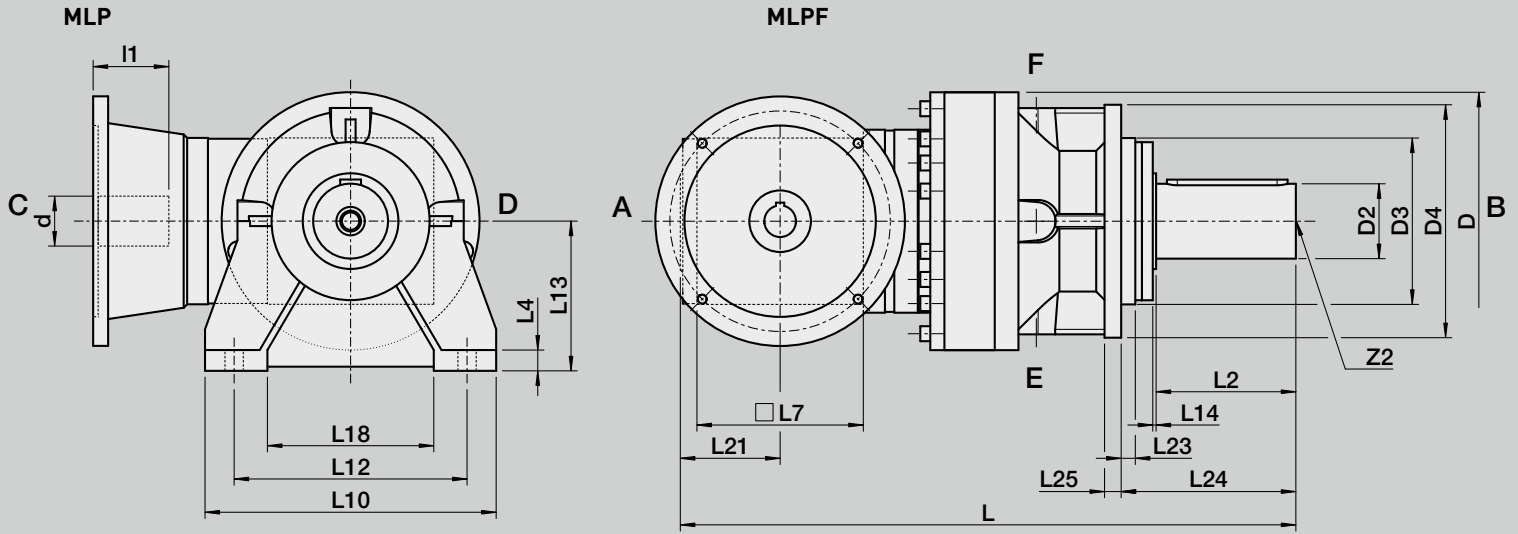
Size	Ratio	d x l1	D	D2 x L2	D3	D4	D6	D17	D28	L	L7
		G7		j6	f7				f7		
08	60 - 210	11 x 23	175	50 x 100	110	160	9,0	130	-	452	120
		14 x 30									
		19 x 40									
		24 x 50									
		28 x 60									
16	60 - 210	19 x 40	220	60 x 120	130	200	11,0	165	-	531	140
		24 x 50									
		28 x 60									
		32 x 60									
32	60 - 210	19 x 40	265	70 x 140	150	230	13,5	195	-	614	160
		24 x 50									
		28 x 60									
		32 x 60									
64	60 - 210	28 x 60	310	90 x 170	200	280	17,5	250	-	741	200
		32 x 60									
		38 x 80									
		42 x 110									
128	60 - 210	48 x 110	380	110 x 210	230	340	22,0	295	-	886	230
		38 x 80									
		42 x 110									
		55 x 110									
256	60 - 210	38 x 80	455	140 x 220	370	-	22,0	415	300	1072	260
		42 x 110									
		48 x 110									
		60 x 140									



L14	L21	L23	L24	L25	L27	L28	Key D2 according to DIN 6885/1	T	2T	Z2
1	75	5	106	12	-	-	A 14 x 9 x 90	15°	12 x 30°	D M16
1	85	5	126	15	-	-	A 18 x 11 x 100	15°	12 x 30°	D M20
2	98	13	155	20	-	-	A 20 x 12 x 120	15°	12 x 30°	D M20
2	121	12	210	20	-	-	A 25 x 14 x 145	15°	12 x 30°	D M24
3	138	18	246	25	-	-	A 28 x 16 x 180	15°	12 x 30°	D M24
4	172	12	450	175	260	50	A 36 x 20 x 200	9°	20 x 18°	D M24

MLP / MLPF

DIMENSIONS MOTOR MOUNTING 3-STAGE



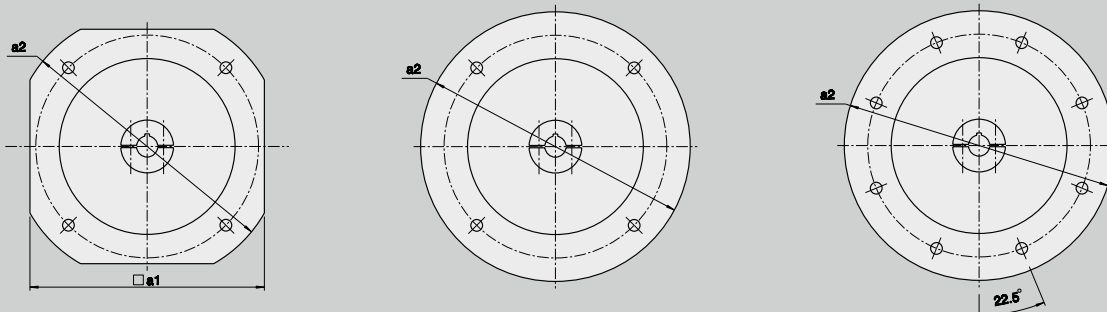
Motor dimensions																				
b1	80	80	95	95	110	110	130	130	95	95	110	110	110	110	130	130	130	130	180	180
e1	100	100	115	115	130	130	165	165	115	115	130	130	130	130	165	165	165	165	215	215
a1	125	125	125	125	130	130	140	140			145	145			145	145			200	
a2	140	140	140	140	160	160	190	190	145	145	160	160	160	160	190	190	200	200	250	250
s2*	4x M6	4x Ø7	4x M8	4x Ø9	4x M8	4x Ø9	4x M10	4x Ø11	4x M8	4x Ø9	4x M8	4x Ø9	4x M8	4x Ø9	4x M10	4x Ø11	4x M10	4x Ø11	4x M12	4x M12
c1	25	25	25	25	25	25	25	25	12	12	12	12	12	12	15	15	15	15	18	18
f1	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

Gearbox dimensions																					
d x l1	Size	L15	Version																		
11 x 23	08	145	C	x	x	x	x	x	x	x	x										
14 x 30		145		x	x	x	x	x	x	x	x										
19 x 40		145		x	x	x	x	x	x	x	x										
24 x 50		145		x	x	x	x	x	x	x	x										
28 x 60		145		x	x	x	x	x	x	x	x										
19 x 40	16	215	A									x	x	x	x	x	x	x	x	x	x
24 x 50		215		x	x	x	x	x	x	x	x										
28 x 60		215		x	x	x	x	x	x	x	x										
32 x 60		215		x	x	x	x	x	x	x	x										
38 x 80		235		x	x	x	x	x	x	x	x										
19 x 40	32	230	A																		
24 x 50		230																			
28 x 60		230																			
32 x 60		230																			
38 x 80		250																			
28 x 60	64	280	A																		
32 x 60		280																			
38 x 80		280																			
42 x 110		310																			
48 x 110		310																			
38 x 80	128	305	A																		
42 x 110		335																			
48 x 110		335																			
55 x 110		335																			
38 x 80		256		370	B																
42 x 110	370																				
48 x 110	370																				
55 x 110	370																				
60 x 140	370																				

* Depth of thread: 2 x Ø or flange thickness



View V

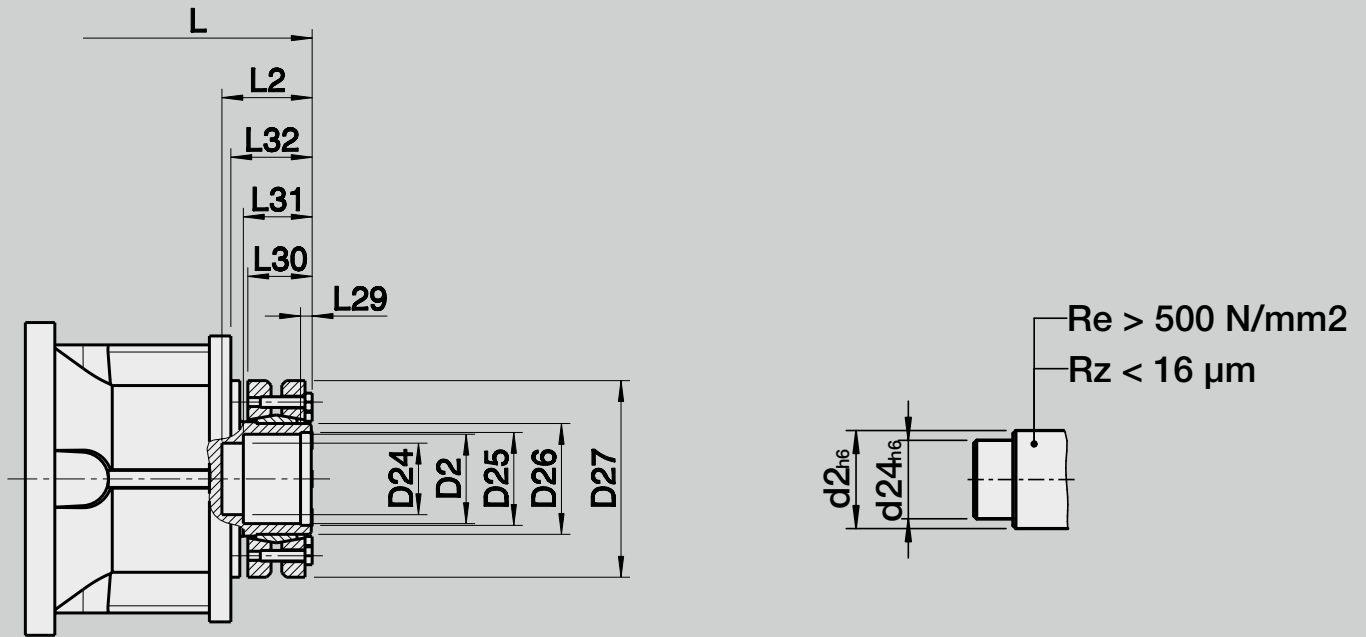


Motor dimensions																									
230	230	130	130	130	130	180	180	230	230	180	180	230	230	250	250	230	230	250	250	300	300	230	250	300	350
265	265	165	165	165	165	215	215	265	265	215	215	265	265	300	300	265	265	300	300	350	350	265	300	350	400
242		145	145			200		242		200		242		260		242		260		345					
300	300	190	190	200	200	250	250	300	300	250	250	300	300	350	350	300	300	350	350	400	400	300	350	400	450
4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	4x	8x
M12	M12	M10	Ø11	M10	Ø11	M12	M12	M12	M12	M12	M12	M12	M12	M12	M16	M16	M12	M12	M16	M16	M16	M16	M12	M16	M16
18	18	15	15	15	15	18	18	18	18	18	18	18	18	18	24	24	18	18	24	24	24	24	25	25	25
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	6	6	5	5	6	6	6	6	7	7	7
x	x																								
x	x																								
x	x																								
x	x																								
		x	x	x	x	x	x	x	x																
		x	x	x	x	x	x	x	x																
		x	x	x	x	x	x	x	x																
		x	x	x	x	x	x	x	x																
		x	x	x	x	x	x	x	x																
										x	x	x	x	x	x										
										x	x	x	x	x	x										
										x	x	x	x	x	x										
										x	x	x	x	x	x										
										x	x	x	x	x	x										
																						x	x	x	x
																						x	x	x	x
																						x	x	x	x
																						x	x	x	x
																						x	x	x	x

* Depth of thread: 2 x Ø or flange thickness

PFH / MPFH / LPFH / MLPFH 08 - 256

MOUNTING SHRINK DISCS TO HOLLOW OUTPUT SHAFTS



Not suitable for cantilever load. A counter bearing or bearing of the shaft is required for radial load.

Size	D2	D24	D25	D26	D27	L2	L29	L30	L31	L32
	H7	H7		f7						
08	50	40	52	62	110,0	45	6	35	33	45
16	60	50	62	80	145,5	55	8	39	37	50
32	70	60	72	90	155,0	65	10	42	44	70
64	90	70	92	120	215,0	85	11	62	59	105
128	110	90	112	155	265,0	100	15	75	71	120
256	140	120	142	185	330,0	133	18	101	98	336

-stage	PFH	MPFH		LPFH/MLPH
		L	d	
1	329	19-32	322,5	-
	-	38	342,5	
2	354	14-32	320,5	-
	400	14-32	366,5	
3	-	11-28	-	391
	394	28-38	-	
1	-	42-55	387,0	-
	400	19-38	417,0	
2	443	14-32	384,0	-
	-	19-38	409,5	
3	465	28-38	424,0	455
	-	42-55	454,0	
1	463	19-32	456,5	-
	-	38	476,5	
2	488	14-32	454,5	-
	-	19-38	529,0	
3	550	38-60	529,0	529
	554	28-38	547,0	
1	-	42-55	577,0	-
	560	19-38	544,0	
2	-	28-48	-	636
	678	38-60	604,0	
3	-	28-38	637,0	-
	676	52-55	667,0	
1	676	19-32	669,5	-
	-	38	689,5	
2	-	38-55	-	760
	836	38-60	815,0	
3	840	28-38	833,0	-
	-	42-55	863,0	
		38-60		958

ENQUIRY AND ORDER FORM

Vogel-Project number

(to be filled out by VOGEL representative):

Customer / Company	Line
Customer no.	Note
Street	
Postal code	Place
Country	Registered by (Name of contact at VOGEL)
Contact person	Date
Phone	Fax
E-mail	Reply fax to ...
Date	Telefax: +49 7022 / 6001-
	Reply e-mail to ...

ENQUIRY AND ORDER FORM

Gearbox data

Quantity

Gearbox type

Gearbox size

Ratio

Construction type

Symbol

Unit

i

Backlash

j

arcmin

Standard

Reduced

Value

Operating hours/year:

Operating hours/day:

Duty:

%

ED

Lubrication

Synthetic

Oil

For use in the food industry

Mineral

Grease

Side under:

Breather side:

Oil sight glass side:

Drainage side:

Gearbox performance data

Symbol

Unit

Nominal input speed

n_{1N}

min^{-1}

Max. input speed

$n_{1\text{maxzul}}$

min^{-1}

Nominal output torque

$T_{2N\text{zul}}$

Nm

Max. output torque

$T_{2\text{max}}$

Nm

Nominal power input

P_{1N}

kW

Max. power input

$P_{1\text{max}}$

kW

Gearbox shaft loads output

Symbol

Unit

Radial load output

F_{2r}

N

Distance radial

y_2

mm

Distance axial

x_2

mm

Axial load output

F_{2a}

N

Distance radial

y_2

mm

Distance axial

x_2

mm

According to drawing

ENQUIRY AND ORDER FORM

Application

Duty type

No. of cycles

Z 1/h

Ambient temperature

°C

Ambient air

Free of particles Dust
 Fibres Gas

Other:

Customer drawing - Application - Number

Motor data

Symbol

Unit

Motor type

Capacity

kW

Speed

min⁻¹

Outer dim. flange

mm

Centring-Ø (b1)

mm

Pitch circle-Ø (e1)

mm

Motor mounting (s2)

Motor shaft (Ø d x l1)

mm

Direct connection

Yes No

Connection through coupling:

Additional data for ATEX versions

Symbol

Unit

Category:

Zone:

Explosion group:

Temperature class:

Max. surface temperature:

°C

Note!

Missing data will be clarified individually. Further information following design.

Further information/requirements: