



Industrial gearboxes



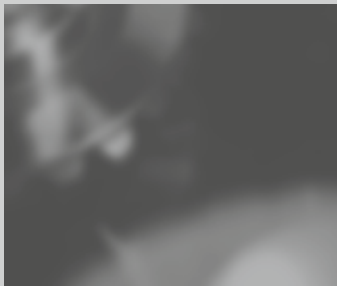
SERVO gears



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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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.

DIMENSIONING AND SELECTION

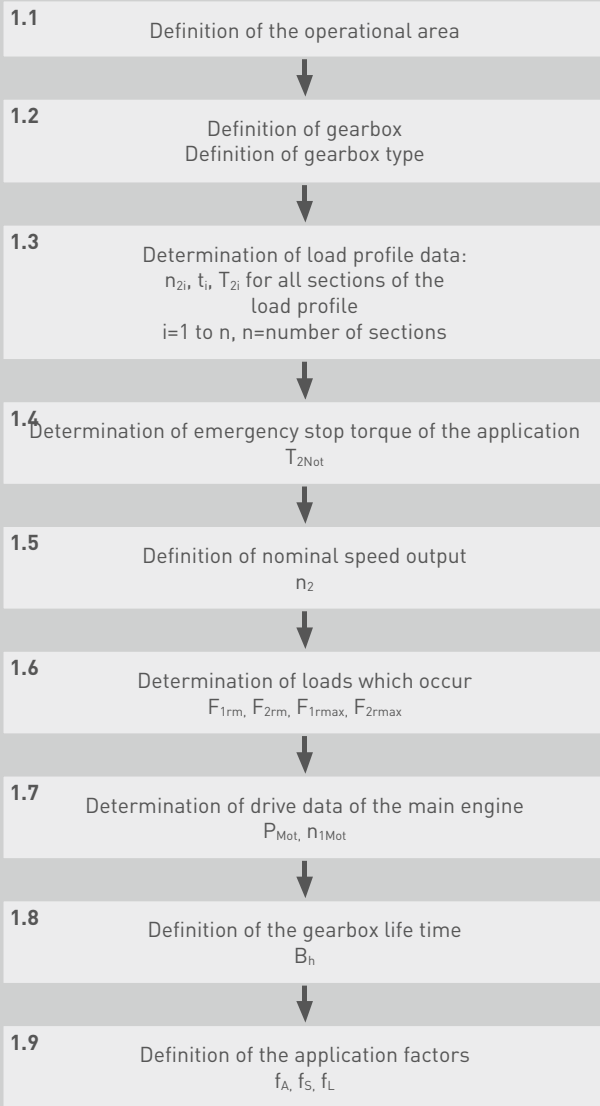
Formula symbols and indices

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

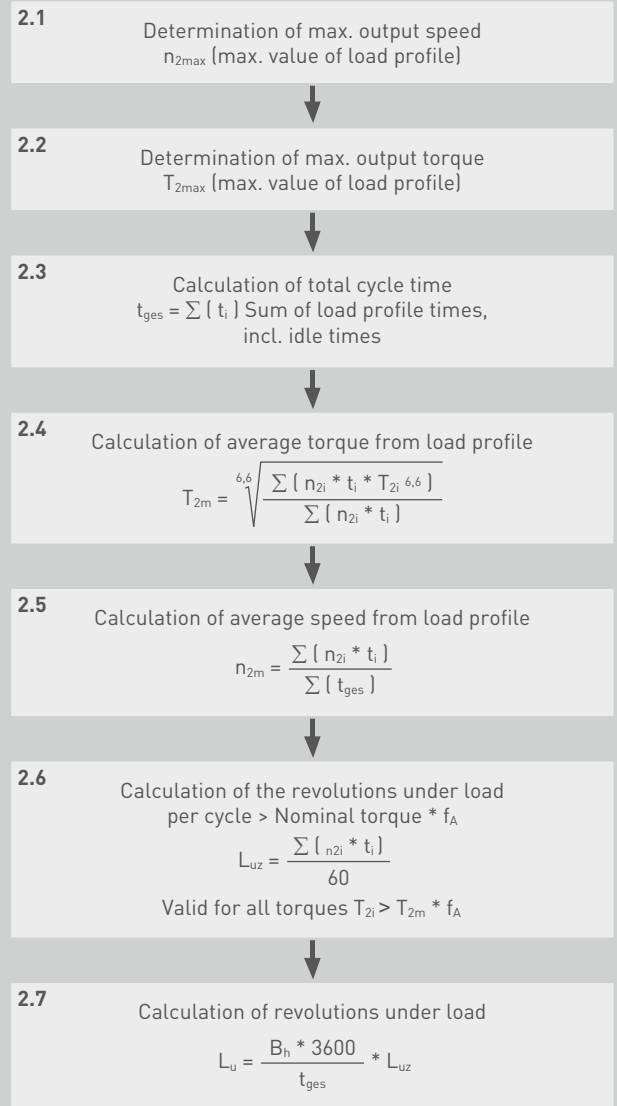
Designation	Unit	Symbol
Nominal input speed	min ⁻¹	n ₁
Average input speed	min ⁻¹	n _{1m}
Maximum input speed	min ⁻¹	n _{1max}
Max. input speed	min ⁻¹	n _{1maxzul}
Nominal speed main engine	min ⁻¹	n _{1Mot}
Permissible average input speed	min ⁻¹	n _{1mzul}
Nominal output speed	min ⁻¹	n ₂
Output speed	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



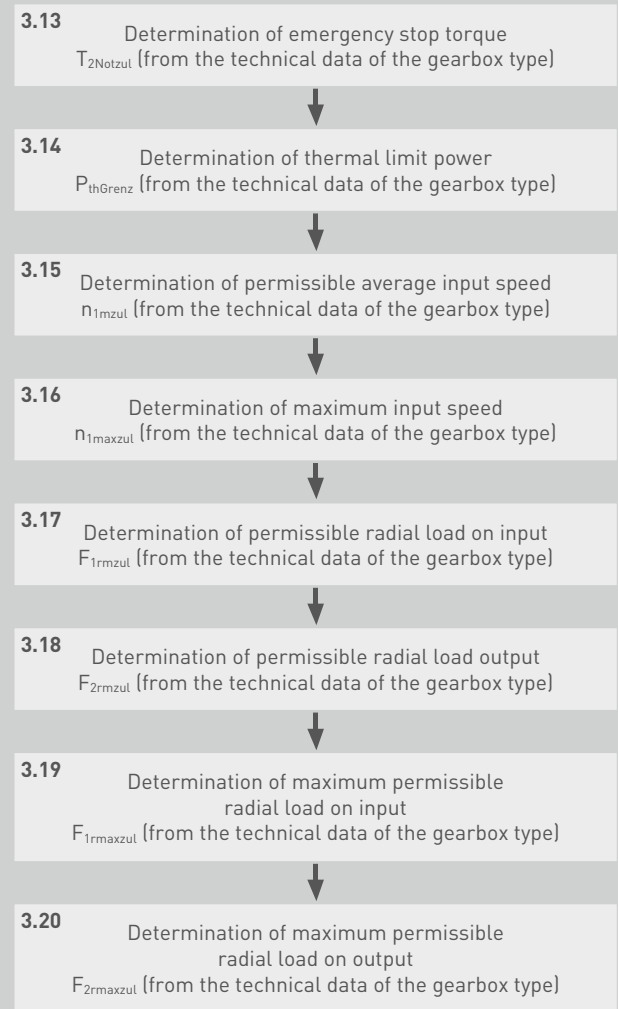
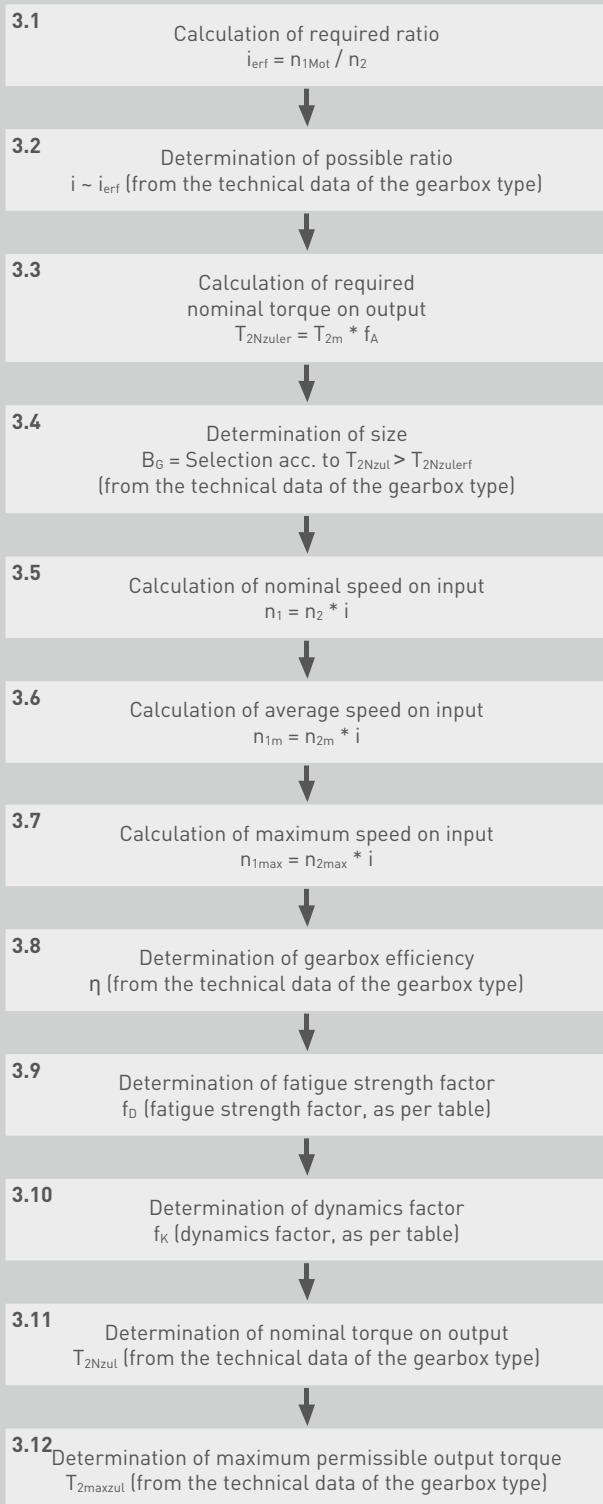
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2

3

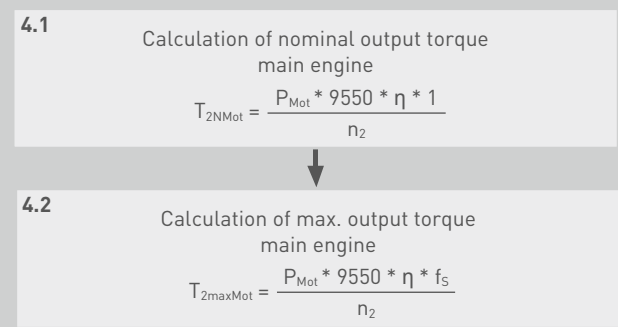
DETAILED GEARBOX SELECTION

3 Determination of gearbox values



4

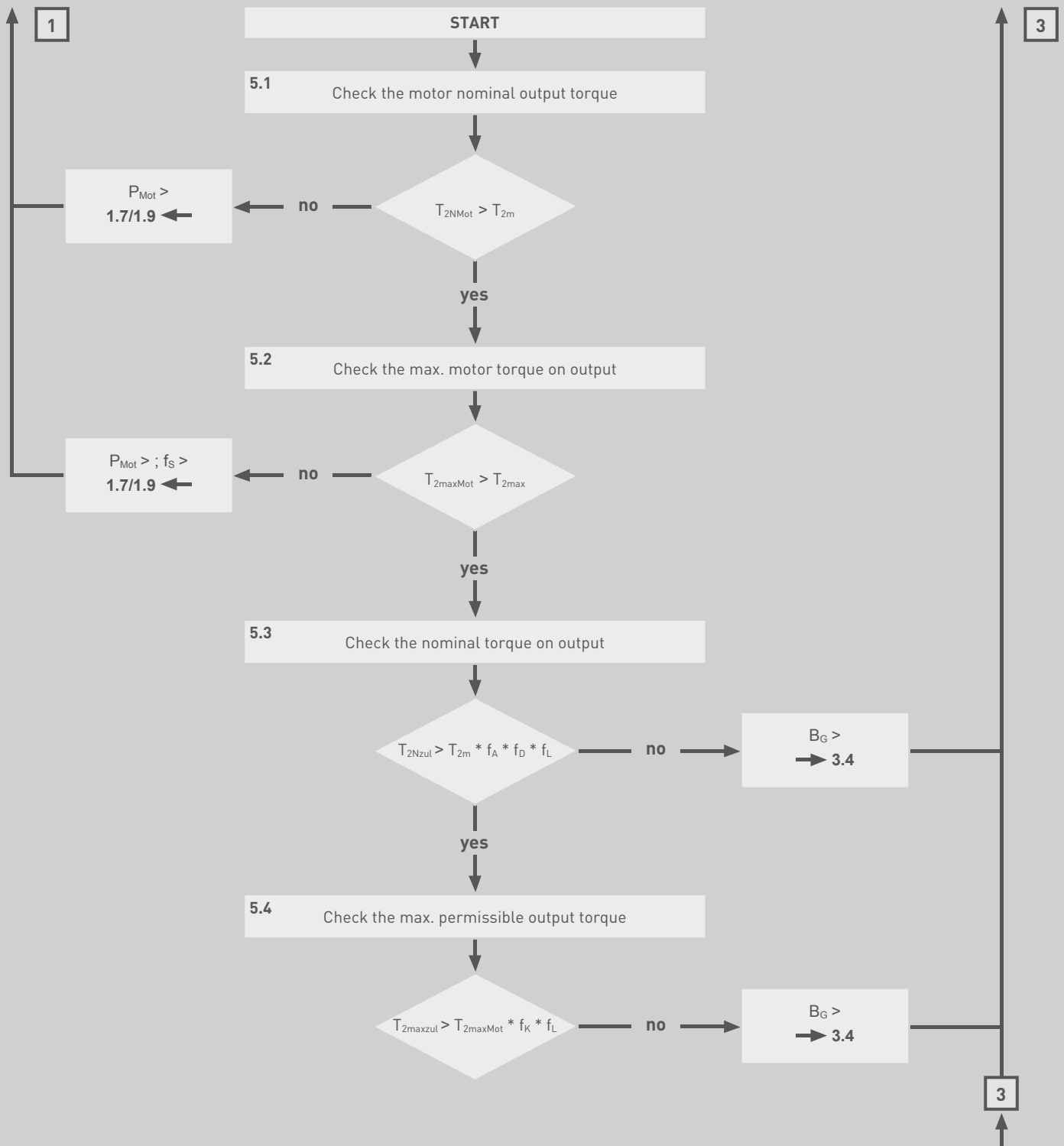
4 Determination of main engine



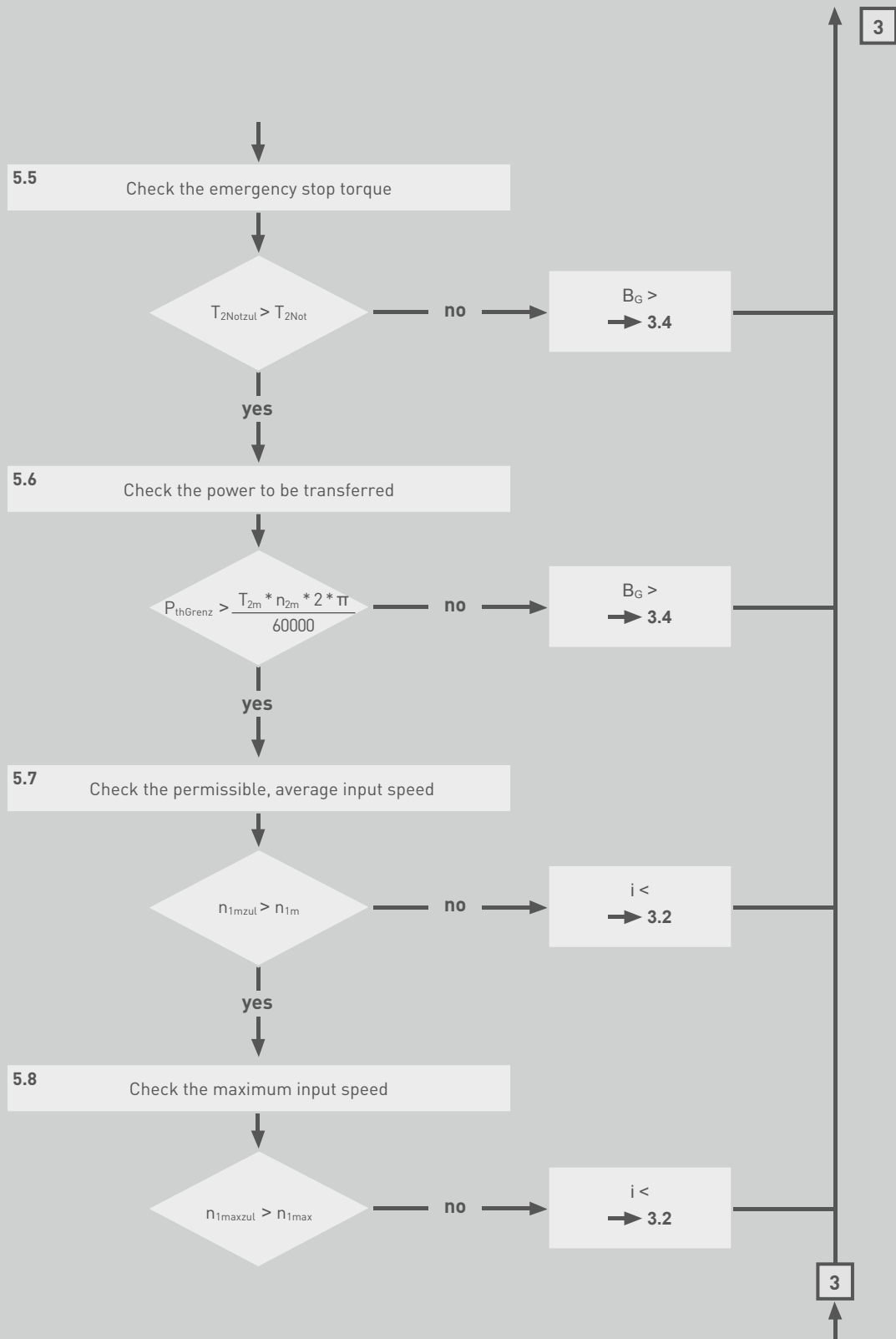
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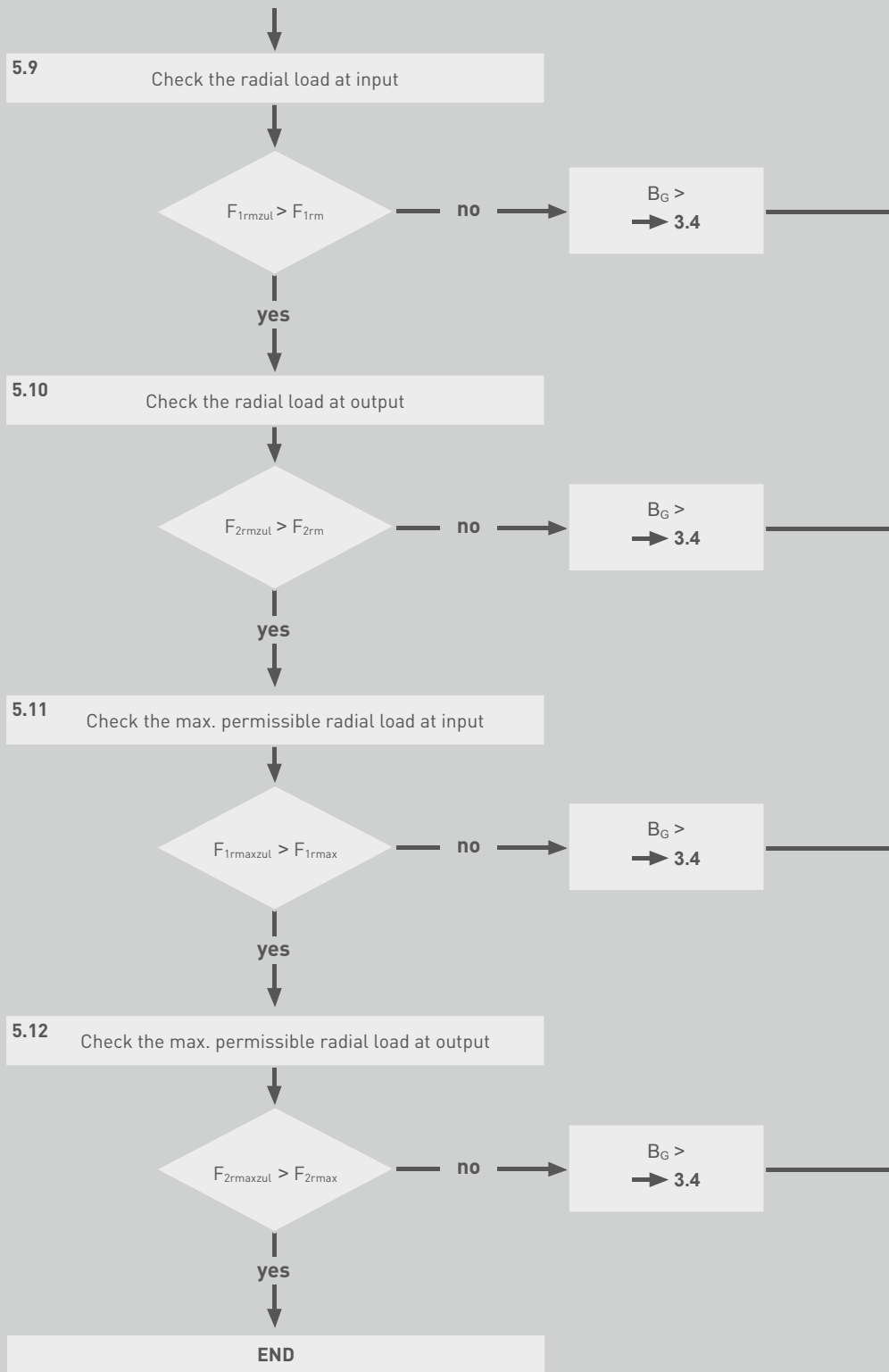
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5 Comparison of the gearbox with the application



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										
	Operating time per day	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
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			
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.)	a.)
	Washing filters	-	-	1.50	-	-	2.00	-	-	1.75	
	Yankee cylinders (drying technology)	a.)	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

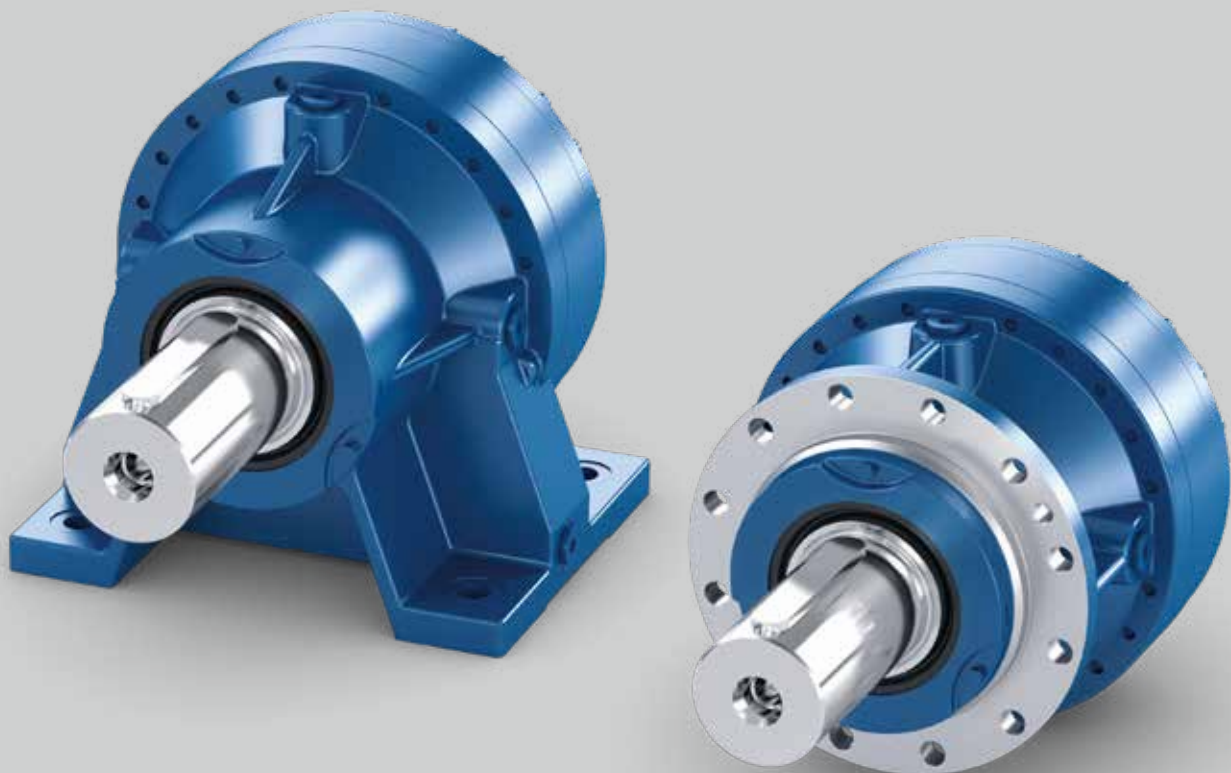
9 From the technical data of the gearbox type, at permissible average input speed

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	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		
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	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		
Max. input speed	n _{1maxzul}	min ⁻¹	2644	3111	3250	3250	3250	3750	3750	3750	3750	3750	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		
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 (Tu = 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	150404	
Max. permissible radial load output	F _{2rmaxzul}	N	152000						152000					
Efficiency	η	-	0,96						0,95					
Thermal limit power (Tu = 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

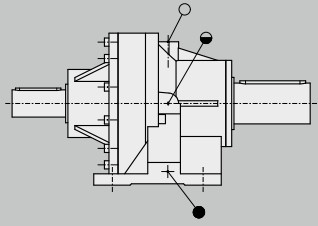
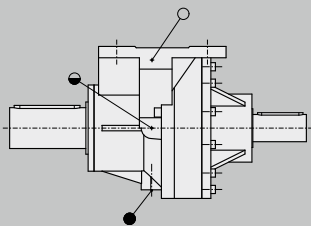
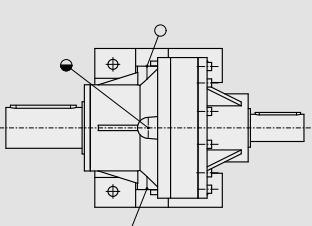
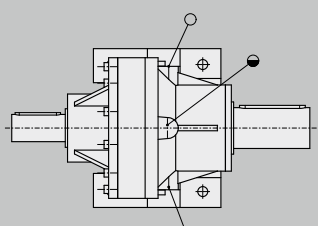
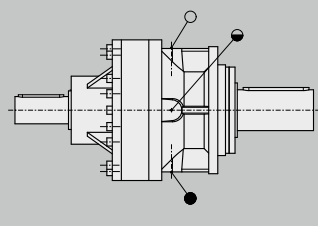
P / PF			512										
Gear stage			2					3					
Ratio	i		13,60	16,00	20,00	25,00	35,00	46,24	68,00	100,00	125,00	175,00	245,00
Combination	i		3,4x4	4x4	5x4	5x5	7x5	3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5
Max. permissible output torque	T _{2maxzul}	Nm	79900	79900	79900	66300	66300	79900	66300	79900	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
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 / P F / P F H

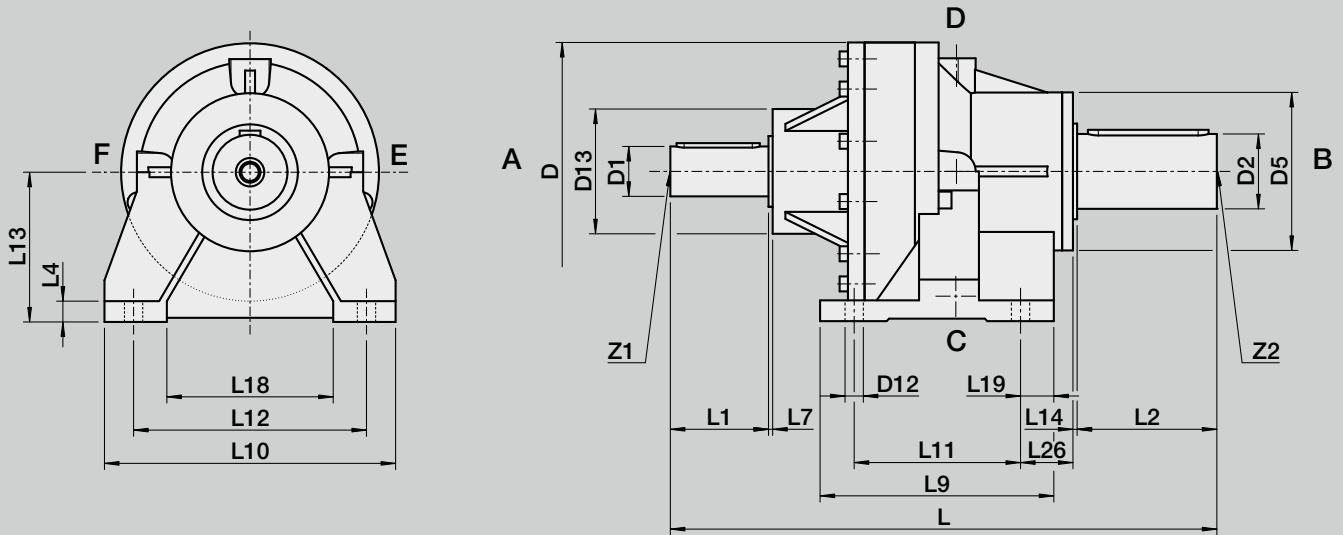
MOUNTING POSITION AND LUBRICATION

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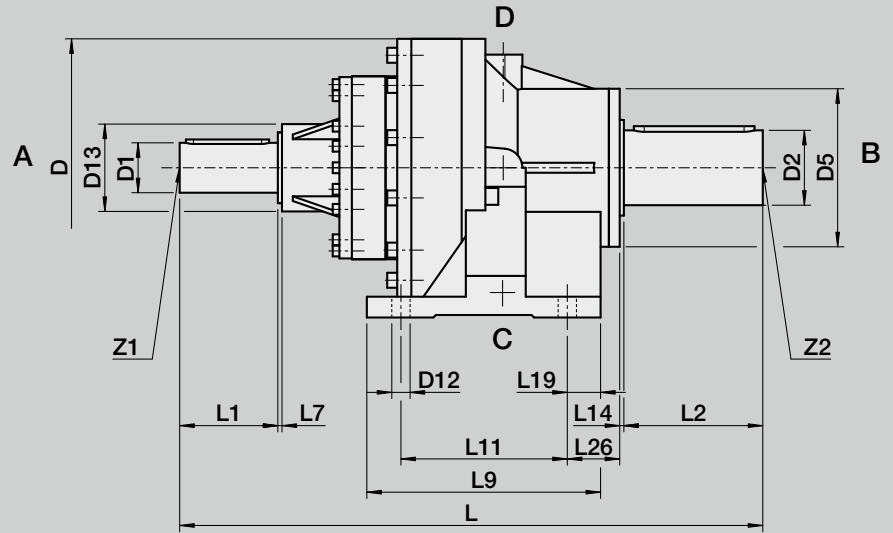
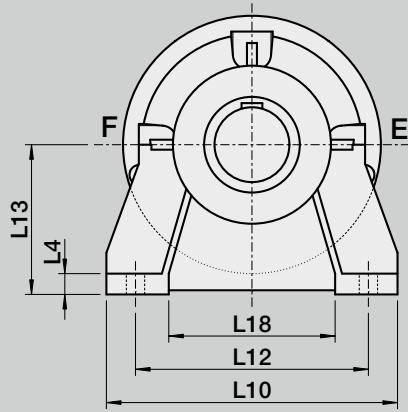
D I M E N S I O N S 1 - S T A G E



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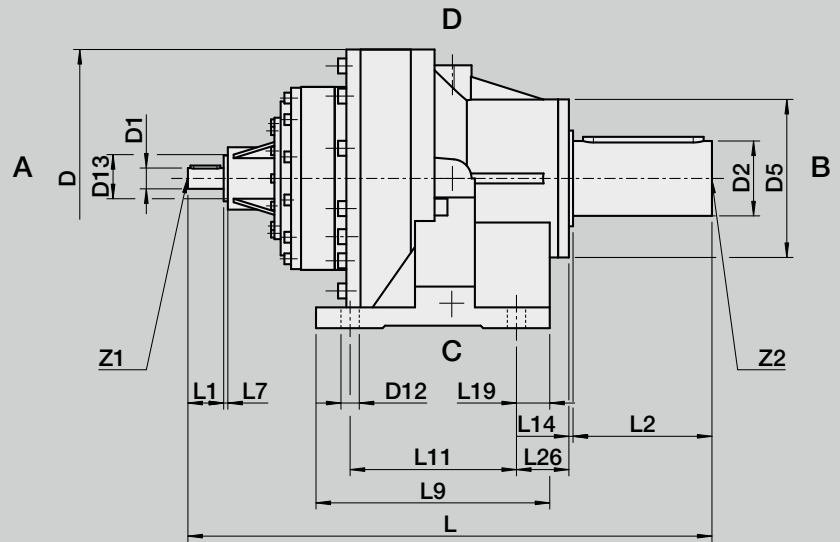
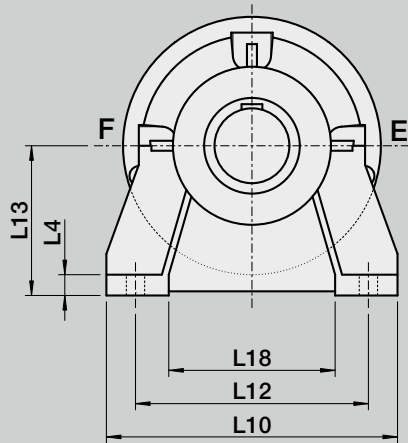
D I M E N S I O N S 2 - S T A G E



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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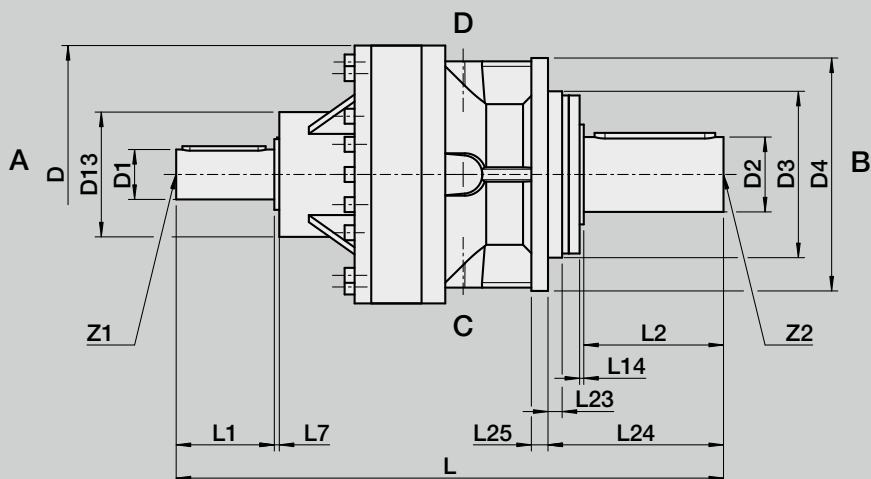
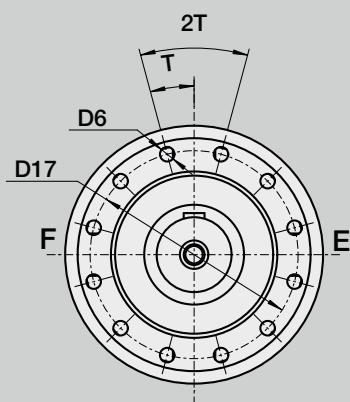
DIMENSIONS 3 - STAGE



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

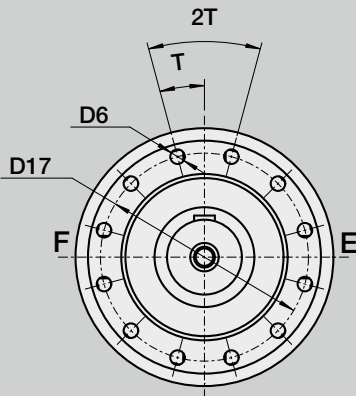
P F 0 8 - P F 1 2 8
D I M E N S I O N S 1 - S T A G E



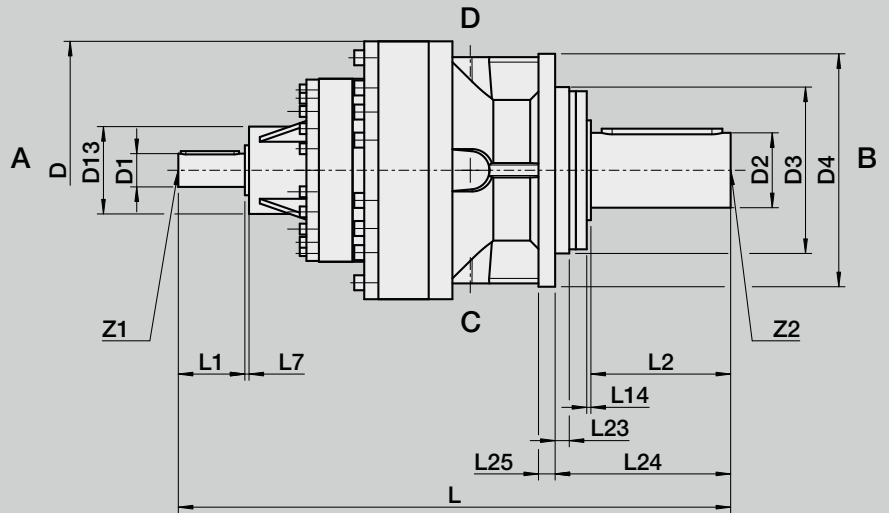
L25	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	T	2T	Z1 DIN 332	Z2 DIN 332
12	A 10 x 8 x 50	A 14 x 9 x 90	15°	12 x 30°	D M12	D M16
15	A 12 x 8 x 70	A 18 x 11 x 100	15°	12 x 30°	D M16	D M20
20	A 14 x 9 x 90	A 20 x 12 x 120	15°	12 x 30°	D M16	D M20
20	A 18 x 11 x 100	A 25 x 14 x 145	15°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

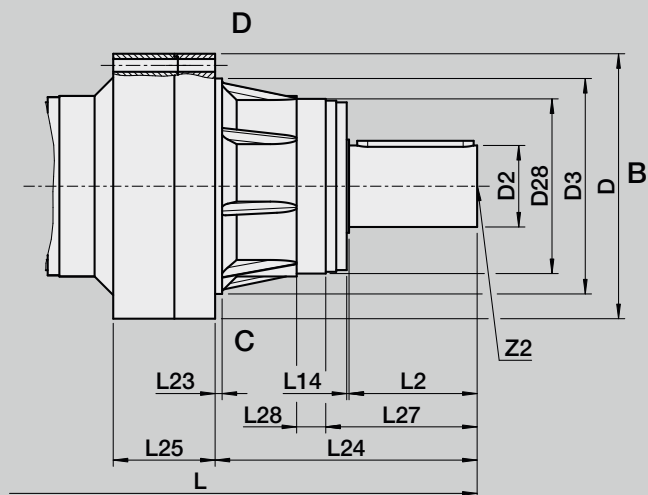


Size	Ratio	D	D1 x L1	D2 x L2	D3	D4	D6	D13	D17	D28	L	L7	L14	L23
			j6	j6	f7					f7				
08	13,6 - 35,0	175	20 x 45	50 x 100	110	160	9,0	75	130	-	415	1	1	5
16	13,6 - 35,0	220	25 x 45	60 x 120	130	200	11,0	75	165	-	476	1	1	5
32	13,6 - 35,0	265	32 x 60	70 x 140	150	230	13,5	90	195	-	548	1	2	13
64	13,6 - 35,0	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

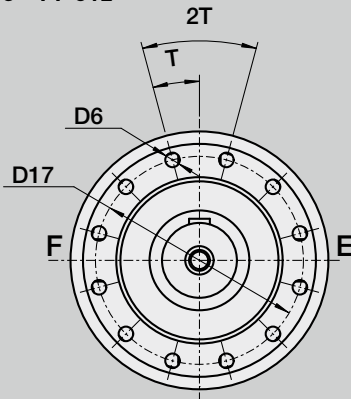
PF 256



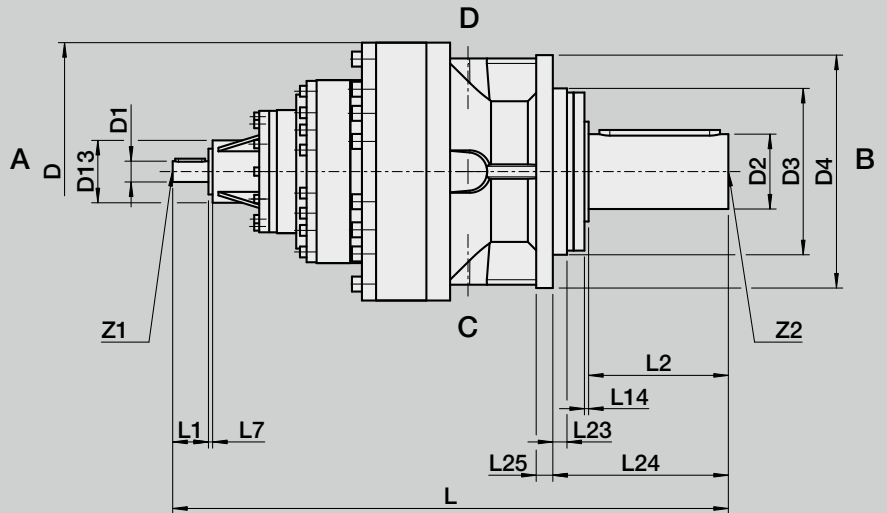
L24	L25	L27	L28	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	T	2T	Z1 DIN 332	Z2 DIN 332
106	12	-	-	A 10 x 8 x 50	A 14 x 9 x 90	15°	12 x 30°	D M12	D M16
126	15	-	-	A 12 x 8 x 70	A 18 x 11 x 100	15°	12 x 30°	D M16	D M20
155	20	-	-	A 10 x 8 x 50	A 20 x 12 x 120	15°	12 x 30°	D M12	D M20
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

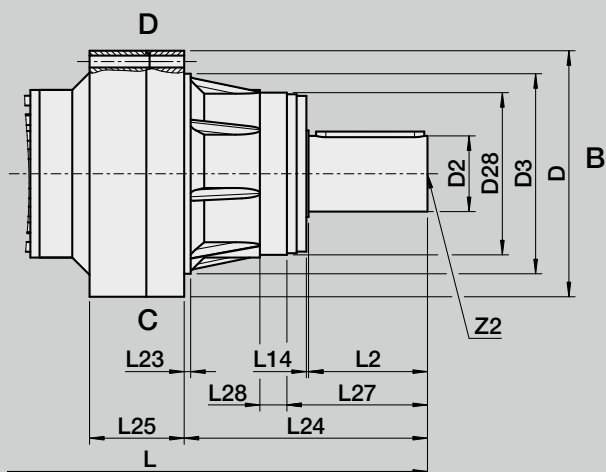


Size	Ratio	D	D1 x L1	D2 x L2	D3	D4	D6	D13	D17	D28	L	L7	L14	L23
			j6	j6	f7					f7				
08	46,24 - 245,00	175	20 x 45	50 x 100	110	160	9,0	75	130	-	461	1	1	5
16	46,24 - 245,00	220	20 x 45	60 x 120	130	200	11,0	75	165	-	519	1	1	5
32	46,24 - 245,00	265	20 x 45	70 x 140	150	230	13,5	75	195	-	573	1	2	13
64	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 _{2rmmaxzul}	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	4,90					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)	Ø 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
	Ø 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
	Ø 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
	Ø 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
	Ø 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
	Ø 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	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		
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	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		
Max. input speed	$n_{1maxzul}$	min ⁻¹	2644	3111	3250	3250	3250	3750	3750	3750	3750	3750	4000	4000	4000	4000	4000		
Max. backlash*	j	arcmin	≤ 10					≤ 15					≤ 20						
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	
Maximum permissible radial load output	$F_{2rmaxzul}$	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)	Ø d 14	J_1	kgcm ²	-	-	-	-	-	-	-	-	-	3,24	3,10	2,66	2,65	2,56	2,55	
	Ø 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
	Ø 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
	Ø 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
	Ø 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
	Ø 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	-	-	-	-	-	-
	Ø d 42	J_1	kgcm ²	67,34	60,40	55,06	50,87	49,21	-	-	-	-	-	-	-	-	-	-	-
	Ø d 48	J_1	kgcm ²	77,20	70,27	64,93	60,74	59,08	-	-	-	-	-	-	-	-	-	-	-
	Ø 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	$F_{2rmazul}$	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	$F_{2rmazul}$	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

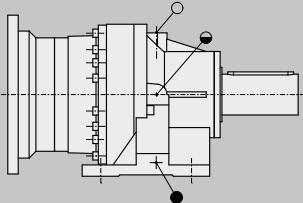
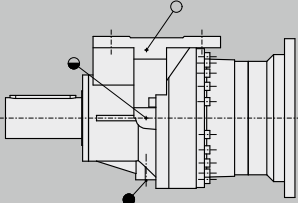
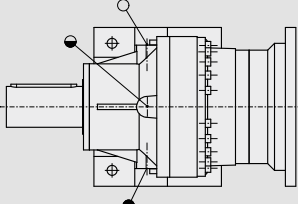
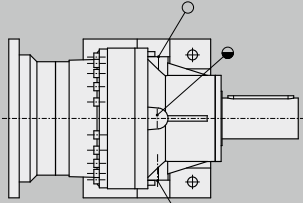
MP / MPF			512					
Gear stage			3					
Ratio	i		46,24	68,00	100,00	125,00	175,00	245,00
Combination	i		3,4x3,4x4	3,4x4x5	5x5x4	5x5x5	7x5x5	7x7x5
Maximum permissible output torque	T _{2maxzul}	Nm	79900	66300	79900	66300	66300	66300
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	50000	40000	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)	∅ 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

-  Breather
-  Sight glass
-  Drainage



M P F

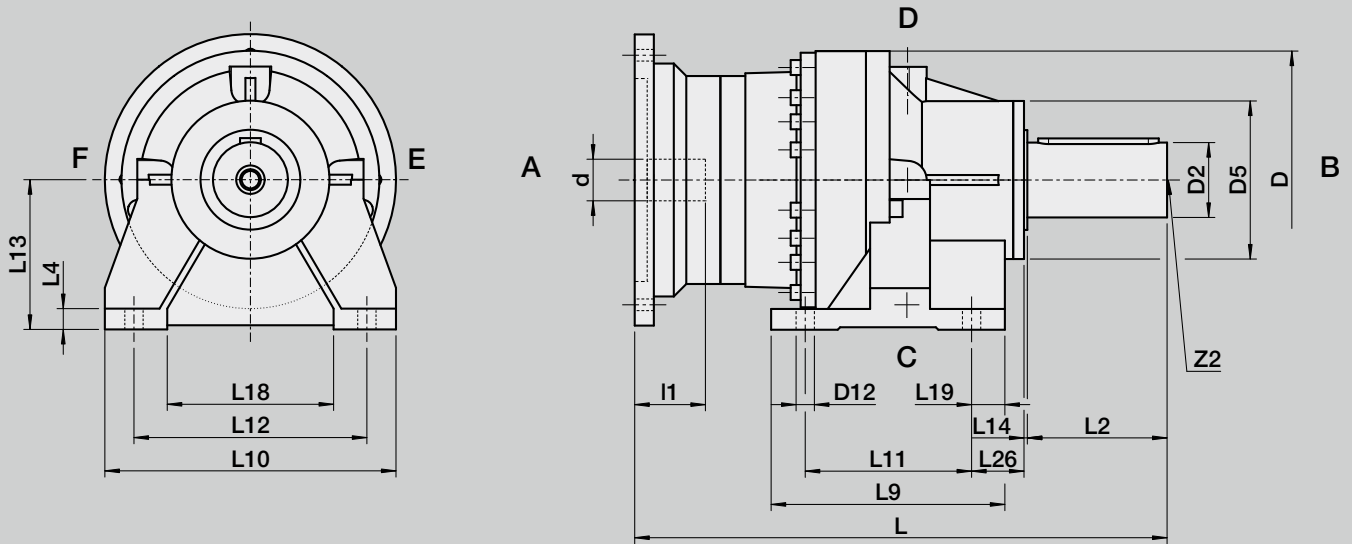
MOUNTING POSITION AND LUBRICATION

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					403,5				
		32 x 60									
16	3,4 - 9,0	38 x 80	220	60 x 120	130	17,5	463,0	16	180	260	140
		28 x 60									
		32 x 60									
		38 x 80									
		42 x 110					493,0				
48 x 110											
55 x 110											
32	3,4 - 9,0	28 x 60	265	70 x 140	150	17,5	509,0	22	230	310	170
		32 x 60									
		38 x 80					539,0				
		42 x 110									
		48 x 110									
64	3,4 - 9,0	55 x 110	310	90 x 170	190	22,0	634,0	25	281	350	200
		60 x 140									
		38 x 80					730,0				
		42 x 110									
128	3,4 - 9,0	48 x 110	380	110 x 210	240	26,0	730,0	25	290	420	220
		55 x 110									
		60 x 140									



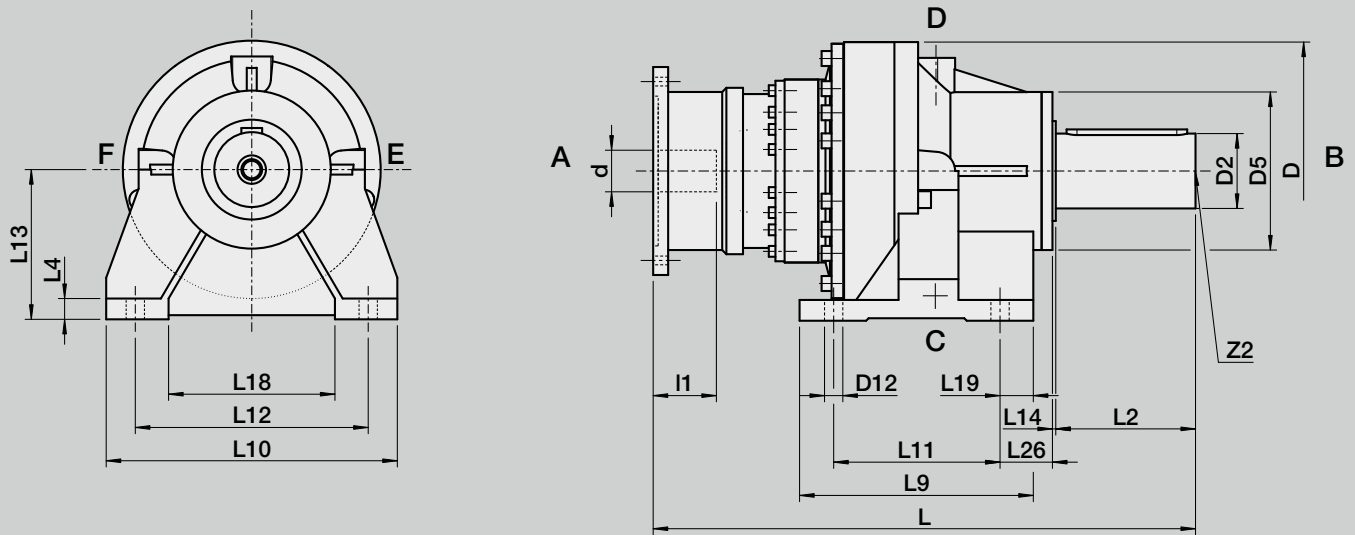
MP 08 - MP 128

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					561,5				
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					682,0				
		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					793,0				
		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									



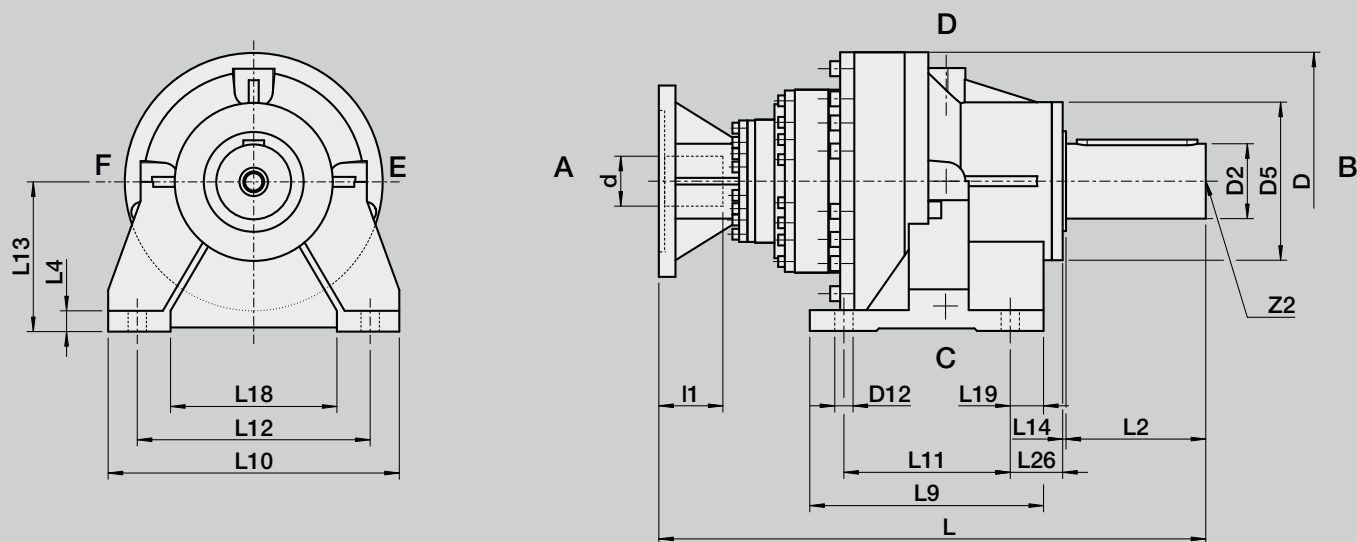
MP 08 - MP 256

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										

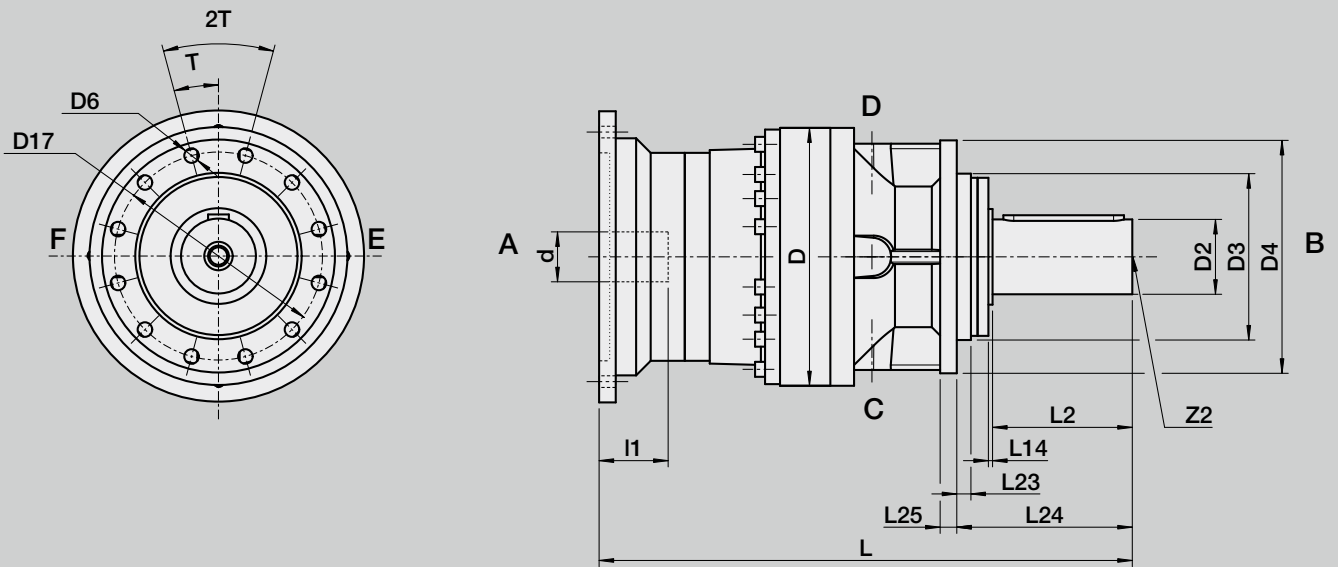


MP 08 - MP 256

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							



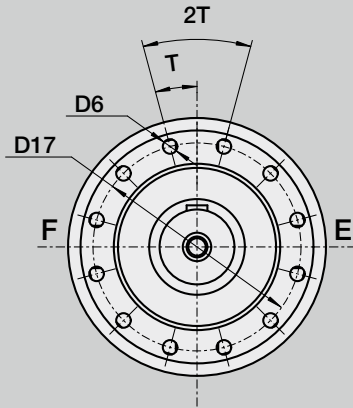
M P F 0 8 - M P F 1 2 8
D I M E N S I O N S 1 - S T A G E

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

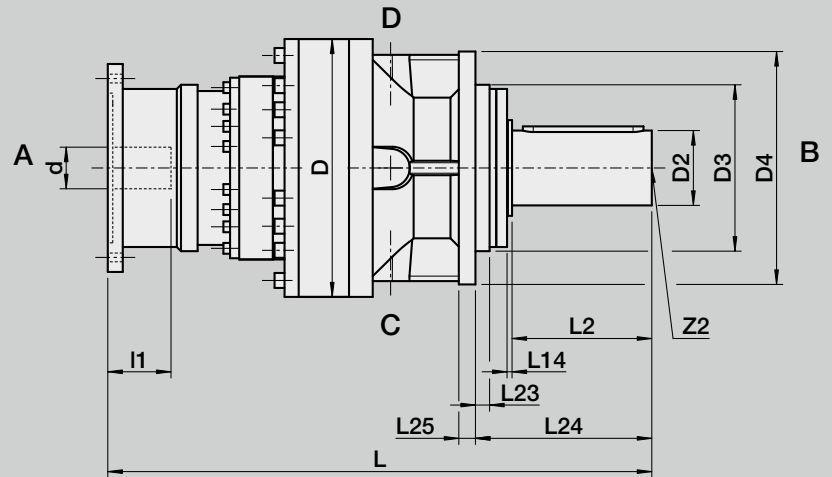
MPF 08 - MPF 256

DIMENSIONS 2-STAGE

MPF 08 - MPF 128



MPF 08 - MPF 128

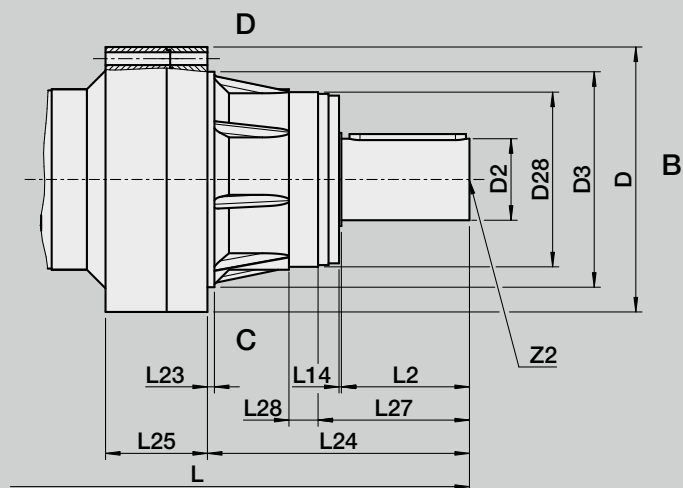


Size	Ratio	d x l1	D	D2 x L2	D3	D4	D6	D17	D28	L	L14
		G7		j6	f7				f7		
08	13,6 - 35,0	14 x 30	175	50 x 100	110	160	9,0	130	-	381,5	1
		19 x 40									
		24 x 50									
		28 x 60									
		32 x 60									
16	13,6 - 35,0	19 x 40	220	60 x 120	130	200	11,0	165	-	460,0	1
		24 x 50									
		28 x 60									
		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

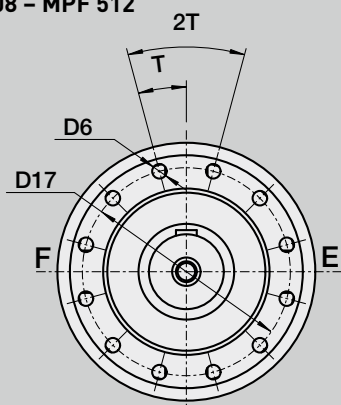


L23	L24	L25	L27	L28	Key D2 according to DIN 6885/1	T	2T	Z2
5	106	12	-	-	A 14 x 9 x 90	15°	12 x 30°	D M16
5	126	15	-	-	A 18 x 11 x 100	15°	12 x 30°	D M20
13	155	20	-	-	A 20 x 12 x 120	15°	12 x 30°	D M20
12	210	20	-	-	A 25 x 14 x 145	15°	12 x 30°	D M24
18	246	25	-	-	A 28 x 16 x 180	15°	12 x 30°	D M24
12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

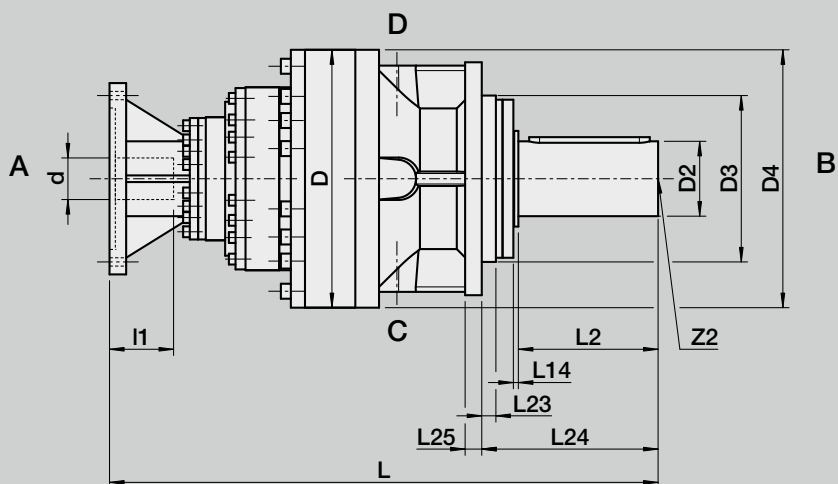
MPF 08 - MPF 512

DIMENSIONS 3-STAGE

MPF 08 - MPF 512



MPF 08 - MPF 128, PF 512

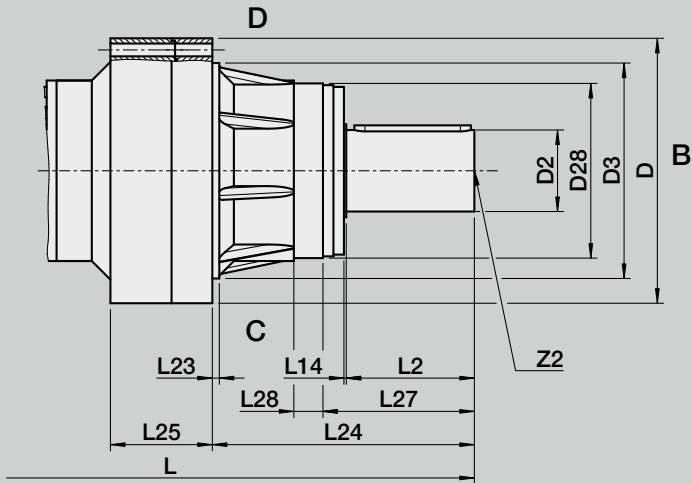


Size	Ratio	d x l1	D	D2 x L2	D3	D4	D6	D17	D28	L	L14
		G7		j6	f7				f7		
08	46,24 - 245,00	14 x 30	175	50 x 100	110	160	9,0	130	-	427,5	1
		19 x 40									
		24 x 50									
		28 x 60									
16	46,24 - 245,00	14 x 30	220	60 x 120	130	200	11,0	165	-	485,5	1
		19 x 40									
		24 x 50									
		28 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



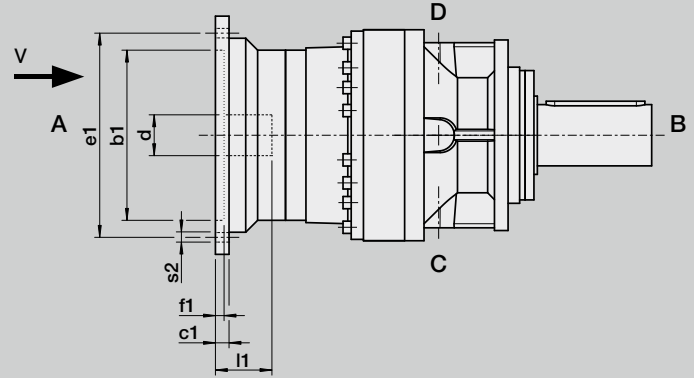
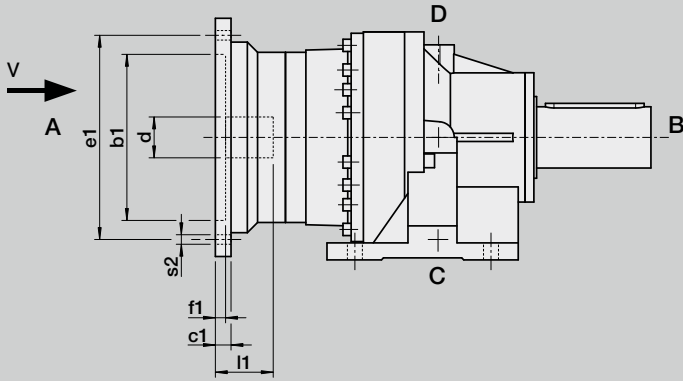
L23	L24	L25	L27	L28	Key D2 according to DIN 6885/1	T	2T	Z1	Z2
5	106	12	-	-	A 14 x 9 x 90	15°	12 x 30°		D M16
5	126	15	-	-	A 18 x 11 x 100	15°	12 x 30°		D M20
13	155	20	-	-	A 20 x 12 x 120	15°	12 x 30°		D M20
12	210	20	-	-	A 25 x 14 x 145	15°	12 x 30°		D M24
18	246	25	-	-	A 28 x 16 x 180	15°	12 x 30°		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									
G7											
19 x 40	08	A	x	x	x	x	x	x	x	x	x
24 x 50			x	x	x	x	x	x	x	x	x
28 x 60			x	x	x	x	x	x	x	x	x
32 x 60			x	x	x	x	x	x	x	x	x
38 x 80			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											

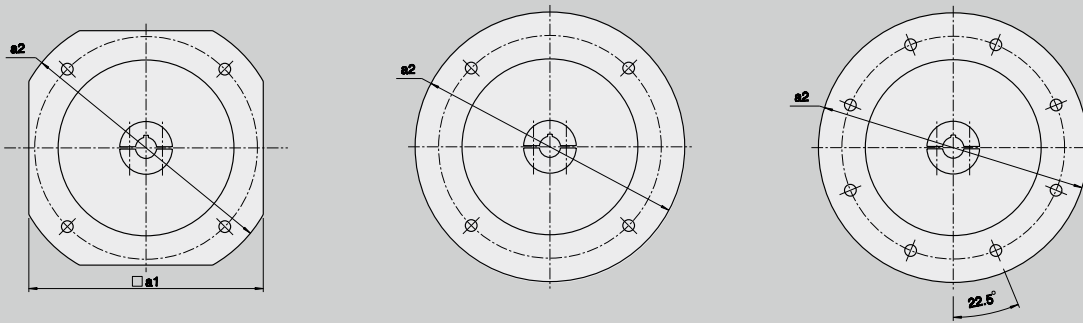
* Depth of thread: 2 x Ø or flange thickness



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

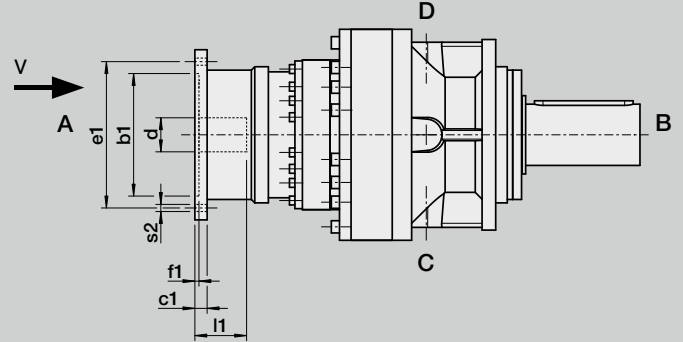
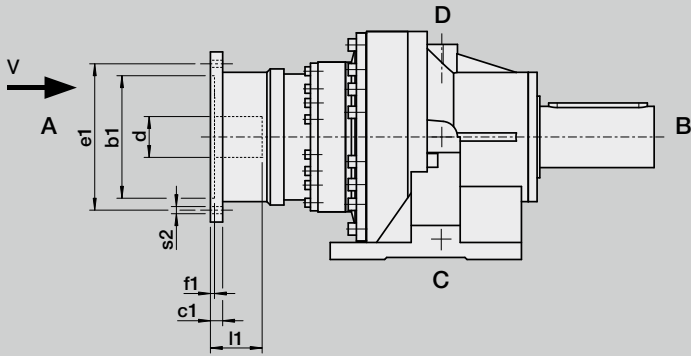
* Depth of thread: 2 x Ø or flange thickness

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

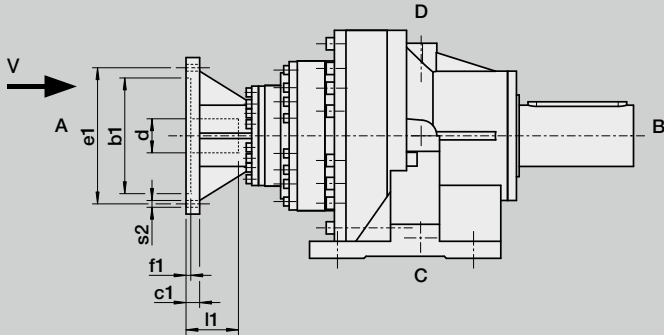
d x l1	Size	Version													
G7															
14 x 30	08	C	x	x	x	x	x	x	x						
19 x 40			x	x	x	x	x	x	x						
24 x 50			x	x	x	x	x	x	x	x					
28 x 60			x	x	x	x	x	x	x	x					
32 x 60			x	x	x	x	x	x	x	x					
19 x 40	16	C								x	x	x			
24 x 50										x	x	x			
28 x 60											x	x	x		
32 x 60											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

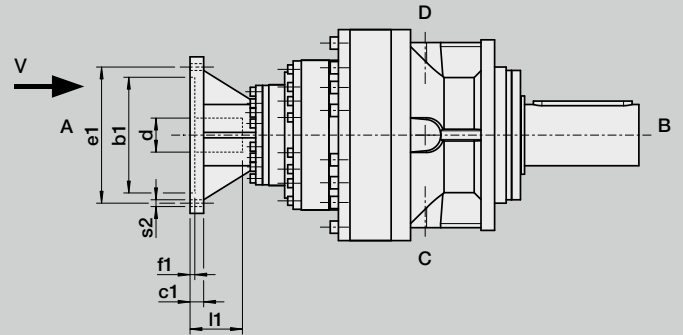
MP / MPF

DIMENSIONS MOTOR MOUNTING 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



L P

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

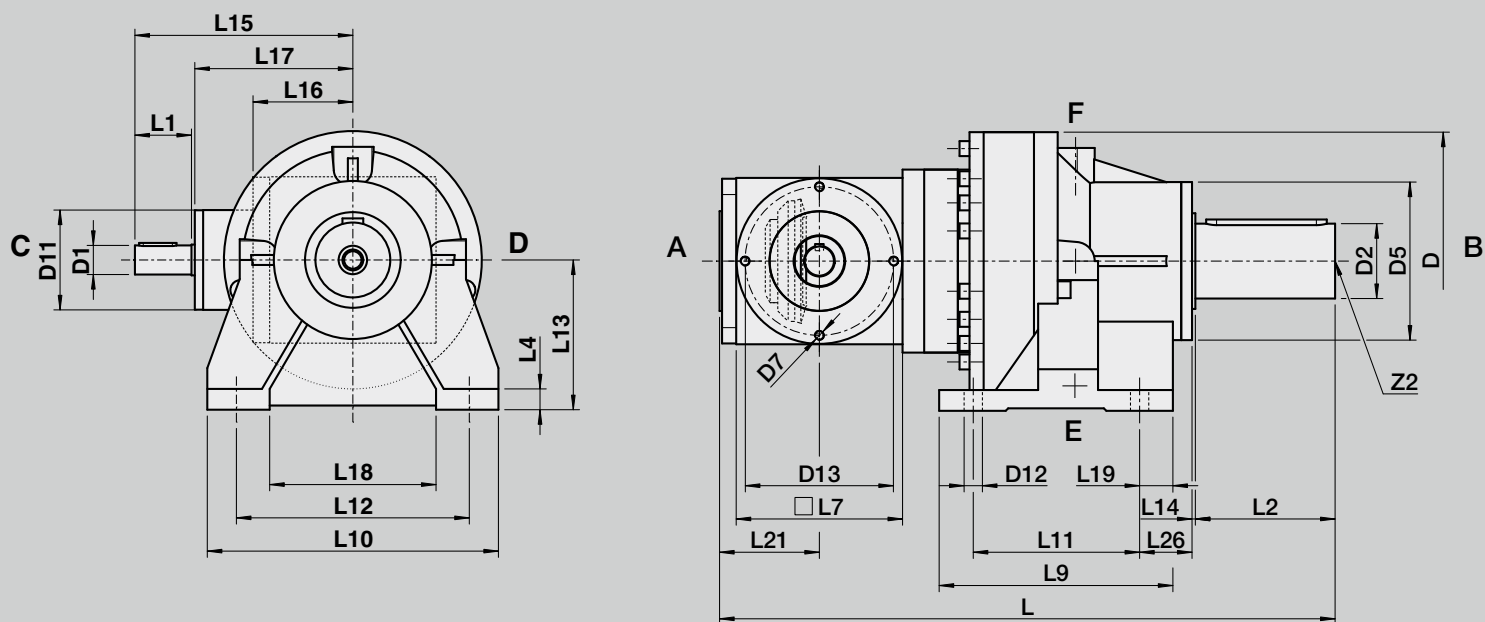
MOUNTING POSITION AND LUBRICATION

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

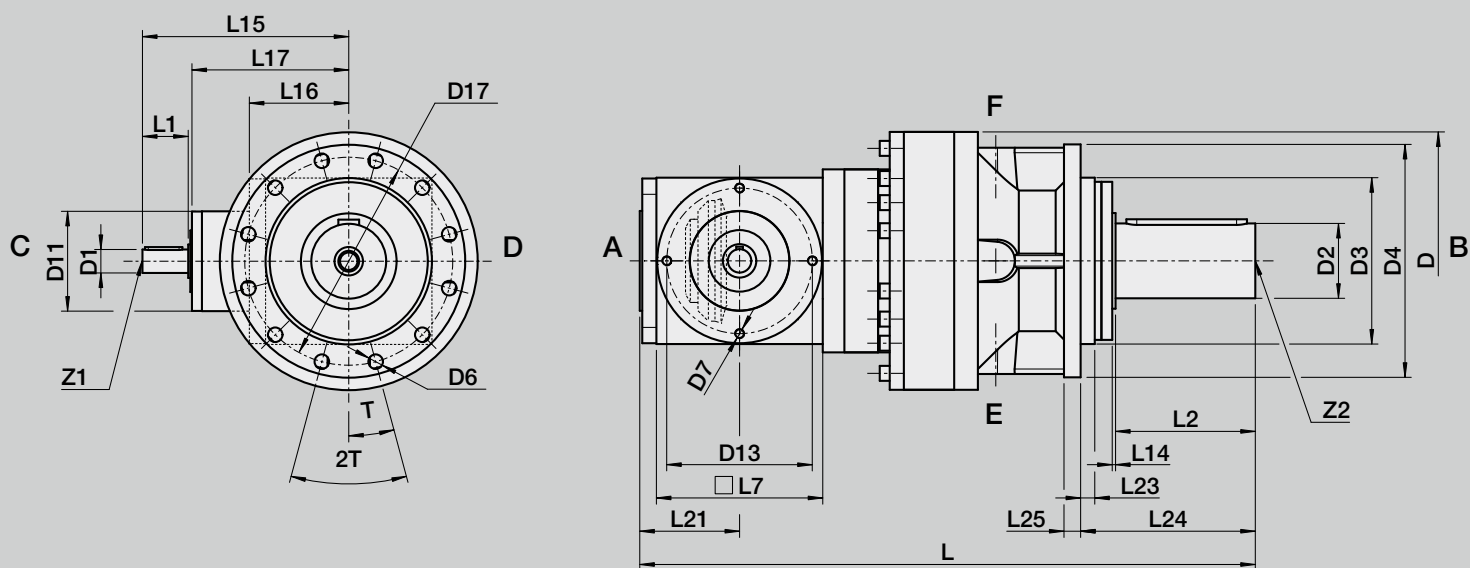


Size	Ratio	D	D1 x L1	D2 x L2	D5	D7	D11	D12	D13	L	L4	L7	L9	L10
			j6	j6										
08	60 - 80	175	20 x 40	50 x 100	108	M10	80	11,0	100	452	12	120	150	205
	100 - 210		15 x 30											
16	60 - 80	220	28 x 50	60 x 120	130	M10	95	17,5	115	531	16	140	180	260
	100 - 210		24 x 50											
32	60 - 80	265	28 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											

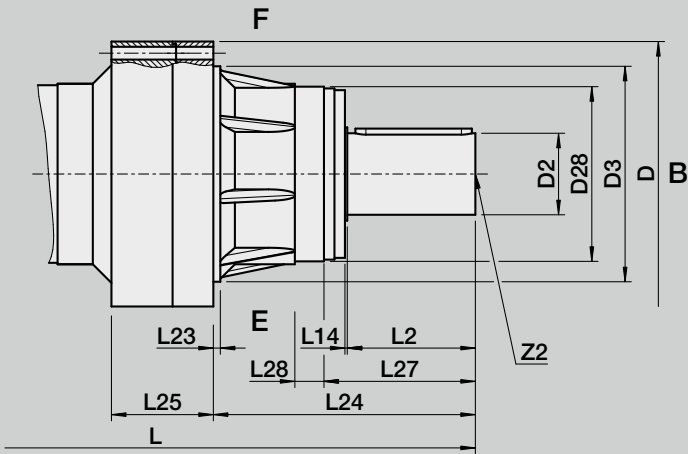


L11	L12	L13	L14	L15	L16	L17	L18	L19	L21	Key D1 according to DIN 6885/1	Key D2 according to DIN 6885/1	Z1	Z2
120	170	100	1	157 147	75	115	135	15	75	6 x 6 x 30 5 x 4 x 20	A 14 x 9 x 90	D M 6 D M 5	D M16
140	215	130	1	195	83	143	170	20	85	8 x 7 x 40 8 x 7 x 40	A 18 x 11 x 100	D M10 D M 8	D M20
170	255	160	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 (Tu = 20° 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 (Tu = 20° 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	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 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 ($T_u = 20^\circ$ 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	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 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 ($T_u = 20^\circ$ 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

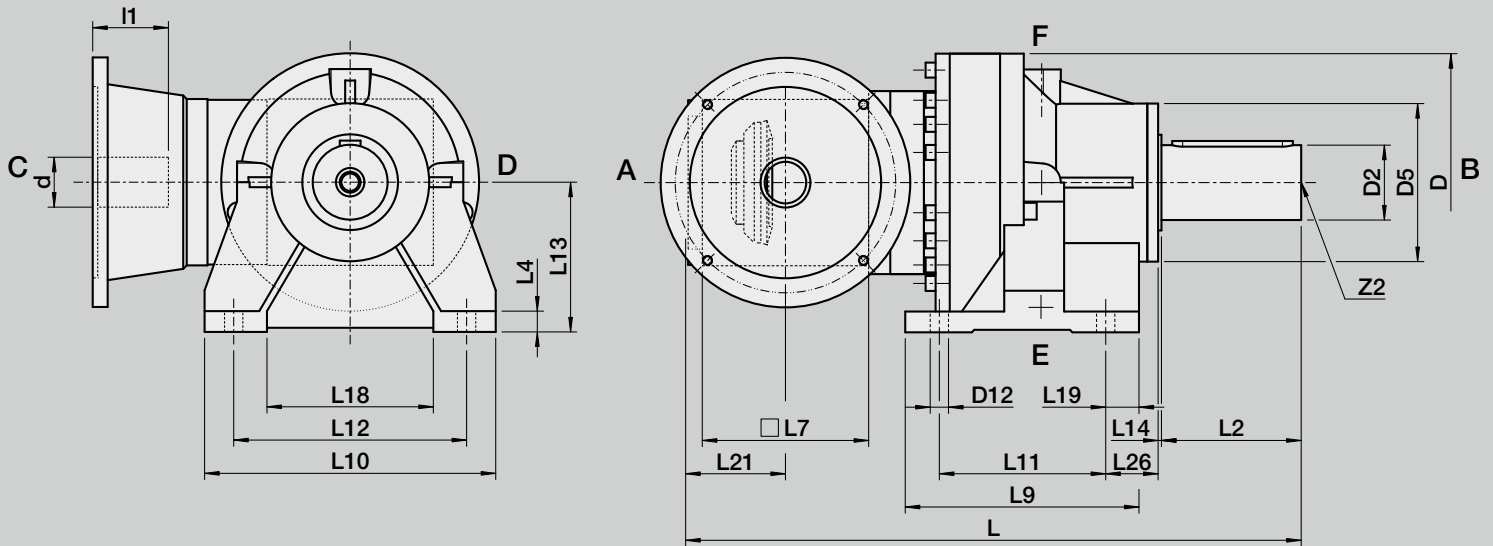


MLPF

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

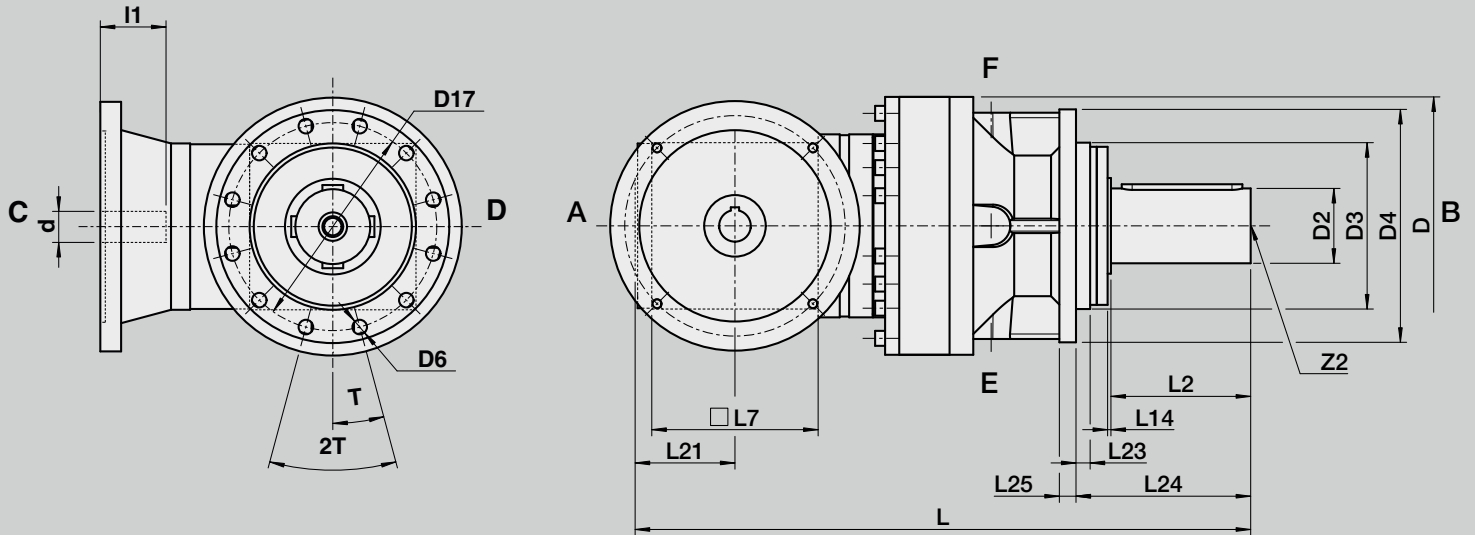


Size	Ratio	d x l1	D	D2 x L2	D5	D12	L	L4	L7	L9	L10
		G7		j6							
08	60 - 210	11 x 23	175	50 x 100	108	11,0	452	12	120	150	205
		14 x 30									
		19 x 40									
		24 x 50									
		28 x 60									
16	60 - 210	19 x 40	220	60 x 120	130	17,5	531	16	140	180	260
		24 x 50									
		28 x 60									
		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									
		42 x 110									



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



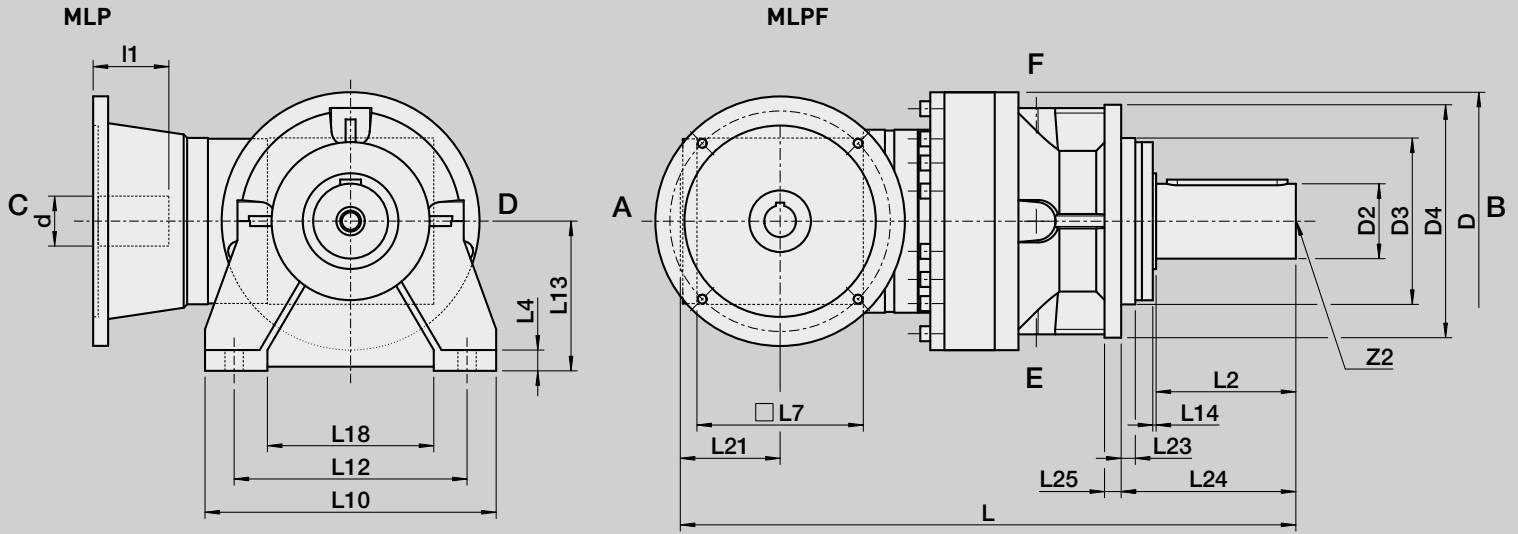
Size	Ratio	d x l1	D	D2 x L2	D3	D4	D6	D17	D28	L	L7
		G7		j6	f7				f7		
08	60 - 210	11 x 23	175	50 x 100	110	160	9,0	130	-	452	120
		14 x 30									
		19 x 40									
		24 x 50									
		28 x 60									
16	60 - 210	19 x 40	220	60 x 120	130	200	11,0	165	-	531	140
		24 x 50									
		28 x 60							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



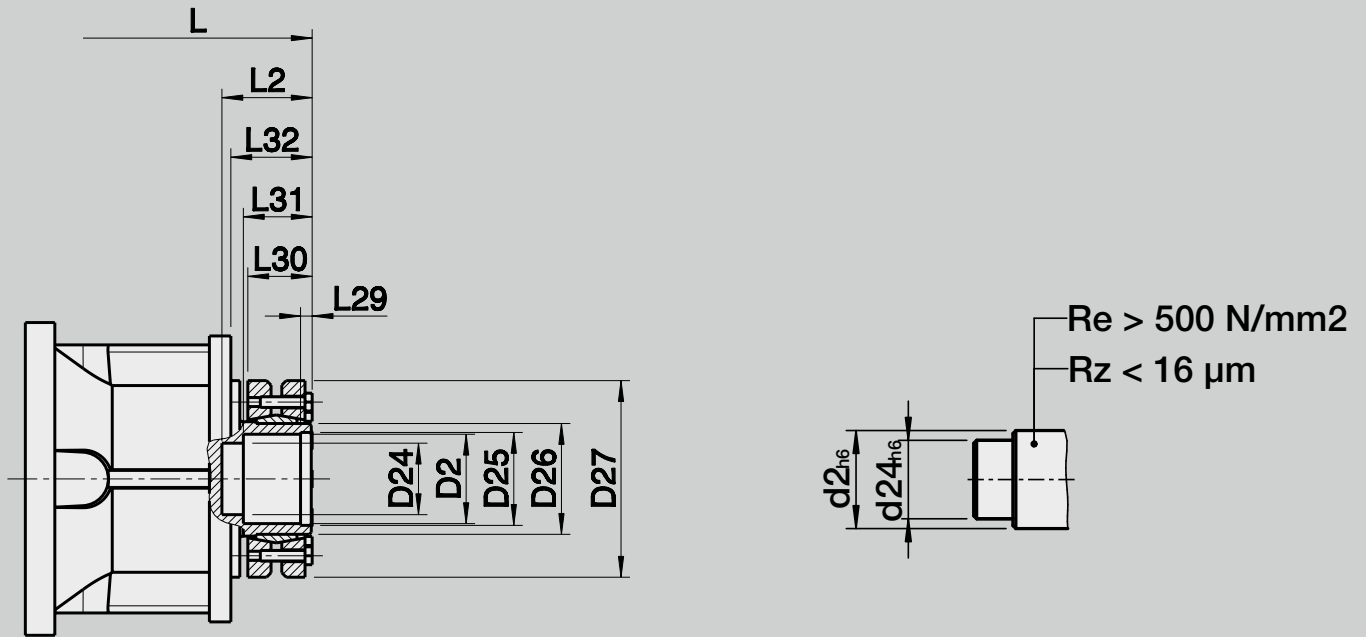
Motor dimensions																				
b1	80	80	95	95	110	110	130	130	95	95	110	110	110	110	130	130	130	130	180	180
e1	100	100	115	115	130	130	165	165	115	115	130	130	130	165	165	165	165	215	215	
a1	125	125	125	125	130	130	140	140			145	145		145	145				200	
a2	140	140	140	140	160	160	190	190	145	145	160	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												
28 x 60		215		x	x	x	x	x	x	x												
32 x 60		215		x	x	x	x	x	x	x												
38 x 80		235		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

P F H / M P F H / L P F H / M L P F H 0 8 - 2 5 6

M O U N T I N G S H R I N K D I S C S T O H O L L O W O U T P U T S H A F T S



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

L

TECHNICAL DATA

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

Gear teeth:	Klingelnberg spiral bevel toothing	Lubrication:	Oil lubrication/grease lubrication
Direction of rotation:	The opposite direction when facing C and A	Mounting position:	Any, specify when ordering
Life time:	20000 h L _{10h}	Surface protection:	Primer coat RAL 7035 Light grey
Permissible gearbox temperature at housing:	-10 °C to +80 °C (deviating temperature ranges on request)	Protection rating:	IP 54





L

TECHNICAL DATA

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

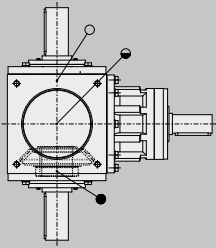
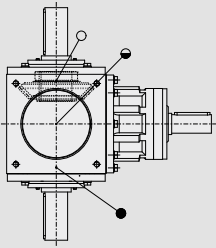
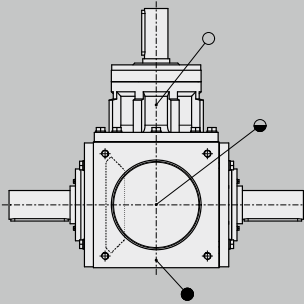
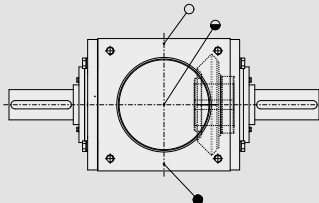
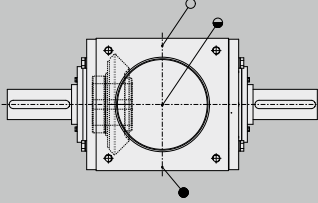
L		500								
Ratio	i		1,0	1,5	2,0	3,0	4,0	5,0	6,0	
Maximum permissible output torque	$T_{2maxzul}$	Nm	7920	8100	8280	7560	5400	4680	3600	
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	2620	2700	2640	2050	1850	1650	1450	
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	8800	9000	9200	8400	6000	5200	4000	
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	600	900	1200	1750	1750	1750	1750	
Max. input speed	$n_{1maxzul}$	min ⁻¹	1100	1650	2200	2500	2500	2500	2500	
Max. backlash*	j	arcmin	≤ 10							
Permissible radial load input (at permissible average input speed)	F_{1rmzul}	N	21014	18584	17032	15192	15192	15192	15192	
Maximum permissible radial load input	$F_{1rmaxzul}$	N	40000							
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	19871	19871	19871	20042	21867	23397	24726	
Maximum permissible radial load output	$F_{2rmaxzul}$	N	40000							
Efficiency	η	-	0,97							
Thermal limit power ($T_u = 20^\circ \text{C}$ ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	32,5							
Weight	m	kg	200							
Running noise (with n_{1mzul})	LPA	db(A)	≤ 75							
Inertia (with reference to input)	D1	J_1	kgcm ²	4556,7	2046,2	1535,7	886,3	694,7	491,8	443,4




L		600								
Ratio	i		1,0	1,5	2,0	3,0	4,0	5,0	6,0	
Maximum permissible output torque	$T_{2maxzul}$	Nm	14040	14400	14760	15300	14400	11700	11160	
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	5000	5050	5000	4600	5700	4300	4000	
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	15600	16000	16400	17000	16000	13000	12400	
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	500	750	1000	1500	1500	1500	1500	
Max. input speed	$n_{1maxzul}$	min ⁻¹	850	1275	1700	2250	2250	2250	2250	
Max. backlash*	j	arcmin	≤ 10							
Permissible radial load input (at permissible average input speed)	F_{1rmzul}	N	32077	28368	26000	22994	22994	22994	22994	
Maximum permissible radial load input	$F_{1rmaxzul}$	N	60000							
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	38000	38000	38000	38000	41461	44362	46882	
Maximum permissible radial load output	$F_{2rmaxzul}$	N	70000							
Efficiency	η	-	0,97							
Thermal limit power ($T_u = 20^\circ \text{C}$ ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	53							
Weight	m	kg	400							
Running noise (with n_{1mzul})	LPA	db(A)	≤ 75							
Inertia (with reference to input)	D1	J_1	kgcm ²	17577,1	8561,9	3529,3	1377,8	891,5	660,35	536,30

* measured with 2 % nominal torque on output shaft

L

MOUNTING POSITION AND LUBRICATION

L			
Side view			on request
Mounting position (underside)	A	B	C
Side of oil fittings*	D - E - F	D - E - F	E - F
Side view			
Mounting position (underside)	D	E	F
Side of oil fittings*	E - F	D	D

-  Breather
-  Sight glass
-  Drainage

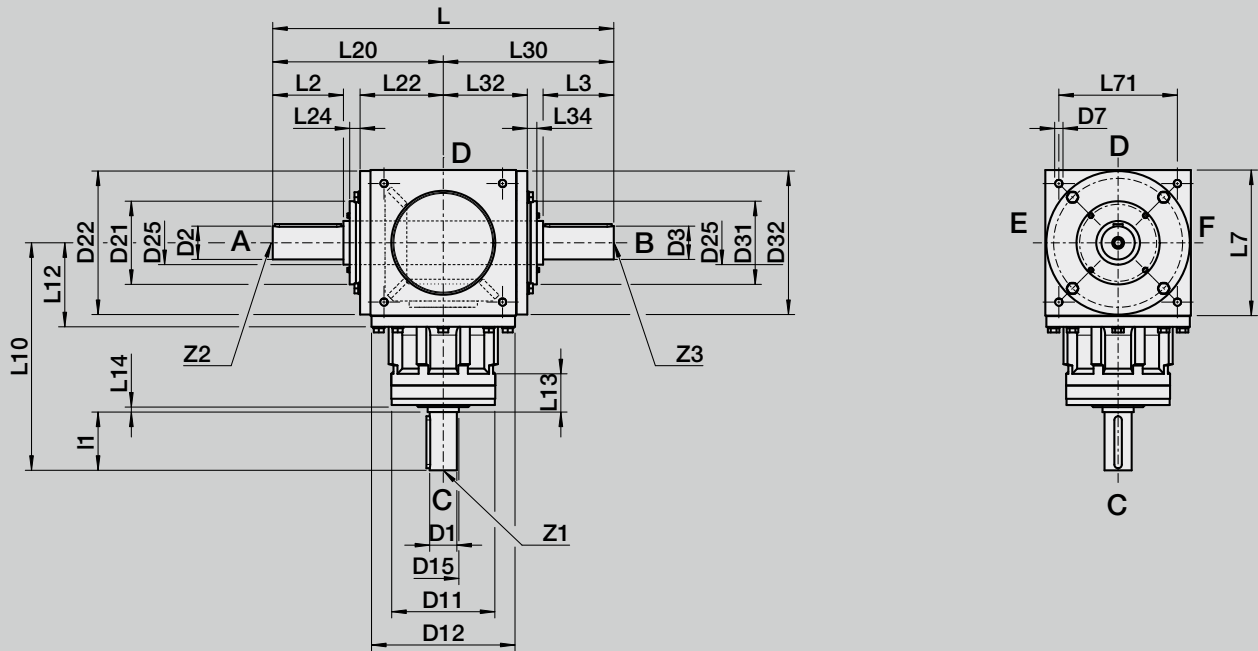
* Oil fittings can be fitted to the sides shown. When the side is not specified, oil fittings will be on side shown in bold.



L 500 - L 600

DIMENSIONS

L 500



Size	Ratio	D1	D2	D3	D7	D11	D12	D15	D21	D22	D25	D31	D32	L	L1	L2	L3	L7	L10	
		j6	j6	j6			f7			f7			f7							
500	1 - 2	80						85							170					570
	3 + 4	65	80	80	M20	250	345	70	200	345	90	200	345	820	140	170	170	350		540
	5 + 6	55													110					510
600	1 - 2	90						95							150					600
	3 + 4	75	90	90	M20	190	445	75	-	445	95	-	445	940	120	150	150	450		570
	5 + 6	60													110					530

Design

BA 30

BA 40

BA 50

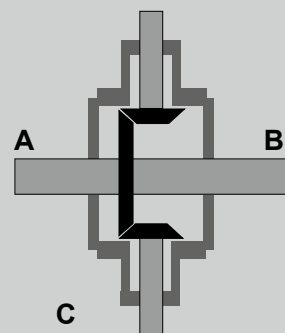
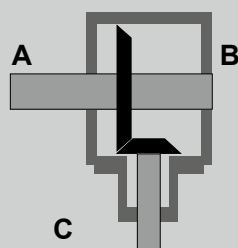
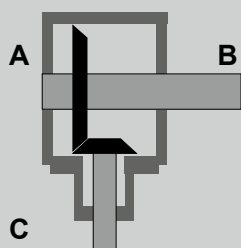
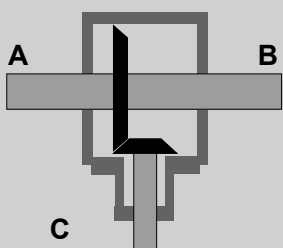
BA 60

D

D

D

D

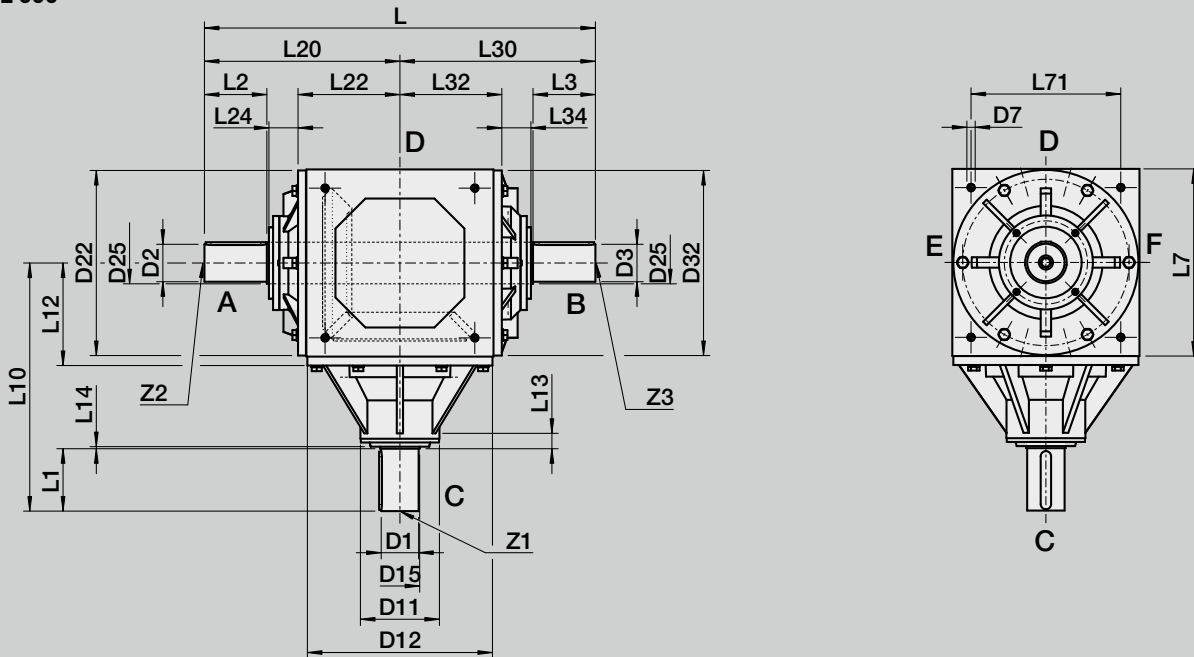




L 500 - L 600

DIMENSIONS

L 600



L12	L13	L14	L20	L22	L24	L30	L32	L34	L71	Key D1 according to DIN 6885/1	Key D2/D3 according to DIN 6885/1	Z1 DIN 332	Z2 DIN 332	Z3 DIN 332
										22 x 14 x 160				
202	90	5	410	200	25	410	202	23	285	18 x 11 x 125	22 x 14 x 160	D M20	D M20	D M20
										16 x 10 x 90				
250	33	5	470	245	70	470	246	70	360	25 x 14 x 140	25 x 14 x 145	D M24	D M24	D M24
										20 x 12 x 110		D M20		
	53	3								18 x 11 x 100				

H

TECHNICAL DATA

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

Gear teeth:	Klingelnberg spiral bevel toothing	Lubrication:	Oil lubrication/grease lubrication
Direction of rotation:	The opposite direction when facing C and A	Mounting position:	Any, specify when ordering
Life time:	20000 h L _{10h}	Surface protection:	Primer coat RAL 7035 Light grey
Permissible gearbox temperature at housing:	-10 °C to +80 °C (deviating temperature ranges on request)	Protection rating:	IP 54





H

TECHNICAL DATA

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

H		500								
Ratio	i		1,0	1,5	2,0	3,0	4,0	5,0	6,0	
Maximum permissible output torque	$T_{2maxzul}$	Nm	7920	8100	8280	7560	5400	4680	3600	
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	2620	2700	2640	2050	1850	1650	1450	
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	8800	9000	9200	8400	6000	5200	4000	
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	600	900	1200	1750	1750	1750	1750	
Max. input speed	$n_{1maxzul}$	min ⁻¹	1100	1650	2200	2500	2500	2500	2500	
Max. backlash*	j	arcmin	≤ 10							
Permissible radial load input (at permissible average input speed)	F_{1rmzul}	N	21014	18584	17032	15192	15192	15192	15192	
Maximum permissible radial load input	$F_{1rmaxzul}$	N	40000							
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	26495	26495	26495	26722	29156	31196	32968	
Maximum permissible radial load output	$F_{2rmaxzul}$	N	50000							
Efficiency	η	-	0,97							
Thermal limit power ($T_u = 20^\circ\text{C}$ Umgebungstemperatur Innenaufstellung, sauber, S1-Betrieb)	$P_{thGrenz}$	kW	32,5							
Weight	m	kg	200							
Running noise (with n_{1mzul})	LPA	db(A)	≤ 75							
Inertia (with reference to input)	D1	J_1	kgcm ²	4338,3	2609,5	1480,7	872,1	681,2	482,9	437,3

H		600								
Ratio	i		1,0	1,5	2,0	3,0	4,0	5,0	6,0	
Maximum permissible output torque	$T_{2maxzul}$	Nm	14040	14400	14760	15300	14400	11700	11160	
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	5000	5050	5000	4600	5700	4300	4000	
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	15600	16000	16400	17000	16000	13000	12400	
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	500	750	1000	1500	1500	1500	1500	
Max. input speed	$n_{1maxzul}$	min ⁻¹	850	1275	1700	2250	2250	2250	2250	
Max. backlash*	j	arcmin	≤ 10							
Permissible radial load input (at permissible average input speed)	F_{1rmzul}	N	32077	28368	26000	22994	22994	22994	22994	
Maximum permissible radial load input	$F_{1rmaxzul}$	N	60000							
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	48000	48000	48000	48000	52372	56036	59219	
Maximum permissible radial load output	$F_{2rmaxzul}$	N	85000							
Efficiency	η	-	0,97							
Thermal limit power ($T_u = 20^\circ\text{C}$ ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	53							
Weight	m	kg	400							
Running noise (with n_{1mzul})	LPA	db(A)	≤ 75							
Inertia (with reference to input)	D1	J_1	kgcm ²	19745,1	8917,7	4071,3	1618,6	1027,1	746,8	596,6

* measured with 2 % nominal torque on output shaft

H

MOUNTING POSITION AND LUBRICATION

H			
Side view			on request
Mounting position (underside)	A	B	C
Side of oil fittings*	D - E - F	D - E - F	E - F
Side view			
Mounting position (underside)	D	E	F
Side of oil fittings*	E - F	D	D

- Breather
- Sight glass
- Drainage

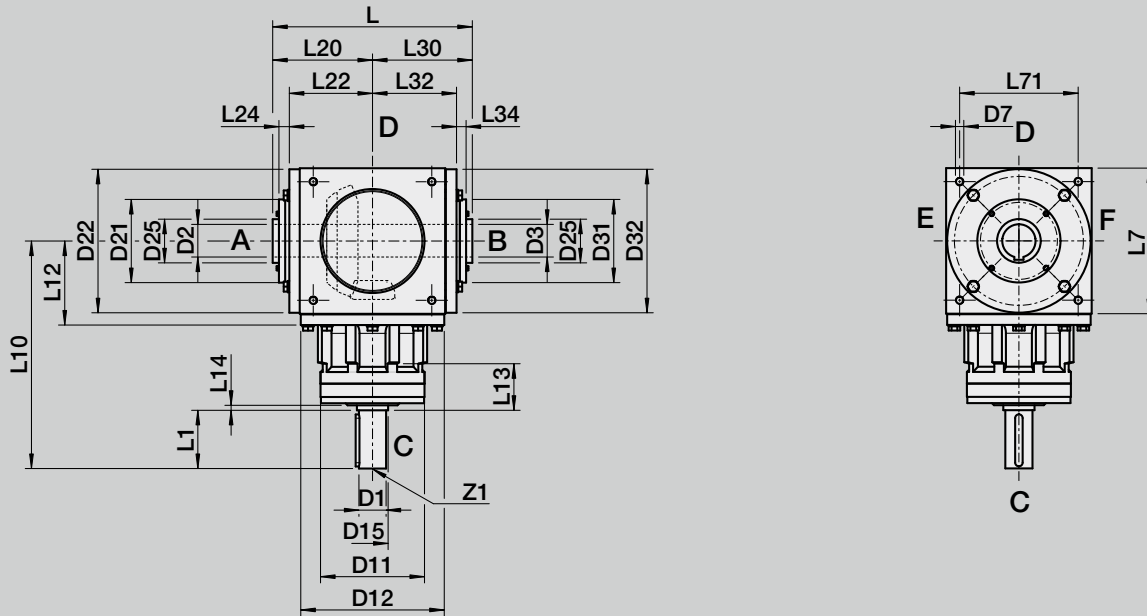
* Oil fittings can be fitted to the sides shown. When the side is not specified, oil fittings will be on side shown in bold.



H 500 - H 600

DIMENSIONS

H 500

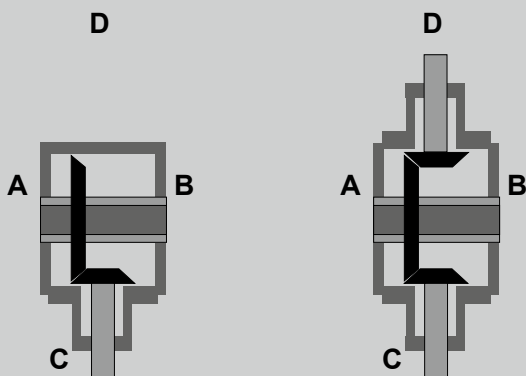


Size	Ratio	D1	D2	D3	D7	D11	D12	D15	D21	D22	D25	D31	D32	L	L1	L7
		j6	H7	H7			f7			f7			f7			
500	1 - 2	80						85							170	
	3 + 4	65	80	80	M20	250	345	70	200	345	105	200	345	480	140	350
	5 + 6	55													110	
600	1 - 2	90						95							150	
	3 + 4	75	100	100	M20	190	445	75	300	445	145	300	445	640	120	450
	5 + 6	60													110	

Design

BA 70

BA 80

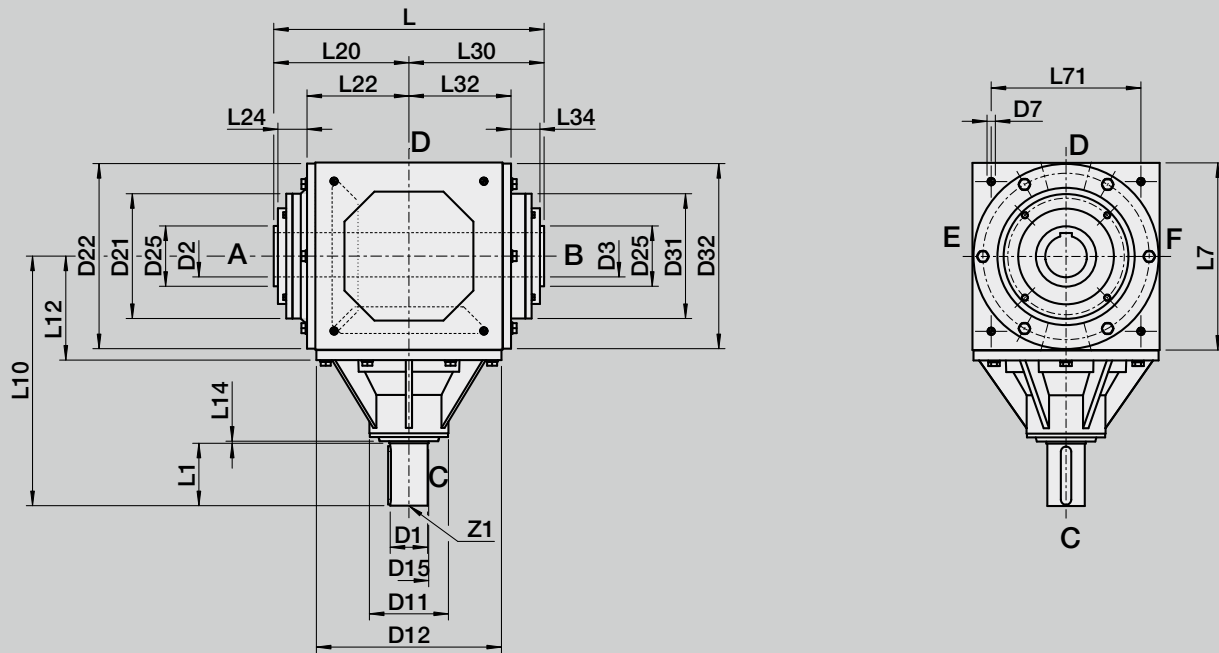




H 500 - H 600

DIMENSIONS

H 600



L10	L12	L13	L14	L20	L22	L24	L30	L32	L34	L71	Key D1 according to DIN 6885/1	Key D2/D3 according to DIN 6885/1	Z1 DIN 332
												JS9	
570											22 x 14 x 160		
540	202	90	5	240	200	25	240	202	23	285	18 x 11 x 125	22	D M20
510											16 x 10 x 90		
600		33	5								25 x 14 x 140		D M24
570	250			320	245	70	320	246	70	360	20 x 12 x 110	22	D M20
530		53	3								18 x 11 x 100		

M L

TECHNICAL DATA

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

Gear teeth:	Klingelnberg spiral bevel toothing	Lubrication:	Oil lubrication/grease lubrication
Direction of rotation:	The opposite direction when facing C and A	Mounting position:	Any, specify when ordering
Life time:	20000 h L _{10h}	Surface protection:	Primer coat RAL 7035 Light grey
Permissible gearbox temperature at housing:	-10 °C to +80 °C (deviating temperature ranges on request)	Protection rating:	IP 54





ML

TECHNICAL DATA

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

ML		500								
Ratio	i		1,0	1,5	2,0	3,0	4,0	5,0	6,0	
Maximum permissible output torque	$T_{2maxzul}$	Nm	7920	8100	8280	7560	5400	4680	3600	
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	2620	2700	2640	2050	1850	1650	1450	
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	8800	9000	9200	8400	6000	5200	4000	
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	600	900	1200	1750	1750	1750	1750	
Max. input speed	$n_{1maxzul}$	min ⁻¹	1100	1650	2200	2500	2500	2500	2500	
Max. backlash*	j	arcmin	≤ 10							
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	19871	19871	19871	20042	21867	23397	24726	
Maximum permissible radial load output	$F_{2rmaxzul}$	N	40000							
Efficiency	η	-	0,97							
Thermal limit power ($T_u = 20^\circ\text{C}$ ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	32,5							
Weight	m	kg	approx. 200							
Running noise (with n_{1mzul})	LPA	db(A)	≤ 75							
Inertia (with reference to input)	$\emptyset d$ 48	J_1	kgcm ²	4791,8	2981,3	1770,8	1245,3	1043,7	464,8	413,5
	$\emptyset d$ 55	J_1	kgcm ²	4811,8	3001,4	1791,2	1265,8	1065,2	483,3	434,9
	$\emptyset d$ 60	J_1	kgcm ²	4809,3	2998,3	1787,5	1263,9	1063,3	481,5	433,1
	$\emptyset d$ 65	J_1	kgcm ²	4846,9	3036,4	1825,8	1302,3	1101,8	519,9	471,5

ML		600							
Ratio	i		1,0	1,5	2,0	3,0	4,0	5,0	6,0
Maximum permissible output torque	$T_{2maxzul}$	Nm	on request						
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm							
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm							
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹							
Max. input speed	$n_{1maxzul}$	min ⁻¹							
Max. backlash*	j	arcmin							
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N							
Maximum permissible radial load output	$F_{2rmaxzul}$	N							
Efficiency	η	-							
Thermal limit power ($T_u = 20^\circ\text{C}$ ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW							
Weight	m	kg							
Running noise (with n_{1mzul})	LPA	db(A)							
Inertia (with reference to input)	$\emptyset d$	J_1							

* measured with 2 % nominal torque on output shaft

M H

TECHNICAL DATA

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

Gear teeth:	Klingelnberg spiral bevel toothing	Lubrication:	Oil lubrication/grease lubrication
Direction of rotation:	The opposite direction when facing C and A	Mounting position:	Any, specify when ordering
Life time:	20000 h L _{10h}	Surface protection:	Primer coat RAL 7035 Light grey
Permissible gearbox temperature at housing:	-10 °C to +80 °C (deviating temperature ranges on request)	Protection rating:	IP 54





M H

TECHNICAL DATA

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

MH		500								
Ratio	i		1,0	1,5	2,0	3,0	4,0	5,0	6,0	
Maximum permissible output torque	$T_{2maxzul}$	Nm	7920	8100	8280	7560	5400	4680	3600	
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	2620	2700	2640	2050	1850	1650	1450	
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	8800	9000	9200	8400	6000	5200	4000	
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	600	900	1200	1750	1750	1750	1750	
Max. input speed	$n_{1maxzul}$	min ⁻¹	1100	1650	2200	2500	2500	2500	2500	
Max. backlash*	j	arcmin	≤ 10							
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	26495	26495	26495	26722	29156	31196	32968	
Maximum permissible radial load output	$F_{2rmaxzul}$	N	50000							
Efficiency	η	-	0,97							
Thermal limit power ($T_u = 20^\circ\text{C}$ ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	32,5							
Weight	m	kg	approx. 200							
Running noise (with n_{1mzul})	LPA	db(A)	≤ 75							
Inertia (with reference to input)	∅ d 48	J_1	kgcm ²	4573,2	2845,5	1715,8	1212,7	1033,1	456,2	410,4
	∅ d 55	J_1	kgcm ²	4591,7	2862,9	1734,3	1231,2	1051,5	474,6	428,9
	∅ d 60	J_1	kgcm ²	4589,8	2816,1	1732,4	1229,3	1049,7	472,8	427,1
	∅ d 65	J_1	kgcm ²	4627,7	2899,2	1770,7	1267,2	1087,3	510,7	464,9

MH		600							
Ratio	i		1,0	1,5	2,0	3,0	4,0	5,0	6,0
Maximum permissible output torque	$T_{2maxzul}$	Nm	on request						
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm							
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm							
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹							
Max. input speed	$n_{1maxzul}$	min ⁻¹							
Max. backlash*	j	arcmin							
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N							
Maximum permissible radial load output	$F_{2rmaxzul}$	N							
Efficiency	η	-							
Thermal limit power ($T_u = 20^\circ\text{C}$ ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW							
Weight	m	kg							
Running noise (with n_{1mzul})	LPA	db(A)							
Inertia (with reference to input)	-	J_1							

* measured with 2 % nominal torque on output shaft



ML

MOUNTING POSITION AND LUBRICATION

ML			
Side view			on request
Mounting position (underside)	A	B	C
Side of oil fittings*	D - E - F	D - E - F	E - F
Side view			
Mounting position (underside)	D	E	F
Side of oil fittings*	E - F	D	D

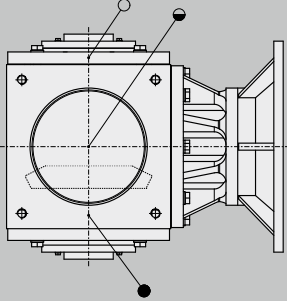
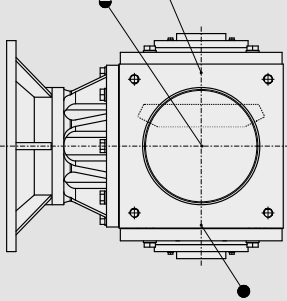
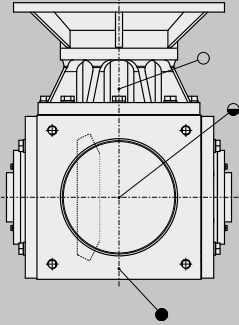
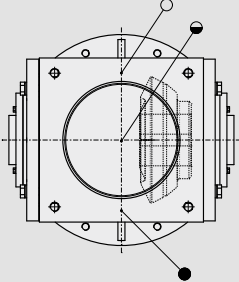
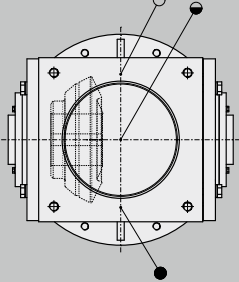
- Breather
- Sight glass
- Drainage




* Oil fittings can be fitted to the sides shown. When the side is not specified, oil fittings will be on side shown in bold.



M H

MOUNTING POSITION AND LUBRICATION

MH			
Side view			on request
Mounting position (underside)	A	B	C
Side of oil fittings*	D - E - F	D - E - F	E - F
Side view			
Mounting position (underside)	D	E	F
Side of oil fittings*	E - F	D	D

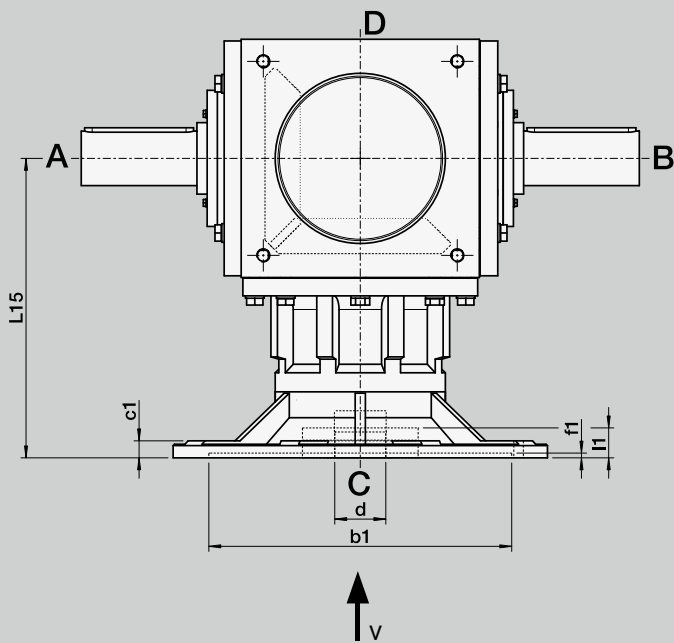
-  Breather
-  Sight glass
-  Drainage

* Oil fittings can be fitted to the sides shown. When the side is not specified, oil fittings will be on side shown in bold.

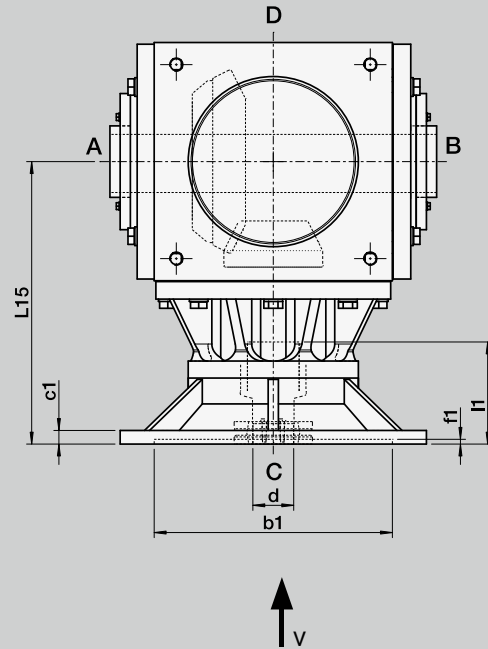
ML / MH 500

DIMENSIONS MOTOR MOUNTING

ML 500



MH 500



Motor dimensions

a2		350	400	450	550
b1	H7	250	300	350	450
e1		300	350	400	500
s2*		4x	4x	8x	8x
		M16	M16	M16	M16
c1		25	25	25	25
f1		7	7	7	7

Gearbox dimensions

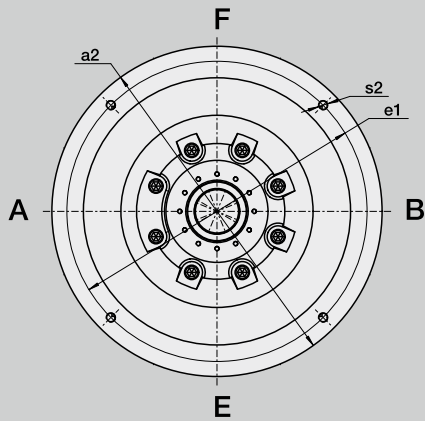
d	x	l1	Size	Ratio	L15	Version				
G7										
42	x	110	500	1 - 4	440	B	x	x	x	x
55	x	110					x	x	x	x
60	x	140		x	x		x	x		
65	x	140		x	x		x	x		
				5 + 6	415					

* Depth of thread: 2 x Ø or flange thickness

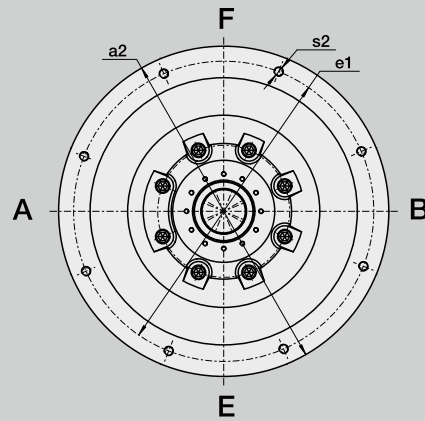
ML / MH 500

DIMENSIONS MOTOR MOUNTING

View V



4 x threaded mounting bores

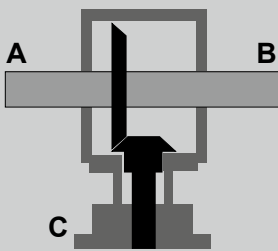


8 x threaded mounting bores

Design

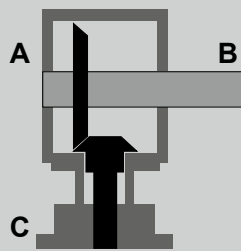
BA 30

D



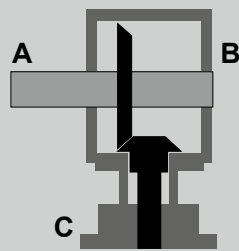
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D



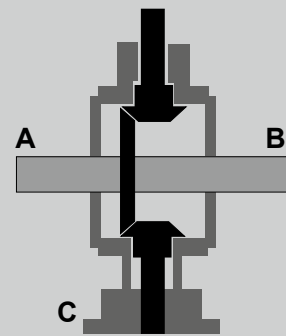
BA 50

D



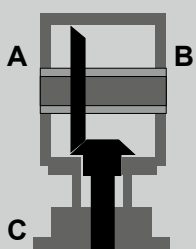
BA 60

D



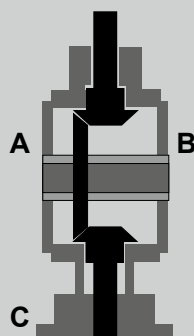
BA 70

D

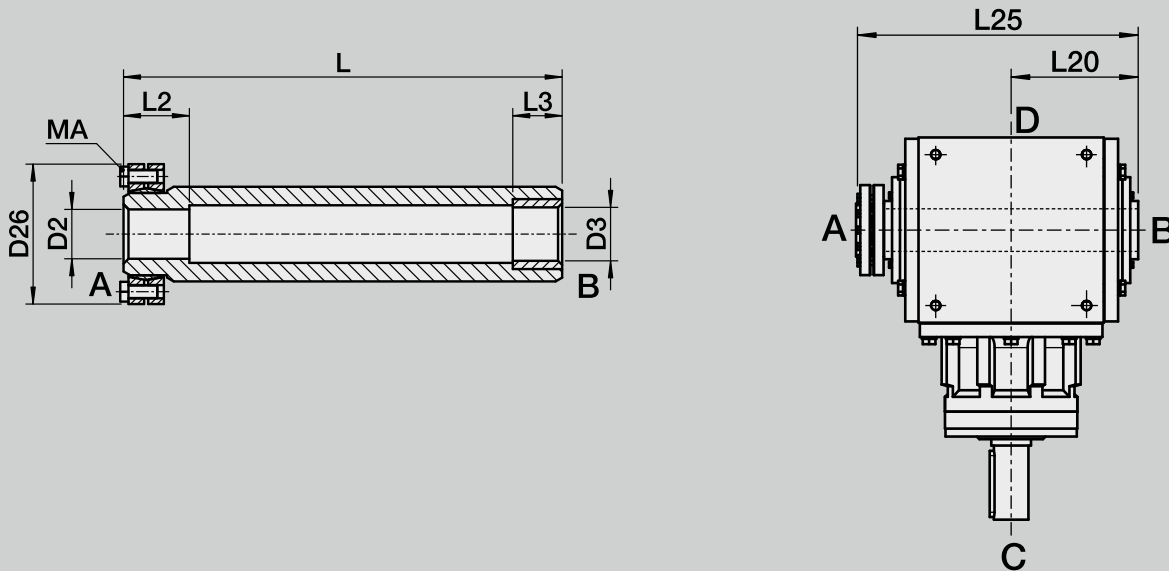


BA 80

D



ADDITIONAL OPTIONS
H / MH 500 - 600 SHRINK DISC
 DIMENSIONS



Order details: Side A (or B) with shrink disc.

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

Size	D2/D3	D26	L	L20	L25	L2/L3	MA
	H7						Nm
500	80	170	533	240	533	54/60	The required clamping torques MA can be found on the shrink disc.
600	100	230	705	320	708	150/61	

Shaft material for the insert shaft: minimum yield strength approx. 360 N/mm².

Recommended shaft fit h6.



LV

TECHNICAL DATA

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

Gear teeth:	Klingelnberg spiral bevel toothing	Lubrication:	Oil lubrication/grease lubrication
Direction of rotation:	The opposite direction when facing C and A	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





LV

TECHNICAL DATA

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

LV			500						
Ratio	i		1,0	1,5	2,0	3,0	4,0	5,0	6,0
Maximum permissible output torque	$T_{2maxzul}$	Nm	7920	8100	8280	7560	5400	4680	3600
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	2620	2700	2640	2050	1850	1650	1450
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	8800	9000	9200	8400	6000	5200	4000
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	min ⁻¹	600	900	1200	1750	1750	1750	1750
Max. input speed	$n_{1maxzul}$	min ⁻¹	1100	1650	2200	2500	2500	2500	2500
Max. backlash*	j	arcmin	≤ 10						
Permissible radial load input (at permissible average input speed)	F_{1rmzul}	N	21014	18584	17032	15192	15192	15192	15192
Maximum permissible radial load input	$F_{1rmaxzul}$	N	40000						
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	26495	26495	26495	26722	29156	31196	32968
Maximum permissible radial load output	$F_{2rmaxzul}$	N	50000						
Efficiency	η	-	0,97						
Thermal limit power ($T_u = 20^\circ\text{C}$ ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	32,5						
Weight	m	kg	approx. 230						
Running noise (with n_{1mzul})	LPA	db(A)	≤ 75						
Inertia (with reference to input)	-	J_1	kgcm ²	on request					

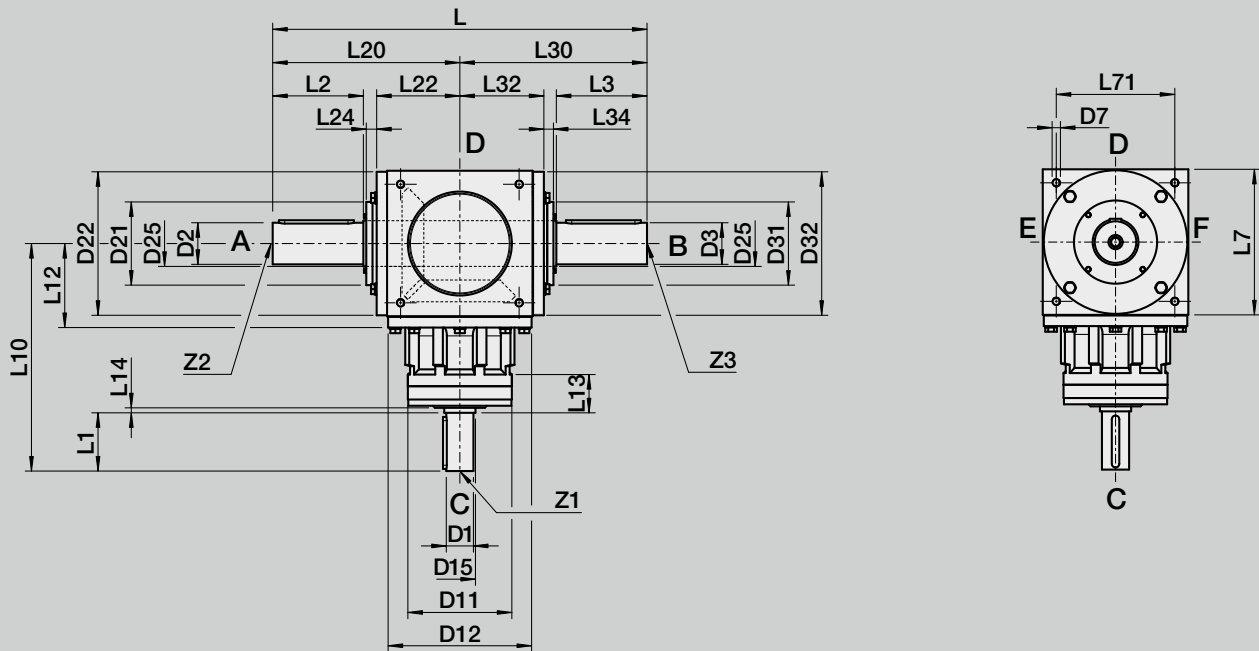
LV			600						
Ratio	i		1,0	1,5	2,0	3,0	4,0	5,0	6,0
Maximum permissible output torque	$T_{2maxzul}$	Nm	14040	14400	14760	15300	14400	11700	11160
Nominal torque on output (with n_{1mzul})	T_{2Nzul}	Nm	5000	5050	5000	4600	5700	4300	4000
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$	Nm	15600	16000	16400	17000	16000	13000	12400
Permissible average input speed (with T_{2Nzul})	n_{1mzul}	1/min	500	750	1000	1500	1500	1500	1500
Max. input speed	$n_{1maxzul}$	1/min	850	1275	1700	2250	2250	2250	2250
Max. backlash*	j	arcmin	≤ 10						
Permissible radial load input (at permissible average input speed)	F_{1rmzul}	N	32077	28368	26000	22994	22994	22994	22994
Maximum permissible radial load input	$F_{1rmaxzul}$	N	60000						
Permissible radial load output (at permissible average input speed)	F_{2rmzul}	N	48000	48000	48000	48000	52372	56036	59219
Maximum permissible radial load output	$F_{2rmaxzul}$	N	85000						
Efficiency	η	-	0,97						
Thermal limit power ($T_u = 20^\circ\text{C}$ ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$	kW	53						
Weight	m	kg	approx. 440						
Running noise (with n_{1mzul})	LPA	db(A)	≤ 75						
Inertia (with reference to input)	-	J_1	kgcm ²	on request					

* measured with 2 % nominal torque on output shaft

LV 500 - LV 600

DIMENSIONS

LV 500

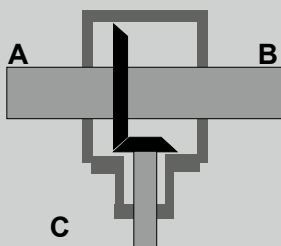


Size	Ratio	D1	D2	D3	D7	D11	D12	D15	D21	D22	D25	D31	D32	L	L1	L2	L3	L7	L10	
		j6	j6	j6			f7			f7			f7							
500	1 - 2	80						85							170					570
	3 + 4	65	100	100	M20	250	345	70	200	345	105	200	345	900	140	210	210		350	540
	5 + 6	55													110					510
600	1 - 2	90													150					600
	3 + 4	75	140	140	M20	190	445	95	300	445	145	300	445	1040	120	200	200		450	570
	5 + 6	60						75							110					530

Design

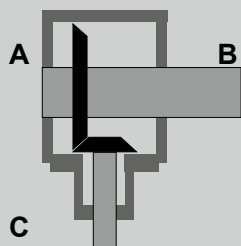
BA 30

D



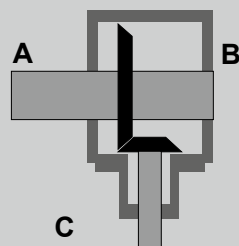
BA 40

D



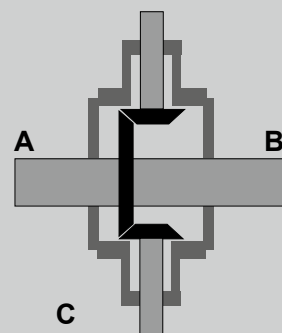
BA 50

D



BA 60

D

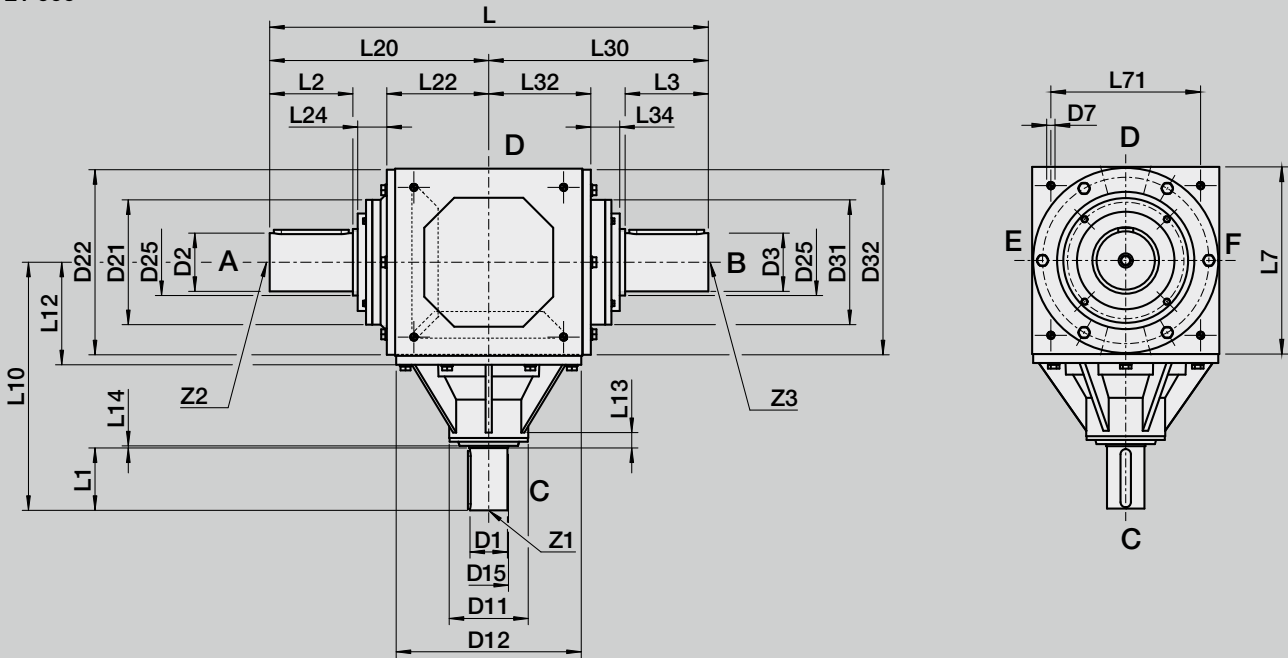




LV 500 - LV 600

DIMENSIONS

LV 600



L12	L13	L14	L20	L22	L24	L30	L32	L34	L71	Key D1 according to DIN 6885/1	Key D2/D3 according to DIN 6885/1	Z1 DIN 332	Z2 DIN 332	Z3 DIN 332
										22 x 14 x 160				
202	90	5	450	200	25	450	202	23	285	18 x 11 x 125	28 x 16 x 180	D M20	D M24	D M24
										16 x 10 x 90				
250	33	5	520	245	70	520	246	70	360	25 x 14 x 140	36 x 20 x 180	D M24	D M24	D M24
										20 x 12 x 110		D M20		
										18 x 11 x 100		D M20		

LS

TECHNICAL DATA

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

Gear teeth:	Klingelnberg spiral bevel toothing	Lubrication:	Oil lubrication/grease lubrication
Direction of rotation:	The opposite direction when facing C and A	Mounting position:	Any, specify when ordering
Life time:	20000 h L _{10h}	Surface protection:	Primer coat RAL 7035 Light grey
Permissible gearbox temperature at housing:	-10 °C to +80 °C (deviating temperature ranges on request)	Protection rating:	IP 54





LS

TECHNICAL DATA

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

LS		500	
Ratio	i	1,5	2,0
Maximum permissible output torque	$T_{2maxzul}$ Nm		
Nominal torque on output (with n_{1mzul})	T_{2Nzul} Nm		
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$ Nm		
Permissible average input speed (with T_{2Nzul})	n_{1mzul} min ⁻¹		
Max. input speed	$n_{1maxzul}$ min ⁻¹		
Max. backlash*	j arcmin		
Permissible radial load input (at permissible average input speed)	F_{1rmzul} N		
Maximum permissible radial load input	$F_{1rmxzul}$ N		on request
Permissible radial load output (at permissible average input speed)	F_{2rmzul} N		
Maximum permissible radial load output	$F_{2rmxzul}$ N		
Efficiency	η -		
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$ kW		
Weight	m kg		
Running noise (with n_{1mzul})	LPA db(A)		
Inertia (with reference to input)	- J_1 kgcm ²		

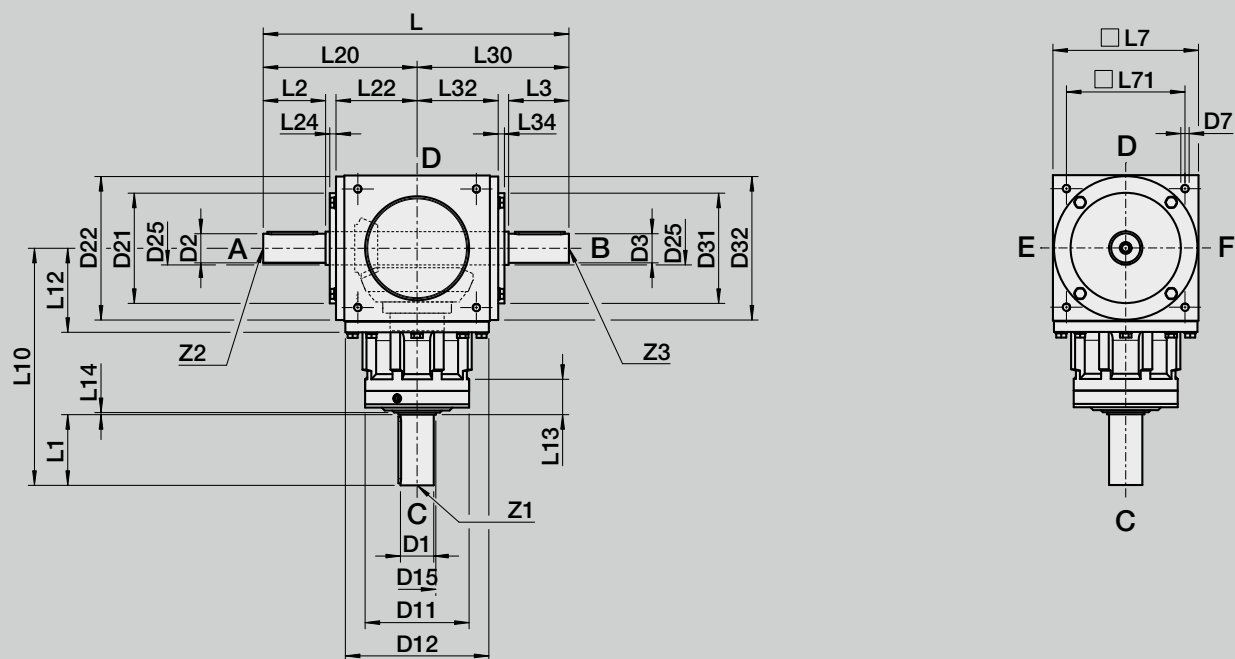
LS		600	
Ratio	i	1,5	2,0
Maximum permissible output torque	$T_{2maxzul}$ Nm		
Nominal torque on output (with n_{1mzul})	T_{2Nzul} Nm		
Emergency stop torque (permissible 1000 times during gearbox life time)	$T_{2Notzul}$ Nm		
Permissible average input speed (with T_{2Nzul})	n_{1mzul} min ⁻¹		
Max. input speed	$n_{1maxzul}$ min ⁻¹		
Max. backlash*	j arcmin		
Permissible radial load input (at permissible average input speed)	F_{1rmzul} N		
Maximum permissible radial load input	$F_{1rmxzul}$ N		on request
Permissible radial load output (at permissible average input speed)	F_{2rmzul} N		
Maximum permissible radial load output	$F_{2rmxzul}$ N		
Efficiency	η -		
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	$P_{thGrenz}$ kW		
Weight	m kg		
Running noise (with n_{1mzul})	LPA db(A)		
Inertia (with reference to input)	- J_1 kgcm ²		

* measured with 2 % nominal torque on output shaft

LS 500 - LS 600

DIMENSIONS

LS 500



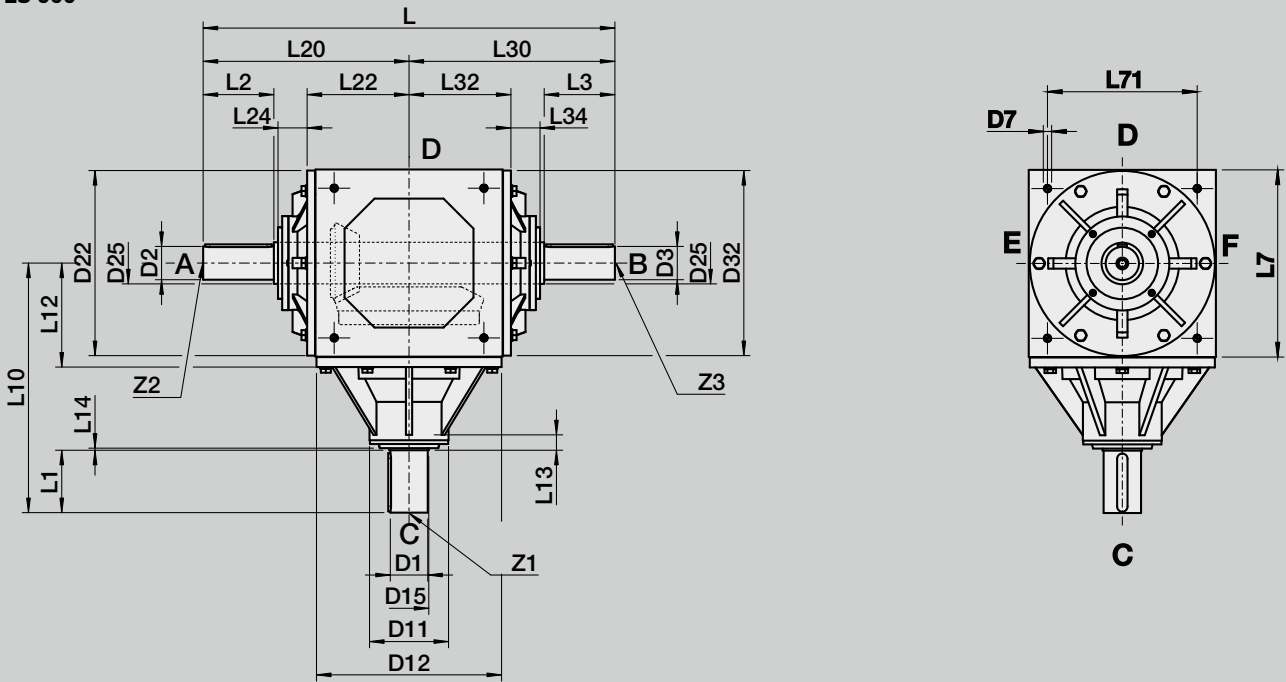
Size	Ratio	D1	D2	D3	D7	D11	D12	D15	D21	D22	D25	D31	D32	L	L1	L2	L3	L7	L10
		j6	j6	j6			f7			f7			f7						
500	1,5 + 2	80	70	70	M20	250	345	85	265	345	80	265	345	730	170	150	150	350	570
600	1,5 + 2	90	80	80	M20	190	445	95	-	445	85	-	445	980	150	170	170	450	600



LS 500 - LS 600

DIMENSIONS

LS 600



L12	L13	L14	L20	L22	L24	L30	L32	L34	L71	Key D1 according to DIN 6885/1	Key D2/D3 according to DIN 6885/1	Z1 DIN 332	Z2 DIN 332	Z3 DIN 332
202	90	5	365	195	15	365	195	15	285	22 x 14 x 160	20 x 12 x 120	D M20	D M20	D M20
250	33	5	490	245	70	490	245	70	360	25 x 14 x 140	22 x 14 x 160	D M24	D M20	D M20

K S

TECHNICAL DATA

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

Gear teeth:	Klingelnberg spiral bevel toothing	Lubrication:	Oil lubrication
Direction of rotation:	The opposite direction when facing C and A	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





KS

TECHNICAL DATA

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

KS			64															
			without offset										with offset					
Ratio	i		6,0	7,5	9,6	12,0	14,4	16,8	19,2	21,6	24,0	26,4	28,8	33,6	38,4	43,2	48,0	
Combination	i		2x3	2,5x3	2x4,8	2,5x4,8	3,0x4,8	3,5x4,8	4x4,8	4,5x4,8	5x4,8	5,5x4,8	6x4,8	7x4,8	8x4,8	9x4,8	10x4,8	
Max. permissible output torque	T _{2maxzul}	Nm	7560	6480	9000	9360	9360	9720	9720	10260	9900	9900	9540	10080	10080	9720	10260	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	3780	3230	4060	4340	4000	4300	4400	5200	4500	4400	4300	4100	4100	4100	4000	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	8400	7200	10000	10400	10400	10800	10800	11400	11000	11000	10600	11200	11200	10800	11400	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1400	1400	1400	1400	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Max. input speed	n _{1maxzul}	min ⁻¹	2800	2800	2800	2800	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Max. backlash*	j	arcmin	≤ 10										≤ 10					
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	8128	8128	8128	8128	7295	7295	7295	7295	7295	7295	7295	7295	7295	7295	7295	
Maximum permissible radial load input	F _{1rmaxzul}	N	20000										20000					
Permissible radial load output (at permissible average average input speed)	F _{2rmzul}	N	34485	36898	39764	42546	40356	42286	44032	45632	47112	48493	49789	52170	54324	56298	58124	
Max. permissible radial load output	F _{2rmaxzul}	N	58000										58000					
Efficiency	η	-	0,96										0,935					
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	30										18,5					
Weight	m	kg	approx. 280										approx. 280					
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75										≤ 75					
Inertia (with reference to input)	D1	J ₁	kgcm ²	401	243	297	174	144	111	94	93	91	87	81	68	63	60	54

* measured with 2 % nominal torque on output shaft

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

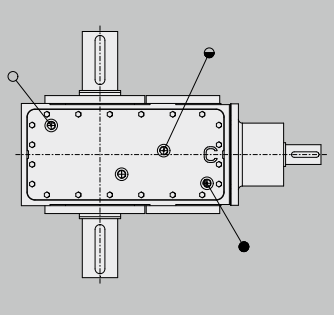
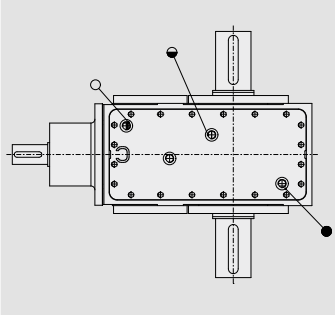
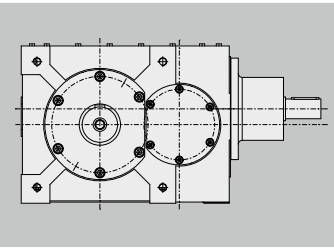
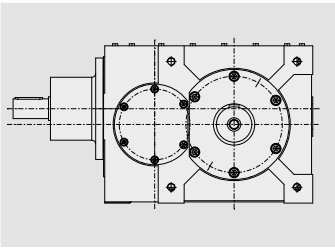
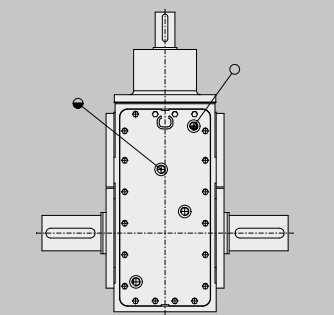
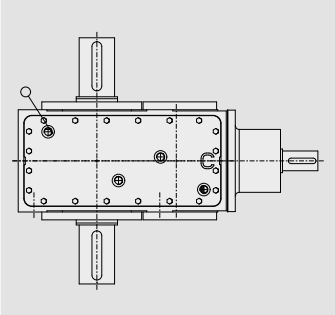
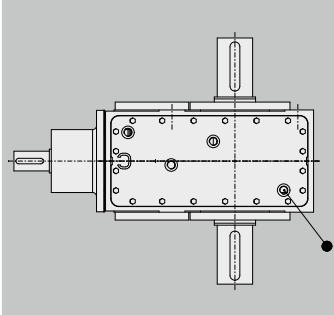
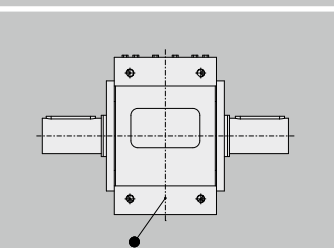
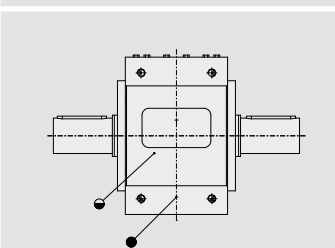
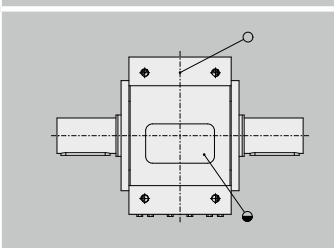
KS			128															
			without offset										with offset					
Ratio	i		6,0	7,5	9,6	12,0	14,4	16,8	19,2	21,6	24,0	26,4	28,8	33,6	38,4	43,2	48,0	
Combination	i		2x3	2,5x3	2x4,8	2,5x4,8	3,0x4,8	3,5x4,8	4x4,8	4,5x4,8	5x4,8	5,5x4,8	6x4,8	7x4,8	8x4,8	9x4,8	10x4,8	
Max. permissible output torque	T _{2maxzul}	Nm	15840	16020	23040	23040	22500	21240	20880	19440	22500	23040	22500	20880	20700	19800	19440	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	8180	8240	12180	12520	11350	11400	11250	9950	11900	12300	11900	10400	10300	9900	9700	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	17600	17800	25600	25600	25000	23600	23200	21600	25000	25600	25000	23200	23000	22000	21600	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1200	1200	1200	1200	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Max. input speed	n _{1maxzul}	min ⁻¹	2200	2200	2200	2200	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	
Max. backlash*	j	arcmin	≤ 10										≤ 10					
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	17032	17032	17032	17032	15192	15192	15192	15192	15192	15192	15192	15192	15192	15192	15192	
Maximum permissible radial load input	F _{1rmaxzul}	N	40000										40000					
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	42704	45692	49241	52686	49663	52038	54187	56156	57978	59676	61271	64201	66852	69281	71529	
Max. permissible radial load output	F _{2rmaxzul}	N	72000										72000					
Efficiency	η	-	0,96										0,935					
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	49										30,5					
Weight	m	kg	approx. 700										approx. 700					
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75										≤ 75					
Inertia (with reference to input)	D1	J ₁	kgcm ²	2046	1328	1761	1146	1323	753	782	728	683	664	646	607	587	573	563




* measured with 2 % nominal torque on output shaft



K S

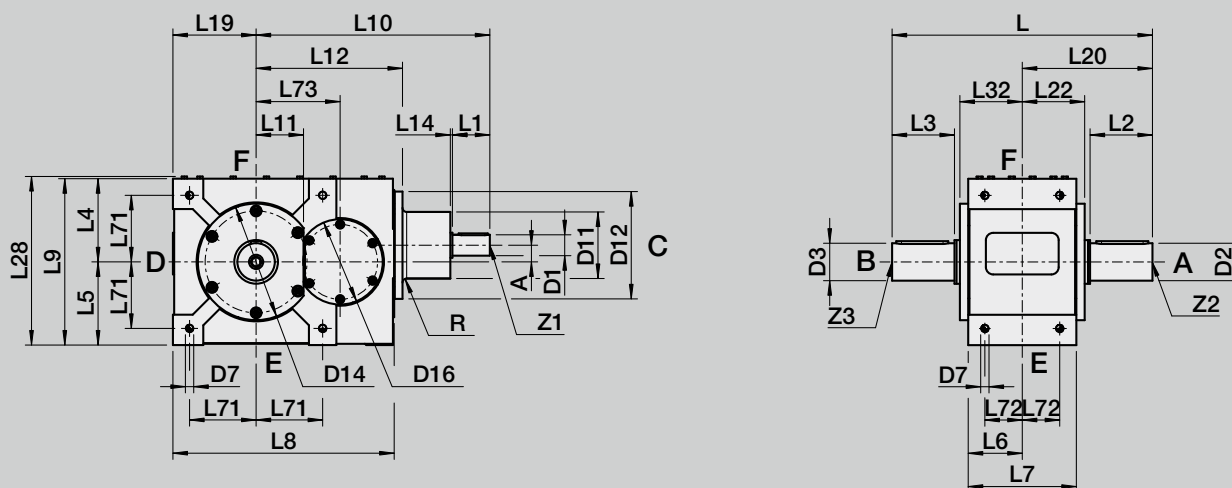
MOUNTING POSITION AND LUBRICATION

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

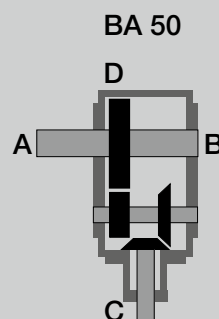
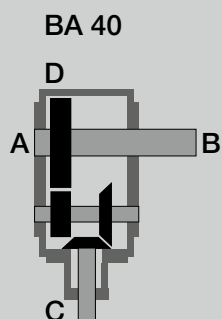
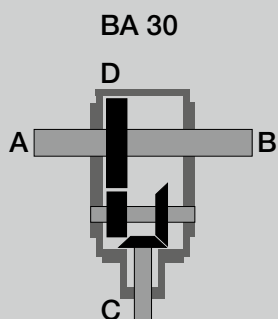
-  Breather
-  Sight glass
-  Drainage

KS 64 - KS 128

DIMENSIONS



Size	Ratio	D1	D2	D3	D7*	D11	D12	D14	D16	Key D1 according to DIN 6885/1	Key D2 / D3 according to DIN 6885/1	L	L1	L2	L3	L4
64	6,0 + 9,6	60	j6	j6		f7	f7	f7		18 x 11 x 90			110			
	7,5 + 12 - 19,2	50	90	90	M20	160	258	280	205	14 x 9 x 70	25 x 14 x 125	606	90	150	150	200
	21,6 - 48,0	45														
128	6,0 + 9,6	80								22 x 14 x 160			170			
	7,5 + 12 - 19,2	65	110	110	M24	250	345	340	280	18 x 11 x 125	28 x 16 x 200	890	140	220	220	250
	21,6 - 48,0	55								16 x 10 x 90			110			

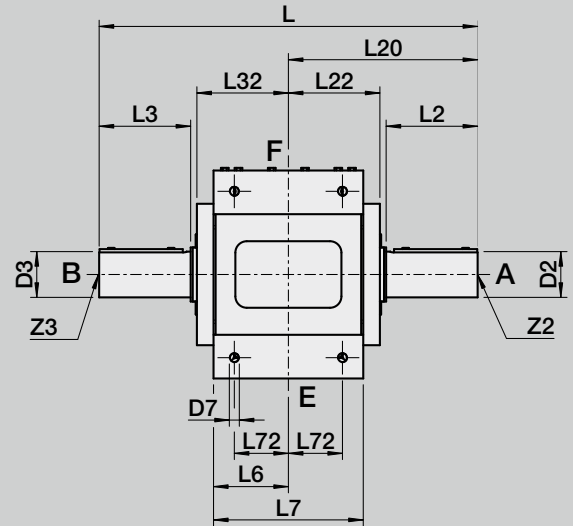
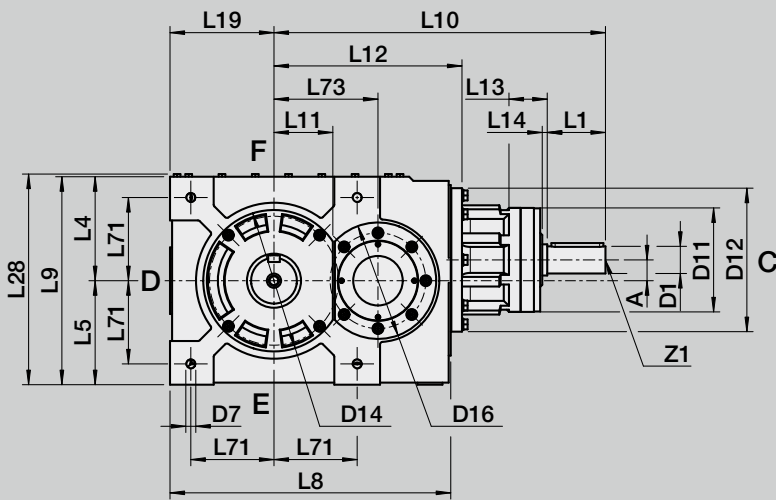


* Depth of thread: 1.5x Ø



KS 64 - KS 128

DIMENSIONS



L5	L6	L7	L8	L9	L10	L11	L12	L13	L14	L19	L20	L22	L28	L32	L71	L72	L73	A*	R
					582														
200	130	260	532	400	562	114	352	-	5	200	303	150	407	150	160	90	202	40/0	5
					820														
250	180	360	675	500	790	142	452	90	5	250	445	220	510	220	200	130	250	50/0	12
					760														

Size	Ratio	Z1 DIN 332	Z2 DIN 332	Z3 DIN 332
64	6,0 + 9,6	M20		
	7,5 + 12 - 19,2	M16	M24	M24
	21,6 - 48,0			
128	6,0 + 9,6	M20	M24	M24
	7,5 + 12 - 19,2			
	21,6 - 48,0			

A* from ratio 33.6, otherwise (valid for size 64,128)

K S H

TECHNICAL DATA

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

Gear teeth:	Klingelnberg spiral bevel toothing	Lubrication:	Oil lubrication
Direction of rotation:	The opposite direction when facing C and A	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





K S H

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

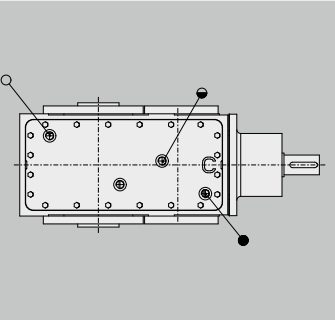
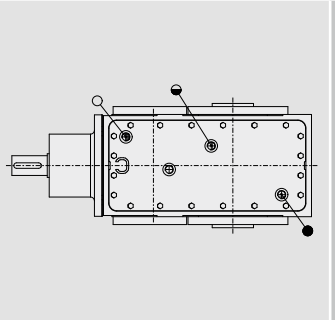
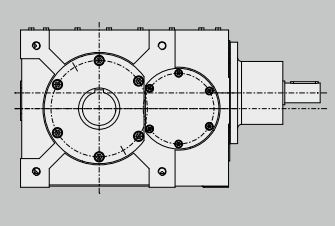
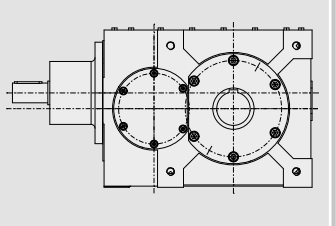
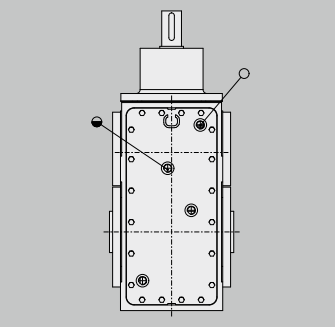
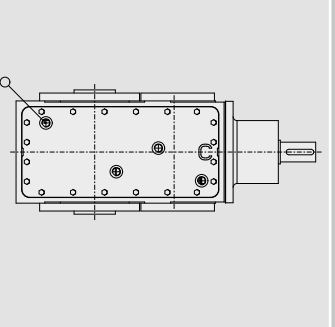
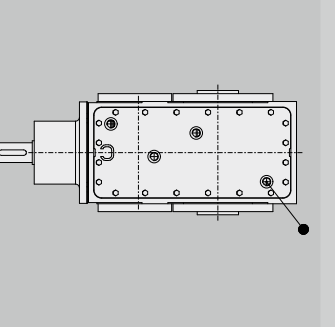
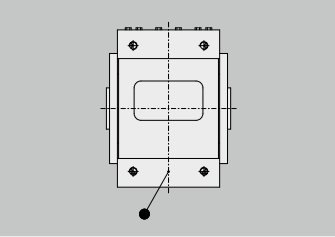
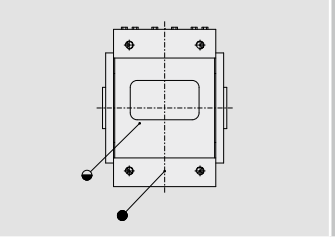
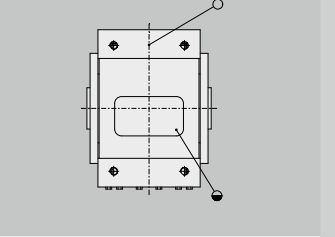
KSH			64															
			without offset										with offset					
Ratio	i		6,0	7,5	9,6	12,0	14,4	16,8	19,2	21,6	24,0	26,4	28,8	33,6	38,4	43,2	48,0	
Combination	i		2x3	2,5x3	2x4,8	2,5x4,8	3,0x4,8	3,5x4,8	4x4,8	4,5x4,8	5x4,8	5,5x4,8	6x4,8	7x4,8	8x4,8	9x4,8	10x4,8	
Max. permissible output torque	T _{2maxzul}	Nm	7560	6480	9000	9360	9360	9720	9720	10260	9900	9900	9540	10080	10080	9720	10260	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	3780	3230	4060	4340	4000	4300	4400	5200	4500	4400	4300	4100	4100	4100	4000	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	8400	7200	10000	10400	10400	10800	10800	11400	11000	11000	10600	11200	11200	10800	11400	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1400	1400	1400	1400	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	
Max. input speed	n _{1maxzul}	min ⁻¹	2800	2800	2800	2800	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	
Max. backlash*	j	arcmin	≤ 10										≤ 10					
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	8128	8128	8128	8128	7295	7295	7295	7295	7295	7295	7295	7295	7295	7295	7295	
Maximum permissible radial load input	F _{1rmaxzul}	N	20000										20000					
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	34485	36898	39764	42546	40356	42286	44032	45632	47112	48493	49789	52170	54324	56298	58124	
Max. permissible radial load output	F _{2rmaxzul}	N	58000										58000					
Efficiency	η	-	0,96										0,935					
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	30										18,5					
Weight	m	kg	approx. 280										approx. 280					
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75										≤ 75					
Inertia (with reference to input)	D1	J ₁	kgcm ²	401	243	297	174	144	111	94	93	91	87	82	68	63	60	54




KSH			128															
			without offset										with offset					
Ratio	i		6,0	7,5	9,6	12,0	14,4	16,8	19,2	21,6	24,0	26,4	28,8	33,6	38,4	43,2	48,0	
Combination	i		2x3	2,5x3	2x4,8	2,5x4,8	3,0x4,8	3,5x4,8	4x4,8	4,5x4,8	5x4,8	5,5x4,8	6x4,8	7x4,8	8x4,8	9x4,8	10x4,8	
Max. permissible output torque	T _{2maxzul}	Nm	15840	16020	23040	23040	22500	21240	20880	19440	22500	23040	22500	20880	20700	19800	19440	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	8180	8240	12180	12520	11350	11400	11250	9950	11900	12300	11900	10400	10300	9900	9700	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	17600	17800	25600	25600	25000	23600	23200	21600	25000	25600	25000	23200	23000	22000	21600	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1200	1200	1200	1200	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	1750	
Max. input speed	n _{1maxzul}	min ⁻¹	2200	2200	2200	2200	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500	
Max. backlash*	j	arcmin	≤ 10										≤ 10					
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	17032	17032	17032	17032	15192	15192	15192	15192	15192	15192	15192	15192	15192	15192	15192	
Maximum permissible radial load input	F _{1rmaxzul}	N	40000										40000					
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	42704	45692	49241	52686	49663	52038	54187	56156	57978	59676	61271	64201	66852	69281	71529	
Max. permissible radial load output	F _{2rmaxzul}	N	72000										72000					
Efficiency	η	-	0,96										0,935					
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	49										30,5					
Weight	m	kg	approx. 700										approx. 700					
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75										≤ 75					
Inertia (with reference to input)	D1	J ₁	kgcm ²	2046	1328	1761	1146	1323	753	782	728	683	664	646	607	587	573	563

* measured with 2 % nominal torque on output shaft

K S H

MOUNTING POSITION AND LUBRICATION

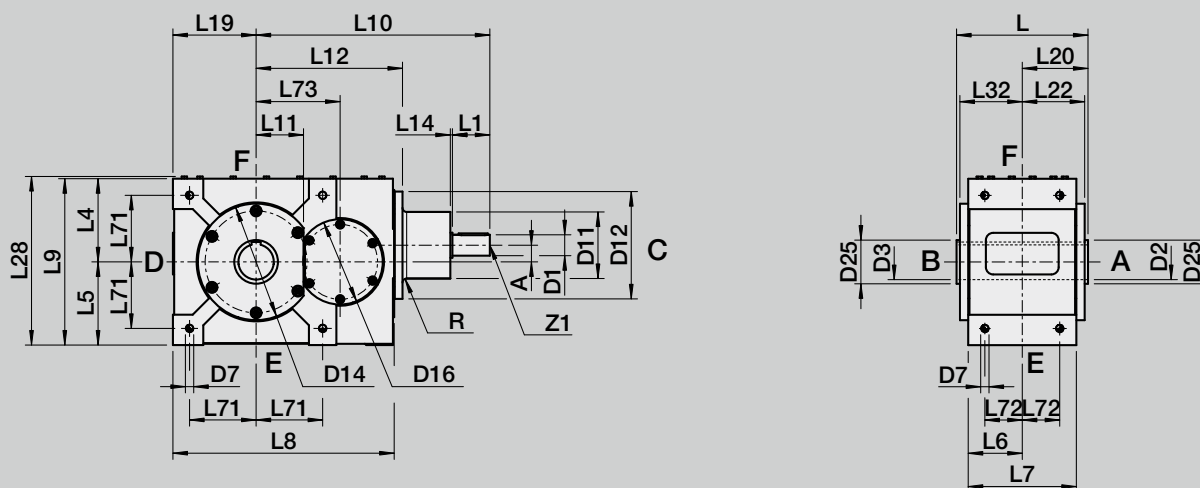
KSH			
View			on request
View			on request
Mounting position (underside)	A	B	C
Side of oil fittings Breather - Sight glass - Drainage	F	F	D - F - F
View			
View			
Mounting position (underside)	D	E	F
Side of oil fittings Breather - Sight glass - Drainage	F - F - D	F - D - D	D - D - F

-  Breather
-  Sight glass
-  Drainage



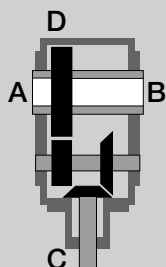
KSH 64 - KSH 128

DIMENSIONS



Size	Ratio	D1	D2	D3	D7*	D11	D12	D14	D16	D25	Key D1 according to DIN 6885/1	Passfedernut according to DIN 6885/1	L	L1	L4	L5
64	6,0 + 9,6	60	H7	H7		f7	f7	f7			18 x 11 x 90	JS9				
	7,5 + 12 - 19,2	50	85	85	M20	160	258	280	205	105	14 x 9 x 70	22	306	110	200	200
	21,6 - 48,0	45												90		
128	6,0 + 9,6	80									22 x 14 x 160					
	7,5 + 12 - 19,2	65	100	100	M24	250	345	340	280	130	18 x 11 x 125	28	450	170	250	250
	21,6 - 48,0	55									16 x 10 x 90			110		

BA 70

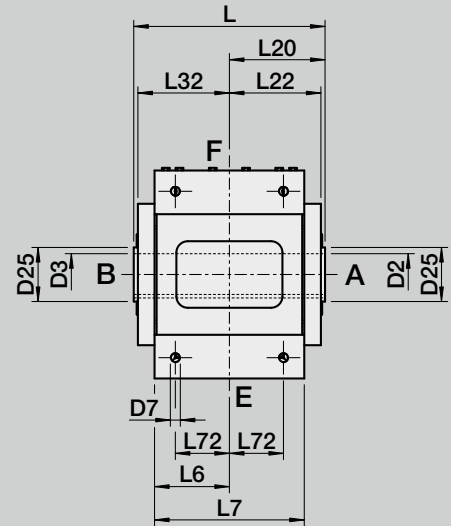
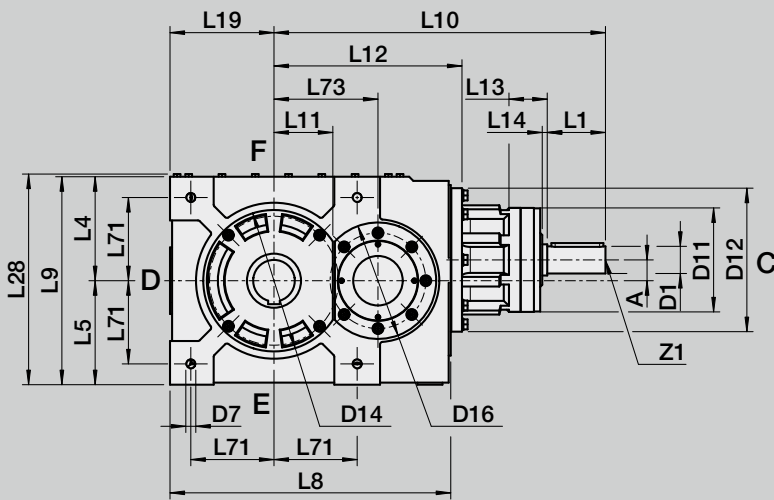


* Depth of thread: 1.5x Ø



KSH 64 - KSH 128

DIMENSIONS



L6	L7	L8	L9	L10	L11	L12	L13	L14	L19	L20	L22	L28	L32	L71	L72	L73	A*	R	Z1 DIN 332
				582															
130	260	532	400	562	114	352	-	5	200	153	150	407	150	160	90	202	40/0	5	M20
				760															10
180	360	675	500	820	142	452	90	5	250	255	220	510	220	200	130	250	50/0	12	M20
				760															

A* from ratio 33.6, otherwise (valid for size 64,128)

M K S

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 two pages are intended only for rough preselection.

Gear teeth:	Klingelnberg Spiralverzahnung	Lubrication:	Oil lubrication
Direction of rotation:	The opposite direction when facing C and A	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





M K S

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

MKS		64								
		without offset								
Ratio	i		6,0	7,5	9,6	12,0	14,4	16,8	19,2	
Combination	i		2 x 3	2,5 x 3	2 x 4,8	2,5 x 4,8	3,0 x 4,8	3,5 x 4,8	4 x 4,8	
Max. permissible output torque	T _{2maxzul}	Nm	7560	6480	9000	9360	9360	9720	9720	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	3780	3230	4060	4340	4000	4300	4400	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	8400	7200	10000	10400	10400	10800	10800	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1400	1400	1400	1400	2000	2000	2000	
Max. input speed	n _{1maxzul}	min ⁻¹	2800	2800	2800	2800	3000	3000	3000	
Max. backlash*	j	arcmin	≤ 10							
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	34485	36898	39764	42546	40356	42286	44032	
Max. permissible radial load output	F _{2rmazul}	N	58000							
Efficiency	η	-	0,96							
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	30							
Weight	m	kg	approx. 303							
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75							
Inertia (with reference to input)	Ø d 38	J ₁	kgcm ²	343	238	239	169	149	118	102
	Ø d 42	J ₁	kgcm ²	347	242	244	173	153	122	107
	Ø d 48	J ₁	kgcm ²	355	250	251	181	161	129	114
	Ø d 55	J ₁	kgcm ²	363	258	259	189	169	138	122
	Ø d 60	J ₁	kgcm ²	408	303	305	234	214	183	167

MKS		64									
		without offset				with offset					
Ratio	i		21,6	24,0	26,4	28,8	33,6	38,4	43,2	48,0	
Combination	i		4,5 x 4,8	5 x 4,8	5,5 x 4,8	6 x 4,8	7 x 4,8	8 x 4,8	9 x 4,8	10 x 4,8	
Max. permissible output torque	T _{2maxzul}	Nm	10260	9900	9900	9540	10080	10080	9720	10260	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	5200	4500	4400	4300	4100	4100	4100	4000	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	11400	11000	11000	10600	11200	11200	10800	11400	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	2000	2000	2000	2000	2000	2000	2000	2000	
Max. input speed	n _{1maxzul}	min ⁻¹	3000	3000	3000	3000	3000	3000	3000	3000	
Max. backlash*	j	arcmin	≤ 10								
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	45632	47112	48493	49789	52170	54324	56298	58124	
Max. permissible radial load output	F _{2rmazul}	N	58000				58000				
Efficiency	η	-	0,96				0,935				
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	30				18,5				
Weight	m	kg	approx. 303				approx. 303				
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75								
Inertia (with reference to input)	Ø d 38	J ₁	kgcm ²	100	103	94	89	77	74	67	65
	Ø d 42	J ₁	kgcm ²	104	108	101	94	84	78	72	70
	Ø d 48	J ₁	kgcm ²	111	115	108	101	91	85	79	77
	Ø d 55	J ₁	kgcm ²	120	130	116	109	100	94	87	85
	Ø d 60	J ₁	kgcm ²	165	168	161	155	145	139	132	130

* measured with 2 % nominal torque on output shaft



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

MKS		128								
		without offset								
Ratio	i		6,0	7,5	9,6	12,0	14,4	16,8	19,2	
Combination	i		2 x 3	2,5 x 3	2 x 4,8	2,5 x 4,8	3,0 x 4,8	3,5 x 4,8	4 x 4,8	
Max. permissible output torque	T _{2maxzul}	Nm	15840	16020	23040	23040	22500	21240	20880	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	8180	8240	12180	12520	11350	11400	11250	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	17600	17800	25600	25600	25000	23600	23200	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1200	1200	1200	1200	1750	1750	1750	
Max. input speed	n _{1maxzul}	min ⁻¹	2200	2200	2200	2200	2500	2500	2500	
Max. backlash*	j	arcmin	≤ 10							
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	42704	45692	49241	52686	49663	52038	54187	
Max. permissible radial load output	F _{2rmazul}	N	72000							
Efficiency	η	-	0,96							
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	49							
Weight	m	kg	approx. 750							
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75							
Inertia (with reference to input)	∅ d 38	J ₁	kgcm ²	2289	1572	2005	1387	1566	996	1026
	∅ d 42	J ₁	kgcm ²	2294	1577	2010	1395	1571	1001	1031
	∅ d 48	J ₁	kgcm ²	2301	1584	2017	1402	1578	1008	1038
	∅ d 55	J ₁	kgcm ²	2309	1592	2025	1410	1587	1017	1046
	∅ d 60	J ₁	kgcm ²	2354	1637	2070	1455	1632	1062	1091
∅ d 65	J ₁	kgcm ²	2369	1652	2085	1470	1647	1077	1106	

MKS		128										
		without offset					with offset					
Ratio	i		21,6	24,0	26,4	28,8	33,6	38,4	43,2	48,0		
Combination	i		4,5 x 4,8	5 x 4,8	5,5 x 4,8	6 x 4,8	7 x 4,8	8 x 4,8	9 x 4,8	10 x 4,8		
Max. permissible output torque	T _{2maxzul}	Nm	19440	22500	23040	22500	20880	20700	19800	19440		
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	9950	11900	12300	11900	10400	10300	9900	9700		
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	21600	25000	25600	25000	23200	23000	22000	21600		
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1750	1750	1750	1750	1750	1750	1750	1750		
Max. input speed	n _{1maxzul}	min ⁻¹	2500	2500	2500	2500	2500	2500	2500	2500		
Max. backlash*	j	arcmin	≤ 10					≤ 10				
Permissible radial load input (at permissible average input speed)	F _{1rmzul}	N	15192	15192	15192	15192	15192	15192	15192	15192		
Max. zulässige Radialkraft Antrieb	F _{1rmazul}	N	40000									
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	56156	57978	59676	61271	64201	66852	69281	71529		
Max. permissible radial load output	F _{2rmazul}	N	72000									
Efficiency	η	-	0,96					0,935				
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	49					30,5				
Weight	m	kg	approx. 750					approx. 750				
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75							≤ 75		
Inertia (with reference to input)	∅ d 38	J ₁	kgcm ²	972	927	907	890	850	831	817	806	
	∅ d 42	J ₁	kgcm ²	976	931	912	894	855	835	821	811	
	∅ d 48	J ₁	kgcm ²	983	939	919	902	862	843	829	818	
	∅ d 55	J ₁	kgcm ²	992	947	927	910	870	851	837	827	
	∅ d 60	J ₁	kgcm ²	1037	992	972	955	915	896	881	872	
∅ d 65	J ₁	kgcm ²	1052	1007	988	970	930	911	897	887		

* measured with 2 % nominal torque on output shaft



M K S

MOUNTING POSITION AND LUBRICATION

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

- Breather
- Sight glass
- Drainage

Special case:

With gearbox size 128 and mounting position D the gearbox is equipped with oil-forced lubrication. This will entail additional cost. Please make a separate request. See page 157

M K S H

TECHNICAL DATA

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

Gear teeth:	Klingelnberg spiral bevel toothing	Lubrication:	Oil lubrication
Direction of rotation:	The opposite direction when facing C and A	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





M K S H

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

MKSH		64								
		without offset								
Ratio	i		6,0	7,5	9,6	12,0	14,4	16,8	19,2	
Combination	i		2 x 3	2,5 x 3	2 x 4,8	2,5 x 4,8	3,0 x 4,8	3,5 x 4,8	4 x 4,8	
Max. permissible output torque	T _{2maxzul}	Nm	7560	6480	9000	9360	9360	9720	9720	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	3780	3230	4060	4340	4000	4300	4400	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	8400	7200	10000	10400	10400	10800	10800	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1400	1400	1400	1400	2000	2000	2000	
Max. input speed	n _{1maxzul}	min ⁻¹	2800	2800	2800	2800	3000	3000	3000	
Max. backlash*	j	arcmin	≤ 10							
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	34485	36898	39764	42546	40356	42286	44032	
Max. permissible radial load output	F _{2rmazul}	N	58000							
Efficiency	η	-	0,96							
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	30							
Weight	m	kg	approx. 303							
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75							
Inertia (with reference to input)	∅ d 38	J ₁	kgcm ²	343	238	239	169	149	118	102
	∅ d 42	J ₁	kgcm ²	347	242	244	173	153	122	107
	∅ d 48	J ₁	kgcm ²	355	250	251	181	161	129	114
	∅ d 55	J ₁	kgcm ²	363	258	259	189	169	138	122
	∅ d 60	J ₁	kgcm ²	408	303	305	234	214	183	167

MKSH		64									
		without offset				with offset					
Ratio	i		21,6	24,0	26,4	28,80	33,60	38,40	43,20	48,00	
Combination	i		4,5 x 4,8	5 x 4,8	5,5 x 4,8	6 x 4,8	7 x 4,8	8 x 4,8	9 x 4,8	10 x 4,8	
Max. permissible output torque	T _{2maxzul}	Nm	10260	9900	9900	9540	10080	10080	9720	10260	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	5200	4500	4400	4300	4100	4100	4100	4000	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	11400	11000	11000	10600	11200	11200	10800	11400	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	2000	2000	2000	2000	2000	2000	2000	2000	
Max. input speed	n _{1maxzul}	min ⁻¹	3000	3000	3000	3000	3000	3000	3000	3000	
Max. backlash*	j	arcmin	≤ 10				≤ 10				
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	45632	47112	48493	49789	52170	54324	56298	58124	
Max. permissible radial load output	F _{2rmazul}	N	58000				58000				
Efficiency	η	-	0,96				0,935				
Thermal limit power (Tu = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	30				18,5				
Weight	m	kg	approx. 303				approx. 303				
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75				≤ 75				
Inertia (with reference to input)	∅ d 38	J ₁	kgcm ²	100	103	94	89	77	74	67	65
	∅ d 42	J ₁	kgcm ²	104	108	101	94	84	78	72	70
	∅ d 48	J ₁	kgcm ²	111	115	108	101	91	85	79	77
	∅ d 55	J ₁	kgcm ²	120	130	116	109	100	94	87	85
	∅ d 60	J ₁	kgcm ²	165	168	161	155	145	139	132	130

* measured with 2 % nominal torque on output shaft



M K S H

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

MKSH		128								
		without offset								
Ratio	i		6,0	7,5	9,6	12,0	14,4	16,8	19,2	
Combination	i		2 x 3	2,5 x 3	2 x 4,8	2,5 x 4,8	3,0 x 4,8	3,5 x 4,8	4 x 4,8	
Max. permissible output torque	T _{2maxzul}	Nm	15840	16020	23040	23040	22500	21240	20880	
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	8180	8240	12180	12520	11350	11400	11250	
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	17600	17800	25600	25600	25000	23600	23200	
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1200	1200	1200	1200	1750	1750	1750	
Max. input speed	n _{1maxzul}	min ⁻¹	2200	2200	2200	2200	2500	2500	2500	
Max. backlash*	j	arcmin	≤ 10							
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	42704	45692	49241	52686	49663	52038	54187	
Max. permissible radial load output	F _{2rmaxzul}	N	72000							
Efficiency	η	-	0,96							
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	49							
Weight	m	kg	approx. 750							
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75							
Inertia (with reference to input)	Ø d 38	J ₁	kgcm ²	2289	1572	2005	1387	1566	996	1026
	Ø d 42	J ₁	kgcm ²	2294	1577	2010	1395	1571	1001	1031
	Ø d 48	J ₁	kgcm ²	2301	1584	2017	1401	1578	1008	1038
	Ø d 55	J ₁	kgcm ²	2309	1592	2025	1410	1587	1017	1046
	Ø d 60	J ₁	kgcm ²	2354	1637	2070	1455	1632	1062	1091
Ø d 65	J ₁	kgcm ²	2369	1652	2085	1470	1647	1077	1106	

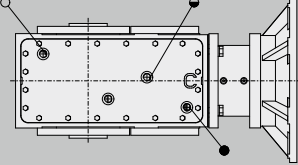
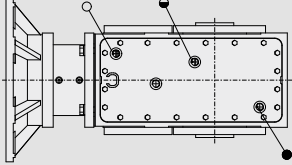
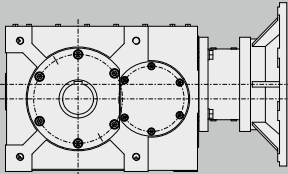
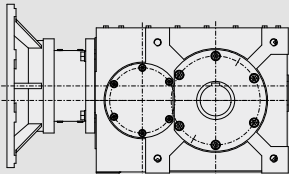
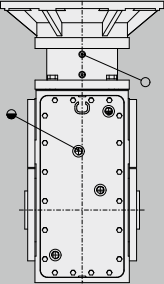
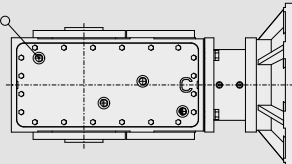
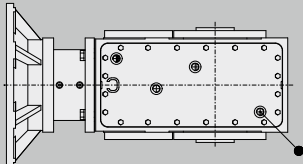
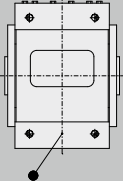
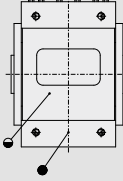
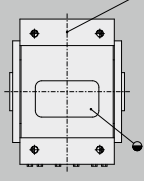
MKSH		128										
		without offset					with offset					
Ratio	i		21,6	24,0	26,4	28,8	33,6	38,4	43,2	48,0		
Combination	i		4,5 x 4,8	5 x 4,8	5,5 x 4,8	6 x 4,8	7 x 4,8	8 x 4,8	9 x 4,8	10 x 4,8		
Max. permissible output torque	T _{2maxzul}	Nm	19440	22500	23040	22500	20880	20700	19800	19440		
Nominal torque on output (with n _{1mzul})	T _{2Nzul}	Nm	9950	11900	12300	11900	10400	10300	9900	9700		
Emergency stop torque (permissible 1000 times during gearbox life time)	T _{2Notzul}	Nm	21600	25000	25600	25000	23200	23000	22000	21600		
Permissible average input speed (with T _{2Nzul})	n _{1mzul}	min ⁻¹	1750	1750	1750	1750	1750	1750	1750	1750		
Max. input speed	n _{1maxzul}	min ⁻¹	2500	2500	2500	2500	2500	2500	2500	2500		
Max. backlash*	j	arcmin	≤ 10					≤ 10				
Permissible radial load output (at permissible average input speed)	F _{2rmzul}	N	56156	57978	59676	61271	64201	66852	69281	71529		
Max. permissible radial load output	F _{2rmaxzul}	N	72000					72000				
Efficiency	η	-	0,96					0,935				
Thermal limit power (T _u = 20° C ambient temperature indoor set-up, clean, S1 operation)	P _{thGrenz}	kW	49					30,5				
Weight	m	kg	approx. 750					approx. 750				
Running noise (with n _{1mzul})	L _{PA}	dB(A)	≤ 75					≤ 75				
Inertia (with reference to input)	Ø d 38	J ₁	kgcm ²	972	927	907	890	850	831	817	806	
	Ø d 42	J ₁	kgcm ²	976	931	912	894	855	835	821	811	
	Ø d 48	J ₁	kgcm ²	984	939	919	902	862	843	829	818	
	Ø d 55	J ₁	kgcm ²	992	947	927	910	870	851	837	827	
	Ø d 60	J ₁	kgcm ²	1037	992	972	955	915	896	881	872	
	Ø d 65	J ₁	kgcm ²	1052	1007	988	970	930	911	897	887	




* measured with 2 % nominal torque on output shaft



M K S H

MOUNTING POSITION AND LUBRICATION

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

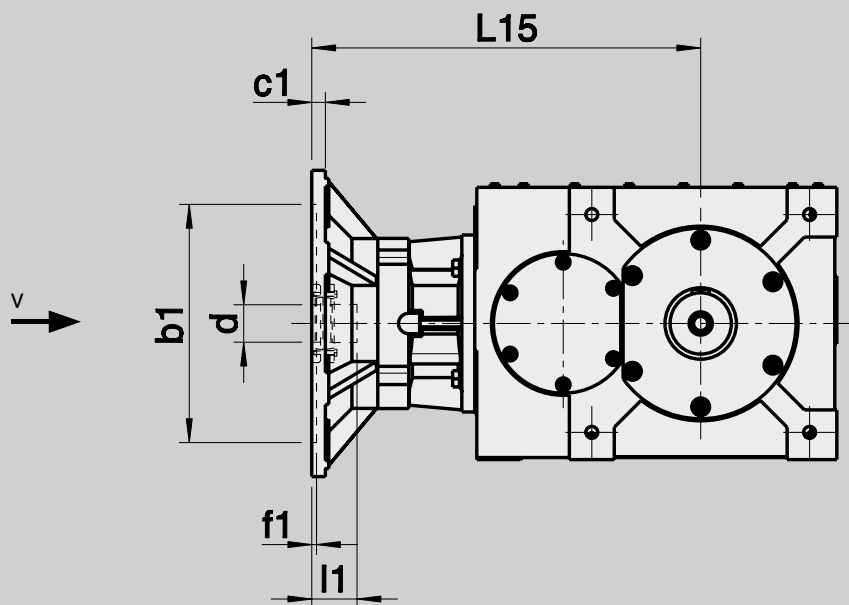
-  Breather
-  Sight glass
-  Drainage

Special case:

With gearbox size 128 and mounting position D the gearbox is equipped with oil-forced lubrication. This will entail additional cost. Please make a separate request. See page 157

MKS / MKSH / MKSHF 64 - 128
DIMENSIONS MOTOR MOUNTING

MKS / MKSH / MKSHF 64 - 128

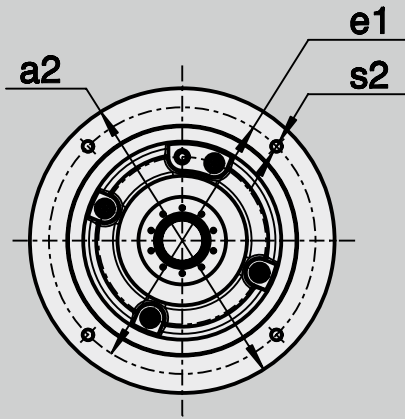


Gearbox dimensions

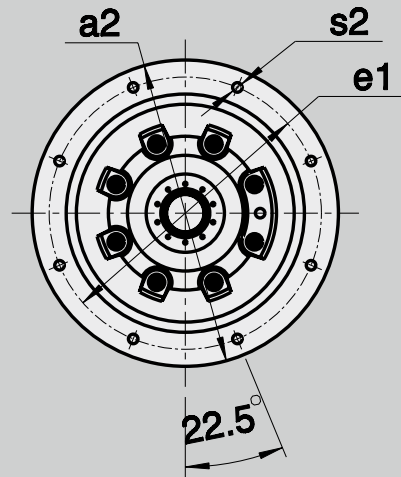
d	x	l1	Size	Ratio	L15	Version
G7						
38	x	80	64	6,0 - 48,0	572	B
42	x	110				
48	x	110				
55	x	110				
60	x	140				
42	x	110	128	6,0 - 19,2	690	B
48	x	110				
55	x	110				
60	x	140				
65	x	140				
42	x	110	128	21,6 - 48,0	665	B
48	x	110				
55	x	110				
60	x	140				
65	x	140				



View V



4 x threaded mounting bores



8 x threaded mounting bores

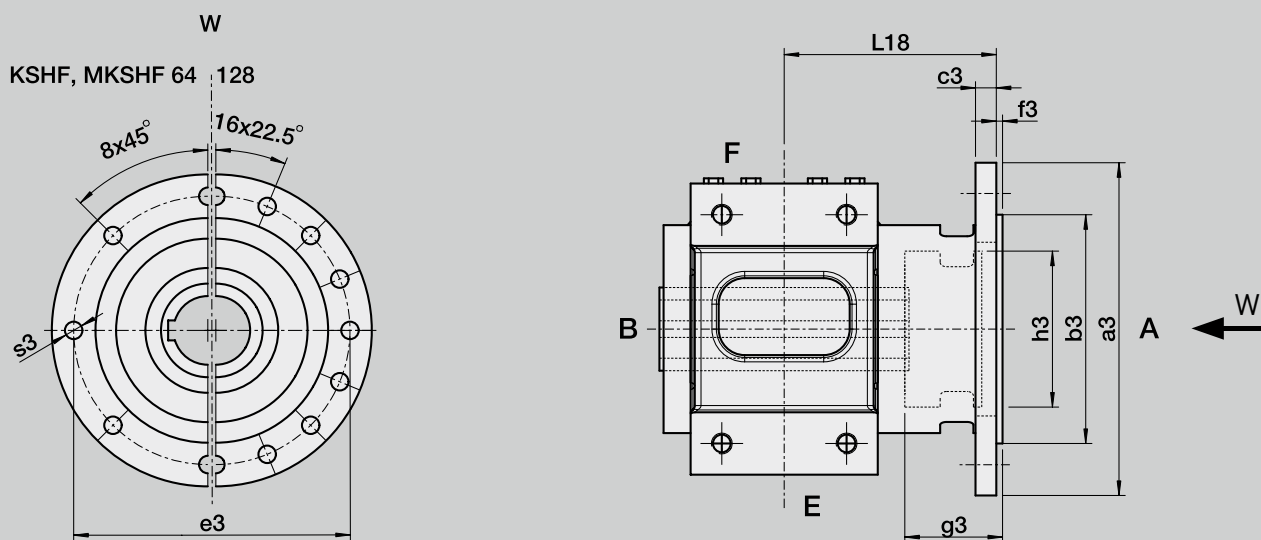
Motor dimensions

	300	350	400	450	550
a2	300	350	400	450	550
b1	230	250	300	350	450
e1	265	300	350	400	500
s2*	4 x M12	4 x M16	4 x M16	8 x M16	8 x M16
c1	25	25	25	25	25
f1	7	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

* Depth of thread: 2 x Ø or flange thickness

ADDITIONAL OPTIONS
KSHF / MKSHF 64 - 128
OUTPUT FLANGE
 DIMENSIONS

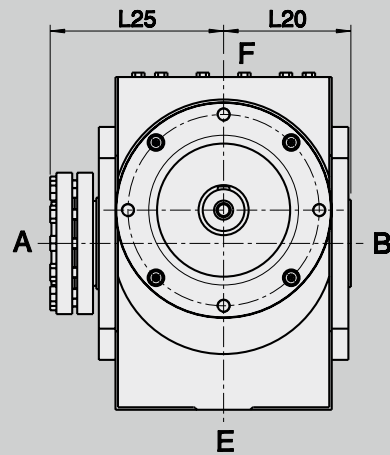
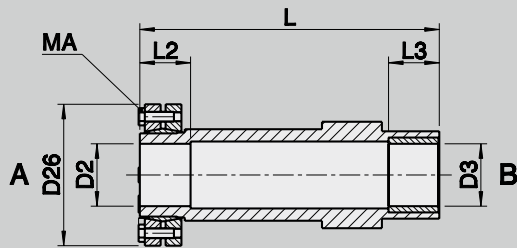


Order details: Output flange mounted on side A (or B).

Order option: Flange and shrink disc only available reciprocally on either side A or B.

Size	a3	b3	c3	e3	f3	g3	h3	s3	L18
		f7							
64	400	300	20	350	5	65	200	8 x Ø 18	210
128	550	450	25	500	5	91	355	16 x Ø 18	300

ADDITIONAL OPTIONS
 KSHF/MKSHF 64 - 128
 SHRINK DISC
 DIMENSIONS



Order details: Side A (or B) with shrink disc.

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

Size	D2/D3	D26	L	L20	L25	L2/L3	MA
	H7						
64	80	170	360	153	211	54/61	The required clamping torques MA can be found on the shrink disc.
128	100	230	508	225	292	60/61	

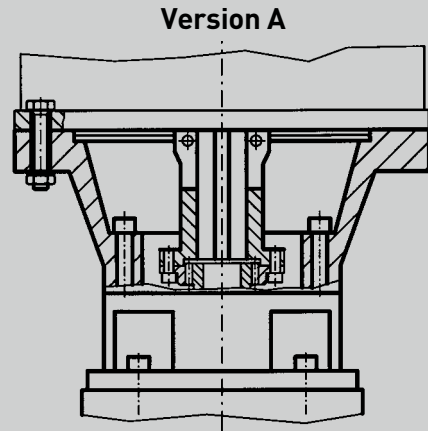
Shaft material for the insert shaft: minimum yield strength approx. 360 N/mm².

Recommended shaft fit h6

Version A

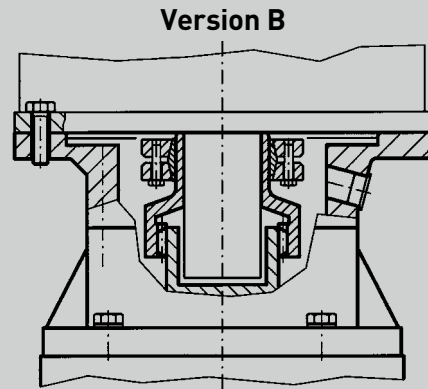
Attention! To make sure to transfer the motor torque in case of an emergency stop, it is required to use a motor shaft with keyway.

It is essential that the motor shaft and the bore on the clamping sleeve are dirt and grease free. Take the clamping bush and fit it to the motor shaft back to the shaft shoulder. Then tighten the coupling screws to the recommended torque. Do this in 3 step eitherway with 20% / 50% and then 100%. The torque which can be found on a sticker on the coupling. Grease the tooth profile of the clamping bush. With the gearbox in the vertical position and the input flange facing upwards mount the motor onto the gearbox and tighten the motor flange/gearbox fixing bolts.



Version B

It is essential that the motor shaft and the bore on the profiled bush are dirt and grease free. Take the profiled bush together with the shrink disc and fit it to the motor shaft back to the shaft shoulder. Then tighten the coupling screws to the recommended torque, which can be found on a sticker on the coupling. Grease the tooth profile of the profiled bush. With the gearbox in the vertical position and the input flange facing upwards mount the motor onto the gearbox and tighten the motor flange/gearbox fixing bolts.

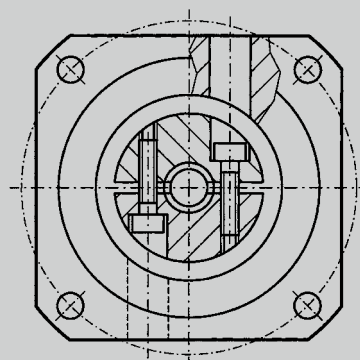
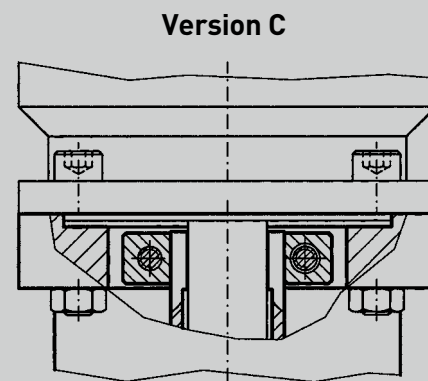


Version C

The connection between motor and gearbox is made using a shrink disc bush without a keyway. For maximum performance we recommend the use of motors with reduced shaft tolerance and concentricity according to DIN 42955 R standards.

When fitting the motor, position the gearbox vertically with the motor flange upwards. Before assembly, degrease the motor shaft and the blind hole in the gearbox. Remove the lock screw or two plastic plugs from the motor flange of the gearbox, and insert a long Allen key to reach the tangential clamping screw in the coupling. The coupling must first be turned to the correct position for the screw to be accessible. Lower the motor vertically with the motor shaft in the blind hole. Ensure that the motor shaft has completely entered the bore, and that the flanges of motor and gearbox are in contact with each other over their full surface. The motor flange screws can now be inserted (do not tighten them completely). Then tighten the screws of the coupling with the required tightening torque. Do this in 3 steps alternately with 20%, 50% and then 100%.

The torque values for motor mounting can be accessed in our motor mounting manual, which is offered separately. Finish tightening the motor flange screws. After assembly, it is important to reinsert the lock screw or plastic plugs into their holes.

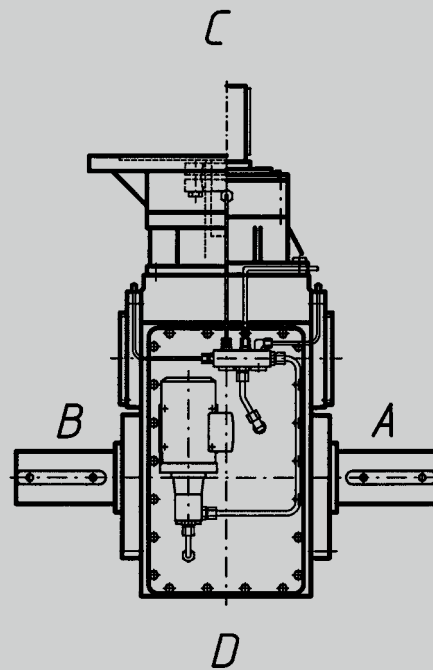
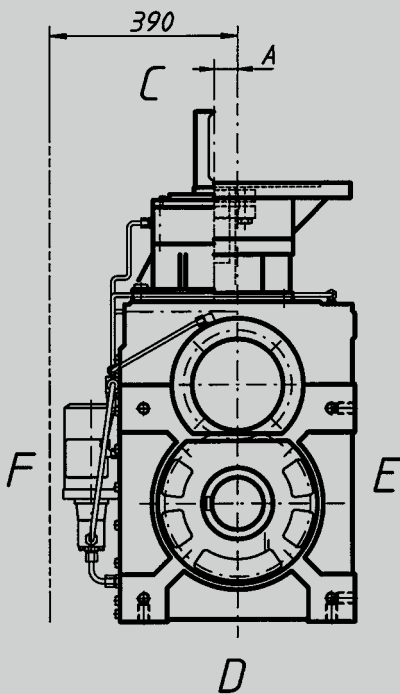


Mounting Position D = Under

In this mounting position (**D = underside**) the gearbox has an electrical powered oil pump. The pump delivers the oil to the bearings in the input flange and to the gear-set. The pump and its oil pipes are mounted on side F. Please consider the necessary mounting space.

Electrical connection data of the pump:

P = 0,18 kW
 Voltage = 400 / 230 V
 Speed = 1380 rpm at 50 Hz
 Protection type IP 55
 Please ask for other voltages

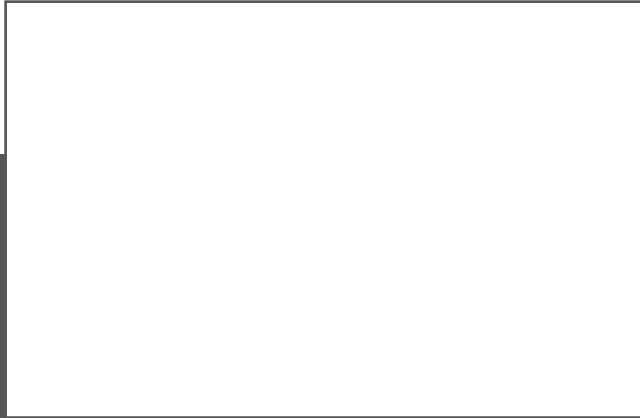


Additional price. Please request.

Attention!

Please pay attention, that the oil pump is running, before the gearbox is starting.

Your stamp:



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