PREMIUM STEPHAN

MK SERIES GEARED MOTORS

Contents

1. The Premium Group

Combined for better performance

Integrated solutions for mechanical drive technology are our strength. We have formed a group of top businesses which in cooperation with one other, offer economical solutions for your drive technology needs, everything from single products to integrated system solutions.

Your basis for success

High-quality products, application expertise and absolute dependability; your decision for the whole Spectrum of the Premium family is a decision for a strong and reliable partner.

The Premium Stephan Company

Premium Stephan, a member of the Premium group, has been developing and manufacturing a wide choice of gear units, geared motors and other products from the field of mechanical drive technology at the Hameln site for decades. Perfected design, computation and manufacturing technologies have contributed to Premium Stephan's outstanding reputation as a partner for individual drive solutions. Customer-oriented customised gear units or backlash-free precision gears for industrial robots are established components in our product assortment, along with the M4, C4 and E4 series. In our production area of 17,000 m², we manufacture according to the most modern, computer-assisted and especially "streamlined" management principles of the third century. Premium Stephan is an associated partner of the Premium group for mechanical drive technology. Along with planning, development and design, we offer our customers not only individual products, but customised solutions through worldwide distribution. Whether assemblies or closed systems, we have the correct solution for your application.

We possess outstanding references in the development, construction and manufacture of individual drive solutions. Through our worldwide distribution, we also offer package solutions for over-sized gear units and drive elements:

- Standard gear units
- Drive-Packages
- Complete solutions
- Customised gear units
- Low-backlash gear units

2. The M4 Product Family

Features	Strong	Advantages

The optimized gearing and shaft geometry compensates deflection under load. Application-hardened, hard-machined gear wheels correspond to high quality requirements.

Gear unit casings, covers, feet, flanges, and motor casings are heavily ribbed and securely connected to each other.

Carefully dimensioned shaft and roller bearings absorb high external loads. The components are dimensioned to withstand peak loads even under the most adverse operating conditions.

The Premium Stephan M4 transfers higher torques with a given shaft-center distance for a long, low-maintenance service life.

The ruggedly designed casing ensures maximum robustness under high load and failure-free operation.

High load-carrying capacities to absorb high external forces at the input and output shaft ensure a long bearing life of the Premium Stephan M4 geared motor.

Features	Silent	Advantages

Optimized gearing geometry and precise abrasive engineering practice create a smooth rolling of the tooth flanks involved in the engagement.

The inside of the casing was reinforced by ribs Similar to the star-shaped output cover.

Using high-precision machining of the motor flange, motor and gear unit were integrated into a harmonic unit.

The result is a nearly perfect tooth engagement, even load distribution across the complete face width, minimum vibrations and, therefore, a smooth, low-noise running.

Perfectly tied-in ribs dampen vibrations and ensure that vibrations are not passed on to the environment as noise.

The pinion mounted directly on the motor shaft engages in the gearing of the gear unit without angle error and does not create any disturbing noise.

Features	Standard	Advantages

Connection dimensions of shafts, feet, and flanges are identical with those of the market standard.

The Premium Stephan M4 program features a broad range of designs and numerous standard options. Additional information can be found in the overview of the product program.

The Premium Stephan M4 series corresponds to the market standard; based on the outstanding performance Specificityons, it is predestined to replace existing drives.

The most economical design for the respective application can be selected and is available worldwide.

Features	Smart	Advantages

The Easy Fit System :

Pre-assembled gear units, motors and wheel sets are stocked in the Premium Stephan assembly centers throughout the world.

Short assembly time and high part interchangeability are granted at each assembly center side due to the unique Easy Fit System.

Guaranteed High Quality.

Over millions of design variants can be quickly assembled through a corresponding combination of pre-assembly components which allows for worldwide availability.

Short delivery time.

2. The M4 Product Family

The Premium Stephan **M4** pre-assembly system offers the right components for every application.

The M4 series includes a complete range of coaxial helical geared motors, parallel shaft helical geared motors, and helical bevel geared motors.

The four **S**

Strong,
Silent,
Standard,
Smart

"**S**trong" because of the high rated torques that are above the market standard. They are the most powerful drives on the geared motor market.

"**S**ilent" because of the optimized gearing geometry and precision-finished face flanks that allow for an extremely smooth, low-noise running, and

"**S**tandard" because of market-oriented dimensions that facilitate the conversion to M4 and allow for a Simple assembly for a worldwide geared motor application.

"**S**mart" The unique EasyFit system allows in minutes to assembly a customize geared motor at dealers place (assembly house).

The modular M4 series was built using a minimum of components, thereby ensuring high reliability and Simple maintenance.

2.1 Use as prescribed

Gear units/geared motors are designed for the purpose of converting rotational Speed and torque. They are intended for use in industrial systems and may only be used as recommended in the Premium Stephan technical documentation and in accordance with the Specifications on the nameplate.

3. Product Description

3.1 Quality through innovation and control

The products manufactured by Premium Stephan meet very high quality requirements. Constant control with strict compliance of initiated quality guidelines meets highest demands. State-of-the-art processing centers, contiguous measuring and test technology, and distinctive quality awareness in all employees are a guarantor for efficient and function-oriented products.

Flexible production flows, supported by the Premium Stephan modular system, guarantee high availability while considering individual demands.

The torsionally-rigid gear unit casings are made of high-quality cast iron and guarantee a vibration-free operation. The robust structure of the M4 geared motors is based on ribbed castings and optimum roller bearings to allow for absorbing even high external loads.

A high efficiency is reached through helical, hardened and precision-machined gear wheels. The motor output becomes effective at the output shaft without nearly any losses.

The gear units are tested in the experimental test field and tested for extreme requirements. With standard motor type of enclosure IP 55 and insulation class F, our electric motors are even safe to operate under extreme operating conditions.

Constant innovation and always looking for better manufacturing processes allow for withstanding the growing requirements of the market.

3.2 General technical data

3.2.1 Motor output and output torque

The motor output and torque values listed in the selection tables refer to normal operating conditions and the standard type of construction or to comparable types of construction of the respective type of gear unit. The decisive factor is that the drive stage does not completely run in the oil bath.

3.2.2 Output Speeds

The output Speeds listed in the selection tables are guide values and can be calculated using the Specified motor Speed n_1 (for rated operation) and the respectively valid exact gear ratio i_{ex}. However, the actual output Speed depends on the effective motor load and the local supply conditions and, therefore, may deviate slightly.

3.2.3 Service Factor

The Service Factor SF listed in the selection tables is calculated using the maximum permissible torque of the gear unit and the output torque permitted by the installed motor output. Service Factors are not standardized and, therefore, may differ dependent upon the manufacturer. For Premium Stephan M4 geared motors, a gear unit with an application factor of SF = 1 already offers an enduring dimensioning and, therefore, ensures highest reliability. In case of doubt, we would gladly provide you with more information in a personal consultation.

3.2.4 Weights

The weights Specified are guide values for further dimensioning. Due to the variation in gear ratios and different types of construction (oil quantity), the exact weights may deviate slightly.

3. Product Description

3.3 General construction design and dimensioning

3.3.1 The gear unit

Gear wheels	Carburized and hardened helical and ground or rotary-beveled Spur gears. Bevel gear wheels with helical gearing, lapped bearing surfaces
Castings	GG-20 cast iron as standard
Bearings	Sufficiently dimensioned roller bearings so that input and output shaft can absorb Significant external loads
Shafts	Output shafts made of quenched and tempered steel
Lubrication	Splash lubrication with gear unit oil or grease for designs with oil-feed tubing, the lubrication is carried out via integrated pump. Roller bearing at the output shaft end is lubricated for life with grease.
Seals	Radial shaft seals, with dust lip at the output Side
Efficiency	The efficiency of a gear unit is primarily determined by Splash losses, bearing and gearing friction. On an average across all sizes, the efficiency measures approx. 99 % for standard (or Similar) types of construction for each gear stage.

3.3.2 The Motor

Design	Geared motors with integrated motor up to 45 kW (pinion directly on motor shaft). For universal motor assembly (drive end U), a standard IEC motor of B5 may be attached.
Casting	Aluminum alloy as standard up to size 132. A motor housing of cast iron is available as an option. Cast iron is standard starting with Size 160.
Bearing	Deep-groove ball bearing lubricated for life. Starting at Size 200 with equipment for regreasing.
Type of enclosure	IP 55, higher types of enclosure available upon request. Number of poles: Preferably 4-pole motors (1,500 rpm), other number of poles and pole changing motors are possible.
Voltages	up to 3 kW: 230/400 V ± 10% 50 Hz, 265/460 V ± 10% 60 Hz from 4 kW to 22 kW: 400/690 V ± 10% 50 Hz, 460 V delta ± 10% 60 Hz. Other voltages upon request
Insulation	Insulation class F, utilized to B. Suitable for humidity up to 95%.
Cable entries	On principle, the cable entries of the motors are implemented with the corresponding metric threads. Screwed cable glands are not part of the scope of delivery.
Efficiency class	The standard motors are manufactured according to efficiency class **IE 2.** Energy efficient motors to efficiency class **IE 3** are available as an option.
Standards	The motors in the range of 0.12 to 22 kW, are according to the standards to CE, CSA and UL. Country Specific executions for USA and Canada are possible on request.

3. Product Description

3.3.3 The brake motor

Deign	Integrated, DC-excited Spring-applied disk brake. Connection via a rectifier installed in the terminal box.
Voltage	Connection: 230 or 400 VAC corresponding to 102 or 178 V DC at the brake coil.
Type of enclosure	IP 55 as standard.

3.3.4 Operating conditions

Please consult page 14, chapter 2.5 for hazardous locations according to ATEX.
The geared motors are suited for use at ambient temperatures from -10 °C to +40 °C and installation altitudes up to 1.000 m.a.s.l.. As delivered with oil filling (see above), ambient temperatures from 0 °C to 40 °C are permitted as standard. In case of deviating ambient temperatures and in aggressive environments (acid vapors or Similar), the manufacturer must be consulted first.

3.3.5 Outputs, torques and Speeds

The outputs and torques listed in the tables refer to a condition at operating temperature with permissible ambient temperatures and standard lubricants. The Specified output Speeds are rounded values and refer to the rated Speed of the motor at delivered rated output.

3.3.6 Installation instructions

The geared motor must be installed free of vibrations. Power transmission elements such as belt pulleys or Similar should be arranged as close to the gear unit housing as possible. The cooling air intake of the motor must not be obstructed by unfavorable installation or contamination. The brake must be accessible for maintenance work.

3.3.7 Reference to applicable standards

The gear unit components, such as shafts, pinions, gear wheels, and bearings are dimensioned according to pertinent EN, ISO or DIN standards.

3.3.8 Delivery instructions

Lubricant	Sizes 1 and 2: Filled with lubricant for life, ventilation not necessary.
Gear unit oil	Starting with size 3: Gear units for Germany, Switzerland, and Austria are delivered in filled condition (except for SCA, SCP), otherwise unfilled (internally preserved). Before commissioning, the drain plug must be replaced by the supplied vent plug.
Coating	RAL 5002 top coat as standard.
Terminal box	Bores are closed with plastic plugs. Screwed glands are not supplied.
Corrosion protection	Uncoated parts of the drives (e.g. output shafts) are corrosion-protected.
Lifting Lugs	Starting with gear unit Size 3 and motor Size 112.

3.4 Notes about the operation in hazardous atmosphere (ATEX)

Attention! You cannot select gearboxes and geared motors for application in hazardous locations (ATEX) from this catalogue. Please advise requirements to your nearest Premium Stephan branch. In the framework of harmonizing European laws, the EC Directive 94/9/EG, generally known as ATEX 100a, has been in force since July 2003. Premium Stephan gear units and geared motors implemented as parallel shaft gear units, helical and bevel gear units in ATEX design meet all the requirements of EC Directive 94/9/EG for device category 2 and 3. The drives can be delivered for use in gaseous as well as dust atmosphere.

3. Product Description

3.4.1 Zonal classification

According to Directive 99/92 EG (ATEX 137), the system operator together with the controlling authority determines which zone must be taken into account. The zone definition is carried out according to different criteria, such as operating condition of the system, the period in which an explosive atmosphere may occur, and whether an air- dust or an air-gas mixture occurs.

Probability of occurrence	Air-gas mixture (G) zone	Air-dust mixture (D) zone
Continuous and long-term	0	20
Occasionally during normal operation	1	21
Rarely, without importance during normal operation	2	22

3.4.2 Device safety classified into categories

Electrical and mechanical equipment are classified into three categories according to the safety requirements. Assigning the devices to the categories is determined by the manufacturer based on a detailed danger analysis. The connection between the zones and the device category is Specified in Directive 94/9/EG.

Premium Stephan gear units meet all requirements of category 2 and 3. The design, dimensioning and classification- on into the corresponding category was performed in close collaboration with TÜV NORD CERT. Devices of category 1 are not supplied by Premium Stephan. Devices of category 2 meet all requirements of category 3 and may also be used here.

Category	Type of defect	Prerequisite/use
1 (no drives from Premium Stephan)	Safety in normal operation and also for rare faults (two errors occurring Simultaneously must be handled)	Devices of this category: ● 1 G in zone 0, 1 and 2 for gas ● 1 D in zone 20, 21 and 22 for dust
2	Safety in normal operation and in case of an expected fault	Devices of this category: ● 2 G in zone 1 and 2 for gas ● 2 D in zone 21 and 22 for dust
3	Safety in normal operation	Devices of this category: 3G in zone 2 for Gas 3D in zone 22 for dust

Premium Stephan gear units to Directive 94/9/EG for use in air-gas and air-dust mixture.
Premium Stephan has several decades of experience in the design, manufacture and use of drives in hazardous areas. With the introduction of Directive 94/9/EG, the standard series EN 13463 was issued as the basis for explosion protection for mechanical devices.

Premium Stephan M4 gear units in the designs MK, MP and MK meet all requirements of category 2. Requirements for dust protection and gas protection were taken into account for the approval. For this reason, no distinctions are made with respect to categories 2 and 3. Our gear units of category 2 also meet all requirements of category 3.

3.4.3 Type of protection for gear units

Protection through structural safety
EN 13463-5 (identifier "c")
For this type of explosion protection, the protection is ensured through design and construction measures at the devices as well as the experience of the manufacturer.

3. Product Description

Protection through liquid enclosure
EN 13463-8 (identifier "k")
Potential ignition sources inside the gear unit are rendered ineffective through complete or partial immersion in a protective liquid (gear unit oil) or through constant wetting with a liquid film, the protective liquid can be exclusively intended for preventing a potential ignition source to become effective. In devices such as gear units, it also serves the purpose of lubricating and cooling moving parts.

Premium Stephan gear units for category 2G and 2D
Gear units of category 2G can be used in zone 1 and 2 for gases and gear units of category 2D can be used in zone 21 and 22 for dust. For category 2, Premium Stephan issues a certificate of conformity and certifies the following:

- The compliance of the products with standard EN 13463 with the relevant sections.
- The internal manufacturing control according to Directive 94/9/EG Appendix VIII
- Filing the product documentation with the notified body, TÜV NORD CERT

Premium Stephan gear units for category 3G and 3D
Gear units of category 3 can be used in zone 2 for gases and zone 22 for dust. A separate certification for category 3 is not issued Since all devices for category 2 also meet the requirements of category 3.

Premium Stephan geared motors conforming to Directive 94/9/EG
The experiences collected over decade-long use in hazardous atmosphere also entered into the dimensioning and design according to the new ATEX directives. The following components were taken into account based on this experience:

- Shrink-fit ring covers according to the standard
- All bolts are secured against automatic loosening and protected against rust
- Stainless steel nameplates
- Proven shaft seals at input and output shaft
- High-quality lubricants
- Oil-level control for all Sizes

3.4.4 Type of protection for motors

Motors to Directive 94/9/EG for use with gas
The ATEX motors used by Premium Stephan are manufactured by a well-known German manufacturer. The EN 50014 standard is the basis for the approval. Supplementary standards Specify the measures of how an ignition is pre- vented.

Flameproof enclosure to EN 50018, type of protection "d"
Motors of this type of enclosure can be used for mains operation and inverter operation in zone 1. Motors with flame-proof enclosure can only be combined with the Premium Stephan gear unit in lantern version.

Increased safety to EN 50019, type of protection "e"
The basis of this type of enclosure is avoiding high temperatures at the surface and in the inside during normal operation and in case of a fault, such as a blocked rotor with applied supply voltage. Motors to EN 50019 can be used in zone 1 with mains operation.

Protection through non-sparking equipment to EN 50021, type of protection "n"
The motor design ensures that no gases are ignited during normal operation. A malfunction is not taken into account. Motors to "n" can be used in zone 2 with mains operation.

Motors to Directive 94/9/EG for use with dust
The EN 50281-1 standard serves as the basis for the approval of motors in an explosive dust-gas atmosphere. The decisive factor consists of meeting certain criteria against the intrusion of foreign particles in accordance with EN 60259 IP types of enclosure. Motors of category 3 require at least type of enclosure IP54 and category 2 type of enclosure IP6x.

Dust-proof motors to EN50281-1-1, type of enclosure IP65
Deign measures prevent any dust from entering into the inside of the motor. The surface temperature under normal operating conditions does not cause an ignition of dust deposits. A protection in case of faults is ensured through temperature monitoring. These motors correspond to category 2D and can be used in zone 21 and 22 with mains operation.

Dust-protected motors to EN50281-1-1, type of enclosure IP55
In this case, dust cannot enter the motor in dangerous quantities. Only the surface temperature represents an ignition risk and, for this reason, must be protected with temperature sensors. These motors are certified to category 3D and can be used for mains operation in zone 22. For inverter operation, Premium Stephan can perform a corresponding acceptance with the selected inverter.

4. Instructions for Drive Selection

4.1 Service factors / Applications / Operating conditions

4.1.1 Required Service Factor (SFmin)

Determine the required application factor according to the following formula:

$$SF_{min} = F \times C$$

Whereby the following applies:

F = application factor dependent upon the load characteristic values of the application and the operating time.

The values listed below can be used as guide values for applications that are not listed.
Both criteria - the "Load characteristics related to the application" as well as the "inertia factor M" - must be taken into account.
The criterion resulting in the highest F-value is decisive.

Load characteristics of the application	M	F		
		8h/24h	16h/24h	24h/24h
Uniform loads	<0,2	0.8 - 1*	1	1.2
Moderate shock load	<3	1.1	1.25	1.5
Heavy shock load	<10	1.4	1.6	1.7

M = Inertia factor

$$M = \frac{\text{Moment of inertia of driven machine related to motor shaft}}{\text{Mass moments of inertia of the motor (+brake)}}$$

C = correction factor dependent upon the number of start-ups per hour.

		C		
		8h/24h	16h/24h	24h/24h
	<10	1	1	1
Start-ups / hour	<100	1.1	1.1	1.15
	<500	1.1	1.15	1.25

4.1.2 Selecting the frame Size

A geared motor must be selected for the required motor output ***(Pm)*** and the output Speed ***(n_2)*** who's Service Factor ***(SF)*** is greater than or equal to the required Service Factor ***(SF_{min}).*** The selection can also be made based on the available output torque (T2m) of the geared motor.

4. Instructions for Drive Selection

4.1.3 Required application factors for different applications

APPLICATION	Runtime hours/day		
	8h/24h	**16h/24h**	**24h/24h**
Construction and building materials machinery			
Mixer	1.25	1.5	1.75
Cement mills	1.5	1.75	2
Mortar guns	0.8 -1*	1	1.25
Breweries, distilleries			
Mills	0.8 - 1*	1	1.25
Bottling machinery	0.8 - 1*	1	1.25
Elevators			
Bucket elevators	1	1.25	1.5
Load elevators	1	1.25	1.5
Escalators	0.8 - 1*	1	1.25
Filters	1	1.25	1.5
Generators	0.8 - 1*	1	1.25
Wood and plastics processing			
Main drive for saws	1.5	1.75	2
Feed drives for saws	1	1.25	1.5
Crushers	1.5	1.75	2
Machines for gluing, veneering	0.8 - 1*	1	1.25
Drills	0.8 - 1*	1	1.25
Extruders	1.25	1.5	1.75
Machine tools			
Roller straightening, punching device, bending machines	1.25	1.5	1.75
Main and feed drives	1	1.25	1.5
Supply and servo drives	0.8 - 1*	1	1.25
Presses	1.75	2	2
Edging machines	1.5	1.75	2
Plate shears	1.75	2	2
Cranes and hoisting machines			
Hoisting gears, traveling drives	**	**	**
Packaging machines			
Packing machines	1.25	1.5	1.75
Wrapping machines	0.8 - 1*	1	1.25
Compressors			
Centrifugal compressors	1	1.25	1.5
Rotating screw compressors	1	1.25	1.5
Mixers			
Constant density	0.8 - 1*	1	1.25
Variable density	1	1.25	1.5
Iron and steel industry			
Wire-drawing benches	1.25	1.5	1.75
Winding drums	1	1.25	1.5
Roller-table drives	**	**	**

* = 0.8 if operating time < 3h/24h and no external loads occur
** = drives must be dimensioned by the manufacturer
\+ = it is recommended consulting the manufacturer for selecting the reverse lock

4. Instructions for Drive Selection

APPLICATION	Runtime hours/day		
	8h/24h	**16h/24h**	**24h/24h**
Iron and steel industry			
Non-reversible rolling mills - multi-operation	1.25	1.5	1.75
- single operation	1.5	1.75	2
Mills			
Ball mills, rod mills	1.75	1.75	1.75
Hammer mills, centrifugal mills	1.5	1.75	2
Winding drives			
Pumps			
Rotary pumps	1	1.25	1.5
Circulation, gear, vane pumps	0.8 - 1*	1	1.25
Piston pumps: 1 cylinder	**	**	**
2 cylinders or more	1	1.25	1.5
Screw pumps	1 +	1.25 +	1.5
Agitators			
Pure liquid (constant density)	0.8 - 1*	1	1.25
Liquid with variable density	1	1.25	1.5
Liquid mixed with solid bodies	1.25	1.5	1.75
Conveyor systems			
Even load	0.8 - 1*	1	1.25
Heavy operation, chain, screw conveyor	1	1.25	1.5
Shaker conveyor	1.5	1.75	2
Fans			
Radial	0.8 - 1*	1	1.25
Industrial fans	1	1.25	1.5
Fan drives in cooling towers	2	2	2
Food-processing industry			
Crusher	1.75	2	2.25
Root cutting, kneading machines	1.25	1.5	1.75
Meat grinders	1.25	1.5	1.5
Filling machines	0.8 - 1*	1	1.5
Dough kneading machine	1	1.25	1.5
Extruders	1.25	1.5	1.75
Sugar-cane cutter	1.75	1.75	1.75
Toaster	1.25	1.25	1.25
Waste water facilities			
Surface aerator	1.5	1.5	1.5
Revolving systems	1.75	1.75	1.75
Rakes and channels	0.8 - 1*	1	1.25
Screw pumps	1	1.25	1.5
Screens			
Revolving screens (stones, grit)	1	1.25	1.5
Screens with water circulation	0.8 - 1*	1	1.25
Servo drives for systems			
Service operation	0.8 - 1*	-	-
Setting-up mode, operation without load	1.25	1.25	1.25
Normal operation	Same as main drive		

* = 0.8 if operating time < 3h/24h and no external loads occur
** = drives must be dimensioned by the manufacturer
\+ = it is recommended consulting the manufacturer for selecting the reverse lock

4. Instructions for Drive Selection

APPLICATION		Runtime hours/day	
	8h/24h	**16h/24h**	**24h/24h**
Agricultural machines			
Mechanical gutter cleaners	0.8 - 1*	1	*
Harvesting machines	0.8 - 1*	1	*
Textile machinery			
Looms	1.25	1.5	1.75
Spinning machines	0.8 - 1*	1	1.25
Laundry machines	1	1.25	1.5
Print and paper technology			
Sheeting cutter	1	1.25	1.5
Winding drives	0.8 - 1*	1	1.25
Bale feeder	1	1.25	1.25

* = 0.8 if operating time < 3h/24h and no external loads occur
** = drives must be dimensioned by the manufacturer
\+ = it is recommended consulting the manufacturer for selecting the reverse lock

These Service factors (SF) are empirical values that are based on AGMA and ISO information and experience. They apply to driven machines corresponding to today's state of the art for normal opera- ting conditions and for actuating with electric motors. A consultation is required for Special applications, passenger elevators or Special operating conditions, e.g. high mass acceleration factors.

4.2 External loads, axial / radial, conversion, connections

The permissible radial loads listed in the selection tables are guide values and used only for rough orientation purposes. The data refer to action of load in the middle of the respective solid shaft. If no radial load is present, half the value of the radial load Specified in the selection tables is permitted as axial load. The resulting maximum value of a radial load for each gear unit Size generally occurs at low Speeds and is determined by the material and geometry of the shaft. For all lower values of the frame Size, the predetermined bearing life LH10 of the output shaft bearing is limiting. Since variables such as torque, Speed, direction of rotation and load angle of action enter into the calculation and Premium Stephan always assumes the worst-case scenario, Significantly higher external loads are permissible in most cases while giving the effective loads. Please contact us and we will gladly recalculate your Specific case.

4.3 Thermal break even performance

Torque and output stated in the selection charts are mechanical limit values. Depending on mounting position and mounting Situation it is possible that the gearbox will overload thermal before reaching the mechanical breakeven performance. Outputs marked (1) are exceeding the thermal break even performance already under normal application conditions.
If the real operation conditions are known, the heat breakeven performance can be recalculated by Premium Stephan. The heat breakeven performance can be increased by using appropriate measures (such as using synthetic lubricants with increased thermal consistency). The following data is necessary for recalculation:

Type or gearbox .....

Mounting position .....

Input Speed (range) 1/min

Ratio .....

Used output .....kW

Duty / power-on time .....

Ambient Temperature .....°C

Installation Site .....

O in a small, closed room

O large rooms

O outside

Mounting Situation (Sketch/drawing)

.....

4. Instructions for Drive Selection

Increased Splash losses may occur for mounting positions with high oil level.(MK all V-mountings, MP mounting pos. 2, 5 and 6, MK mounting pos. 2 and 4) or input Speed above 1800 1/min and may lead to excessive heating. Please contact Premium Stephan in these individual cases.

4.4 Notes about the dimensional drawings

The dimensional drawings featured in this catalog are nonbinding. In particular, slightly deviating dimensions may occur for motor dimensions dependent upon the technical requirements. Binding dimensional drawings can be created upon request.

Note:
The user is responsible for providing protective covers and professional setup of the complete equipment.

The flanges on the output Side are manufactured according to DIN 42955-N, whereby the tolerances of the center- ring gears correspond to DIN 42948. Keyways of the output shafts are manufactured according to DIN 6885-T1-"Form A".

Detailed dimensions of the shafts and recommendations for the designs of the machine shafts can be found in the technical appendix of this catalog.

4.5 Delivery times

Manufacturing and stocking of M4 components are constantly adapted to customer demands. Modern control methods are used in the process. Delivery time for standard design is max. 3 weeks. If necessary we can also achieve 24h deli- very service. We can also achieve short delivery times for all remaining geared motors. Please contact us and we will gladly assist you.

4.6 Shaft arrangements

In most cases, different shaft arrangements can be implemented for the parallel shaft helical geared motors MP4 and the helical bevel geared motors MK4.

Definitions:

Gear Unit with Solid shaft with MKB/V..A

- Deign L : Shaft output left (top view)
- Deign R : Shaft output right (top view)
- Deign T : Shaft output right and left (top view)

Gear Unit with Hollow shaft MKB/V..S

- Deign L : Machine shaft is inserted in the hollow shaft from the left (top view)
- Deign R : Machine shaft is inserted in the hollow shaft from the right (top view)
- Deign T : Machine shaft is inserted through the hollow shaft. Shaft output right and left (top view)

Gear Unit with Hollow shaft with shrink disc MKB/V..A

- Deign L : Machine shaft is inserted in the hollow shaft from the left (top view)
- Deign R : Machine shaft is inserted in the hollow shaft from the right (top view)
- Deign T : Machine shaft is inserted through the hollow shaft. Shaft output right and left (top view)

Gear Unit with Hollow shaft with taper bush MKB/V..A

- Deign L : Machine shaft is inserted in the hollow shaft from the left (top view)
- Deign R : Machine shaft is inserted in the hollow shaft from the right (top view)
- Deign T : Machine shaft is inserted through the hollow shaft. Shaft output right and left (top view)

Gear Unit with Hollow spline shaft MKB/V..A

- Deign L : Machine shaft is inserted in the hollow shaft from the left (top view)
- Deign R : Machine shaft is inserted in the hollow shaft from the right (top view)
- Deign T : Machine shaft is inserted through the hollow shaft. Shaft output right and left (top view)

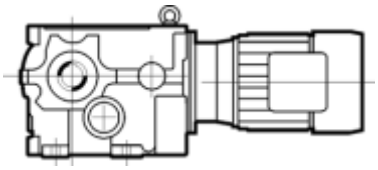
4. Instructions for Drive Selection

4.7 Types of construction outside of the axis intersection

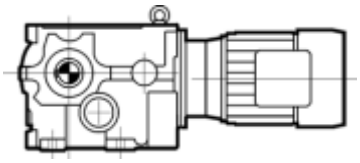
In addition to the mounting positions in the axis intersection, any other mounting positions are also feasible. The use of geared motors in sloping positions are frequently permissible. However, the optimum lubricant supply must always be ensured. Fill quantities and required oil attachments are Specified by Premium Stephan. Please contact us. We will find a solution for your mounting position.

5. MK4 Helical Bevel

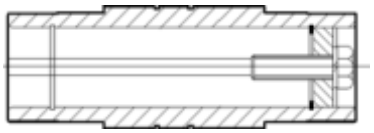
5.1.1 Version variants for MIK4 helical bevel geared motors



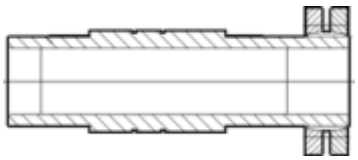
MKB..S
Shaft-mounted version with hollow shaft



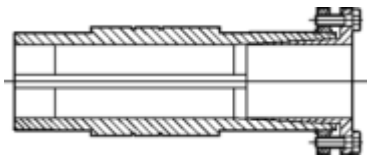
MKB..A
Foot mounting with solid shaft



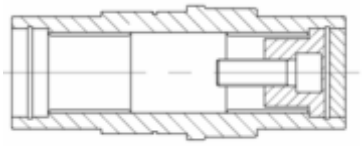
MK..S
Hollow shaft with keyway



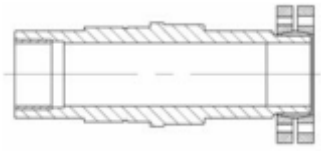
MK..S
Hollow shaft with shrink disc



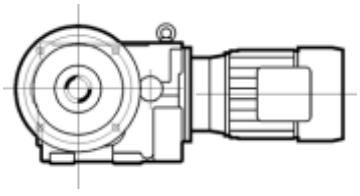
MK..A
Hollow shaft with taper bush



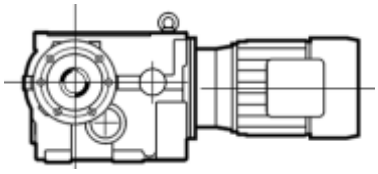
MK..A
Hollow spline shaft



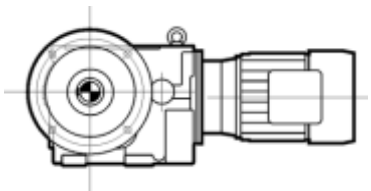
MK..A
Hollow shaft with shrink disc and bronze bushing



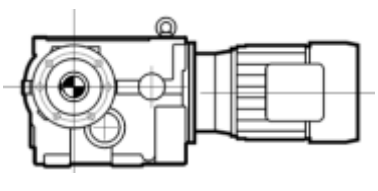
MKV..S
B5 flange version with hollow shaft



MKV..A
B14 flange version with hollow shaft



MKV..A
B5 flange version with solid shaft

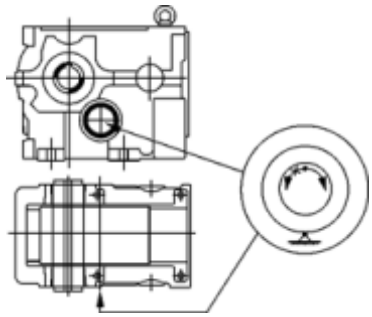


MKV..A
B14 flange version with solid shaft

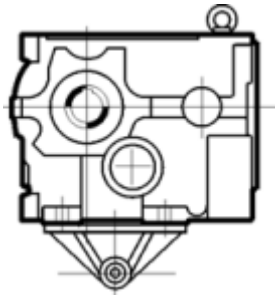
5. MK4 Inline

5.1.1 Version variants for MK4 helical bevel geared motors

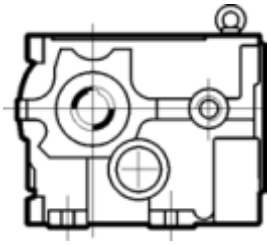
Versions on the drive end



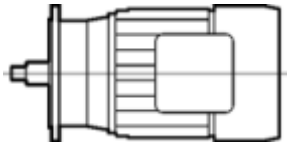
MK..A
Reverse lock on the intermediate shaft only possible at the location shown



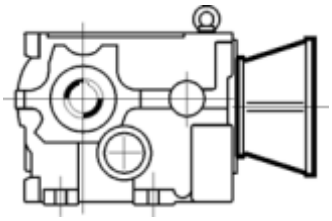
MK..A
Torque arm



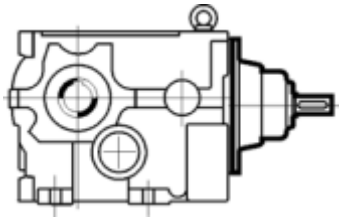
Fixing point for alternate Torque arm (for small sizes). Please consult us.



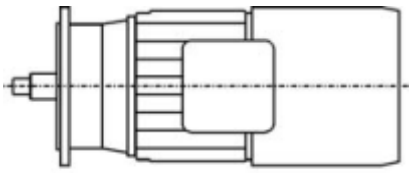
Integral motor



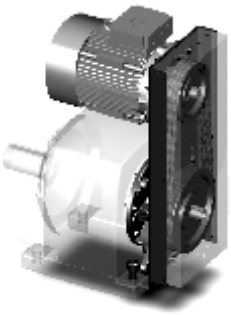
A to L
Adaptors for IEC standard motors



M
Gear unit with free input shaft



Integrated brake motor



N
Motor base version for V-belt drive motor mounposition IM B5 (schematic drawing)

Overview

	6 Sizes					
	2	**3**	**4**	**5**	**6**	**7**
T2m (Nm)	440	800	1600	2900	4900	8000
Pm (kW)	0.12 to 75 kW					
i	**7.1 ... 315** C					

5. MK4 Inline

5.2 Ordering information

Gear units with two and three stages

M	K	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

3	**Casing** B Foot Version V Flange Version
4	**Number of Stages** 2 2-stage 3 3-stage
5-6	**Size** 2-3-4-5-6-7
7	**Adaptor Size** A 140 - 11 B 160 - 14 C 200 - 19 D 200 - 24 E 250 - 28 F 300 - 38 G 350 - 42 H 350 - 48 I 400 - 55 J 450 - 60 K 500 - 65 L 550 - 75 M SISO
8-11	**Motor Frame Size** 0000 - No Motor
12	**Number of Motor Poles** 0 - No Motor T - Two Pole F - Four Pole S - Six Pole E - Eight Pole
13-17	**Total Gear Ratio**
18	**Supply Condition** S - Standard A - Additional Accessories e.g. Torque arm, hold back, Special motor etc.

Example

M	K	B	3	0	5	D	0	9	0	L	F	1	4	8	7	3	S

MK foot version, Three stage, Size 5, Adaptor 200-24 Motor frame size 090L, Four pole motor,
Total gear ratio I = 14.73, Standard Supply Condition.

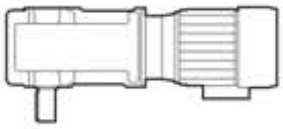
M	K	B	3	0	2	D	0	9	0	S	F	0	0	7	1	9	S

MK flange version, Two stage, Size 1, Adaptor 200-24 Motor frame size 090S, Four pole motor,
Total gear ratio I = 7.19, Standard Supply Condition.

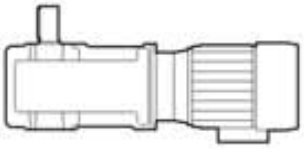
5. MK4 Inline

5.3 Mounting positions

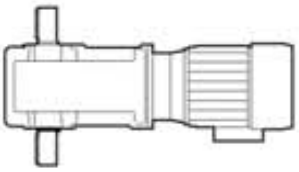
L



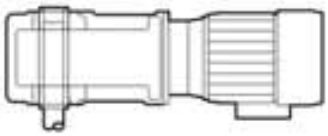
R



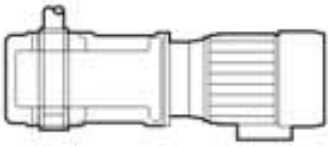
T



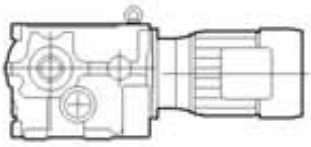
L



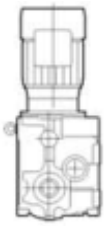
R



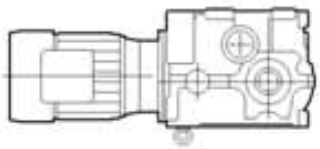
1



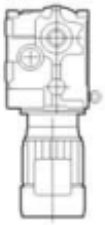
2



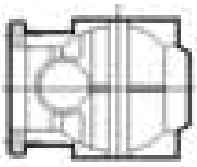
3



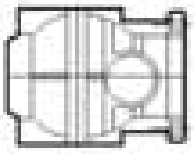
4



5



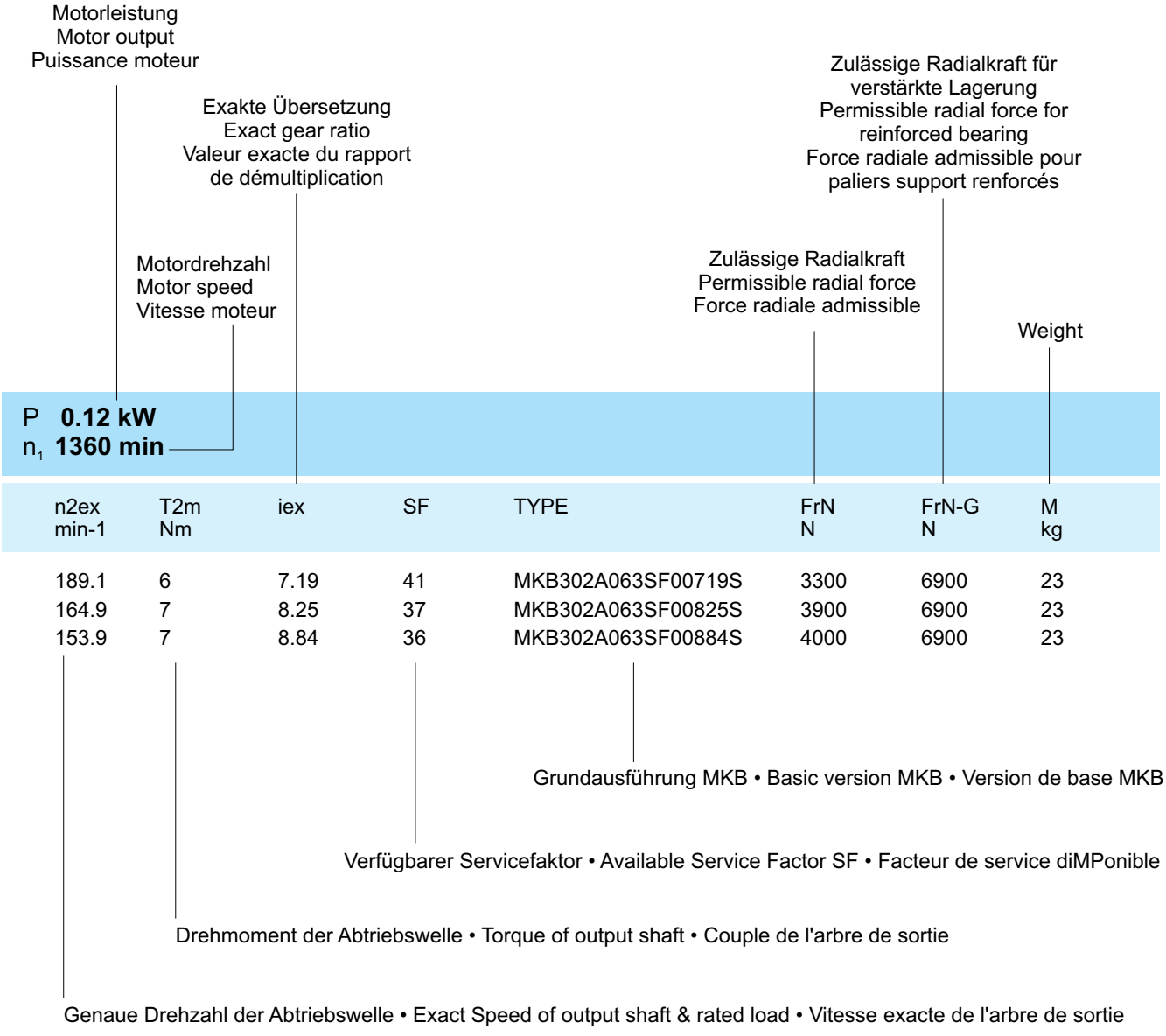
6



5. MK4 Inline

5.3 Auswahltabellen Getriebemotoren MK4
Selection tables for MK4 geared motors
Tableaux de sélection pour les motoréducteurs MK4

Beispiel : Auswahltabelle Getriebemotoren
Example : Geared Motor selection table
Exemple de tableau de sélection pour motoréducteurs



P 0.12 kW n_1 1360 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
189.1	6	7.19	41	MKB302A063SF00719S	3300	6900	23
164.9	7	8.25	37	MKB302A063SF00825S	3900	6900	23
153.9	7	8.84	36	MKB302A063SF00884S	4000	6900	23
133.7	9	10.17	33	MKB302A063SF01017S	4200	6900	23
115.7	10	11.76	29	MKB302A063SF01176S	4400	6900	23
108.9	11	12.48	37	MKB302A063SF01248S	4500	6900	23
95	12	14.31	33	MKB302A063SF01431S	4000	6900	23
88.7	13	15.34	32	MKB302A063SF01534S	4800	6900	23
77.1	15	17.65	29	MKB302A063SF01765S	5000	6900	23
66.7	17	20.4	26	MKB302A063SF02040S	5300	6900	23
61.9	19	21.99	24	MKB302A063SF02199S	5400	6900	23
57.3	20	23.74	22	MKB302A063SF02374S	5500	6900	23
48.8	23	27.86	19	MKB302A063SF02786S	5800	6900	23
44.9	26	30.3	17	MKB302A063SF03030S	6000	6900	23
37.5	31	36.24	14	MKB302A063SF03624S	6300	6900	23
34.1	34	39.9	13	MKB302A063SF03990S	6500	6900	23
30.8	37	44.17	12	MKB302A063SF04417S	6700	6900	23
27.6	41	49.21	11	MKB302A063SF04921S	6900	6900	23
24.6	47	55.25	9.5	MKB302A063SF05525S	6900	6900	23
22.1	52	61.51	8.5	MKB302A063SF06151S	6900	6900	23
19.8	58	68.78	7.6	MKB302A063SF06878S	6900	6900	23
17	67	79.96	6.5	MKB302A063SF07996S	6900	6900	23
15.3	75	89.08	5.9	MKB302A063SF08908S	6900	6900	23
13.6	84	100.23	5.2	MKB302A063SF10023S	6900	6900	23
12.3	93	110.71	4.7	MKB302A063SF11071S	6900	6900	23
11.1	104	122.91	4.2	MKB302A063SF12291S	6900	6900	23
9.9	116	137.82	3.8	MKB302A063SF13782S	6900	6900	23

P 0.18 kW n_1 1370 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
190.5	9	7.19	28	MKB302A063LF00719S	3300	6900	23
166.1	10	8.25	25	MKB302A063LF00825S	3900	6900	23
155	11	8.84	24	MKB302A063LF00884S	4000	6900	23
134.7	13	10.17	22	MKB302A063LF01017S	4200	6900	23
116.5	15	11.76	20	MKB302A063LF01176S	4400	6900	23
109.7	16	12.48	25	MKB302A063LF01248S	4400	6900	23
95.7	18	14.31	22	MKB302A063LF01431S	4000	6900	23
89.3	19	15.34	22	MKB302A063LF01534S	4700	6900	23
77.6	22	17.65	19	MKB302A063LF01765S	5000	6900	23
67.1	26	20.4	17	MKB302A063LF02040S	5200	6900	23
62.3	28	21.99	16	MKB302A063LF02199S	5300	6900	23
57.7	30	23.74	15	MKB302A063LF02374S	5400	6900	23

P 0.18 kW n_1 1370 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
49.2	35	27.86	13	MKB302A063LF02786S	5700	6900	23
45.2	38	30.3	12	MKB302A063LF03030S	5900	6900	23
37.8	45	36.24	9.7	MKB302A063LF03624S	6200	6900	23
34.3	50	39.9	8.8	MKB302A063LF03990S	6400	6900	23
31	55	44.17	7.9	MKB302A063LF04417S	6600	6900	23
27.8	62	49.21	7.1	MKB302A063LF04921S	6800	6900	23
24.8	69	55.25	6.3	MKB302A063LF05525S	6900	6900	23
22.3	77	61.51	5.7	MKB302A063LF06151S	6900	6900	23
19.9	86	68.78	5.1	MKB302A063LF06878S	6900	6900	23
17.1	100	79.96	4.4	MKB302A063LF07996S	6900	6900	23
15.4	112	89.08	3.9	MKB302A063LF08908S	6900	6900	23
13.7	126	100.23	3.5	MKB302A063LF10023S	6900	6900	23
12.4	139	110.71	3.2	MKB302A063LF11071S	6900	6900	23
11.1	154	122.91	2.9	MKB302A063LF12291S	6900	6900	23
9.9	173	137.82	2.5	MKB302A063LF13782S	6900	6900	23

P 0.25 kW n_1 1400 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
194.6	12	7.19	20	MKB302B071LF00719S	3200	6900	24
169.8	14	8.25	18	MKB302B071LF00825S	3900	6900	24
158.4	15	8.84	18	MKB302B071LF00884S	3900	6900	24
137.7	17	10.17	16	MKB302B071LF01017S	4100	6900	24
119.1	20	11.76	14	MKB302B071LF01176S	4300	6900	24
112.1	21	12.48	18	MKB302B071LF01248S	4400	6900	24
97.8	24	14.31	16	MKB302B071LF01431S	3900	6900	24
91.3	26	15.34	16	MKB302B071LF01534S	4700	6900	24
79.3	30	17.65	14	MKB302B071LF01765S	4900	6900	24
68.6	35	20.4	13	MKB302B071LF02040S	5100	6900	24
63.7	37	21.99	12	MKB302B071LF02199S	5200	6900	24
59	40	23.74	11	MKB302B071LF02374S	5300	6900	24
50.3	48	27.86	9.3	MKB302B071LF02786S	5600	6900	24
46.2	52	30.3	8.5	MKB302B071LF03030S	5700	6900	24
38.6	62	36.24	7.1	MKB302B071LF03624S	6100	6900	24
35.1	68	39.9	6.5	MKB302B071LF03990S	6200	6900	24
31.7	75	44.17	5.8	MKB302B071LF04417S	6400	6900	24
28.5	84	49.21	5.2	MKB302B071LF04921S	6600	6900	24
25.3	94	55.25	4.7	MKB302B071LF05525S	6800	6900	24
22.8	105	61.51	4.2	MKB302B071LF06151S	6900	6900	24
20.4	117	68.78	3.8	MKB302B071LF06878S	6900	6900	24
17.5	136	79.96	3.2	MKB302B071LF07996S	6900	6900	24
15.7	152	89.08	2.9	MKB302B071LF08908S	6900	6900	24
14	171	100.23	2.6	MKB302B071LF10023S	6900	6900	24

P 0.25 kW n_1 1400 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
12.6	189	110.71	2.3	MKB302B071LF11071S	6900	6900	24
11.4	210	122.91	2.1	MKB302B071LF12291S	6900	6900	24
10.2	235	137.82	1.9	MKB302B071LF13782S	6900	6900	24

P 0.37 kW n_1 1400 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
194.6	18	7.19	14	MKB302B071SF00719S	3200	6900	25
169.8	21	8.25	12	MKB302B071SF00825S	3800	6900	25
158.4	22	8.84	12	MKB302B071SF00884S	3900	6900	25
137.7	26	10.17	11	MKB302B071SF01017S	4100	6900	25
119.1	30	11.76	9.8	MKB302B071SF01176S	4200	6900	25
112.1	32	12.48	12	MKB302B071SF01248S	4300	6900	25
97.8	36	14.31	11	MKB302B071SF01431S	3900	6900	25
91.3	39	15.34	11	MKB302B071SF01534S	4600	6900	25
79.3	45	17.65	9.7	MKB302B071SF01765S	4800	6900	25
68.6	51	20.4	8.5	MKB302B071SF02040S	5000	6900	25
63.7	55	21.99	7.9	MKB302B071SF02199S	5100	6900	25
59	60	23.74	7.3	MKB302B071SF02374S	5200	6900	25
50.3	70	27.86	6.3	MKB302B071SF02786S	5400	6900	25
46.2	76	30.3	5.8	MKB302B071SF03030S	5600	6900	25
38.6	91	36.24	4.8	MKB302B071SF03624S	5800	6900	25
35.1	101	39.9	4.4	MKB302B071SF03990S	6000	6900	25
31.7	111	44.17	3.9	MKB302B071SF04417S	6100	6900	25
28.5	124	49.21	3.5	MKB302B071SF04921S	6300	6900	25
25.3	139	55.25	3.2	MKB302B071SF05525S	6500	6900	25
22.8	155	61.51	2.8	MKB302B071SF06151S	6700	6900	25
20.4	174	68.78	2.5	MKB302B071SF06878S	6800	6900	25
17.5	202	79.96	2.2	MKB302B071SF07996S	6900	6900	25
15.7	225	89.08	2	MKB302B071SF08908S	6900	6900	25
14	253	100.23	1.7	MKB302B071SF10023S	6900	6900	25
12.6	279	110.71	1.6	MKB302B071SF11071S	6900	6900	25
12.3	288	114.13	2.8	MKB303B071SF11413S	10200	13500	36
11.4	310	122.91	1.4	MKB302B071SF12291S	6900	6900	25
10.9	323	128.05	2.5	MKB303B071SF12805S	10500	13500	36
10.2	348	137.82	1.3	MKB302B071SF13782S	6900	6900	25
7.7	461	182.63	3	MKB304B071SF18263S	15700	18000	58

P 0.55 kW n_1 1420 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
197.4	27	7.19	9.4	MKB302C080KF00719S	3200	6900	27
172.2	30	8.25	8.5	MKB302C080KF00825S	3700	6900	27
160.7	33	8.84	8.3	MKB302C080KF00884S	3800	6900	27

P 0.55 kW n_1 1420 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
139.6	38	10.17	7.4	MKB302C080KF01017S	4000	6900	27
120.8	43	11.76	6.7	MKB302C080KF01176S	4100	6900	27
113.7	46	12.48	8.4	MKB302C080KF01248S	4200	6900	27
99.2	53	14.31	7.6	MKB302C080KF01431S	3800	6900	27
92.6	57	15.34	7.3	MKB302C080KF01534S	4400	6900	27
80.5	65	17.65	6.6	MKB302C080KF01765S	4600	6900	27
69.6	75	20.4	5.8	MKB302C080KF02040S	4800	6900	27
64.6	81	21.99	5.4	MKB302C080KF02199S	4900	6900	27
59.8	88	23.74	5	MKB302C080KF02374S	5000	6900	27
51	103	27.86	4.3	MKB302C080KF02786S	5200	6900	27
46.9	112	30.3	3.9	MKB302C080KF03030S	5300	6900	27
39.2	134	36.24	3.3	MKB302C080KF03624S	5500	6900	27
35.6	148	39.9	3	MKB302C080KF03990S	5600	6900	27
32.2	163	44.17	2.7	MKB302C080KF04417S	5800	6900	27
28.9	182	49.21	2.4	MKB302C080KF04921S	5900	6900	27
25.7	204	55.25	2.2	MKB302C080KF05525S	6000	6900	27
23.1	227	61.51	1.9	MKB302C080KF06151S	6100	6900	27
20.6	254	68.78	1.7	MKB302C080KF06878S	6200	6900	27
19.7	266	71.9	3	MKB303C080KF07190S	8600	13500	38
17.8	296	79.96	1.5	MKB302C080KF07996S	6300	6900	27
17.7	297	80.34	2.7	MKB303C080KF08034S	8800	13500	38
15.9	329	89.08	1.3	MKB302C080KF08908S	6400	6900	27
16	329	89.02	2.4	MKB303C080KF08902S	9000	13500	38
14.2	371	100.23	1.2	MKB302C080KF10023S	6500	6900	27
14.3	367	99.18	2.2	MKB303C080KF09918S	9200	13500	38
12.8	409	110.71	1.1	MKB302C080KF11071S	6500	6900	27
12.4	422	114.13	1.9	MKB303C080KF11413S	9400	13500	38
11.6	455	122.91	0.97	MKB302C080KF12291S	6500	6900	27
11.1	474	128.05	1.7	MKB303C080KF12805S	9600	13500	38
10.3	510	137.82	0.86	MKB302C080KF13782S	6500	6900	27
10.6	495	133.86	2.9	MKB304C080KF13386S	13700	18000	60
9.6	544	147.16	2.7	MKB304C080KF14716S	14000	18000	60
7.8	675	182.63	2	MKB304C080KF18263S	14700	18000	60

P 0.75 kW n_1 1415 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
196.7	36	7.19	6.9	MKB302C080NF00719S	3100	6900	28
171.6	42	8.25	6.2	MKB302C080NF00825S	3600	6900	28
160.1	45	8.84	6	MKB302C080NF00884S	3700	6900	28
139.1	51	10.17	5.4	MKB302C080NF01017S	3900	6900	28
120.4	60	11.76	4.9	MKB302C080NF01176S	4000	6900	28
113.3	63	12.48	6.2	MKB302C080NF01248S	4100	6900	28

P 0.75 kW n_1 1415 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
98.9	72	14.31	5.5	MKB302C080NF01431S	3700	6900	28
92.3	78	15.34	5.3	MKB302C080NF01534S	4300	6900	28
80.2	89	17.65	4.8	MKB302C080NF01765S	4500	6900	28
69.3	103	20.4	4.3	MKB302C080NF02040S	4600	6900	28
64.4	111	21.99	4	MKB302C080NF02199S	4700	6900	28
59.6	120	23.74	3.7	MKB302C080NF02374S	4800	6900	28
50.8	141	27.86	3.1	MKB302C080NF02786S	4900	6900	28
46.7	153	30.3	2.9	MKB302C080NF03030S	5000	6900	28
39	183	36.24	2.4	MKB302C080NF03624S	5200	6900	28
35.5	202	39.9	2.2	MKB302C080NF03990S	5300	6900	28
32	224	44.17	2	MKB302C080NF04417S	5300	6900	28
28.8	249	49.21	1.8	MKB302C080NF04921S	5400	6900	28
26.7	268	52.91	3	MKB303C080NF05291S	7600	13500	39
25.6	280	55.25	1.6	MKB302C080NF05525S	5500	6900	28
24	298	58.91	2.7	MKB303C080NF05891S	7800	13500	39
23	311	61.51	1.4	MKB302C080NF06151S	5500	6900	28
21.8	328	64.86	2.4	MKB303C080NF06486S	7900	13500	39
20.6	348	68.78	1.3	MKB302C080NF06878S	5600	6900	28
19.7	364	71.9	2.2	MKB303C080NF07190S	8100	13500	39
17.7	405	79.96	1.1	MKB302C080NF07996S	5600	6900	28
17.6	407	80.34	2	MKB303C080NF08034S	8200	13500	39
15.9	451	89.08	0.98	MKB303C080NF08908S	5600	6900	28
15.9	451	89.02	1.8	MKB303C080NF08902S	8400	13500	39
14.1	507	100.23	0.87	MKB302C080NF10023S	5500	6900	28
14.3	502	99.18	1.6	MKB303C080NF09918S	8500	13500	39
12.4	578	114.13	1.4	MKB303C080NF11413S	8600	13500	39
12.4	579	114.33	2.8	MKB304C080NF11433S	12600	18000	61
11.1	648	128.05	1.2	MKB303C080NF12805S	8700	13500	39
11.1	643	127.01	2.5	MKB304C080NF12701S	12800	18000	61
10.6	678	133.86	2.2	MKB304C080NF13386S	13000	18000	61
9.6	745	147.16	2	MKB304C080NF14716S	13200	18000	61

P 1.1 kW n_1 1410 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
196	54	7.19	4.7	MKB302D090SF00719S	3000	6900	33
171	61	8.25	4.2	MKB302D090SF00825S	3500	6900	33
159.6	66	8.84	4.1	MKB302D090SF00884S	3600	6900	33
138.7	76	10.17	3.7	MKB302D090SF01017S	3700	6900	33
119.9	88	11.76	3.3	MKB302D090SF01176S	3800	6900	33
112.9	93	12.48	4.2	MKB302D090SF01248S	3900	6900	33
98.5	107	14.31	3.8	MKB302D090SF01431S	3500	6900	33
91.9	114	15.34	3.6	MKB302D090SF01534S	4000	6900	33

P 1.1 kW n_1 **1410 min^{-1}**

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
79.9	131	17.65	3.3	MKB302D090SF01765S	4200	6900	33
69.1	152	20.4	2.9	MKB302D090SF02040S	4300	6900	33
64.1	164	21.99	2.7	MKB302D090SF02199S	4300	6900	33
59.4	177	23.74	2.5	MKB302D090SF02374S	4400	6900	33
50.6	208	27.86	2.1	MKB302D090SF02786S	4500	6900	33
46.5	226	30.3	1.9	MKB302D090SF03030S	4500	6900	33
38.9	270	36.24	1.6	MKB302D090SF03624S	4600	6900	33
38.8	271	36.34	3	MKB303D090SF03634S	6500	13500	44
35.3	297	39.9	1.5	MKB302D090SF03990S	4600	6900	33
33.5	314	42.09	2.6	MKB303D090SF04209S	6700	13500	44
31.9	329	44.17	1.3	MKB302D090SF04417S	4600	6900	33
31	339	45.51	2.4	MKB303D090SF04551S	6800	13500	44
28.7	367	49.21	1.2	MKB302D090SF04921S	4600	6900	33
26.7	394	52.91	2	MKB303D090SF05291S	6900	13500	44
25.5	412	55.25	1.1	MKB302D090SF05525S	4600	6900	33
23.9	439	58.91	1.8	MKB303D090SF05891S	7000	13500	44
22.9	458	61.51	0.96	MKB302D090SF06151S	4500	6900	33
21.7	483	64.86	1.7	MKB303D090SF06486S	7100	13500	44
20.5	512	68.78	0.86	MKB302D090SF06878S	4500	6900	33
19.6	536	71.9	1.5	MKB303D090SF07190S	7200	13500	44
17.5	599	80.34	1.3	MKB303D090SF08034S	7200	13500	44
18.2	578	77.59	2.8	MKB304D090SF07759S	10800	18000	66
15.8	663	89.02	1.2	MKB303D090SF08902S	7300	13500	44
15.2	692	92.82	2.3	MKB304D090SF09282S	11100	18000	66
14.2	739	99.18	1.1	MKB303D090SF09918S	7300	13500	44
13.6	770	103.35	2.1	MKB304D090SF10335S	11300	18000	66
12.4	850	114.13	0.94	MKB303D090SF11413S	7200	13500	44
12.3	852	114.33	1.9	MKB304D090SF11433S	11500	18000	66
11	954	128.05	0.84	MKB303D090SF12805S	7100	13500	44
11.1	946	127.01	1.7	MKB304D090SF12701S	11600	18000	66
10.6	988	132.65	2.9	MKB305D090SF13265S	14700	27000	97
10.5	997	133.86	1.5	MKB304D090SF13386S	11700	18000	66
9.5	1108	148.73	2.6	MKB305D090SF14873S	14900	27000	97
9.6	1096	147.16	1.3	MKB304D090SF14716S	11800	18000	66
8.5	1239	166.25	2.3	MKB305D090SF16625S	15200	27000	107
7.7	1361	182.63	1	MKB304D090SF18263S	12000	18000	66

P 1.5 kW n_1 **1410 min^{-1}**

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
196	73	7.19	3.4	MKB302D090LF00719S	2900	6900	34
171	84	8.25	3.1	MKB302D090LF00825S	3300	6900	34
159.6	90	8.84	3	MKB302D090LF00884S	3400	6900	34
138.7	103	10.17	2.7	MKB302D090LF01017S	3500	6900	34
119.9	119	11.76	2.4	MKB302D090LF01176S	3600	6900	34
112.9	127	12.48	3.1	MKB302D090LF01248S	3600	6900	34
98.5	145	14.31	2.8	MKB302D090LF01431S	3400	6900	34
91.9	156	15.34	2.7	MKB302D090LF01534S	3800	6900	34
79.9	179	17.65	2.4	MKB302D090LF01765S	3800	6900	34
69.1	207	20.4	2.1	MKB302D090LF02040S	3900	6900	34
64.1	223	21.99	2	MKB302D090LF02199S	3900	6900	34
59.4	241	23.74	1.8	MKB302D090LF02374S	3900	6900	34
50.6	283	27.86	1.6	MKB302D090LF02786S	4000	6900	34
47.5	301	29.67	2.7	MKB303D090LF02967S	5800	13500	45
46.5	308	30.3	1.4	MKB302D090LF03030S	4000	6900	34
44.5	322	31.68	2.5	MKB303D090LF03168S	5900	13500	45
38.9	368	36.24	1.2	MKB302D090LF03624S	3900	6900	34
38.8	369	36.34	2.2	MKB303D090LF03634S	6000	13500	45
35.3	405	39.9	1.1	MKB302D090LF03990S	3900	6900	34
33.5	428	42.09	1.9	MKB303D090LF04209S	6100	13500	45
31.9	449	44.17	0.98	MKB302D090LF04417S	3800	6900	34
31	462	45.51	1.7	MKB303D090LF04551S	6200	13500	45
28.7	500	49.21	0.88	MKB302D090LF04921S	3700	6900	34
26.7	537	52.91	1.5	MKB303D090LF05291S	6200	13500	45
23.9	598	58.91	1.3	MKB303D090LF05891S	6200	13500	45
25.3	566	55.67	2.8	MKB304D090LF05567S	9400	18000	67
21.7	659	64.86	1.2	MKB303D090LF06486S	6200	13500	45
23.2	617	60.7	2.6	MKB304D090LF06070S	9600	18000	67
19.6	730	71.9	1.1	MKB303D090LF07190S	6200	13500	45
20.1	714	70.26	2.2	MKB304D090LF07026S	9800	18000	67
17.5	816	80.34	0.98	MKB303D090LF08034S	6100	13500	45
18.2	788	77.59	2	MKB304D090LF07759S	9900	18000	67
15.8	904	89.02	0.88	MKB303D090LF08902S	6000	13500	45
15.2	943	92.82	1.7	MKB304D090LF09282S	10100	18000	67
13.6	1050	103.35	1.5	MKB304D090LF10335S	10200	18000	67
13.9	1028	101.22	2.8	MKB305D090LF10122S	12900	27000	98
12.3	1161	114.33	1.4	MKB304D090LF11433S	10200	18000	67
12.7	1129	111.17	2.6	MKB305D090LF11117S	13100	27000	98
11.1	1290	127.01	1.2	MKB304D090LF12701S	10300	18000	67
10.6	1348	132.65	2.2	MKB305D090LF13265S	13300	27000	98
10.5	1360	133.86	1.1	MKB304D090LF13386S	10300	18000	67
9.5	1511	148.73	1.9	MKB305D090LF14873S	13500	27000	98
9.6	1495	147.16	0.98	MKB304D090LF14716S	10200	18000	67
8.4	1711	168.44	2.9	MKB306D090LF16844S	22500	40000	164
7.5	1918	188.84	2.6	MKB306D090LF18884S	22900	40000	164

P 2.2 kW n_1 **1420 min^{-1}**

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
197.4	106	7.19	2.3	MKB302E100LF00719S	2800	6900	37
172.2	122	8.25	2.1	MKB302E100LF00825S	3100	6900	37
160.7	131	8.84	2.1	MKB302E100LF00884S	3100	6900	37
139.6	150	10.17	1.9	MKB302E100LF01017S	3200	6900	37
138	152	10.29	2.9	MKB303E100LF01029S	4400	13500	48
120.8	174	11.76	1.7	MKB302E100LF01176S	3200	6900	37
123.2	171	11.53	2.6	MKB303E100LF01153S	4500	13500	48
113.7	185	12.48	2.1	MKB302E100LF01248S	3200	6900	37
109.6	192	12.95	2.5	MKB303E100LF01295S	4600	13500	48
99.2	212	14.31	1.9	MKB302E100LF01431S	3100	6900	37
92.6	227	15.34	1.8	MKB302E100LF01534S	3300	6900	37
91	231	15.6	3	MKB303E100LF01560S	4800	13500	48
80.5	261	17.65	1.6	MKB302E100LF01765S	3300	6900	37
77.1	272	18.41	2.7	MKB303E100LF01841S	4900	13500	48
69.6	302	20.4	1.5	MKB302E100LF02040S	3200	6900	37
68.9	305	20.62	2.5	MKB303E100LF02062S	5000	13500	48
64.6	325	21.99	1.4	MKB302E100LF02199S	3200	6900	37
61.3	343	23.18	2.3	MKB303E100LF02318S	5000	13500	48
59.8	351	23.74	1.3	MKB302E100LF02374S	3200	6900	37
57.7	364	24.61	2.2	MKB303E100LF02461S	5100	13500	48
51	412	27.86	1.1	MKB302E100LF02786S	3100	6900	37
47.9	439	29.67	1.8	MKB303E100LF02967S	5100	13500	48
46.9	448	30.3	0.98	MKB302E100LF03030S	3000	6900	37
44.8	469	31.68	1.7	MKB303E100LF03168S	5100	13500	48
39.2	536	36.24	0.82	MKB302E100LF03624S	2700	6900	37
39.1	538	36.34	1.5	MKB303E100LF03634S	5100	13500	48
41.3	508	34.37	2.9	MKB304E100LF03437S	7900	18000	70
33.7	623	42.09	1.3	MKB303E100LF04209S	5100	13500	48
35.3	595	40.19	2.6	MKB304E100LF04019S	8100	18000	70
31.2	673	45.51	1.2	MKB303E100LF04551S	5100	13500	48
32.8	640	43.29	2.5	MKB304E100LF04329S	8200	18000	70
26.8	783	52.91	1	MKB303E100LF05291S	4900	13500	48
28.9	727	49.15	2.2	MKB304E100LF04915S	8300	18000	70
24.1	872	58.91	0.92	MKB303E100LF05891S	4800	13500	48
25.5	824	55.67	1.9	MKB304E100LF05567S	8400	18000	70
21.9	960	64.86	0.83	MKB303E100LF06486S	4600	13500	48
23.4	898	60.7	1.8	MKB304E100LF06070S	8400	18000	70
20.2	1040	70.26	1.5	MKB304E100LF07026S	8500	18000	70
20	1049	70.89	2.8	MKB305E100LF07089S	11000	27000	101
18.3	1148	77.59	1.4	MKB304E100LF07759S	8500	18000	70
17.6	1197	80.88	2.4	MKB305E100LF08088S	11100	27000	101
15.3	1373	92.82	1.2	MKB304E100LF09282S	8400	18000	70
16.2	1297	87.69	2.2	MKB305E100LF08769S	11100	27000	101

P 0.75 kW n_1 1415 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
13.7	1529	103.35	1	MKB304E100LF10335S	8200	18000	70
14	1498	101.22	1.9	MKB305E100LF10122S	11200	27000	101
12.4	1691	114.33	0.95	MKB304E100LF11433S	8100	18000	70
12.8	1645	111.17	1.8	MKB305E100LF11117S	11200	27000	101
12.8	1647	111.35	3	MKB306E100LF11135S	19000	40000	167
11.2	1879	127.01	0.85	MKB304E100LF12701S	7900	18000	70
10.7	1963	132.65	1.5	MKB305E100LF13265S	11100	27000	101
11	1902	128.53	2.6	MKB306E100LF12853S	19400	40000	167
9.5	2200	148.73	1.3	MKB305E100LF14873S	10900	27000	101
10.1	2088	141.15	2.3	MKB306E100LF14115S	19500	40000	167
8.4	2492	168.44	2	MKB306E100LF16844S	19800	40000	167
7.5	2794	188.84	1.8	MKB306E100LF18884S	19900	40000	167

P 3.7 kW n_1 1420 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
197.4	179	7.19	1.40	MKB302E112MF00719S	2400	6900	45
172.2	205	8.25	1.30	MKB302E112MF00825S	2400	6900	45
181.6	195	7.82	1.94	MKB303E112MF00782S	3700	12900	56
185.5	190	7.66	2.81	MKB304E112MF00766S	5200	15400	78
160.7	220	8.84	1.19	MKB302E112MF00884S	2400	6900	45
162.9	217	8.72	1.83	MKB303E112MF00872S	3700	13300	56
159.8	221	8.89	2.59	MKB304E112MF00889S	5400	15900	78
139.6	253	10.17	1.08	MKB302E112MF01017S	2300	6900	45
138	256	10.29	1.73	MKB303E112MF01029S	3800	13500	56
142.7	248	9.95	2.49	MKB304E112MF00995S	5500	16500	78
120.8	292	11.76	0.99	MKB302E112MF01176S	2200	6900	45
123.2	287	11.53	1.62	MKB303E112MF01153S	3800	13500	56
124.6	284	11.39	2.27	MKB304E112MF01139S	5700	17100	78
113.7	311	12.48	1.30	MKB302E112MF01248S	2200	6900	45
109.6	322	12.95	1.40	MKB303E112MF01295S	3800	13500	56
113.6	311	12.5	2.16	MKB304E112MF01250S	5800	17500	78
99.2	356	14.31	1.08	MKB302E112MF01431S	2400	6900	45
101.5	348	13.99	1.94	MKB303E112MF01399S	3800	13500	56
102.4	345	13.87	3.03	MKB304E112MF01387S	5900	17900	78
92.6	382	15.34	1.08	MKB302E112MF01534S	2000	6900	45
91	388	15.6	1.84	MKB303E112MF01560S	3800	13500	56
88.2	401	16.1	2.70	MKB304E112MF01610S	6000	18000	78
80.5	439	17.65	0.98	MKB302E112MF01765S	1800	6900	45
77.1	458	18.41	1.62	MKB303E112MF01841S	3800	13500	56
78.8	448	18.02	2.60	MKB304E112MF01802S	6000	18000	78
69.6	508	20.4	0.87	MKB302E112MF02040S	1500	6900	45
68.9	513	20.62	1.52	MKB303E112MF02062S	3700	13500	56
68.8	514	20.63	2.38	MKB304E112MF02063S	6200	18000	78

P 3.7 kW n_1 **1420 min^{-1}**

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
61.3	576	23.18	1.41	MKB303E112MF02318S	3600	13500	56
62.7	564	22.64	2.27	MKB304E112MF02264S	6200	18000	78
57.7	612	24.61	1.30	MKB303E112MF02461S	3500	13500	56
54.3	651	26.15	2.05	MKB304E112MF02615S	6300	18000	78
47.9	738	29.67	1.08	MKB303E112MF02967S	3300	13500	56
49.1	720	28.91	1.95	MKB304E112MF02891S	6300	18000	78
44.8	789	31.68	1.02	MKB303E112MF03168S	3200	13500	56
44.3	798	32.09	1.84	MKB304E112MF03209S	6300	18000	78
44.3	798	32.07	3.25	MKB305E112MF03207S	8200	27000	109
39.1	904	36.34	0.89	MKB303E112MF03634S	2900	13500	56
41.3	856	34.37	1.73	MKB304E112MF03437S	6300	18000	78
40.2	879	35.29	3.02	MKB305E112MF03529S	8300	27000	109
35.3	1001	40.19	1.62	MKB304E112MF04019S	6200	18000	78
35.7	990	39.75	2.70	MKB305E112MF03975S	8300	27000	109
32.8	1077	43.29	1.51	MKB304E112MF04329S	6100	18000	78
32.2	1097	44.1	2.59	MKB305E112MF04410S	8300	27000	109
28.9	1223	49.15	1.30	MKB304E112MF04915S	5900	18000	78
28.1	1257	50.51	2.27	MKB305E112MF05051S	8300	27000	109
25.5	1386	55.67	1.19	MKB304E112MF05567S	5700	18000	78
23.9	1478	59.31	1.94	MKB305E112MF05931S	8100	27000	109
23.4	1510	60.7	1.06	MKB304E112MF06070S	5500	18000	78
22.4	1577	63.47	1.84	MKB305E112MF06347S	8000	27000	109
22.1	1599	64.14	3.02	MKB306E112MF06414S	14600	40000	175
20.2	1749	70.26	0.92	MKB304E112MF07026S	5100	18000	78
20	1767	70.89	1.62	MKB305E112MF07089S	7800	27000	109
18.9	1869	75.31	2.60	MKB306E112MF07531S	14700	40000	175
17.6	2008	80.88	1.41	MKB305E112MF08088S	7500	27000	109
17.6	2008	80.59	2.48	MKB306E112MF08059S	14700	40000	175
16.2	2181	87.69	1.30	MKB305E112MF08769S	7300	27000	109
15.8	2236	90.02	2.17	MKB306E112MF09002S	14700	40000	175
14	2524	101.22	1.19	MKB305E112MF10122S	6700	27000	109
13.8	2560	102.7	1.94	MKB306E112MF10270S	14500	40000	175
14.2	2488	100.03	3.24	MKB307E112MF10003S	18500	60900	268
12.8	2760	111.17	1.05	MKB305E112MF11117S	6200	27000	109
12.8	2760	111.35	1.74	MKB306E112MF11135S	14400	40000	175
13.1	2697	108.41	2.92	MKB307E112MF10841S	18600	62100	268
10.7	3302	132.65	0.88	MKB305E112MF13265S	5200	27000	109
11	3212	128.53	1.51	MKB306E112MF12853S	14000	40000	175
11.1	3183	127.92	2.49	MKB307E112MF12792S	18600	64300	268
10.1	3498	141.15	1.41	MKB306E112MF14115S	13700	40000	175
10	3533	142.68	2.28	MKB307E112MF14268S	18600	65000	268
8.4	4206	168.44	1.18	MKB306E112MF16844S	12800	40000	175
8.9	3970	158.67	2.04	MKB307E112MF15867S	18400	65000	268
7.5	4711	188.84	1.04	MKB306E112MF18884S	12000	40000	175

P 5.5 kW n_1 **1440 min^{-1}**

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
184.2	285	7.82	1.4	MKB303F132SF00782S	3200	12500	67
188.1	279	7.66	1.9	MKB304F132SF00766S	4900	15000	89
165.2	318	8.72	1.3	MKB303F132SF00872S	3200	12800	67
162	324	8.89	1.8	MKB304F132SF00889S	5000	15500	89
139.9	375	10.29	1.2	MKB303F132SF01029S	3200	13300	67
144.7	363	9.95	1.7	MKB304F132SF00995S	5100	16100	89
124.9	420	11.53	1.1	MKB303F132SF01153S	3200	13500	67
126.4	416	11.39	1.5	MKB304F132SF01139S	5200	16600	89
111.2	472	12.95	0.99	MKB303F132SF01295S	3100	13500	67
115.2	456	12.5	1.5	MKB304F132SF01250S	5200	17000	89
108.9	482	13.22	2.9	MKB305F132SF01322S	6700	22500	120
102.9	510	13.99	1.3	MKB303F132SF01399S	3200	13500	67
103.8	506	13.87	2.1	MKB304F132SF01387S	5300	17400	89
92.3	569	15.6	1.2	MKB303F132SF01560S	3000	13500	67
89.5	587	16.1	1.9	MKB304F132SF01610S	5300	18000	89
78.2	672	18.41	1.1	MKB303F132SF01841S	2800	13500	67
79.9	657	18.02	1.8	MKB304F132SF01802S	5300	17900	89
69.8	752	20.62	1	MKB303F132SF02062S	2600	13500	67
69.8	753	20.63	1.6	MKB304F132SF02063S	5300	18000	89
72.4	725	19.88	3	MKB305F132SF01988S	7000	24800	120
62.1	845	23.18	0.93	MKB303F132SF02318S	2400	13500	67
63.6	826	22.64	1.6	MKB304F132SF02264S	5300	18000	89
63.9	822	22.53	2.8	MKB305F132SF02253S	7100	25600	120
58.5	897	24.61	0.89	MKB303F132SF02461S	2300	13500	67
55.1	954	26.15	1.4	MKB304F132SF02615S	5200	18000	89
56.8	924	25.35	2.6	MKB305F132SF02535S	7100	26300	120
49.8	1054	28.91	1.3	MKB304F132SF02891S	5100	18000	89
49.5	1060	29.06	2.4	MKB305F132SF02906S	7100	27000	120
44.9	1170	32.09	1.2	MKB304F132SF03209S	5000	18000	89
44.9	1170	32.07	2.2	MKB305F132SF03207S	7000	27000	120
41.9	1253	34.37	1.2	MKB304F132SF03437S	4900	18000	89
40.8	1287	35.29	2.1	MKB305F132SF03529S	7000	27000	120
35.8	1466	40.19	1.1	MKB304F132SF04019S	4600	18000	89
36.2	1450	39.75	1.9	MKB305F132SF03975S	6800	27000	120
33.3	1579	43.29	1	MKB304F132SF04329S	4400	18000	89
32.7	1608	44.1	1.7	MKB305F132SF04410S	6700	27000	120
32.1	1634	44.81	3	MKB306F132SF04481S	12500	40000	186
29.3	1793	49.15	0.89	MKB304F132SF04915S	4000	18000	89
28.5	1842	50.51	1.6	MKB305F132SF05051S	6400	27000	120
28.5	1841	50.48	2.7	MKB306F132SF05048S	12600	40000	186
24.3	2163	59.31	1.3	MKB305F132SF05931S	6000	27000	120
25.7	2042	55.99	2.4	MKB306F132SF05599S	12500	40000	186
22.7	2315	63.47	1.3	MKB305F132SF06347S	5700	27000	120
22.5	2339	64.14	2.1	MKB306F132SF06414S	12400	40000	186

P 5.5 kW — n_1 1440 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
20.3	2586	70.89	1.1	MKB305F132SF07089S	5300	27000	120
19.1	2747	75.31	1.8	MKB306F132SF07531S	12100	40000	186
17.8	2950	80.88	0.98	MKB305F132SF08088S	4600	27000	120
17.9	2940	80.59	1.7	MKB306F132SF08059S	12000	40000	186
18.1	2901	79.53	2.8	MKB307F132SF07953S	15900	55700	279
16.4	3198	87.69	0.91	MKB305F132SF08769S	4100	27000	120
16	3283	90.02	1.5	MKB306F132SF09002S	11600	40000	186
16.5	3182	87.25	2.5	MKB307F132SF08725S	15800	56700	279
14	3746	102.7	1.3	MKB306F132SF10270S	11100	40000	186
14.4	3649	100.03	2.2	MKB307F132SF10003S	15700	58400	279
12.9	4061	111.35	1.2	MKB306F132SF11135S	10600	40000	186
13.3	3954	108.41	2	MKB307F132SF10841S	15600	59300	279
11.2	4688	128.53	1	MKB306F132SF12853S	9700	40000	186
11.3	4666	127.92	1.7	MKB307F132SF12792S	15100	61100	279
10.2	5148	141.15	0.95	MKB306F132SF14115S	8900	40000	186
10.1	5204	142.68	1.5	MKB307F132SF14268S	14600	62200	279
9.1	5787	158.67	1.4	MKB307F132SF15867S	14100	63200	279

P 7.5 kW — n_1 1445 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
184.8	387	7.82	0.99	MKB303F132MF00782S	2700	12000	68
188.7	379	7.66	1.4	MKB304F132MF00766S	4500	14700	90
171.4	418	8.43	2.8	MKB305F132MF00843S	5700	19600	121
165.8	432	8.72	0.95	MKB303F132MF00872S	2700	12300	68
162.6	440	8.89	1.3	MKB304F132MF00889S	4500	15100	90
159.9	448	9.04	2.7	MKB305F132MF00904S	5800	20000	121
140.4	510	10.29	0.85	MKB303F132MF01029S	2500	12600	68
145.2	493	9.95	1.2	MKB304F132MF00995S	4600	15600	90
142.6	502	10.13	2.5	MKB305F132MF01013S	5900	20500	121
126.8	565	11.39	1.1	MKB304F132MF01139S	4600	16000	90
123.9	578	11.66	2.2	MKB305F132MF01166S	5900	21300	121
115.6	620	12.5	1.1	MKB304F132MF01250S	4600	16300	90
109.3	655	13.22	2.1	MKB305F132MF01322S	6000	21900	121
103.3	693	13.99	0.97	MKB303F132MF01399S	2400	12800	68
104.2	687	13.87	1.5	MKB304F132MF01387S	4600	16700	90
92.6	773	15.6	0.91	MKB303F132MF01560S	2000	13400	68
89.8	798	16.1	1.4	MKB304F132MF01610S	4500	17200	90
93.8	763	15.4	2.7	MKB305F132MF01540S	6100	22700	121
78.5	913	18.41	0.8	MKB303F132MF01841S	1600	13500	68
80.2	893	18.02	1.3	MKB304F132MF01802S	4500	17100	90
83.7	856	17.27	2.5	MKB305F132MF01727S	6100	23300	121
70	1023	20.63	1.2	MKB304F132MF02063S	4300	17900	90

P 7.5 kW n_1 **1445 min^{-1}**

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
72.7	985	19.88	2.2	MKB305F132MF01988S	6000	24000	121
63.8	1122	22.64	1.1	MKB304F132MF02264S	4100	18000	90
64.1	1117	22.53	2.1	MKB305F132MF02253S	6000	24600	121
55.3	1296	26.15	1	MKB304F132MF02615S	3900	18000	90
57	1256	25.35	1.9	MKB305F132MF02535S	5900	25200	121
50	1433	28.91	0.98	MKB304F132MF02891S	3600	18000	90
49.7	1441	29.06	1.7	MKB305F132MF02906S	5700	25900	121
45	1590	32.09	0.91	MKB304F132MF03209S	3300	18000	90
45.1	1590	32.07	1.6	MKB305F132MF03207S	5500	26300	121
42	1703	34.37	0.87	MKB304F132MF03437S	3100	18000	90
40.9	1749	35.29	1.5	MKB305F132MF03529S	5300	26700	121
39.2	1829	36.9	2.7	MKB306F132MF03690S	10700	38800	187
36.3	1970	39.75	1.4	MKB305F132MF03975S	4900	27000	121
35.5	2018	40.72	2.4	MKB306F132MF04072S	10600	39600	187
32.8	2186	44.1	1.3	MKB305F132MF04410S	4600	27000	121
32.2	2221	44.81	2.2	MKB306F132MF04481S	10500	40000	187
28.6	2504	50.51	1.2	MKB305F132MF05051S	4000	27000	121
28.6	2502	50.48	2	MKB306F132MF05048S	10300	40000	187
24.4	2940	59.31	0.99	MKB305F132MF05931S	3100	27000	121
25.8	2775	55.99	1.8	MKB306F132MF05599S	10000	40000	187
26.9	2667	53.81	3	MKB307F132MF05381S	13600	49200	280
22.8	3146	63.47	0.92	MKB305F132MF06347S	2700	27000	121
22.5	3179	64.14	1.5	MKB306F132MF06414S	9500	40000	187
23.3	3070	61.93	2.6	MKB307F132MF06193S	13500	50700	280
20.4	3514	70.89	0.83	MKB305F132MF07089S	1900	27000	121
19.2	3733	75.31	1.3	MKB306F132MF07531S	8700	40000	187
20.7	3462	69.85	2.3	MKB307F132MF06985S	13300	51900	280
17.9	3995	80.59	1.2	MKB306F132MF08059S	8300	40000	187
18.2	3942	79.53	2	MKB307F132MF07953S	13000	53100	280
16.1	4461	90.02	1.1	MKB306F132MF09002S	7600	40000	187
16.6	4324	87.25	1.8	MKB307F132MF08725S	12600	54000	280
14.1	5090	102.7	0.96	MKB306F132MF10270S	6400	40000	187
14.4	4958	100.03	1.6	MKB307F132MF10003S	12000	55200	280
13	5519	111.35	0.89	MKB306F132MF11135S	5600	40000	187
13.3	5373	108.41	1.5	MKB307F132MF10841S	11600	55800	280
11.3	6340	127.92	1.3	MKB307F132MF12792S	10400	57000	280
10.1	7072	142.68	1.1	MKB307F132MF14268S	9400	57700	280
9.1	7865	158.67	1	MKB307F132MF15867S	8300	58200	280

P 9.3 kW n_1 **1435 min^{-1}**

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
183.6	484	7.82	0.79	MKB303G160SF00782S	2300	11700	70
187.4	474	7.66	1.16	MKB304G160SF00766S	4200	14400	92
170.2	522	8.43	2.23	MKB305G160SF00843S	5400	19400	123
161.5	550	8.89	1.06	MKB304G160SF00889S	4200	14800	92
158.8	559	9.04	2.13	MKB305G160SF00904S	5400	19700	123
144.2	616	9.95	0.97	MKB304G160SF00995S	4200	15200	92
141.6	627	10.13	2.03	MKB305G160SF01013S	5500	20300	123
126	705	11.39	0.91	MKB304G160SF01139S	4100	15700	92
123	722	11.66	1.84	MKB305G160SF01166S	5500	20900	123
114.8	774	12.5	0.86	MKB304G160SF01250S	4100	15900	92
108.5	819	13.22	1.74	MKB305G160SF01322S	5500	21500	123
102.6	866	13.99	0.77	MKB303G160SF01399S	1800	12300	70
103.5	858	13.87	1.26	MKB304G160SF01387S	4000	16200	92
100.1	887	14.33	2.81	MKB306G160SF01433S	9500	30800	189
89.2	996	16.1	1.07	MKB304G160SF01610S	3800	16600	92
93.2	953	15.4	2.13	MKB305G160SF01540S	5500	22300	123
89	998	16.12	2.42	MKB306G160SF01612S	9600	31700	189
79.6	1116	18.02	1.06	MKB304G160SF01802S	3900	16600	92
83.1	1069	17.27	2.03	MKB305G160SF01727S	5400	22800	123
69.5	1278	20.63	0.96	MKB304G160SF02063S	3400	17200	92
72.2	1230	19.88	1.74	MKB305G160SF01988S	5300	23400	123
63.4	1401	22.64	0.91	MKB304G160SF02264S	3200	17400	92
63.7	1394	22.53	1.65	MKB305G160SF02253S	5100	24000	123
54.9	1618	26.15	0.83	MKB304G160SF02615S	2800	17600	92
56.6	1569	25.35	1.55	MKB305G160SF02535S	4900	24500	123
49.6	1790	28.91	0.78	MKB304G160SF02891S	2500	17700	92
49.4	1798	29.06	1.36	MKB305G160SF02906S	4600	25000	123
50.2	1769	28.61	2.71	MKB306G160SF02861S	9800	36000	189
44.7	1987	32.07	1.35	MKB305G160SF03207S	4300	25400	123
44.6	1991	32.18	2.42	MKB306G160SF03218S	9600	36800	189
40.7	2182	35.29	1.26	MKB305G160SF03529S	4000	25700	123
38.9	2283	36.9	2.13	MKB306G160SF03690S	9400	37800	189
36.1	2460	39.75	1.06	MKB305G160SF03975S	3500	26100	123
35.2	2523	40.72	1.93	MKB306G160SF04072S	9200	38500	189
32.5	2733	44.1	1.06	MKB305G160SF04410S	2900	26300	123
32	2775	44.81	1.74	MKB306G160SF04481S	9000	39100	189
31.9	2784	44.97	2.90	MKB307G160SF04497S	12300	46400	282
28.4	3127	50.51	0.93	MKB305G160SF05051S	2100	26600	123
28.4	3127	50.48	1.55	MKB306G160SF05048S	8500	39800	189
29.6	3000	48.55	2.71	MKB307G160SF04855S	12300	47100	282
24.2	3670	59.31	0.79	MKB305G160SF05931S	900	26700	123
25.6	3469	55.99	1.45	MKB306G160SF05599S	8100	40000	189
26.7	3326	53.81	2.42	MKB307G160SF05381S	12100	48000	282

P 9.3 kW n_1 1435 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
22.4	3965	64.14	1.26	MKB306G160SF06414S	7300	40000	189
23.2	3828	61.93	2.13	MKB307G160SF06193S	11700	49300	282
19.1	4650	75.31	1.07	MKB306G160SF07531S	6100	40000	189
20.5	4332	69.85	1.83	MKB307G160SF06985S	11300	50300	282
17.8	4989	80.59	0.97	MKB306G160SF08059S	5500	40000	189
18	4934	79.53	1.64	MKB307G160SF07953S	10700	51300	282
15.9	5585	90.02	0.88	MKB306G160SF09002S	4400	40000	189
16.4	5415	87.25	1.45	MKB307G160SF08725S	10200	52000	282
14	6343	102.7	0.78	MKB306G160SF10270S	2800	40000	189
14.3	6210	100.03	1.25	MKB307G160SF10003S	9200	52900	282
13.2	6728	108.41	1.16	MKB307G160SF10841S	8500	53300	282
11.2	7929	127.92	0.97	MKB307G160SF12792S	6800	54000	282
10.1	8793	142.68	0.91	MKB307G160SF14268S	5400	54300	282
9	9868	158.67	0.81	MKB307G160SF15867S	3800	54500	282

P 11.0 kW n_1 1465 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
191.3	549	7.66	0.98	MKB304G160MF00766S	3800	14000	161
173.8	604	8.43	1.9	MKB305G160MF00843S	5000	19000	192
164.8	637	8.89	0.91	MKB304G160MF00889S	3700	14400	161
162.1	648	9.04	1.9	MKB305G160MF00904S	5000	19300	192
147.2	713	9.95	0.85	MKB304G160MF00995S	3700	14700	161
144.6	727	10.13	1.7	MKB305G160MF01013S	5000	19800	192
125.6	836	11.66	1.6	MKB305G160MF01166S	5000	20400	192
110.8	948	13.22	1.5	MKB305G160MF01322S	4900	20900	192
115.9	907	12.64	2.7	MKB306G160MF01264S	8700	29300	258
105.6	994	13.87	1.1	MKB304G160MF01387S	3300	15500	161
102.2	1028	14.33	2.4	MKB306G160MF01433S	8800	30200	258
91	1154	16.1	0.95	MKB304G160MF01610S	3000	15800	161
95.1	1104	15.4	1.9	MKB305G160MF01540S	4800	21600	192
90.9	1156	16.12	2.1	MKB306G160MF01612S	8900	31000	258
81.3	1292	18.02	0.9	MKB304G160MF01802S	3000	15800	161
84.8	1238	17.27	1.7	MKB305G160MF01727S	4600	22000	192
71	1480	20.63	0.82	MKB304G160MF02063S	2400	16200	161
73.7	1425	19.88	1.5	MKB305G160MF01988S	4400	22600	192
65	1616	22.53	1.4	MKB305G160MF02253S	4100	23000	192
66.8	1572	21.93	3	MKB306G160MF02193S	8800	33100	258
57.8	1817	25.35	1.3	MKB305G160MF02535S	3700	23400	192
58	1810	25.24	2.7	MKB306G160MF02524S	8700	34000	258
50.4	2084	29.06	1.2	MKB305G160MF02906S	3200	23800	192
51.2	2052	28.61	2.4	MKB306G160MF02861S	8500	34800	258
45.7	2299	32.07	1.1	MKB305G160MF03207S	2800	24100	192

P 11.0 kW n_1 1465 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
45.5	2308	32.18	2.1	MKB306G160MF03218S	8200	35500	258
41.5	2530	35.29	1	MKB305G160MF03529S	2300	24200	192
39.7	2646	36.9	1.9	MKB306G160MF03690S	7800	36300	258
36.9	2850	39.75	0.95	MKB305G160MF03975S	1600	24400	192
36	2920	40.72	1.7	MKB306G160MF04072S	7400	36800	258
37.1	2832	39.5	2.8	MKB307G160MF03950S	11000	43800	351
33.2	3162	44.1	0.89	MKB305G160MF04410S	900	24500	192
32.7	3213	44.81	1.5	MKB306G160MF04481S	7000	37200	258
32.6	3224	44.97	2.5	MKB307G160MF04497S	10700	44800	351
29	3622	50.51	0.8	MKB305G160MF05051S		24500	192
29	3619	50.48	1.4	MKB306G160MF05048S	6300	37700	258
30.2	3481	48.55	2.3	MKB307G160MF04855S	10500	45500	351
26.2	4015	55.99	1.2	MKB306G160MF05599S	5600	38100	258
27.2	3858	53.81	2.1	MKB307G160MF05381S	10100	46200	351
22.8	4599	64.14	1.1	MKB306G160MF06414S	4500	38400	258
23.7	4441	61.93	1.8	MKB307G160MF06193S	9500	47200	351
19.5	5400	75.31	0.91	MKB306G160MF07531S	2800	38600	258
21	5008	69.85	1.6	MKB307G160MF06985S	8800	48000	351
18.2	5779	80.59	0.85	MKB306G160MF08059S	2000	38600	258
18.4	5702	79.53	1.4	MKB307G160MF07953S	7900	48700	351
16.8	6256	87.25	1.3	MKB307G160MF08725S	7100	49200	351
14.6	7173	100.03	1.1	MKB307G160MF10003S	5700	49700	351
13.5	7773	108.41	1	MKB307G160MF10841S	4700	49900	351
11.5	9172	127.92	0.87	MKB307G160MF12792S	2300	50000	351

P 15.0 kW n_1 1460 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
173.2	827	8.43	1.4	MKB305G160LF00843S	4200	18300	212
161.6	887	9.04	1.4	MKB305G160LF00904S	4100	18500	212
159.8	896	9.14	2.7	MKB306G160LF00914S	7600	26300	278
144.1	994	10.13	1.3	MKB305G160LF01013S	4000	19000	212
149	961	9.8	2.5	MKB306G160LF00980S	7600	26600	278
125.2	1144	11.66	1.1	MKB305G160LF01166S	3900	19400	212
132.9	1078	10.98	2.3	MKB306G160LF01098S	7600	27400	278
110.4	1297	13.22	1.1	MKB305G160LF01322S	3600	19900	212
115.5	1240	12.64	2	MKB306G160LF01264S	7600	28300	278
101.9	1406	14.33	1.7	MKB306G160LF01433S	7500	29000	278
105.8	1354	13.81	2.9	MKB307G160lF01381S	9500	33600	371
94.8	1511	15.4	1.4	MKB305G160LF01540S	3300	20300	212
90.6	1582	16.12	1.5	MKB306G160LF01612S	7400	29700	278
93.2	1537	15.67	2.6	MKB307G160LF01567S	9600	34600	371
84.5	1694	17.27	1.3	MKB305G160LF01727S	3000	20600	212

P 15.0 kW n_1 1460 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
73.5	1950	19.88	1.1	MKB305G160LF01988S	2500	21000	212
74.7	1918	19.55	2.4	MKB306G160LF01955S	7200	30500	278
64.8	2211	22.53	1	MKB305G160LF02253S	1900	21200	212
66.6	2151	21.93	2.2	MKB306G160LF02193S	6900	31300	278
57.6	2487	25.35	0.97	MKB305G160LF02535S	1300	21400	212
57.8	2476	25.24	2	MKB306G160LF02524S	6400	32000	278
50.2	2851	29.06	0.88	MKB305G160LF02906S	500	21500	212
51	2807	28.61	1.7	MKB306G160LF02861S	5900	32500	278
52.4	2733	27.86	2.9	MKB307G160LF02786S	9200	39000	371
45.5	3146	32.07	0.83	MKB305G160LF03207S		21500	212
45.4	3157	32.18	1.6	MKB306G160LF03218S	5400	33000	278
46.2	3102	31.62	2.6	MKB307G160LF03162S	8900	39800	371
39.6	3621	36.9	1.4	MKB306G160LF03690S	4500	33400	278
41.1	3487	35.54	2.3	MKB307G160LF03554S	8500	40600	371
35.9	3995	40.72	1.2	MKB306G160LF04072S	3800	33600	278
37	3875	39.5	2.1	MKB307G160LF03950S	8100	41300	371
32.6	4396	44.81	1.1	MKB306G160LF04481S	3000	33700	278
32.5	4412	44.97	1.8	MKB307G160LF04497S	7500	42000	371
28.9	4952	50.48	0.99	MKB306G160LF05048S	1800	33800	278
26.1	5493	55.99	0.89	MKB306G160LF05599S	600	33700	278
27.1	5279	53.81	1.5	MKB307G160LF05381S	6300	42900	371
23.6	6076	61.93	1.3	MKB307G160LF06193S	5100	43400	371
20.9	6853	69.85	1.2	MKB307G160LF06985S	3800	43600	371
18.4	7803	79.53	1	MKB307G160LF07953S	2200	43800	371
16.7	8560	87.25	0.93	MKB307G160LF08725S	800	43800	371
14.6	9814	100.03	0.82	MKB307G160LF10003S		43500	371

P 18.5 kW n_1 1445 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
172.6	1023	8.43	1.1	MKB305H180MF00843S	3500	17700	242
161	1097	9.04	1.1	MKB305H180MF00904S	3400	17900	242
159.2	1109	9.14	2.2	MKB306H180MF00914S	6800	25700	308
143.6	1230	10.13	1	MKB305H180MF01013S	3200	18300	242
148.5	1189	9.8	2.1	MKB306H180MF00980S	6800	26000	308
124.7	1416	11.66	0.92	MKB305H180MF01166S	2900	18600	242
132.5	1334	10.98	1.8	MKB306H180MF01098S	6700	26700	308
131.4	1344	11.07	2.9	MKB307H180MF01107S	8600	31300	401
110	1606	13.22	0.87	MKB305H180MF01322S	2500	18900	242
115.1	1535	12.64	1.6	MKB306H180MF01264S	6600	27400	308
116.3	1519	12.51	2.6	MKB307H180MF01251S	8700	32200	401
101.5	1740	14.33	1.4	MKB306H180MF01433S	6400	28100	308
105.4	1676	13.81	2.4	MKB307H180MF01381S	8600	32900	401

P 18.5 kW n_1 1445 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
94.5	1870	15.4	1.1	MKB305H180MF01540S	2000	19300	242
90.2	1958	16.12	1.3	MKB306H180MF01612S	6200	28600	308
92.9	1902	15.67	2.1	MKB307H180MF01567S	8600	33800	401
84.3	2097	17.27	1	MKB305H180MF01727S	1500	19400	242
73.2	2413	19.88	0.91	MKB305H180MF01988S	800	19600	242
74.4	2374	19.55	2	MKB306H180MF01955S	5700	29300	308
64.6	2736	22.53	0.84	MKB305H180MF02253S		19600	242
66.4	2662	21.93	1.8	MKB306H180MF02193S	5100	29900	308
65.1	2713	22.34	2.9	MKB307H180MF02234S	8100	36100	401
57.6	3064	25.24	1.6	MKB306H180MF02524S	4400	30300	308
57.6	3065	25.24	2.6	MKB307H180MF02524S	7800	36900	401
50.9	3474	28.61	1.4	MKB306H180MF02861S	3700	30600	308
52.2	3383	27.86	2.4	MKB307H180MF02786S	7400	37500	401
45.2	3908	32.18	1.3	MKB306H180MF03218S	2800	30800	308
46	3839	31.62	2.1	MKB307H180MF03162S	6900	38200	401
39.4	4481	36.9	1.1	MKB306H180MF03690S	1600	30900	308
40.9	4315	35.54	1.9	MKB307H180MF03554S	6300	38700	401
35.7	4944	40.72	0.99	MKB306H180MF04072S	600	30900	308
36.8	4796	39.5	1.7	MKB307H180MF03950S	5600	39200	401
32.4	5460	44.97	1.5	MKB307H180MF04497S	4600	39600	401
30	5895	48.55	1.4	MKB307H180MF04855S	3900	39800	401
27	6534	53.81	1.2	MKB307H180MF05381S	2800	40000	401
23.5	7520	61.93	1.1	MKB307H180MF06193S	1100	40000	401
20.8	8481	69.85	0.94	MKB307H180MF06985S		39900	401
18.3	9656	79.53	0.83	MKB307H180MF07953S		39500	401

P 22.0 kW n_1 1460 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
173.2	1213	8.43	0.95	MKB305H180LF00843S	2800	17100	272
161.6	1300	9.04	0.92	MKB305H180LF00904S	2600	17300	272
159.8	1315	9.14	1.9	MKB306H180LF00914S	6100	25100	338
144.1	1458	10.13	0.86	MKB305H180LF01013S	2300	17500	272
149	1410	9.8	1.7	MKB306H180LF00980S	6100	25300	338
151.8	1384	9.61	2.9	MKB307H180LF00961S	7900	29800	431
132.9	1581	10.98	1.5	MKB306H180LF01098S	5900	26000	338
131.9	1593	11.07	2.5	MKB307H180LF01107S	7900	30700	431
115.5	1819	12.64	1.3	MKB306H180LF01264S	5600	26600	338
116.7	1800	12.51	2.2	MKB307H180LF01251S	7900	31500	431
101.9	2063	14.33	1.2	MKB306H180LF01433S	5300	27100	338
105.8	1987	13.81	2	MKB307H180LF01381S	7800	32100	431
94.8	2216	15.4	0.93	MKB305H180LF01540S	700	18200	272
90.6	2320	16.12	1.1	MKB306H180LF01612S	4900	27500	338

P 22.0 kW n_1 1460 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
93.2	2255	15.67	1.8	MKB307H180LF01567S	7600	32900	431
84.5	2485	17.27	0.87	MKB305H180LF01727S	100	18200	272
74.7	2814	19.55	1.7	MKB306H180LF01955S	4300	28000	338
75.2	2792	19.4	2.9	MKB307H180LF01940S	7100	34200	431
66.6	3155	21.93	1.5	MKB306H180LF02193S	3400	28400	338
65.3	3215	22.34	2.5	MKB307H180LF02234S	6700	34900	431
57.8	3632	25.24	1.3	MKB306H180LF02524S	2400	28600	338
57.8	3632	25.24	2.2	MKB307H180LF02524S	6200	35500	431
51	4117	28.61	1.2	MKB306H180LF02861S	1400	28700	338
52.4	4009	27.86	2	MKB307H180LF02786S	5700	36000	431
45.4	4631	32.18	1.1	MKB306H180LF03218S	300	28600	338
46.2	4550	31.62	1.8	MKB307H180LF03162S	4900	36400	431
39.6	5310	36.9	0.92	MKB306H180LF03690S		28400	338
41.1	5114	35.54	1.6	MKB307H180LF03554S	4000	36800	431
35.9	5860	40.72	0.84	MKB306H180LF04072S		28100	338
37	5684	39.5	1.4	MKB307H180LF03950S	3100	37000	431
32.5	6470	44.97	1.2	MKB307H180LF04497S	1700	37200	431
30.1	6986	48.55	1.1	MKB307H180LF04855S	800	37200	431
27.1	7743	53.81	1	MKB307H180LF05381S		37100	431
23.6	8912	61.93	0.9	MKB307H180LF06193S		36700	431
20.9	10051	69.85	0.8	MKB307H180LF06985S		36100	431

P 30.0 kW n_1 1465 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
160.3	1787	9.14	1.40	MKB306I200LF00914S	4500	23700	348
168.1	1705	8.72	2.3	MKB307I200LF00872S	6700	28000	441
152.4	1880	9.61	2.1	MKB307I200LF00961S	6500	28600	441
133.4	2148	10.98	1.1	MKB306I200LF01098S	3900	24300	348
132.3	2165	11.07	1.8	MKB307I200LF01107S	6300	29300	441
115.9	2473	12.64	0.99	MKB306I200LF01264S	3300	24600	348
117.1	2446	12.51	1.6	MKB307I200LF01251S	6000	29900	441
102.2	2803	14.33	0.87	MKB306I200LF01433S	2700	24900	348
106.1	2700	13.81	1.5	MKB307I200LF01381S	5800	30400	441
93.5	3064	15.67	1.3	MKB307I200LF01567S	5300	31000	441
83.3	3440	17.59	2.3	MKB307I200LF01759S	4800	31400	441
74.9	3824	19.55	1.2	MKB306I200LF01955S	900	25100	348
75.5	3794	19.4	2.1	MKB307I200LF01940S	4300	31800	441
66.8	4288	21.93	1.1	MKB306I200LF02193S		25000	348
65.6	4369	22.34	1.8	MKB307I200LF02234S	3400	32200	441
58	4935	25.24	0.98	MKB306I200LF02524S		24700	348
58	4936	25.24	1.6	MKB307I200LF02524S	2500	32400	441
51.2	5595	28.61	0.87	MKB306I200LF02861S		24300	348

P 30.0 kW n_1 1465 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
52.6	5448	27.86	1.5	MKB307I200LF02786S	1600	32500	441
46.3	6183	31.62	1.3	MKB307I200LF03162S	300	32500	441
41.2	6950	35.54	1.2	MKB307I200LF03554S		32400	441
37.1	7725	39.5	1	MKB307I200LF03950S		32100	441
32.6	8793	44.97	0.91	MKB307I200LF04497S		31600	441
30.2	9493	48.55	0.84	MKB307I200LF04855S		31100	441

P 37.0 kW n_1 1470 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
168.6	2095	8.72	1.9	MKB307J225SF00872S	5500	27100	511
152.9	2311	9.61	1.7	MKB307J225SF00961S	5300	27500	511
132.8	2661	11.07	1.5	MKB307J225SF01107S	4900	28100	511
117.5	3006	12.51	1.3	MKB307J225SF01251S	4500	28600	511
106.5	3318	13.81	1.2	MKB307J225SF01381S	4000	28900	511
83.6	4228	17.59	1.9	MKB307J225SF01759S	2600	29500	511
75.8	4664	19.4	1.7	MKB307J225SF01940S	1900	29700	511
65.8	5370	22.34	1.5	MKB307J225SF02234S	600	29700	511
58.2	6067	25.24	1.3	MKB307J225SF02524S		29700	511
52.8	6697	27.86	1.2	MKB307J225SF02786S		29500	511
46.5	7600	31.62	1.1	MKB307J225SF03162S		29100	511
41.4	8542	35.54	0.94	MKB307J225SF03554S		28500	511

P 45.0 kW n_1 1470 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
168.6	2548	8.72	1.5	MKB307J225MF00872S	4300	26000	541
152.9	2811	9.61	1.4	MKB307J225MF00961S	3900	26300	541
132.8	3237	11.07	1.2	MKB307J225MF01107S	3300	26700	541
106.5	4036	13.81	0.98	MKB307J225MF01381S	2000	27200	541
93.8	4580	15.67	0.86	MKB307J225MF01567S	1100	27300	541
83.6	5143	17.59	1.5	MKB307J225MF01759S	100	27300	541
75.8	5672	19.4	1.4	MKB307J225MF01940S		27300	541
65.8	6531	22.34	1.2	MKB307J225MF02234S		27000	541
58.2	7378	25.24	1.1	MKB307J225MF02524S		26600	541
52.8	8144	27.86	0.98	MKB307J225MF02786S		26000	541
46.5	9243	31.62	0.87	MKB307J225MF03162S		25200	541

P 55.0 kW n_1 1475 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
169.2	3104	8.72	1.3	MKB307K250MF00872S	2700	24600	640.1
153.4	3424	9.61	1.2	MKB307K250MF00961S	2200	24800	640.1
133.2	3942	11.07	1	MKB307K250MF01107S	1300	25000	640.1
117.9	4454	12.51	0.89	MKB307K250MF01251S	400	25100	640.1
106.8	4916	13.81	0.81	MKB307K250MF01381S		25100	640.1
83.8	6264	17.59	1.3	MKB307K250MF01759S		24600	640.1
76	6909	19.4	1.2	MKB307K250MF01940S		24300	640.1
66	7956	22.34	1	MKB307K250MF02234S		23500	640.1
58.4	8987	25.24	0.89	MKB307K250MF02524S		22600	640.1
52.9	9921	27.86	0.81	MKB307K250MF02786S		21700	640.1

P 75.0 kW n_1 1480 min^{-1}

n2ex min-1	T2m Nm	iex	SF	TYPE	Fr NN	FrN-G N	M kg
169.8	4219	8.72	0.92	MKB307L280SF00872S		22000	785.1
153.9	4653	9.61	0.85	MKB307L280SF00961S		21900	785.1
84.1	8513	17.59	0.93	MKB307L280SF01759S		19200	785.1
76.3	9390	19.4	0.85	MKB307L280SF01940S		18300	785.1

5. MK4

5.4 DIMENSIONAL DRAWING OF GEAR MOTOR
MKB3…S/A : SHAFT MOUNTED

DIMENSIONAL DRAWINGS OF GEARED MOTORS

Model	L	J	I	E	F	A	B	H	D	C	G
MK-02	238	35	35	162	130	18	112	186	70.5	55	103
MK-03	293.5	30	33	176	120	20	140	228	88	70	129
MK-04	341.5	40	55	214.5	150	25	180	288	110	87	161
MK-05	426	55	70	250	180	30	212	340	129	102	197
MK-06	445	75	80	320	240	35	265	420	160	NA	200
MK-07	525	95	100	380	280	40	315	513	200	NA	241

MOTOR DETAILS

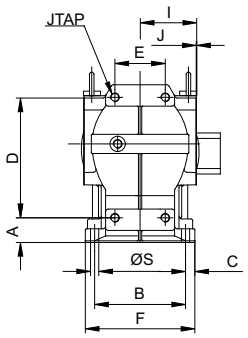
MOTOR FRAME		63	71	80	90S	90L	100	112	132S	132M	160M	160L	180M	180L
	d	124	140	157	174	174	195	220	260	260	316	316	354	354
	Kb	35	44	57	72	72	82	83	103	103	136	136	120	121
	g1	116	124	134	140	140	162	170	206	206	226	226	265	265
Model														
MK-02	**K**	480.5	514.99	519.2	557.5	582.5	618.5	640.5	-	-	-	-	-	-
MK-03	**K**	-	560.3	566.8	605	630	676.7	698.7	761	799	901.3	945.3	-	-
MK-04	**K**	-	-	608	644.83	669.83	718.83	740.83	807.82	845.82	947.5	991.5	1042	1080
MK-05	**K**	-	-	692.5	729.33	754.33	803.33	825.33	892.32	930.32	1032	1076	1126	1164

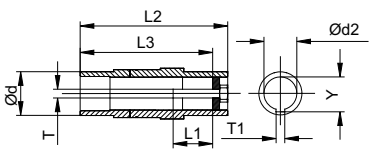
MOTOR FRAME		100	112	132S	132M	160M	160L	180M	180L	200L	225S	225M	250M	280
	d	195	220	260	260	316	316	354	354	394	450	450	489	544
	Kb	82	83	103	103	136	136	120	121	125	149	149	151	150
	g1	162	170	206	206	226	226	265	265	312	337	337	415	445
Model														
MK-06	**K**	818.13	840.13	906.12	944.12	1045	1089	1139	1177	1237	1282.12	1307.12	1379.12	1475.12
MK-07	**K**	898.13	920.13	986.12	1024.1	1125	1169	1219	1257	1317	1362.12	1387.12	1459.12	1555.12

5. MK4

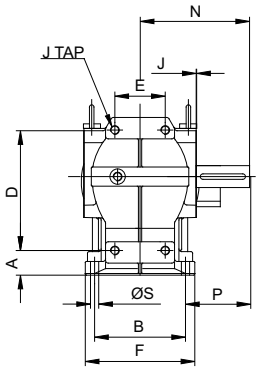
MKB3...S/A - SHAFT MOUNTED

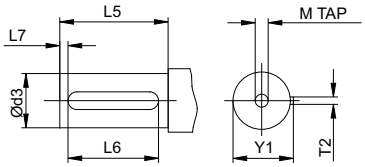
MKB3...S :
SHAFT MOUNTED



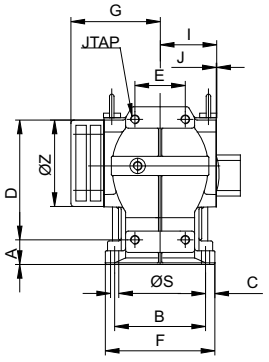


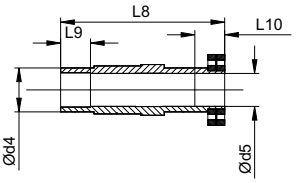
MKB3...A :
SOLID SHAFT





MKB3...A :
HOLLOW SHAFT
WITH SHRINK DISK





DIMENSIONAL DRAWINGS OF GEARED MOTORS

Model	F	B	ØS	C	A	D	E	J	I	P	N	G	ØZ	L1	L2	L3	L5
MK-02	145	120	11	15	30	144	70	2	75	75	135	115	100	49	150	132	60
MK-03	170	140	13.5	20	38	174	85	2	90	101	171	131	110	58	180	156	80
MK-04	200	165	17.5	22.5	45	220	92	2.5	105	124	206	150	135	58	210	183	100
MK-05	230	180	22	30	61	251	100	2.5	120	150	240	170	170	74	240	210	120
MK-06	290	240	28	30	75	295		4	150	171	291	210	200	76	300	270	140
MK-07	340	270	33	40	95	360		5	175	212	347	245	230	83	350	313	170

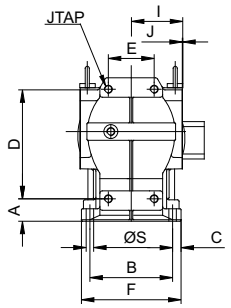
MOTOR DETAILS

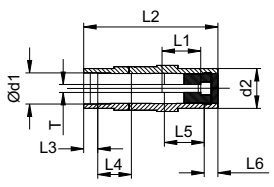
Model	L6	L7	L8	L9	L10	Ød	Ød2	Ød3	Ød4	Ød5	T	T1	Y	T2	Y1	MTAP	J TAP
MK-02	50	3.5	177	20	32	50	35H7	30k6	50	35H7	M12	10	38.3	8	33	M10X22	M10X19
MK-03	70	2	208	20	38	55	40H7	40k6	55	40H7	M16	12	43.3	12	43	M16X36	M12X20
MK-04	80	10	241	25	36	70	50H7	50k6	70	50H7	M16	14	53.8	14	53.5	M16X36	M16X31
MK-05	110	5	281	40	41	85	60H7	60m6	85	65H7	M20	18	64.4	18	64	M20X42	M20X39
MK-06	125	7.5	345	50	55	100	70H7	70m6	100	75H7	M20	20	74.9	20	74.5	M20X42	Ø28
MK-07	160	3	405	60	65	120	90H7	90m6	120	95H7	M24	25	95.4	25	95	M24X50	Ø33

5. MK4

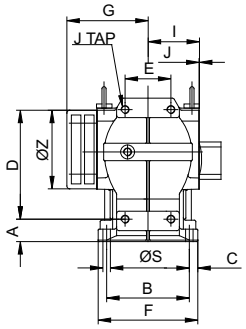
MKB3... S/A - SHAFT MOUNTED

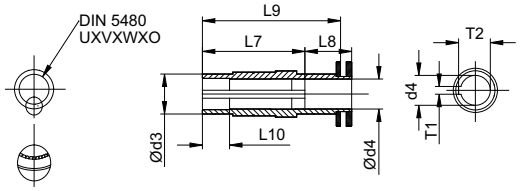
MKB3...A :
HOLLOW SHAFT
WITH SPLINING



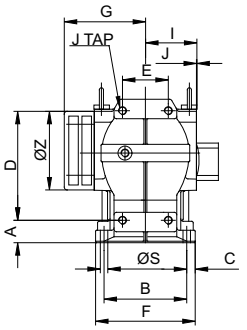


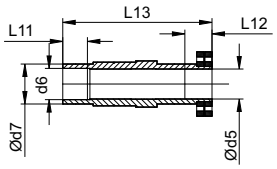
MKB3...A :
HOLLOW SHAFT WITH
CONICAL CLAMPING SLEEVE





MKB3...A :
HOLLOW SHAFT WITH
SHRINK DISK AND BRONZE BUSH





DIMENSIONAL DRAWINGS OF GEARED MOTORS

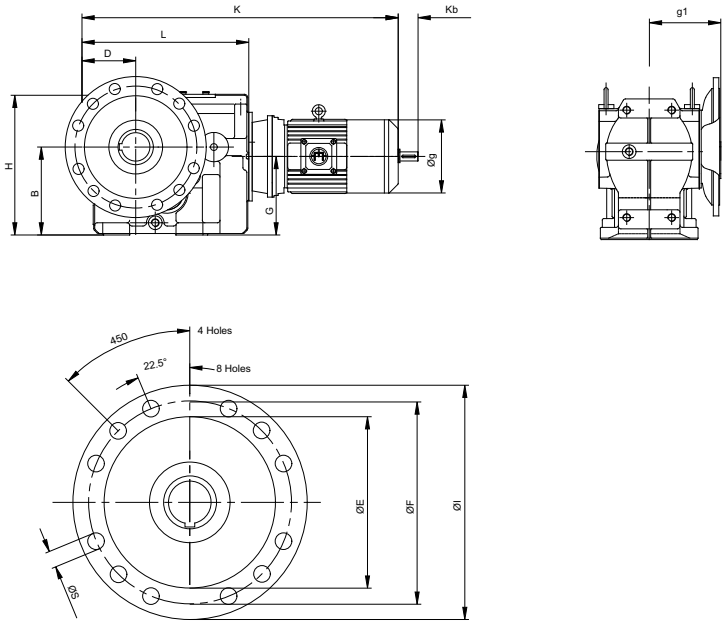
Model	F	B	ØS	C	A	D	E	J	I	G	ØZ	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
MK-02	145	120	11	15	30	144	70	2	75	115	100	30	150	18	32	32	18	NA			
MK-03	170	140	13.5	20	38	174	85	2	90	131	110	50	180	25	42	42	25	NA			
MK-04	200	165	17.5	22.5	45	220	92	2.5	105	150	135	50	210	23	52	52	23	174	66.5	228	30
MK-05	230	180	22	30	61	251	100	2.5	120	170	170	60	240	25	62	62	25	191	85	261	40
MK-06	290	240	28	30	75	295		4	150	210	200	60	300	25	72	72	25	243	91	322	70
MK-07	340	270	33	40	95	360		5	175	245	230	60	350	26	89	89	26	309	75.5	372	90

MOTOR DETAILS

Model	L11	L12	L13	Ød1	Ød2	Ød3	Ød4	Ød5	Ød6	Ød7	T	T1	T2	UXVXWXO
MK-02	20	32	177	37(+0.1)	50	NA		35H7	36H7	50	M10	NA		35X2X30X16
MK-03	20	38	208	47(+0.1)	55	NA		40H7	42H7	55	M16	NA		45X2X30X21
MK-04	30	36	241	55(+0.1)	70	70	50H7	50H7	52H7	70	M16	14	53.8	50X2X30X24
MK-05	40	41	281	72(+0.1)	85	85	60H7	65H7	66H7	85	M20	18	64.4	65X2X30X31
MK-06	50	55	345	72(+0.1)	100	100	70H7	75H7	76H7	100	M20	20	74.9	70X2X30X34
MK-07	60	65	405	90(+0.1)	120	120	90H7	95H7	96H7	120	M20	25	95.4	85X3X30X27

5. MK4

MKV3…S/A : FLANGE MOUNTED – Maxi Flange (B5)



DIMENSIONAL DRAWINGS OF GEARED MOTORS

MODEL	L	G	B	H	D	ØS	ØE	ØF	ØI	NO OF HOLES ON OUTPUT FLANGE
MK-02	238	103	112	186	70.5	11	130	165	200	4
MK-03	294	129	140	228	88	13.5	180	215	250	4
MK-04	342	161	180	288	110	13.5	230	265	300	4
MK-05	426	197	212	340	129	18	250	300	350	4
MK-06	445	200	265	420	160	17.5	350	400	450	8
MK-07	525	241	315	513	200	17.5	350	400	450	8

MOTOR DETAILS

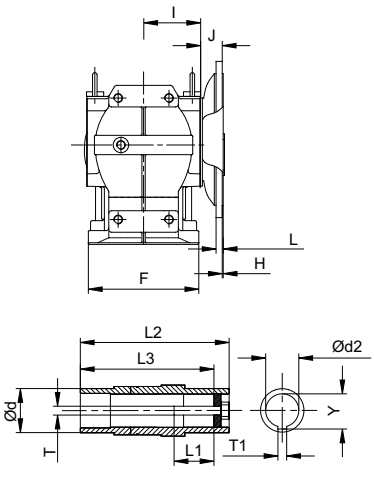
MOTOR FRAME		63	71	80	90S	90L	100	112	132S	132M	160M	160L	180M	180L
	d	124	140	157	174	174	195	220	260	260	316	316	354	354
	Kb	35	44	57	72	72	82	83	103	103	136	136	120	121
	g1	116	124	134	140	140	162	170	206	206	226	226	265	265
Model														
MK-02	**K**	481	515	519	558	583	618.5	640.5	-	-	-	-	-	-
MK-03	**K**	-	560	567	605	630	676.7	698.7	761	799	901	945	-	-
MK-04	**K**	-	-	608	645	670	718.83	740.83	808	845.82	948	992	1042	1080
MK-05	**K**	-	-	693	729	754	803.33	825.33	892	930.32	1032	1076	1126	1164

MOTOR FRAME		100	112	132S	132M	160M	160L	180M	180L	200L	225S	225M	250M
	d	195	220	260	260	316	316	354	354	394	450	450	489
	Kb	82	83	103	103	136	136	120	121	125	149	149	151
	g1	162	170	206	206	226	226	265	265	312	337	337	415
Model													
MK-06	**K**	818.13	840.13	906	944.12	1045	1089	1139	1177	1237	1282	1307	1379
MK-07	**K**	898.13	920.13	986	1024.12	1125	1169	1219	1257	1317	1362	1387	1459

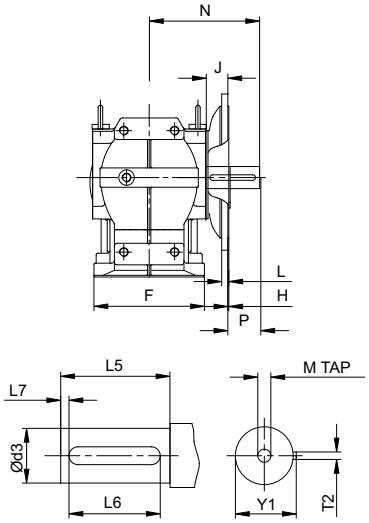
5. MK4

MKV3... S/A - FLANGE MOUNTED Maxi Flange (B5)

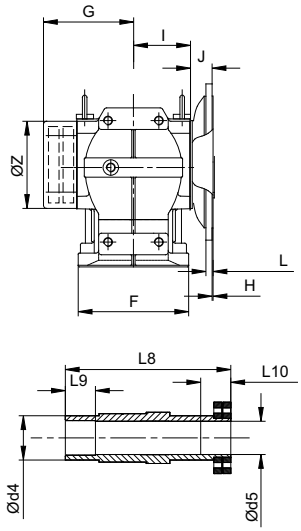
MKV3...S :
SHAFT MOUNTED



MKV3...A :
SOLID SHAFT



MKV3...A :
HOLLOW SHAFT
WITH SHRINK DISK



DIMENSIONAL DRAWINGS OF GEARED MOTORS

MODEL	I	J	L	H	F	P	N	G	ØZ	L1	L2	L3	L5	L6
MK-02	75	25	10	3.5	145	35	135	115	100	49	150	132	60	50
MK-03	90	23	13	4	170	58	171	131	110	58	180	156	80	70
MK-04	105	37	15	4	200	64	206	150	135	58	210	183	100	80
MK-05	120	30	15	5	230	90	240	170	170	74	240	210	120	110
MK-06	150	41.5	20	5	290	99.5	291	210	200	76	300	270	140	125
MK-07	175	41	20	5	340	131	347	245	230	83	350	313	170	160

MOTOR DETAILS

MODEL	L7	L8	L9	L10	Ød	Ød2	Ød3	Ød4	Ød5	T	T1	Y	T2	Y1	MTAP
MK-02	3.5	177	20	32	50	35H7	30k6	50	35H7	M12	10	38.3	8	33	M10X22
MK-03	2	208	20	38	55	40H7	40k6	55	40H7	M16	12	43.3	12	43	M16X36
MK-04	10	241	25	36	70	50H7	50k6	70	50H7	M16	14	53.8	14	53.5	M16X36
MK-05	5	281	40	41	85	60H7	60m6	85	65H7	M20	18	64.4	18	64	M20X42
MK-06	7.5	345	50	55	100	70H7	70m6	100	75H7	M20	20	74.9	20	74.5	M20X42
MK-07	3	405	60	65	120	90H7	90m6	120	95H7	M24	25	95.4	25	95	M24X50

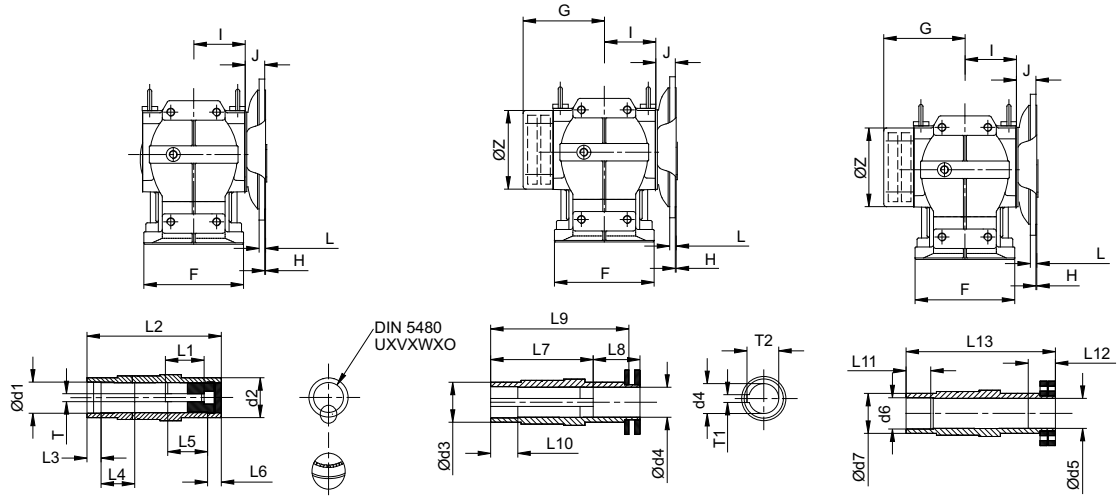
5. MK4

MKV3... S/A - FLANGE MOUNTED - Maxi Flange (B5)

MKV3...A :
HOLLOW SHAFT
WITH SPLINING

MKV3...A :
HOLLOW SHAFT WITH
CONICAL CLAMPING SLEEVE

MKV3...A :
HOLLOW SHAFT WITH
SHRINK DISK
AND BRONZE BUSH



DIMENSIONAL DRAWINGS OF GEARED MOTORS

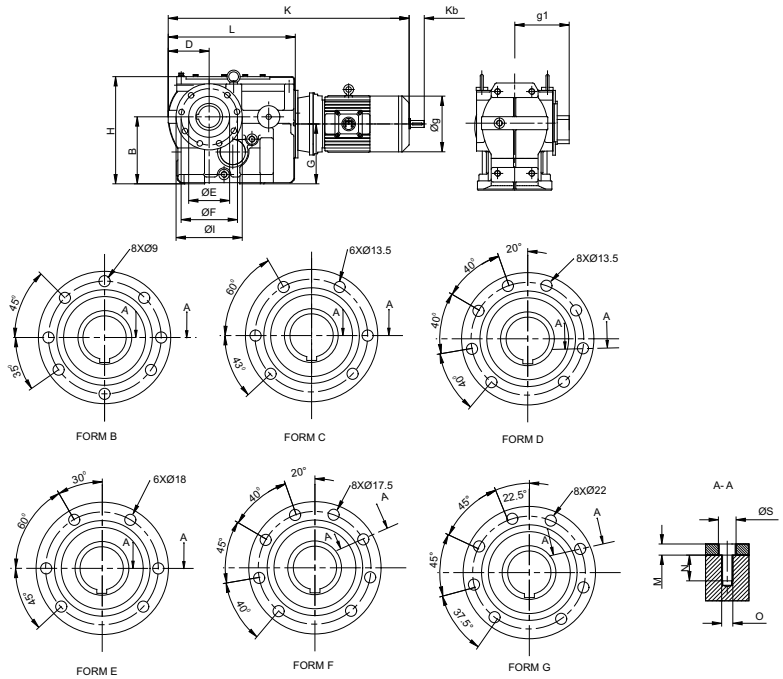
MODEL	I	J	L	H	F	G	ØZ	L1	L2	L3	L4	L5	L6	L7	L8	L9
MK-02	75	25	10	3.5	145	115	100	30	150	18	32	32	18	NA		
MK-03	90	23	13	4	170	131	110	50	180	25	42	42	25	NA		
MK-04	105	37	15	4	200	150	135	50	210	23	52	52	23	174	66.5	228
MK-05	120	30	15	5	230	170	170	60	240	25	62	62	25	191	85	261
MK-06	150	41.5	20	5	290	210	200	60	300	25	72	72	25	243	91	322
MK-07	175	41	20	5	340	245	230	60	350	26	89	89	26	309	75.5	372

MOTOR DETAILS

MODEL	L11	L12	L13	Ød1	Ød2	Ød3	Ød4	Ød5	Ød6	Ød7	T	T1	T2	UXVXWXO
MK-02	20	32	177	37(+0.1)	50	NA		35H7	36H7	50	M10	NA		35X2X30X16
MK-03	20	38	208	47(+0.1)	55	NA		40H7	42H7	55	M16	NA		45X2X30X21
MK-04	30	36	241	55(+0.1)	70	70	50H7	50H7	52H7	70	M16	14	53.8	50X2X30X24
MK-05	40	41	281	72(+0.1)	85	85	60H7	65H7	66H7	85	M20	18	64.4	65X2X30X31
MK-06	50	55	345	72(+0.1)	100	100	70H7	75H7	76H7	100	M20	20	74.9	70X2X30X34
MK-07	60	65	405	90(+0.1)	120	120	90H7	95H7	96H7	120	M20	25	95.4	85X3X30X27

5. MK4

MKV3…A : FLANGE MOUNTED – Mini Flange (B14)



DIMENSIONAL DRAWINGS OF GEARED MOTORS

MODEL	L	G	B	H	D	ØE	ØF	ØI	ØS	M	N	O	HOLE PATTERN OF OUTPUT FLANGE
MK-02	238	103	112	186	70.5	80	102	120	9	10	16	M8	FORM B
MK-03	294	129	140	228	88	105	125	155	13.5	10.5	20	M12	FORM C
MK-04	342	161	180	288	110	125	142	170	13.5	12.5	22	M12	FORM D
MK-05	426	197	212	340	129	155	178	215	18	13.5	26	M16	FORM E
MK-06	445	200	265	420	160	180	220	260	17.5	18	30	M16	FORM F
MK-07	525	241	315	513	200	210	260	304	22	8	36	M20	FORM G

MOTOR DETAILS

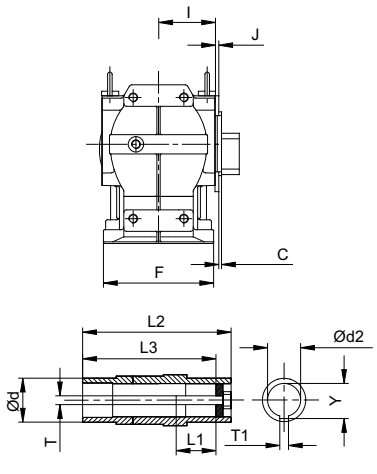
MOTOR FRAME		63	71	80	90S	90L	100	112	132S	132M	160M	160L	180M	180L
	d	124	140	157	174	174	195	220	260	260	316	316	354	354
	Kb	35	44	57	72	72	82	83	103	103	136	136	120	121
	g1	116	124	134	140	140	162	170	206	206	226	226	265	265
Model														
MK-02	**K**	480.5	514.99	519.2	557.5	582.5	618.5	640.5	-	-	-	-	-	-
MK-03	**K**	-	560.3	566.8	605	630	676.7	698.7	761	799	901.3	945.3	-	-
MK-04	**K**	-	-	608	644.83	669.83	718.83	740.83	807.82	845.82	947.5	991.5	1041.5	1079.5
MK-05	**K**	-	-	692.5	729.33	754.33	803.33	825.33	892.32	930.32	1032	1076	1126	1164

MOTOR FRAME		100	112	132S	132M	160M	160L	180M	180L	200L	225S	225M	250M
	d	195	220	260	260	316	316	354	354	394	450	450	489
	Kb	82	83	103	103	136	136	120	121	125	149	149	151
	g1	162	170	206	206	226	226	265	265	312	337	337	415
Model													
MK-06	**K**	818.13	840.13	906.12	944.12	1045.3	1089.3	1139.3	1177.3	1237	1282.12	1307.12	1379.12
MK-07	**K**	898.13	920.13	986.12	1024.1	1125.3	1169.3	1219.3	1257.3	1317	1362.12	1387.12	1459.12

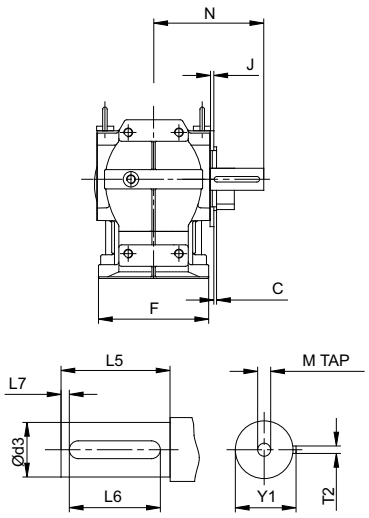
5. MK4

MKV3…A.. FLANGE MOUNTED Mini Flange (B14)

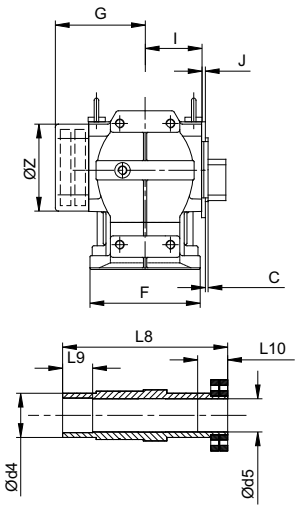
MKV3...A :
SHAFT MOUNTED



MKV3...A :
SOLID SHAFT



MKV3...A :
HOLLOW SHAFT WITH SHRINK DISK



DIMENSIONAL DRAWINGS OF GEARED MOTORS

MODEL	I	J	F	C	N	G	ØZ	L1	L2	L3	L5	L6	L7
MK-02	75	8	145	3	135	115	100	49	150	132	60	50	3.5
MK-03	90	8.5	170	3.5	171	131	110	58	180	156	80	70	2
MK-04	105	10	200	3.5	206	150	135	58	210	183	100	80	10
MK-05	120	11	230	4	240	170	170	74	240	210	120	110	5
MK-06	150	14	290	4	291	210	200	76	300	270	140	125	7.5
MK-07	175	14	340	4	347	245	230	83	350	313	170	160	3

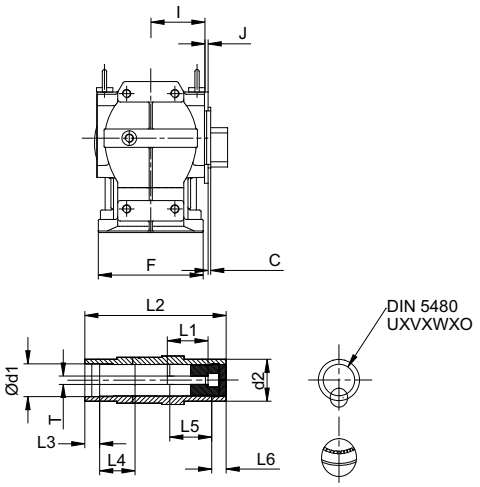
MOTOR DETAILS

MODEL	L8	L9	L10	Ød	Ød2	Ød3	Ød4	Ød5	T	T1	Y	T2	Y1	MTAP
MK-02	177	20	32	50	35H7	30k6	50	35H7	M12	10	38.3	8	33	M10X22
MK-03	208	20	38	55	40H7	40k6	55	40H7	M16	12	43.3	12	43	M16X36
MK-04	241	25	36	70	50H7	50k6	70	50H7	M16	14	53.8	14	53.5	M16X36
MK-05	281	40	41	85	60H7	60m6	85	65H7	M20	18	64.4	18	64	M20X42
MK-06	345	50	55	100	70H7	70m6	100	75H7	M20	20	74.9	20	74.5	M20X42
MK-07	405	60	65	120	90H7	90m6	120	95H7	M24	25	95.4	25	95	M24X50

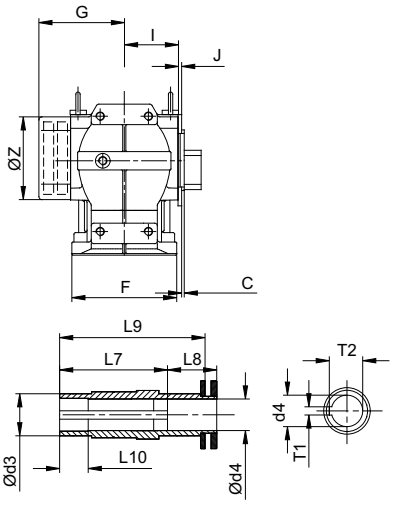
5. MK4

MKV3…A.. FLANGE MOUNTED Mini Flange (B14)

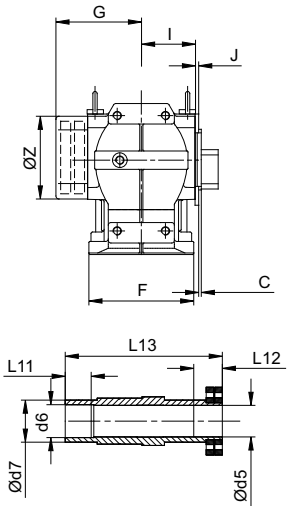
MKV3...A :
HOLLOW SHAFT
WITH SPLINING



MKV3...A :
HOLLOW SHAFT WITH
CONICAL CLAMPING
SLEEVE



MKV3...A :
HOLLOW SHAFT WITH
SHRINK DISK AND
BRONZE BUSH



DIMENSIONAL DRAWINGS OF GEARED MOTORS

MODEL	I	J	F	C	G	ØZ	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
MK-02	75	8	145	3	115	100	30	150	18	32	32	18	NA			
MK-03	90	8.5	170	3.5	131	110	50	180	25	42	42	25	NA			
MK-04	105	10	200	3.5	150	135	50	210	23	52	52	23	174	66.5	228	30
MK-05	120	11	230	4	170	165	60	240	25	62	62	25	191	85	261	40
MK-06	150	14	290	4	210	205	60	300	25	72	72	25	243	91	322	70
MK-07	175	14	340	4	245	225	60	350	26	89	89	26	309	75.5	372	90

MOTOR DETAILS

MODEL	L11	L12	L13	Ød1	Ød2	Ød3	Ød4	Ød5	Ød6	Ød7	T	T1	T2	UXVXWXO
MK-02	20	32	177	37(+0.1)	50	NA		35H7	36H7	50	M10	NA		35X2X30X16
MK-03	20	38	208	47(+0.1)	55	NA		40H7	42H7	55	M16	NA		45X2X30X21
MK-04	30	36	241	55(+0.1)	70	70	50H7	50H7	52H7	70	M16	14	53.8	50X2X30X24
MK-05	40	41	281	72(+0.1)	85	85	60H7	65H7	66H7	85	M20	18	64.4	65X2X30X31
MK-06	50	55	345	72(+0.1)	100	100	70H7	75H7	76H7	100	M20	20	74.9	70X2X30X34
MK-07	60	65	405	90(+0.1)	120	120	90H7	95H7	96H7	120	M20	25	95.4	85X3X30X27

5. MK4

5.5 Auswahl Getriebe MK4
Selection of gear unit MK4
Sélection d'un réducteur MK4

Beispiel: Auswahltabellen Getriebe
Example: Gear unit selection table
Exemple de tableau de sélection pour réducteurs

Getriebeart und -größe
Gear unit type and size
Type et taille du réducteur

Synchrondrehzahl des Motors
Synchronous speed of motor
Vitesse synchrone du moteur

Gewichte
Weights
Poids

Max. Nenndrehmoment
Max. rated torque
Couple nominal maxi.

MK..02

Type	m [kg]
MK..302.....0...	20
MK302M00000...	22

440 Nm

Type	...	n_{syn} =	1500 min^{-1}					1000 1/min					750 1/min				
		i_{ex}	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_r N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN
MK302...	7.1	7.19	209	5.5	250	2000	8000	139	3.6	250	2500	8000	104	2.7	250	3000	8000
	8	8.25	182	5	260	2000	8000	121	3.3	260	2500	8000	91	2.5	260	3000	8000
	9	8.84	170	4.8	270	2000	8000	113	3.2	270	3000	8000	85	2.4	270	3500	8000
	10	10.17	147	4.3	280	2500	8000	98	2.9	280	3000	8000	74	2.2	280	3500	8000

Zulässige Radialkraft
Permissible radial force
Force radiale admissible

Drehmoment an der Abtriebswelle
Torque at output shaft
Couple au niveau de l'arbre de sortie

Mechanische Nennleistung des Getriebes
Mechanical rated power of gear unit
Puissance nominale mécanique du réducteur

Auswahldrehzahl der Abtriebswelle
Selection speed of output shaft
Vitesse de l'arbre de sortie

Exakte Übersetzung
Exact gear ratio
Valeur exacte du rapport de démultiplication

Nenn Übersetzung
Rated gear ratio
Réduction nominale

5. MK4

MK..02

Type	m [kg]
MK302.....0...	20
MK302M00000...	22

440 Nm

Type	...	n_{syn} =	1500 min^{-1}					1000 1/min					750 1/min				
		i_{ex}	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_r N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN
MK302...	7.1	7.19	209	5.5	250	2000	8000	139	3.6	250	2500	8000	104	2.7	250	3000	8000
	8	8.25	182	5	260	2000	8000	121	3.3	260	2500	8000	91	2.5	260	3000	8000
	9	8.84	170	4.8	270	2000	8000	113	3.2	270	3000	8000	85	2.4	270	3500	8000
	10	10.17	147	4.3	280	2500	8000	98	2.9	280	3000	8000	74	2.2	280	3500	8000
	11.2	11.76	128	3.9	290	2500	8000	85	2.6	290	3000	8000	64	1.9	290	3500	8000
	12.5	12.48	120	4.9	390	1500	6900	80	3.3	390	2000	6900	60	2.5	390	3000	6900
	14	14.31	105	4.4	400	2000	6900	70	3	400	2500	6900	52	2.2	400	3000	6900
	16	15.34	98	4.2	415	2000	6900	65	2.9	415	2500	6900	49	2.1	415	3500	6900
	18	17.65	85	3.8	430	2000	6900	57	2.6	430	3000	6900	42	1.9	430	3500	6900
	20	20.4	74	3.4	440	2500	6900	49	2.3	440	3000	6900	37	1.7	440	4000	6900
	22.4	21.99	68	3.1	440	2500	6900	45	2.1	440	3500	6900	34	1.6	440	4000	6900
	25	23.74	63	2.9	440	3000	6900	42	2	440	3500	6900	32	1.5	440	4500	6900
	28	27.86	54	2.5	440	3000	6900	36	1.7	440	4000	6900	27	1.3	440	4500	6900
	31.5	30.3	50	2.3	440	3500	6900	33	1.5	440	4500	6900	25	1.2	440	4500	6900
	35.5	36.24	41	1.9	440	3500	6900	28	1.3	440	4500	6900	21	1	440	4500	6900
	40	39.9	38	1.8	440	4000	6900	25	1.2	440	4500	6900	19	0.87	440	4500	6900
	45	44.17	34	1.6	440	4000	6900	23	1.1	440	4500	6900	17	0.78	440	4500	6900
	50	49.21	30	1.4	440	4500	6900	20	0.94	440	4500	6900	15	0.7	440	4500	6900
	56	55.25	27	1.3	440	4500	6900	18	0.83	440	4500	6900	14	0.63	440	4500	6900
	63	61.51	24	1.1	440	4500	6900	16	0.75	440	4500	6900	12	0.56	440	4500	6900
	71	68.78	22	1	440	4500	6900	15	0.67	440	4500	6900	11	0.5	440	4500	6900
	80	79.96	19	0.86	440	4500	6900	13	0.58	440	4500	6900	9.4	0.43	440	4500	6900
	90	89.08	17	0.78	440	4500	6900	11	0.52	440	4500	6900	8.4	0.39	440	4500	6900
	100	100.2	15	0.69	440	4500	6900	10	0.46	440	4500	6900	7.5	0.35	440	4500	6900
	112	110.7	14	0.62	440	4500	6900	9	0.42	440	4500	6900	6.8	0.31	440	4500	6900
	125	122.9	12	0.56	440	4500	6900	8.1	0.38	440	4500	6900	6.1	0.28	440	4500	6900
	140	137.8	11	0.5	440	4500	6900	7.3	0.33	440	4500	6900	5.4	0.25	440	4500	6900
	160																
	180																
	200																

5. MK4

MK..03

Type	m [kg]
MK303.....0...	33
MK303M00000...	37

800 Nm

Type	...	n_{syn} =	1500 min^{-1}					1000 1/min					750 1/min				
		i_{ex}	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_r N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN
MK303...	7.1																
	8	7.82	192	7.7	385	3000	13000	128	5.2	385	3500	15000	96	3.9	385	4500	15500
	9	8.72	172	7.4	410	3000	13500	115	4.9	410	4000	15500	86	3.7	410	4500	15500
	10	10.29	146	6.6	435	3000	14000	97	4.4	435	4000	15500	73	3.3	435	4500	15500
	11.2	11.53	130	6.1	450	3500	14500	87	4.1	450	4000	15500	65	3.1	450	5000	15500
	12.5	12.95	116	5.7	470	3500	14500	77	3.8	470	4000	15500	58	2.9	470	5000	15500
	14	13.99	107	7.5	670	1000	13500	71	5	670	2000	13500	54	3.8	670	2500	13500
	16	15.6	96	7	700	1000	13500	64	4.7	700	2000	13500	48	3.5	700	3000	13500
	18	18.41	81	6.2	730	1500	13500	54	4.2	730	2500	13500	41	3.1	730	3000	13500
	20	20.62	73	5.8	760	1500	13500	48	3.9	760	2500	13500	36	2.9	760	3500	13500
	22.4	23.18	65	5.4	790	2000	13500	43	3.6	790	3000	13500	32	2.7	790	4000	13500
	25	24.61	61	5.1	800	2000	13500	41	3.4	800	3500	13500	30	2.6	800	4000	13500
	28	29.67	51	4.2	800	2500	13500	34	2.8	800	3500	13500	25	2.1	800	4500	13500
	31.5	31.68	47	4	800	3000	13500	32	2.7	800	4000	13500	24	2	800	4500	13500
	35.5	36.34	41	3.5	800	3000	13500	28	2.3	800	4500	13500	21	1.8	800	4500	13500
	40	42.09	36	3	800	3500	13500	24	2	800	4500	13500	18	1.5	800	4500	13500
	45	45.51	33	2.8	800	4000	13500	22	1.9	800	4500	13500	16	1.4	800	4500	13500
	50	52.91	28	2.4	800	4000	13500	19	1.6	800	4500	13500	14	1.2	800	4500	13500
	56	58.91	25	2.2	800	4500	13500	17	1.4	800	4500	13500	13	1.1	800	4500	13500
	63	64.86	23	2	800	4500	13500	15	1.3	800	4500	13500	12	0.97	800	4500	13500
	71	71.9	21	1.8	800	4500	13500	14	1.2	800	4500	13500	10	0.87	800	4500	13500
	80	80.34	19	1.6	800	4500	13500	12	1.1	800	4500	13500	9.3	0.78	800	4500	13500
	90	89.02	17	1.4	800	4500	13500	11	0.94	800	4500	13500	8.4	0.71	800	4500	13500
	100	99.2	15	1.3	800	4500	13500	10.1	0.85	800	4500	13500	7.6	0.63	800	4500	13500
	112	114.1	13	1.1	800	4500	13500	8.8	0.73	800	4500	13500	6.6	0.55	800	4500	13500
	125	128.1	12	0.98	800	4500	13500	7.8	0.65	800	4500	13500	5.9	0.49	800	4500	13500
	140	143.7	10	0.88	800	4500	13500	7	0.58	800	4500	13500	5.2	0.44	800	4500	13500
	160																
	180																
	200																

5. MK4

MK..04

Type	m [kg]
MK304.....0...	55
MK304M00000...	59

1600 Nm

Type	...	n_{syn} =	1500 min^{-1}					1000 1/min					750 1/min				
		i_{ex}	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_r N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN
MK304...	7.1																
	8	7.66	196	11	540	4000	14500	131	7.4	540	4500	15500	98	5.5	540	5000	16500
	9	8.89	169	10	580	4000	14500	112	6.8	580	4000	15500	84	5.1	580	5000	17000
	10	9.95	151	9.6	610	4000	14500	101	6.4	610	4500	16000	75	4.8	610	5000	17500
	11.2	11.4	132	8.8	640	4000	15000	88	5.9	640	4500	16500	66	4.4	640	5000	18000
	12.5	12.5	120	8.4	670	4000	15000	80	5.6	670	4500	17000	60	4.2	670	5500	18000
	14	13.9	108	12	1050	2000	14500	72	7.9	1050	2000	16500	54	5.9	1050	2000	17500
	16	16.1	93	10.5	1100	2000	15000	62	7.2	1100	2000	17000	47	5.4	1100	2500	18000
	18	18	83	10	1160	2000	16000	55	6.7	1160	2500	17500	42	5.1	1160	2500	18000
	20	20.6	73	9.3	1220	2000	16500	48	6.2	1220	2500	18000	36	4.6	1220	2500	18000
	22.4	22.6	66	8.9	1280	2000	17000	44	5.9	1280	2500	18000	33	4.4	1280	2500	18000
	25	26.2	57	8.1	1350	2500	17500	38	5.4	1350	2500	18000	29	4.1	1350	3000	18000
	28	28.9	52	7.7	1410	2500	18000	35	5.1	1410	3000	18000	26	3.8	1410	3500	18000
	31.5	32.1	47	7.1	1450	2500	18000	31	4.7	1450	3000	18000	23	3.5	1450	3500	18000
	35.5	34.4	44	6.8	1480	2500	18000	29	4.5	1480	3000	18000	22	3.4	1480	4000	18000
	40	40.2	37	6.1	1570	2500	18000	25	4.1	1570	3500	18000	19	3.1	1570	4500	18000
	45	43.3	35	5.8	1600	3000	18000	23	3.9	1600	4000	18000	17	2.9	1600	5000	18000
	50	49.2	31	5.1	1600	3000	18000	20	3.4	1600	4500	18000	15	2.6	1600	5500	18000
	56	55.7	27	4.5	1600	3500	18000	18	3	1600	5000	18000	13	2.3	1600	5500	18000
	63	60.7	25	4.1	1600	4000	18000	16	2.8	1600	5500	18000	12	2.1	1600	5500	18000
	71	70.3	21	3.6	1600	4500	18000	14	2.4	1600	5500	18000	11	1.8	1600	5500	18000
	80	77.6	19	3.2	1600	4500	18000	13	2.2	1600	5500	18000	9.7	1.6	1600	5500	18000
	90	92.8	16	2.7	1600	5500	18000	11	1.8	1600	5500	18000	8.1	1.4	1600	5500	18000
	100	103	15	2.5	1600	5500	18000	9.7	1.6	1600	5500	18000	7.3	1.2	1600	5500	18000
	112	114	13	2.2	1600	5500	18000	8.7	1.5	1600	5500	18000	6.6	1.1	1600	5500	18000
	125	127	12	2	1600	5500	18000	7.9	1.3	1600	5500	18000	5.9	1	1600	5500	18000
	140	134	11	1.7	1460	5500	18000	7.5	1.2	1460	5500	18000	5.6	0.9	1460	5500	18000
	160	147	10	1.6	1460	5500	18000	6.8	1.1	1460	5500	18000	5.1	0.8	1460	5500	18000
	180	183	8	1.2	1370	5500	18000	5.5	0.79	1370	5500	18000	4.1	0.6	1370	5500	18000
	200																

(1) Achtung! Maximale Thermische Leistung beachten Attention! Please consult page 12 for thermal break even performance.
Attention! Vérifier svp la puissance thermique maximum.

5. MK4

MK..05

Type	m [kg]
MK305.....0...	96
MK305M00000...	110

2900 Nm

Type	...	n_{syn} =	1500 min^{-1}					1000 1/min					750 1/min				
		i_{ex}	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_r N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN
MK305...	7.1																
	8	8.43	178	22	1150	4000	16500	119	15	1150	4500	17500	89	11	1150	4500	18500
	9	9.04	166	21	1200	4000	16500	111	14	1200	4500	17500	83	11	1200	5000	19000
	10	10.13	148	20	1250	4000	16500	99	13	1250	4500	17500	74	9.7	1250	5000	19500
	11.2	11.66	129	18	1300	3500	16500	86	12	1300	4500	18000	64	8.8	1300	5000	20000
	12.5	13.22	113	17	1400	3500	16500	76	11	1400	4500	18000	57	8.3	1400	5000	20500
	14	14.36	104	22	1950	1500	19000	70	14	1950	1500	21000	52	10.5	1950	1500	22500
	16	15.4	97	21	2050	1500	19500	65	14	2050	1500	22000	49	10.5	2050	1500	24000
	18	17.27	87	20	2150	1500	20500	58	13	2150	2000	23000	43	9.8	2150	2000	24500
	20	19.88	75	18	2200	1500	21000	50	12	2200	2000	23500	38	8.7	2200	2000	25500
	22.4	22.53	67	16	2300	1500	21500	44	11	2300	2000	24500	33	8	2300	2000	26500
	25	25.35	59	15	2400	3000	23500	39	9.9	2400	2000	25000	30	7.4	2400	2500	27000
	28	29.06	52	14	2500	2500	24000	34	9	2500	2000	26000	26	6.8	2500	3000	27000
	31.5	32.07	47	13	2600	2000	24000	31	8.5	2600	2000	27000	23	6.4	2600	3500	27000
	35.5	35.29	43	12	2650	2000	25000	28	7.9	2650	2500	27000	21	5.9	2650	4000	27000
	40	39.75	38	11	2700	2000	25500	25	7.1	2700	3500	27000	19	5.3	2700	5000	27000
	45	44.1	34	10	2800	2000	26500	23	6.6	2800	4000	27000	17	5	2800	5500	27000
	50	50.51	30	9	2900	2500	27000	20	6	2900	4500	27000	15	4.5	2900	6000	27000
	56	59.31	25	7.7	2900	3500	27000	17	5.1	2900	6000	27000	13	3.8	2900	7500	27000
	63	63.47	24	7.2	2900	4500	27000	16	4.8	2900	6500	27000	12	3.6	2900	7500	27000
	71	70.89	21	6.4	2900	4500	27000	14	4.3	2900	6500	27000	11	3.2	2900	7500	27000
	80	80.88	19	5.6	2900	4500	27000	12	3.8	2900	7500	27000	9.3	2.8	2900	7500	27000
	90	87.69	17	5.2	2900	5500	27000	11	3.5	2900	7500	27000	8.6	2.6	2900	7500	27000
	100	101.2	15	4.5	2900	6000	27000	9.9	3	2900	7500	27000	7.4	2.3	2900	7500	27000
	112	111.2	13	4.1	2900	6500	27000	9	2.8	2900	7500	27000	6.7	2.1	2900	7500	27000
	125	132.7	11	3.4	2900	7500	27000	7.5	2.3	2900	7500	27000	5.7	1.7	2900	7500	27000
	140	148.7	10	3.1	2900	7500	27000	6.7	2.1	2900	7500	27000	5	1.6	2900	7500	27000
	160																
	180																
	200																

(1) Achtung! Maximale Thermische Leistung beachten Attention! Please consult page 12 for thermal break even performance.
Attention! Vérifier svp la puissance thermique maximum.

5. MK4

MK..06

Type	m [kg]
MK306.....0...	195
MK306M00000...	262

4900 Nm

Type	...	n_{syn} =	1500 min^{-1}					1000 1/min					750 1/min				
		i_{ex}	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_r N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN
MK306...	7.1																
	8																
	9	9.14	164	42(1)	2450	5500	26000	109	28	2450	4500	27000	82	21	2450	5000	28000
	10	9.8	153	39(1)	2450	4500	26000	102	26	2450	5000	27500	77	20	2450	5500	28500
	11.2	10.98	137	35(1)	2450	4500	26000	91	24	2450	5000	28000	68	18	2450	6000	30500
	12.5	12.64	119	30(1)	2450	4500	26500	79	21	2450	5500	28500	59	15	2450	6500	31500
	14	14.33	105	27	2450	5000	27000	70	18	2450	6000	29500	52	14	2450	7000	33000
	16	16.12	93	24	2450	5000	27500	62	16	2450	6500	31000	47	12	2450	8000	37500
	18	18.24	82	40(1)	4630	-	22500	55	28	4900	-	27000	41	21	4900	2500	30500
	20	19.55	77	38(1)	4670	-	24000	51	26	4900	1500	28000	38	20	4900	3000	32000
	22.4	21.93	68	34(1)	4760	-	25000	46	24	4900	2000	29500	34	18	4900	3500	33500
	25	25.24	59	30(1)	4830	-	26000	40	21	4900	2500	31000	30	15	4900	4500	35000
	28	28.61	52	27(1)	4880	1000	27500	35	18	4900	3500	32500	26	14	4900	5000	36500
	31.5	32.18	47	24	4900	1500	29000	31	16	4900	4000	34500	23	12	4900	6000	38500
	35.5	36.9	41	21	4900	2500	30500	27	14	4900	5000	36000	20	11	4900	7000	40000
	40	40.72	37	19	4900	3000	32000	25	13	4900	5500	37500	18	9.5	4900	7500	40000
	45	44.81	33	17	4900	3500	33500	22	12	4900	6500	39500	17	8.6	4900	8500	40000
	50	50.48	30	15	4900	4500	35000	20	10	4900	7000	40000	15	7.6	4900	9500	40000
	56	55.99	27	14	4900	5000	36500	18	9.2	4900	8000	40000	13	6.9	4900	10500	40000
	63	64.14	23	12	4900	6000	38500	16	8	4900	9000	40000	12	6	4900	11500	40000
	71	75.31	20	10	4900	7000	40000	13	6.8	4900	10000	40000	10	5.1	4900	12500	40000
	80	80.59	19	9.5	4900	7500	40000	12	6.4	4900	11000	40000	9.3	4.8	4900	13500	40000
	90	90.02	17	8.5	4900	8500	40000	11	5.7	4900	12000	40000	8.3	4.3	4900	13500	40000
	100	102.7	15	7.5	4900	9500	40000	9.7	5	4900	13000	40000	7.3	3.7	4900	13500	40000
	112	111.3	13	6.9	4900	10500	40000	9	4.6	4900	13500	40000	6.7	3.5	4900	13500	40000
	125	128.5	12	6	4900	11500	40000	7.8	4	4900	13500	40000	5.8	3	4900	13500	40000
	140	141.2	11	5.5	4900	12500	40000	7.1	3.6	4900	13500	40000	5.3	2.8	4900	13500	40000
	160	168.4	8.9	4.6	4900	13500	40000	5.9	3	4900	13500	40000	4.5	2.3	4900	13500	40000
	180	188.8	7.9	4.1	4900	13500	40000	5.3	2.7	4900	13500	40000	4	2.1	4900	13500	40000
	200																

(1) Achtung! Maximale Thermische Leistung beachten Attention! Please consult page 12 for thermal break even performance.
Attention! Vérifier svp la puissance thermique maximum.

5. MK4

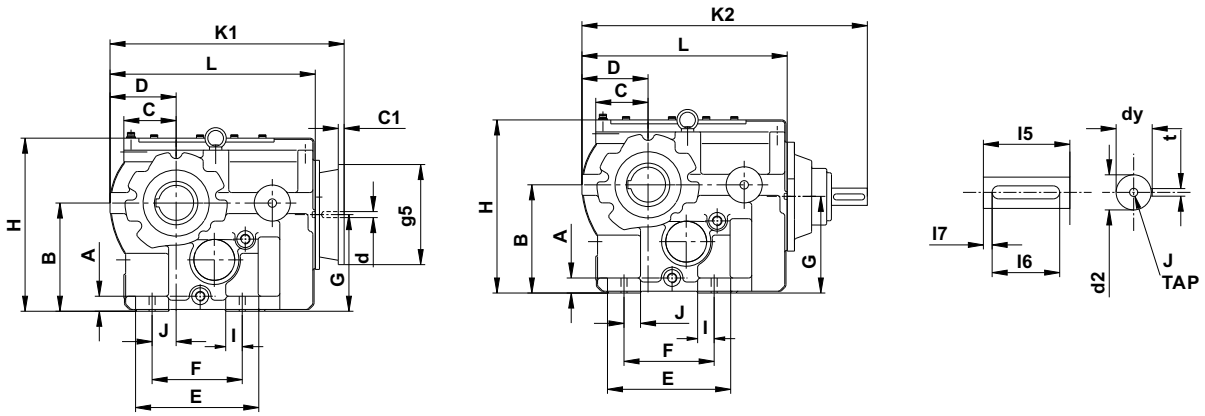
MK..07	Type	m [kg]	8000 Nm
	MK307.....0...	280	
	MK307M00000...	355	

Type	...	n_{syn} =	1500 min^{-1}					1000 1/min					750 1/min				
		i_{ex}	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_r N	F_rN GN	n_2 min^{-1}	P kW	T_2 Nm	F_rN N	F_rN GN
MK307...	7.1																
	8																
	9	8.72	172	70(1)	3900	8500	36000	115	47(1)	3900	7000	36000	86	36	4000	8000	38000
	10	9.62	156	65(1)	3960	8000	36000	104	43(1)	3960	7500	37000	78	32	4000	8000	38500
	11.2	11.1	136	56(1)	3960	7000	35500	90	37(1)	3960	7500	37500	68	28	4000	8500	39000
	12.5	12.5	120	50(1)	3960	7000	36000	80	33(1)	3960	8000	38000	60	25	4000	9000	41000
	14	13.8	109	45(1)	3960	7000	36500	72	30(1)	3960	8000	41500	54	23	4000	10000	42500
	16	15.7	96	40(1)	3960	7500	37000	64	26(1)	3960	9000	40000	48	20	4000	11000	44500
	18	17.6	85	70(1)	7880	4000	34500	57	47(1)	7880	-	34500	43	36	8000	3000	39500
	20	19.4	77	65(1)	8000	2000	34000	52	43(1)	8000	1000	36500	39	32	8000	4000	41000
	22.4	22.3	67	56(1)	8000	-	32500	45	38(1)	8000	2500	38000	34	28	8000	5000	43000
	25	25.2	59	50(1)	8000	-	33500	40	33(1)	8000	3500	40000	30	25	8000	6000	45000
	28	27.9	54	45(1)	8000	-	35500	36	30	8000	4500	42000	27	23	8000	7000	47500
	31.5	31.6	47	40(1)	8000	2000	37000	32	27	8000	5500	44000	24	20	8000	8000	49500
	35.5	35.5	42	35(1)	8000	3000	39000	28	24	8000	6500	46500	21	18	8000	9500	52000
	40	39.5	38	32(1)	8000	4000	41000	25	21	8000	7500	48500	19	16	8000	10500	54500
	45	45	33	28	8000	5000	43500	22	19	8000	9000	51000	17	14	8000	11500	57000
	50	48.6	31	26	8000	6000	45000	21	18	8000	10000	53000	15	13	8000	13000	59500
	56	53.8	28	24	8000	7000	47500	19	16	8000	12000	55500	14	12	8000	14000	62000
	63	61.9	24	21	8000	8000	49500	16	14	8000	12500	58000	12	10	8000	15500	65000
	71	69.9	21	18	8000	9500	52000	14	12	8000	13500	61000	11	9	8000	17000	65000
	80	79.5	19	16	8000	10500	54500	13	11	8000	15000	63500	9.4	7.9	8000	18500	65000
	90	87.3	17	15	8000	11500	57000	11	9.6	8000	16500	65000	8.6	7.2	8000	20000	65000
	100	100	15	13	8000	13000	59500	10	8.4	8000	18000	65000	7.5	6.3	8000	21000	65000
	112	108	14	12	8000	14000	62000	9.2	7.7	8000	19500	65000	6.9	5.8	8000	21000	65000
	125	128	12	9.8	8000	15500	64500	7.8	6.5	8000	21000	65000	5.9	4.9	8000	21000	65000
	140	143	11	8.8	8000	17000	65000	7	5.9	8000	21000	65000	5.3	4.4	8000	21000	65000
	160	159	9.5	7.9	8000	18000	65000	6.3	5.3	8000	2100	65000	4.7	4	8000	21000	65000
	180																
	200																

(1) Achtung! Maximale Thermische Leistung beachten Attention! Please consult page 12 for thermal break even performance.
Attention! Vérifier svp la puissance thermique maximum.

5. MK4

5.5 DIMENSIONAL DRAWING OF GEAR HEAD
MKB3…S/A : SHAFT MOUNTED



DIMENSIONAL DRAWINGS OF GEAR HEAD

Model	L	J	I	E	F	A	B	H	D	C	G
MK-02	238	35	35	162	130	18	112	186	70.5	55	103
MK-03	293.5	30	33	176	120	20	140	228	88	70	129
MK-04	341.5	40	55	214.5	150	25	180	288	110	87	161
MK-05	426	55	70	250	180	30	212	340	129	102	197
MK-06	445	75	80	320	240	35	265	420	160	NA	200
MK-07	525	95	100	380	280	40	315	513	200	NA	241

TOTAL LENGTH

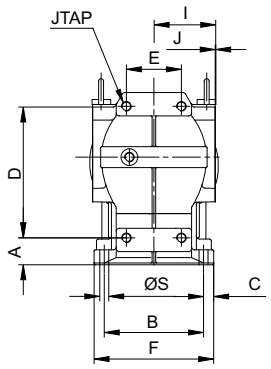
MOTOR FRAME		63	71	80	90S	90L	100	112	132S	132M	160M	160L	180M	180L
	d	11	14	19	24	24	28	28	38	38	42	42	48	48
	C1	16	17	17.5	17.5	17.5	22	22	22	22	24	24	24	24
	g5	140	160	200	200	200	250	250	300	300	350	350	350	350
Model														
MK-02	**K1**	278.5	283.99	292.2	305.5	305.5	312.5	312.5	-	-	-	-	-	-
MK-03	**K1**	-	329.3	339.8	353	353	370.7	370.7	392	392	426.3	426.3	-	-
MK-04	**K1**	-	-	381	392.83	392.83	412.83	412.83	438.82	438.82	472.5	472.5	472.5	472.5
MK-05	**K1**	-	-	465.5	477.33	477.33	497.33	497.33	523.32	523.32	557	557	557	557

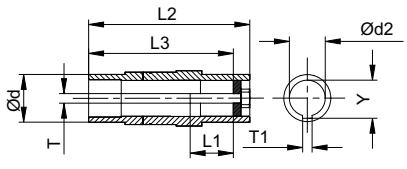
MOTOR FRAME		100	112	132S	132M	160M	160L	180M	180L	200L	225S	225M	250M	280
	d	28	28	38	38	42	42	48	48	55	60	60	65	75
	C1	22	22	22	22	24	24	24	24	26	26	26	28	28
	g5	250	250	300	300	350	350	350	350	400	450	450	550	550
Model														
MK-06	**K1**	512.13	512.13	537.12	537.12	570.3	570.3	570.3	570.3	575	605.12	605.12	605.12	605.12
MK-07	**K1**	592.13	592.13	617.12	617.12	650.3	650.3	650.3	650.3	655	685.12	685.12	685.12	685.12

5. MK4

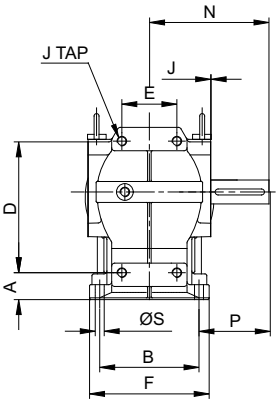
MKB3...S/A - SHAFT MOUNTED

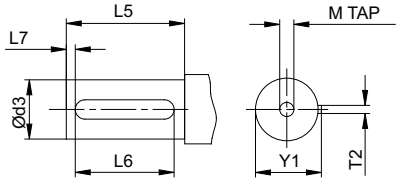
MKB3...S/A :
SHAFT MOUNTED



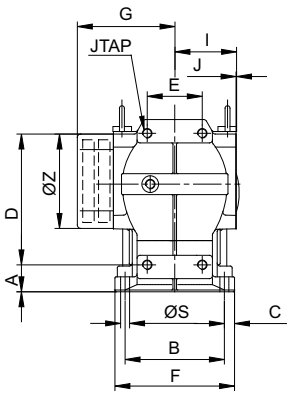


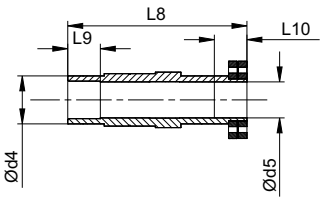
MKB3...A :
SOLID SHAFT





MKB3...A :
HOLLOW SHAFT
WITH SHRINK DISK





DIMENSIONAL DRAWINGS OF GEAR HEAD

Model	F	B	ØS	C	A	D	E	J	I	P	N	G	ØZ	L1	L2	L3
MK-02	145	120	11	15	30	144	70	2	75	75	135	115	100	49	150	132
MK-03	170	140	13.5	20	38	174	85	2	90	101	171	131	110	58	180	156
MK-04	200	165	17.5	22.5	45	220	92	2.5	105	124	206	150	135	58	210	183
MK-05	230	180	22	30	61	251	100	2.5	120	150	240	170	170	74	240	210
MK-06	290	240	28	30	75	295		4	150	171	291	210	200	76	300	270
MK-07	340	270	33	40	95	360		5	175	212	347	245	230	83	350	313

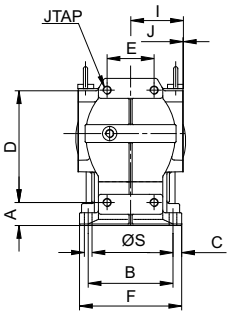
TOTAL LENGTH

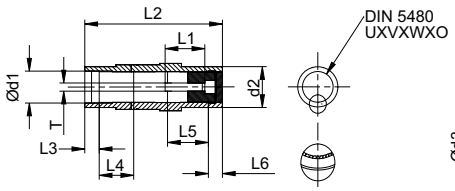
Model	L6	L7	L8	L9	L10	Ød	Ød2	Ød3	Ød4	Ød5	T	T1	Y	T2	Y1	MTAP	J TAP
MK-02	50	3.5	177	20	32	50	35H7	30k6	50	35H7	M12	10	38.3	8	33	M10X22	M10X19
MK-03	70	2	208	20	38	55	40H7	40k6	55	40H7	M16	12	43.3	12	43	M16X36	M12X20
MK-04	80	10	241	25	36	70	50H7	50k6	70	50H7	M16	14	53.8	14	53.5	M16X36	M16X31
MK-05	110	5	281	40	41	85	60H7	60m6	85	65H7	M20	18	64.4	18	64	M20X42	M20X39
MK-06	125	7.5	345	50	55	100	70H7	70m6	100	75H7	M20	20	74.9	20	74.5	M20X42	Ø28
MK-07	160	3	405	60	65	120	90H7	90m6	120	95H7	M24	25	95.4	25	95	M24X50	Ø33

5. MK4

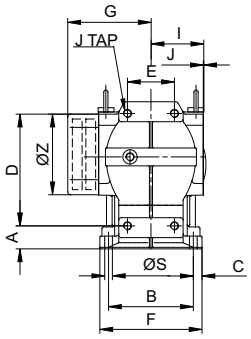
MKB3...S/A - SHAFT MOUNTED

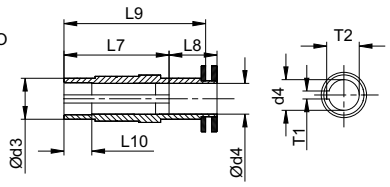
MKB3...A :
HOLLOW SHAFT WITH SPLINING



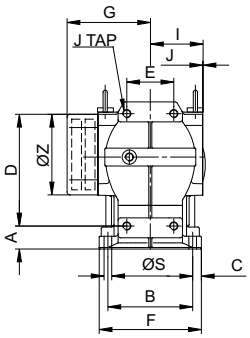


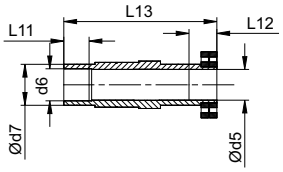
MKB3...A :
HOLLOW SHAFT WITH CONICAL CLAMPING SLEEVE





MKB3...A :
HOLLOW SHAFT WITH SHRINK DISK AND BRONZE BUSH





DIMENSIONAL DRAWINGS OF GEAR HEAD

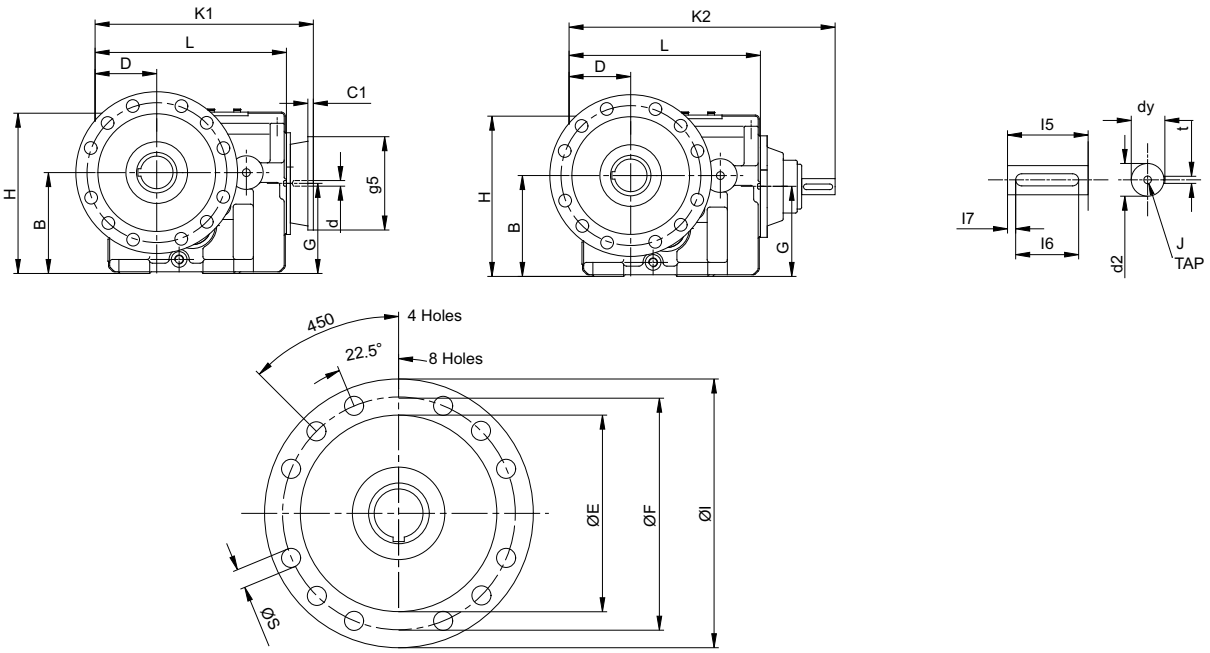
Model	F	B	ØS	C	A	D	E	J	I	G	ØZ	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
MK-02	145	120	11	15	30	144	70	2	75	115	100	30	150	18	32	32	18	NA			
MK-03	170	140	13.5	20	38	174	85	2	90	131	110	50	180	25	42	42	25	NA			
MK-04	200	165	17.5	22.5	45	220	92	2.5	105	150	135	50	210	23	52	52	23	174	66.5	228	30
MK-05	230	180	22	30	61	251	100	2.5	120	170	170	60	240	25	62	62	25	191	85	261	40
MK-06	290	240	28	30	75	295		4	150	210	200	60	300	25	72	72	25	243	91	322	70
MK-07	340	270	33	40	95	360		5	175	245	230	60	350	26	89	89	26	309	75.5	372	90

TOTAL LENGTH

Model	L11	L12	L13	Ød1	Ød2	Ød3	Ød4	Ød5	Ød6	Ød7	T	T1	T2	UXVXWXO
MK-02	20	32	177	37(+0.1)	50	NA		35H7	36H7	50	M10	NA		35X2X30X16
MK-03	20	38	208	47(+0.1)	55	NA		40H7	42H7	55	M16	NA		45X2X30X21
MK-04	30	36	241	55(+0.1)	70	70	50H7	50H7	52H7	70	M16	14	53.8	50X2X30X24
MK-05	40	41	281	72(+0.1)	85	85	60H7	65H7	66H7	85	M20	18	64.4	65X2X30X31
MK-06	50	55	345	72(+0.1)	100	100	70H7	75H7	76H7	100	M20	20	74.9	70X2X30X34
MK-07	60	65	405	90(+0.1)	120	120	90H7	95H7	96H7	120	M20	25	95.4	85X3X30X27

5. MK4

MKV3…S/A : FLANGE MOUNTED – Maxi Flange (B5)



DIMENSIONAL DRAWINGS OF GEAR HEAD

MODEL	L	G	B	H	D	ØS	ØE	ØF	ØI	NO OF HOLES ON OUTPUT FLANGE
MK-02	238	103	112	186	70.5	11	130	165	200	4
MK-03	294	129	140	228	88	13.5	180	215	250	4
MK-04	342	161	180	288	110	13.5	230	265	300	4
MK-05	426	197	212	340	129	18	250	300	350	4
MK-06	445	200	265	420	160	17.5	350	400	450	8
MK-07	525	241	315	513	200	17.5	350	400	450	8

TOTAL LENGTH

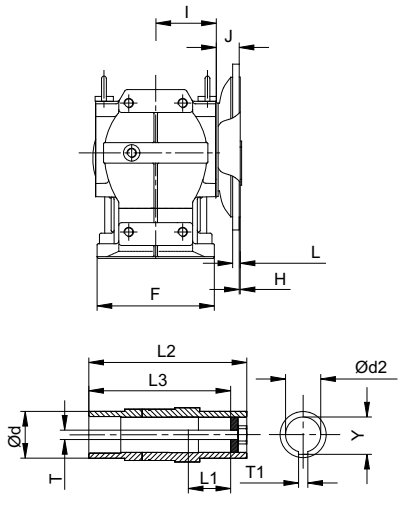
MOTOR FRAME		63	71	80	90S	90L	100	112	132S	132M	160M	160L	180M	180L
	d	11	14	19	24	24	28	28	38	38	42	42	48	48
	C1	16	17	17.5	17.5	17.5	22	22	22	22	24	24	24	24
	g5	140	160	200	200	200	250	250	300	300	350	350	350	350
Model														
MK-02	**K1**	279	284	292	306	306	312.5	312.5	-	-	-	-	-	-
MK-03	**K1**	-	329	340	353	353	370.7	370.7	392	392	426.3	426.3	-	-
MK-04	**K1**	-	-	381	393	393	412.83	412.83	439	439	472.5	472.5	472.5	472.5
MK-05	**K1**	-	-	466	477	477	497.33	497.33	523	523	557	557	557	557

MOTOR FRAME		100	112	132S	132M	160M	160L	180M	180L	200L	225S	225M	250M	280
	d	28	28	38	38	42	42	48	48	55	60	60	65	75
	C1	22	22	22	22	24	24	24	24	26	26	26	28	28
	g5	250	250	300	300	350	350	350	350	400	450	450	550	550
Model														
MK-06	**K1**	512.13	512.13	537	537	570.3	570.3	570.3	570.3	575	605.12	605.12	605.12	605.12
MK-07	**K1**	592.13	592.13	617	617	650.3	650.3	650.3	650.3	655	685.12	685.12	685.12	685.12

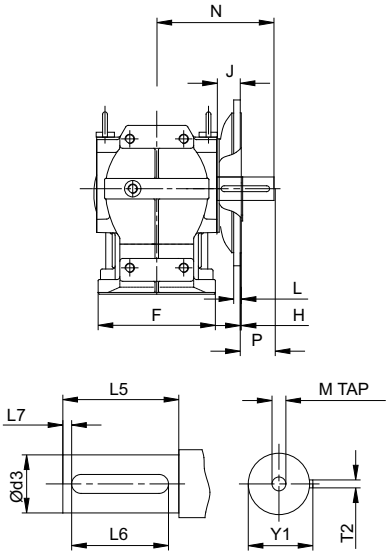
5. MK4

MKV3…S/A : FLANGE MOUNTED – Maxi Flange (B5)

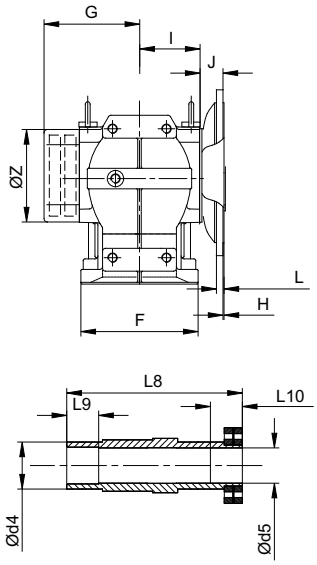
MKV3...S/A :
SHAFT MOUNTED



MKV3...A :
SOLID SHAFT



MKV3...A :
HOLLOW SHAFT
WITH SHRINK DISK



DIMENSIONAL DRAWINGS OF GEAR HEAD

MODEL	I	J	L	H	F	P	N	G	ØZ	L1	L2	L3	L5	L6
MK-02	75	25	10	3.5	145	35	135	115	100	49	150	132	60	50
MK-03	90	23	13	4	170	58	171	131	110	58	180	156	80	70
MK-04	105	37	15	4	200	64	206	150	135	58	210	183	100	80
MK-05	120	30	15	5	230	90	240	170	170	74	240	210	120	110
MK-06	150	41.5	20	5	290	99.5	291	210	200	76	300	270	140	125
MK-07	175	41	20	5	340	131	347	245	230	83	350	313	170	160

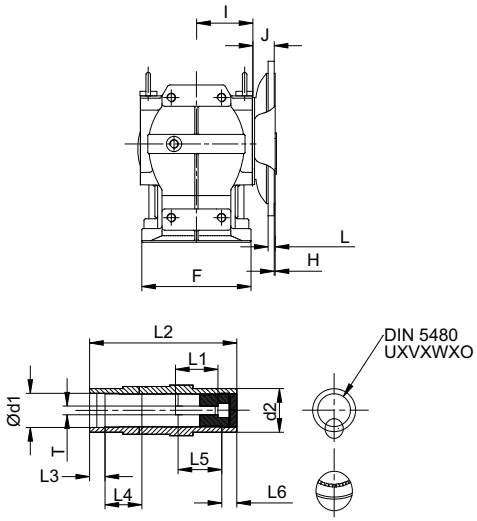
TOTAL LENGTH

MODEL	L7	L8	L9	L10	Ød	Ød2	Ød3	Ød4	Ød5	T	T1	Y	T2	Y1	MTAP
MK-02	3.5	177	20	32	50	35H7	30k6	50	35H7	M12	10	38.3	8	33	M10X22
MK-03	2	208	20	38	55	40H7	40k6	55	40H7	M16	12	43.3	12	43	M16X36
MK-04	10	241	25	36	70	50H7	50k6	70	50H7	M16	14	53.8	14	53.5	M16X36
MK-05	5	281	40	41	85	60H7	60m6	85	65H7	M20	18	64.4	18	64	M20X42
MK-06	7.5	345	50	55	100	70H7	70m6	100	75H7	M20	20	74.9	20	74.5	M20X42
MK-07	3	405	60	65	120	90H7	90m6	120	95H7	M24	25	95.4	25	95	M24X50

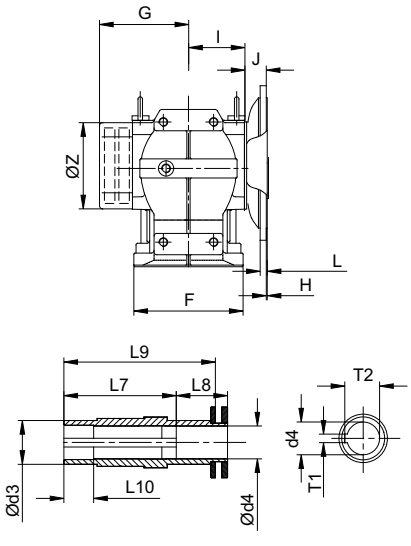
5. MK4

MKV3…S/A : FLANGE MOUNTED – Maxi Flange (B5)

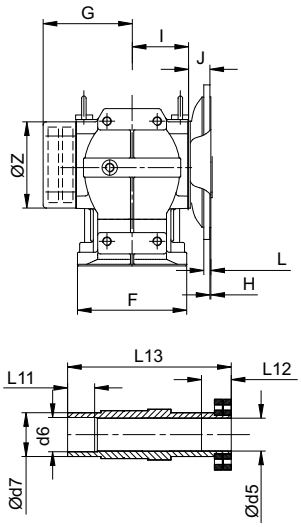
MKV3...A :
HOLLOW SHAFT
WITH SPLINING



MKV3...A :
HOLLOW SHAFT WITH
CONICAL CLAMPING
SLEEVE



MKV3...A :
HOLLOW SHAFT WITH
SHRINK DISK AND
BRONZE BUSH



DIMENSIONAL DRAWINGS OF GEAR HEAD

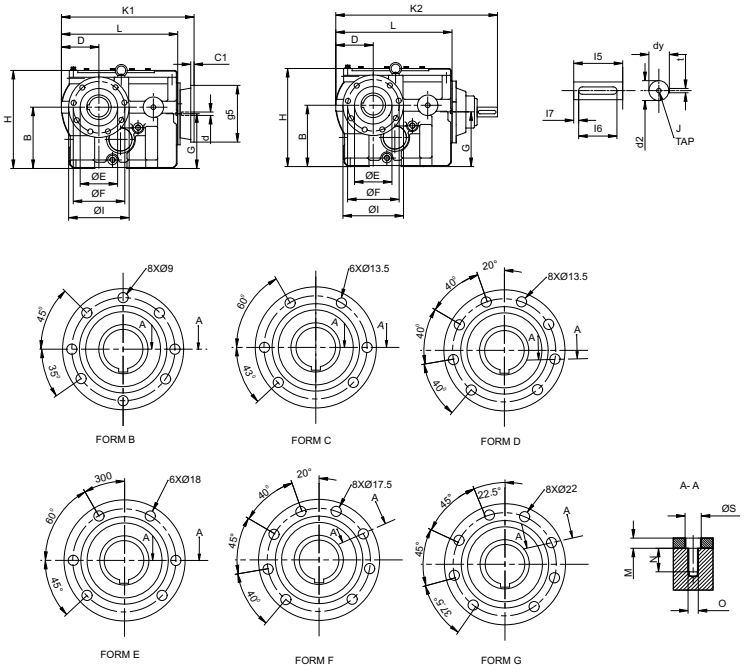
MODEL	I	J	L	H	F	G	ØZ	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
MK-02	75	25	10	3.5	145	115	100	30	150	18	32	32	18	NA			
MK-03	90	23	13	4	170	131	110	50	180	25	42	42	25	NA			
MK-04	105	37	15	4	200	150	135	50	210	23	52	52	23	174	66.5	228	30
MK-05	120	30	15	5	230	170	170	60	240	25	62	62	25	191	85	261	40
MK-06	150	41.5	20	5	290	210	200	60	300	25	72	72	25	243	91	322	70
MK-07	175	41	20	5	340	245	230	60	350	26	89	89	26	309	75.5	372	90

TOTAL LENGTH

MODEL	L11	L12	L13	Ød1	Ød2	Ød3	Ød4	Ød5	Ød6	Ød7	T	T1	T2	UXVXWXO
MK-02	20	32	177	37(+0.1)	50	NA		35H7	36H7	50	M10	NA		35X2X30X16
MK-03	20	38	208	47(+0.1)	55	NA		40H7	42H7	55	M16	NA		45X2X30X21
MK-04	30	36	241	55(+0.1)	70	70	50H7	50H7	52H7	70	M16	14	53.8	50X2X30X24
MK-05	40	41	281	72(+0.1)	85	85	60H7	65H7	66H7	85	M20	18	64.4	65X2X30X31
MK-06	50	55	345	72(+0.1)	100	100	70H7	75H7	76H7	100	M20	20	74.9	70X2X30X34
MK-07	60	65	405	90(+0.1)	120	120	90H7	95H7	96H7	120	M20	25	95.4	85X3X30X27

5. MK4

MKV3…S/A : FLANGE MOUNTED – Mini Flange (B5)



DIMENSIONAL DRAWINGS OF GEAR HEAD

MODEL	L	G	B	H	D	ØE	ØF	ØI	ØS	M	N	O	HOLE PATTERN OF OUTPUT FLANGE
MK-02	238	103	112	186	70.5	80	102	120	9	10	16	M8	FORM B
MK-03	294	129	140	228	88	105	125	155	13.5	10.5	20	M12	FORM C
MK-04	342	161	180	288	110	125	142	170	13.5	12.5	22	M12	FORM D
MK-05	426	197	212	340	129	155	178	215	18	13.5	26	M16	FORM E
MK-06	445	200	265	420	160	180	220	260	17.5	18	30	M16	FORM F
MK-07	525	241	315	513	200	210	260	304	22	8	36	M20	FORM G

TOTAL LENGTH

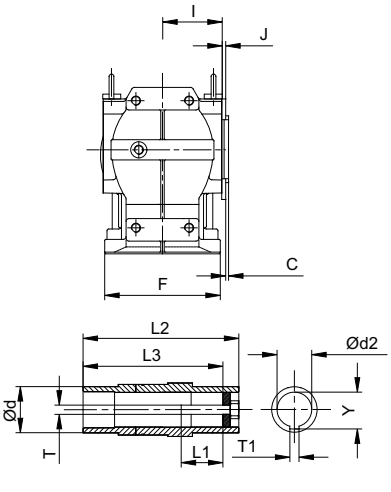
MOTOR FRAME		63	71	80	90S	90L	100	112	132S	132M	160M	160L	180M	180L
	d	11	14	19	24	24	28	28	38	38	42	42	48	48
	C1	16	17	17.5	17.5	17.5	22	22	22	22	24	24	24	24
	g5	140	160	200	200	200	250	250	300	300	350	350	350	350
Model														
MK-02	**K1**	278.5	283.99	292.2	305.5	305.5	312.5	312.5	-	-	-	-	-	-
MK-03	**K1**	-	329.3	339.8	353	353	370.7	370.7	392	392	426.3	426.3	-	-
MK-04	**K1**	-	-	381	392.83	392.83	412.83	412.83	438.82	438.82	472.5	472.5	472.5	472.5
MK-05	**K1**	-	-	465.5	477.33	477.33	497.33	497.33	523.32	523.32	557	557	557	557

MOTOR FRAME		100	112	132S	132M	160M	160L	180M	180L	200L	225S	225M	250M	280
	d	28	28	38	38	42	42	48	48	55	60	60	65	75
	C1	22	22	22	22	24	24	24	24	26	26	26	28	28
	g5	250	250	300	300	350	350	350	350	400	450	450	550	550
Model														
MK-06	**K1**	512.1	512.1	537.1	537.1	570.3	570.3	570.3	570.3	575	605.1	605.1	605.1	605.1
MK-07	**K1**	592.1	592.1	617.1	617.1	650.3	650.3	650.3	650.3	655	685.1	685.1	685.1	685.1

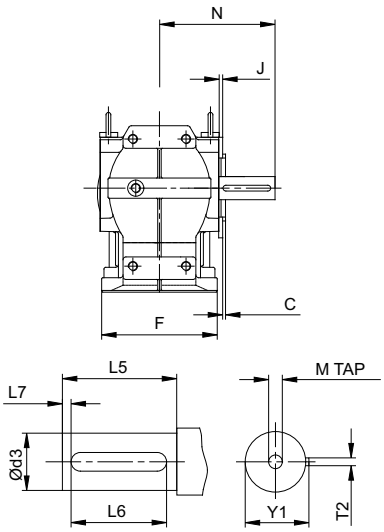
5. MK4

MKV3…A : FLANGE MOUNTED – Mini Flange (B5)

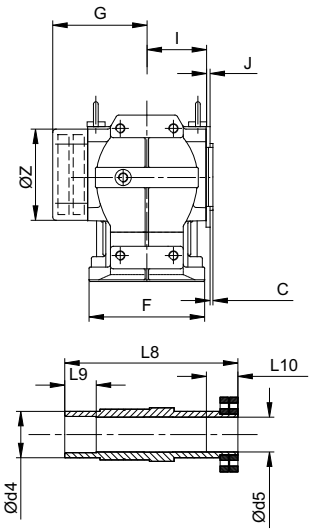
MKV3...A :
SHAFT MOUNTED



MKV3...A :
SOLID SHAFT



MKV3...A :
HOLLOW SHAFT
WITH SHRINK DISK



DIMENSIONAL DRAWINGS OF GEAR HEAD

MODEL	I	J	F	C	N	G	ØZ	L1	L2	L3	L5	L6	L7
MK-02	75	8	145	3	135	115	100	49	150	132	60	50	3.5
MK-03	90	8.5	170	3.5	171	131	110	58	180	156	80	70	2
MK-04	105	10	200	3.5	206	150	135	58	210	183	100	80	10
MK-05	120	11	230	4	240	170	170	74	240	210	120	110	5
MK-06	150	14	290	4	291	210	200	76	300	270	140	125	7.5
MK-07	175	14	340	4	347	245	230	83	350	313	170	160	3

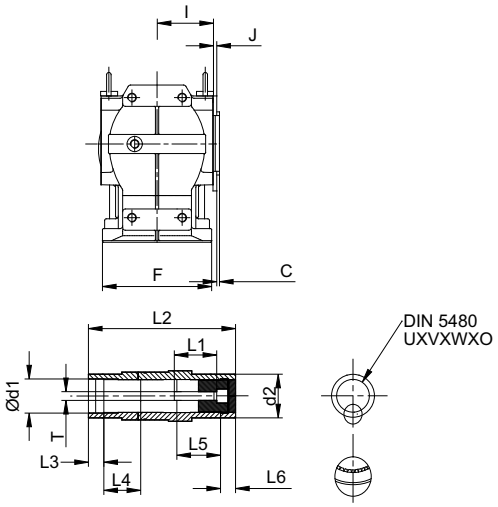
TOTAL LENGTH

MODEL	L8	L9	L10	Ød	Ød2	Ød3	Ød4	Ød5	T	T1	Y	T2	Y1	MTAP
MK-02	177	20	32	50	35H7	30k6	50	35H7	M12	10	38.3	8	33	M10X22
MK-03	208	20	38	55	40H7	40k6	55	40H7	M16	12	43.3	12	43	M16X36
MK-04	241	25	36	70	50H7	50k6	70	50H7	M16	14	53.8	14	53.5	M16X36
MK-05	281	40	41	85	60H7	60m6	85	65H7	M20	18	64.4	18	64	M20X42
MK-06	345	50	55	100	70H7	70m6	100	75H7	M20	20	74.9	20	74.5	M20X42
MK-07	405	60	65	120	90H7	90m6	120	95H7	M24	25	95.4	25	95	M24X50

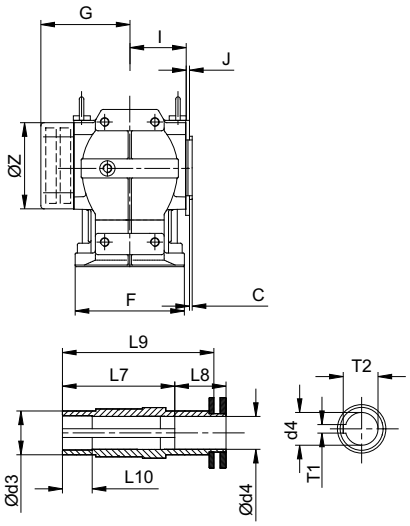
5. MK4

MKV3…A : FLANGE MOUNTED – Mini Flange (B5)

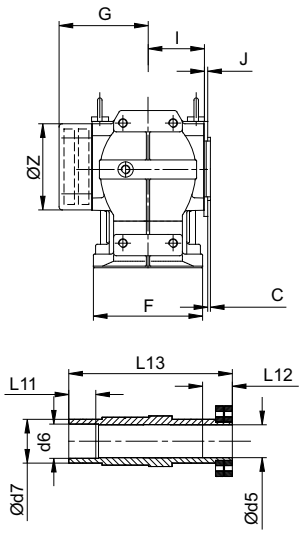
MKV3...A :
HOLLOW SHAFT
WITH SPLINING



MKV3...A :
HOLLOW SHAFT WITH
CONICAL CLAMPING
SLEEVE



MKV3...A :
HOLLOW SHAFT WITH
SHRINK DISK AND
BRONZE BUSH



DIMENSIONAL DRAWINGS OF GEAR HEAD

MODEL	I	J	F	C	G	ØZ	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
MK-02	75	8	145	3	115	100	30	150	18	32	32	18	NA			
MK-03	90	8.5	170	3.5	131	110	50	180	25	42	42	25	NA			
MK-04	105	10	200	3.5	150	135	50	210	23	52	52	23	174	66.5	228	30
MK-05	120	11	230	4	170	165	60	240	25	62	62	25	191	85	261	40
MK-06	150	14	290	4	210	205	60	300	25	72	72	25	243	91	322	70
MK-07	175	14	340	4	245	225	60	350	26	89	89	26	309	75.5	372	90

TOTAL LENGTH

MODEL	L11	L12	L13	Ød1	Ød2	Ød3	Ød4	Ød5	Ød6	Ød7	T	T1	T2	UXVXWXO
MK-02	20	32	177	37(+0.1)	50	NA		35H7	36H7	50	M10	NA		35X2X30X16
MK-03	20	38	208	47(+0.1)	55	NA		40H7	42H7	55	M16	NA		45X2X30X21
MK-04	30	36	241	55(+0.1)	70	70	50H7	50H7	52H7	70	M16	14	53.8	50X2X30X24
MK-05	40	41	281	72(+0.1)	85	85	60H7	65H7	66H7	85	M20	18	64.4	65X2X30X31
MK-06	50	55	345	72(+0.1)	100	100	70H7	75H7	76H7	100	M20	20	74.9	70X2X30X34
MK-07	60	65	405	90(+0.1)	120	120	90H7	95H7	96H7	120	M20	25	95.4	85X3X30X27

6. Technical Appendix

6. Technical Appendix

6.1 Technical Appendix, General

6.1.1 *Symbols used*

Formula sign	Description
C	Correction factor
cos n	Power factor
d	Speed of runner
F	Application factor
F_2	Factor dependent upon stray mass moment of inertia
F_b	Factor dependent upon output and operating time
F_m	Factor dependent upon load torque
F_{rN}	Permissible rated external load
F_{rN-G}	Permissible rated external load for reinforced bearing
F_p	Calculated radial load
f_r	Factor for the radial load
Fr	Calculated radial load (N)
F_x	Axial load
F_x	N Rated axial load
F_z	Dependent upon additional mass moment of inertia
i	Gear ratio
I_A	Starting current
i_{ex}	Exact gear ratio
i_N	Rated gear ratio
I_n	Rated current
J1	Inertia of brake hub and brake disk
J2	Inertia of the motor without brake
J3	Inertia of the motor with brake
JE	Inertia of the motor
J_{zus}	Inertia of the additional mass
M	Mass acceleration factor
m	Mass
M_b	Calculated bending moment
M_{bn}	Rated bending moment
η	Efficiency
n_1	Rated speed of the motor
n_2	Selection of the output speed
n_{2ex}	Exact speed of output shaft (full load)
Lp	Mean sound pressure level at 1 m, without load
n_{max}	Max. permissible speed
n_{syn}	Synchronous speed of the motor
P	Mechanical rated output of the gear unit
P_a	Output power
P_m	Motor output
P_N	Rated switching capacity (motor brake)

6. Technical Appendix

6. Technical Appendix

6.1 Technical Appendix, General

6.1.1 *Symbols used*

Formula sign	Description
P_{zo}	Drive power
r	Pitch circle radius of power transmission element
SF	Available service factor
SF_{min}	Required service factor
Sr	Speed range for motors with inverter
t_b	Brake time
t_1	Operating time of the single-disc safety brake
t_2	Braking time of the single-disc safety brake
T_2	Torque at the output shaft
t_3	Braking time of single-disc safety brakes switching at the AC side
T_A	Starting torque of the motor
T_a	Output torque (load torque)
T_B	Braking torque of the motor
T_K	Breakdown torque of the motor
T_n	Rated torque
T_S	Pull-up torque of the motor
W_{max}	Energy capability per braking
Z	Max. permissible operating frequency of brake motors
Z_B	No. of brakings per hour
Z_{o1}	No-load operating frequency per hour without brake
Z_{o2}	No-load operating frequency per hour with brake

6. Technical Appendix

6.2 Project planning checklist

Data

1. Load			
Motor output	P_m	=	kW
Motor speed			min^{-1}
Output power	P_a	=	kW
Output torque	T_a	=	Nm
Operating time in hours/day	≤ 8h | ≤16h | ≤ 24h		
Torque peaks Ta	T_a	=	Nm
Frequency			/h
Duration			S
Operating frequency			c/h
Inertia of driven machine			kgm^2
Acceleration time			s
Reversing operation			
Backstop required			
2. Speed			
Constant speed			
Variable speed			
Direction of rotation: CW = clockwise			
CCW = counter clockwise			
3. Connection of motor/gear unit			
Geared motor (integrated assembly)			
Gear unit for IEC motors			
Free drive shaft			
Coupling			
V-belt drive:			
Diameter of belt pulley :			
Motor	Ø		mm
Gear unit	Ø		mm
Belt profile			
Number of belts			
Other: please specify			
4. Connection of gear unit/driven machine			
Coupling			
Sprocket, diameter	Ø		mm
Pinion, diameter	Ø		mm
Other : please specify			

6. Technical Appendix

6.2 Project planning checklist

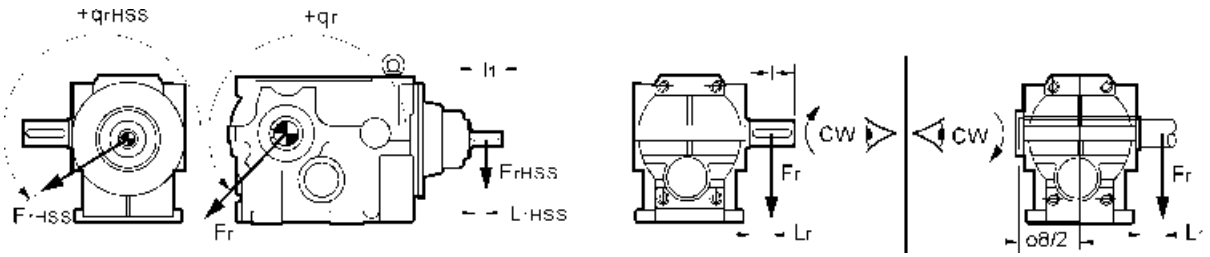
Data

5. External load on output shaft			
Radial load			
Distance between point of action	F_r	=	N
and shaft shoulder	L_r	=	mm
Direction of load (see below)	Qr	=	°
Axial load			
Pointing to the gear unit	F_x	= +	N
Pointing away from the gear unit	F_x	= -	N

6. External load on drive shaft			
Radial load			
Distance between point of action	F_{rHSS}	=	N
and shaft shoulder	L_{rHSS}	=	mm
Direction of load	Q_{rHSS}	=	° Axial load
Axial load			
Pointing to the gear unit	Fx	= +	NP
Pointing away from the gear unit	Fx	= -	N

Definitions :

MK4



6. Technical Appendix

6.2 Project planning checklist

Data

7. Brake

Braking torque TB	T_B	=	Nm
Braking time	T_b	=	s

8. Mounting parameters

Mounting position			
Ambient temperature (°C)	min/max	=	/ °C
Exposure to solar radiation			
Max. noise emission			dB(A)
Measuring distance			M
Environmental conditions			
Air humidity in %			%
Dust			
Aggressive atmosphere, please specify			

Electrical details

AC		DC	V	Hz
3ph	1ph			

Voltage and frequency

Operating mode		S	%
		/	
Type of enclosure	IP		
Insulation class			
Drive: Type			
Order No.:			

Sketch :

6. Technical Appendix

6.2.1 Coating Systems

The standard available coatings for the different types of applications from Premium Stephan are summarized in the following tables. Before the dip primer coating, all castings undergo grit blasting for surface preparation (SA 2 ½). If no special coating is defined, the delivery features system 1 in RAL 5002. For high-quality coatings (4...6), the final color tone can be defined by the customer. If no color tine is specified, the final coating is done in RAL 5002 (blue).

Deviating versions are possible in addition to the listed coatings (e.g. through customer regulations). However, they must be checked by Premium Stephan for feasibility in each case before placing an order. It is possible that it may result in significant deviations with respect to extra prices and delivery time. Please contact us.

Table : 1

System no.:	**0**		**1**		**2**		**3**	
Paint coat								
1	Dip primer coating Color : Red- brown	20 µm	Dip primer coating Color : Red- brown	20 µm	Dip primer coating Color : Red- brown	20 µm	Dip primer coating Color : Red- brown	20 µm
2			1C top coat Color: RAL 5002 Acrylic/PVC	40 µm	1C top coat Color: RAL 7035 Acrylic/PVC	40 µm	1C top coat Color: RAL 7035 Acrylic/PVC	40 µm
3							1C top coat Color: RAL 5002 Acrylic/PVC	40 µm
4								
5								
6								
Total coating thickness		**20 µm**		**60 µm**		**60 µm**		**100 µm**
Additional paint coats							1	
Drying time less than			1 day		1 day		1 day	
Corrosion protection	++		+++		++		++++	
Temperature resistance								
Continuous load up to	100 °C		100 °C		100 °C		100 °C	
Short-term load up to	160 °C		160 °C		160 °C		160 °C	
Chemical resistance	-		+		-		++	
Mechanical resistance	-		+		-		++	
UV resistance	-		+		-		++	
Application	Only S4 - gear heads for assembly center		Standard coating for S4 indoor installation		Pre-coating for final coating at customer		High-quality coating for S4 indoor installation	
Extra price	No		No		No		Yes	

6. Technical Appendix

6.2.1 Coating Systems

Table : 2

System no.:	**4**		**5**		**6**	
Paint coat						
1	Dip primer coat Color: Red-brown	20 µm	Dip primer coat Color: Red-brown	20 µm	Dip primer coat Color: Red-brown	20 µm
2	2C paint base Color: RAL 7035 Polyurethane (Derocryl)	40 µm	2C paint base Color: RAL 7035 Epoxy	40 µm	2C paint base Color: RAL 7035 Epoxy	40 µm
3	2C top coat Color: NKW Polyurethane (Derocryl)		2C paint base Color RAL 7035 Epoxy	40 µm	2C paint base Color RAL 7035 Epoxy	40 µm
4			2C top coat Color: NKW Epoxy	40 µm	2C top coat Color: NKW Epoxy	40 µm
5			2C top coat Color: NKW Epoxy	40 µm	2C top coat Color: NKW Epoxy	40 µm
6					2C top coat Color: NKW Polyurethane (Derocryl)	30 µm
Total coating thickness		**100 µm**		**180 µm**		**210 µm**
Additional paint coats	1		3		4	
Drying time less than	2 days		3 days		4 days	
Corrosion protection	+++++		+++++		+++++	
Temperature resistance						
Continuous load up to	100 °C		100 °C		100 °C	
Short-term load up to	160 °C		160 °C		160 °C	
Chemical resistance	+++		++++		+++++	
Mechanical resistance	+++		++++		+++++	
UV resistance	++++		++++		++++	
Application	Standard coating for S4 outdoor installation		High-quality coating for S4 indoor and outdoor installation at average environmental loads		High-quality coating for S4 indoor and outdoor installation in extremeapplications	
Extra price	Yes		Yes		Yes	

Key				
-	Insufficient		NKW	Per customer request
+	Available			
++	Sufficient			
+++	Satisfactory			
++++	Good			
	Excellent			

6. Technical Appendix

6.2.2 Type of enclosure

The motors correspond to type of enclosure IP55 to IEC 34 - 5 as standard, i.e. they are protected against harmful penetration of dust and water.

The first code number IP5* identifies the protection against harmful dust accumulations inside the motor. The second code IP*5 identifies the protection against the penetration of jet water from all directions. Higher types of enclosure can be supplied upon request.

6.2.3 Insulation class

Proven insulation materials according to class F are used for all motors (limiting temperature 155 °C). However, the actual heating corresponds only to insulation class B (limiting temperature 130 °C). Exception: size 132MG-4G (9 kW).

This ensures high reliability and long service life. It is also possible to operate the motors under special conditions, such as an unfavorable electrical supply, an ambient temperature of 55 °C, or a permanently increased load of up to 110 % of the rated output.

6.2.4 Protection against tropical influences

All motors are designed in type of enclosure IP55 to IEC 34 - 5. They are suitable for use under dusty and humid environmental influences and, to a limited extent, in tropical environments.

If the environmental conditions promote the formation of mildew, algae or condensate, an additional tropical insulation should be provided.

If motors are exposed to humid or condensate-forming conditions for an extended period of time, an electrical space heater (option) is recommended to avoid moisture condensate inside the motor windings. A control device must ensure that the space heater is switched off during operation and switched on during standstill. The standard supply voltage is 230 V ± 10 %.

6.2.5 Protection of motors against non-permissible loads

Selecting the correct protective device largely determines the operational reliability and service life of the motor. Suitable overcurrent release devices (motor protecting switches) are placed in the supply line for direct protection against overload and blocking.

Motors with an output starting at 4 kW are equipped with thermistors (PTC thermistors) as standard. Motors with lower outputs can be supplied with thermistors or thermostats (thermal contacts) upon request (option). Standard motors can be retrofitted with thermostats.

Thermistors (PTC thermistors) are temperature-dependent resistors to IEC 34-11 and DIN 44081 / 44082. Technical data: see below.

Thermostats (thermo switches, thermal contacts) are temperature-dependent bimetal switches. The response temperature is 150 °C and cannot be adjusted. Technical data: see below.

Selecting the correct motor protection is dependent upon the application:

- Possible causes of a thermal overload in each specific application
- Value of product being manufactured
- Costs arising from loss of production
- Possible dangers due to a motor fault

6. Technical Appendix

6.2.6 Type of enclosure

Motor fault	Motor protecting switch		Built into the motor windings	
	Thermal	Magnetic	Thermostats	Thermistors
Continuous overload	G	G	G	G
High operating frequency, unsuitable operating mode	A	A	A	G
Continuous undervoltage or overvoltage or incorrect supply frequency	A	A	G	G
High ambient temperature at motor installation site	P	P	G	G
Insufficient ventilation, blockage of air flow	P	P	G	G
Failure of a supply phase	P	P	A	G
Blockage of rotor	G	G	A	G

Key	
G	Good
A	Acceptable
P	Poor or no protection
Thermistor	Response temperature 160 °C, design to IEC34-11 and DIN 44081 / 44082
Thermostat	Response temperature 150 °C, max. 250 VAC, 1.6 A, cos n_0.6

6.2.7 Safe switching of high inductances

a) Switching of multi-pole motor windings.
Switching a multi-pole motor winding in conjunction with unfavorable conductor routing may lead to voltage peaks that can damage or destroy the winding insulation. It is recommended to equip the supply lines with varistors.

b) Switching of brake coils.
Varistors must be used to avoid damaging switching over voltages when switching brake coils on the DC side. The brake rectifiers and brake controllers used by Premium-Stephan feature varistors as standard. On principle, special braking contactors or contacts of category AC3 according to IEC158 must be used for switching of brake coils.

6.2.8 50-Hz motors on a 60-Hz supply system

Motors dimensioned for 50 Hz can also be operated on 60-Hz supply networks without any problems. In this case, the rated speed increases by 20%. At the same time, current and power factor remain unchanged. The additional information can be found in the table.

Motor winding 50 Hz	**Connection to 60 Hz**	**Power P**	**Torque T**
400 V ± 10 %	380/400 V ± 5 % 50 Hz	0.90 x P(50 Hz)	0.75 x T(50 Hz)
400 V ± 10 %	400 V -10 % / + 25 %	1.00 x P(50 Hz)	0.83 x T(50 Hz)
400 V ± 10 %	440 V -10 % / +15 %	1.10 x P(50 Hz)	0.92 x T(50 Hz)
400 V ± 10 %	460 V ± 10 %	1.15 x P(50 Hz)	0.96 x T(50 Hz)
400 V ± 10 %	480 V - 10 % + 5%	1.20 x P(50 Hz)	1.00 x T(50 Hz)
500 V ± 10 %	500 V -10 % / + 25 %	1.00 x P(50 Hz)	0.83 x T(50 Hz)
500 V ± 10 %	575 V ± 10 %	1.15 x P(50 Hz)	0.96 x T(50 Hz)

6. Technical Appendix

6.2.9 Operation with inverter

The operation of three-phase AC induction motors with frequency inverter (variable voltage and frequency) causes stray losses in the motor. For this reason, it is generally required to reduce the rated torque of the motors so that the permissible winding temperature is not exceeded. An additional reduction of the output is required due to reduced motor speed and, therefore, reduced self-cooling. The output reduction is dependent upon the torque demand of the driven machine and the speed setting range.

For vertical versions with tubing (SCA, SFA, SCP), the output speed ranges according to chapter 7.4.7 must be taken into account. In case of doubt, a consultation with our plant is required.

High speeds

Standard motors can generally also be operated above their rated speed. If standard motors must be operated with frequencies above 60 Hz, please consult our plant.

Power tables

Rated powers of 4-pole motors from the Premium Stephan series are listed for various applications. Data for other pole numbers are available upon request.

The powers apply to correctly installed frequency inverters with characteristics of column A or B.

	A	**B**
Complete harmonic distortion	< 2.5%	< 6%
Maximum peak voltage	1600 V	1400 V
Max. voltage rise du / dt	1.0 kV / s	5.6 kV / s
Max. carrier switching frequency	5 kHz	5 kHz
Max. motor to inverter cable length	30 m	60 M

6.2.10 Standard version

Our motors and geared motors correspond to the relevant standards. The most important ones are:

	IEC (CEI)	DIN	VDE
Rated output	IEC 34 - 1, IEC 85	DIN EN 60034 - 1	VDE 0530 - 1
Dimensions	IEC 72	DIN 42673 / 42677	
Mounting position	IEC 34 - 7	DIN EN 60034 - 7	VDE 0530 - 7
Cylindrical shaft ends	IEC 72	DIN 748 - 3	
Terminal designations	IEC 34 - 8	DIN VDE 0530 - 8	VDE 0530 - 8
Enclosure types (IP code)	IEC 34 - 5	DIN VDE 0530 - 5	VDE 0530 - 5
Cooling types (IC code)	IEC 34 - 6	DIN EN 60034 - 6	VDE 0530 - 6
Noise limits	IEC 34 - 9	DIN EN 60034 - 9	VDE 0530 - 9
Supply voltage	IEC 38	DIN IEC 38	

6. Technical Appendix

6.2.11 Explosion-protected motors

	IEC (CEI)	DIN
General	IEC 79 - 0	DIN EN 50014
Increased safety (EEx e)	IEC 79 - 7	DIN EN 50019
Flame-proof enclosure (EEx d)	IEC 34 - 1	DIN EN 50018
Non sparking (EEx n)		DIN EN 50021
Electrical equipment for use in areas with combustible dust		DIN EN 50281

6.2.12 Thermal standards

Three-phase AC squirrel-cage motors from Premium-Stephan correspond to the thermal regulations of the relevant national and international standards for permissible over temperature.

Standard	**Permissible ambient temperature**	**Permissible over temperature in K (measured using the resistance method) Insulation class**	
	°C	**B**	**F**
DIN, VDE, IEC	40	80	105
British Standards (BS)	40	80	105
Canadian Standards (CSA)	40	80	105
USA (NEMA)	40	80	105
American Bureau of shipping (ABS)	50	75	95
Bureau Veritas (BV)	50	70	90
Det Norske Veritas	45	70	90
Germanischer Lloyd (GL)	45	75	95
Lloyds Register (LR)	45	70	90

6.2.13 Tolerances

The following tolerances apply to the performance specifications of electrical machines to DIN EN 60034:

- Efficiency 0 — - 0.15 (1 - 0) — for rated outputs $\leq$ 50 kW
  - - 0.10 (1 - 0) — for rated outputs > 50 kW
- Power factor cos n: - (1-cos n) / 6
- Slip: ± 20 % — for rated outputs > 1 kW
  - ± 30 % — for rated outputs 1 kW
- Starting current: + 20%
- Starting torque: - 15% ... + 25%
- Mass moment of inertia: ± 10%
- Sound pressure level: + 3 dB(A)

6. Technical Appendix

6.2.14 Calculation of maximum permissible operating frequency of motors:

The maximum permissible operating frequency of a brake motor is dependent upon:
- the size of the accelerated mass moments of inertia
- the relative operating time
- the relative load, i.e. the ratio of actual output power and
- rated output of the motor
- load torque during acceleration

The no-load operating frequency listed in the tables can be converted to the actual application using the following formula :

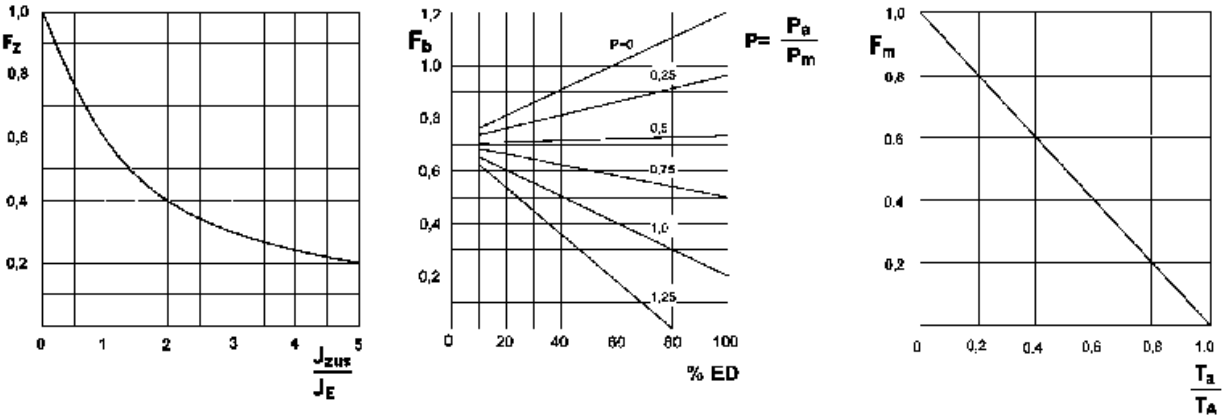
$$Z = Z_o \times F_z \times F_b \times F_m$$

F_z	Dependent upon additional mass moment of inertia
F_b	Dependent upon output and operating time
F_m	Dependent upon load torque
Z_o	No-load operating frequency at 60% operating time
JE	Mass moment of inertia of the motor
J_{zus}	Mass moment of inertia of driven machine referenced to the motor shaft
T_a	Load torque
TA	Acceleration torque (motor)
ED	Operating time

$$\text{whereby } P = P_a / P_m$$

P_a	Power demand after completed acceleration
P_m	Rated motor output

Technical Appendix



6.2.15 Spring-applied single-disk safety brake for direct current and dry run

In the electromagnetic single-disk brake, the braking force is applied through springs and the brake is electrically released. In case of a power failure, the brake is applied. This allows it to meet the predetermined safety require- ments. The brakes can be supplied with a manual release upon request.

The brakes are manufactured and tested according to VDE 0580 and correspond to CENELEC Memorandum no. 3, part 3, par. 2.3 of the EC safety directives.

6. Technical Appendix

6.2.15 Spring-applied single-disk safety brake for direct current and dry run

In the electromagnetic single-disk brake, the braking force is applied through springs and the brake is electrically released. In case of a power failure, the brake is applied. This allows it to meet the predetermined safety requirements. The brakes can be supplied with a manual release upon request.

The brakes are manufactured and tested according to VDE 0580 and correspond to CENELEC Memorandum no. 3, part 3, par. 2.3 of the EC safety directives.

Standard voltages:

102 VDC / 230 VAC	for motor output up to 3 kW
178 VDC / 400 VAC	for motor output starting at 4 kW

Other voltages can be supplied and must be specified when ordering.

Technical data:

The response times apply to normal operating temperatures and rated voltage with adjusted gap. The values listed are subject to the regular tolerances.

t_1 *(operating time)* is the time from switching on the voltage to the drop-off of the brake torque to 10% of the rated torque T_B.

t_2 *or* t_3 *(breaktime)* is the time from switching off the voltage to an increase of the brake torque to 90% of its rated value. t_2 applies to switching on the DC side, t_3 to switching on the AC side.

T29The brakes correspond to enclosure type IP55 and, therefore are protected against damaging dust accumulations and jet water.

P_R is the permissible braking energy in Joule per second. The permissible braking energy per braking W_{Rmax} is dependent upon the operating frequency. The listed values apply to a motor speed of 1500 min^{-1}.

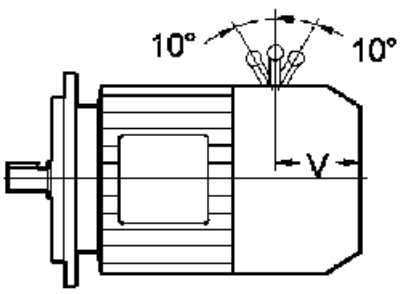
The dynamic braking torque TB applies to dry run, run in brake and normal operating conditions. The braking torque decreases with increasing motor speed.

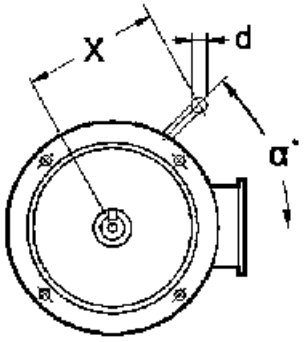
If the friction areas contain oil or grease, the braking torque is reduced down to 50%. If the brake is not run in, the braking torque may be 20% less than the rated torque.

6.2.16 Brake kit

Standard motors of size 63 to 180 can be converted to brake motors. *Brake kits* are available for this purpose. The brake hub is installed on the motor shaft to ensure an operationally reliable design. Only the plastic fan blade is driven by a screw-in shaft.

Position of the manual release lever





6. Technical Appendix

Motor Size	Brake Size	TB Nm	"0	X mm	d mm	Vmm
63	08	4	0	85	25	75
71	08	4	0	85	25	75
80	10	10	0	98	25	91
90	13	20	0	117	25	93
100	15	40	30	128	32	97
112	15	40	30	128	32	115
132	20	80	30	166	40	122
160	23	150	30	210	40	161
180	26	240	30	230	40	183
200 / 225	458-25	400	0	500	24	
250 / 280	Upon request					

6.2.17 Brake data

Motor Size	Brake Size	T_B Nm	$n_{max.}$ min^{-1}	P_R J/ s	W_{Rmax} J	W_{RN} J	P_{zo} W	t_1 ms	t_2 ms	t_3 ms	J_1 kg*cm²	m kg
63	08	5	10000	80	3×10^3	5×10^7	22	35	30	70	0,15	0,8
71	08	5	10000	80	3×10^3	5×10^7	22	35	30	70	0,15	0,8
80	10	10	5400	100	6×10^3	12×10^7	28	45	45	95	0,45	1,4
90	13	20	5400	130	12×10^3	20×10^7	34	60	60	140	1,72	2,5
100	15	40	4000	160	25×10^3	35×10^7	42	80	75	175	4,5	4,0
112	15	40	4000	160	25×10^3	35×10^7	42	80	75	175	4,5	4,0
132	20	100	3500	250	50×10^3	125×10^7	100	160	120	280	12,2	10
160	23	150	3000	300	75×10^3	200×10^7	150	200	150	350	28,5	12.6
180	26	250	3000	350	105×10^3	340×10^7	250	220	180	500	66,5	19,5
200	458-25	400	3000	520	125×10^3		110	110	375	950	200	29
225	458-25	400	3000	520	125×10^3		110	110	375	950	200	29
250	Upon request											
280	Upon request											

T_B	Rated torque
$n_{max.}$	Max. speed
P_R	Max. friction power
W_{Rmax}	Max. friction energy per operation
W_{RN}	Friction energy until re-adjustment
P_{zo}	Coil power
t_1	Operating time
t_2	Break time (switching on DC side)
t_3	Break time (switching on AC side)
J_1	Moment of inertia of the brake
m	Weight

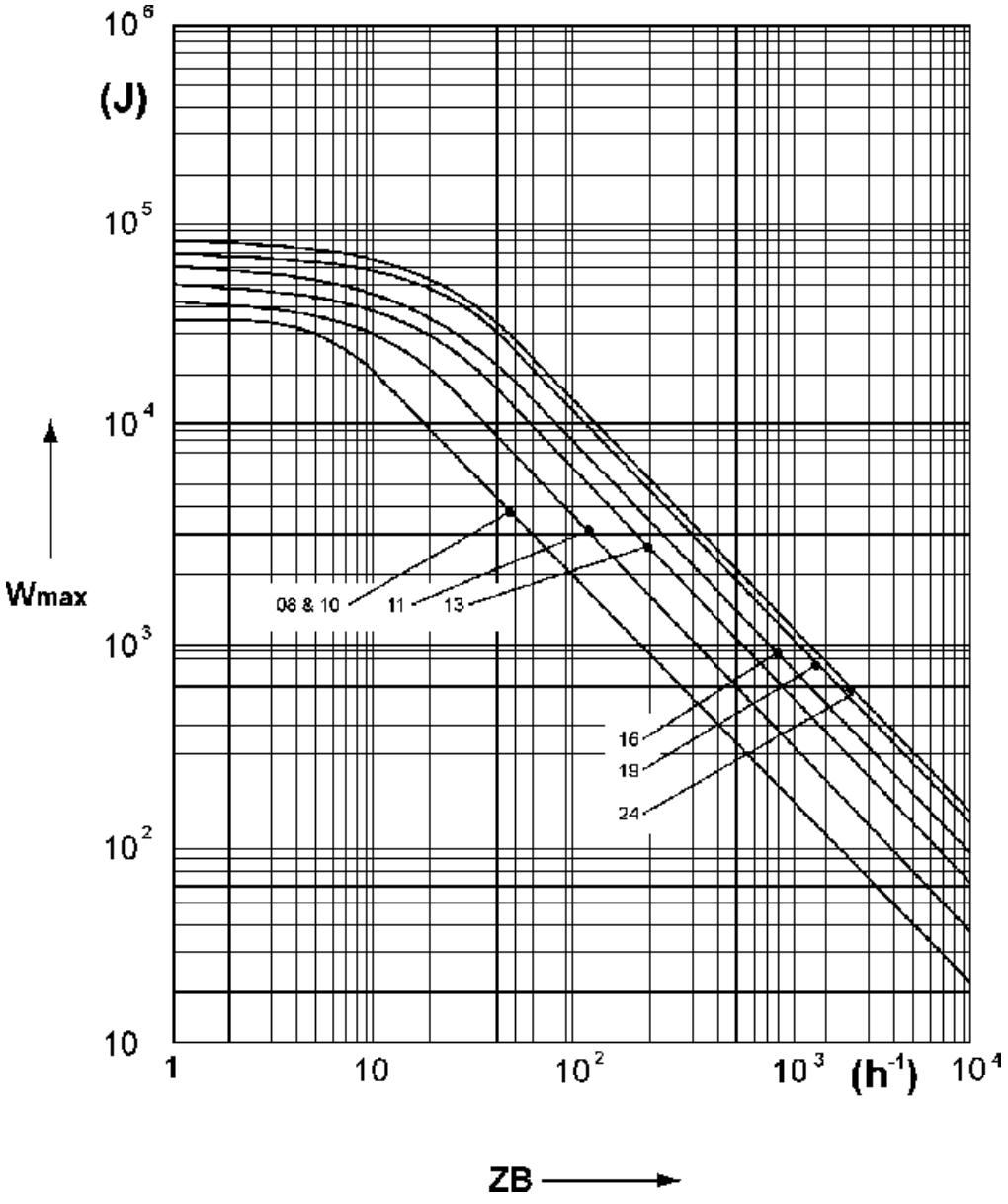
6. Technical Appendix

6.2.18 Power capability per braking

In general, the permissible operating frequency of a brake motor is limited by the heating of the motor. The brake output should be determined for each braking W for control purposes.

$1W = 0.0055 \times n^2 \times (J_{zus} + JE)$

The permissible value W_{Rmax} can be found in the diagram.



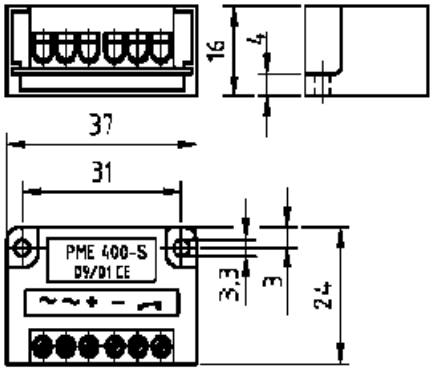
6. Technical Appendix

6.2.19 Brake rectifier

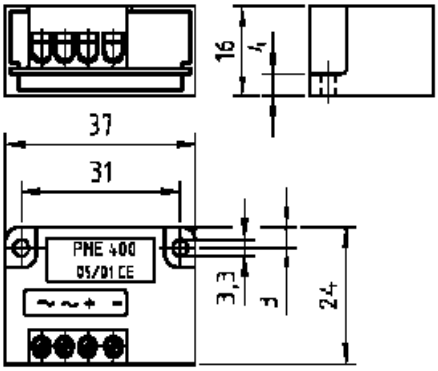
The brake rectifiers being used generate the necessary direct voltage (DC) for operating the brake from the AC supply voltage (AC).

Dependent upon the voltage applied, one-way or bridge rectifiers are used. The brakes are usually switched on the AC side. However, the brakes can also be switched on the DC side for short brake application times. For this purpose, the built-in switching bridge must be removed.

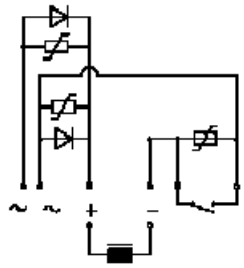
Rectifier for switching at the DC side or at the AC side



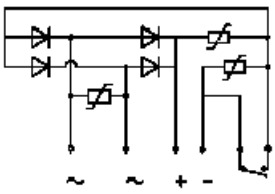
Rectifier for switching at the AC side



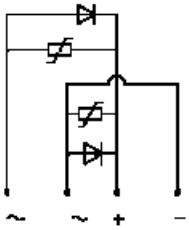
Half wave rectifier
Switching at the DC side
PME 400-S



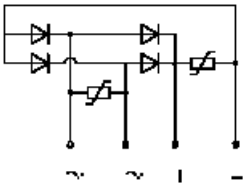
Full wave rectifier
Switching at the DC side
PMB 400 – S



Half wave rectifier
Switching at the AC side
PME 400



Full wave rectifier
Switching at the AC side
PMB 400



6.2.20 Tachometer generator

T33If speed control or synchronous control is required, the motors can be equipped with tachometer generators or pulse generators.

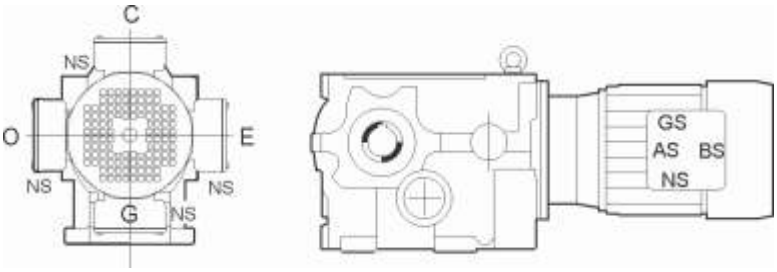
6. Technical Appendix

Notizen / Notice / Notes :

6. Technical Appendix

6.2.21 Terminal box position

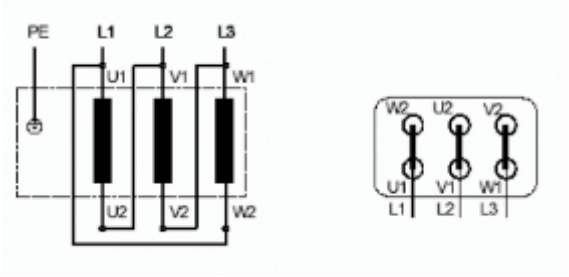
MK4



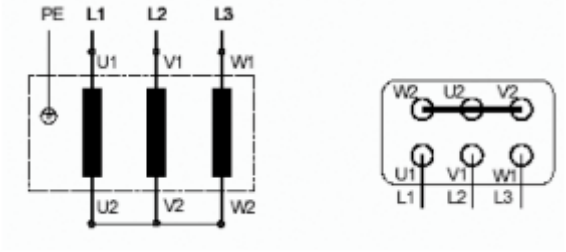
The terminal box position is independent of the mounting position. The normal position is "O". The cable entry is arranged in position "NS" as standard.

6.2.22 Connection diagrams

Motor connection diagrams



Delta Connection - Low Voltage



Star Connection - HIgh Voltage

Connection designations of add-on devices

	IEC standard	UK standard
PTC thermistor	10 - 11	TP1 - TP2
Thermal contacts (NC contact)	20 - 21	TB1 - TB2
Thermal contacts (NO contact)	30 - 31	
Magnetic brake	60 - 61	BR1 - BR2
Space heater	70 - 71	H1 - H2
Three-phase AC external fan	U - V - W	
Single-phase external fan	U1 - U2	

6.2.23 2nd shaft end

The motors can be supplied with a second shaft end upon request. Please contact us.

6.2.24 Plug connectors (Harting)

The motors can be supplied with plug connectors upon request. Please contact us.

6. Technical Appendix

6.2.25 Cast iron fan

The motors can be supplied with cast iron fan upon request. Please contact us.

6.2.26 Cable entries

Size	Cable entry
63 to 90	1 x M20X1.5
100	1 x M20X1.5
112 to 132	1 x M25X1.5
160 to 180	2 x M32X1.5

Cable entries are closed during transport.
Screwed cable glands are not part of the scope of delivery!

6.3.1 Technical Appendix, Mechanical

6.3.2 Backstops in the input lantern

Backstops are used to limit the direction of rotation to a freely selectable direction of rotation. In the opposite direction, backstops act as a blocker. Backstops are frequently used for conveyor drives that are operated in a tilt position or for fan drives. In both cases, there is only one free direction of rotation, whereby a spinning of the drive is desired for the opposite direction.

In certain applications, backstops can be an alternative to an electromagnetic brake on the motor.

The backstops are placed at the drive shaft (U/L-lantern) between the regular bearing and are mounted dependent upon the desired free direction of rotation according to the order. The free direction of rotation must be specified at ordering.

If speed-disengaging backstops are used, this safety component needs to be checked only every 6 000 operating hours or no later than every 3 years. The system operator must take all the necessary safety precautions to avoid failure of the backstop that may result in personal injuries and/or damages to the drive unit and/or the application.

It is necessary to replace the backstop under the following conditions:

- In the event of observing unusually high wear of the gear unit.
- When the oil in the gear unit is contaminated.
- In the event of unusually high load.

This may have had an adverse effect on the condition of the clamping elements and bearing races in the integrated backstop.

CAUTION!

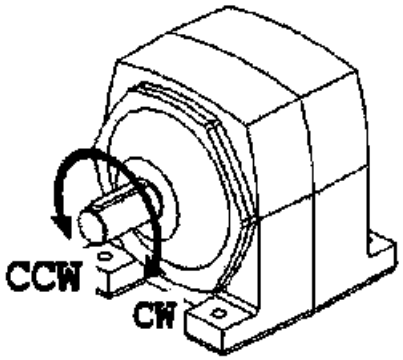
Only authorized, qualified personnel is permitted to replace the backstop or change the direction of rotation of the backstop while complying with the operating instructions for the respective backstop.

Never loosen or release any part of the backstop facility while the drive is under load: This could affect the reversal action of the drive and load; the drive unit must be in a no-load condition and secured against inadvertent movements.

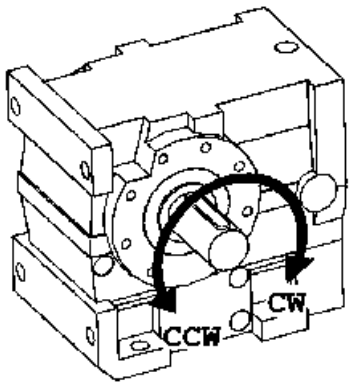
6.3.3 Indication of output rotating direction when using backstops

For the order of a gearbox with backstop you have to indicate the required direction of rotation, viewed at output shaft on output side of gearbox. For drives with left and right output shaft the direction of rotation is given viewed at side L. To avoid damage to the gearbox or the unit , the direction of rotation needs to be checked before operating.

6. Technical Appendix



CW = rotation right, CCW = rotation left



CW = rotation right, CCW = rotation left

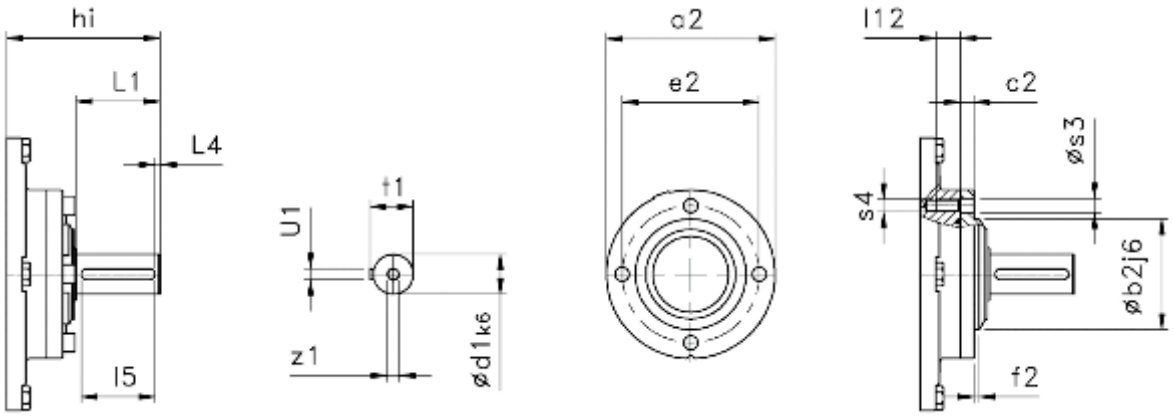
6.3.4 Motor base versions

Our motor base version is a special variant to connect or drive a gear unit with a motor by means of belt drive. This provides the following advantages:

- Compact version - an advantage, for example, if structural conditions do not allow for an integral mounting of the motor.
- After installing the drive in the machine or system, the total gear ratio can be adjusted using a simple change in the belt drive gear ratio.

6.3.5 Gear unit with free drive shaft

All gear units of the S4 family can also be designed with free drive shaft. In this case, there is a standard for the shaft dimensions of the drive shaft dependent upon the gear unit type (MI4) and the gear unit size. This standard is also shown in the dimensioned drawings of the gear units. In addition to these standard dimensions, alternate dimensions are possible or even required, based on applied external loads. The following table provides an overview of the options in the design of the drive shafts. Lines with a light-gray background contain the values for our standard dimensions.



6. Technical Appendix

Mounting flange

Gear unit connection	Mounting dimensions								Mounting flange on the drive end							
	$Ød_1$	L_1	L_4	l_5	t_1	U_1	z_1	h_i	a_2	b_2	e_2	f_2	c_2	l_{12}	S_4	s_4
	mm	mm	mm	mm	mm	mm	mm	mm	mm	j6	mm	mm	mm	mm	mm	mm
S115	**19**	**40**	**4**	**32**	**21.5**	**6**	**M6x16**	**110.5**	**130**	**85**	**105**	**14**	**11**	**19**	**11**	**M10**
	28	60	5	50	31	8	M10x22	110.5	130	85	105	14	11	19	11	M10
S162	19	40	4	32	21.5	6	M6x16	101.5	130	85	105	14	11	19	11	M10
	28	**60**	**5**	**50**	**31**	**8**	**M10x22**	**121.5**	**130**	**85**	**105**	**14**	**11**	**19**	**11**	**M10**
	38	80	5	70	41	10	M12x28	158	160	105	130	13	13	23	13.5	M12
S235	28	60	5	50	31	8	M10x22	109.5	130	85	105	14	11	19	11	M10
	38	**80**	**5**	**70**	**41**	**10**	**M12x28**	**146**	**160**	**105**	**130**	**13**	**13**	**23**	**13.5**	**M12**
S300	38	80	5	70	41	10	M12x28	138	160	105	130	13	13	23	13.5	M12

T43For permissible loads at the drive shaft please contact *Premium-Stephan*.

Gear unit connection - Dimensional assignment

Gear unit connection	MI4
S115	MK..2.
S162	MK..3 / MK..4
S235	MK..5 / MK..6
S300	MK..7

For permissible loads at the drive shaft please contact *Premium-Stephan*.

6.3.6 Noise level

This chapter discusses the noise levels (sound pressure levels) of the S4 gear unit series of size 1 to 9. design index 6 and 7. Motor noises are not taken into account.

Table 1 listed below shows sound pressure level Lp' that can be expected with high probability for standardized conditions. Slight deviations are possible due to manufacturing tolerances.

To obtain values from other conditions, correcting factors must be added according to Tables 2-4.

$$L_p = L_p' + K_1 + K_2 + K_3$$

If the noise level must be guaranteed, 3 dBA must be added at the top tolerance limit. See also the attached examples.

The listed values refer only to the gear units and are intended for an initial orientation. Lower values are partially possible for the noise level. Please contact us.

Sound pressure under standardized conditions:

Table 1 shows values and tolerances for sound pressure Lp' in dBA at a distance of 1 meter from the gear unit (Input speed n1 = 1500 1/min gear ratio i = 11.2). The reference power is dependent upon the service factor SF.

6. Technical Appendix

Table -1

Gear unit size	for SF = 2: Consumed power in kW for SF > 2: Half the catalog power data, ½ P in kW							
	1 kW	2 kW	5 kW	10 kW	20 kW	50 kW	75 kW	100 kW
1...4	58 +/- 1	62 +/- 1	66 +/- 1.5	69.5 +/- 1.5	73 +/- 2			
5...7	57 +/- 1	61 +/- 1	65 +/- 1.5	68.5 +/- 1.5	72 +/- 2	77 +/- 2	79 +/- 3	
8...9	56 +/- 1	60 +/- 1	64 +/- 1.5	68.5 +/- 1.5	71 +/- 2	76 +/- 2	78 +/- 3	80 +/- 3

Correcting factor for non-standard conditions:

Table 2: Correcting factor K_1 in dBA for distance from gear unit

Gear unit size	Distance from gear unit [m]					
	1 m	3 m	5 m	10 m	30 m	50 m
1...4	0	-6	-10	-16	-26	-30
5...7	0	-5	-9	-15	-25	-29
8...9	0	-4	-8	-14	-24	-28

Table 3: Correcting factor K_2 in dBA for input speed n1

Gear unit size	Input speed n_1 [1/min]						
	500 RPM	750 RPM	1000 RPM	1500 RPM	1800 RPM	2400 RPM	3000 RPM
1...9	-7	-5	-3	0	+1.5	+5	+8

Table 4: Correcting factor K_3 in dBA for gear ratio

Gear unit size	Gear unit ratio i	
	2.8...10	>= 11.2
1...9	+2	0

Examples

Example 1

MIB304F132MF02500S, consumed power P_a = 7.5 kW
Expected sound pressure level at 1 meter?
Service factor SF=1.2 ' use consumed power according to Table 1 (interpolate and round the values)
Lp' = (67.8 +/- 1.5) dBA
Distance = 1 m, n1 = 1500 1/min i = 11.2 ' K_1=K_2=K_3 = 0
$L_p = L_p'$
Guaranteed value = (67.8 + 1.5 + 3) dBA = 72.3 **dBA**

6. Technical Appendix

6.3.7 Mass moments of inertia J (10^{-3} kgm^2)

The listed values each refer to the drive shaft of the gear unit.

MI4

3-stage gear units J (10^{-3} kgm^2)

	Size					
i_N	MK.302	MK.303	MK.304	MK.305	MK.306	MK.307
7.1	0.232					
8	0.185	0.473	2	5.4		
9	0.165	0.403	1.55	4.9	8.2	18.5
10	0.133	0.313	1.3	4.1	7.3	15.5
11.2	0.106	0.267	1.05	3.3	6	12
12.5	0.24	0.225	0.88	2.6	4.7	9.7
14	0.202	0.535	1.7	4.8	3.7	8.3
16	0.187	0.475	1.35	4.4	3.1	6.7
18	0.161	0.398	1.1	3.7	6.3	15.5
20	0.139	0.359	0.891	2.95	5.6	13.5
22.4	0.129	0.322	0.768	2.35	4.7	10.5
25	0.12	0.307	0.609	2	3.7	8.4
28	0.105	0.26	0.52	1.6	2.95	7.2
31.5	0.0984	0.253	0.439	1.4	2.45	5.8
35.5	0.086	0.228	0.392	1.2	1.95	4.7
40	0.0827	0.208	0.305	0.984	1.65	4
45	0.0761	0.198	0.271	0.854	1.45	3.2
50	0.0717	0.183	0.218	0.675	1.15	2.95
56	0.0676	0.173	0.179	0.516	1	2.5
63	0.0646	0.165	0.154	0.48	0.792	1.9
71	0.0617	0.158	0.119	0.4	0.646	1.55
80	0.0586	0.151	0.108	0.33	0.598	1.3
90	0.0567	0.147	0.0819	0.3	0.504	1.15
100	0.0494	0.142	0.069	0.237	0.42	0.918
112	0.049	0.137	0.0591	0.211	0.383	0.809
125	0.0486	0.134	0.0498	0.159	0.31	0.608
140	0.0483	0.121	0.0137	0.137	0.28	0.523
160			0.0119		0.22	0.442
180			0.00895		0.195	
200						

6. Technical Appendix

6.3.8 External loads at the output shaft

Calculation

Occurring radial load

The radial load exerted through a power transmission element is derived from the following formula:

$$F_r = \frac{9550 \times P_a \times f_r}{n_2 \times r} \quad \text{or} \quad F_r = \frac{T_a \times f_r}{r}$$

whereby

F_r = calculated radial load (N)
T_a = output torque (Nm)
n_2 = output speed (min-1)
r = pitch circle radius of power transmission element (m)
f_r = factor for the radial load
= 1 for a sprocket (single string)
= 1.25 for a gear wheel or sprocket (double string)
= 1.5 for a V-belt pulley
= 2.5 for a flat belt pulley

6. Technical Appendix

Point of action of the radial load

The distance of the point of action to the shaft shoulder must be as small as possible.
The following tables provide the permissible rated external loads (FrN) at four different points of action. For other points of action, the values can be determined through interpolation.

Check:

Check whether $F_rN = F_r \times SF_{min}$

whereby

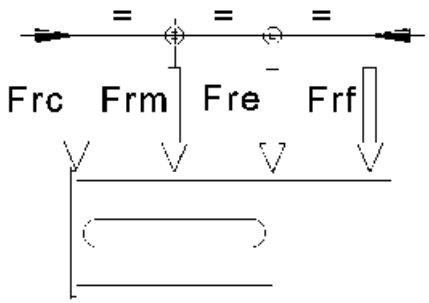
SF_{min} = required Service Factor

F_{rN} = permissible rated external load

Permissible rated external loads F_{rN*} (N) at the output shaft for multi-stage gear units (entire S4 family).

Point of action Ar

n_2	Ar	Size					
min-1		MK02	MK03	MK04	MK05	MK06	MK07
	A_{rc}	1.25	1.25	1.25	1.25	1.25	1.3
<20	A_{rm}	1	1	1	1	1	1
	A_{re}	0.5	0.5	0.8	0.85	0.65	0.6
	A_{rf}	0.3	0.3	0.55	0.6	0.45	0.45
	A_{rc}	1.25	1.25	1.25	1.25	1.25	1.25
45	A_{rm}	1	1	1	1	1	1
	A_{re}	0.5	0.5	0.8	0.85	0.75	0.8
	A_{rf}	0.3	0.3	0.55	0.6	0.5	0.55
	A_{rc}	1.25	1.25	1.25	1.25	1.25	1.25
60	A_{rm}	1	1	1	1	1	1
	A_{re}	0.5	0.5	0.8	0.85	0.8	0.85
	A_{rf}	0.3	0.3	0.55	0.6	0.55	0.55
	A_{rc}	1.25	1.3	1.25	1.25	1.25	1.25
75	A_{rm}	1	1	1	1	1	1
	A_{re}	0.75	0.55	0.85	0.85	0.85	0.85
	A_{rf}	0.45	0.35	0.6	0.7	0.6	0.6
	A_{rc}	1.25	1.25	1.25	1.25	1.25	1.25
95	A_{rm}	1	1	1	1	1	1
	A_{re}	0.8	0.6	0.8	0.85	0.85	0.8
	A_{rf}	0.5	0.4	0.6	0.7	0.65	0.65
	A_{rc}	1.2	1.2	1.25	1.25	1.25	1.25
150	A_{rm}	1	1	1	1	1	1
	A_{re}	0.85	0.7	0.85	0.85	0.85	0.85
	A_{rf}	0.65	0.45	0.6	0.7	0.7	0.7
	A_{rc}	1.25	1.15	1.25	1.25	1.25	1.25
240	A_{rm}	1	1	1	1	1	1
	A_{re}	0.85	0.8	0.85	0.85	0.85	0.85
	A_{rf}	0.75	0.55	0.7	0.7	0.7	0.7



$F_{rc} = F_{rN} \times A_{rc}$

$F_{rm} = F_{rN} \times A_{rm}$

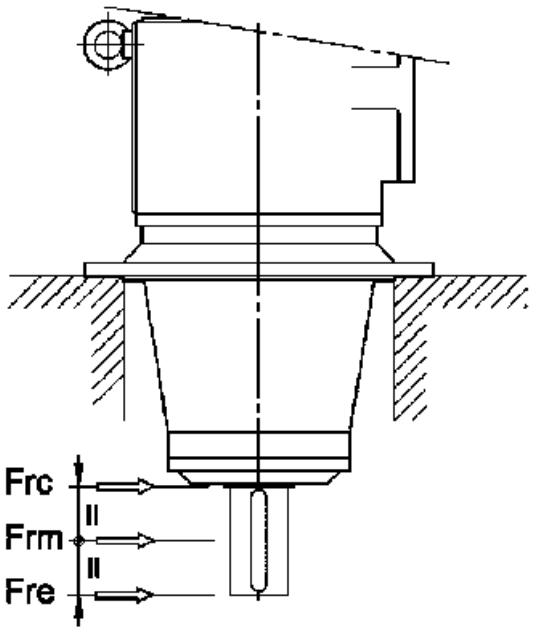
$F_{re} = F_{rN} \times A_{re}$

$F_{rf} = F_{rN} \times A_{rf}$

6. Technical Appendix

Permissible rated external loads FrN (N) at the output shaft for multi-stage gear units with elongated bearing casing (MI4 only)

		Version MIBA - MIVA for MI4	
n_2	F_{rN}	Size	
min $^{-1}$	(N)	MK.204	MK.304
	F_{rc}	32500	19000
≤ 60	F_{rm}	15000	8900
	F_{re}	9900	5800
	F_{rc}	32500	19000
75	F_{rm}	15000	8900
	F_{re}	9900	5800
	F_{rc}	28000	15500
95	F_{rm}	13500	6500
	F_{re}	9000	5000
	F_{rc}	26000	-
150	F_{rm}	13500	-
	F_{re}	9000	-
	F_{rc}	26000	-
240	F_{rm}	13500	-
	F_{re}	9000	-



$F_{rc} = FrN \times A_{rc}$

$F_{rm} = FrN \times A_{rm}$

$F_{re} = FrN \times A_{re}$

6.3.9 Installation, General Conditions

The drive units must be installed or attached free of vibration or mounted on a flat, rigid and solid frame or foundation in order to avoid vibrations.

CAUTION!
The drive units must be aligned with utmost care! Stress and strain in the housing must be avoided.

To align the gear unit, place it on 3 of the 4 mounting points and use shims to match the fourth point to an accuracy of less than 0.2 mm.

6. Technical Appendix

After the gear unit has been aligned correctly and after the shims have been fitted, the gear unit must be firmly screwed down to the foundation. Screw class 8.8 in accordance with DIN 267. Screw size: see dimensional drawings. The screws must be tightened to the torque requirements as specified by the manufacturer. Trouble-free lubrication and ventilation are ensured only when the gear unit is mounted in the correct position.

It is necessary to correct the amount of lubricant and the position of the breather screw if the mounting position of the gear unit is changed.

Before start-up, check the position-dependent oil level by loosening the oil level plug of the drive unit.

CAUTION!
Sizes 1 and 2 are lubricated for life. In this case, the surface temperature and the noise level emitted by the gear unit must be constantly monitored during the procedure.

Intermediate inserts or pads made of plastic must be used if there is a risk of electrochemical corrosion between the gear unit and system. Gear unit casings must be grounded.

The cooling air intake of the motor must not be obstructed.

6.3.10 Mounting power transmission elements

Observe the operating instructions provided with the power transmission elements. Use elastic couplings for direct power transmission from gear unit to driven machine, while slip couplings are required in case of a blocking risk. Only use rigid couplings in connection with unsupported or overhanging shafts (e.g. with agitators or aerators).

Due to the radial loads that occur, power transmission elements such as flat belts or V-belts, gearwheels and sprockets, cranks, eccentric cams etc. are to be arranged as close to the gear unit housing as possible. Consequently, the bearings and drive shaft are then subject to the lowest load. Refer to the technical sales documentation for the maximum permissible load values.

The protective coating on the end of the shaft must be removed by suitable means prior to mounting the transmission elements. The same procedure applies for transmitting the drive power to the gear unit in connection with a free drive shaft. Great care must be taken while fitting power transmission elements onto the ground output shaft of the gear unit, and can be carried out using the threaded hole provided for this purpose on the end face of the shaft. Preferably, the power transmission element should be heated to a temperature of approx. 100 C°. The hole is to be dimensioned in accordance with ISO H7. All parts must be thoroughly deburred, cleaned and the fit locations lightly greased. Avoid all knocks and impact to the end of the shaft.

6.3.11 Mounting coupling on output shaft

Observe the operating instructions from the coupling manufacturer.

Accurate alignment and regular inspection are necessary.

The maximum permissible shaft extensions of the coup- ling used must be maintained and checked.

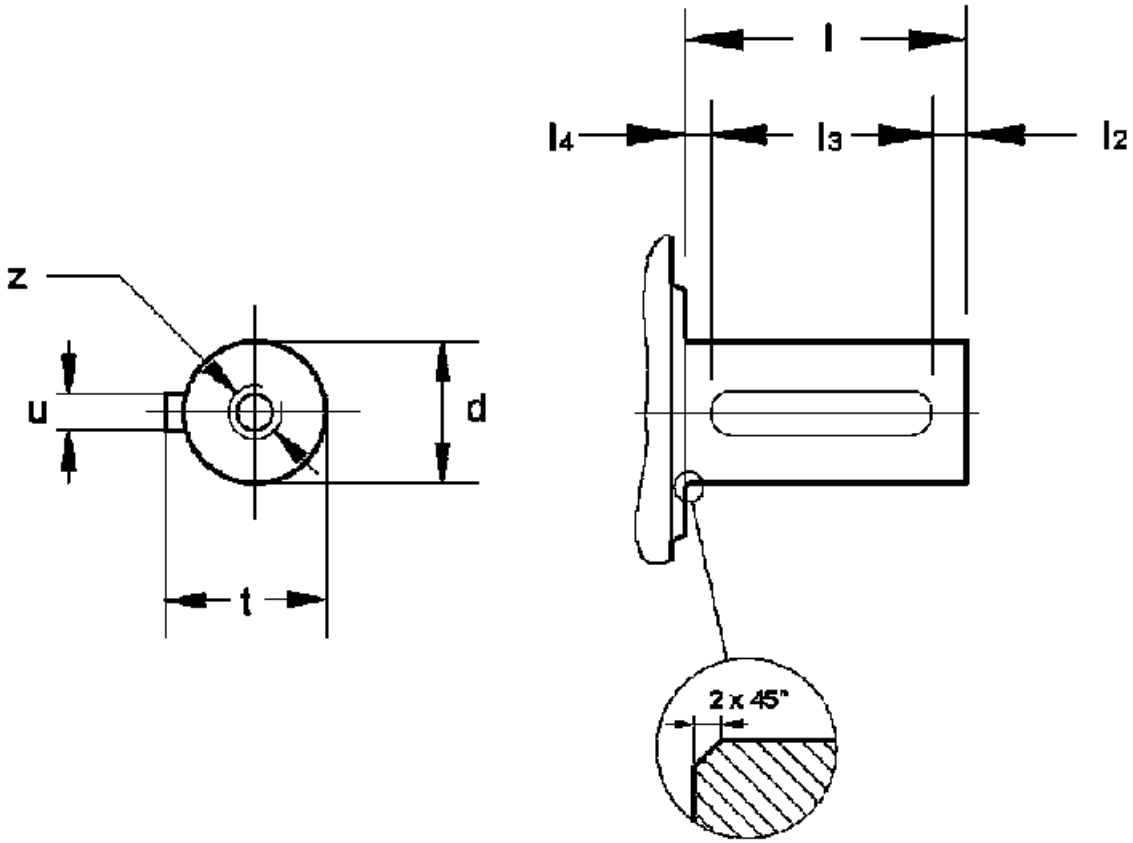
The specified distance between the coupling halves should be maintained.

Only adjust the radial offset after the angle offset and the distance between the shaft ends have been checked.
Recheck the angle offset after correcting the radial offset.

6. Technical Appendix

6.3.12 Mounting gear units with solid shaft

Shaft dimensions



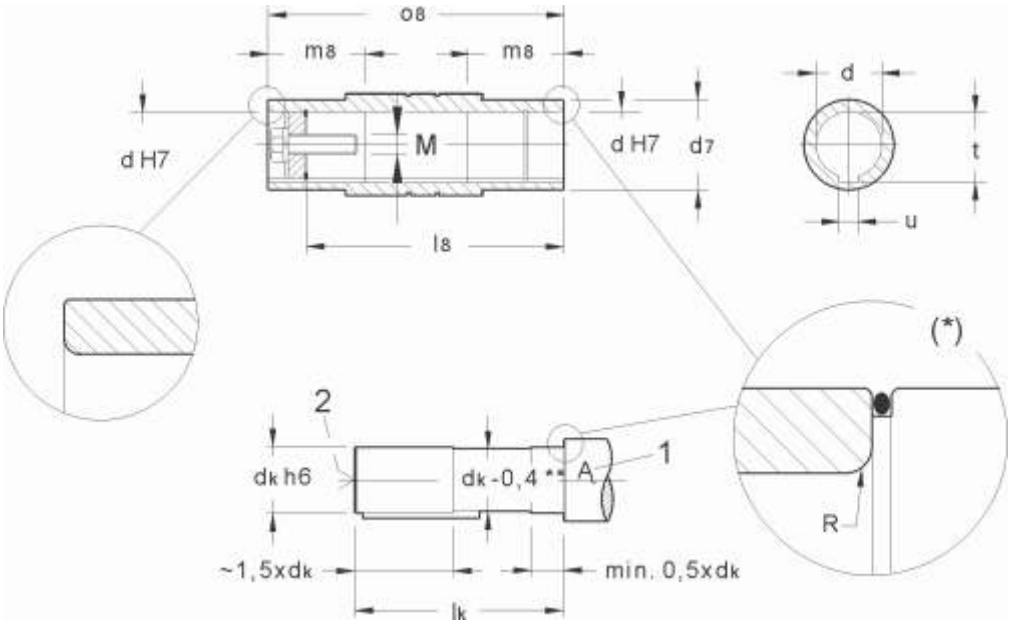
Size	d	L	l_2	l_3	l_4	t	u	z
MK02	30k6	60	3,5	50	6,5	33	8	M10x22
MK03	40k6	80	2	70	8	43	12	M16x36
MK04	50k6	100	10	80	10	53,5	14	M16x36
MK05	60m6	120	5	110	5	64	18	M20x42
MK06	70m6	140	4	125	11	74,5	20	M20x42
MK07	90m6	170	5	153	12	95	25	M24x50

Feather key to DIN 6885-T1-"Form A"

6. Technical Appendix

6.3.13 Mounting shaft-mounted geared motors with hollow shaft with keyway

Shaft dimensions



Size	d	d_7	l_8	M	m_8	o_8	R	t	u	d_k	L_k
MK02	35	50	132	M12	50	150	3	38.3	10	35	109
MK03	40	55	156	M16	60	180	3	43.3	12	40	127
MK04	50	70	183	M16	65	210	4	53.8	14	50	154
MK05	60	85	210	M20	75	240	4	64.4	18	60	174
MK06	70	100	270	M20	80	300	4	74.9	20	70	234
MK07	90	120	313	M24	90	350	4	95.4	25	90	279

1: Driven machine drive shaft

2: Centering to DIN 332 "Form D"

(*) An O-ring is recommended to provide increased protection against moisture.

The dimensions apply to the hollow shaft.

** Recommended for simple mounting. Keyways to DIN 6885-T1-"Form A"

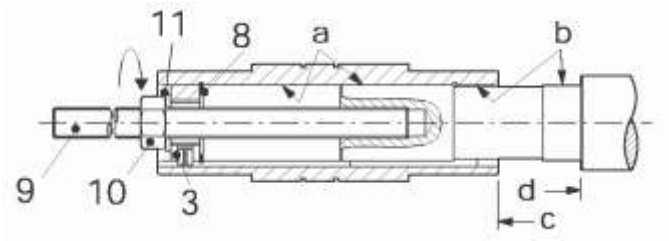
Feather key to DIN 6885-T1-"Form A"

T57Occurring loads must be considered for the selection of the material of the machine shaft.

6. Technical Appendix

Assembly

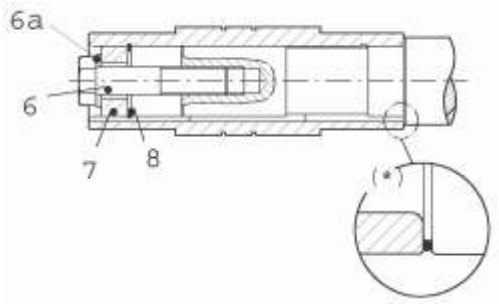
- Clean and degrease contact surfaces (a) and (b).
- Grease contact surfaces (a) and (b) with "Molykote D321R" or an equivalent lubricant.
- Slide the geared motor onto the driven shaft until the faces (c) and (d) are positioned opposite each other.
  Fit a threaded rod (9), nut (10), puller ring (11), thrust washer (3) and a retaining ring (8) as required.
- Remove tools (3, 9, 10, 11).



Mounting

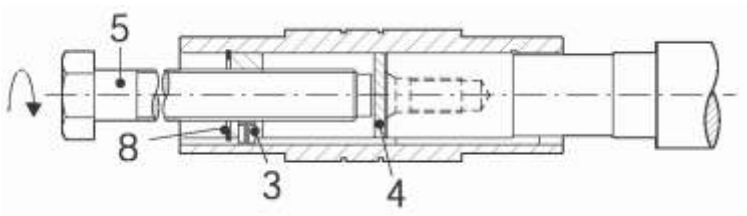
- Fit the mounting ring (7) against the retaining ring (8). Secure the machine shaft by means of mounting screw (6) and washer (6a).
- Fit protective cover.
- If the shaft is subject to external axial loads, follow the special guidelines provided on the dimensioned drawing.

(*) An O-ring is recommended to provide increased protection against moisture.



Disassembly

- Remove mounting screw (6), washer (6a), mounting ring (7) and retaining ring (8).
- Fit pulling washer (4) and thrust washer (3) and reinstall retaining ring (8).
- Fit pulling screw (5) in threaded center of thrust washer (3).
- Remove the geared motor from the drive shaft by tightening the screw (5).



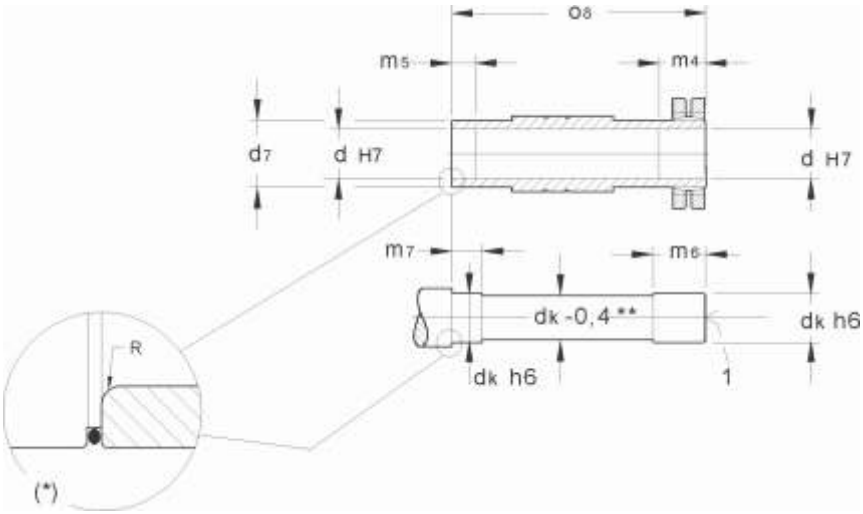
Note :

Items 3, 4, 5, 9, 10 and 11 do not belong to the standard scope of delivery, however, they are optionally available in the form of an assembly kit.

6. Technical Appendix

6.3.14 Mounting shaft-mounted geared motors with hollow shaft with shrink-fit ring

Shaft dimensions



Size	d	d_k	d_7	m_4	m_5	m_6	m_7	o_8	R
MK02	35	35	50	32	20	37	25	177	3
MK03	40	40	55	38	20	43	25	208	3
MK04	50	50	70	36	25	41	30	241	4
MK05	65	65	85	41	40	46	30	281	4
MK06	75	75	100	55	50	60	55	345	4
MK07	95	95	120	65	60	75	70	405	4

1) Centering to DIN 332 "Form D" recommended for simple assembly/disassembly

(*) An O-ring is recommended to provide increased protection against moisture.

The dimensions apply to the hollow shaft.

** Recommended for simple mounting.

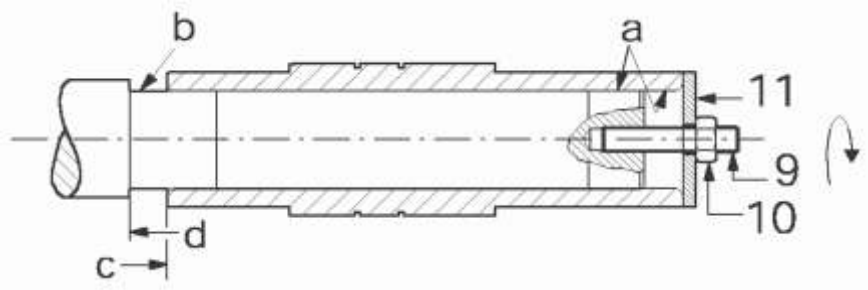
Occurring loads must be considered for the selection of the material of the machine shaft.

The shrink-fit ring supplied by Premium Stephan is ready for installation. Do not pull apart before initial assembly.

6. Technical Appendix

Assembly

- Clean and degrease contact surfaces (a) and (b).
- Grease contact surface (b) - BUT ON NO ACCOUNT contact surface (a) - with "Molykote D321R" or an equivalent lubricant.
- Slide the geared motor onto the driven shaft until the faces (c) and (d) are positioned opposite each other. If necessary, fit a threaded rod (9), nut (10) and a thrust washer (11).
- Remove tools (9, 10, 11).



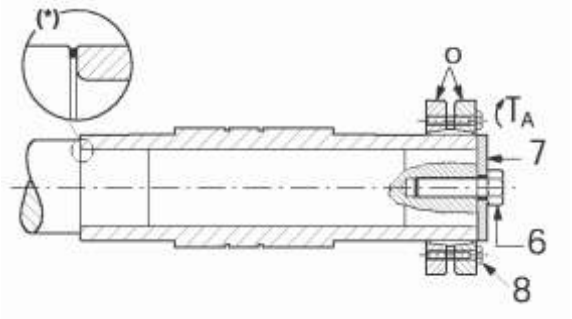
To prevent the shaft slipping, the screws must be tightened to the torque specified in the table below in order to be able to transmit the output torque specified on the type identification plate.

Mounting

- Install shrink-fit ring. Remove the spacer rings fitted between the outer rings (o) for transportation purposes.
  IMPORTANT : The two outer rings (o) must be arranged plane-parallel during the assembly procedure and while tightening the screws.
- Use a torque wrench to tighten the screws (8) in stages one after the other until the specified tightening torque TA (see table) is reached. Do not tighten the screws crosswise.

Size	TA (Nm)
MK02	12
MK03	12
MK04	12
MK05	30
MK06	35
MK07	59

CAUTION!
T60The screws for the shrink-fit ring must never be tightened if the shrink-fit ring is not fitted.



Securing in connection with axial load

A securing ring (7) and screw (6) must be fitted if the axial load is not taken up by the shoulder of the machine shaft.

Disassembly

- Release all screws (8) evenly by turning a quarter turn one after the other.
- Remove the shrink-fit ring from the hollow shaft.
- Remove the gear unit from the drive shaft.

Note : Items 6, 7, 9, 10 and 11 do not belong to the standard scope of delivery, however, they are optionally available in the form of an assembly kit.

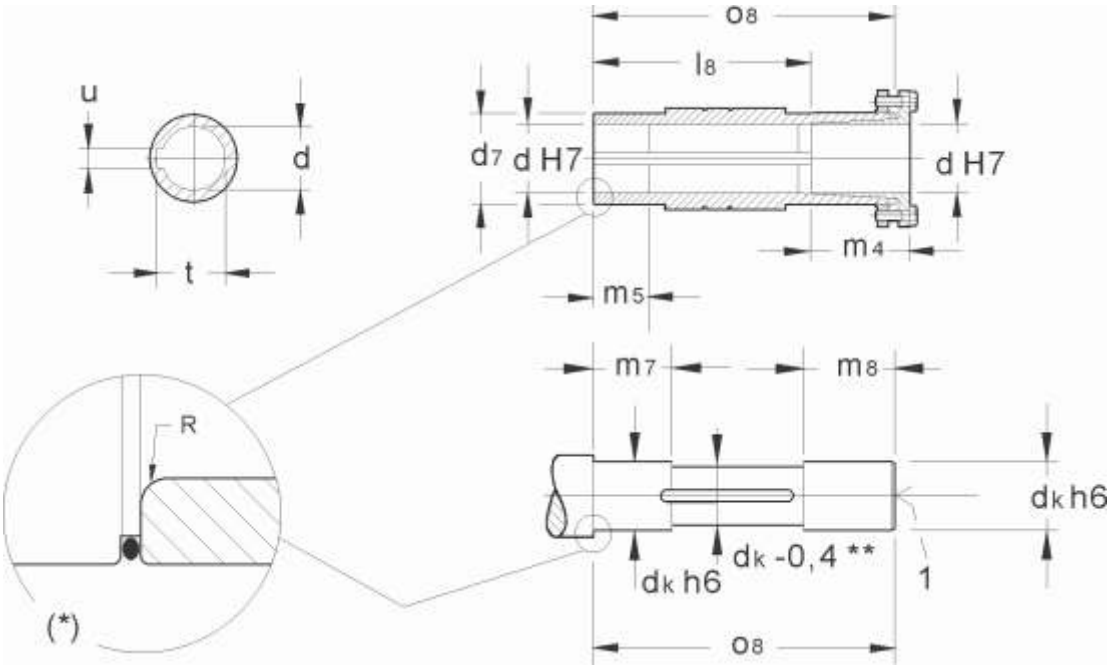
6. Technical Appendix

Cleaning and lubricating

If reused, the removed shrink-fit rings need not be disassembled into individual parts for cleaning and lubricating purposes unless they are heavily soiled. After cleaning, grease the conical surfaces with "Molykote D321R" (or an equivalent, solid lubricant with a coefficient of friction of μ = 0.04).

6.3.15 *Mounting shaft-mounted geared motors with hollow shaft with conical taper bush*

Shaft dimensions



Size	d	d_k	d_7	l_8	m_4	m_5	m_7	m_8	o_8	R	T	u
MK04	50	50	70	174	66.5	30	40	70	228	4	53.8	14
MK05	60	60	85	191	85	40	50	90	261	4	64.4	18
MK06	70	70	100	243	91	70	80	80	322	4	74.9	20
MK07	90	90	120	309	75.5	90	100	65	372	4	95.4	25

1) Centering to DIN 332 "Form D"

(*) An O-ring is recommended to provide increased protection against moisture.

The dimensions apply to the hollow shaft.

** Recommended for simple mounting.

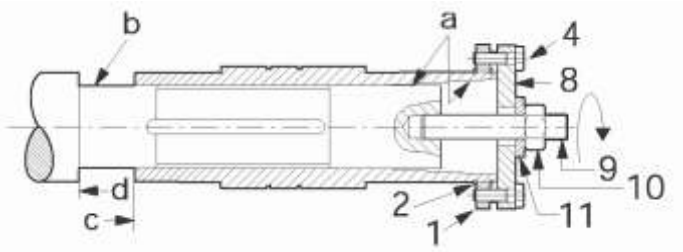
Occurring loads must be considered for the selection of the material of the machine shaft.

The Premium Stephan taper bush system is supplied separately.

6. Technical Appendix

Assembly

- Clean and degrease contact surfaces (a) and (b).
- Grease contact surface (b) - BUT ON NO ACCOUNT contact surface (a) - with "Molykote D321R" or an equivalent lubricant.
- Fit support ring (1) either between the two shaft retaining rings (2) or between the shaft retaining ring (2) and the shoulder of the hollow shaft.
- Align the hollow shaft of the geared motor and the machine shaft. The feather key and keyway must be aligned opposite each other.
- Slide the geared motor onto the driven shaft until the faces (c) and (d) are positioned opposite each other. If necessary, fit a threaded rod (9), nut (10), washer (11) and a thrust washer (8). Secure the thrust washer with screws (4).
- Remove tools (8, 9, 10, 11).



To prevent the shaft slipping, the screws must be tightened to the torque specified in the table below in order to be able to transmit the output torque specified on the type identification plate.

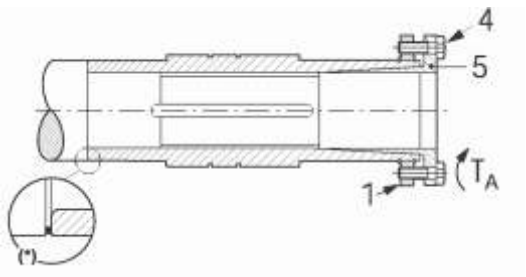
Mounting

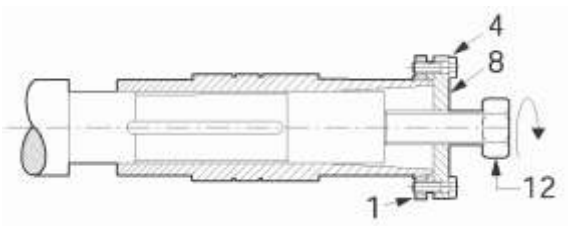
- Fit conical clamping sleeve in hollow shaft without using force.
- Align through-holes in clamping sleeve with threaded holes in support ring (1), fit screws (4) and secure hand-tight.
- Use a torque wrench to tighten screws (4) in stages one after the other until the necessary tightening torque TA (see table) is reached.
- Retighten screws after 24 hours of operation.
- Fit protective cover.

Size	TA (Nm)
MK02	12
MK03	12
MK04	12
MK05	30
MK06	35
MK07	59

Disassembly

- Release all screws (4) evenly by turning a quarter turn one after the other.
- Remove taper bushing (5). If the taper bushing (5) does not release of its own accord, fit two bolts in the tapped holes and tighten them against the support ring (1).
- Secure thrust washer (8) with pin (4).
- Fit pulling screw (12) in threaded center of thrust washer (8).
- Tighten pulling screw (12) in order to remove the geared motor from the machine shaft.

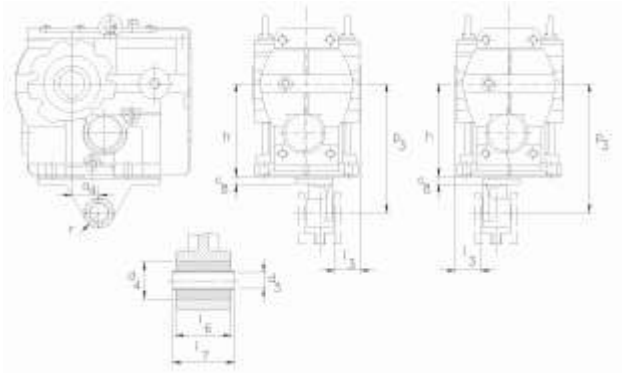




6. Technical Appendix

6.3.16 Torque support MK4

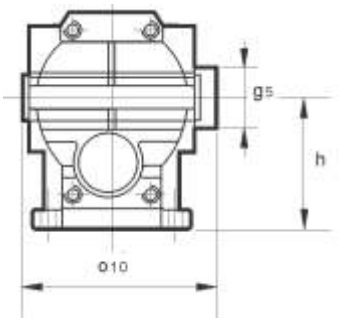
The reaction forces in connection with helical bevel gear unit motors that are used as slip-on gear units must be taken up by a torque support (optionally available) or by a flexible element (no rigid connection).

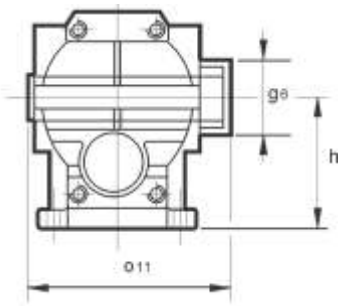


Size	a_4	r	c_8	h	i_3	p_3	d_3	d_4	l_6	l_7
MK02	30	22.5	12	112	20	160	10.4	26	31	36
MK03	45	29	13	140	25	200	16.4	36	54	60
MK04	52.5	29	14	180	25	250	16.4	36	54	60
MK05	60	41	16	212	30	300	25	52	72	80
MK06	70	41	17	265	40	350	25	52	92	100
MK07	74	41	20	315	45	450	25	52	92	100

Dimensions in mm

6.3.17 *Protection covers for MK4 output shafts*



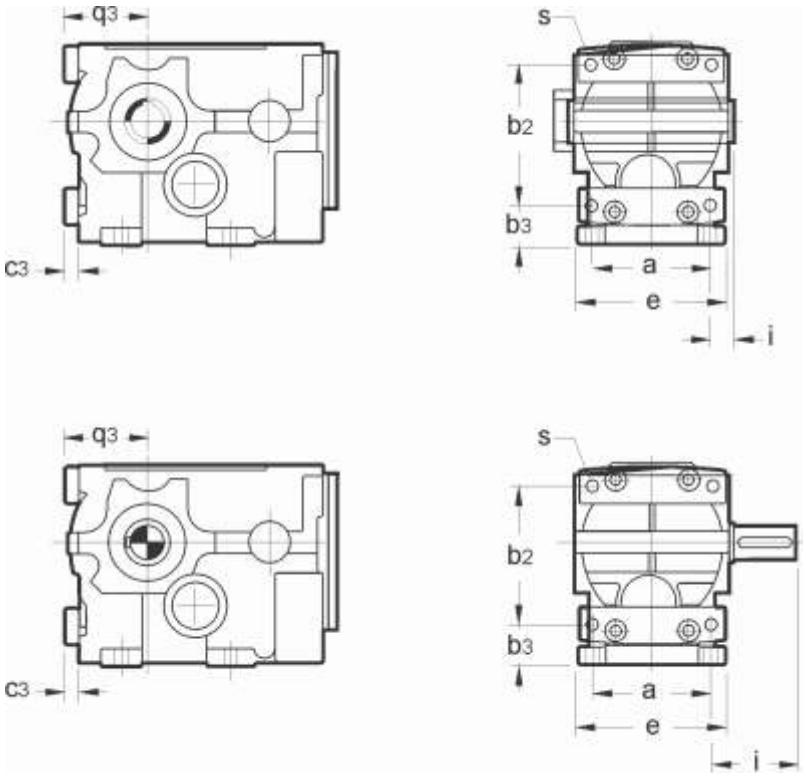


Size	MK.S			MK.A / MK.A / MK.A		
	g_5	o_{10}	h	g_6	o_{11}	h
MK02	100	166	112	100	190	112
MK03	110	195	140	110	221	140
MK04	135	230	180	135	255	180
MK05	170	262	212	170	290	212
MK06	200	332	265	200	360	265
MK07	230	395	315	230	420	315

T65The protection cover is not a part of the standard scope of delivery.

6. Technical Appendix

6.3.18 Foot plates for MK4 gear units size 2 to 5



Size	A	b_2	b_3	c_3	e	i		q_3	s
						MKB..S	MKB..A		
MK02	120	130	37	16	145	15	75	71	11
MK03	140	160	45	18	170	20	101	90	14
MK04	165	200	55	25	200	22.5	123.5	112	17.5
MK05	180	233	70	25	230	30	150	132	23

T66The foot plates are not a part of the standard scope of delivery.
Sizes 66 to 96 have cast-on feet, see dimensional drawings.

Notes

Notes