auma®

Solutions for a world in motion

ESCALATOR GEAR UNITS

AUMA DRIVES

Our name means highest precision, engineering art and customised solutions in manufacturing gear units and drive systems. Safety-relevant applications such as the transport of people have always been a core automation competence for our gear units. We have complemented the elevator drive range by AUMA Drives escalator gear units for more than a decade. More than 27,000 AUMA Drives escalator gear units are reliably automating escalators in airpoirts, underground stations and department stores worldwide. With the FTS.1 and FTSST.1 series – and going beyond with the so-called twin drives – we cover motor power between 5 kW and 90 kW. The major assets of escalator gear units are their capability to withstand high loads and their functional safety, long running times, reliability and efficiency. We offer 100 % traceability for all components within the power drive.

ESCALATOR GEAR UNITS

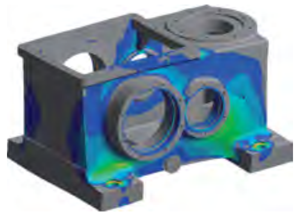
ESCALATOR GEAR UNITS WITHOUT COMPROMISE

No matter whether you go to airports, underground stations or department stores – It is impossible to imagine everyday life without escalators. The core of all systems is the drive technology, imperatively meeting highest demands: a matter of course for Auma Drives. We guarantee high resilience and functional safety, long service performance, reliability and economic viability.

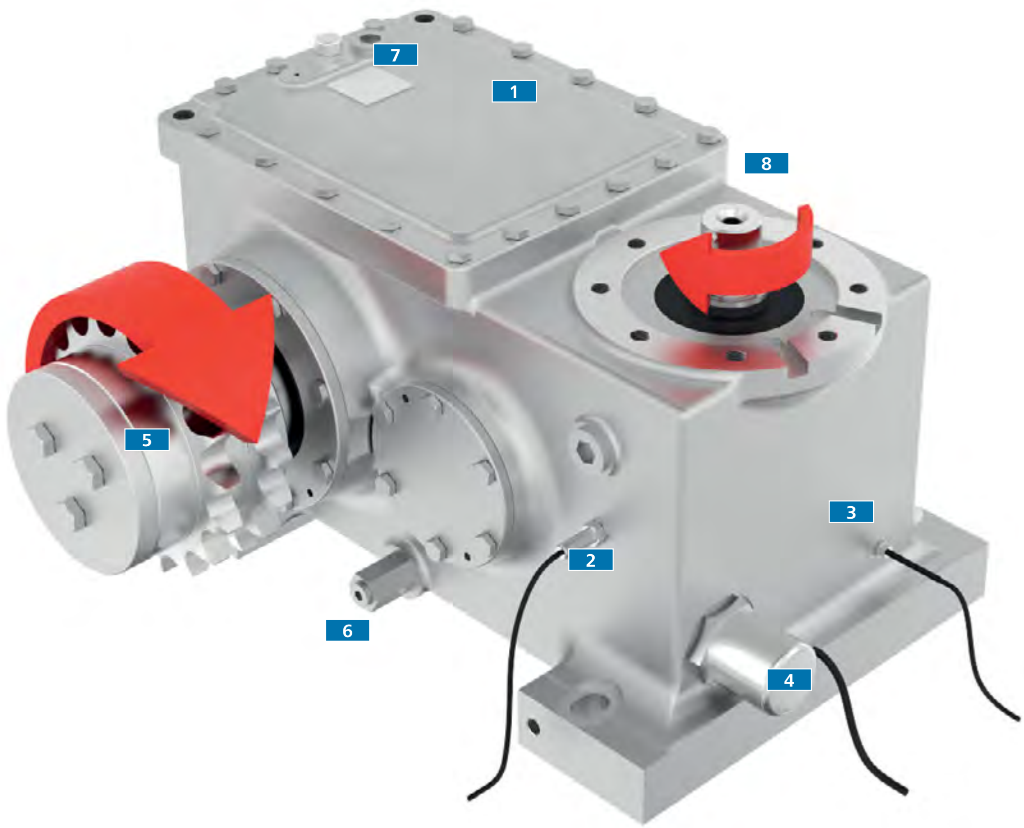
Our worm gear units keep the noise level constantly below 55 dB (A). They are lubricated for life and subject to continuous quality control – from incoming goods to final inspection at the acoustic measurement room. Our products fulfil all requirements of standards DIN 3990, DIN 3996:2012, EN 115 and APTA according to the customer's product specifications.

DESIGN AND CHARACTERISTICS

Various outstanding features have established our gear units as first class escalator gear units. Vibration and shock-absorbing torque transmission, one of the main assets of worm gear units, means low-noise transport and therefore convenience for the passengers. Worm gearings with ZK type tooth profile optimised for this purpose have high overload capabilities and are therefore ideally suited for frequent load changes in daily operation. This is achieved by implementing grinded worm shafts made of case-hardened steel and worm wheels made of highly wear-resistant special bronze. Worm gearings correspond to DIN 3996:2012, the latest method for calculation of load capacity. The load capacity for the spur gear stages of our FTSST.1 heavy duty range have been calculated according to DIN 3990. All machine elements within AUMA Drives escalator gear units meet the safety factor ≥ 5 according to EN 115:2010. FEM optimised housings warrant for maximum stiffness and consequently reduced vibration within the powertrain.



ESCALATOR GEAR UNIT FTSST.1



NOISE EMISSION, EFFICIENCY AND LIFETIME

With regard to low-noise applications and noise emissions, worm gear units will always be the measure of all things.
In our in-house acoustic measurement room complying with DIN standards, the acoustic pressure level of our escalator gear units is measured and recorded as part of final inspection.

Machining of worm wheel sets on state-of-the-art equipment as well as unique measuring technology, partially in special development projects in close cooperation with our partners, ensure optimum gear quality. When using synthetic polyglycol lubricants, typical heavy industry worm gearings achieve an efficiency rating of up to 97 % thanks to our gearing optimisation technology. Paired with the implementation of top grade materials, selected standard parts and high precision housing machining, maximum service life and highest reliability are achieved. The evidence of these results were confirmed by internal verifications and tests on customers' test benches.

OPTIONS AND MOUNTING PARTS

If specifically desired, AUMA Drives escalator gear units can be provided with integrated sensor technology for monitoring oil level, oil sump temperature and system vibration. When implemented in extremely low temperature environments, we offer an optional oil heater to ensure optimum lubrication as early as during the start-up phase.

1 Vibration sensor

2 Option: Oil level sensor

3 Oil temperature sensor

4 Lubricant heater

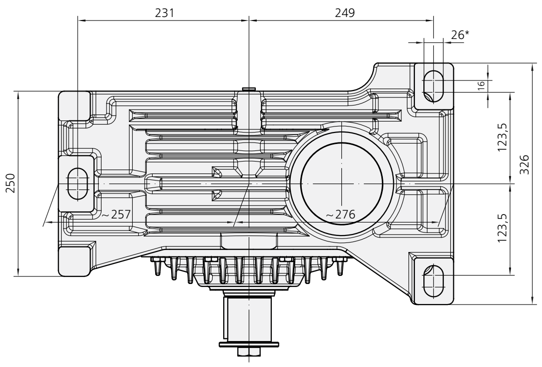
5 Chain pinion

6 Oil drain

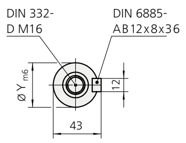
7 Breather

8 Drive shaft

DIMENSION SHEET – TYPE FTS 125.1

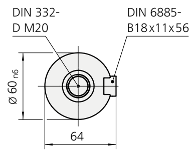


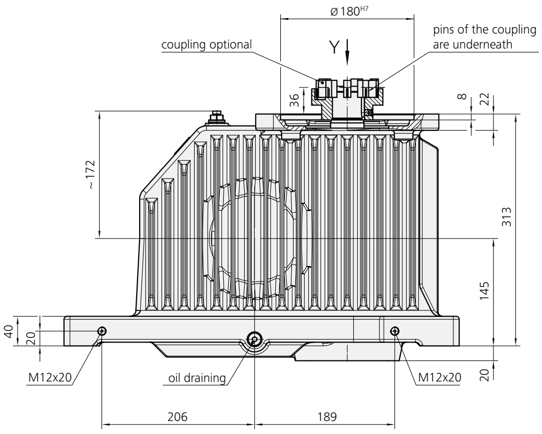
Y 1:2

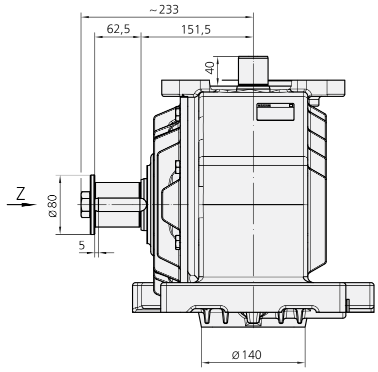


Z 1:2

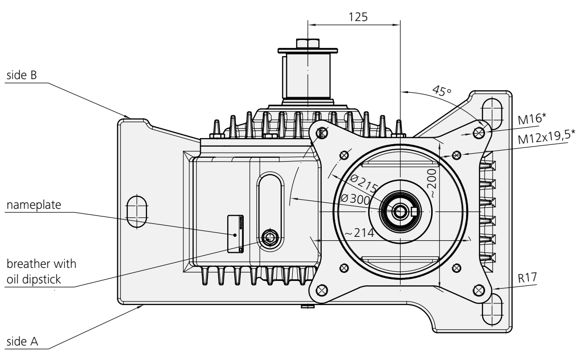
view without cover and screw

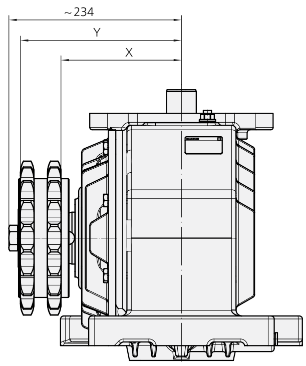






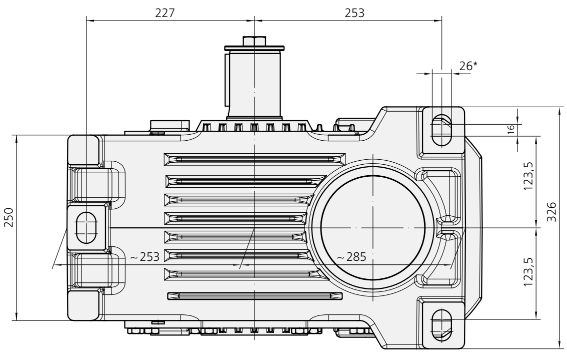
Output side B

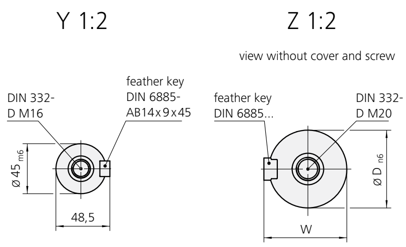


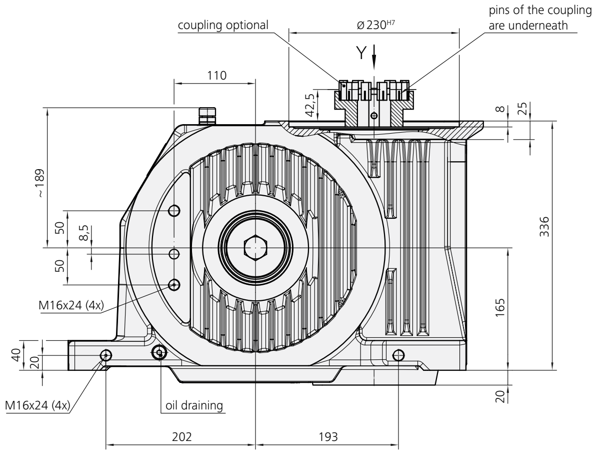


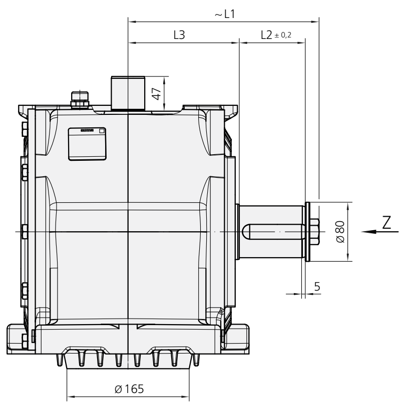
Pinion		
Type of pinion	X [mm]	Y [mm]
Duplex-1 1/4'' (double) for chains acc. to DIN 8187	162.3	217.1
Duplex-1 1/4'' (double) for chains acc. to DIN 8188	163.7	217.1

* Strength class of screws 10.9

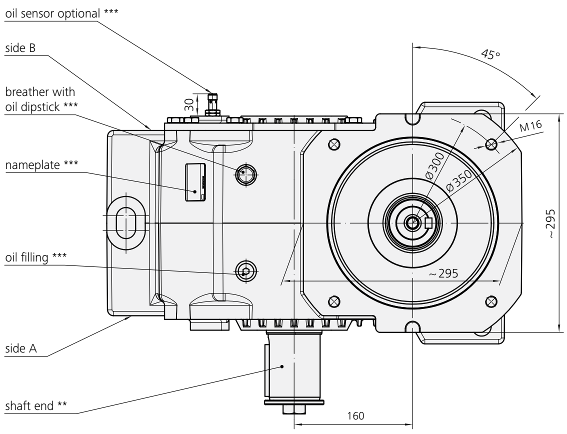




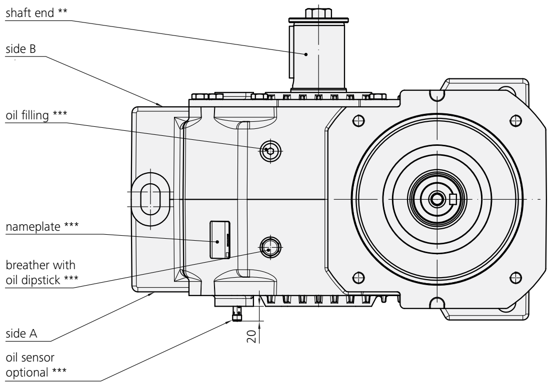




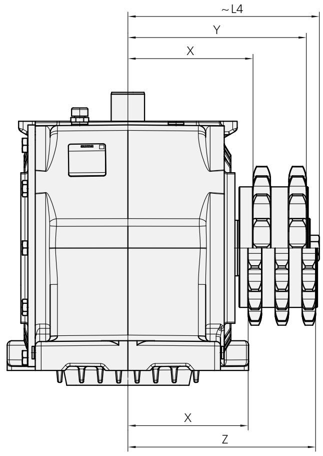
Output side A



Output side B

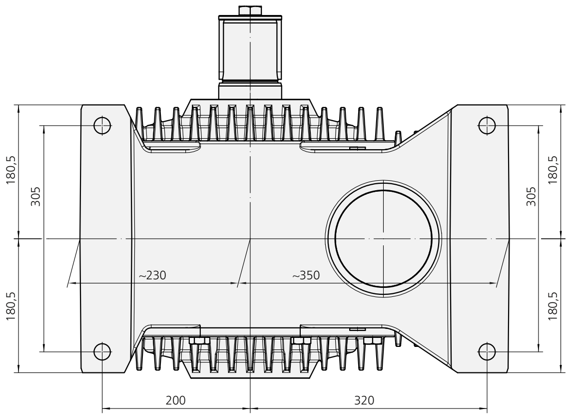


Pinion										
Type of pinion	ØD [mm]	L1 [mm]	L2 [mm]	L3 [mm]	L4 [mm]	W [mm]	X [mm]	Y [mm]	Z [mm]	feather key
Duplex-1 1/2'' (double) for chains DIN 8187	70	258	89.0	150.0	259	74.5	168.9	240.9		B20x12x17
Duplex-1 1/2'' (double) for chains DIN 8188	70	258	89.0	150.0	259	74.5	172.0	240.9		B20x12x17
Duplex-1 1/4'' (double) for chains DIN 8187	60	233	62.5	151.5	234	64.0	160.8	215.6		B18x11x56
Duplex-1 1/4'' (double) for chains DIN 8188	60	233	62.5	151.5	234	64.0	162.2	215.6		B18x11x56
Triple-1 1/4'' (triple) for chains DIN 8187	70	258	89.0	150.0	259	74.5	162.3		253.7	B20x12x70
Triple-1 1/4'' (triple) for chains DIN 8188	70	258	89.0	150.0	259	74.5	164.5		253.7	B20x12x70

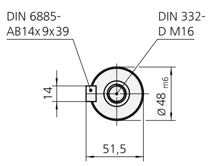


* Strength class of screws 10.9
** Specify mounting side of pinion or shaft end on order
*** Position of oil filling, breather, oil sensor and machine plate depend on output drive sides A and B

DIMENSION SHEET – TYPE FTS 180.1

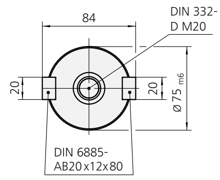


Y 1:2

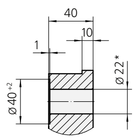


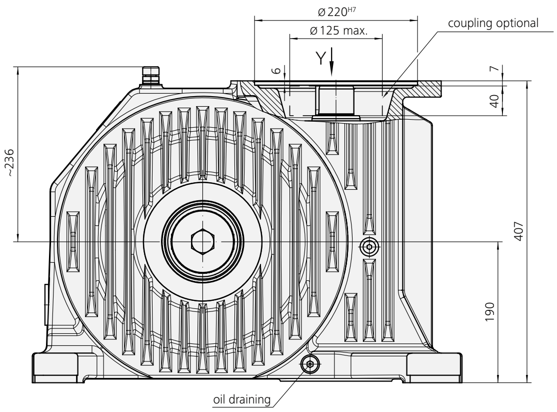
Z 1:2

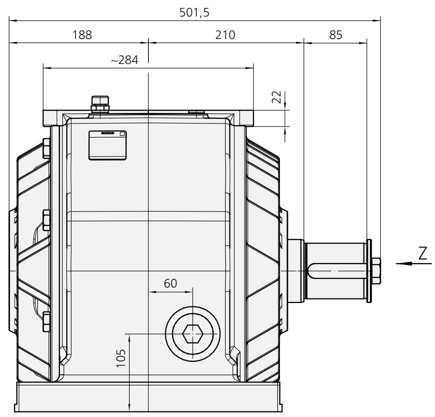
view without cover and screw



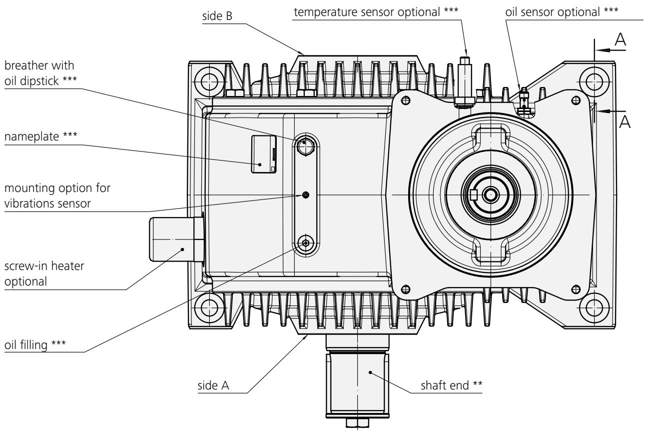
A-A 1:2



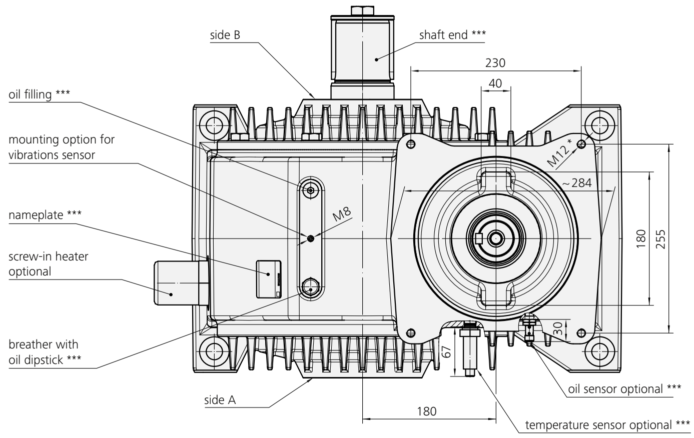




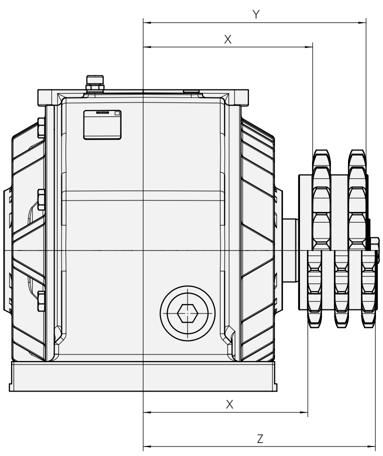
Output side A



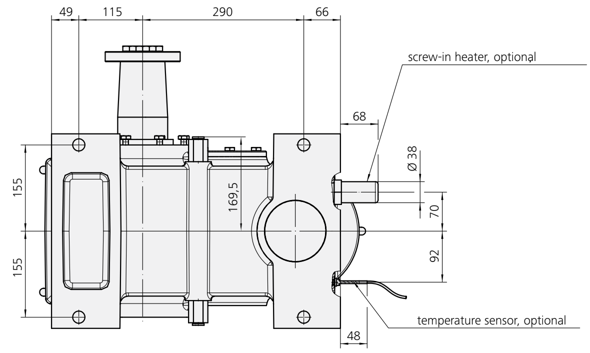
Output side B



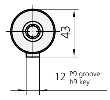
Pinion			
Type of pinion	X [mm]	Y [mm]	Z [mm]
Duplex-1 1/2'' (double) for chains DIN 8187	228.9	300.9	
Duplex-1 1/2'' (double) for chains DIN 8188	232.0	300.9	
Triple-1 1/4'' (triple) for chains DIN 8187	222.3		313.7
Triple-1 1/4'' (triple) for chains DIN 8188	224.5		313.7

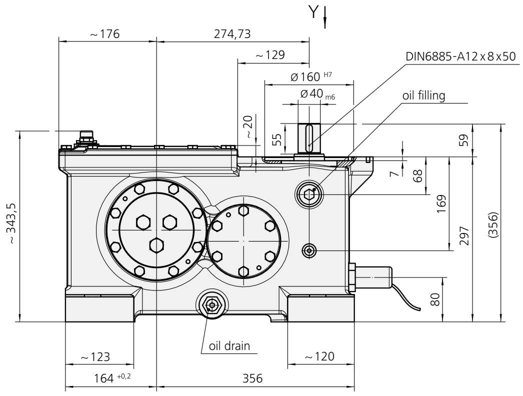


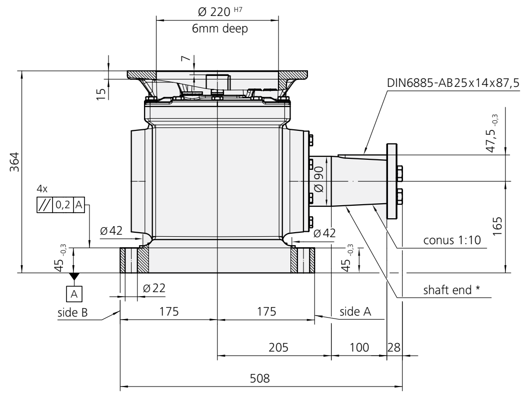
* Strength class of screws 10.9
** Specify mounting side of pinion or shaft end on order
*** Position of oil filling, breather, oil sensor and machine plate depend on output drive sides A and B



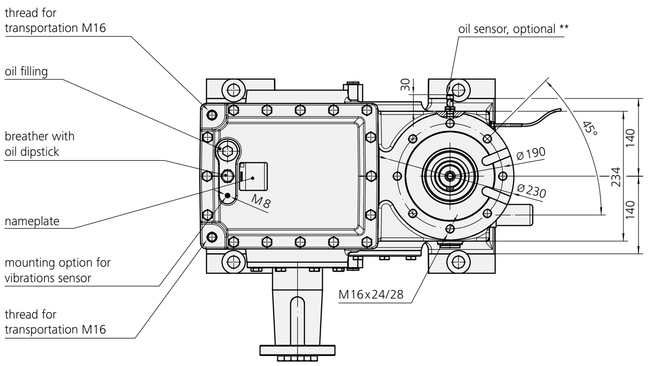
Y 1:2



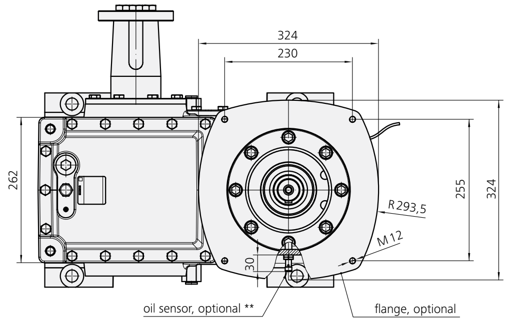




Output side A



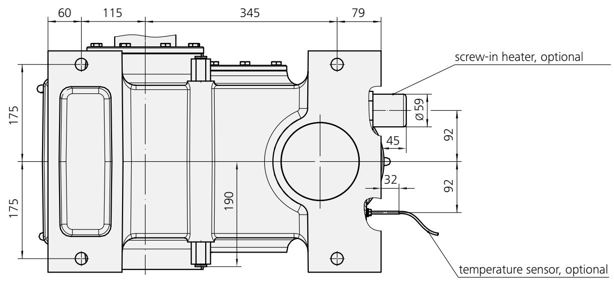
Output side B



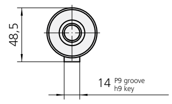
* Specify mounting side of shaft end on order

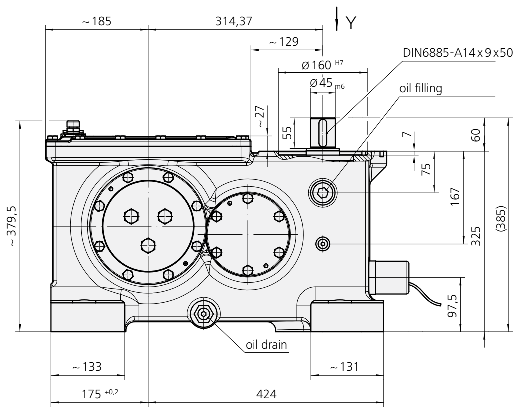
** Position of oil sensor depend on output drive sides A and B

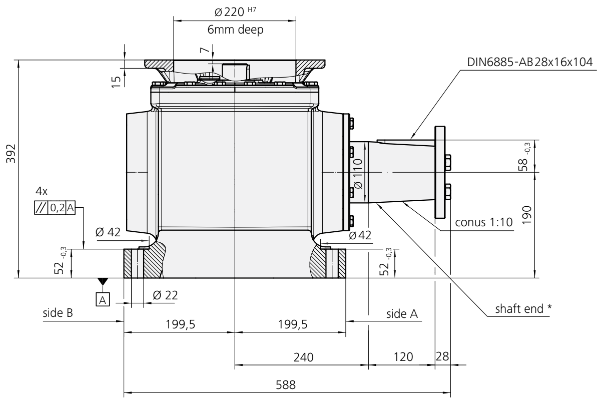
DIMENSION SHEET – TYPE FTSST 180.1



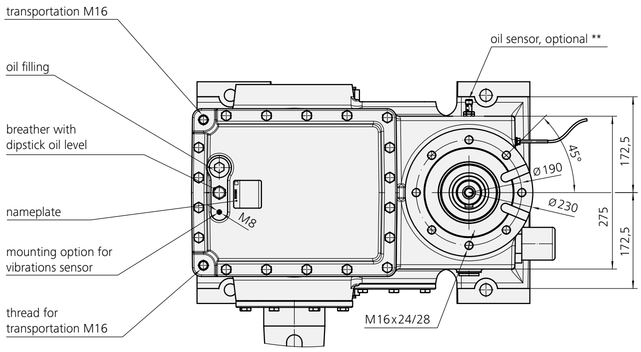
Y 1:2



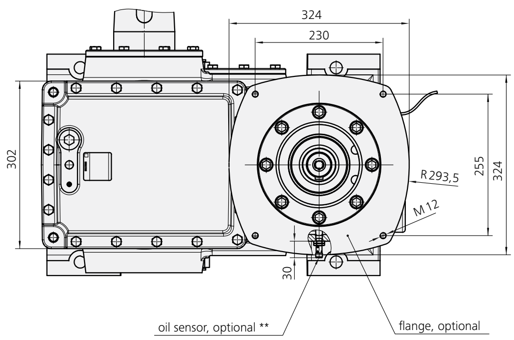




Output side A

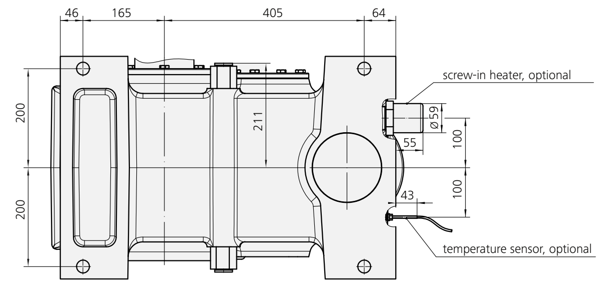


Output side B

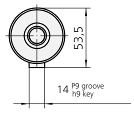


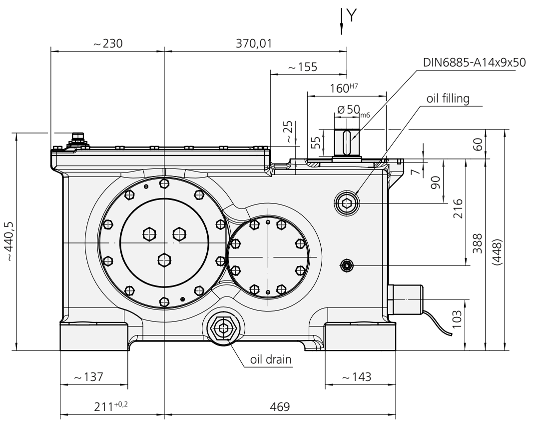
* Specify mounting side of shaft end on order

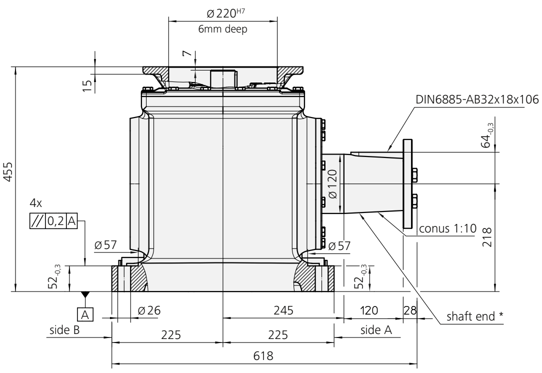
** Position of oil sensor depend on output drive sides A and B



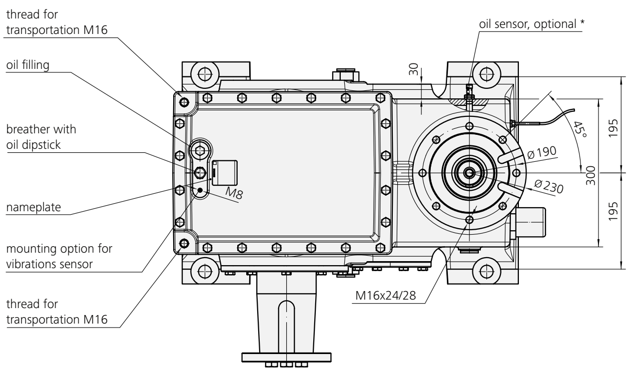
Y 1:2



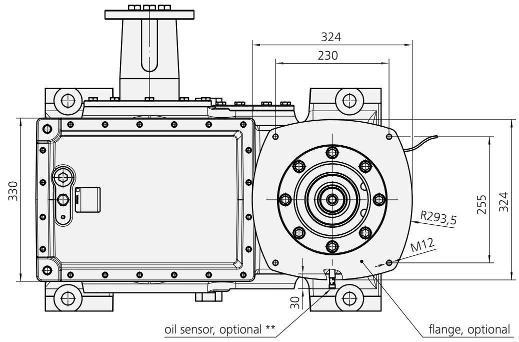




Output side A



Output side B



* Specify mounting side of shaft end on order

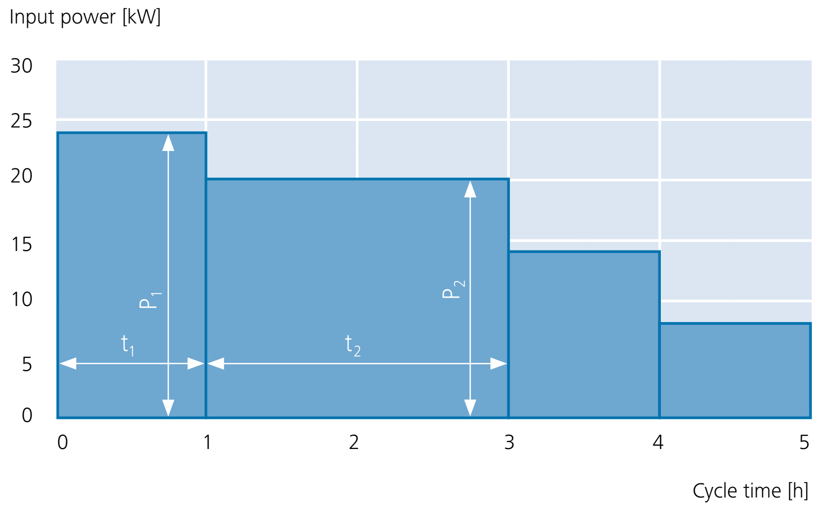
** Position of oil sensor depend on output drive sides A and B

GEAR UNIT SELECTION

FTS 125.1 | FTS 160.1 | FTS 180.1 | FTSST 158.1 | FTSST 180.1 | FTSST 212.1

Our comprehensive product portfolio and the large number of possible transmission ratios offer many selection criteria for finding the optimum gear unit for your application and hence a cost-efficient drive solution. Rated motor power and speed and the desired speed at the pinion are decisive for the gear unit type, size and transmission ratio. Determination of computed lifetime of the selected motor-gear unit combination is based on the load spectrum of the escalator to be automated. The load spectrum is the variable for the varying loads due to fluctuating number of people to be transported during the day. By means of the computed equivalent power P_{eq} lifetime and permissible radial force are determined on the basis of graphs. The course of action is demonstrated by means of the following example:

1. LOAD SPECTRUM (EXAMPLE)



EXAMPLE

Load event 1 = 24 kW across 1/5 of time

Load event 2 = 20 kW across 2/5 of time

Load event 3 = 14 kW across 1/5 of time

Load event 4 = 8 kW across 1/5 of time

2. CYCLE TIME

$$t_{tot} = t_1 + t_2 + t_3 + \cdots t_i$$

$t_{tot} = 5\,h$

3. EQUIVALENT POWER P_{EQ}

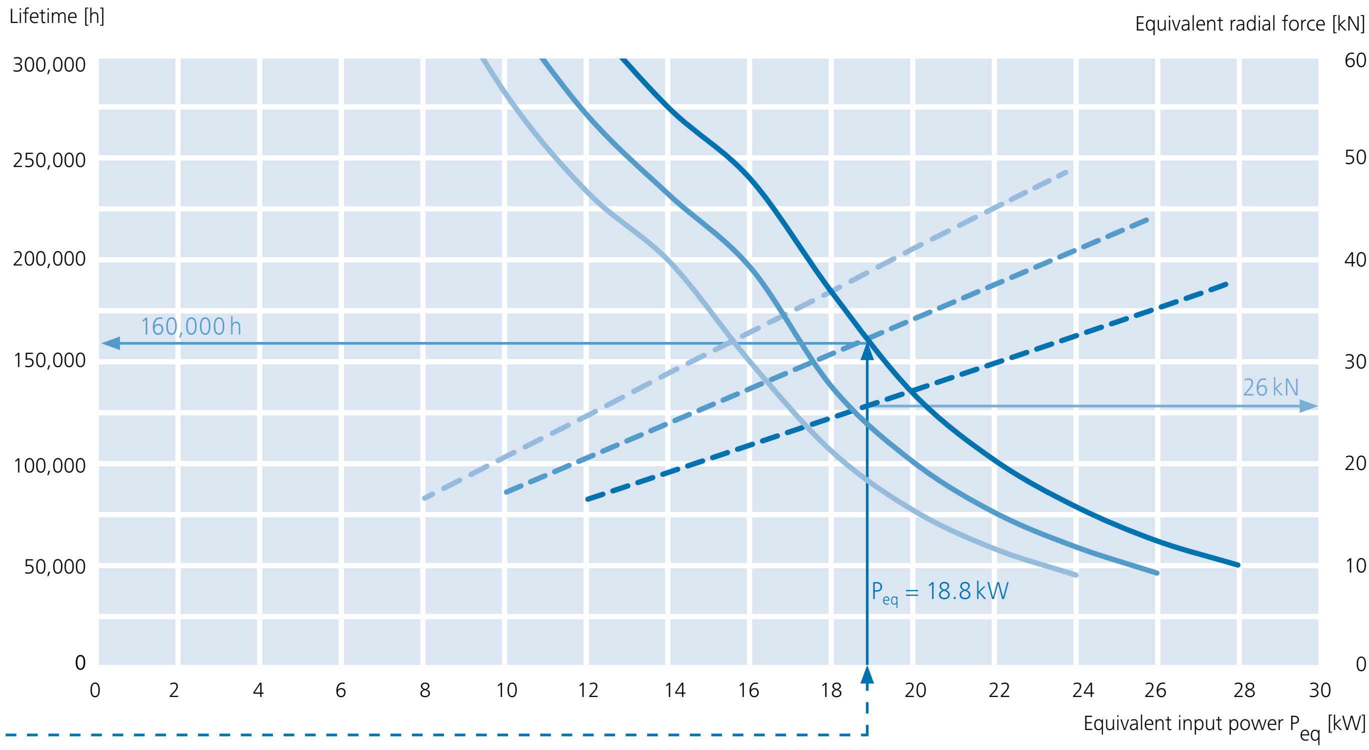
$$P_{eq} = \sqrt[3]{P_1^3 \times \frac{t_1}{t_{tot}} + P_2^3 \times \frac{t_2}{t_{tot}} + P_3^3 \times \frac{t_3}{t_{tot}} + \ldots + P_i^3 \times \frac{t_i}{t_{tot}}}$$

$P_{eq} = 18.8\,kW$

4. GRAPHIC DETERMINATION OF RESULTING LIFETIME AND PERMISSIBLE RADIAL FORCE AT OUTPUT SHAFT

Gear unit selected as example: FTSST 180.1 with transmission ratio i = 20.4 and motor speed of 1,480 rpm.

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	≥ 94 %	
Max. output torque	6. 5 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	71 kN (according to EN 115 » safety factor ≥ 5)	x = 300 mm



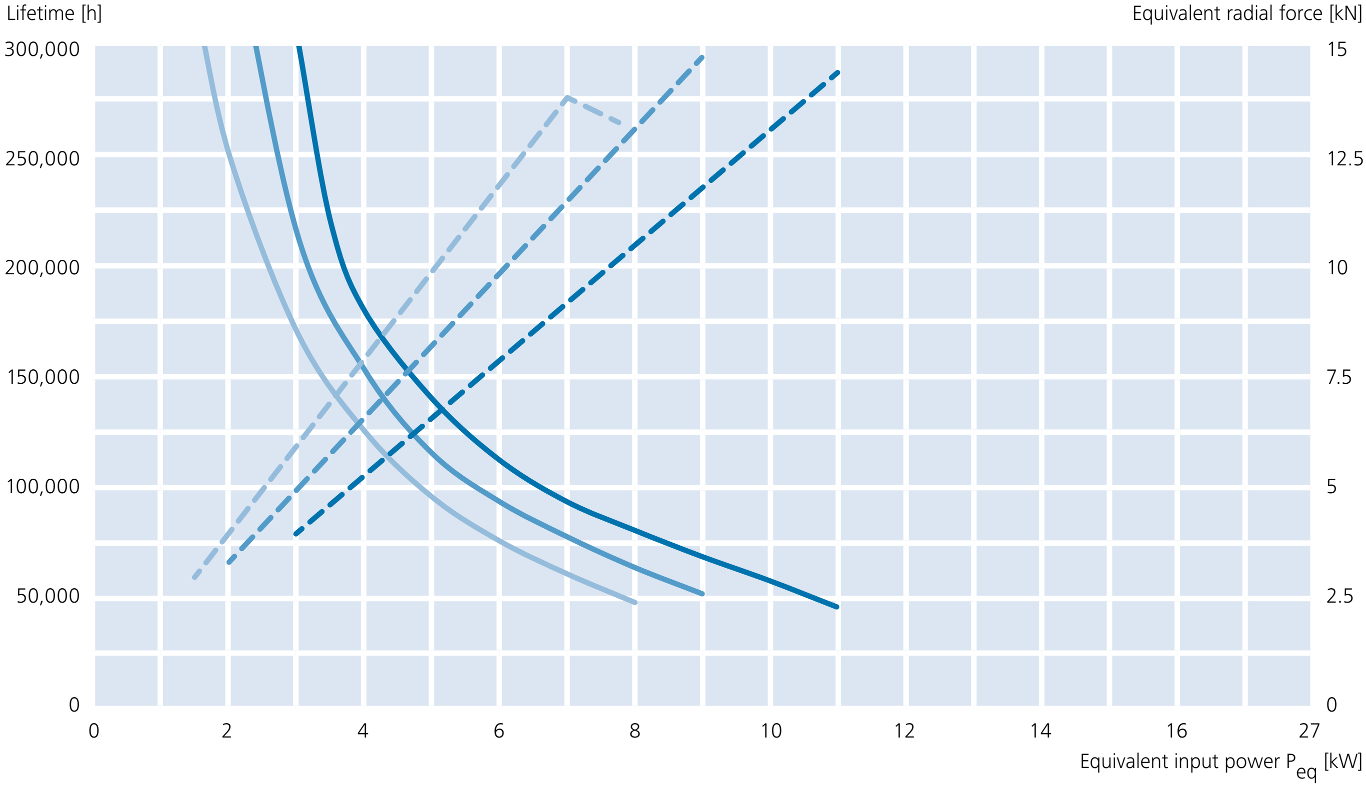
Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
——— (light)	– – – (light)	980	30	61
——— (medium)	– – – (medium)	1,180	30	51
——— (dark)	– – – (dark)	1,480	30	41

5. RESULT

The selected gear unit FTSST180.1 with reduction ratio i = 20.4 achieves a computed lifetime of 160,000 hours.
The permissible radial load on the output shaft at α = 60° is 26 kN.

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	≥ 91 %	
Max. output torque	2.0 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	17 kN (according to EN 115 » safety factor ≥ 5)	x = 183 mm

TRANSMISSION RATIO 20.5

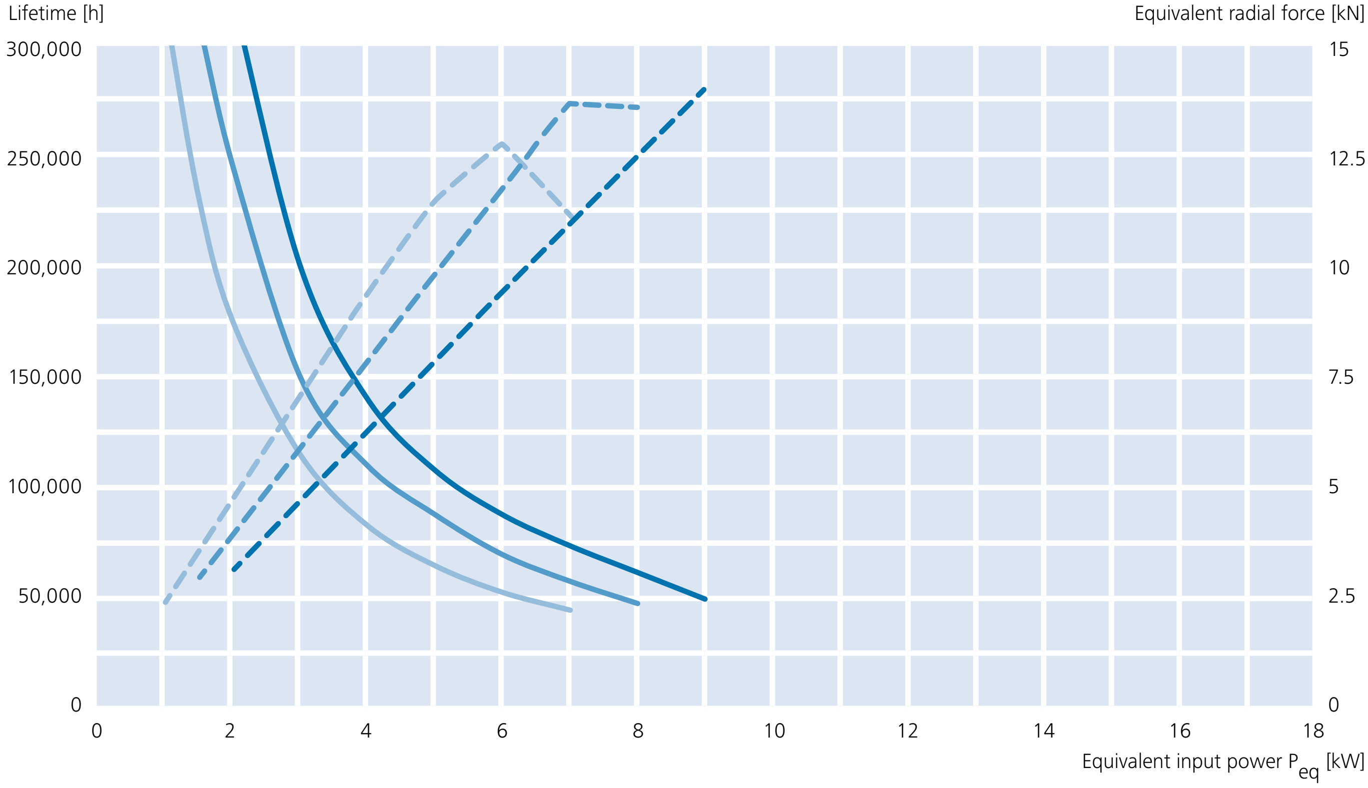


Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
——— (light)	- - - (light)	980	9.0	17
——— (medium)	- - - (medium)	1,180	9.5	15
——— (dark)	- - - (dark)	1,480	10.5	14

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	≥ 91 %	
Max. output torque	2.0 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	17 kN (according to EN 115 » safety factor ≥ 5)	x = 183 mm

TRANSMISSION RATIO 24.5

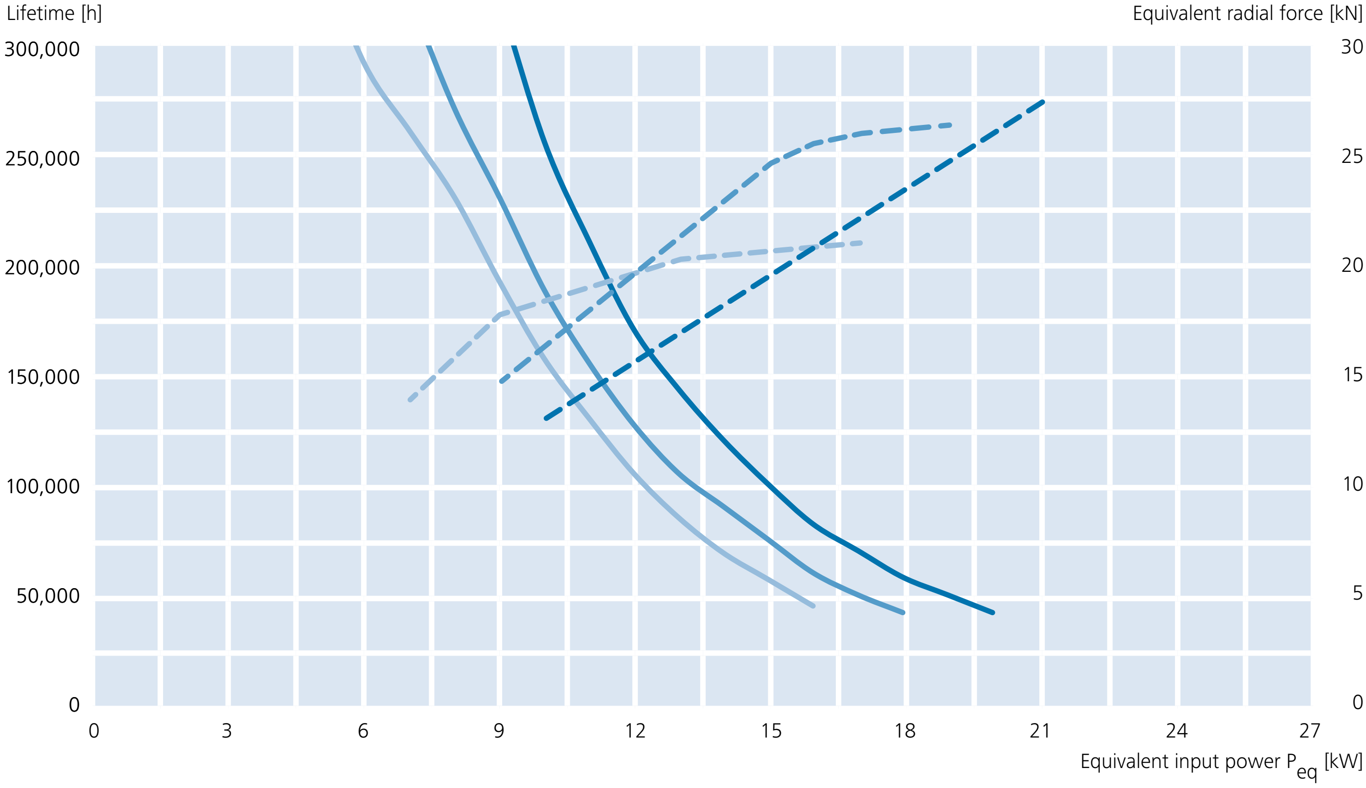


Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
———	– – – – – –	980	7.5	17
———	– – – – – –	1,180	8.0	15
———	– – – – – –	1,480	9.0	14

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	≥ 91 %	
Max. output torque	4 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	32 kN (according to EN 115 » safety factor ≥ 5)	x = 194.5 mm

TRANSMISSION RATIO 20.5



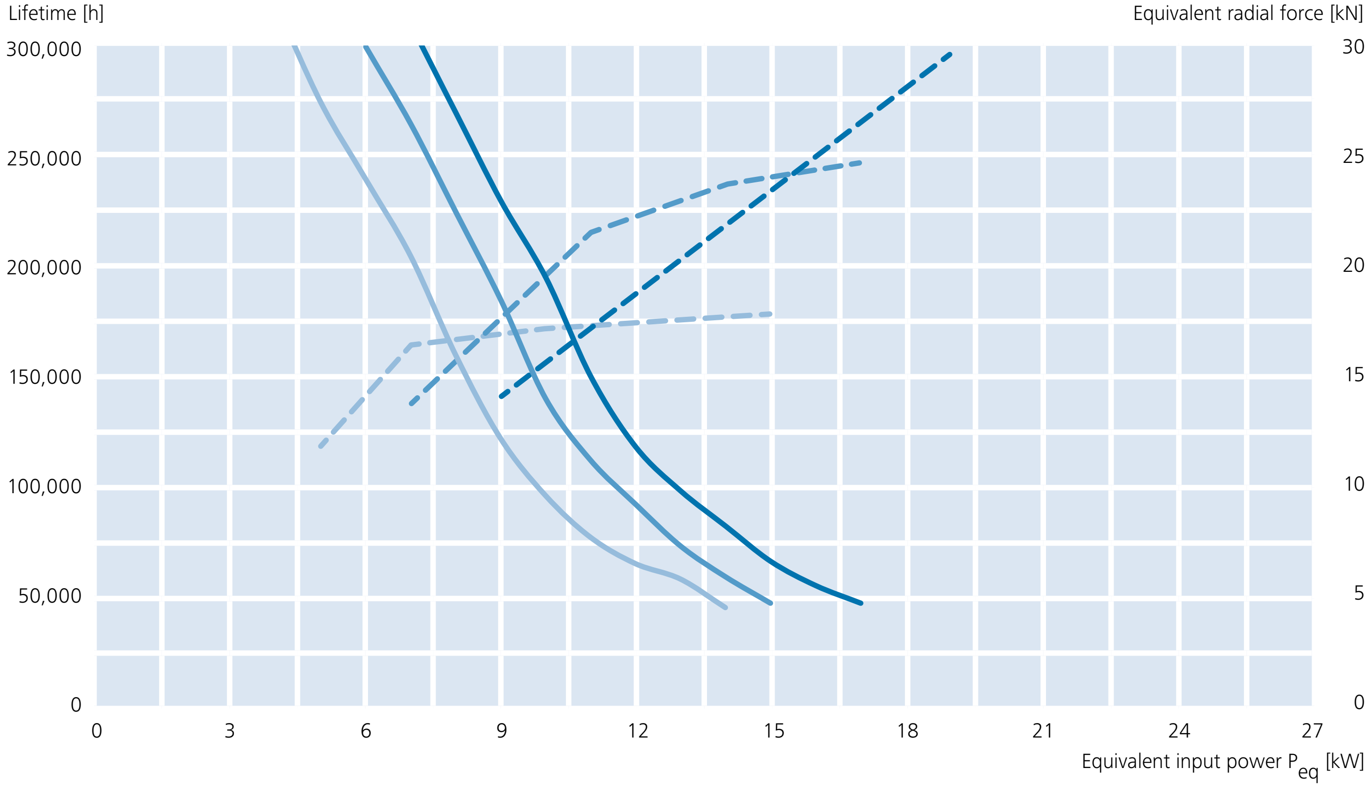
Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
		980	19	32
		1,180	22	32
		1,480	22	29

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

PERFORMANCE – TYPE FTS 160.1

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	≥ 91 %	
Max. output torque	4 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	32 kN (according to EN 115 » safety factor ≥ 5)	x = 194.5 mm

TRANSMISSION RATIO 24.5

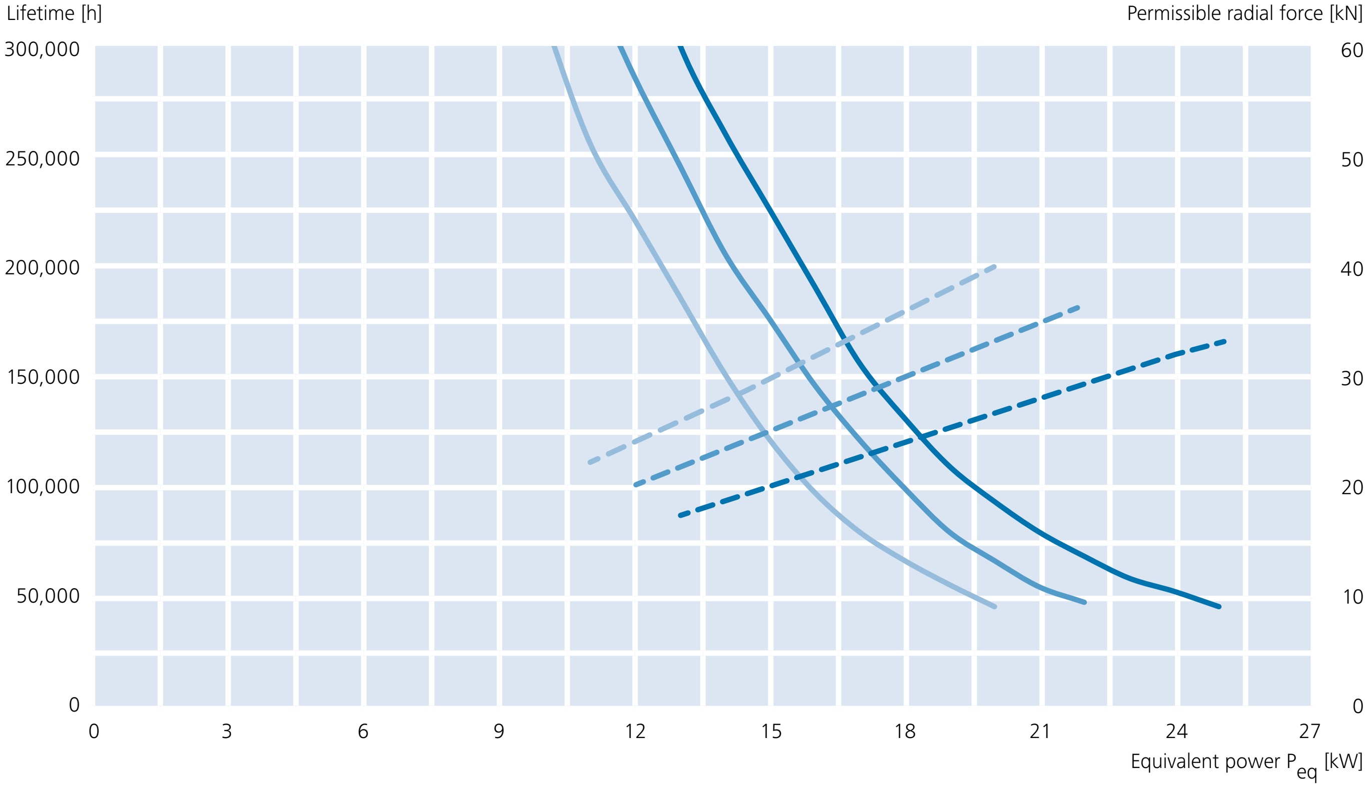


Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
(light line)	(light dashed)	980	17	32
(medium line)	(medium dashed)	1,180	19	32
(dark line)	(dark dashed)	1,480	19	30

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	≥ 92 %	
Max. output torque	4.4 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	44 kN (according to EN 115 » safety factor ≥ 5)	x = 252.5 mm

TRANSMISSION RATIO 20.5

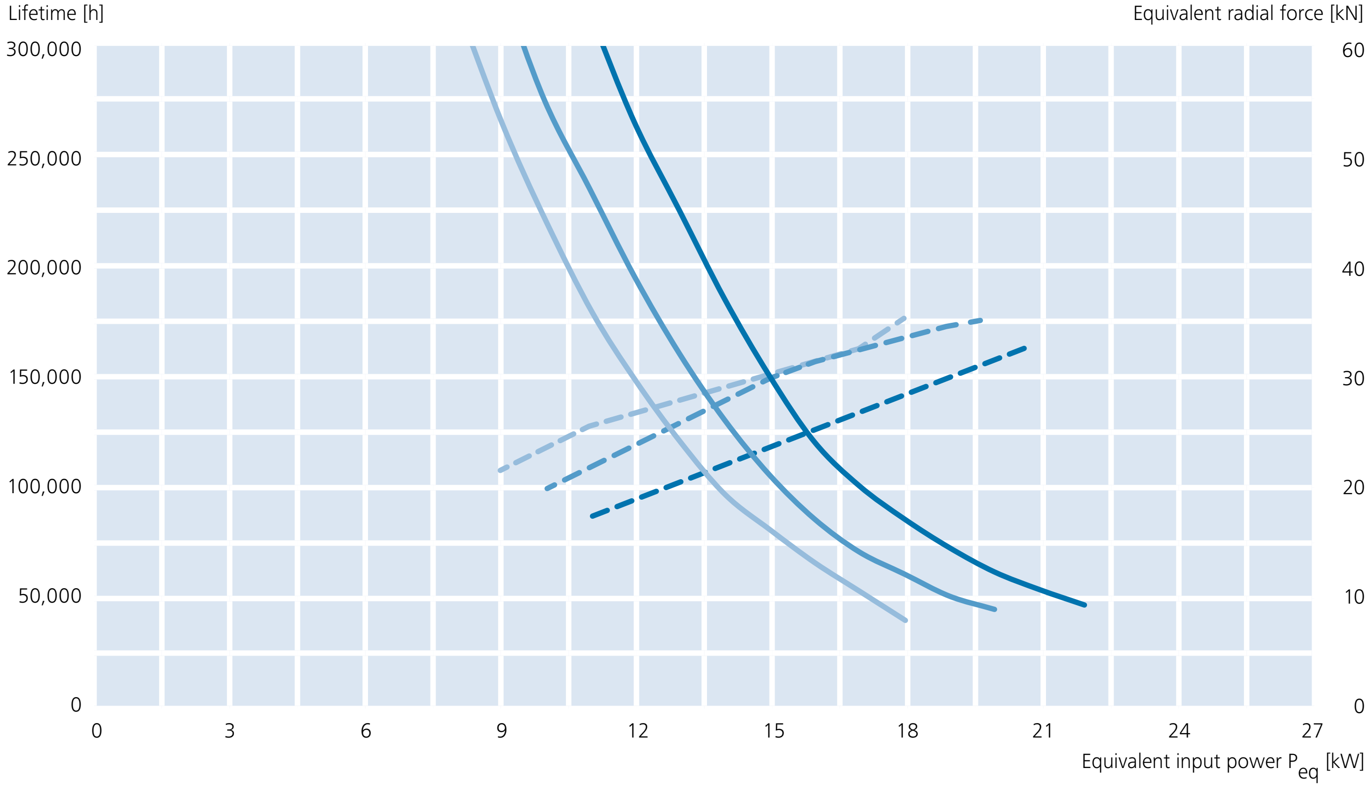


Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
——	– – –	980	23	44
——	– – –	1,180	25	42
——	– – –	1,480	25	33

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	≥ 92 %	
Max. output torque	4.4 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	44 kN (according to EN 115 » safety factor ≥ 5)	x = 252.5 mm

TRANSMISSION RATIO 24.5



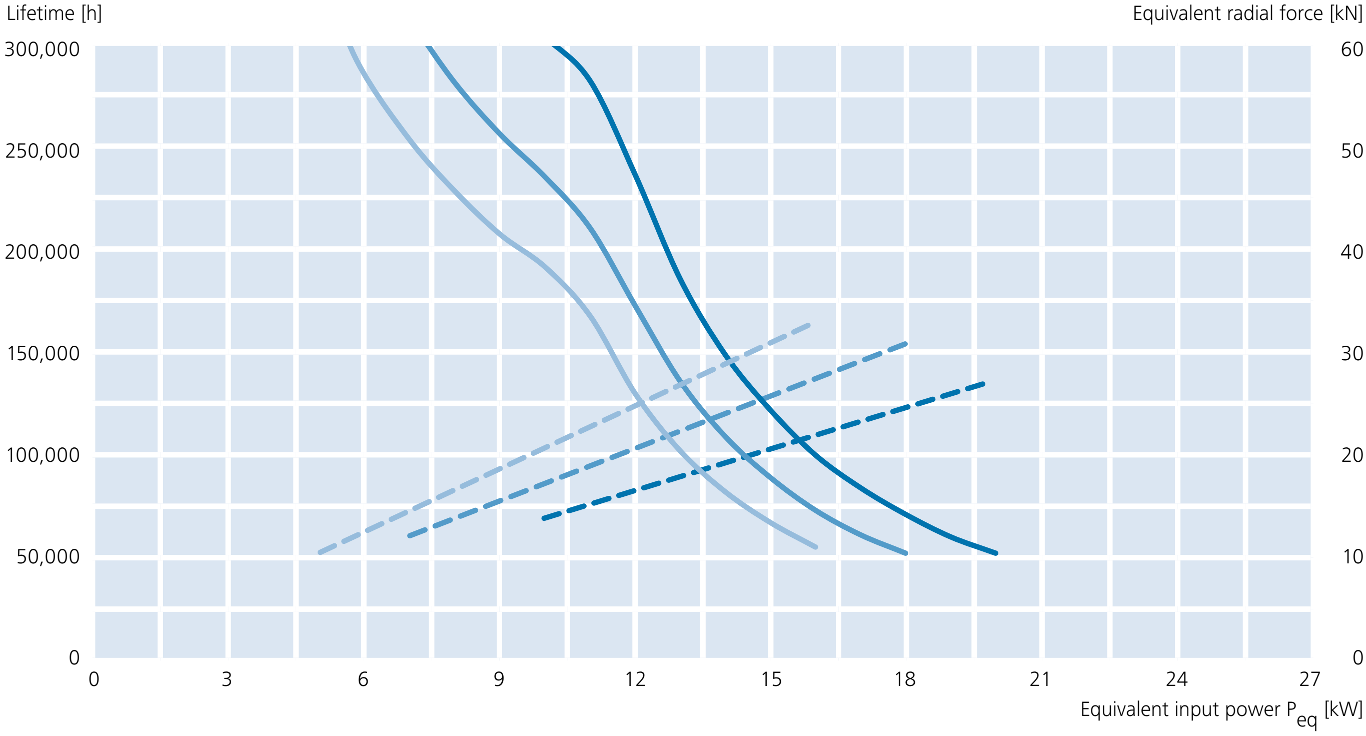
Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
		980	22	44
		1,180	22	44
		1,480	24	38

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

PERFORMANCE – TYPE FTSST 158.1

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	up to 95 %	
Max. output torque	4.6 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	50 kN (according to EN 115 » safety factor ≥ 5)	x = 255 mm

TRANSMISSION RATIO 20.4

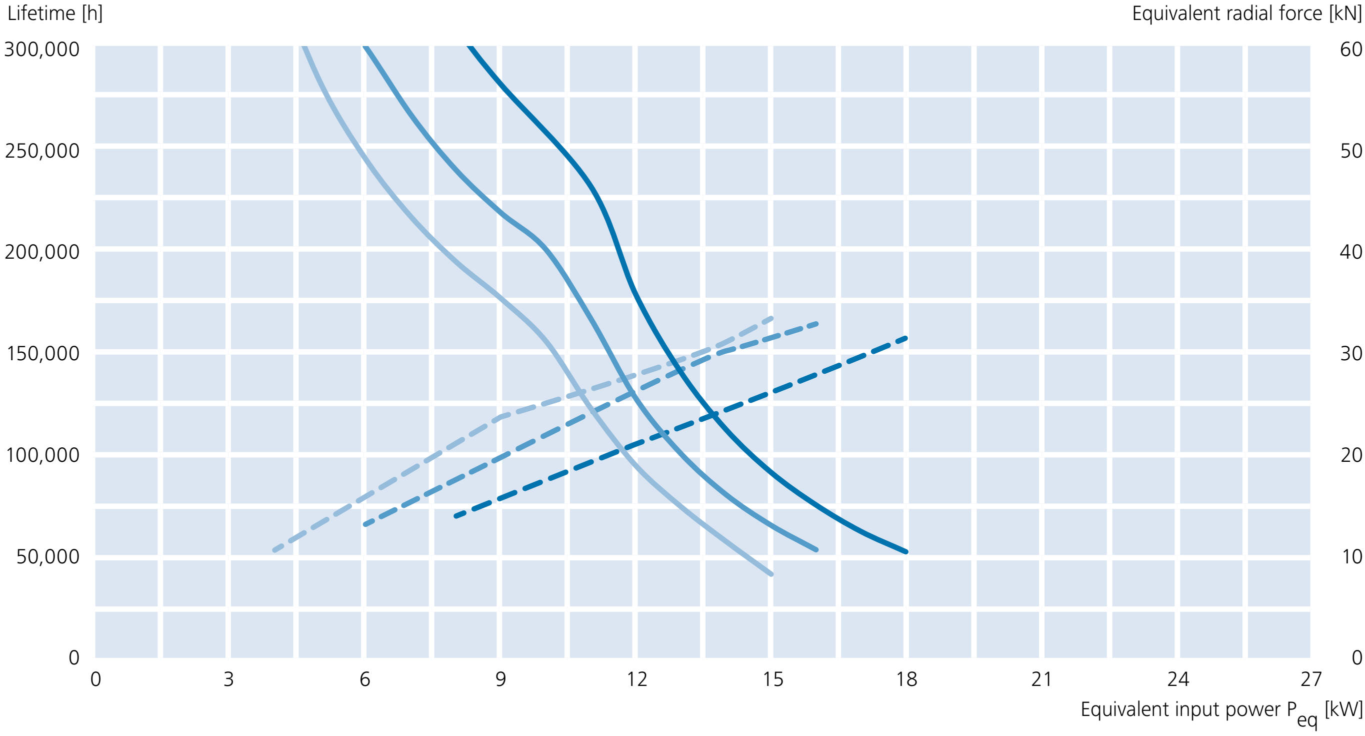


Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
		980	18.6	38
		1,180	20	34
		1,480	22	30

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	up to 95 %	
Max. output torque	4.6 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	50 kN (according to EN 115 » safety factor ≥ 5)	x = 255 mm

TRANSMISSION RATIO 26.0



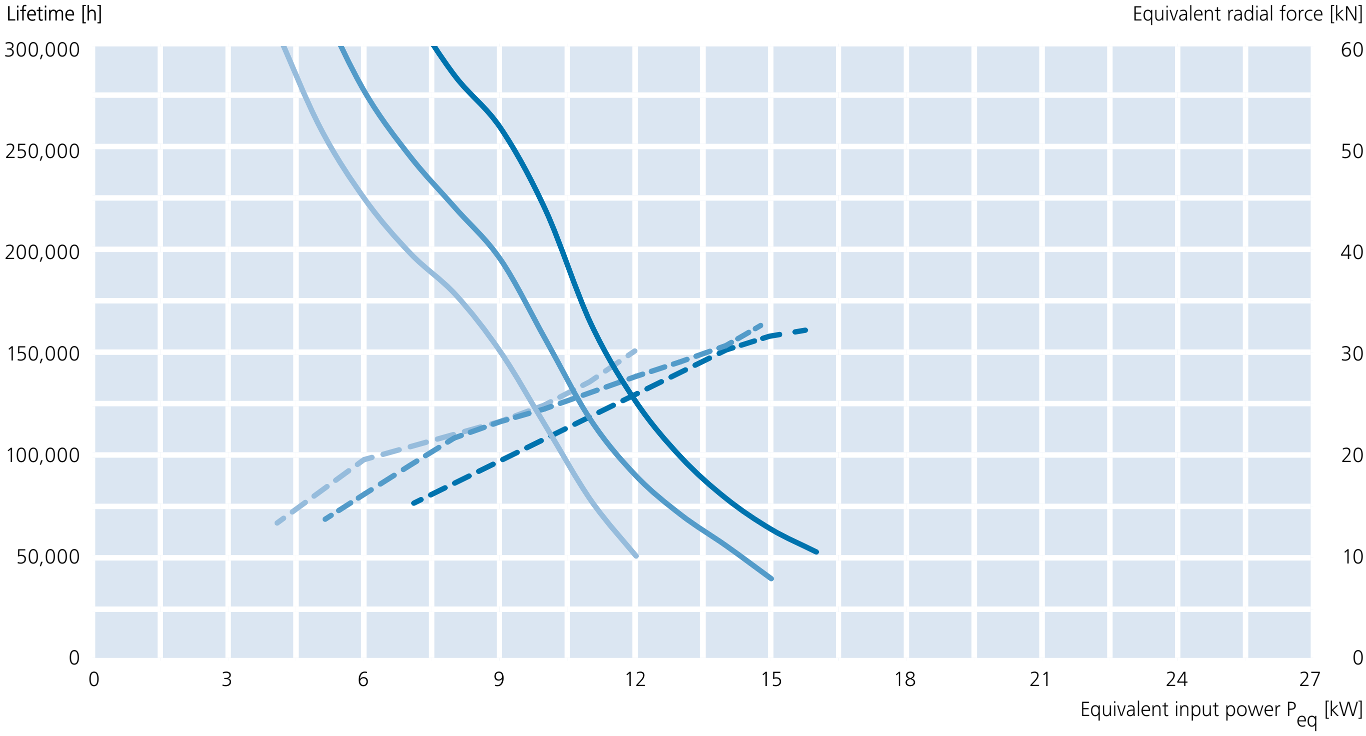
Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
		980	18.6	49
		1,180	18.6	40
		1,480	22.0	38

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

PERFORMANCE – TYPE FTSST 158.1

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	up to 95 %	
Max. output torque	4.6 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	50 kN (according to EN 115 » safety factor ≥ 5)	x = 255 mm

TRANSMISSION RATIO 32.5

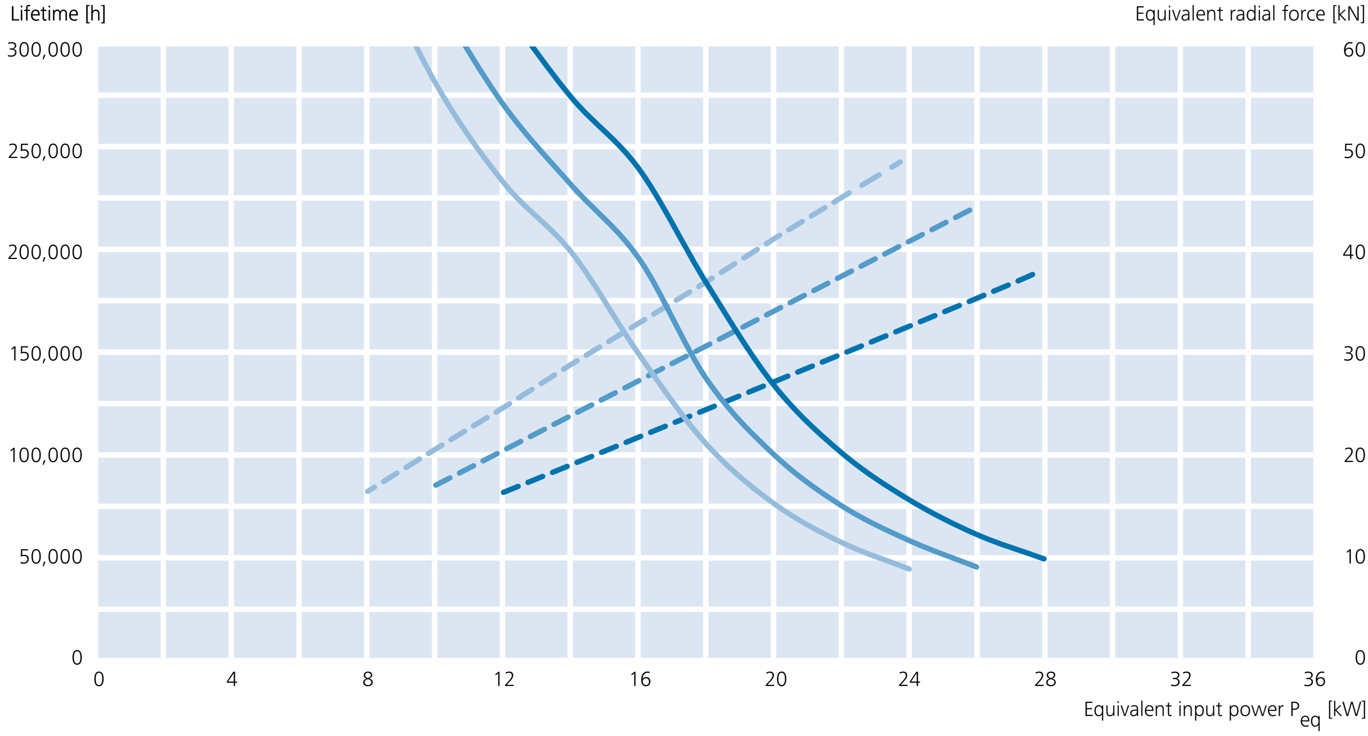


Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
——— (light blue, solid)	- - - - (light blue, dashed)	980	15	49
——— (medium blue, solid)	- - - - (medium blue, dashed)	1,180	16	44
——— (dark blue, solid)	- - - - (dark blue, dashed)	1,480	18.6	40

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	up to 95 %	
Max. output torque	6.5 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	71 kN (according to EN 115 » safety factor ≥ 5)	x = 300 mm

TRANSMISSION RATIO 20.4



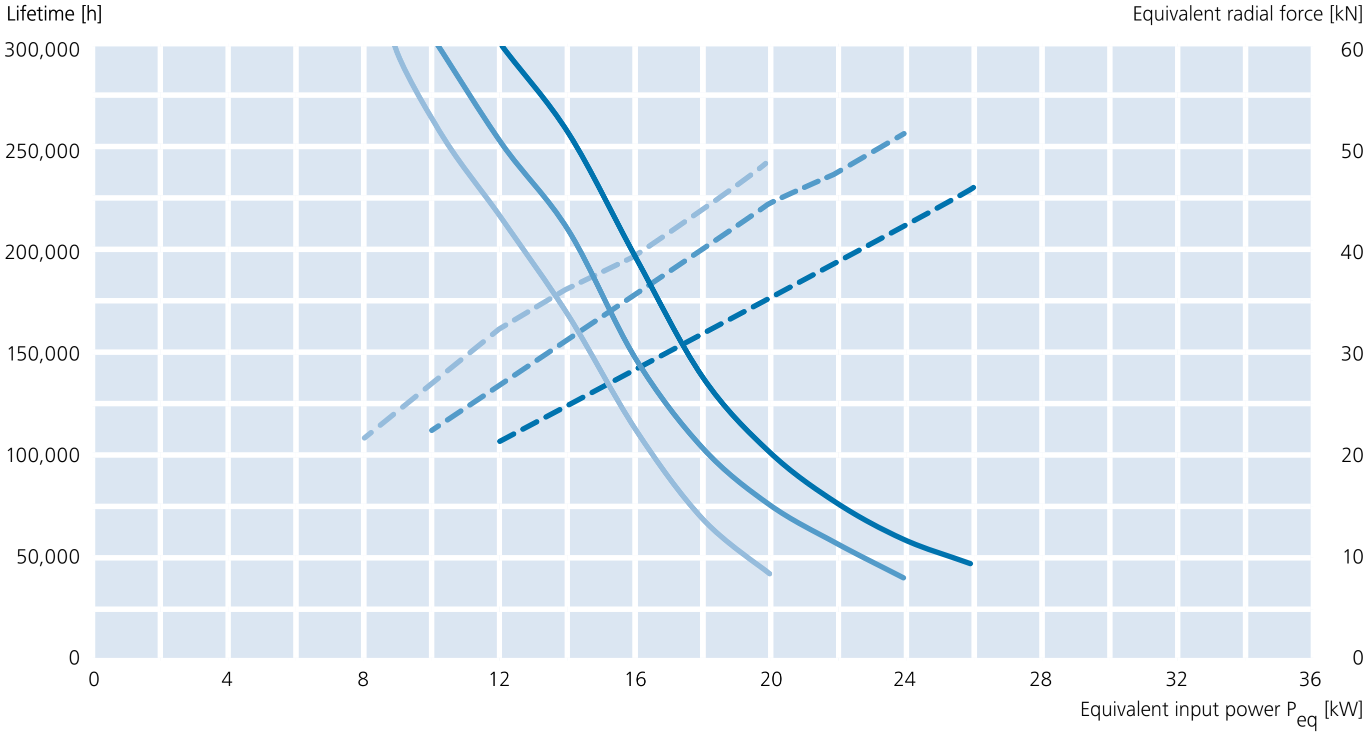
Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
———	– – – – – –	980	30	61
———	– – – – – –	1,180	30	51
———	– – – – – –	1,480	30	41

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

PERFORMANCE – TYPE FTSST 180.1

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	up to 95 %	
Max. output torque	6.5 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	71 kN (according to EN 115 » safety factor ≥ 5)	x = 300 mm

TRANSMISSION RATIO 26.6

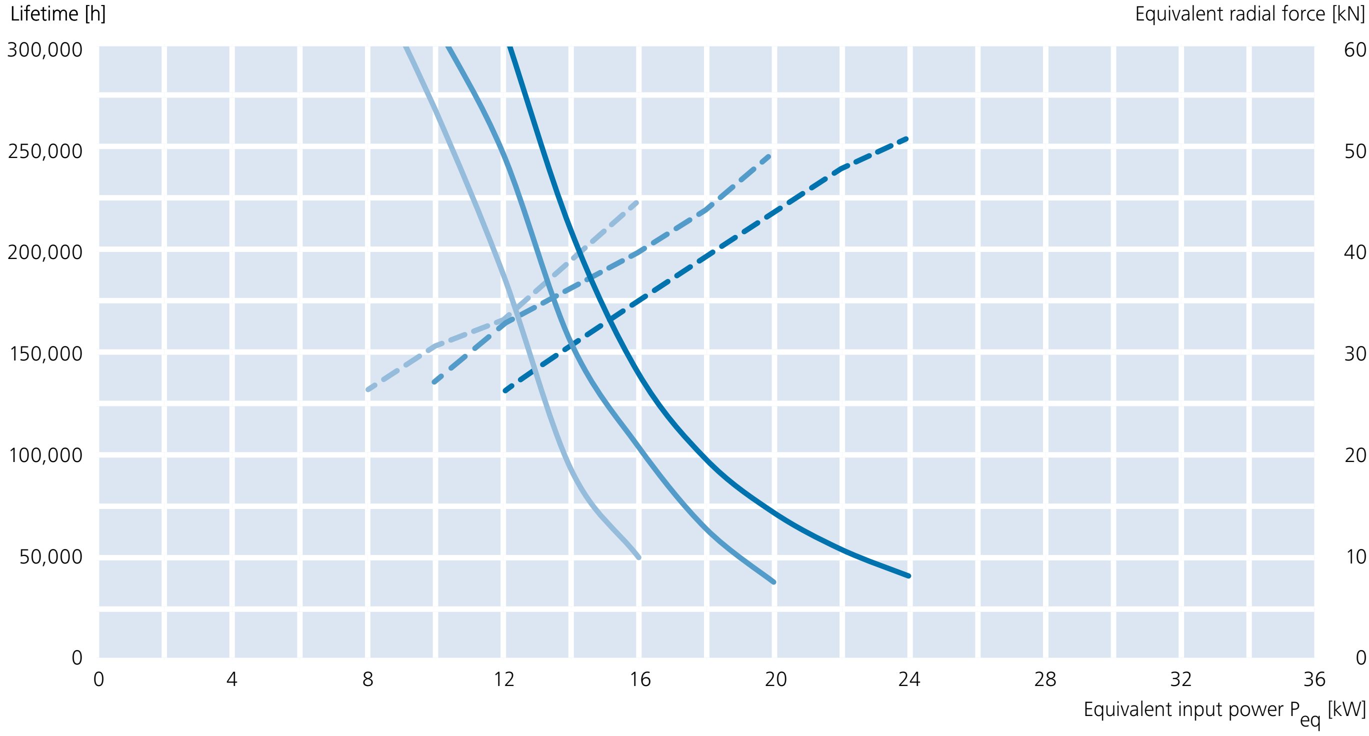


Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
———	- - - - - -	980	30	58
———	- - - - - -	1,180	30	67
———	- - - - - -	1,480	30	54

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	up to 95 %	
Max. output torque	6.5 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	71 kN (according to EN 115 » safety factor ≥ 5)	x = 300 mm

TRANSMISSION RATIO 32.8



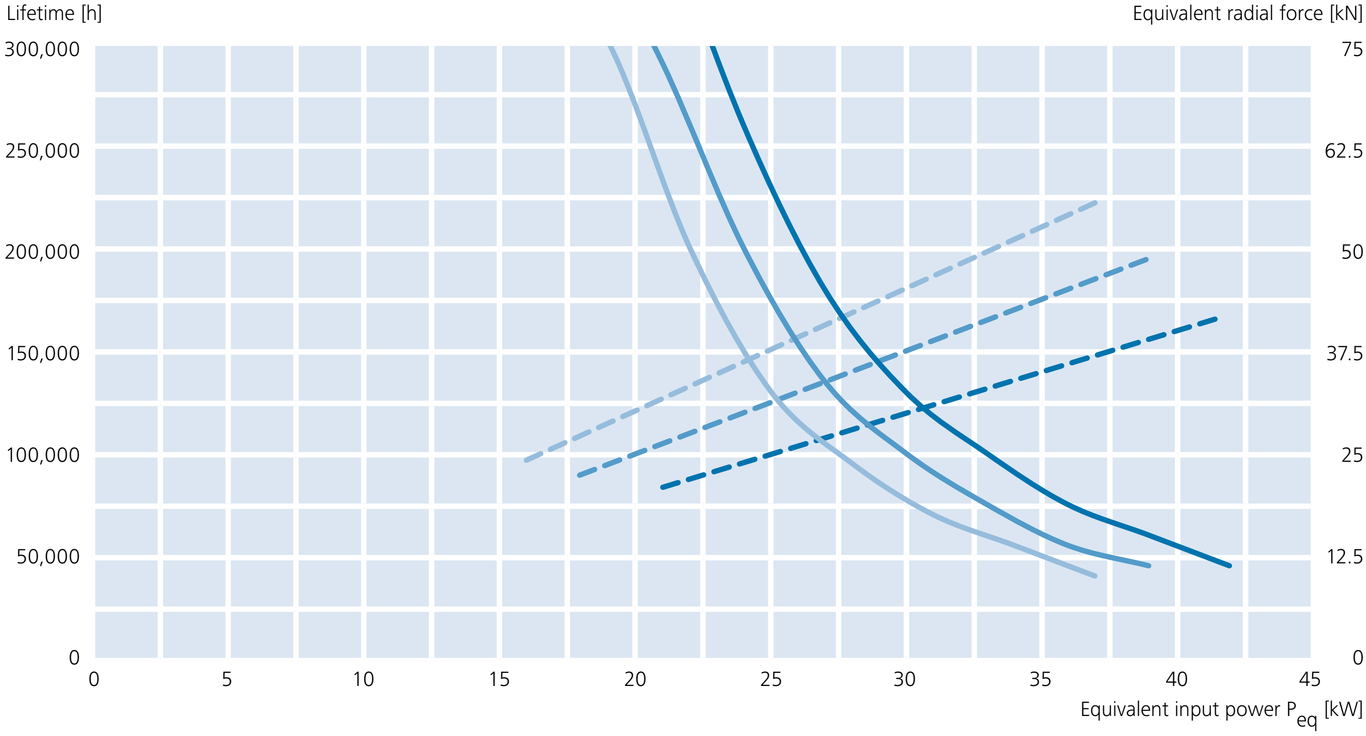
Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
———	– – – – – –	980	24	58
———	– – – – – –	1,180	30	57
———	– – – – – –	1,480	30	66

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

PERFORMANCE – TYPE FTSST 212.1

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	up to 95 %	
Max. output torque	12.2 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	100 kN (according to EN 115 » safety factor ≥ 5)	x = 305 mm

TRANSMISSION RATIO 20.1

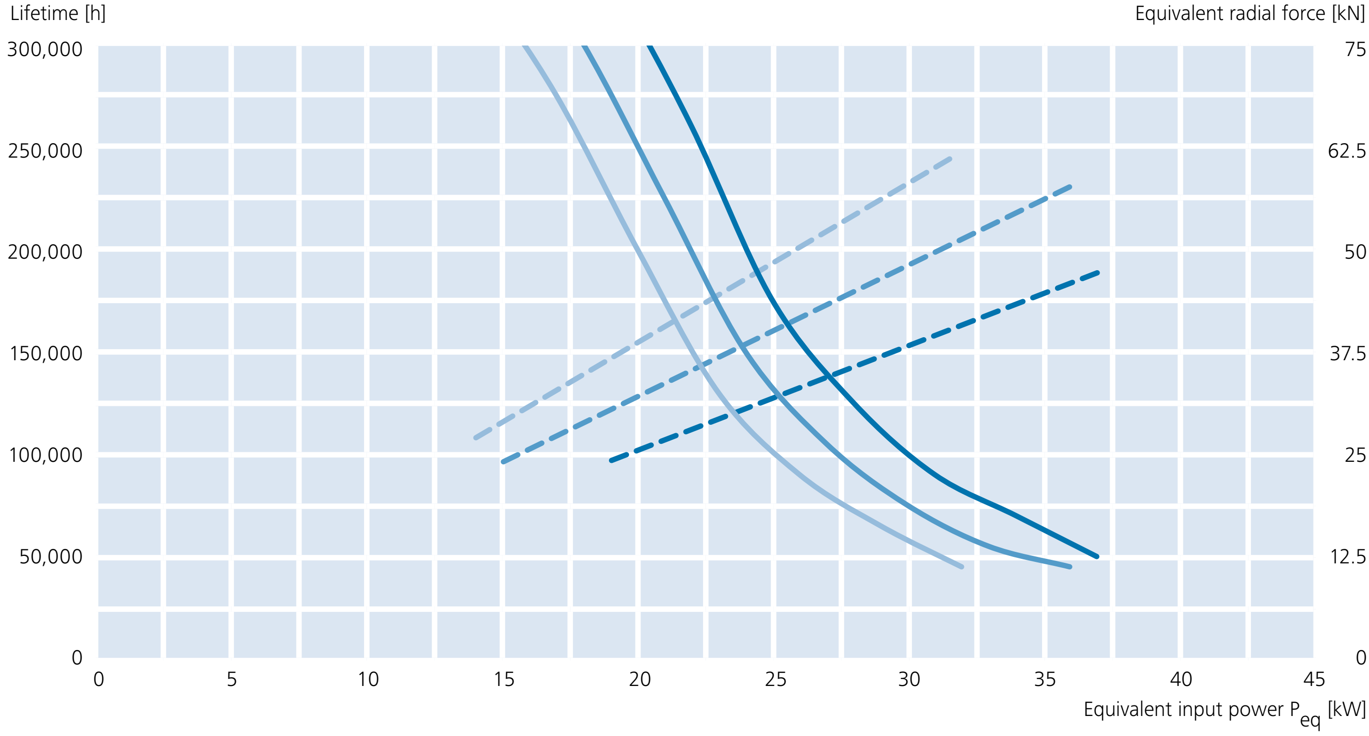


Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
		980	39	59
		1,180	42	53
		1,480	45	45

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	up to 95 %	
Max. output torque	12.2 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	100 kN (according to EN 115 » safety factor ≥ 5)	x = 305 mm

TRANSMISSION RATIO 25.7



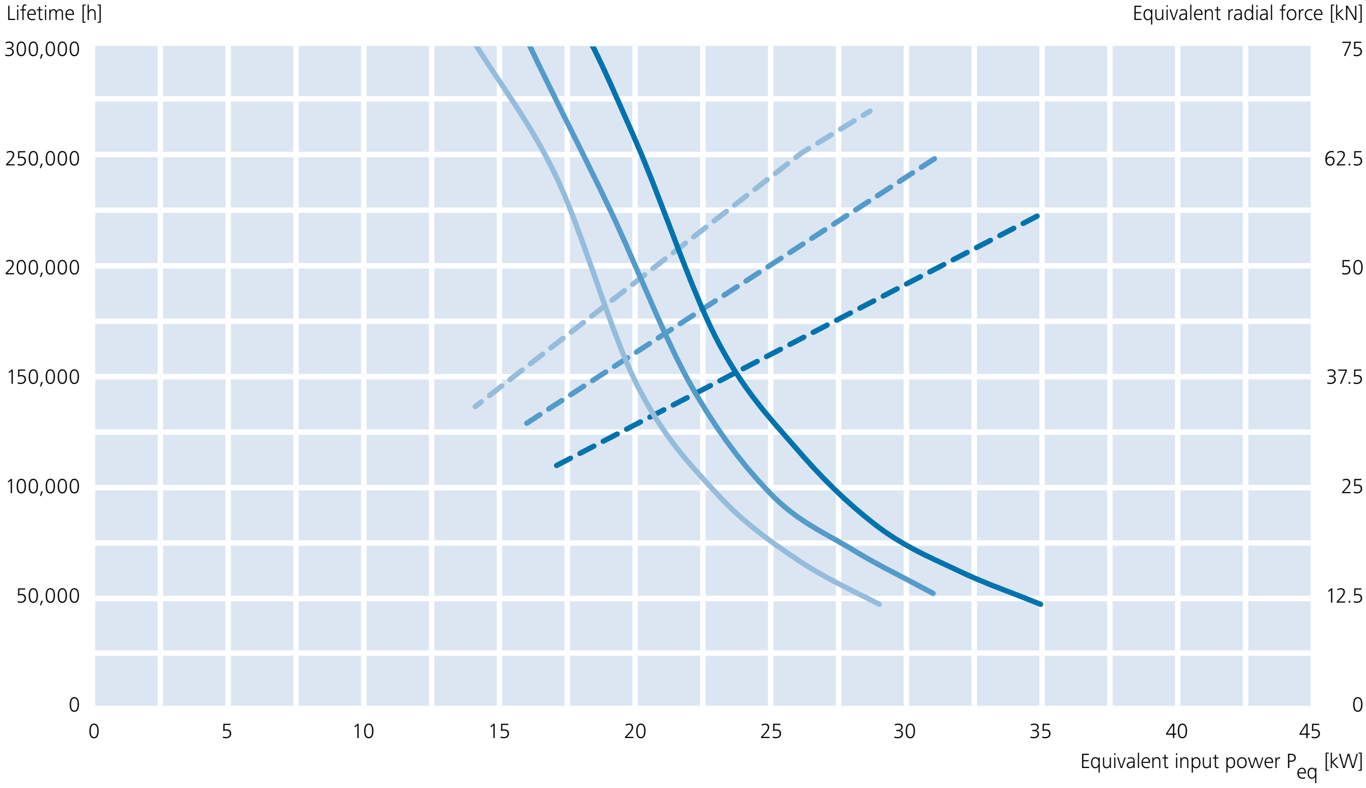
Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
———	– – – – – – –	980	36	61
———	– – – – – – –	1,180	39	63
———	– – – – – – –	1,480	42	54

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

PERFORMANCE – TYPE FTSST 212.1

Lubrication	Polyglycol	
Ambient temperature	40 °C	
Efficiency	up to 95 %	
Max. output torque	12.2 kNm (according to EN 115 » safety factor ≥ 5)	α = 60°
Max. radial force	100 kN (according to EN 115 » safety factor ≥ 5)	x = 305 mm

TRANSMISSION RATIO 32.1



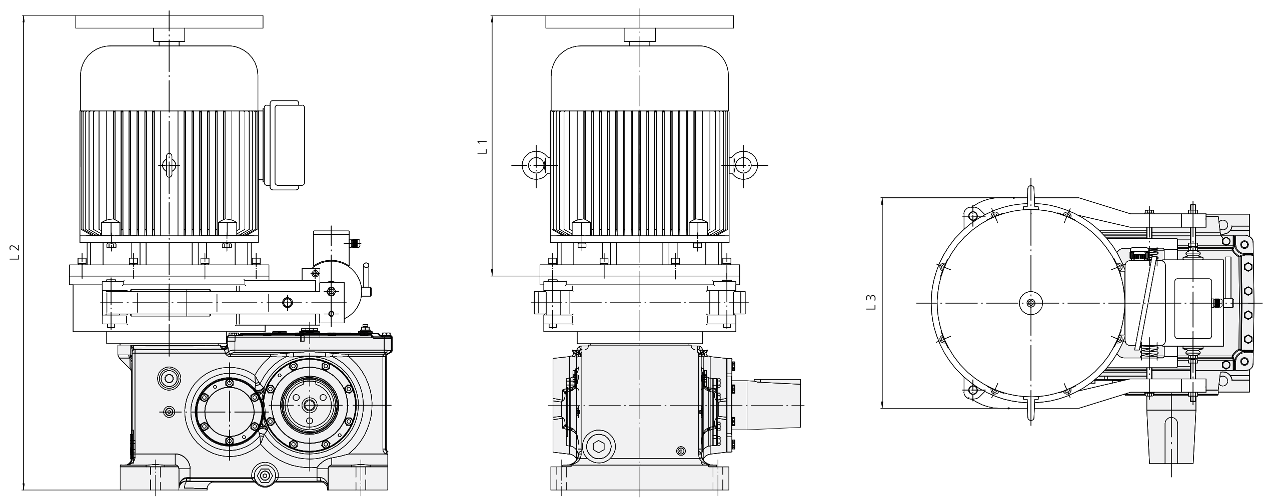
Lifetime	Radial force	Input speed [rpm]	Max. rated motor power [kW]	Max. rated radial force [kN]
		980	32	56
		1,180	35	59
		1,480	38	61

The calculations of machine elements are based on the standards and guidelines reflecting the current state-of-the-art. Tooth profiles comply with the latest revision of DIN 3996:2012.

ESCALATOR DRIVE (INCLUDING BRAKE MOTOR)

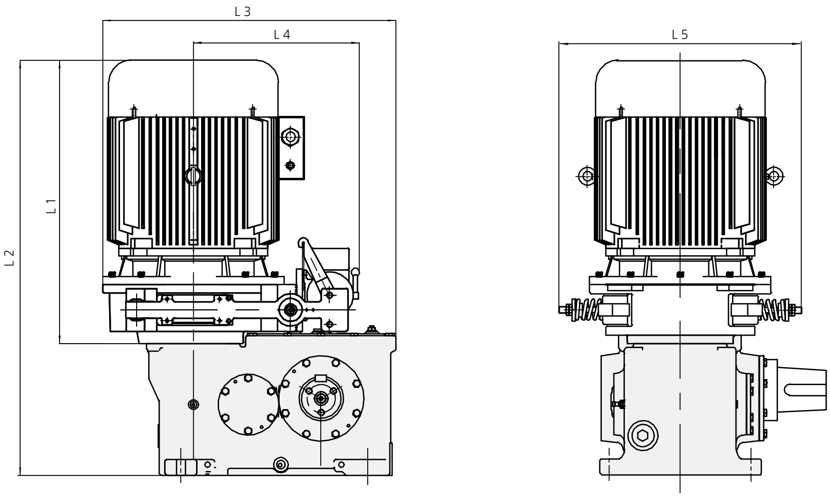
On request, we supply escalator gear units with brake motors of several manufacturers. For detailed description of all available configurations please address requests to inquiries.drv@auma.com. It will be our pleasure to assist you.

TYPE JIALI



JIALI					
Gearbox	**Motor power [kW]**	**Number of poles [-]**	**L1 [mm]**	**L2 [mm]**	**L3 [mm]**
FTSST 158.1	7.5	4	491	940	428
	11				
	15		510	959	428
	18.5				
	22		530	979	428
	7.5	6	470	919	428
	11				
	15		510	959	428
FTSST 180.1	24	4	585	1,065	475
	27				
	30				
	18.5	6	585	1,065	475
	22				
	24		600	1,080	475
	27				
FTSST 212.1	37	4	600	1,138	540
	40				
	42				
	45				
	30	6	600	1,138	540
	37		580	1,118	615
	39				

TYPE HUAXING



HUAXING							
Gearbox	**Motor power [kW]**	**Number of poles [-]**	**L1 [mm]**	**L2 [mm]**	**L3 [mm]**	**L4 [mm]**	**L5 [mm]**
FTSST 180.1	15	6	579	904	723	409	600
	18.5						
	15	4					
	18.5						
	22	6	639	964	723	409	600
	24						
	27.2						
	22	4					
	24						
	27.2						
	30	6	704	1,029	723	409	600
	30	4					

REFERENCES

The list below is a small excerpt of public sector projects equipped with AUMA Drives escalator gear units.

Bart San Francisco 洛杉矶地铁	USA 美国
Canary Wharf - Crossrail 伦敦地铁	United Kingdom 英国
Marmaray, Istanbul 土耳其地铁	Turkey 土耳其
London Heathrow 伦敦希思罗机场	United Kingdom 英国
Highspeed Trainstation Tianjin to Bejing 北京天津高铁延长线	China 中国
Chengdu Metro 成都地铁2号线	China 中国
Lyon Confluence Phase 3 里昂地铁	France 法国
SNCF Montparnasse 法铁	France 法国
Rhätische Bahn Arosa 瑞士铁路	Switzerland 瑞士
SNCF Porte de Clichy 法铁	France 法国
SNCF Pereire-Levallois 法铁	France 法国
Métro Lille 法铁	France 法国
Shopping Mall, Hamburg 汉堡	Germany 德国
SNCF Gare de Lyon 法铁	France 法国
NZL Amsterdam Centraal Station 阿姆斯特丹中心地铁站	The Netherlands 荷兰
New Jersey Journal Square 新泽西地铁	USA 美国
Phoenix Sky Harbor International Airport 凤凰城机场	USA 美国
New York 7th-Avenue 纽约第7大街地铁站	USA 美国
Metro Cairo 开罗地铁	Egypt 埃及
Subway Madrid 马德里地铁	Spain 西班牙
Metro Napoli Toledo 意大利地铁	Italy 意大利
Subway Barcelona 巴塞罗那地铁	Spain 西班牙
Airport Dubai 迪拜机场	The United Arab Emirates 阿拉伯联合酋长国
Metro Moscow 莫斯科地铁	Russia 俄罗斯
WMATA Washington 华盛顿地铁	USA 美国
Taichung/Taipei 台中地铁	China Taipei 中国台北
Metro Tianjin 天津地铁6号线	China 中国
Subway Munich 慕尼黑地铁	Germany 德国
Metro Paris 巴黎地铁	France 法国
Metro Vienna 维也纳地铁	Austria 奥地利
Changsha Magnev 长沙磁悬浮	China 中国
Metro Salvador 萨尔瓦多地铁	Brazil 巴西
Metro Doha 多哈地铁	Katar 卡塔尔
Metro Chengdu Line 成都地铁 4号线	China 中国
Metro Wuhan 武汉地铁8号线	China 中国

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www.auma.com