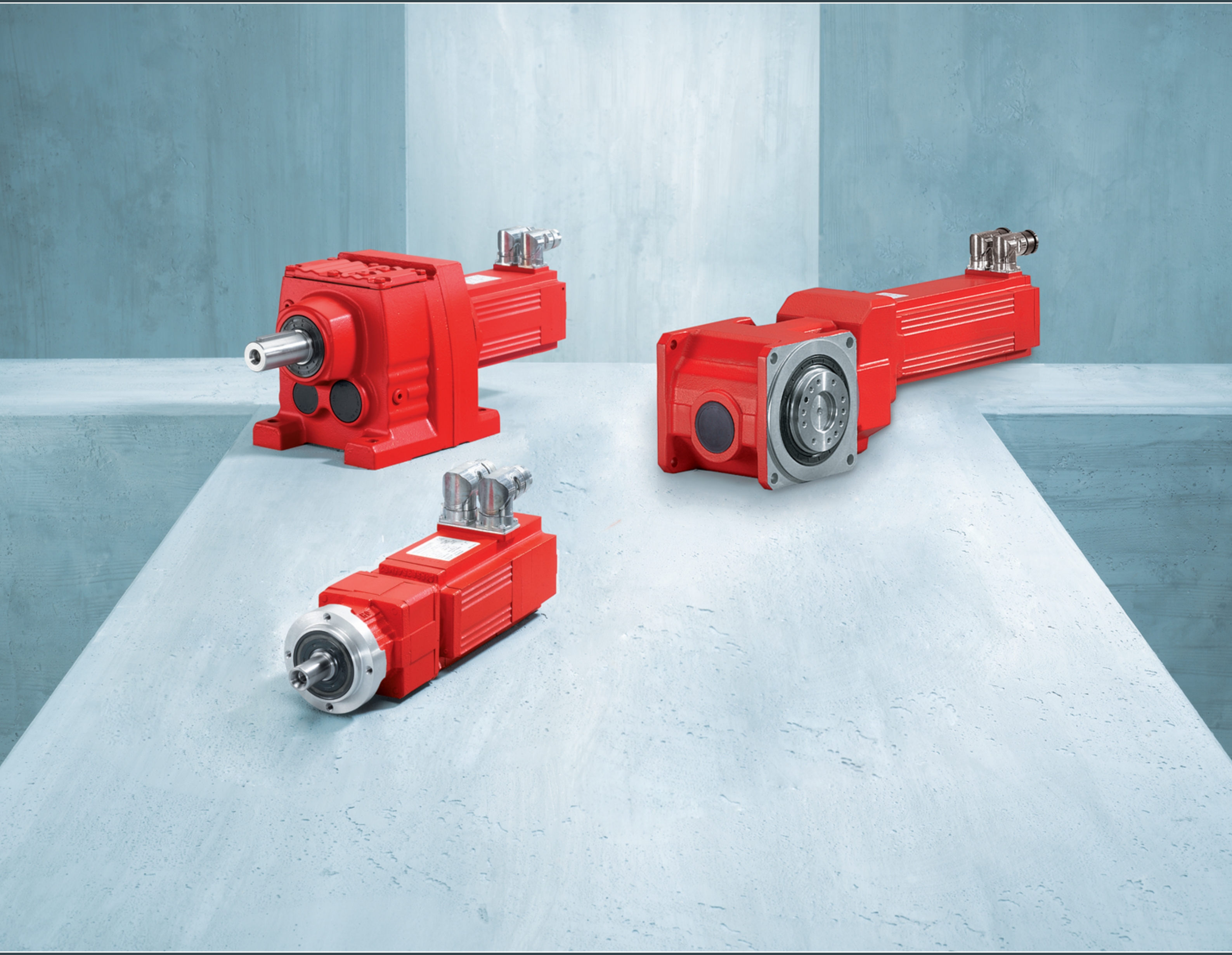
Catalog



CMP40 – CMP112, CMPZ71 – CMPZ100 Synchronous Servo Gearmotors

with R, F, K, S, W, BS.F, PS.F and PS.C Gear Units

Edition 04/2017

22316612/EN

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1 Introduction

1.1 The SEW-EURODRIVE group of companies

1.1.1 Global presence

Driving the world – with innovative drive solutions for all industries and for every application. Products and systems from SEW-EURODRIVE are used all over the world. Be it in the automotive, building materials, food and beverage or metal-processing industry – the decision to use drive technology "made by SEW-EURODRIVE" stands for reliability for both functionality and investment.

We are represented in the most important branches of industry all over the world: with 15 manufacturing plants and 77 Drive Technology Centers worldwide as well as our customer support, which we consider an integrative service that continues our commitment to outstanding quality.

1.1.2 Always the right drive

The SEW-EURODRIVE modular concept offers millions of combinations. This wide selection enables you to choose the correct drive for all applications: each based on the required speed and torque range, space available, and the ambient conditions. Gear units and gearmotors offering a unique and finely tuned performance range and the best economic prerequisites to face your drive challenges.

AC asynchronous motors by SEW-EURODRIVE can be mounted directly or via adapter to SEW-EURODRIVE gear units. They meet all worldwide requirements regarding energy efficiency and technical regulations. A wide range of options and accessories ensures high flexibility for adjusting the motor to the requirements of the user and the application.

Our electronic components — MOVITRAC® frequency inverters, MOVIDRIVE® drive inverters and MOVIAXIS® multi-axis servo inverters — enhance the gearmotors, forming a combination that blends perfectly with the existing SEW-EURODRIVE systems program. As in the case for mechanical systems, the development, production and assembly is carried out completely by SEW-EURODRIVE. In combination with our drive electronics, these drives provide the utmost in flexibility.

Products of the servo drive system, such as low backlash servo gear units, compact servomotors or MOVIAXIS® multi-axis servo inverters provide precision and dynamics. From single-axis or multi-axis applications all the way to synchronized process sequences, servo drive systems by SEW-EURODRIVE offer a flexible and customized implementation of your application.

For economical, decentralized installations, SEW-EURODRIVE offers components from its decentralized drive system, such as MOVIMOT®, the gearmotor with integrated frequency inverter or MOVI-SWITCH®, the gearmotor with integrated switching and protection function. SEW-EURODRIVE hybrid cables have been designed specifically to ensure cost-effective solutions, independent of the philosophy behind or the size of the system. The latest developments from SEW-EURODRIVE: DRC.. electronic motor, MOVIGEAR® mechatronic drive system, MOVIFIT® decentralized drive controller, MOVIPRO® decentralized drive, positioning, and application controller, as well as MOVITRANS® system components for contactless energy transfer.

Power, quality, and robustness combined in a single standard product: With SEW-EURODRIVE, powerful movements are delivered by industrial gear units with high torques. The modular concept will once again provide optimum adaptation of industrial gear units to meet a wide range of different applications.

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1.1.3 Your ideal partner

Its global presence, extensive product range and broad spectrum of services make SEW-EURODRIVE the ideal partner for the machinery and plant construction industry when it comes to providing drive systems for demanding drive tasks in all industries and applications.

1.2 Products and systems from SEW-EURODRIVE

The products and systems by SEW-EURODRIVE are divided into the following product groups:

- Industrial gear units
- Gearmotors and frequency inverters
- Servo drive systems
- Decentralized drive systems
- MAXOLUTION®

Products and systems used in applications of several groups are listed in a separate group entitled "products and systems covering several product groups". The following tables indicate the products and systems included in the respective product group:

Industrial gear units
• X, MC, ML series helical and bevel-helical gear units
• P002 – 102 series planetary gear units
• XP130 – 250 series planetary gear units
• P-X series planetary bevel-helical gear units
• Application solutions with connections
– Girth gears
– Swing base
– Gearmotor
– Motor
– Coupling
– Brake
– Lubrication system
For conveyor drives, bucket conveyors, agitators, cooling towers, crane systems, and much more.

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Gearmotors and frequency inverters		
Gear units / gearmotors	**Motors**	**Frequency inverter**
• Helical gear units / helical gearmotors • Parallel-shaft helical gear units / parallel-shaft helical gearmotors • Helical-bevel gear units / helical-bevel gearmotors • Helical-worm gear units / helical-worm gearmotors • SPIROPLAN® right-angle gearmotors • EMS drives • Geared torque motors • Pole-changing gearmotors • Variable-speed gear units / variable-speed gearmotors • Aseptic gearmotors • Explosion-proof gear units / gearmotors • Explosion-proof variable-speed gear units / variable-speed gearmotors	• Asynchronous AC motors / AC brakemotors • Pole-changing AC motors / AC brakemotors • Explosion-proof AC motors / AC brakemotors • Torque motors • Single-phase motors / Single-phase brakemotors • Asynchronous linear motors	• MOVITRAC® frequency inverters • MOVI4R-U® frequency inverters • MOVIDRIVE® drive inverters • Control, technology and communication options for inverters

Servo drive systems		
Servo gear units / servo gearmotors	**Servomotors**	**Servo drive inverters / servo inverters**
• Low backlash planetary servo gear units / planetary servo gearmotors • Low backlash helical-bevel servo gear units / helical-bevel servo gearmotors • R, F, K, S, W gear units / R, F, K, S, W gearmotors • Explosion-proof servo gear units / servo gearmotors	• Asynchronous servomotors / servo brakemotors • Synchronous servomotors / servo brakemotors • Explosion-proof servomotors / servo brakemotors • Synchronous linear motors	• MOVIDRIVE® servo drive inverters • MOVIAXIS® multi-axis servo inverter • Control, technology and communication options for servo drive inverters and servo inverters

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Decentralized drive systems		
Decentralized drives	**Communication and installation**	**Contactless energy transfer system**
• DRC.. electronic motor / MOVIGEAR® mechatronic drive system – DBC – Direct Binary Communication – DAC - Direct AS-Interface Communication – DSC – Direct SBus Communication – SNI – Single Line Network Installation • MOVIMOT® gearmotors with integrated frequency inverter • MOVIMOT® motors / brakemotors with integrated frequency inverter • MOVI-SWITCH® gearmotors with integrated switching and protection functions • MOVI-SWITCH® motors / brakemotors with integrated switching and protection function • Explosion-proof MOVIMOT® and MOVI-SWITCH® gearmotors	• Fieldbus interfaces • Field distributors for decentralized installation • MOVIFIT® product range – MOVIFIT® FDC for controlling MOVIGEAR® and DRC.. drive units – MOVIFIT® MC for controlling MOVIMOT® drives – MOVIFIT® SC with integrated electronic motor switch – MOVIFIT® FC with integrated frequency inverter • MOVIPRO® product range – MOVIPRO® SDC – decentralized drive and positioning control	• MOVITRANS® system – Stationary components for energy supply – Mobile components for energy consumption – Line cables and installation material

MAXOLUTION®
• MAXOLUTION® packages for predefined application solutions
• MAXOLUTION® systems for customer-specific system solutions and plants

Products and systems covering several product groups
• Operator panels
• MOVI-PLC® drive-based control system
• Components of the design "functional safety"
• Diagnostic units

In addition to its products and systems, SEW-EURODRIVE offers a comprehensive range of services. These include:

- Technical consulting
- User software
- Seminars and training
- Extensive technical documentation
- International customer service

Visit our website at:

→ **www.sew-eurodrive.com**

The website provides comprehensive information and services.

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1.3 Documentation

1.3.1 Content of this publication

The “Synchronous Servo Gearmotors” catalog provides a detailed description of the following product groups from SEW-EURODRIVE:

- The combination of CMP.. and CMPZ.. synchronous servomotors mounted directly to
  - R, F, K, S, W gear units
  - BS.F gear units
  - PS.F gear units
  - PS.C gear units

The descriptions include:

- Product descriptions
- Overview of types
- Project planning notes
- Visual representation of mounting positions
- Explanation on the order information
- Combination overviews and technical data
- Dimension sheets

1.3.2 Additional documentation

In addition to this “Synchronous Servo Gearmotors” catalog (GSE1), other documents can be ordered or downloaded on the SEW-EURODRIVE website. The complete range of technical documentation is available in various languages for download at our website **www.sew-eurodrive.com**.

- For information on options for the servomotors, refer to the “Synchronous Servomotors” catalog (MOT2).
- For information on options for the gear units as well as for information on adapters, refer to the “Gear Units” catalog (GK) and the “Servo Gear Units” catalog (GSK).

1.4 Product names and trademarks

All product names included in this documentation are trademarks or registered trademarks of the respective titleholders.

1.5 Copyright notice

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2 Product characteristics

2.1 General information

2.1.1 Installation altitude

Due to the low air density at high installation altitudes, heat dissipation on the surface of motors and gear units decreases. The rated data listed in the catalog applies to an installation altitude of maximum 1000 m above sea level. Installation altitudes > 1000 m above sea level must be taken into account for project planning of gear units and gearmotors, see chapter "Derating depending on the installation altitude" (→ 🗎 70).

2.1.2 Weights

Please note that the weight information shown in the catalogs only apply to the gear units and gearmotors without lubricant. The weight varies according to gear unit design and gear unit size. The lubricant fill depends on the mounting position selected, which means that in this case no universally applicable information can be given. Refer to the chapter "Lubricant fill quantities" (→ 🗎 148) for recommended lubricant fill quantities depending on the mounting position. For the exact weight, refer to the quotation or the order confirmation.

2.1.3 Speeds

The quoted output speeds of the gearmotors are recommended values. The output speed can be calculated based on the rated speed of the motor and the gear unit ratio.

2.1.4 Noise

The noise levels of all SEW-EURODRIVE gear units, motors and gearmotors are well within the maximum permitted noise levels set forth in the VDI guideline 2159 for gear units and IEC/EN 60034 for motors.

2.1.5 Painting

The gear units, synchronous servomotors and servo gearmotors from SEW-EURODRIVE are painted as follows:

Type	Painting according to DIN 1843
Synchronous gearmotor with BS.F../PS.F../..PS.C..	Black RAL 9005
Synchronous gearmotor with R, F, K, S, W gear unit	

Special paintings are available on request.

2.1.6 Power and torque

The listed torque ratings refer to mounting position M1 and similar mounting positions in which the input gear stage is not completely submerged in oil. In addition, the gearmotors are assumed to be standard versions with standard lubrication and under normal ambient conditions.

2.1.7 Heat dissipation and accessibility

Servo gearmotors and brakes can reach surface temperatures > 100 °C during operation. Make sure to maintain adequate distance from heat-sensitive components when installing gearmotors/geared brakemotors to the driven machine.

2.1.8 Multi-stage gearmotors

You can achieve particularly low output speeds by using compound gear units or compound gearmotors. This requires a helical gear unit on the input end as a second gear unit.

It may be necessary to limit the maximum motor torque to match the maximum permitted output torque of the gear unit.

2.1.9 Brakemotors

On request, motors and gearmotors can be supplied with an integrated mechanical brake. The brakes from SEW-EURODRIVE are divided into the following 3 categories:

- Type 1: BK permanent magnet holding brake (CMP40-63)

  The BK brake is a permanent magnet holding brake with emergency off function that releases electrically and closes through the power of the permanent magnetic field. The BK brake is equipped with the typical properties of a holding brake for highly dynamic servomotors and is therefore suitable for applications with very high switching frequencies.
- Type 2: BP spring-loaded holding brake (CMP71-100)

  The BP brake is a DC-operated electromagnetic disk brake that releases electrically and closes through spring force. The BP brake is intended to hold loads in idle state.
- Type 3: BY spring-loaded holding brake with increased working capacity (CMPZ71-100 and CMP112)

  The DC-operated electromagnetic disk brake BY is a spring-loaded brake with increased working capacity and emergency stop properties that releases electrically and closes through spring force. The optional manual brake release allows the brake to be released manually.

  The manual brake release function is self-reengaging (..HR). A hand lever is supplied.

Due to their operating principle, all brake types are applied automatically if the power fails, bringing it in compliance with basic safety requirements. All brake types are controlled by a brake control that is either installed in the wiring space of the motor (terminal box) or in the control cabinet.

If the brakes of type 1 and 2 are operated at the MOVIAXIS® servo inverter or at the MOVIDRIVE® inverter, a direct brake control is also possible. For information on combinations that allow the direct brake control, refer to the system manual of the servo inverter or of the inverter.

A characteristic feature of the brakes is their very short design, as the brake endshield is a part of both the motor and the brake. Therefore, the integrated construction of the SEW-EURODRIVE brakemotor permits particularly compact and sturdy solutions.

For more information on the brakes, refer to the "Synchronous Servomotors" catalog (MOT2).

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2.1.10 Motor design without encoder

The servomotors CMP(Z)40 – 100 are available in encoderless design which eliminates the use of a separate encoder connection on the motor. The motor has a single hybrid connector that is installed at the center of the motor's B-side. Together with the insulation insert, the connector is the only visible feature distinguishing the design without encoder from the standard design.

2.1.11 Corrosion and surface protection

General information

For motor and gear unit operation in aggressive environments, SEW-EURODRIVE optionally offers the following preventive measure:

- KS corrosion protection for motors
- Surface protection OS for motors and gear units

For motors, optimum protection is offered by a combination of KS corrosion protection and OS surface protection.

Optional preventive measures are also available for the output shafts.

KS corrosion protection

KS corrosion protection for motors comprises the following measures:

- All retaining screws that are loosened during operation are made of stainless steel.
- Various motor parts have a surface coating.
- The flange contact surfaces and shaft ends are treated with a temporary rust preventive.
- For brakemotors, additional measures are performed.

A label saying “KORROSIONSSCHUTZ“ (corrosion protection) indicates that special treatment has been applied.

INFORMATION

The following motor options are not available with KS corrosion protection:

- VR forced cooling fan

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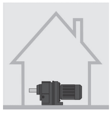
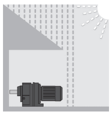
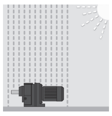
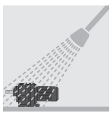
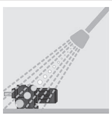
OS surface protection

As an option for standard surface protection, motors and gear units are also available with surface protection OS1 to OS4. The special measure "Z" is also available in addition. Special measure "Z" means that large contour recesses are filled with rubber before painting.

Surface protection[1) 2)]		**Ambient conditions**	**Sample applications**
Standard		Suitable for machines and systems within buildings and interior rooms with neutral atmospheres. Similar to corrosivity category[3)] : • C1 (negligible)	• Machines and systems in the automobile industry • Transport systems in logistics • Conveyor belts at airports
OS1		Suited for environments prone to condensation and atmospheres with low humidity or contamination, such as applications outdoors under roof or with protective device. According to corrosivity category[3)]: • C2 (low)	• Systems in saw mills • Hall gates • Agitators and mixers
OS2		Suitable for environments with high humidity or mean atmospheric contamination, such as applications outdoors subject to direct weathering. According to corrosivity category[3)]: • C3 (moderate)	• Applications in amusement parks • Funiculars and chair-lifts • Applications in gravel plants • Systems in nuclear power plants
OS3		Suitable for environments with high humidity and occasionally severe atmospheric and chemical contamination. Occasionally acidic or caustic wet cleaning. Also for applications in coastal areas with moderate salt load. According to corrosivity category[3)]: • C4 (high)	• Sewage treatment plants • Port cranes • Mining applications
OS4		Suitable for environments with permanent humidity or severe atmospheric or chemical contamination. Regular acidic and caustic wet cleaning, also with chemical cleaning agents. According to corrosivity category[3)]: • C5-1 (very high)	• Drives in malting plants • Wet areas in the beverage industry • Conveyor belts in the food industry

1) Motors/brakemotors in degree of protection IP56 or IP66 are only available with OS2, OS3, or OS4 surface protection.
2) Gearmotors with OS2 – OS4 surface protection are only offered in combination with KS corrosion protection.
3) According to DIN EN ISO 12944-2, classification of ambient conditions

Special protection measures

Gearmotor output shafts can be treated with special optional protective measures for operation subject to severe environmental pollution or in particularly demanding applications.

Gear unit type	Measure	Protection principle	Suitable for
R, F, K, S, W, BS.F202 – 602	FKM oil seal[1)]	High quality material	Drives subject to chemical contamination
R, F, K, S, W	Surface treatment on output shaft end	Surface treatment on the contact surface of the oil seal	Severe environmental impact and in conjunction with FKM oil seal
R, F, K, S, W	Output shaft made of stainless steel	Surface protection with high-quality material	Particularly demanding applications in terms of surface protection

1) For PS.F, PS.C and BS.F802 gear units, FKM oil seals are used as a standard.

NOCO® fluid

As standard, SEW-EURODRIVE supplies NOCO® fluid corrosion protection and lubricant with every hollow shaft gear unit. Use NOCO® fluid when installing hollow shaft gear units. Using this fluid helps prevent contact corrosion and makes it easier to disassemble the drive at a later time. NOCO® fluid is also suitable for protecting machined metal surfaces that do not have corrosion protection, such as parts of shaft ends or flanges. You can also order NOCO® fluid in larger quantities from SEW-EURODRIVE.

Batch size	Packaging type	Part number
5.5 g	Sachet	09107819
100 g	Tube	03253147
1 kg	Tub	09107827

NOCO® fluid is a food grade substance according to NSF-H1. The food-grade NOCO® fluid has a corresponding NSF-H1 label on the packaging.

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2.1.12 Extended storage

Design

SEW-EURODRIVE recommends the "extended storage" gear unit design for storage periods longer than 9 months. The lubricant of gear units for extended storage is mixed with a VCI anti-corrosion agent (**v**olatile **c**orrosion **i**nhibitors). Please note that this VCI anti-corrosion agent is only effective in a temperature range of -25 °C to +50 °C. The flange contact surfaces and shaft ends are also treated with an anti-corrosion agent. As standard, the gear unit with "extended storage" option will be supplied with OS1 surface protection. Instead of OS1, you can order OS2, OS3 or OS4.

INFORMATION

For W, PS.F, and BS.F gear units, the extended storage option is not available yet.

INFORMATION

To prevent the VCI anti-corrosion agent from evaporating, the gear units in "extended storage" design must remain tightly sealed until startup.

The gear units come with the oil fill according to the specified mounting position (M1 – M6). Always check the oil level before you take the gear unit into operation!

Storage conditions

Observe the storage conditions specified in the following table for extended storage:

Climate zone	Packaging[1)]	Storage[2)]	Storage duration
Temperate (Europe, USA, Canada, China and Russia, excluding tropical zones)	• Packed in containers • With desiccant and moisture indicator sealed in the plastic wrap	• Roofed • Protected against rain and snow • Shock-free	Up to 3 years with regular checks of the packaging and moisture indicator (rel. humidity < 50%)
	Open	• Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, < 50% relative humidity) • No sudden temperature variations • Controlled ventilation with filter (free from dust and dirt) • No aggressive vapors • No shocks	2 years or more with regular inspections • Check for cleanness and mechanical damage during the inspection • Check corrosion protection

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Climate zone	Packaging[1]	Storage[2]	Storage duration
Tropical (Asia, Africa, Central and South America, Australia, New Zealand excluding temperate zones)	• Packed in containers • With desiccant and moisture indicator sealed in the plastic wrap • Protected against insect damage and mildew by chemical treatment	• Roofed • Protected against rain and snow • Shock-free	Up to 3 years with regular checks of the packaging and moisture indicator (rel. humidity < 50%)
	Open	• Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, < 50% relative humidity) • No sudden temperature variations • Controlled ventilation with filter (free from dust and dirt) • No aggressive vapors • No shocks • Protected against insect damage	2 years or more with regular inspections • Check for cleanness and mechanical damage during the inspection • Check corrosion protection

1) The packaging must be carried out by an experienced company using the packaging materials that have been explicitly specified for the particular application.
2) SEW-EURODRIVE recommends to store the gear units according to the mounting position.

2.1.13 Condition monitoring

DUO10A oil aging sensor

The DUO10A diagnostic unit consists of a temperature sensor and the actual evaluation unit. The service life curves of the oil grades common in SEW-EURODRIVE gear units are stored in the evaluation unit. SEW-EURODRIVE can customize any oil grade in the diagnostic unit. Standard parameterization is performed directly on the evaluation unit. During operation, this unit analyzes the oil temperature to calculate the remaining service life in days until the next oil change. The remaining service life is displayed directly on the evaluation unit. When the service life is expired, a binary signal can be sent to a higher-level system and evaluated or visualized in the system.

Using the DUO10A diagnostic unit, the system operator no longer has to replace the oil within predefined intervals, but can adapt the replacement interval individually to the actual load. The benefits are reduced maintenance and service costs and increased system availability.

For technical data and part numbers of the DUO10A oil aging sensor, refer to chapter "Information on oil aging sensor /DUO10A" (→ 🗎 184).

Vibration SmartCheck /DUV40A

DUV40A Vibration SmartCheck vibration monitoring is used to detect damage of gear units and gearmotors early (e.g. bearing damage or imbalances). For this, permanent frequency-selective monitoring of the gearmotor is used. Apart from the vibration analysis, additional measured values of up to 3 signal encoders can be detected, recorded and analyzed. The additional signals can be used as reference value for signal analysis e.g. to trigger time or event-based measuring tasks. After the analysis and depending on user-defined alarm limits, the system can switch outputs and display the state using LEDs.

Vibration SmartCheck is configured using the FAG software SmartWeb. If you use several Vibration SmartCheck systems, you can control them via the FAG software SmartUtility Light centrally from one PC.

The full version of the SmartUtility software allows you to open sensors directly via the FAG software SmartWeb, to analyze measurement data in the SmartUtility Viewer and to download configurations or uploading configurations on other devices.

For information on the scope of delivery, part numbers and technical data, refer to chapter "Information on Vibration SmartCheck /DUV40A" (→ 🗎 186).

2.1.14 Explosion protection according to ATEX

Area of application

ATEX directive 2014/34/EU includes requirements for devices and protective systems for designated use in potentially explosive atmospheres for the European Economic Area. Other European countries, such as Switzerland, have since fallen in with this regulation.

Available designs according to ATEX

SEW-EURODRIVE supplies explosion-proof gear units, gearmotors, options and accessories in accordance with the corresponding ATEX directive 2014/34/EU.

Depending on equipment and dimensioning, the following gear unit and motor designs are available:

- Gear units in II2GD design for use in zones 1, 2, 21 and 22
- Motors in II3GD design for use in zones 2 and 22
- Motors in II3G design for use in zone 22

Other documentation

For detailed information about explosion-proof SEW-EURODRIVE products, refer to the "Explosion-Proof Drives" catalog and the "Explosion-Proof AC Motors" catalog.

2.1.15 International markets

On request, SEW-EURODRIVE supplies motors that are certified or registered for the relevant market.

Mark	Meaning
	CE mark to state compliance with European guidelines, such as the Low Voltage Directive
	ATEX mark to state compliance with the European Directive 94/9/EC
	UR logo to confirm that UL (Underwriters Laboratory) is informed about the registered components; register number by UL: E337323
MC170602	CSA mark to confirm the Canadian Standard Association (CSA) and the market conformity of AC motors
	EAC mark (EurAsian Conformity) Confirms compliance with the regulations of the economic and customs union of Russia, Belarus and Kazakhstan
013	UkrSEPRO mark (Ukrainian Certification of Products) Confirms compliance with the technical regulations of the country Ukraine.

2.2 General product description of R, F, K, S, W gear units

2.2.1 Operating temperatures

Gear units and gearmotors from SEW-EURODRIVE can be operated in a wide ambient temperature range.

Gear unit

The following standard temperature ranges are permitted for filling the gear units according to the lubricant table:

Gear unit	Filled with	Permitted standard temperature range
K..19, K..29, K..39, K..49	CLP(PG) VG460	-20 °C to +60 °C
K..37 , K..47, K..57– K..107 **RX.57 – RX.107** **R.07 – R.127** **F..27 – F..107**	CLP(CC) VG220	-15 °C to +40 °C
S..37 – S..97	CLP(PG) VG680	0 °C to +40 °C
W..10 – W..30, W..37, W..47	CLP(SEW-PG) VG460	-20 °C to +40 °C

The rated data of the gear units and gearmotors specified in the catalog refer to an ambient temperature of +25 °C.

INFORMATION

For information on churning losses and thermal rating, refer to chapter "Churning losses and thermal rating" (→ 🗎 58).

Gear units from SEW-EURODRIVE can be operated outside the standard temperature range if project planning is adapted to ambient temperatures from as low as up to -40 °C in the intensive cooling range until up to +60 °C. Project planning must take special operating conditions into account and adapt the drive to the ambient conditions by selecting suitable lubricants and seals.

SEW-EURODRIVE recommends thermal project planning for the drives in general and offers to perform the project planning.

Motors

The motors of the CMP.. and CMPZ.. series are designed for use in a temperature range from -20 °C to +40 °C.

This expands the standardized temperature range required by IEC 60034.

Using the motors outside the above temperature range is possible with some special adjustments. Contact SEW-EURODRIVE in this case.

INFORMATION

In addition, adhere to the project planning notes for the frequency inverter and consider the thermal effects of inverter operation.

2.2.2 Backlash reduction

Helical, parallel-shaft helical and helical-bevel gear units with reduced backlash (only K..7) are available as of gear unit size 37.

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The rotational clearance of these gear units is considerably less than that of the standard designs so that positioning tasks can be solved with great precision. The rotational clearance is specified in angular minutes in the chapter "Geometrically possible combinations" (see chapter "Information on the selection tables" (→ 🗎 190)). The rotational clearance for the output shaft is specified without load (max. 1% of the rated output torque), the gear unit input end is blocked. For further information, refer to chapter Reduced backlash gear unit design /R.

K..9 helical-bevel gear units are not available with reduced backlash.

2.2.3 RM gear units, RM gearmotors

RM gear units and RM gearmotors are a special design of helical gear units with an extended output bearing hub. They were designed especially for agitating applications and allow for high overhung and axial loads and bending moments. The other data is the same as for standard helical gear units and standard helical gearmotors.

2.2.4 SPIROPLAN® gearmotors

SPIROPLAN® right-angle gearmotors are robust, single- and two-stage right-angle gearmotors with SPIROPLAN® gearing. The difference to the helical-worm gear units is the material combination of the steel-on-steel gearing, the special tooth meshing relation and the aluminum housing. As a result, SPIROPLAN® right-angle gearmotors are wear-free and lightweight.

The particularly short design and the aluminum housing make for very compact and lightweight drive solutions.

The wear-free gearing and the life-long lubrication facilitate long periods of maintenance-free operation. The identical hole spacing in the foot and face as well as the same axle height to both makes for a number of mounting options.

On request, SPIROPLAN® gearmotors can be equipped with a torque arm.

2.2.5 Components on the input side

The following components on the input side are available for the gear units from SEW-EURODRIVE:

- **Input shaft assembly with input shaft end,** optionally with
  - Centering shoulder
  - Backstop
  - Motor platform
- **Adapter**
  - For mounting IEC or NEMA motors with the option of a backstop
  - For mounting servomotors with a square flange
  - With torque limiting safety couplings and speed or slip monitor
  - With hydraulic start-up coupling, also available with disk brake or backstop

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2.3 General product description – BS.F, PS.F, PS.C gear units

2.3.1 Operating temperatures

Servo gear units can be operated at ambient temperatures between -20 C and +40 C. Contact SEW-EURODRIVE if the ambient temperatures exceed this temperature range.

INFORMATION

For information on churning losses and thermal rating, refer to chapter "Churning losses and thermal rating" (→ 🗎 58).

2.3.2 Direct motor mounting

The servo gearmotors from SEW-EURODRIVE make it possible to mount servo gear units directly to the synchronous servomotors from SEW-EURODRIVE without an adapter or coupling. These integrated servo gearmotors offer shaft-hub connections that are all positive and free from backlash.

2.3.3 Motor mounting with adapter

Use the modular motor adapters to connect all other commercial servomotors in a simple and time-efficient manner to the gear units from SEW-EURODRIVE. For more information, refer to the “Servo Gear Units” (GSK) catalog.

2.3.4 Low backlash and positioning accuracy

The BS.F and PS.F gear units ensure low rotational clearance, even in the standard designs. The rotational clearance can be further reduced (/R) for all types and can even be minimized (/M) for PS.F gear units. Rotational clearance will remain constantly low for the entire gear unit life due to the wear-free operating performance and high-endurance design of the running gears.

The rotational clearance is specified in angular minutes in the technical data. The rotational clearance is specified for the output shaft (max. 3% of the rated output torque), the gear unit input end is blocked.

2.3.5 Extensive ratio range with fine graduation

All ratios from i = 3 to i = 100 are integer and finely stepped. This means that the gear units are especially suitable for use with controllers that require integer resolution ratios.

2.3.6 Reliability, long service life and low maintenance

The high reliability of servo gear units from SEW-EURODRIVE in the system is ensured by the use of high-strength materials, high-quality rolling bearings, long-lasting oil seals and synthetic lubricants.

2.3.7 High overload capacity

Exactly matched components as well as backlash-free and positively connected drive elements ensure that highest torques can be transferred and that large axial and radial forces can be absorbed.

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2.3.8 Torsionally rigid

The special design of SEW-EURODRIVE servo gear units in conjunction with large shaft diameters ensure high torsional rigidity.

3 Overview of types and type designations

3.1 Designs and options – R, F, K, S, W gear units

Below an overview of type designations for R, F, K, S, and W gear units and their options.

3.1.1 Helical gear units

Designation	Description
RX..	Single-stage foot-mounted design
RXF..	Single-stage B5 flange-mounted design
R..	Foot-mounted design
R..F	Foot-mounted and B5 flange-mounted design
RF..	B5 flange-mounted design
RZ..	B14 flange-mounted design
RM..	B5 flange-mounted design with extended bearing hub

3.1.2 Parallel-shaft helical gear units

Designation	Description
F..	Foot-mounted design
FA..B	Foot-mounted design and hollow shaft
FH..B	Foot-mounted design and hollow shaft with shrink disk
FV..B	Foot-mounted design and splined hollow shaft to DIN 5480
FF..	B5 flange-mounted design
FAF..	B5 flange-mounted design and hollow shaft
FHF..	B5 flange-mounted design and hollow shaft with shrink disk
FVF..	B5 flange-mounted design and hollow shaft with splined hollow shaft to DIN 5480
FA..	Hollow shaft
FH..	Hollow shaft with shrink disk
FT..	Hollow shaft with TorqLOC® hollow shaft mounting system
FV..	Splined hollow shaft to DIN 5480
FZ..	B14 flange-mounted design
FAZ..	B14 flange-mounted design and hollow shaft
FHZ..	B14 flange-mounted design and hollow shaft with shrink disk
FVZ..	B14 flange-mounted design and hollow shaft with splined hollow shaft to DIN 5480

3.1.3 Helical-bevel gear units

Designation	
K..	Foot-mounted design
KA..B	Foot-mounted design and hollow shaft
KAF..B	B5 flange-mounted design, hollow shaft and foot-mounted design
KF..B	Foot-mounted design, B5 flange-mounted design
KH..B	Foot-mounted design and hollow shaft with shrink disk
KHF..B	B5 flange-mounted design and hollow shaft with shrink disk and foot-mounted design
KV..B	Foot-mounted design and hollow shaft with splined hollow shaft to DIN 5480
KF..	B5 flange-mounted design
KAF..	B5 flange-mounted design and hollow shaft
KHF..	B5 flange-mounted design and hollow shaft with shrink disk
KVF..	B5 flange-mounted design and hollow shaft with splined hollow shaft to DIN 5480
KA..	Hollow shaft
KH..	Hollow shaft with shrink disk
KT..	Hollow shaft with TorqLOC® hollow shaft mounting system
KV..	Splined hollow shaft according DIN 5480
KZ..	B14 flange-mounted design
KAZ..	B14 flange-mounted design and hollow shaft
KHZ..	B14 flange-mounted design and hollow shaft with shrink disk
KVZ..	B14 flange-mounted design and hollow shaft with splined hollow shaft to DIN 5480

3.1.4 Helical-worm gear units

Designation	Description
S..	Foot-mounted design
SF..	B5 flange-mounted design
SAF..	B5 flange-mounted design and hollow shaft
SHF..	B5 flange-mounted design and hollow shaft with shrink disk
SA..	Hollow shaft
SH..	Hollow shaft with shrink disk
ST..	Hollow shaft with TorqLOC® hollow shaft mounting system
SAZ..	B14 flange-mounted design and hollow shaft
SHZ..	B14 flange-mounted design and hollow shaft with shrink disk

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3.1.5 SPIROPLAN® gear units

Designation	Description
W..	Foot-mounted design
WF..	B5 flange-mounted design
WAF..	B5 flange-mounted design and hollow shaft
WA..	Hollow shaft
WA..B	Foot-mounted design and hollow shaft
WH..B	Foot-mounted design and hollow shaft with shrink disk
WHF..	B5 flange-mounted design and hollow shaft with shrink disk
WH..	Hollow shaft with shrink disk
WT..	Hollow shaft with TorqLOC® hollow shaft mounting system

3.1.6 Options

R, F and K gear units:

Designation	Description
/R	Reduced backlash

K, S and W gear units:

Designation	Description
/T	With torque arm

F gear units:

Designation	Description
/G	With rubber buffer

3.1.7 Condition monitoring

Designation	Description
/DUO	Diagnostic Unit Oil = Oil aging sensor
/DUV40A	Diagnostic Unit Vibration = Vibration sensor

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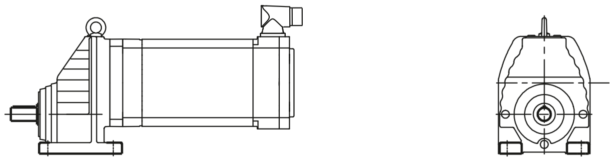
3.2 Gearmotor designs – R, F, K, S, W gear units

INFORMATION

The designs described in this chapter refer to gearmotors from SEW-EURODRIVE. They also apply to gear units without motors.

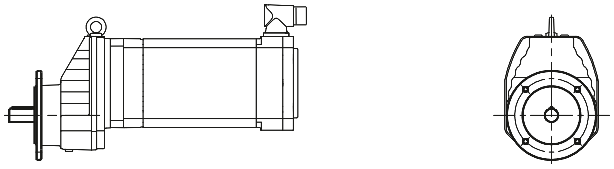
3.2.1 Helical gearmotors

The following designs of helical gearmotors are available:



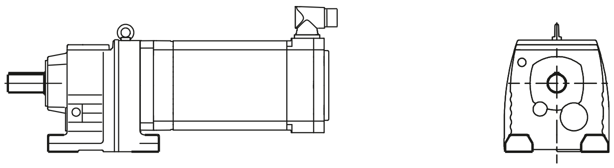
RX..CMP..

Single-stage helical gearmotor in foot-mounted design



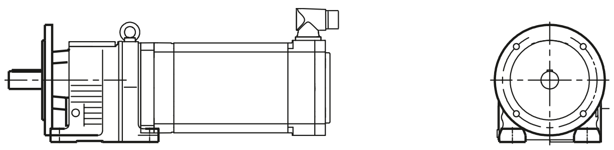
RXF..CMP..

Single-stage helical gearmotor in B5 flange-mounted design



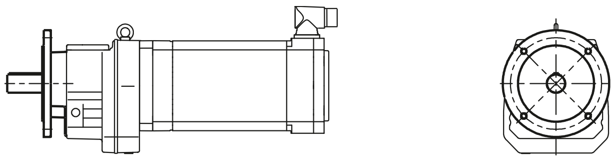
R..CMP..

Foot-mounted helical gearmotor



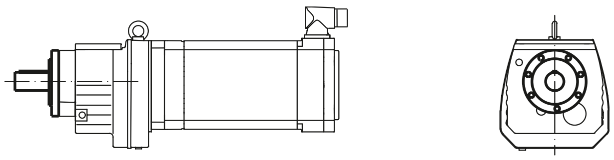
R..F CMP..

Foot and B5 flange-mounted helical gearmotor



RF..CMP..

B5 flange-mounted helical gearmotor

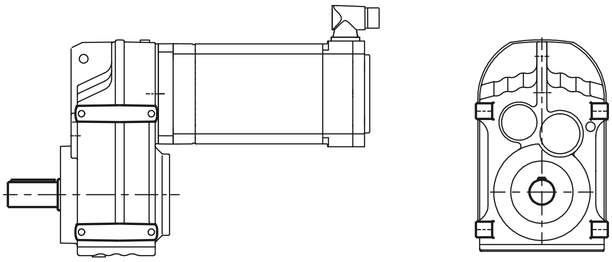


RZ..CMP..

B14 flange-mounted helical gearmotor

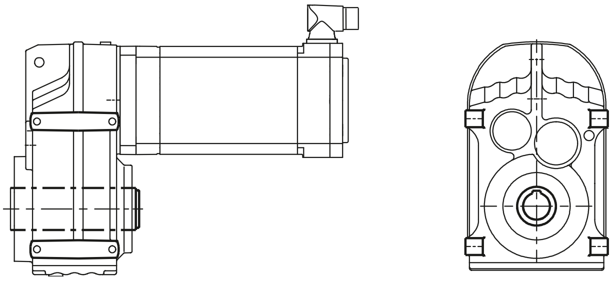
3.2.2 Parallel-shaft helical gearmotors

The following designs of parallel-shaft helical gearmotors are available:



F..CMP..

Foot-mounted parallel-shaft helical gearmotor

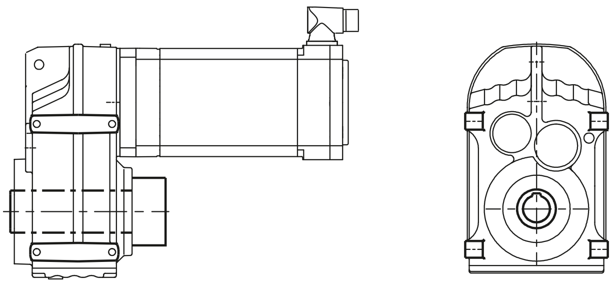


FA..B CMP..

Foot-mounted parallel-shaft helical gearmotor with hollow shaft

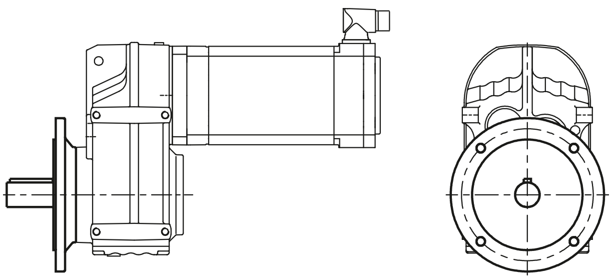
FV..B CMP..

Foot-mounted parallel-shaft helical gearmotor with hollow shaft and splined hollow shaft according to DIN 5480



FH..B CMP..

Foot-mounted parallel-shaft helical gearmotor with hollow shaft and shrink disk



FF..CMP..

B5 flange-mounted parallel-shaft helical gearmotor

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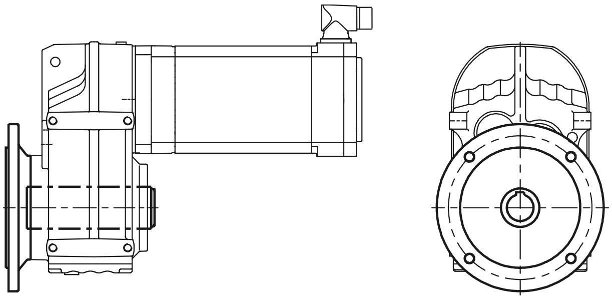
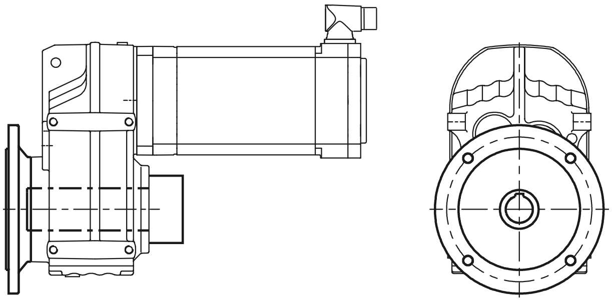


FAF..CMP..

B5 flange-mounted parallel-shaft helical gearmotor with hollow shaft

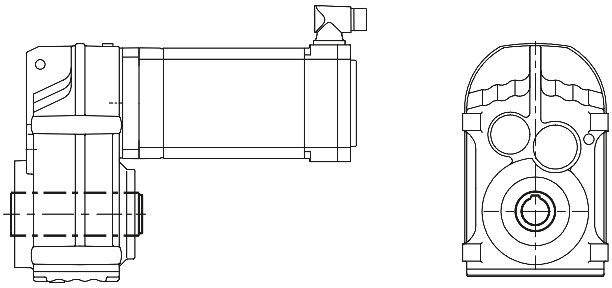
FVF..CMP..

B5 flange-mounted parallel-shaft helical gearmotor with hollow shaft and splined hollow shaft according to DIN 5480



FHF..CMP..

B5 flange-mounted parallel-shaft helical gearmotor with hollow shaft and shrink disk

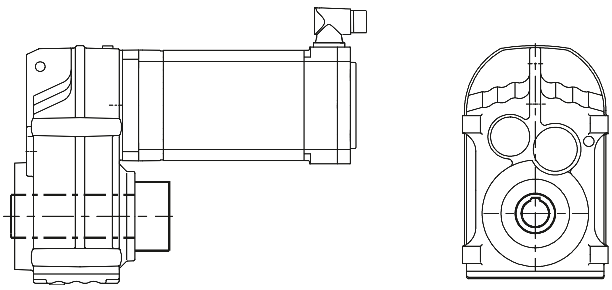


FA..CMP..

Parallel-shaft helical gearmotor with hollow shaft

FV..CMP..

Parallel-shaft helical gearmotor with hollow shaft and splined hollow shaft according to DIN 5480

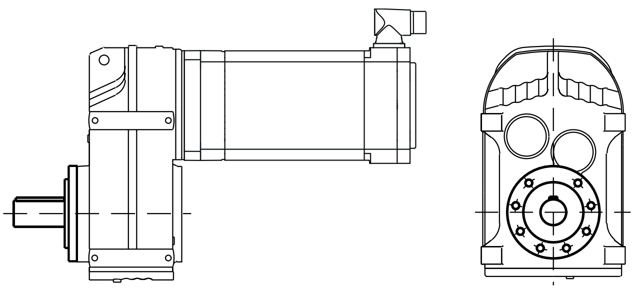


FH..CMP..

Parallel-shaft helical gearmotor with hollow shaft and shrink disk

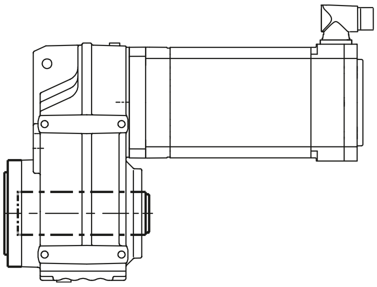
FT..CMP..

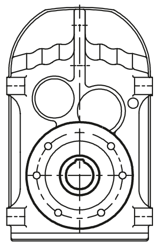
Parallel-shaft helical gearmotor with hollow shaft and TorqLOC® hollow shaft mounting system



FZ..CMP..

Parallel-shaft helical gearmotor in B14 flange-mounted design.



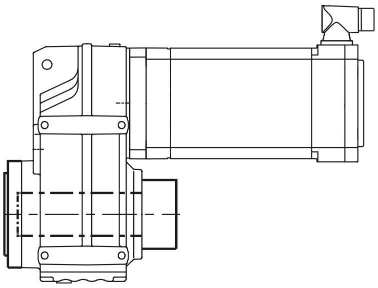


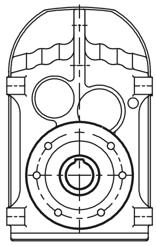
FAZ..CMP..

B14 flange-mounted parallel-shaft helical gearmotor with hollow shaft

FVZ..CMP..

Parallel-shaft helical gearmotor in B14 flange-mounted design with hollow shaft and splined hollow shaft according to DIN 5480



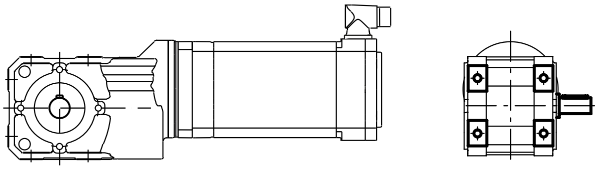


FHZ..CMP..

B14 flange-mounted parallel-shaft helical gearmotor with hollow shaft and shrink disk

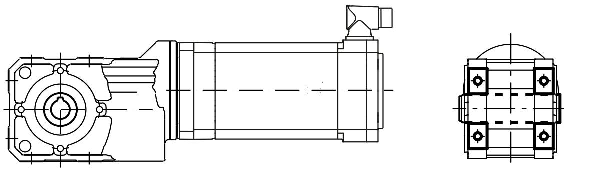
3.2.3 Helical-bevel gearmotors, gear unit sizes K..19 and K..29

The following designs of helical-bevel gearmotors with gear units of size K..9 are available:



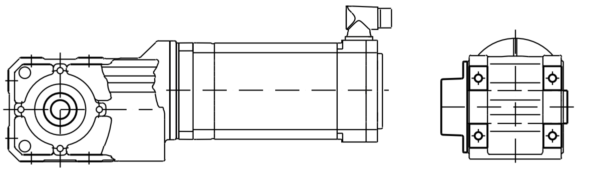
K19 CMP.., K29 CMP..

Foot-mounted helical-bevel gearmotor



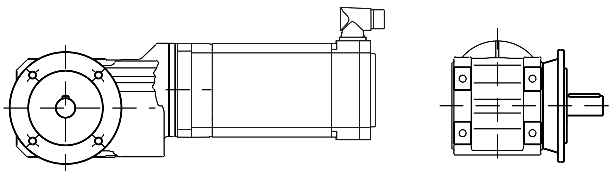
KA19B CMP.., KA29B CMP..

Foot-mounted helical-bevel gearmotor with hollow shaft



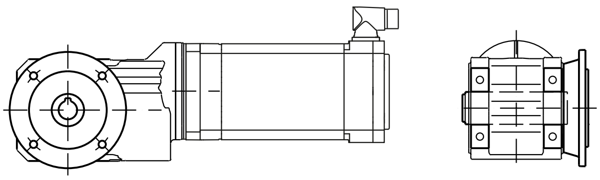
KH19B CMP.., KH29B CMP..

Foot-mounted helical-bevel gearmotor with hollow shaft and shrink disk



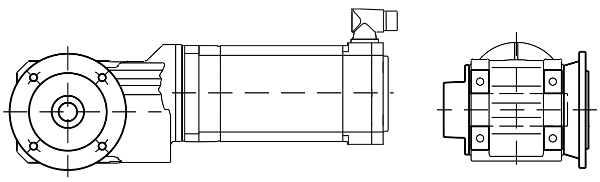
KF19B CMP.., KF29B CMP..

Helical-bevel gearmotor in B5 flange-mounted design in foot-mounted design



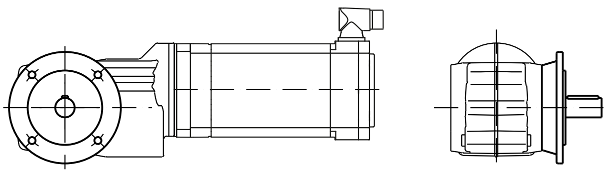
KAF19B CMP.., KAF29B CMP..

Helical-bevel gearmotor in B5 flange-mounted design with hollow shaft in foot-mounted design



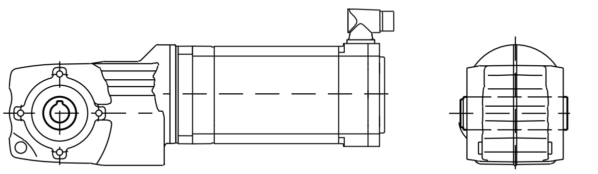
KHF19B CMP.., KHF29B CMP..

Helical-bevel gearmotor in B5 flange-mounted design with hollow shaft and shrink disk in foot-mounted design



KF19 CMP.., KF29 CMP..

B5 flange-mounted helical-bevel gearmotor



KA19 CMP.., KA29 CMP..

Helical-bevel gearmotor with hollow shaft

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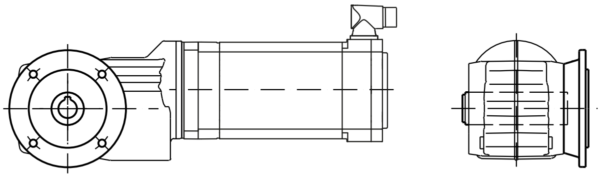
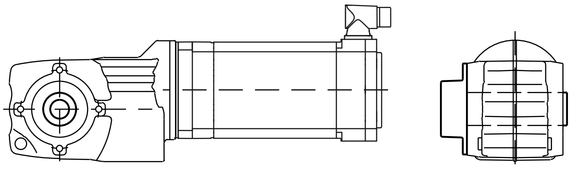


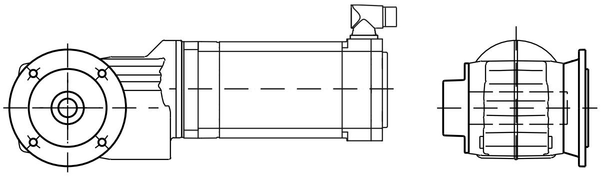
KAF19 CMP.., KAF29 CMP..

B5 flange-mounted helical-bevel gearmotor with hollow shaft



KH19 CMP.., KH29 CMP..

Helical-bevel gearmotor with hollow shaft and shrink disk

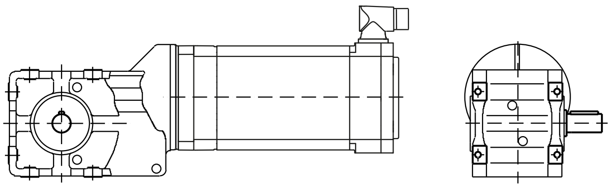


KHF19 CMP.., KHF29 CMP..

B5 flange-mounted helical-bevel gearmotor with hollow shaft and shrink disk

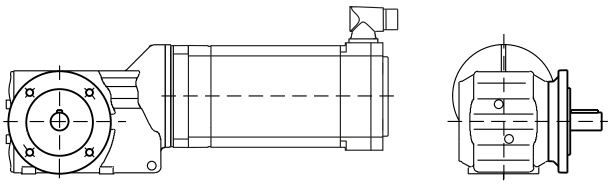
3.2.4 Helical-bevel gearmotors, gear unit sizes K..39 and K..49

The following designs of helical-bevel gearmotors with gear units of size K..9 are available:



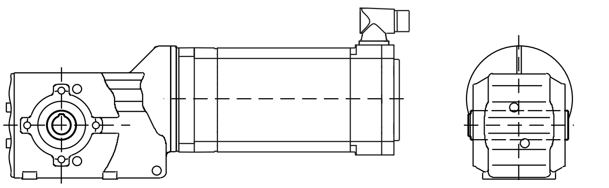
K39 CMP.., K49 CMP..

Foot-mounted helical-bevel gearmotor



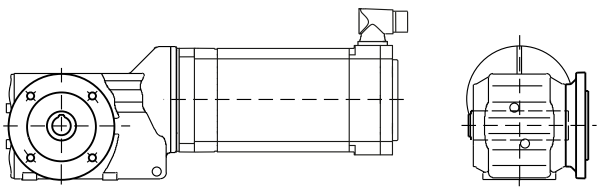
KF39 CMP.., KF49 CMP..

B5 flange-mounted helical-bevel gearmotor



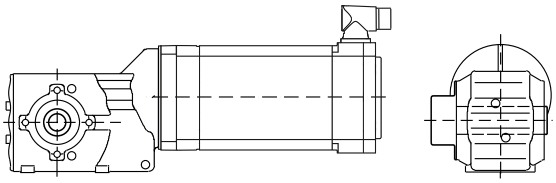
KA39 CMP.., KA49 CMP..

Helical-bevel gearmotor with hollow shaft



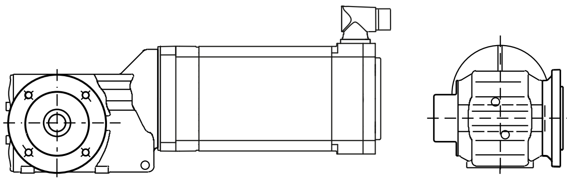
KAF39 CMP.., KAF49 CMP..

B5 flange-mounted helical-bevel gearmotor with hollow shaft



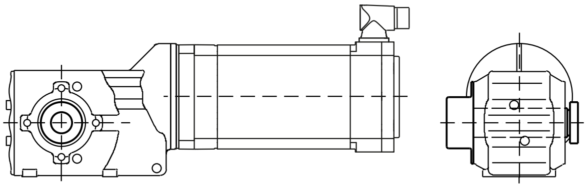
KH39 CMP.., KH49 CMP..

Helical-bevel gearmotor with hollow shaft and shrink disk



KHF39 CMP.., KHF49 CMP..

B5 flange-mounted helical-bevel gearmotor with hollow shaft and shrink disk

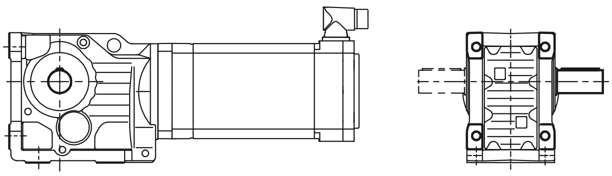


KT39 CMP.., KT49 CMP..

Helical-bevel gearmotor with hollow shaft and TorqLOC® hollow shaft mounting system

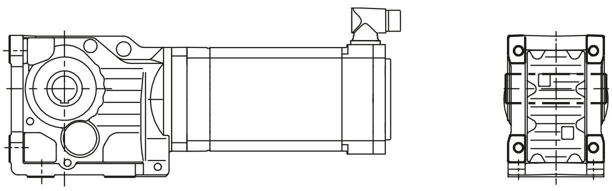
3.2.5 Helical-bevel gearmotors, gear unit sizes K..7

The following designs of helical-bevel gearmotors with gear units of size K..7 are available:



K..7 CMP..

Foot-mounted helical-bevel gearmotor

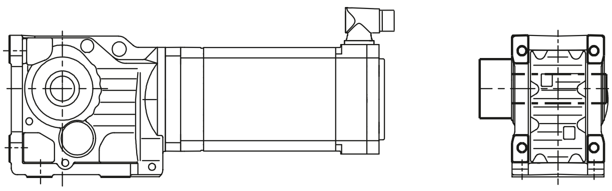


KA..7B CMP..

Helical-bevel gearmotor in foot-mounted design with hollow shaft

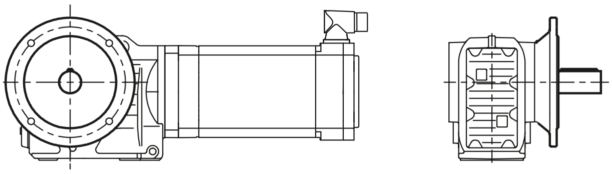
KV..7B CMP..

Foot-mounted helical-bevel gearmotor with hollow shaft and splined hollow shaft according to DIN 5480



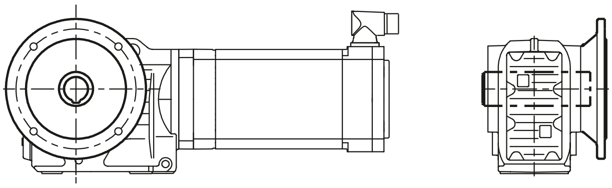
KH..7B CMP..

Foot-mounted helical-bevel gearmotor with hollow shaft and shrink disk



KF..7 CMP..

B5 flange-mounted helical-bevel gearmotor

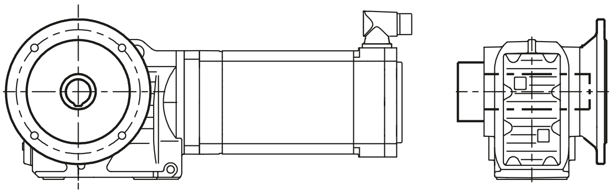


KAF..7 CMP..

B5 flange-mounted helical-bevel gearmotor with hollow shaft

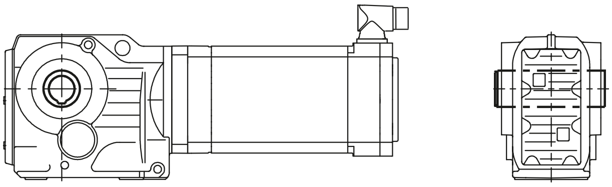
KVF..7 CMP..

Helical-bevel gearmotor in B5 flange-mounted design with hollow shaft and splined hollow shaft according to DIN 5480



KHF..7 CMP..

Helical-bevel gearmotor in B5 flange-mounted design with hollow shaft and shrink disk

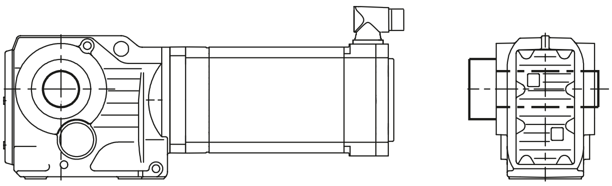


KA..7 CMP..

Helical-bevel gearmotor with hollow shaft

KV..7 CMP..

Helical-bevel gearmotor with hollow shaft and splined hollow shaft according to DIN 5480

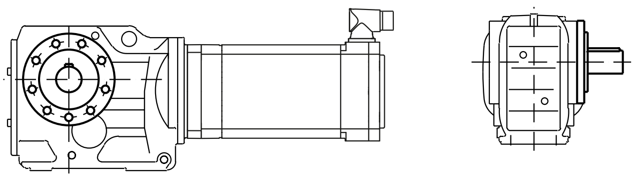


KH..7 CMP..

Helical-bevel gearmotor with hollow shaft and shrink disk

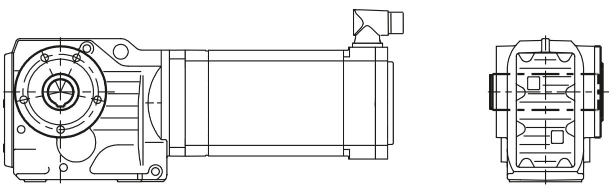
KT..7 CMP..

Helical-bevel gearmotor with hollow shaft and TorqLOC®hollow shaft mounting system



KZ..7 CMP..

Helical-bevel gearmotor in B14 flange-mounted design.

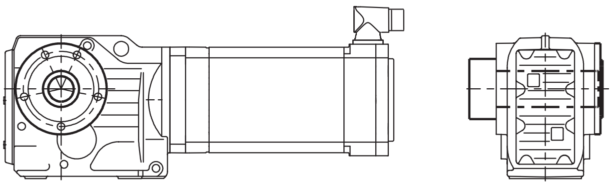


KAZ..7 CMP..

Helical-bevel gearmotor in B14 flange-mounted design with hollow shaft

KVZ..7 CMP..

Helical-bevel gearmotor in B14 flange-mounted design with hollow shaft and splined hollow shaft according to DIN 5480



KHZ..7 CMP..

Helical-bevel gearmotor in B14 flange-mounted design with hollow shaft and shrink disk

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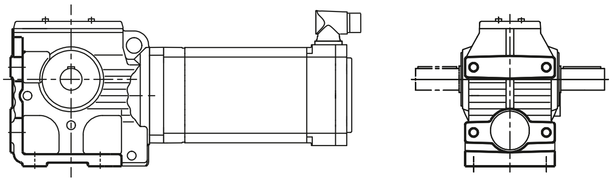
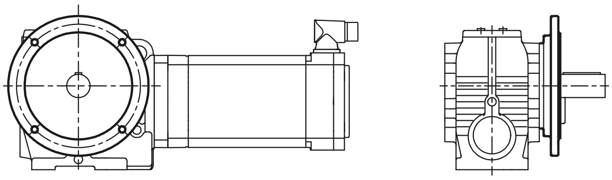
3.2.6 Helical-worm gearmotors

The following designs of helical-worm gearmotors are available:



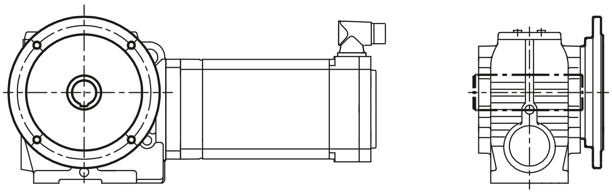
S..CMP..

Foot-mounted helical-worm gearmotor



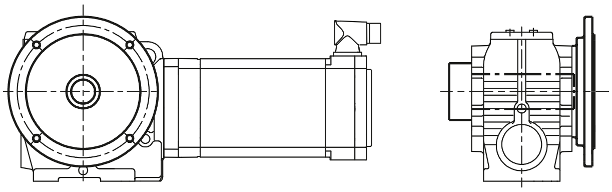
SF..CMP..

Helical-worm gearmotor in B5 flange-mounted design



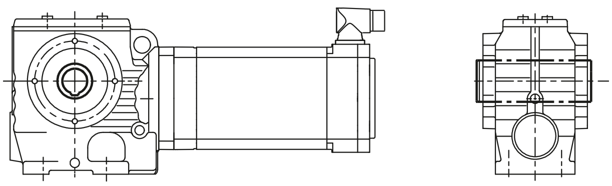
SAF..CMP..

Helical-worm gearmotor in B5 flange-mounted design with hollow shaft



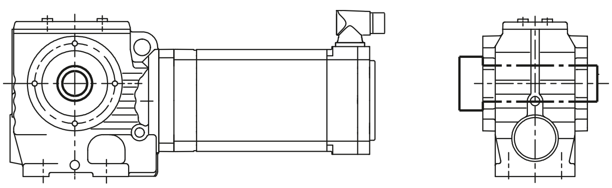
SHF..CMP..

Helical-worm gearmotor in B5 flange-mounted design with hollow shaft and shrink disk



SA..CMP..

Helical-worm gearmotor with hollow shaft

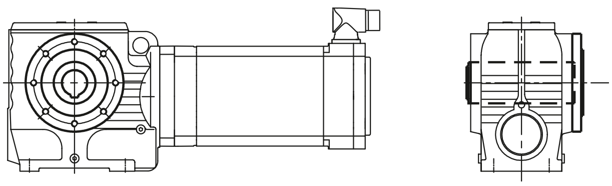


SH..CMP..

Helical-worm gearmotor with hollow shaft and shrink disk

ST..CMP..

Helical-worm gearmotor with hollow shaft and TorqLOC® hollow shaft mounting system



SAZ..CMP..

Helical-worm gearmotor in B14 flange-mounted design with hollow shaft

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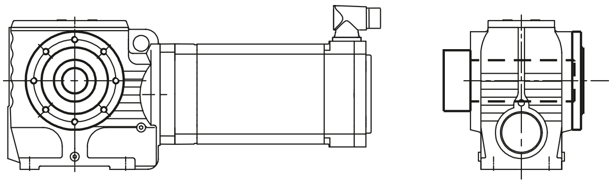
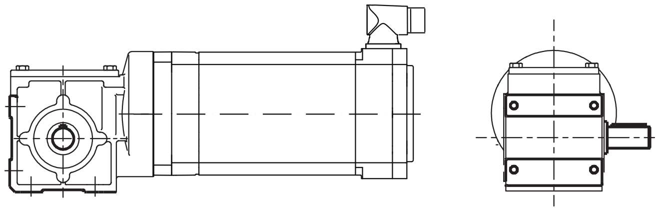


SHZ..CMP..

Helical-worm gearmotor in B14 flange-mounted design with hollow shaft and shrink disk

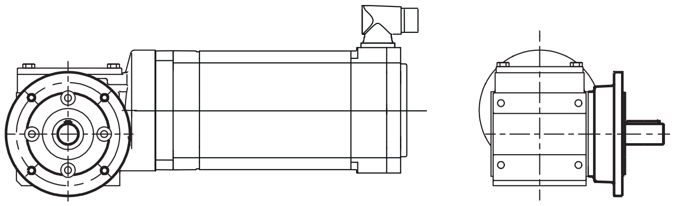
3.2.7 SPIROPLAN® gearmotors, gear unit sizes W..10, W..20, W..30

The following designs of SPIROPLAN® gearmotors with gear units in sizes W..10, W..20, and W..30 are available:



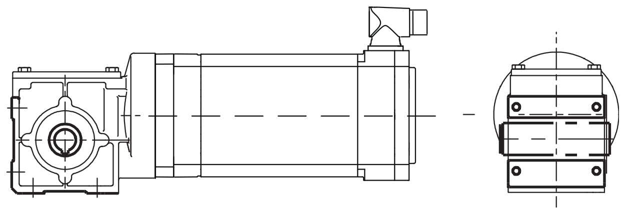
W10 CMP.., W20 CMP.., W30 CMP..,

Foot-mounted SPIROPLAN® gearmotor



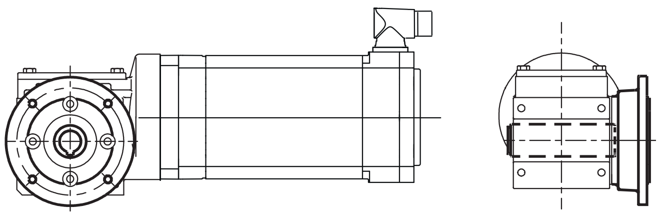
WF10 CMP.., WF20 CMP.., WF30 CMP..

Flange mounted SPIROPLAN® gearmotor



WA10 CMP.., WA20 CMP.., WA30 CMP..

SPIROPLAN® gearmotor with hollow shaft

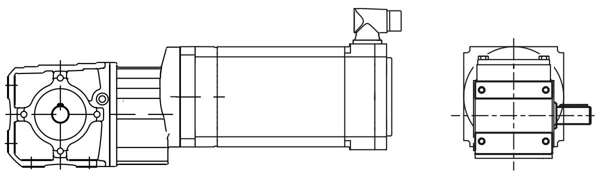


WAF10 CMP.., WAF20 CMP.., WAF30 CMP..

Flange-mounted SPIROPLAN® gearmotor with hollow shaft

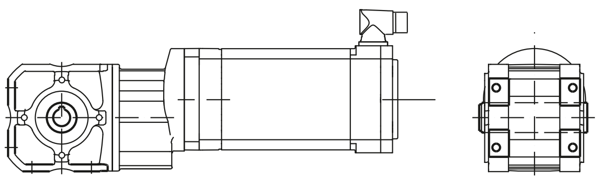
3.2.8 SPIROPLAN® gearmotors, gear unit sizes W..37 and W..47

The following designs of SPIROPLAN® gearmotors with gear units in sizes W..37 and W..47 are available:



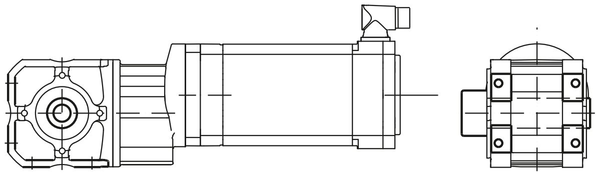
W37 CMP.., W47 CMP..

Foot-mounted SPIROPLAN® gearmotor



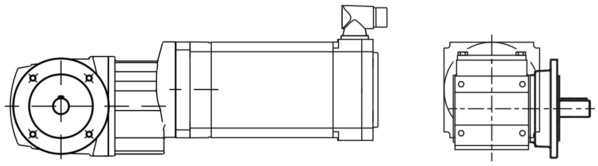
WA37B CMP.., WA47B CMP..

Foot-mounted SPIROPLAN® gearmotor with hollow shaft



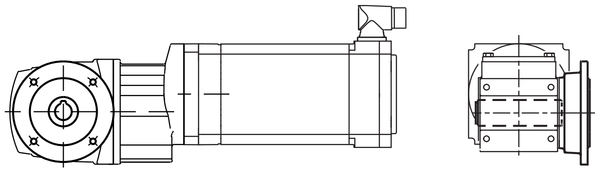
WH37B CMP.., WH47B CMP..

Foot-mounted SPIROPLAN® gearmotor with hollow shaft and shrink disk



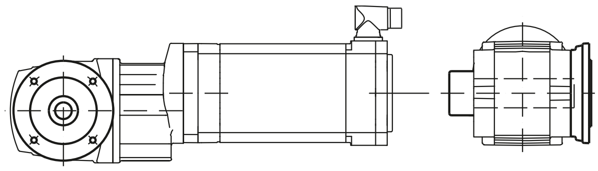
WF37 CMP.., WF47 CMP..

SPIROPLAN® gearmotor in B5 flange mounted design



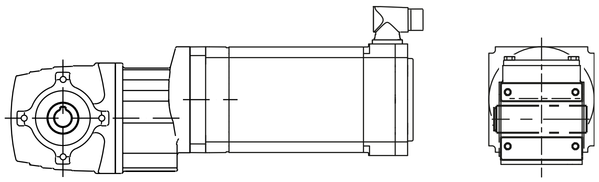
WAF37 CMP.., WAF47 CMP..

SPIROPLAN® gearmotor in B5 flange-mounted design with hollow shaft



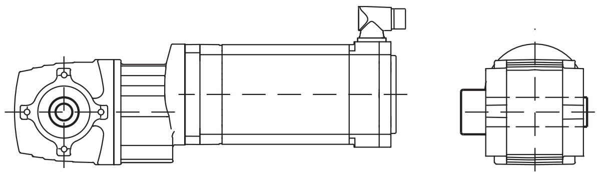
WHF37 CMP.., WHF47 CMP..

SPIROPLAN® gearmotor in B5 flange-mounted design with hollow shaft and shrink disk



WA37 CMP.., WA47 CMP..

SPIROPLAN® gearmotor with hollow shaft



WH37 CMP.., WH47 CMP..

SPIROPLAN® gearmotor with hollow shaft and shrink disk

WT37 CMP.., WT47 CMP..

SPIROPLAN® gearmotor with hollow shaft and TorqLOC® hollow shaft mounting system

3.3 Designs and options – BS.F, PS.F and PS.C gear units

3.3.1 BS.F helical-bevel gear unit

Designation	Description
BSF..	Solid shaft without key (smooth)
BSKF..	Solid shaft with key
BSBF..	Solid shaft with flange block shaft
BSHF..	Hollow shaft with shrink disk
BSAF..	Hollow shaft with keyway
BSF..B	Solid shaft without key (smooth) and foot/front-end mounting
BSKF..B	Solid shaft with key and foot/front-end mounting
BSBF..B	Solid shaft with flange block shaft and foot/front-end mounting
BSHF..B	Hollow shaft with shrink disk and foot/front-end mounting
BSAF..B	Hollow shaft with keyway and foot/front-end mounting

3.3.2 PS.F planetary gear unit

Designation	Description
PSF..	Solid shaft without key (smooth)
PSKF..	Solid shaft with key
PSBF..	Solid shaft with flange block shaft

3.3.3 PS.C planetary gear unit

Designation	Designation
PSC..	Solid shaft without key (smooth)
PSKC..	B5 output flange, solid shaft with key
PSCZ..	B14 output flange, solid shaft
PSKCZ..	B14 output flange, solid shaft with key

3.3.4 Options

BS.F gear units

Designation	Description
../R	Reduced backlash
../T	Torque arm
../I	Hollow shaft and shrink disk at the output end

PS.F gear units

Designation	Description
../R	Reduced backlash

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Designation	Description
../M	Minimized backlash

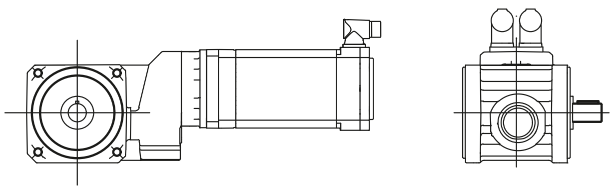
3.4 Designs of the gearmotors – BS.F, PS.F and PS.C gear units

INFORMATION

The designs described in this chapter refer to gearmotors from SEW-EURODRIVE. They also apply to gear units without motors.

3.4.1 BS.F helical-bevel gearmotors

The following designs of BS.F helical-bevel gearmotors are available:

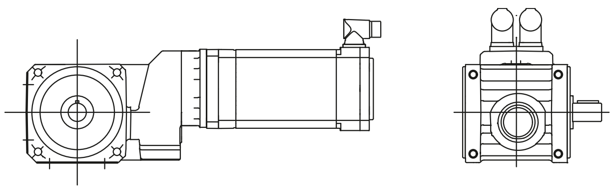


BSF.. CMP..

Gearmotor with solid shaft (smooth), B5 output flange

BSKF.. CMP..

Gearmotor with solid shaft and key, B5 output flange

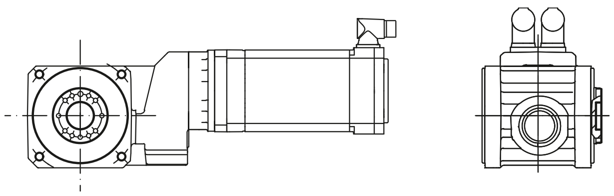


BSF..B CMP..

Gearmotor with solid shaft and front-end mounting

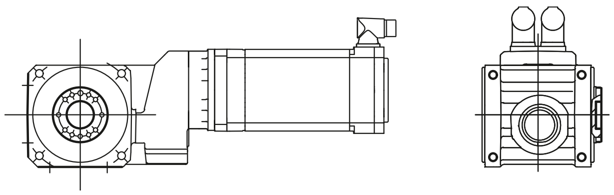
BSKF..B CMP..

Gearmotor with solid shaft, key and front-end mounting



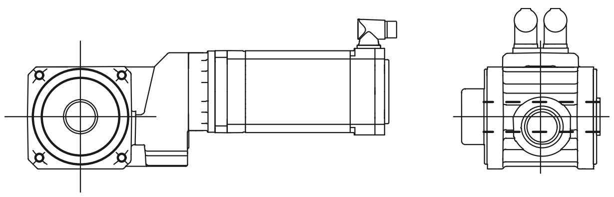
BSBF.. CMP..

Gearmotor with flange block shaft, B5 output flange



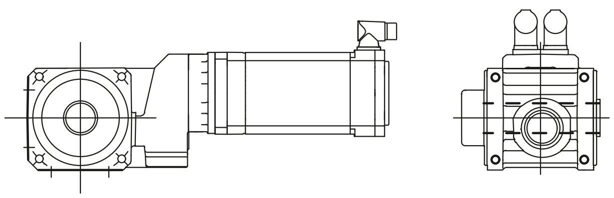
BSBF..B CMP..

Gearmotor with flange block shaft and front-end mounting



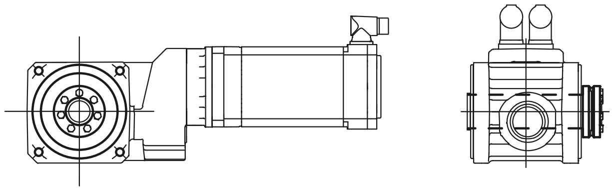
BSHF.. CMP..

Gearmotor with hollow shaft and shrink disk, B5 output flange



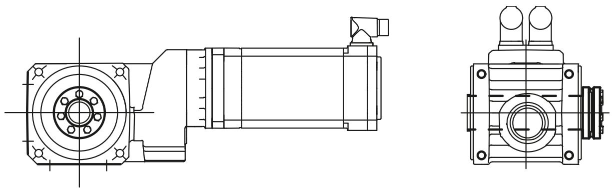
BSHF..B CMP..

Gearmotor with hollow shaft, shrink disk and front-end mounting



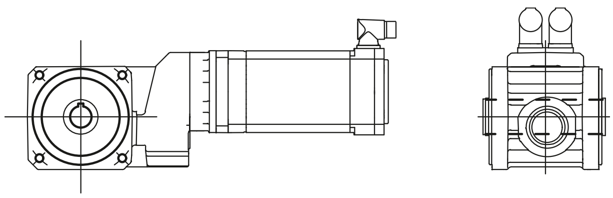
BSHF../I CMP..

Gearmotor with hollow shaft and shrink disk at the output side



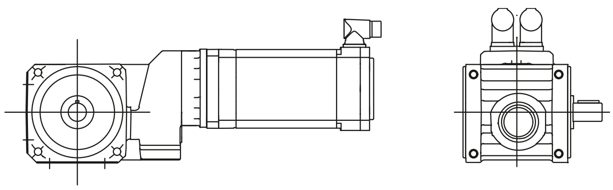
BSHF..B /I CMP..

Gearmotor with hollow shaft and shrink disk at the output side and front-end mounting



BSAF.. CMP..

Gearmotor with hollow shaft and keyway, B5 output flange



BSAF..B CMP..

Gearmotor with hollow shaft and keyway, B5 output flange and front-end mounting

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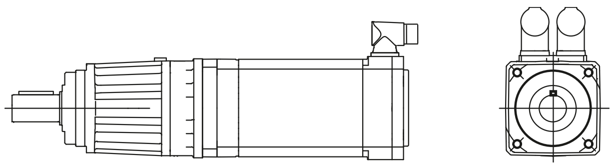
3.4.2 PS.F planetary gearmotors

The following designs of planetary gearmotors are available:

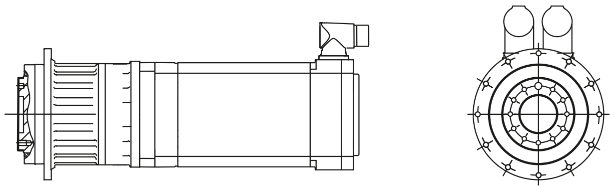


PSF.. CMP..

Gearmotor with solid shaft (smooth), B5 output flange

PSKF.. CMP..

Gearmotor with solid shaft and key, B5 output flange

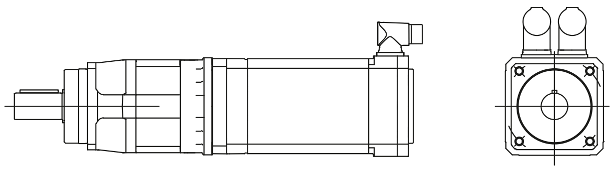


PSBF.. CMP..

Gearmotor with flange block shaft, B5 output flange

3.4.3 PS.C planetary gearmotors

The following designs of planetary gearmotors are available:

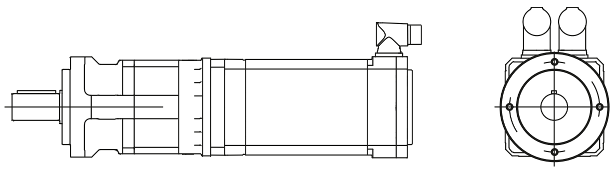


PSC.. CMP..

Gearmotor with solid shaft (smooth), B5 output flange

PSKC.. CMP..

Gearmotor with solid shaft and key, B5 output flange



PSCZ.. CMP..

Gearmotor with solid shaft (smooth), B14 output flange

PSKCZ.. CMP..

Gearmotor with solid shaft and key, B14 output flange

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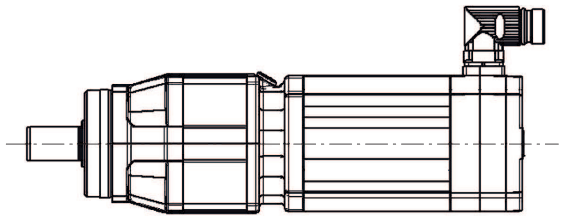
3.5 Example of the type designation of a servo gearmotor

Example: Order code servo gearmotor PS.C..



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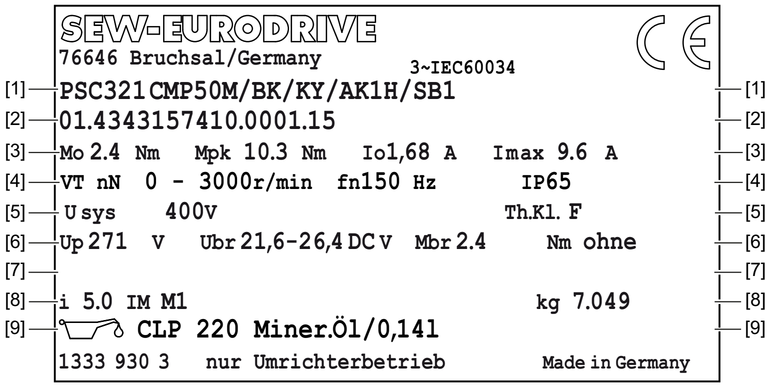
For example, a servo gearmotor with brake, manual brake release, PTC thermistor and plug connector has the following type designation:

Example: PSC321CMP50M/BK/PK/AK1H/SB1		
Gear unit type	**PSC**	Gear unit
Gear unit size	**321**	
Motor series	**CMP**	Motor
Motor size	**50**	
Length	**M**	
Brake	**/BK**	Options
Temperature sensor	**/PK**	
Multi-turn absolute encoder	**/AK1H**	
Plug connector for motor and brake, connector housing with axial encoder cable entry	**/SB1**	

3.6 Nameplate servo gearmotor

Example: Nameplate PS.C.. servo gearmotor



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Line	Information
[1]	• Type designation
[2]	• Serial number
[3]	• Standstill torque of the servomotor • Dynamic limit torque of the servomotor • Standstill current • Maximum permitted current
[4]	• Variable torque • Rated speed • Nominal frequency of the servomotor • Degree of protection according to IEC 60034-5
[5]	• System voltage, voltage of the supplying inverter • Temperature class of the servomotor
[6]	• Voltage at open terminals with a rated speed of the servomotor in no-load operation • Operating voltage of the brake • Nominal torque of the brake • Delivery without brake rectifier
[7]	• Maximum permitted output torque for short-time duty • Maximum permitted output speed for short-time duty • Maximum permitted input speed for short-time duty
[8]	• Gear unit ratio • Mounting position • Mass of the servo gearmotor
[9]	• Oil type and oil fill volume

INFORMATION

• The nameplate of servo gearmotors is fixed to the servomotor!

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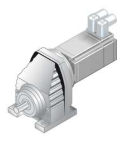
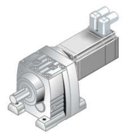
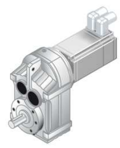
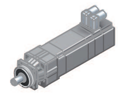
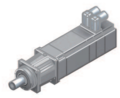
3.7 Overview of servo gearmotors

3.7.1 Axially parallel gear units

Gear unit type For details, refer to			RX.. (→ 🗎 199)	R.. (→ 🗎 199)	F.. (→ 🗎 294)	PS.C.. (→ 🗎 643)	PS.F.. (→ 🗎 591)
Technical data:							
Figure							
Peak torque	M_{a_pk}	Nm	54 – 1150	46 – 7000	130 – 8860	37 – 427	26 – 4200
Max. continuous torque	M_{a_max}	Nm	36 – 830	31 – 6000	87 – 7840	29 – 347	20 – 3000
Max. input speed	n_{e_pk}	min^{-1}	to 4500	to 4500	to 4500	to 7000	to 8000
Peak overhung load	$F_{r\_a\_pk}$	N	3970 – 30000	1220 – 43000	4500 – 65000	2000 – 11000	1900 – 83000
Gear ratio range	i		1.3 – 8.23	3.21 – 262.65	3.77 – 276.77	3 – 100	3 – 100
Option with reduced back-lash	/R		X	X	X	–	X
Option with minimized back-lash	/M		–	–	–	–	X
Mechanical data:							
Hollow shaft			–	–	X	–	–
Foot mounting			X	X	–	–	–
Flange block			–	–	–	–	X
B5 flange			X	X	X	X	X
B14 flange			–	X	X	X	–

X = available, – = not available

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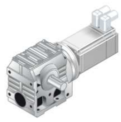
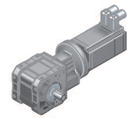
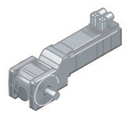
3.7.2 Right-angle gear unit

Gear unit type **For details, refer to**			**K..7** **(→ 🗎 377)**	**K..9** **(→ 🗎 377)**	**S..** **(→ 🗎 485)**	**W..** **(→ 🗎 516)**	**BS.F..** **(→ 🗎 548)**
Technical data:							
Figure							
Peak torque	M_{a_pk}	Nm	187 – 9090	67 – 605	60 – 655	91 – 270	51 – 1910
Max. continuous torque	M_{a_max}	Nm	125 – 8000	61 – 500	43 – 480	70 – 180	40 – 1500
Max. input speed	n_{e_pk}	min^{-1}	4500	4500	4500	4500	4500
Peak overhung load	$F_{R\_a\_pk}$	N	4100 – 65000	3600 – 9000	3000 – 12000	2950 – 7600	2380 – 36000
Gear ratio range	i		3.98 – 176.05	2.81 – 75.20	6.8 – 75.06	3.2 – 74.98	3 – 40
Option with reduced backlash	/R		X	–	X	–	X
Option with minimized backlash	/M		–	–	–	–	–
Mechanical data:							
Hollow shaft			X	X	X	X	X
Foot mounting			X	X	X	X	X
Flange block			–	–	–	–	X
B5 flange			X	X	X	X	X
B14 flange			X	–	X	–	–

X = available, – = not available

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4 Project planning notes for servo gearmotors

4.1 Additional documentation on project planning

For detailed information about project planning for the motor, the gear unit and the inverter, refer to the following documentation from SEW-EURODRIVE:

Drive Technology – Practical Implementation

- Project planning for drives

Technical data for motors and gear units

- "Synchronous Servomotors" (MOT2) catalog
- “Servo Gear Units” (GSK) catalog
- “Gear Units” (GK) catalog

Electronics documentation

- "MOVIDRIVE® MDX60/61B" (MDX) system manual
- “Multi-Axis Servo Inverter MOVIAXIS® MX” (MX) system manual
- "MOVITRAC® 07B" (MC) system manual

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4.2 Drive and gear unit selection data

Determining application data

First, you require the data (mass, speed, setting range, etc.) of the machine to be driven to select the correct drive (see following table). These data help determine the required power, torque and speed. Refer to the "Drive Engineering – Practical Implementation, Project Planning" publication or the SEW Workbench project planning software for assistance.

Selecting the correct drive

After calculating the performance, speed, torque and overhung load of the drive, while considering all mechanical requirements, a suitable drive can be determined.

Application data

The data of the application must be known for selecting a drive, or must be specified by the customer.

The abbreviations used for project planning are summarized in the following table:

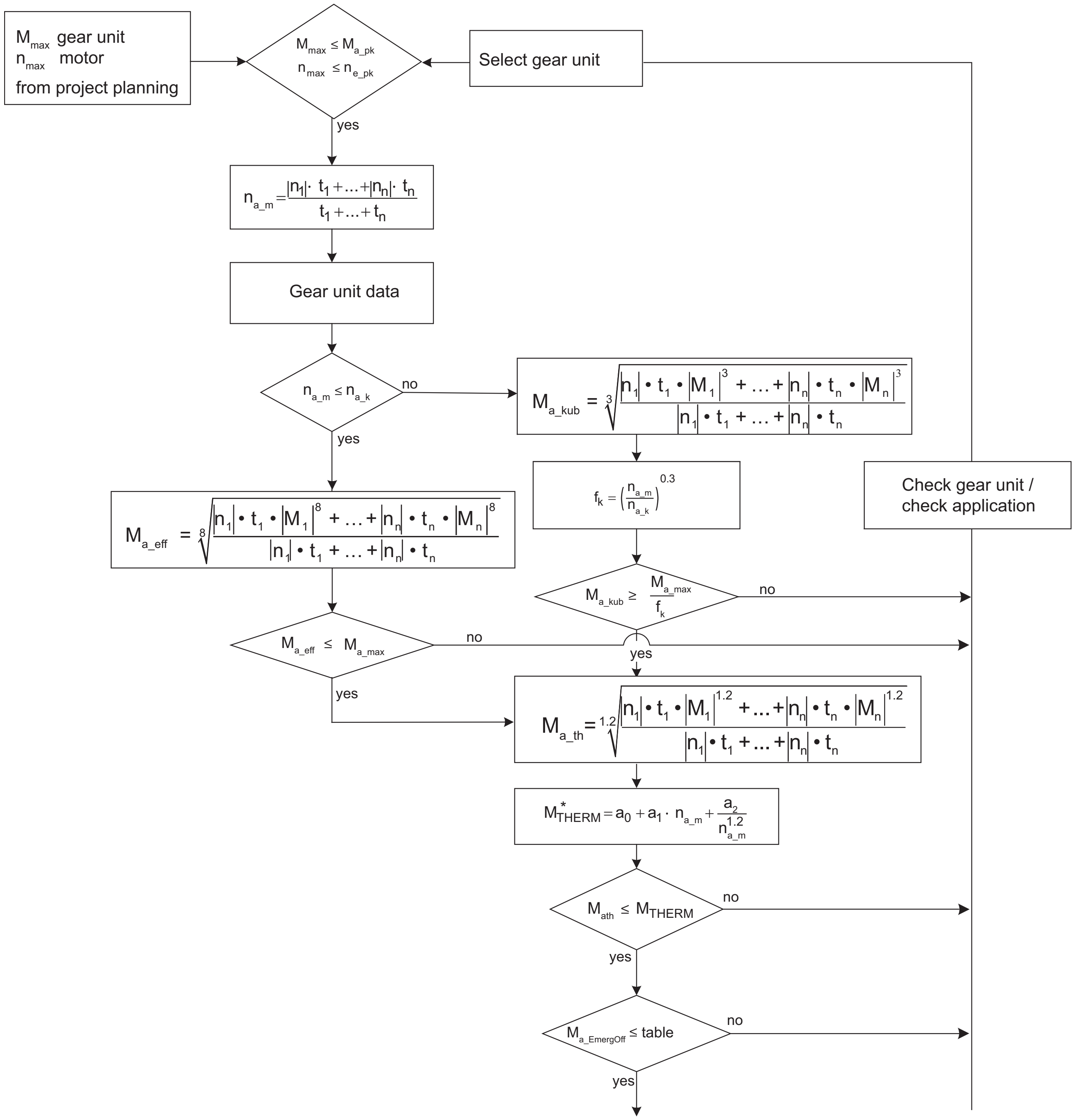
Designation	Meaning	Unit
φ	Rotational clearance	`
η	Gear unit efficiency for M_{apk}	
F_A	Axial load (tension and compression) on the output shaft	N
f_k	Speed ratio	
F_R	Overhung load on the output shaft	N
$F_{R\_a\_pk}$	Maximum permitted overhung load at the output shaft for short-time duty (load application point is the middle of the shaft end)	N
$F_{R\_a\_max}$	Maximum permitted overhung load at the output shaft for continuous duty (load application point is the middle of the shaft end)	N
$F_{R\_e\_pk}$	Maximum permitted overhung load at the input shaft for short-time duty (load application point is the middle of the shaft end)	N
$F_{R\_e\_max}$	Maximum permitted overhung load at the input shaft for continuous duty (load application point is the middle of the shaft end)	N
$F_{R\_a\_kub}$	Cubic overhung load with cubic torque M_{akub}	N
F_Z	Transmission element factor for overhung load	
H	Installation altitude	m above sea level
i	Gear unit ratio	
J_A	Mass moment of inertia of the adapter	kgm^2
J_G	Mass moment of inertia of the gear unit	kgm^2
J_{ext}	Mass moment of inertia (external) reduced on motor shaft	kgm^2
J_{mot}	Mass moment of inertia of the motor	kgm^2
J_L	Mass moment of inertia of the load	kgm^2
k	Mass moment of inertia ratio J_{ext}/J_{Mot}	
$M_1 – M_n$	Output torque in time period t_1 to t_n	Nm
M_0	Standstill torque (thermal continuous torque at low speeds)	Nm
M_{a_DYN}	Dynamic output torque assumed for the drive in project planning	Nm
M_{a_eff}	Effective torque for component testing calculated in project planning	Nm
M_{a_kub}	Effective torque for bearing testing calculated in project planning	Nm
M_{a_max}	Maximum permitted output torque for continuous duty	Nm

Designation	Meaning	Unit
M_{a_pk}	Maximum permitted torque for short-time duty	Nm
$M_{a\_EmergOff}$	Maximum permitted emergency stop torque, max. 1000 emergency stops	Nm
M_{a_th}	Effective torque for thermal testing calculated in project planning	Nm
M_B	Rated brake torque	Nm
M_{pk}	Dynamic limit torque of the servomotor	Nm
M_{eff}	Effective torque requirement (in relation to the motor)	Nm
M_{max}	Maximum output torque of the drive in project planning	Nm
ML	Mounting location (UL)	
n_{a_pk}	Maximum permitted output speed for short-time duty	1/min
n_{e_pk}	Maximum permitted input speed for short-time duty	1/min
n_{e_m}	Mean input speed	1/min
n_{a_m}	Mean output speed	1/min
n_{a_k}	Breakpoint speed (output)	1/min
n_N	Rated speed	1/min
$n_1 – n_n$	Output speed in time period t_1 to t_n	1/min
n_{etn_pk}	Maximum input speed in section	1/min
P_B	Braking power	W
P_{B_pk}	Peak braking power	W
P_{B_eff}	Effective braking power	W
P_{B_tn}	Braking power in section t_n	W
$t_1 – t_n$	Time period 1 to n	s
t_z	Cycle time	s
T_{amb}	Ambient temperature	°C
U_{sys}	System voltage, voltage of the supplying inverter	V
U_{Br}	Operating voltage of the brake	V

4.3 Project planning procedure

The following flow diagram presents a schematic view of the project planning procedure for a servo gearmotor for a positioning drive in S3 duty cycle under normal operating conditions, an installation altitude of < 1000 m above sea level, and an ambient temperature range of 25 °C. Contact SEW-EURODRIVE if other conditions apply.

4.3.1 Project planning procedure: Part 1, servo gear units



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* For thermal project planning of R, F, K, S, W gear units, please contact SEW-EURODRIVE.

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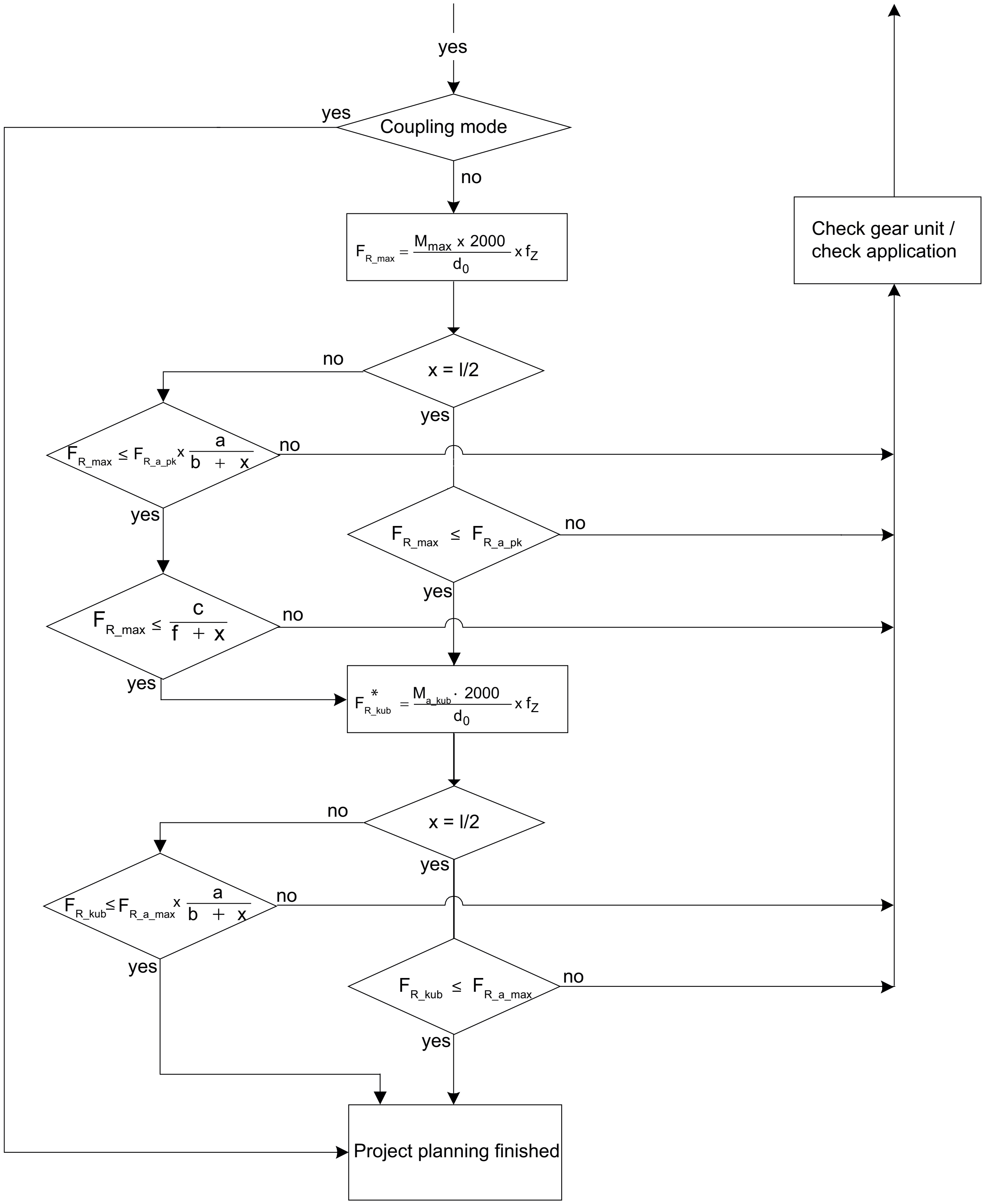
4.3.2 Project planning procedure: Part 2, servo gear units



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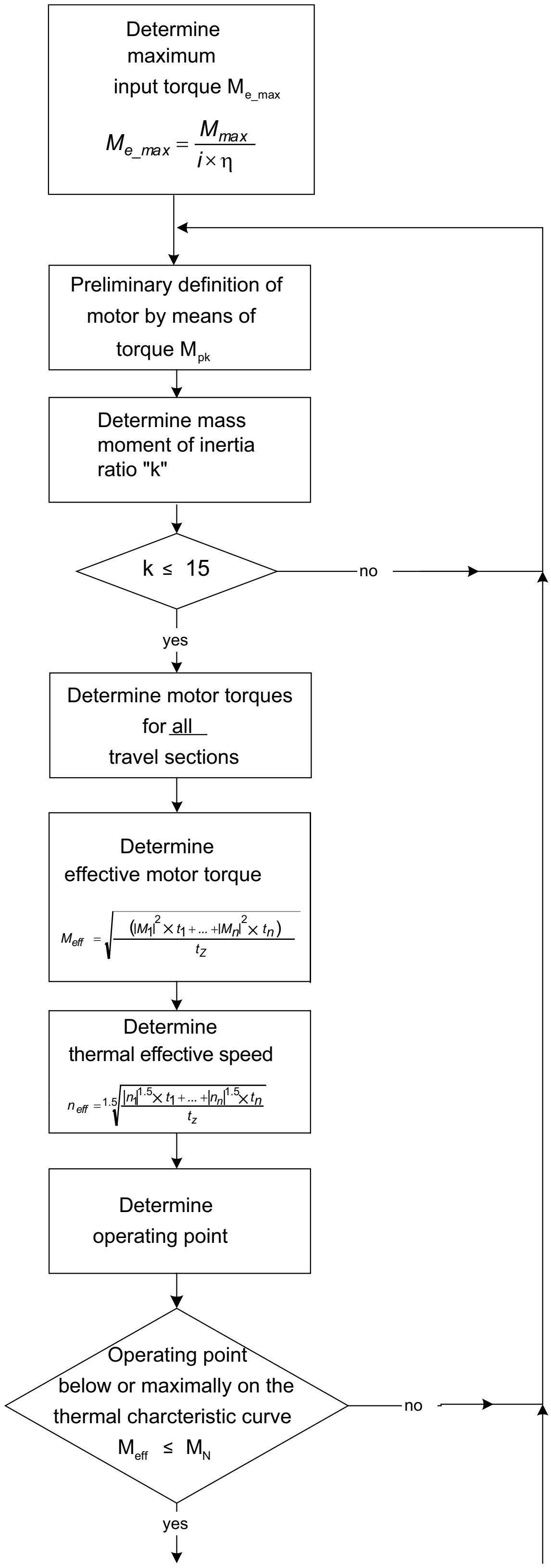
* For preloaded drives (toothed belts, flat belts, narrow belts, and pinion/gear rack), the cubic overhung load (F_{R_Kub}) equals the maximum overhung load (F_{R_max}).

4.3.3 Project planning procedure: Part 3, servomotors



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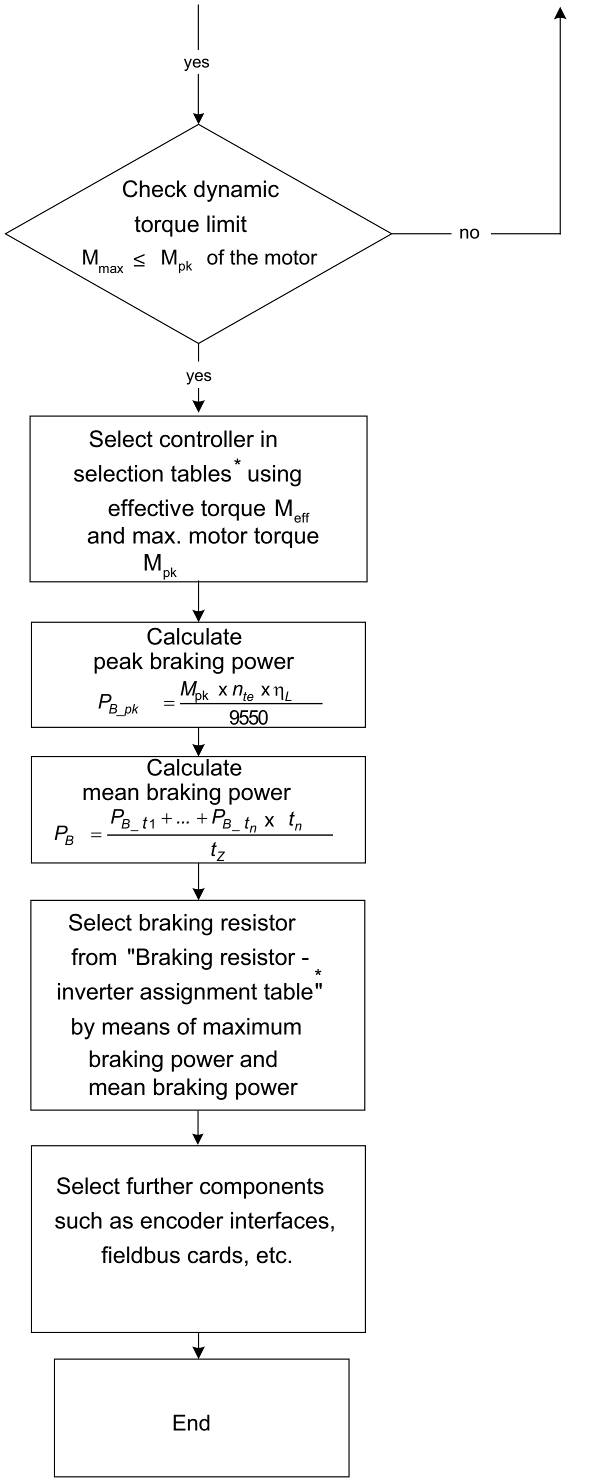
4.3.4 Project planning procedure: Part 4, servomotors



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* MOVIDRIVE® system manual, MOVIAXIS® system manual

For more information on the project planning of brakes, refer to the "Synchronous Servomotors" catalog (MOT2).

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4.4 Project planning notes – R, F, K, S, W gear units

4.4.1 Efficiency of gear units

General information

The efficiency of the gear units is mainly determined by the gearing and bearing friction as well by churning losses. Keep in mind that the starting efficiency of a gear unit is always less than its efficiency at operating speed. This factor is particularly true for helical-worm and SPIROPLAN® right-angle gear units.

INFORMATION

For information on churning losses and thermal rating, refer to chapter "Churning losses and thermal rating" (→ 🗎 58).

R, F, K gear units

Depending on the number of gear stages, the gearing efficiency of helical, parallel-shaft and helical-bevel gear units is up to 96% (3-stage), 97% (2-stage) and 98% (1-stage).

S and W gear units

The gearing in helical-worm and SPIROPLAN® gear units produces a high proportion of sliding friction. This is the reason why these gear units have higher tooth friction losses and lower efficiency than R, F or K gear units.

Other factors influencing the efficiency:

- Gear ratio of the helical-worm or SPIROPLAN® stage
- Input speed
- Ambient temperature

Helical-worm gear units from SEW-EURODRIVE are helical gear/worm combinations that are significantly more efficient than plain helical-worm gear units.

The efficiency may reach $\eta < 0.5$ if the helical-worm gear stage has a very high gear ratio.

Self-locking

Retrodriving torque in helical-worm or SPIROPLAN® gear units produces an efficiency of $\eta' = 2 - 1/\eta$, which is significantly less favorable than the forward efficiency. The helical-worm or SPIROPLAN® gear unit is statically self-locking if the forward efficiency η is ≤ 0.5. The SPIROPLAN® gear units W..10 – W..30 are to some extent (with high ratios) dynamically self-locking. Contact SEW-EURODRIVE if you want to make technical use of the braking effect of self-locking characteristics.

INFORMATION

Note that the self-locking effect of helical-worm and SPIROPLAN® gear units is not permitted as the sole safety function for hoists.

Run-in phase

The tooth flanks of new helical-worm and SPIROPLAN® gear units are not yet completely smooth. That fact makes for a greater friction angle and less efficiency than during later operation. This effect intensifies with increasing gear ratio.

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During the run-in phase, the nominal efficiency of the gear unit is reduced by the relevant value from the following tables.

	Worm	
	i range	**η reduction**
1-start	approx. 50 – 280	approx. 12%
2-start	approx. 20 – 75	approx. 6%
3-start	approx. 20 – 90	approx. 3%
5-start	approx. 6 – 25	approx. 3%
6 start	approx. 7 – 25	approx. 2 %

SPIROPLAN® W10 to W30		SPIROPLAN® W37 and W47	
i range	**η reduction**	**i range**	**η reduction**
approx. 35 – 75	approx. 15%	-	-
approx. 20 – 35	approx. 10%	-	-
approx. 10 – 20	approx. 8%	approx. 30 – 70	approx. 8%
approx. 8	approx. 5%	approx. 10 – 30	approx. 5%
approx. 6	approx. 3%	approx. 3 – 10	approx. 3%

The run-in phase usually lasts 48 hours. The following conditions must be met for helical-worm and SPIROPLAN® gear units to achieve their nominal efficiency ratings:

- The gear unit has been completely run-in.
- The gear unit has reached nominal operating temperature.
- The recommended lubricant has been filled.
- The gear unit is operating in the nominal load range.

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4.4.2 Churning losses and thermal rating

* (→ 🗎 X)

Churning losses may occur with the following conditions. They must be considered during thermal check:

- A mounting position where the first gear unit stage is fully immersed in the lubricant. The respective mounting position of the gear units are indicated with a * in chapter "Mounting position sheets" (→ 🗎 94).
- A high mean input speed and thus a high circumferential velocity of the gear wheels of the input gear stage. The respective gear unit ratios are indicated with the footnote [1)] in the selection tables (see also chapter "Information on the selection tables" (→ 🗎 190)).

If one or both requirements are met, determine the requirements of the application and the corresponding operating conditions (see chapter "Data for calculating the thermal rating" (→ 🗎 58)) and contact SEW-EURODRIVE. SEW-EURODRIVE can calculate the thermal rating based on the actual operating conditions. The thermal rating of the gear unit can be increased by appropriate measure e.g. by using a synthetic lubricant with higher thermal endurance properties.

INFORMATION

To reduce churning losses to a minimum, use gear units preferably in M1 mounting position.

Data for calculating the thermal rating

The following information is required for calculating the thermal rating:

Gear unit type and design:

- Gear unit ratio i
- Mean input speed n_{e_m} or mean output speed n_{a_m} in min^{-1}
- Effective motor torque M_{eff} in Nm
- Input motor power P_e in kW
- Mounting position M1 – M6 or pivoting angle

Installation site:

- Ambient temperature T_{amb} in °C
- In small, closed rooms or in large rooms (halls) or outdoors

Installation on site:

- Space-critical or well ventilated
- Steel or concrete base

4.4.3 Overhand and axial loads of R, F, K, S, and W gear units

Determining the overhung load

An important factor for determining the resulting overhung load is the type of transmission element mounted to the shaft end. The following transmission element factors f_Z must be considered for various transmission elements.

Transmission element	Transmission element factor f_Z	Comments
Gear wheels	1.15	< 17 teeth
Sprockets	1.40	< 13 teeth
Sprockets	1.25	< 20 teeth
Narrow V-belt pulleys	1.75	Consider influence of pre-tension force
Flat belt pulleys	2.50	Consider influence of pre-tension force
Toothed belt pulleys	1.50	Consider influence of pre-tension force
Gear rack pinion, pretensioned	2.00	Consider influence of pre-tension force
Gear rack pinion, not pretensioned	1.15	< 17 teeth

The overhung load exerted on the motor or gear shaft is calculated as follows:

$$F_R = \frac{M_d \times 2000}{d_0} \times f_Z$$

F_R Overhung load in N

M_d Torque in Nm

d_0 Mean diameter of the installed transmission element in mm

f_Z Transmission element factor

Permitted overhung load

The basis for determining the permitted overhung loads is the computation of the rated bearing service life L_{10h} of the rolling bearings (according to ISO 281).

For special operating conditions, the permitted overhung loads can be determined on the basis of the modified service life L_{na} on request.

The permitted overhung loads F_{R_a} for the output shafts of foot-mounted gear units with a solid shaft are listed in the selection tables for gearmotors. For other designs, please contact SEW-EURODRIVE.

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INFORMATION

The values refer to force application to the center of the output shaft end l/2 (in right-angle gear units as viewed onto the A-side output). For gear units with hollow shaft and key (shaft-mounted design), the values refer to force application to the front end of the hollow shaft. The values for the force application angle α and direction of rotation are based on the most unfavorable conditions.

- Only 50% of the F_{R_a} values specified in the selection tables are permitted in mounting positions M1, M3, M5 and M6 with wall attachment on the front face for K and S gear units.
- Foot and flange-mounted helical gearmotors (R..F): A maximum of 50% of the overhung load F_{R_a} specified in the selection tables is permitted in the case of torque transmission via the flange mounting.

Higher permitted overhung loads

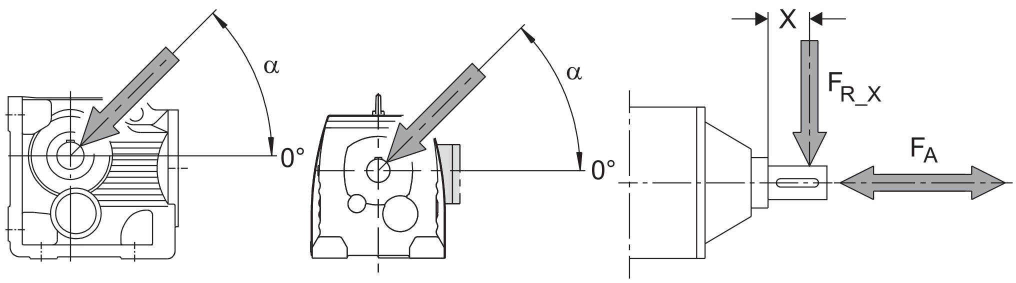
Exactly considering the force application angle α and the direction of rotation makes it possible to achieve a higher overhung load than listed in the selection tables.

Furthermore, higher output shaft loads are permitted if heavy duty bearings are installed, especially with R, F and K gear units.

Contact SEW-EURODRIVE in such cases.

Definition of the force application

Force application is defined according to the following figure:



α	Force application angle	F_A	Permitted axial load in N
F_{R_X}	Permitted overhung load at point X in N		

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Permitted axial forces

If there is no overhung load, then an axial load F_A (tension or compression) amounting to 50% of the overhung load given in the selection tables is permitted. This condition applies to the following gearmotors:

- Helical gearmotors except for R..127
- Parallel shaft and helical-bevel gearmotors with solid shaft except for F97...
- Helical-worm gearmotors with solid shaft

INFORMATION

Contact SEW-EURODRIVE for all other gear unit designs and in the event of significantly greater axial loads or combinations of overhung load and axial load.

Input end: Overhung load conversion for off-center force application

INFORMATION

Contact SEW-EURODRIVE with regard to the project planning of gear units with input shaft assemblies and off-center force application.

On the output side: Overhung load conversion for off-center force application

The permitted overhung loads must be calculated according to the selection tables using the following formulas in the event of force application to areas other than the center of the shaft end. The smaller of the two values F_{RX_L} (according to bearing service life) and F_{RX_W} (according to shaft strength) is the permitted value for the overhung load at point X. Note that the calculations apply to M_{amax}. The permitted overhung load values F_{Ramax} and F_{Rapk} listed in the data tables are valid for force application at l/2 (solid shaft) or force application at the shaft end face (front end surface of the hollow shaft).

The following conditions must be met:

F_{RX_L} according to bearing service life:

$$F_{RX\_L} = F_{Ramax} \times \frac{a}{b + X}$$

F_{RX_W} according to shaft strength:

$$F_{RX\_W} = \frac{c}{f + X}$$

F_{RX}	Permitted overhung load at point X in N
F_{Ramax}	permitted overhung load in N
X	Distance from the shaft shoulder to the force application point in mm
a, b, f	Gear unit constants for overhung load conversion in mm
c	Gear unit constant for overhung load conversion in Nmm

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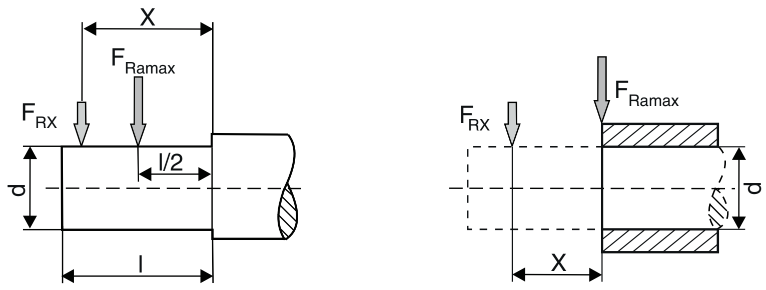

Solid shaft Hollow shaft

Gear unit constants for overhung load conversion

Gear unit type	a mm	b mm	c Nmm	f mm	d mm	l mm
RX57	43.5	23.5	1.51×10^5	34.2	20	40
RX67	52.5	27.5	2.42×10^5	39.7	25	50
RX77	60.5	30.5	1.95×10^5	0	30	60
RX87	73.5	33.5	7.69×10^5	48.9	40	80
RX97	86.5	36.5	1.43×10^6	53.9	50	100
RX107	102.5	42.5	2.47×10^6	62.3	60	120
R07	72.0	52.0	4.67×10^4	11	20	40
R17	88.5	68.5	6.53×10^4	17	20	40
R27	106.5	81.5	1.56×10^5	11.8	25	50
R37	118	93	1.24×10^5	0	25	50
R47	137	107	2.44×10^5	15	30	60
R57	147.5	112.5	3.77×10^5	18	35	70
R67	168.5	133.5	2.65×10^5	0	35	70
R77	173.7	133.7	3.97×10^5	0	40	80
R87	216.7	166.7	8.47×10^5	0	50	100
R97	255.5	195.5	1.06×10^6	0	60	120
R107	285.5	215.5	2.06×10^6	0	70	140
R127	311	226	$4.93 \text{ x } 10^6$	0	90	170
F27	109.5	84.5	1.13×10^5	0	25	50
F37	123.5	98.5	1.07×10^5	0	25	50
F47	153.5	123.5	1.40×10^5	0	30	60
F57	170.7	135.7	2.70×10^5	0	35	70
F67	181.3	141.3	4.12×10^5	0	40	80
F77	215.8	165.8	7.87×10^5	0	50	100
F87	263	203	1.06×10^6	0	60	120
F97	350	280	2.09×10^6	0	70	140
F107	373.5	288.5	4.23×10^6	0	90	170

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Gear unit type	a mm	b mm	c Nmm	f mm	d mm	l mm
K19	103.7	83.7	8.66×10^4	0	20	40
K29	124.5	99.5	1.26×10^5	0	25	50
K37	123.5	98.5	1.30×10^5	0	25	50
K39	155.5	125.5	2.25×10^5	0	30	60
K47	153.5	123.5	1.40×10^5	0	30	60
K49	183.5	148.5	2.63×10^5	0	35	70
K57	169.7	134.7	2.70×10^5	0	35	70
K67	181.3	141.3	4.12×10^5	0	40	80
K77	215.8	165.8	7.69×10^5	0	50	100
K87	252	192	1.64×10^6	0	60	120
K97	319	249	2.80×10^6	0	70	140
K107	373.5	288.5	5.53×10^6	0	90	170
S37	118.5	98.5	6.0×10^4	0	20	40
S47	130	105	1.33×10^5	0	25	50
S57	150	120	2.14×10^5	0	30	60
S67	184	149	3.04×10^5	0	35	70
S77	224	179	5.26×10^5	0	45	90
S87	281.5	221.5	1.68×10^6	0	60	120
S97	326.3	256.3	2.54×10^6	0	70	140
W10	84.8	64.8	3.6×10^4	0	16	40
W20	98.5	78.5	4.4×10^4	0	20	40
W30	109.5	89.5	6.0×10^4	0	20	40
W37	121.1	101.1	$6.95 \text{ x } 10^4$	0	20	40
W47	145.5	115.5	$4.26 \text{ x } 10^5$	35.6	30	60

Values for designs not listed are available on request.

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4.5 Project planning notes – BS.F, PS.F, PS.C gear units

4.5.1 Efficiency of the servo gear units

General information

The efficiency of gear units is mainly determined by the gearing and bearing friction. Keep in mind that the starting efficiency of a gear unit is always less than its efficiency at operating speed.

BS.F gear units

The maximum efficiency of BS.F gear units is approx. 94% (2 stage).

PS.F, PS.C gear units

The maximum efficiency of planetary gear units varies with the number of gear stages, between 98% (2-stage) and 99% (1-stage).

INFORMATION

For PS.F gear units with rotational clearance option “M” used in operating mode S1, please contact SEW-EURODRIVE.

INFORMATION

When input and output elements are mounted on **servo gear units**, the **shaft shoulder can be used as a stop** for transmission elements (belt pulley, pinion gear, etc.).

INFORMATION

For information on churning losses and thermal rating, refer to chapter "Churning losses and thermal rating" (→ 🗎 58).

4.5.2 Overhung loads and axial loads – BS.F, PS.F and PS.C gear units

Determining the overhung load

An important factor for determining the resulting overhung load is the type of transmission element mounted to the shaft end. The following transmission element factors f_Z must also be considered for various transmission elements according to the following formula:

Transmission element	Transmission element factor f_Z	Comments
Gear wheels	1.15	< 17 teeth
Sprockets	1.40	< 13 teeth
Sprockets	1.25	< 20 teeth
Narrow V-belt pulleys	1.75	Consider influence of pretension force
Flat belt pulleys	2.50	Consider influence of pretension force
Toothed belt pulleys	1.50	Consider influence of pretension force
Gear rack pinion, pretensioned	2.00	Consider influence of pretension force
Gear rack pinion, not pretensioned	1.15	< 17 teeth

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Permitted overhung load

The basis for determining the permitted overhung loads is the computation of the nominal bearing service life L_{H10} of the rolling bearing (according to ISO 281).

For special operating conditions, the permitted overhung loads can be determined with regard to the modified bearing service life L_{n_a} on request.

INFORMATION

The values refer to force applied to the center of the shaft end (in right-angle gear units as viewed onto the A-side output). The values for the force application angle α and direction of rotation are based on the most unfavorable conditions.

INFORMATION

Reduction of overhung loads

Only 50% of the F_{R_amax} and $F_{R\_a\_pk}$ values specified in the selection tables are permitted in mounting positions M1 and M3 with wall attachment on the front face (/B) for BS.F gear units.

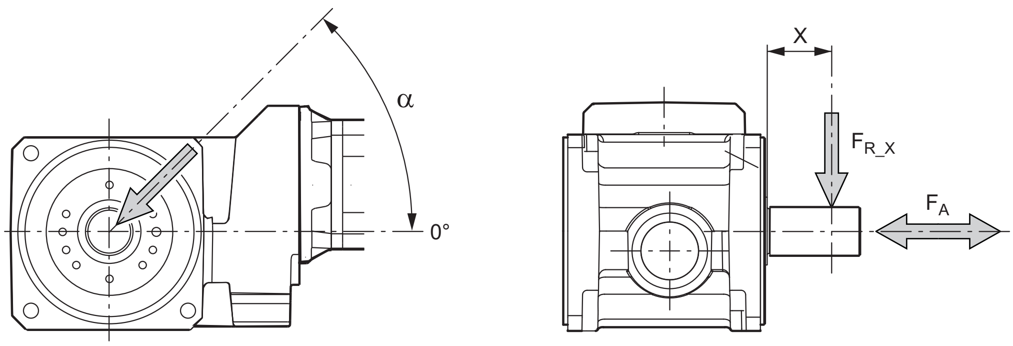
Higher permitted overhung loads

Exactly considering the force application angle α and the direction of rotation makes it possible to achieve a higher overhung load than listed in the selection tables.

Contact SEW-EURODRIVE in such cases.

Definition of the force application

The force application is defined according to the following figure:



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Permitted axial forces

If there is no overhung load, then an axial force F_A (pull or push) amounting to 50% of the overhung load given in the selection tables is permitted.

On the output side: Overhung load conversion for off-center force application

The permitted overhung loads must be calculated according to the selection tables using the following formulas in the event of force application to areas other than the center of the shaft end. The smaller of the two values F_{RX_L} (according to bearing service life) and F_{RX_W} (according to shaft strength) is the permitted value for the overhung load at point X. Note that the calculations apply to M_{amax}. The permitted overhung load values F_{Ramax} and F_{Rapk} listed in the data tables are valid for force application at l/2 (solid shaft) or force application at the shaft end face (front end surface of the hollow shaft or front end of flange block shaft with BSBF and PSBF gear units).

The following conditions must be met:

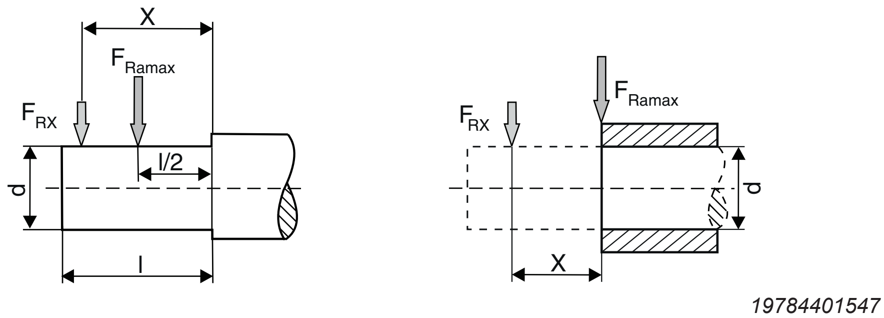
F_{RX_L} according to bearing service life:

$$F_{RX\_L} = F_{Ramax} \times \frac{a}{b + X}$$

F_{RX_W} according to shaft strength:

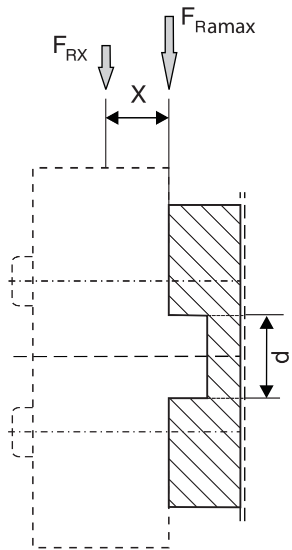
$$F_{RX\_W} = \frac{c}{f + X}$$

F_{RX}	Permitted overhung load at point X in N
F_{Ramax}	permitted overhung load in N
X	Distance from the shaft shoulder to the force application point in mm
a, b, f	Gear unit constants for overhung load conversion in mm
c	Gear unit constant for overhung load conversion in Nmm



Solid shaft

Hollow shaft



Flange block shaft

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Gear unit constants for overhung load conversion

BSF/BS.F gear units	Size	a mm	b mm	c Nmm	f mm	d mm	l mm
BSF/BSKF	202	113.1	95.6	7.35×10^4	0	20	35
BSHF/BSAF		116.6	116.6	-	-	-	-
BSBF		101.5	101.5	-	-	-	-
BSF/BSKF	302	122.6	104.6	8.61×10^4	0	22	36
BSHF/BSAF		126.6	126.6	-	-	-	-
BSBF		111.0	111.0	-	-	-	-
BSF/BSKF	402	152.2	123.2	2.56×10^5	0	32	58
BSHF/BSAF		143.7	143.7	-	-	-	-
BSBF		132.0	132.0	-	-	-	-
BSF/BSKF	502	175.4	134.4	4.92×10^5	0	40	82
BSHF/BSAF		162.4	162.4	-	-	-	-
BSBF		145.3	145.3	-	-	-	-
BSF/BSKF	602	195.9	154.9	9.84×10^5	0	55	82
BSHF/BSAF		189.9	189.9	-	-	-	-
BSBF		170.8	170.8	-	-	-	-
BSF/BSKF	802	242.7	190.2	1.89×10^6	0	75	105
BSHF/BSAF		243.2	243.2	-	-	-	-
BSBF		206.0	206.0	-	-	-	-

PSF/PS.F gear units	Size	a mm	b mm	c Nmm	f mm	d mm	l mm
PSF/PSKF	121/122	47.6	36.6	2.08×10^4	0	14	22
PSF/PSKF	221/222	53.6	39.6	2.41×10^4	0	16	28
PSBF	221/222	64.1	64.1	-	-	-	-
PSF/PSKF	321/322	65.0	47.0	7.97×10^4	0	22	36
PSBF	321/322	72.5	72.5	-	-	-	-
PSF/PSKF	521/522	83.1	54.1	2.52×10^5	0	32	58
PSBF	521/522	87.5	87.5	-	-	-	-
PSF/PSKF	621/622	113.6	72.3	5.48×10^5	0	40	82
PSBF	621/622	105.0	105.0	-	-	-	-
PSF/PSKF	721/722	126.6	85.6	1.42×10^6	0	55	82
PSBF	721/722	138.5	138.5	-	-	-	-
PSF/PSKF	821/822	153.2	100.7	3.21×10^6	0	75	105
PSBF	821/822	156.0	156.0	-	-	-	-
PSF / PSKF	921/922	170.7	105.7	5.30×10^6	0	85	130

PS.C gear units	Size	a mm	b mm	c Nmm	f mm	d mm	l mm
PS.C	221/222	57	43	3.41×10^4	0	16	28
	321/322	63.5	45.5	7.55×10^4	0	22	36
	521/522	95.5	66.5	2.13×10^5	0	32	58
	621/622	107.5	66.5	3.68×10^5	0	40	82

Values for designs not listed are available on request.

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4.6 Project planning notes – CMP(Z).. motors

4.6.1 Thermal characteristics

Notes on selecting synchronous servomotors

Project planning for a servomotor involves the following tasks for determining the thermal and dynamic load on the motor:

- Calculating the **effective operating point** for checking the thermal load on the motor.
- Calculating the **maximum operating point** for determining the motor/inverter combination.
- Determining the **mass moment of inertia ratio** J_{ext}/J_{mot} for checking the stability of speed control.

Procedure

- Determine the maximum speed taking account of the mass moment of inertia ratio $\mathbf{J_{ext}/J_{mot}} \leq 15$
- Maximum required torque M_{max} of the application at the corresponding speed and torque with maximum speed $\mathbf{n}_{max}$

  $\mathbf{M_{max} \leq M_{dyn\_Mot}}$ with $\mathbf{n}_{max}$

  M_{dyn_Mot} corresponds to the maximum torque with the specific motor/inverter combination. This operating point must lie below the characteristic curve for the maximum torque of the motor/inverter combination.
- Effective torque requirement at average speed $\mathbf{n}_{eff}$ of the application (effective operating point).

  $\mathbf{M}_{eff} \leq \mathbf{M}_n$ with $\mathbf{n}_{eff}$

  This operating point must lie below the characteristic curve (MS1 or MS1/VR) for continuous torque to ensure thermal stability of the drive.

4.6.2 Operating temperatures

Maximum ambient temperature

Motors of the CMP.. series are designed for use in a temperature range between -20 °C and +40 °C.

Higher operating temperatures

CMP.. servomotors can optionally be used at a maximum ambient temperature of 60 °C.

Please contact SEW-EURODRIVE if the motors are used at higher ambient temperatures. See also chapter "Derating for increased ambient temperature" (→ 🗎 70).

INFORMATION

Operating the motor at higher ambient temperatures requires that the suitable power cable is selected.

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Cold storage application

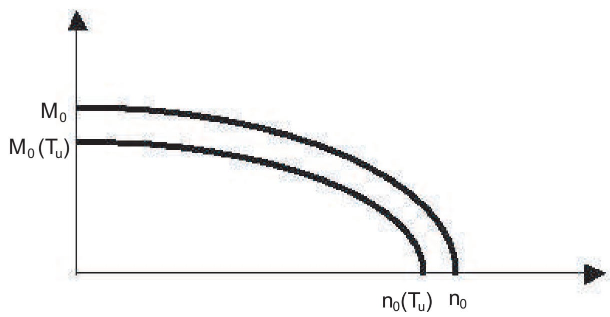
Taking suitable measures, motors can be used for cold storage applications up to -40 °C. The temperature range from -40 °C to +10 °C is listed on the nameplate.

4.6.3 Derating

Derating for increased ambient temperature

For the project planning of permanent-field synchronous servomotors of the CMP.. series, the following derating applies in the ambient temperature range +40°C to +60°C:

- The thermal speed/limit torque characteristic curve is re-scaled towards the origin (minimized). The thermal operating point based on effective torque and thermally effective speed of the application must be below the re-scaled characteristic curve.



$$M_0\,(T_U) = M_0 \times \left(\sqrt{\frac{145°C - T_U}{105°C}}\right)$$

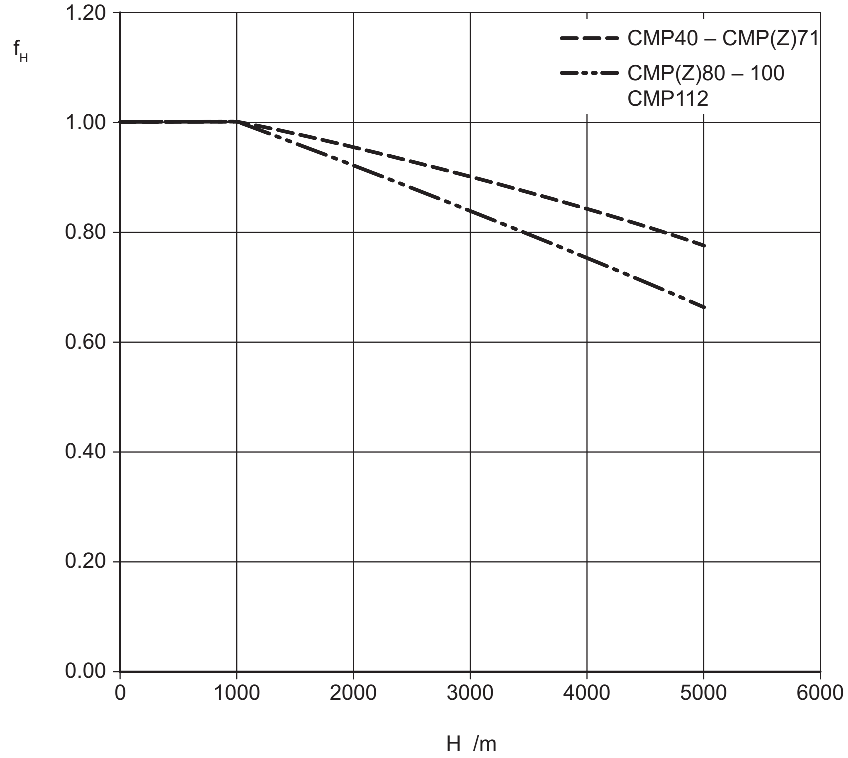
$$n_0\,(T_U) = K_e \times n_0 \times \left(\sqrt{\frac{145°C - T_U}{105°C}}\right)$$

T_U	Ambient temperature [°C]
M_0	Static torque under nominal conditions
$M_0(T_U)$	Standstill torque at increased temperature 40 °C < T_A < 60 °C
n_0	Thermal limit speed under nominal conditions
$n_0(T_U)$	Thermal limit speed at increased temperatures 40 °C < T_A < 60 °C
K_e	Encoder factor for resolver = 1; for electronic encoder (e.g. HIPEFACE® encoder) = 0.9

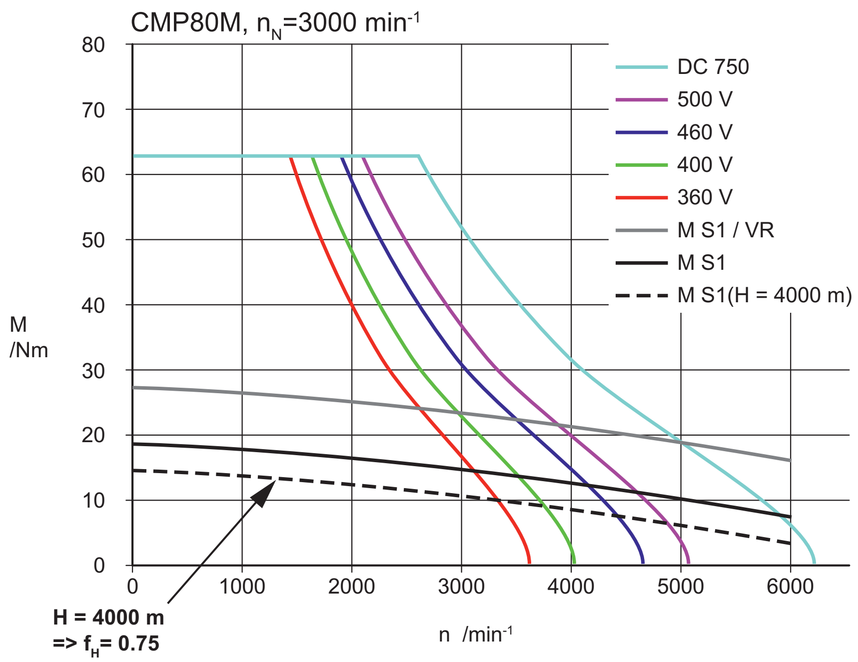
Derating depending on the installation altitude

The following diagram shows the factor f_H by which the thermal motor torque is reduced as a function of the installation altitude.

For drives in explosion-proof design, the following illustration applies only to category 3. The maximum installation altitude is 1000 m in category 2.



The thermal limit characteristic curve of the respective motor can be moved downwards in parallel using the factor f_H. The following figure shows an example using a servo motor CMP80M:



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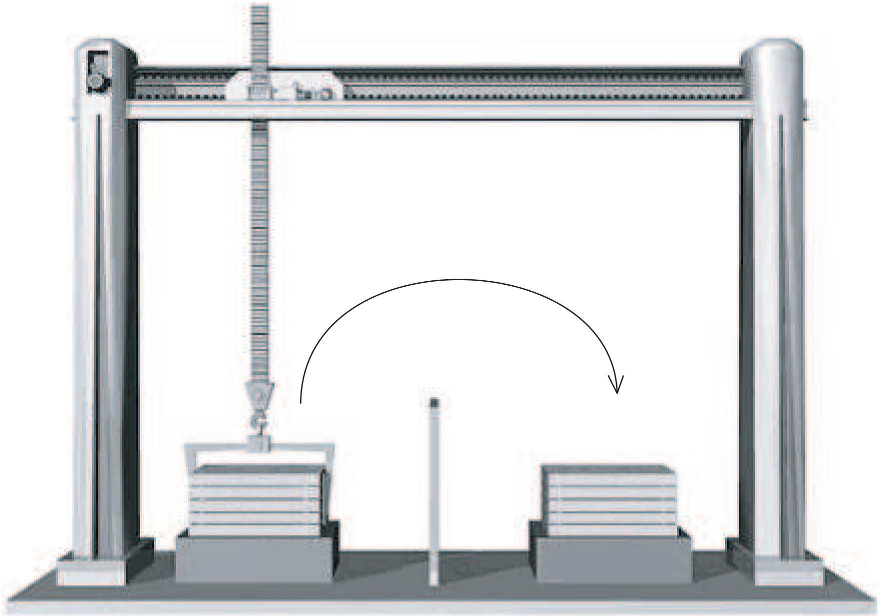
4.7 Project planning example

In the example, a gantry with synchronous servomotors is determined.

The symbols used in the equations are explained in chapter "Drive and gear unit selection data" (→ 🗎 50).

4.7.1 Selecting the x-axis (travel axis)



Gantry with servo drives – travel axis

The following data is given:

- Total moved mass: m_L = 50 kg
- Diameter of the belt pulley: d_0 = 75 mm
- Friction coefficient of the axis: μ = 0.01
- Travel speed: v_{max} = 2 ms^{-1}
- Maximum occurring acceleration/deceleration: a_{max} = 10 ms^{-2}
- Cycle time: t_z = 3 s
- Pause time: t_p = 1.8 s
- Load efficiency: η_L= 0.9
- Mounting position of the gear unit: IM = M1

For the drive, a PS.C gear unit is designed to be mounted directly to a CMP.. servomotor.

The overhung load is to act on the shaft center.

Power is transmitted via a belt pulley.

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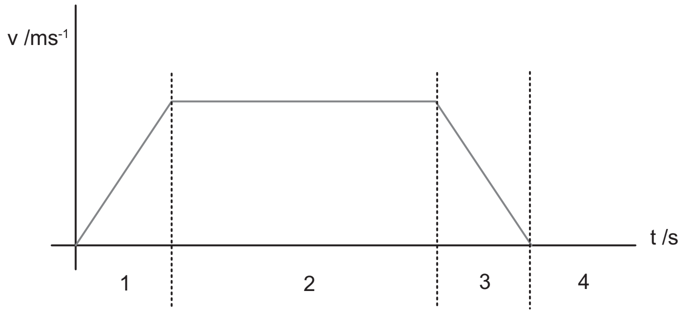
Travel sections

Diagram: Travel sections 1 to 4



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Acceleration time in travel section 1, deceleration time in travel section 3

$$t_1 = t_3 = \frac{v_{max}}{a_{max}} = \frac{2}{10}s = 0.2s$$

$[t_1] = [t_3] = s$
$[v_{max}] = ms^{-1}$
$[a_{max}] = ms^{-2}$

Travel time for constant travel in travel section 2

$$t_2 = t_z - t_p - t_1 - t_3$$
$$t_2 = (3 - 1.8 - 0.2 - 0.2)s$$
$$t_2 = 0.8s$$

$[t] = s$

M_{stat} for all travel sections

$$M_{stat} = \frac{(m \times g \times \mu) \times \frac{d_0}{2}}{\eta_L}$$
$$M_{stat} = \frac{(50 \times 9.81 \times 0.01) \times \frac{0.075}{2}}{0.9} Nm$$
$$M_{stat} = 0.2043 \text{Nm}$$

$[m] = kg$
$[g] = ms^{-2}$
$[d_0] = m$

M_{dyn} during acceleration in travel section 1

$$M_{dyn1} = \frac{(m \times a) \times \frac{d_0}{2}}{\eta_L}$$
$$M_{dyn1} = \frac{(50 \times 10) \times \frac{0.075}{2}}{0.9} Nm$$
$$M_{dyn1} = 20.83 Nm$$

$[M_{dyn1}] = Nm$
$[m] = kg$
$[a] = ms^{-2}$
$[d_0] = m$

M_{dyn} during deceleration in travel section 3

$$M_{dyn3} = (m \times a) \times \frac{d_0}{2} \times \eta_L$$
$$M_{dyn3} = (50 \times (-10) \times \frac{0.075}{2} \times 0.9) Nm$$
$$M_{dyn3} = 16.875 Nm$$

$[M_{dyn3}]$ = Nm
[m] = kg
[a] = ms^{-2}
$[d_0]$ = m
$[\eta_L]$ = 1

M_{max} during acceleration in travel section 1

$$M_{max1} = M_{stat} + M_{dyn1}$$
$$M_{max1} = 0.2043 Nm + 20.8333 \text{Nm}$$
$$M_{max1} = 21.04 \text{Nm}$$

[M] = Nm

M_{max} during deceleration in travel section 3

$$M_{max3} = M_{stat} + M_{dyn3}$$
$$M_{max3} = 0.2043 Nm + (-16.87 \text{Nm})$$
$$\text{M}_{max3} = -16.6657 \text{Nm}$$

[M] = Nm

Output speed

$$n_{a\_max} = \frac{v_{max}}{d_0 \times \pi} \times 60$$
$$n_{a\_max} = \left(\frac{2}{0.075 \times \pi} \times 60 \right) min^{-1}$$
$$n_{a\_max} = 509.295 min^{-1}$$

$[n_{a\_max}]$ = min^{-1}
$[v_{max}]$ = ms^{-1}
$[d_0]$ = m

Gear ratio including 10% motor speed reserve

n_N = 4500 min^{-1} is an assumption

$$i = \frac{n_N \times 0.9}{n_{a\_max}}$$
$$i = \frac{4500 \times 0.9}{509.295}$$
$$i = 7.95$$

[n] = min^{-1}

Selected gear ratio i = 7

Maximum input speed

$$n_{max} = n_{a\_max} \times i$$
$$n_{max} = (509.295 \times 7) \text{min}^{-1}$$
$$n_{max} = 3565.065 \text{min}^{-1}$$

[n] = min^{-1}

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Servo gear unit project planning

The gear unit is selected on the basis of the table below

							c_T	F_{R_a}	$F_{R\_a\_pk}$
		M_{a_max}	M_{a_pk}	$M_{a\_EmergOff}$	n_{a_k}	J_G	PSC	PSC	PSC
	i	Nm	Nm	Nm	min^{-1}	$10^{-4}kgm^2$	Nm/'	N	N
PSC221 1	3	29	40	60	1500	0.172	3.46	1170	2000
	5	34	42	63	720	0.0578	3.44	1390	2000
	7	32	39	59	800	0.03	3.28	1550	2000
	10	30	37	56	700	0.0144	2.92	1750	2000

				M1;M3;M5-6			M2			M4			φ
		n_{e_pk}	η	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	
	i	1/min	%										'
PSC221 1	3	7000	99	101.00	-0.093	0	106.00	-0.104	0	109.00	-0.110	0	10
	5	7000	99	160.00	-0.181	0	163.00	-0.190	0	167.00	-0.200	0	10
	7	7000	99	186.00	-0.257	0	187.00	-0.264	0	186.00	-0.267	0	10
	10	7000	99	158.00	-0.178	0	161.00	-0.184	0	164.00	-0.194	0	10

Selection condition:

$M_{max1} \leq M_{a\_pk}$

21.04 Nm ≤ 39 Nm

$n_{max} \leq n_{e\_pk}$

3565 min^{-1} ≤ 7000 min^{-1}

Condition is fulfilled.

Mean output speed

[n] = min^{-1}

$$\overline{n_a} = \frac{n_1 \times t_1 + ... + n_n \times t_n}{t_1 + ... + t_n}$$

$$\overline{n_a} = \frac{\frac{509.295}{2} \times 0.2 + 509.295 \times 0.8 + \frac{509.295}{2} \times 0.2}{0.2 + 0.8 + 0.2 + 1.8} min^{-1}$$

$$\overline{n_a} = 169.765 min^{-1}$$

Selection condition:

$\overline{n_a} \leq n_{a\_k}$

169.765 min^{-1} ≤ 800 min^{-1}

Condition is fulfilled.

Effective torque of servo gear unit

[M] = Nm

[n] = min^{-1}

[t] = s

$$M_{a\_eff} = \sqrt[8]{\frac{n_1 \times t_1 \times |M1|^8 + ... + n_n \times t_n \times |M_n|^8}{n_1 \times t_1 + ... + n_n \times t_n}}$$

$$M_{a\_eff} = \sqrt[8]{\frac{\frac{509.295}{2} \times 0.2 \times |21.04|^8 + 509.295 \times 0.8 \times |0.2043|^8 + \frac{509.295}{2} \times 0.2 \times |-16.67|^8}{0.2 \times 254.64 + 0.8 \times 509.295 + 0.2 \times 254.64}} Nm$$

$$M_{a\_eff} = 16.065 Nm$$

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Selection condition:

$M_{a\_eff} \leq M_{a\_max}$

16.065 Nm ≤ 32 Nm

Condition is fulfilled.

Thermal torque of servo gear unit

$$M_{a\_Therm} = \sqrt[1.2]{\frac{n_1 \times t_1 \times |M1|^{1.2} + ... + n_n \times t_n \times |M_n|^{1.2}}{n_1 \times t_1 + ... + n_n \times t_n}}$$

$$M_{a\_Therm} = \sqrt[1.2]{\frac{\frac{509.295}{2} \times 0.2 \times |21.04|^{1.2} + 509.295 \times 0.8 \times |0.2043|^{1.2} + \frac{509.295}{2} \times 0.2 \times |-16.67|^{1.2}}{0.2 \times 254.64 + 0.8 \times 509.295 + 0.2 \times 254.64}}$$

$$M_{a\_Therm} = 5.009 Nm$$

[M] = Nm

[n] = min^{-1}

[t] = s

Thermal factors for mounting position M1

a_0 = 186

a_1 = -0.257

a_3 = 0

$$M_{Therm} = a_0 + a_1 \times \overline{n_a} + \frac{a_2}{\overline{n_a}^{1.2}}$$

$$M_{Therm} = \left(186 + (-0.257 \times 169.765) + \frac{0}{169.765^{1.2}}\right) Nm$$

$$M_{Therm} = 142.37 Nm$$

[M_{Therm}] = Nm

[n] = min^{-1}

Selection condition:

$M_{a\_Therm} \leq M_{Therm}$

5.035 Nm ≤ 142.37 Nm

Condition is fulfilled.

Calculation of the overhung load on the shaft end

$$F_{R\_max} = \frac{M_{max}}{\frac{d_0}{2}} \times f_z$$

$$F_{R\_max} = \left(\frac{21.04}{\frac{0.075}{2}} \times 2.5\right) N$$

$$F_{R\_max} = 1402 N$$

[F_{R_max}] = N

[M_{max}] = Nm

[d_0] = m

[f_Z] = 1

The force application point is the center of the output shaft.

Selection condition:

$F_{R\_max} \leq F_{R\_a\_pk}$

1402 N ≤ 2000 N

Condition is fulfilled.

F_{R_kub}: For preloaded drives (toothed belts, flat belts, narrow belts, and pinion/gear rack), the cubic overhung load (F_{R_Kub}) equals the maximum overhung load (F_{R_max}).

Load torques in travel sections 1 to 3

Travel section 1

$$M_{e\_max1} = \frac{M_{dyn1}}{i \times \eta_G}$$
$$M_{e\_max1} = \frac{21.04}{7 \times 0.99} Nm$$
$$M_{e\_max1} = 3.036 Nm$$

$[M_{e\_max1}]$ = Nm
$[M_{dyn1}]$ = Nm

Travel section 2

$$M_{e\_max2} = \frac{M_{stat}}{i \times \eta_G}$$
$$M_{e\_max2} = \frac{0.2043}{7 \times 0.99} Nm$$
$$M_{e\_max2} = 0.0294 Nm$$

$[M_{e\_max2}]$ = Nm
$[M_{stat}]$ = Nm

Travel section 3

$$M_{e\_max3} = \frac{M_{dyn3} \times \eta_G}{i}$$
$$M_{e\_max3} = \frac{-16.67 \times 0.99}{7} Nm$$
$$M_{e\_max3} = -2.357 Nm$$

$[M_{e\_max3}]$ = Nm
$[M_{dyn3}]$ = Nm

4.7.2 Motor selection

Preliminary determination of motor using torque M_{pk}.

n_N	Motor	M_0	I_0	M_{pk}	I_{max}	M_{0VR}	I_{0VR}	J_{Mot}	J_{BMot}	M_{B1}	M_{B2}	L_1	R_1	V_{p0} cold
min^{-1}		Nm	A	Nm	A	Nm	A	kgcm^2		Nm		mH	Ω	V
4500	CMP40S	0.5	1.2	1.9	6.1	-	-	0.1	0.13	0.85	--	23	11.94	27.5
	CMP40M	0.8	0.95	3.8	6.0	-	-	0.15	0.18	0.95	--	45.5	19.92	56
	CMP50S	1.3	1.32	5.2	7.0	1.7	1.7	0.42	0.48	3.1	4.3	37	11.6	62
	CMP50M	2.4	2.3	10.3	13.1	3.5	3.35	0.67	0.73	4.3	3.1	20.5	5.29	66
	CMP50L	3.3	3.15	15.4	19.5	4.8	4.6	0.92	0.99	4.3	3.1	14.6	3.56	68
	CMP63S	2.9	3.05	11.1	18.3	4	4.2	1.15	1.49	7	9.3	18.3	3.34	64
	CMP63M	5.3	5.4	21.4	32.4	7.5	7.6	1.92	2.26	9.3	7	9.8	1.49	67
	CMP63L	7.1	6.9	30.4	41.4	10.3	10	2.69	3.03	9.3	7	7.2	1.07	71

Selected motor:

CMP63M

M_{pk} = 21.4 Nm

$J_{Mot} = 1.92 \times 10^{-4}\ kgm^2$

4.7.3 Determining the inertia ratio "k"

$$J_{ext} = 91.2 \times m \times \left(\frac{v_{max}}{n_{max}}\right)^2 + J_G$$
$$J_{ext} = 91.2 \times 50 \times \frac{2^2}{3565.065} + 0.03 \times 10^{-4}$$
$$J_{ext} = 14.38125 \times 10^{-4} kgm^2$$

$[J_{ext}] = kgm^2$
$[J_G] = kgm^2$
$[m] = kg$
$[v_{max}] = ms^{-1}$
$[n_{max}] = min^{-1}$

J_{ext} is thus in relation to the motor shaft.

$$k = \frac{J_{ext}}{J_{Mot}}$$
$$k = \frac{14.38125 \times 10^{-4}}{1.92 \times 10^{-4}}$$
$$k = 7.49$$

$[J_{ext}] = kgm^2$
$[J_{Mot}] = kgm^2$

Selection condition:

k ≤ 15

7.49 ≤ 15

Condition is fulfilled.

4.7.4 Intrinsic acceleration or deceleration of motor in sections 1 and 3

$$M_{GMot\_dyn} = (J_G + J_{Mot}) \times \frac{n_{max}}{9.55 \times t}$$
$$M_{GMot\_dyn} = \left((0.03 \times 10^{-4} + 1.92 \times 10^{-4}) \times \frac{3565.065}{9.55 \times 0.2}\right) Nm$$
$$M_{GMot\_dyn} = 0.3639 Nm$$

$[M_{GMot\_dyn}] = Nm$
$[J_G] = kgm^2$
$[J_{Mot}] = kgm^2$
$[n_{max}] = min^{-1}$

4.7.5 Maximum motor torques in sections 1 and 3

Travel section 1

$$M_{max1} = M_{e\_max1} + M_{GMot\_dyn}$$
$$M_{max1} = (3.036 + 0.3639) Nm$$
$$M_{max1} = 3.3999 Nm$$

$[M_{max1}] = Nm$
$[M_{GMot\_dyn}] = Nm$

Travel section 3

$$M_{max3} = M_{e\_max3} + M_{GMot\_dyn}$$
$$M_{max3} = (-2.357 - 0.3639) Nm$$
$$M_{max3} = -2.7209 Nm$$

$[M_{max3}] = Nm$
$[M_{GMot\_dyn}] = Nm$

The absolute value must be greater since the mass moment of inertia of the motor has to be decelerated during deceleration. The signs are adjusted accordingly.

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4.7.6 Effective motor torque

$$M_{eff} = \sqrt{\frac{1}{t_z}(M_1^2 \times t_1 + ... + M_n^2 \times t_n)}$$

$$M_{eff} = \sqrt{\frac{3.399^2 \times 0.2 + 0.0294^2 \times 0.8 + (-2.7209)^2 \times 0.2}{3}} Nm$$

$$M_{eff} = 1.1246 Nm$$

$[M_{eff}]$ = Nm
$[M_n]$ = Nm
[t] = s

4.7.7 Thermal effective motor speed

$$n_{eff} = \sqrt[1.5]{\frac{n_1^{1.5} \times t_1 + ... + n_n^{1.5} \times t_n}{t_z}}$$

$$n_{eff} = \sqrt[1.5]{\frac{\left(\frac{3565.065}{2}\right)^{1.5} \times 0.2 + (3565.065)^{1.5} \times 0.8 + \left(\frac{3565.065}{2}\right)^{1.5} \times 0.2}{3}}$$

$$n_{eff} = 1646.3 min^{-1}$$

$[n_{eff}]$ = min^{-1}
$[n_n]$ = min^{-1}
$[t_n]$ = min^{-1}

4.7.8 Determining the dynamic and thermal motor operating points

- The thermal operating point must be below or exactly on the thermal limit characteristic curve:

  $M_{eff} \leq M_N$

- The dynamic limit torque must be checked:

  $M_{Mot\_max} \leq M_{pk}$

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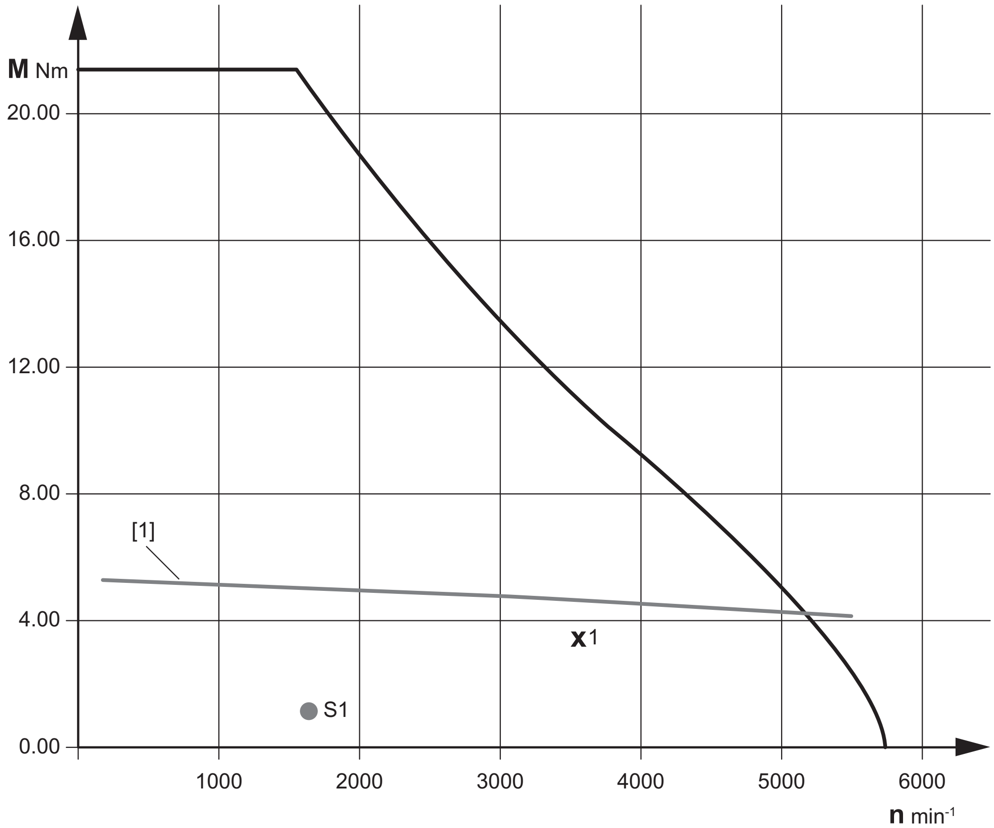

[1] Thermal limit characteristic curve in S1 – 100% operation
S1 M_{eff} at 1646.3 min^{-1} and 1.1246 Nm
X1 M_{max} at 3565 min^{-1} and 3.4 Nm

4.7.9 Inverter assignment

Select a suitable inverter using the assignment table of CMP.. servomotors for MOVIDRIVE® or MOVIAXIS® .

4.7.10 Calculating the braking resistor

The selection of the braking resistor depends, among other factors, on the used inverter. For further information, refer to the system manual for MOVIDRIVE® inverters or MOVIAXIS® servo inverters.

You can also determine the braking resistor via the “SEW Workbench”.

Peak braking power in travel section 3

$$P_{B\_pk} = \frac{M_{tn} \times n_{tn} \times \eta_L}{9550}$$

$$P_{B\_pk} = \left(\frac{1.9931 \times 3565 \times 0.9}{9550}\right) kW$$

$$P_{B\_pk} = 0.6696\, kW$$

$[P_{B\_pk}]$ = kW
$[M_{tn}]$ = Nm
$[n_{tn}]$ = min^{-1}

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Mean braking power in travel section 3

$$\overline{P_B} = \frac{M_{tn} \times n_{tn} \times \eta_L}{9550}$$

$$\overline{P_B} = \frac{1.9931 \times \frac{3565}{2} \times 0.9}{9550}$$

$$\overline{P_B} = 0.3348\, kW$$

[$\overline{P_B}$] = kW
[M_{tn}] = Nm
[n_{tn}] = min^{-1}

Effective braking power

$$P_{B\_eff} = \frac{P_B \times t_3}{t_z}$$

$$P_{B\_eff} = \left(\frac{0.3348 \times 0.2}{3}\right) kW$$

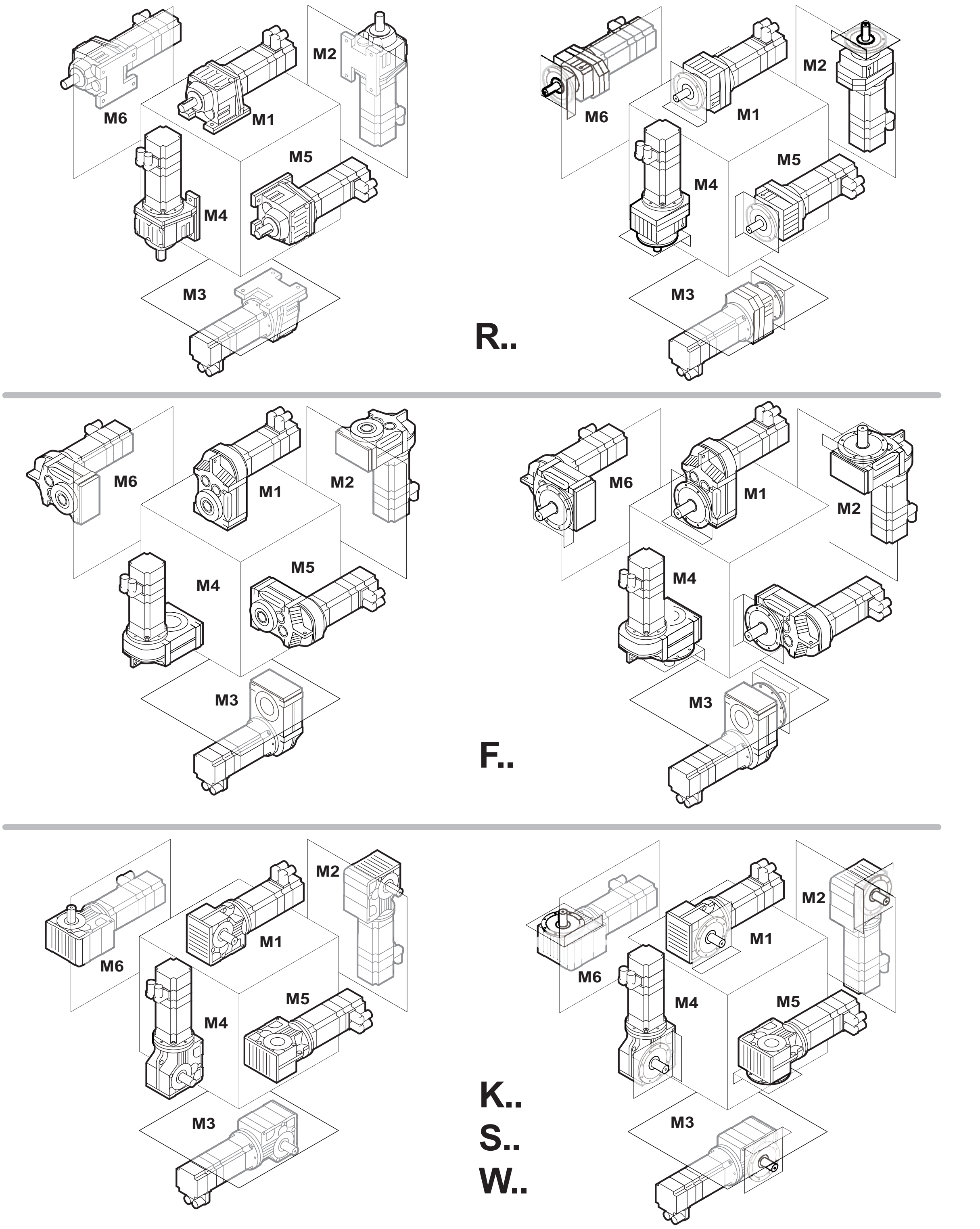
$$P_{B\_eff} = 0.223\, kW$$

[P_{B_eff}] = kW
[P_B] = kW
[t_3] = s
[t_z] = s

5 Gear unit mounting positions and order information

5.1 General mounting position information – R, F, K, S, W gear units

The following illustration shows the SEW-EURODRIVE mounting positions M1 – M6:



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5.1.1 Change of mounting position

Make sure to read the following information when you operate the gearmotor in a mounting position other than the one indicated in the order:

- Adjust the lubricant fill quantity to the changed mounting position.
- Adjust the position of the breather valve.
- When changing the mounting position to M4: Contact SEW-EURODRIVE. Depending on the drives operating mode, an oil expansion tank might be necessary (see chapter Oil expansion tank).
- For helical-bevel gearmotors: Contact SEW-EURODRIVE if you want to change to mounting position M5 or M6, independent of the initial mounting position.
- For helical-worm gearmotors: Contact the SEW-EURODRIVE when changing to mounting position M2 or M3.
- If you change the mounting position to a mounting position that requires more oil, SEW-EURODRIVE recommends to perform a thermal check/project planning again.

5.1.2 Universal mounting position M0

SPIROPLAN® W10 – W30 gear units can be ordered with M0 universal mounting position. These small SPIROPLAN® gear units are entirely enclosed due to their small size and have no breather valve. You can use them in any mounting position M1 – M6 without having to adjust the gear unit.

All W10 - W30 gear units have the same oil fill quantity.

5.1.3 Mounting position MX

Mounting position MX is available for all gear units of the sizes R..7, F..7, K..7, K..9, S..7, and SPIROPLAN® W..7.

In contrast to the M0 mounting position, gear units in MX mounting position must be adjusted according to the mounting position prior to startup.

For mounting position MX, the gear units are delivered with the maximally possible amount of oil and sealed with oil screw plugs. A breather valve is included with each drive. The oil fill volume must be adapted according to the mounting position of the gear unit (see chapter "Lubricant fill quantities" (→ 🗎 148)). Customers will also have to install the enclosed breather valve at the proper location depending on the mounting position, see chapter "Mounting position sheets" (→ 🗎 94).

Before startup, always check that the oil level is correct.

Compound gear units in MX mounting position

In MX mounting position, both gear units (primary and subsequent gear unit) are in the same mounting position.

5.1.4 Position of breather valve/oil drain plug in motor flange

As shown in the mounting position sheets in chapter "Mounting position sheets" (→ 🗎 94), the position of the breather valve and oil drain plug depend on the gearmotor mounting position.

The following table shows the position of the breather valve and the oil drain plug depending on the mounting position:

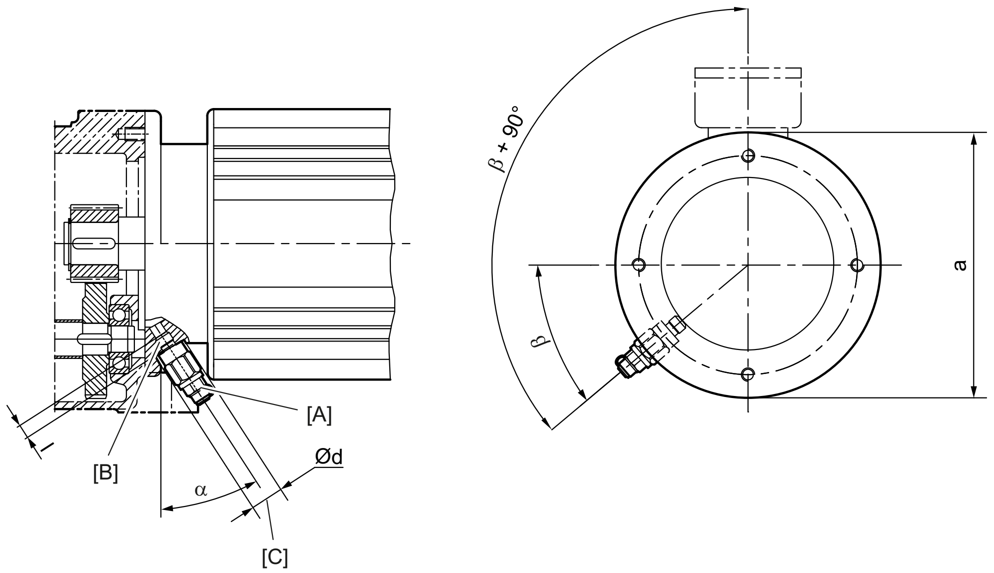
Mounting position	Breather valve position	Oil drain plug position
M1, M3, M5, M6	In the gear unit housing	In the gear unit housing
M4	**In the motor flange**	In the gear unit housing
M2	In the gear unit housing	**In the motor flange**

If the breather valve (M4 mounting position) or the oil drain plug (M2 mounting position) is positioned in the motor flange, the position depends on the terminal box position.

INFORMATION

The position of the breather valve / oil drain plug in the mounting position sheets in chapter "Mounting position sheets" (→ 🗎 94) always refers to the standard terminal box position 0°. Note that the position of the breather valve / oil drain plug is changed depending on the possible terminal box positions (90°, 180°, 270°).

The following illustration shows the exact position of the breather valve / oil drain plug in the motor flange.



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[A]	Position of breather valve / oil drain plug	[d]	Diameter of the countersinking
[B]	Continuous core drilling	[l]	Thread length
[C]	Counterbored bore	[a]	Flange diameter
[α]	Drill angle	[β]	Position angle

Dimension tables

The following tables contain the dimensions regarding the position of the breather valve and the oil drain plug depending on the motor size.

CMP.. motor type	a mm	α °	β °	Thread designation	Ø d mm	l mm
CMP40	LIA120	30	45	M10x1	15	10

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CMP.. motor type	a mm	α °	β °	Thread designation	Ø d mm	l mm
CMP50	LIA120	30	45	M10x1	15	10
	LIA160	75	45	M10x1	15	10
	Q90	30	0	M10x1	15	9
	Q112	30	0	M10x1	15	9
CMP63	LIA120	30	45	M10x1	15	10
	LIA160	30	45	M10x1	15	10
	LIA200	75	45	M12x1.5	18	12
	Q90	30	0	M10x1	15	7.7
	Q112	30	0	M10x1	15	7.7
	Q142	30	0	M10x1	15	9.5
CMP(Z)71	LIA120	30	45	M10x1	15	10
	LIA160	30	45	M10x1	15	10
	LIA200	45	45	M12x1.5	18	12
	LIA250	270	45	M12x1.5	18	13.1
	Q90	15	0	M10x1	15	10
	Q112	15	0	M10x1	15	10
	Q142	15	0	M10x1	15	10
	Q182	60	0	M10x1	15	10
CMP(Z)80	LIA120	30	45	M10x1	15	10
	LIA160	45	45	M10x1	15	10
	LIA200	45	45	M12x1.5	18	12
	LIA250	45	45	M12x1.5	18	12
	LIA300	90	45	M22x1.5	28	13.9
	LIA350	90	45	M22x1.5	28	13
	Q112	15	0	M10x1	15	10
	Q142	15	0	M10x1	15	10
	Q182	60	0	M10x1	15	10
CMP(Z)100	LIA160	15	45	M10x1	15	10
	LIA200	30	45	M12x1.5	18	12
	LIA250	45	45	M12x1.5	18	12
	LIA300	60	45	M22x1.5	28	14.4
	LIA350	60	45	M22x1.5	28	15.3
	Q112	0	0	M10x1	15	10
	Q142	15	0	M10x1	15	10
	Q182	0	0	M10x1	15	12.4

CMP.. motor type	a mm	α °	β °	Thread designation	Ø d mm	l mm
CMP112	LIA160	30	63	M10x1	15	10.7
	LIA200	30	64	M12x1.5	18	10.4
	LIA250	30	73	M12x1.5	18	19
	LIA300	45	0	M22x1.5	28	21
	LIA350	45	0	M22x1.5	28	33
	Q142	0	0	M10x1	15	10.3
	Q182	0	0	M10x1	15	11.4

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5.2 Order information for servo gearmotors – R, F, K, S, W gear units

INFORMATION

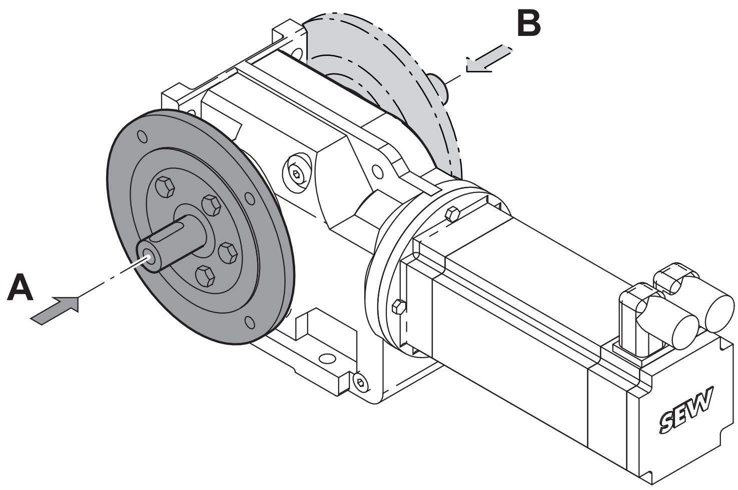
The following order information is required for gear units or gearmotors in addition to the mounting position to exactly determine the drive design.

This information is also required for gearmotors that do not depend on a particular mounting position.

5.2.1 Position of the output shaft and the output flange

In right-angle gear units, you also have to indicate the position of the output shaft and the output flange:

- A or B or AB



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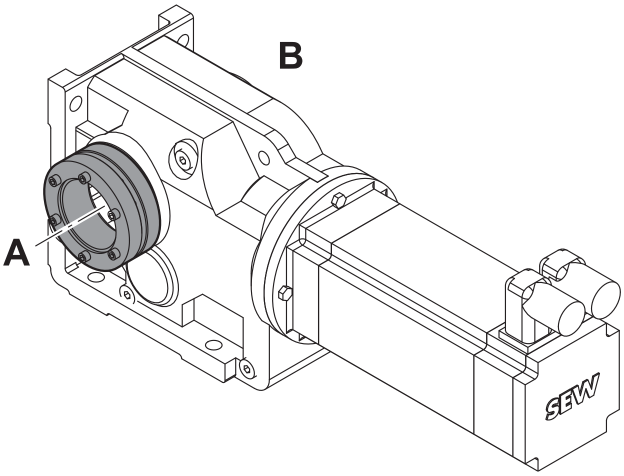
5.2.2 Position of the output end in right-angle gear units

In shaft-mounted right-angle gear units with a shrink disk, you also have to indicate whether the A- or B-side is the output end. In the following figure, the B-side is the output end. The shrink disk is located on the opposite side, the A-side.

In shaft-mounted right-angle gear units, the designation "output end" is equivalent to the designation "position of the output shaft" used for right-angle gear units with solid shaft.



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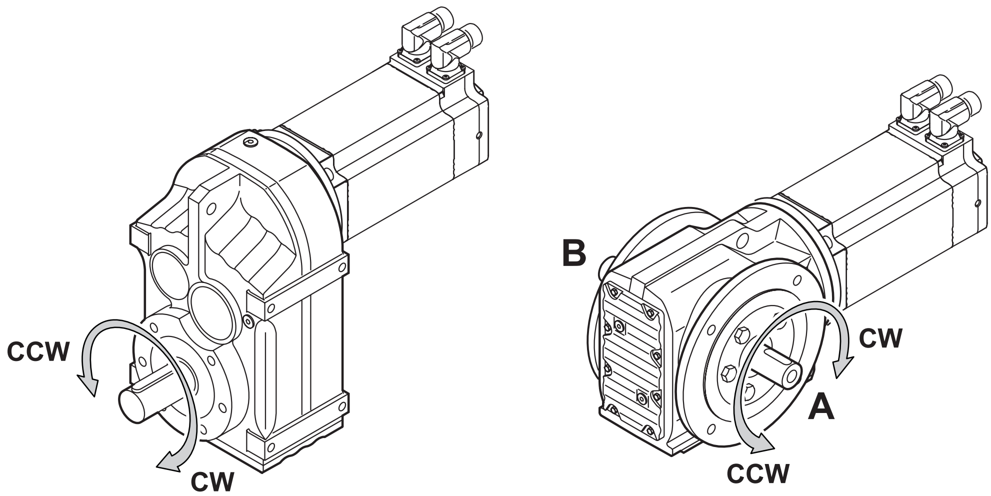
INFORMATION

For the permitted mounting surfaces (= hatched area), refer to the mounting position sheets (→ 🗎 94).

5.2.3 Direction of rotation of the output shaft

The direction of rotation is determined with a view to the output shaft:

- Clockwise rotation (CW) = Rotating clockwise
- Counterclockwise rotation (CCW) = Rotating counterclockwise



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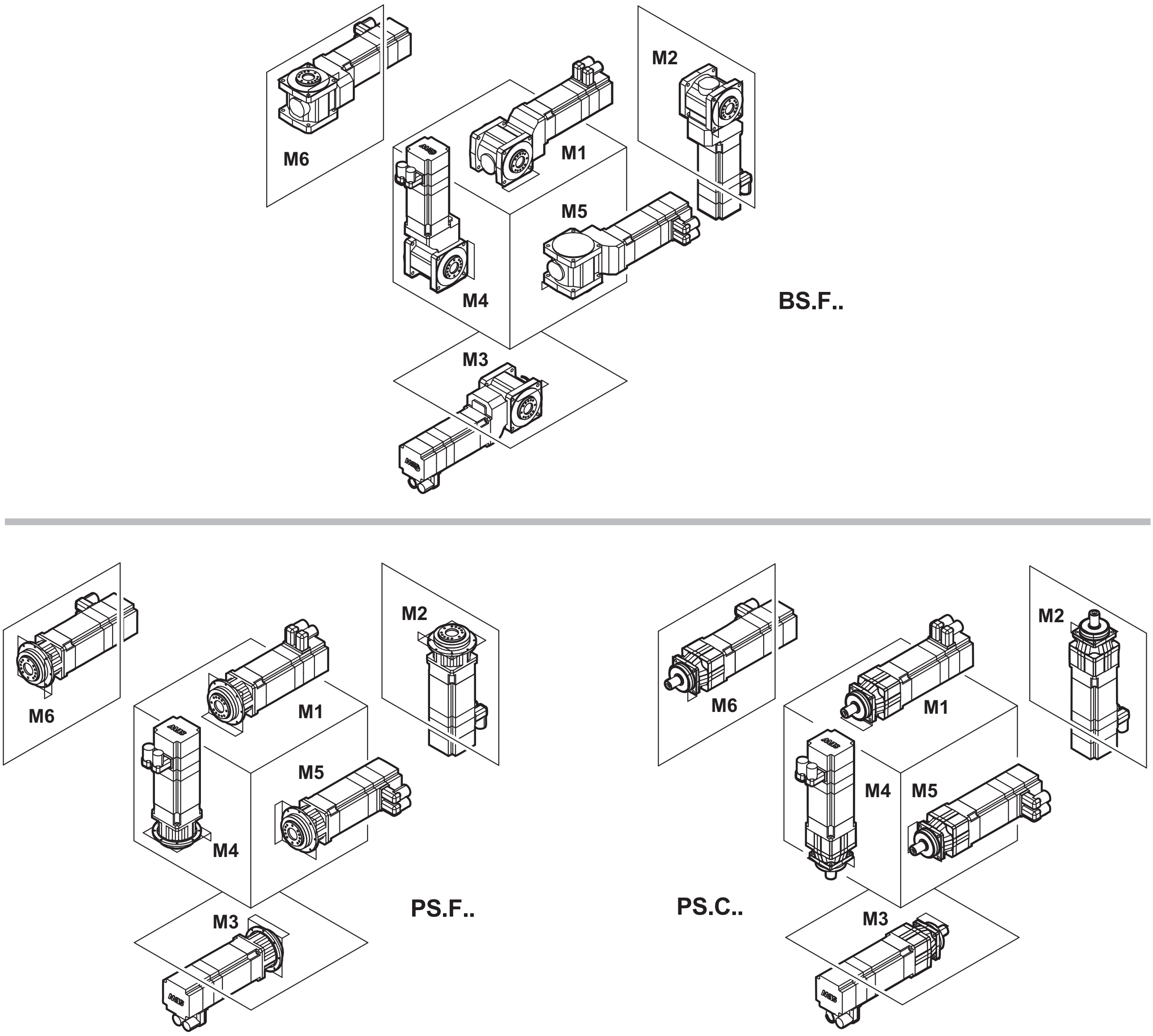
In right-angle gear units, you also have to indicate whether the direction of rotation is given looking onto the A- or B-side.

5.3 General information on the mounting positions – BS.F, PS.F, PS.C gear units

5.3.1 Mounting position designations

The following illustration shows the SEW-EURODRIVE mounting positions M1 to M6:



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5.3.2 Universal mounting position M0

The PS.F and PS.C servo gear units can be ordered in the universal mounting position M0. The gear units are entirely enclosed and have no breather valve (with the exception of PS(K)F722 with direct motor mounting).

The gear units in mounting position M0 are filled with the oil fill volume for mounting position M2 (output shaft vertically upwards). For this reason, the thermal gear unit project planning for mounting position M2 must be carried out.

5.4 Order information for servo gearmotors – BS.F, PS.F, PS.C gear units

INFORMATION

The following order information is required for gear units or gearmotors in addition to the mounting position to exactly determine the drive design.

This information is also required for gearmotors that do not depend on a particular mounting position.

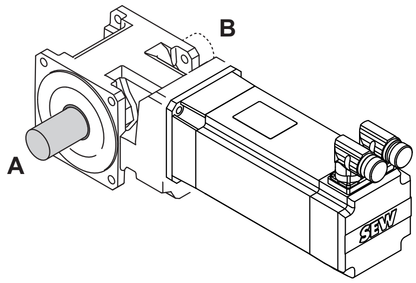
5.4.1 Definition of A and B-sides of output shafts

When installing the gear unit via one of the output flanges, the gear unit must be attached to the shaft output side via the B5 output flange.

Gear unit type	Output end/position of the output shaft	Shrink disk position	Mounting
BSF../BSKF../ BSBF	A-side	–	Mounting via B5 flange on the A-side
	B-side	–	Mounting via B5 flange on the B-side
BSHF..	A-side	B-side	Mounting via B5 flange on the A-side
	B-side	A-side	Mounting via B5 flange on the B-side
BSHF.. /I	A-side	A-side	Mounting via B5 flange on the A-side
	B-side	B-side	Mounting via B5 flange on the B-side
BSAF..	A-side	–	Mounting via B5 flange on the A-side
	B-side	–	Mounting via B5 flange on the B-side
BSF../BSKF..	AB	–	Mounting via B5 flange on the A- and/or B-side

For BS.F.. helical-bevel gear units, the position of the output shaft A, B or AB (see the following figure) must be specified.

BSF../BSKF../ BSBF../BSAF..



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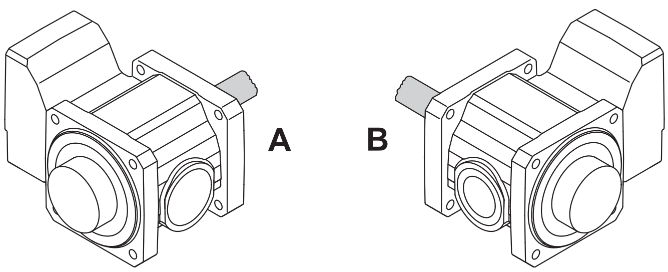
BSHF



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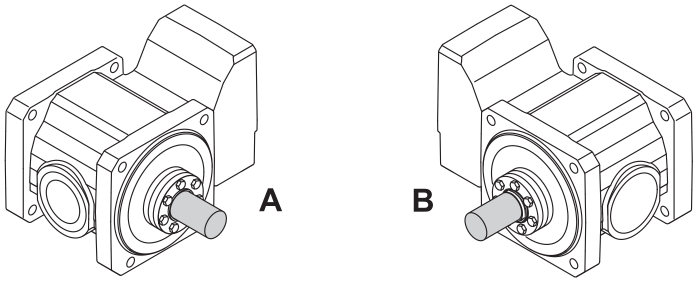
BSHF../I



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5.4.2 Direction of rotation of the output shaft

For the designation of the direction of rotation of the output shaft, refer to chapter "Direction of rotation of the output shaft" (→ 🗎 88).

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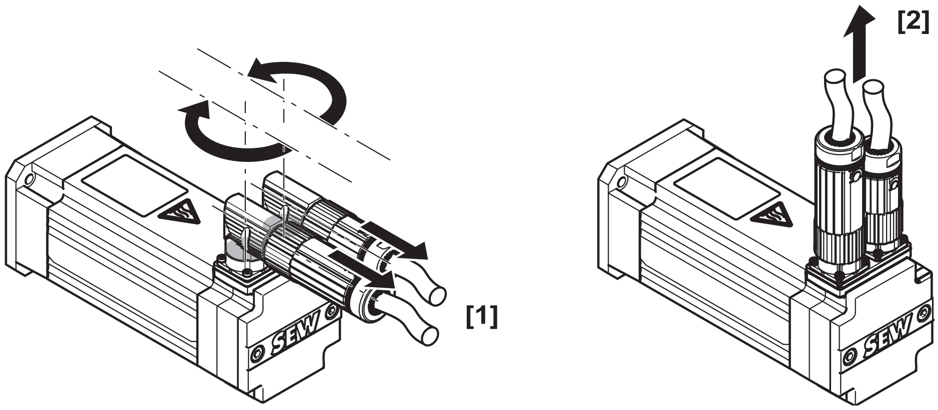
5.5 Order information for servomotors

5.5.1 Connection with plug connector

As standard, the power or the power with brake supply is connected to the motor with a right-angle connector.

An "adjustable" position has been defined for right-angle connectors [1]. If not specified otherwise, the 270° design is delivered with the connector position "adjustable".

A "radial" position has been defined for the straight connector housing (radial output). The radial connectors [2] are available as options for sizes 40 – 100.



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[1] "Adjustable" connector position [2] "Radial" connector position

The different plug connectors of the individual motor sizes are available in different designs:

Connector position		Plug connector		
		SM1/SB1	SMB/SBB	SMC/SBC
between axes		X	X	–
adjustable	The position can be selected in the order	–	–	X
	Steplessly adjustable positions	X	X	–

X = available, – = not available

5.5.2 Connection with terminal box

Position of terminal box and cable entry

The product standard EN 60034 specifies that the following designations have to be used for motor terminal box positions:

- As viewed onto the output shaft = A-end
- Designation as R (right), B (bottom), L (left) and T (top)

This new designation applies to motors without a gear unit in mounting position B3 (= M1). For gearmotors, the previous designation is retained.

The position of the motor terminal box has so far been specified with 0°, 90°, 180° or 270° as viewed onto the fan guard = B-end.

The following figure shows both designations. Where the mounting position of the motor changes, "R", "B", "L" and "T" are rotated accordingly.

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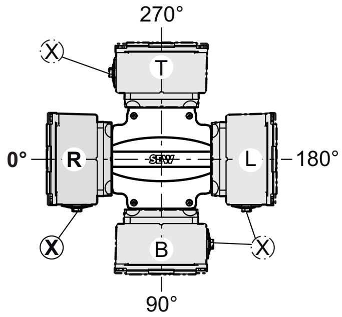
The cable entry position is specified with x, 1, 2, 3.

Unless other information is provided regarding the terminal box, the 270° design with "x" cable entry will be supplied (see figure below).



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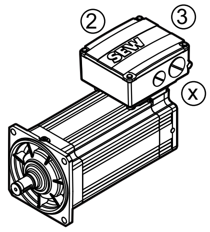
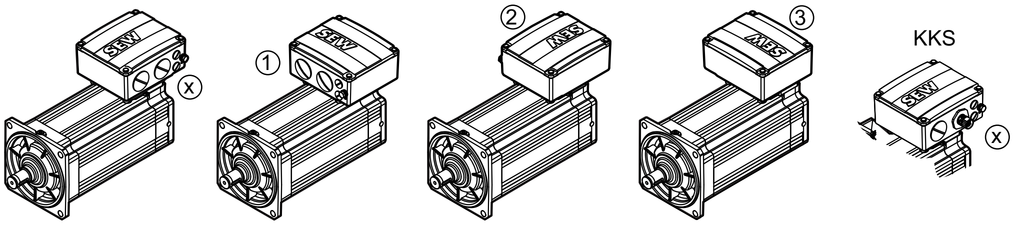
CMP50 – CMP63

KK



CMP.71 – CMP.100, CMP112

KK



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5.5.3 Connecting the forced cooling fan

The position of the cable entry of the forced cooling fan is delivered as shown in the dimension sheets. Cable entry turned by 180° is available on request.

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5.6 Mounting position sheets

5.6.1 Key to the mounting position sheets

INFORMATION

The positions of the breather valve, oil level plug, and oil drain plug specified in the mounting position sheets are binding and comply with the assembly specifications.

The motors are only depicted symbolically on the mounting position sheets.

INFORMATION

For gear units with solid shaft: The displayed shaft is always on the A-side.

For shaft-mounted gear units: The shaft with dashed lines represents the customer shaft. The output end (= shaft position) is always shown on the A-side.

INFORMATION

SPRIOPLAN® gearmotors are not dependent on the mounting position, except for W..37 and W..47 gearmotors in mounting position M4. However, mounting positions M1 to M6 are also shown for SPIROPLAN® gearmotors to assist you in working with this documentation.

INFORMATION

SPIROPLAN® gearmotors W..10 to W..30 cannot be equipped with breather valves, oil level plugs or oil drain plugs.

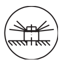
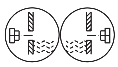
SPIROPLAN® gearmotors W..37 and W..47 are equipped with breather valves in mounting position M4 and with oil drain plugs in mounting position M2.

INFORMATION

Some gear units can be supplied in mounting position M0. In this case, the gear unit is delivered in a universal mounting position and can be adjusted to various mounting positions by the customer. It may be necessary to contact SEW-EURODRIVE.

Symbols used

The following table shows the icons used in the mounting position sheets.

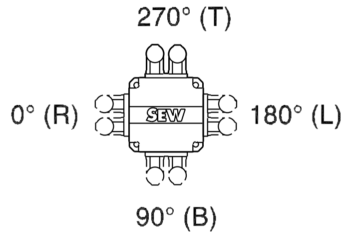
Icon	Meaning
	Breather valve
	Oil level plug [1]
	Oil drain plug

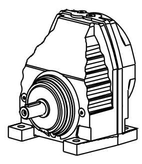
1) Does not apply to the 1st gear unit (large gear unit) of compound gear units. See chapter "Position of the oil level plug of compound gear units".

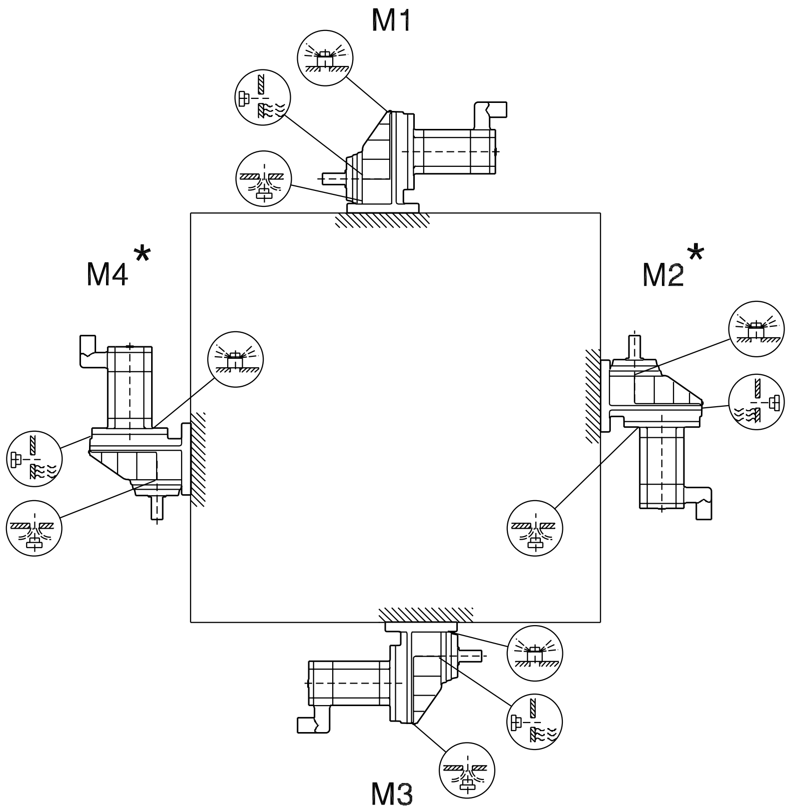
5.6.2 Mounting positions of helical gearmotors R

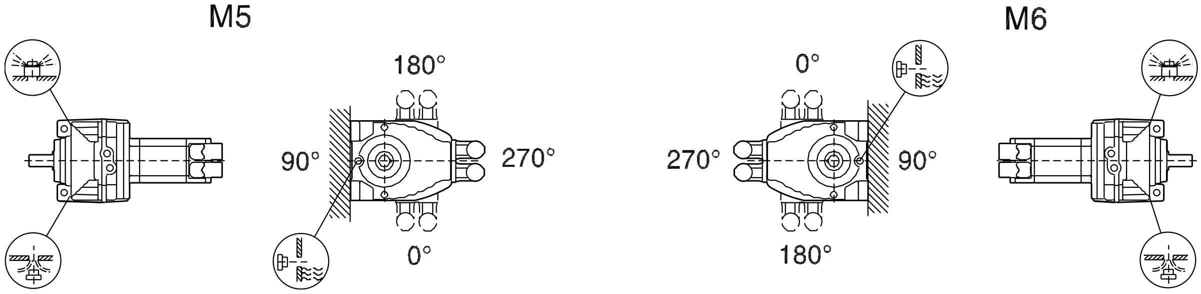
RX57–RX107

01 172 01 09





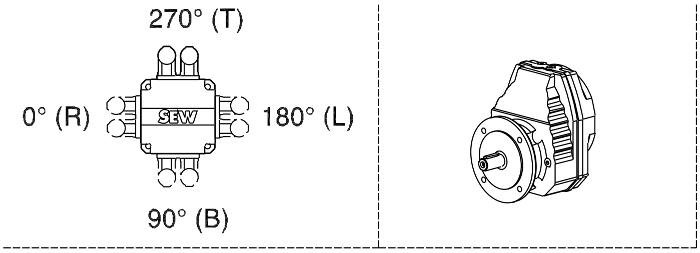


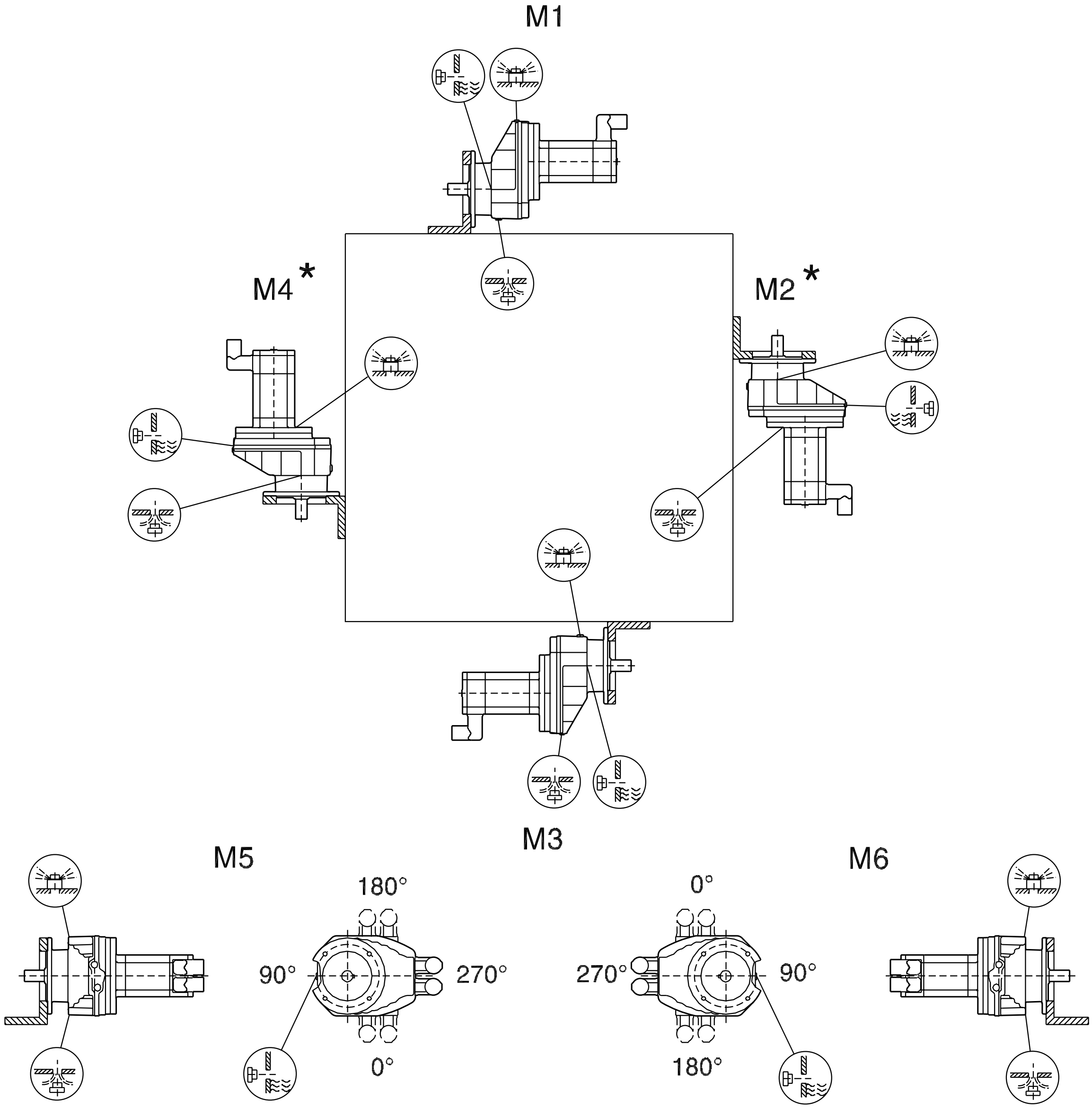


* (→ 🗎 58)

RXF57-RXF107

01 173 01 09

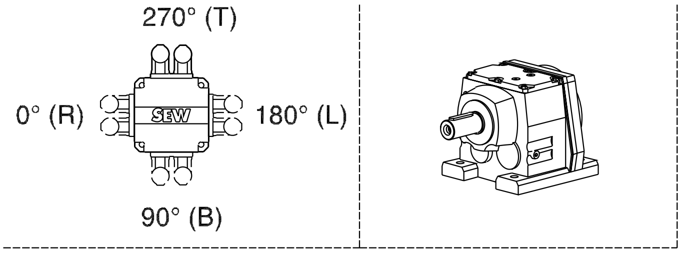


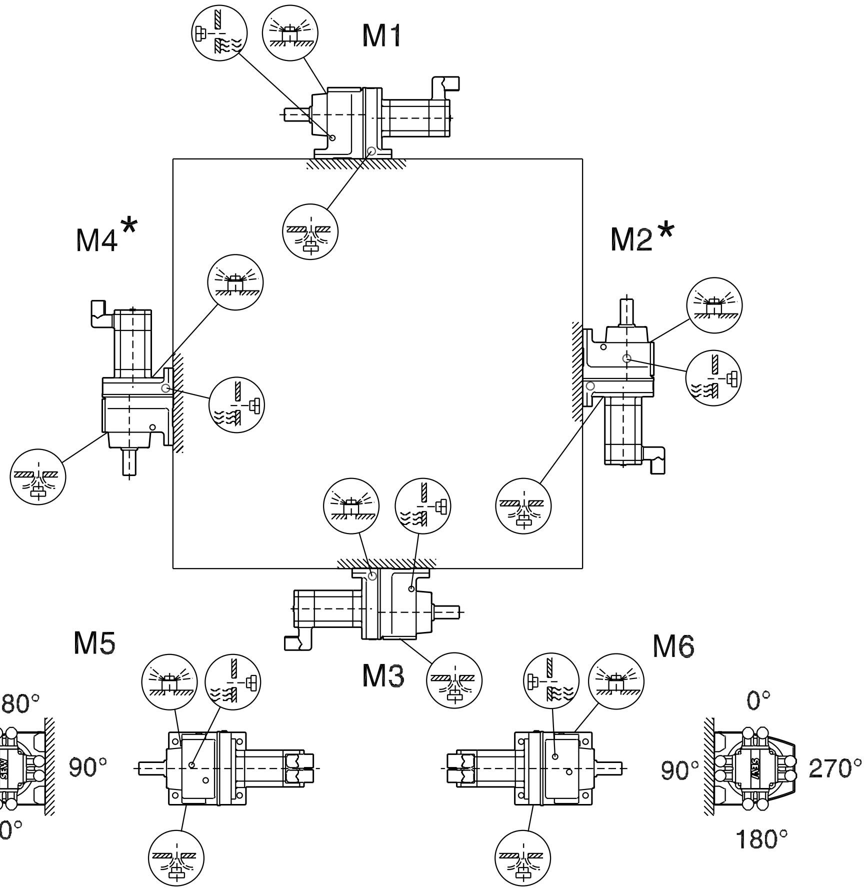


* (→ 🗎 58)

R07-R127

01 174 01 09





R07 M1, M2 , M3 , M5 , M6

R17, R27 M1, M3 , M5 , M6

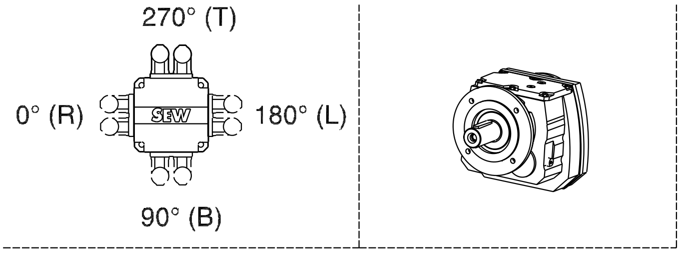
R07, R17, R27

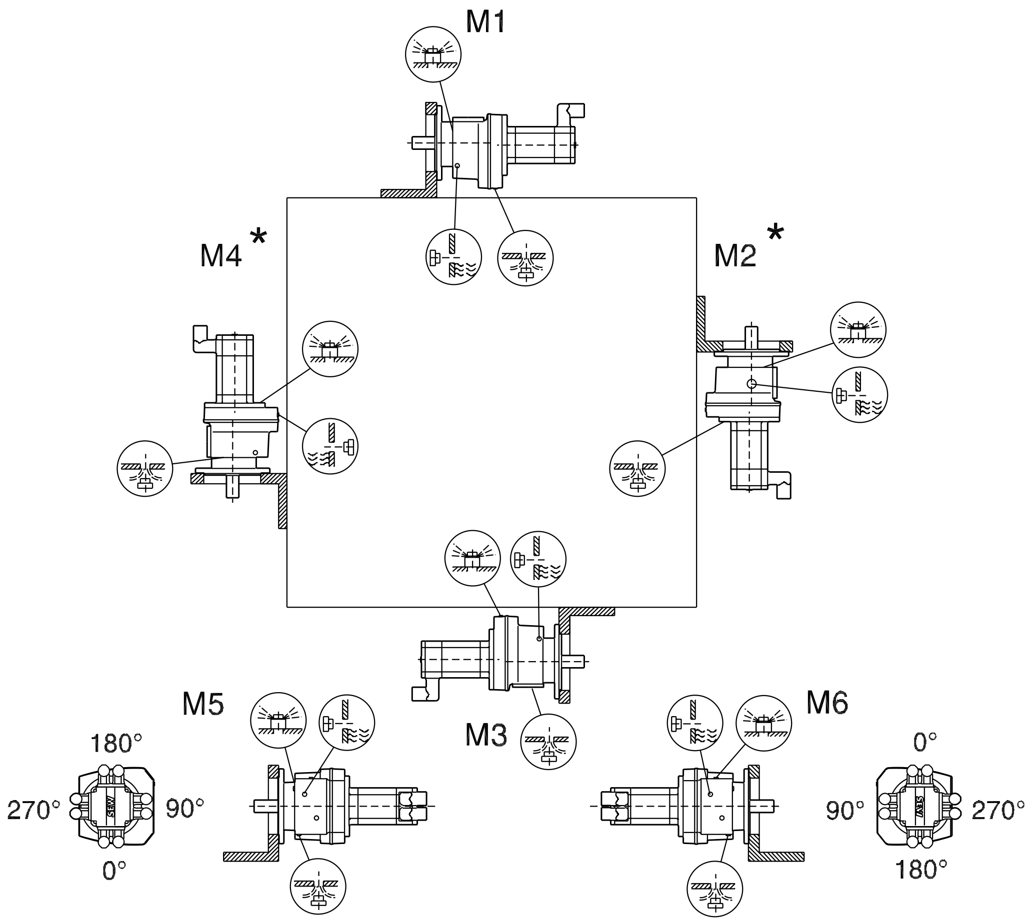
R47, R57 M5

* (→ 🗎 58)

RF07-RF127, RZ07-87

01 175 01 09





RF/RZ07 M1, M2 , M3 , M5 , M6

RF/RZ17,27 M1, M3 , M5 , M6

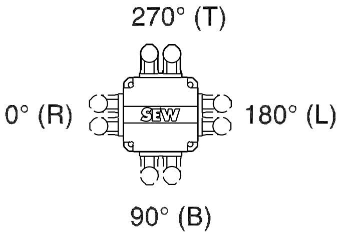
RF/RZ07, 17, 27

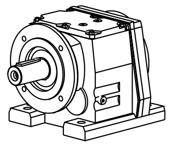
RF/RZ47, 57 M5

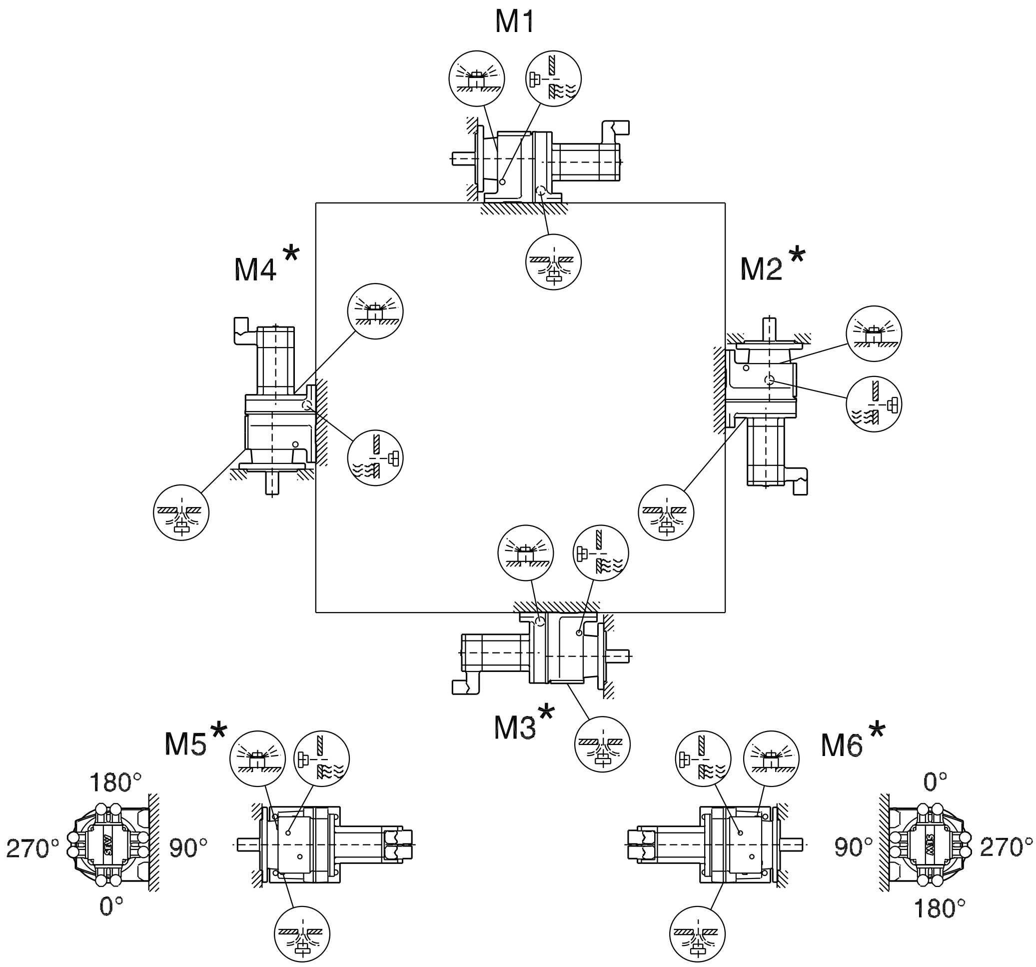
* (→ 🗎 58)

R07F-R87F

01 176 01 09





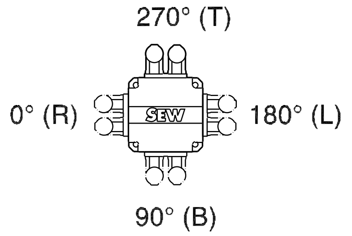


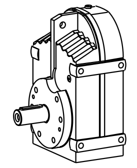
R07F	⊗	M1, M2 , M3 , M5 , M6
R17F, R27F	⊗	M1, M3 , M5 , M6
R07F, R17F, R27F	⊗ ⊗	
R47F, R57F	⊗	M5

* (→ 🗎 58)

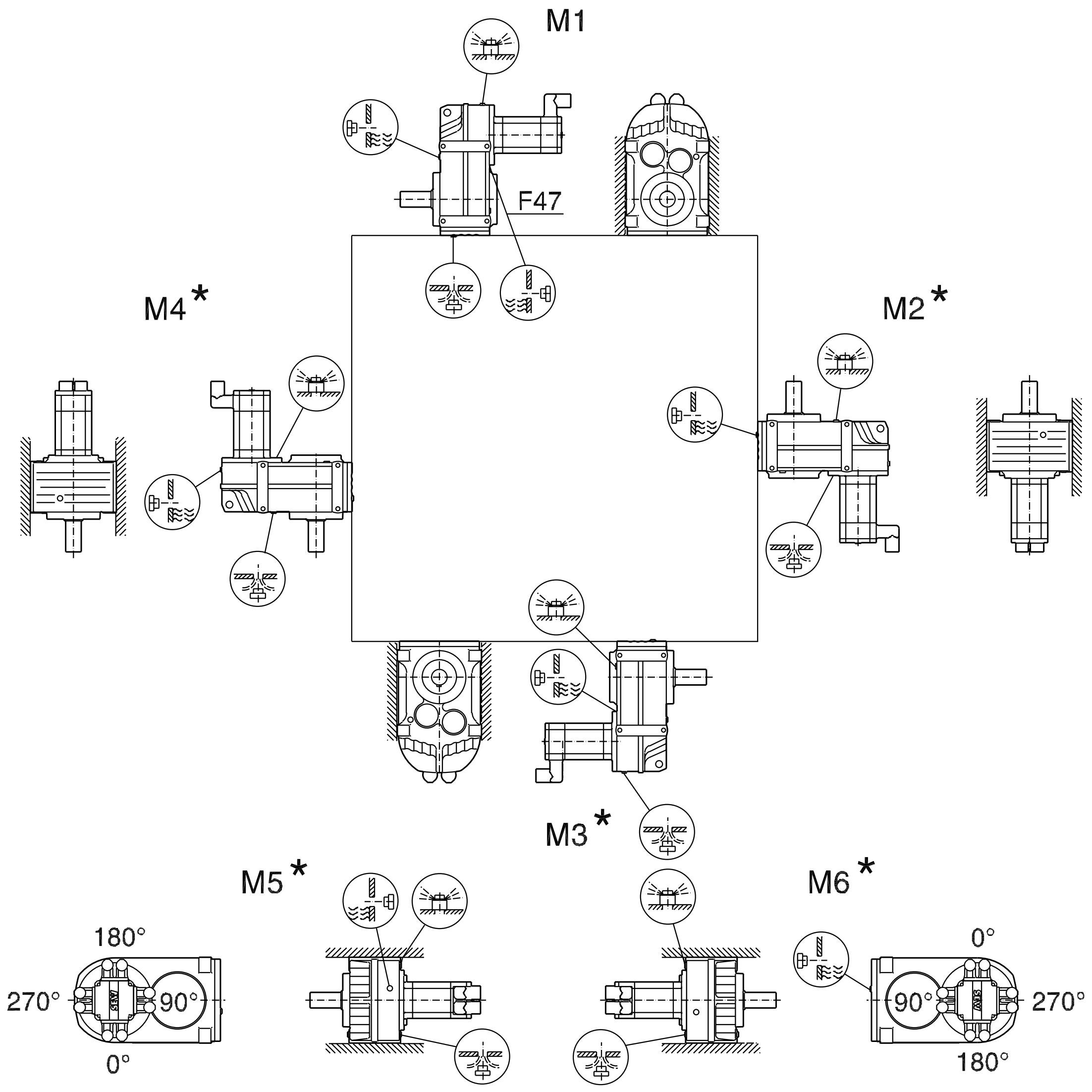
5.6.3 Mounting positions of parallel-shaft helical gearmotors F

F/FA..B/FH27B-107B, FV27B-107B





42 197 01 09



F..27 M1, M3, M5, M6

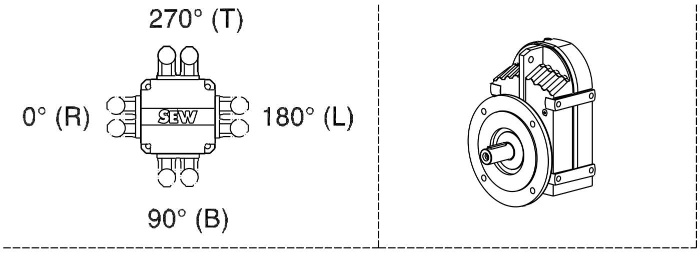
F..27 M1 - M6

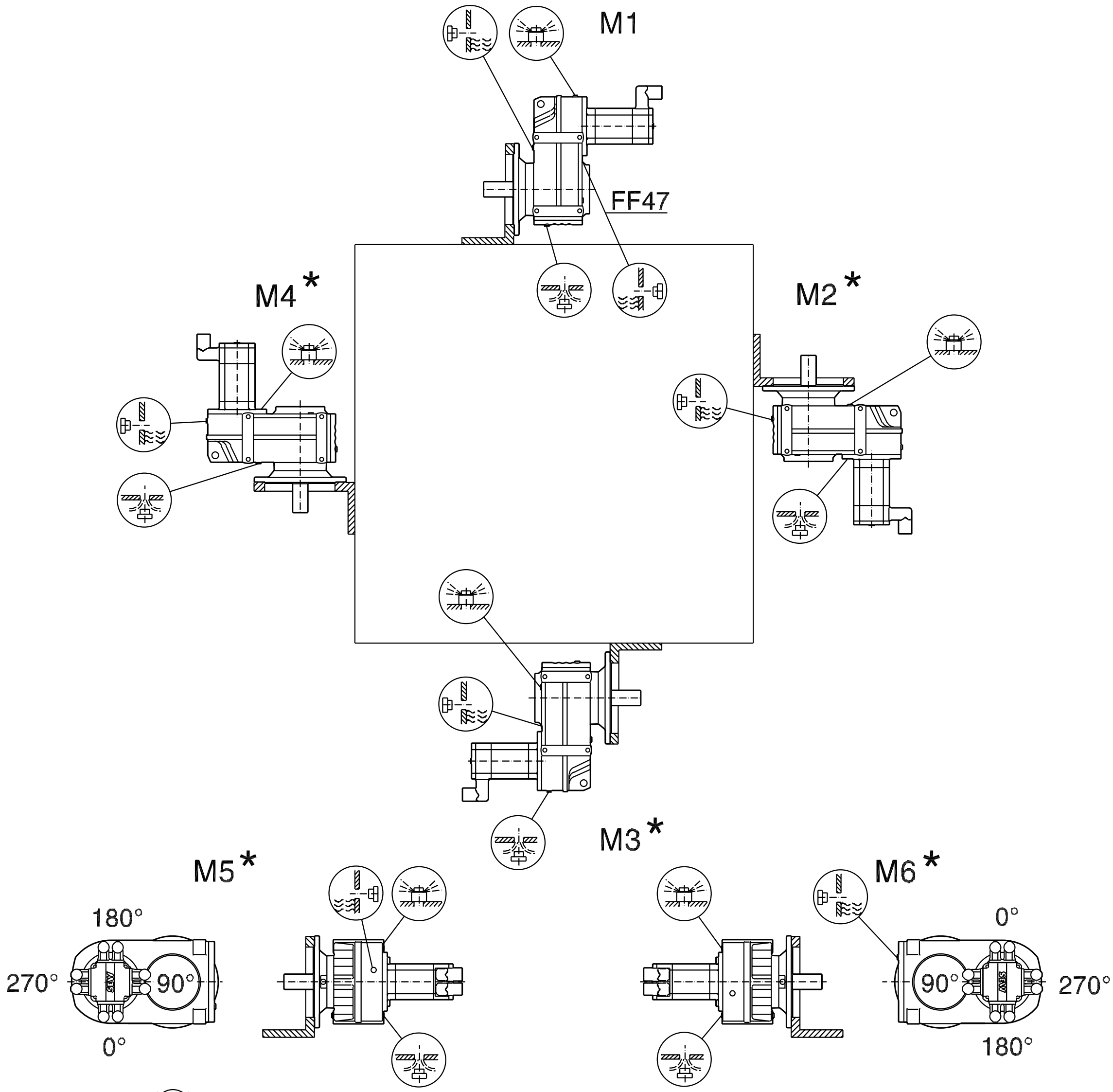
F..27 M1, M3, M5, M6

* (→ 🗎 58)

FF/FAF/FHF/FZ/FAZ/FHZ27-107, FVF/FVZ27-107

42 198 01 09





F..27 M1, M3, M5, M6

F..27 M1 - M6

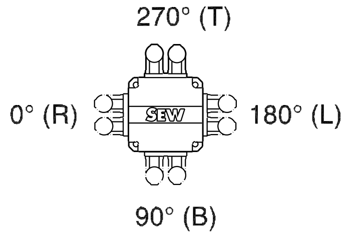
F..27 M1, M3, M5, M6

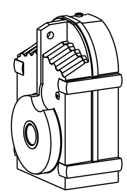
* (→ 🗎 58)

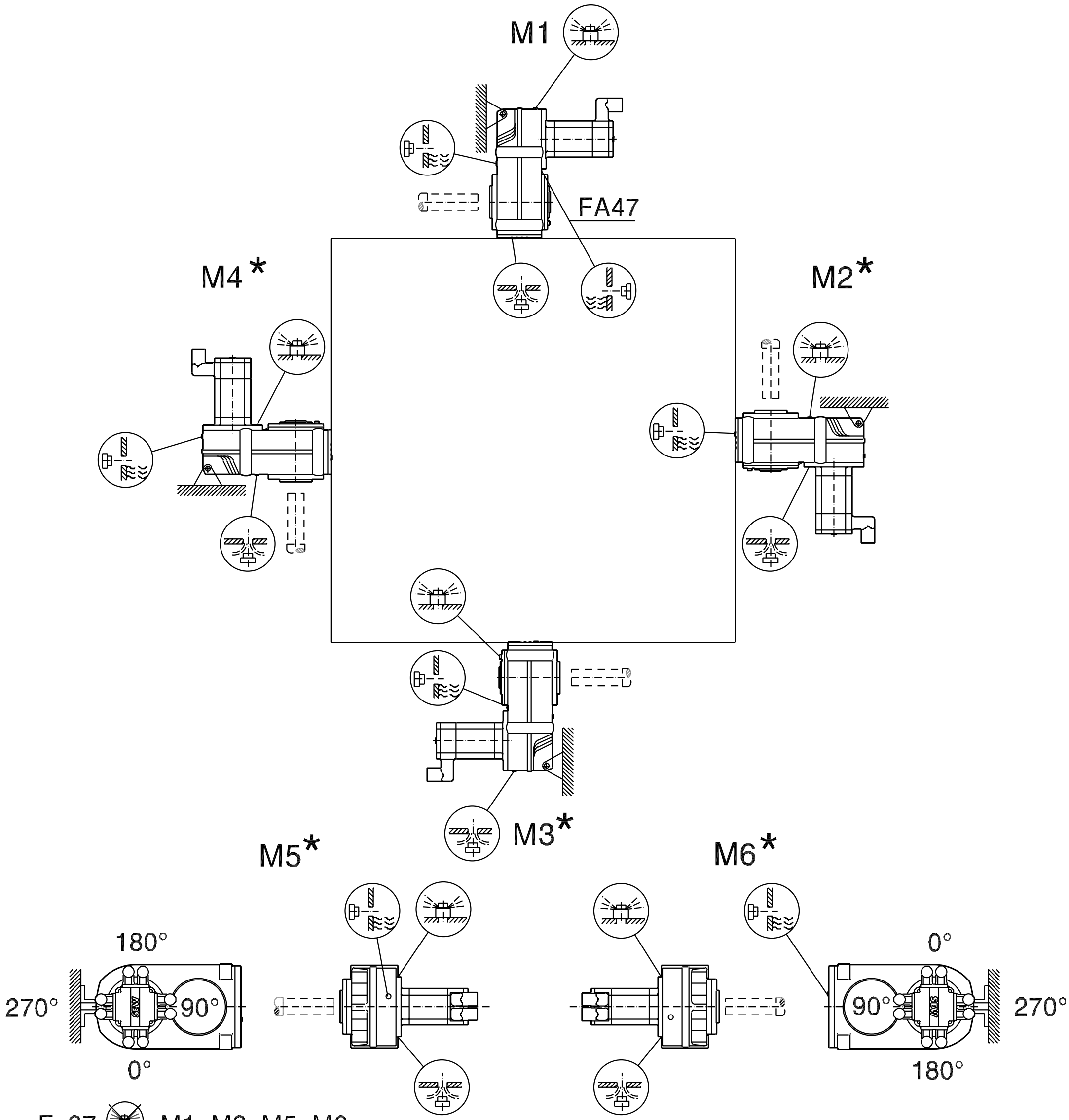
22316612/EN – 04/2017

FA/FH27-157, FV27-107, FT37-97

42 199 01 09







F..27 M1, M3, M5, M6

F..27 M1 - M6

F..27 M1, M3, M5, M6

* (→ 🗎 58)

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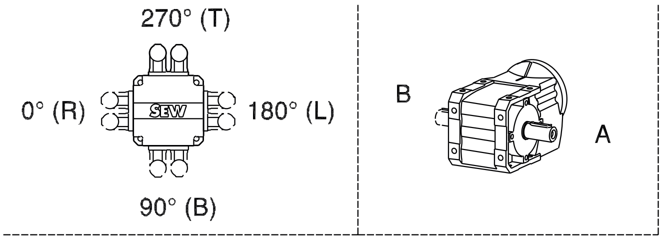
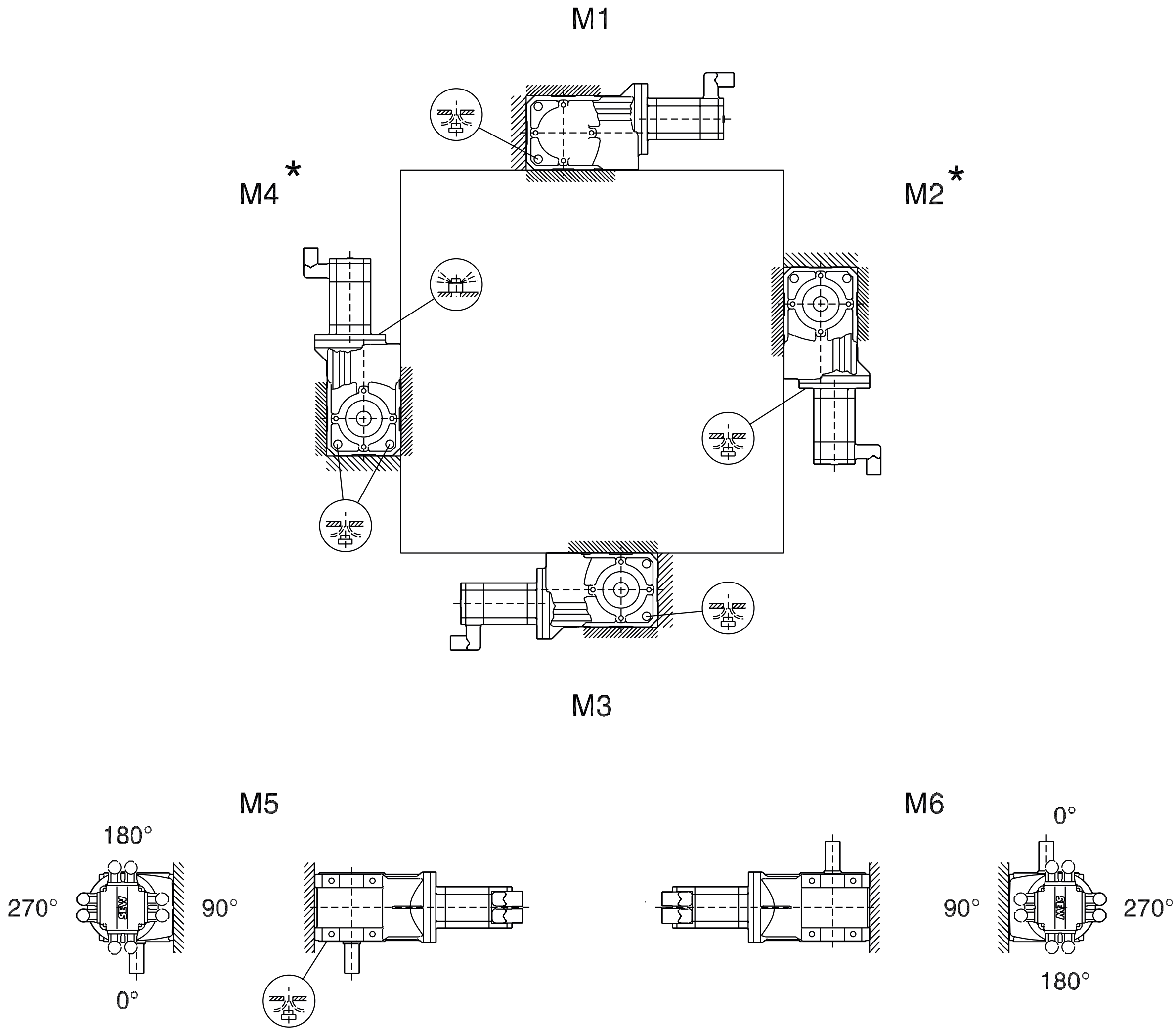
5.6.4 Mounting positions of helical-bevel gearmotors K

K/KA..B/KH19B-29B



33 399 00 15



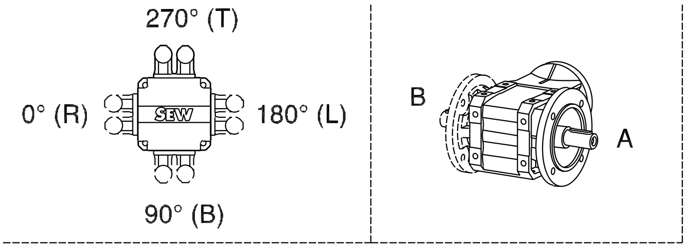
18521924107

* (→ 🗎 58)

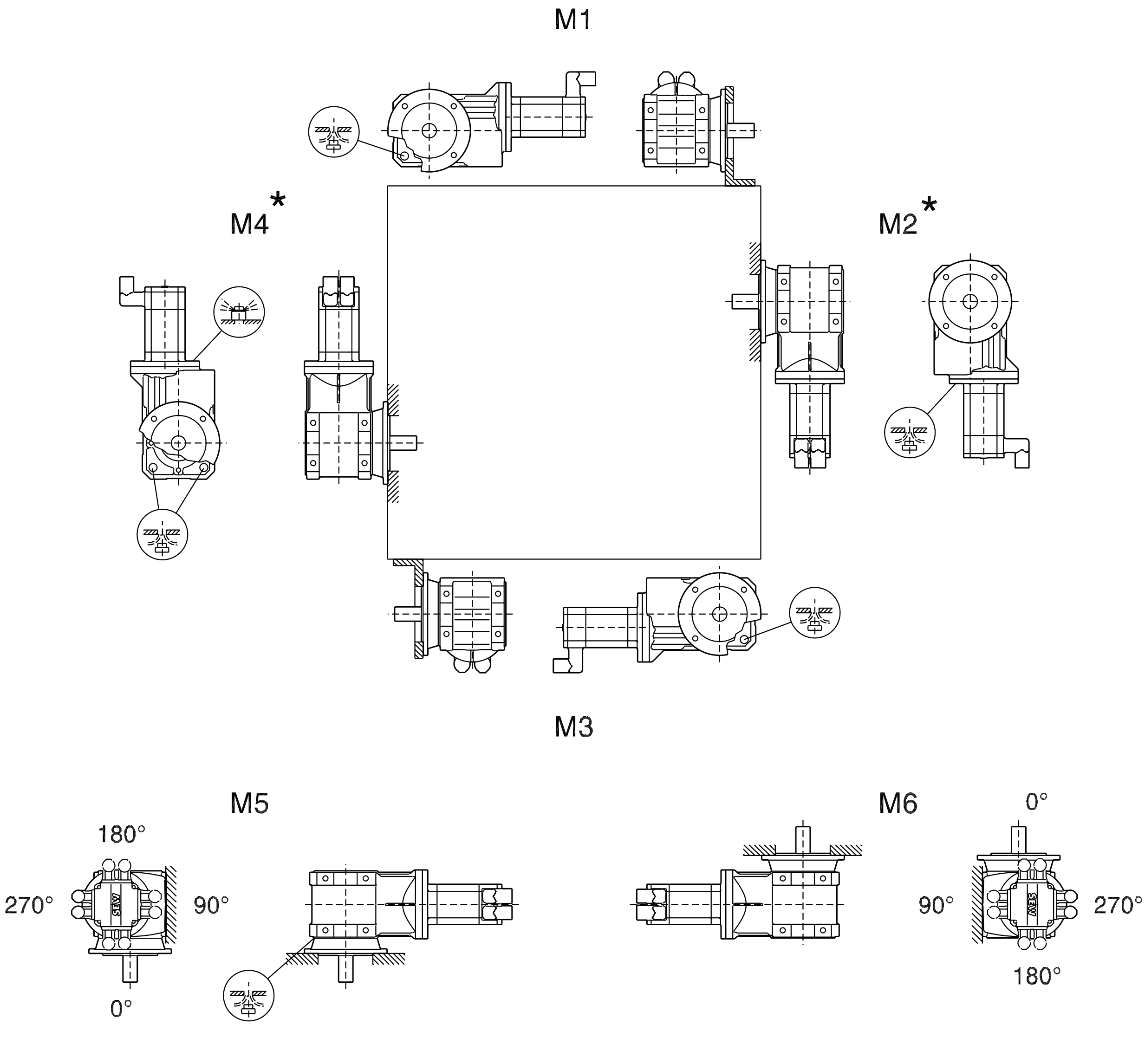
Observe the notes in chapter "Overhand and axial loads of R, F, K, S, and W gear units" (→ 🗎 59).

22316612/EN – 04/2017

KF..B/KAF..B/KHF19B-29



33 400 00 15

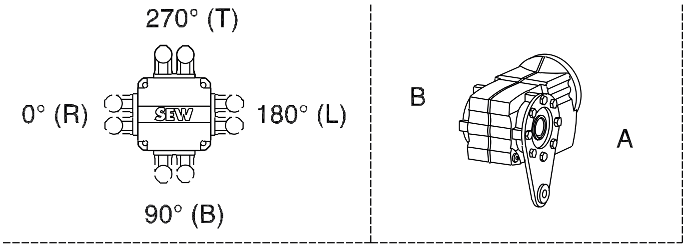


18522131339

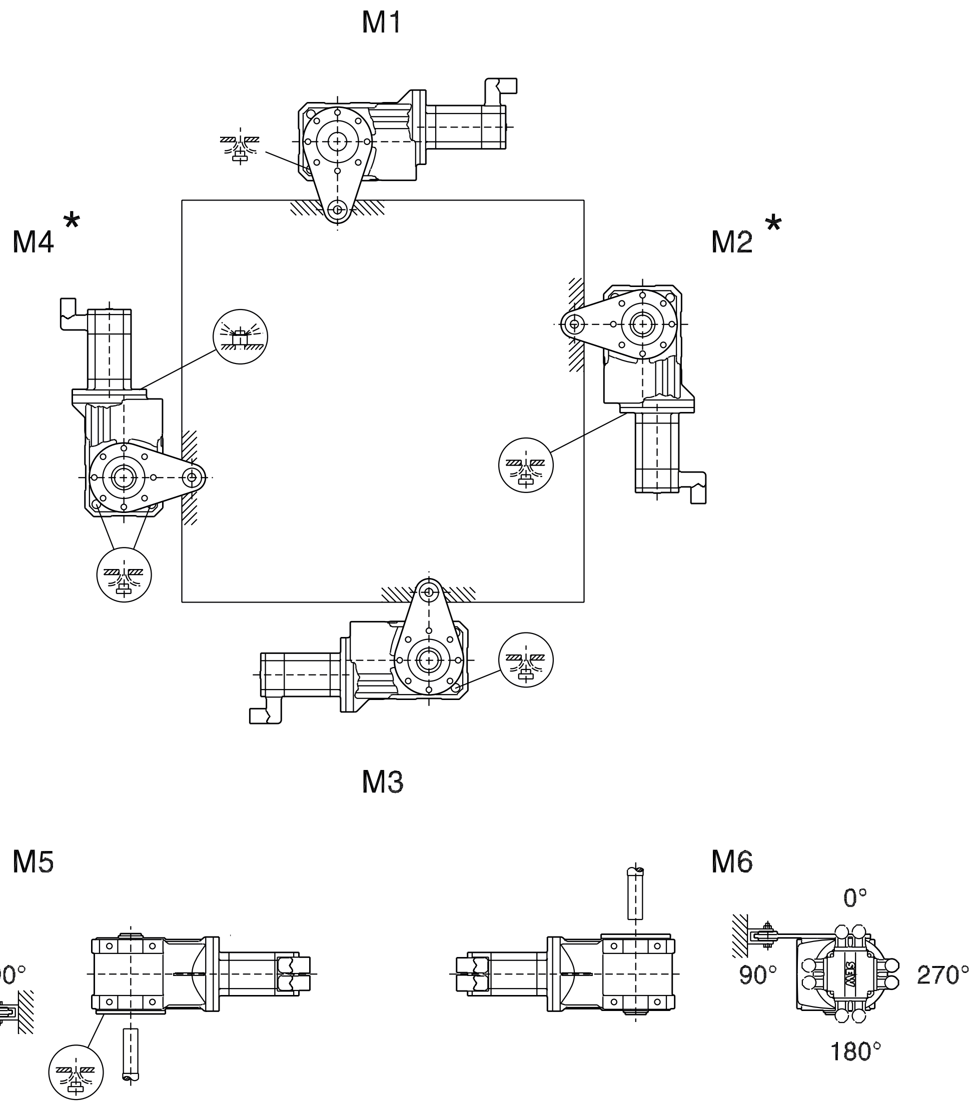
* (→ 🗎 58)

Observe the notes in chapter "Overhand and axial loads of R, F, K, S, and W gear units" (→ 🗎 59).

KA..B/KH19B-29



33 401 00 15



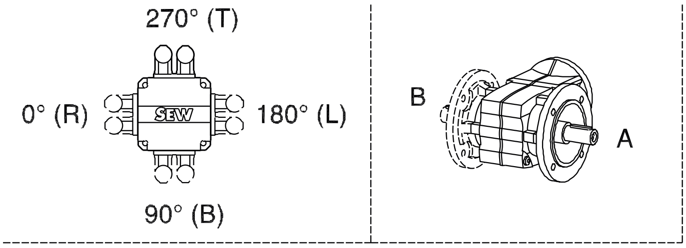
18522133771

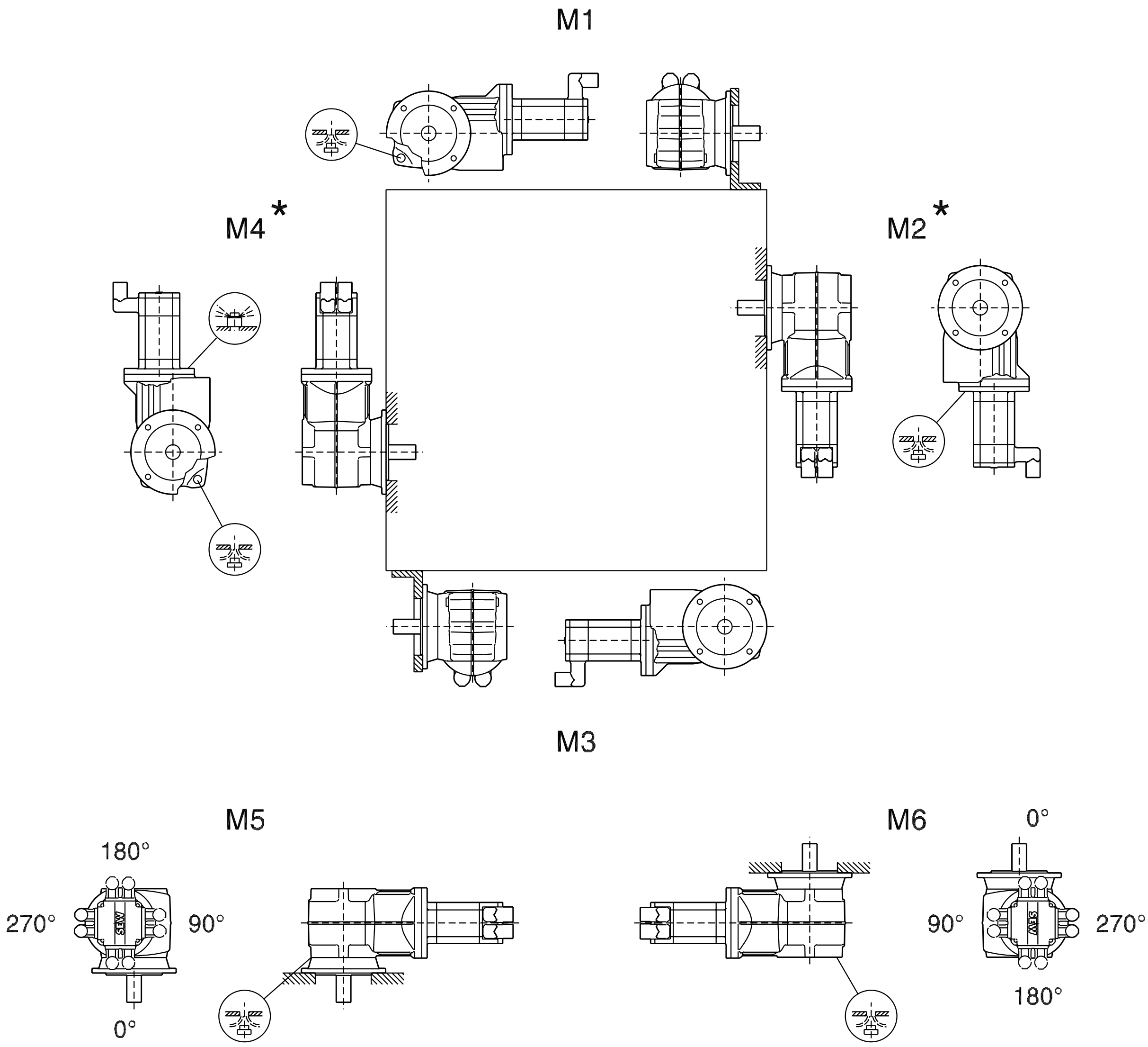
* (→ 🗎 58)

Observe the notes in chapter "Overhand and axial loads of R, F, K, S, and W gear units" (→ 🗎 59).

KF/KAF/KHF19-29

33 402 00 15





18522136203

* (→ 🗎 58)

Observe the notes in chapter "Overhand and axial loads of R, F, K, S, and W gear units" (→ 🗎 59).

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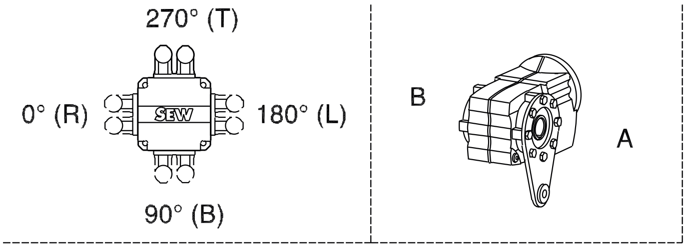
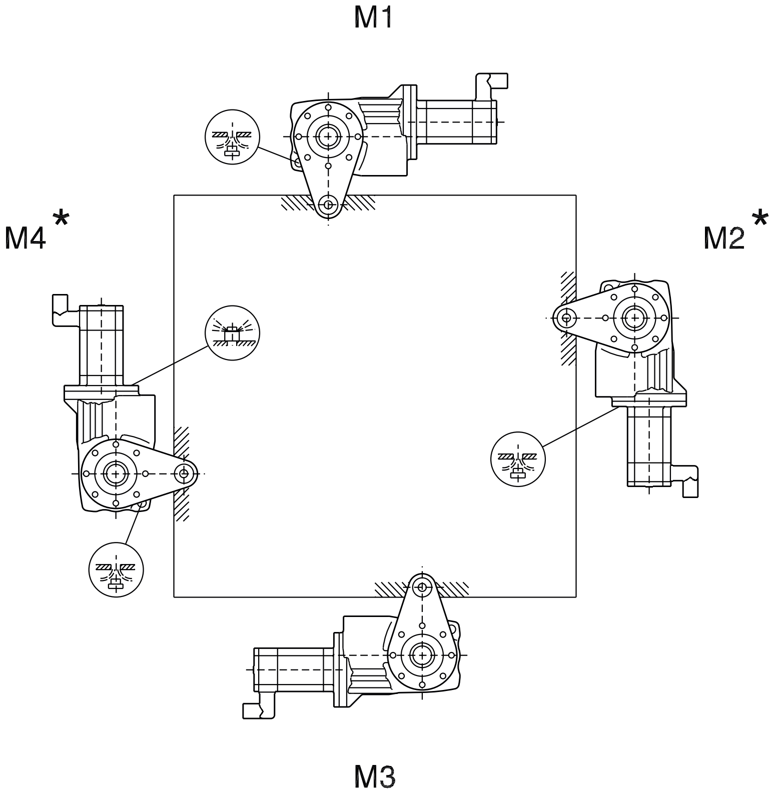
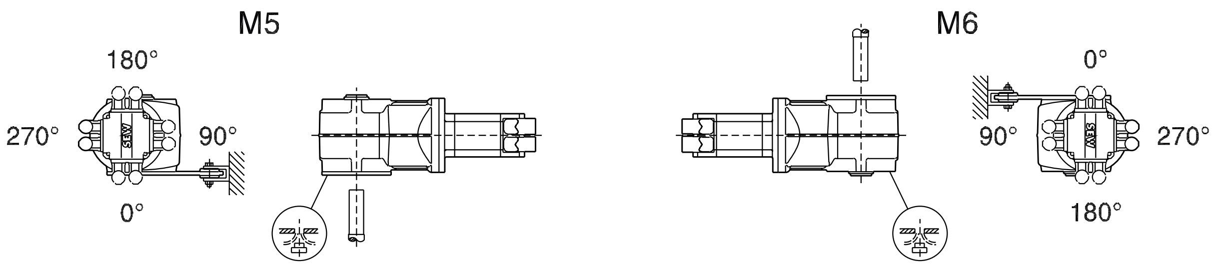
KA/KH19-29

33 403 00 15





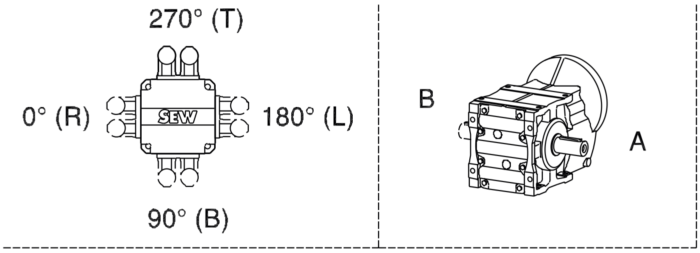


18522138635

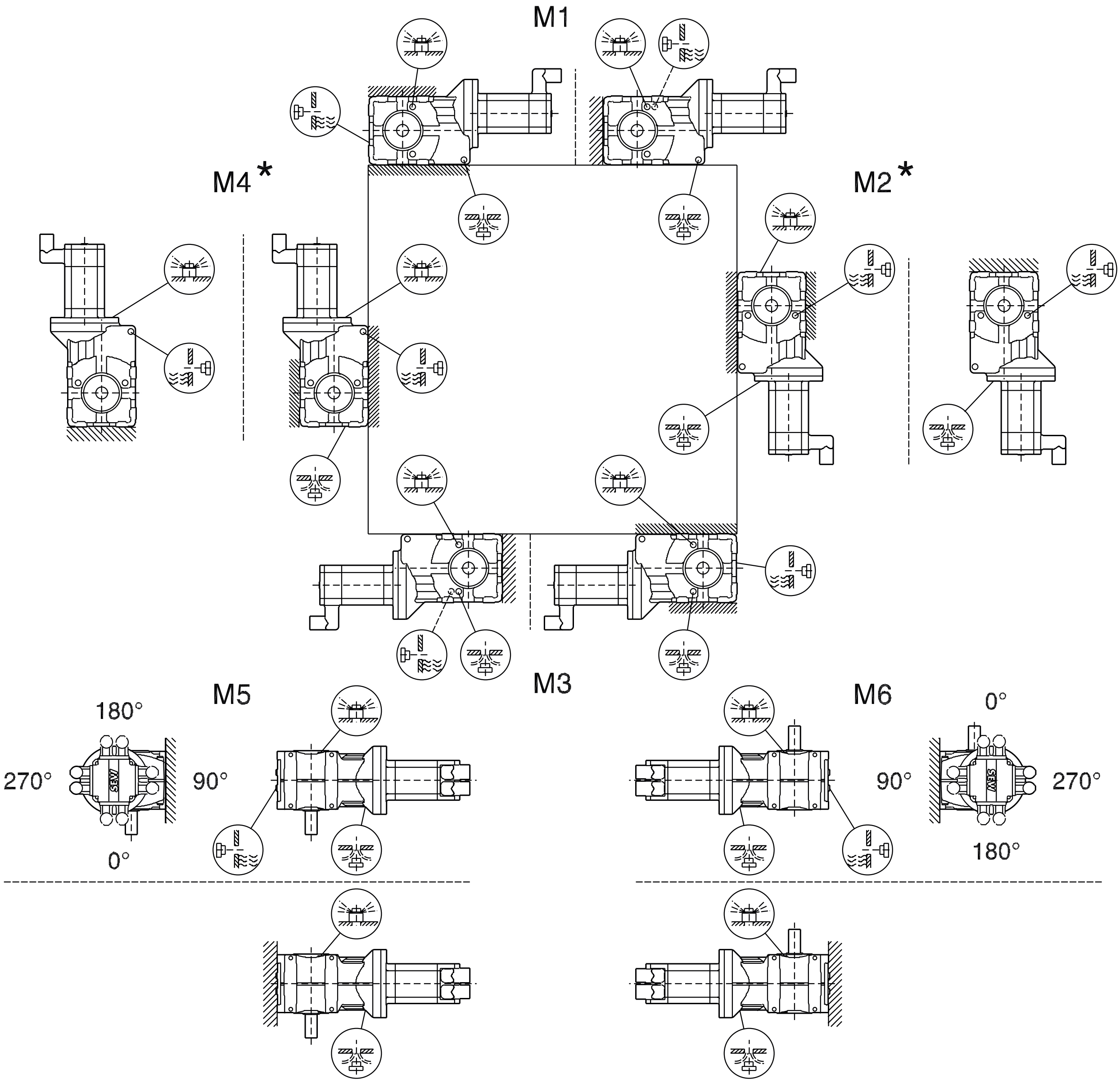
* (→ 🗎 58)

22316612/EN – 04/2017

K39-49



33 404 00 15

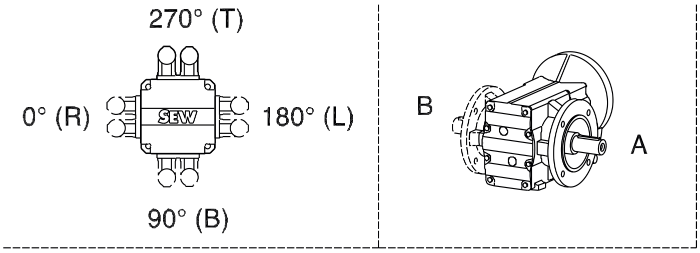


18522141067

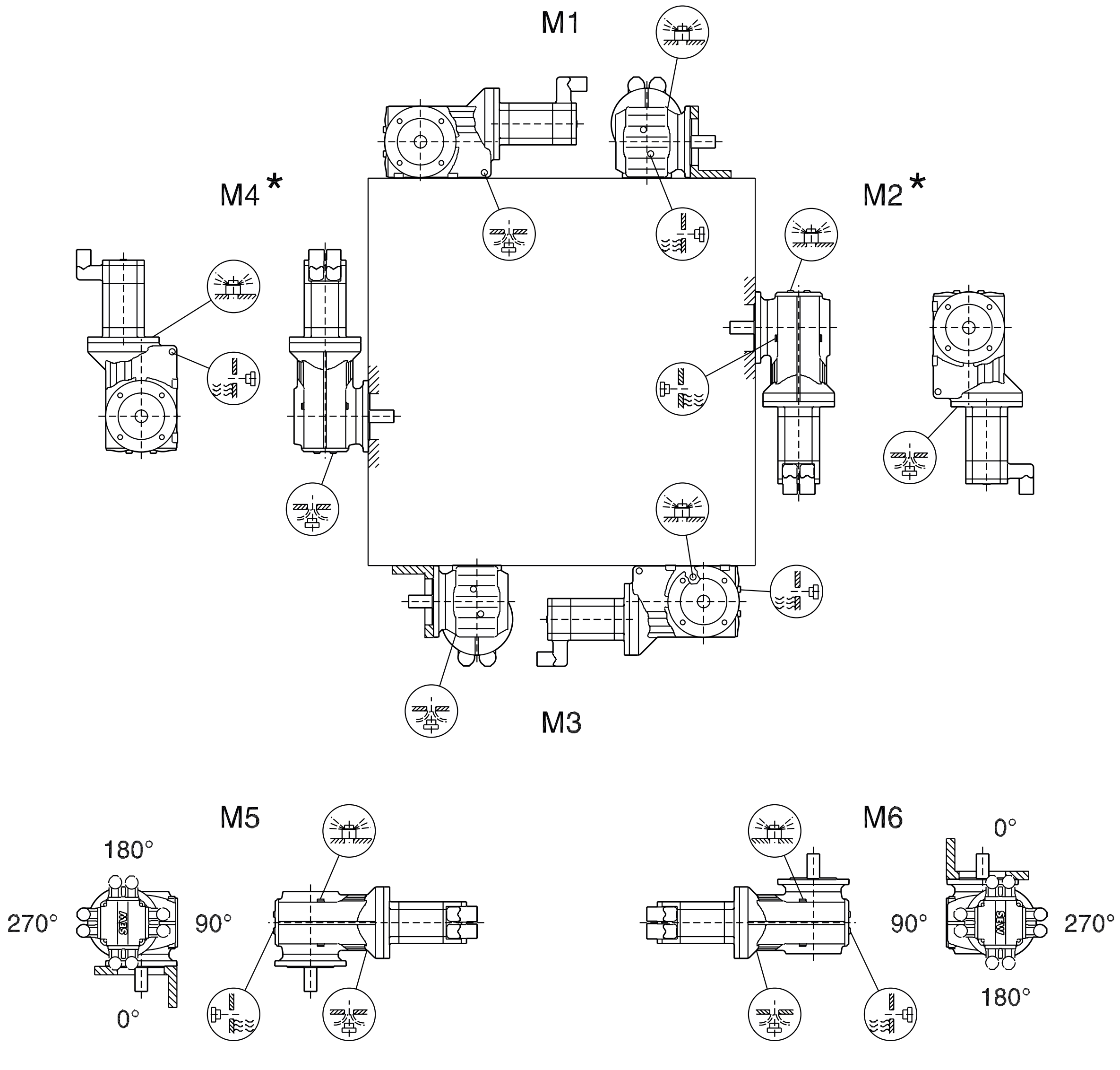
* (→ 58)

22316612/EN – 04/2017

KF/KAF/KHF39-49



33 405 00 15



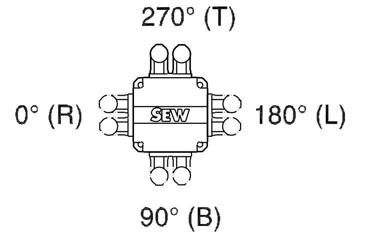
18522143499

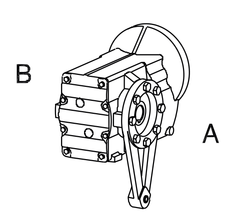
* (→ 🗎 58)

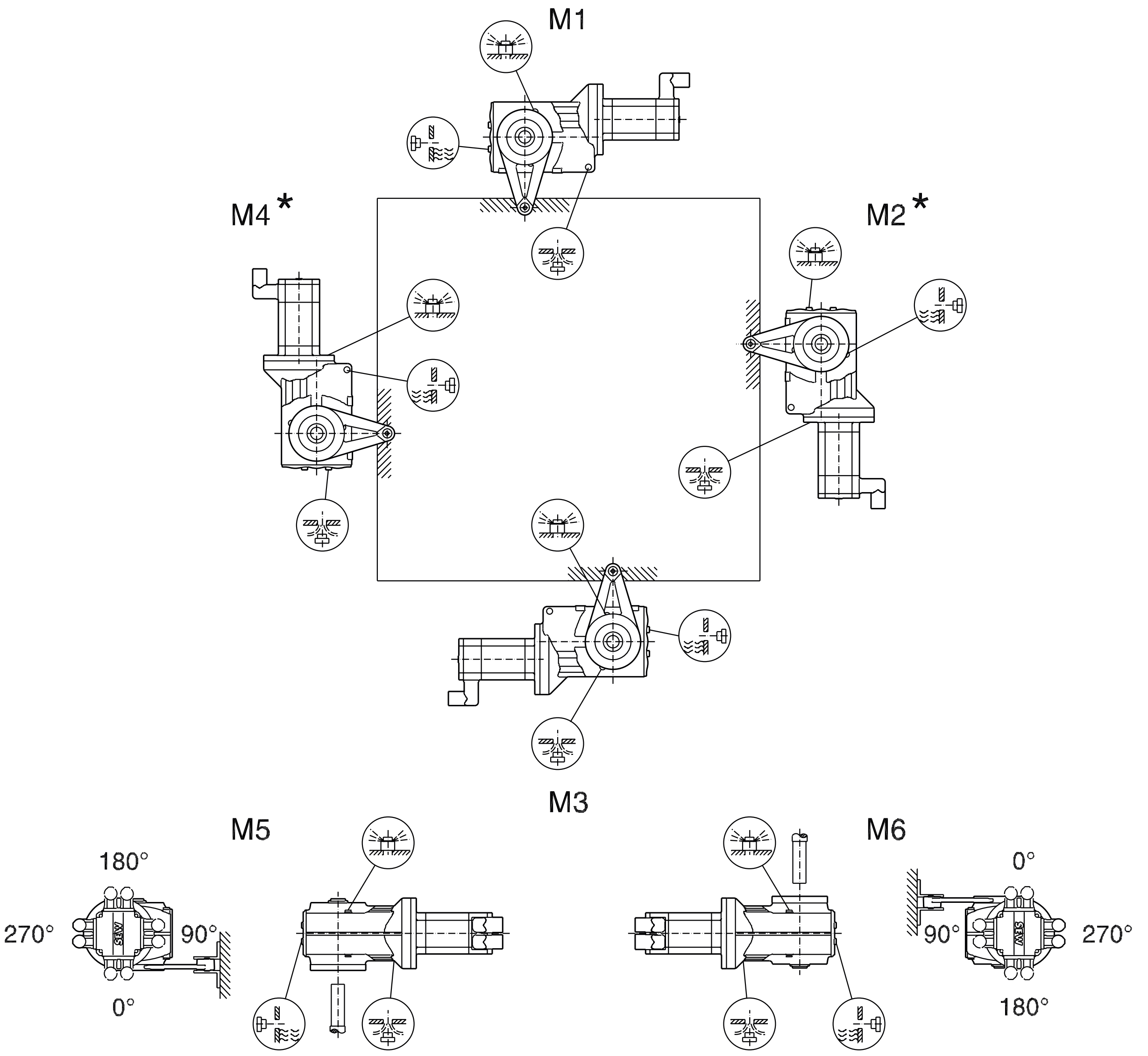
22316612/EN – 04/2017

KA/KH/KT39-49

33 406 00 15







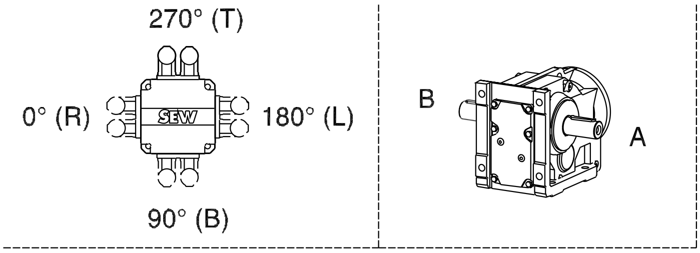
18522145931

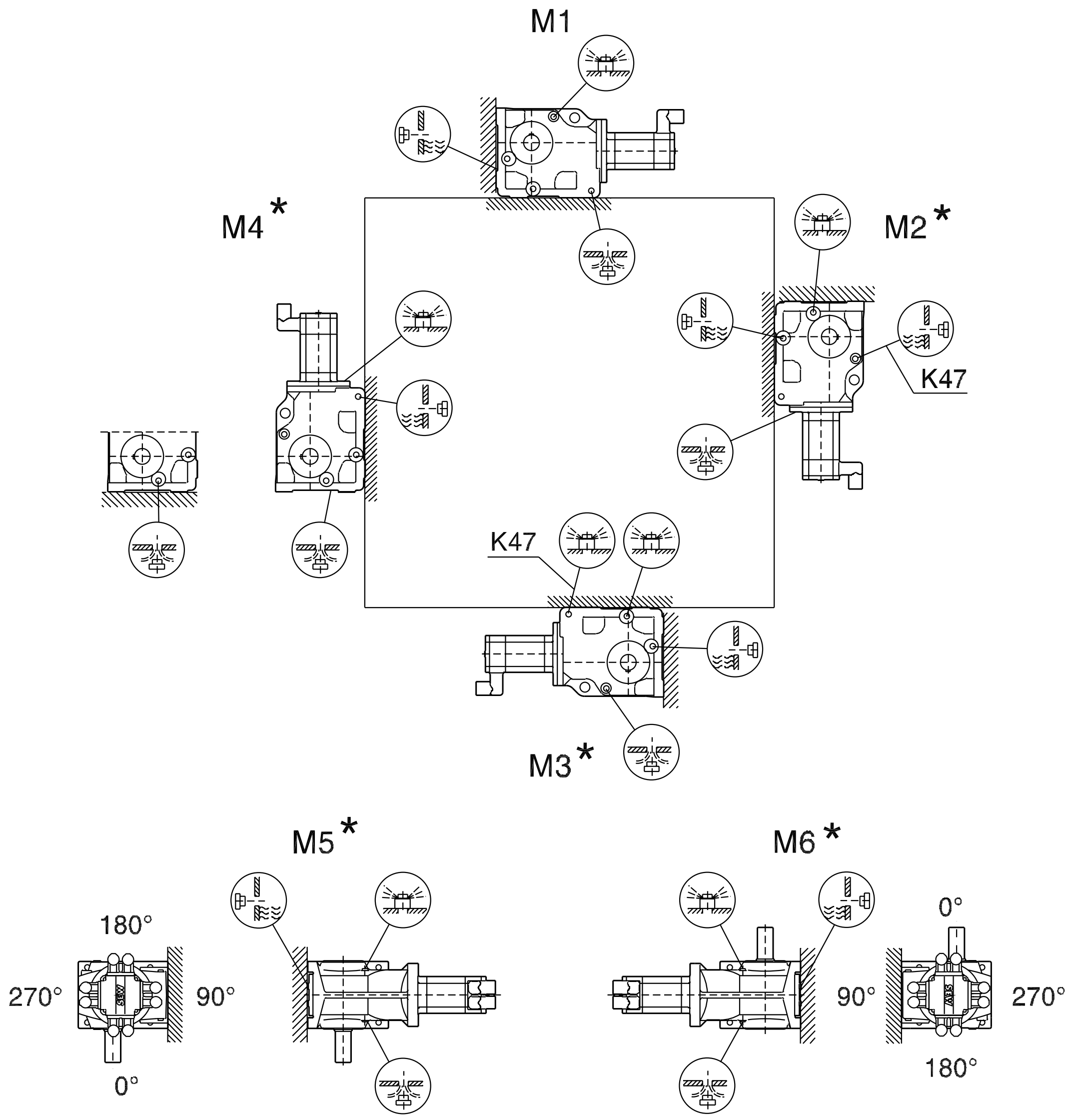
* (→ 🗎 58)

22316612/EN – 04/2017

K/KA..B/KH37B-107B, KV37B-107B

33 212 01 09



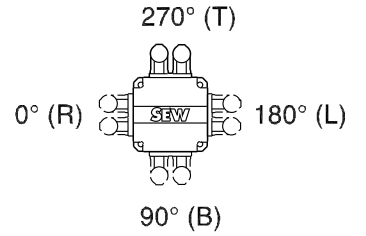


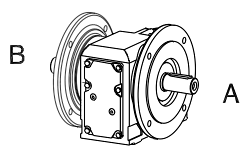
* (→ 🗎 58)

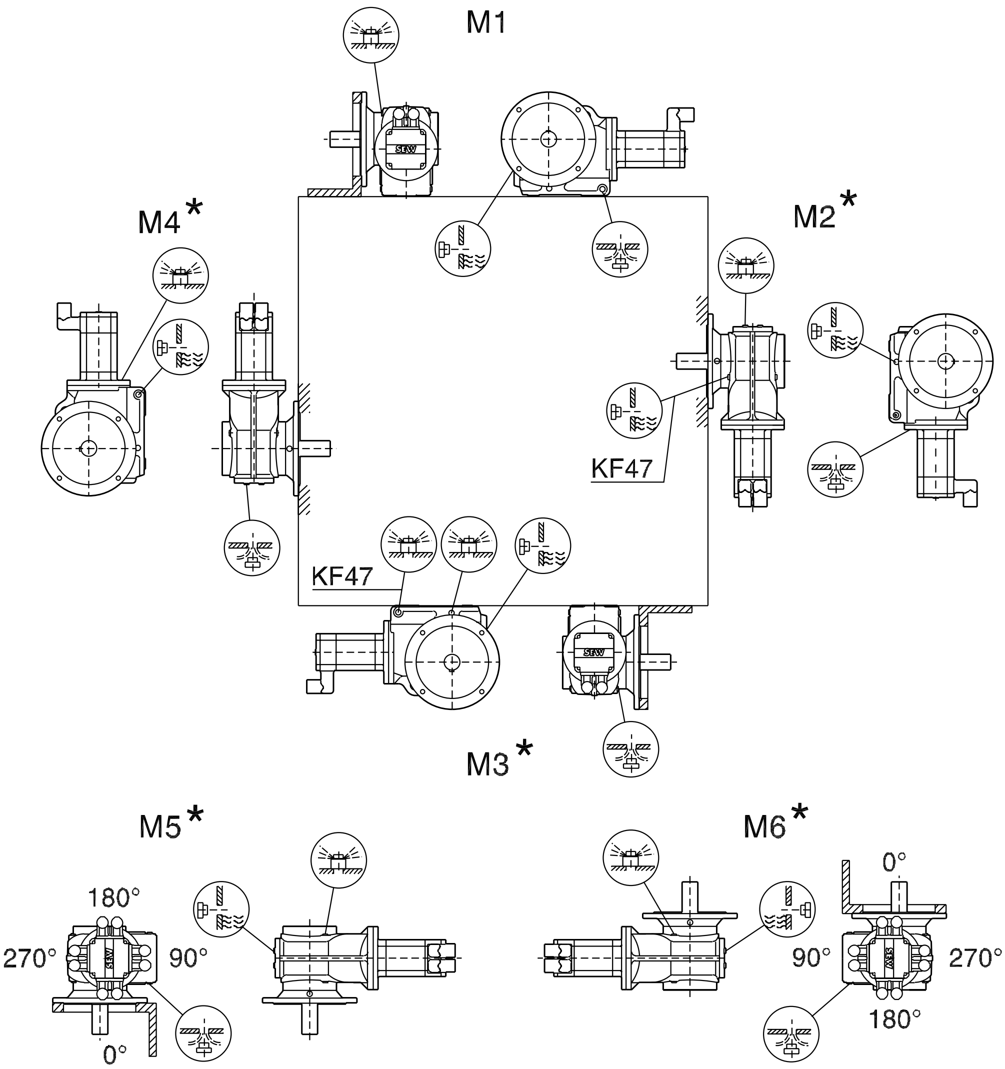
Observe the notes in chapter "Overhand and axial loads of R, F, K, S, and W gear units" (→ 🗎 59).

KF/KAF/KHF/KZ/KAZ/KHZ37-107, KVF/KVZ37-107

33 213 01 09





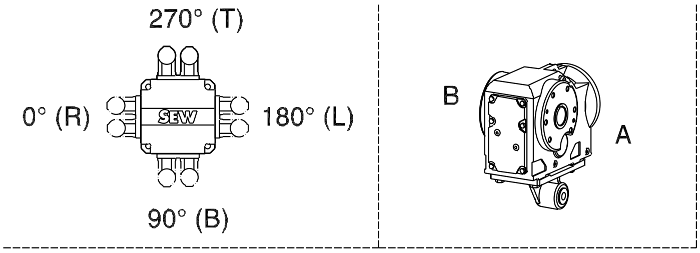


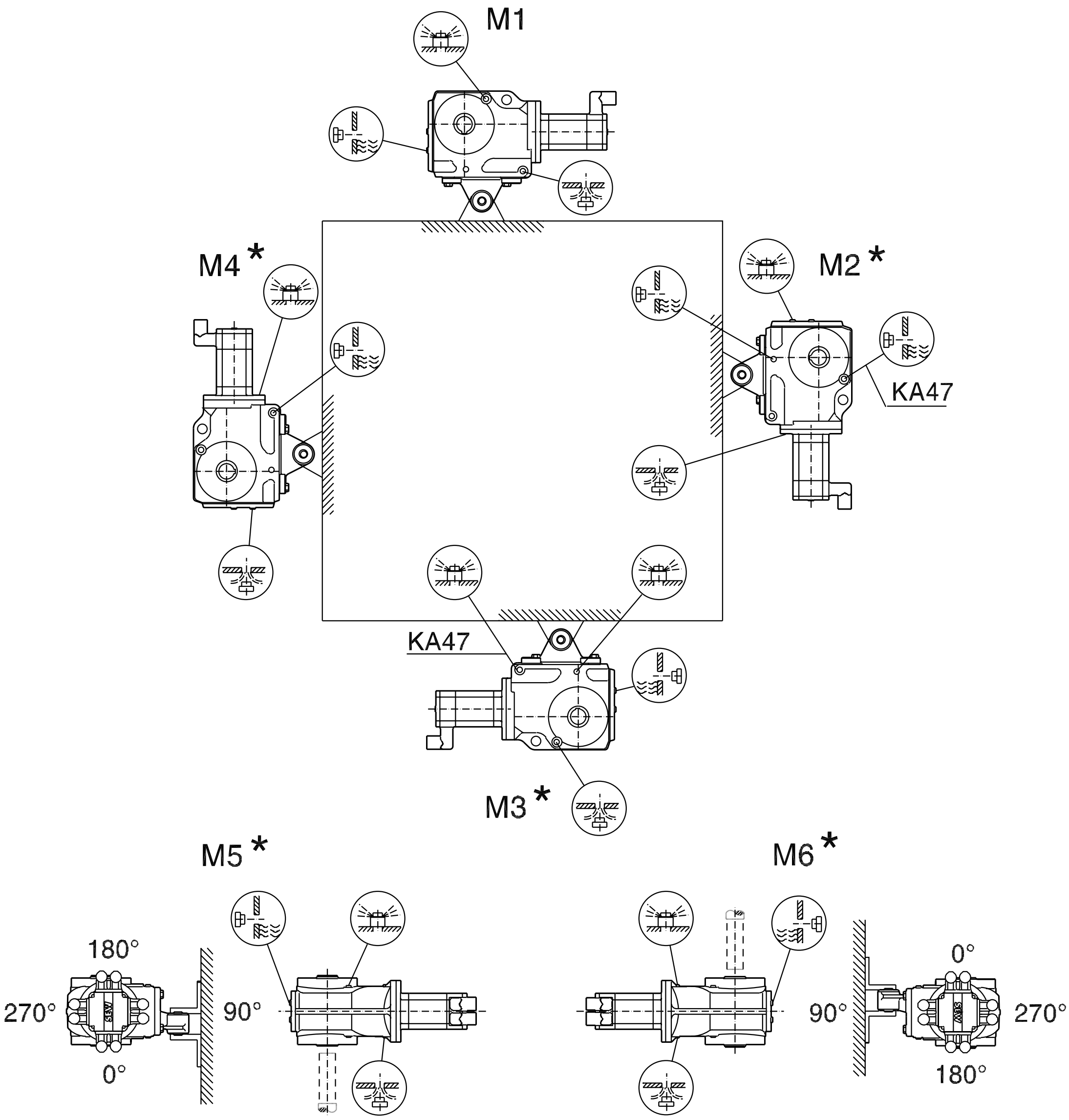
* (→ 🗎 58)

22316612/EN – 04/2017

KA/KH37-107, KV37-107, KT37-97

33 214 01 09



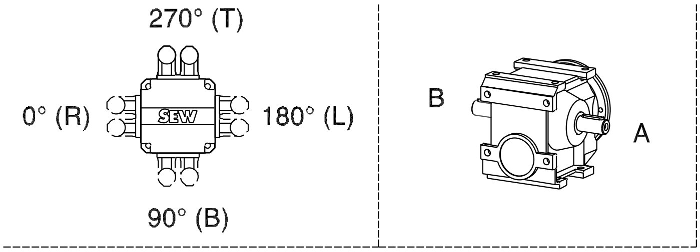


* (→ 🗎 58)

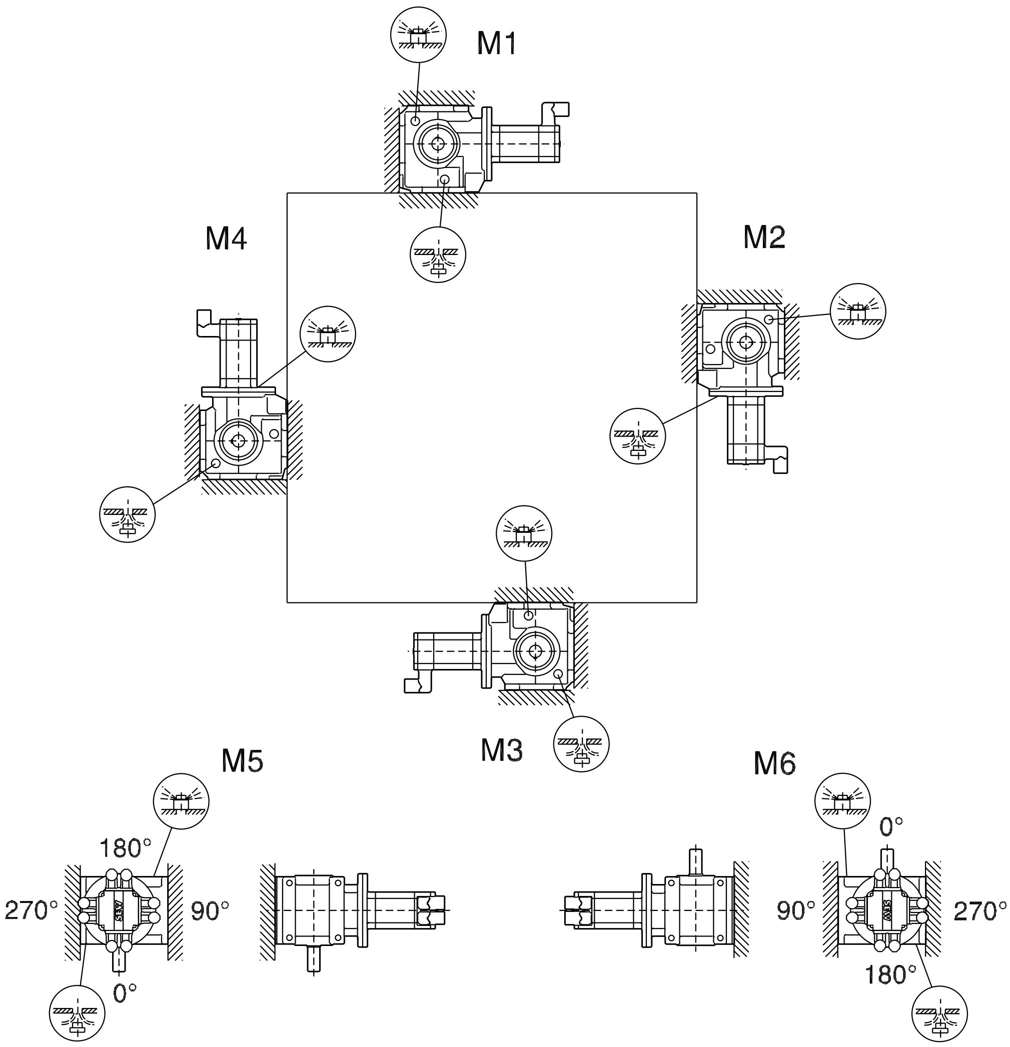
22316612/EN – 04/2017

5.6.5 Mounting positions of helical-worm gearmotors S

S37



02 117 01 09



* (→ 🗎 58)

Observe the notes in chapter "Overhand and axial loads of R, F, K, S, and W gear units" (→ 🗎 59).

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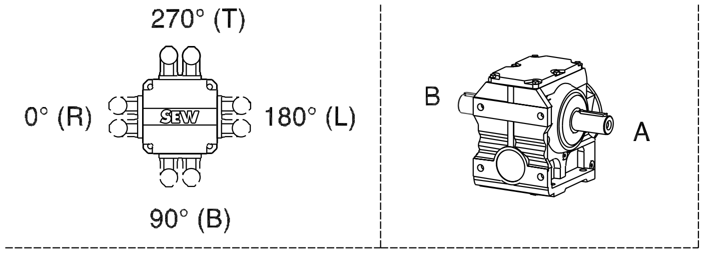
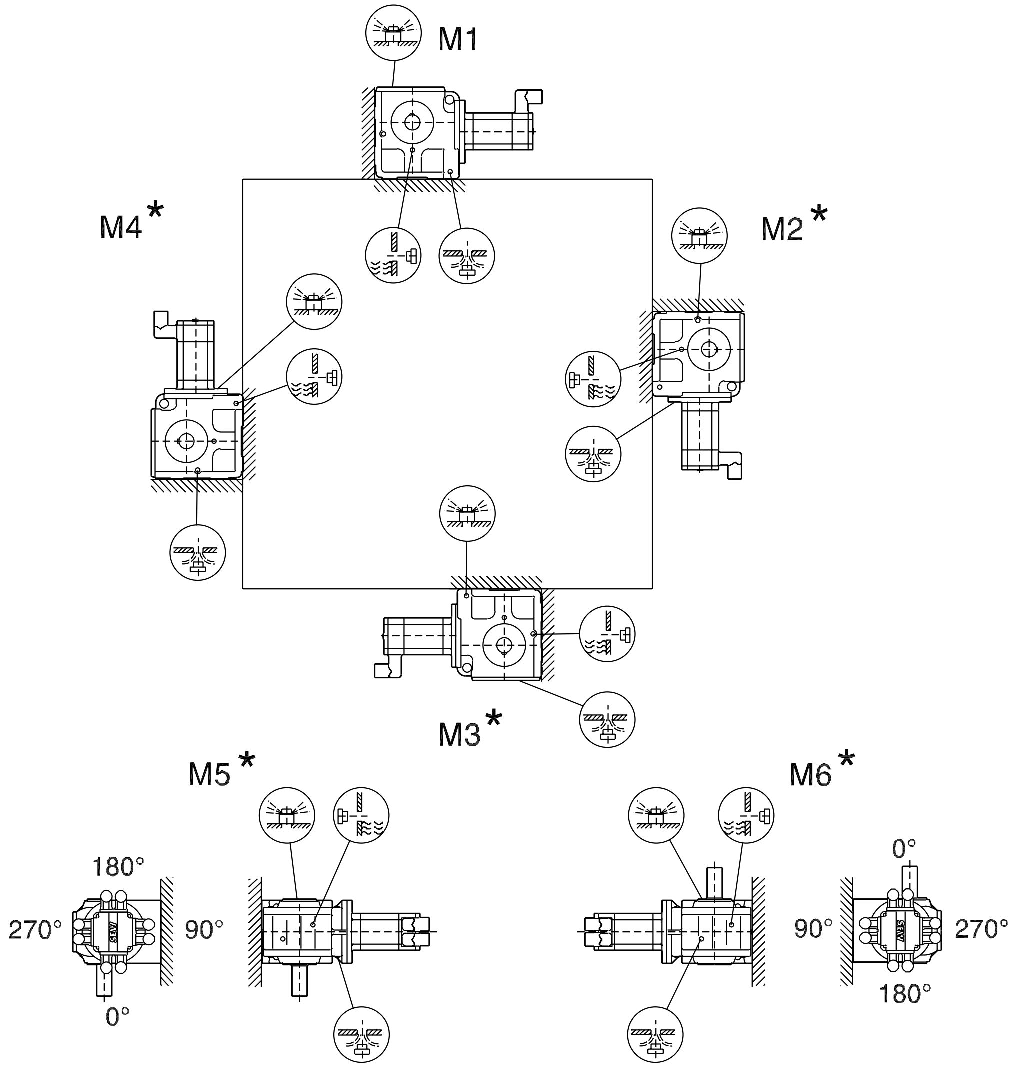
S47-S97

02 118 01 09



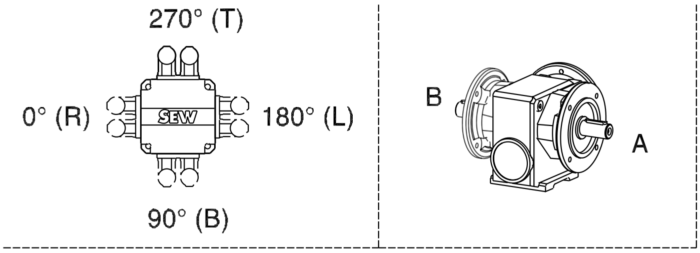


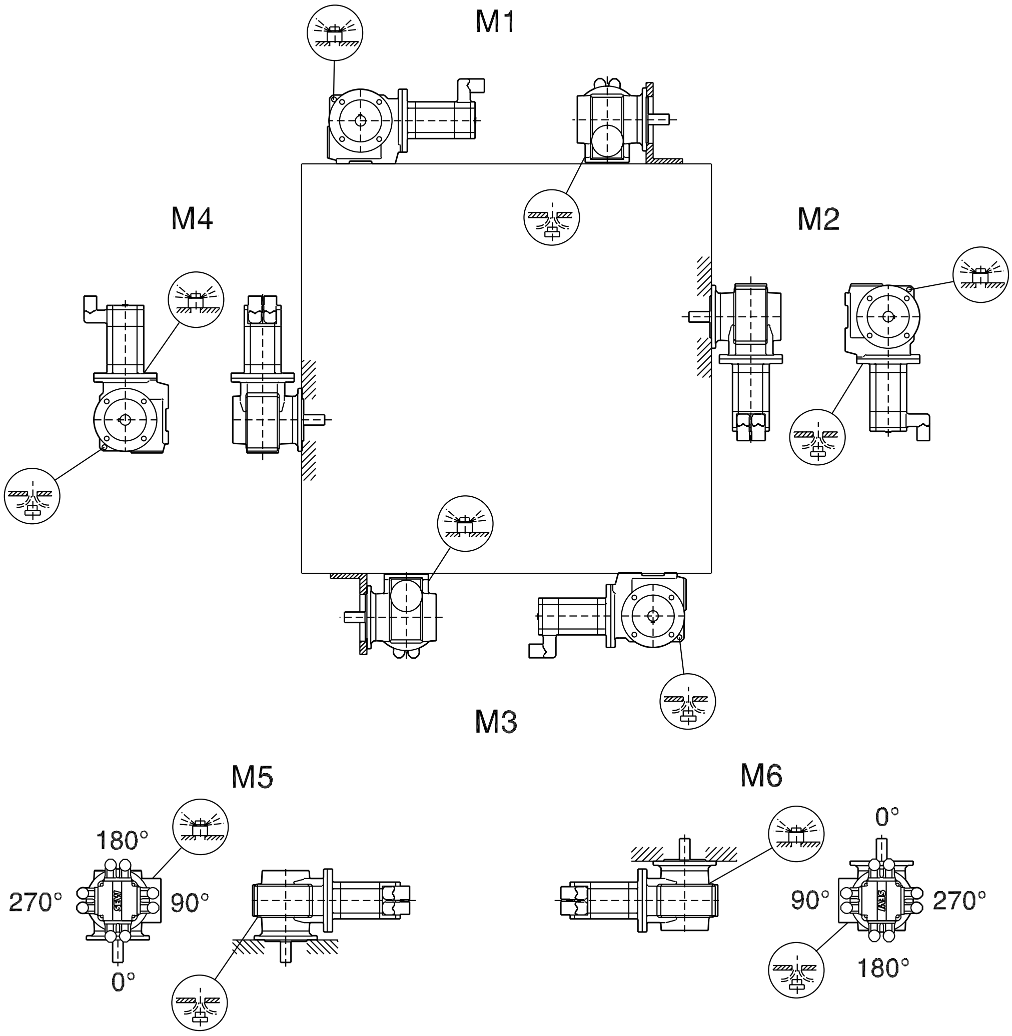
* (→ 🗎 58)

Observe the notes in chapter "Overhand and axial loads of R, F, K, S, and W gear units" (→ 🗎 59).

SF/SAF/SHF37

02 119 01 09

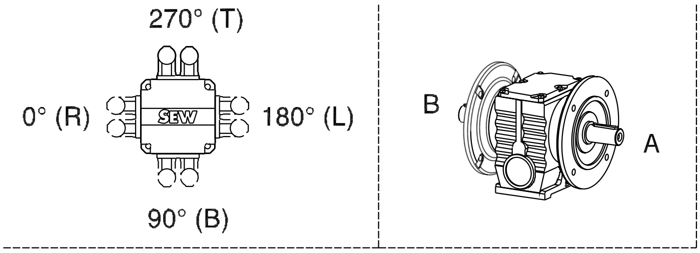


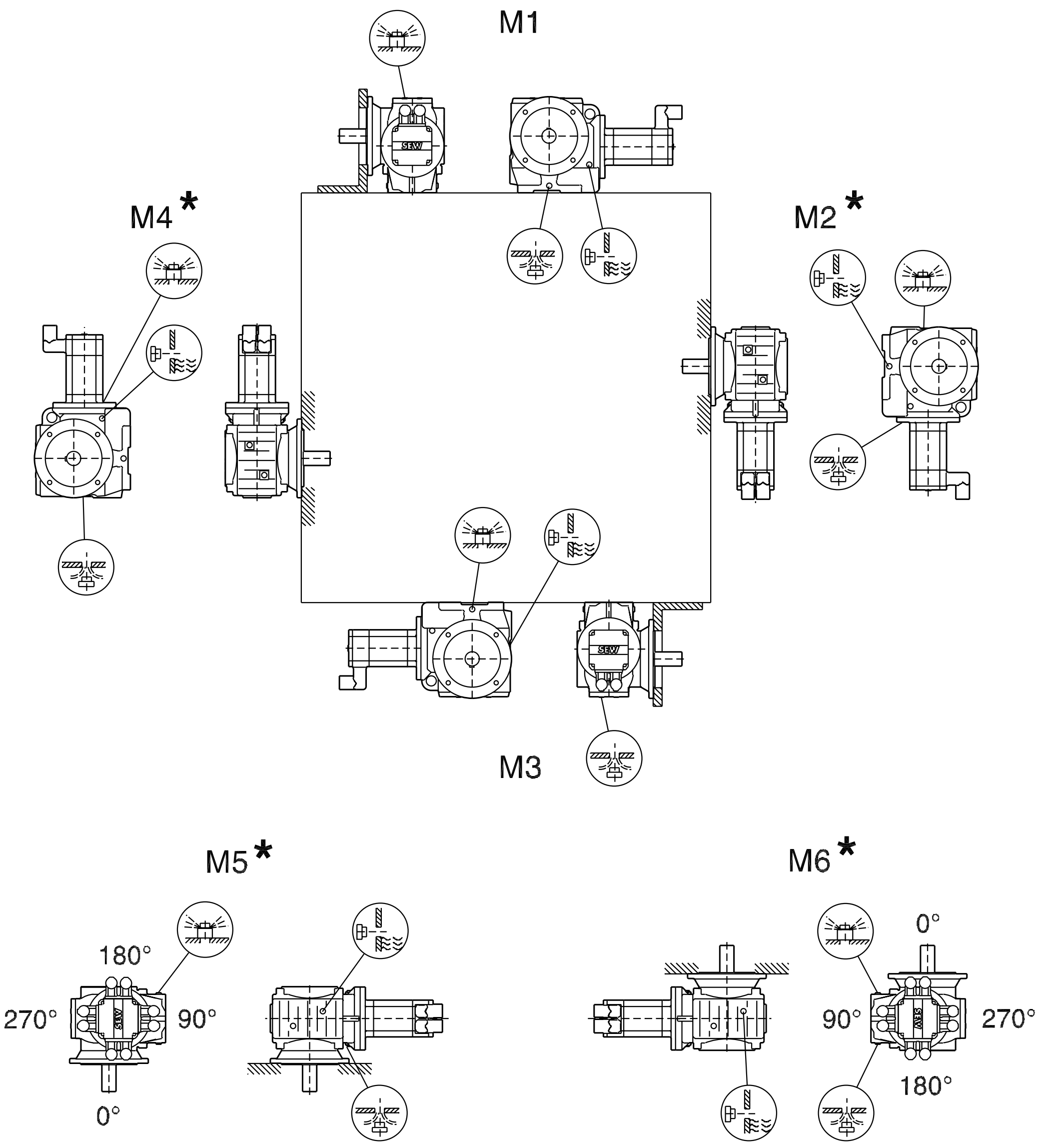


22316612/EN – 04/2017

SF/SAF/SHF/SAZ/SHZ47-97

02 120 01 09

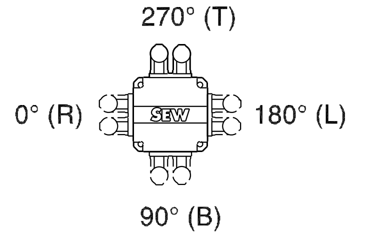


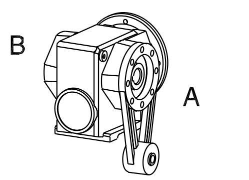


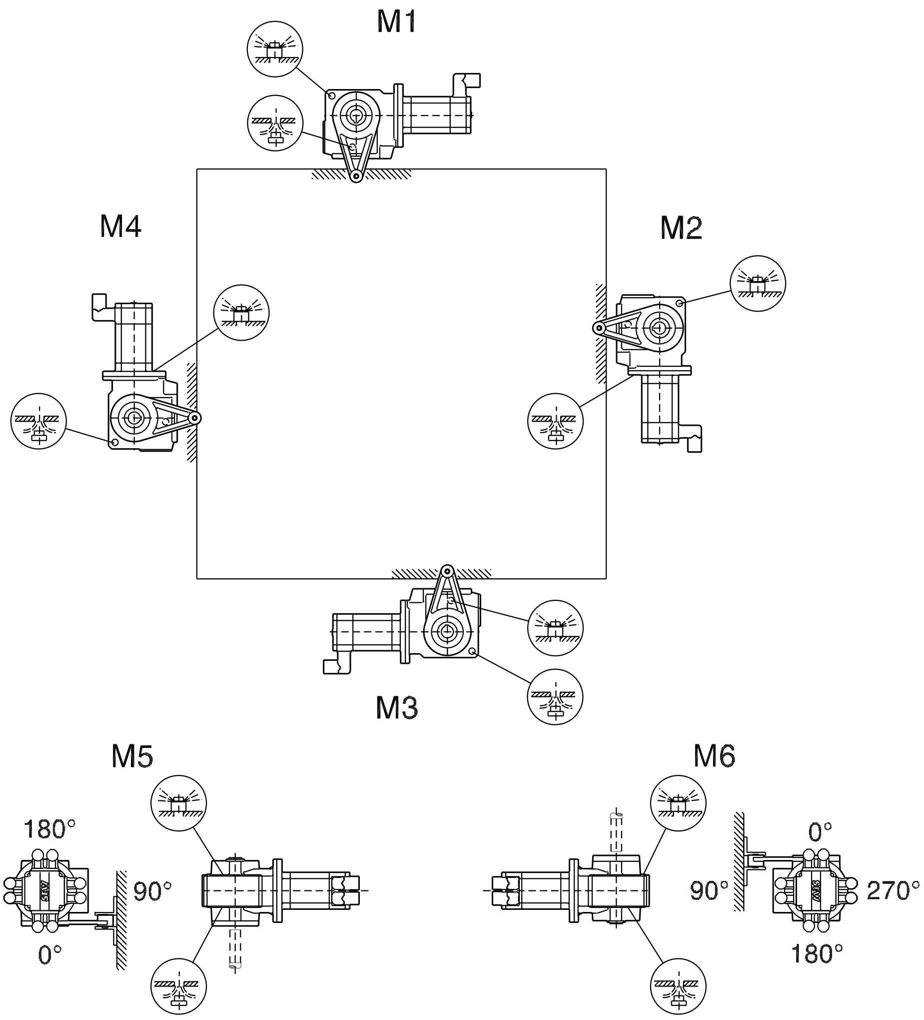
* (→ 🗎 58)

SA/SH/ST37

02 121 01 09



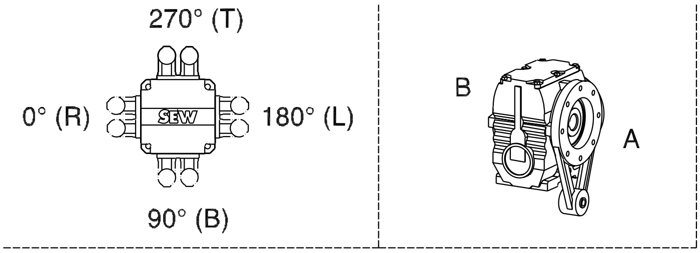


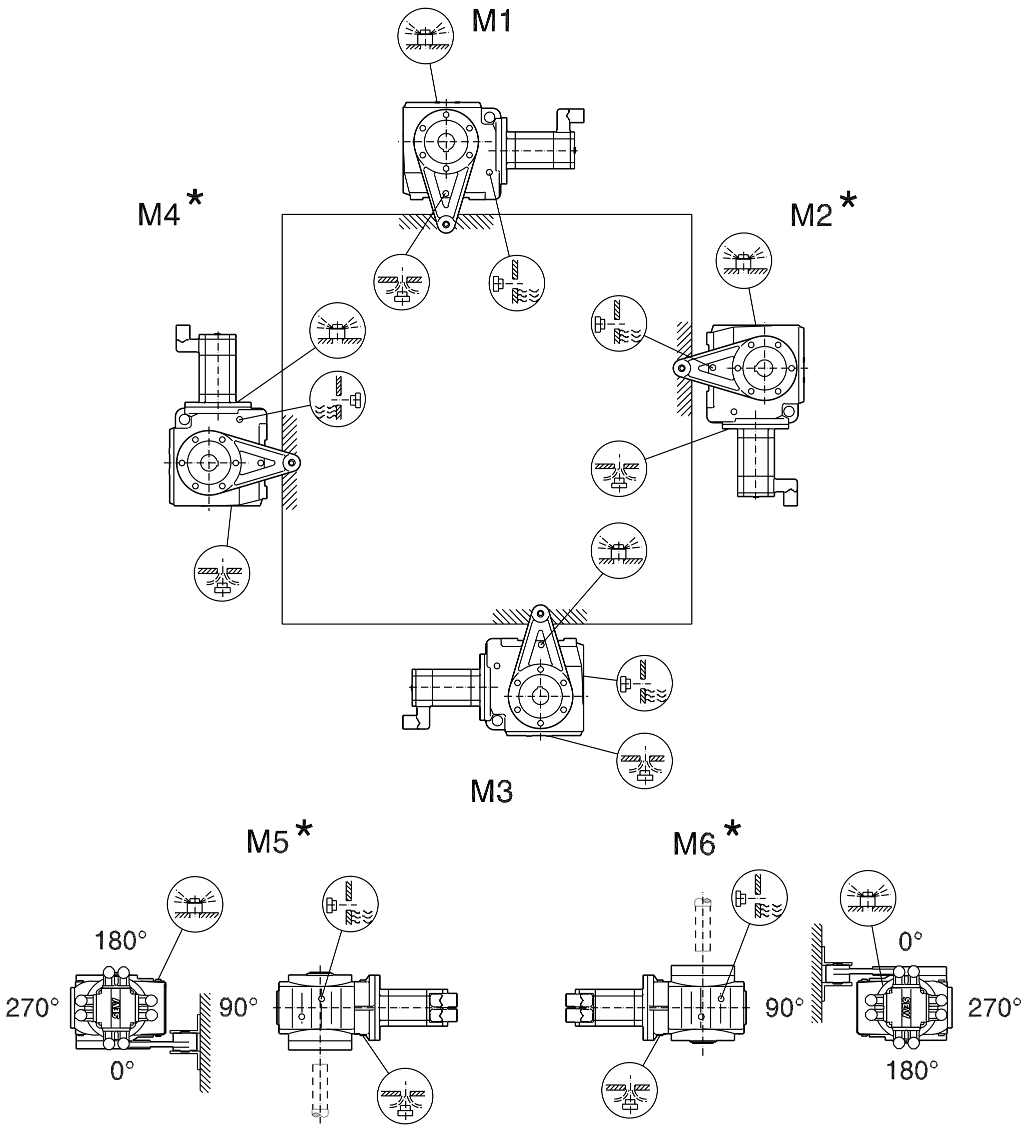


22316612/EN – 04/2017

SA/SH/ST47-97

02 122 01 09



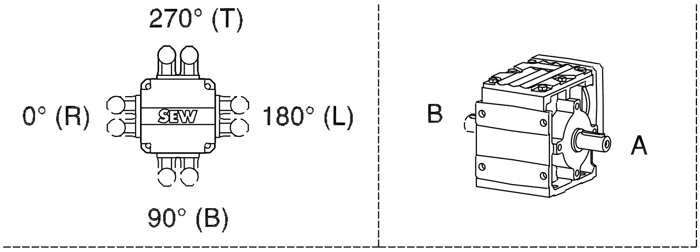


* (→ 🗎 58)

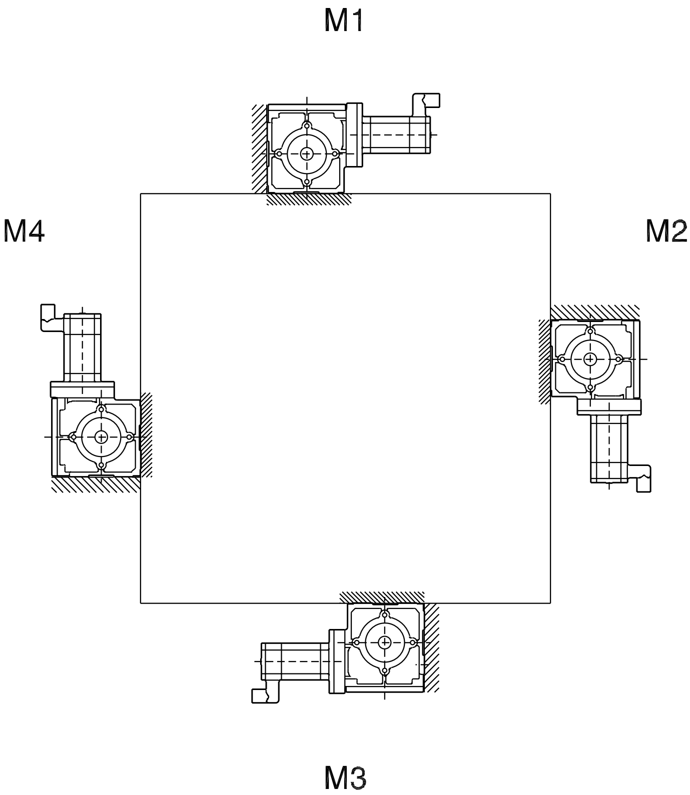
22316612/EN – 04/2017

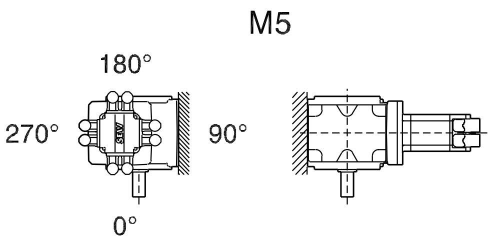
5.6.6 Mounting positions of SPIROPLAN® gearmotors W

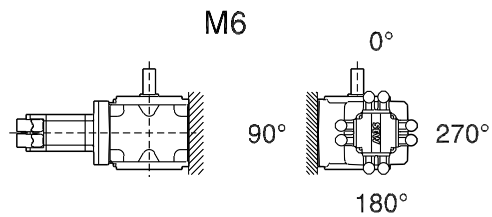
W10-30



20 023 00 16



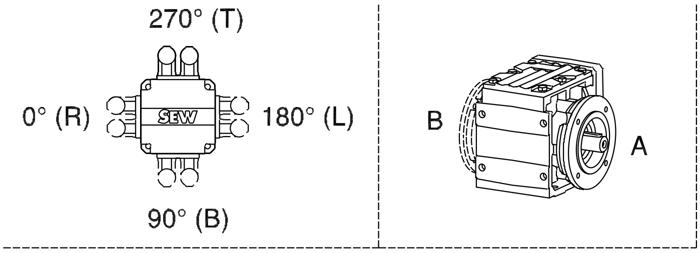


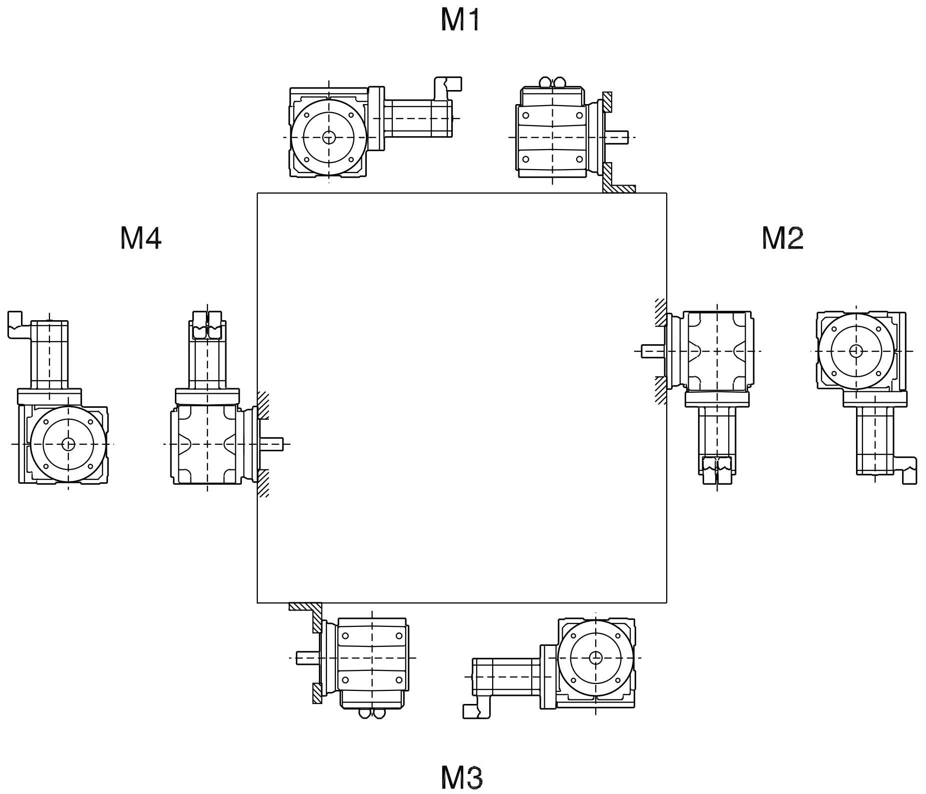


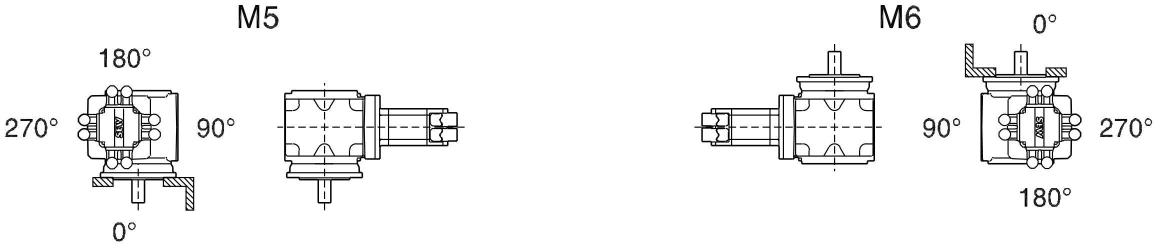
5

WF10-30

20 024 00 16



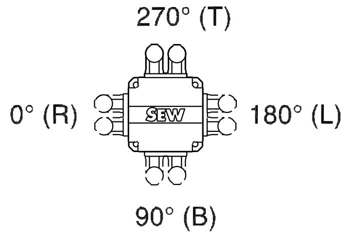


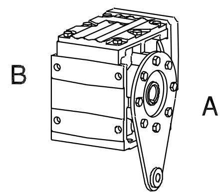


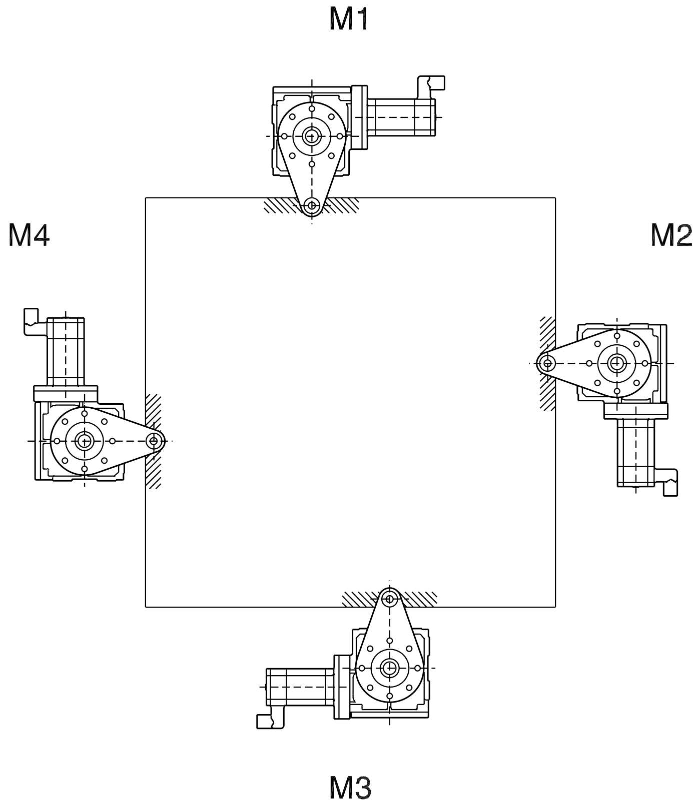
22316612/EN – 04/2017

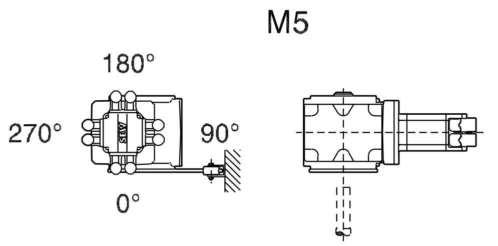
WA10-30

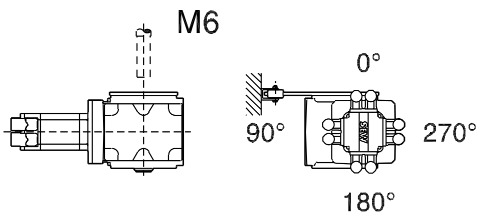
20 025 00 16







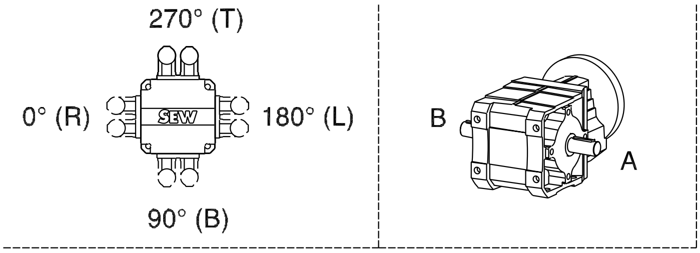


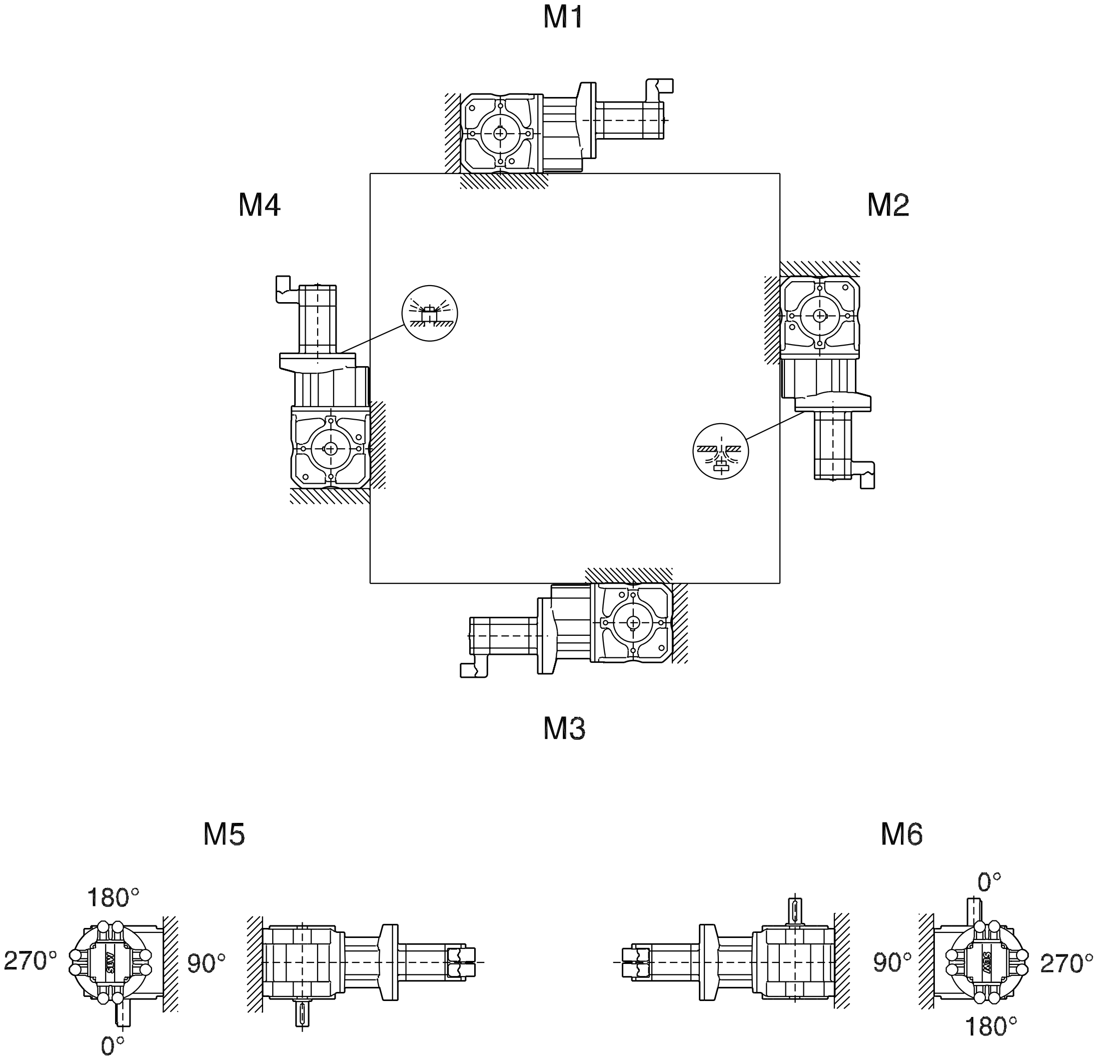


22316612/EN – 04/2017

W/WA..B/WH37B-47B

20 072 01 09

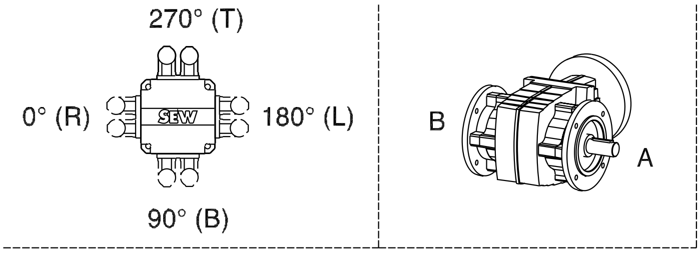


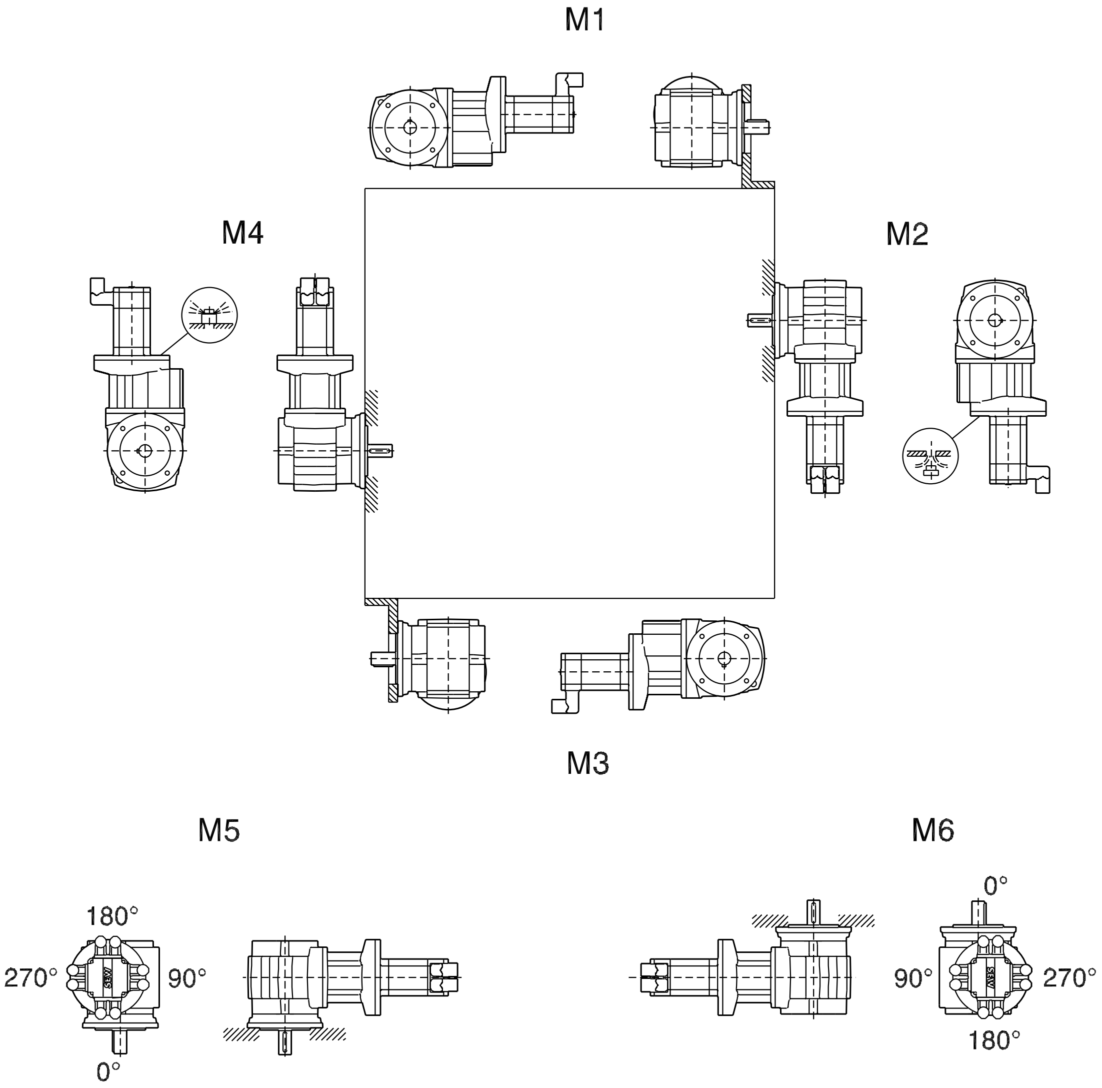


22316612/EN – 04/2017

WF/WAF/WHF37-47

20 073 01 09





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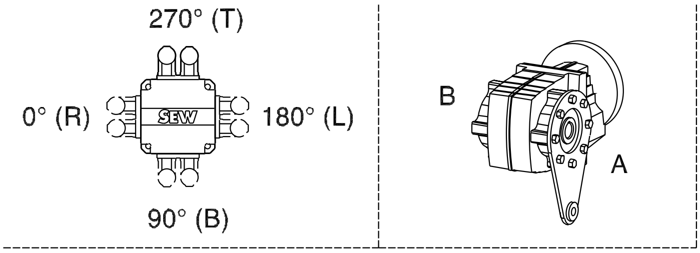
WA/WH/WT37-47



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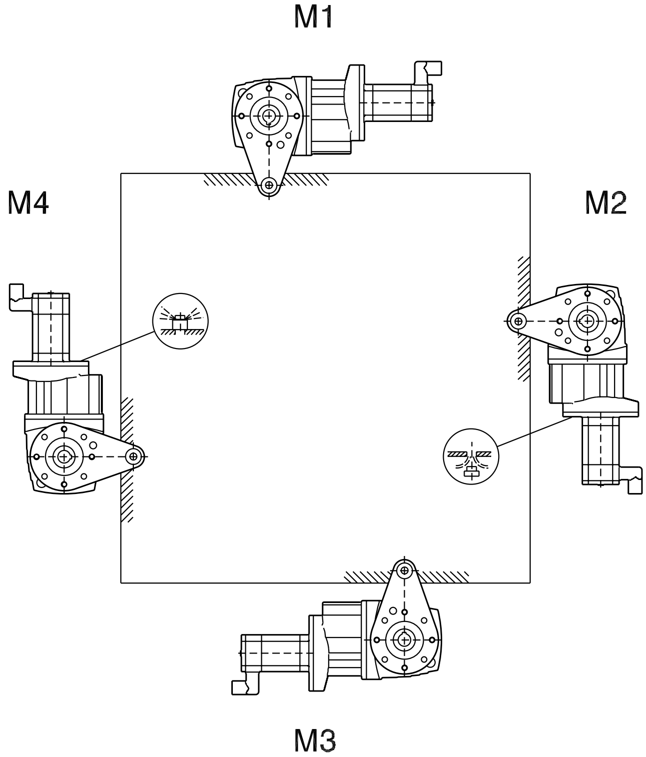

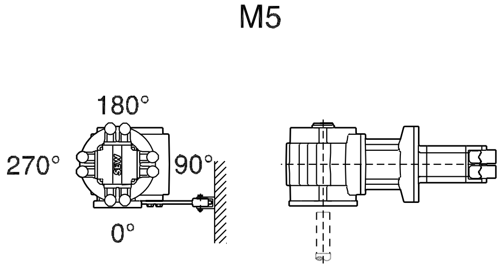

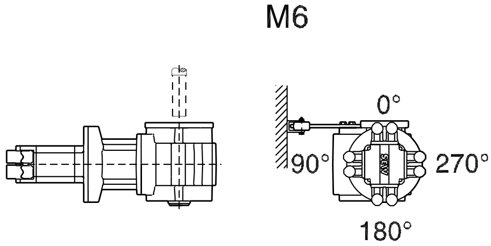

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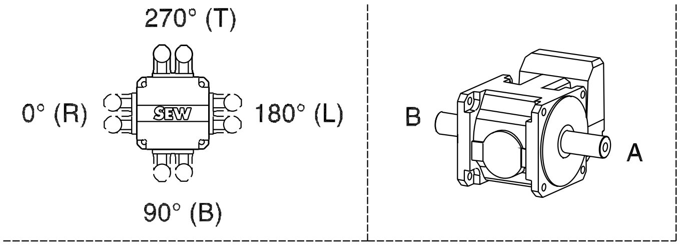
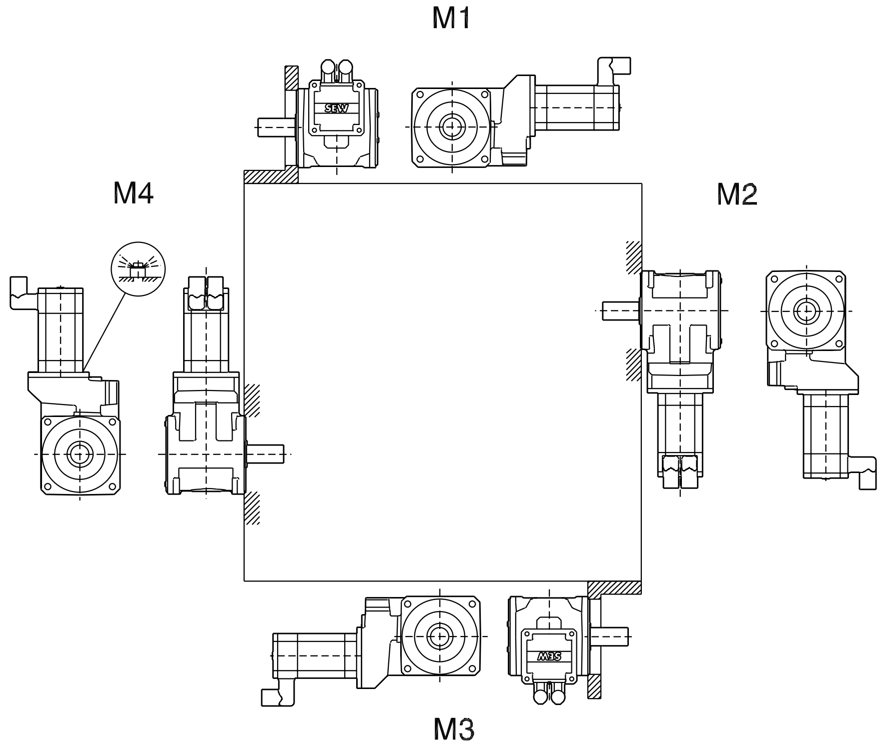
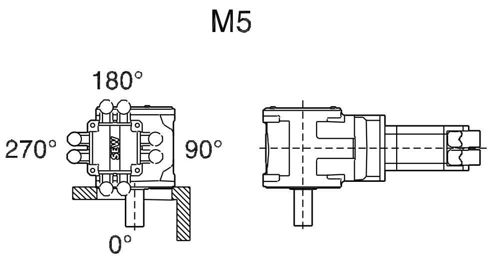
5.6.7 Mounting positions of BS.F helical-bevel gearmotors

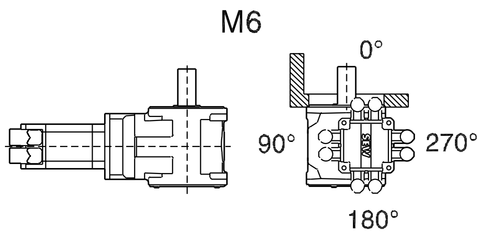
BSF202-802

56 037 02 03









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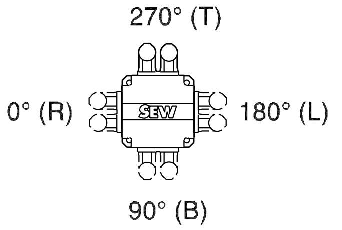

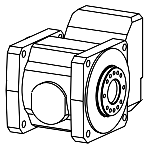

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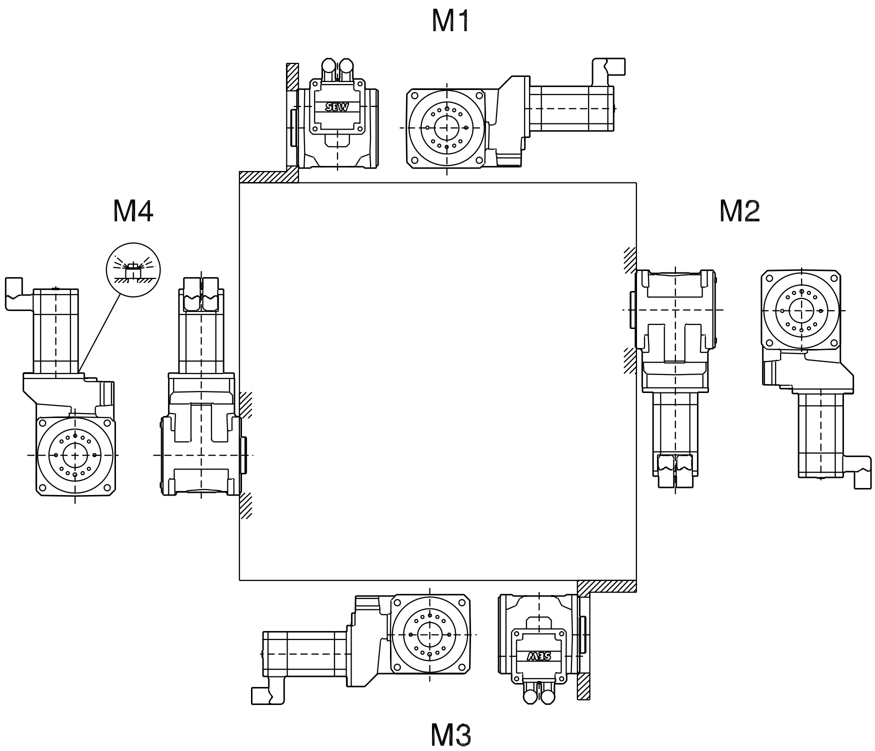
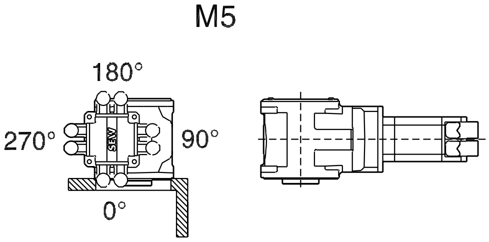
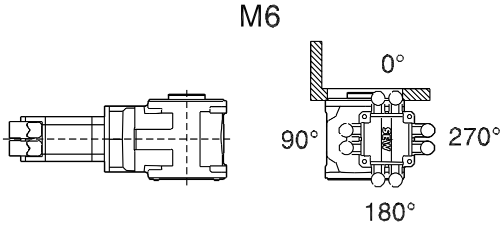
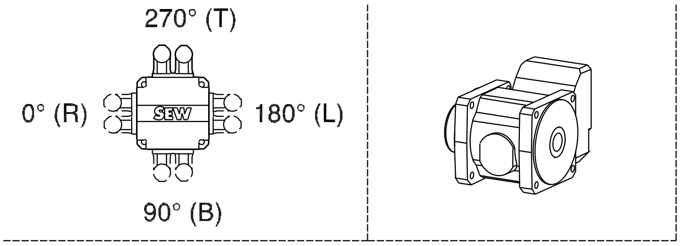


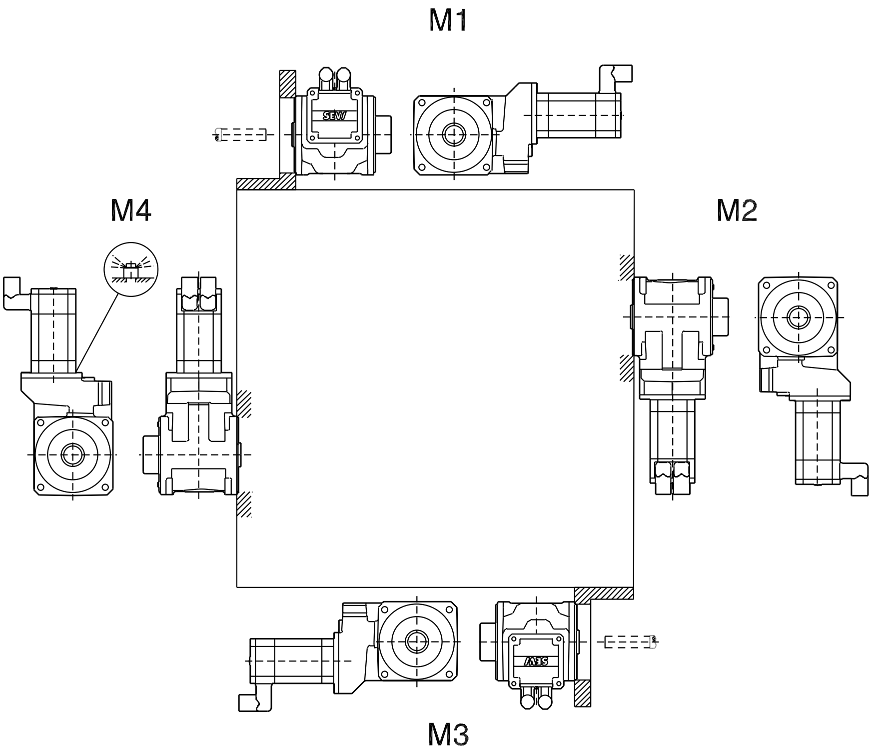


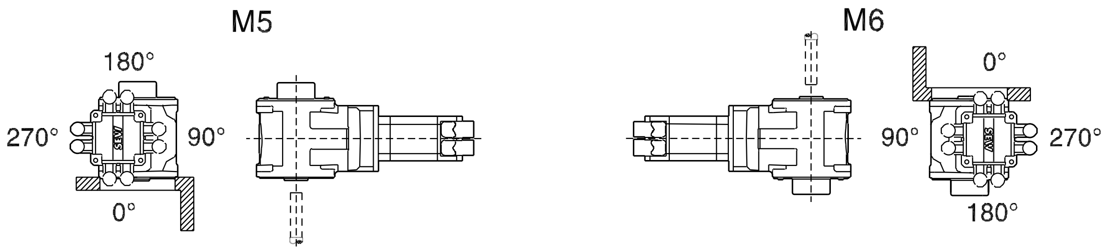


BSHF202-802

56 056 02 03







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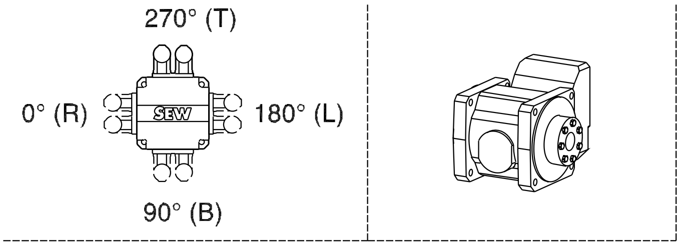

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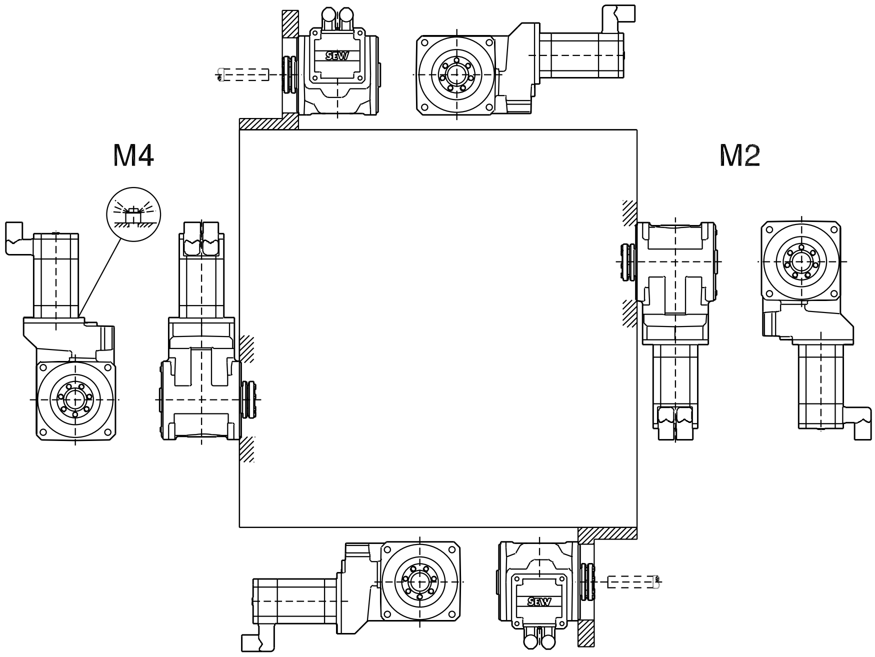

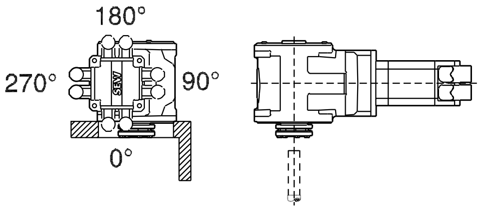

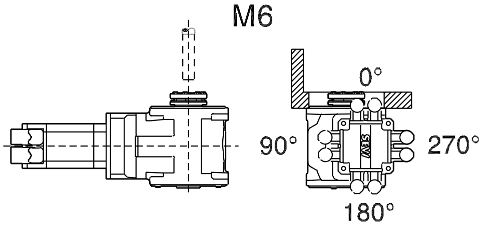

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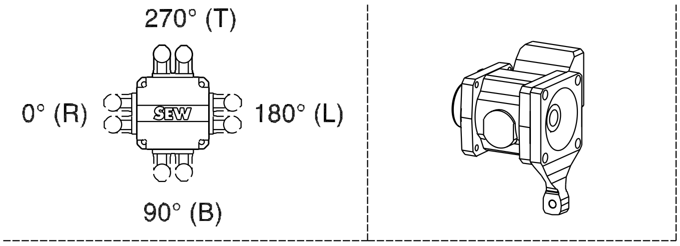

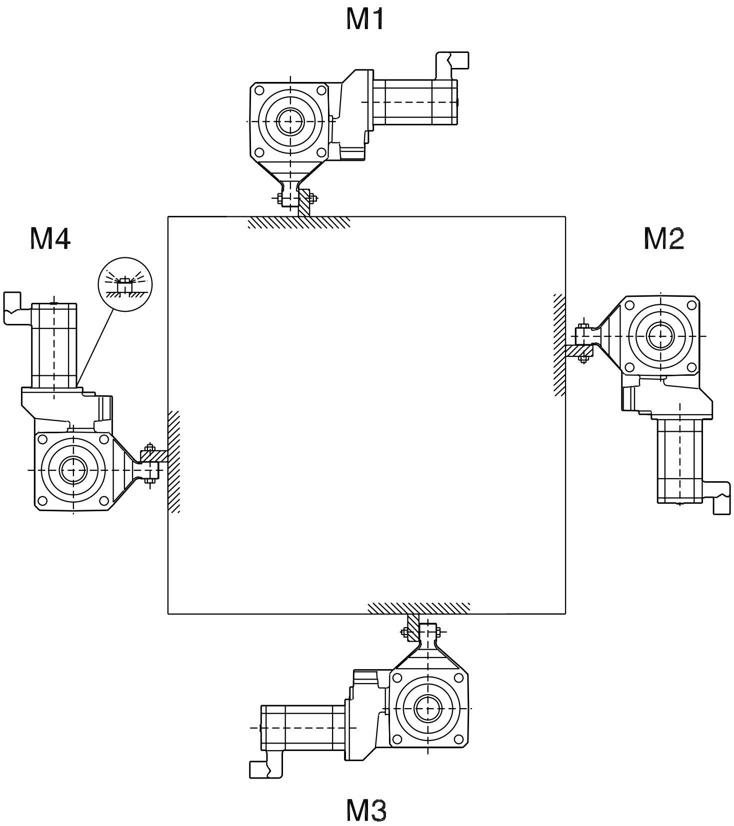

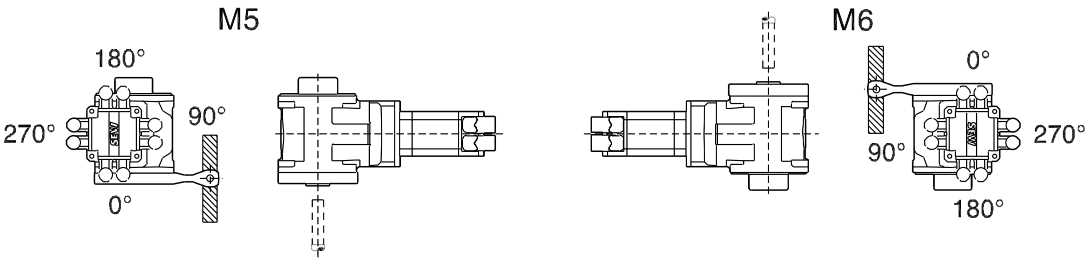

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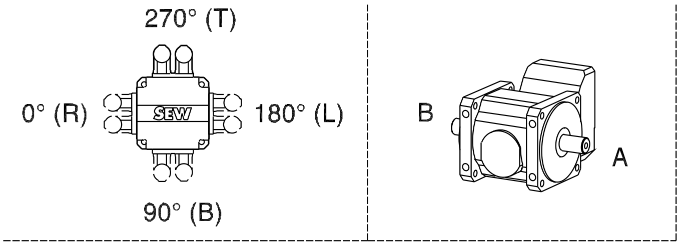

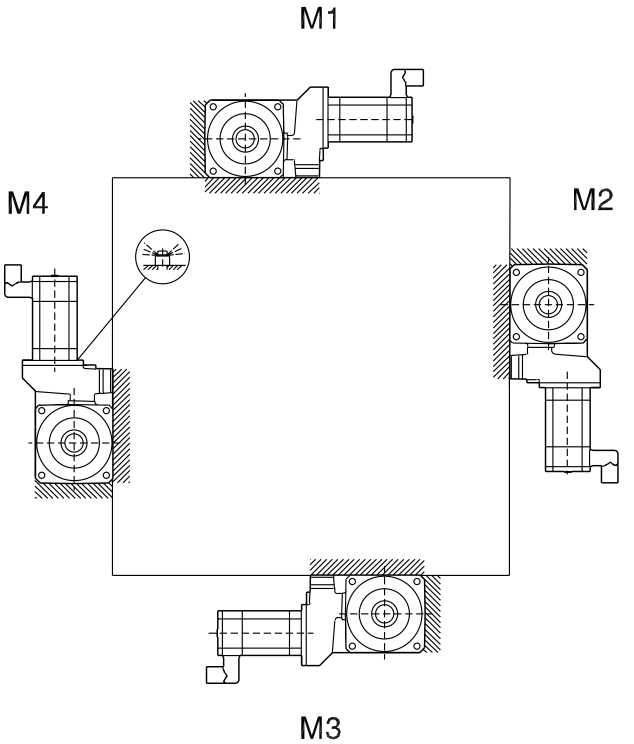

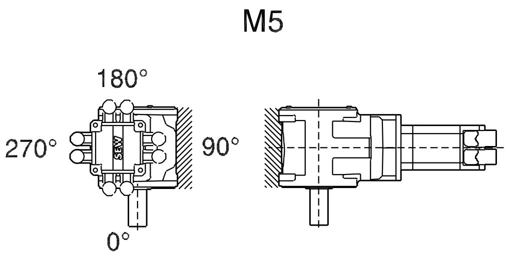

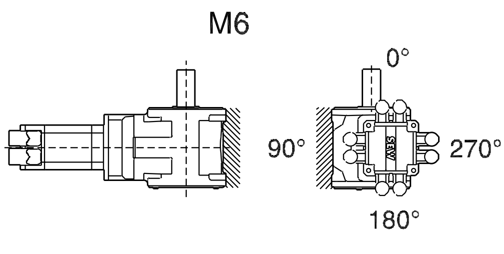

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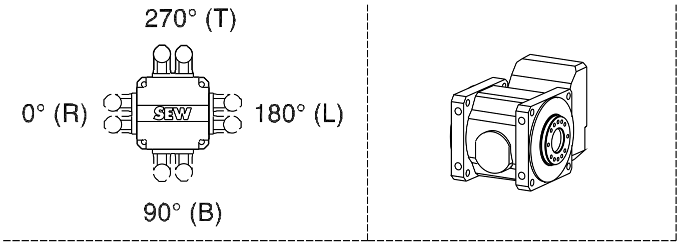
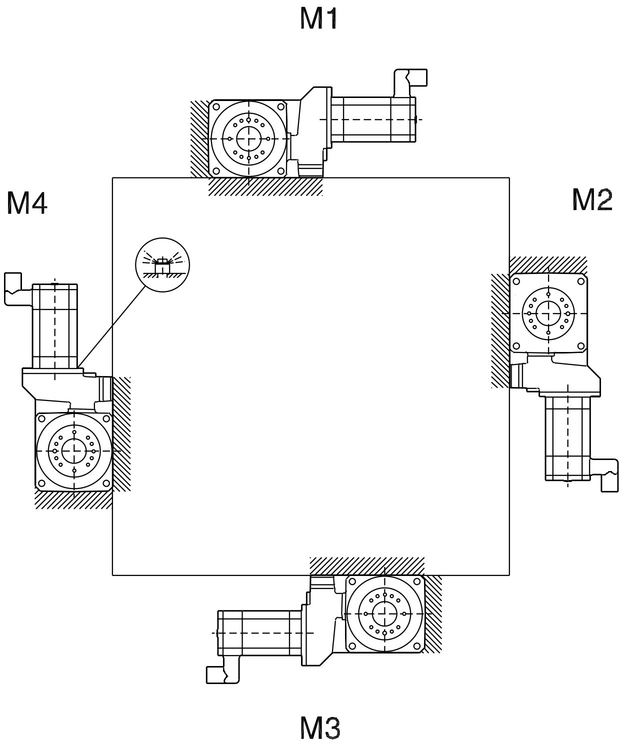
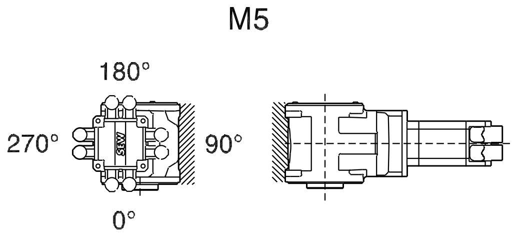
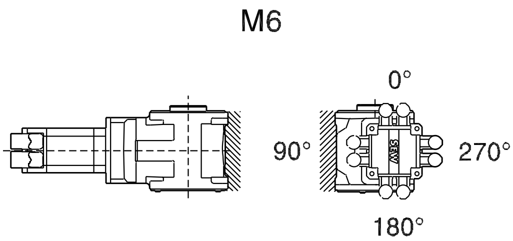
56 041 02 03









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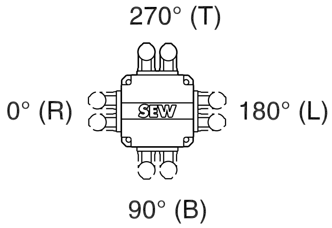

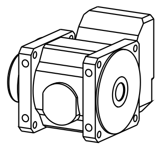

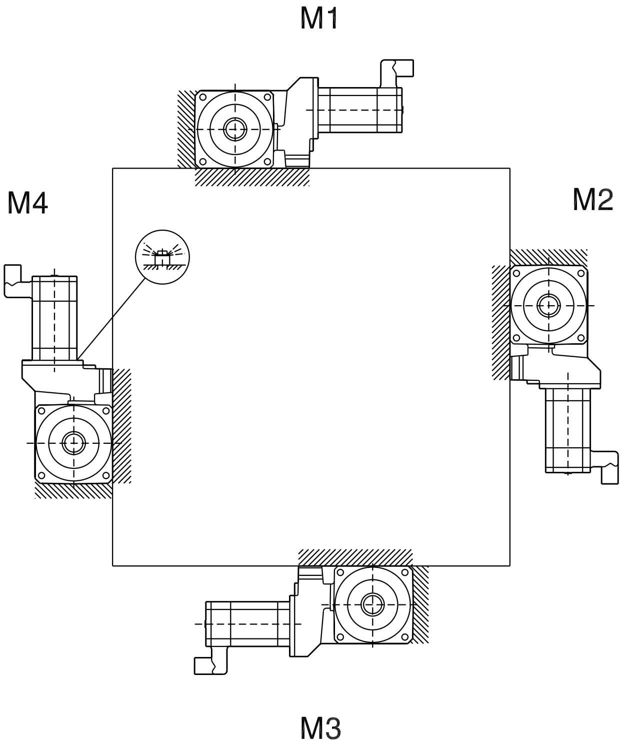

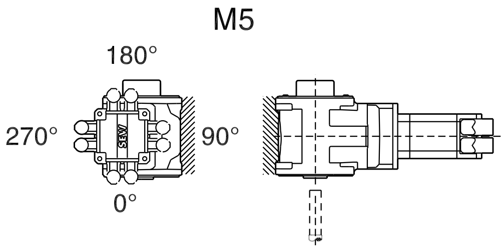

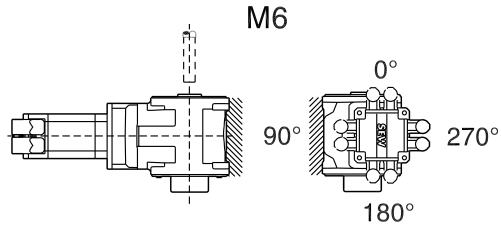

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BSHF202B-802B /I

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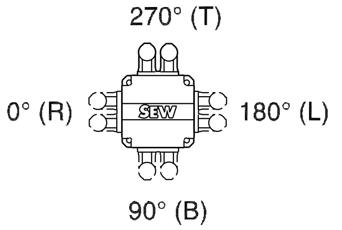

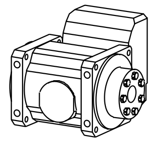

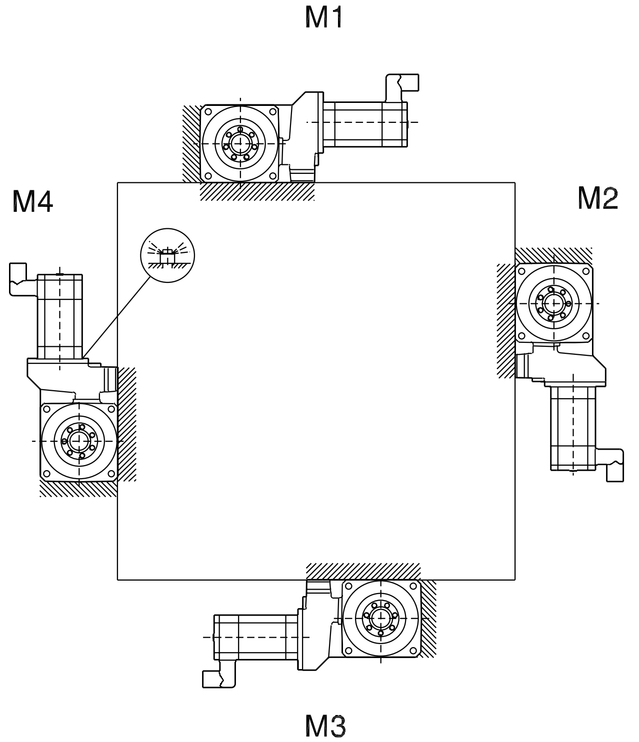

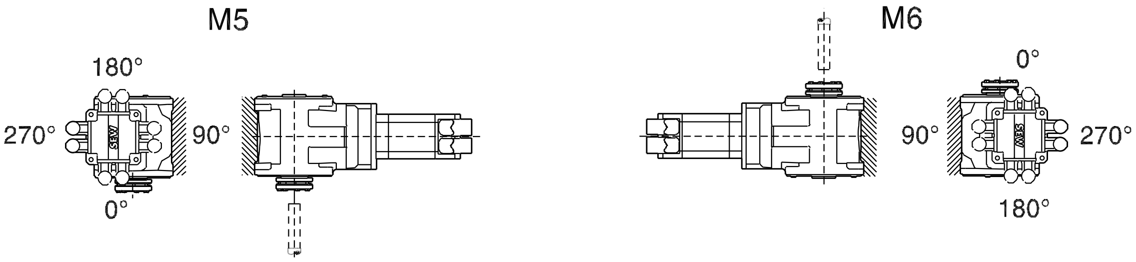

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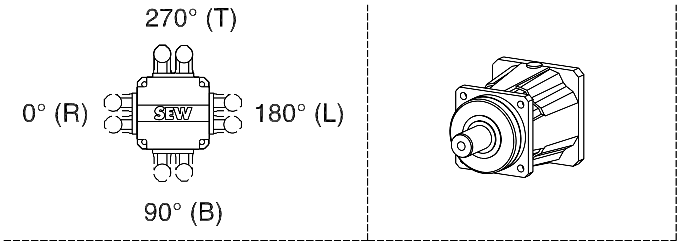
5.6.8 Mounting positions of PS.F, PS.C planetary gearmotors

PS.F121-922/PS.C221-622



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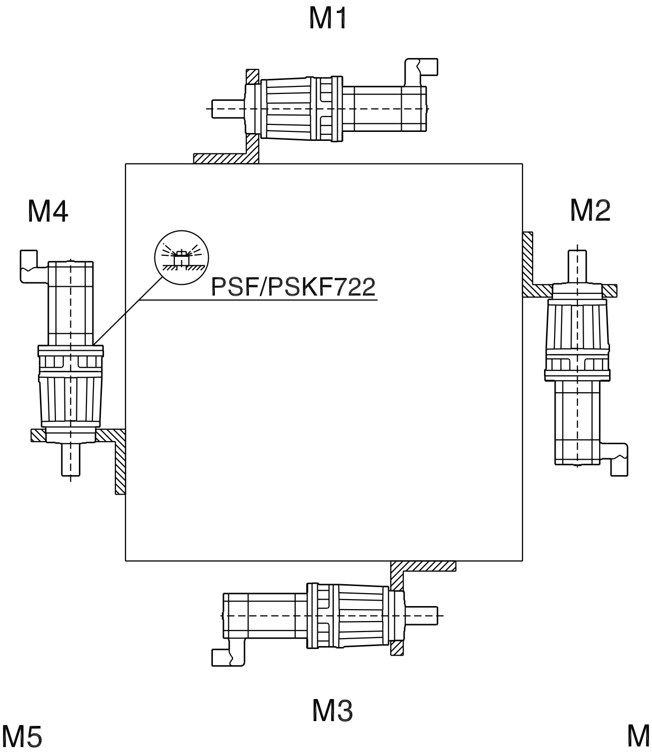

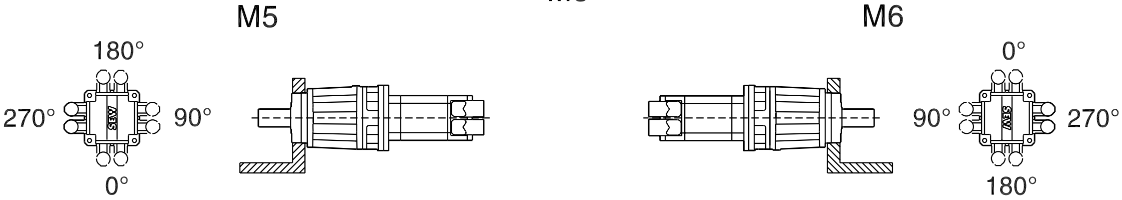

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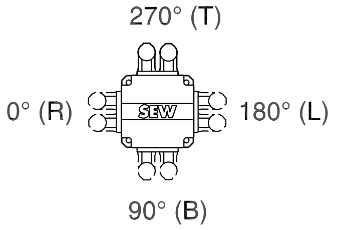
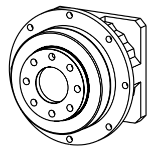
PSBF121-922





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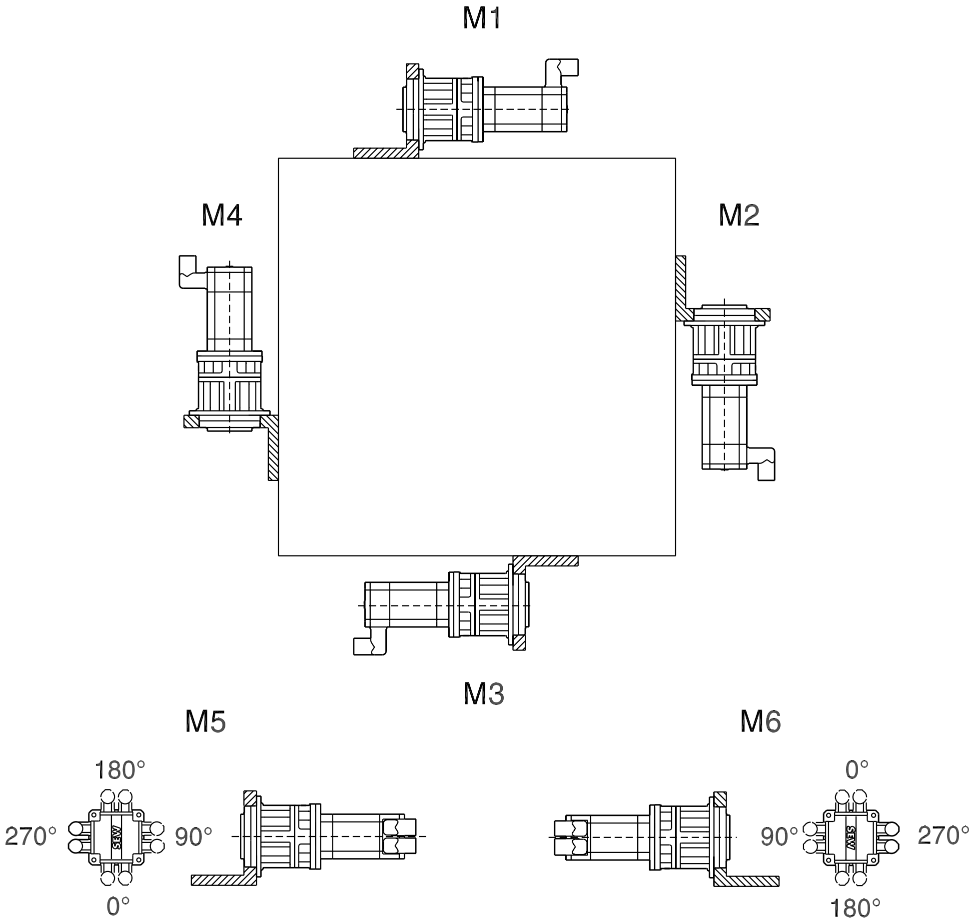

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6 Design and operating notes

6.1 Lubricants

INFORMATION

BS.F helical-bevel and PS.F planetary gear units from SEW-EURODRIVE are supplied exclusively with synthetic lubricants.

For drives for the food industry, contact SEW-EURODRIVE.

6.1.1 Bearing greases

The gear unit rolling bearings are given a factory-fill with the greases listed below. SEW-EURODRIVE recommends re-greasing the rolling bearings with a grease filling at the same time as changing the oil.

	Ambient temperature	Manufacturer	Type
Gear unit rolling bearings	-40 °C to +80 °C	Fuchs	Renolit CX-TOM 15[1]
	-40 °C to +80 °C	Klüber	Petamo GHY 133 N
	-40 °C to +40 °C	Bremer & Leguil	Cassida Grease GTS 2
	-20 °C to +40 °C	Fuchs	Plantogel 2S

1) Bearing grease based on semi-synthetic base oil

6.1.2 Lubricant table

NOTICE

Selecting improper lubricants may damage the gear unit.

Possible damage to property.

- Note the following information.

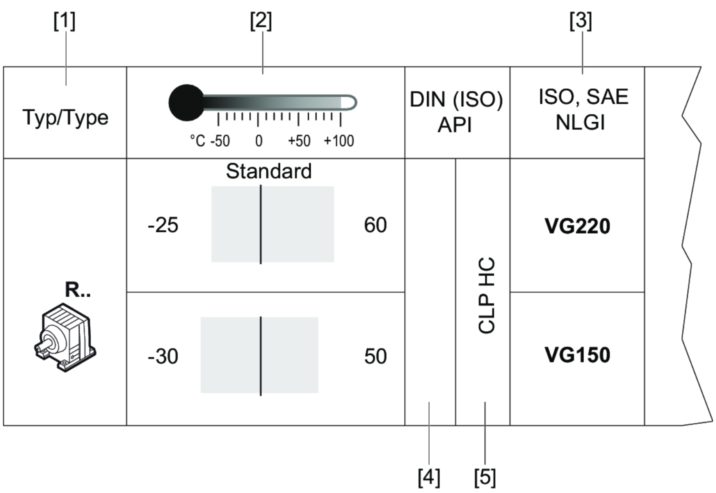
- The oil viscosity and type (mineral/synthetic) that are to be used are determined by SEW-EURODRIVE specifically for each order. This information is noted in the order confirmation and on the gear unit's nameplate.

  If you use other lubricants for the gear units and/or use the lubricants at temperatures outside the recommended temperature range, SEW-EURODRIVE does not assume liability.

  The lubricant recommendation in the lubricant table in no way represents a guarantee regarding the quality of the lubricant delivered by each respective supplier. Each lubricant manufacturer is responsible for the quality of their product.
- Do not mix synthetic lubricants.
- Do not mix synthetic and mineral lubricants.
- Oils of the same viscosity class from different manufacturers do not have the same characteristics. In particular, the minimally and maximally permitted oil bath temperatures are manufacturer-specific. These temperatures are specified in the lubricant tables.
- The values specified in the lubricant tables apply as of the time of printing of this document. The data of the lubricants are subject to dynamic change on the part of the lubricant manufacturers. For up-to-date information about the lubricants, visit:

  www.sew-eurodrive.de/lubricants

Information on table structure



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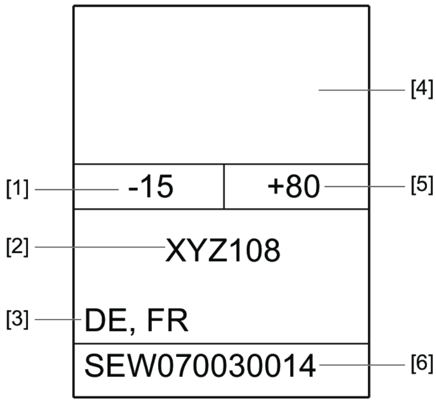
[1] Gear unit type
[2] Ambient temperature
[3] Viscosity class
[4] Note on special approvals
[5] Lubricant type

Information on the various lubricants



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[1] Lowest oil sump temperature, **Temperatures below this value are not permitted**
[2] Trade name
[3] Factory filling for these countries
[4] Manufacturer
[5] Highest oil sump temperature, **Temperatures above this value are not permitted**
[6] Approvals regarding compatibility of the lubricant with approved oil seals

Lubricant compatibility with oil seal

Approval	Explanation
SEW07004_ _13:	A lubricant especially recommended with regard to compatibility with the approved oil seals. The lubricant exceeds the state-of-the-art requirements.

Limitations of use of oil seals with the specific lubricant are described in the following table:

<table>
<tr><th colspan="3">Material class</th><th colspan="2">Manufacturer</th><th colspan="2">Material</th><th>Approved oil sump temperature</th></tr>
<tr><td rowspan="6">S</td><td rowspan="2">1</td><td rowspan="2">NBR</td><td>1</td><td>Freudenberg</td><td></td><td>72 NBR 902</td><td rowspan="2">-40 °C to +80 °C</td></tr>
<tr><td>2</td><td>Trelleborg</td><td></td><td>4NV11</td></tr>
<tr><td colspan="7"></td></tr>
<tr><td rowspan="3">2</td><td rowspan="3">FKM</td><td rowspan="2">1</td><td rowspan="2">Freudenberg</td><td>1</td><td>75 FKM 585</td><td rowspan="3">-25 °C to +115 °C</td></tr>
<tr><td>2</td><td>75 FKM 170055</td></tr>
<tr><td>2</td><td>Trelleborg</td><td>1</td><td>VCBVR</td></tr>
</table>

Examples:

S11: Only the elastomer Freudenberg 72NBR902 meets the requirements of the approval in conjunction with the specific lubricant.

S2: Only the elastomer FKM meets the requirements of the approval in conjunction with the specific lubricant.

Key

The following table shows the abbreviations and icons used in the lubricant table and explains what they mean:

Abbreviation/ icon	Meaning
	Synthetic lubricant (marked gray)
	Mineral lubricant
CLP	Mineral oil
CLP PG	Polyglycol
CLP HC	Synthetic hydrocarbons – polyalphaolefin (PAO)
E	Ester-based oil
HLP	Hydraulic oil
	Lubricant for the food processing industry – NSF-H1-compliant
	Easily biodegradable oil for environmentally sensitive areas (agriculture, forestry, water management)
	Lubricant suitable for ATEX environment
1)	Helical-worm gear units with CLP-PG: Contact SEW-EURODRIVE.
2)	Special lubricant only for SPIROPLAN® gear units
3)	SEW-fB ≥ 1.2 required
4)	Observe the critical starting behavior at low temperatures
5)	Low-viscosity grease
6)	The specified ambient temperatures are guide values for preselection of a suitable lubricant. The exact upper and lower temperature limits for project planning are specified in the table with the respective trade name.
Oil seal	Oil seal

Lubricant table for R.., F.., and K..7 gear units

The lubricant table is valid at the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

	6) °C -50 0 +50 +100	DIN (ISO) API	ISO,SAE NLGI	bremer & leguil	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
R.. K..7 F..	Standard -15 +40	CLP	VG 220		-15 +80 Optigear 1100/220	-15 +80 Renolin CLP 220	-15 +80 Mobilgear 600 XP 220 DE, FR SEW070030013	-15 +80 Klüberoil GEM 1-220 N	-15 +80 Shell Omala S2 G 220 CN, US	-15 +80 Meropa 220	-15 +80 Carter EP 220
	4) -20 +30		VG 150		-20 +70 Optigear BM 150	-20 +70 Renolin CLP 150	-20 +70 Mobilgear 600 XP 150 SEW070030013	-20 +70 Klüberoil GEM 1-150 N	-20 +70 Shell Omala S2 G 150	-20 +70 Meropa 150	-20 +70 Carter EP 150
R.. RES	-25 +80	CLP PG Ex	VG 220		-25 +115 Optigear Synthetic 800/220	-25 +115 Renolin PG 220	-25 +115 Mobil Glygoyle 220 DE, FR	-25 +115 Klübersynth GH 6-220	-25 +115 Shell Omala S4 WE 220 CN, US	-25 +115 Synlube CLP 220	-25 +115 Carter SY 220
K..7 KES F..	-25 +60	CLP HC Ex	VG 220		-30 +110 Optigear Synthetic PD 220	-25 +110 Renolin Unisyn CLP 220	-25 +110 Mobil SHC 630 DE, FR	-25 +110 Klübersynth GEM 4-220N BR	-25 +110 Shell Omala S4 GX 220 CN, US	-25 +110 Pinnacle EP 220	-25 +110 Carter SH 220
	4) -30 +50		VG 150		-30 +100 Optigear Synthetic PD 150	-30 +95 Renolin Unisyn CLP 150	-30 +100 Mobil SHC 629 DE	-30 +100 Klübersynth GEM 4-150N	-30 +100 Shell Omala S4 GX 150	-25 +95 Pinnacle EP 150	-30 +95 Carter SH 150
	4) -35 +20		VG 68			-35 +75 Renolin Unisyn CLP 68	-40 +75 Mobil SHC 626 DE		-40 +75 Shell Omala S4 GX 68		
	4) -40 0		VG 32			-40 +50 Renolin Unisyn CLP 32	-40 +50 Mobil SHC 624 DE				-40 +50 Dacnis SH 32

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Observe the thermal limit of the oil seal materials, see chapter "Lubricant compatibility with oil seal" (→ 🗎 139).

	6) °C -50 0 +50 +100	DIN (ISO) API	ISO,SAE NLGI	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
R.. RES	Standard -15 … +40	CLP HC - NSF H1	VG 460	-15 … +100 Cassida Fluid GL 460	-15 … +100 Optileb GT 460 DE, FR SEW070040013			-15 … +105 Klüberoil 4UH1-460 N			
	-25 … +30		VG 220	-25 … +80 Cassida Fluid GL 220	-25 … +80 Optileb GT 220 DE, FR SEW070040013			-25 … +80 Klüberoil 4UH1-220 N			
K..7 KES	4) -35 … 0		VG 68	-40 … +50 Cassida Fluid HF 68	-35 … +50 Optileb HY 68 DE, FR			-35 … +50 Klüberoil 4UH1-68 N			
F..	4) -40 … -10		VG 32	-40 … +30 Cassida Fluid HF 32	-40 … +30 Optileb HY 32			-40 … +30 Klüber Summit HySyn FG 32			
	-20 … +40	E	VG 460			-20 … +80 Plantogear 460 S DE, FR		-20 … +80 Klüberbio CAS-460			

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Observe the thermal limit of the oil seal materials, see chapter "Lubricant compatibility with oil seal" (→ 🗎 139).

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Lubricant table for K..9 gear units

The lubricant table is valid at the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

	6) °C -50 0 +50 +100	DIN (ISO) API	ISO,SAE NLGI	bremer & leguil	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
K.9	Standard -20 +60	CLP PG ⟨Ex⟩	VG 460					-20 +95 Klübersynth GH 6-460 DE			
	-15 +80		VG 680					-15 +115 Klübersynth GH 6-680 DE			
	-25 +40		VG 220					-25 +70 Klübersynth GH 6-220 DE			
	4) -30 +30		VG 150					-30 +60 Klübersynth GH 6-150 DE			
	Standard -20 +60	CLP PG - NSF H1 ⟨Ex⟩	VG 460					-20 +95 Klübersynth UH1 6-460 DE			
	-15 +80		VG 680					-15 +115 Klübersynth UH1 6-680 DE			
	-25 +40		VG 220					-25 +70 Klübersynth UH1 6-220 DE			
	4) -30 +30		VG 150					-30 +60 Klübersynth UH1 6-150 DE			

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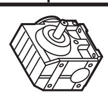
Notice: Also observe the thermal limit of the oil seal materials (see chapter "Lubricant compatibility with oil seal" (→ 🗎 139)) and the oil change intervals according to the assembly and operating instructions.

Lubricant table for S.. gear units

The lubricant table is valid at the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

S.. (HS..)	6) °C	DIN (ISO) API	ISO,SAE NLGI	bremer & leguil	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
	Standard 0 … +40	CLP	VG 680		0 … +80 Optigear BM 680 SO	0 … +80 Renolin SEW 680 DE, FR	0 … +80 Mobilgear 600 XP 680 SEW070030013	0 … +80 Klüberoil GEM 1-680 N	0 … +80 Shell Omala S2 G 680 US	0 … +80 Meropa 680	0 … +80 Carter EP 680
	4) -20 … +25	CLP	VG 150		-20 … +65 Optigear BM 150	-20 … +65 Renolin CLP 150	-20 … +65 Mobilgear 600 XP 150 DE, FR SEW070030013	-20 … +65 Klüberoil GEM 1-150 N	-20 … +65 Shell Omala S2 G 150	-20 … +65 Meropa 150	-20 … +65 Carter EP 150
	1) -15 … +80	CLP PG (Ex)	VG 680		-15 … +115 Optigear Synthetic 800/600	-15 … +115 Renolin PG 680	-15 … +115 Mobil Glygoyle 680	-15 … +115 Klübersynth GH 6-680	-15 … +115 Shell Omala S4 WE 680	-20 … +115 Synlube CLP 680	
	1) -25 … +40	CLP PG (Ex)	VG 220		-25 … +90 Optigear Synthetic 800/220	-25 … +95 Renolin PG 220	-25 … +100 Mobil Glygoyle 220 DE, FR	-25 … +100 Klübersynth GH 6-220	-25 … +90 Shell Omala S4 WE 220	-25 … +90 Synlube CLP 220	-25 … +90 Carter SY 220
	-15 … +60	CLP HC (Ex)	VG 460		-20 … +110 Optigear Synthetic PD 460	-15 … +100 Renolin Unisyn CLP 460	-20 … +105 Mobil SHC 634	-15 … +105 Klübersynth GEM 4-460 N	-15 … +105 Shell Omala S4 GX 460	-15 … +105 Pinnacle EP 460	-15 … +105 Carter SH 460
	4) -30 … +30	CLP HC (Ex)	VG 150		-30 … +75 Optigear Synthetic PD 150	-30 … +70 Renolin Unisyn CLP 150	-30 … +75 Mobil SHC 629	-30 … +70 Klübersynth GEM 4-150 N	-30 … +75 Shell Omala S4 GX 150	-30 … +70 Pinnacle EP 150	-30 … +70 Carter SH 150
	4) -35 … +20	CLP HC (Ex)	VG 68			-35 … +50 Renolin Unisyn CLP 68	-35 … +55 Mobil SHC 626 DE		-40 … +50 Shell Omala S4 GX 68		
	4) -40 … 0	CLP HC (Ex)	VG 32			-40 … +30 Renolin Unisyn OL 32	-40 … +30 Mobil SHC 624 DE				-40 … +30 Dacnis SH 32

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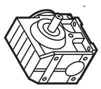
Observe the thermal limit of the oil seal materials, see chapter "Lubricant compatibility with oil seal" (→ 🗎 139).

	6) °C	DIN (ISO) API	ISO,SAE NLGI	bremer & leguil	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
S.. (HS..) 	Standard -15 ... +40		VG 460	-15 ... +85 Cassida Fluid GL 460	-15 ... +90 Optileb GT 460			-15 ... +90 Klüberoil 4UH1-460 N			
	-25 ... +30	CLP HC - NSF H1	VG 220	-25 ... +75 Cassida Fluid GL 220	-25 ... +70 Optileb GT 220			-25 ... +70 Klüberoil 4UH1-220 N			
	4) -35 ... 0		VG 68	-35 ... +40 Cassida Fluid HF 68	-35 ... +40 Optileb HY 68			-35 ... +40 Klüberoil 4UH1-68 N			
	4) -40 ... -10		VG 32	-40 ... +25 Cassida Fluid HF 32	-40 ... +20 Optileb HY 32			-40 ... +25 Klüber Summit HySyn FG 32			
	-20 ... +40	E	VG 460			-20 ... +80 Plantogear 460 S		-20 ... +80 Klüberbio CAS-460			

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Observe the thermal limit of the oil seal materials, see chapter "Lubricant compatibility with oil seal" (→ 🗎 139).

Lubricant table for W.. gear units

The lubricant table is valid at the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

W.. (HW..)	6) °C -50 0 +50 +100	DIN (ISO) API	ISO,SAE NLGI	bremer & leguil	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
	2) Standard -20 … +40	SEW PG Ex	VG 460					-20 … +80 Klüber SEW HT-460-5 FR S1			
	3) -20 … +60	H1 PG Ex	VG 460					-20 … +115 Klübersynth UH1 6-460			
	4) -40 … +10	API GL5 Ex	SAE 75W90 (~VG 100)				-40 … +65 Mobil Synth Gear Oil 75 W90 FR				

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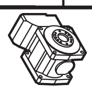
Observe the thermal limit of the oil seal materials, see chapter "Lubricant compatibility with oil seal" (→ 🗎 139).

6

Lubricant table for BS.F, PS.F and PS.C gear units

The lubricant table is valid at the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

Gear unit	6) °C	DIN (ISO) API	ISO,SAE NLGI	bremer & leguil	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TEXACO	TOTAL
BS F 	Standard -25 … +60	CLP PG Ex	VG 220					-25 … +100 Klübersynth GH 6-220 DE			
	-20 … +60	CLP PG NSF H1 Ex	VG 460					-20 … +115 Klübersynth UH1 6-460 DE			
PSF 	Standard -25 … +80	CLP PG Ex	VG 220					-25 … +100 Klübersynth GH 6-220 DE,BR			
	3) -20 … +80	CLP PG NSF H1 Ex	VG 460					-20 … +100 Klübersynth UH1 6-460 DE			
	4) -40 … 0	CLP HC Ex	VG 32				-40 … +50 Mobil SHC 624 DE				
PS C 	Standard -15 … +40	CLP	VG 220				-15 … +80 Mobilgear 600 XP 220 DE SEW070030013				
	4) -40 … 0	CLP HC Ex	VG 32				-40 … +50 Mobil SHC 624 DE				
	5) -20 … +40	Fett/ Grease Ex	NLGI 00				-20 … +80 Mobilux EP 004 DE				
	-20 … +40	Fett/ Grease Ex	NLGI 1					-20 … +80 Klübersynth UH1 14-151 DE			

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Notice: Also observe the thermal limit of the oil seal materials (see chapter "Lubricant compatibility with oil seal" (→ 🗎 139)) and the oil change intervals according to the assembly and operating instructions.

6.1.3 Lubricant fill quantities

INFORMATION

The specified fill quantities are **guide values**. The exact values vary depending on the number of gear stages and gear ratio. Check the **oil level plug for the exact oil quantity**.

INFORMATION

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific mounting position. The mounting position (see chapter "Gear unit mounting positions and order information" (→ 🗎 82) must therefore be specified in the drive order.

When the mounting position is changed, the lubricant fill quantity must be adapted accordingly (see the following chapters). Consequently, a **mounting position** may only be **changed** after consultation with SEW-EURODRIVE, otherwise your **rights to claim under limited warranty no longer apply**.

The following tables show guide values for lubricant fill quantities in relation to the mounting position M1 – M6.

Helical (R) gear units

R.., R..F

<table>
<tr><th rowspan="2">Gear unit</th><th colspan="6">Fill quantity in liters</th></tr>
<tr><th>M1[1)]</th><th>M2</th><th>M3</th><th>M4</th><th>M5</th><th>M6</th></tr>
<tr><td>R07</td><td>0.12</td><td colspan="5">0.20</td></tr>
<tr><td>R17</td><td>0.25</td><td>0.55</td><td>0.35</td><td>0.55</td><td>0.35</td><td>0.40</td></tr>
<tr><td>R27</td><td>0.25/0.40</td><td>0.70</td><td>0.50</td><td>0.70</td><td colspan="2">0.50</td></tr>
<tr><td>R37</td><td>0.30/0.95</td><td>0.85</td><td>0.95</td><td>1.05</td><td>0.75</td><td>0.95</td></tr>
<tr><td>R47</td><td>0.70/1.50</td><td>1.60</td><td>1.50</td><td>1.65</td><td colspan="2">1.50</td></tr>
<tr><td>R57</td><td>0.80/1.70</td><td>1.90</td><td>1.70</td><td>2.10</td><td colspan="2">1.70</td></tr>
<tr><td>R67</td><td>1.10/2.30</td><td>2.40</td><td>2.80</td><td>2.90</td><td>1.80</td><td>2.00</td></tr>
<tr><td>R77</td><td>1.20/3.00</td><td>3.30</td><td>3.60</td><td>3.80</td><td>2.50</td><td>3.40</td></tr>
<tr><td>R87</td><td>2.30/6.0</td><td>6.4</td><td colspan="2">7.2</td><td>6.3</td><td>6.5</td></tr>
<tr><td>R97</td><td>4.60/9.8</td><td colspan="2">11.7</td><td>13.4</td><td>11.3</td><td>11.7</td></tr>
<tr><td>R107</td><td>6.0/13.7</td><td>16.3</td><td>16.9</td><td>19.2</td><td>13.2</td><td>15.9</td></tr>
<tr><td>R127</td><td>6.4/17</td><td>18.3</td><td>18.2</td><td>22.0</td><td>16.8</td><td>17.9</td></tr>
</table>

1) The larger gear unit of multi-stage gear units must be filled with the larger oil quantity.

RF.., RZ..

<table>
<tr><th rowspan="2">Gear unit</th><th colspan="6">Fill quantity in liters</th></tr>
<tr><th>M1[1)]</th><th>M2</th><th>M3</th><th>M4</th><th>M5</th><th>M6</th></tr>
<tr><td>RF07</td><td>0.12</td><td colspan="5">0.20</td></tr>
<tr><td>RF17</td><td>0.25</td><td>0.55</td><td>0.35</td><td>0.55</td><td>0.35</td><td>0.40</td></tr>
<tr><td>RF27</td><td>0.25/0.40</td><td>0.70</td><td>0.50</td><td>0.70</td><td colspan="2">0.50</td></tr>
<tr><td>RF37</td><td>0.35/0.95</td><td>0.90</td><td>0.95</td><td>1.05</td><td>0.75</td><td>0.95</td></tr>
<tr><td>RF47</td><td>0.65/1.50</td><td>1.60</td><td>1.50</td><td>1.65</td><td colspan="2">1.50</td></tr>
<tr><td>RF57</td><td>0.80/1.70</td><td>1.80</td><td>1.70</td><td>2.00</td><td colspan="2">1.70</td></tr>
<tr><td>RF67</td><td>1.20/2.50</td><td>2.50</td><td>2.70</td><td>2.80</td><td>1.90</td><td>2.10</td></tr>
<tr><td>RF77</td><td>1.20/2.60</td><td>3.10</td><td>3.30</td><td>3.60</td><td>2.40</td><td>3.00</td></tr>
<tr><td>RF87</td><td>2.40/6.0</td><td>6.4</td><td>7.1</td><td>7.2</td><td>6.3</td><td>6.4</td></tr>
<tr><td>RF97</td><td>5.1/10.2</td><td>11.9</td><td>11.2</td><td>14.0</td><td>11.2</td><td>11.8</td></tr>
<tr><td>RF107</td><td>6.3/14.9</td><td>15.9</td><td>17.0</td><td>19.2</td><td>13.1</td><td>15.9</td></tr>
<tr><td>RF127</td><td>6.6/16.0</td><td>18.3</td><td>18.2</td><td>21.4</td><td>15.9</td><td>17.0</td></tr>
</table>

1) The larger gear unit of multi-stage gear units must be filled with the larger oil quantity.

RX..

<table>
<tr><th rowspan="2">Gear unit</th><th colspan="6">Fill quantity in liters</th></tr>
<tr><th>M1</th><th>M2</th><th>M3</th><th>M4</th><th>M5</th><th>M6</th></tr>
<tr><td>RX57</td><td>0.60</td><td>0.80</td><td colspan="2">1.30</td><td colspan="2">0.90</td></tr>
<tr><td>RX67</td><td colspan="2">0.80</td><td>1.70</td><td>1.90</td><td colspan="2">1.10</td></tr>
<tr><td>RX77</td><td>1.10</td><td>1.50</td><td>2.60</td><td>2.70</td><td colspan="2">1.60</td></tr>
<tr><td>RX87</td><td>1.70</td><td>2.50</td><td colspan="2">4.80</td><td colspan="2">2.90</td></tr>
<tr><td>RX97</td><td>2.10</td><td>3.40</td><td>7.4</td><td>7.0</td><td colspan="2">4.80</td></tr>
<tr><td>RX107</td><td>3.90</td><td>5.6</td><td>11.6</td><td>11.9</td><td colspan="2">7.7</td></tr>
</table>

RXF..

<table>
<tr><th rowspan="2">Gear unit</th><th colspan="6">Fill quantity in liters</th></tr>
<tr><th>M1</th><th>M2</th><th>M3</th><th>M4</th><th>M5</th><th>M6</th></tr>
<tr><td>RXF57</td><td>0.50</td><td>0.80</td><td colspan="2">1.10</td><td colspan="2">0.70</td></tr>
<tr><td>RXF67</td><td>0.70</td><td>0.80</td><td>1.50</td><td>1.40</td><td colspan="2">1.00</td></tr>
<tr><td>RXF77</td><td>0.90</td><td>1.30</td><td>2.40</td><td>2.00</td><td colspan="2">1.60</td></tr>
<tr><td>RXF87</td><td>1.60</td><td>1.95</td><td>4.90</td><td>3.95</td><td colspan="2">2.90</td></tr>
<tr><td>RXF97</td><td>2.10</td><td>3.70</td><td>7.1</td><td>6.3</td><td colspan="2">4.80</td></tr>
<tr><td>RXF107</td><td>3.10</td><td>5.7</td><td>11.2</td><td>9.3</td><td colspan="2">7.2</td></tr>
</table>

Parallel shaft helical (F) gear units

F.., FA..B, FH..B, FV..B

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	0.60
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.60	3.50	2.10	3.50	2.80	2.90
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.90	7.30	4.30	8.00	6.00	6.30
F..87	10.8	13.0	7.70	13.8	10.8	11.0
F..97	18.5	22.5	12.6	25.2	18.5	20.0
F..107	24.5	32.0	19.5	37.5	27.0	27.0

FF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
FF27	0.60	0.80	0.65	0.70	0.60	0.60
FF37	1.00	1.25	0.70	1.30	1.00	1.10
FF47	1.60	1.85	1.10	1.90	1.50	1.70
FF57	2.30	3.10	1.70	3.10	2.30	2.40
FF67	2.70	3.80	1.90	3.80	2.90	3.20
FF77	5.90	7.30	4.30	8.10	6.00	6.30
FF87	10.8	13.2	7.80	14.1	11.0	11.2
FF97	19.0	22.5	12.6	25.6	18.9	20.5
FF107	25.5	32.0	19.5	38.5	27.5	28.0

FA.., FH.., FV.., FAF.., FAZ.., FHF.., FZ.., FHZ.., FVF.., FVZ.., FT..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	0.60
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.70	3.50	2.10	3.40	2.90	3.00
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.90	7.30	4.30	8.00	6.00	6.30
F..87	10.8	13.0	7.70	13.8	10.8	11.0
F..97	18.5	22.5	12.6	25.2	18.5	20.0
F..107	24.5	32.0	19.5	37.5	27.0	27.0

Helical-bevel (K) gear units

INFORMATION

All K..19 and K..29 gear units have a universal mounting position, which means that K..19 and K..29 gear units of the same design are filled with the same oil quantity independent of the mounting position. An exception to this is the M4 mounting position.

K.., KA..B, KH..B, KV..B

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..19	0.40			0.45	0.40	
K..29	0.70			0.85	0.70	
K..39	0.90	1.70	1.55	1.9	1.55	1.30

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Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..49	1.70	3.40	2.80	4.20	3.15	2.80
K..37	0.50	1.00		1.25	0.95	
K..47	0.80	1.30	1.50	2.00	1.60	
K..57	1.10	2.20		2.80	2.30	2.10
K..67	1.10	2.40	2.60	3.45	2.60	
K..77	2.20	4.10	4.40	5.80	4.20	4.40
K..87	3.70	8.0	8.70	10.90	8.0	
K..97	7.0	14.0	15.70	20.0	15.70	15.50
K..107	10.0	21.0	25.50	33.50	24.0	

KF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
KF19	0.40			0.45	0.40	
KF29	0.70			0.85	0.70	
KF39	0.90	1.70	1.55	1.9	1.55	1.30
KF49	1.70	3.40	2.80	4.20	3.15	2.80
KF37	0.50	1.10		1.50	1.00	
KF47	0.80	1.30	1.70	2.20	1.60	
KF57	1.20	2.20	2.40	3.15	2.50	2.30
KF67	1.10	2.40	2.80	3.70	2.70	
KF77	2.10	4.10	4.40	5.90	4.50	
KF87	3.70	8.20	9.0	11.90	8.40	
KF97	7.0	14.70	17.30	21.50	15.70	16.50
KF107	10.0	21.80	25.80	35.10	25.20	

KA.., KH.., KV.., KAF.., KHF.., KVF.., KZ.., KAZ.., KHZ.., KVZ.., KT..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..19	0.40			0.45	0.40	
K..29	0.70			0.85	0.70	
K..39	0.90	1.70	1.55	1.9	1.55	1.30
K..49	1.70	3.40	2.80	4.20	3.15	2.80
K..37	0.50	1.00		1.40	1.00	
K..47	0.80	1.30	1.60	2.15	1.60	
K..57	1.20	2.20	2.40	3.15	2.70	2.40
K..67	1.10	2.40	2.70	3.70	2.60	
K..77	2.10	4.10	4.60	5.90	4.40	
K..87	3.70	8.20	8.80	11.10	8.0	
K..97	7.0	14.70	15.70	20.0	15.70	
K..107	10.0	20.50	24.0	32.40	24.0	

Helical-worm (S) gear units

S..

Gear unit	Fill quantity in liters					
	M1	M2	M3[1)]	M4	M5	M6
S37	0.25	0.40	0.50	0.55	0.40	
S47	0.35	0.80	0.70/0.90	1.00	0.80	
S57	0.50	1.20	1.00/1.20	1.45	1.30	
S67	1.00	2.00	2.20/3.10	3.10	2.60	2.60
S77	1.90	4.20	3.70/5.4	5.9	4.40	
S87	3.30	8.1	6.9/10.4	11.3	8.4	

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Gear unit	Fill quantity in liters					
	M1	M2	M3[1)]	M4	M5	M6
S97	6.8	15.0	13.4/18.0	21.8	17.0	

1) The larger gear unit of multi-stage gear units must be filled with the larger oil quantity.

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SF..

Gear unit	Fill quantity in liters					
	M1	M2	M3[1)]	M4	M5	M6
SF37	0.25	0.40	0.50	0.55	0.40	
SF47	0.40	0.90	0.90/1.05	1.05	1.00	
SF57	0.50	1.20	1.00/1.50	1.55	1.40	
SF67	1.00	2.20	2.30/3.00	3.20	2.70	
SF77	1.90	4.10	3.90/5.8	6.5	4.90	
SF87	3.80	8.0	7.1/10.1	12.0	9.1	
SF97	7.4	15.0	13.8/18.8	22.6	18.0	

1) The larger gear unit of multi-stage gear units must be filled with the larger oil quantity.

SA.., SH.., SAF.., SHZ.., SAZ.., SHF.., ST..

Gear unit	Fill quantity in liters					
	M1	M2	M3[1)]	M4	M5	M6
S..37	0.25	0.40	0.50		0.40	
S..47	0.40	0.80	0.70/0.90	1.00	0.80	
S..57	0.50	1.10	1.00/1.50	1.50	1.20	
S..67	1.00	2.00	1.80/2.60	2.90	2.50	
S..77	1.80	3.90	3.60/5.0	5.8	4.50	
S..87	3.80	7.4	6.0/8.7	10.8	8.0	
S..97	7.0	14.0	11.4/16.0	20.5	15.7	

1) The larger gear unit of multi-stage gear units must be filled with the larger oil quantity.

SPIROPLAN® (W) gear units

INFORMATION

SPIROPLAN® gear units W..10 to W..30 have a universal mounting position, which means that gear units of the same design are filled with the same oil quantity independent of the mounting position.

The oil fill quantity of SPIROPLAN® gear units W..37 and W..47 in mounting position M4 is different from that of the other mounting positions.

W.., WA..B, WH..B

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
W..10	0.16					
W..20	0.24					
W..30	0.40					
W..37	0.50			0.70	0.50	
W..47	0.90			1.40	0.90	

WF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
WF10	0.16					
WF20	0.24					
WF30	0.40					
WF37	0.50			0.70	0.50	
WF47	0.90			1.55	0.90	

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WA.., WAF..,WH.., WT.., WHF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
W..10	0.16					
W..20	0.24					
W..30	0.40					
W..37	0.50			0.70	0.50	
W..47	0.80			1.40	0.80	

BS.F.. gear units

The following tables show guide values for lubricant fill quantities in relation to the mounting position M1 – M6.

BS.F.. helical-bevel gear unit fill quantity

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
BS.F202	0.15	0.25	0.25	0.30	0.25	0.25
BS.F302	0.25	0.50	0.50	0.55	0.35	0.35
BS.F402	0.45	0.80	0.80	1.05	0.65	0.65
BS.F502	1.00	1.80	1.80	2.50	1.50	1.50
BS.F602	1.60	2.50	2.80	4.10	2.00	2.60
BS.F802	3.30	5.30	5.70	7.90	4.50	4.50

Fill quantity tolerance for BS.F..

Fill quantity in liters	Tolerance
to 1 l	0.01 l
> 1 l	1% of the fill quantity

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PS.F.. gear units

The following tables show guide values for lubricant fill quantities in relation to the mounting position M1 – M6.

Fill quantities for PSBF.. planetary gear units

PSBF.. planetary gear units	Direct mounting - fill quantity in liters		
	M1 (M3, M5, M6)	M2	M4
PSBF221	0.025	0.051	0.025
PSBF222	0.035	0.074	0.060
PSBF321	0.045	0.085	0.050
PSBF322	0.070	0.145	0.130
PSBF521	0.093	0.168	0.103
PSBF522	0.143	0.308	0.273
PSBF621	0.198	0.358	0.188
PSBF622	0.298	0.568	0.498
PSBF721	0.404	0.544	0.314
PSBF722	0.544	0.834	1.004
PSBF821	–	–	–
PSBF822	0.995	1.895	1.995

Fill quantities of PS.F.. planetary gear units

PSF.. planetary gear units	Direct mounting - fill quantity in liters		
	M1 (M3, M5, M6)	M2	M4
PSF121	0.023	0.037	0.023
PSF122	0.035	0.068	0.054
PSF221	0.035	0.063	0.035
PSF222	0.045	0.085	0.085
PSF321	0.070	0.120	0.070
PSF322	0.095	0.185	0.190
PSF521	0.140	0.245	0.150
PSF522	0.200	0.380	0.395
PSF621	0.300	0.500	0.320
PSF622	0.410	0.710	0.780
PSF721	0.600	1.060	0.650
PSF722	0.750	1.280	1.645
PSF821	–	–	–
PSF822	1.550	2.640	3.350
PSF921	–	–	–
PSF922	2.050	3.650	4.350

Fill quantity tolerance for PS.F

Fill quantity in liters	Tolerance
to 1 l	0.01 l
> 1 l	1% of the fill quantity

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6.2 Gear unit venting

INFORMATION

The function of breather valves can be impaired by dirt and dust in the environment.

If necessary, contact SEW-EURODRIVE to discuss alternative venting systems.

6.3 Reduced backlash gear unit design /R

Helical, parallel-shaft helical and helical-bevel gear units with reduced backlash are available as of gear unit size 37. The rotational clearance of these gear units is considerably less than that of the standard designs so that positioning tasks can be solved with great precision. The rotational clearance is specified in angular minutes in the chapter "Geometrically possible combinations". The rotational clearance for the output shaft is specified without load (max. 1% of the rated output torque); the gear unit input end is blocked. For information on the combination tables, refer to chapter Structure of the selection tables.

The reduced backlash design is available for the following gear units:

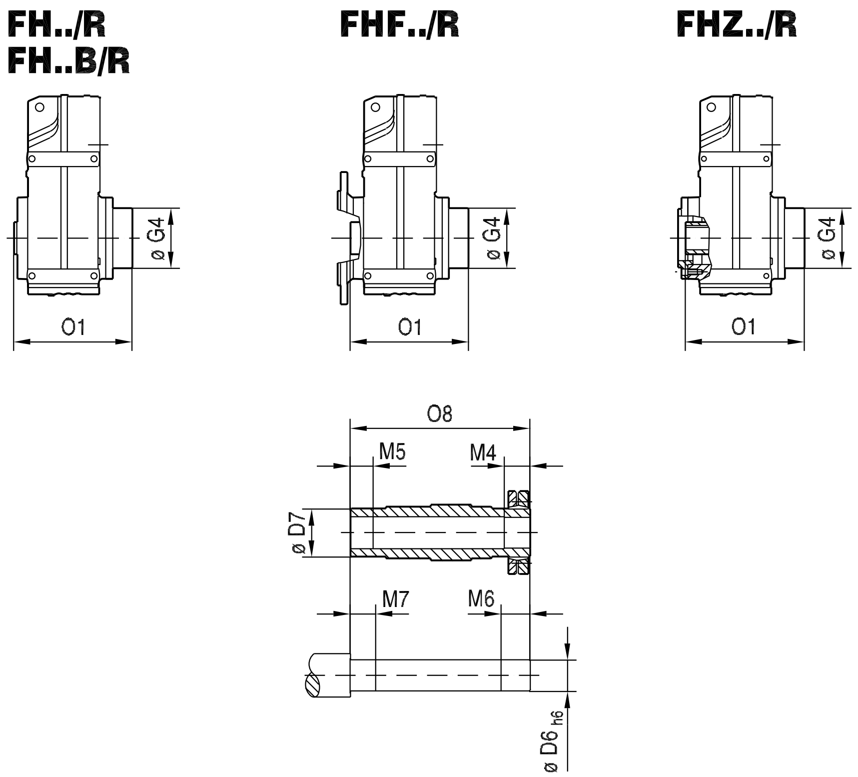
- Helical gear units (R), sizes 37 to 127
- Parallel-shaft helical gear units (F), sizes 37 to 107
- Helical-bevel gear units (K), sizes 37 to 107

Multi-stage gear units are not available with reduced backlash.

The dimensions of the reduced backlash designs correspond to the dimensions of the standard designs, except for parallel-shaft gear units FH.87 and FH.97 with reduced backlash.

The following figure shows the dimensions of the FH.87 and FH.97 gear units with reduced backlash:

42 020 00 09



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Type	Dimensions in mm								
	D6	D7	G4	M4	M5	M6	M7	O1	O8
FH.87/R	Ø 65 $_{h6}$	Ø 85	Ø 163	41	40	46	45	312.5	299.5
FH.97/R	Ø 75 $_{h6}$	Ø 95	Ø 184	55	50	60	55	382.5	367

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6.4 Assembly/disassembly of gear units with hollow shaft and key

INFORMATION

Use the supplied NOCO® fluid for mounting. The fluid prevents contact corrosion and facilitates subsequent dismounting.

INFORMATION

The key dimension X is specified for the customer and depends on the application requirements and the used materials.

See figure "Customer shaft with and without contact shoulder".

INFORMATION

For the dimensioning of the keyed connection, observe that the hollow shaft of the gear unit (hub) is made of the material C45R(1.1201).

SEW-EURODRIVE recommends **2 options for mounting** gear units with hollow shaft and key onto the input shaft of the driven machine (= customer shaft):

- Mounting using supplied fastening parts
- Mounting/dismounting with SEW-EURODRIVE assembly and disassembly kit

The following sections describe the two options.

6.4.1 Mounting using supplied fastening parts

The following fastening parts are provided as standard:

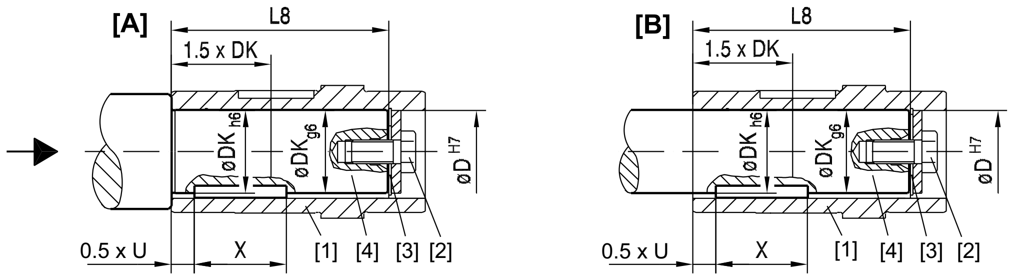
- Retaining screw with washer [2]
- Retaining ring [3]

Note the following information concerning the customer shaft:

- The installation length of the customer shaft with contact shoulder [A] must be "L8" - 1 mm.
- The installation length of the customer shaft without contact shoulder [B] must equal "L8".

The following figure shows the customer shaft with contact shoulder [A] and without contact shoulder [B].

00 001 00 02



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DK	Diameter of customer shaft	[2]	Retaining screw with washer
X	Key dimension	[3]	Retaining ring
U	Key width	[4]	Customer shaft
[1]	Hollow shaft		

Dimensions and tightening torques MS for retaining screw [2] for the **standard gear units**:

Gear unit type	D^{H7} mm	DK mm	L8 mm	MS Nm	U mm
WA..10	16		69	8	5
WA..20	18		84	8	6
WA..20	20		84	8	6
KA..19	20		92	8	6
FA..27	25		89	20	8
KA..29	25		107	20	8
KA..29	30		107	20	8
WA..30, WA..37	20		105	8	6
SA..37	20		104	8	6
FA..37, KA..37, SA..47	30		105	20	8
KA..39	30		137	20	8
KA..39	35		137	20	10

Gear unit type	D^{H7} mm	DK mm	L8 mm	MS Nm	U mm
KA..49	35		160	20	10
KA..49	40		154	20	12
SA..47, WA..37	25		105	20	8
FA..47, KA..47, SA..57	35		132	20	10
WA..47	30		122	20	8
SA..57	30		132	20	8
FA..57, KA..57	40		142	40	12
FA..67, KA..67	40		156	40	12
SA..67	40		144	40	12
SA..67	45		144	40	14
FA..77, KA..77, SA..77	50		183	40	14
SA..77	60		180	80	18
FA..87, KA..87	60		210	80	18
SA..87	60		220	80	18
SA..87	70		220	80	20
FA..97, KA..97	70		270	80	20
SA..97	70		260	80	20
SA..97	90		255	200	25
FA..107, KA..107	90		313	200	25

Dimensions and tightening torques MS for retaining screw [2] for the **servo gear units**:

Gear unit type	D^{H7} mm	DK mm	L8 mm	MS Nm	U mm
BSAF202	20	20	104	8	6
BSAF302	25	25	118	20	8
BSAF402	30	30	138	20	8
BSAF502	40	40	158	40	12
BSAF602	55	55	179	80	16
BSAF802	70	70	222	80	20

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6.4.2 Assembly/disassembly with SEW-EURODRIVE assembly and disassembly kit

Assembly

You can also use the optional assembly/disassembly kit for mounting. This can be ordered for the specific gear unit types by quoting the part numbers in the following table. The delivery includes:

- Spacer tube for mounting without contact shoulder [5]
- Retaining screw for mounting [2]
- Forcing washer for dismounting [7]
- Fixed nut for dismounting [8]

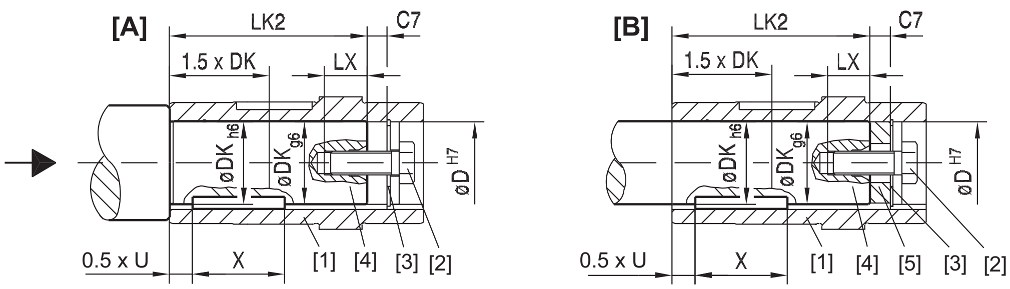
The short retaining screw delivered as standard is not required.

Note the following information concerning the customer shaft:

- The installation length of the customer shaft must be LK2. **Do not use the spacer tube** if the customer shaft **has a contact shoulder [A]**.
- The installation length of the customer shaft must be LK2. Use the spacer tube if the customer shaft **has no contact shoulder [B]**.

The following figure shows the customer shaft with contact shoulder [A] and without contact shoulder [B].

00 002 00 02



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DK	Diameter of customer shaft	[2]	Retaining screw with washer
X	Key dimension	[3]	Retaining ring
U	Key width	[4]	Customer shaft
[1]	Hollow shaft	[5]	Spacer tube

Dimensions, tightening torque MS and part numbers for retaining screw [2]:

Type	D^{H7} mm	DK mm	LK2 mm	LX^{+2} mm	C7 mm	MS Nm	Part number of assembly/disassembly kit	U mm
WA..10	16		58	12.5	11	8	6437125	5
WA..20	18		72	16	12	8	643682X	6
WA..20	20		72	16	12	8	6436838	6
WA..30, WA..37	20		93	16	12	8	6436838	6
SA..37	20		92	16	12	8	6436838	6
KA..19	20		80	16	12	8	6436838	6
KA..29	25		91	22	16	20	6436846	8
FA..27	25		73	22	16	20	6436846	8

Type	D^{H7} mm	DK mm	LK2 mm	LX^{+2} mm	C7 mm	MS Nm	Part number of assembly/disassembly kit	U mm
SA..47, WA..37	25		89	22	16	20	6436846	8
WA..47	30		106	22	16	20	6436854	8
FA..37, KA..37	30		89	22	16	20	6436854	8
SA..47	30		89	22	16	20	6436854	8
SA..57	30		116	22	16	20	6436854	8
KA..29	30		91	22	16	20	6436854	8
KA..39	30		121	22	16	20	6436854	8
KA..39	35		119	28	18	20	6436862	10
FA..47, KA..47, SA..57	35		114	28	18	20	6436862	10
KA..49	35		142	28	18	20	6436862	10
KA..49	40		136	36	18	40	6436870	12
FA..57, KA..57	40		124	36	18	40	6436870	12
FA..67	40		138	36	18	40	6436870	12
KA..67	40		138	36	18	40	6436870	12
SA..67	40		126	36	18	40	6436870	12
SA..67	45		126	36	18	40	6436889	14
FA..77, KA..77, SA..77	50		165	36	18	40	6436897	14
FA..87, KA..87	60		188	42	22	80	6436900	18
SA..77	60		158	42	22	80	6436900	18
SA..87	60		198	42	22	80	6436900	18
FA..97, KA..97	70		248	42	22	80	6436919	20
SA..87	70		198	42	22	80	6436919	20
SA..97	70		238	42	22	80	6436919	20
FA..107, KA..107	90		287	50	26	200	6436927	25
SA..97	90		229	50	26	200	6436927	25

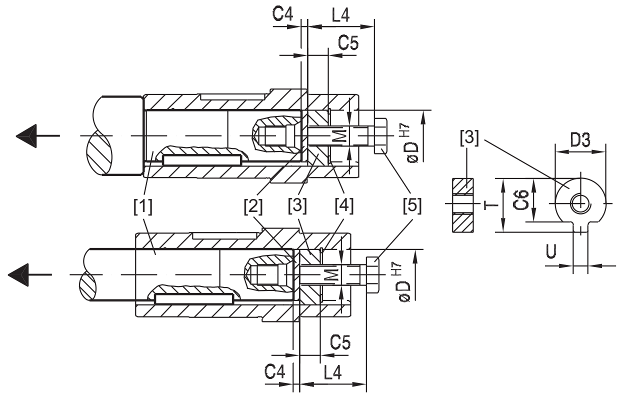
Disassembly

INFORMATION

The depicted assembly kit for attaching the customer shaft is a recommendation by SEW-EURODRIVE.

- You must always check whether this design can compensate the present axial loads.
- In particular applications (e.g. mounting agitator shafts), a different design may have to be used to secure the shaft axially. You can use your own devices to secure the shaft axially, if you ensure that these designs do not cause potential sources of combustion according to DIN EN 13463 (e.g. impact sparks).

The following figure shows the SEW-EURODRIVE assembly/disassembly kit.



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[1] Customer shaft
[2] Forcing washer
[3] Fixed nut for dismounting
[4] Retaining ring
[5] Retaining screw

Dimensions and part numbers of the assembly/disassembly kit:

Type	D^{H7} mm	M[1)]	C4 mm	C5 mm	C6 mm	$U^{-0.5}$ mm	$T^{-0.5}$ mm	$D3^{-0.5}$ mm	L4 mm	Part number assembly/disassembly kit
WA..10	16	M5	5	5	12	4.5	18	15.7	50	6437125
WA..20	18	M6	5	6	13.5	5.5	20.5	17.7	25	643682X
WA..20, WA..30, SA..37, WA..37, KA..19	20	M6	5	6	15.5	5.5	22.5	19.7	25	6436838
FA..27, SA..47, WA..47, KA..29	25	M10	5	10	20	7.5	28	24.7	35	6436846
FA..37, KA..29, KA..37, KA..39, SA..47, SA..57, WA..47,	30	M10	5	10	25	7.5	33	29.7	35	6436854
FA..47, KA..39, KA..47, KA..49, SA..57	35	M12	5	12	29	9.5	38	34.7	45	6436862
FA..57, KA..57, FA..67, KA..49, KA..67, SA..67	40	M16	5	12	34	11.5	41.9	39.7	50	6436870
SA..67	45	M16	5	12	38.5	13.5	48.5	44.7	50	6436889
FA..77, KA..77, SA..77	50	M16	5	12	43.5	13.5	53.5	49.7	50	6436897
FA..87, KA..87, SA..77, SA..87	60	M20	5	16	56	17.5	64	59.7	60	6436900
FA..97, KA..97, SA..87, SA..97	70	M20	5	16	65.5	19.5	74.5	69.7	60	6436919
FA..107, KA..107, SA..97	90	M24	5	20	80	24.5	95	89.7	70	6436927

1) Retaining screw

6

6.5 Gear units with hollow shaft

6.5.1 Chamfers on hollow shafts

The following figure shows the chamfers of parallel-shaft helical, helical-bevel, helical-worm and SPIROPLAN® gear units with hollow shaft:

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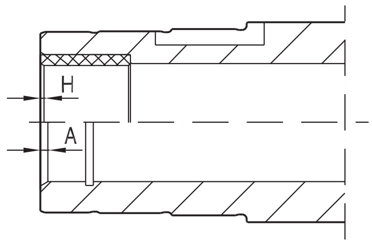

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Dimension table for the chamfers of the F, K, S, and W gear units:

Gear unit	Design	
	with hollow shaft (A)	with hollow shaft and shrink disk (H)
W..10	1.5 × 30°	-
W..20	2 × 30°	-
W..30	2 × 30°	-
F..27	2 × 30°	0.5 × 45°
K..19	2 × 30°	0.5 × 45°
K..29	2 × 30°	0.5 × 45°
F../K../S../W..37	2 × 30°	0.5 × 45°
K..39	2 × 30°	-
F../K../S../ W..47	2 × 30°	0.5 × 45°
K..49	2 × 30°	-
S..57	2 × 30°	0.5 × 45°
F../K..57	2 × 30°	0.5 × 45°
F../K../S..67	2 × 30°	0.5 × 45°
F../K../S..77	2 × 30°	0.5 × 45°
F../K../S..87	3 × 30°	0.5 × 45°
F../K../S..97	3 × 30°	0.5 × 45°
F../K..107	3 × 30°	0.5 × 45°

Dimension table for the chamfers of the BS.F gear units:

Gear unit	Design	
	with hollow shaft (A)	with hollow shaft and shrink disk (H)
BS.F202	2 × 30°	0.5 × 45°

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Gear unit	Design	
	with hollow shaft (A)	with hollow shaft and shrink disk (H)
BS.F302	2 × 30°	0.5 × 45°
BS.F402	2 × 30°	0.5 × 45°
BS.F502	2 × 30°	3 x 2°
BS.F602	2 × 30°	3 x 2°
BS.F802	2 × 30°	3 x 2°

6.5.2 Special motor/gear unit combinations

Please note for parallel-shaft helical gearmotors with hollow shaft (FA..B, FV..B, FH..B, FAF, FVF, FHF, FA, FV, FH, FT, FAZ, FVZ, FHZ):

- If you are using a customer shaft pushed through on the motor end, there may be a collision when a "small gear unit" is used in combination with a "large motor."
- Check the motor dimension AC to decide whether there will be a collision with a pushed-through customer shaft.

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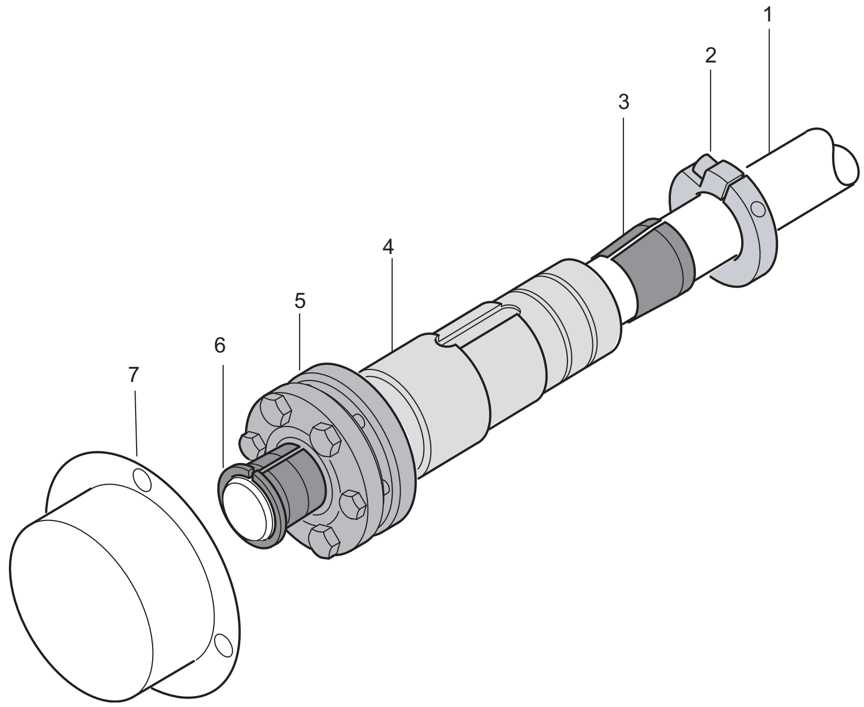
6.6 TorqLOC® mounting system for gear units with hollow shaft

6.6.1 Description of TorqLOC®

The TorqLOC® hollow shaft mounting system is used for achieving a non-positive connection between the customer's shaft and the hollow shaft in the gear unit. The TorqLOC® hollow shaft mounting system is an alternative to the hollow shaft with shrink disk, the hollow shaft with key and the splined hollow shaft that have been used so far.

The TorqLOC® hollow shaft mounting system consists of the following components:



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[1]	Customer shaft	[5]	Shrink disk
2]	Clamping ring	[6]	Conical steel bushing
[3]	Conical bronze bushing	[7]	Fixed hood cover
[4]	Hollow shaft in gear unit		

6.6.2 Benefits of TorqLOC®

The TorqLOC® hollow shaft mounting system provides the following advantages:

- Cost saving because the customer shaft can be made from drawn material up to quality h11.
- Cost saving because different customer shaft diameters can be covered by one hollow shaft diameter and different bushings.
- Simple installation since there is no need to accommodate any shaft connections.
- Simple removal even after many hours of operation because the formation of contact corrosion has been reduced and the conical connections can easily be released.

6.6.3 Technical data of TorqLOC®

The TorqLOC® hollow shaft mounting system is approved for output torques of 92 Nm to 8000 Nm.

The following gear units are available with TorqLOC® hollow shaft mounting system:

- Parallel-shaft helical gear units in gear unit sizes 37 to 157 (FT37 – FT107)
- Helical-bevel gear units in gear unit sizes 37 to 157 (KT37 – KT107), 39 and 49 (KT39, KT49)
- Helical-worm gear units in gear unit sizes 37 to 97 (ST37 – ST97)
- SPIROPLAN® gear units in gear unit sizes 37 and 47 (WT.7)

Available options

The following options are available for gear units with a TorqLOC® hollow shaft mounting system:

- For helical-bevel, helical-worm and SPIROPLAN® gear units (KT.., ST.., WT.7..): "torque arm" option (../T)
- For parallel-shaft helical gear units (FT..): "rubber buffer" option (../G)

6.7 Gear unit with flange block shaft

INFORMATION

Only use screws in **strength class 12.9** to fasten the output elements onto the flange block shaft of the gear unit.

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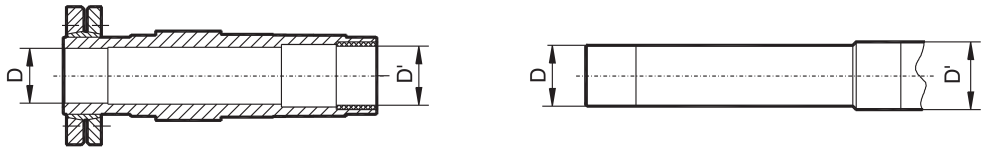
6.8 Shouldered hollow shaft option with shrink disk

The following gear units with a hollow shaft and shrink disk also have the option of the larger bore diameter D':

- Parallel-shaft helical gear units FH/FHF/FHZ37 – 107
- Helical-bevel gear units KH/KHF/KHZ37 – 107
- Helical-worm gear units SH/SHF47 – 97

D’ = D as standard.



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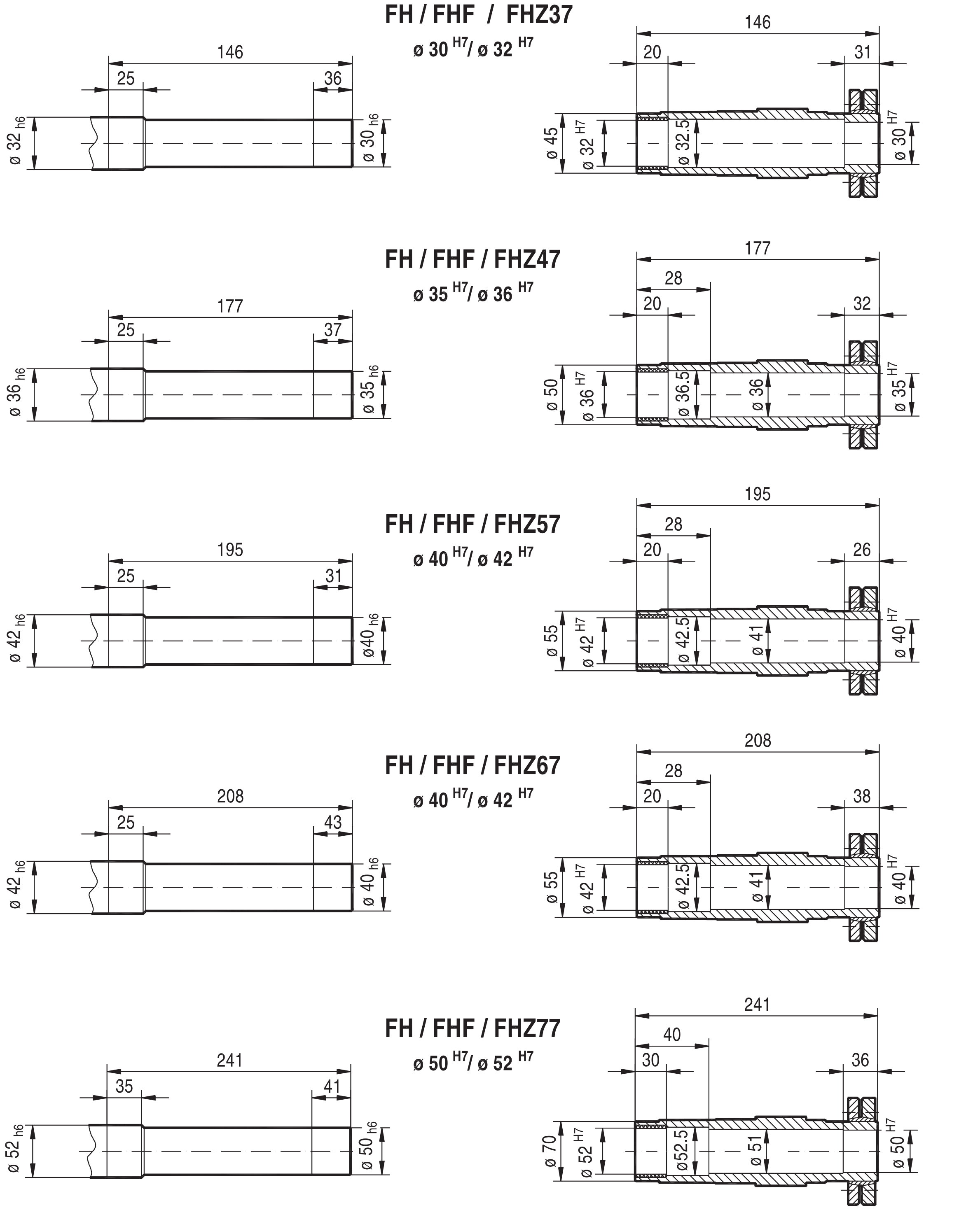
Gear units	Bore diameter D/ optionally D' mm
FH/FHF/FHZ37, KH/KHF/KHZ37, SH/SHF/SHZ47	30/32
FH/FHF/FHZ47, KH/KHF/KHZ47, SH/SHF/SHZ57	35/36
FH/FHF/FHZ57, KH/KHF/KHZ57	40/42
FH/FHF/FHZ67, KH/KHF/KHZ67, SH/SHF/SHZ67	40/42
FH/FHF/FHZ77, KH/KHF/KHZ77, SH/SHF/SHZ77	50/52
FH/FHF/FHZ87, KH/KHF/KHZ87, SH/SHF/SHZ87	65/66
FH/FHF/FHZ97, KH/KHF/KHZ97, SH/SHF/SHZ97	75/76
FH/FHF/FHZ107, KH/KHF/KHZ107	95/96

Diameter D/D' must be specified when ordering gear units with a shouldered hollow shaft (optional bore diameter D').

6.8.1 Sample order

FH77CMP40M with hollow shaft 50/52 mm

6.8.2 Parallel-shaft helical gear units with shouldered hollow shaft (dimensions in mm):



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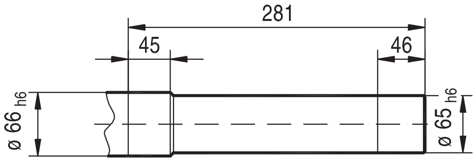
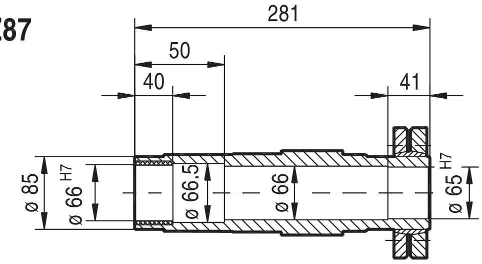
FH / FHF / FHZ87

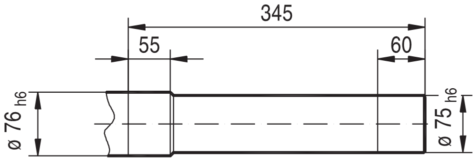
ø 65 H7/ ø 66 H7

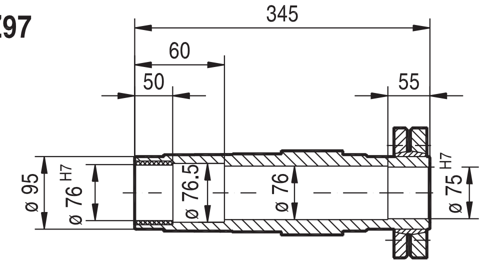




FH / FHF / FHZ97

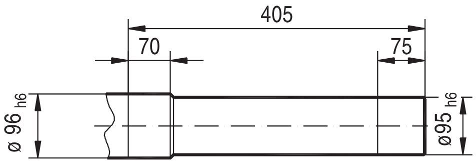
ø 75 H7/ ø 76 H7

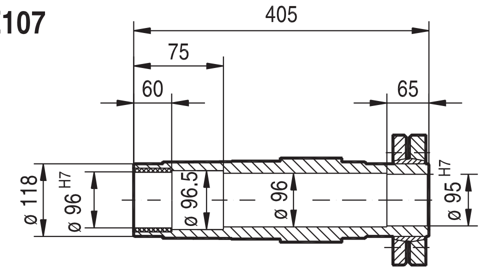




FH / FHF / FHZ107

ø 95 H7/ ø 96 H7





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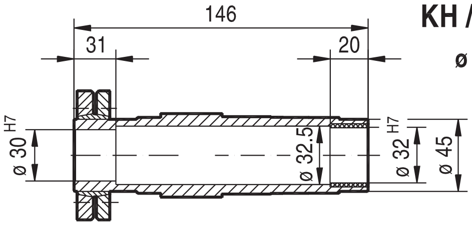
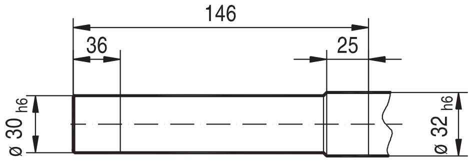
6.8.3 Helical-bevel gear units with shouldered hollow shaft (dimensions in mm):

KH / KHF / KHZ37

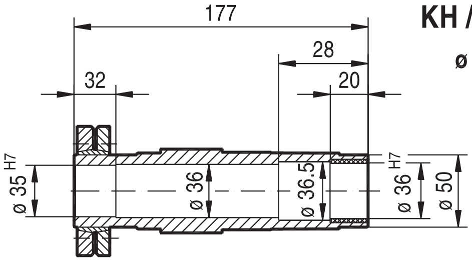
ø 30 ^{H7}/ ø 32 ^{H7}

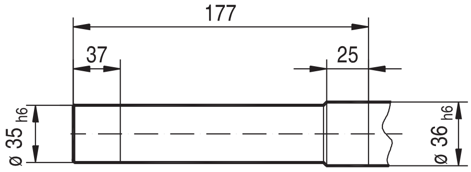




KH / KHF / KHZ47

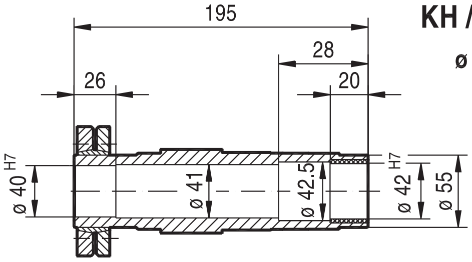
ø 35 ^{H7}/ ø 36 ^{H7}

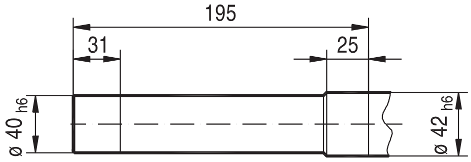




KH / KHF / KHZ57

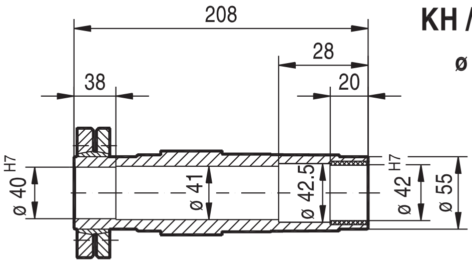
ø 40 ^{H7}/ ø 42 ^{H7}

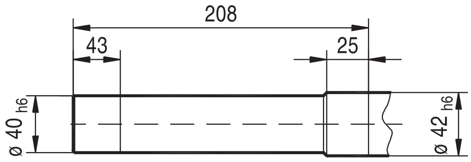




KH / KHF / KHZ67

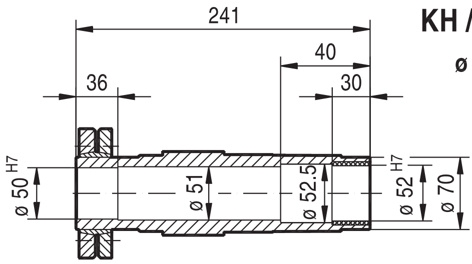
ø 40 ^{H7}/ ø 42 ^{H7}

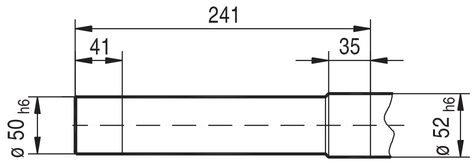




KH / KHF / KHZ77

ø 50 ^{H7}/ ø 52 ^{H7}





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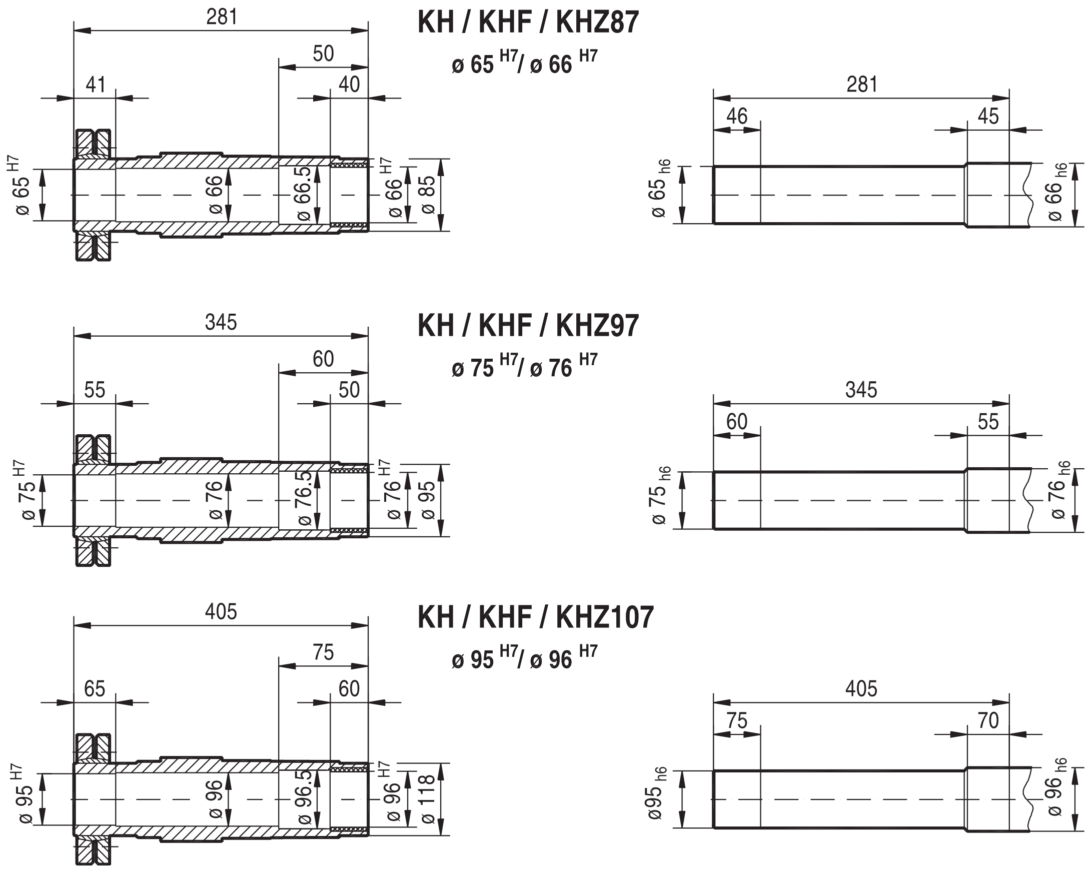

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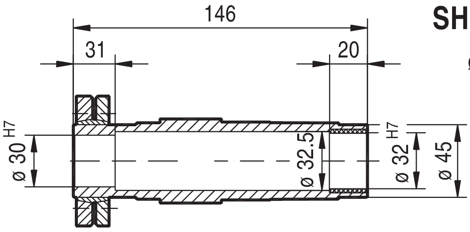
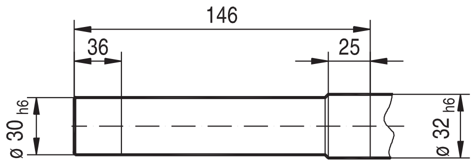
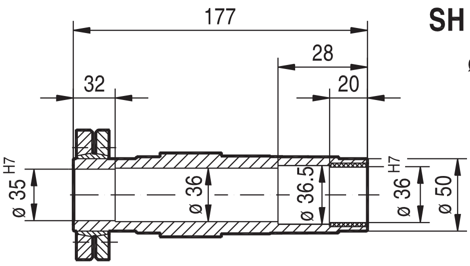
6.8.4 Helical-worm gear units with shouldered hollow shaft (dimensions in mm):



SH / SHF / SHZ47

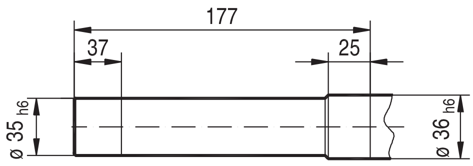
ø 30^{H7}/ ø 32^{H7}

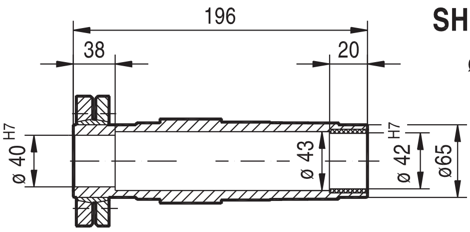




SH / SHF / SHZ57

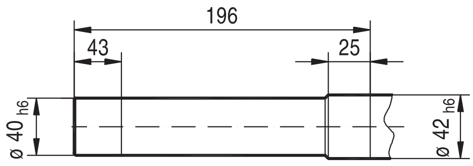
ø 35^{H7}/ ø 36^{H7}

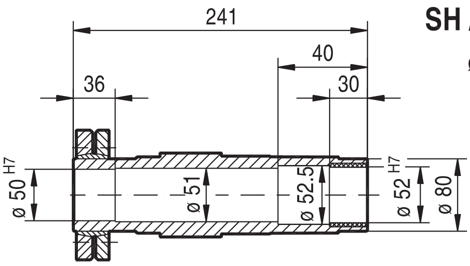




SH / SHF / SHZ67

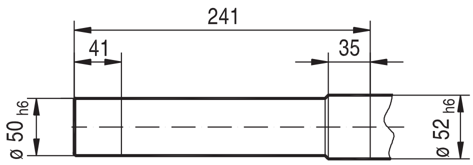
ø 40^{H7}/ ø 42^{H7}





SH / SHF / SHZ77

ø 50^{H7}/ ø 52^{H7}



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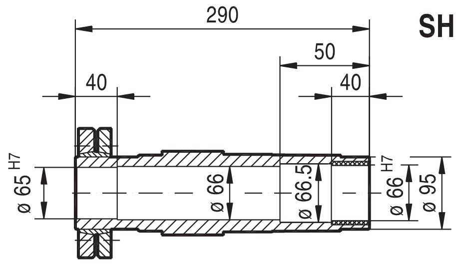
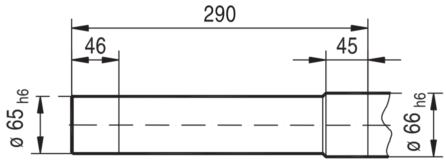
SH / SHF / SHZ87

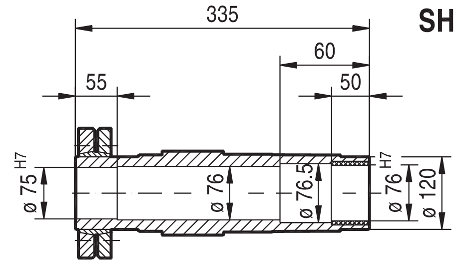
ø 65 H7/ ø 66 H7

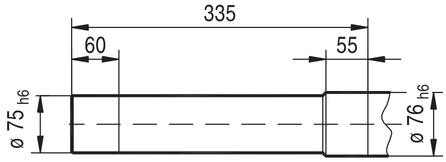




SH / SHF / SHZ97

ø 75 H7/ ø 76 H7





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6.9 Gear unit mounting

Strength class of the screws

Always mount gearmotors using screws of strength class 8.8.

The gearmotors in flange-mounted design and in foot-/flange-mounted design listed in the following table are an exception. Always use screws of strength class 10.9 for these gearmotors. Use suitable washers.

Gear unit	Flange Ø in mm	Strength class of the screws
RF37/R37F	120	10.9
RF47/R47F	140	
RF57/R57F	160	
FF/FAF77/KF/KAF77	250	
RF147	450	
RF167	550	
RZ37 – RZ87	60ZR – 130ZR	

6.10 Torque arms

6.10.1 Available torque arms

NOTICE

Danger due to static overdetermination if gear units with foot (e.g. KA19/29B) are mounted both via the torque arm and via the foot plate.

Risk of injuries and damage to property

- Especially with the KA.9B/T design, it is not permitted to use the foot plates and the torque arm at the same time.
- Attach the KA.9B/T design only via the torque arm.
- Attach the K.9 or KA.9B design only via the foot plate.
- If you want to use foot plates and torque arms for mounting, contact SEW-EURODRIVE.

The following table lists the part numbers of available torque arms.

Gear unit	Size			
	19	29	39	49
KA, KH, KT	10684115	10684107	10682163	06442439

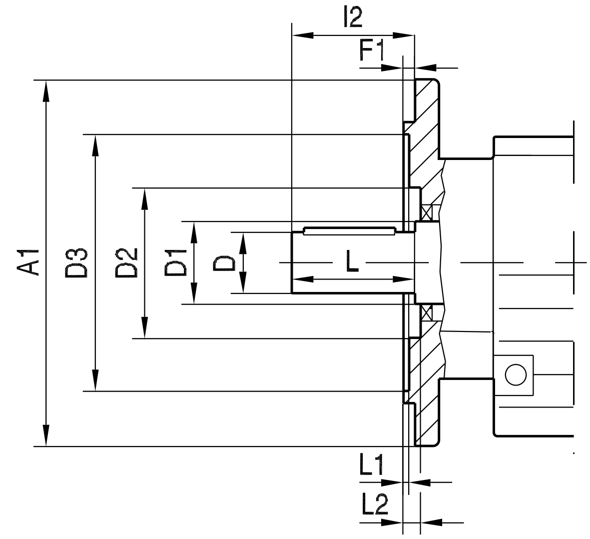
Gear unit	Size					
	27	37	47	57	67	77
KA, KH, KV, KT	-	6434258	6434282	6434312	6434312	6434347
SA, SH, ST	-	1269941	6442374	6442404	6442439	6442463
FA, FH, FV, FT Rubber buffer (2 pieces)	0133485	0133485	0133485	0133485	0133485	0133493

Gear unit	Size		
	87	97	107
KA, KH, KV, KT	6434371	6434401	6434436
SA, SH, ST	6442498	6442528	-
FA, FH, FV, FT Rubber buffer (2 pieces)	0133493	0133507	0133507

Gear unit	Size				
	10	20	30	37	47
WA, WH, WT	10610219	1680730	1680110	10611290	10611851

Gear unit	Size					
	202	302	402	502	602	802
BSHF, BSAF	10630988	10631003	10631038	10631054	10631070	10631097

6.11 Flange contours of RF.. and R..F gear units



Type	Dimensions in mm											
	A1	D	D1	D2		D3	F1	I2	L	L1[1]		L2[1]
				RF	R..F					RF	R..F	
RF07, R07F	120	20	22	38	38	72	3	40	40	2	2	6
	140[2]	20	22	38	-	85	3	40	40	2	-	6
	160[2]	20	22	38	-	100	3.5	40	40	2.5	-	6.5
RF17, R17F	120	20	25	46	46	65	3	40	40	1	1	5
	140	20	25	46	-	78	3	40	40	1	-	5
	160[2]	20	25	46	-	95	3.5	40	40	1	-	6
RF27, R27F	120	25	30	54	54	66	3	50	50	1	1	6
	140	25	30	54	-	79	3	50	50	3	-	7
	160	25	30	54	-	92	3.5	50	50	3	-	7
RF37, R37F	120	25	35	60	63	70	3	50	50	5	4	7
	160	25	35	60	-	96	3.5	50	50	1	-	7.5
	200[2]	25	35	60	-	119	3.5	50	50	1	-	7.5
RF47, R47F	140	30	35	72	64	82	3	60	60	4	1	6
	160	30	35	72	-	96	3.5	60	60	0.5	-	6.5
	200	30	35	72	-	116	3.5	60	60	0.5	-	6.5
RF57, R57F	160	35	40	76	75	96	3.5	70	70	4	2.5	5
	200	35	40	76	-	116	3.5	70	70	0	-	5
	250[2]	35	40	76	-	160	4	70	70	0.5	-	5.5
RF67, R67F	200	35	50	90	90	118	3.5	70	70	2	4	7
	250	35	50	90	-	160	4	70	70	1	-	7.5
RF77, R77F	250	40	52	112	100	160	4	80	80	0.5	2.5	7
	300[2]	40	52	112	-	210	4	80	80	0.5	-	7
RF87, R87F	300	50	62	123	122	210	4	100	100	0	1.5	8
	350	50	62	123	-	226	5	100	100	1	-	9
RF97	350	60	72	136		236	5	120	120	0		9
	450	60	72	136		320	5	120	120	0		9
RF107	350	70	82	157		232	5	140	140	0		11
	450	70	82	186		316	5	140	140	0		11
RF127	450	90	108	180		316	5	170	170	0		10

1) Check dimensions L1 and L2 for selection and installation of output elements.
2) The flange contour protrudes from under the base surface.

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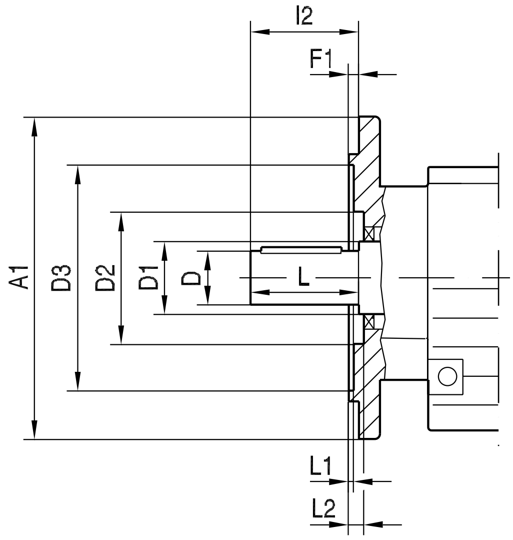
6.12 Flange contours of FF.., KF.., SF.. and WF.. gear units



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Check dimensions L1 and L2 for selection and installation of output elements.

Type	Dimensions in mm									
	A1	D	D1	D2	D3	F1	I2	L	L1	L2
FF27	160	25	40	66	96	3.5	50	50	3	18.5
FF37	160	25	30	70	94	3.5	50	50	2	6
FF47	200	30	40	72	115	3.5	60	60	3.5	7.5
FF57	250	35	40	84	155	4	70	70	4	9
FF67	250	40	50	84	155	4	80	80	4	9
FF77	300	50	55	82	205	4	100	100	5	9
FF87	350	60	65	115	220	5	120	120	5	9
FF97	450	70	75	112	320	5	140	140	8	10
FF107	450	90	100	159	318	5	170	170	16	9
KF19	120	20	25	-	70	2.5	40	40	-	11.5
KF19	160	20	25	-	100	2.5	40	40	-	11.5
KF29	160	25	30	-	109	3.5	50	50	-	6.5
KF29	200	25	30	-	115	3.5	50	50	-	6.5
KF37	160	25	30	70	94	3.5	50	50	2	6
KF39	160	30	39	68	96	3.5	60	60	13.5	23.5
KF47	200	30	40	72	115	3.5	60	60	3.5	7.5
KF49	200	35	49	76	115	3.5	70	70	24.5	28
KF57	250	35	40	84	155	4	70	70	4	9
KF67	250	40	50	84	155	4	80	80	4	9
KF77	300	50	55	82	205	4	100	100	5	9
KF87	350	60	65	115	220	5	120	120	5	9
KF97	450	70	75	112	320	5	140	140	8	10
KF107	450	90	100	159	318	5	170	170	16	9
SF37	120	20	25	-	68	3	40	40	6	-
SF37	160	20	25	-	96	3.5	40	40	5.5	-
SF47	160	25	30	70	94	3.5	50	50	2	6
SF57	200	30	40	72	115	3.5	60	60	3.5	7.5
SF67	200	35	45	-	115	3.5	70	70	8.5	-
SF77	250	45	55	108	160	4	90	90	8	9
SF87	350	60	65	130	220	5	120	120	6	10
SF97	450	70	75	150	320	5	140	140	8.5	10
WF10	80	16	25	-	39	2.5	40	40	30	-

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Type	Dimensions in mm									
	A1	D	D1	D2	D3	F1	I2	L	L1	L2
WF10	120	16	25	39	74	3	40	40	5	30
WF20	110	20	30	44	53	-4	40	40	27	35
WF20	120	20	30	-	45	2.5	40	40	37.5	-
WF30	120	20	30	48	63	2.5	40	40	18	27
WF30	160	20	30	48	63	2.5	40	40	33	42
WF37	120	20	30	-	70	2.5	40	40	-	10.5
WF37	160	20	30	-	70	2.5	40	40	-	25.5
WF47	160	30	35	-	92	3.5	10	60	6	-

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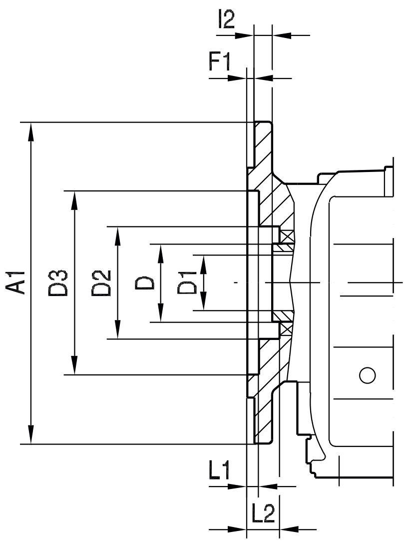
6.13 Flange contours of FAF.., KAF.., SAF.. and WAF.. gear units



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Check dimensions L1 and L2 for selection and installation of output elements.

Type	Dimensions in mm								
	A1	D	D1	D2	D3	F1	I2	L1	L2
FAF27	160	40	25	66	96	3.5	20	3	18.5
FAF37	160	45	30	62	94	3.5	24	2	30
FAF47	200	50	35	70	115	3.5	25	3.5	31.5
FAF57	250	55	40	76	155	4	23.5	4	31
FAF67	250	55	40	76	155	4	23	4	31
FAF77	300	70	50	95	205	4	37	5	45
FAF87	350	85	60	120	220	5	30	5	39
FAF97	450	95	70	135	320	5	41.5	5.5	51
FAF107	450	118	90	224	320	5	41	16	52
KAF19	120	30	20	60	70	2.5	25	9	25.5
KAF19	160	30	20	60	100	2.5	25	9	25.5
KAF29	160	40	25 / 30	-	105	3.5	33.5	-	6.5
KAF29	200	40	25 / 30	-	118	3.5	33.5	-	6.5
KAF39	160	50	30 / 35	68	96	3.5	24.5	10	27
KAF37	160	45	30	62	94	3.5	24	2	30
KAF47	200	50	35	70	115	3.5	25	3.5	8.5
KAF49	200	55	35 / 40	76	115	3.5	32.5	16	34.5
KAF57	250	55	40	76	155	4	23.5	4	31
KAF67	250	55	40	76	155	4	23	4	31
KAF77	300	70	50	95	205	4	37	5	45
KAF87	350	85	60	120	220	5	30	5	39
KAF97	450	95	70	135	320	5	41.5	5.5	51
KAF107	450	118	90	224	320	5	41	16	52
SAF37	120	35	20	-	68	3	15	6	-
SAF37	160	35	20	-	96	3.5	15	5.5	-
SAF47	160	45	30 / 25	62	94	3.5	24	2	30
SAF57	200	50	35 / 30	70	115	3.5	25	3.5	31.5
SAF67	200	65	45 / 40	91	115	3.5	42.5	4	48.5
SAF77	250	80	60 / 50	112	164	4	45.5	5	53.5
SAF87	350	95	70 / 60	131	220	5	52.5	6	62.5
SAF97	450	120	90 / 70	160	320	5	60	6.5	69
WAF10	80	25	16	-	39	2.5	23	30	-

Type	Dimensions in mm								
	A1	**D**	**D1**	**D2**	**D3**	**F1**	**I2**	**L1**	**L2**
WAF10	120	25	16	39	74	3	23	5	30
WAF20	110	30	18 / 20	44	53	-4	30	27	35
WAF20	120	30	18 / 20	-	45	2.5	30	37.5	-
WAF30	120	30	20	48	63	2.5	19.5	18	27
WAF30	160	30	20	48	63	2.5	34.5	33	42
WAF37	120	35	20 / 25	54	70	2.5	19.5	10.5	27
WAF37	160	35	20 / 25	54	70	2.5	34.5	25.5	42
WAF47	160	45	25 / 30	72	92	3.5	10	6	45

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6.14 Safety covers

6.14.1 Rotating safety cover

Safety

The following gear unit types with hollow shaft and shrink disk are equipped with a rotating safety cover as standard:

Gear unit type	Sizes
KH..	19 – 29 and 37 – 97
FH.., SH.., WH..	37 – 97

6.14.2 Fixed plastic safety cover

The following gear unit types with hollow shaft and shrink disk are equipped with a fixed plastic safety cover as standard:

Gear unit type	Sizes
FH..	27 and 107
KH..	107

Should you require a fixed plastic safety cover for other gear unit types or sizes, the part number required to order the cover can be found in the following chapter.

6.14.3 Fixed sheet metal safety cover

The following gear unit types with hollow shaft and shrink disk are equipped with a fixed sheet metal safety cover as standard:

Gear unit type	Sizes
FT.., KT.., ST.., WT.. (with TorqLOC® hollow shaft mounting system)	All available sizes
Explosion-proof gear units FH.., KH.., SH.., WH.. gear units	All available sizes

Should you require a fixed sheet metal safety cover for other gear unit types or sizes, the part number required to order the cover can be found in the following chapter.

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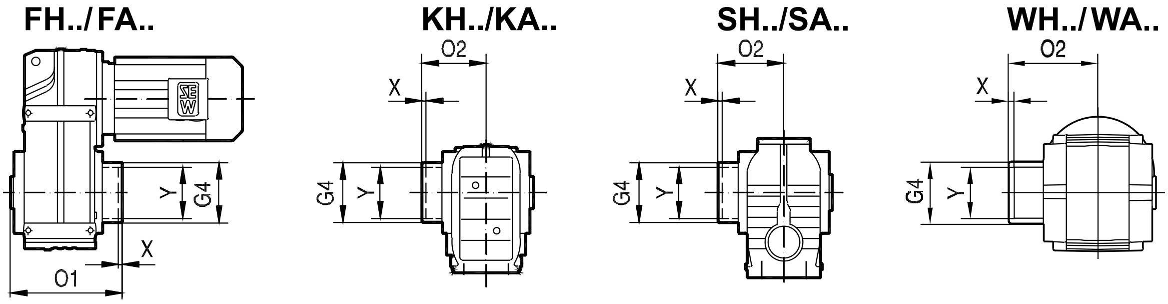
6.14.4 Part numbers and dimensions for fixed plastic safety covers



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Parallel-shaft helical gearmotors	FH/FA ..37	FH/FA ..47	FH/FA ..57	FH/FA ..67	FH/FA ..77	FH/FA ..87	FH/FA ..97
Part number	6435130	6435149	6435157	6435157	6435165	6435173	6435181
G4 in mm	78	88	100	100	121	164	185
O1 in mm	157	188.5	207.5	221.5	255	295	363.5
X in mm	2	4.5	7.5	6	6	4	6.5
Y in mm	75	83	83	93	114	159	174

Helical-bevel gearmotors	KH/KA ..19	KH/KA ..29
Part number	10684158	10684166
G4 in mm	62	68
O2 in mm	83	90
X in mm	2	4
Y in mm	50	60

Helical-bevel gearmotors[1)]	KH/KA ..37	KH/KA ..47	KH/KA ..57	KH/KA ..67	KH/KA ..77	KH/KA ..87	KH/KA ..97
Part number	6435130	6435149	6435157	6435157	6435165	6435173	6435181
G4 in mm	78	88	100	100	121	164	185
O2 in mm	95	111.5	122.5	129	147	172	210.5
X in mm	0	1.5	5.5	3	1	2	4.5
Y in mm	75	83	83	93	114	159	174

1) Not possible in foot-mounted helical-bevel gear units with hollow shaft (KH..B and KA..B)

Helical-worm gearmotors	SH/SA ..37	SH/SA ..47	SH/SA ..57	SH/SA ..67	SH/SA ..77	SH/SA .. 87	SH/SA ..97
Part number	6435122	6435130	6435149	6435157	6435165	6435173	6435181
G4 in mm	59	78	88	100	121	164	185
O2 in mm	88	95	111.5	123	147	176	204.5
X in mm	1	0	1.5	3	1	0	0.5
Y in mm	53	75	83	93	114	159	174

SPIROPLAN® gearmotors	WH/WA ..37	WH/WA ..47
Part number	10611363	10611940
G4 in mm	68	80.5
O2 in mm	95.5	109.5
X in mm	11	12.5
Y in mm	50	72

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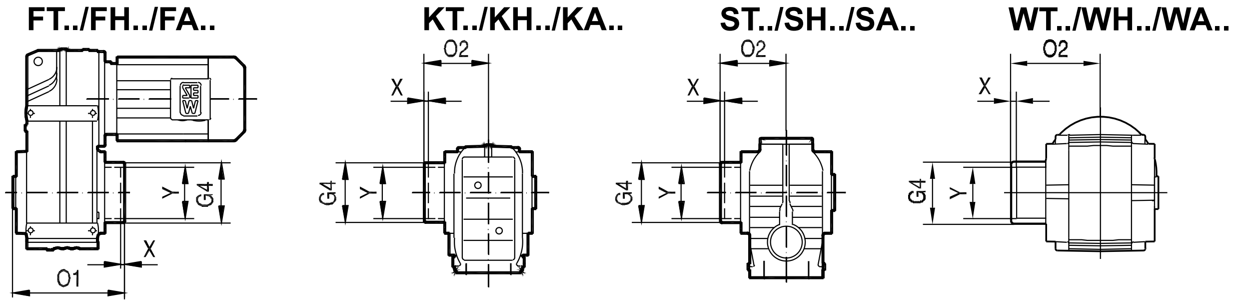
6.14.5 Part numbers and dimensions for fixed sheet metal safety covers



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Parallel-shaft helical gearmotors	FT/FH/FA ..37	FT/FH/FA ..47	FT/FH/FA ..57	FT/FH/FA ..67	FT/FH/FA ..77	FT/FH/FA ..87	FT/FH/FA ..97	FT/FH/FA ..107
Part number	0643584X	06435858	06435866	06435866	06435874	06435882	06435890	06421814
G4 in mm	81	90	101	101	124	165	200	196
O1 in mm	166	199	222	236	285	322	382	421
X in mm	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Y in mm	78	87	98	98	121	162	197	193

Helical-bevel gearmotors	KH/KA ..19	KH/KA ..29	KT/KA ..39	KT/KA ..49
Part number	06442595	10631259	10682651	10682964
G4 in mm	62	68	86	97
O2 in mm	83	90	117.5	138
X in mm	1.5	1.5	1	1
Y in mm	80	87	84	95

Helical-bevel gearmotors[1)]	KT/KH/KA ..37	KT/KH/KA ..47	KT/KH/KA ..57	KT/KH/KA ..67	KT/KH/KA ..77	KT/KH/KA ..87	KT/KH/KA ..97	KT/KH/KA ..107
Part number	0643584X	06435858	06435866	06435866	06435874	06435882	06435890	06421814
G4 in mm	81	90	101	101	124	165	200	196
O2 in mm	104	122	137	143	177	229	382	246
X in mm	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Y in mm	78	87	98	98	121	162	197	193

1) Not possible in foot-mounted helical-bevel gear units with hollow shaft (KH..B and KA..B)

Helical-worm gearmotors	ST/SH/SA ..37	ST/SH/SA ..47	ST/SH/SA ..57	ST/SH/SA ..67	ST/SH/SA ..77	ST/SH/SA ..87	ST/SH/SA ..97
Part number	06444768	0643584X	06435858	06435866	06435874	06435882	06435882
G4 in mm	64	81	90	101	124	165	165
O2 in mm	98	104	122	137	177	203	223
X in mm	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Y in mm	61	78	87	98	121	162	162

SPIROPLAN® gearmotors	WT/WH/WA ..37	WT/WH/WA ..47
Part number	10611479	10611959
G4 in mm	67	78
O2 in mm	95.5	109
X in mm	1	1
Y in mm	64	76

6.15 Technical data condition monitoring

6.15.1 Information on oil aging sensor /DUO10A

Technical data

	Technical data		
Preset oil grades	OIL1	CLP mineral oil	T_{max} = 100 °C
		Biodegradable oil	T_{max} = 100 °C
	OIL2	CLP HC synthetic oil	T_{max} = 130 °C
		CLP PAO oil	T_{max} = 130 °C
	OIL3	CLP PG polyglycol	T_{max} = 130 °C
	OIL4	Food grade oil	T_{max} = 100 °C
Switch outputs	1: Early warning (time to next oil change can be set to between 2 and 100 days) 2: Main alarm (time to oil change 0 days) 3: Exceeded temperature T_{max} 4: DUO10A is ready for operation		
Permitted oil temperature	-40 °C – +130 °C		
Permitted temperature sensor	PT1000		
EMC	IEC1000-4-2/3/4/6		
Ambient temperature	-25 °C – +70 °C		
Operating voltage	DC 18 – 28 V		
Current consumption for DC 24 V	< 90 mA		
Protection class	III		
Degree of protection	IP67 (optionally IP69K)		
Housing materials	Evaluation unit: V2A, EPDM/X, PBT, FPM Temperature sensor: V4A		
Electrical connection	Evaluation unit: M12 plug connector PT1000 temperature sensor: M12 plug connector		

Designations and part numbers

Designation	Description	Part number
 DUO10A	Evaluation unit (basic unit)	13438751
DUO10A-PUR-M12-5m	5 m PUR cable with 1 connector	13438778
DUO10A-PVC-M12-5m	5 m PVC cable with 1 connector	13438786
DUO10A	Angle bracket	13438808
DUO10A D = 34	Mounting clamp	13438794
W4843 PT1000 	PT1000 temperature sensor	13438816
W4843_4x0,34-2m-PUR	2 m PUR cable for PT1000[1)]	13438824
W4843_4x0,34-2m-PVC	2 m PVC cable for PT1000[2)]	13438832
 DUO10A	Protection cap (for aseptic design, IP69K)	13439022

1) PUR cables are particularly suited for use in oil-contaminated environments.
2) PVC cables are particularly suited for use in moist environments.

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Mounting to standard gear units (R, F, K,S)

Adapter for mounting the PT1000 temperature sensor in screw plug holes:

Complete adapter for PT1000 sensor	Part number
M10 × 1	13439030
M12 × 1.5	13439049
M22 × 1.5	13439057
M33 × 2	13439065
M42 × 2	13439073

Mounting base for installing the diagnostic unit at the gear unit with an angle bracket:

Mounting base with sealing ring	Part number
M10 × 1	13434411
M12 × 1.5	13438271
M22 × 1.5	13438298
M33 × 2	13438301
M42 × 2	13438328

6.15.2 Information on Vibration SmartCheck /DUV40A

Scope of delivery

- Device Vibration SmartCheck with integrated software FAG SmartWeb
- User documentation Vibration SmartCheck and FAG SmartWeb on CD-ROM
- FAG SmartUtility Light software with user documentation on CD-ROM
- 1 Retaining screw: Hexagon socket head screw M6x45
- 1 O-ring to secure the retaining screw against loss
- 1 closing plug with logo to close assembly opening
- 3 closing plugs to close unused M12 connections

INFORMATION

Cables for connecting the device are not included in the standard delivery of Vibration SmartCheck devices.

Technical data

Vibration SmartCheck	
Housings	Fiberglass-reinforced plastic
Fastening	Hexagon socket head screw M6 x 45 Contact surface on the machine: 25 mm Ø
Current consumption	< 200 mA at 24 V
Ambient temperature	-20 to +70° C
Internal operating temperature	-20 to +85 °C

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Vibration SmartCheck	
Voltage supply	11 – 32 VDC or Power over Ethernet (PoE) based on 802.3af Mode A
Size	44 mm x 57 mm x 55 mm
Weight	Approx. 210 g
Degree of protection	IP 67
Operating system	Embedded Linux
Software	FAG SmartWeb (Mozilla Firefox ESR 38 (recommended), Internet Explorer 11, Internet Explorer 9 not recommended due to performance reasons) Vibration SmartUtility Light or optionally Vibration SmartUtility Languages: German, English, Chinese, Spanish, and French

Internal sensor technology	
Vibration	Acceleration sensor (piezoelectric sensor) Frequency range 0.8 Hz – 10 kHz Measuring range ±50 g
Temperature	Measuring range -20 to +70° C

Measurement	
Measurement functions	Acceleration Speed and distance by integration System temperature Process parameters (e.g. speed, load, pressure)
Diagnostic methods	Time signal, envelope, spectrum and trend analysis, speed and frequency checking

Characteristic values (time and frequency range)	
Defined characteristic values	DIN/ISO 10816
Calculated characteristic values	RMS, frequency selected RMS, direct component, peak, peak to peak, crest factor, Wellhausen count, carpet level, condition monitoring Other user-specific characteristic values are possible

Signal processor	
Frequency resolution	1600, 3200, 6400 or 12 800 lines Minimum line width 0.0039 Hz at 50 Hz (depending on the low pass)
Measurement resolution	24 bit (A/D converter)
Frequency range	0.8 Hz – 10 kHz
Low passes	50 Hz – 10 kHz (50 Hz, 100 Hz, 200 Hz, 500 Hz, 1 kHz, 2 kHz, 5 kHz, 10 kHz)
High passes (envelope only)	750 Hz, 1 kHz, 2 kHz (other filters on request)

Memory	
Program and data	64 MB RAM, 128 MB Flash

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Inputs and outputs	
Inputs	**2 analog inputs** (0 – 10 V / 0 – 24 V / 0 – 20 mA / 4 – 20 mA), frequency range 0 – 500 Hz, 12 Bit **1 digital input** (0 – 30 V, 0.1 Hz – 1 kHz)
Outputs	**1 analog output** (0 – 10 V / -20 mA / 4 – 20 mA), 12 Bit **1 switching output** (open collector, max. 1 A, 28 V) Optional galvanic isolation between inputs and outputs

Interfaces	
Control elements	2 capacitive pushbuttons (learn mode, alarm reset, restart, factory settings)
Display elements	1 LED for displaying statuses and alarms 1 LED for confirming the pushbuttons 2 LEDs for the communication display
Communication	Ethernet, 100 MB/s RS485 (currently not supported)
Electrical connections	3 M12 plug connectors (polarity reversal protected) for supply, RS485, Inputs/outputs, and Ethernet

Part numbers

	Description	Part number
Sensor	Vibration SmartCheck	19175892
Cables	8-pin voltage supply cable for SmartCheck, 5 m; M12(B) <-> open end	19179596
Cables	Ethernet cable for SmartCheck, 5 m; M12 <-> RJ45	19179618
Cables	I/O cable 8-pin for SmartCheck 5 m; M12(St) <-> open end	19179626

	Description	Part number
Base for mounting on standard gear units (R, F, K, and S gear units)	Mounting base with sealing ring M10 x 1	20593422
	Mounting base with sealing ring M12 x 1.5	20593430
	Mounting base with sealing ring M22 x 1.5	20593449
	Mounting base with sealing ring M33 x 2	20593457
	Mounting base with sealing ring M42 x 2	20593465

	Description	Part number
Base for mounting on industrial gear units	Mounting base with sealing ring G3/4	20593384
	Mounting base with sealing ring G1	20593392
	Mounting base with sealing ring G1 1/4	20593406
	Mounting base with sealing ring G1 1/2	20593414

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	Description	Part number
Base for mounting on standard motors	Mounting base M5	21014175
	Mounting base M6	21014167
	Mounting base M8	20593503
	Mounting base M10	21014248
	Mounting base M12	20593473
	Mounting base M16	20593481
	Mounting base M20	20593511

7 Important information on selection tables and dimension drawings

7.1 Information on the selection tables

7.1.1 Structure of the selection tables standard gear units

INFORMATION

SPIROPLAN® (W) gearmotors W10..CMP.. to W30..CMP.. can only be combined with the BK brake to a limited extent. The selection tables for SPIROPLAN® (W) gearmotors W10..CMP.. to W30..CMP.. have an additional column to show the possible combinations with the BK brake (→ 🗎 518).

[1] [2] [3] [4]

K107, M_{a_Dyn} Nm	CMP..							8000 Nm
i	80L	100S	100M	100L	112S	112M	112L	112H
				3				
7.35	750		760	1260	620	950	1580	1900
8.69	890	565	900	1490	730	1130	1870	2250
9.94	1020	650	1030	1700	830	1290	2140	2570
11.73	1200	765	1210	2010	990	1530	2530	3040
13.43	1370	880	1390	2300	1130	1750	2530	3040

[5] [6]

18434571403

[1] Gear unit type and size
[2] Number of gear unit stages
[3] Motor type and size
[4] Nominal output torque of the gear unit
[5] Gear unit ratio
[6] Dynamic output torque M_{a_Dyn} of the drive in Nm ($M_{a\_Dyn} = M_{Mot\_pk} \times i \times \eta$)

Dark-gray field: Preferred combination
Light-gray field: Contact SEW-EURODRIVE.
White field: Combination not possible

K107, m kg	CMP..							
s	80L	100S	100M	100L	112S	112M	112L	112H
3	285	285	290	300	310	325	335	340
KF: + 12 kg / KA: + -27kg / KAF: + -3.2 kg								

[7] [8]

18434573835

[7] Change of mass depending on the gear unit design
[8] Mass of the gearmotor

CMP..				c_{TG}				φ
	i	n_{e_pk} min⁻¹	η %	K Nm/'	KF Nm/'	KA Nm/'	KAF Nm/'	/R '
K107 3	7.35	3197	96	519	488	862	862	9
	8.69	3597	96	519	488	862	862	9
	9.94	3924	96	519	488	862	862	9
	11.73	4378	96	519	488	862	862	9
	13.43	4500	96	519	488	862	862	9
	14.64	3597	96	661	612	1341	1341	7

7

i Gear unit ratio
n_{e_pk} Maximum permitted input speed for short-time duty in min^{-1}
η Efficiency of the gear unit (at M_{a_pk}, n_e=1400 min^{-1}, mounting position M1, S1 duty cycle)
C_{TG} Torsional rigidity of the gear unit in Nm per angular minute ’
φ Rotational clearance (/R = rotational clearance, reduced), specified in angular minutes ’

CMP..							$F_{R\_a\_max}$				$F_{R\_a\_pk}$			
n_e = 1400	i	M_{a_max} Nm	M_{a_pk} Nm	$M_{aEmerg.Off}$ Nm	n_{a_k} min⁻¹	J_G 10^{-4} kg*m²	K N	KF N	KA N	KAF N	K N	KF N	KA N	KAF N
K107 3	7.35[1)]	3600	4720	6120	286	231	24400	28500	9900	47100	65000	65000	65000	65000
	8.69	4070	4780	6910	207	170	24600	29100	9270	48300	65000	65000	65000	65000
	9.94	4190	4840	7120	201	136	25800	30500	10000	50500	65000	65000	65000	65000
	11.73	4300	4910	7310	196	104	27500	32300	11100	53500	65000	65000	65000	65000

i Gear unit ratio
M_{a_max} Maximum permitted output torque for continuous duty
M_{a_pk} Maximum permitted output torque for short-time duty
$M_{aEmerg.Off}$ Maximum permitted output emergency off torque, max. 1000 emergency stops
n_{a_k} Breakpoint speed (output)
J_G Mass moment of inertia of the gear unit with reference to the input shaft
$F_{R\_a\_max}$ Maximum permitted overhung load at the output shaft for continuous duty, load application point is the center of the shaft end
$F_{R\_a\_pk}$ Maximum permitted overhung load at the output shaft for short-time duty, load application point is the center of the shaft end

[1)] If the specification of a gear ratio has the footnote [1)], increased churning losses (see chapter "Churning losses and thermal rating" (→ 🗎 58)) and therefore increased heat generation may occur in the gear unit under unfavorable conditions.

Determine the requirements of the application and the corresponding operating conditions (see chapter "Data for calculating the thermal rating" (→ 🗎 58)). Contact SEW-EURODRIVE to calculate the thermal rating based on the actual operating conditions. The thermal rating of the gear unit can be increased by appropriate measures e.g. by using a synthetic lubricant with higher thermal endurance properties.

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7.1.2 Structure of the selection tables servo gear units

[1] [2] [3] [4]

PSF321, M_{a_Dyn} Nm	CMP..							110Nm
i	50S	50M	50L	63S	63M	63L	71S	71M
1								
3.00		31	46	33	64	90	57	91
4.00	21	41	61	44	85	120	76	122
5.00	26	51	76	55	108	150	95	152
7.00	36	71	107	77	148	>168	133	>168
10.00	51	102	>121	110				

[5] [6]

18434576267

[1] Gear unit type and size
[2] Number of gear unit stages
[3] Motor type and size
[4] Nominal output torque of the gear unit
[5] Gear unit ratio
[6] Dynamic output torque M_{a_Dyn} of the drive in Nm ($M_{a\_Dyn} = M_{Mot\_pk} \times i \times \eta$)

INFORMATION

In fields marked with ">...",M_{a_Dyn} must not exceed the maximum permitted torque M_{a_pk} in short-time duty because the motor may overload the gear unit. The motor current I_{max} must be limited at startup.

Dark-gray fields contain the preferred combinations.
Light-gray fields: Consult SEW-EURODRIVE
White fields mean: Combination not possible

PSF321, m kg	CMP..							
s	50S	50M	50L	63S	63M	63L	71S	71M
1	21	41	61	44	85	120	76	122

[7] [8]

18434578699

[7] Number of gear unit stages
[8] Mass of the gearmotor

CMP..		n_{a_pk}	η	M1;M3;M5-6			M2			M4			φ		
	i	min^{-1}	%	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSF321 1	3.00	7000	99	205	-0.222	0	234	-0.327	0	288	-0.595	0	6	3	1
	4.00	7000	99	276	-0.316	0	312	-0.455	0	387	-0.833	0	6	3	1
	5.00	7000	99	290	-0.355	0	328	-0.501	0	414	-0.930	0	6	3	1
	7.00	7000	99	296	-0.418	0	335	-0.581	0	422	-1.036	0	6	3	1
	10.00	7000	99	269	-0.477	0	302	-0.617	0	374	-1.016	0	6	3	1

i Gear unit ratio
n_{a_pk} Maximum permitted input speed for short-time duty in min^{-1}
η Efficiency of the gear unit (at M_{apk}, n_e=1500 min^{-1}, mounting position M1, S1 duty cycle)
a_0, a_1, a_2 Gear unit constants relating to gear unit warming depending on the mounting position
φ Rotational clearance (/R = rotational clearance, reduced, /M = rotational clearance, minimized), specified in angular minutes ’

CMP.. n_e = 1500	i	M_{a_max} Nm	M_{a_pk} Nm	$M_{aEmerg.Off}$ Nm	n_{a_k} min^{-1}	J_{G_A} 10^{-4} kgm^2	C_T PSF Nm/'	$F_{R\_a\_max}$ PSF N	$F_{R\_a\_pk}$ PSF N
PSF321 1	3.00[1]	85	125	188	2333	0.69	11	4380	5280
	4.00	110	170	255	1750	0.35	12	4770	4420
	5.00	110	169	250	1400	0.22	12	5100	4450
	7.00	110	168	250	1000	0.12	10	5480	4470
	10.00	110	121	182	700	0.059	7.6	5480	5330

i Gear unit ratio
M_{a_max} Maximum permitted output torque for continuous duty
M_{a_pk} Maximum permitted output torque for short-time duty
$M_{aEmergOff}$ Maximum permitted output emergency off torque, max. 1000 emergency stops
n_{a_k} Breakpoint speed (output)
J_G Mass moment of inertia of the gear unit with reference to the input shaft
C_{TG} Torsional rigidity of the gear unit in Nm per angular minute ’
$F_{R\_a\_max}$ Maximum permitted overhung load at the output shaft for continuous duty, load application point is the center of the shaft end
$F_{R\_a\_pk}$ Maximum permitted overhung load at the output shaft for short-time duty, load application point is the center of the shaft end

[1] If the specification of a gear ratio has the footnote [1], increased churning losses (see chapter "Churning losses and thermal rating" (→ 🗎 58)) and therefore increased heat generation may occur in the gear unit under unfavorable conditions.

Determine the requirements of the application and the corresponding operating conditions (see chapter "Data for calculating the thermal rating" (→ 🗎 58)). Contact SEW-EURODRIVE to calculate the thermal rating based on the actual operating conditions. The thermal rating of the gear unit can be increased by appropriate measures e.g. by using a synthetic lubricant with higher thermal endurance properties.

7.2 Dimension sheet information

7.2.1 Symbols for scope of delivery

▱	Standard parts supplied by SEW-EURODRIVE.
▭	Standard parts not supplied by SEW-EURODRIVE.

7.2.2 Tolerances

Shaft heights

The following tolerances apply to the indicated dimensions:

h	≤ 250 mm	→ -0.5 mm
h	> 250 mm	→ -1 mm

Foot-mounted gear units: Check the mounted motor because it may project below the mounting surface.

Shaft ends

Diameter tolerance:

Ø	≤ 50 mm	→ ISO k6
Ø	> 50 mm	→ ISO m6

Centering bores according to DIN 332, shape DR:

Ø	= 7 – 10 mm	→ M3
Ø	> 10 – 13 mm	→ M4
Ø	> 13 – 16 mm	→ M5
Ø	> 16 – 21 mm	→ M6
Ø	> 21 – 24 mm	→ M8
Ø	> 24 – 30 mm	→ M10
Ø	> 30 – 38 mm	→ M12
Ø	> 38 – 50 mm	→ M16
Ø	> 50 – 85 mm	→ M20
Ø	> 85 – 130 mm	→ M24
Ø	> 130 mm	→ M30

Keys: according to DIN 6885 (domed type)

Keyway width to ISO N9

Hollow shafts

Diameter tolerance:

Ø → ISO H7 measured with plug gauge

Keys: according to DIN 6885 (domed type)

Exception: Key for WA.37 with shaft Ø 25 mm and for KA.29 with shaft Ø 30 mm according to DIN 6885-3 (low form)

Keyway width to ISO JS9

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Multiple-spline shafts

D_m Measuring roller diameter

M_e Check size

The fit of the hollow shafts with splined hollow shaft is 9H.

The assumed fit of the customer shaft in the dimension sheets of the catalog is 7d.

The fit pair 9H/7d specified in the dimension sheets is a clearance fit. Depending on the application requirements, it is the customer's responsibility to choose another fit pair and to manufacture the customer shaft accordingly.

Flanges

Centering shoulder tolerance:

Ø ≤ 230 mm (flange sizes A120 – A300) → ISO j6

Ø > 230 mm (flange sizes A350 – A660) → ISO h6

Up to 3 different flange dimensions are available for each size of helical gear unit, SPIROPLAN® gear unit, AC (brake) motor and explosion-proof AC (brake) motor. The mountable flange for each size can be found in the respective dimension sheets.

7.2.3 Eyebolts, lifting eyes

R07 to R27 helical gear units and SPIROPLAN® gearmotors W..10 to W..30 are delivered without special transportation fixtures. All other gear units and motors are equipped with cast-on lifting eyes, screw-on lifting eyes or screw-on lifting eyebolts.

Gear unit/motor type	Screw-on		Cast-on
	Lifting eyebolts	Lifting eyes	Lifting eyes
R..37 – R..57	—	X	—
R..67 – R..127	X	—	—
RX57 – RX67	—	X	—
RX77 – RX107	X	—	—
F..27 – F..107	—	—	X
K..19 – K..49	—	X	—
K..37 – K..107	—	—	X
S..37 – S47	—	X	—
S..47 – S..97	—	—	X
W..37 – W..47	—	X	—
BS.F502 – 802	—	X	—
PS.F621 – 921	—	X	—
PS.F622 – 922	—	X	—

X = available, – = not available

7.2.4 Breather valves

The gear unit dimension drawings always show the screw plugs. The corresponding screw plug is replaced by an activated breather valve at the factory depending on the ordered mounting position M1 to M6. The result may be slightly altered contour dimensions.

7.2.5 Shrink disk connection

In order to non-positively transfer the torques stated in the catalog in case of gear units with hollow shaft and shrink disk connection, observe the following peripheral conditions in addition to the information on the respective dimension sheet when dimensioning the customer shaft:

- Surface roughness Rz ≤ 16 µm
- Elastic limit of the customer shaft material R_e and/or $Rp_{0.2}$ ≥ 305 N/mm²
- Design of the customer shaft as solid shaft

For customer shaft designs as hollow shaft, contact SEW-EURODRIVE.

7.2.6 Splined hollow shaft

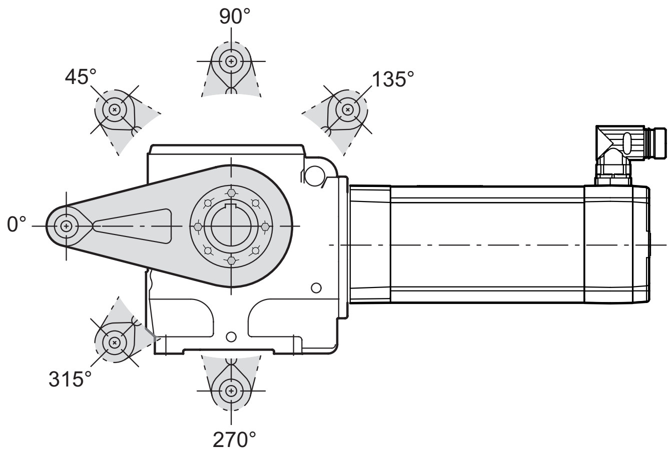
FV.. hollow shaft gear unit sizes 27 to 107, and KV.. sizes 37 to 107 are supplied with splining according to standard 5480.

7.2.7 Rubber buffer for FA/FH/FV/FT

The depictions on the dimension sheets show the rubber buffers for FA/FH/FV/FT gear units in loose state. Preload rubber buffer by the indicated value ΔL. The characteristic curve of spring for the rubber buffer is available upon request from SEW-EURODRIVE.

7.2.8 Torque arm position

The following illustration shows the possible torque arm positions for helical-worm gear units, the 2-stage K..9 helical-bevel gear units, the SPIROPLAN® gear units (135 ° position not possible with SPIROPLAN® gear units), and BS.F gear units as well as the respective angles:



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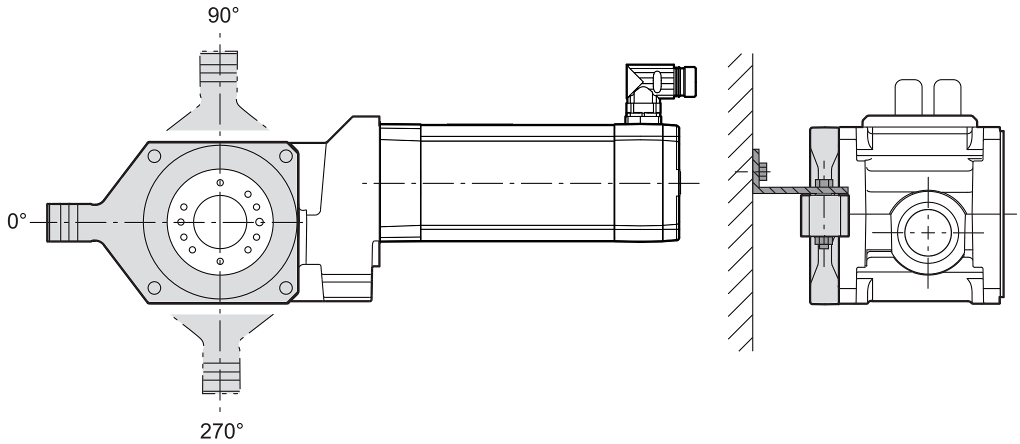
The following illustration shows the possible torque arm positions for BS.F gear units as well as the respective angles:



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For more information about torque arms, refer to the respective dimension sheets of the gearmotors:

Gearmotor	Dimension sheets on page
K..9 and K..7 helical-bevel gearmotors	(→ 🗎 380)
Helical-worm gearmotors	(→ 🗎 487)
SPIROPLAN® gearmotors	(→ 🗎 518)
BS.F helical-bevel gearmotors	(→ 🗎 589)

7.2.9 Tolerances and chamfers for flange block gear units

Inner centering	→ ISO H7
Outer centering	→ ISO h7

For the corresponding dimension sheet, refer to chapter "Dimension sheet tolerances and chamfers of flange block gear units" (→ 🗎 590).

7.2.10 Front and foot-end mounting of BS.F..B gear units

For the corresponding dimension sheet, refer to chapter "Dimension sheet front-end mounting" (→ 🗎 588).

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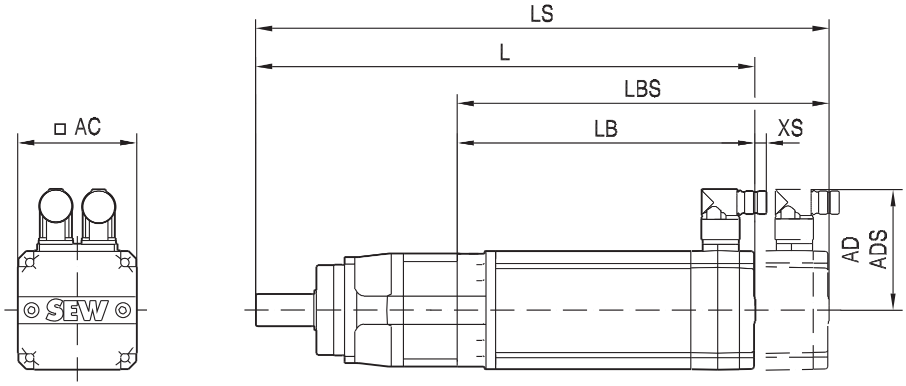
7.3 Gearmotor dimensions

7.3.1 Dimension designations of gearmotors

The dimensions of the gearmotors are described below:



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L	Total length of gearmotor	AC	Diameter of motor
LS	Total length of gearmotor including brake	AD	Center of motor shaft to top part of terminal box
LB	Length of motor	ADS	Center of brakemotor shaft to top part of terminal box
LBS	Length of brakemotor	XS	Projecting length of the plug connector beyond the motor housing

INFORMATION

Type and source of the danger

For motors with other feedback systems than resolvers, possible additional lengths must be considered.

7.3.2 Motor options

The motor dimensions may change when installing motor options. Refer to the dimension drawings of the motor options in the "AC Motors" catalog.

7.3.3 Special designs

The terminal box dimensions in special designs might vary from the standard.

7.4 Dimensions for CMPZ.. motors

CMPZ.. motors differ from CMP.. motors in the additional rotor mass. This additional rotor mass makes CMPZ.. motors longer than CMP.. motors.

For additional lengths of the CMPZ.. motors, refer to the technical data of CMPZ.. motors.

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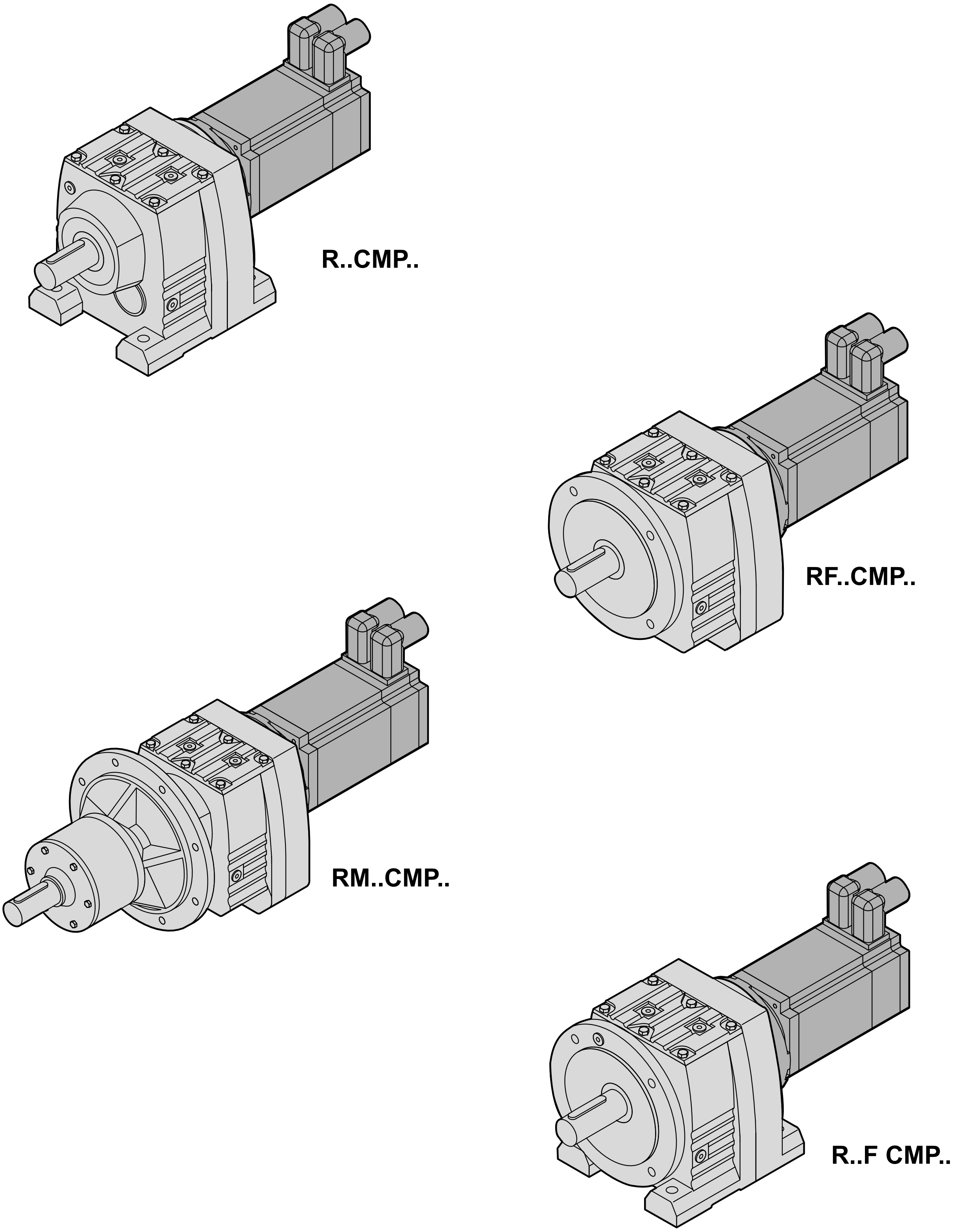
8 Helical gearmotors – R gear units

8.1 R../RX..CMP.. designs



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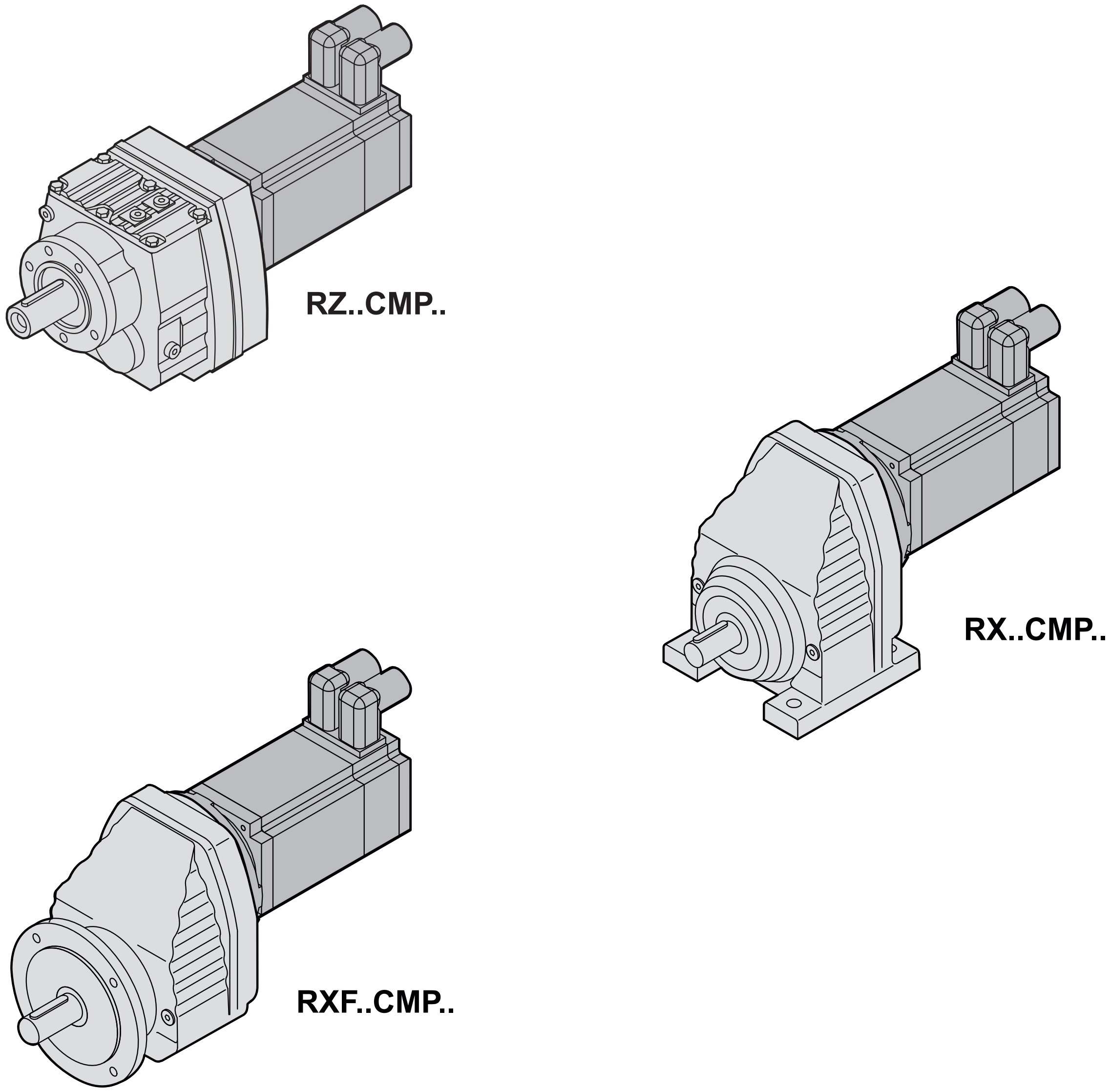

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8.2 RX57–107..CMP.. selection tables and dimension sheets

8.2.1 RX57..

RX57, M_{aDyn} Nm													69 Nm
	CMP												
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
1													
1.30	6.6	13	20	14	27	39	24	39	60	54	80	87	>90
1.48	7.5	15	22	16	31	44	28	45	68	61	>90	>90	>90
1.65	8.4	17	25	18	35	49	31	50	76	68	>90	>90	>90
1.92	9.8	19	29	21	40	57	36	58	88	79	>90	>90	>90
2.04	10	21	31	22	43	61	38	62	>90	84	>90	>90	>90
2.37	12	24	36	26	50	71	45	72	>90	>90			
2.64	13	27	40	29	55	79	50	80	>90	>90			
2.91	15	29	44	32	61		55						
3.14	16	32	47	34	66	>90	59	>90					
3.55	18	36	54	39	74		67						
3.79	19	38	57	41	79		71						
4.35	22	44		47									
5.07	26												
5.50	28												

(→ 190)

RX57, m kg													
	CMP												
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
1	13	14	14	15	16	18	18	19	22	24	26	33	50
RXF: + 1.9 kg													

CMP..				c_{TG}	
	i	n_{epk} min^{-1}	η %	RX Nm/'	RXF Nm/'
RX57 1	1.30	2483	98	4.2	4.2
	1.48	2827	98	4.2	4.2
	1.65	3151	98	4.2	4.2
	1.92	3667	98	4.2	4.2
	2.04	3896	98	4.2	4.2
	2.37	4500	98	4.2	4.2
	2.64	4500	98	4.2	4.2
	2.91	4500	98	4.2	4.2
	3.14	4500	98	4.2	4.2
	3.55	4500	98	4.2	4.2
	3.79	4500	98	4.2	4.2
	4.35	4500	98	4.2	4.2
	5.07	4500	98	4.2	4.2
	5.50	4500	98	4.2	4.2

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CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} RX N	F_{Ramax} RXF N	F_{Rapk} RX N	F_{Rapk} RXF N
	1.30	63	90	107	1154	1.9	132	132	3940	3940
	1.48	68	90	116	1014	1.4	112	112	3950	3950
	1.65	69	90	117	1091	1.2	430	430	3960	3960
	1.92	69	90	117	1250	0.94	880	880	3970	3970
	2.04	69	90	117	1324	0.85	1070	1070	3970	3970
	2.37	69	90	117	1477	0.64	1500	1500	3980	3980
RX57	2.64	69	90	117	1629	0.55	1810	1810	3980	3980
1	2.91	67	90	114	1856	0.44	2170	2170	3980	3980
	3.14	65	90	111	2197	0.42	2320	2320	3990	3990
	3.55	69	90	117	1972	0.35	2420	2420	3990	3990
	3.79	69	90	117	1847	0.32	2480	2480	3990	3990
	4.35	68	90	116	1609	0.26	2640	2640	4000	4000
	5.07	36	54	61	1381	0.21	3030	3030	4210	4210
	5.50	39	58	66	1273	0.18	3100	3100	4190	4190

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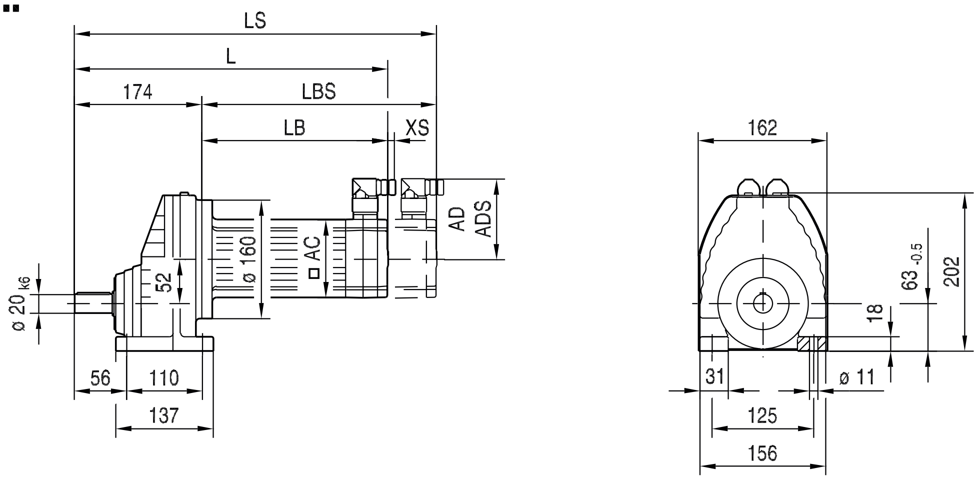
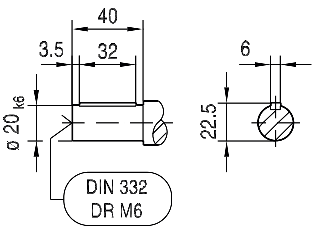
RX57..





(→ 🗎 194)	CMP..											
	50S	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**100S**
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	313	352	391	347	397	447	340	365	415	380	418	416
LS	342	381	420	376	426	476	405	430	480	458	496	512
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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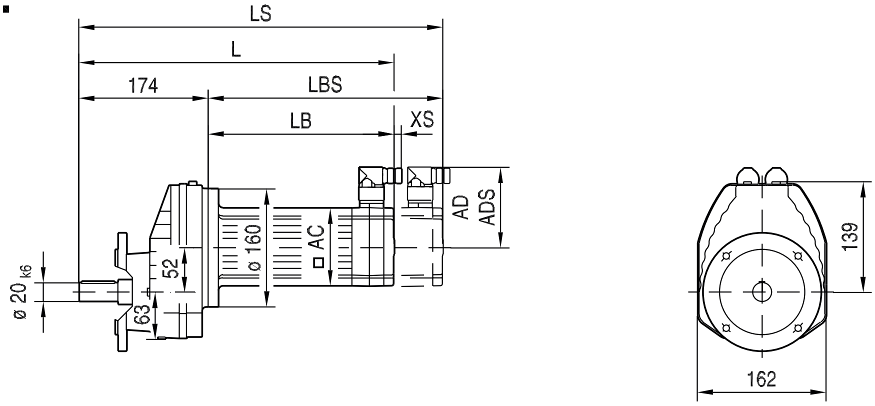
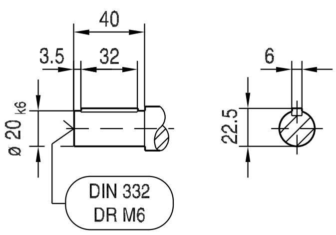
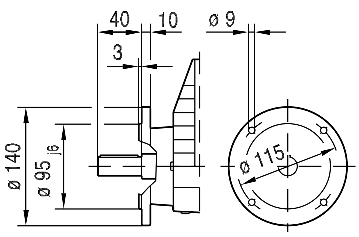
01 014 02 07

RXF57..

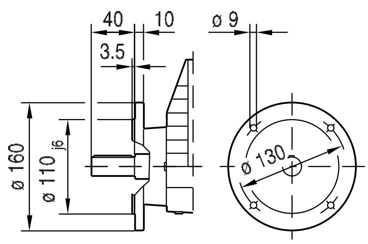




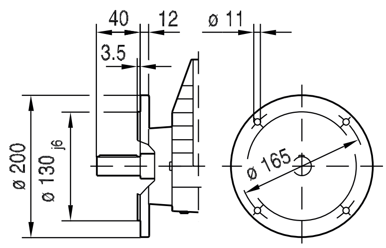
ø 140



ø 160



ø 200



(→ 🗎 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	313	352	391	347	397	447	340	365	415	380	418	416
LS	342	381	420	376	426	476	405	430	480	458	496	512
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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8.2.2 RX67..

RX67, M_{aDyn} Nm													134 Nm
	CMP												
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
	1												
1.40		14	21	15	30	42	27	43	65	58	87	95	114
1.61	8.3	16	25	18	34	48	31	49	75	67	100	109	131
1.86	9.6	19	28	20	39	56	35	57	86	78	115	126	151
2.04	11	21	31	22	43	61	39	62	95	85	126	138	166
2.40	12	24	37	26	51	72	46	73	111	100	149	162	>163
2.54	13	26	39	28	54	76	48	77	118	106	157	>162	>162
2.89	15	29	44	31	61	86	54	87	133	119			
3.20	16	32	48	35	67	95	60	97	>142	132			
3.77	19	38	57	41	79	112	71	114					
4.30	22	43	65	47	90		81						
4.53	23	46	68	49	95		85						
5.18	26	52		56									
6.07	31												

(→ 190)

RX67, m kg													
	CMP												
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
1	15	16	17	17	19	20	21	22	24	27	29	35	53
RXF: + 4.0 kg													

CMP..				c_{TG}	
		n_{epk}	η	RX	RXF
	i	min^{-1}	%	Nm/'	Nm/'
RX67 1	1.40	2507	99	8.1	8.1
	1.61	2883	99	8.1	8.1
	1.86	3330	99	8.1	8.1
	2.04	3653	99	8.1	8.1
	2.40	4297	99	8.1	8.1
	2.54	4500	99	8.1	8.1
	2.89	4500	98	8.1	8.1
	3.20	4500	98	8.1	8.1
	3.77	4500	98	8.1	8.1
	4.30	4500	98	8.1	8.1
	4.53	4500	98	8.1	8.1
	5.18	4500	98	8.1	8.1
	6.07	4500	98	8.1	8.1

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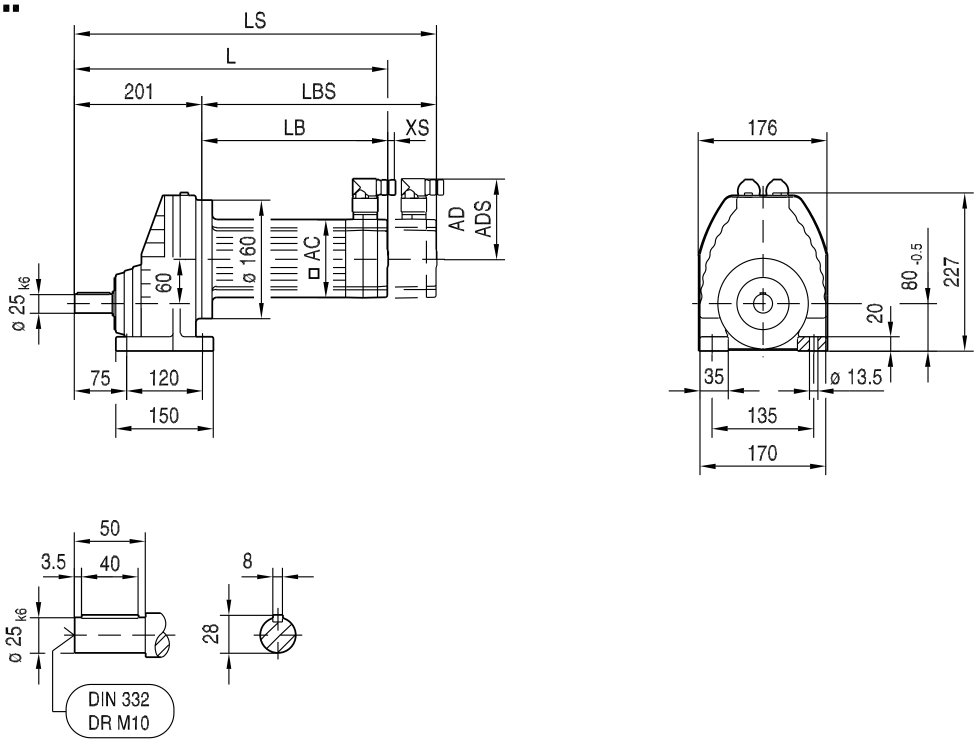
CMP..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	RX	RXF	RX	RXF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N
RX67 1	1.40	104	156	177	1071	3.2	205	205	5450	5450
	1.61	114	171	194	932	2.6	245	245	5380	5380
	1.86	126	187	210	806	2.1	225	225	5300	5300
	2.04	134	186	225	735	1.8	230	230	5310	5310
	2.40	123	163	205	1125	1.4	1530	1530	5460	5460
	2.54	118	162	200	1339	1.3	2000	2000	5470	5470
	2.89	106	142	180	1972	1.0	2640	2640	5590	5590
	3.20	100	142	170	2188	0.88	2800	2800	5590	5590
	3.77	87	130	148	1857	0.69	3090	3090	5660	5660
	4.30	80	109	136	1628	0.47	3300	3300	5770	5770
	4.53	82	110	139	1545	0.42	3350	3350	5760	5760
	5.18	75	110	128	1351	0.34	3580	3580	5760	5760
	6.07	43	64	73	1153	0.28	4000	4000	5970	5970

01 015 00 07

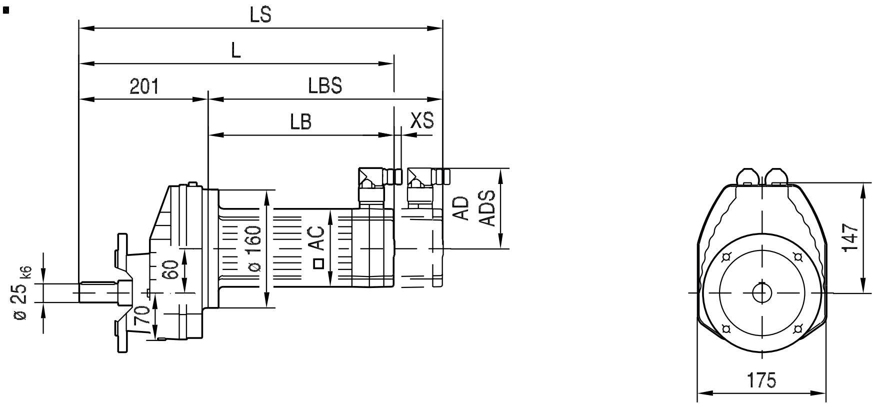
RX67..

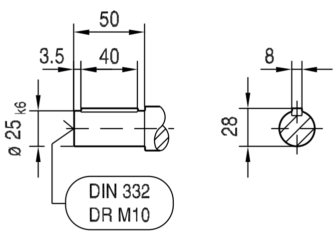


(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	340	379	418	374	424	474	367	392	442	407	445	443
LS	369	408	447	403	453	503	432	457	507	485	523	539
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

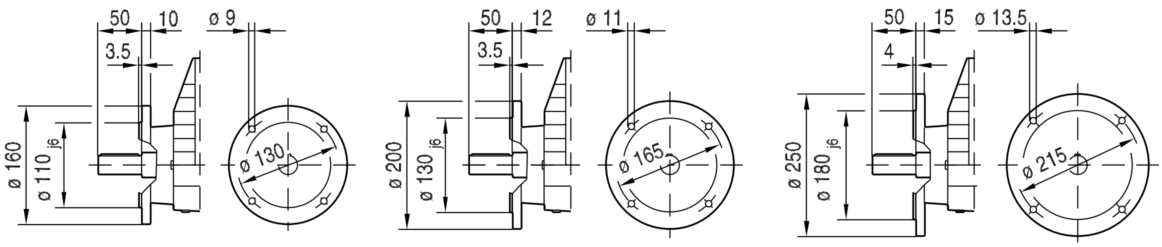
01 016 00 07

RXF67..





ø 160 **ø 200** **ø 250**



(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	340	379	418	374	424	474	367	392	442	407	445	443
LS	369	408	447	403	453	503	432	457	507	485	523	539
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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8.2.3 RX77..

RX77, M_{aDyn} Nm															215 Nm
	CMP														
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
								1							
1.42	15	30	42	27	43	65	59	87	149	95	150	>230	122	189	>230
1.67	18	35	50	32	51	78	70	103	177	113	179	>255	145	220	>255
1.88	21	40	57	36	57	87	78	117	199	127	200	>280	164	250	>280
2.13	23	45	64	40	65	99	89	132	225	144	225	>300	186	285	
2.43	27	51	73	46	74	113	101	151	255	164	255	>305	210	>305	
2.70	30	57	81	51	82	125	113	167		183					
3.08	34	65	93	59	94	143	128	191		205					
3.25	35	68	97	61	98	149	134	199		215					
3.70	40	78	110	70	112	170	153								
4.04	44	85	120	76	122	186	167								
4.73	51	99	141	89	143										
5.35	58	112		101											
5.63	61	118		106											
6.41	70														
7.47															
8.00															

(→ 🗎 190)

RX77, m kg															
	CMP														
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
1	26	28	29	31	32	35	36	38	42	43	47	56	62	70	86
RXF: + 2.3 kg															

CMP..				c_{TG}	
	i	n_{epk} min^{-1}	η %	RX Nm/'	RXF Nm/'
RX77 1	1.42	2164	98	17	17
	1.67	2545	99	17	17
	1.88	2865	99	17	17
	2.13	3246	99	17	17
	2.43	3703	99	17	17
	2.70	4114	99	17	17
	3.08	4500	99	17	17
	3.25	4500	98	17	17
	3.70	4500	98	17	17
	4.04	4500	98	17	17
	4.73	4500	98	17	17
	5.35	4500	98	17	17
	5.63	4500	98	17	17
	6.41	4500	98	17	17
	7.47	4500	97	17	17
	8.00	4500	97	17	17

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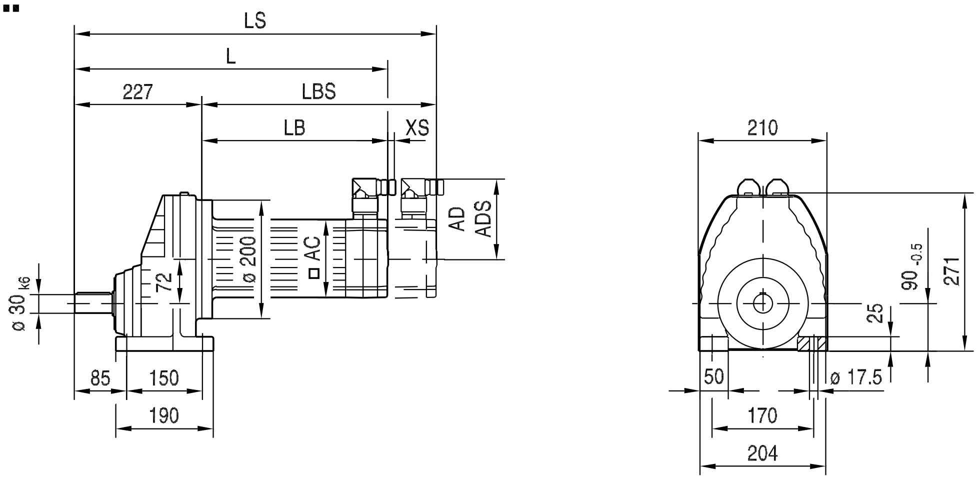
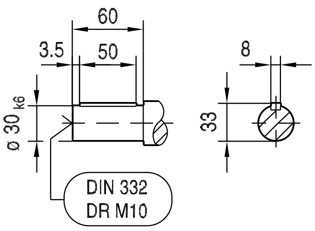
CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	F_{Ramax} RX N	F_{Ramax} RXF N	F_{Rapk} RX N	F_{Rapk} RXF N
RX77 1	1.42	155	230	260	1056	7.6	240	240	10000	10000
	1.67	173	255	290	898	6.0	240	240	10000	10000
	1.88	187	280	315	798	5.0	255	255	10000	10000
	2.13	200	300	340	704	4.1	360	360	10000	10000
	2.43	215	305	365	658	3.4	425	425	10000	10000
	2.70	215	285	365	741	3.0	1030	1030	10000	10000
	3.08	193	260	325	1104	2.5	2490	2490	10000	10000
	3.25	182	260	305	1385	2.3	3140	3140	10000	10000
	3.70	153	215	260	1892	1.9	4280	4280	10000	10000
	4.04	143	210	240	1733	1.6	4490	4490	10000	10000
	4.73	123	184	205	1480	1.3	4890	4890	10000	10000
	5.35	103	154	175	1308	0.90	5240	5240	10000	10000
	5.63	110	165	187	1243	0.81	5300	5300	10000	10000
	6.41	103	154	175	1092	0.66	5600	5600	10000	10000
	7.47	53	79	90	937	0.53	6200	6200	10000	10000
	8.00	57	85	97	875	0.46	6330	6330	10000	10000

01 017 01 07

RX77..





(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	394	444	494	385	410	460	425	459	527	457	497	577	574	617	705
LS	423	473	523	450	475	525	503	537	605	553	593	673	686	729	817
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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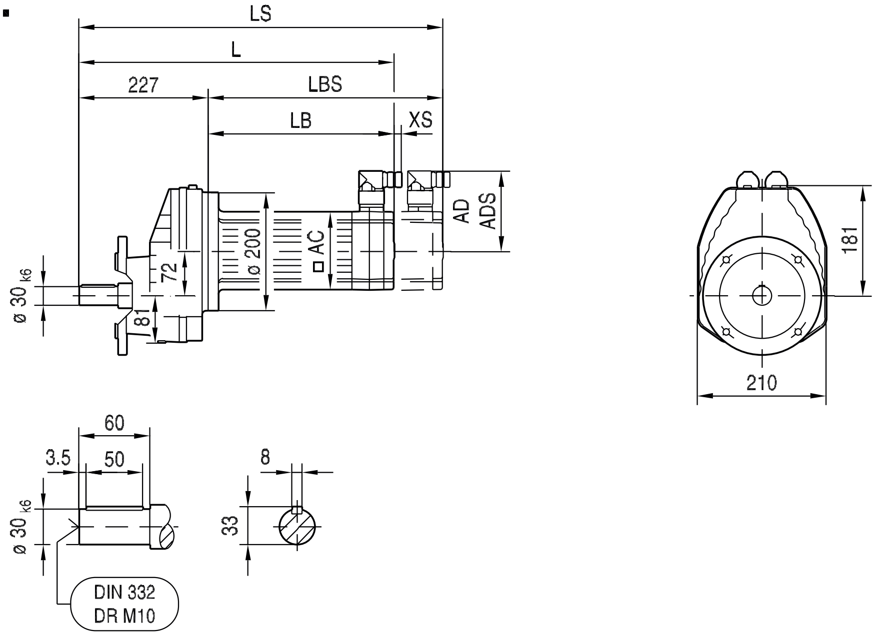
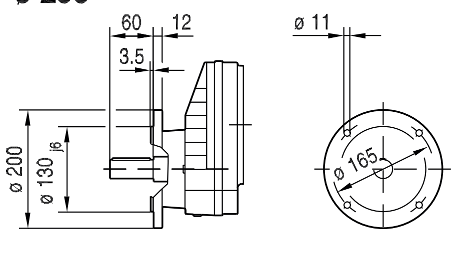
01 018 02 07

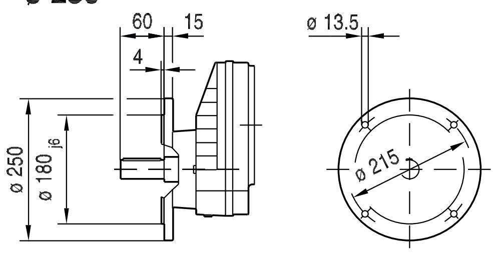
RXF77..



ø 200



ø 250



(→ 194)	CMP..														
	63S	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	394	444	494	385	410	460	425	459	527	457	497	577	574	617	705
LS	423	473	523	450	475	525	503	537	605	553	593	673	686	729	817
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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8.2.4 RX87

RX87, M_{aDyn} Nm														405 Nm
	CMP													
i	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
							1							
1.39					85	146	93	147	240	120	185	305	365	>435
1.60		49	74	67	99	169	108	171	280	139	215	355	425	>470
1.93		59	90	80	120	200	131	205	340	168	255	425	515	>530
2.15	41	66	100	90	133	225	145	225	380	187	285	475	>540	>540
2.48	47	76	115	103	154	260	168	265	435	215	330	>540	>540	
2.76	52	84	128	115	171	290	187	295	485	240	370	>535	>535	
3.09	59	94	143	129	191	325	205	330	>540	265	415			
3.48	66	106	162	145	215	365	235	370	>540	300	465			
3.78	71	114	174	156	230		250							
4.50	85	136	205	186	275		300							
5.07	95	153	230	205										
5.56	105	168	255	225										
6.45	121	195												
7.20	135													
7.63	144													
8.65														

(→ 🗎 190)

RX87, m kg														
	CMP													
s	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
1	48	49	51	54	56	60	58	62	71	78	86	100	110	120
RXF: + 5.0 kg														

CMP..				c_{TG}	
	i	n_{epk} min⁻¹	η %	RX Nm/'	RXF Nm/'
RX87 1	1.39	2170	98	34	34
	1.60	2498	99	34	34
	1.93	3013	99	34	34
	2.15	3356	99	34	34
	2.48	3871	99	34	34
	2.76	4308	99	34	34
	3.09	4500	99	34	34
	3.48	4500	99	34	34
	3.78	4500	98	34	34
	4.50	4500	98	34	34
	5.07	4500	98	34	34
	5.56	4500	98	34	34
	6.45	4500	98	34	34
	7.20	4500	98	34	34
	7.63	4500	98	34	34
	8.65	4500	98	34	34

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CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} RX N	F_{Ramax} RXF N	F_{Rapk} RX N	F_{Rapk} RXF N
RX87 1	1.39	290	435	490	1007	25	74	74	12700	12700
	1.60	315	470	535	875	19	74	74	12500	12500
	1.93	355	530	600	725	15	185	185	12300	12300
	2.15	385	540	655	651	13	42	42	12300	12300
	2.48	405	540	685	605	11	470	470	12300	12300
	2.76	405	535	685	652	9.4	1200	1200	12400	12400
	3.09	405	540	685	744	8.1	2030	2030	12400	12400
	3.48	405	540	685	805	6.9	2810	2810	12400	12400
	3.78	305	455	515	1852	6.2	5050	5050	12700	12700
	4.50	290	435	490	1556	4.8	5520	5520	12800	12800
	5.07	250	375	425	1381	3.9	5990	5990	13000	13000
	5.56	225	335	380	1259	3.4	6330	6330	13000	13000
	6.45	192	285	325	1085	2.7	6860	6860	13000	13000
	7.20	140	210	235	972	1.8	7380	7380	13000	13000
	7.63	149	220	250	917	1.6	7500	7500	13000	13000
	8.65	139	205	235	809	1.3	7890	7890	13000	13000

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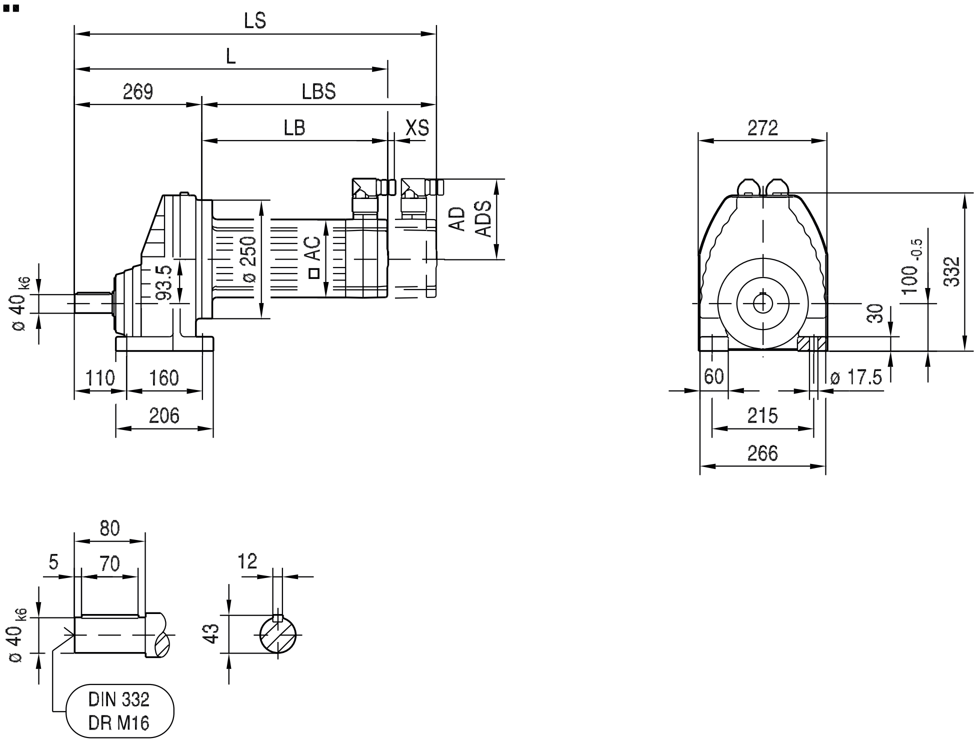
01 019 01 07

RX87..



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(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	423	448	498	462	496	564	494	534	614	611	654	742	785	828
LS	488	513	563	540	574	642	590	630	710	723	766	854	897	940
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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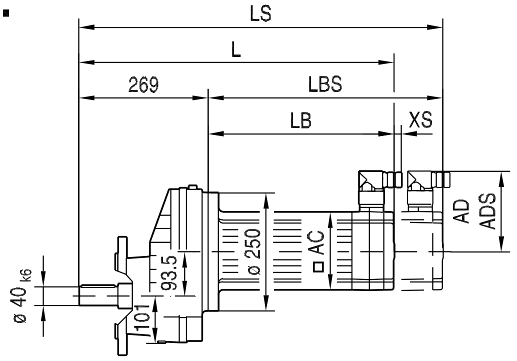
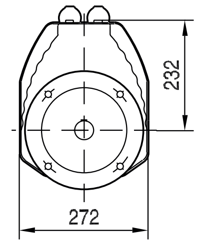
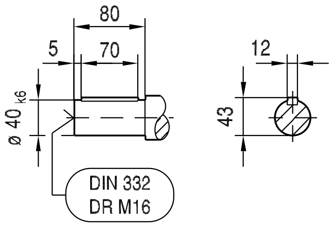
01 020 02 07

RXF87..







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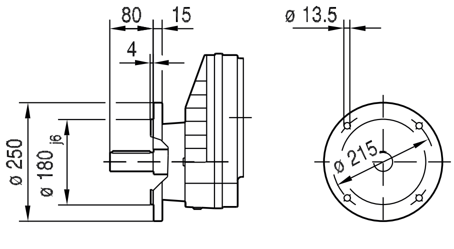
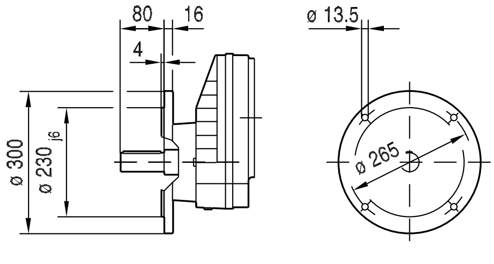


ø 300



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	423	448	498	462	496	564	494	534	614	611	654	742	785	828
LS	488	513	563	540	574	642	590	630	710	723	766	854	897	940
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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8.2.5 RX97..

RX97, M_{aDyn} Nm											595 Nm
	CMP										
i	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
1											
1.42		87	149	95	150	245	122	189	310	375	445
1.64		101	172	110	174	285	141	215	360	430	510
1.96		120	205	131	205	340	169	260	430	515	610
2.24	93	139	235	151	235	395	195	300	495	595	705
2.64	110	164	275	179	280	465	225	355	585	705	>800
2.92	122	181	305	197	310	515	250	390	650	780	>800
3.30	138	200	345	220	350	580	285	440	735	>800	
3.64	152	225	385	245	385	640	315	490	>800	>800	
4.04	168	250	425	270	430	715	350	540			
4.52	188	280	475	305	480	>800	390	605			
4.91	200	300		325							
5.79	235	355		385							
6.56	270										
7.16	295										
8.23											

(→ 190)

RX97, m kg											
	CMP										
s	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
1	78	80	84	86	90	99	100	110	125	135	145
RXF: + 8.6 kg											

CMP..				c_{TG}	
	i	n_{epk} min^{-1}	η %	RX Nm/'	RXF Nm/'
RX97 1	1.42	2187	98	58	58
	1.64	2526	98	58	58
	1.96	3019	98	58	58
	2.24	3450	99	58	58
	2.64	4066	99	58	58
	2.92	4497	99	58	58
	3.30	4500	99	58	58
	3.64	4500	99	58	58
	4.04	4500	99	58	58
	4.52	4500	99	58	58
	4.91	4500	98	58	58
	5.79	4500	98	58	58
	6.56	4500	98	58	58
	7.16	4500	98	58	58
	8.23	4500	98	58	58

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CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} RX N	F_{Ramax} RXF N	F_{Rapk} RX N	F_{Rapk} RXF N
RX97 1	1.42[1)]	455	680	770	986	61	132	132	20000	20000
	1.64[1)]	505	755	850	854	51	51	51	20000	20000
	1.96	570	800	960	714	41	19	19	20000	20000
	2.24	595	800	1010	670	33	545	545	20000	20000
	2.64	595	800	1010	795	28	2020	2020	20000	20000
	2.92	595	800	1010	856	24	2890	2890	20000	20000
	3.30	595	800	1010	909	20	3820	3820	20000	20000
	3.64	595	800	1010	962	18	4610	4610	20000	20000
	4.04	595	800	1010	1015	15	5450	5450	20000	20000
	4.52	595	800	1010	1062	13	6210	6210	20000	20000
	4.91	395	590	670	1426	12	7240	7240	20000	20000
	5.79	420	630	710	1209	9.2	7650	7650	20000	20000
	6.56	300	450	510	1067	5.8	8510	8510	20000	20000
	7.16	260	390	440	978	5.1	8960	8960	20000	20000
	8.23	225	335	380	851	4.0	9570	9570	20000	20000

1) (→ 190)

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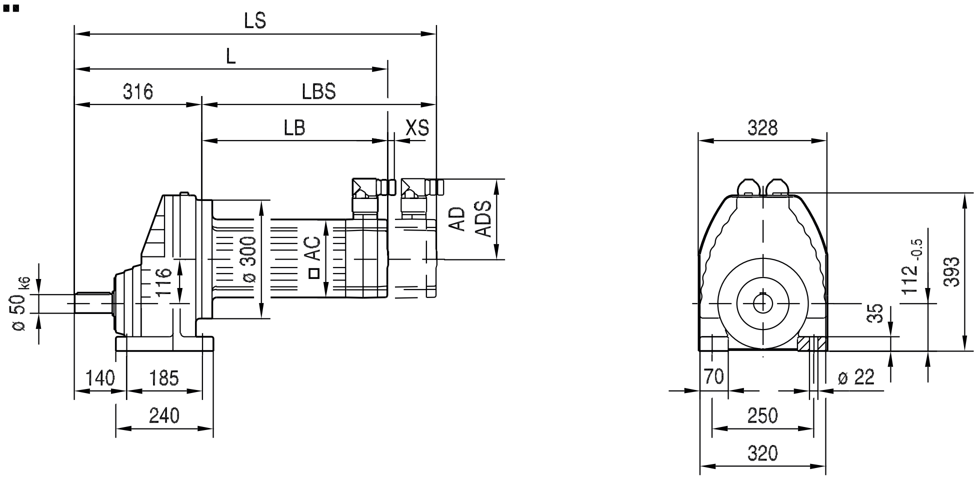
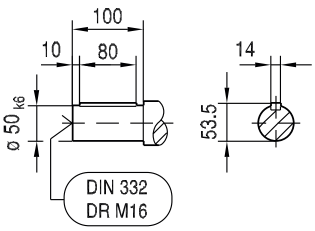
01 021 01 07

RX97..





(→ 🗎 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	503	537	605	536	576	656	653	696	784	827	870
LS	581	615	683	632	672	752	765	808	896	939	982
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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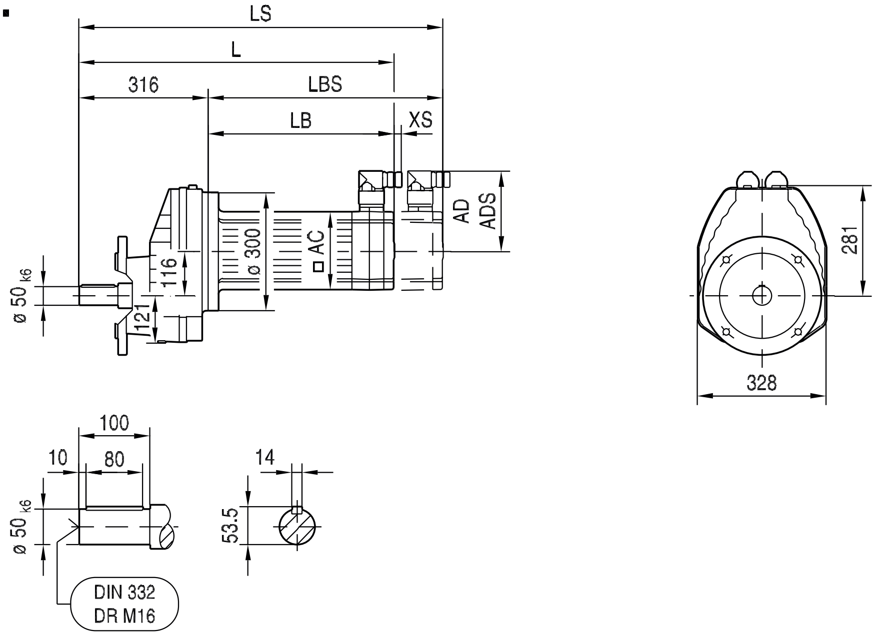
01 022 02 07

RXF97..



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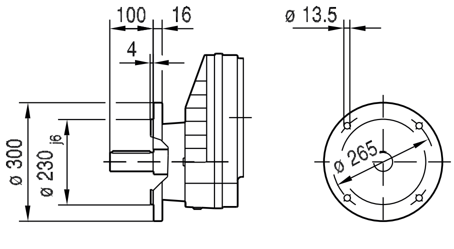
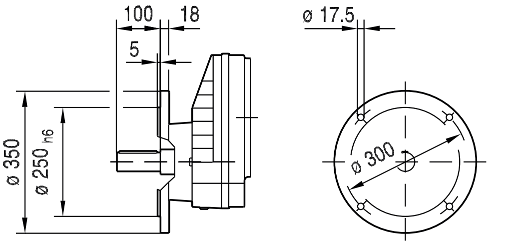


ø 350



(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	503	537	605	536	576	656	653	696	784	827	870
LS	581	615	683	632	672	752	765	808	896	939	982
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

8.2.6 RX107..

RX107, M_{aDyn} Nm									830 Nm
					CMP				
i	80L	100S	100M	100L	112S	112M	112L	112H	112E
					1				
1.44	151		152	250	124	192	315	380	450
1.71	179	114	181	295	147	225	375	450	535
1.95	200	131	205	340	168	255	425	515	610
2.30	240	154	240	400	198	305	505	605	720
2.64	275	179	280	465	225	355	585	705	830
3.07	325	205	325	540	265	410	680	820	970
3.38	355	225	360	595	290	455	750	900	1070
3.81	400	255	405	670	330	510	840	1010	
4.20	440	280	445	740	365	565	930	1120	
4.65	490	310	495	820	405	625			
5.19	545	350	550	910	450	695			
5.61		375							
6.63		440							

(→ 🗎 190)

RX107, m kg									
					CMP				
s	80L	100S	100M	100L	112S	112M	112L	112H	112E
1	115	120	125	130	135	140	155	165	175
RXF: + 17 kg									

CMP..				c_{TG}	
		n_{epk}	η	RX	RXF
	i	min^{-1}	%	Nm/'	Nm/'
RX107 1	1.44	2101	98	93	93
	1.71	2495	98	93	93
	1.95	2845	98	93	93
	2.30	3356	98	93	93
	2.64	3852	99	93	93
	3.07	4479	99	93	93
	3.38	4500	99	93	93
	3.81	4500	99	93	93
	4.20	4500	99	93	93
	4.65	4500	99	93	93
	5.19	4500	99	93	93
	5.61	4500	98	93	93
	6.63	4500	98	93	93

CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} RX N	F_{Ramax} RXF N	F_{Rapk} RX N	F_{Rapk} RXF N
RX107 1	1.44[1)]	645	960	1090	972	111	315	315	30000	30000
	1.71[1)]	705	1050	1190	819	84	345	345	30000	30000
	1.95	765	1090	1300	769	70	420	420	30000	30000
	2.30	830	1110	1410	696	57	760	760	30000	30000
	2.64	830	1120	1410	720	47	1850	1850	30000	30000
	3.07	830	1130	1410	814	39	3300	3300	30000	30000
	3.38	830	1130	1410	858	34	4190	4190	30000	30000
	3.81	830	1140	1410	919	29	5260	5260	30000	30000
	4.20	830	1150	1410	952	25	6140	6140	30000	30000
	4.65	695	1040	1180	1505	19	7380	7380	30000	30000
	5.19	695	1040	1180	1349	17	7780	7780	30000	30000
	5.61	455	680	770	1248	15	9040	9040	30000	30000
	6.63	460	690	780	1056	12	9660	9660	30000	30000

1) (→ 190)

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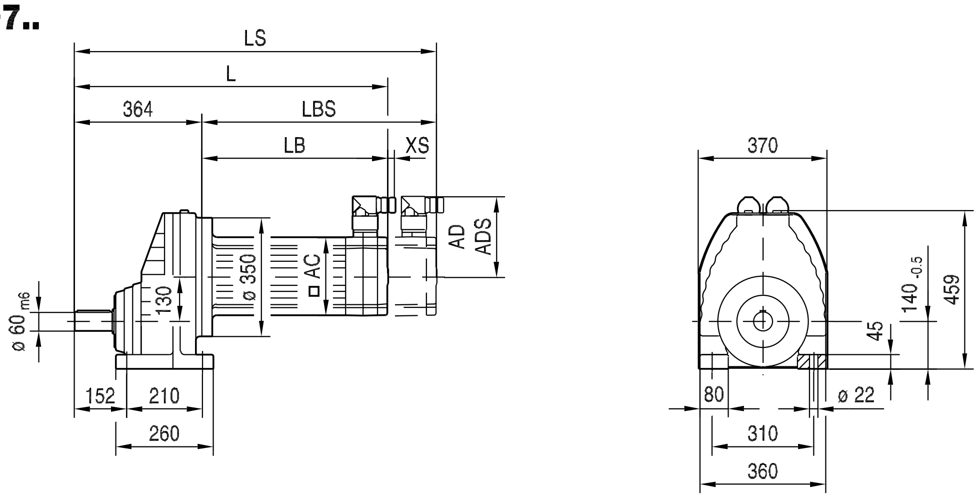
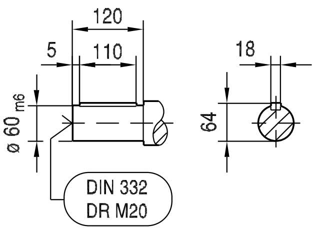
01 023 01 07

RX107..





(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	648	578	618	698	695	738	826	869	912
LS	726	674	714	794	807	850	938	981	1024
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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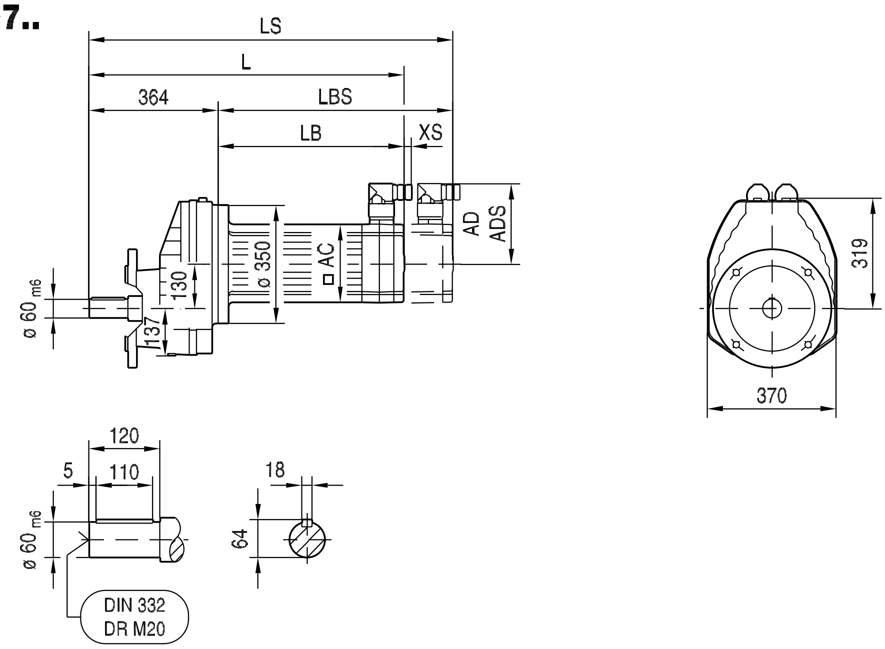
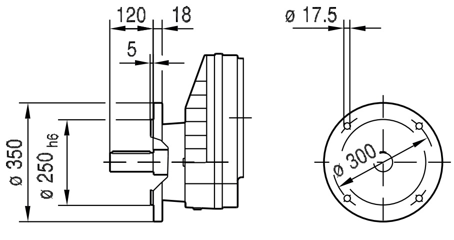
01 024 02 07

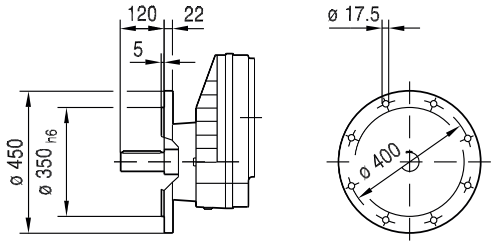
RXF107..



ø 350



ø 450



(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	648	578	618	698	695	738	826	869	912
LS	726	674	714	794	807	850	938	981	1024
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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8.3 R07–127..CMP.. selection tables and dimension sheets

8.3.1 R07..

R07, M_{aDyn} Nm	50 Nm
i	CMP 40M
2	
3.21	12
3.68	14
3.95	15
4.57	17
4.92	18
5.76	21
6.83	25
7.48	28
7.85	29
9.01	33
9.67	35
11.18	41
12.06	44
14.12	>51
16.73	>51
18.31	>51
3	
21.73	>51
23.32	>51
26.97	>51
29.08	>51
34.05	>51
38.51	>51
40.34	>51
41.31	>51
44.16	>51
47.78	>51
51.52	>51
60.32	>51
71.47	>51
78.24	>51

(→ 190)

R07, m kg	
s	CMP 40M
2	4.2
3	4.3
RF: + - kg	

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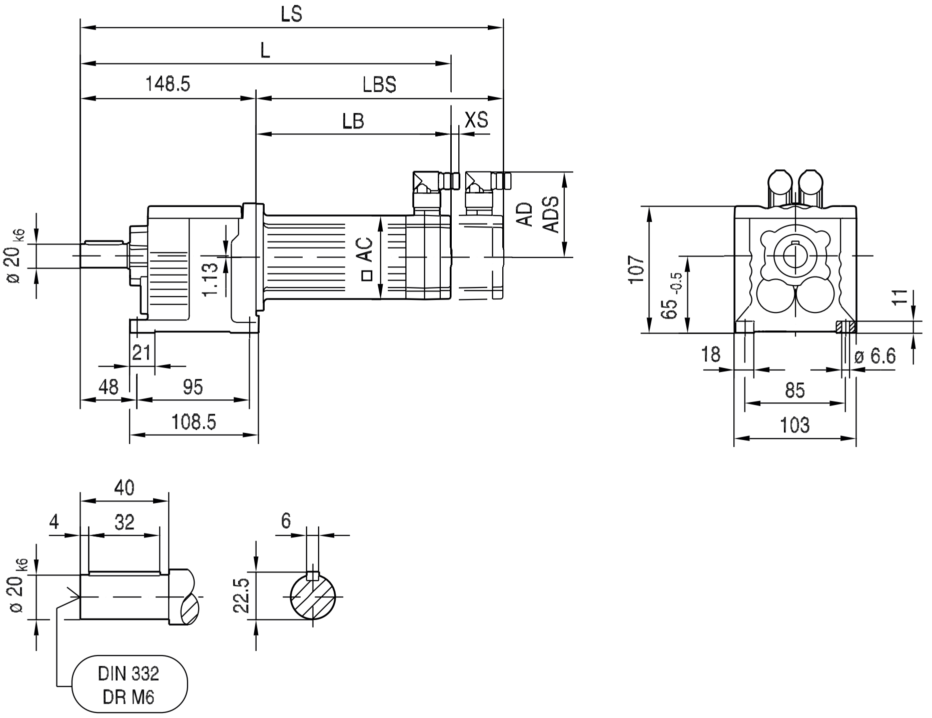
CMP..	i	n_{epk} min^{-1}	η %	c_{TG} R Nm/'	c_{TG} RF Nm/'
R07 2	3.21	3872	97	2.8	2.7
	3.68	4439	97	2.8	2.7
	3.95	4500	97	2.8	2.7
	4.57	4500	97	2.8	2.7
	4.92	4500	97	2.8	2.7
	5.76	4500	97	2.8	2.7
	6.83	4500	97	2.8	2.7
	7.48	4500	97	2.8	2.7
	7.85	4500	96	3.9	3.7
	9.01	4500	96	3.9	3.7
	9.67	4500	96	3.9	3.7
	11.18	4500	96	3.9	3.7
	12.06	4500	96	3.9	3.7
	14.12	4500	96	3.9	3.7
	16.73	4500	96	3.9	3.7
	18.31	4500	96	3.9	3.7
R07 3	21.73	4500	93	4.1	3.9
	23.32	4500	93	4.1	3.9
	26.97	4500	93	4.1	3.9
	29.08	4500	93	4.1	3.9
	34.05	4500	93	4.1	3.9
	38.51	4500	91	4.1	3.9
	40.34	4500	92	4.1	3.9
	41.31	4500	91	4.1	3.9
	44.16	4500	92	4.1	3.9
	47.78	4500	90	4.1	3.9
	51.52	4500	90	4.1	3.9
	60.32	4500	90	4.1	3.9
	71.47	4500	89	4.1	3.9
	78.24	4500	88	4.1	3.9

CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m^2	F_{Ramax} R N	F_{Ramax} RF N	F_{Rapk} R N	F_{Rapk} RF N
R07 2	3.21	31	46	53	561	0.24	495	415	1530	1250
	3.68	33	46	56	516	0.19	500	420	1530	1250
	3.95	34	46	58	506	0.17	505	425	1530	1250
	4.57	36	46	61	460	0.13	520	435	1530	1250
	4.92	37	46	63	427	0.12	530	445	1530	1250
	5.76	40	46	68	365	0.090	530	440	1530	1250
	6.83	43	46	73	307	0.070	535	450	1530	1250
	7.48	43	46	73	321	0.060	595	500	1530	1250
	7.85	49	51	83	166	0.20	645	585	1500	1220
	9.01	50	51	85	166	0.16	685	620	1500	1220
	9.67	50	51	85	165	0.14	710	645	1500	1220
	11.18	50	51	85	179	0.11	760	695	1500	1220
	12.06	50	51	85	182	0.10	790	720	1500	1220
	14.12	50	51	85	184	0.080	850	780	1500	1220
	16.73	50	51	85	191	0.060	920	840	1500	1220
	18.31	50	51	85	191	0.050	960	880	1500	1220

CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} R N	F_{Ramax} RF N	F_{Rapk} R N	F_{Rapk} RF N
R07 3	21.73	50	51	85	161	0.16	1040	950	1500	1220
	23.32	50	51	85	163	0.14	1080	980	1500	1220
	26.97	50	51	85	163	0.11	1150	1050	1500	1220
	29.08	50	51	85	162	0.10	1190	1080	1500	1220
	34.05	50	51	85	162	0.080	1270	1160	1500	1220
	38.51	50	51	85	171	0.14	1340	1220	1500	1220
	40.34	50	51	85	164	0.060	1370	1230	1500	1220
	41.31	50	51	85	169	0.13	1380	1230	1500	1220
	44.16	50	51	85	159	0.050	1420	1230	1500	1220
	47.78	50	51	85	147	0.10	1470	1230	1500	1220
	51.52	50	51	85	136	0.090	1510	1230	1500	1220
	60.32	50	51	85	116	0.070	1510	1230	1500	1220
	71.47	50	51	85	98	0.060	1510	1230	1500	1220
	78.24	50	51	85	89	0.050	1510	1230	1500	1220

01 025 00 07

R07..



R07F..

(→ 🗎 194)	CMP..							
	40M							
AC	57							
AD	78							
ADS	78							
L	284							
LS	314							
LB	136							
LBS	166							
XS	19							

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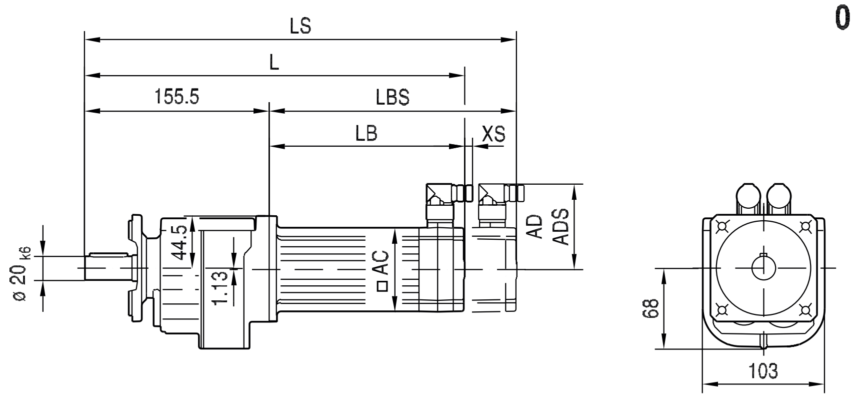
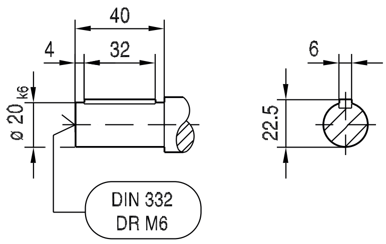
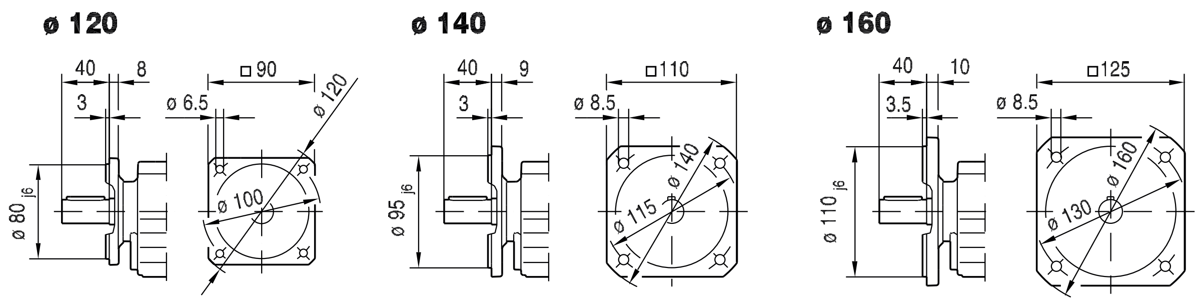
01 026 01 07

RF07..







(→ 194)	CMP..							
	40M							
AC	57							
AD	78							
ADS	78							
L	291							
LS	321							
LB	136							
LBS	166							
XS	19							

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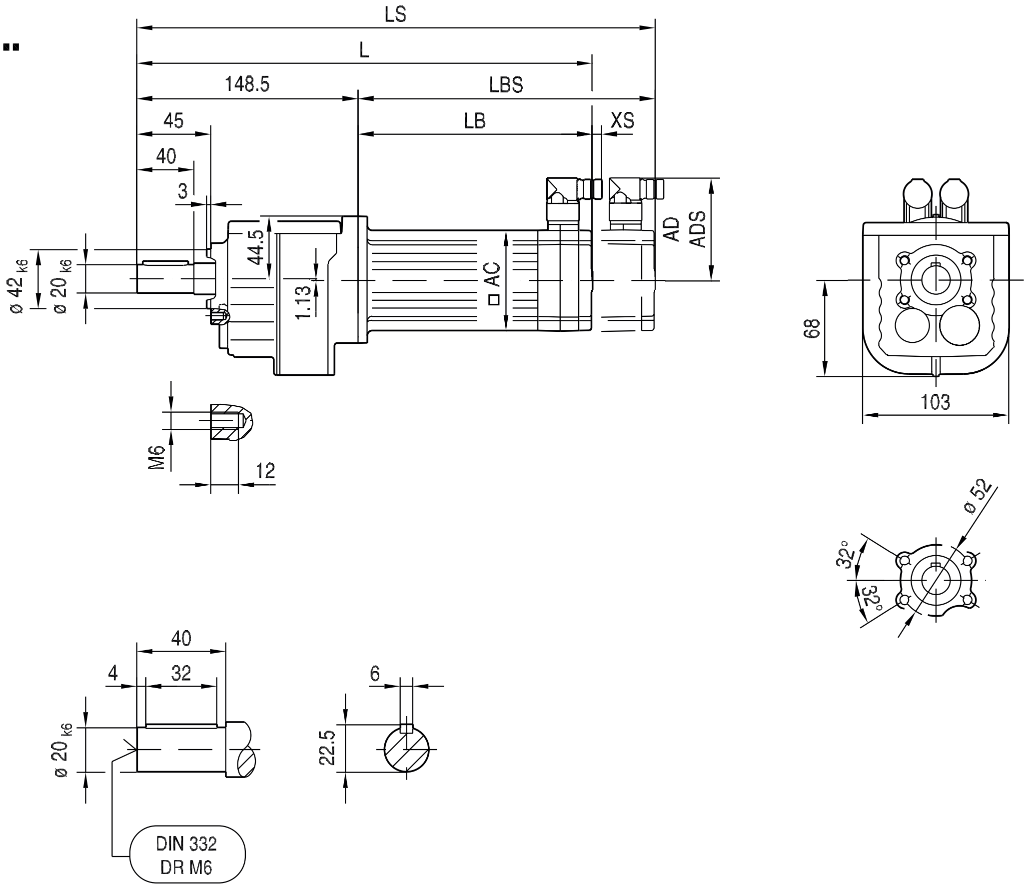
01 027 00 07

RZ07..



(→ 194)	CMP..							
	40M							
AC	57							
AD	78							
ADS	78							
L	284							
LS	314							
LB	136							
LBS	166							
XS	19							

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8.3.2 R17..

R17, M_{aDyn} Nm			85 Nm
		CMP	
i	50S	50M	63S
2			
3.83	19	38	41
4.51	23	45	49
5.09	26	51	55
5.76	29	58	>59
6.15	31	>57	>57
7.04	36	>58	>58
7.55	38	>59	>59
8.63	43	85	>86
10.15	51	>86	>86
11.45	57	>86	>86
12.98	65	>86	>86
13.84	69	>86	>86
15.84	79	>86	>86
16.99	85	>86	>86
19.71	>86	>86	>86
23.15	>86		
25.23	>86		
3			
24.07	>86	>86	>86
28.32	>86	>86	>86
31.94	>86	>86	>86
36.20	>86	>86	>86
38.61	>86	>86	>86
44.18	>86	>86	>86
47.44	>86	>86	>86
53.76	>86	>86	>86
57.35	>86	>86	>86
65.61	>86	>86	>86
70.39	>86	>86	>86
81.64	>86	>86	>86

(→ 190)

R17, m kg			
		CMP	
s	50S	50M	63S
2	6.8	8.2	9.2
3	7.1	8.5	9.5
RF: + -0.05 kg			

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CMP..	i	n_{epk} min^{-1}	η %	c_{TG} R Nm/'	c_{TG} RF Nm/'
R17 2	3.83	4500	97	3.0	3.0
	4.51	4500	97	3.0	3.0
	5.09	4500	97	3.0	3.0
	5.76	4500	97	3.0	3.0
	6.15	4500	97	3.0	3.0
	7.04	4500	97	3.0	3.0
	7.55	4500	97	3.0	3.0
	8.63	4500	96	4.4	4.3
	10.15	4500	96	4.4	4.3
	11.45	4500	96	4.4	4.3
	12.98	4500	96	4.4	4.3
	13.84	4500	96	4.4	4.3
	15.84	4500	96	4.4	4.3
	16.99	4500	96	4.4	4.3
	19.71	4500	96	4.4	4.3
	23.15	4500	96	4.4	4.3
	25.23	4500	96	4.4	4.3
R17 3	24.07	4500	93	4.6	4.4
	28.32	4500	93	4.6	4.4
	31.94	4500	93	4.6	4.4
	36.20	4500	93	4.6	4.4
	38.61	4500	93	4.6	4.4
	44.18	4500	93	4.6	4.4
	47.44	4500	92	4.6	4.4
	53.76	4500	92	4.6	4.4
	57.35	4500	92	4.6	4.4
	65.61	4500	92	4.6	4.4
	70.39	4500	91	4.6	4.4
	81.64	4500	91	4.6	4.4

CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m^2	F_{Ramax} R N	F_{Ramax} RF N	F_{Rapk} R N	F_{Rapk} RF N
R17 2	3.83	45	52	77	366	0.46	820	755	2500	2200
	4.51	48	54	82	310	0.35	870	795	2500	2200
	5.09	51	55	87	275	0.29	890	820	2500	2190
	5.76	53	59	90	243	0.24	930	860	2500	2180
	6.15	54	57	92	228	0.22	950	880	2500	2190
	7.04	55	58	94	227	0.18	1010	930	2500	2180
	7.55	56	59	95	225	0.16	1040	950	2500	2180
	8.63	72	86	122	162	0.39	1090	1000	1700	1510
	10.15	77	86	131	138	0.30	1140	1050	1700	1510
	11.45	81	86	138	122	0.26	1180	1080	1700	1510
	12.98	85	86	145	108	0.21	1230	1130	1700	1510
	13.84	85	86	145	108	0.20	1270	1160	1700	1510
	15.84	85	86	145	114	0.16	1350	1240	1700	1510
	16.99	85	86	145	112	0.15	1400	1280	1700	1510
	19.71	85	86	145	117	0.12	1500	1380	1700	1510
	23.15	85	86	145	117	0.090	1620	1480	1700	1510
	25.23	85	86	145	119	0.080	1680	1540	1700	1510

CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	F_{Ramax} R N	F_{Ramax} RF N	F_{Rapk} R N	F_{Rapk} RF N
R17 3	24.07	85	86	145	104	0.41	1650	1510	1700	1510
	28.32	85	86	145	106	0.32	1770	1560	1700	1510
	31.94	85	86	145	103	0.27	1770	1560	1700	1510
	36.20	85	86	145	105	0.22	1770	1560	1700	1510
	38.61	85	86	145	104	0.20	1770	1560	1700	1510
	44.18	85	86	145	104	0.17	1770	1560	1700	1510
	47.44	85	86	145	110	0.25	1770	1560	1700	1510
	53.76	85	86	145	108	0.21	1770	1560	1700	1510
	57.35	85	86	145	108	0.19	1770	1560	1700	1510
	65.61	85	86	145	107	0.16	1770	1560	1700	1510
	70.39	85	86	145	99	0.14	1770	1560	1700	1510
	81.64	85	86	145	86	0.11	1770	1560	1700	1510

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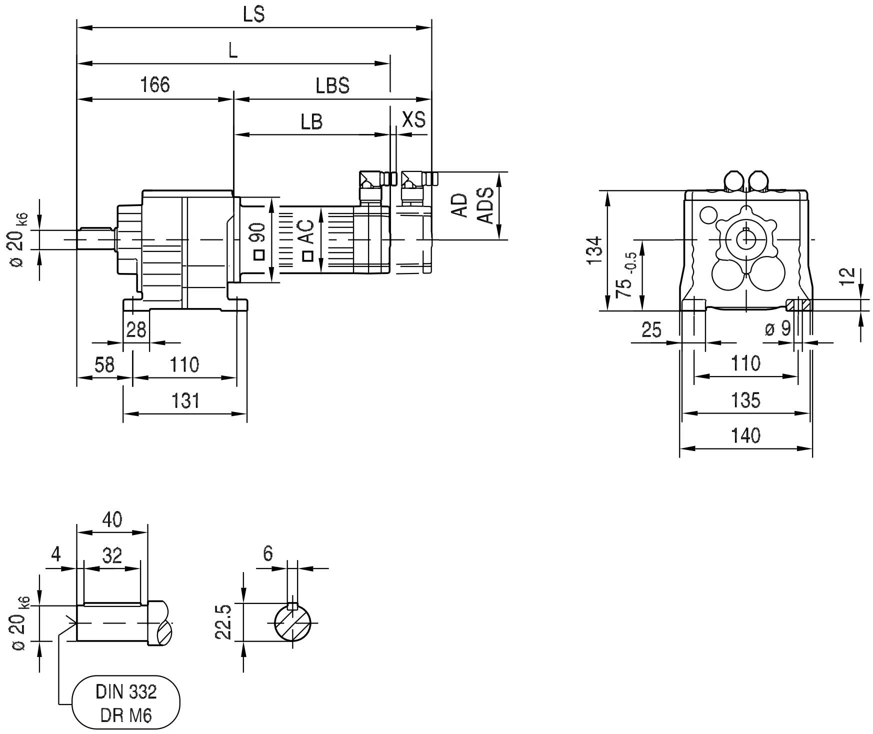
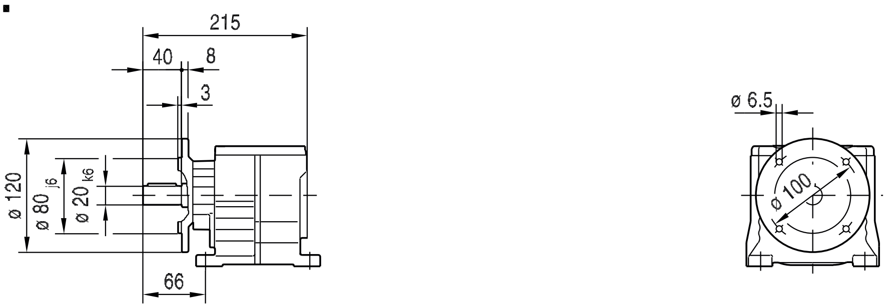
01 028 00 07

R17..



R17F..



(→ 194)	CMP..							
	50S	50M	63S					
AC	73	73	88					
AD	86	86	92					
ADS	86	86	92					
L	304	343	322					
LS	333	372	351					
LB	138	177	156					
LBS	167	206	185					
XS	18	18	14					

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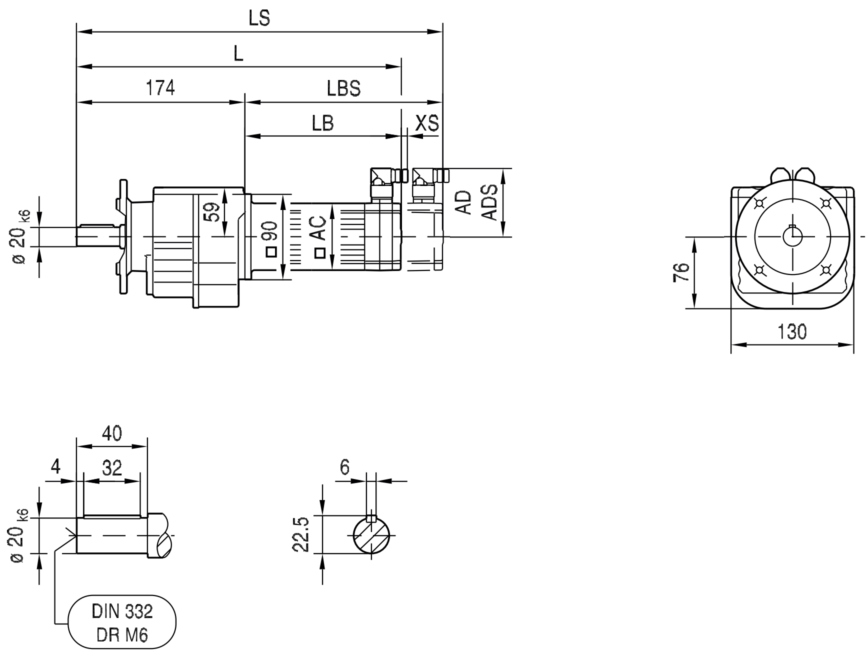
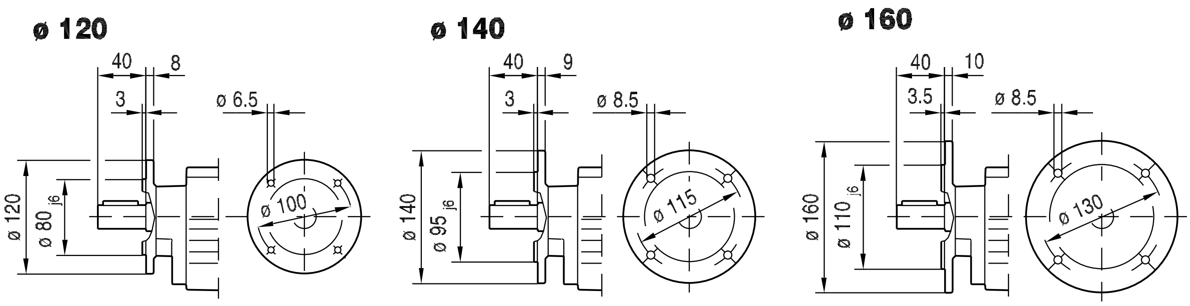
01 029 00 07

RF17..





(→ 194)	CMP..							
	50S	50M	63S					
AC	73	73	88					
AD	86	86	92					
ADS	86	86	92					
L	312	351	330					
LS	341	380	359					
LB	138	177	156					
LBS	167	206	185					
XS	18	18	14					

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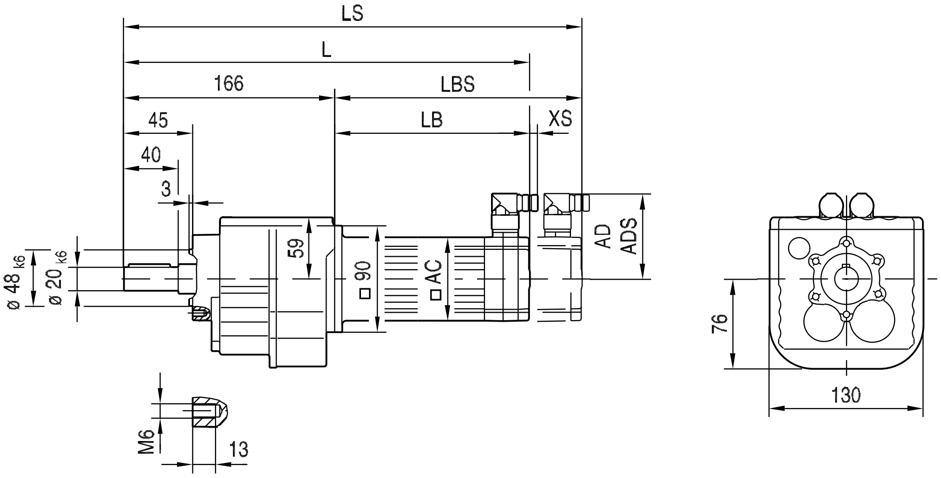
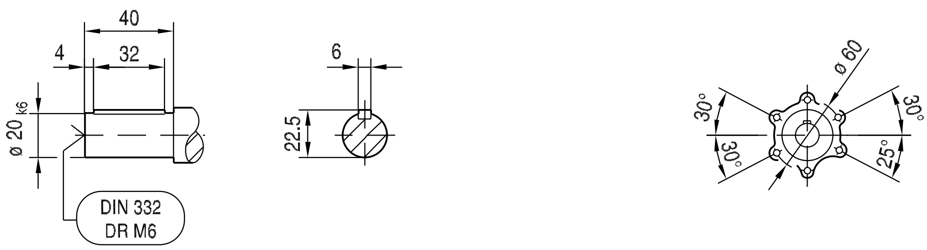
01 030 00 07

RZ17..





(→ 194)	CMP..							
	50S	50M	63S					
AC	73	73	88					
AD	86	86	92					
ADS	86	86	92					
L	304	343	322					
LS	333	372	351					
LB	138	177	156					
LBS	167	206	185					
XS	18	18	14					

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8.3.3 R27..

R27, M_{aDyn} Nm										130 Nm
					CMP						
i	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
					2						
3.37	12	17	34	50	36	70	99	63	101	>118	>118
4.00	15	20	40	60	43	83	118	74	120	>127	>127
4.27	16	22	43	64	46	89	126	80	128	>130	>130
5.00	18	25	50	75	54	104	>142	93	>142	>142	>142
5.60	21	28	56	84	60	116	>144	104	>144	>144	>144
6.59	24	33	66	98	71	137	>145	123	>145		
7.63	28	38	76	114	82	>148		142			
8.16	30	41	82	122	88	>148		>148			
9.41	35	47	94		101						
10.13	37	51	101	>136	109	>136	>136	>136	>136	>136	>136
11.86	44	60	118	>136	128	>136	>136	>136	>136	>136	>136
13.28	49	67	133	>136	>136	>136	>136	>136	>136	>136	>136
15.63	58	79	>136	>136	>136	>136	>136	>136	>136		
18.08	67	91	>136	>136	>136	>136		>136			
19.35	71	98	>136	>136	>136	>136		>136			
22.32	82	113	>136		>136						
26.09	95	130									
28.37	103	>136									
					3						
24.47	87	120	>136	>136	>136	>136	>136	>136	>136	>136	>136
28.78	103	>136	>136	>136	>136	>136	>136	>136	>136	>136	>136
32.47	116	>136	>136	>136	>136	>136	>136	>136	>136	>136	>136
36.79	131	>136	>136	>136	>136	>136		>136			
39.25	>136	>136	>136	>136	>136	>136	>136	>136	>136		
44.90	>136	>136	>136	>136	>136	>136		>136			
48.17	>136	>136	>136	>136	>136	>136		>136			
55.87	>136	>136	>136		>136						
61.30	>136	>136	>136	>136	>136	>136	>136	>136	>136	>136	>136
69.47	>136	>136	>136	>136	>136	>136		>136			
74.11	>136	>136	>136	>136	>136	>136	>136	>136	>136		
84.78	>136	>136	>136	>136	>136	>136		>136			
90.96	>136	>136	>136	>136	>136	>136		>136			
105.49	>136	>136	>136		>136						
123.91	>136	>136									
135.09	>136	>136									

(→ 190)

R27, m kg											
					CMP						
s	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
2	5.5	7.2	8.1	9.0	9.2	11	12	12	14	16	20
3	5.7	7.4	8.3	9.2	9.5	11	12	12	14	16	20

RF: + -0.05 kg

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CMP..				c_{TG}	
		n_{epk}	η	R	RF
	i	min^{-1}	%	Nm/'	Nm/'
	3.37	4500	97	7.2	7.1
	4.00	4500	97	7.2	7.1
	4.27	4500	97	7.2	7.1
	5.00	4500	97	7.2	7.1
	5.60	4500	97	7.2	7.1
	6.59	4500	97	7.2	7.1
	7.63	4500	97	7.2	7.1
	8.16	4500	97	7.2	7.1
R27	9.41	4500	97	7.2	7.1
2	10.13	4500	97	9.0	8.8
	11.86	4500	97	9.0	8.8
	13.28	4500	97	9.0	8.8
	15.63	4500	97	9.0	8.8
	18.08	4500	97	9.0	8.8
	19.35	4500	97	9.0	8.8
	22.32	4500	97	9.0	8.8
	26.09	4500	96	9.0	8.8
	28.37	4500	96	9.0	8.8
	24.47	4500	94	9.0	8.8
	28.78	4500	94	9.0	8.8
	32.47	4500	94	9.0	8.8
	36.79	4500	94	9.0	8.8
	39.25	4500	94	9.0	8.8
	44.90	4500	94	9.0	8.8
	48.17	4500	94	9.0	8.8
R27	55.87	4500	94	9.0	8.8
3	61.30	4500	92	9.1	8.8
	69.47	4500	92	9.1	8.8
	74.11	4500	92	9.1	8.8
	84.78	4500	92	9.1	8.8
	90.96	4500	92	9.1	8.8
	105.49	4500	92	9.1	8.8
	123.91	4500	91	9.1	8.8
	135.09	4500	91	9.1	8.8

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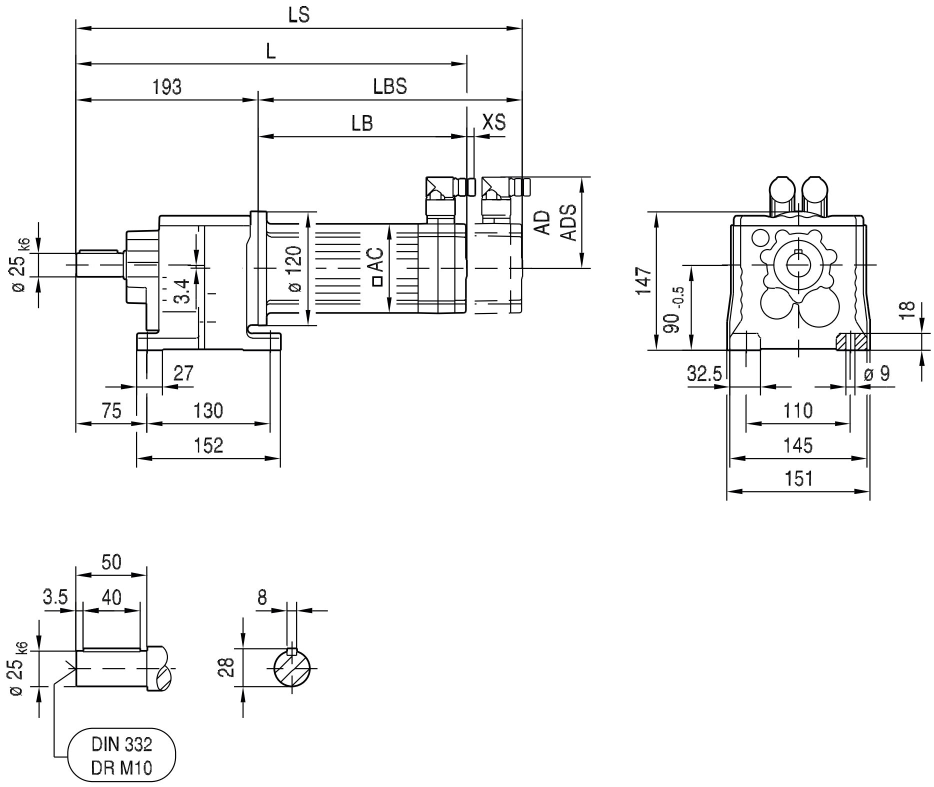
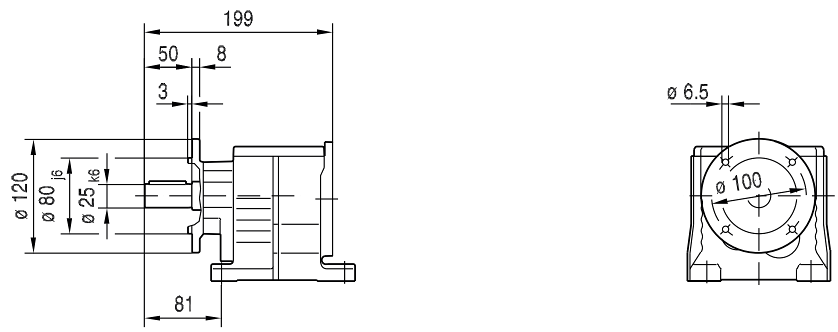
CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	F_{Ramax} R N	F_{Ramax} RF N	F_{Rapk} R N	F_{Rapk} RF N
	3.37	79	118	134	415	1.1	900	790	4290	3690
	4.00	85	127	145	350	0.85	900	800	4250	3660
	4.27	87	130	148	328	0.76	920	810	4230	3640
	5.00	95	142	162	280	0.58	860	760	4180	3590
	5.60	99	144	168	250	0.48	880	775	4170	3580
	6.59	106	145	180	212	0.36	880	775	4160	3580
	7.63	112	148	190	183	0.29	900	795	4150	3570
	8.16	116	148	197	172	0.26	870	770	4150	3570
R27 2	9.41	122	149	205	149	0.21	900	795	4140	3560
	10.13	122	136	205	138	0.61	1890	1670	4210	3620
	11.86	129	136	215	118	0.47	1980	1750	4210	3620
	13.28	130	136	220	120	0.39	2140	1910	4210	3620
	15.63	130	136	220	122	0.29	2290	2170	4210	3620
	18.08	130	136	220	122	0.24	2440	2310	4210	3620
	19.35	130	136	220	124	0.22	2510	2380	4210	3620
	22.32	130	136	220	125	0.18	2660	2520	4210	3620
	26.09	130	136	220	126	0.14	2840	2690	4210	3620
	28.37	130	136	220	130	0.12	2940	2780	4210	3620
	24.47	130	136	220	98	0.49	2760	2620	4210	3620
	28.78	130	136	220	97	0.37	2950	2800	4210	3620
	32.47	130	136	220	99	0.31	3100	2940	4210	3620
	36.79	130	136	220	98	0.25	3260	3090	4210	3620
	39.25	130	136	220	97	0.22	3350	3170	4210	3620
	44.90	130	136	220	98	0.18	3530	3340	4210	3620
	48.17	130	136	220	98	0.16	3630	3430	4210	3620
R27 3	55.87	130	136	220	98	0.13	3840	3640	4210	3620
	61.30	130	136	220	106	0.26	3980	3640	4210	3620
	69.47	130	136	220	101	0.22	4180	3640	4210	3620
	74.11	130	136	220	94	0.20	4230	3640	4210	3620
	84.78	130	136	220	83	0.16	4230	3640	4210	3620
	90.96	130	136	220	77	0.15	4230	3640	4210	3620
	105.49	130	136	220	66	0.12	4230	3640	4210	3620
	123.91	130	136	220	56	0.090	4230	3640	4210	3620
	135.09	130	136	220	52	0.080	4230	3640	4210	3620

01 031 01 07

R27..



R27F..



(→ 🗎 194)	CMP..										
	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	336	338	377	416	373	423	476	365	393	440	405
LS	366	367	406	445	401	451	505	430	458	505	483
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

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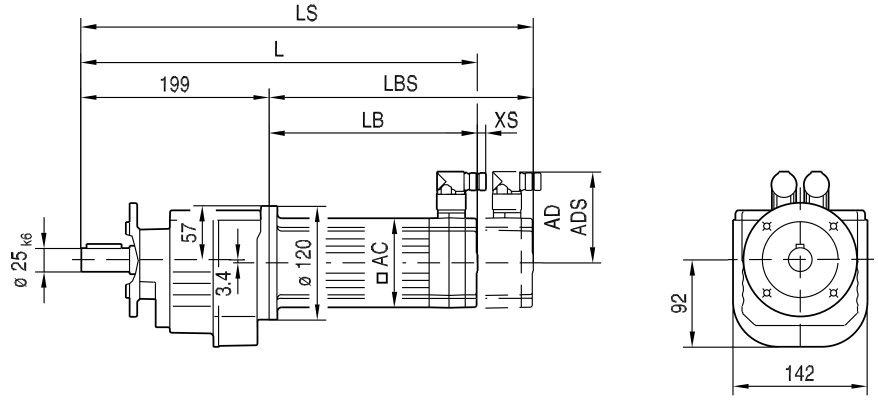
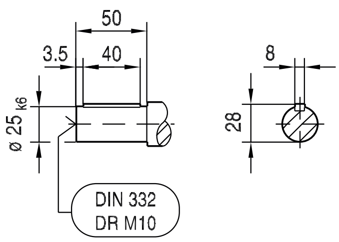
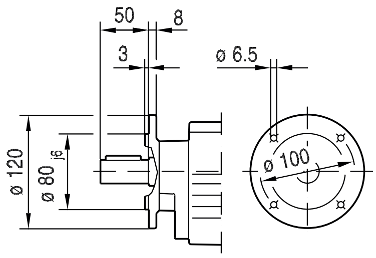
01 032 00 07

RF27..

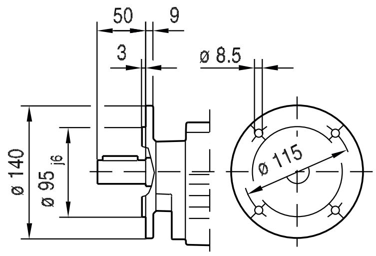




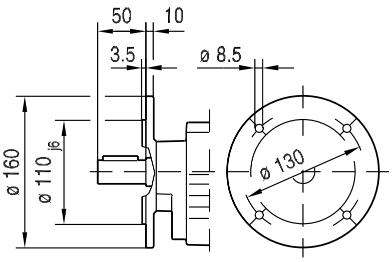
ø 120



ø 140



ø 160



(→ 194)	CMP..										
	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	342	344	383	422	379	429	482	371	399	446	411
LS	372	373	412	451	407	457	511	436	464	511	489
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

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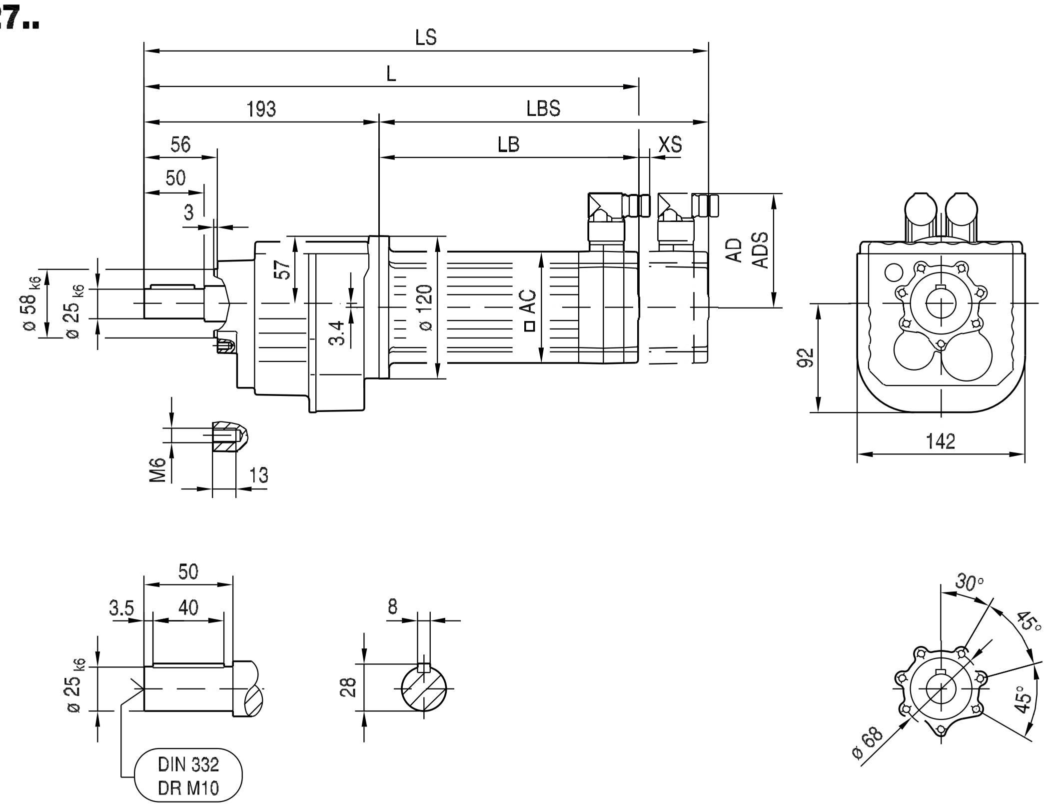
01 033 00 07

RZ27..



(→ 🗎 194)	CMP..										
	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	336	338	377	416	373	423	476	365	393	440	405
LS	366	367	406	445	401	451	505	430	458	505	483
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

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8.3.4 R37..

R37, M_{aDyn} Nm										200 Nm
	CMP										
i	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
2											
3.41	13	17	34	51	37	71	101	64	102	>147	139
4.05	15	20	40	60	44	84	119	75	121	>153	>153
4.32	16	22	43	65	47	90	127	80	129	>155	>155
5.06	19	26	51	76	54	105	149	94	151	>156	>156
5.67	21	29	57	85	61	118	>156	106	>156	>156	>156
6.67	25	34	67	100	72	138	>166	124	>166		
7.97	29	40	80	119	86	165	>205	148	>205	>205	>205
9.47	35	48	95	141	102	197	>205	176	>205	>205	>205
10.11	37	51	101	151	109	>205	>205	188	>205	>205	>205
11.83	44	60	118	177	127	>205	>205	>205	>205	>205	>205
13.25	49	67	132	198	143	>205	>205	>205	>205	>205	>205
15.60	58	79	156	>205	168	>205	>205	>205	>205		
18.05	67	91	180	>205	194	>205		>205			
19.31	71	97	193	>205	>205	>205		>205			
22.27	82	112	>205		>205						
26.03	96	131									
28.32	104	143									
3											
24.42	88	121	>205	>205	>205	>205	>205	>205	>205	>205	>205
28.73	104	142	>205	>205	>205	>205	>205	>205	>205	>205	>205
32.40	117	160	>205	>205	>205	>205	>205	>205	>205	>205	>205
36.72	133	181	>205	>205	>205	>205		>205			
39.17	141	193	>205	>205	>205	>205	>205	>205	>205		
44.81	162	>205	>205	>205	>205	>205		>205			
48.08	174	>205	>205	>205	>205	>205		>205			
55.76	200	>205	>205		>205						
61.18	>205	>205	>205	>205	>205	>205	>205	>205	>205	>205	>205
69.33	>205	>205	>205	>205	>205	>205		>205			
73.96	>205	>205	>205	>205	>205	>205	>205	>205	>205		
84.61	>205	>205	>205	>205	>205	>205		>205			
90.77	>205	>205	>205	>205	>205	>205		>205			
105.28	>205	>205	>205		>205						
123.66	>205	>205									
134.82	>205	>205									

(→ 190)

R37, m kg											
	CMP										
s	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
2	11	13	14	15	15	17	18	18	19	22	26
3	12	13	14	15	15	17	18	18	20	22	26
RF: + 1.5 kg											

CMP..				c_{TG}		φ
		n_{epk}	η	R	RF	/R
	i	min^{-1}	%	Nm/'	Nm/'	'
R37 2	3.41	3587	97	9.7	9.5	14
	4.05	4261	97	9.7	9.5	13
	4.32	4500	97	9.7	9.5	13
	5.06	4500	97	9.7	9.5	13
	5.67	4500	97	9.7	9.5	12
	6.67	4500	97	9.7	9.5	12
	7.97	4500	97	13	12	8
	9.47	4500	97	13	12	8
	10.11	4500	97	13	12	8
	11.83	4500	97	13	12	8
	13.25	4500	97	13	12	8
	15.60	4500	97	13	12	8
	18.05	4500	97	13	12	8
	19.31	4500	97	13	12	7
	22.27	4500	97	13	12	7
	26.03	4500	97	13	12	7
	28.32	4500	97	13	12	7
R37 3	24.42	4500	95	13	12	9
	28.73	4500	95	13	12	9
	32.40	4500	95	13	12	9
	36.72	4500	95	13	12	9
	39.17	4500	95	13	12	9
	44.81	4500	95	13	12	9
	48.08	4500	95	13	12	9
	55.76	4500	95	13	12	9
	61.18	4500	94	13	13	8
	69.33	4500	94	13	13	8
	73.96	4500	94	13	13	8
	84.61	4500	93	13	13	8
	90.77	4500	93	13	13	8
	105.28	4500	93	13	13	8
	123.66	4500	93	13	13	8
	134.82	4500	93	13	13	8

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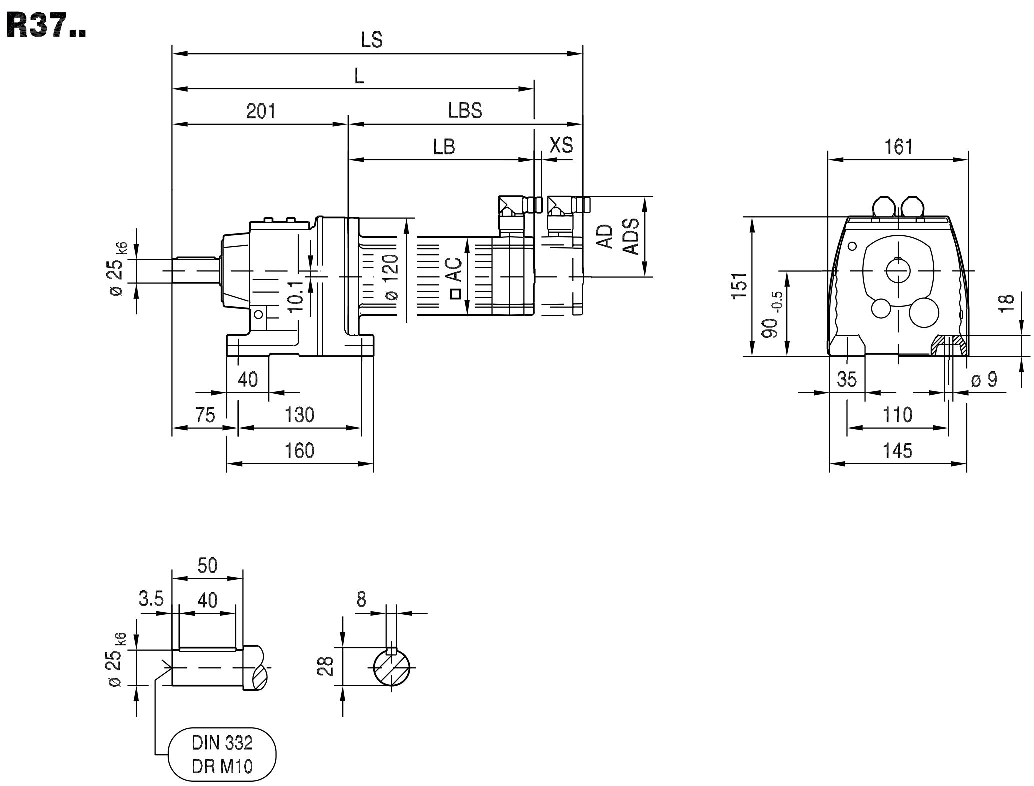
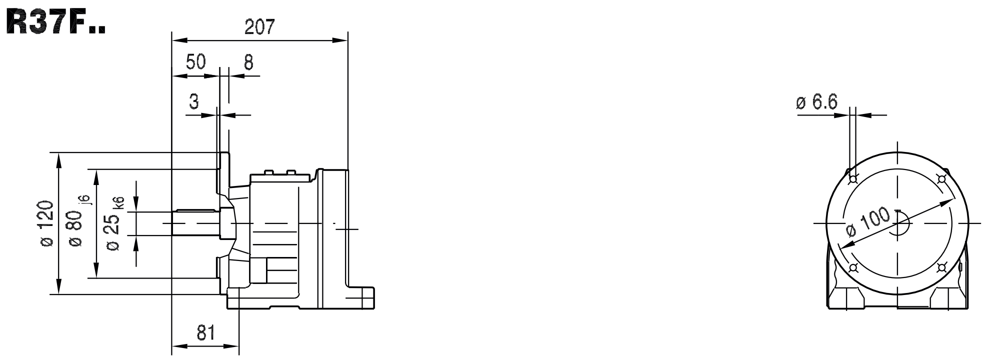
CMP..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	R	RF	R	RF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N
	3.41	112	147	190	411	1.4	900	800	5500	5500
	4.05	122	153	205	346	1.1	840	750	5440	5440
	4.32	126	155	210	324	0.95	820	725	5430	5430
	5.06	135	156	230	277	0.72	790	700	5420	5420
	5.67	142	156	240	247	0.59	760	675	5420	5420
	6.67	144	166	245	210	0.43	1000	890	5320	5320
	7.97	156	205	265	176	0.96	1720	1520	4880	4880
R37	9.47	167	205	280	148	0.74	1760	1560	4880	4880
2	10.11	170	205	285	138	0.66	1820	1620	4880	4880
	11.83	183	205	310	118	0.51	1810	1610	4880	4880
	13.25	190	205	320	106	0.43	1880	1670	4880	4880
	15.60	200	205	340	90	0.31	2010	1780	4880	4880
	18.05	200	205	340	94	0.26	2390	2120	4880	4880
	19.31	200	205	340	93	0.23	2570	2280	4880	4880
	22.27	200	205	340	99	0.19	2970	2640	4880	4880
	26.03	185	205	315	127	0.15	3860	3420	4880	4880
	28.32	200	205	340	99	0.13	3690	3270	4880	4880
	24.42	200	205	340	70	0.53	3240	2870	4880	4880
	28.73	200	205	340	70	0.39	3740	3310	4880	4880
	32.40	200	205	340	71	0.31	4120	3650	4880	4880
	36.72	200	205	340	71	0.25	4540	4020	4880	4880
	39.17	200	205	340	71	0.23	4760	4220	4880	4880
	44.81	200	205	340	71	0.19	4940	4640	4880	4880
	48.08	200	205	340	73	0.17	4940	4870	4880	4880
R37	55.76	200	205	340	74	0.13	4940	4940	4880	4880
3	61.18	200	205	340	75	0.26	4940	4940	4880	4880
	69.33	200	205	340	75	0.22	4940	4940	4880	4880
	73.96	200	205	340	76	0.20	4940	4940	4880	4880
	84.61	200	205	340	76	0.16	4940	4940	4880	4880
	90.77	200	205	340	76	0.15	4940	4940	4880	4880
	105.28	200	205	340	66	0.12	4940	4940	4880	4880
	123.66	200	205	340	57	0.090	4940	4940	4880	4880
	134.82	200	205	340	52	0.080	4940	4940	4880	4880

01 034 00 07





(→ 194)	CMP..										
	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	344	346	385	424	381	431	484	373	401	448	413
LS	374	375	414	453	409	459	513	438	466	513	491
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

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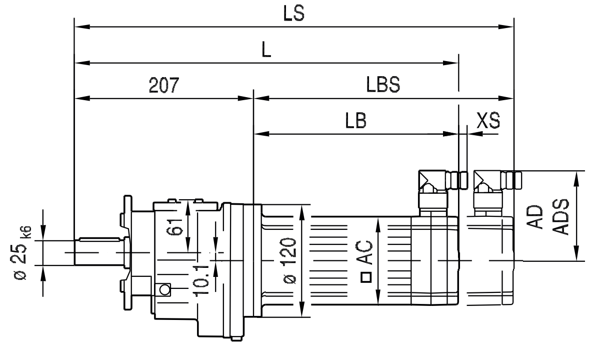
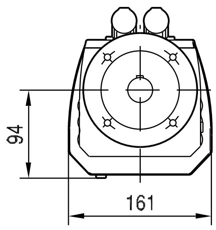
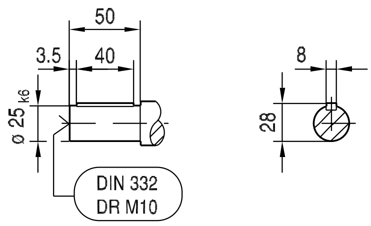
01 035 01 07

RF37..







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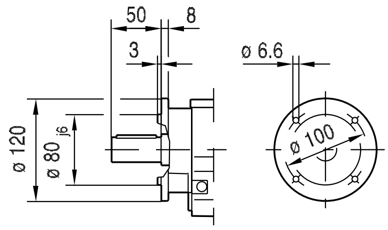
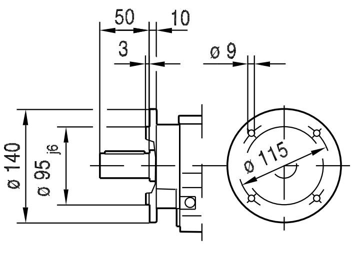
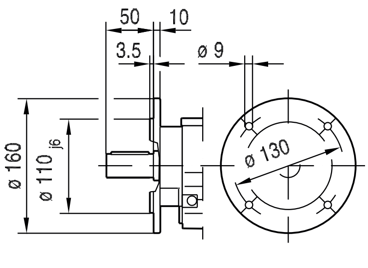


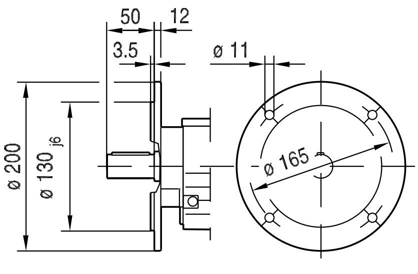
ø 140



ø 160



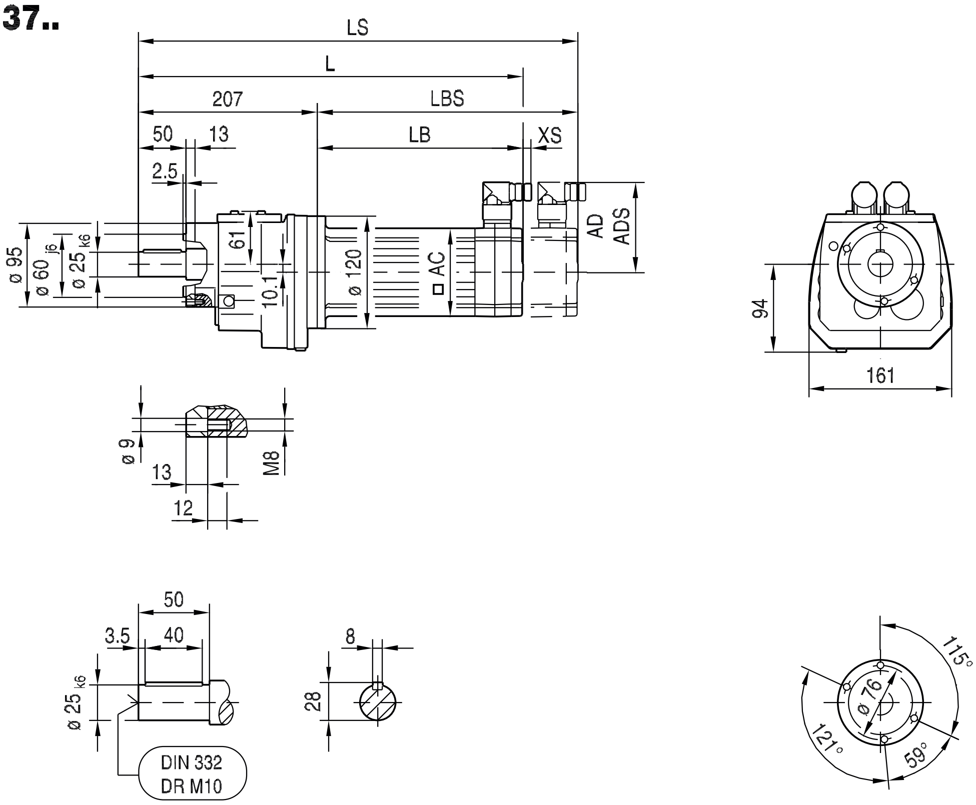
ø 200



(→ 🗎 194)	CMP..										
	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	350	352	391	430	387	437	490	379	407	454	419
LS	380	381	420	459	415	465	519	444	472	519	497
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

01 036 00 07

RZ37..



(→ 🗎 194)	CMP..										
	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	350	352	391	430	387	437	490	379	407	454	419
LS	380	381	420	459	415	465	519	444	472	519	497
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

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8.3.5 R47..

R47, M_{aDyn} Nm													300 Nm
	CMP												
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
2													
3.83	19	38	57	41	80	113	71	114	>166	156	>166	>166	>166
4.34	22	43	65	47	90	128	81	130	>170	>170	>170	>170	>170
4.85	24	48	72	52	101	143	90	145	>175	>175	>175	>175	>175
5.64	28	56	84	61	117	166	105	169	>180	>180	>180	>180	>180
6.00	30	60	90	65	125	177	112	179	>182	>182	>182	>182	>182
6.96	35	70	104	75	144	>187	130	>187	>187	>187			
7.76	39	78	116	84	161	>190	145	>190	>190	>190			
8.01	40	80	120	86	166	235	149	235	>300	>300	>300	>300	>300
9.07	46	91	135	98	188	265	169	270	>305	>305	>305	>305	>305
10.15	51	101	152	109	210	295	189	300	>305	>305	>305	>305	>305
11.79	59	118	176	127	240	>305	215	>305	>305	>305	>305	>305	>305
12.54	63	125	187	135	260	>305	230	>305	>305	>305	>305	>305	>305
14.56	73	145	215	157	300	>305	270	>305	>305	>305			
16.22	82	162	240	175	>305	>305	300	>305	>305	>305			
17.89	90	179	265	193	>305		>305						
19.27	97	193	285	205	>305	>305	>305	>305					
21.81	110	215	>305	230	>305		>305						
23.28	117	230	>305	250	>305		>305						
26.74	135	265		285									
31.12	157												
33.79	170												
3													
23.59	117	230	>305	245	>305	>305	>305	>305					
26.70	132	260	>305	280	>305	>305	>305	>305					
29.88	148	290	>305	>305	>305	>305	>305	>305					
34.73	172	>305	>305	>305	>305	>305	>305	>305					
36.93	182	>305	>305	>305	>305	>305	>305	>305					
42.87	210	>305	>305	>305	>305	>305	>305	>305					
47.75	235	>305	>305	>305	>305	>305	>305	>305					
52.69	260	>305	>305	>305	>305		>305						
56.73	280	>305	>305	>305	>305	>305	>305	>305					
64.21	>305	>305	>305	>305	>305		>305						
68.54	>305	>305	>305	>305	>305		>305						
76.23	>305	>305	>305	>305	>305		>305						
84.90	>305	>305	>305	>305	>305		>305						
93.68	>305	>305	>305	>305	>305		>305						
100.86	>305	>305	>305	>305	>305		>305						
114.17	>305	>305	>305	>305	>305		>305						
121.87	>305	>305	>305	>305	>305		>305						
139.99	>305	>305		>305									
162.94	>305												
176.88	>305												

(→ 190)

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R47, m kg													
	CMP												
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
2	16	17	18	18	20	21	22	23	25	28	30	36	54
3	17	18	19	19	20	22	22	24	26	28	31	37	54
RF: + 0.15 kg													

CMP..	i	n_{epk} min^{-1}	η %	c_{TG} R Nm/'	c_{TG} RF Nm/'	φ /R '
R47 2	3.83	3657	97	11	11	11
	4.34	4144	97	11	11	11
	4.85	4500	97	11	11	10
	5.64	4500	97	11	11	10
	6.00	4500	97	11	11	10
	6.96	4500	97	11	11	10
	7.76	4500	97	11	11	10
	8.01	4500	97	15	15	8
	9.07	4500	97	15	15	8
	10.15	4500	97	15	15	7
	11.79	4500	97	15	15	7
	12.54	4500	97	15	15	7
	14.56	4500	97	15	15	7
	16.22	4500	97	15	15	7
	17.89	4500	97	15	15	7
	19.27	4500	97	15	15	7
	21.81	4500	97	15	15	7
	23.28	4500	97	15	15	7
	26.74	4500	97	15	15	7
	31.12	4500	97	15	15	7
	33.79	4500	97	15	15	7
R47 3	23.59	4500	95	15	15	8
	26.70	4500	95	15	15	8
	29.88	4500	95	15	15	8
	34.73	4500	95	15	15	8
	36.93	4500	95	15	15	8
	42.87	4500	95	15	15	8
	47.75	4500	95	15	15	8
	52.69	4500	95	15	15	8
	56.73	4500	95	15	15	8
	64.21	4500	95	15	15	8
	68.54	4500	95	15	15	8
	76.23	4500	94	15	15	7
	84.90	4500	94	15	15	7
	93.68	4500	94	15	15	7
	100.86	4500	93	15	15	7
	114.17	4500	93	15	15	7
	121.87	4500	93	15	15	7
	139.99	4500	93	15	15	7
	162.94	4500	93	15	15	7
	176.88	4500	93	15	15	7

CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} R N	F_{Ramax} RF N	F_{Rapk} R N	F_{Rapk} RF N
R47 2	3.83	144	166	245	392	2.6	2080	2080	5960	5960
	4.34	146	170	245	415	2.0	2190	2190	5940	5940
	4.85	150	175	255	392	1.7	2280	2280	5930	5930
	5.64	155	180	260	372	1.3	2410	2410	5920	5920
	6.00	156	182	265	383	1.2	2470	2470	5910	5910
	6.96	159	187	270	374	0.93	2620	2620	5890	5890
	7.76	163	190	275	361	0.77	2720	2720	5880	5880
	8.01	205	300	345	200	2.0	2690	2690	5420	5420
	9.07	220	305	370	165	1.6	2780	2780	5390	5390
	10.15	230	305	390	158	1.3	2880	2880	5390	5390
	11.79	245	305	415	136	1.1	3020	3020	5390	5390
	12.54	250	305	425	128	0.95	3080	3080	5390	5390
	14.56	265	305	450	110	0.74	3230	3230	5390	5390
	16.22	275	305	465	99	0.63	3350	3350	5390	5390
	17.89	290	305	490	84	0.51	3390	3390	5390	5390
	19.27	295	305	500	83	0.48	3530	3530	5390	5390
	21.81	300	305	510	78	0.39	3710	3710	5390	5390
	23.28	300	305	510	82	0.36	3820	3820	5390	5390
	26.74	300	305	510	82	0.29	4050	4050	5390	5390
	31.12	220	305	370	212	0.23	4610	4610	5390	5390
	33.79	240	305	405	163	0.20	4680	4680	5390	5390
R47 3	23.59	300	305	510	85	1.7	3840	3840	5390	5390
	26.70	300	305	510	86	1.4	4050	4050	5390	5390
	29.88	300	305	510	84	1.2	4240	4240	5390	5390
	34.73	300	305	510	84	0.93	4520	4520	5390	5390
	36.93	300	305	510	84	0.85	4630	4630	5390	5390
	42.87	300	305	510	86	0.67	4930	4930	5390	5390
	47.75	300	305	510	86	0.56	5140	5140	5390	5390
	52.69	300	305	510	85	0.47	5350	5350	5390	5390
	56.73	300	305	510	85	0.44	5420	5420	5390	5390
	64.21	300	305	510	86	0.37	5420	5420	5390	5390
	68.54	300	305	510	86	0.33	5420	5420	5390	5390
	76.23	300	305	510	89	0.60	5420	5420	5390	5390
	84.90	300	305	510	82	0.52	5420	5420	5390	5390
	93.68	300	305	510	75	0.43	5420	5420	5390	5390
	100.86	300	305	510	69	0.41	5420	5420	5390	5390
	114.17	300	305	510	61	0.34	5420	5420	5390	5390
	121.87	300	305	510	57	0.31	5420	5420	5390	5390
	139.99	300	305	510	50	0.25	5420	5420	5390	5390
	162.94	300	305	510	43	0.20	5420	5420	5390	5390
	176.88	300	305	510	40	0.18	5420	5420	5390	5390

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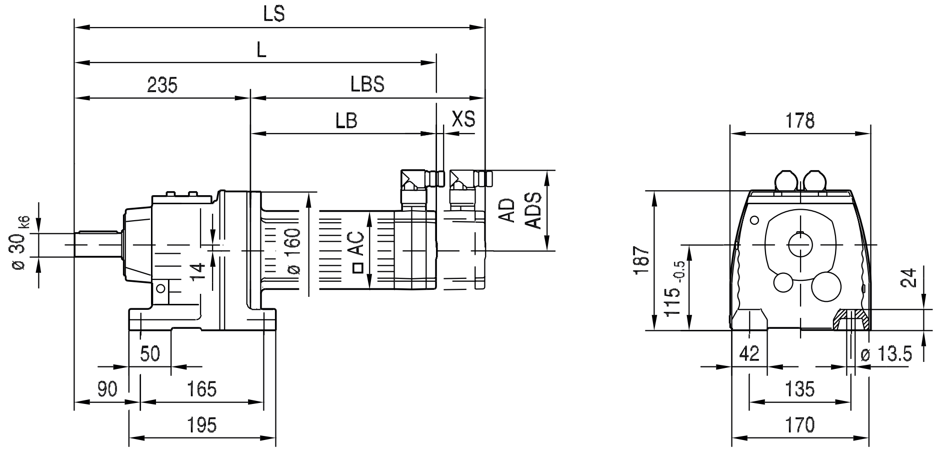
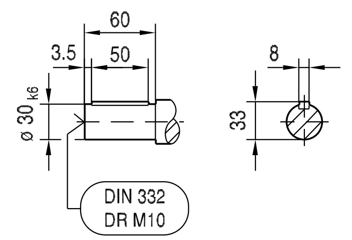
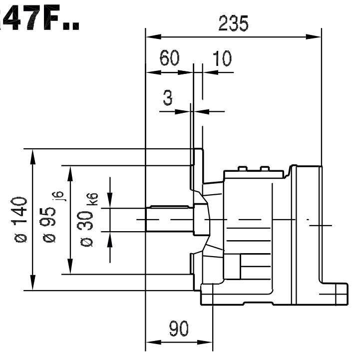
01 037 00 07

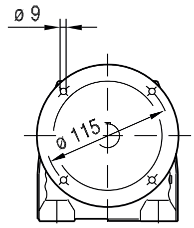
R47..





R47F..





(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	374	413	452	408	458	508	401	426	476	441	479	477
LS	403	442	481	437	487	537	466	491	541	519	557	573
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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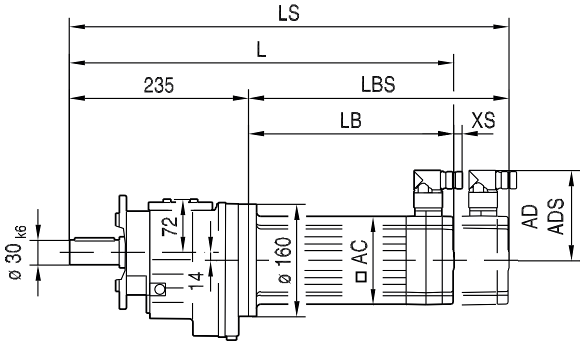
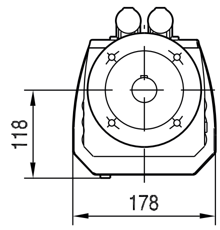
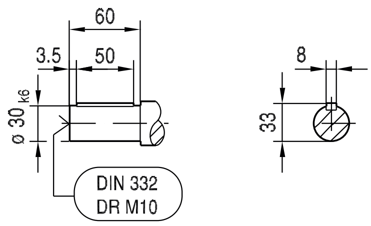
01 038 00 07

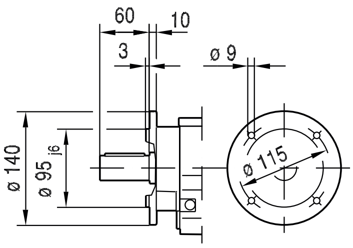
RF47..



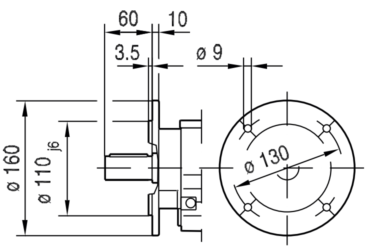




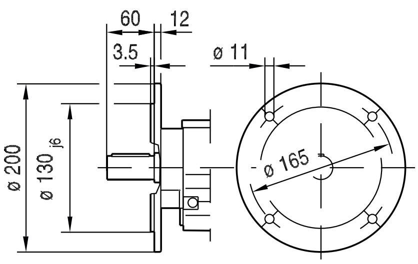
ø 140



ø 160



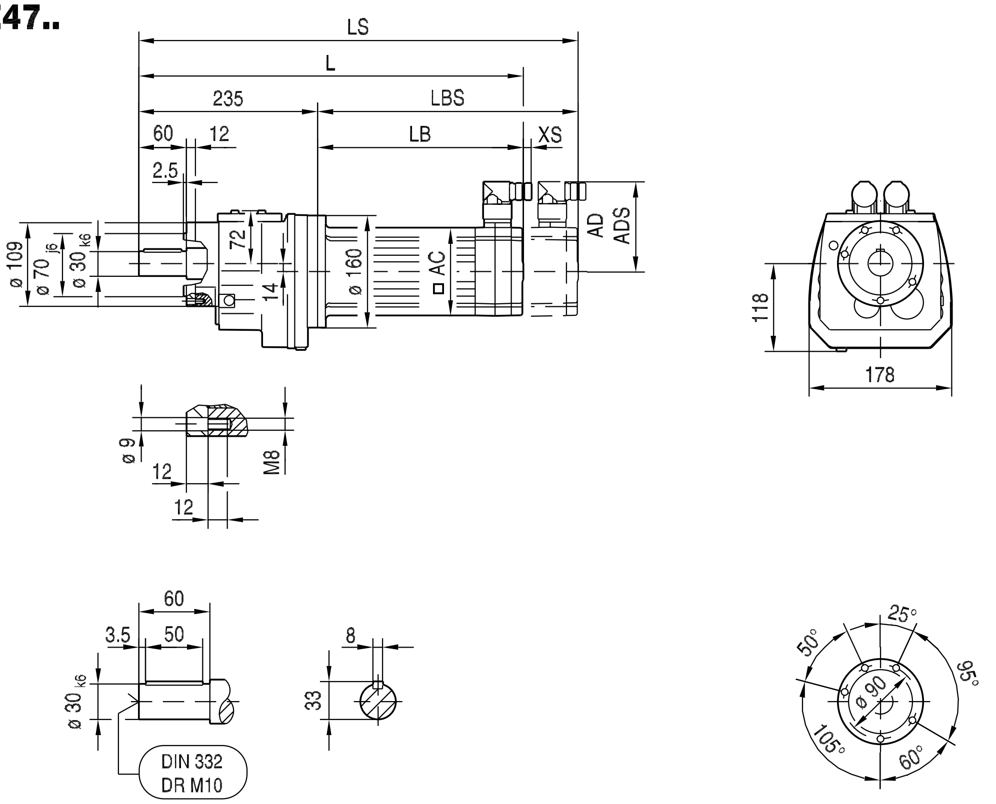
ø 200



(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	374	413	452	408	458	508	401	426	476	441	479	477
LS	403	442	481	437	487	537	466	491	541	519	557	573
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

01 039 00 07

RZ47..



(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	374	413	452	408	458	508	401	426	476	441	479	477
LS	403	442	481	437	487	537	466	491	541	519	557	573
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

8.3.6 R57..

R57, M_{aDyn} Nm																	450 Nm
	CMP																
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
2																	
4.39		44	66	47	91	129	82	131	200	179	265	>420	290	>420	>420	370	>420
5.05	25	50	75	54	105	149	94	151	225	205	305	>425	330	>425	>425	>425	>425
5.82	29	58	87	63	121	172	108	174	260	235	350	>425	385	>425	>425	>425	>425
6.41	32	64	96	69	133	189	119	192	290	260	385		420				
7.53	38	75	112	81	156	220	140	220	340	305	>425		>425				
7.97	40	80	119	86	165	235	148	235	360	325	>425		>425				
9.06	46	91	135	98	188	265	169	270	410	365							
9.35	47	93	140	101	194	275	174	275	425	380	>455	>455	>455	>455	>455	>455	>455
10.79	54	108	161	116	220	315	200	320	>455	440	>455	>455	>455	>455	>455	>455	>455
11.88	60	119	177	128	245	350	220	350	>455	>455	>455		>455				
13.95	70	139	205	150	285	410	255	415	>455	>455	>455		>455				
14.77	74	148	220	159	305	435	275	440	>455	>455	>455		>455				
16.79	85	168	250	181	345	>455	310	>455	>455	>455							
18.60	94	186	275	200	385	>455	345	>455	>455	>455							
21.93	111	215	325	235	>455	>455	405	>455									
24.99	126	245	370	265	>455		>455										
26.31	133	260	390	280	>455		>455										
3																	
26.97	133	260	390	280	>455	>455	>455	>455	>455	>455	>455		>455				
30.18	149	295	440	315	>455	>455	>455	>455	>455	>455	>455		>455				
35.07	173	340	>455	365	>455	>455	>455	>455	>455	>455	>455		>455				
37.30	184	360	>455	390	>455	>455	>455	>455	>455	>455	>455		>455				
43.30	210	420	>455	>455	>455	>455	>455	>455	>455	>455							
48.23	235	>455	>455	>455	>455	>455	>455	>455	>455	>455							
53.22	260	>455	>455	>455	>455		>455										
57.29	280	>455	>455	>455	>455	>455	>455	>455									
64.85	320	>455	>455	>455	>455		>455										
69.23	340	>455	>455	>455	>455		>455										
80.55	390	>455	>455	>455	>455	>455	>455	>455	>455	>455							
89.71	435	>455	>455	>455	>455	>455	>455	>455	>455	>455							
98.99	>455	>455	>455	>455	>455		>455										
106.58	>455	>455	>455	>455	>455	>455	>455	>455									
120.63	>455	>455	>455	>455	>455		>455										
128.77	>455	>455	>455	>455	>455		>455										
147.92	>455	>455		>455													
172.17	>455																
186.89	>455																

(→ 190)

R57, m kg																	
	CMP																
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
2	21	22	23	23	25	26	27	28	30	33	35	39	41	46	54	59	67
3	22	23	24	24	26	27	27	29	31	34	36	40	42	46	55	60	68
RF: + 3.4 kg / RM: + 15 kg																	

CMP..				c_{TG}			φ
		n_{epk}	η	R	RF	RM	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	'
R57 2	4.39	4500	97	21	21	17	10
	5.05	4500	97	21	21	17	10
	5.82	4500	97	21	21	17	10
	6.41	4500	97	21	21	17	9
	7.53	4500	97	21	21	17	9
	7.97	4500	97	21	21	17	9
	9.06	4500	97	21	21	17	9
	9.35	4500	97	25	25	20	7
	10.79	4500	97	25	25	20	7
	11.88	4500	97	25	25	20	7
	13.95	4500	97	25	25	20	7
	14.77	4500	97	25	25	20	7
	16.79	4500	97	25	25	20	7
	18.60	4500	97	25	25	20	7
	21.93	4500	97	25	25	20	7
	24.99	4500	97	25	25	20	6
	26.31	4500	97	25	25	20	6
R57 3	26.97	4500	95	26	26	20	8
	30.18	4500	95	26	26	20	8
	35.07	4500	95	26	26	20	8
	37.30	4500	95	26	26	20	8
	43.30	4500	95	26	26	20	8
	48.23	4500	95	26	26	20	8
	53.22	4500	95	26	26	20	8
	57.29	4500	95	26	26	20	8
	64.85	4500	95	26	26	20	8
	69.23	4500	95	26	26	20	7
	80.55	4500	94	26	26	20	7
	89.71	4500	94	26	26	20	7
	98.99	4500	94	26	26	20	7
	106.58	4500	94	26	26	20	7
	120.63	4500	94	26	26	20	7
	128.77	4500	94	26	26	20	7
	147.92	4500	94	26	26	20	7
	172.17	4500	93	26	26	20	7
	186.89	4500	93	26	26	20	7

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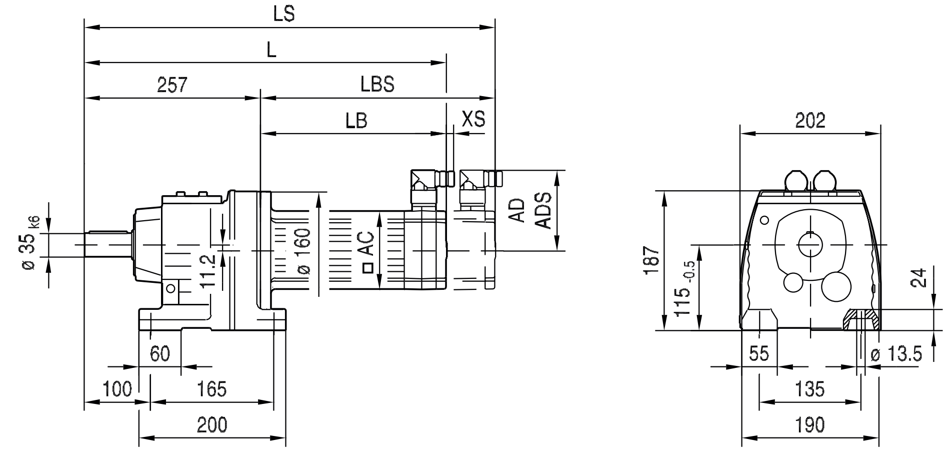
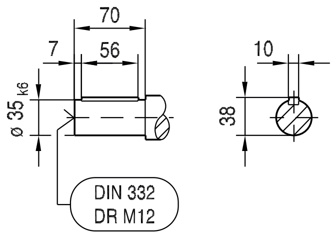
CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	F_{Ramax} R N	F_{Ramax} RF N	F_{Ramax} RM N	F_{Rapk} R N	F_{Rapk} RF N	F_{Rapk} RM N
R57 2	4.39	280	420	475	319	4.3	1900	1900	4000	7230	7230	4000
	5.05	305	425	515	277	3.4	1730	1730	4000	7210	7210	4000
	5.82	320	425	540	241	2.7	1820	1820	4000	7210	7210	4000
	6.41	335	425	570	218	2.3	1770	1770	4000	7210	7210	4000
	7.53	350	425	595	226	1.8	1950	1950	4000	7210	7210	4000
	7.97	355	425	600	213	1.6	2020	2020	4000	7210	7210	4000
	9.06	375	425	635	188	1.3	2010	2010	4000	7210	7210	4000
	9.35	370	455	625	193	2.8	3180	3180	4000	7080	7080	4000
	10.79	390	455	660	167	2.2	3330	3330	4000	7080	7080	4000
	11.88	405	455	685	143	1.9	3430	3430	4000	7080	7080	4000
	13.95	430	455	730	122	1.6	3610	3610	4000	7080	7080	4000
	14.77	435	455	740	115	1.4	3690	3690	4000	7080	7080	4000
	16.79	450	455	765	107	1.1	3860	3860	4000	7080	7080	4000
	18.60	450	455	765	108	0.94	4050	4050	4000	7080	7080	4000
	21.93	450	455	765	109	0.73	4370	4370	4000	7080	7080	4000
	24.99	450	455	765	108	0.51	4640	4640	4000	7080	7080	4000
	26.31	450	455	765	110	0.45	4750	4750	4000	7080	7080	4000
R57 3	26.97	450	455	765	63	1.5	4800	4800	4000	7080	7080	4000
	30.18	450	455	765	63	1.3	5040	5040	4000	7080	7080	4000
	35.07	450	455	765	66	0.97	5390	5390	4000	7080	7080	4000
	37.30	450	455	765	64	0.89	5530	5530	4000	7080	7080	4000
	43.30	450	455	765	65	0.70	5900	5900	4000	7080	7080	4000
	48.23	450	455	765	64	0.60	6170	6170	4000	7080	7080	4000
	53.22	450	455	765	66	0.49	6430	6430	4000	7080	7080	4000
	57.29	450	455	765	65	0.46	6630	6630	4000	7080	7080	4000
	64.85	450	455	765	65	0.38	6980	6980	4000	7080	7080	4000
	69.23	450	455	765	65	0.35	7100	7100	4000	7080	7080	4000
	80.55	450	455	765	56	0.62	7100	7100	4000	7080	7080	4000
	89.71	450	455	765	56	0.54	7100	7100	4000	7080	7080	4000
	98.99	450	455	765	56	0.45	7100	7100	4000	7080	7080	4000
	106.58	450	455	765	55	0.42	7100	7100	4000	7080	7080	4000
	120.63	450	455	765	56	0.35	7100	7100	4000	7080	7080	4000
	128.77	450	455	765	54	0.32	7100	7100	4000	7080	7080	4000
	147.92	450	455	765	47	0.26	7100	7100	4000	7080	7080	4000
	172.17	450	455	765	41	0.21	7100	7100	4000	7080	7080	4000
	186.89	450	455	765	37	0.18	7100	7100	4000	7080	7080	4000

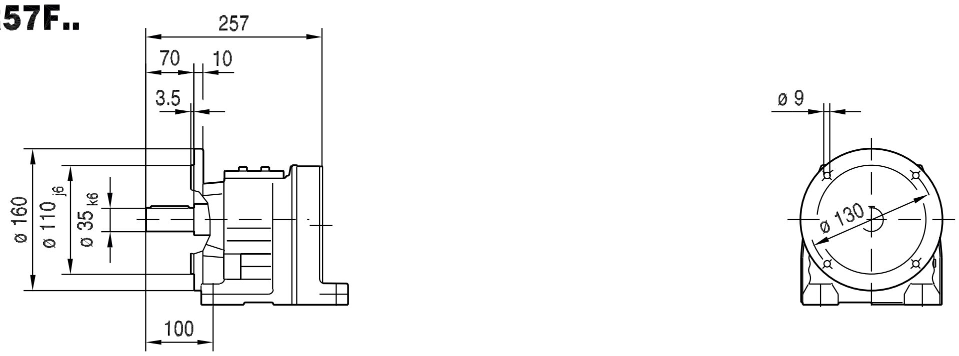
01 040 01 07

R57..





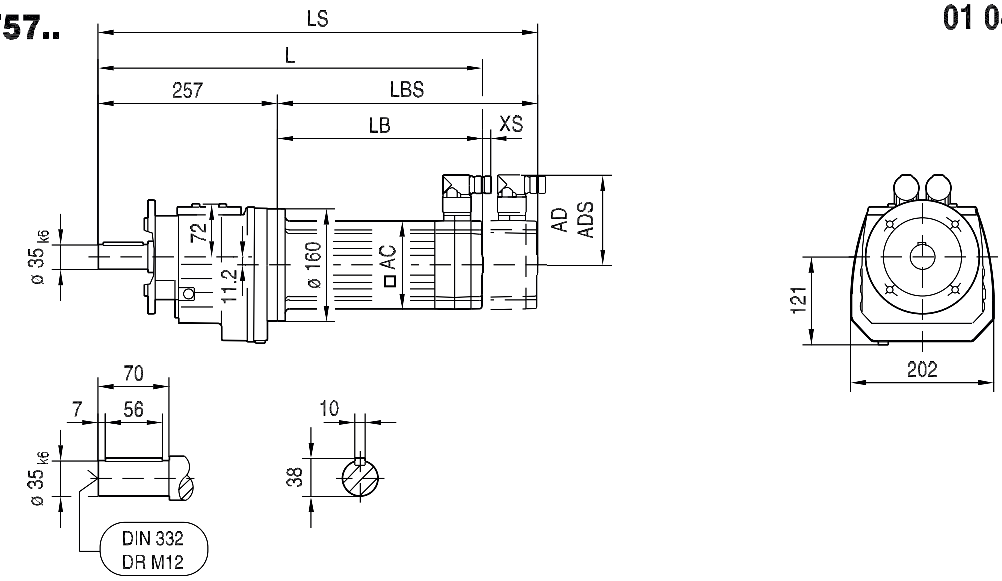
R57F..

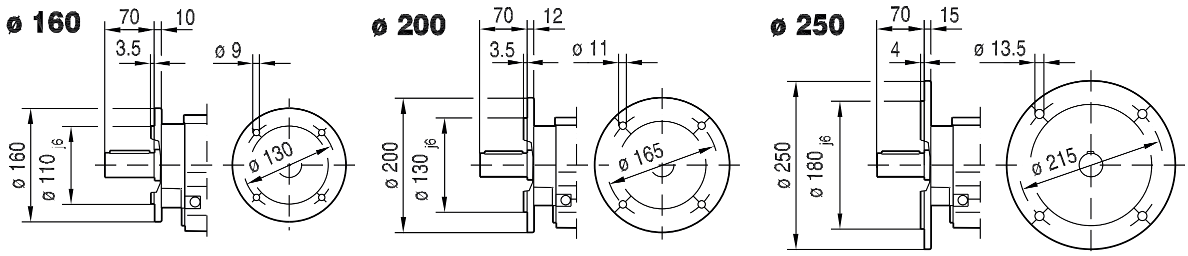


(→ 194)	CMP..																
	50S	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	396	435	474	430	480	530	423	448	498	463	501	565	499	536	616	613	647
LS	425	464	503	459	509	559	488	513	563	541	579	643	595	632	712	725	759
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

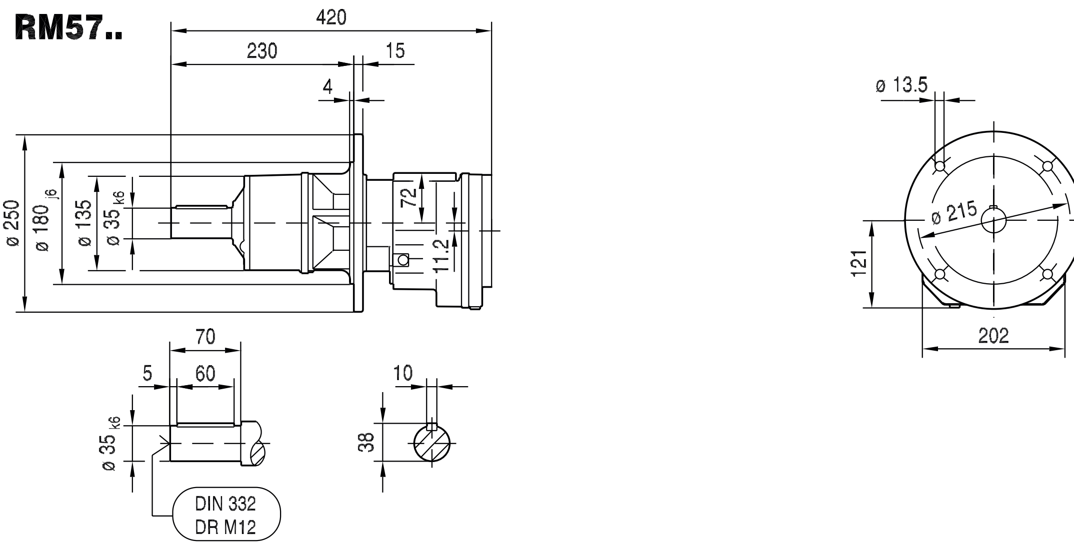
RF57..

01 041 01 07





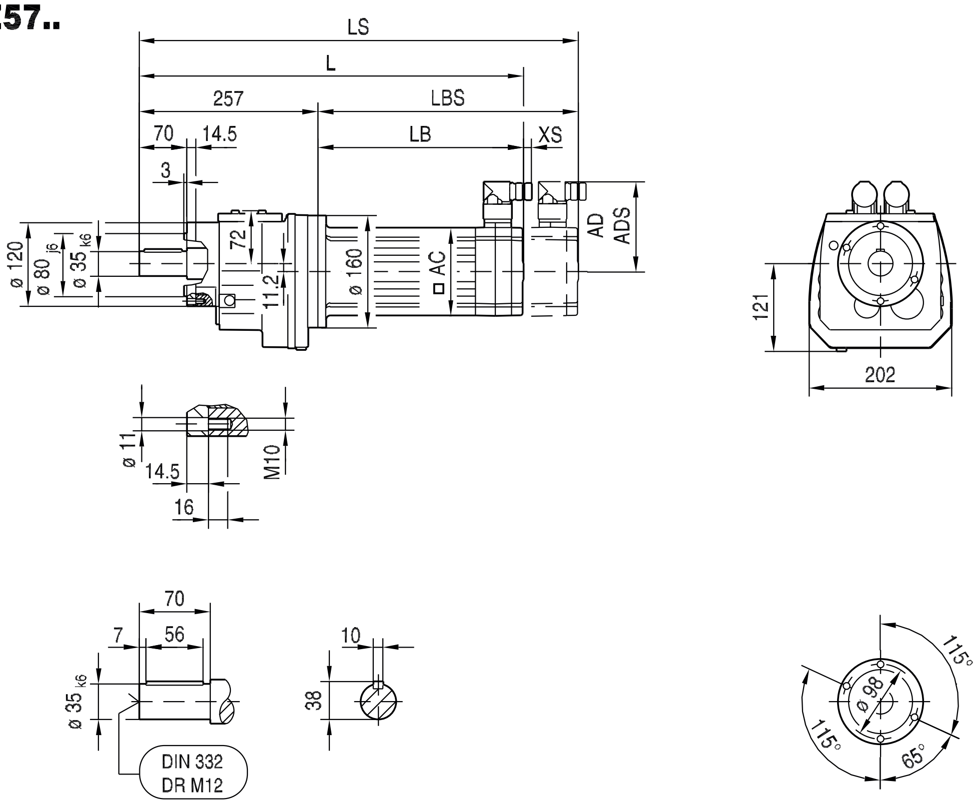
RM57..



(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	396	435	474	430	480	530	423	448	498	463	501	565	499	536	616	613	647
LS	425	464	503	459	509	559	488	513	563	541	579	643	595	632	712	725	759
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

01 042 01 07

RZ57..



(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	396	435	474	430	480	530	423	448	498	463	501	565	499	536	616	613	647
LS	425	464	503	459	509	559	488	513	563	541	579	643	595	632	712	725	759
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

8.3.7 R67

R67, M_{aDyn} Nm — 600 Nm

i	CMP 50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
2																	
4.29		43	64	46	89	127	80	128	195	175	260	>405	280	>405	>405	365	>405
4.93	25	49	74	53	102	145	92	147	220	200	295	>435	325	>435	>435	420	>435
5.70	29	57	85	61	118	168	106	170	255	230	345	>465	375	>465	>465	>465	>465
6.27	32	63	94	68	130	185	117	187	285	255	380		415				
7.36	37	74	110	79	153	215	137	215	330	300	445		>485				
7.79	39	78	116	84	162	225	145	230	350	315	470		>485				
8.70		87	130	94	181	255	162	255	395	355	525	>660	575	>660	>660	>660	>660
10.00	50	100	149	108	205	290	186	295	450	405	605	>665	660	>665	>665	>665	>665
11.54	58	115	172	124	235	340	210	340	520	470	>665	>665	>665	>665	>665	>665	>665
12.70	64	127	190	137	260	370	235	375	575	515	>665		>665				
14.91	75	149	220	161	305	435	275	445	>665	605	>665		>665				
15.79	80	158	235	170	325	465	290	470	>665	640	>665		>665				
17.95	91	179	265	193	370	525	330	535	>665	>665							
19.89	100	199	295	210	410	585	370	590	>665	>665							
23.44	118	230	350	250	485	>665	435	>665									
26.72	135	265	395	285	550		495										
28.13	142	280	420	300	580		520										
3																	
28.83	142	280	420	300	585	>595	525	>595	>595	>595	>595		>595				
32.27	159	315	470	340	>595	>595	585	>595	>595	>595	>595		>595				
37.50	185	365	545	395	>595	>595	>595	>595	>595	>595	>595		>595				
39.88	197	390	580	420	>595	>595	>595	>595	>595	>595	>595		>595				
46.29	225	450	>600	485	>600	>600	>600	>600	>600	>600							
51.56	250	500	>600	540	>600	>600	>600	>600	>600	>600							
56.89	280	555	>600	595	>600		>600										
61.26	300	595	>600	>600	>600	>600	>600	>600									
69.75	340	>660	>660	>660	>660	>660	>660	>660	>660	>660	>660		>660				
74.17	365	>660	>660	>660	>660	>660	>660	>660	>660	>660	>660		>660				
86.11	425	>660	>660	>660	>660	>660	>660	>660	>660	>660							
95.91	470	>660	>660	>660	>660	>660	>660	>660	>660	>660							
105.83	520	>660	>660	>660	>660		>660										
113.94	560	>660	>660	>660	>660	>660	>660	>660									
128.97	635	>660	>660	>660	>660		>660										
137.67	>660	>660	>660	>660	>660		>660										
158.14	>660	>660		>660													
184.07	>660																
199.81	>660																

(→ 190)

R67, m kg

s	CMP 50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
2	28	29	30	30	31	33	33	34	37	39	41	46	48	52	61	65	73
3	29	30	31	31	32	34	34	35	38	40	42	47	49	53	62	66	74

RF: + 3.2 kg / RM: + 19 kg

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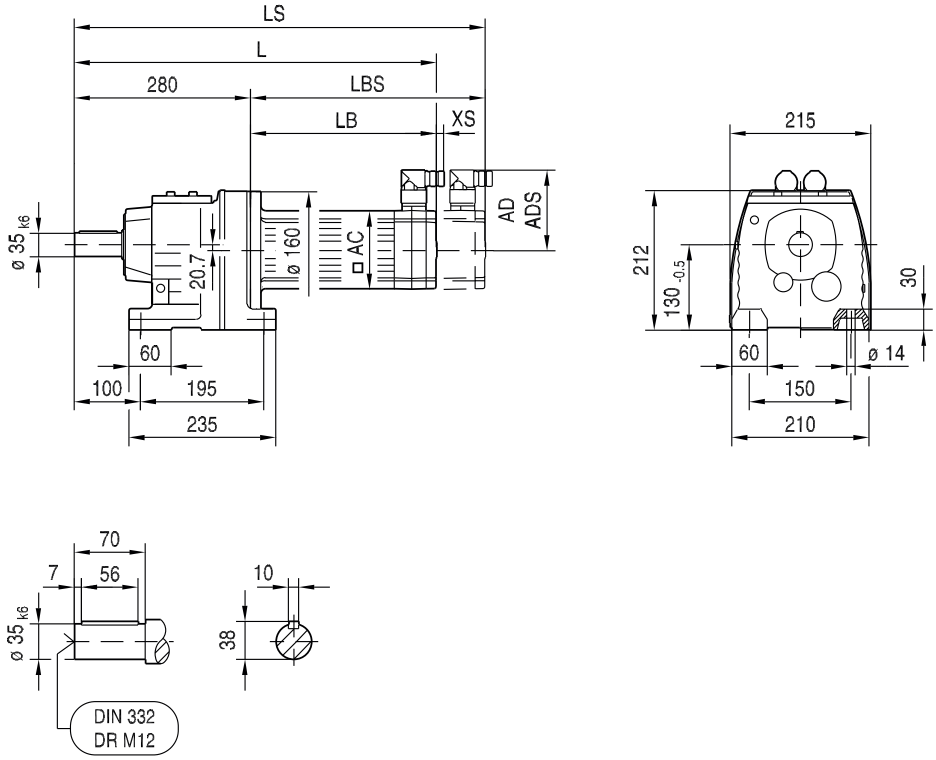
CMP..	i	n_{epk} min^{-1}	η %	c_{TG} R Nm/'	c_{TG} RF Nm/'	c_{TG} RM Nm/'	φ /R '
R67 2	4.29	3700	97	24	24	22	10
	4.93	4252	97	24	24	22	9
	5.70	4500	97	24	24	22	9
	6.27	4500	97	24	24	22	9
	7.36	4500	97	24	24	22	8
	7.79	4500	97	24	24	22	8
	8.70	4500	97	32	32	28	7
	10.00	4500	97	32	32	28	7
	11.54	4500	97	32	32	28	7
	12.70	4500	97	32	32	28	6
	14.91	4500	97	32	32	28	6
	15.79	4500	97	32	32	28	6
	17.95	4500	97	32	32	28	6
	19.89	4500	97	32	32	28	6
	23.44	4500	97	32	32	28	6
	26.72	4500	97	32	32	28	6
	28.13	4500	97	32	32	28	6
R67 3	28.83	4500	95	33	33	29	7
	32.27	4500	95	33	33	29	7
	37.50	4500	95	33	33	29	7
	39.88	4500	95	33	33	29	7
	46.29	4500	95	33	33	29	7
	51.56	4500	95	33	33	29	7
	56.89	4500	95	33	33	29	7
	61.26	4500	95	33	33	29	7
	69.75	4500	95	33	33	29	7
	74.17	4500	95	33	33	29	7
	86.11	4500	95	33	33	29	6
	95.91	4500	95	33	33	29	6
	105.83	4500	95	33	33	29	6
	113.94	4500	95	33	33	29	6
	128.97	4500	95	33	33	29	6
	137.67	4500	94	33	33	29	6
	158.14	4500	94	33	33	29	6
	184.07	4500	94	33	33	29	6
	199.81	4500	93	33	33	29	6

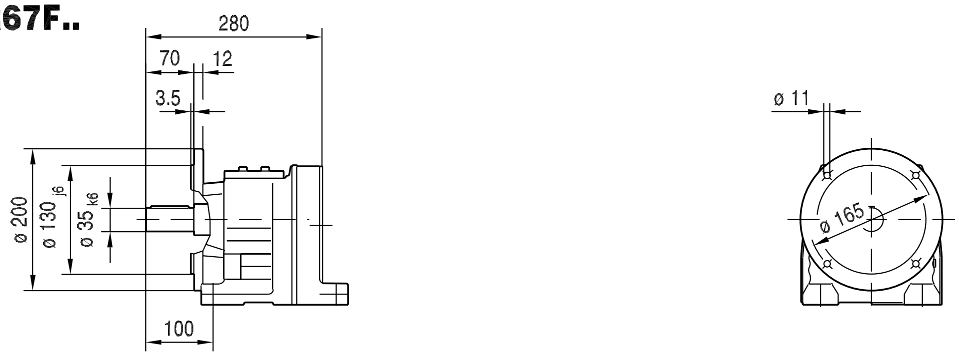
CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} R N	F_{Ramax} RF N	F_{Ramax} RM N	F_{Rapk} R N	F_{Rapk} RF N	F_{Rapk} RM N
R67 2	4.29	270	405	455	326	5.9	5000	5000	8720	9300	9300	9800
	4.93	290	435	490	284	4.6	5210	5210	9120	9100	9100	9760
	5.70	310	465	525	246	3.6	5450	5450	9560	8870	8870	9710
	6.27	330	485	560	223	3.0	5590	5590	9850	8710	8710	9680
	7.36	370	485	625	190	2.4	5790	5790	9850	8710	8710	9680
	7.79	380	485	645	180	2.1	5830	5830	9840	8710	8710	9680
	8.70	440	660	745	161	4.0	5960	5960	9750	5350	5350	9330
	10.00	470	665	795	140	3.2	6220	6220	9700	4700	4700	9320
	11.54	500	665	850	130	2.5	6500	6500	9660	4700	4700	9320
	12.70	520	665	880	118	2.2	6640	6640	9620	4700	4700	9320
	14.91	550	665	930	101	1.7	6980	6980	9560	4700	4700	9320
	15.79	560	665	950	95	1.6	7130	7130	9540	4700	4700	9320
	17.95	590	665	1000	84	1.2	7330	7330	9480	4700	4700	9320
	19.89	600	665	1020	75	1.0	7560	7560	9460	4700	4700	9320
	23.44	560	665	950	94	0.80	8010	8010	9540	4700	4700	9320
	26.72	540	665	910	105	0.56	8210	8210	9580	4700	4700	9320
	28.13	540	665	910	103	0.50	8210	8210	9580	4700	4700	9320
R67 3	28.83	520	595	880	49	1.5	8400	8400	9620	7620	7620	9470
	32.27	540	595	910	43	1.3	8210	8210	9580	7620	7620	9470
	37.50	570	595	960	37	1.0	7900	7900	9520	7620	7620	9470
	39.88	580	595	980	35	0.93	7790	7790	9500	7620	7620	9470
	46.29	600	600	1020	32	0.72	7560	7560	9460	7560	7560	9460
	51.56	600	600	1020	33	0.61	7560	7560	9460	7560	7560	9460
	56.89	600	600	1020	33	0.50	7560	7560	9460	7560	7560	9460
	61.26	600	600	1020	33	0.47	7560	7560	9460	7560	7560	9460
	69.75	600	660	1020	29	0.88	7560	7560	9460	5350	5350	9330
	74.17	600	660	1020	28	0.81	7560	7560	9460	5350	5350	9330
	86.11	600	660	1020	29	0.63	7560	7560	9460	5350	5350	9330
	95.91	600	660	1020	29	0.54	7560	7560	9460	5350	5350	9330
	105.83	600	660	1020	29	0.45	7560	7560	9460	5350	5350	9330
	113.94	600	660	1020	30	0.42	7560	7560	9460	5350	5350	9330
	128.97	600	660	1020	29	0.36	7560	7560	9460	5350	5350	9330
	137.67	600	660	1020	30	0.32	7560	7560	9460	5350	5350	9330
	158.14	600	660	1020	30	0.26	7560	7560	9460	5350	5350	9330
	184.07	600	660	1020	30	0.21	7560	7560	9460	5350	5350	9330
	199.81	600	660	1020	30	0.19	7560	7560	9460	5350	5350	9330

01 043 01 07

R67..



R67F..



(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	419	458	497	453	503	553	446	471	521	486	524	588	522	559	639	636	670
LS	448	487	526	482	532	582	511	536	586	564	602	666	618	655	735	748	782
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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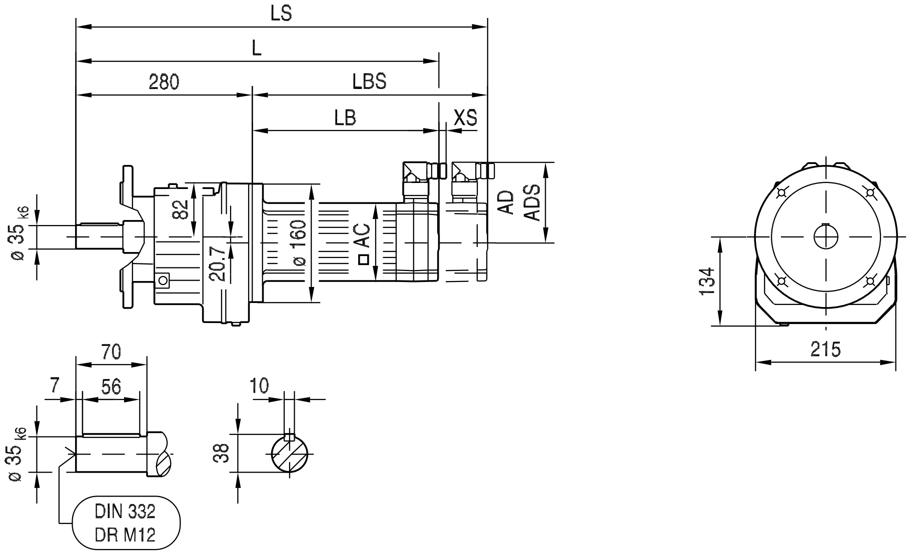
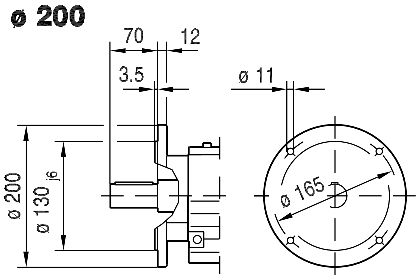
01 044 01 07

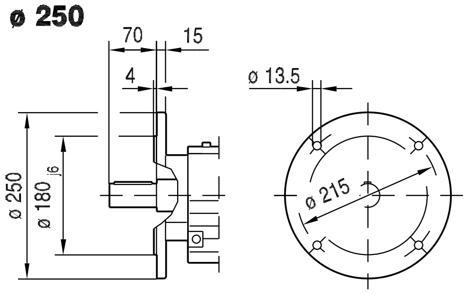
RF67..



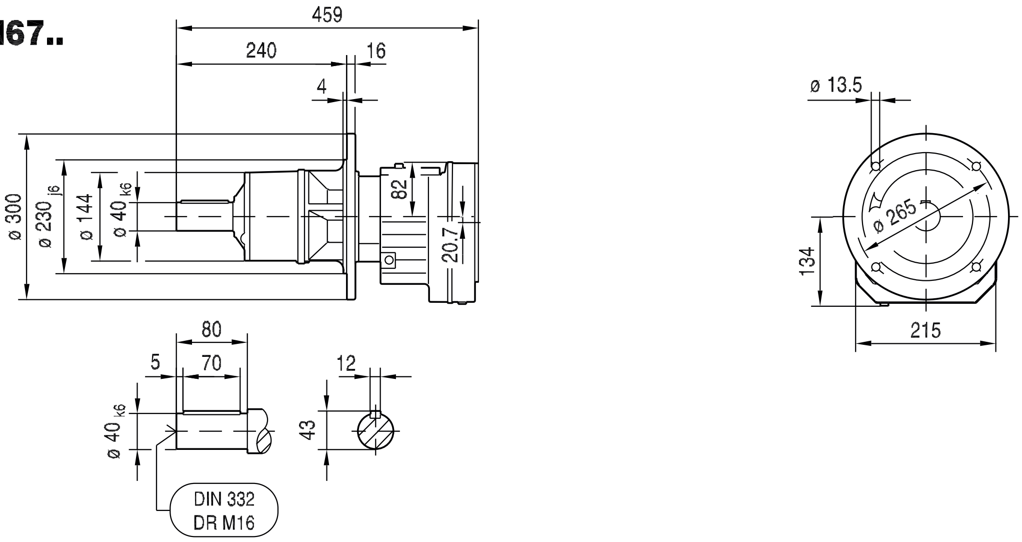
ø 200



ø 250



RM67..



(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	419	458	497	453	503	553	446	471	521	486	524	588	522	559	639	636	670
LS	448	487	526	482	532	582	511	536	586	564	602	666	618	655	735	748	782
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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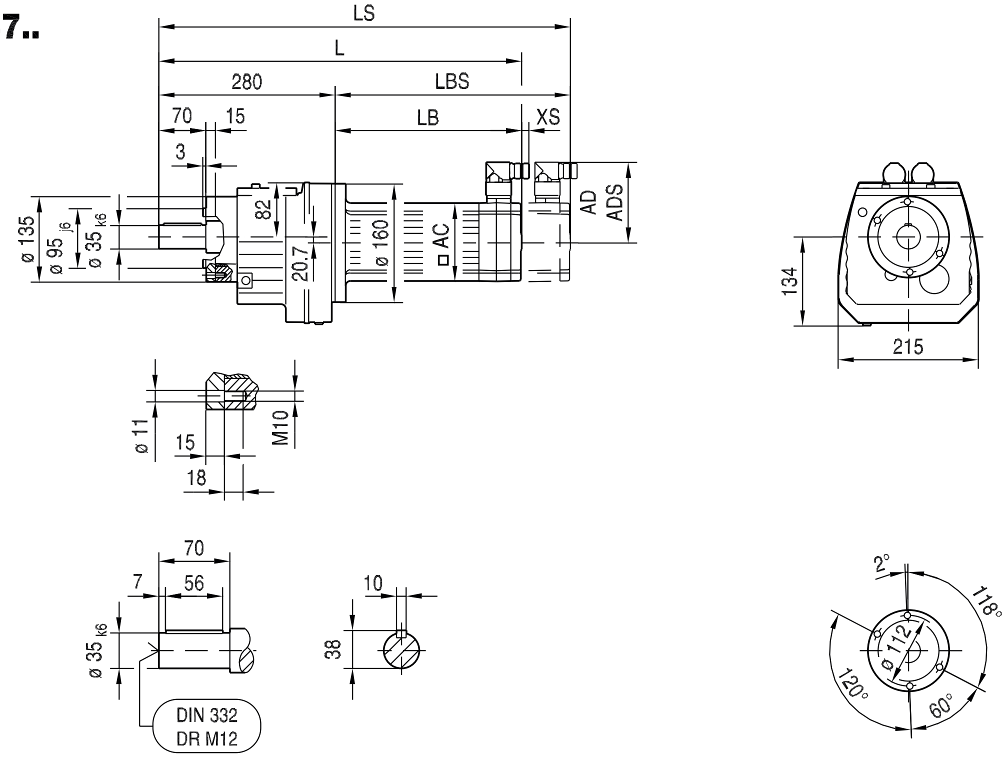
01 045 01 07

RZ67..



(→ 🗎 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	419	458	497	453	503	553	446	471	521	486	524	588	522	559	639	636	670
LS	448	487	526	482	532	582	511	536	586	564	602	666	618	655	735	748	782
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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SEW EURODRIVE

8.3.8 R77..

R77, M_{aDyn} Nm															820 Nm
	CMP														
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
2															
5.31	57	110	157	99	159	240	215	320	550	350	555	>765	450	700	>765
5.99	64	124	177	112	179	270	240	360	620	395	625	>810	510	790	>810
6.79	73	141	200	126	200	305	275	410	700	445	710	>840	575	>840	
7.74	83	161	225	144	230	350	315	465	800	510	810	>840	660	>840	
8.59	92	178	250	160	255	390	350	520		565					
9.64	104	200	280	180	285	435	390	585	>900	635	>900	>900	820	>900	>900
10.88	117	225	320	200	325	490	440	660	>900	720	>900	>900	>900	>900	>900
12.33	133	255	360	225	365	560	500	745	>900	810	>900	>900	>900	>900	
14.05	151	290	410	260	415	635	570	850	>900	>900	>900	>900	>900	>900	
15.60	168	320	460	290	465	705	635	>900		>900					
17.82	192	365	525	330	530	810	725	>900		>900					
18.80	200	390	550	350	560	850	765	>900		>900					
21.43	230	440	630	395	640	>900	870								
23.37	250	485	685	435	695	>900	>900								
3															
25.23	265	515	735	465	745	>900	>900	>900	>900	>900	>900	>900	>900	>900	
29.00	305	595	840	530	850	>900	>900	>900	>900	>900	>900	>900	>900	>900	
33.47	355	685	>900	615	>900	>900	>900	>900	>900	>900	>900	>900	>900	>900	
36.83	385	745	>900	670	>900	>900	>900	>900		>900					
43.26	455	870	>900	785	>900	>900	>900	>900		>900					
45.81	480	>900	>900	830	>900	>900	>900	>900		>900					
52.07	545	>900	>900	>900	>900	>900	>900								
57.68	605	>900	>900	>900	>900	>900	>900								
65.77	690	>900	>900	>900	>900	>900	>900	>900		>900					
77.24	810	>900	>900	>900	>900	>900	>900	>900		>900					
81.80	860	>900	>900	>900	>900	>900	>900	>900		>900					
92.97	>900	>900	>900	>900	>900	>900	>900								
102.99	>900	>900	>900	>900	>900	>900	>900								
121.42	>900	>900	>900	>900	>900										
138.39	>900	>900		>900											
145.67	>900	>900		>900											
166.59	>900														
195.24															

(→ 190)

R77, m kg															
	CMP														
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
2	35	36	38	40	41	43	44	47	51	51	56	64	71	79	95
3	36	37	39	41	42	44	46	48	52	52	57	65	72	80	96
RF: + 5.7 kg / RM: + 31 kg															

CMP..	i	n_{epk} min^{-1}	η %	c_{TG} R Nm/'	RF Nm/'	RM Nm/'	φ /R '
R77 2	5.31	4500	97	42	42	46	8
	5.99	4500	97	42	42	46	8
	6.79	4500	97	42	42	46	8
	7.74	4500	97	42	42	46	8
	8.59	4500	97	42	42	46	7
	9.64	4500	97	51	51	58	7
	10.88	4500	97	51	51	58	6
	12.33	4500	97	51	51	58	6
	14.05	4500	97	51	51	58	6
	15.60	4500	97	51	51	58	6
	17.82	4500	97	51	51	58	6
	18.80	4500	97	51	51	58	6
	21.43	4500	97	51	51	58	6
	23.37	4500	97	51	51	58	6
R77 3	25.23	4500	96	53	53	61	7
	29.00	4500	96	53	53	61	7
	33.47	4500	96	53	53	61	7
	36.83	4500	95	53	53	61	7
	43.26	4500	95	53	53	61	7
	45.81	4500	95	53	53	61	7
	52.07	4500	95	53	53	61	7
	57.68	4500	95	53	53	61	7
	65.77	4500	95	53	53	61	7
	77.24	4500	95	53	53	61	6
	81.80	4500	95	53	53	61	6
	92.97	4500	95	53	53	61	6
	102.99	4500	95	53	53	61	6
	121.42	4500	94	53	53	61	6
	138.39	4500	94	53	53	61	6
	145.67	4500	94	53	53	61	6
	166.59	4500	94	53	53	61	6
	195.24	4500	93	53	53	61	6

CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	F_{Ramax} R N	RF N	RM N	F_{Rapk} R N	RF N	RM N
R77 2	5.31	510	765	860	264	7.7	3990	3990	12700	10400	10400	13000
	5.99	540	810	910	234	6.4	3990	3990	13000	10000	10000	13000
	6.79	580	840	980	206	5.2	3850	3850	13000	9730	9730	13000
	7.74	610	840	1030	181	4.2	3940	3940	13000	9730	9730	13000
	8.59	630	840	1070	175	3.7	4110	4110	13000	9730	9730	13000
	9.64	630	900	1070	145	6.6	6300	6300	13000	9110	9110	13000
	10.88	660	900	1120	129	5.5	6490	6490	13000	9110	9110	13000
	12.33	690	900	1170	114	4.5	6740	6740	13000	9110	9110	13000
	14.05	720	900	1220	100	3.7	7050	7050	13000	9110	9110	13000
	15.60	740	900	1250	90	3.3	7390	7390	13000	9110	9110	13000
	17.82	780	900	1320	79	2.7	7620	7620	13000	9110	9110	13000
	18.80	780	900	1320	74	2.5	7980	7980	13000	9110	9110	13000
	21.43	820	900	1390	65	2.0	8250	8250	13000	9110	9110	13000
	23.37	820	900	1390	64	1.7	8870	8870	13000	9110	9110	13000

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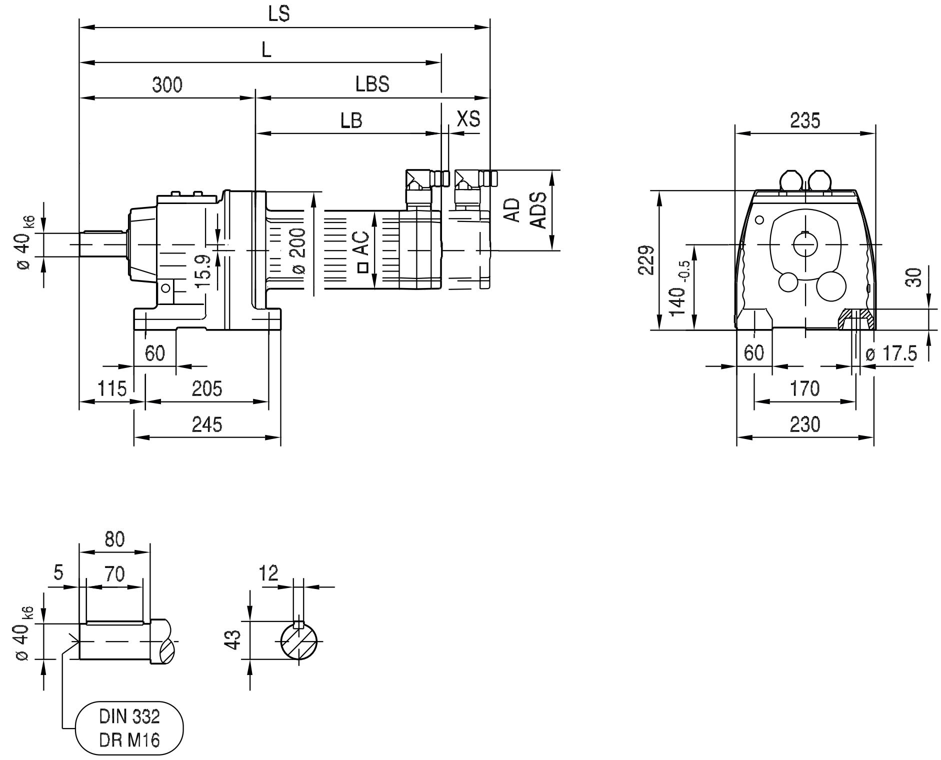
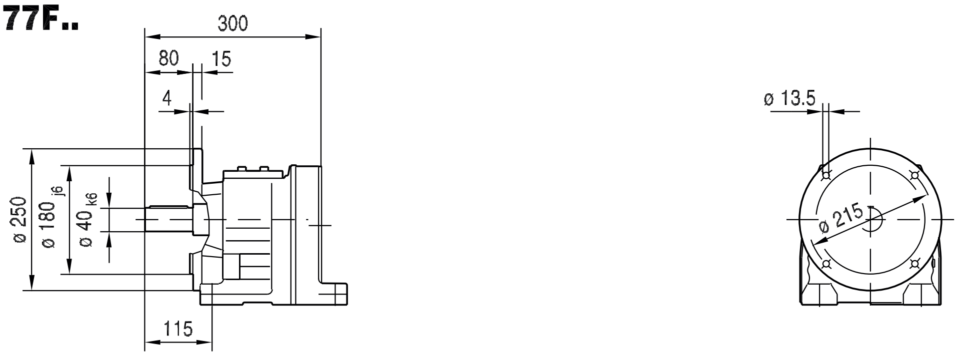
CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	F_{Ramax} R N	F_{Ramax} RF N	F_{Ramax} RM N	F_{Rapk} R N	F_{Rapk} RF N	F_{Rapk} RM N
R77 3	25.23	780	900	1320	59	3.7	10100	10100	13000	9110	9110	13000
	29.00	820	900	1390	52	3.0	9920	9920	13000	9110	9110	13000
	33.47	820	900	1390	51	2.2	9920	9920	13000	9110	9110	13000
	36.83	820	900	1390	52	1.9	9920	9920	13000	9110	9110	13000
	43.26	820	900	1390	53	1.6	9920	9920	13000	9110	9110	13000
	45.81	820	900	1390	52	1.4	9920	9920	13000	9110	9110	13000
	52.07	820	900	1390	54	1.1	9920	9920	13000	9110	9110	13000
	57.68	820	900	1390	54	0.97	9920	9920	13000	9110	9110	13000
	65.77	820	900	1390	38	1.6	9920	9920	13000	9110	9110	13000
	77.24	820	900	1390	38	1.3	9920	9920	13000	9110	9110	13000
	81.80	820	900	1390	38	1.2	9920	9920	13000	9110	9110	13000
	92.97	820	900	1390	39	0.99	9920	9920	13000	9110	9110	13000
	102.99	820	900	1390	38	0.86	9920	9920	13000	9110	9110	13000
	121.42	820	900	1390	39	0.68	9920	9920	13000	9110	9110	13000
	138.39	820	900	1390	38	0.46	9920	9920	13000	9110	9110	13000
	145.67	820	900	1390	38	0.42	9920	9920	13000	9110	9110	13000
	166.59	820	900	1390	38	0.34	9920	9920	13000	9110	9110	13000
	195.24	820	900	1390	36	0.27	9920	9920	13000	9110	9110	13000

01 046 02 07

R77..



R77F..



(→ 194)	CMP..													
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	467	517	567	458	483	533	498	532	600	530	570	650	647	690	778
LS	496	546	596	523	548	598	576	610	678	626	666	746	759	802	890
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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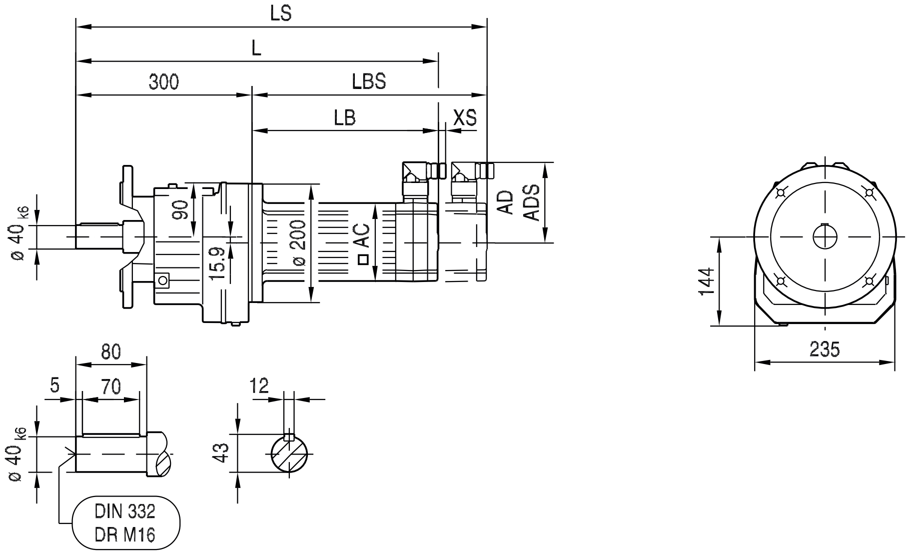
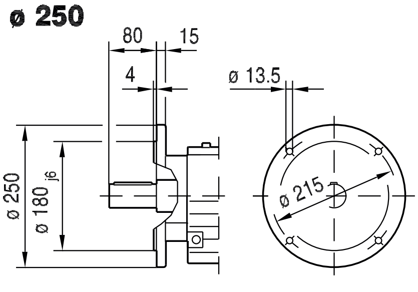
01 047 02 07

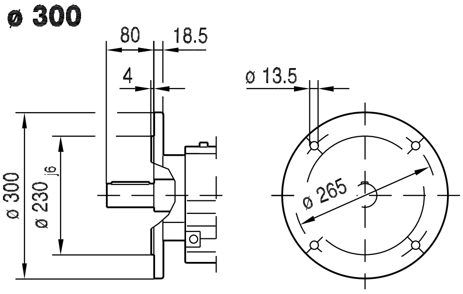
RF77..



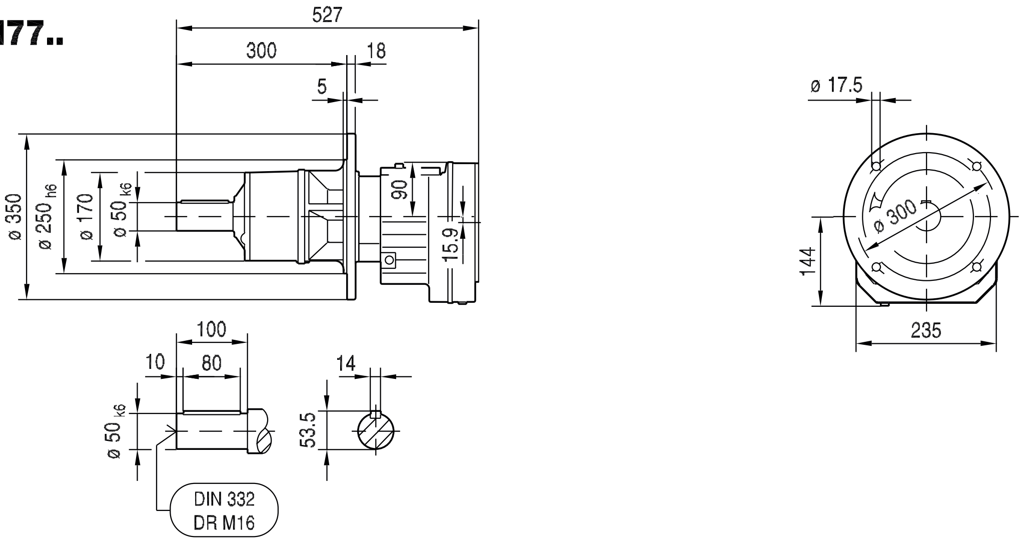
ø 250



ø 300



RM77..



(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	467	517	567	458	483	533	498	532	600	530	570	650	647	690	778
LS	496	546	596	523	548	598	576	610	678	626	666	746	759	802	890
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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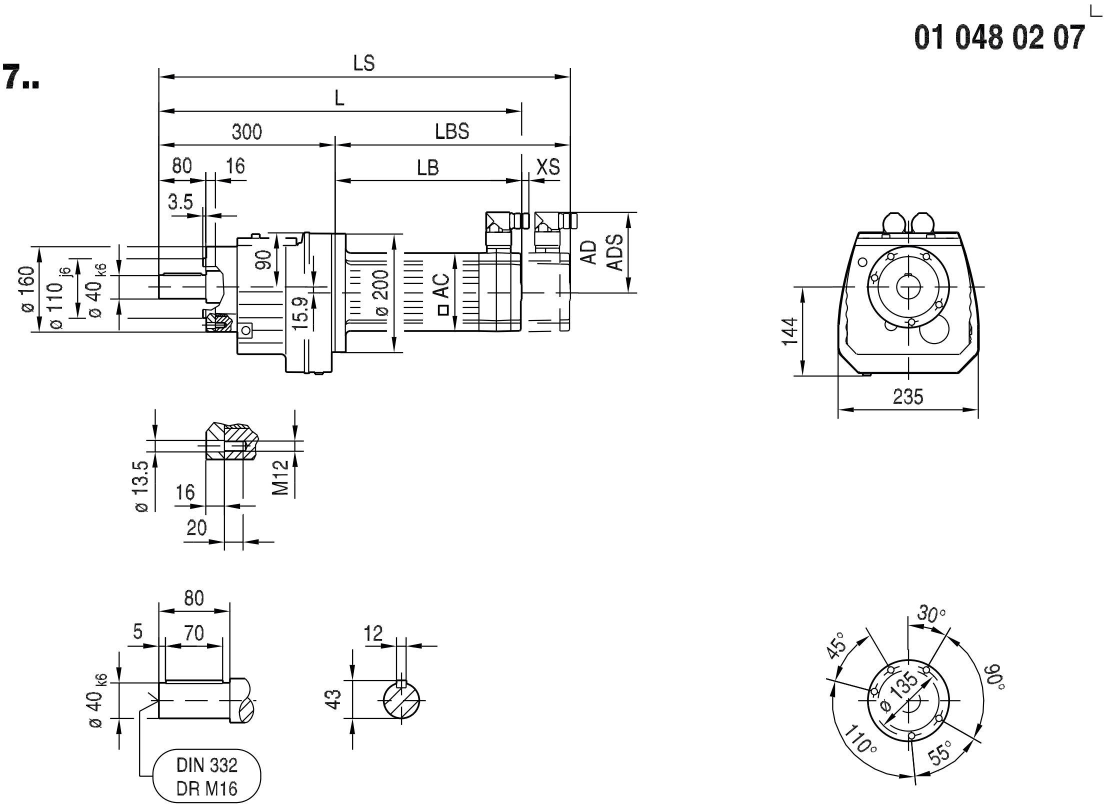
01 048 02 07

RZ77..



(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	467	517	567	458	483	533	498	532	600	530	570	650	647	690	778
LS	496	546	596	523	548	598	576	610	678	626	666	746	759	802	890
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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8.3.9 R87..

R87, M_{aDyn} Nm														1550 Nm
	CMP													
i	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
2														
5.30		158	240	215	320	550	350	555	910	450	695	1150	>1270	>1270
6.39		191	290	260	385	660	420	665	1100	545	840	>1270	>1270	>1270
7.13	133	210	320	290	430	740	470	745	1230	605	940	>1270	>1270	>1270
8.22	153	245	370	335	495	850	540	860	>1270	700	1080	>1270	>1270	
9.14	170	270	415	370	550	940	605	950	>1270	780	1200	>1270	>1270	
9.90		295	450	400	600	1020	655	1030	>1550	840	1300	>1550	>1550	>1550
11.93		355	540	485	720	1230	790	1240	>1550	1010	>1550	>1550	>1550	>1550
13.33	245	395	605	540	800	1380	880	1390	>1550	1130	>1550	>1550	>1550	>1550
15.35	285	455	695	625	930	>1550	1010	>1550	>1550	1310	>1550	>1550	>1550	
17.08	315	510	775	695	1030	>1550	1130	>1550	>1550	1450	>1550	>1550	>1550	
19.10	355	570	860	775	1150	>1550	1260	>1550	>1550	>1550	>1550			
21.51	400	640	970	870	1300	>1550	1420	>1550	>1550	>1550	>1550			
23.40	435	695	1060	950	1420		>1550							
27.84	515	830	1260	1130	>1550		>1550							
31.40	580	930	1420	1280										
34.40	640	1020	>1550	1400										
3														
27.88	510	820	1250	1120	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
32.66	600	960	1470	1310	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
36.84	675	1080	>1550	1480	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
41.74	765	1230	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550			
47.58	870	1400	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550			
52.82	970	>1550	>1550	>1550	>1550		>1550							
60.35	1110	>1550	>1550	>1550	>1550		>1550							
63.68	1170	>1550	>1550	>1550	>1550		>1550							
72.57	1330	>1550	>1550	>1550										
81.92	1490	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550			
93.38	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550			
103.65	>1550	>1550	>1550	>1550	>1550		>1550							
118.43	>1550	>1550	>1550	>1550	>1550		>1550							
124.97	>1550	>1550	>1550	>1550	>1550		>1550							
142.41	>1550	>1550	>1550	>1550										
155.34	>1550	>1550	>1550	>1550										
181.77	>1550	>1550												
205.71	>1550													
216.54	>1550													
246.54														

(→ 190)

R87, m kg														
	CMP													
s	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
2	66	67	70	73	75	79	77	81	90	97	105	120	130	140
3	68	69	71	74	76	80	78	82	91	98	105	120	130	140
RF: + 7.1 kg / RM: + 37 kg														

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CMP..	i	n_{epk} min^{-1}	η %	c_{TG} R Nm/'	c_{TG} RF Nm/'	c_{TG} RM Nm/'	φ /R '
R87 2	5.30	4500	97	76	76	78	7
	6.39	4500	97	76	76	78	7
	7.13	4500	97	76	76	78	7
	8.22	4500	97	76	76	78	7
	9.14	4500	97	76	76	78	6
	9.90	4500	97	93	93	96	6
	11.93	4500	97	93	93	96	6
	13.33	4500	97	93	93	96	6
	15.35	4500	97	93	93	96	6
	17.08	4500	97	93	93	96	6
	19.10	4500	97	93	93	96	6
	21.51	4500	97	93	93	96	6
	23.40	4500	97	93	93	96	6
	27.84	4500	97	93	93	96	6
	31.40	4500	97	93	93	96	5
	34.40	4500	97	93	93	96	5
R87 3	27.88	4500	96	97	97	99	7
	32.66	4500	96	97	97	99	7
	36.84	4500	96	97	97	99	7
	41.74	4500	96	97	97	99	7
	47.58	4500	96	97	97	99	7
	52.82	4500	96	97	97	99	6
	60.35	4500	96	97	97	99	6
	63.68	4500	96	97	97	99	6
	72.57	4500	96	97	97	99	6
	81.92	4500	95	97	97	100	6
	93.38	4500	95	97	97	100	6
	103.65	4500	95	97	97	100	6
	118.43	4500	95	97	97	100	6
	124.97	4500	95	97	97	100	6
	142.41	4500	95	97	97	100	6
	155.34	4500	94	97	97	100	6
	181.77	4500	94	97	97	100	6
	205.71	4500	94	97	97	100	6
	216.54	4500	94	97	97	100	6
	246.54	4500	93	97	97	100	6

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CMP.. n_e = 1400	i	M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	F_{Ramax} R	F_{Ramax} RF	F_{Ramax} RM	F_{Rapk} R	F_{Rapk} RF	F_{Rapk} RM
		Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N
R87 2	5.30	910	1270	1540	264	25	1710	1710	16600	18600	18600	20000
	6.39	1020	1270	1730	219	19	970	970	17600	18600	18600	20000
	7.13	1070	1270	1810	196	16	820	820	18300	18600	18600	20000
	8.22	1160	1270	1970	170	13	225	225	19100	18600	18600	20000
	9.14	1210	1270	2050	153	11	99	99	19800	18600	18600	20000
	9.90	1180	1550	2000	141	21	3520	3520	20000	16900	16900	19700
	11.93	1230	1550	2090	117	17	4120	4120	20000	16900	16900	19700
	13.33	1280	1550	2170	105	14	4220	4220	20000	16900	16900	19700
	15.35	1340	1550	2270	91	12	4450	4450	20000	16900	16900	19700
	17.08	1390	1550	2360	82	10	4580	4580	19900	16900	16900	19700
	19.10	1440	1550	2440	79	8.7	4800	4800	19800	16900	16900	19700
	21.51	1500	1550	2550	70	7.3	4970	4970	19800	16900	16900	19700
	23.40	1550	1550	2630	60	6.6	5000	5000	19700	16900	16900	19700
	27.84	1550	1550	2630	61	5.1	6640	6640	19700	16900	16900	19700
	31.40	1550	1550	2630	61	4.1	7820	7820	19700	16900	16900	19700
	34.40	1500	1550	2550	70	3.6	9480	9480	19800	16900	16900	19700
R87 3	27.88	1500	1550	2550	54	9.8	7370	7370	19800	16900	16900	19700
	32.66	1550	1550	2630	49	7.6	8220	8220	19700	16900	16900	19700
	36.84	1550	1550	2630	49	6.2	9470	9470	19700	16900	16900	19700
	41.74	1550	1550	2630	50	5.1	10800	10800	19700	16900	16900	19700
	47.58	1550	1550	2630	50	4.1	12300	12300	19700	16900	16900	19700
	52.82	1550	1550	2630	51	3.6	13500	13500	19700	16900	16900	19700
	60.35	1550	1550	2630	51	2.9	15200	15200	19700	16900	16900	19700
	63.68	1550	1550	2630	50	2.7	15800	15800	19700	16900	16900	19700
	72.57	1550	1550	2630	51	2.2	16900	16900	19700	16900	16900	19700
	81.92	1550	1550	2630	51	4.0	16900	16900	19700	16900	16900	19700
	93.38	1550	1550	2630	51	3.3	16900	16900	19700	16900	16900	19700
	103.65	1550	1550	2630	52	3.0	16900	16900	19700	16900	16900	19700
	118.43	1550	1550	2630	52	2.4	16900	16900	19700	16900	16900	19700
	124.97	1550	1550	2630	52	2.3	16900	16900	19700	16900	16900	19700
	142.41	1550	1550	2630	49	1.9	16900	16900	19700	16900	16900	19700
	155.34	1550	1550	2630	45	1.6	16900	16900	19700	16900	16900	19700
	181.77	1550	1550	2630	39	1.3	16900	16900	19700	16900	16900	19700
	205.71	1550	1550	2630	34	0.90	16900	16900	19700	16900	16900	19700
	216.54	1550	1550	2630	32	0.81	16900	16900	19700	16900	16900	19700
	246.54	1550	1550	2630	28	0.66	16900	16900	19700	16900	16900	19700

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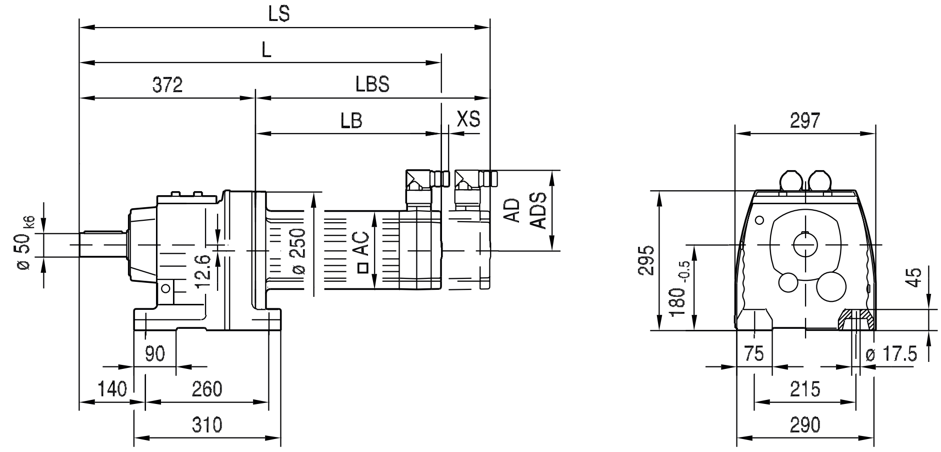
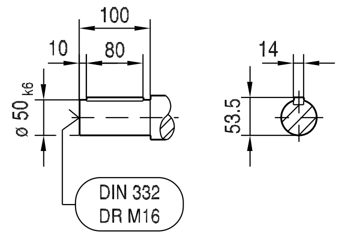
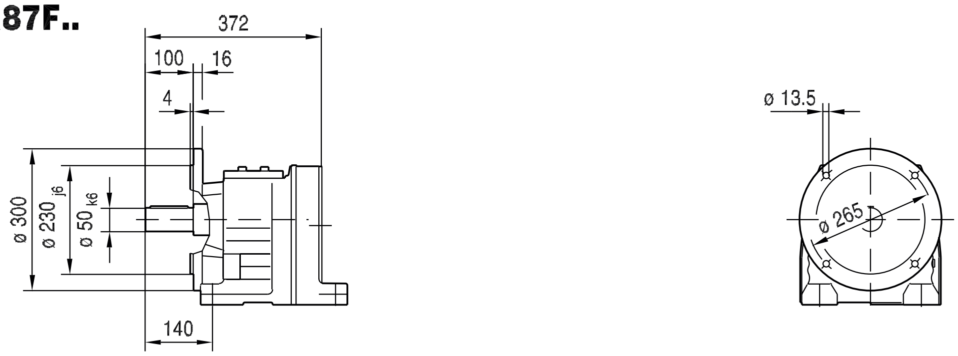
01 049 01 07

R87..





R87F..



(→ 194)	CMP..													
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**	**112H**	**112E**
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	526	551	601	565	599	667	597	637	717	714	757	845	888	931
LS	591	616	666	643	677	745	693	733	813	826	869	957	1000	1043
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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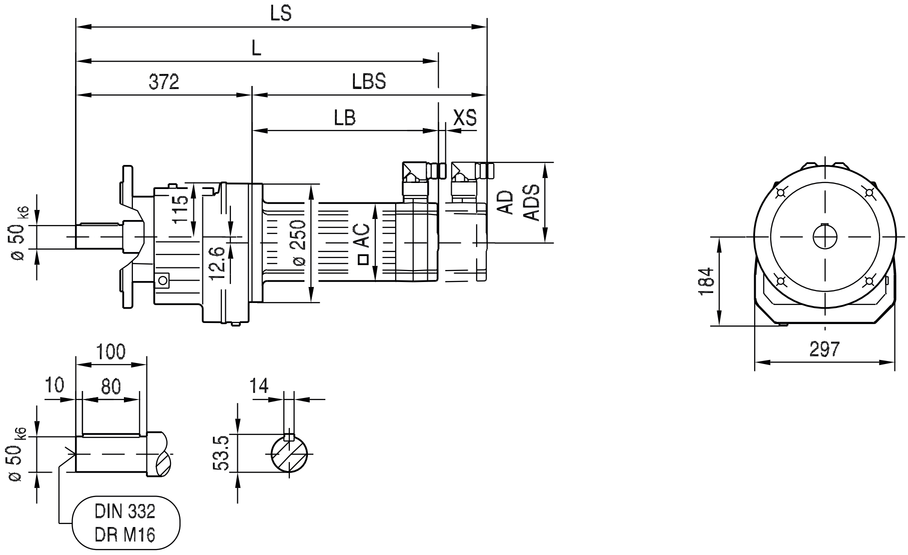
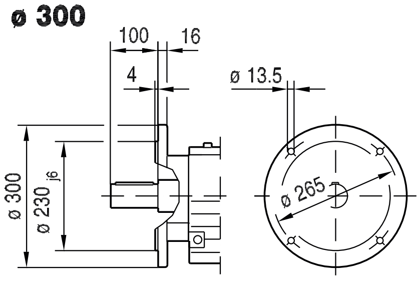
01 050 03 07

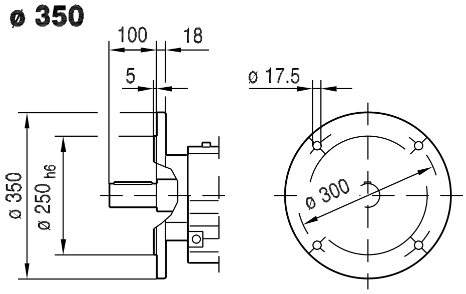
RF87..



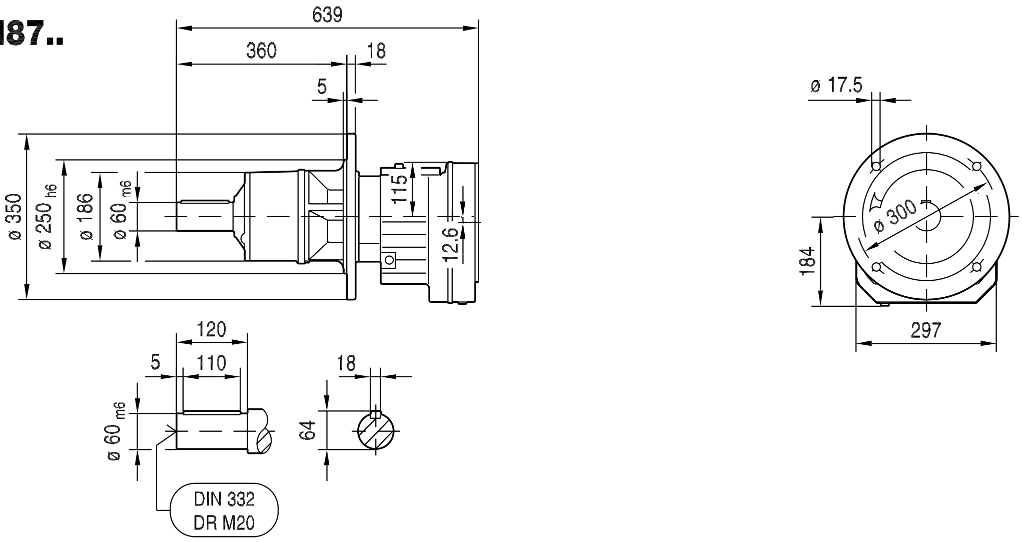
ø 300



ø 350



RM87..



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	526	551	601	565	599	667	597	637	717	714	757	845	888	931
LS	591	616	666	643	677	745	693	733	813	826	869	957	1000	1043
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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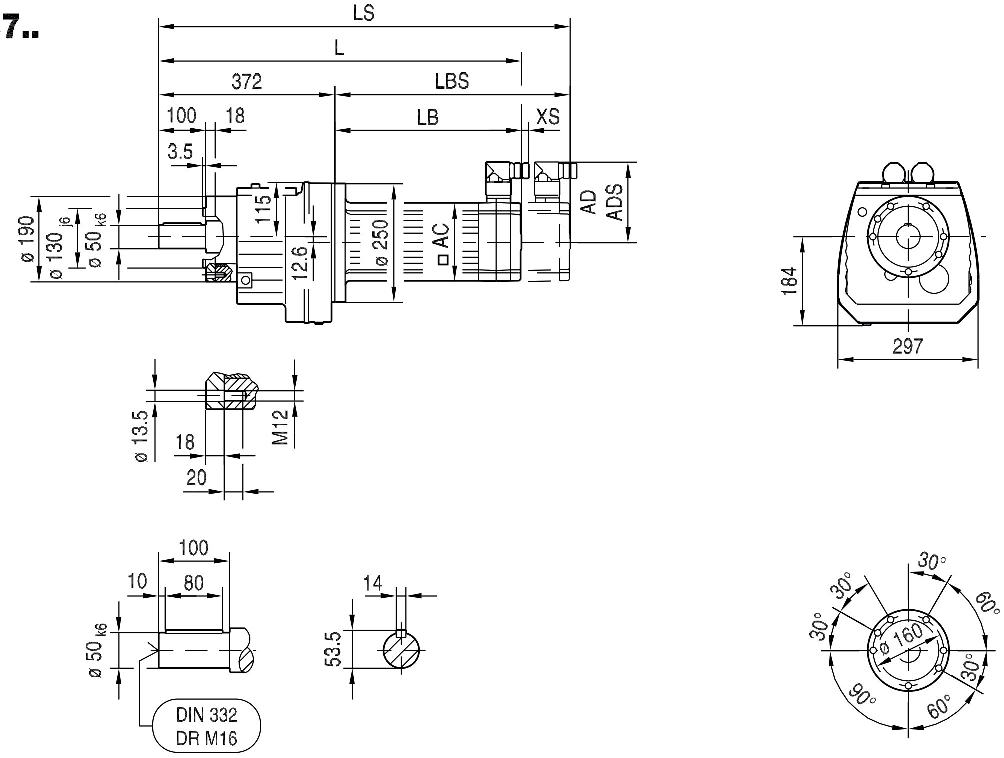
01 051 01 07

RZ87..



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	526	551	601	565	599	667	597	637	717	714	757	845	888	931
LS	591	616	666	643	677	745	693	733	813	826	869	957	1000	1043
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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8.3.10 R97..

R97, M_{aDyn} Nm											3000 Nm
	CMP										
i	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
2											
4.50		270	465	295	470	780	380	590	980	1170	1390
5.20		315	535	340	540	900	440	685	1130	1360	1610
6.21		375	640	410	650	1070	530	810	1350	1620	1920
7.12	290	430	735	470	745	1230	605	930	1550	1860	2210
8.39	340	505	870	555	870	1450	715	1100	1830	2190	>2560
9.29	375	560	960	615	970	1610	790	1220	2020	2430	>2560
10.83		655	1120	715	1130	1870	920	1420	2360	2830	>3090
12.39	505	750	1280	820	1290	2140	1050	1630	2700	>3090	>3090
14.62	595	880	1510	960	1530	2530	1240	1920	>3090	>3090	>3090
16.17	660	980	1670	1070	1690	2800	1380	2130	>3090	>3090	>3090
18.24	740	1100	1890	1200	1910	>3090	1550	2400	>3090	>3090	
20.14	820	1220	2090	1330	2100	>3090	1710	2650	>3090	>3090	
22.37	910	1350	2320	1480	2340	>3090	1900	2950			
25.03	1020	1510	2590	1650	2620	>3090	2130	>3090			
27.19	1110	1650		1800							
32.05	1300	1940		2120							
3											
27.58	1110	1650	2830	1800	2850	>3090	2320	>3090	>3090	>3090	>3090
33.25	1340	1990	>3090	2180	>3090	>3090	2800	>3090	>3090	>3090	>3090
37.13	1500	2230	>3090	2430	>3090	>3090	>3090	>3090	>3090	>3090	>3090
42.78	1720	2570	>3090	2800	>3090	>3090	>3090	>3090	>3090	>3090	
47.58	1920	2850	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	
53.21	2150	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
59.92	2420	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
65.21	2630	>3090		>3090							
72.17	2880	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090
83.15	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	
92.48	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	
103.44	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
116.48	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
126.75	>3090	>3090		>3090							
150.78	>3090	>3090		>3090							
170.02	>3090										
186.30	>3090										
216.28											
241.25											
255.71											
289.74											

(→ 190)

R97, m kg											
	CMP										
s	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
2	110	115	120	120	125	135	135	145	160	170	175
3	115	115	120	125	125	135	140	145	165	170	180
RF: + 17 kg / RM: + 68 kg											

CMP..				c_{TG}			φ
		n_{epk}	η	R	RF	RM	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	'
R97 2	4.50	3597	97	127	127	112	6
	5.20	3924	97	127	127	112	6
	6.21	4378	97	127	127	112	6
	7.12	4500	97	127	127	112	6
	8.39	4500	97	127	127	112	6
	9.29	4500	97	127	127	112	6
	10.83	4378	97	155	155	132	6
	12.39	4500	97	155	155	132	6
	14.62	4500	97	155	155	132	6
	16.17	4500	97	155	155	132	6
	18.24	4500	97	155	155	132	6
	20.14	4500	97	155	155	132	5
	22.37	4500	97	155	155	132	5
	25.03	4500	97	155	155	132	5
	27.19	4500	97	155	155	132	5
	32.05	4500	97	155	155	132	5
R97 3	27.58	4500	96	163	163	138	6
	33.25	4500	96	163	163	138	6
	37.13	4500	96	163	163	138	6
	42.78	4500	96	163	163	138	6
	47.58	4500	96	163	163	138	6
	53.21	4500	96	163	163	138	6
	59.92	4500	96	163	163	138	6
	65.21	4500	96	163	163	138	6
	72.17	4500	95	164	164	139	6
	83.15	4500	95	164	164	139	6
	92.48	4500	95	164	164	139	6
	103.44	4500	95	164	164	139	6
	116.48	4500	95	164	164	139	6
	126.75	4500	95	164	164	139	6
	150.78	4500	95	164	164	139	6
	170.02	4500	95	164	164	139	6
	186.30	4500	95	164	164	139	6
	216.28	4500	94	164	164	139	6
	241.25	4500	94	164	164	139	6
	255.71	4500	94	164	164	139	6
	289.74	4500	93	164	164	139	6

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CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} R N	F_{Ramax} RF N	F_{Ramax} RM N	F_{Rapk} R N	F_{Rapk} RF N	F_{Rapk} RM N
R97 2	4.50	1630	2440	2770	244	80	0	0	17900	24400	24400	26300
	5.20	1780	2560	3020	192	65	0	0	18700	23800	23800	26100
	6.21	1890	2560	3210	161	51	0	0	19900	23800	23800	26100
	7.12	2000	2560	3400	140	41	0	0	20800	23800	23800	26100
	8.39	2030	2560	3450	131	33	0	0	22000	23800	23800	26100
	9.29	2030	2560	3450	129	28	0	0	22800	23800	23800	26100
	10.83	2090	3090	3550	129	46	3720	3720	23700	16000	16000	24500
	12.39	2190	3090	3720	113	37	3850	3850	24800	16000	16000	24500
	14.62	2300	3090	3910	103	30	4240	4240	26200	16000	16000	24500
	16.17	2400	3090	4080	87	26	4130	4130	26200	16000	16000	24500
	18.24	2500	3090	4250	77	22	4270	4270	26100	16000	16000	24500
	20.14	2610	3090	4430	70	19	4110	4110	26000	16000	16000	24500
	22.37	2720	3090	4620	63	16	4060	4060	25800	16000	16000	24500
	25.03	2830	3090	4810	56	14	4140	4140	25700	16000	16000	24500
	27.19	2560	3090	4350	74	13	8380	8380	26000	16000	16000	24500
	32.05	2560	3090	4350	75	9.8	10600	10600	26000	16000	16000	24500
R97 3	27.58	2670	3090	4530	54	24	7260	7260	25900	16000	16000	24500
	33.25	2890	3090	4910	45	19	7160	7160	25600	16000	16000	24500
	37.13	3000	3090	5100	40	16	7410	7410	25400	16000	16000	24500
	42.78	3000	3090	5100	37	13	9480	9480	25400	16000	16000	24500
	47.58	3000	3090	5100	38	11	11100	11100	25400	16000	16000	24500
	53.21	3000	3090	5100	39	9.5	12900	12900	25400	16000	16000	24500
	59.92	3000	3090	5100	40	8.0	14800	14800	25400	16000	16000	24500
	65.21	3000	3090	5100	40	7.1	16300	16300	25400	16000	16000	24500
	72.17	3000	3090	5100	35	14	18000	18000	25400	16000	16000	24500
	83.15	3000	3090	5100	35	11	19800	19800	25400	16000	16000	24500
	92.48	3000	3090	5100	35	9.8	19800	19800	25400	16000	16000	24500
	103.44	3000	3090	5100	35	8.4	19800	19800	25400	16000	16000	24500
	116.48	3000	3090	5100	35	7.0	19800	19800	25400	16000	16000	24500
	126.75	3000	3090	5100	36	6.3	19800	19800	25400	16000	16000	24500
	150.78	3000	3090	5100	35	4.9	19800	19800	25400	16000	16000	24500
	170.02	3000	3090	5100	35	4.0	19800	19800	25400	16000	16000	24500
	186.30	3000	3090	5100	35	3.5	19800	19800	25400	16000	16000	24500
	216.28	3000	3090	5100	32	2.8	19800	19800	25400	16000	16000	24500
	241.25	3000	3090	5100	29	1.8	19800	19800	25400	16000	16000	24500
	255.71	3000	3090	5100	27	1.6	19800	19800	25400	16000	16000	24500
	289.74	3000	3090	5100	24	1.3	19800	19800	25400	16000	16000	24500

8

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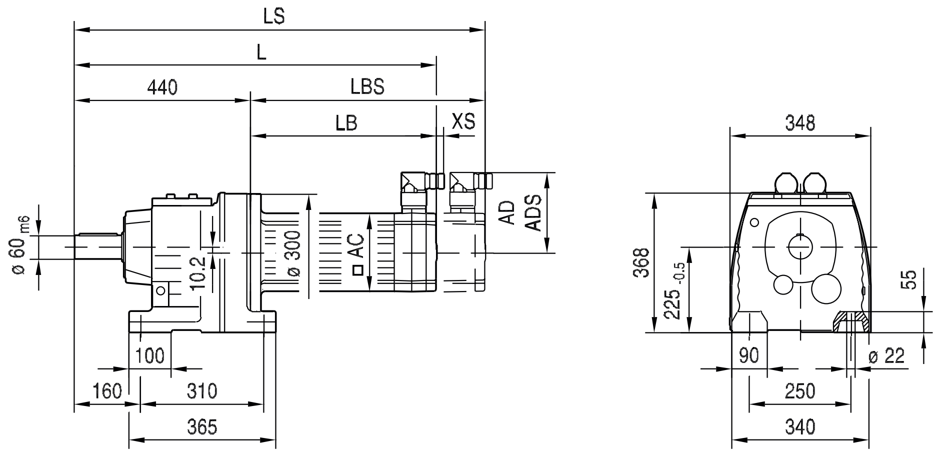
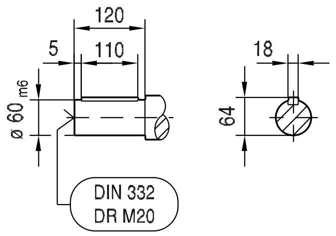
01 052 01 07

R97..





(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	627	661	729	660	700	780	777	820	908	951	994
LS	705	739	807	756	796	876	889	932	1020	1063	1106
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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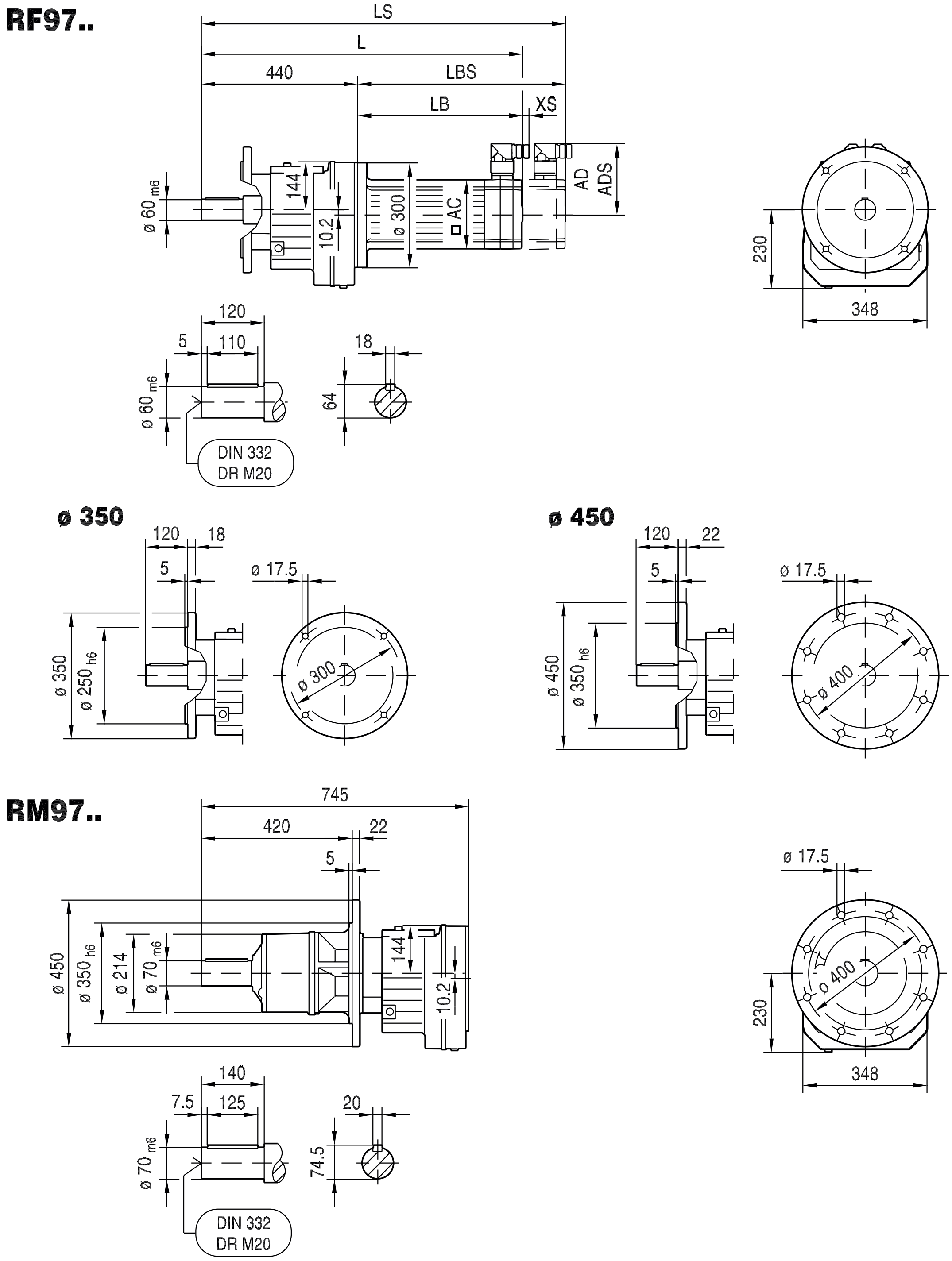
01 053 01 07



(→ 🗎 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	627	661	729	660	700	780	777	820	908	951	994
LS	705	739	807	756	796	876	889	932	1020	1063	1106
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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8.3.11 R107..

R107, M_{aDyn} Nm				CMP					4300 Nm
i	80L	100S	100M	100L	112S	112M	112L	112H	112E
				2					
4.92	510		515	850	415	645	1070	1280	1520
5.82	600	385	605	1000	495	765	1270	1520	1800
6.66	690	440	695	1150	565	870	1450	1740	2060
7.86	810	520	820	1360	670	1030	1710	2050	2430
8.56	880		890	1480	730	1120	1860	2240	2650
10.13	1050	670	1060	1750	860	1330	2210	2650	3140
11.59	1200	765	1210	2010	980	1520	2520	3030	3590
13.66	1410	900	1430	2360	1160	1800	2980	3570	4240
15.65	1620	1030	1630	2710	1330	2060	3410	4090	>4360
18.21	1890	1200	1900	3150	1550	2400	3970	>4360	>4360
20.07	2080	1320	2100	3480	1710	2640	>4360	>4360	>4360
22.62	2340	1490	2360	3920	1930	2980	>4360	>4360	
24.90	2580	1640	2600	4310	2120	3280	>4360	>4360	
27.58	2860	1820	2880	>4360	2350	3630			
30.77	3190	2030	3220	>4360	2620	4050			
				3					
29.49	2990	1910	3020	>4360	2460	3810	>4360	>4360	>4360
35.26	3620	2310	3650	>4360	2970	>4360	>4360	>4360	>4360
40.37	4140	2640	4180	>4360	3410	>4360	>4360	>4360	>4360
47.63	>4360	3120	>4360	>4360	4020	>4360	>4360	>4360	>4360
52.68	>4360	3450	>4360	>4360	>4360	>4360	>4360	>4360	>4360
59.41	>4360	3890	>4360	>4360	>4360	>4360	>4360	>4360	
65.60	>4360	4300	>4360	>4360	>4360	>4360	>4360	>4360	
72.88	>4360	>4360	>4360	>4360	>4360	>4360			
78.57	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360
92.70	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360
102.53	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360
115.63	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	
127.68	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	
141.83	>4360	>4360	>4360	>4360	>4360	>4360			
158.68	>4360	>4360	>4360	>4360	>4360	>4360			
172.34		>4360							
203.16		>4360							
229.95									
251.15									

(→ 190)

R107, m kg				CMP					
s	80L	100S	100M	100L	112S	112M	112L	112H	112E
2	170	175	180	185	190	195	210	220	230
3	175	180	185	195	195	200	220	225	235
RF: + 6.0 kg / RM: + 94 kg									

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CMP..				c_{TG}			φ
		n_{epk}	η	R	RF	RM	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	'
R107 2	4.92	3197	97	208	208	175	9
	5.82	3597	97	208	208	175	9
	6.66	3924	97	208	208	175	9
	7.86	4378	97	208	208	175	9
	8.56	3197	97	250	250	203	7
	10.13	3597	97	250	250	203	7
	11.59	3924	97	250	250	203	7
	13.66	4378	97	250	250	203	7
	15.65	4500	97	250	250	203	7
	18.21	4500	97	250	250	203	7
	20.07	4500	97	250	250	203	7
	22.62	4500	97	250	250	203	7
	24.90	4500	97	250	250	203	7
	27.58	4500	97	250	250	203	7
	30.77	4500	97	250	250	203	7
R107 3	29.49	3924	95	259	259	210	7
	35.26	4378	96	259	259	210	7
	40.37	4500	96	259	259	210	7
	47.63	4500	96	259	259	210	7
	52.68	4500	96	259	259	210	7
	59.41	4500	96	259	259	210	7
	65.60	4500	96	259	259	210	7
	72.88	4500	96	259	259	210	7
	78.57	4500	95	260	260	210	7
	92.70	4500	95	260	260	210	7
	102.53	4500	95	260	260	210	7
	115.63	4500	95	260	260	210	7
	127.68	4500	95	260	260	210	7
	141.83	4500	95	260	260	210	7
	158.68	4500	95	260	260	210	7
	172.34	4500	95	260	260	210	7
	203.16	4500	94	260	260	210	7
	229.95	4500	94	260	260	210	7
	251.15	4500	94	260	260	210	7

CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	F_{Ramax} R N	F_{Ramax} RF N	F_{Ramax} RM N	F_{Rapk} R N	F_{Rapk} RF N	F_{Rapk} RM N
R107 2	4.92[1]	2900	3820	4930	467	144	11300	11300	21100	31800	31800	33500
	5.82	2970	3820	5040	515	108	12100	12100	22400	31800	31800	33500
	6.66	2970	3820	5040	586	88	12800	12800	23500	31800	31800	33500
	7.86	2970	3820	5040	700	70	13800	13800	24900	31800	31800	33500
	8.56[1]	4300	4360	7310	245	129	11300	11300	24400	29100	29100	32100
	10.13	4300	4360	7310	237	97	12400	12400	26000	29100	29100	32100
	11.59	4300	4360	7310	242	80	13300	13300	27300	29100	29100	32100
	13.66	4300	4360	7310	242	64	14400	14400	29000	29100	29100	32100
	15.65	4300	4360	7310	236	52	15400	15400	30500	29100	29100	32100
	18.21	4300	4360	7310	236	43	16600	16600	32300	29100	29100	32100
	20.07	4300	4360	7310	234	37	17300	17300	32800	29100	29100	32100
	22.62	4300	4360	7310	234	31	18300	18300	32800	29100	29100	32100
	24.90	4300	4360	7310	237	27	19200	19200	32800	29100	29100	32100
	27.58	4300	4360	7310	232	21	20100	20100	32800	29100	29100	32100
	30.77	4300	4360	7310	227	18	21100	21100	32800	29100	29100	32100
R107 3	29.49	4300	4360	7310	85	60	20700	20700	32800	29100	29100	32100
	35.26	4300	4360	7310	88	47	22400	22400	32800	29100	29100	32100
	40.37	4300	4360	7310	87	38	23800	23800	32800	29100	29100	32100
	47.63	4300	4360	7310	88	31	25500	25500	32800	29100	29100	32100
	52.68	4300	4360	7310	89	27	26600	26600	32800	29100	29100	32100
	59.41	4300	4360	7310	89	22	28000	28000	32800	29100	29100	32100
	65.60	4300	4360	7310	90	19	29200	29200	32800	29100	29100	32100
	72.88	4300	4360	7310	89	17	29500	29500	32800	29100	29100	32100
	78.57	4300	4360	7310	46	34	29500	29500	32800	29100	29100	32100
	92.70	4300	4360	7310	47	28	29500	29500	32800	29100	29100	32100
	102.53	4300	4360	7310	48	25	29500	29500	32800	29100	29100	32100
	115.63	4300	4360	7310	48	20	29500	29500	32800	29100	29100	32100
	127.68	4300	4360	7310	49	18	29500	29500	32800	29100	29100	32100
	141.83	4300	4360	7310	49	15	29500	29500	32800	29100	29100	32100
	158.68	4300	4360	7310	44	13	29500	29500	32800	29100	29100	32100
	172.34	4300	4360	7310	41	12	29500	29500	32800	29100	29100	32100
	203.16	4300	4360	7310	34	9.2	29500	29500	32800	29100	29100	32100
	229.95	4300	4360	7310	30	5.9	29500	29500	32800	29100	29100	32100
	251.15	4300	4360	7310	28	5.1	29500	29500	32800	29100	29100	32100

1) (→ 190)

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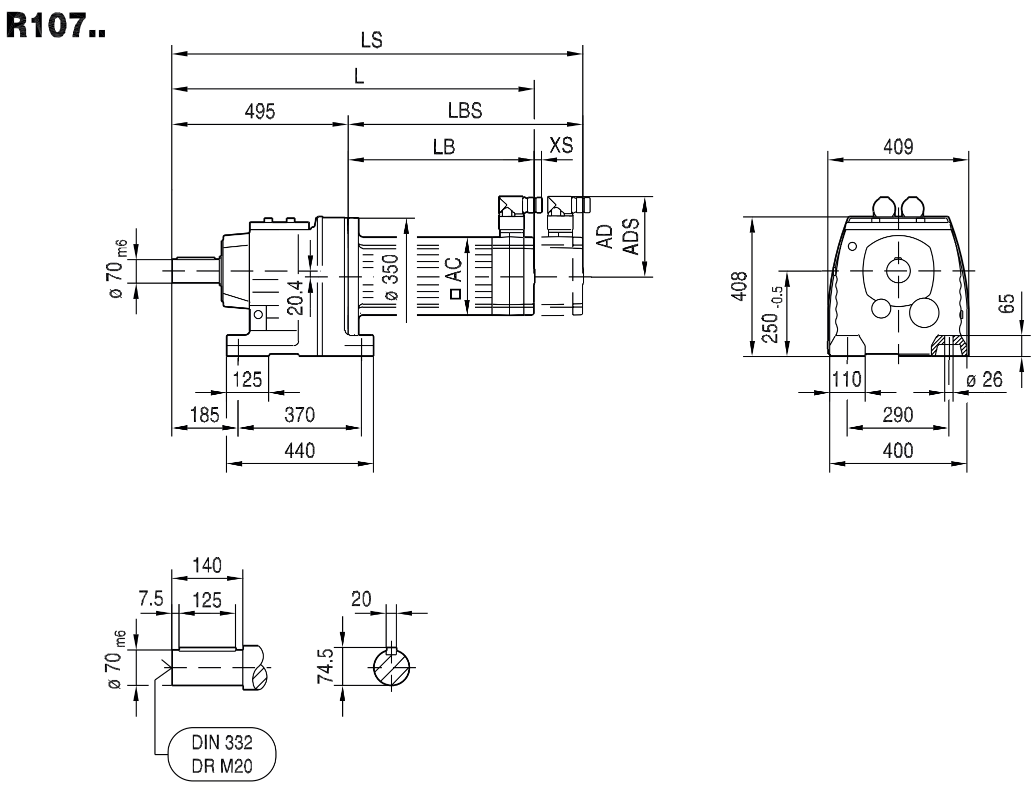
01 054 01 07



8

(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	779	709	749	829	826	869	957	1000	1043
LS	857	805	845	925	938	981	1069	1112	1155
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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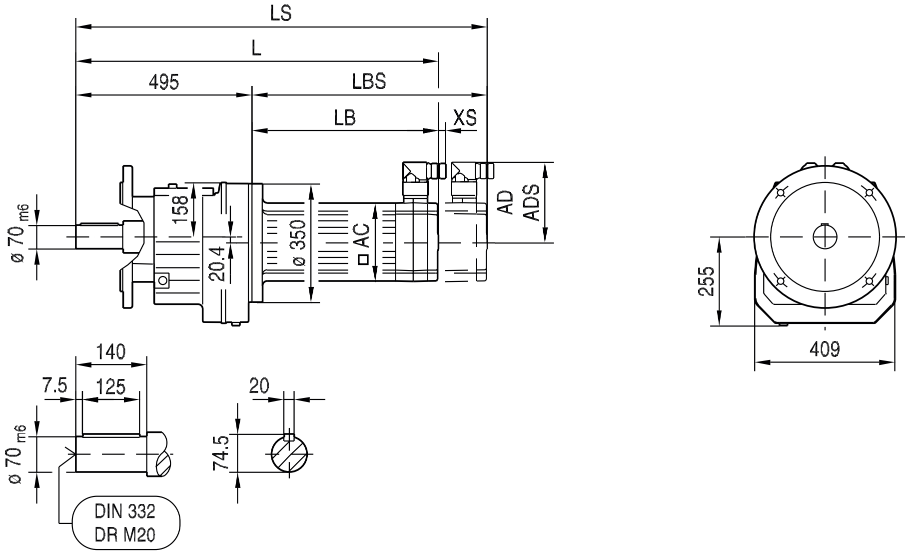
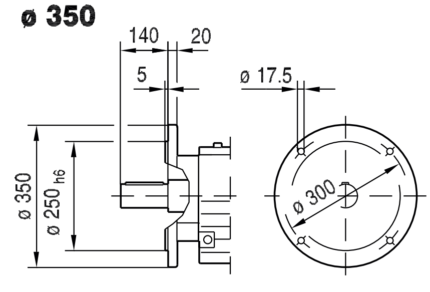
01 055 01 07

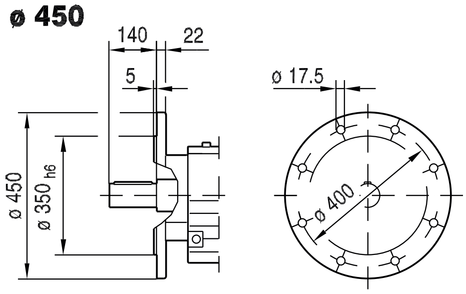
RF107..



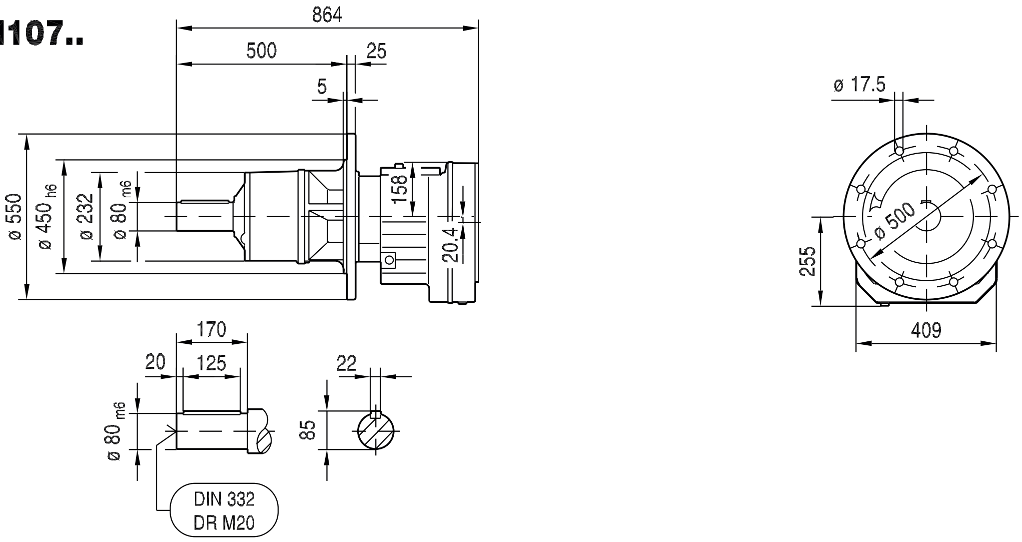
ø 350



ø 450



RM107..



(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	779	709	749	829	826	869	957	1000	1043
LS	857	805	845	925	938	981	1069	1112	1155
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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8.3.12 R127..

R127, M_{aDyn} Nm										6000 Nm
	CMP									
i	80L	100S	100M	100L	112S	112S	112M	112L	112H	112E
2										
5.55	575		580	960		470	730	1210	1450	1720
6.56	680	430	685	1130	520	555	860	1430	1710	2030
7.51	775	495	785	1300	595	640	990	1630	1960	2330
8.85	910	585	920	1530	700	755	1160	1930	2310	2740
8.96	920		930	1550		760	1180	1950	2340	2780
10.59	1090	700	1100	1830	840	900	1390	2310	2770	3280
12.12	1250	800	1260	2100	960	1030	1590	2640	3170	3760
14.29	1480	940	1490	2470	1130	1210	1880	3110	3740	4430
16.37	1690	1080	1710	2830	1300	1390	2150	3570	4280	5080
19.04	1970	1260	1990	3300	1510	1620	2510	4150	4980	5910
20.98	2170	1380	2190	3630	1660	1790	2760	4570	5490	6510
23.65	2450	1560	2470	4100	1880	2010	3110	5160	6190	
26.04	2700	1720	2720	4510	2070	2220	3430	5680	6810	
28.84	2990	1910	3020	5000	2290	2460	3800			
32.18	3330	2130	3370	5580	2550	2740	4240			
3										
30.84	3160	2020	3190	5290	2420	2600	4020	6660	>7000	>7000
36.88	3780	2410	3820	6330	2900	3110	4810	>7000	>7000	>7000
42.22	4330	2760	4370	>7000	3320	3560	5510	>7000	>7000	>7000
49.81	5110	3260	5160	>7000	3920	4200	6500	>7000	>7000	>7000
55.09	5650	3610	5710	>7000	4330	4650	>7000	>7000	>7000	>7000
62.13	6380	4070	6440	>7000	4890	5240	>7000	>7000	>7000	
68.61	>7000	4490	>7000	>7000	5400	5790	>7000	>7000	>7000	
76.21	>7000	4990	>7000	>7000	5990	6430	>7000			
82.17	>7000	5330	>7000	>7000	6400	6860	>7000	>7000	>7000	>7000
85.26	>7000	5590	>7000	>7000	6710	>7000	>7000			
96.95	>7000	6290	>7000	>7000	>7000	>7000	>7000	>7000	>7000	>7000
107.23	>7000	6950	>7000	>7000	>7000	>7000	>7000	>7000	>7000	>7000
120.92	>7000	>7000	>7000	>7000	>7000	>7000	>7000	>7000	>7000	
133.53	>7000	>7000	>7000	>7000	>7000	>7000	>7000	>7000	>7000	
148.33	>7000	>7000	>7000	>7000	>7000	>7000	>7000			
165.95	>7000	>7000	>7000	>7000	>7000	>7000	>7000			
180.23		>7000			>7000					
212.46		>7000			>7000					
240.48										
262.65										

(→ 🗎 190)

R127, m kg										
	CMP									
s	80L	100S	100M	100L	112S	112S	112M	112L	112H	112E
2	215	220	225	235	235	235	245	260	265	275
3	235	235	240	250	250	250	260	275	285	290
RF: + 11 kg / RM: + 105 kg										

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CMP..				c_{TG}			φ
	i	n_{epk} min^{-1}	η %	R Nm/'	RF Nm/'	RM Nm/'	/R '
R127 2	5.55	3196	97	338	338	286	8
	6.56	3596	97	353	353	297	8
	7.51	3923	97	363	363	304	8
	8.85	4378	97	372	372	311	8
	8.96	3196	97	486	486	386	7
	10.59	3596	97	498	498	394	6
	12.12	3923	97	505	505	399	6
	14.29	4378	97	512	512	403	6
	16.37	4500	97	517	517	406	6
	19.04	4500	97	521	521	408	6
	20.98	4500	97	522	522	409	6
	23.65	4500	97	522	522	409	6
	26.04	4500	97	523	523	410	6
	28.84	4500	97	520	520	407	6
	32.18	4500	97	522	522	409	6
R127 3	30.84	3923	96	567	567	436	7
	36.88	4378	96	569	569	437	7
	42.22	4500	96	569	569	437	7
	49.81	4500	96	570	570	438	7
	55.09	4500	96	571	571	438	7
	62.13	4500	96	570	570	438	7
	68.61	4500	96	571	571	438	7
	76.21	4500	96	570	570	438	7
	82.17	4500	95	575	575	441	6
	85.26	4500	96	571	571	438	7
	96.95	4500	95	575	575	441	6
	107.23	4500	95	575	575	441	6
	120.92	4500	95	575	575	441	6
	133.53	4500	95	575	575	441	6
	148.33	4500	95	575	575	441	6
	165.95	4500	95	575	575	441	6
	180.23	4500	95	575	575	441	6
	212.46	4500	95	575	575	441	6
	240.48	4500	95	575	575	440	6
	262.65	4500	95	575	575	440	6

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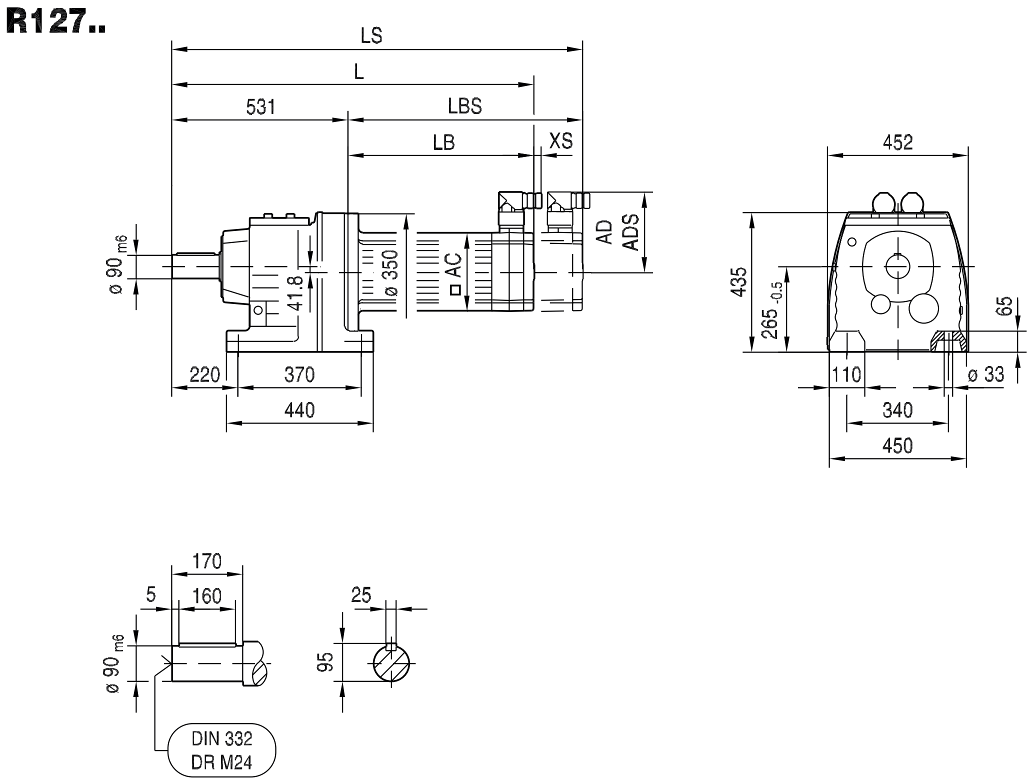
CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} R N	F_{Ramax} RF N	F_{Ramax} RM N	F_{Rapk} R N	F_{Rapk} RF N	F_{Rapk} RM N
R127 2	5.55[1)]	3930	4590	6880	189	230	37600	37600	40900	43000	43000	43000
	6.56	3930	4590	6880	189	189	40200	40200	43000	43000	43000	43000
	7.51	3930	4590	6880	189	167	42400	42400	43000	43000	43000	43000
	8.85	3930	4590	6880	189	146	43000	43000	43000	43000	43000	43000
	8.96[1)]	5420	7000	10500	69	214	41400	41400	43000	43000	43000	42100
	10.59	5700	7000	10500	69	178	43000	43000	43000	43000	43000	42100
	12.12	5940	7000	10500	69	159	43000	43000	43000	43000	43000	42100
	14.29	6000	7000	10500	70	140	43000	43000	43000	43000	43000	42100
	16.37	6000	7000	10500	70	127	43000	43000	43000	43000	43000	42100
	19.04	6000	7000	10500	70	116	43000	43000	43000	43000	43000	42100
	20.98	6000	7000	10500	71	109	43000	43000	43000	43000	43000	42100
	23.65	6000	7000	10500	71	102	43000	43000	43000	43000	43000	42100
	26.04	6000	7000	10500	71	97	43000	43000	43000	43000	43000	42100
	28.84	6000	6760	10100	80	54	43000	43000	43000	43000	43000	42300
	32.18	6000	6660	9990	84	51	43000	43000	43000	43000	43000	42400
R127 3	30.84	5380	7000	10500	22	130	43000	43000	43000	43000	43000	42100
	36.88	5730	7000	10500	22	117	43000	43000	43000	43000	43000	42100
	42.22	6000	7000	10500	23	108	43000	43000	43000	43000	43000	42100
	49.81	6000	7000	10500	23	100	43000	43000	43000	43000	43000	42100
	55.09	6000	7000	10500	23	96	43000	43000	43000	43000	43000	42100
	62.13	6000	7000	10500	23	91	43000	43000	43000	43000	43000	42100
	68.61	6000	7000	10500	23	88	43000	43000	43000	43000	43000	42100
	76.21	6000	7000	10500	23	48	43000	43000	43000	43000	43000	42100
	82.17	6000	7000	10500	14	102	43000	43000	43000	43000	43000	42100
	85.26	6000	7000	10500	23	46	43000	43000	43000	43000	43000	42100
	96.95	6000	7000	10500	14	96	43000	43000	43000	43000	43000	42100
	107.23	6000	7000	10500	14	93	43000	43000	43000	43000	43000	42100
	120.92	6000	7000	10500	14	88	43000	43000	43000	43000	43000	42100
	133.53	6000	7000	10500	15	86	43000	43000	43000	43000	43000	42100
	148.33	6000	7000	10500	15	47	43000	43000	43000	43000	43000	42100
	165.95	6000	7000	10500	15	44	43000	43000	43000	43000	43000	42100
	180.23	6000	7000	10500	15	19	43000	43000	43000	43000	43000	42100
	212.46	6000	7000	10500	15	16	43000	43000	43000	43000	43000	42100
	240.48	6000	7000	10500	15	7.8	43000	43000	43000	43000	43000	42100
	262.65	6000	7000	10500	15	7.0	43000	43000	43000	43000	43000	42100

[1)] (→ 🗎 190)

01 138 00 15



(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	815	745	785	865	862	905	993	1036	1079
LS	893	841	881	961	974	1017	1105	1148	1191
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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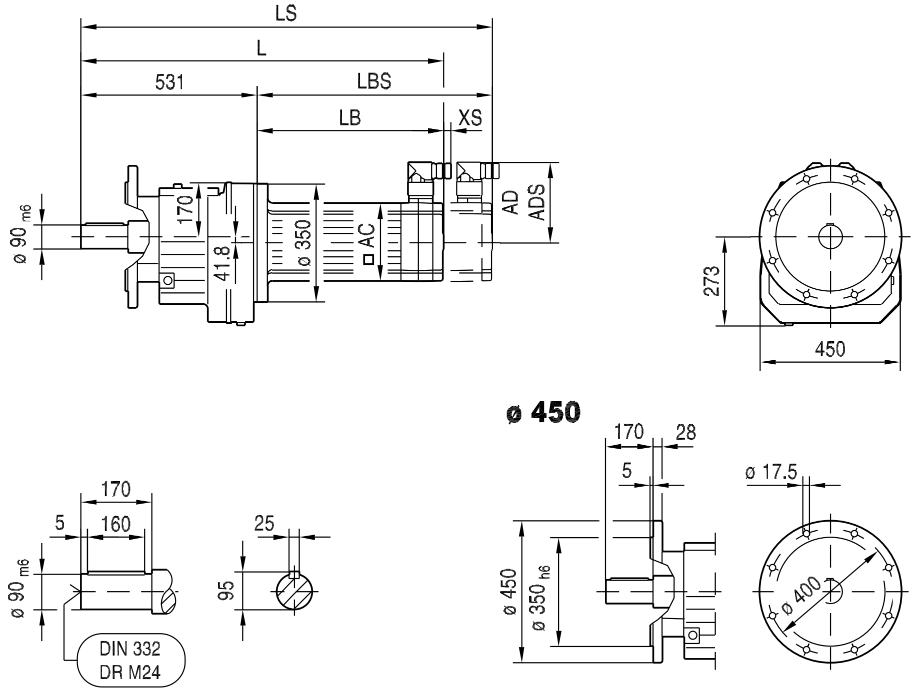
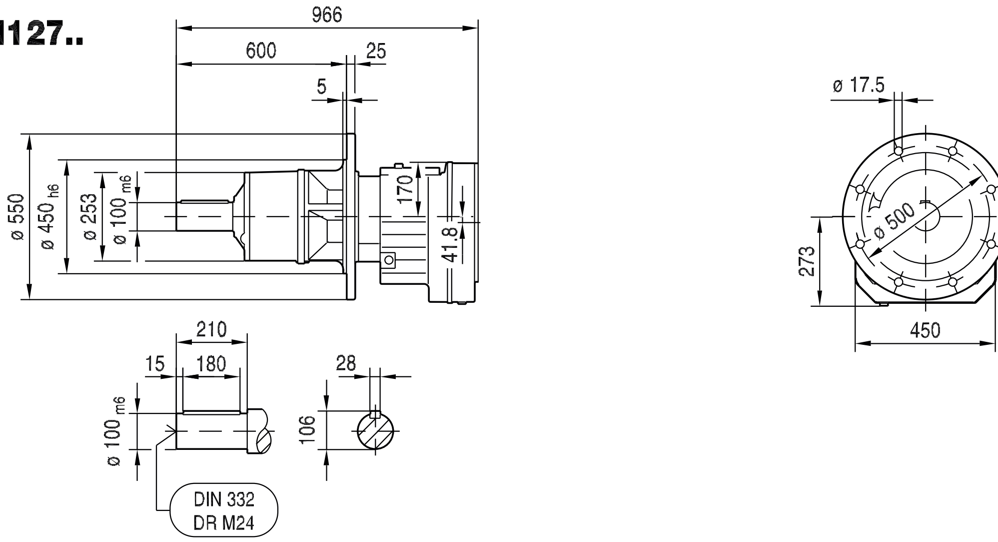
01 139 00 15

RF127..



RM127..



(→ 🗎 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	815	745	785	865	862	905	993	1036	1079
LS	893	841	881	961	974	1017	1105	1148	1191
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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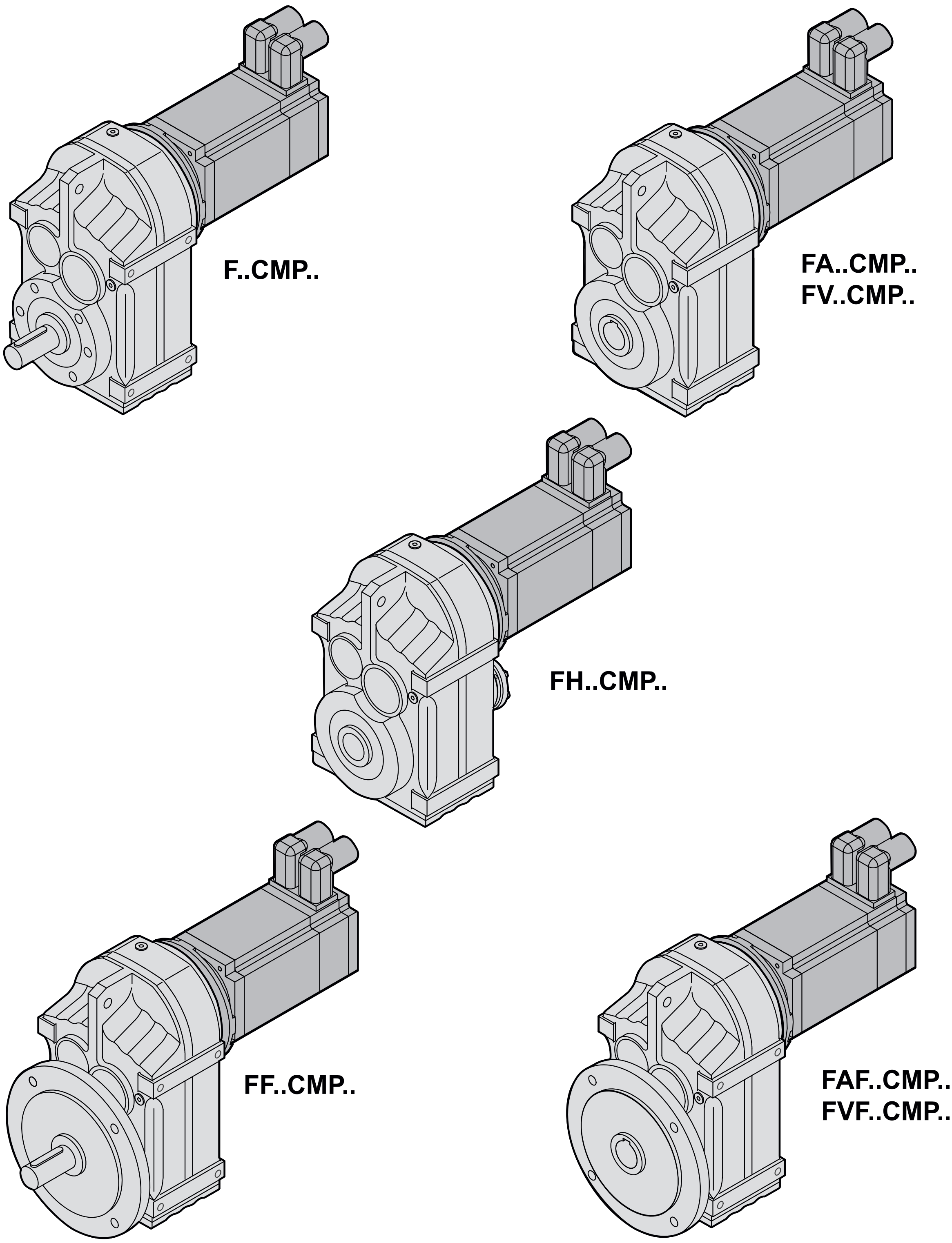
9 Parallel-shaft helical gearmotors – F.. gear units

9.1 F..CMP.. designs



15705955339

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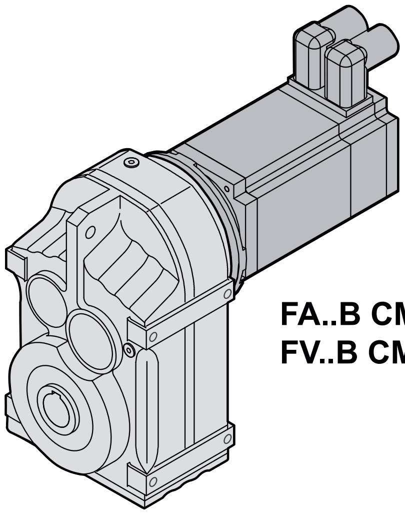
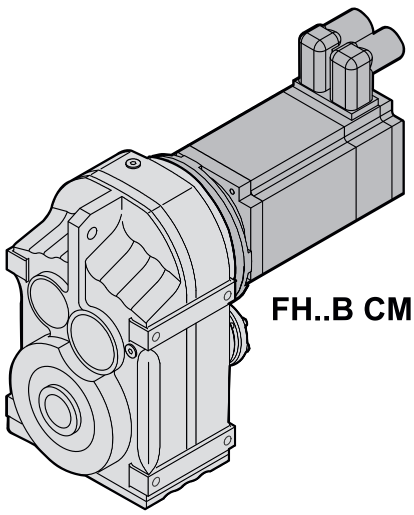
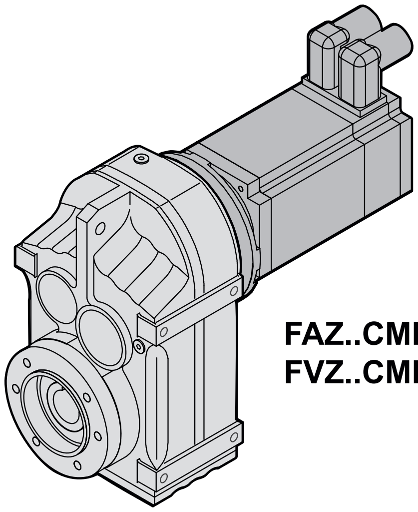


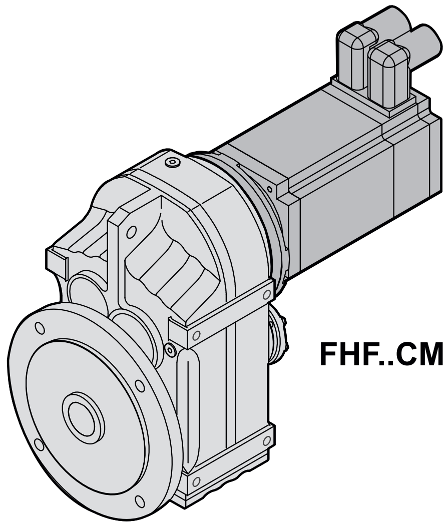
FA..B CMP..
FV..B CMP..



FH..B CMP..

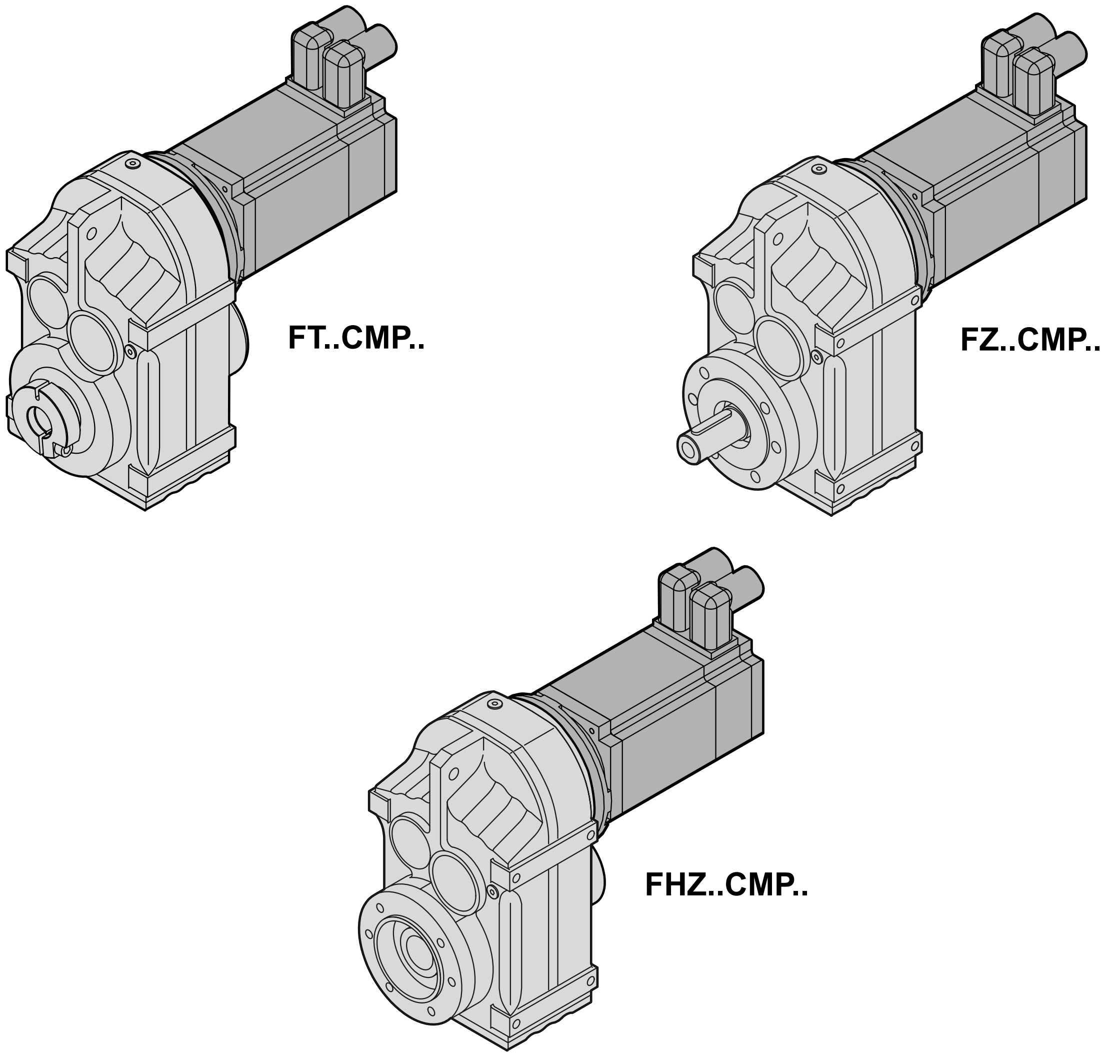


FAZ..CMP..
FVZ..CMP..



FHF..CMP..

15705957771



17420518155

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9.2 F27–107..CMP.. selection tables and dimension sheets

9.2.1 F27..

F27, M_{aDyn} Nm										130 Nm
	CMP									
i	40M	50S	50M	50L	63S	63M	63L	71S	71M	80S
2										
4.16	15	21	42	62	45	86	123	77	124	111
4.93	18	25	49	74	53	102	>144	92	>144	132
5.27	19	27	53	79	57	109	>150	98	>150	141
6.17	23	31	62	92	66	128	>163	115	>163	>163
6.91	25	35	69	103	74	143	>163	129	>163	>163
8.13	30	41	81	121	88	>163	>163	151	>163	>163
9.40	35	47	94	140	101	>163		>163		
9.88	36	50	99	148	106	>157	>157	>157	>157	>157
10.55	39	53	105	>157	114	>157	>157	>157	>157	>157
12.35	46	62	123	>157	133	>157	>157	>157	>157	>157
13.84	51	70	138	>157	149	>157	>157	>157	>157	>157
16.28	60	82	>157	>157	>157	>157	>157	>157	>157	>157
18.84	69	95	>157	>157	>157	>157		>157		
20.15	74	102	>157	>157	>157	>157		>157		
23.25	86	117	>157		>157					
27.18	99	136								
29.56	108	148								
3										
33.83	122	>157	>157	>157	>157	>157	>157	>157	>157	>157
38.33	138	>157	>157	>157	>157	>157		>157		
40.89	148	>157	>157	>157	>157	>157	>157	>157	>157	>157
46.78	>157	>157	>157	>157	>157	>157		>157		
50.19	>157	>157	>157	>157	>157	>157		>157		
56.62	>157	>157	>157	>157	>157	>157	>157	>157	>157	>157
63.86	>157	>157	>157	>157	>157	>157	>157	>157	>157	>157
72.37	>157	>157	>157	>157	>157	>157		>157		
77.21	>157	>157	>157	>157	>157	>157	>157	>157	>157	>157
88.32	>157	>157	>157	>157	>157	>157		>157		
94.76	>157	>157	>157	>157	>157	>157		>157		
109.90	>157	>157	>157		>157					
129.09	>157	>157								
140.74	>157	>157								

(→ 190)

F27, m kg										
	CMP									
s	40M	50S	50M	50L	63S	63M	63L	71S	71M	80S
2	7.1	8.8	9.7	11	11	12	14	14	15	21
3	7.4	9.1	10.0	11	11	13	14	14	15	22
FAF: + 0.70 kg / F: + 0.50 kg / FF: + 1.3 kg										

CMP..				c_{TG}			
		n_{epk}	η	FA	FAF	F	FF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
FA27 2	4.16	4120	97	46	46	21	18
	4.93	4500	97	46	46	21	18
	5.27	4500	97	46	46	21	18
	6.17	4500	97	46	46	21	18
	6.91	4500	97	46	46	21	18
	8.13	4500	97	46	46	21	18
	9.40	4500	97	46	46	21	18
	9.88	4500	97	83	83	26	22
	10.55	4500	97	83	83	26	22
	12.35	4500	97	83	83	26	22
	13.84	4500	97	83	83	26	22
	16.28	4500	97	83	83	26	22
	18.84	4500	97	83	83	26	22
	20.15	4500	97	83	83	26	22
	23.25	4500	97	83	83	26	22
	27.18	4500	96	83	83	26	22
	29.56	4500	96	83	83	26	22
FA27 3	33.83	4500	95	95	95	27	23
	38.33	4500	95	95	95	27	23
	40.89	4500	95	95	95	27	23
	46.78	4500	94	95	95	27	23
	50.19	4500	94	95	95	27	23
	56.62	4500	94	99	99	27	23
	63.86	4500	94	99	99	27	23
	72.37	4500	93	99	99	27	23
	77.21	4500	93	99	99	27	23
	88.32	4500	93	99	99	27	23
	94.76	4500	92	99	99	27	23
	109.90	4500	92	99	99	27	23
	129.09	4500	91	99	99	27	23
	140.74	4500	90	99	99	27	23

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	kg*m²	N	N	N	N	N	N	N	N
FA27 2	4.16	87	130	148	361	1.4	1810	1810	1380	1180	4500	4500	4500	4500
	4.93	96	144	163	304	1.0	1860	1860	1420	1210	4500	4500	4500	4500
	5.27	100	150	170	266	0.90	1880	1880	1440	1220	4500	4500	4500	4500
	6.17	109	163	185	227	0.68	1940	1940	1480	1260	4500	4500	4500	4500
	6.91	114	163	194	217	0.56	2000	2000	1530	1300	4500	4500	4500	4500
	8.13	123	163	205	172	0.42	2080	2080	1580	1350	4500	4500	4500	4500
	9.40	130	163	220	160	0.33	2170	2170	1660	1410	4500	4500	4500	4500
	9.88	130	157	220	202	0.74	2400	2400	1830	1560	4500	4500	4500	4500
	10.55	130	157	220	209	0.67	2490	2490	1900	1620	4500	4500	4500	4500
	12.35	130	157	220	211	0.51	2700	2700	2060	1760	4500	4500	4500	4500
	13.84	130	157	220	210	0.43	2860	2860	2180	1860	4500	4500	4500	4500
	16.28	130	157	220	209	0.32	3110	3110	2370	2020	4500	4500	4500	4500
	18.84	130	157	220	212	0.26	3340	3340	2550	2170	4500	4500	4500	4500
	20.15	130	157	220	213	0.23	3450	3450	2630	2240	4500	4500	4500	4500
	23.25	130	157	220	215	0.19	3690	3690	2820	2400	4500	4500	4500	4500
	27.18	130	157	220	217	0.15	3970	3970	3030	2580	4500	4500	4500	4500
	29.56	130	157	220	220	0.13	4120	4120	3140	2680	4500	4500	4500	4500

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CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
FA27 3	33.83	130	157	220	166	0.31	4380	4380	3340	2850	4500	4500	4500	4500
	38.33	130	157	220	167	0.26	4500	4500	3530	3010	4500	4500	4500	4500
	40.89	130	157	220	166	0.23	4500	4500	3640	3100	4500	4500	4500	4500
	46.78	130	157	220	150	0.18	4500	4500	3860	3290	4500	4500	4500	4500
	50.19	130	157	220	139	0.17	4500	4500	3980	3390	4500	4500	4500	4500
	56.62	130	157	220	124	0.31	4500	4500	4180	3570	4500	4500	4500	4500
	63.86	130	157	220	110	0.26	4500	4500	4400	3750	4500	4500	4500	4500
	72.37	130	157	220	97	0.22	4500	4500	4500	3960	4500	4500	4500	4500
	77.21	130	157	220	91	0.20	4500	4500	4500	4060	4500	4500	4500	4500
	88.32	130	157	220	79	0.16	4500	4500	4500	4290	4500	4500	4500	4500
	94.76	130	157	220	74	0.15	4500	4500	4500	4420	4500	4500	4500	4500
	109.90	130	157	220	64	0.12	4500	4500	4500	4500	4500	4500	4500	4500
	129.09	130	157	220	54	0.090	4500	4500	4500	4500	4500	4500	4500	4500
	140.74	130	157	220	50	0.080	4500	4500	4500	4500	4500	4500	4500	4500

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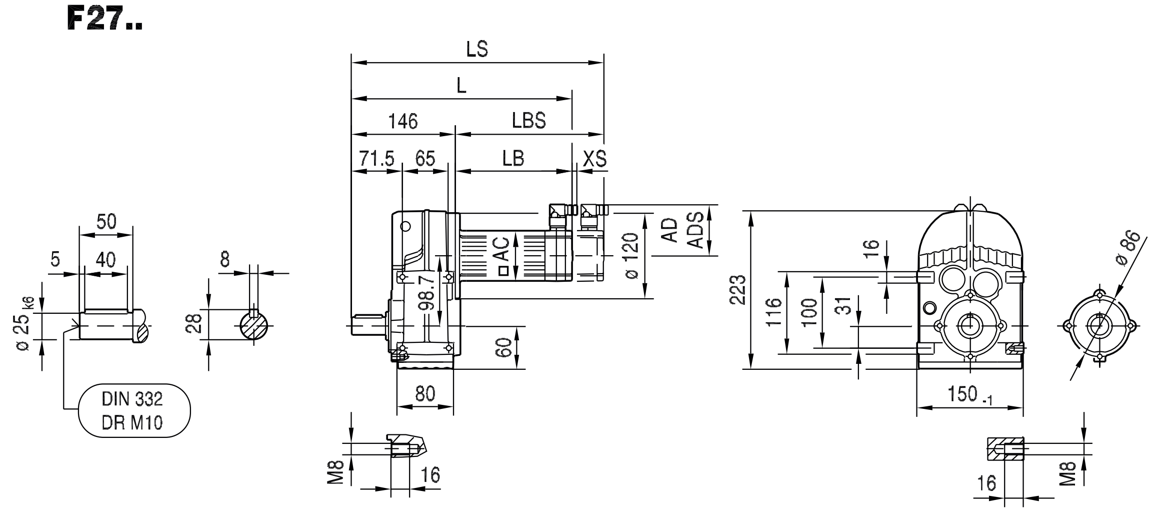
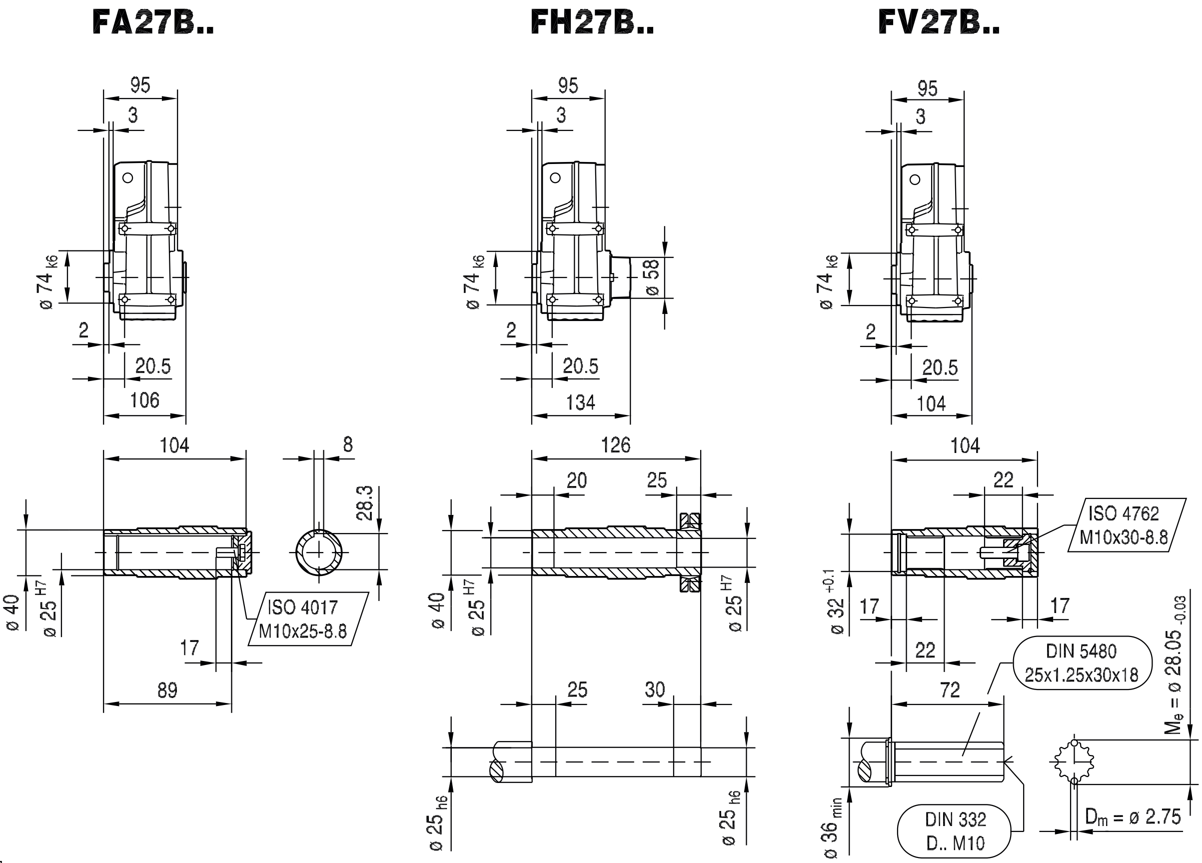
42 008 01 07





(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	289	291	330	369	326	376	429	318	346
LS	319	320	359	398	354	404	458	383	411
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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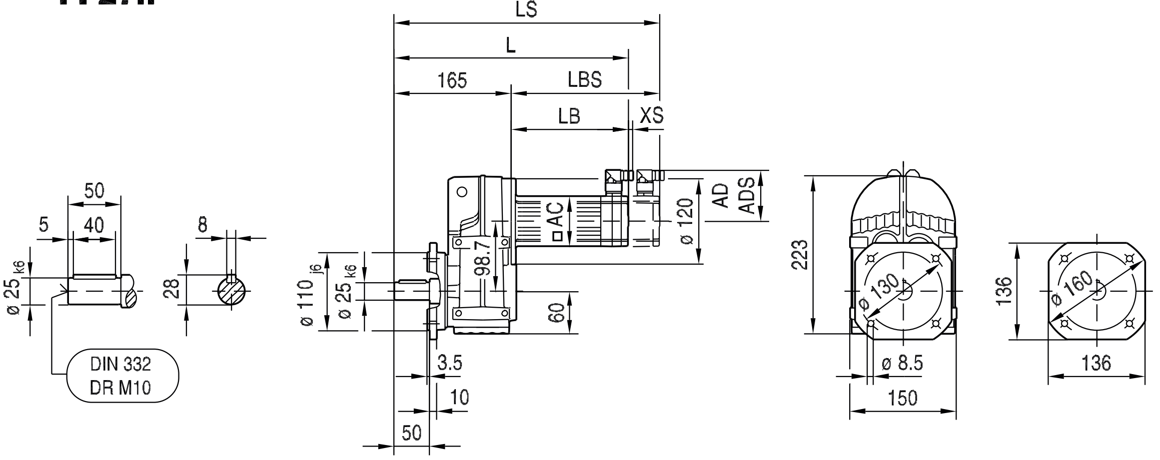
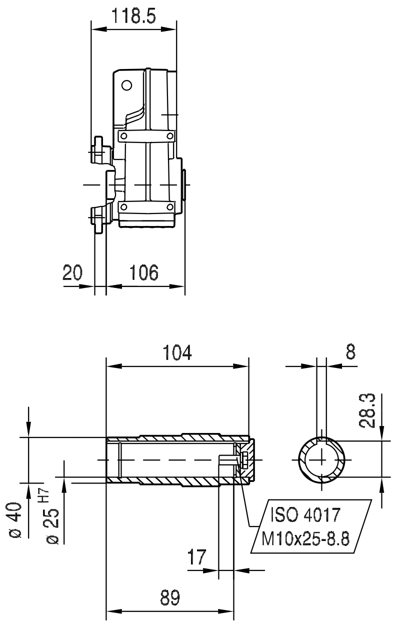
42 009 01 07

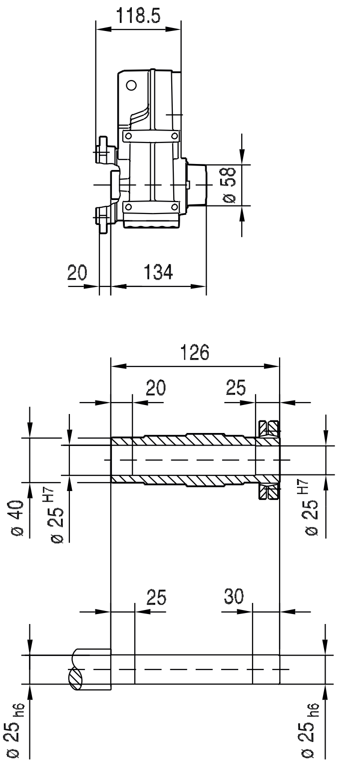
FF27..



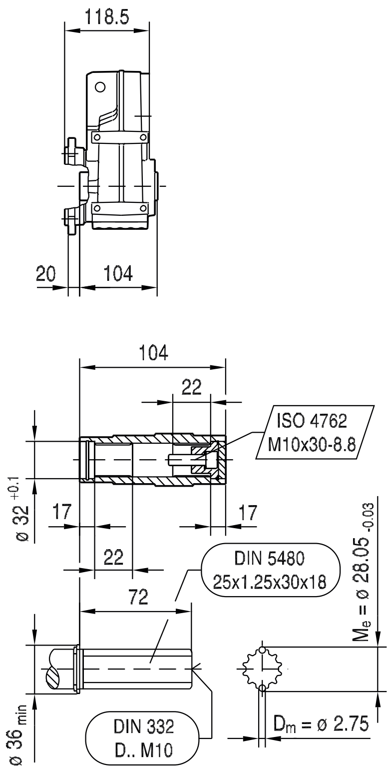
FAF27..



FHF27..



FVF27..



(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	308	310	349	388	345	395	448	337	365
LS	338	339	378	417	373	423	477	402	430
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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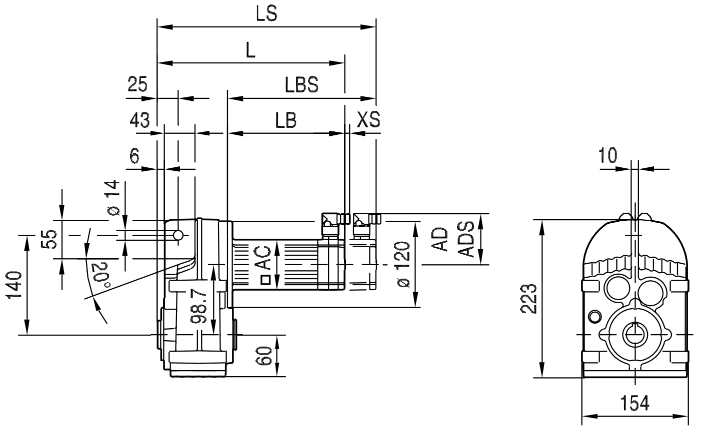
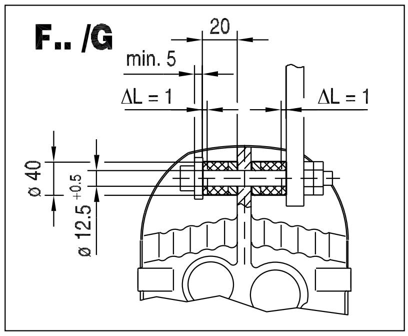
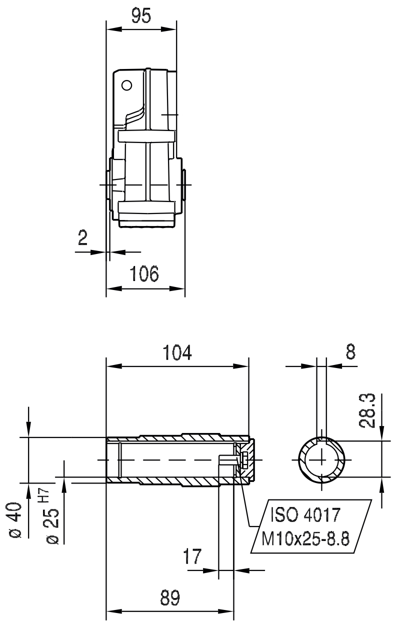
FA27..

42 010 02 07

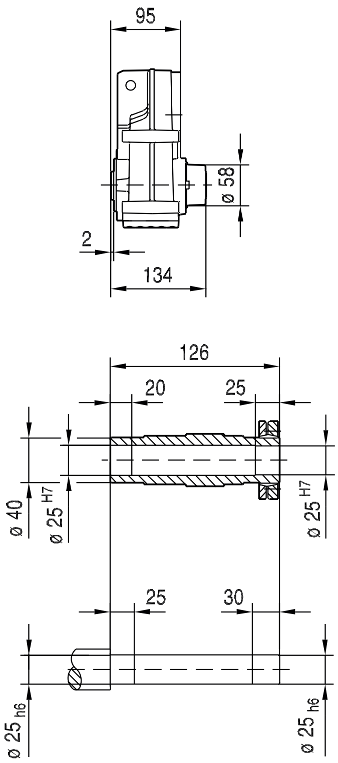




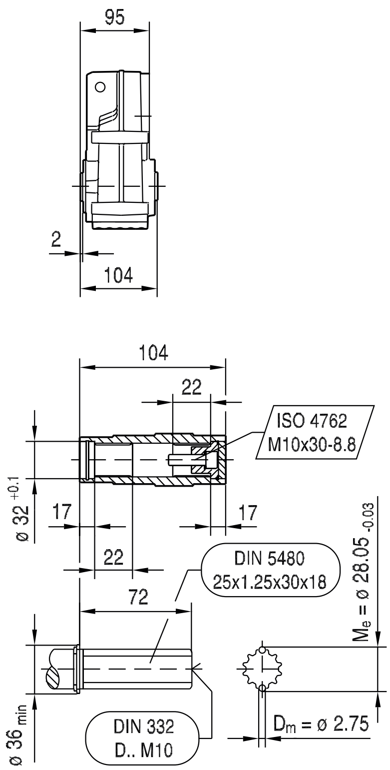
FA27..



FH27..



FV27..



(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	238	240	279	318	275	325	378	267	295
LS	268	269	308	347	303	353	407	332	360
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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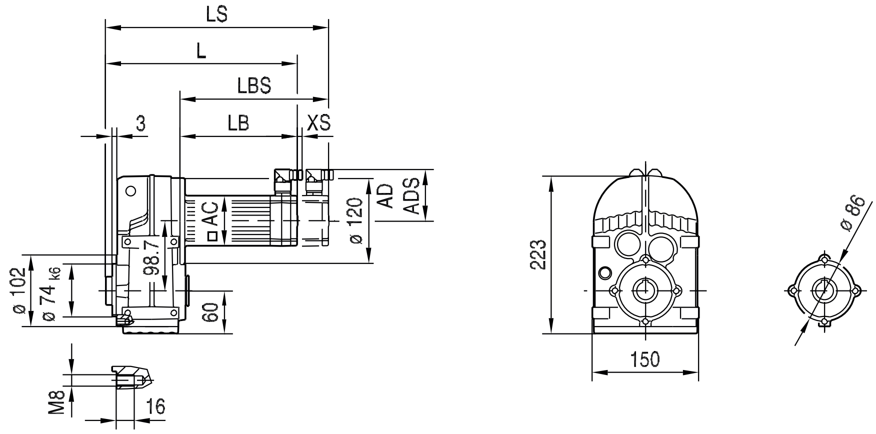
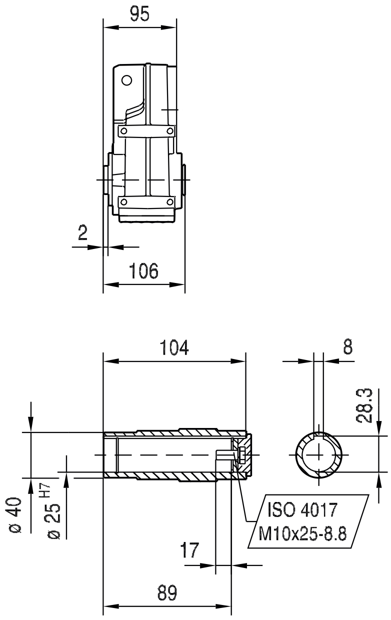
FAZ27..

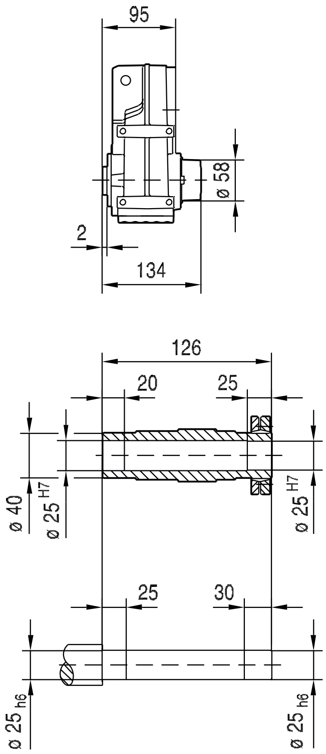
42 011 01 07



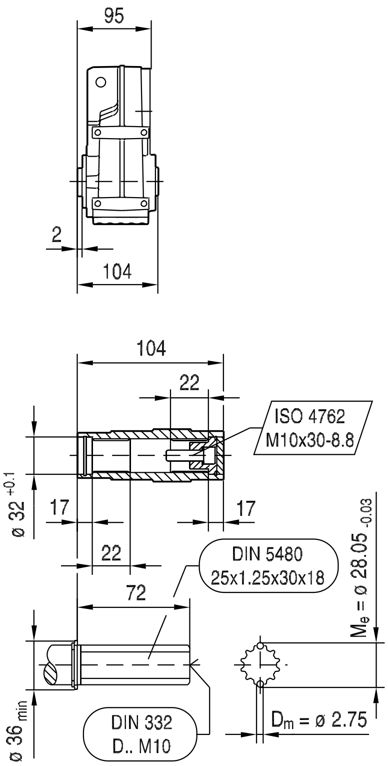
FAZ27..



FHZ27..



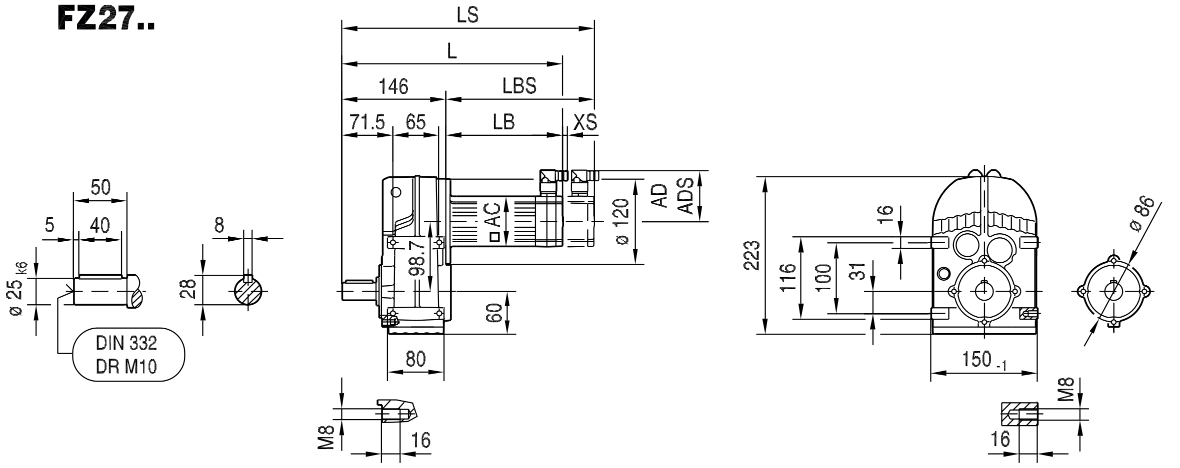
FVZ27..



(→ 194)	CMP..								
	40M	**50S**	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	238	240	279	318	275	325	378	267	295
LS	268	269	308	347	303	353	407	332	360
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

42 001 00 16

FZ27..



(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	159	161	200	239	196	246	299	188	216
LS	189	190	229	268	224	274	328	253	281
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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9.2.2 F37..

F37, M_{aDyn} Nm										200 Nm
	CMP									
i	40M	50S	50M	50L	63S	63M	63L	71S	71M	80S
2										
3.77	14	19	38	56	41	78	111	70	113	101
4.22	16	21	42	63	45	88	124	79	126	113
4.90	18	25	49	73	53	102	144	91	146	131
5.21	19	26	52	78	56	108	154	97	156	139
6.05	22	31	60	90	65	126	178	113	181	161
6.74	25	34	67	101	73	140	>188	126	>188	180
7.44	27	38	74	111	80	154		139		
8.01	30	40	80	120	86	166	235	149	235	210
8.97	33	45	90	134	97	186	>240	167	>240	235
10.42	38	53	104	156	112	215	>240	194	>240	>240
11.08	41	56	111	166	119	225	>240	205	>240	>240
12.87	47	65	129	192	139	>240	>240	235	>240	>240
14.33	53	72	143	210	154	>240	>240	>240	>240	>240
15.81	58	80	158	235	170	>240		>240		
17.03	63	86	170	>240	183	>240	>240	>240	>240	>240
19.27	71	97	193	>240	205	>240		>240		
20.57	76	104	205	>240	220	>240		>240		
23.63	87	119	235		>240					
3										
23.88	87	119	235	>240	>240	>240	>240	>240	>240	>240
28.09	102	140	>240	>240	>240	>240	>240	>240	>240	>240
31.69	116	158	>240	>240	>240	>240	>240	>240	>240	>240
35.91	130	177	>240	>240	>240	>240		>240		
38.31	138	189	>240	>240	>240	>240	>240	>240	>240	>240
43.83	158	215	>240	>240	>240	>240		>240		
47.02	170	230	>240	>240	>240	>240		>240		
51.70	187	>240	>240	>240	>240	>240	>240	>240	>240	>240
54.54	197	>240	>240		>240					
58.32	210	>240	>240	>240	>240	>240	>240	>240	>240	>240
66.09	235	>240	>240	>240	>240	>240		>240		
70.50	>240	>240	>240	>240	>240	>240	>240	>240	>240	>240
80.65	>240	>240	>240	>240	>240	>240		>240		
86.53	>240	>240	>240	>240	>240	>240		>240		
100.36	>240	>240	>240		>240					
117.88	>240	>240								
128.51	>240	>240								

(→ 🗎 190)

F37, m kg										
	CMP									
s	40M	50S	50M	50L	63S	63M	63L	71S	71M	80S
2	13	15	16	17	17	19	20	20	21	28
3	13	15	16	17	17	19	20	20	22	28
FAF: + 1.5 kg / F: + 0.45 kg / FF: + 2.3 kg										

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CMP..				c_{TG}				φ
		n_{epk}	η	FA	FAF	F	FF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
FA37 2	3.77	4500	97	41	41	20	15	12
	4.22	4500	97	41	41	20	15	11
	4.90	4500	97	41	41	20	15	11
	5.21	4500	97	41	41	20	15	10
	6.05	4500	97	41	41	20	15	10
	6.74	4500	97	41	41	20	15	10
	7.44	4500	97	41	41	20	15	10
	8.01	4500	97	84	84	26	19	7
	8.97	4500	97	84	84	26	19	7
	10.42	4500	97	84	84	26	19	7
	11.08	4500	97	84	84	26	19	7
	12.87	4500	97	84	84	26	19	7
	14.33	4500	97	84	84	26	19	6
	15.81	4500	97	84	84	26	19	6
	17.03	4500	97	84	84	26	19	6
	19.27	4500	97	84	84	26	19	6
	20.57	4500	97	84	84	26	19	6
	23.63	4500	97	84	84	26	19	6
FA37 3	23.88	4500	96	94	94	27	19	8
	28.09	4500	96	94	94	27	19	8
	31.69	4500	96	94	94	27	19	8
	35.91	4500	95	94	94	27	19	8
	38.31	4500	95	94	94	27	19	8
	43.83	4500	95	94	94	27	19	8
	47.02	4500	95	94	94	27	19	8
	51.70	4500	95	97	97	27	19	7
	54.54	4500	95	94	94	27	19	8
	58.32	4500	95	97	97	27	19	7
	66.09	4500	95	97	97	27	19	7
	70.50	4500	94	97	97	27	19	7
	80.65	4500	94	97	97	27	19	7
	86.53	4500	94	97	97	27	19	7
	100.36	4500	94	97	97	27	19	7
	117.88	4500	93	97	97	27	19	7
	128.51	4500	93	97	97	27	19	7

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CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
FA37 2	3.77	105	157	179	451	2.8	2470	2470	1970	2220	7000	7000	4810	5860
	4.22	110	165	187	427	2.3	2550	2550	2030	2300	7000	7000	4730	5820
	4.90	120	180	200	367	1.8	2630	2630	2100	2380	7000	7000	4560	5740
	5.21	125	187	210	326	1.6	2660	2660	2120	2410	7000	7000	4470	5700
	6.05	135	188	230	281	1.2	2750	2750	2190	2510	7000	7000	4460	5700
	6.74	140	188	235	267	1.0	2850	2850	2270	2600	7000	7000	4460	5700
	7.44	145	188	245	242	0.83	2940	2940	2350	2680	7000	7000	4460	5700
	8.01	170	240	285	200	1.5	2960	2960	2360	2710	7000	7000	3610	4100
	8.97	175	240	295	190	1.3	3080	3080	2460	2820	7000	7000	3610	4100
	10.42	185	240	315	163	1.0	3230	3230	2580	2960	7000	7000	3610	4100
	11.08	190	240	320	144	0.94	3290	3290	2620	3020	7000	7000	3610	4100
	12.87	200	240	340	124	0.74	3450	3450	2750	3170	7000	7000	3610	4100
	14.33	200	240	340	126	0.63	3650	3650	2910	3330	7000	7000	3610	4100
	15.81	200	240	340	127	0.52	3840	3840	3070	3490	7000	7000	3610	4100
	17.03	200	240	340	129	0.48	3990	3990	3180	3610	7000	7000	3610	4100
	19.27	200	240	340	130	0.40	4250	4250	3390	3820	7000	7000	3610	4100
	20.57	200	240	340	131	0.36	4390	4390	3500	3940	7000	7000	3610	4100
	23.63	200	240	340	135	0.29	4690	4690	3740	4190	7000	7000	3610	4100
FA37 3	23.88	200	240	340	96	0.60	4720	4720	3760	4210	7000	7000	3610	4100
	28.09	200	240	340	96	0.45	5090	5090	4060	4520	7000	7000	3610	4100
	31.69	200	240	340	95	0.35	5380	5380	4290	4760	7000	7000	3610	4100
	35.91	200	240	340	97	0.29	5700	5700	4290	5020	7000	7000	3610	4100
	38.31	200	240	340	97	0.26	5870	5870	4290	5160	7000	7000	3610	4100
	43.83	200	240	340	96	0.21	6240	6240	4290	5460	7000	7000	3610	4100
	47.02	200	240	340	96	0.19	6430	6430	4290	5620	7000	7000	3610	4100
	51.70	200	240	340	95	0.34	6710	6710	4290	5670	7000	7000	3610	4100
	54.54	200	240	340	97	0.15	6860	6860	4290	5670	7000	7000	3610	4100
	58.32	200	240	340	96	0.27	7000	7000	4290	5670	7000	7000	3610	4100
	66.09	200	240	340	95	0.23	7000	7000	4290	5670	7000	7000	3610	4100
	70.50	200	240	340	95	0.21	7000	7000	4290	5670	7000	7000	3610	4100
	80.65	200	240	340	87	0.17	7000	7000	4290	5670	7000	7000	3610	4100
	86.53	200	240	340	81	0.15	7000	7000	4290	5670	7000	7000	3610	4100
	100.36	200	240	340	70	0.12	7000	7000	4290	5670	7000	7000	3610	4100
	117.88	200	240	340	59	0.10	7000	7000	4290	5670	7000	7000	3610	4100
	128.51	200	240	340	54	0.080	7000	7000	4290	5670	7000	7000	3610	4100

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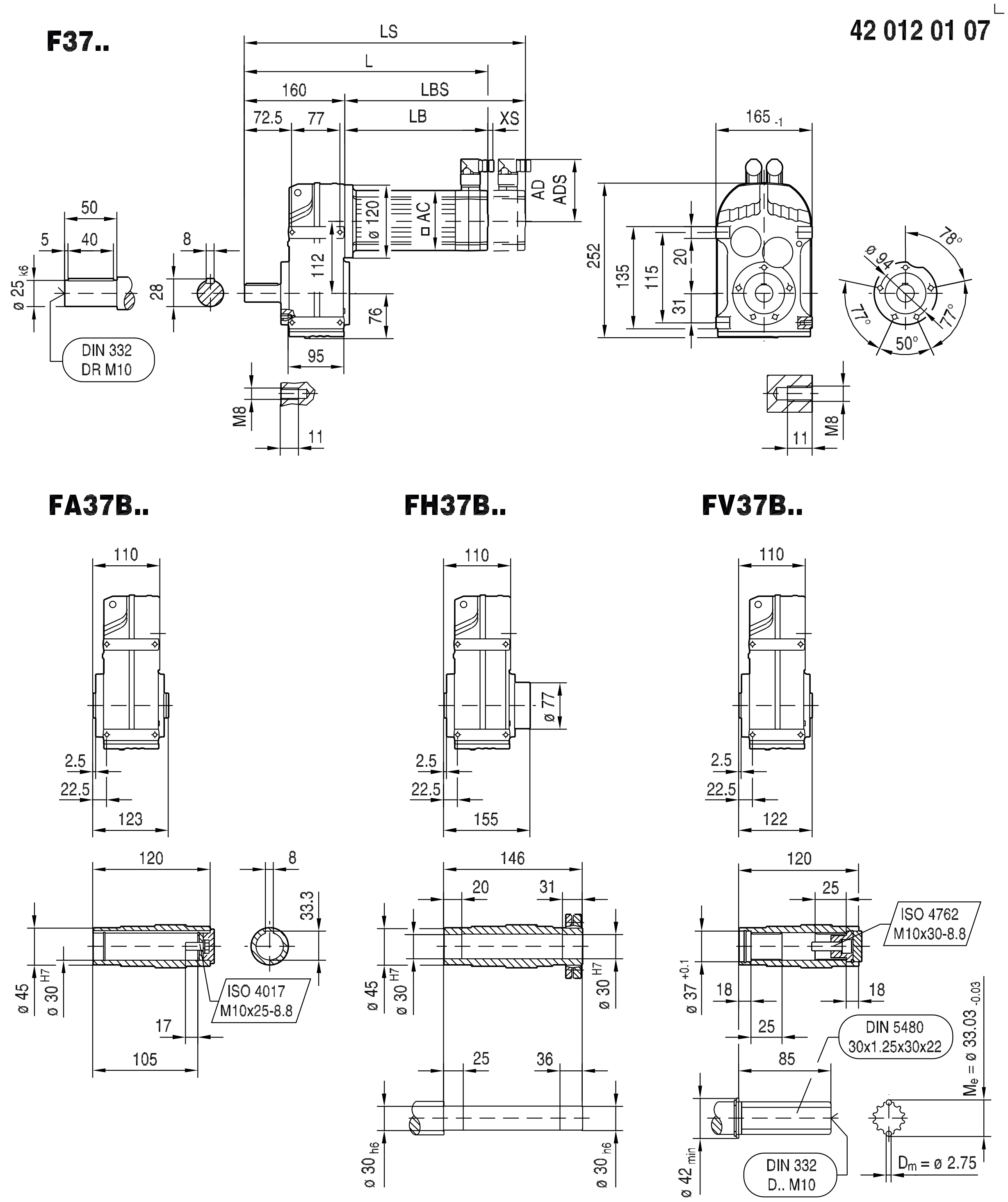
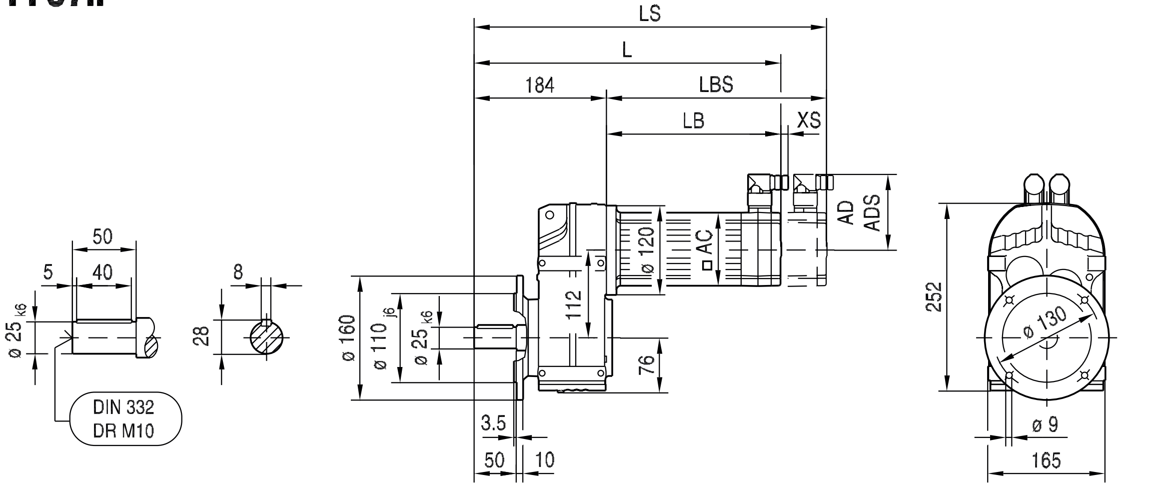


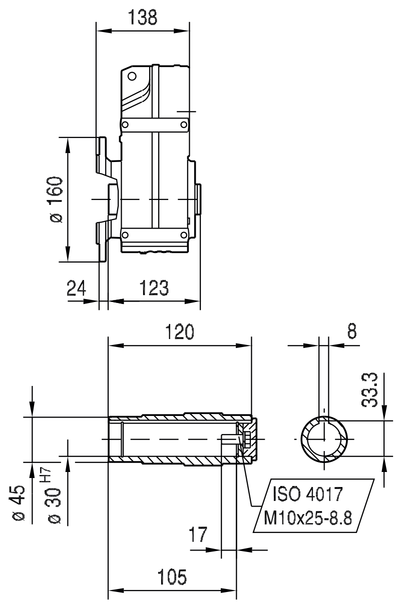
(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	303	305	344	383	340	390	443	332	360
LS	333	334	373	412	368	418	472	397	425
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

FF37..

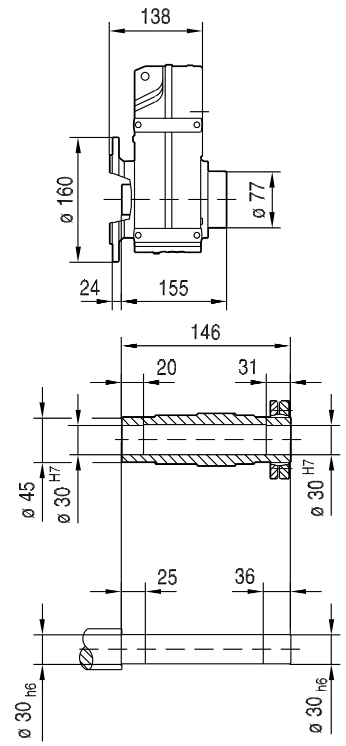
42 013 01 07



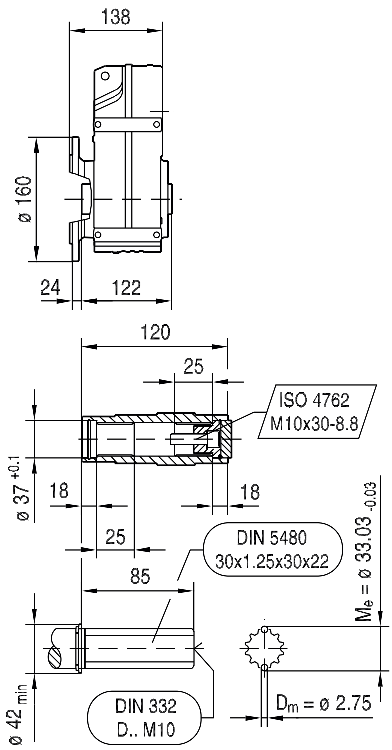
FAF37..



FHF37..



FVF37..



(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	327	329	368	407	364	414	467	356	384
LS	357	358	397	436	392	442	496	421	449
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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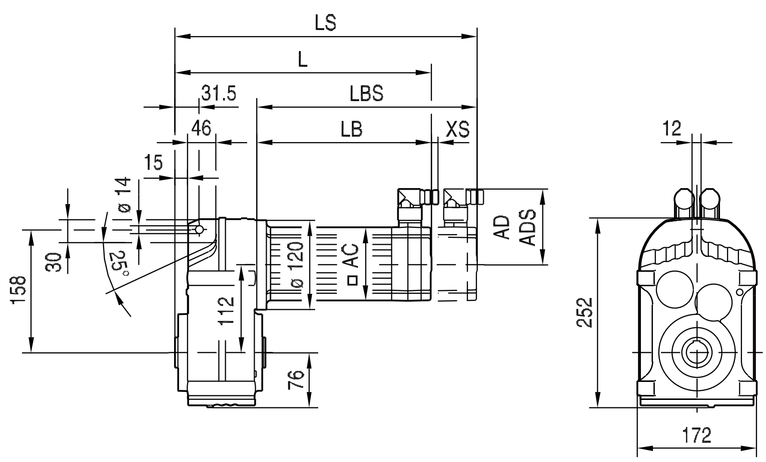
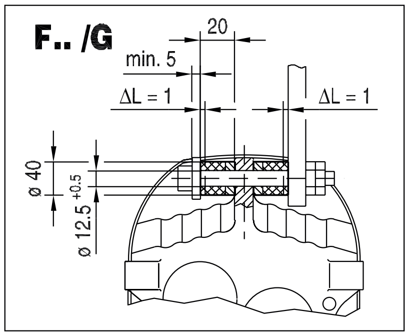
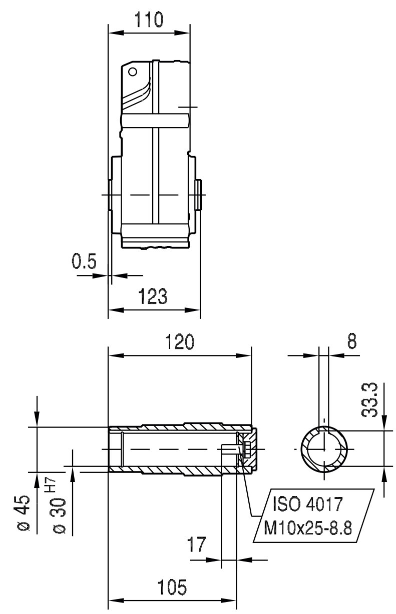
42 014 02 07

FA37..

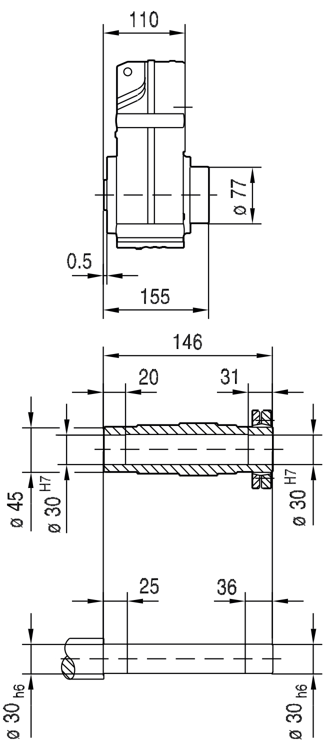




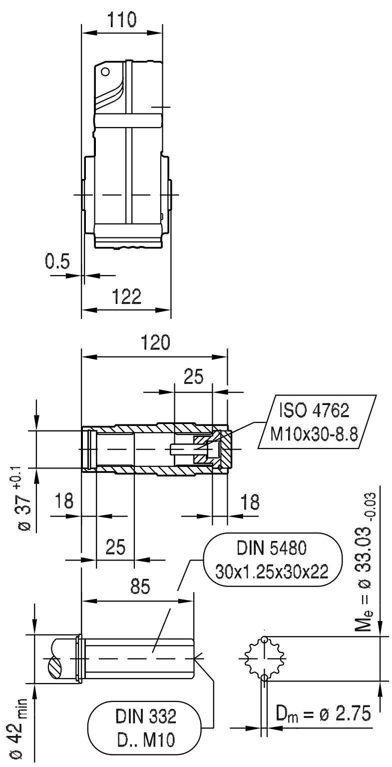
FA37..



FH37..



FV37..



(→ 🗎 194)	CMP..								
	40M	**50S**	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	253	255	294	333	290	340	393	282	310
LS	283	284	323	362	318	368	422	347	375
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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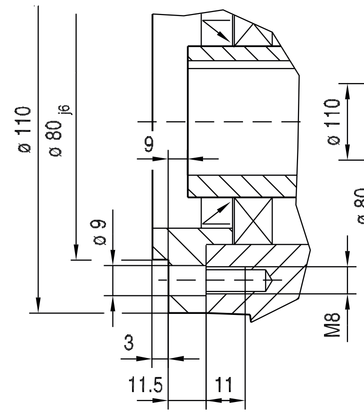
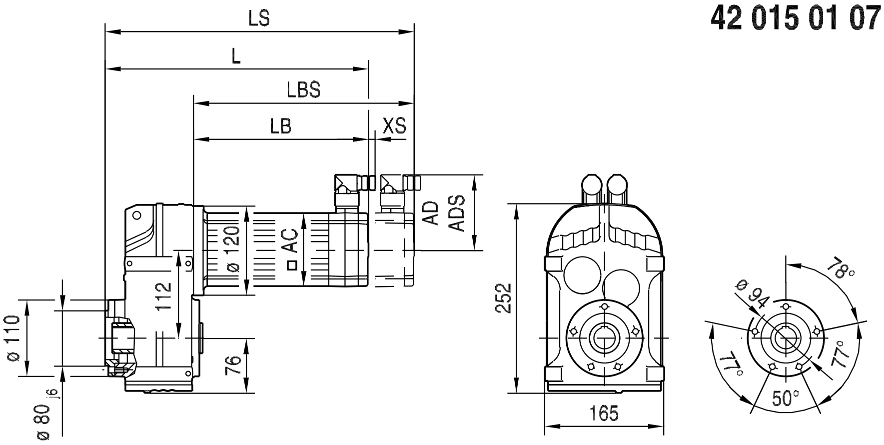
42 015 01 07

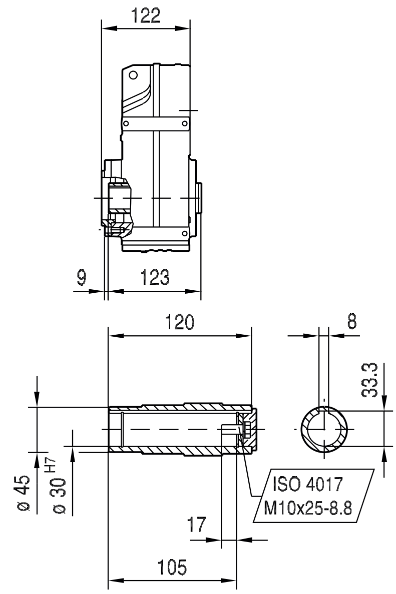
FAZ37..



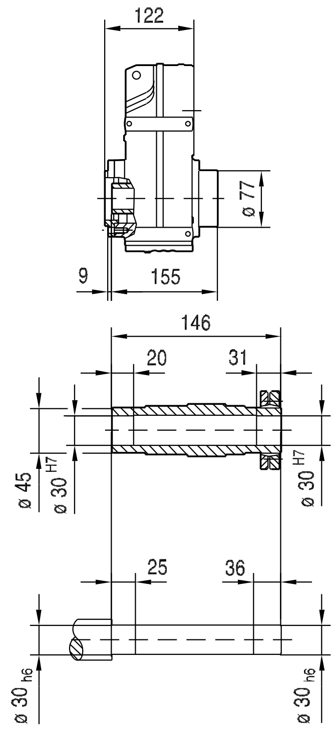


9

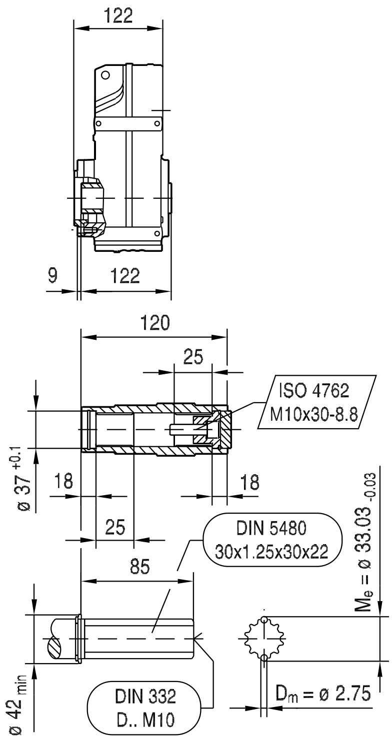
FAZ37..



FHZ37..



FVZ37..



(→ 194)	CMP..								
	40M	**50S**	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	265	267	306	345	302	352	405	294	322
LS	295	296	335	374	330	380	434	359	387
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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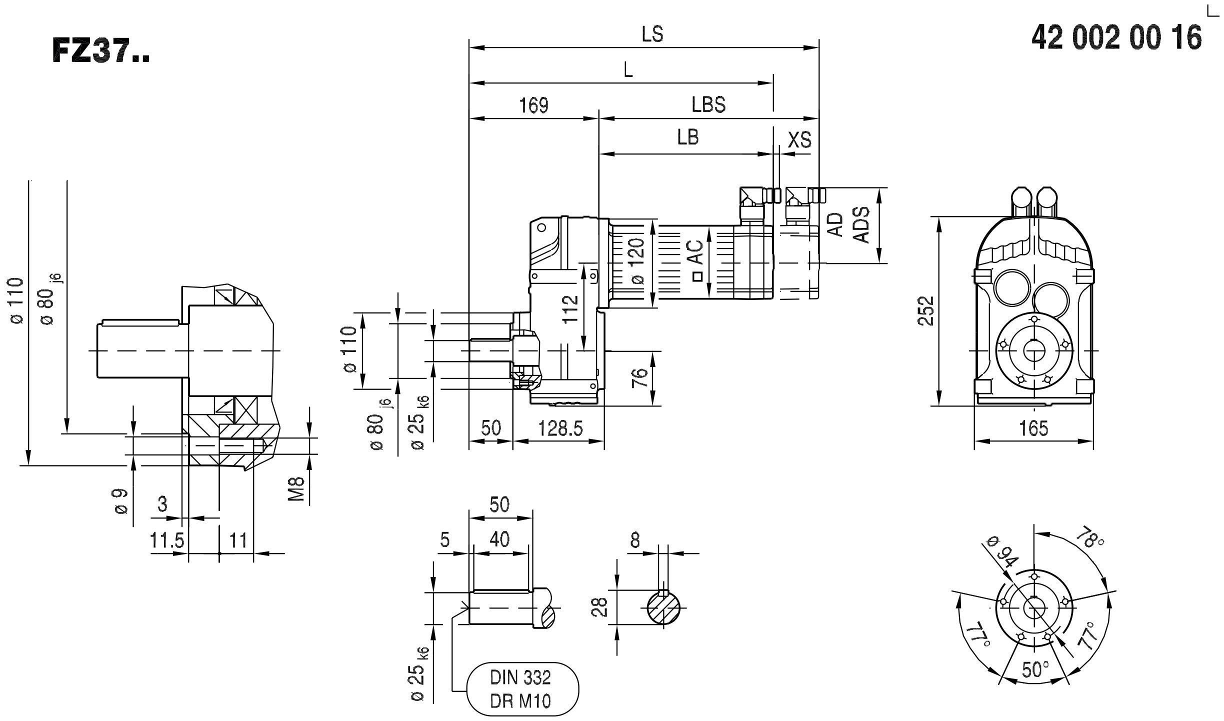
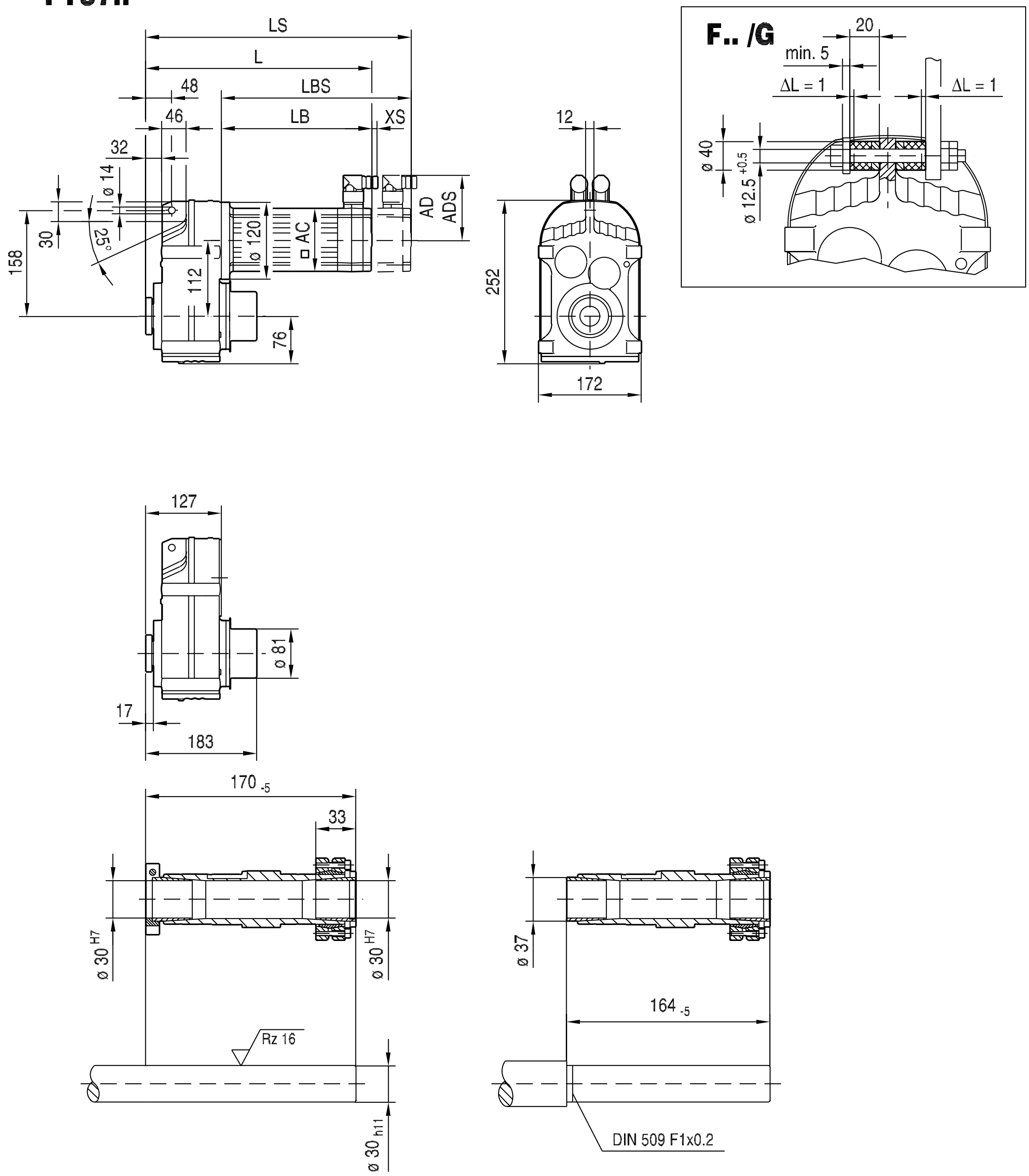
FZ37..



(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	312	314	353	392	349	399	452	341	369
LS	342	343	382	421	377	427	481	406	434
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

42 016 03 07

FT37..



(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	270	272	311	350	307	357	410	299	327
LS	300	301	340	379	335	385	439	364	392
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

9.2.3 F47..

F47, M_{aDyn} Nm	CMP											400 Nm
i	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
2												
4.99	18	25	50	75	54	104	147	93	149	225	200	205
5.76	21	29	58	86	62	120	170	107	172	260	235	235
6.34	23	32	63	95	68	132	187	118	189	285	255	260
7.44	27	38	74	111	80	154	215	139	220	335	300	305
7.88	29	40	79	118	85	164	230	147	235	355	320	320
8.96	33	45	90	134	96	186	260	167	265	405	365	365
10.97	40	55	110	164	118	225	320	200	325	>435	>435	>435
12.66	47	64	126	189	136	260	370	235	375	>435	>435	>435
13.93	51	70	139	205	150	285	410	255	415	>435	>435	>435
16.36	60	83	163	240	176	335	>435	300	>435	>435	>435	>435
17.33	64	87	173	255	187	355	>435	320	>435	>435	>435	>435
19.70	73	99	197	290	210	405	>435	365	>435	>435	>435	>435
21.82	80	110	215	325	230	>435	>435	405	>435	>435	>435	>435
25.72	95	130	255	380	275	>435	>435	>435	>435			
29.32	108	148	290	>435	315	>435		>435				
30.86	114	156	305	>435	330	>435		>435				
3												
28.88	105	144	285	425	305	>435	>435	>435	>435	>435	>435	>435
34.29	125	171	335	>435	365	>435	>435	>435	>435	>435	>435	>435
36.61	134	183	360	>435	390	>435	>435	>435	>435	>435	>435	>435
42.86	156	210	420	>435	>435	>435	>435	>435	>435	>435	>435	>435
48.00	173	235	>435	>435	>435	>435	>435	>435	>435	>435	>435	>435
56.49	200	275	>435	>435	>435	>435	>435	>435	>435			
65.36	235	320	>435	>435	>435	>435		>435				
68.09	245	335	>435	>435	>435	>435	>435	>435	>435			
79.72	285	390	>435	>435	>435	>435	>435	>435	>435			
89.29	320	>435	>435	>435	>435	>435	>435	>435	>435			
105.09	375	>435	>435	>435	>435	>435	>435	>435	>435			
121.57	430	>435	>435	>435	>435	>435		>435				
130.07	>435	>435	>435	>435	>435	>435		>435				
150.06	>435	>435	>435		>435							
175.38	>435	>435										
190.76	>435	>435										

(→ 190)

F47, m kg	CMP											
s	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
2	18	19	20	21	21	23	24	24	26	28	32	34
3	18	20	21	22	22	24	25	25	26	29	33	35

FAF: + 2.7 kg / F: + 0.80 kg / FF: + 3.9 kg

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CMP..				c_{TG}				φ
	i	n_{epk} min^{-1}	η %	FA Nm/'	FAF Nm/'	F Nm/'	FF Nm/'	/R '
FA47 2	4.99	4500	97	99	99	34	30	9
	5.76	4500	97	99	99	34	30	9
	6.34	4500	97	99	99	34	30	8
	7.44	4500	97	99	99	34	30	8
	7.88	4500	97	99	99	34	30	8
	8.96	4500	97	99	99	34	30	8
	10.97	4500	97	125	125	37	32	6
	12.66	4500	97	125	125	37	32	6
	13.93	4500	97	125	125	37	32	6
	16.36	4500	97	125	125	37	32	6
	17.33	4500	97	125	125	37	32	6
	19.70	4500	97	125	125	37	32	6
	21.82	4500	97	125	125	37	32	6
	25.72	4500	97	125	125	37	32	6
	29.32	4500	97	125	125	37	32	6
	30.86	4500	97	125	125	37	32	6
FA47 3	28.88	4500	96	136	136	38	33	7
	34.29	4500	96	136	136	38	33	7
	36.61	4500	96	136	136	38	33	7
	42.86	4500	96	136	136	38	33	7
	48.00	4500	95	136	136	38	33	7
	56.49	4500	95	136	136	38	33	7
	65.36	4500	95	136	136	38	33	7
	68.09	4500	95	138	138	38	33	6
	79.72	4500	95	138	138	38	33	6
	89.29	4500	95	138	138	38	33	6
	105.09	4500	94	138	138	38	33	6
	121.57	4500	94	138	138	38	33	6
	130.07	4500	94	138	138	38	33	6
	150.06	4500	93	138	138	38	33	6
	175.38	4500	93	138	138	38	33	6
	190.76	4500	92	138	138	38	33	6

CMP.. n_e = 1400							F_{Ramax}				F_{Rapk}			
	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m^2	FA N	FAF N	F N	FF N	FA N	FAF N	F N	FF N
FA47 2	4.99	320	435	540	341	4.4	1160	1160	2310	2410	10000	10000	900	900
	5.76	340	435	575	295	3.4	1180	1180	2390	2500	10000	10000	900	900
	6.34	350	435	595	284	2.9	1230	1230	2470	2580	10000	10000	900	900
	7.44	380	435	645	242	2.3	1190	1190	2530	2660	10000	10000	900	900
	7.88	380	435	645	254	2.1	1280	1280	2630	2750	10000	10000	900	900
	8.96	330	435	560	424	1.6	1970	1970	3250	3310	10000	10000	900	900
	10.97	400	435	680	346	2.6	2060	2060	3440	3510	10000	10000	900	900
	12.66	400	435	680	371	2.1	2320	2320	3740	3790	10000	10000	900	900
	13.93	400	435	680	388	1.8	2510	2510	3950	3990	10000	10000	900	900
	16.36	400	435	680	403	1.5	2840	2840	4320	4340	10000	10000	900	900
	17.33	400	435	680	398	1.4	2960	2960	4450	4470	10000	10000	900	900
	19.70	400	435	680	355	1.1	3230	3230	4770	4770	10000	10000	900	900
	21.82	400	435	680	321	0.96	3460	3460	5030	5020	10000	10000	900	900
	25.72	400	435	680	272	0.75	3850	3850	5460	5430	10000	10000	900	900
	29.32	400	435	680	239	0.52	4170	4170	5830	5780	10000	10000	900	900
	30.86	400	435	680	227	0.46	4300	4300	5920	5920	10000	10000	900	900

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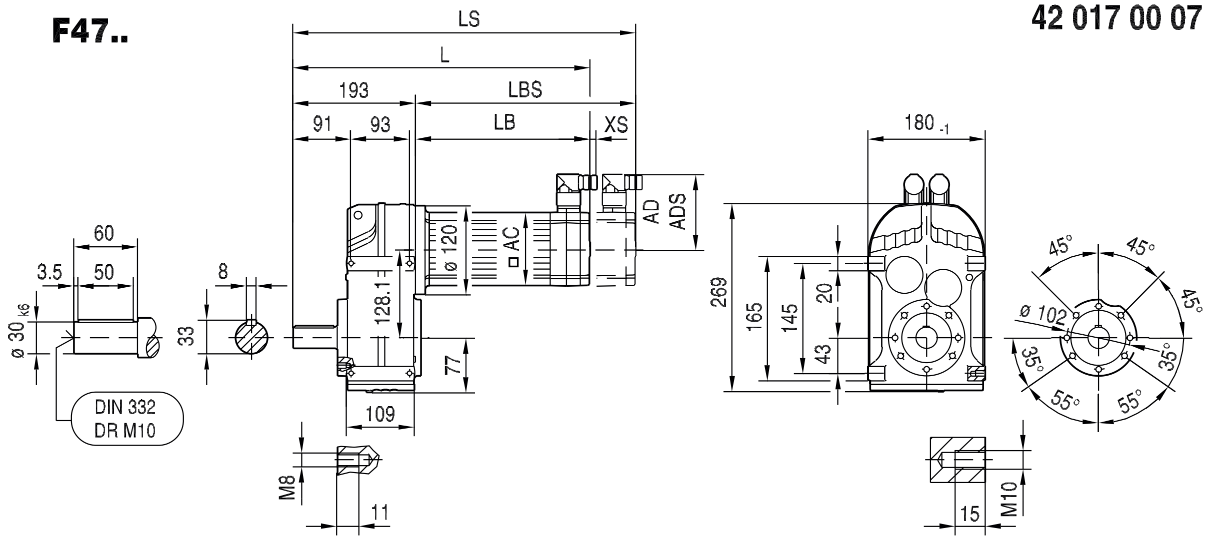
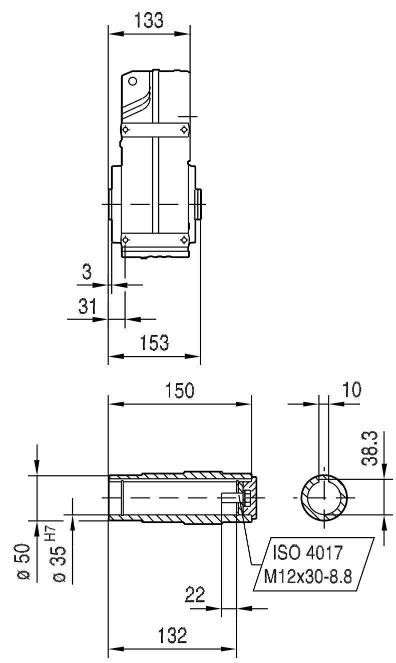
CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg{*}m^2$	N	N	N	N	N	N	N	N
FA47 3	28.88	400	435	680	111	1.1	4130	4130	5790	5740	10000	10000	900	900
	34.29	400	435	680	111	0.85	4580	4580	5920	5920	10000	10000	900	900
	36.61	400	435	680	112	0.76	4750	4750	5920	5920	10000	10000	900	900
	42.86	400	435	680	112	0.58	5190	5190	5920	5920	10000	10000	900	900
	48.00	400	435	680	113	0.48	5520	5520	5920	5920	10000	10000	900	900
	56.49	400	435	680	113	0.36	6020	6020	5920	5920	10000	10000	900	900
	65.36	400	435	680	107	0.29	6490	6490	5920	5920	10000	10000	900	900
	68.09	400	435	680	103	0.61	6620	6620	5920	5920	10000	10000	900	900
	79.72	400	435	680	88	0.48	7160	7160	5920	5920	10000	10000	900	900
	89.29	400	435	680	78	0.40	7570	7570	5920	5920	10000	10000	900	900
	105.09	400	435	680	67	0.30	8180	8180	5920	5920	10000	10000	900	900
	121.57	400	435	680	58	0.25	8760	8760	5920	5920	10000	10000	900	900
	130.07	400	435	680	54	0.23	9040	9040	5920	5920	10000	10000	900	900
	150.06	400	435	680	47	0.18	9640	9640	5920	5920	10000	10000	900	900
	175.38	400	435	680	40	0.14	10000	10000	5920	5920	10000	10000	900	900
	190.76	400	435	680	37	0.13	10000	10000	5920	5920	10000	10000	900	900

42 017 00 07

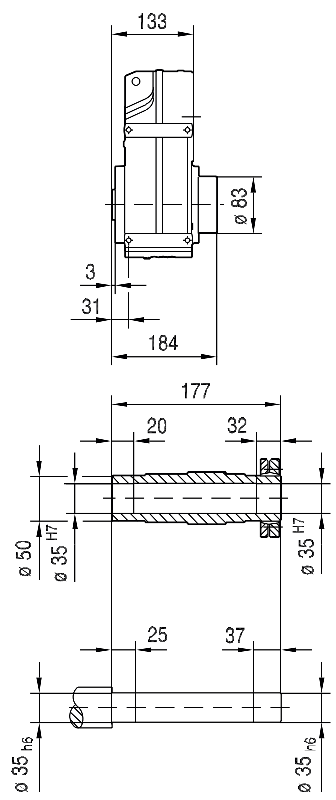
F47..



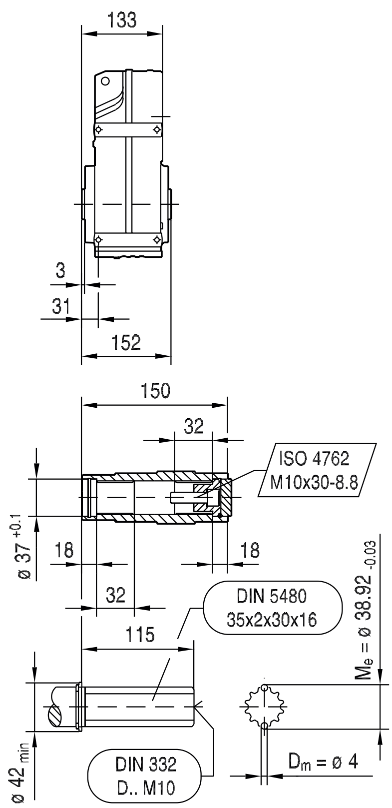
FA47B..



FH47B..



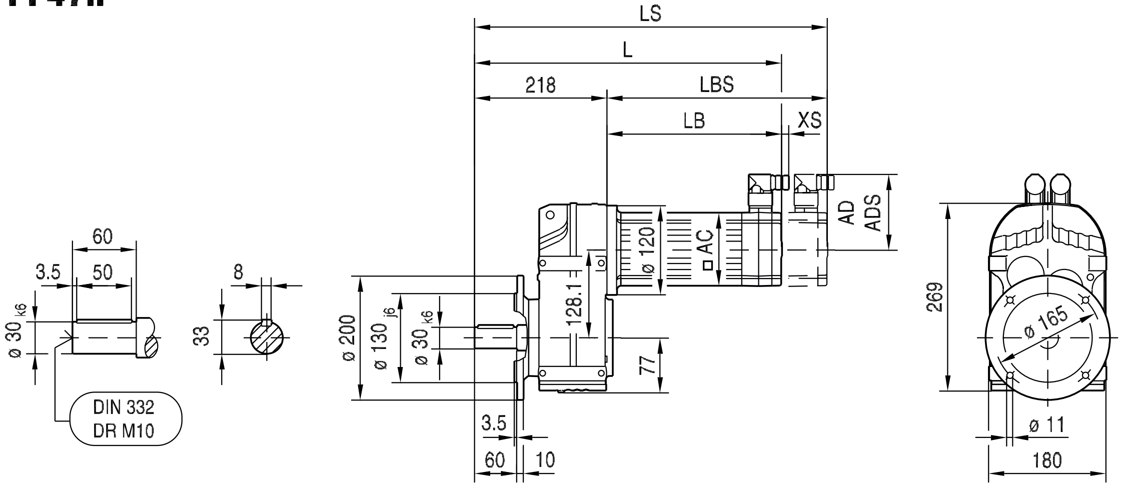
FV47B..



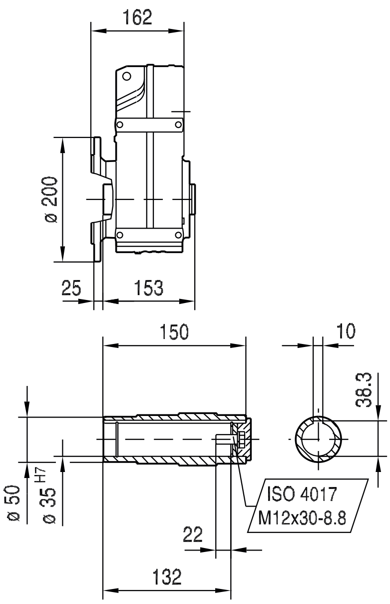
(→ 194)	CMP..										
	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	336	338	377	416	373	423	476	365	393	440	405
LS	366	367	406	445	401	451	505	430	458	505	483
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

42 018 01 07

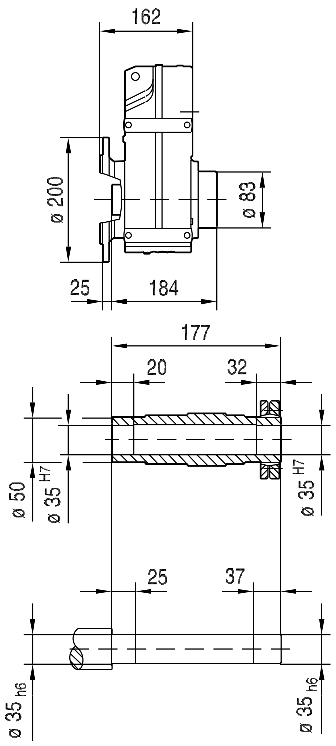
FF47..



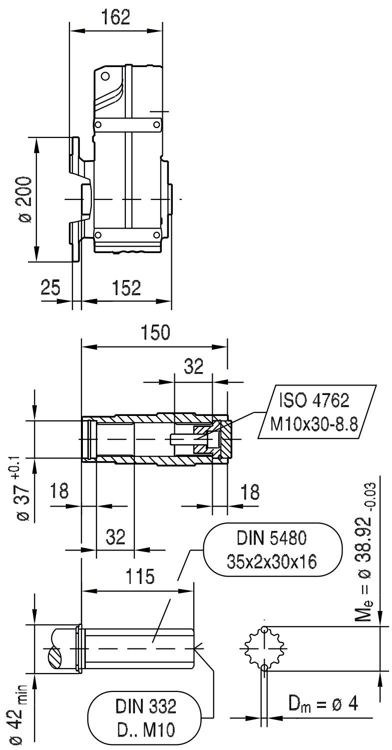
FAF47..



FHF47..



FVF47..



(→ 🗎 194)	CMP..										
	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	361	363	402	441	398	448	501	390	418	465	430
LS	391	392	431	470	426	476	530	455	483	530	508
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

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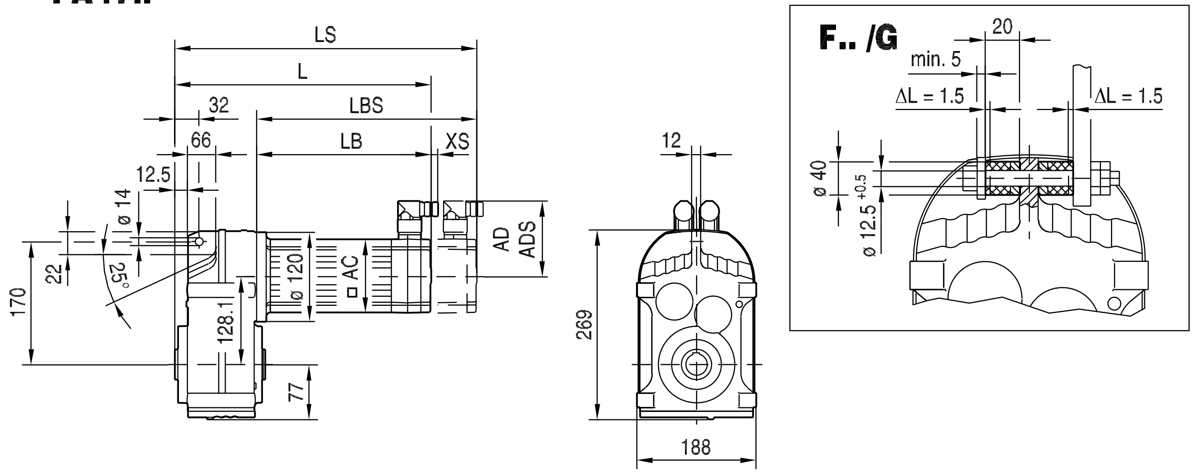
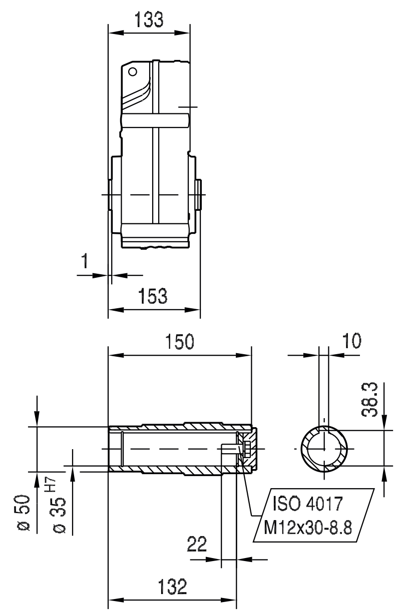
42 019 02 07

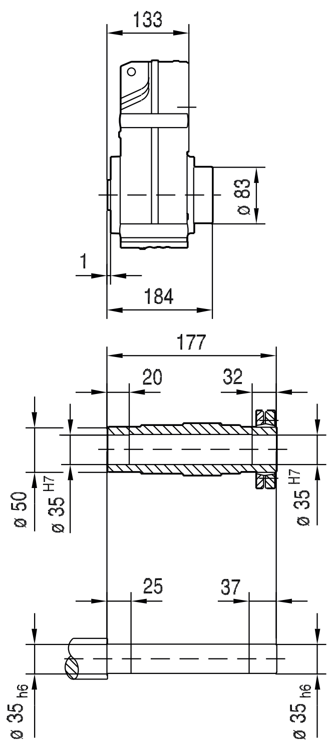
FA47..



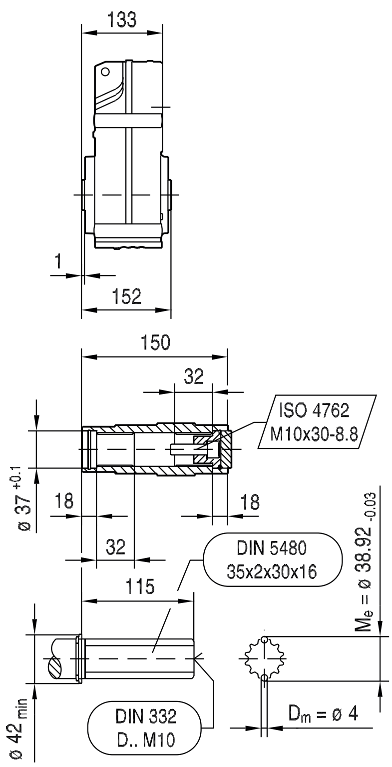
FA47..



FH47..



FV47..



(→ 194)	CMP..										
	40M	**50S**	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	276	278	317	356	313	363	416	305	333	380	345
LS	306	307	346	385	341	391	445	370	398	445	423
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

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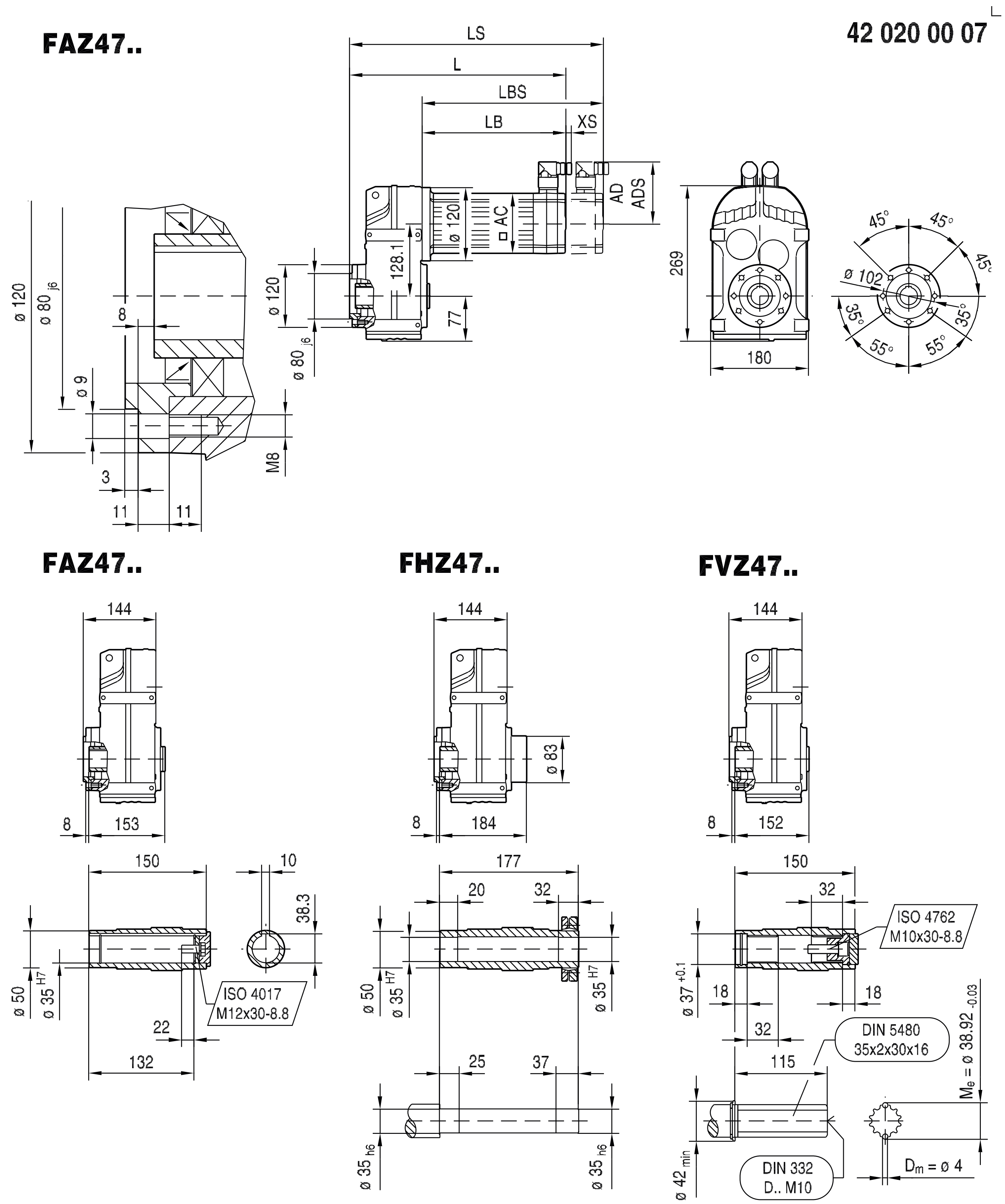

(→ 194)	CMP..										
	40M	**50S**	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	287	289	328	367	324	374	427	316	344	391	356
LS	317	318	357	396	352	402	456	381	409	456	434
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

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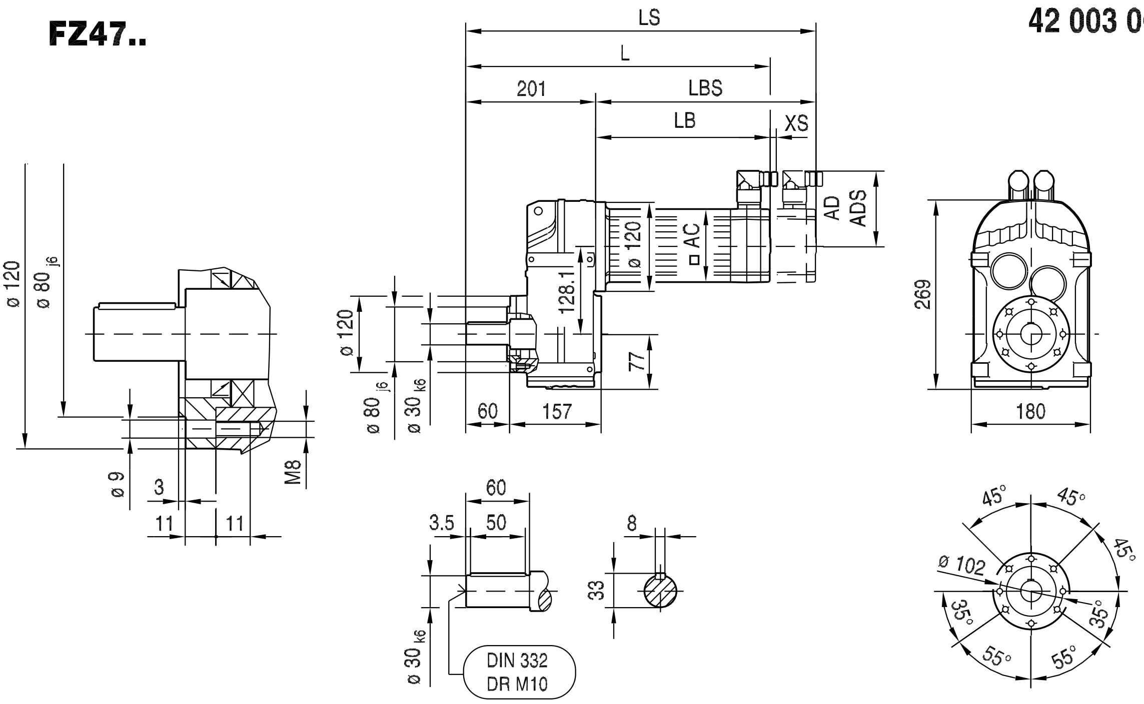
FZ47..

42 003 00 16



(→ 194)	CMP..										
	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	344	346	385	424	381	431	484	373	401	448	413
LS	374	375	414	453	409	459	513	438	466	513	491
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

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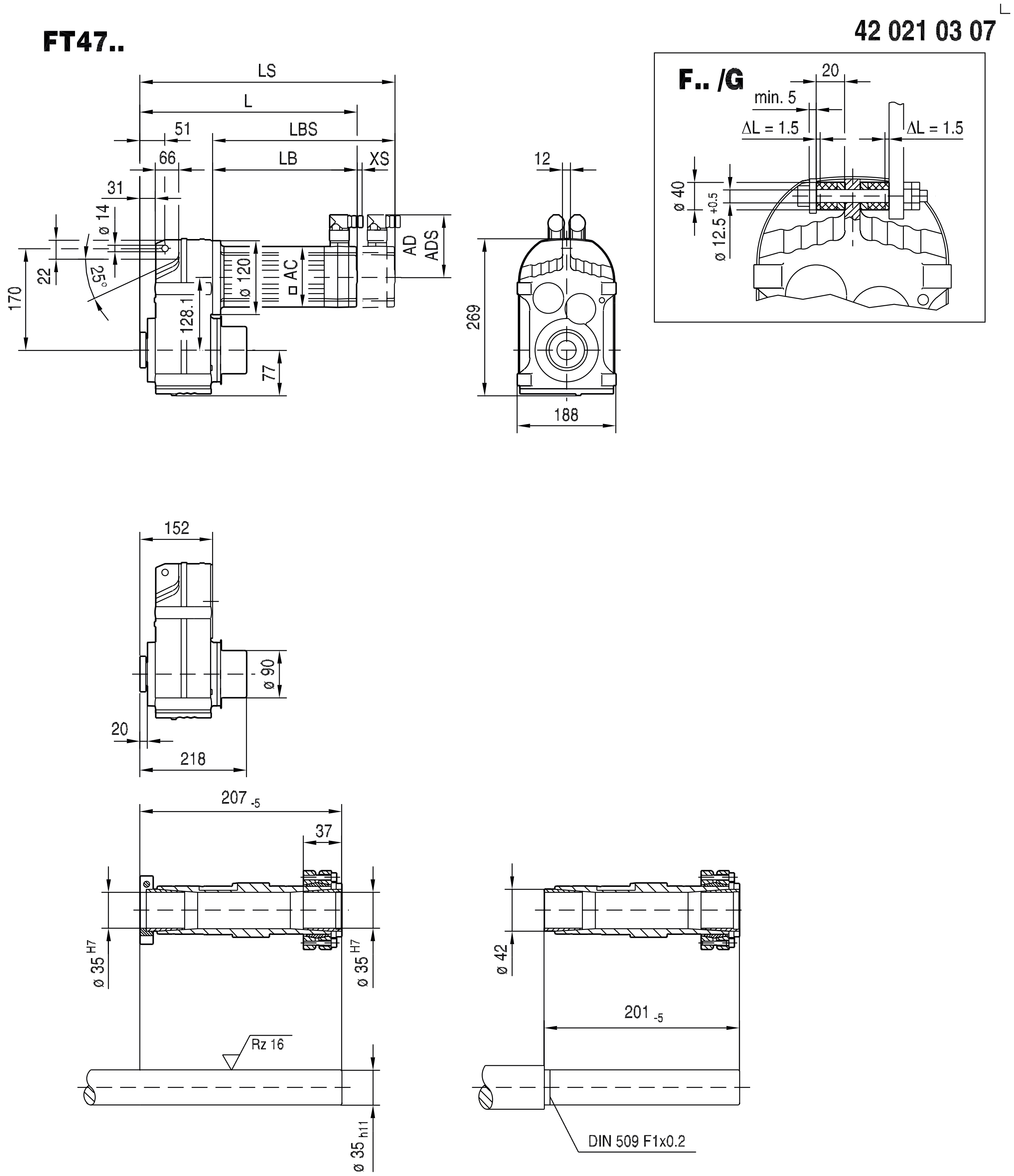

(→ 194)	CMP..										
	40M	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	57	73	73	73	88	88	88	116	116	116	137
AD	78	86	86	86	92	92	92	102	102	102	134
ADS	78	86	86	86	92	92	92	104	104	104	137
L	295	297	336	375	332	382	435	324	352	399	364
LS	325	326	365	404	360	410	464	389	417	464	442
LB	143	145	184	223	180	230	283	172	200	247	212
LBS	173	174	213	252	208	258	312	237	265	312	290
XS	19	18	18	18	14	14	14	11	11	11	37

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9.2.4 F57..

F57, M_{aDyn} Nm													600 Nm
	CMP												
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
2													
5.18	26	52	77	56	108	153	96	155	235	210	310	340	410
5.98	30	60	89	64	124	176	111	179	270	240	360	395	>475
6.58	33	66	98	71	137	194	123	197	295	265	395	435	>480
7.73	39	77	115	83	160	225	144	230	350	315	465	>480	>480
8.19	41	82	122	88	170	240	153	240	370	330	>485	>485	>485
9.31	47	93	139	100	193	270	173	275	420	380			
10.64	54	106	159	115	220	310	198	315	480	430	>645	>645	>645
12.29	62	123	184	132	255	360	225	365	555	500	>645	>645	>645
13.52	68	135	200	146	280	395	250	400	615	550	>645	>645	>645
15.88	80	159	235	171	325	465	295	470	>645	>645	>645	>645	>645
16.81	85	168	250	181	345	495	310	500	>645	>645	>645	>645	>645
19.11	96	191	285	205	395	560	355	570	>645	>645			
21.17	107	210	315	225	435	620	390	630	>645	>645			
24.96	126	245	370	265	515	>645	460	>645					
28.45	144	280	420	305	590		525						
29.94	151	295	445	320	620		555						
34.24	173	340		365									
40.13	200												
3													
30.15	151	295	445	320	615	>645	555	>645	>645	>645	>645	>645	>645
35.79	179	350	525	380	>645	>645	>645	>645	>645	>645	>645	>645	>645
38.21	191	375	560	405	>645	>645	>645	>645	>645	>645	>645	>645	>645
44.73	220	440	>645	475	>645	>645	>645	>645	>645	>645			
50.10	250	495	>645	530	>645	>645	>645	>645	>645	>645			
58.97	290	575	>645	620	>645	>645	>645	>645					
68.22	335	>645	>645	>645	>645		>645						
72.98	360	>645	>645	>645	>645		>645						
83.46	410	>645	>645	>645	>645	>645	>645	>645	>645	>645			
93.47	460	>645	>645	>645	>645	>645	>645	>645	>645	>645			
110.01	535	>645	>645	>645	>645	>645	>645	>645					
127.27	620	>645	>645	>645	>645		>645						
136.16	>645	>645	>645	>645	>645		>645						
157.09	>645	>645		>645									
183.60	>645												
199.70	>645												

(→ 190)

F57, m kg													
	CMP												
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
2	26	27	28	29	30	32	32	33	35	38	40	46	64
3	27	28	29	29	31	32	32	34	36	39	41	47	64
FAF: + 5.5 kg / F: + 0.20 kg / FF: + 6.6 kg													

CMP..				c_{TG}				φ
		n_{epk}	η	FA	FAF	F	FF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
FA57 2	5.18	4468	97	120	120	43	38	9
	5.98	4500	97	120	120	43	38	9
	6.58	4500	97	120	120	43	38	8
	7.73	4500	97	120	120	43	38	8
	8.19	4500	97	120	120	43	38	8
	9.31	4500	97	120	120	43	38	8
	10.64	4500	97	150	150	47	40	6
	12.29	4500	97	150	150	47	40	6
	13.52	4500	97	150	150	47	40	6
	15.88	4500	97	150	150	47	40	6
	16.81	4500	97	150	150	47	40	6
	19.11	4500	97	150	150	47	40	6
	21.17	4500	97	150	150	47	40	6
	24.96	4500	97	150	150	47	40	6
	28.45	4500	97	150	150	47	40	6
	29.94	4500	97	150	150	47	40	6
	34.24	4500	97	150	150	47	40	6
	40.13	4500	96	150	150	47	40	6
FA57 3	30.15	4500	96	169	169	49	41	7
	35.79	4500	96	169	169	49	41	7
	38.21	4500	96	169	169	49	41	7
	44.73	4500	96	169	169	49	41	7
	50.10	4500	96	169	169	49	41	7
	58.97	4500	95	169	169	49	41	7
	68.22	4500	95	169	169	49	41	6
	72.98	4500	95	169	169	49	41	6
	83.46	4500	95	171	171	49	42	6
	93.47	4500	95	171	171	49	42	6
	110.01	4500	94	171	171	49	42	6
	127.27	4500	94	171	171	49	42	6
	136.16	4500	94	171	171	49	42	6
	157.09	4500	94	171	171	49	42	6
	183.60	4500	93	171	171	49	42	6
	199.70	4500	93	171	171	49	42	6

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	kg*m^2	N	N	N	N	N	N	N	N
FA57 2	5.18	415	475	705	405	5.8	2020	2020	3460	3670	11500	11500	9910	8490
	5.98	420	475	710	452	4.5	2240	2240	3730	3940	11500	11500	9910	8490
	6.58	420	480	710	502	3.8	2430	2430	3940	4140	11500	11500	9880	8460
	7.73	420	480	710	595	2.9	2760	2760	4310	4500	11500	11500	9880	8460
	8.19	420	485	710	623	2.6	2880	2880	4450	4640	11500	11500	9840	8440
	9.31	420	460	710	666	2.0	3170	3170	4760	4950	11500	11500	10000	8580
	10.64	600	645	1020	207	3.2	2470	2470	4320	4590	11500	11500	6930	6930
	12.29	600	645	1020	212	2.6	2810	2810	4710	4970	11500	11500	6930	6930
	13.52	600	645	1020	207	2.2	3050	3050	4980	5230	11500	11500	6930	6930
	15.88	600	645	1020	214	1.8	3470	3470	5450	5690	11500	11500	6930	6930
	16.81	600	645	1020	214	1.6	3630	3630	5620	5860	11500	11500	6930	6930
	19.11	600	645	1020	215	1.3	3980	3980	6020	6260	11500	11500	6930	6930
	21.17	600	645	1020	217	1.1	4280	4280	6350	6580	11500	11500	6930	6930
	24.96	575	645	970	252	0.84	4970	4970	7060	7260	11500	11500	6930	6930
	28.45	535	645	910	246	0.59	5690	5690	7760	7930	11500	11500	6930	6930
	29.94	545	645	920	234	0.53	5790	5790	7890	8060	11500	11500	6930	6930
	34.24	500	645	850	204	0.43	6580	6580	8670	8500	11500	11500	6930	6930
	40.13	290	435	490	174	0.34	8750	8750	10500	9550	11500	11500	10400	8850
FA57 3	30.15	590	645	1000	50	1.3	5460	5460	7650	7850	11500	11500	6930	6930
	35.79	600	645	1020	47	0.94	5980	5980	8250	7900	11500	11500	6930	6930
	38.21	600	645	1020	50	0.84	6210	6210	8510	7900	11500	11500	6930	6930
	44.73	600	645	1020	49	0.64	6790	6790	9160	7900	11500	11500	6930	6930
	50.10	600	645	1020	50	0.52	7230	7230	9200	7900	11500	11500	6930	6930
	58.97	600	645	1020	51	0.38	7890	7890	9200	7900	11500	11500	6930	6930
	68.22	600	645	1020	51	0.31	8510	8510	9200	7900	11500	11500	6930	6930
	72.98	600	645	1020	51	0.28	8810	8810	9200	7900	11500	11500	6930	6930
	83.46	600	645	1020	42	0.51	9420	9420	9200	7900	11500	11500	6930	6930
	93.47	600	645	1020	42	0.42	9960	9960	9200	7900	11500	11500	6930	6930
	110.01	600	645	1020	42	0.31	10800	10800	9200	7900	11500	11500	6930	6930
	127.27	600	645	1020	42	0.26	11500	11500	9200	7900	11500	11500	6930	6930
	136.16	600	645	1020	43	0.23	11500	11500	9200	7900	11500	11500	6930	6930
	157.09	600	645	1020	43	0.19	11500	11500	9200	7900	11500	11500	6930	6930
	183.60	600	645	1020	38	0.15	11500	11500	9200	7900	11500	11500	6930	6930
	199.70	600	645	1020	35	0.13	11500	11500	9200	7900	11500	11500	6930	6930

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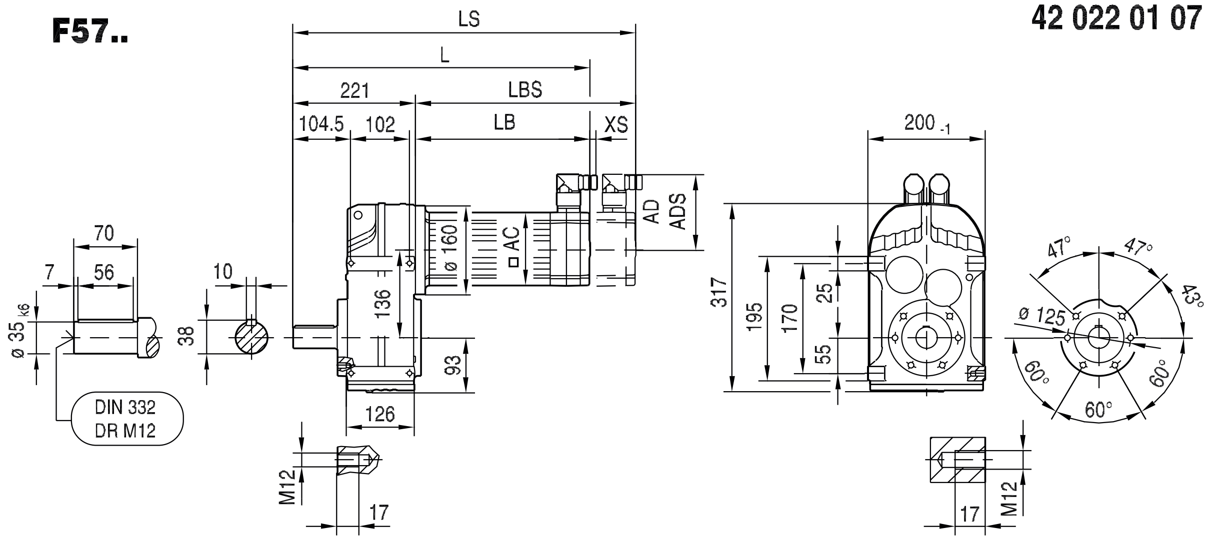
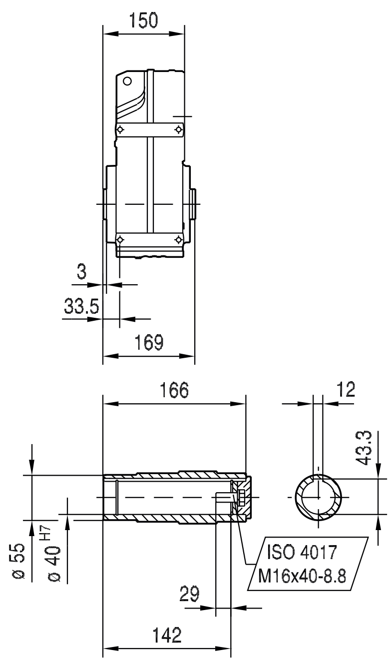
F57..

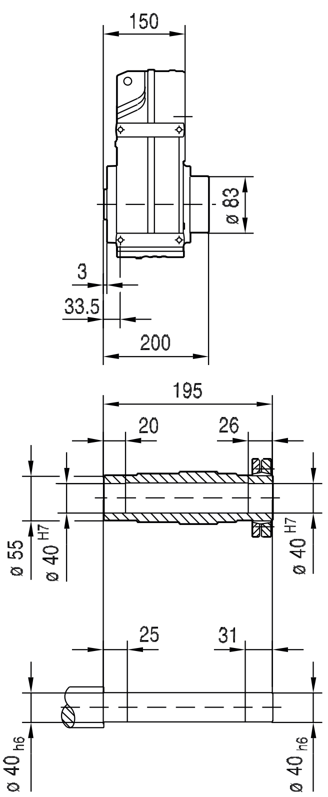
42 022 01 07



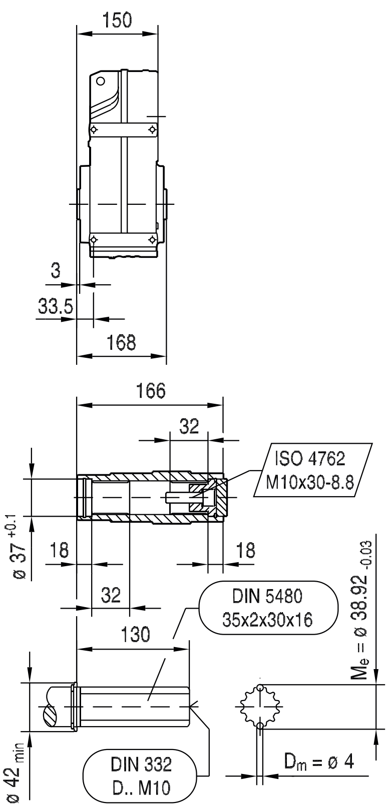
FA57B..



FH57B..



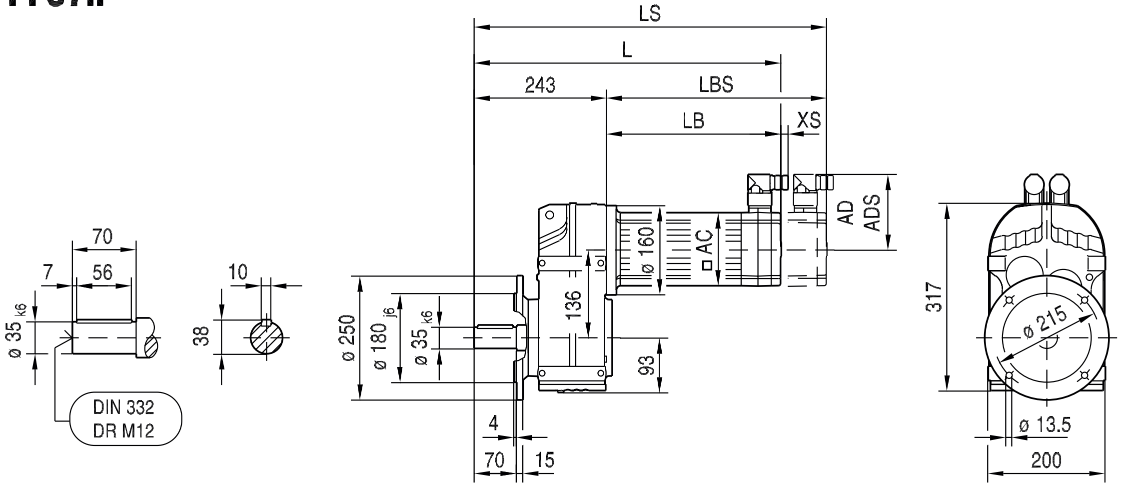
FV57B..



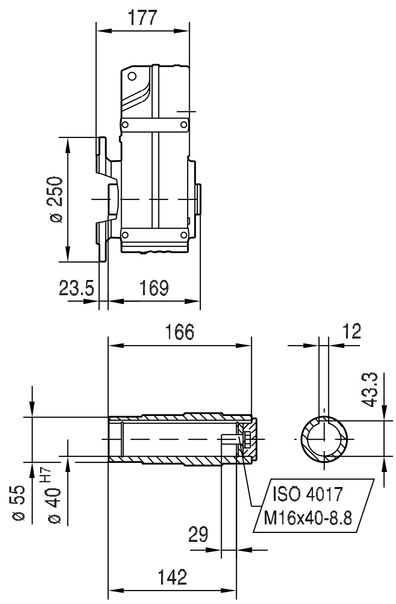
(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	360	399	438	394	444	494	387	412	462	427	465	463
LS	389	428	467	423	473	523	452	477	527	505	543	559
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

FF57..

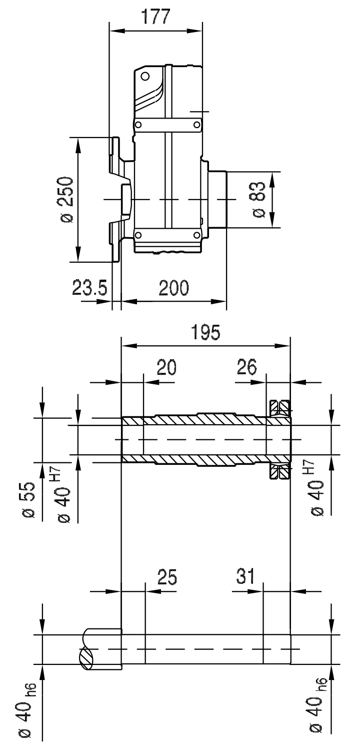
42 023 01 07



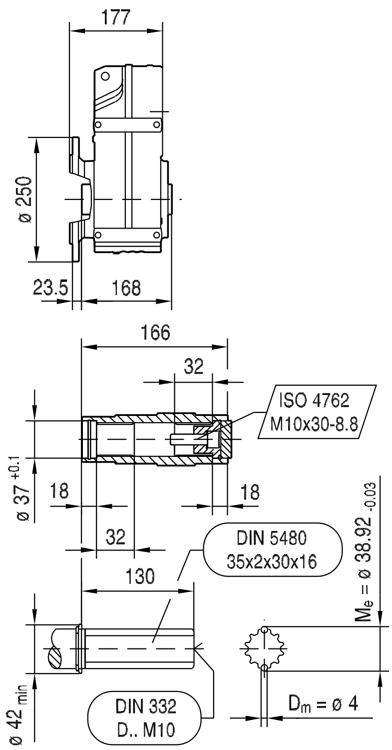
FAF57..



FHF57..



FVF57..



(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	382	421	460	416	466	516	409	434	484	449	487	485
LS	411	450	489	445	495	545	474	499	549	527	565	581
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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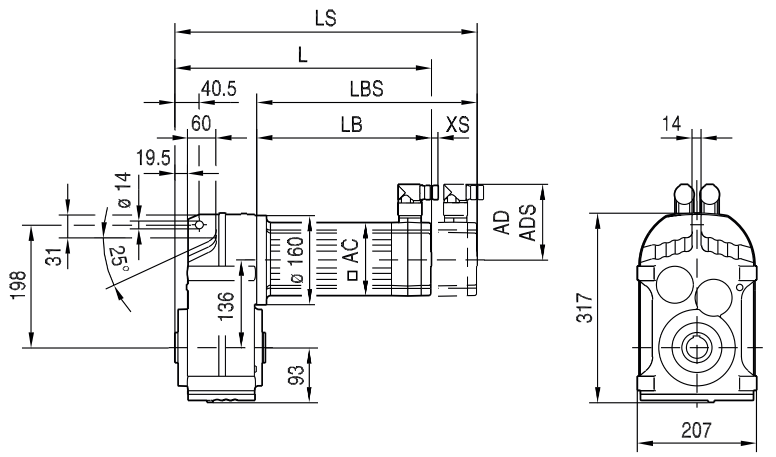
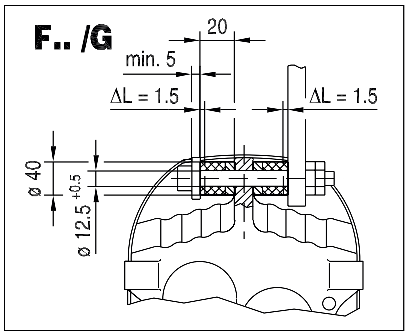
42 024 02 07

FA57..





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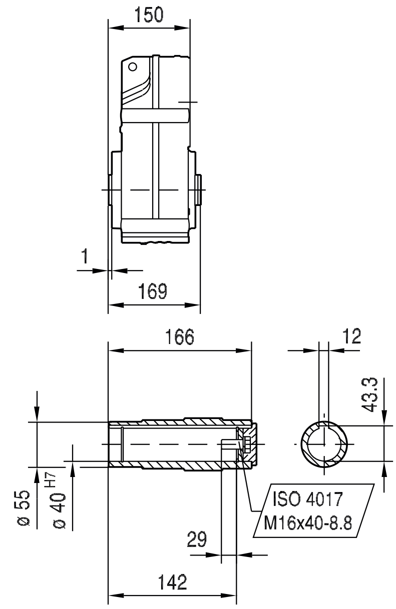

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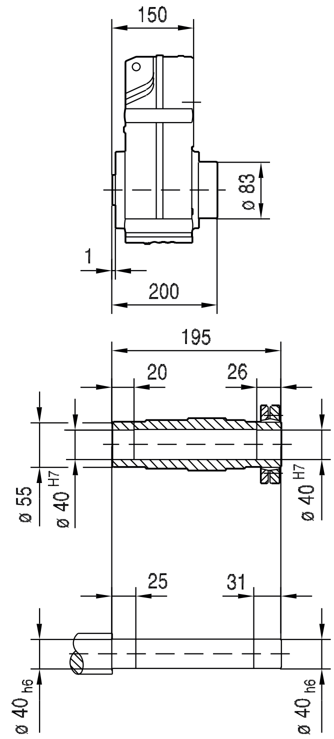

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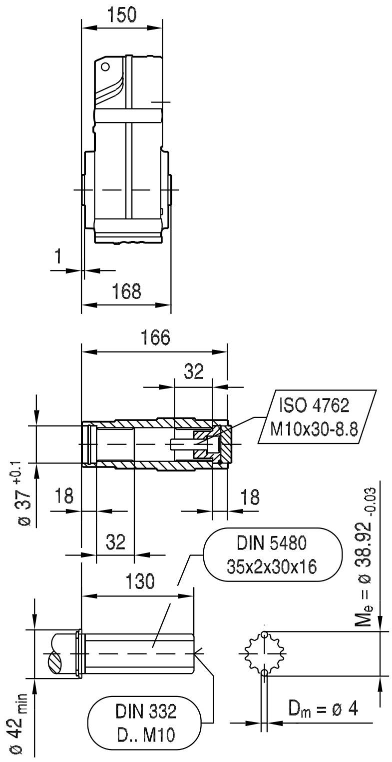

(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	289	328	367	323	373	423	316	341	391	356	394	392
LS	318	357	396	352	402	452	381	406	456	434	472	488
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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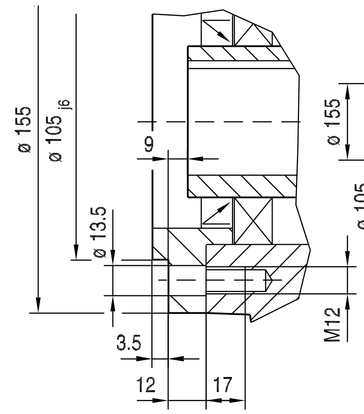
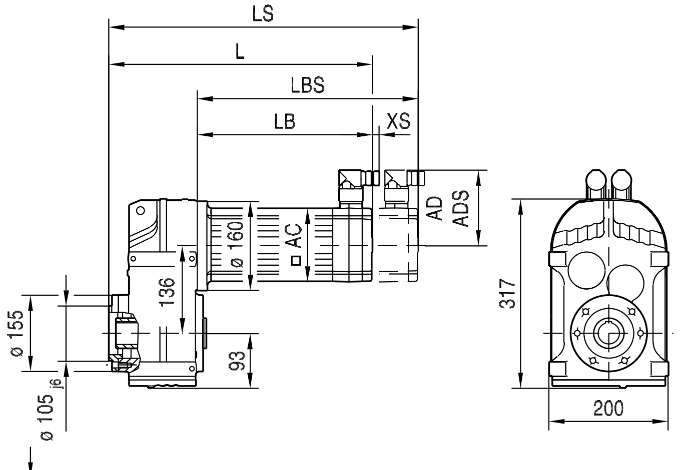
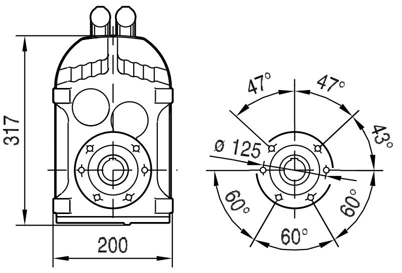
42 025 01 07

FAZ57..







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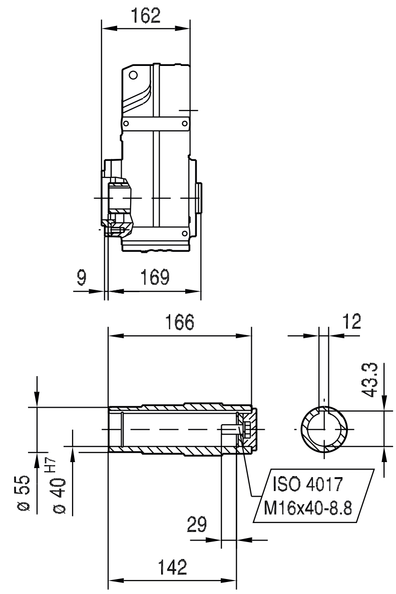

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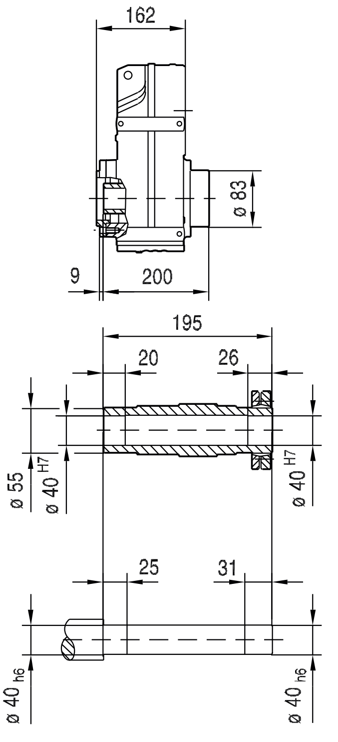

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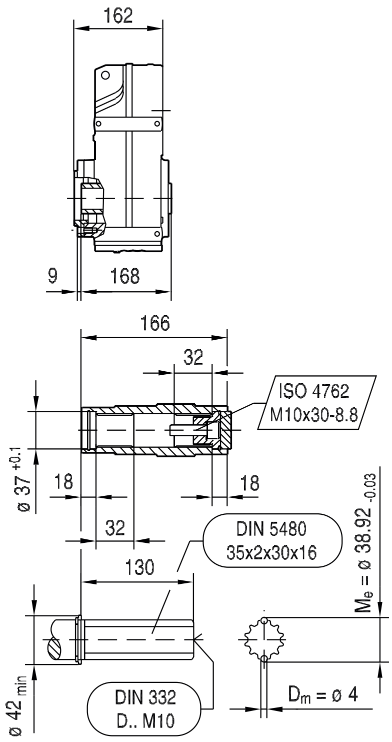

(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	301	340	379	335	385	435	328	353	403	368	406	404
LS	330	369	408	364	414	464	393	418	468	446	484	500
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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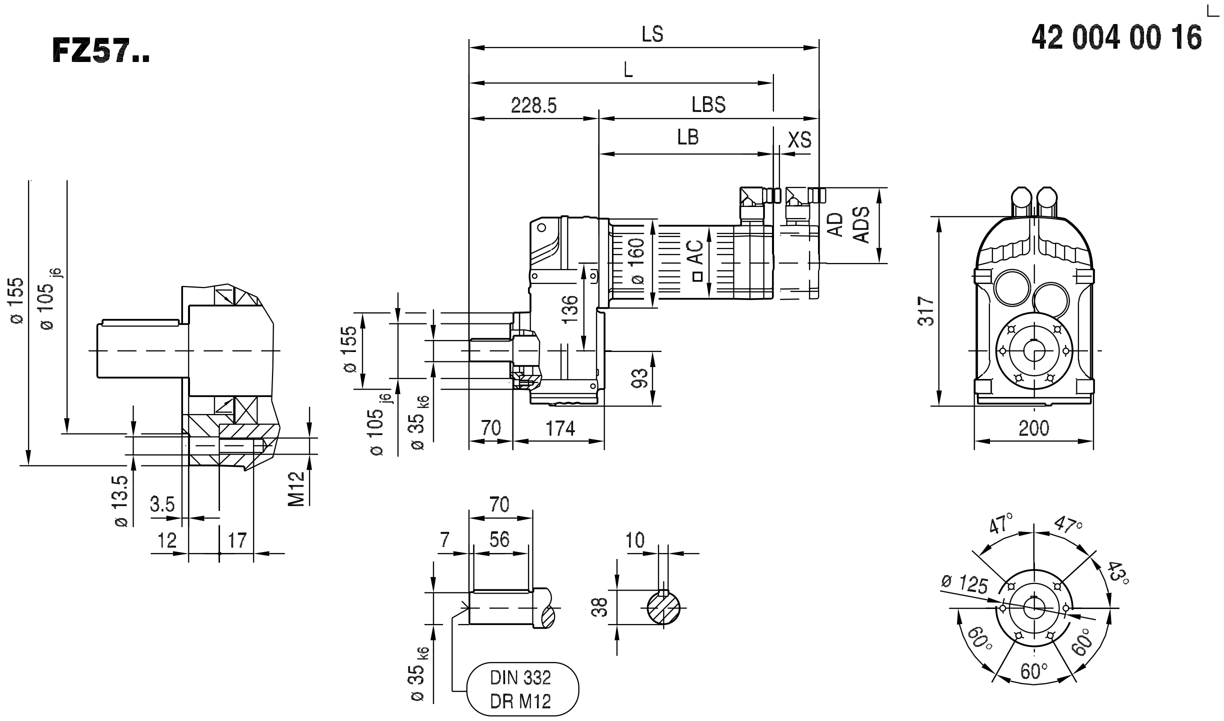
FZ57..

42 004 00 16



(→ 194)	CMP..											
	50S	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**100S**
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	367	406	445	402	452	502	394	419	469	435	473	470
LS	396	435	474	430	480	530	459	484	534	512	550	566
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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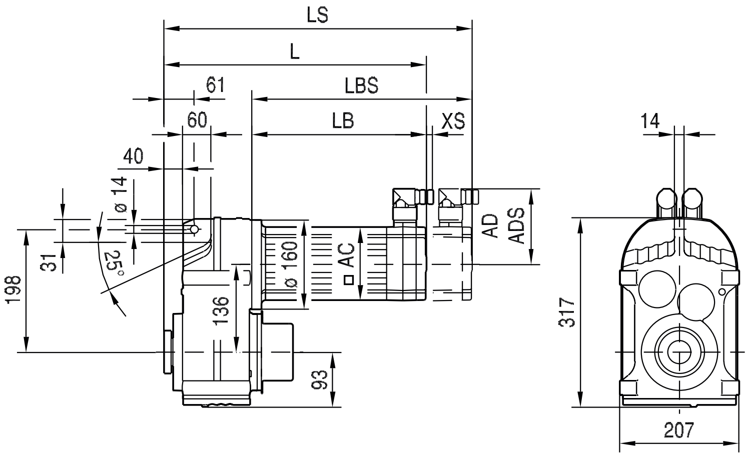
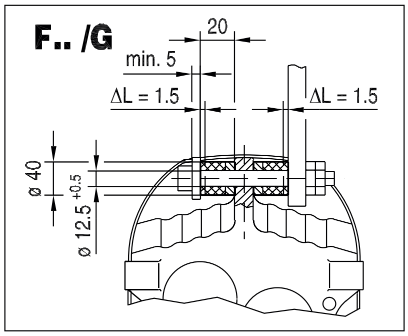
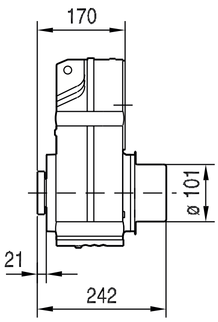
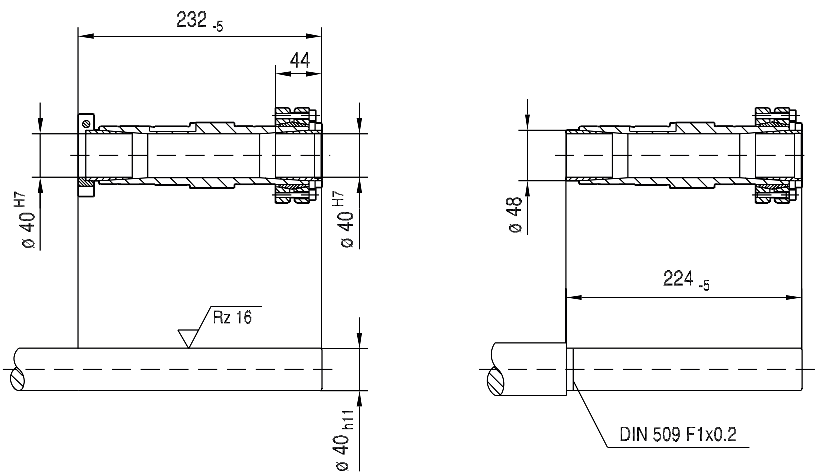
FT57..

42 026 03 07









9

(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	309	348	387	343	393	443	336	361	411	376	414	412
LS	338	377	416	372	422	472	401	426	476	454	492	508
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

9.2.5 F67..

F67, M_{aDyn} Nm																	820 Nm
	CMP																
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
2																	
3.97		40	59	43	82	117	74	119	181	162	240	410	260	415	685	335	520
4.66		47	70	50	97	137	87	139	210	190	280	480	305	485	>700	395	610
5.25		52	78	57	109	155	98	157	235	210	315	540	345	545	>705	445	690
5.95	30	60	90	65	125	177	112	180	270	245	365	620	395	625	>705	510	>705
6.78	34	68	101	73	141	200	126	200	305	275	410	700	445	>710	>710	575	>710
7.53	38	75	112	81	156	220	140	220	340	305	455		495				
8.60	43	86	128	93	179	250	160	255	390	350	520		565				
9.08	46	91	136	98	188	265	169	270	410	370	550		600				
9.66		97	144	104	200	280	180	285	435	390	585	>920	635	>920	>920	820	>920
11.31		113	169	122	230	330	210	335	510	460	685	>920	745	>920	>920	>920	>920
12.76		127	191	137	260	375	235	380	580	520	770	>920	840	>920	>920	>920	>920
14.46	73	144	215	156	300	425	265	430	655	590	870	>920	>920	>920	>920	>920	>920
16.48	83	165	245	177	340	485	305	490	745	670	>920	>920	>920	>920	>920	>920	>920
18.29	92	183	270	197	375	535	340	545	830	745	>920		>920				
20.90	105	205	310	225	430	615	385	620	>920	850	>920		>920				
22.05	111	220	325	235	455	650	410	655	>920	900	>920		>920				
25.13	127	250	375	270	520	740	465	750	>920	>920							
27.41	138	270	405	295	565	800	510	810	>920	>920							
32.08	162	320	475	345	665	>920	595	>920									
36.30	183	360	540	390	750		675										
3																	
34.01	170	335	500	360	695	>920	625	>920	>920	>920	>920		>920				
39.26	196	385	580	415	800	>920	720	>920	>920	>920	>920		>920				
43.20	215	425	635	460	880	>920	795	>920	>920	>920	>920		>920				
50.74	250	500	750	540	>920	>920	>920	>920	>920	>920	>920		>920				
53.73	265	530	790	570	>920	>920	>920	>920	>920	>920	>920		>920				
61.07	300	595	890	640	>920	>920	>920	>920	>920	>920							
67.65	330	660	>920	710	>920	>920	>920	>920	>920	>920							
79.76	390	780	>920	840	>920	>920	>920	>920									
90.59	445	880	>920	>920	>920	>920	>920	>920	>920	>920	>920		>920				
95.94	470	>920	>920	>920	>920	>920	>920	>920	>920	>920	>920		>920				
109.04	535	>920	>920	>920	>920	>920	>920	>920	>920	>920							
120.79	590	>920	>920	>920	>920	>920	>920	>920	>920	>920							
142.40	695	>920	>920	>920	>920	>920	>920	>920									
162.31	790	>920	>920	>920	>920		>920										
170.85	820	>920	>920	>920	>920		>920										
195.39	>920	>920		>920													
228.99	>920																

(→ 🗎 190)

F67, m kg																	
	CMP																
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
2	30	31	32	32	33	35	35	36	39	41	43	48	50	54	63	67	75
3	31	32	33	33	35	36	36	38	40	43	45	49	51	55	64	68	76
FAF: + 6.3 kg / F: + 2.8 kg / FF: + 8.9 kg																	

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CMP..				c_{TG}				φ
		n_{epk}	η	FA	FAF	F	FF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
FA67 2	3.97	4500	97	129	129	68	62	10
	4.66	4500	97	129	129	68	62	9
	5.25	4500	97	129	129	68	62	9
	5.95	4500	98	129	129	68	62	9
	6.78	4500	97	129	129	68	62	9
	7.53	4500	97	129	129	68	62	8
	8.60	4500	97	129	129	68	62	8
	9.08	4500	97	129	129	68	62	8
	9.66	4500	97	173	173	79	71	6
	11.31	4500	97	173	173	79	71	6
	12.76	4500	97	173	173	79	71	6
	14.46	4500	97	173	173	79	71	6
	16.48	4500	97	173	173	79	71	6
	18.29	4500	97	173	173	79	71	6
	20.90	4500	97	173	173	79	71	5
	22.05	4500	97	173	173	79	71	5
	25.13	4500	97	173	173	79	71	5
	27.41	4500	97	173	173	79	71	5
	32.08	4500	97	173	173	79	71	5
	36.30	4500	97	173	173	79	71	5
FA67 3	34.01	4500	96	187	187	82	74	6
	39.26	4500	96	187	187	82	74	6
	43.20	4500	96	187	187	82	74	6
	50.74	4500	96	187	187	82	74	6
	53.73	4500	96	187	187	82	74	6
	61.07	4500	95	187	187	82	74	6
	67.65	4500	95	187	187	82	74	6
	79.76	4500	95	187	187	82	74	6
	90.59	4500	95	189	189	82	74	6
	95.94	4500	95	189	189	82	74	6
	109.04	4500	95	189	189	82	74	6
	120.79	4500	94	189	189	82	74	6
	142.40	4500	94	189	189	82	74	6
	162.31	4500	94	189	189	82	74	6
	170.85	4500	93	189	189	82	74	6
	195.39	4500	93	189	189	82	74	6
	228.99	4500	93	189	189	82	74	6

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
FA67 2	3.97	500	695	850	403	16	1220	1220	8390	8620	13000	13000	11300	11300
	4.66	560	700	950	322	12	1020	1020	8590	8860	13000	13000	11300	11300
	5.25	590	705	1000	286	10.0	1010	1010	8850	9140	13000	13000	11200	11200
	5.95	610	705	1030	286	8.0	1090	1090	9200	9500	13000	13000	11200	11200
	6.78	620	710	1050	295	6.3	1280	1280	9660	9950	13000	13000	11200	11200
	7.53	610	715	1030	332	5.5	1570	1570	10100	10400	13000	13000	11200	11200
	8.60	570	715	960	442	4.4	2180	2180	10900	11200	13000	13000	11200	11200
	9.08	530	715	900	573	4.0	2620	2620	11400	11600	13000	13000	11200	11200
	9.66	820	920	1390	186	8.5	1580	1580	10300	10300	13000	13000	9310	9310
	11.31	820	920	1390	203	6.7	1960	1960	10300	10300	13000	13000	9310	9310
	12.76	820	920	1390	212	5.6	2260	2260	10300	10300	13000	13000	9310	9310
	14.46	820	920	1390	228	4.6	2580	2580	10300	10300	13000	13000	9310	9310
	16.48	820	920	1390	237	3.8	2940	2940	10300	10300	13000	13000	9310	9310
	18.29	820	920	1390	252	3.4	3230	3230	10300	10300	13000	13000	9310	9310
	20.90	820	920	1390	263	2.7	3620	3620	10300	10300	13000	13000	9310	9310
	22.05	820	920	1390	268	2.5	3780	3780	10300	10300	13000	13000	9310	9310
	25.13	820	920	1390	275	2.0	4190	4190	10300	10300	13000	13000	9310	9310
	27.41	820	920	1390	255	1.7	4470	4470	10300	10300	13000	13000	9310	9310
	32.08	820	920	1390	218	1.4	5000	5000	10300	10300	13000	13000	9310	9310
	36.30	820	920	1390	193	0.98	5440	5440	10300	10300	13000	13000	9310	9310
FA67 3	34.01	740	920	1250	44	2.8	5730	5730	11000	11000	13000	13000	9310	9310
	39.26	780	920	1320	38	2.2	5980	5980	10700	10700	13000	13000	9310	9310
	43.20	820	920	1390	35	1.9	6080	6080	10300	10300	13000	13000	9310	9310
	50.74	820	920	1390	34	1.6	6710	6710	10300	10300	13000	13000	9310	9310
	53.73	820	920	1390	34	1.4	6940	6940	10300	10300	13000	13000	9310	9310
	61.07	820	920	1390	34	1.1	7480	7480	10300	10300	13000	13000	9310	9310
	67.65	820	920	1390	35	0.97	7930	7930	10300	10300	13000	13000	9310	9310
	79.76	820	920	1390	36	0.76	8680	8680	10300	10300	13000	13000	9310	9310
	90.59	820	920	1390	56	1.4	9290	9290	10300	10300	13000	13000	9310	9310
	95.94	820	920	1390	56	1.2	9570	9570	10300	10300	13000	13000	9310	9310
	109.04	820	920	1390	57	0.98	10200	10200	10300	10300	13000	13000	9310	9310
	120.79	820	920	1390	57	0.85	10800	10800	10300	10300	13000	13000	9310	9310
	142.40	820	920	1390	49	0.68	11700	11700	10300	10300	13000	13000	9310	9310
	162.31	820	920	1390	43	0.47	12400	12400	10300	10300	13000	13000	9310	9310
	170.85	820	920	1390	41	0.42	12700	12700	10300	10300	13000	13000	9310	9310
	195.39	820	920	1390	36	0.34	13000	13000	10300	10300	13000	13000	9310	9310
	228.99	820	920	1390	31	0.27	13000	13000	10300	10300	13000	13000	9310	9310

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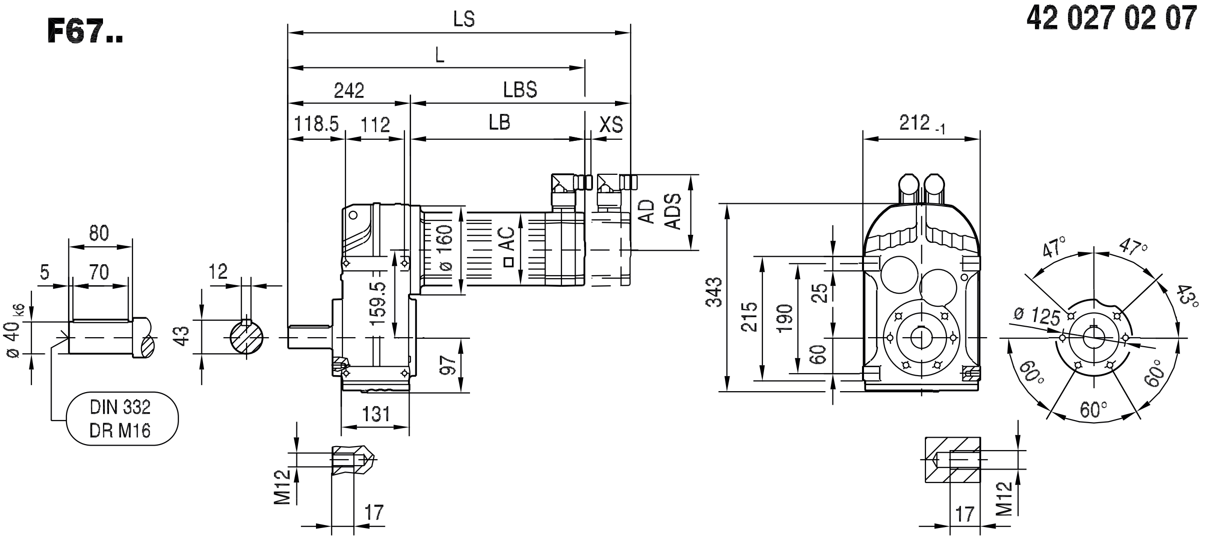
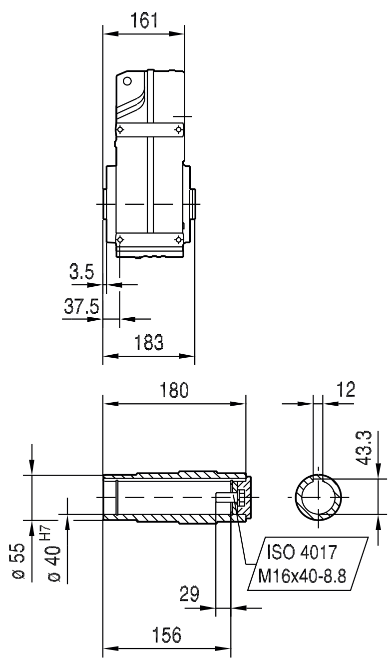
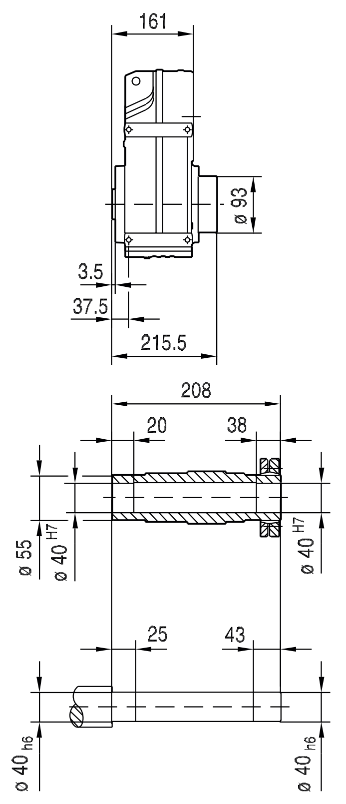
F67..



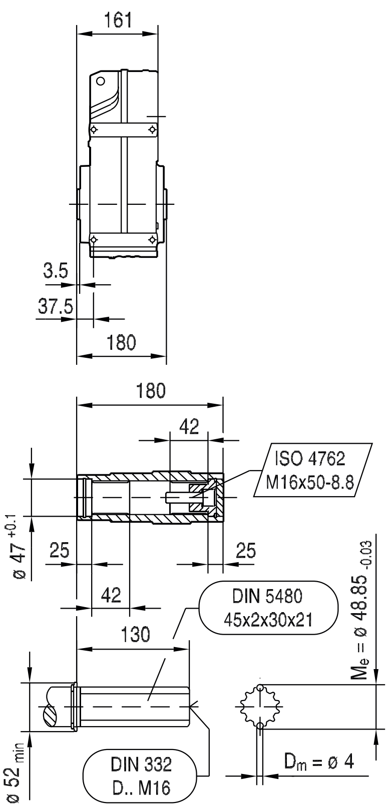
FA67B..



FH67B..



FV67B..



(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	381	420	459	415	465	515	408	433	483	448	486	550	484	521	601	598	632
LS	410	449	488	444	494	544	473	498	548	526	564	628	580	617	697	710	744
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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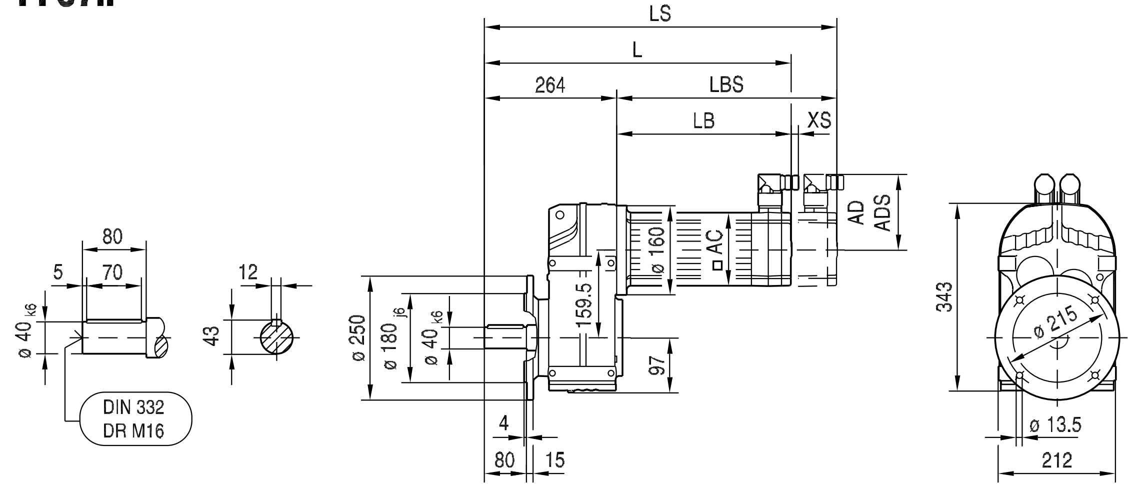
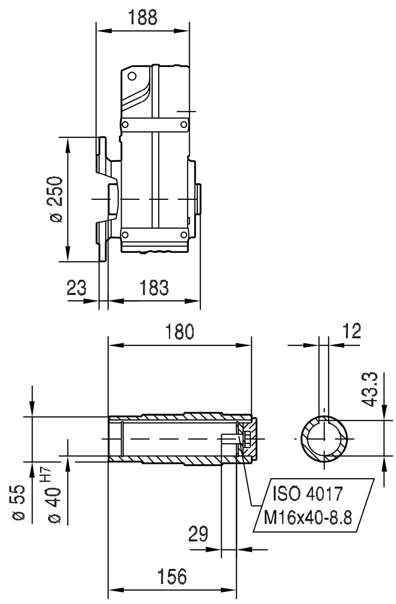
FF67..

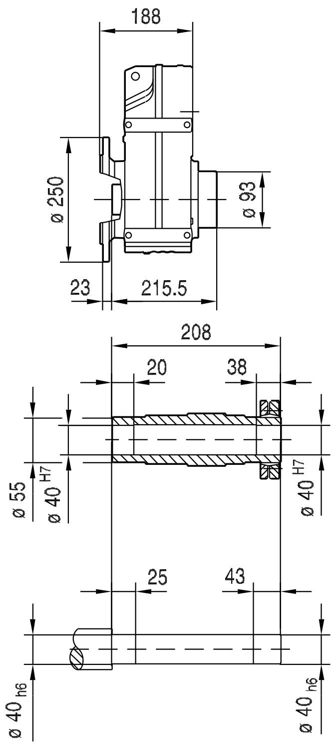
42 028 02 07



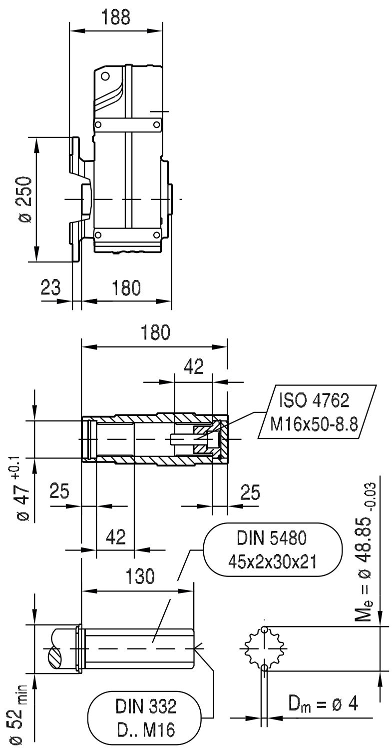
FAF67..



FHF67..



FVF67..



(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	403	442	481	437	487	537	430	455	505	470	508	572	506	543	623	620	654
LS	432	471	510	466	516	566	495	520	570	548	586	650	602	639	719	732	766
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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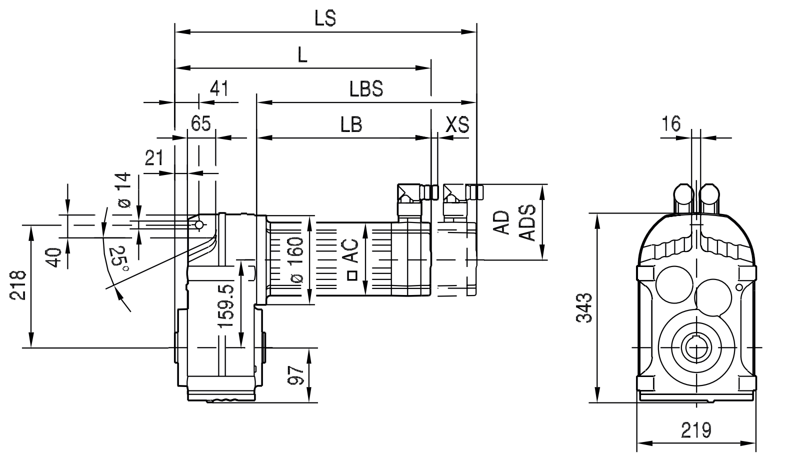
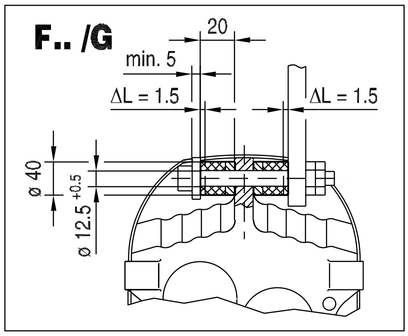
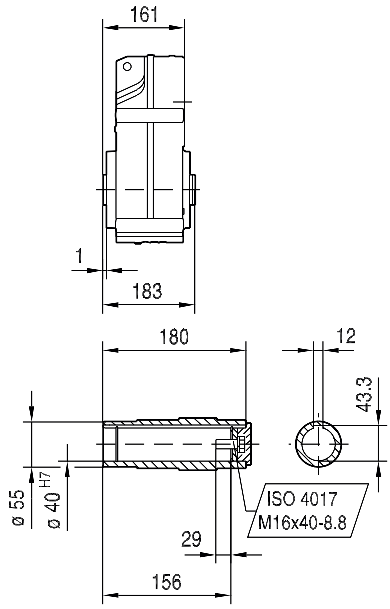
42 029 03 07

FA67..

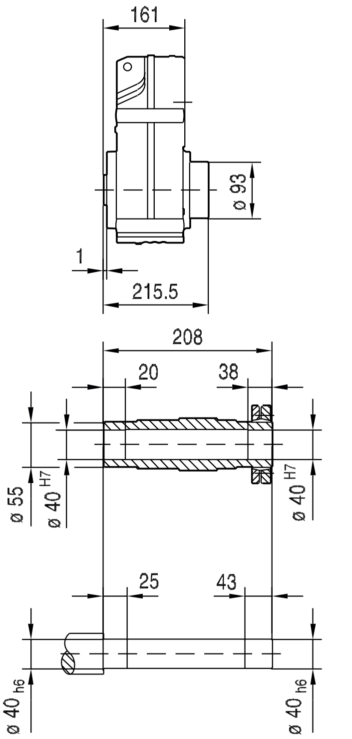




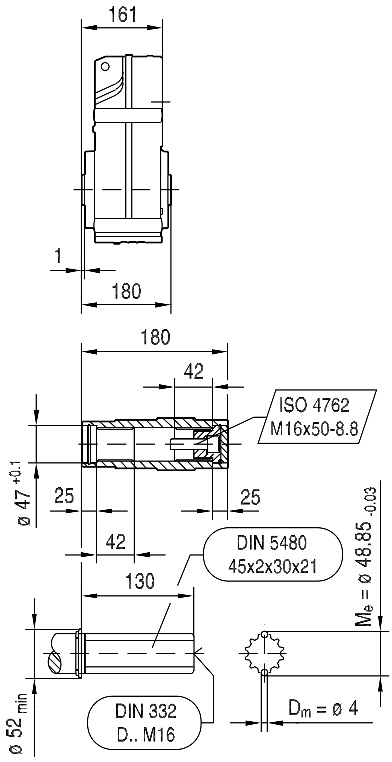
FA67..



FH67..



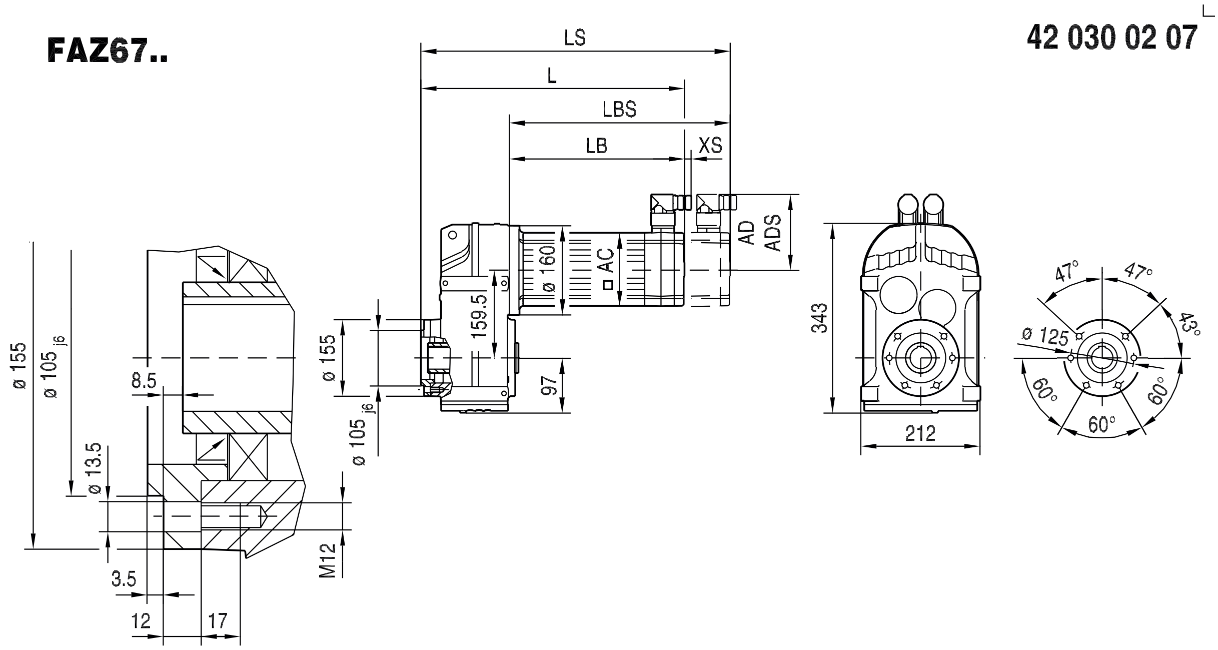
FV67..



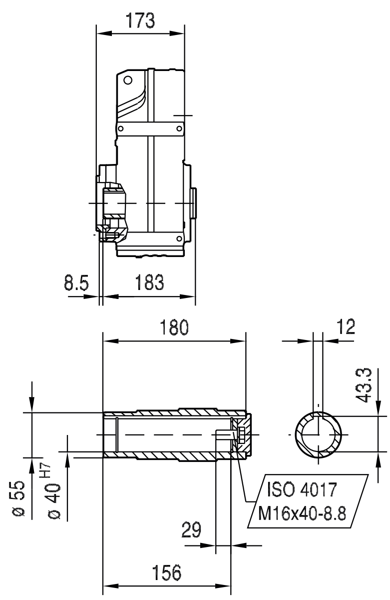
(→ 194)	CMP..																
	50S	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	300	339	378	334	384	434	327	352	402	367	405	469	403	440	520	517	551
LS	329	368	407	363	413	463	392	417	467	445	483	547	499	536	616	629	663
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

42 030 02 07

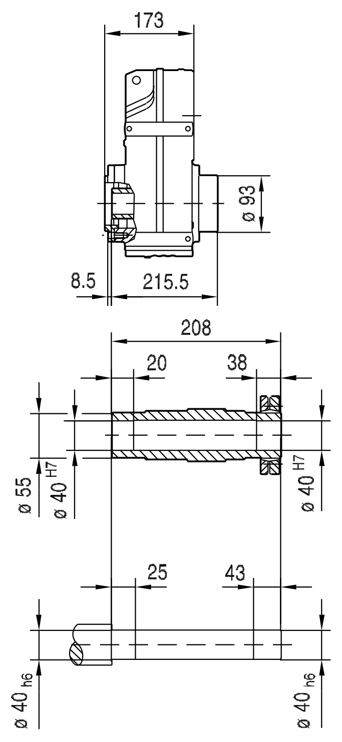
FAZ67..



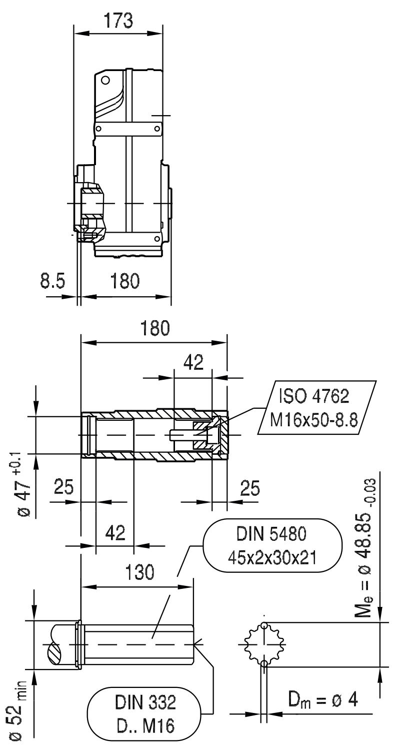
FAZ67..



FHZ67..



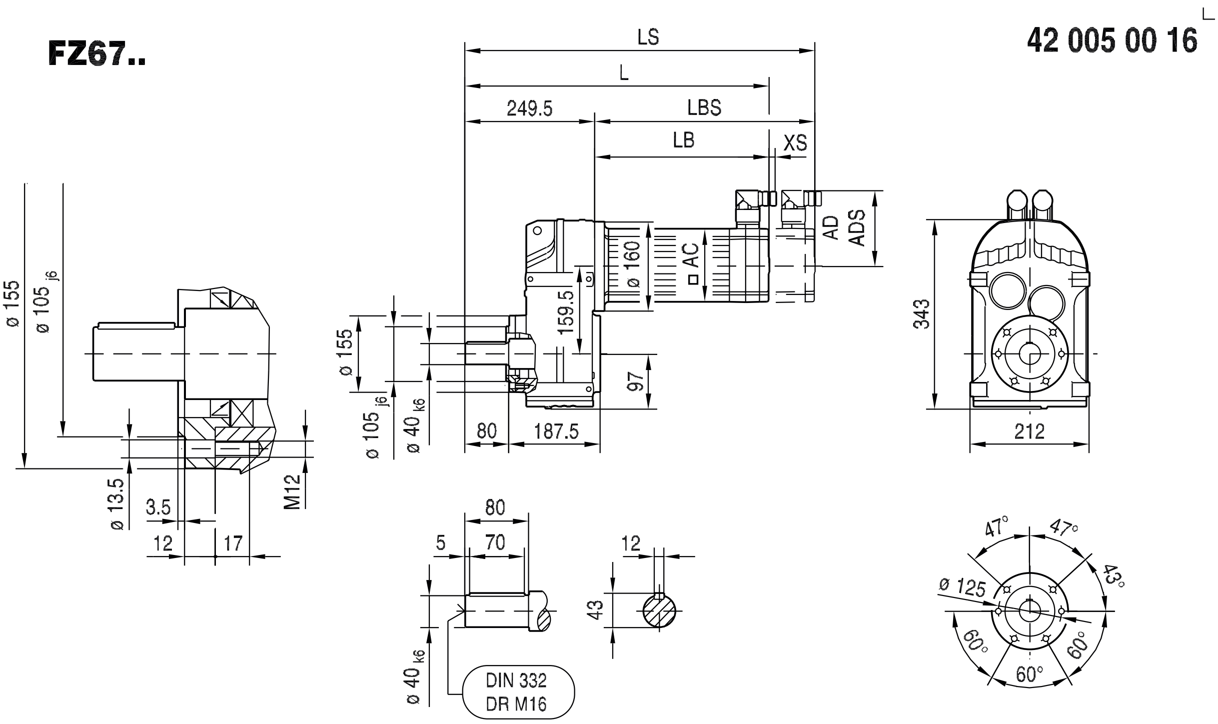
FVZ67..



(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	312	351	390	346	396	446	339	364	414	379	417	481	415	452	532	529	563
LS	341	380	419	375	425	475	404	429	479	457	495	559	511	548	628	641	675
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

FZ67..

42 005 00 16



(→ 194)	CMP..																
	50S	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	388	427	466	423	473	523	415	440	490	456	494	558	491	528	608	606	640
LS	417	456	495	451	501	551	480	505	555	533	571	635	587	624	704	718	752
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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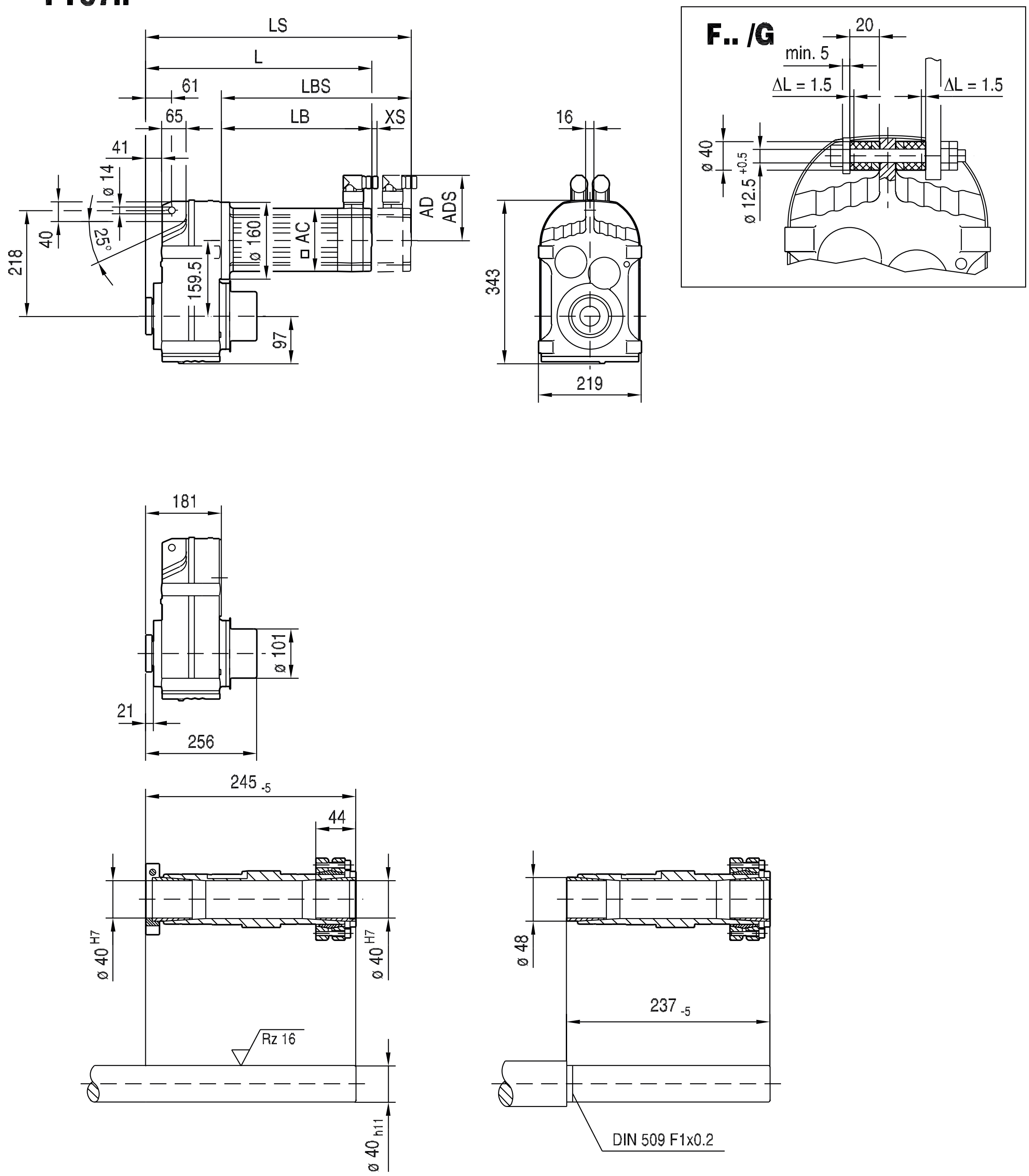
FT67.. 42 031 04 07



(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	320	359	398	354	404	454	347	372	422	387	425	489	423	460	540	537	571
LS	349	388	427	383	433	483	412	437	487	465	503	567	519	556	636	649	683
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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9.2.6 F77..

F77, M_{aDyn} Nm															1500 Nm
	CMP														
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
2															
4.28			126		128	195	175	255	440	280	445	740	365	560	930
5.16			152		154	230	210	310	535	340	540	890	440	680	1120
5.76	62	120	170	107	172	260	235	345	595	380	600	990	490	755	1250
6.64	71	138	196	124	198	300	270	400	685	435	695	1150	565	870	>1320
7.39	80	153	215	138	220	335	300	445	765	485	770	1280	630	970	>1330
8.26	89	171	240	154	245	375	335	500	850	545	860	>1330	705	1080	
9.30	100	193	270	173	275	420	375	560	960	615	970	>1330	790	1220	
10.93			320		325	495	445	660	1130	720	1140	>1530	930	1440	>1530
12.20	131	250	355	225	360	555	495	740	1260	800	1270	>1530	1040	>1530	>1530
14.06	151	290	410	260	420	635	570	850	1450	930	1470	>1530	1200	>1530	>1530
15.64	168	320	460	290	465	710	635	940	>1530	1030	>1530	>1530	1330	>1530	>1530
17.49	188	360	515	325	520	795	710	1060	>1530	1150	>1530	>1530	1490	>1530	
19.70	210	405	580	365	585	890	800	1190	>1530	1300	>1530	>1530	>1530	>1530	
21.43	230	440	630	395	640	970	870	1300		1410					
25.50	270	525	750	470	760	1160	1040	>1530		>1530					
28.75	305	595	840	535	850	1300	1170								
31.51	335	650	920	585	940	1430	1280								
36.58	390	755	1070	680	1090										
3															
25.54	270	520	745	470	755	1140	1030	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530
29.91	315	610	870	550	880	1340	1200	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530
33.74	355	690	980	620	990	1510	1360	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530
38.23	405	785	1110	700	1130	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530	
43.58	460	890	1270	800	1280	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530	
48.37	515	990	1410	890	1430	>1530	>1530	>1530		>1530					
55.27	585	1130	>1530	1010	>1530	>1530	>1530	>1530		>1530					
58.32	620	1190	>1530	1070	>1530	>1530	>1530	>1530		>1530					
66.46	700	1350	>1530	1210	>1530	>1530	>1530								
72.50	760	1470	>1530	1320	>1530	>1530	>1530								
75.02	790	1520	>1530	1360	>1530	>1530	>1530	>1530		>1530					
85.52	900	>1530	>1530	>1530	>1530	>1530	>1530	>1530		>1530					
94.93	1000	>1530	>1530	>1530	>1530	>1530	>1530	>1530		>1530					
108.46	1140	>1530	>1530	>1530	>1530	>1530	>1530	>1530		>1530					
114.45	1200	>1530	>1530	>1530	>1530	>1530	>1530	>1530		>1530					
130.42	1370	>1530	>1530	>1530	>1530	>1530	>1530								
142.27	1480	>1530	>1530	>1530	>1530	>1530	>1530								
166.47	>1530	>1530	>1530	>1530	>1530										
188.40	>1530	>1530		>1530											
198.31	>1530	>1530		>1530											
225.79	>1530														
262.93															
281.71															

(→ 🗎 190)

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F77, m kg	CMP														
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
2	54	55	57	58	60	62	63	65	69	70	74	83	90	98	115
3	55	56	58	60	61	63	65	67	71	71	76	84	91	99	115
FAF: + 6.6 kg / F: + 3.8 kg / FF: + 14 kg															

CMP..	i	n_{epk} min^{-1}	η %	c_{TG} FA Nm/'	FAF Nm/'	F Nm/'	FF Nm/'	φ /R '
FA77 2	4.28	4500	97	263	263	132	106	8
	5.16	4500	97	263	263	132	106	8
	5.76	4500	97	263	263	132	106	8
	6.64	4500	97	263	263	132	106	8
	7.39	4500	97	263	263	132	106	7
	8.26	4500	97	263	263	132	106	7
	9.30	4500	97	263	263	132	106	7
	10.93	4500	97	351	351	151	118	6
	12.20	4500	97	351	351	151	118	5
	14.06	4500	97	351	351	151	118	5
	15.64	4500	97	351	351	151	118	5
	17.49	4500	97	351	351	151	118	5
	19.70	4500	97	351	351	151	118	5
	21.43	4500	97	351	351	151	118	5
	25.50	4500	97	351	351	151	118	5
	28.75	4500	97	351	351	151	118	5
	31.51	4500	97	351	351	151	118	5
	36.58	4500	97	351	351	151	118	5
FA77 3	25.54	4500	96	388	388	157	122	6
	29.91	4500	96	388	388	157	122	6
	33.74	4500	96	388	388	157	122	6
	38.23	4500	96	388	388	157	122	6
	43.58	4500	96	388	388	157	122	6
	48.37	4500	96	388	388	157	122	6
	55.27	4500	96	388	388	157	122	6
	58.32	4500	96	388	388	157	122	6
	66.46	4500	95	388	388	157	122	6
	72.50	4500	95	388	388	157	122	6
	75.02	4500	95	394	394	158	123	6
	85.52	4500	95	394	394	158	123	6
	94.93	4500	95	394	394	158	123	5
	108.46	4500	95	394	394	158	123	5
	114.45	4500	95	394	394	158	123	5
	130.42	4500	95	394	394	158	123	5
	142.27	4500	94	394	394	158	123	5
	166.47	4500	94	394	394	158	123	5
	188.40	4500	94	394	394	158	123	5
	198.31	4500	94	394	394	158	123	5
	225.79	4500	93	394	394	158	123	5
	262.93	4500	93	394	394	158	123	5
	281.71	4500	92	394	394	158	123	5

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CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	F_{Ramax} FA N	F_{Ramax} FAF N	F_{Ramax} F N	F_{Ramax} FF N	F_{Rapk} FA N	F_{Rapk} FAF N	F_{Rapk} F N	F_{Rapk} FF N
FA77 2	4.28	1010	1310	1710	327	42	630	630	10200	10900	20000	20000	16900	17400
	5.16	1080	1320	1830	271	31	640	640	10700	11500	20000	20000	16800	17400
	5.76	1080	1320	1830	295	26	930	930	11300	12000	20000	20000	16800	17400
	6.64	1080	1320	1830	346	20	1310	1310	12000	12700	20000	20000	16800	17400
	7.39	1080	1330	1830	365	17	1610	1610	12500	13300	20000	20000	16800	17400
	8.26	1080	1330	1830	400	14	1940	1940	13100	13900	20000	20000	16800	17400
	9.30	1080	1330	1830	430	12	2300	2300	13800	14600	20000	20000	16800	17400
	10.93	1500	1530	2550	183	19	2080	2080	14200	15100	20000	20000	15500	17000
	12.20	1500	1530	2550	205	16	2450	2450	14900	15800	20000	20000	15500	17000
	14.06	1500	1530	2550	220	13	2940	2940	15700	16700	20000	20000	15500	17000
	15.64	1500	1530	2550	237	11	3330	3330	15700	17100	20000	20000	15500	17000
	17.49	1500	1530	2550	252	9.5	3750	3750	15700	17100	20000	20000	15500	17000
	19.70	1500	1530	2550	264	7.9	4220	4220	15700	17100	20000	20000	15500	17000
	21.43	1500	1530	2550	275	7.1	4560	4560	15700	17100	20000	20000	15500	17000
	25.50	1500	1530	2550	275	5.5	5300	5300	15700	17100	20000	20000	15500	17000
	28.75	1430	1530	2430	243	4.4	6190	6190	16200	17300	20000	20000	15500	17000
	31.51	1380	1530	2340	222	3.8	6870	6870	16500	17500	20000	20000	15500	17000
	36.58	1110	1530	1880	191	3.0	8990	8990	17900	18300	20000	20000	15500	17000
FA77 3	25.54	1450	1530	2460	59	10	5560	5560	16100	17300	20000	20000	15500	17000
	29.91	1500	1530	2550	50	7.8	6010	6010	15700	17100	20000	20000	15500	17000
	33.74	1500	1530	2550	50	6.4	6580	6580	15700	17100	20000	20000	15500	17000
	38.23	1500	1530	2550	50	5.2	7190	7190	15700	17100	20000	20000	15500	17000
	43.58	1500	1530	2550	50	4.3	7850	7850	15700	17100	20000	20000	15500	17000
	48.37	1500	1530	2550	52	3.8	8410	8410	15700	17100	20000	20000	15500	17000
	55.27	1500	1530	2550	52	3.0	9140	9140	15700	17100	20000	20000	15500	17000
	58.32	1500	1530	2550	51	2.8	9450	9450	15700	17100	20000	20000	15500	17000
	66.46	1500	1530	2550	53	2.2	10200	10200	15700	17100	20000	20000	15500	17000
	72.50	1500	1530	2550	52	1.9	10700	10700	15700	17100	20000	20000	15500	17000
	75.02	1500	1530	2550	53	4.0	11000	11000	15700	17100	20000	20000	15500	17000
	85.52	1500	1530	2550	53	3.3	11800	11800	15700	17100	20000	20000	15500	17000
	94.93	1500	1530	2550	54	3.0	12500	12500	15700	17100	20000	20000	15500	17000
	108.46	1500	1530	2550	53	2.5	13400	13400	15700	17100	20000	20000	15500	17000
	114.45	1500	1530	2550	54	2.3	13800	13800	15700	17100	20000	20000	15500	17000
	130.42	1500	1530	2550	54	1.9	14800	14800	15700	17100	20000	20000	15500	17000
	142.27	1500	1530	2550	49	1.6	15400	15400	15700	17100	20000	20000	15500	17000
	166.47	1500	1530	2550	42	1.3	16700	16700	15700	17100	20000	20000	15500	17000
	188.40	1500	1530	2550	37	0.91	17700	17700	15700	17100	20000	20000	15500	17000
	198.31	1500	1530	2550	35	0.82	18100	18100	15700	17100	20000	20000	15500	17000
	225.79	1500	1530	2550	31	0.67	19300	19300	15700	17100	20000	20000	15500	17000
	262.93	1500	1530	2550	27	0.54	20000	20000	15700	17100	20000	20000	15500	17000
	281.71	1500	1530	2550	25	0.47	20000	20000	15700	17100	20000	20000	15500	17000

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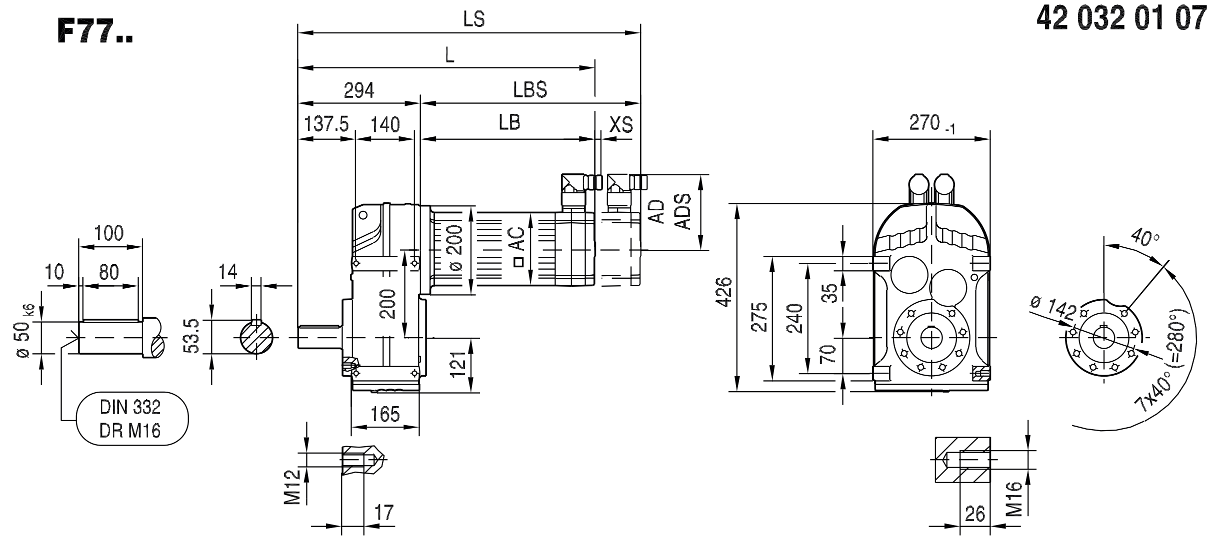
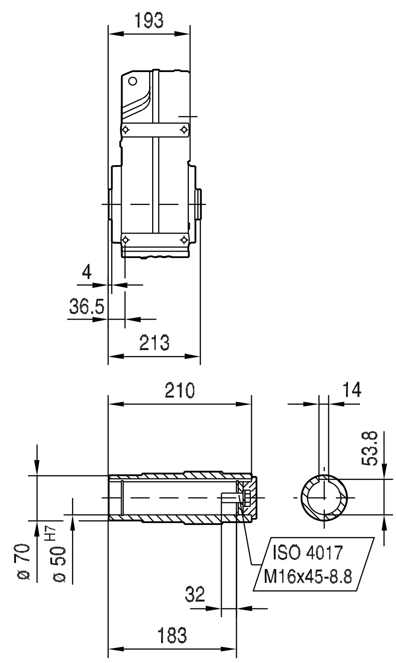
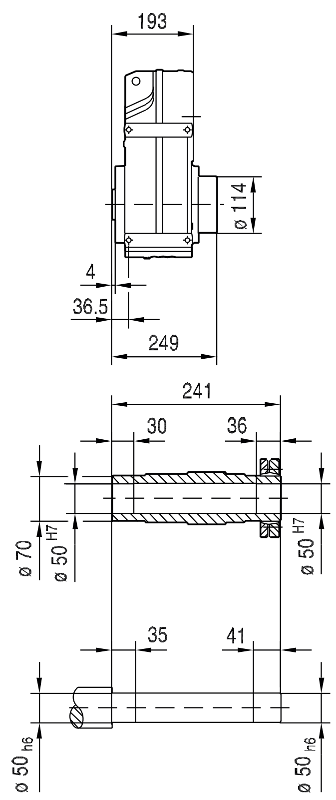
F77.. 42 032 01 07



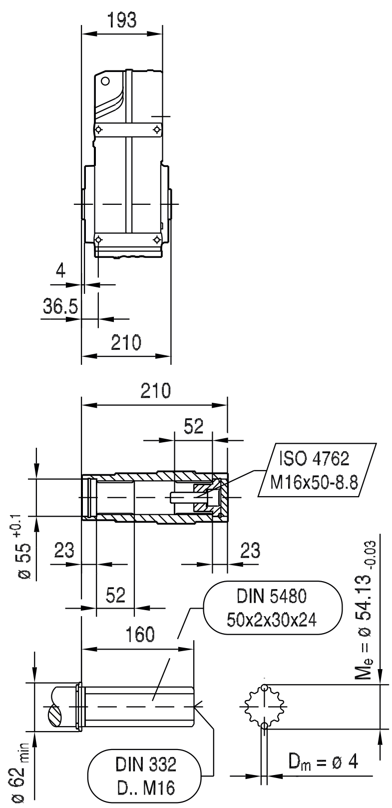
FA77B..



FH77B..



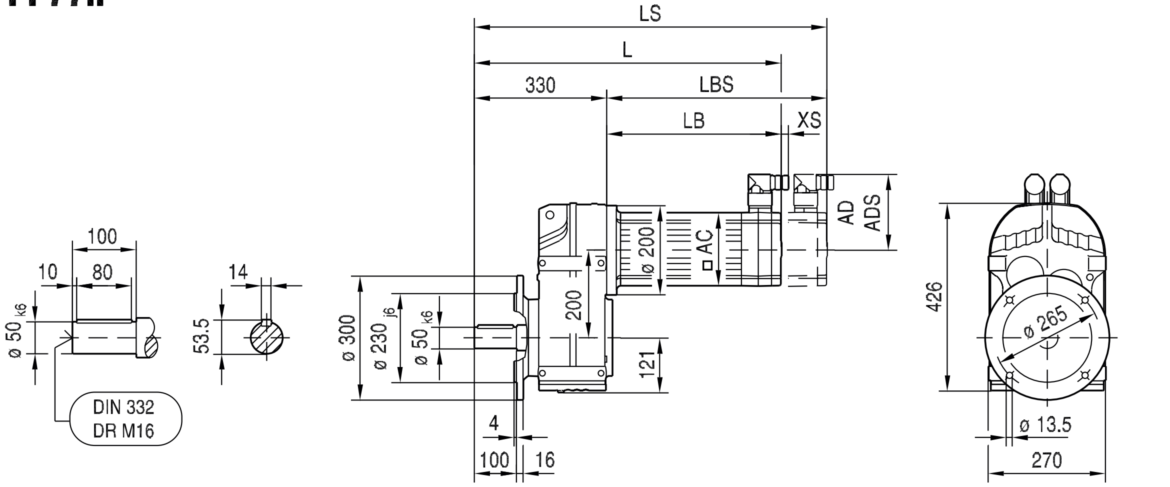
FV77B..



(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	461	511	561	452	477	527	492	526	594	524	564	644	641	684	772
LS	490	540	590	517	542	592	570	604	672	620	660	740	753	796	884
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

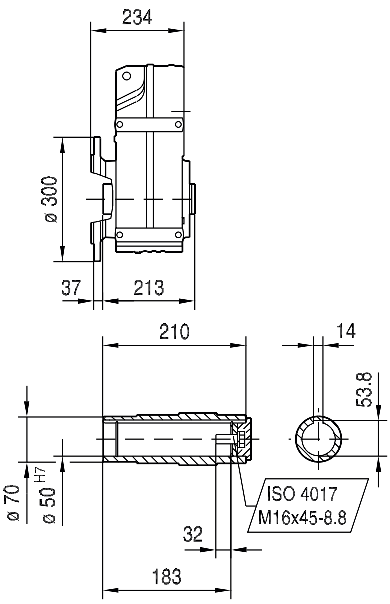
FF77..

42 033 02 07

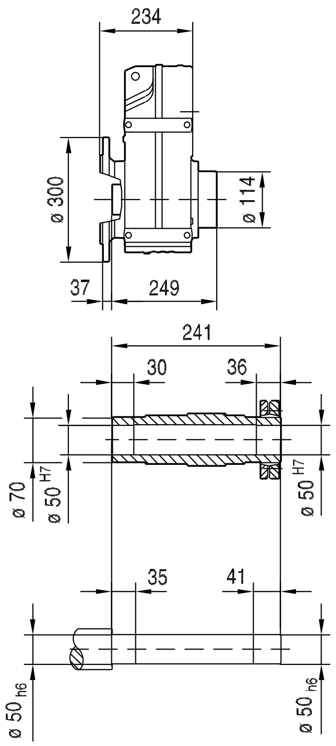


9

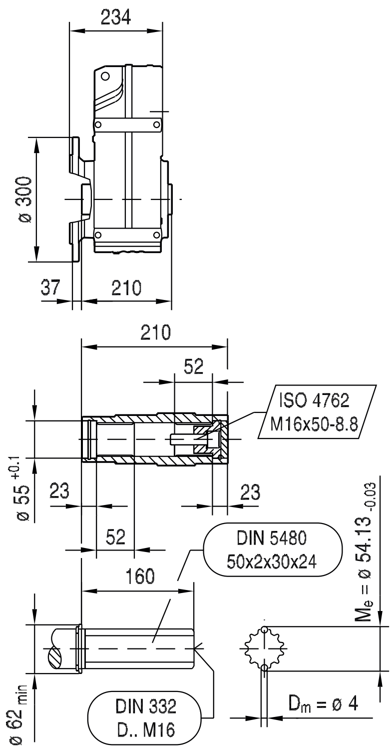
FAF77..



FHF77..



FVF77..



(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	497	547	597	488	513	563	528	562	630	560	600	680	677	720	808
LS	526	576	626	553	578	628	606	640	708	656	696	776	789	832	920
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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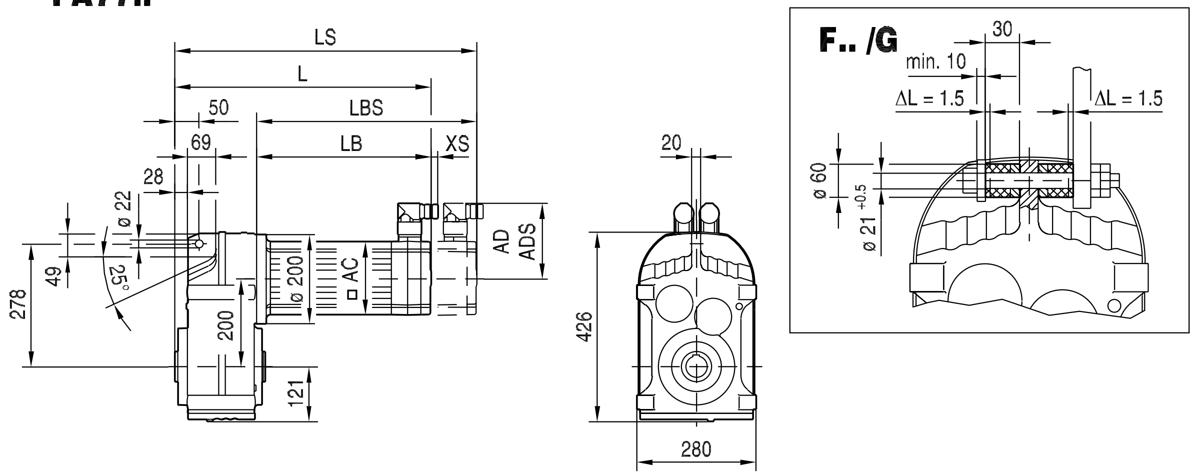
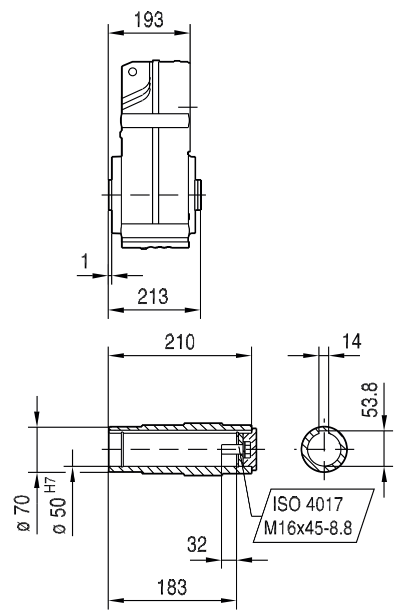
FA77..

42 034 02 07



FA77..



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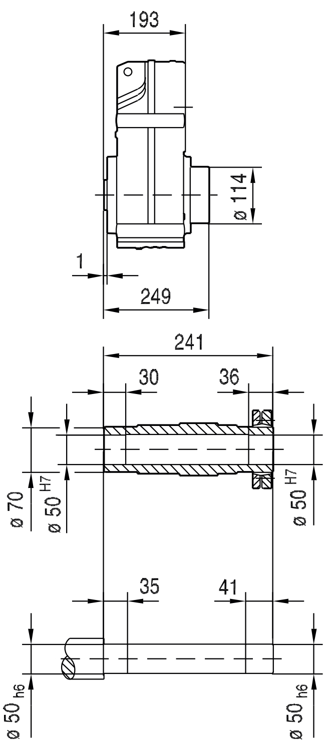
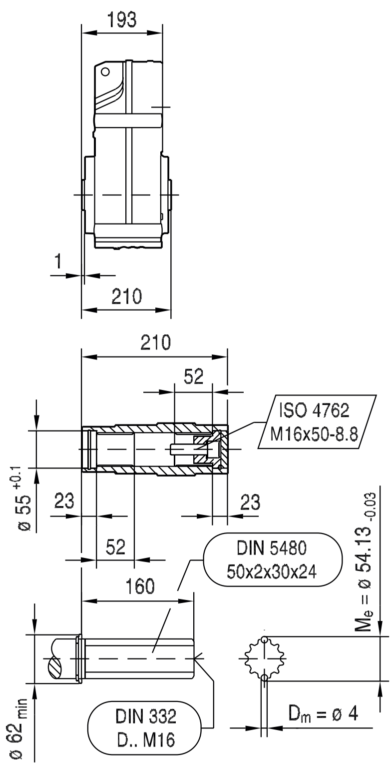


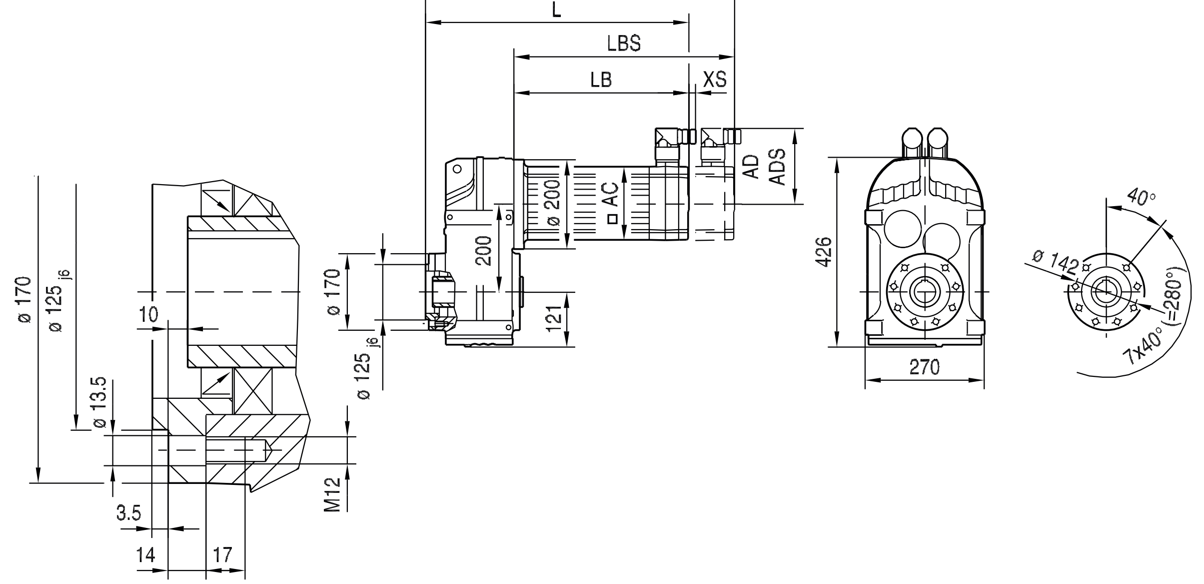
FV77..



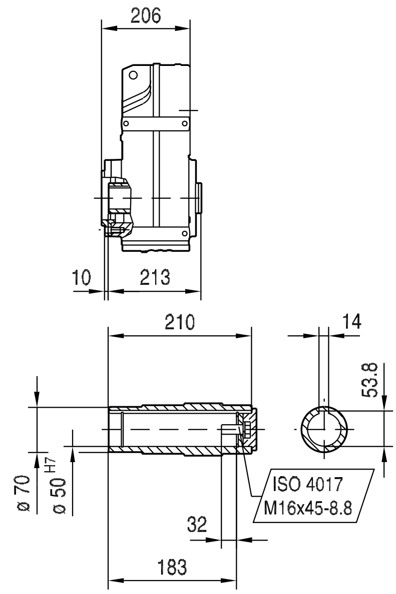
(→ 194)	CMP..														
	63S	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	360	410	460	351	376	426	391	425	493	423	463	543	540	583	671
LS	389	439	489	416	441	491	469	503	571	519	559	639	652	695	783
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

42 035 01 07

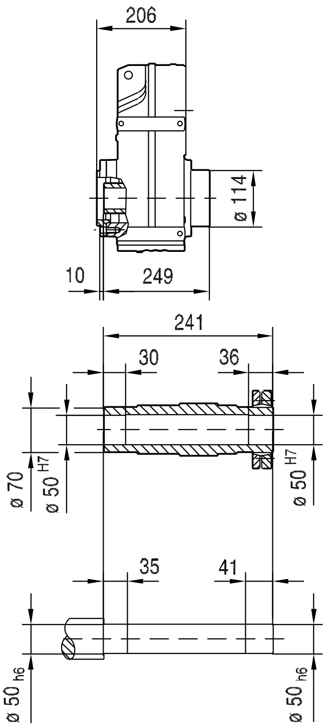
FAZ77..



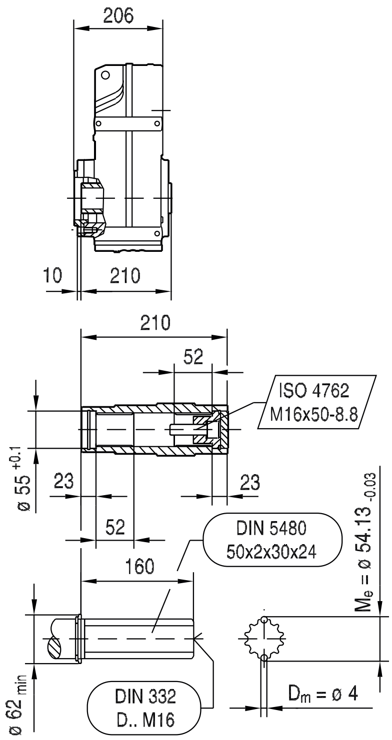
FAZ77..



FHZ77..



FVZ77..



(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	373	423	473	364	389	439	404	438	506	436	476	556	553	596	684
LS	402	452	502	429	454	504	482	516	584	532	572	652	665	708	796
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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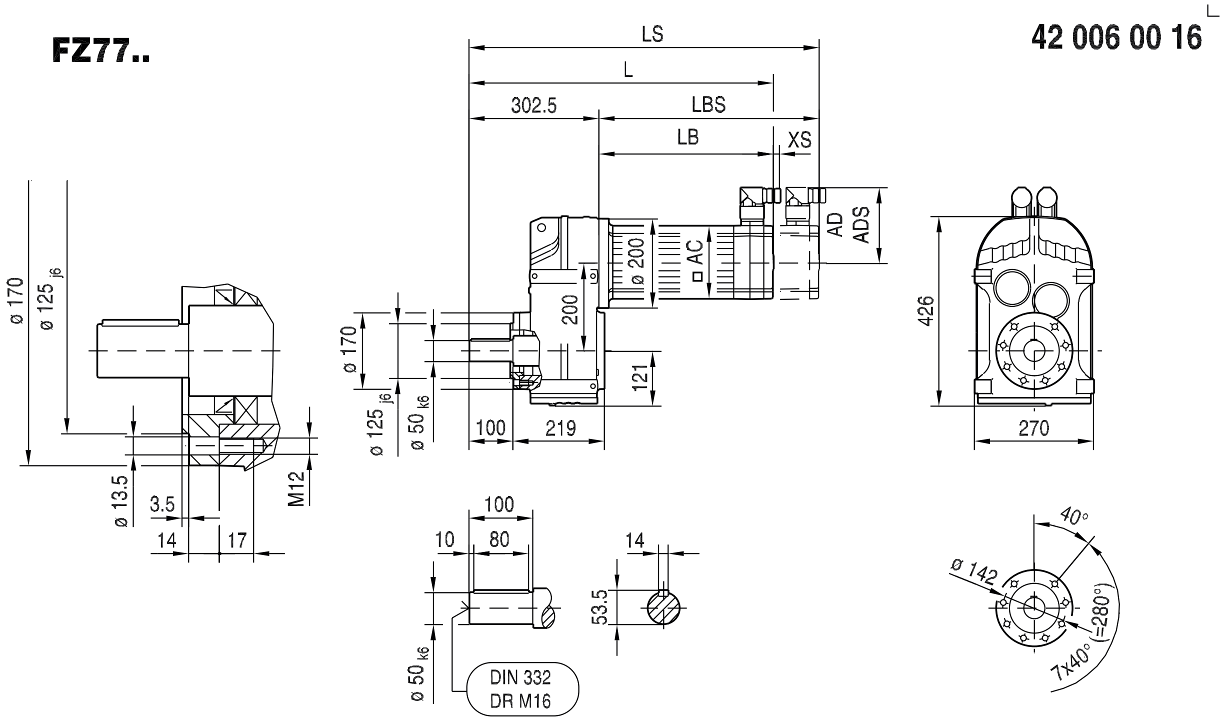

(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	470	520	570	460	485	535	501	535	603	532	572	652	650	693	781
LS	498	548	598	525	550	600	578	612	680	628	668	748	762	805	893
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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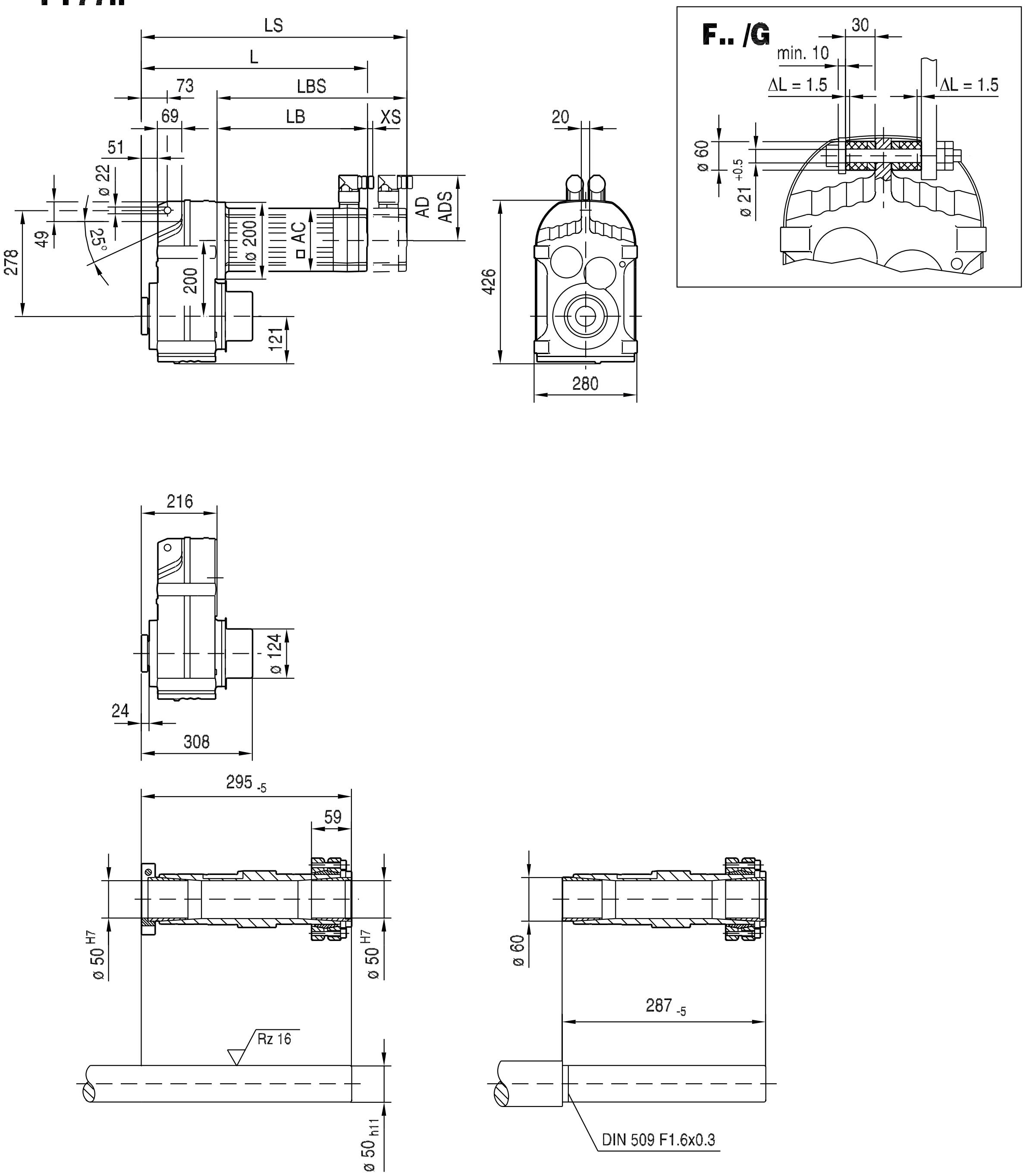
FT77..

42 036 04 07



(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	383	433	483	374	399	449	414	448	516	446	486	566	563	606	694
LS	412	462	512	439	464	514	492	526	594	542	582	662	675	718	806
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

9.2.7 F87..

F87, M_{aDyn} Nm	CMP													3000 Nm
i	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
2														
4.12					250	425	270	430	710	350	540	890	1070	1270
4.92					295	510	325	515	850	415	645	1070	1280	1520
5.63		168	255	225	340	580	370	585	970	480	740	1220	1470	1740
6.65		199	300	270	400	690	440	695	1150	565	870	1450	1740	>1970
7.35	137	215	330	300	445	760	485	765	1270	625	960	1600	1920	>1970
8.29	154	245	375	335	500	860	545	860	1430	705	1090	1800	>1980	
9.58					580	990	630	1000	1660	810	1260	2090	2500	2970
11.46					695	1180	755	1200	1980	970	1510	2500	3000	>3090
13.12		390	595	535	795	1360	860	1370	2270	1110	1730	2860	>3090	>3090
15.48		460	700	630	930	1600	1020	1620	2680	1320	2040	>3090	>3090	>3090
17.12	315	510	775	695	1030	1770	1130	1790	2960	1460	2250	>3090	>3090	>3090
19.31	355	575	870	785	1170	2000	1270	2020	>3090	1640	2540	>3090	>3090	
21.32	395	635	960	870	1290	2210	1410	2230	>3090	1810	2810	>3090	>3090	
23.68	440	705	1070	960	1430	2450	1560	2480	>3090	2020	>3090			
26.50	490	790	1200	1080	1600	2750	1750	2770	>3090	2260	>3090			
28.78	535	850	1300	1170	1740		1900							
33.92	630	1010	1540	1380	2050		2240							
3														
29.20		860	1310	1180	1750	2990	1910	3020	>3090	2460	>3090	>3090	>3090	>3090
35.19		1040	1580	1420	2110	>3090	2300	>3090	>3090	2970	>3090	>3090	>3090	>3090
39.30	720	1160	1760	1580	2360	>3090	2570	>3090	>3090	>3090	>3090	>3090	>3090	>3090
45.28	830	1330	2030	1830	2720	>3090	2960	>3090	>3090	>3090	>3090	>3090	>3090	
50.36	920	1480	2260	2030	3020	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	
56.75		1660	2520	2260	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
68.40		2000	3040	2730	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
76.39	1390	2230	>3090	3050	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
88.01	1600	2570	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
97.89	1780	2860	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
109.49	1990	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
123.29	2240	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090			
134.16	2440	>3090	>3090	>3090	>3090		>3090							
159.61	2910	>3090	>3090	>3090	>3090		>3090							
179.97	>3090	>3090	>3090	>3090										
197.20	>3090	>3090	>3090	>3090										
228.93	>3090	>3090												
255.37	>3090													
270.68	>3090													

(→ 190)

F87, m kg	CMP													
s	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
2	96	98	100	105	105	110	105	110	120	125	135	150	160	170
3	99	100	105	105	110	110	110	115	125	130	140	155	160	170
FAF: + 13 kg / F: + 5.7 kg / FF: + 21 kg														

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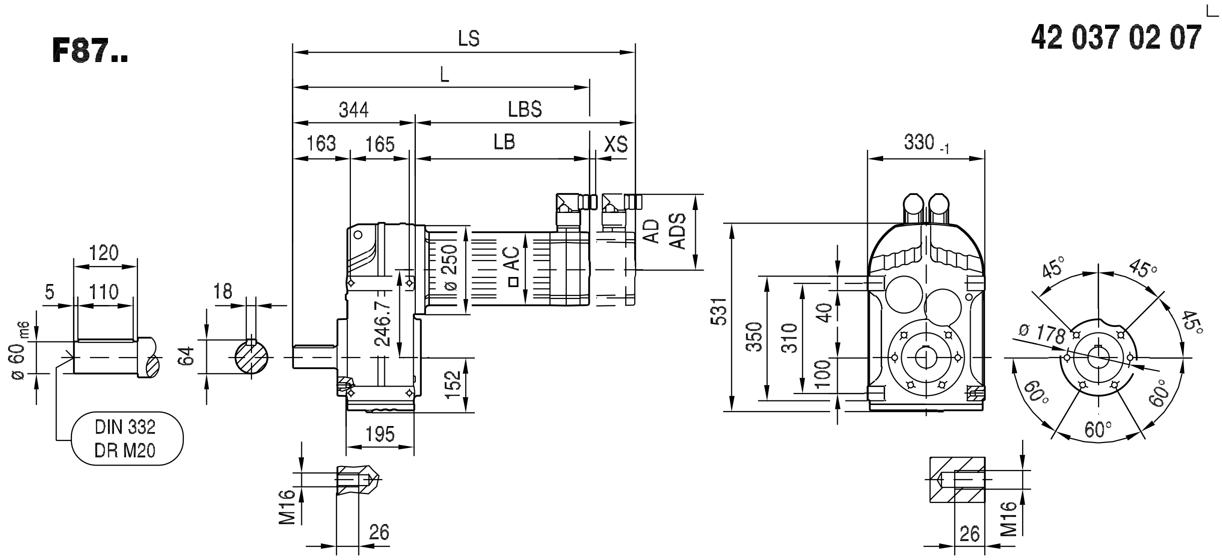
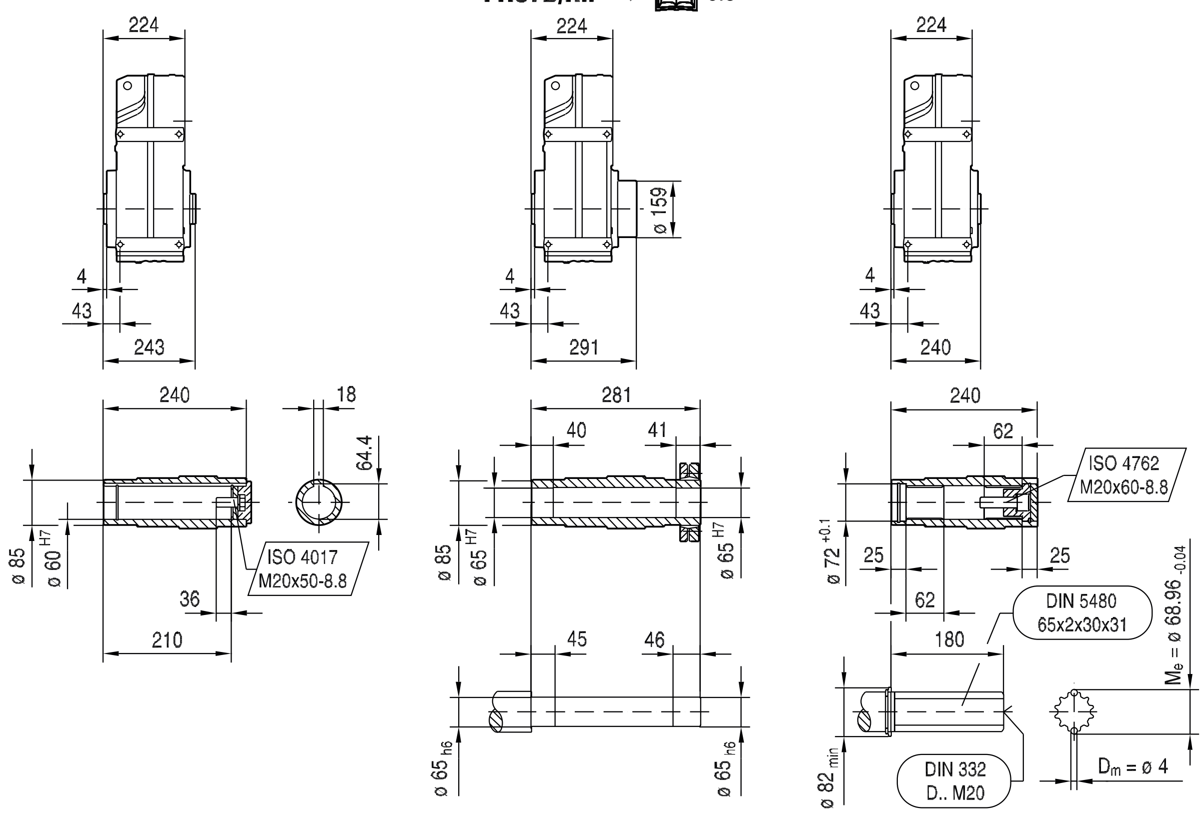
CMP..				c_{TG}				φ
		n_{epk}	η	FA	FAF	F	FF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
FA87 2	4.12	3924	97	465	465	197	186	7
	4.92	4378	97	465	465	197	186	7
	5.63	4500	97	465	465	197	186	7
	6.65	4500	97	465	465	197	186	7
	7.35	4500	97	465	465	197	186	7
	8.29	4500	97	465	465	197	186	7
	9.58	3924	97	711	711	230	216	7
	11.46	4378	97	711	711	230	216	7
	13.12	4500	97	711	711	230	216	7
	15.48	4500	97	711	711	230	216	7
	17.12	4500	97	711	711	230	216	7
	19.31	4500	97	711	711	230	216	7
	21.32	4500	97	711	711	230	216	7
	23.68	4500	97	711	711	230	216	7
	26.50	4500	97	711	711	230	216	7
	28.78	4500	97	711	711	230	216	7
	33.92	4500	97	711	711	230	216	7
FA87 3	29.20	4500	96	833	833	242	226	8
	35.19	4500	96	833	833	242	226	8
	39.30	4500	96	833	833	242	226	8
	45.28	4500	96	833	833	242	226	8
	50.36	4500	96	833	833	242	226	7
	56.75	4500	95	846	846	243	227	7
	68.40	4500	95	846	846	243	227	7
	76.39	4500	95	846	846	243	227	7
	88.01	4500	95	846	846	243	227	7
	97.89	4500	95	846	846	243	227	7
	109.49	4500	95	846	846	243	227	7
	123.29	4500	95	846	846	243	227	7
	134.16	4500	95	846	846	243	227	7
	159.61	4500	95	846	846	243	227	7
	179.97	4500	94	846	846	243	227	7
	197.20	4500	94	846	846	243	227	7
	228.93	4500	94	846	846	243	227	7
	255.37	4500	94	846	846	243	227	7
	270.68	4500	93	846	846	243	227	7

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
FA87 2	4.12	1460	1940	2480	340	114	3020	3020	5980	11800	30000	30000	26400	23400
	4.92	1530	1960	2600	346	85	3310	3310	6430	12600	30000	30000	26300	23400
	5.63	1530	1960	2600	391	67	3850	3850	7020	13400	30000	30000	26300	23400
	6.65	1530	1970	2600	466	52	4550	4550	7790	14400	30000	30000	26300	23400
	7.35	1530	1970	2600	490	44	5000	5000	8280	15000	30000	30000	26300	23400
	8.29	1530	1980	2600	531	36	5550	5550	8890	15800	30000	30000	26200	23300
	9.58	2880	3090	4890	146	63	275	275	5050	11000	30000	30000	16000	16000
	11.46	3000	3090	5100	122	49	575	575	5580	11800	30000	30000	16000	16000
	13.12	3000	3090	5100	114	40	1300	1300	6370	13100	30000	30000	16000	16000
	15.48	3000	3090	5100	110	32	2220	2220	7390	14700	30000	30000	16000	16000
	17.12	3000	3090	5100	105	28	2810	2810	8040	15800	30000	30000	16000	16000
	19.31	3000	3090	5100	104	23	3540	3540	8840	17000	30000	30000	16000	16000
	21.32	3000	3090	5100	98	20	4160	4160	9520	18000	30000	30000	16000	16000
	23.68	3000	3090	5100	97	17	4850	4850	10300	19100	30000	30000	16000	16000
	26.50	3000	3090	5100	98	15	5610	5610	11100	19800	30000	30000	16000	16000
	28.78	2450	3090	4160	191	13	8940	8940	13900	22500	30000	30000	16000	16000
	33.92	2610	3090	4430	150	10	9340	9340	14600	22200	30000	30000	16000	16000
FA87 3	29.20	2510	3090	4260	48	25	8740	8740	13800	22400	30000	30000	16000	16000
	35.19	2610	3090	4430	40	19	9610	9610	14900	22200	30000	30000	16000	16000
	39.30	2720	3090	4620	36	16	9910	9910	15400	22000	30000	30000	16000	16000
	45.28	2820	3090	4790	31	13	10500	10500	16200	21700	30000	30000	16000	16000
	50.36	2940	3090	4990	28	11	10800	10800	16800	21500	30000	30000	16000	16000
	56.75	3000	3090	5100	32	20	11600	11600	17700	19800	30000	30000	16000	16000
	68.40	3000	3090	5100	32	16	13300	13300	19600	19800	30000	30000	16000	16000
	76.39	3000	3090	5100	31	14	14300	14300	19800	19800	30000	30000	16000	16000
	88.01	3000	3090	5100	32	11	15800	15800	19800	19800	30000	30000	16000	16000
	97.89	3000	3090	5100	32	9.9	16900	16900	19800	19800	30000	30000	16000	16000
	109.49	3000	3090	5100	32	8.3	18100	18100	19800	19800	30000	30000	16000	16000
	123.29	3000	3090	5100	32	7.0	19400	19400	19800	19800	30000	30000	16000	16000
	134.16	3000	3090	5100	32	6.3	20400	20400	19800	19800	30000	30000	16000	16000
	159.61	3000	3090	5100	32	4.9	22500	22500	19800	19800	30000	30000	16000	16000
	179.97	3000	3090	5100	32	4.0	24100	24100	19800	19800	30000	30000	16000	16000
	197.20	3000	3090	5100	32	3.5	25300	25300	19800	19800	30000	30000	16000	16000
	228.93	3000	3090	5100	31	2.8	27300	27300	19800	19800	30000	30000	16000	16000
	255.37	3000	3090	5100	27	1.8	28900	28900	19800	19800	30000	30000	16000	16000
	270.68	3000	3090	5100	26	1.6	29800	29800	19800	19800	30000	30000	16000	16000

F87.. 42 037 02 07



FA87B.. **FH87B..** **FH87B/R..** → 6.3 **FV87B..**



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	498	523	573	537	571	639	569	609	689	686	729	817	860	903
LS	563	588	638	615	649	717	665	705	785	798	841	929	972	1015
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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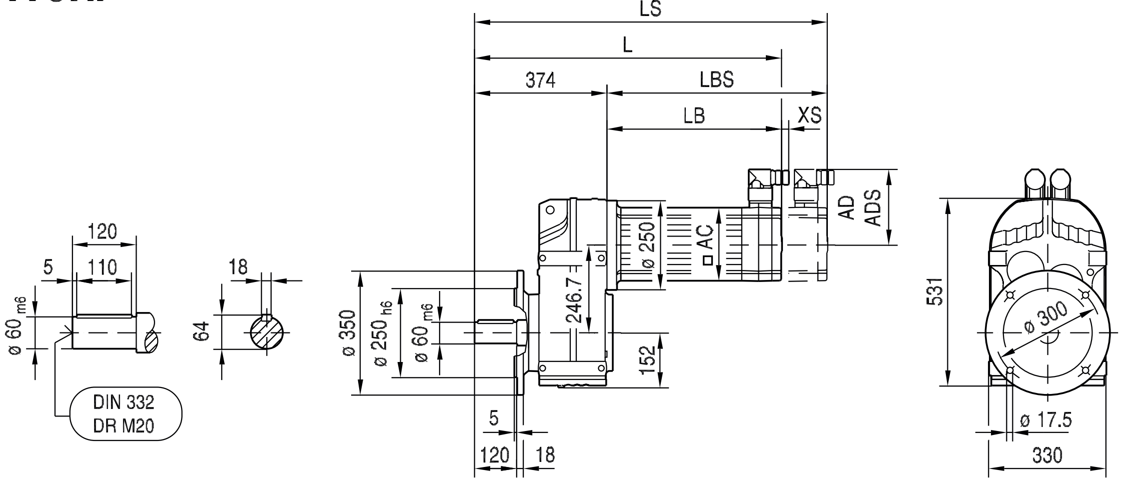
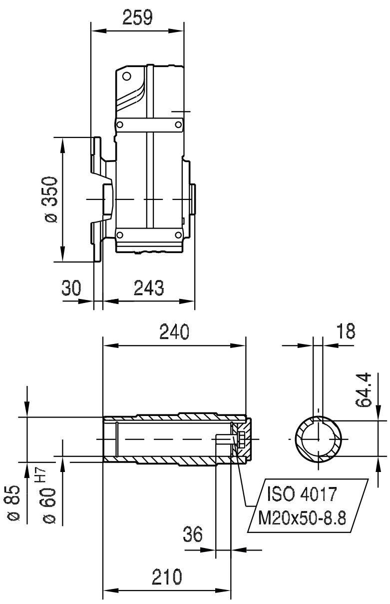
42 038 02 07

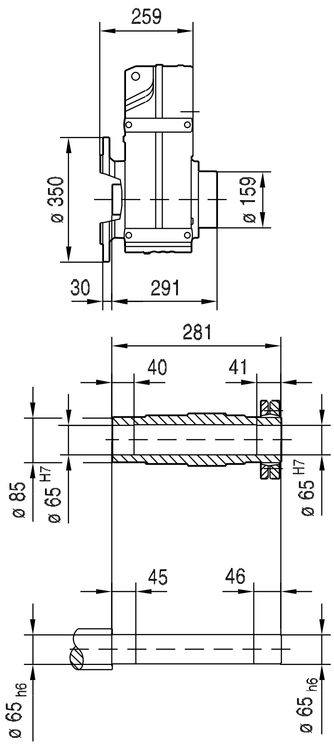
FF87..



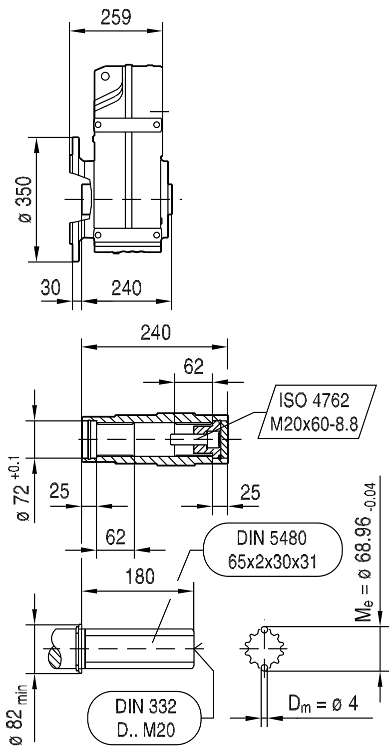
FAF87..



FHF87..
FHF87/R.. → 6.3



FVF87..



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	528	553	603	567	601	669	599	639	719	716	759	847	890	933
LS	593	618	668	645	679	747	695	735	815	828	871	959	1002	1045
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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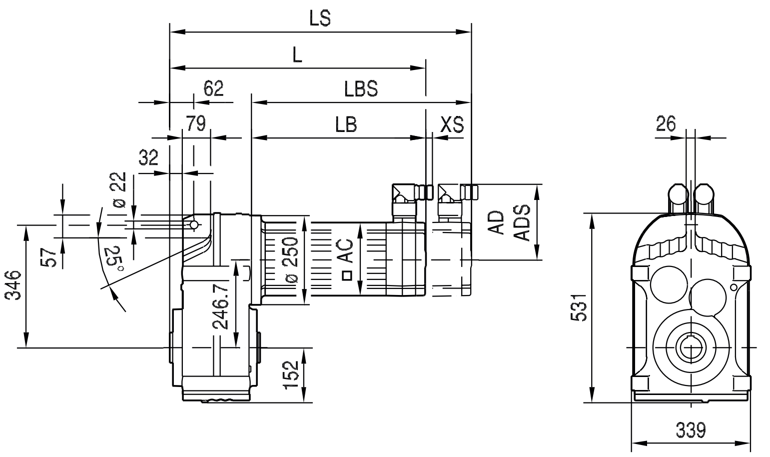
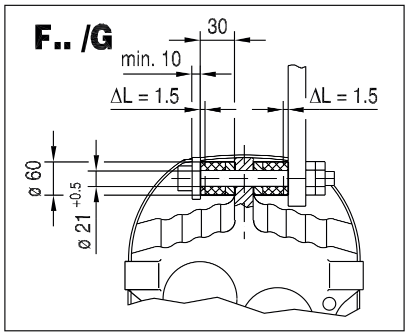
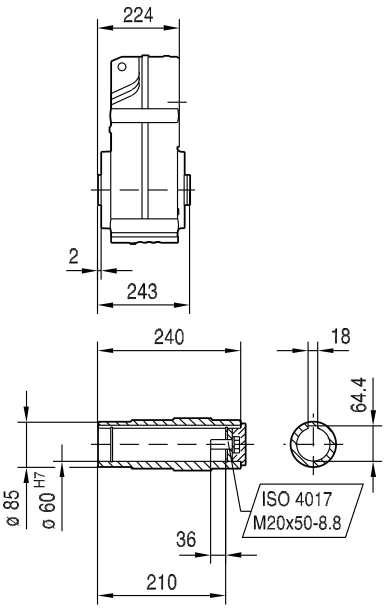
42 039 04 07

FA87..



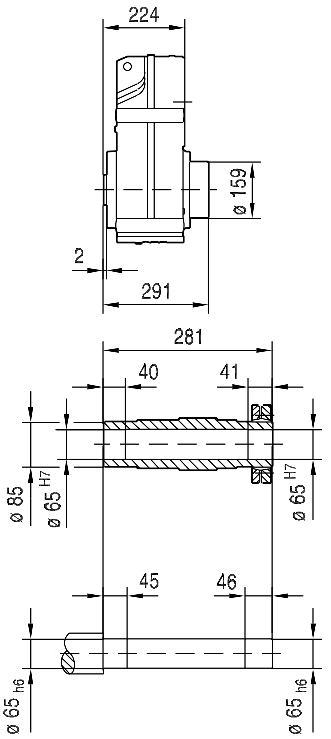


FA87..

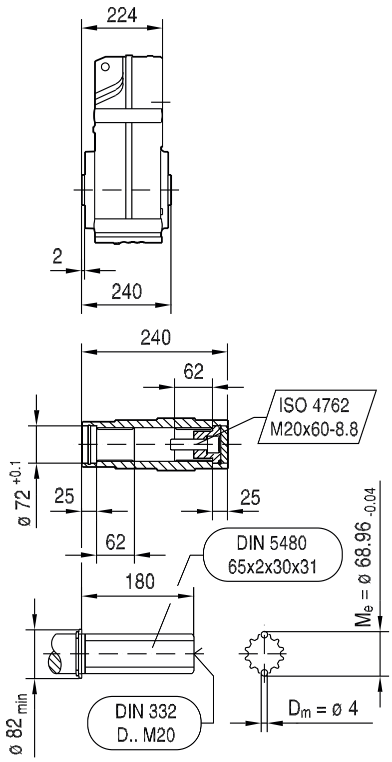


FH87..
FH87/R..

→ 6.3



FV87..



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	378	403	453	417	451	519	449	489	569	566	609	697	740	783
LS	443	468	518	495	529	597	545	585	665	678	721	809	852	895
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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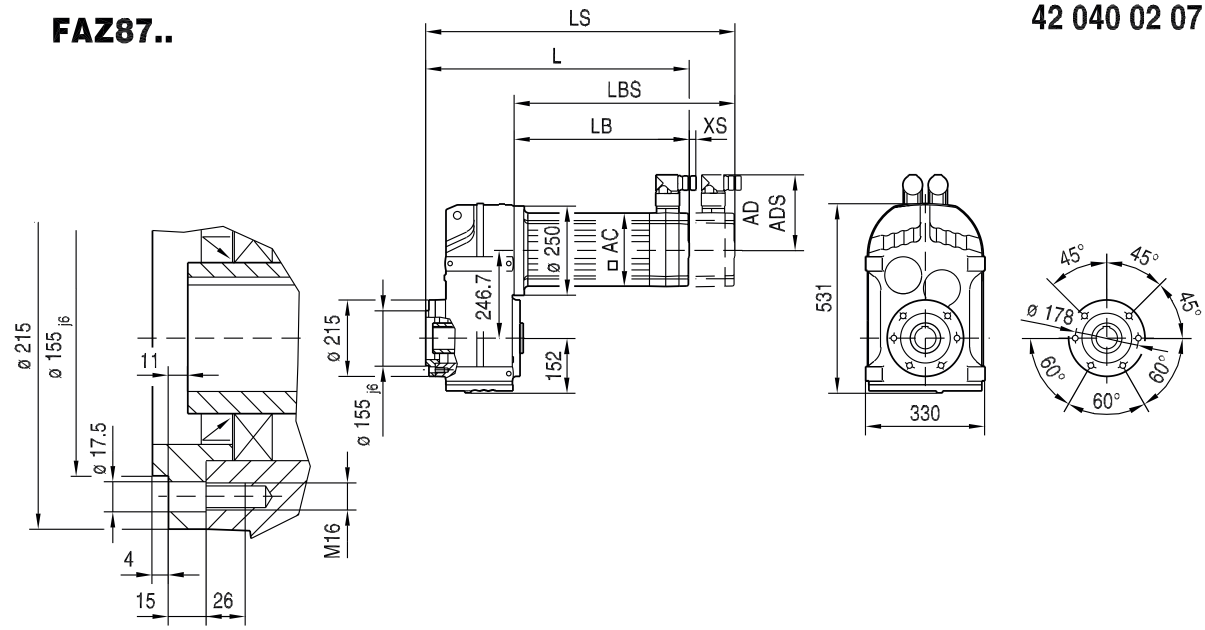
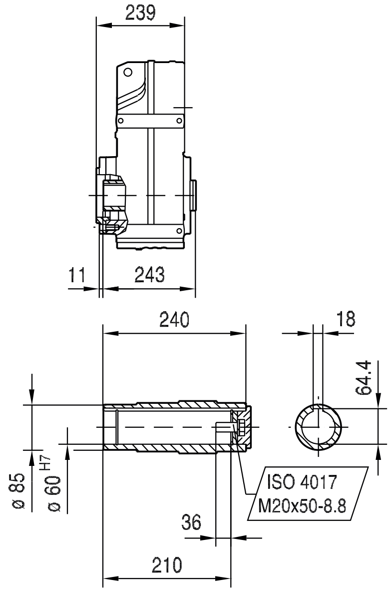
42 040 02 07

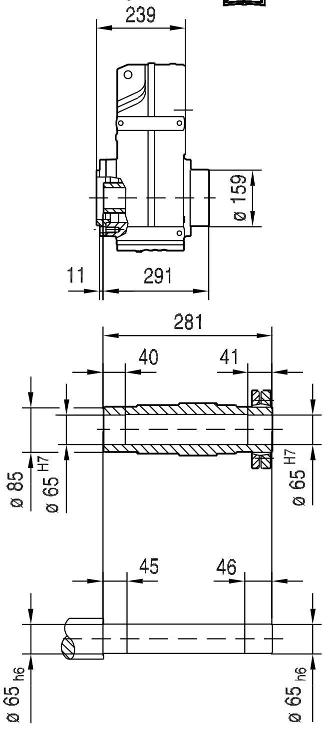
FAZ87..



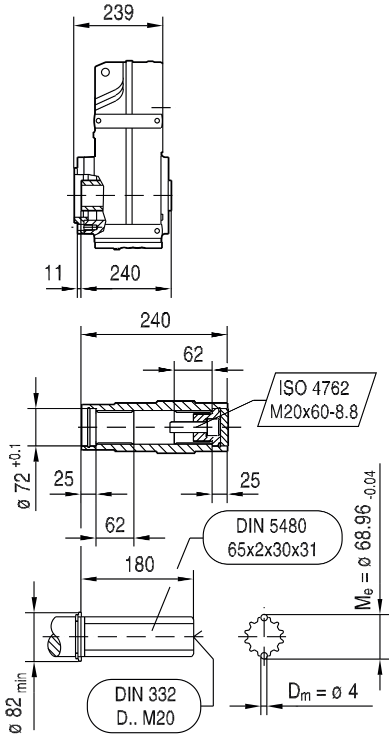
FAZ87..



FHZ87..
FHZ87/R.. → 6.3



FVZ87..



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	393	418	468	432	466	534	464	504	584	581	624	712	755	798
LS	458	483	533	510	544	612	560	600	680	693	736	824	867	910
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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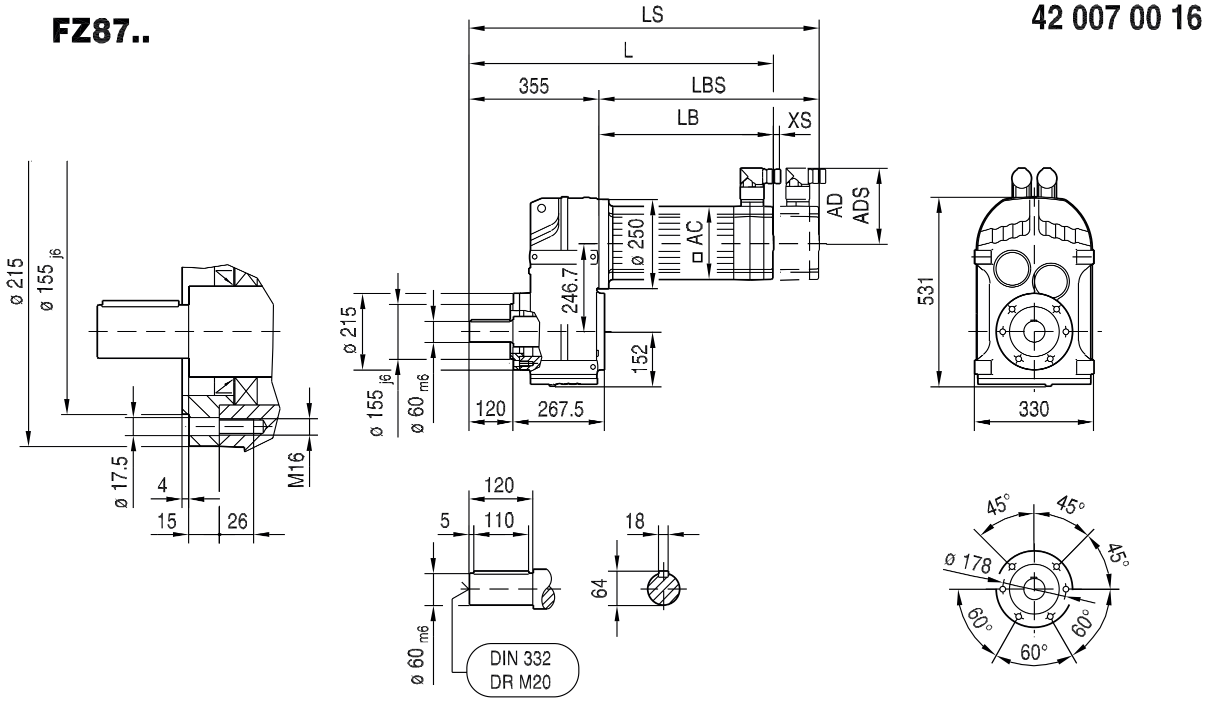
FZ87..

42 007 00 16



(→ 🗎 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	509	534	584	548	582	650	580	620	700	697	740	828	871	914
LS	574	599	649	626	660	728	676	716	796	809	852	940	983	1026
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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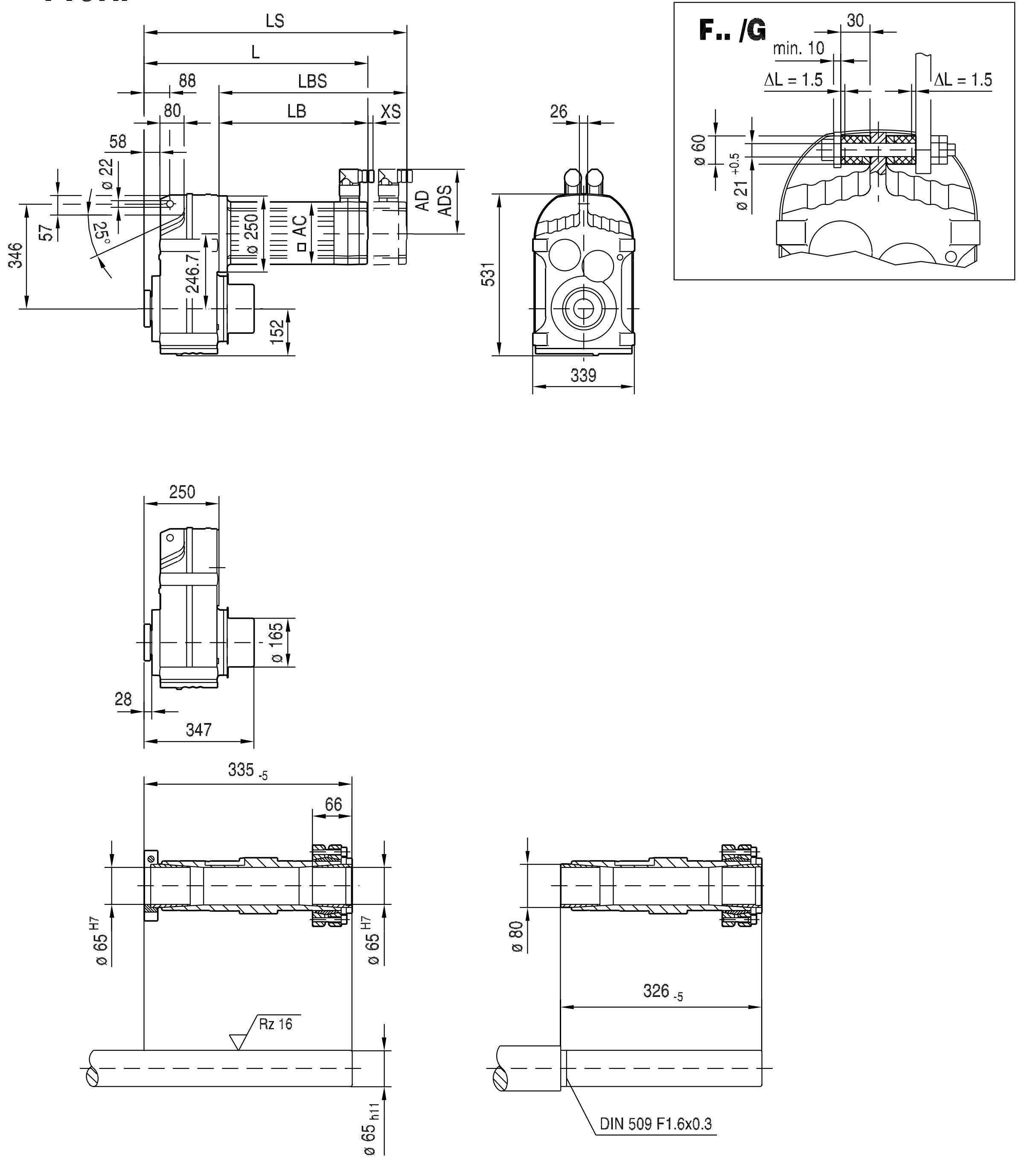
FT87.. 42 041 05 07



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	404	429	479	443	477	545	475	515	595	592	635	723	766	809
LS	469	494	544	521	555	623	571	611	691	704	747	835	878	921
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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9.2.8 F97..

F97, M_{aDyn} Nm	CMP										4300 Nm
i	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
2											
3.87			400		405	670	330	510	840	1010	1200
4.57		275	470	300	475	790	390	600	990	1190	1410
5.23		315	540	345	545	900	445	685	1140	1360	1620
6.17		370	640	405	645	1070	525	810	1340	1610	1910
7.07	285	425	730	465	740	1220	600	930	1540	1850	2190
8.22	335	495	850	540	860	1420	700	1080	1790	2150	2550
9.06	365	550	940	600	940	1570	770	1190	1970	2370	2810
11.16		675	1150	735	1160	1930	950	1470	2430	2920	3460
12.77		775	1320	840	1330	2210	1090	1680	2780	3340	3960
15.06		910	1560	990	1570	2610	1280	1980	3280	3940	>4360
17.25	700	1040	1790	1140	1800	2990	1470	2270	3760	>4360	>4360
20.07	810	1210	2080	1320	2100	3480	1710	2640	>4360	>4360	>4360
22.11	900	1340	2290	1460	2310	3830	1880	2910	>4360	>4360	>4360
24.92	1010	1510	2580	1650	2610	4320	2120	3280	>4360	>4360	
27.44	1120	1660	2840	1810	2870	>4360	2340	3610	>4360	>4360	
30.39	1240	1840	3150	2010	3180	>4360	2590	4000			
33.91	1380	2050	3510	2240	3550	>4360	2890	>4360			
36.64	1490	2220		2420							
43.28	1760	2620		2860							
3											
32.50		1950	3330	2130	3360	>4360	2740	4240	>4360	>4360	>4360
38.86		2330	3990	2540	4020	>4360	3280	>4360	>4360	>4360	>4360
44.49	1790	2670	>4360	2910	>4360	>4360	3750	>4360	>4360	>4360	>4360
52.49	2120	3150	>4360	3440	>4360	>4360	>4360	>4360	>4360	>4360	>4360
58.06	2340	3480	>4360	3800	>4360	>4360	>4360	>4360	>4360	>4360	>4360
65.47	2640	3930	>4360	4290	>4360	>4360	>4360	>4360	>4360	>4360	
72.29	2920	4340	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	
75.63		>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360
80.31	3210	>4360	>4360	>4360	>4360	>4360	>4360	>4360			
86.59	3460	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360
89.85	3590	>4360	>4360	>4360	>4360	>4360	>4360	>4360			
97.58	3900	>4360		>4360							
102.16	4080	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360
112.99	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360
127.42	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	
140.71	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360	
156.30	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360			
174.87	>4360	>4360	>4360	>4360	>4360	>4360	>4360	>4360			
189.92	>4360	>4360		>4360							
223.88	>4360	>4360		>4360							
253.41	>4360										
276.77	>4360										

(→ 190)

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F97, m kg	CMP										
s	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
2	165	165	170	170	175	185	190	195	210	220	230
3	170	170	175	180	180	190	195	200	220	225	235
FAF: + 22 kg / F: + 7.5 kg / FF: + 40 kg											

CMP..	i	n_{epk} min⁻¹	η %	c_{TG} FA Nm/'	FAF Nm/'	F Nm/'	FF Nm/'	φ /R '
FA97 2	3.87	3197	97	627	627	324	283	9
	4.57	3597	97	627	627	324	283	9
	5.23	3924	97	627	627	324	283	9
	6.17	4378	97	627	627	324	283	9
	7.07	4500	97	627	627	324	283	9
	8.22	4500	97	627	627	324	283	8
	9.06	4500	97	627	627	324	283	9
	11.16	3597	97	873	873	380	325	6
	12.77	3924	97	873	873	380	325	6
	15.06	4378	97	873	873	380	325	6
	17.25	4500	97	873	873	380	325	6
	20.07	4500	97	873	873	380	325	6
	22.11	4500	97	873	873	380	325	6
	24.92	4500	97	873	873	380	325	6
	27.44	4500	97	873	873	380	325	6
	30.39	4500	97	873	873	380	325	6
	33.91	4500	97	873	873	380	325	6
	36.64	4500	97	873	873	380	325	6
	43.28	4500	97	873	873	380	325	6
FA97 3	32.50	3924	96	956	956	395	336	6
	38.86	4378	96	956	956	395	336	6
	44.49	4500	96	956	956	395	336	6
	52.49	4500	96	956	956	395	336	6
	58.06	4500	96	956	956	395	336	6
	65.47	4500	96	956	956	395	336	6
	72.29	4500	96	956	956	395	336	6
	75.63	4378	95	965	965	396	337	6
	80.31	4500	95	956	956	395	336	6
	86.59	4500	95	965	965	396	337	6
	89.85	4500	95	956	956	395	336	6
	97.58	4500	95	956	956	395	336	6
	102.16	4500	95	965	965	396	337	6
	112.99	4500	95	965	965	396	337	6
	127.42	4500	95	965	965	396	337	6
	140.71	4500	95	965	965	396	337	6
	156.30	4500	95	965	965	396	337	6
	174.87	4500	94	965	965	396	337	6
	189.92	4500	94	965	965	396	337	6
	223.88	4500	94	965	965	396	337	6
	253.41	4500	93	965	965	396	337	6
	276.77	4500	93	965	965	396	337	6

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CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	kg*m²	N	N	N	N	N	N	N	N
FA97 2	3.87	1800	2700	3060	465	266	10300	10300	9960	16500	40000	40000	33600	30600
	4.57	2050	3000	3480	328	193	10200	10200	9950	16800	40000	40000	32900	30300
	5.23	2150	3020	3650	325	153	10700	10700	10400	17400	40000	40000	32800	30300
	6.17	2250	3030	3820	324	116	11400	11400	11100	18300	40000	40000	32800	30200
	7.07	2360	3040	4010	297	92	11900	11900	11500	19000	40000	40000	32800	30200
	8.22	2360	3050	4010	328	72	13100	13100	12600	20300	40000	40000	32800	30200
	9.06	2360	3050	4010	353	61	13900	13900	13400	21100	40000	40000	32800	30200
	11.16	4100	4360	6970	143	104	9710	9710	10000	18700	40000	40000	29700	28200
	12.77	4300	4360	7310	141	85	10100	10100	10500	19400	40000	40000	29700	28200
	15.06	4300	4360	7310	153	67	11700	11700	11900	21100	40000	40000	29700	28200
	17.25	4300	4360	7310	157	55	13100	13100	13200	22500	40000	40000	29700	28200
	20.07	4300	4360	7310	149	45	14700	14700	14600	24100	40000	40000	29700	28200
	22.11	4300	4360	7310	149	39	15700	15700	15600	25200	40000	40000	29700	28200
	24.92	4300	4360	7310	144	33	17100	17100	16800	26600	40000	40000	29700	28200
	27.44	4300	4360	7310	142	28	18200	18200	17900	27800	40000	40000	29700	28200
	30.39	4300	4360	7310	141	22	19500	19500	19000	28300	40000	40000	29700	28200
	33.91	4300	4360	7310	139	19	20900	20900	20300	28300	40000	40000	29700	28200
	36.64	3070	4360	5210	191	17	27000	27000	25500	30200	40000	40000	29700	28200
	43.28	3070	4360	5210	162	13	29300	29300	27600	30200	40000	40000	29700	28200
FA97 3	32.50	4300	4360	7310	52	60	20300	20300	19800	28300	40000	40000	29700	28200
	38.86	4300	4360	7310	51	48	22700	22700	21900	28300	40000	40000	29700	28200
	44.49	4300	4360	7310	52	39	24500	24500	23600	28300	40000	40000	29700	28200
	52.49	4300	4360	7310	51	31	26900	26900	25800	28300	40000	40000	29700	28200
	58.06	4300	4360	7310	52	27	28500	28500	27200	28300	40000	40000	29700	28200
	65.47	4300	4360	7310	52	23	30400	30400	29000	28300	40000	40000	29700	28200
	72.29	4300	4360	7310	53	20	32000	32000	29900	28300	40000	40000	29700	28200
	75.63	4300	4360	7310	56	42	32800	32800	29900	28300	40000	40000	29700	28200
	80.31	4300	4360	7310	52	17	33800	33800	29900	28300	40000	40000	29700	28200
	86.59	4300	4360	7310	57	34	35100	35100	29900	28300	40000	40000	29700	28200
	89.85	4300	4360	7310	52	14	35700	35700	29900	28300	40000	40000	29700	28200
	97.58	4300	4360	7310	52	13	37200	37200	29900	28300	40000	40000	29700	28200
	102.16	4300	4360	7310	58	28	38100	38100	29900	28300	40000	40000	29700	28200
	112.99	4300	4360	7310	58	25	40000	40000	29900	28300	40000	40000	29700	28200
	127.42	4300	4360	7310	55	20	40000	40000	29900	28300	40000	40000	29700	28200
	140.71	4300	4360	7310	50	18	40000	40000	29900	28300	40000	40000	29700	28200
	156.30	4300	4360	7310	45	15	40000	40000	29900	28300	40000	40000	29700	28200
	174.87	4300	4360	7310	40	13	40000	40000	29900	28300	40000	40000	29700	28200
	189.92	4300	4360	7310	37	12	40000	40000	29900	28300	40000	40000	29700	28200
	223.88	4300	4360	7310	31	9.2	40000	40000	29900	28300	40000	40000	29700	28200
	253.41	4300	4360	7310	28	5.9	40000	40000	29900	28300	40000	40000	29700	28200
	276.77	4300	4360	7310	25	5.1	40000	40000	29900	28300	40000	40000	29700	28200

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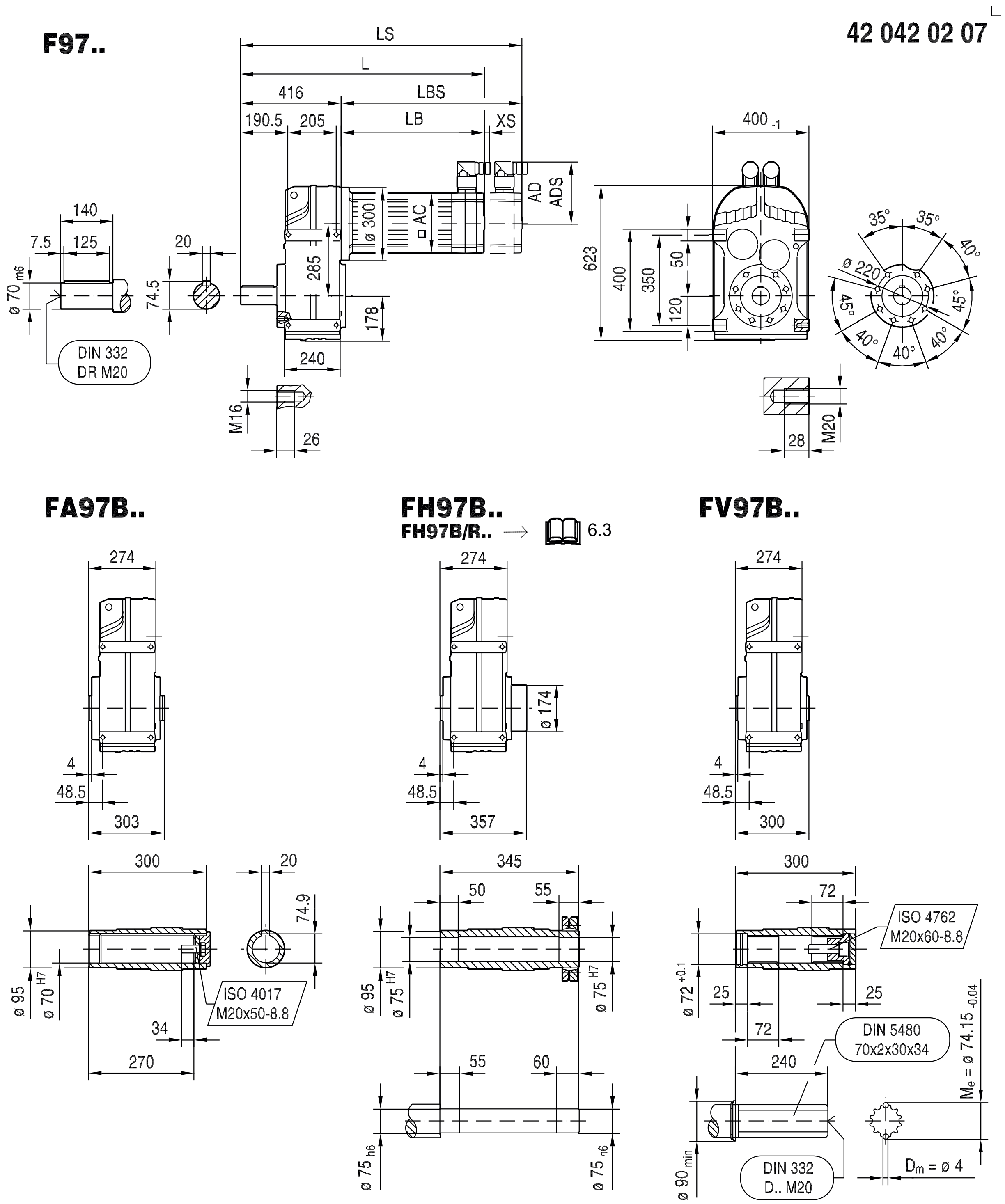

(→ 194)	CMP..										
	80S	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**	**112H**	**112E**
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	603	637	705	636	676	756	753	796	884	927	970
LS	681	715	783	732	772	852	865	908	996	1039	1082
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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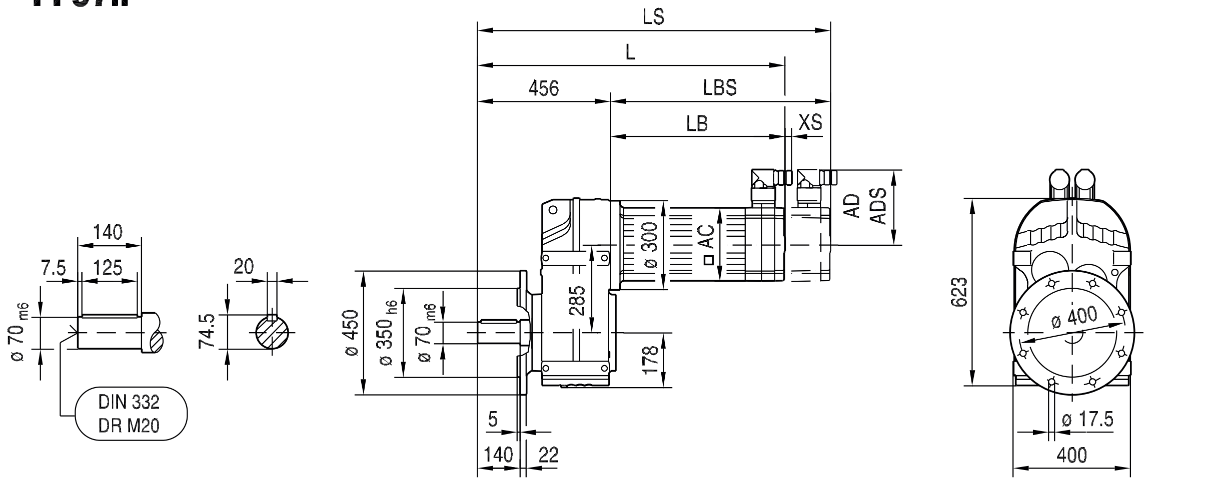
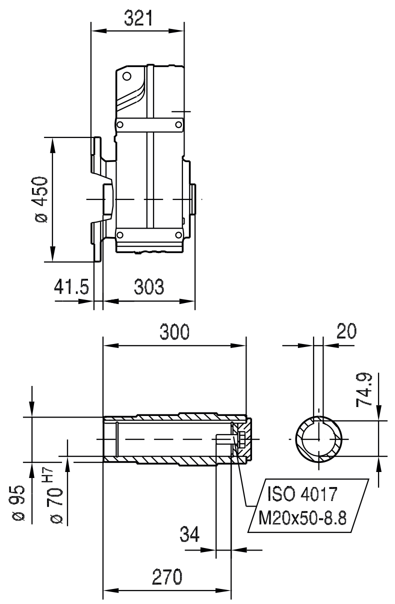
42 043 02 07

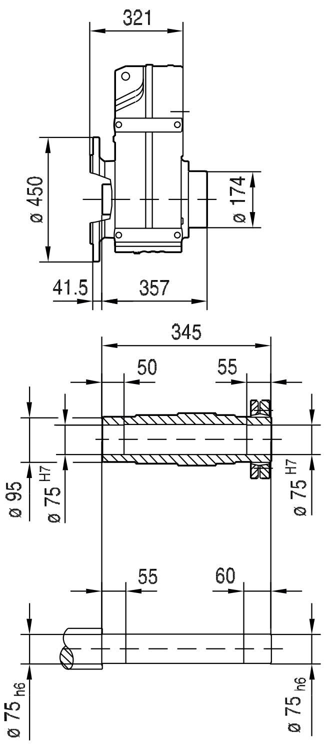
FF97..



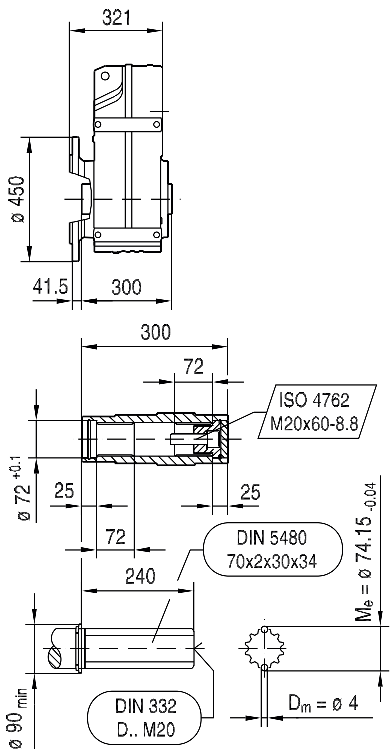
FAF97..



FHF97..
FHF97/R.. → 6.3



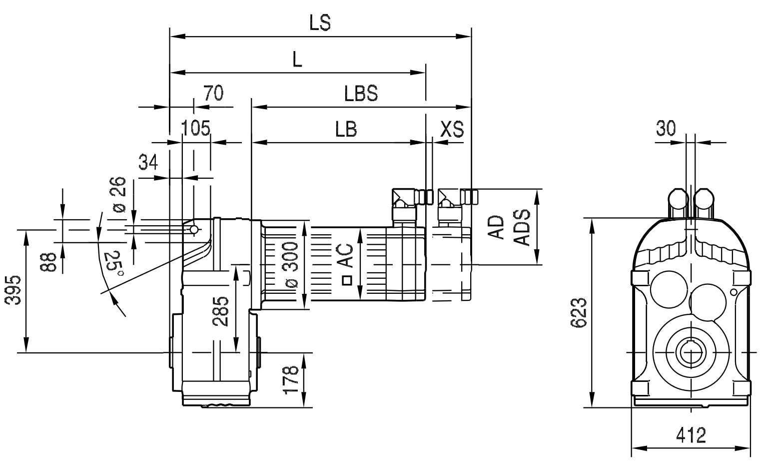
FVF97..

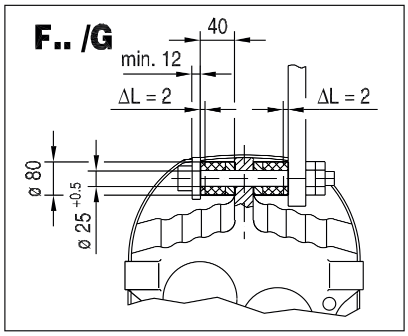


(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	643	677	745	676	716	796	793	836	924	967	1010
LS	721	755	823	772	812	892	905	948	1036	1079	1122
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

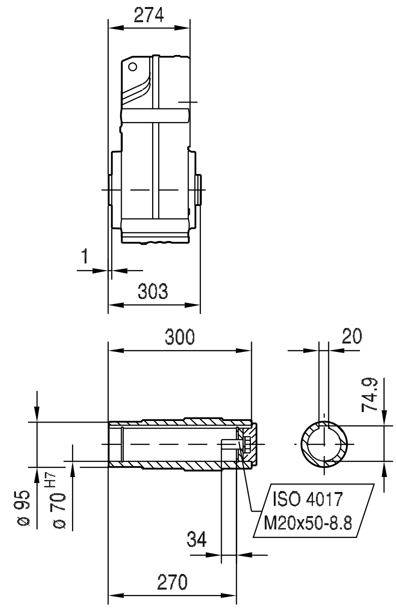
42 044 03 07

FA97..

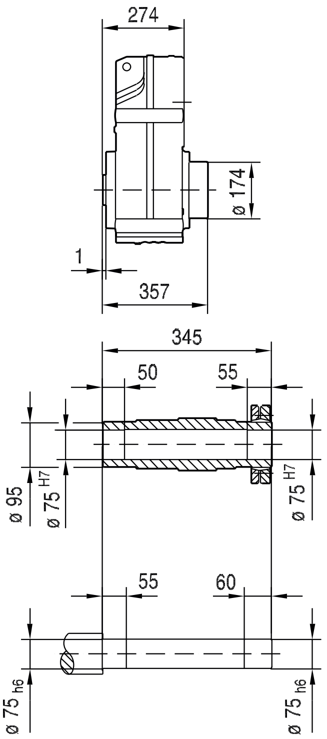




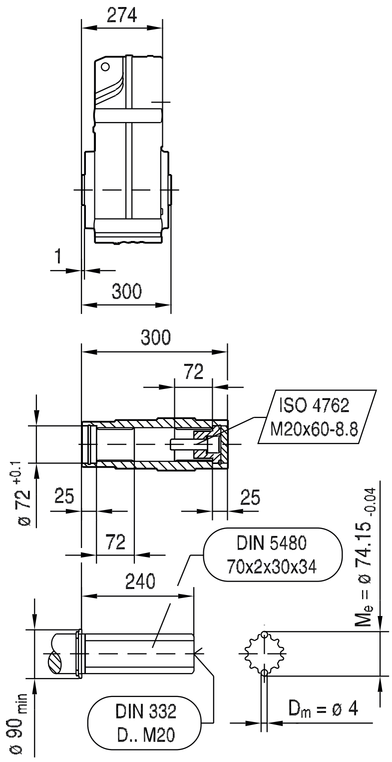
FA97..



FH97..
FH97/R.. → 6.3



FV97..



(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	461	495	563	494	534	614	611	654	742	785	828
LS	539	573	641	590	630	710	723	766	854	897	940
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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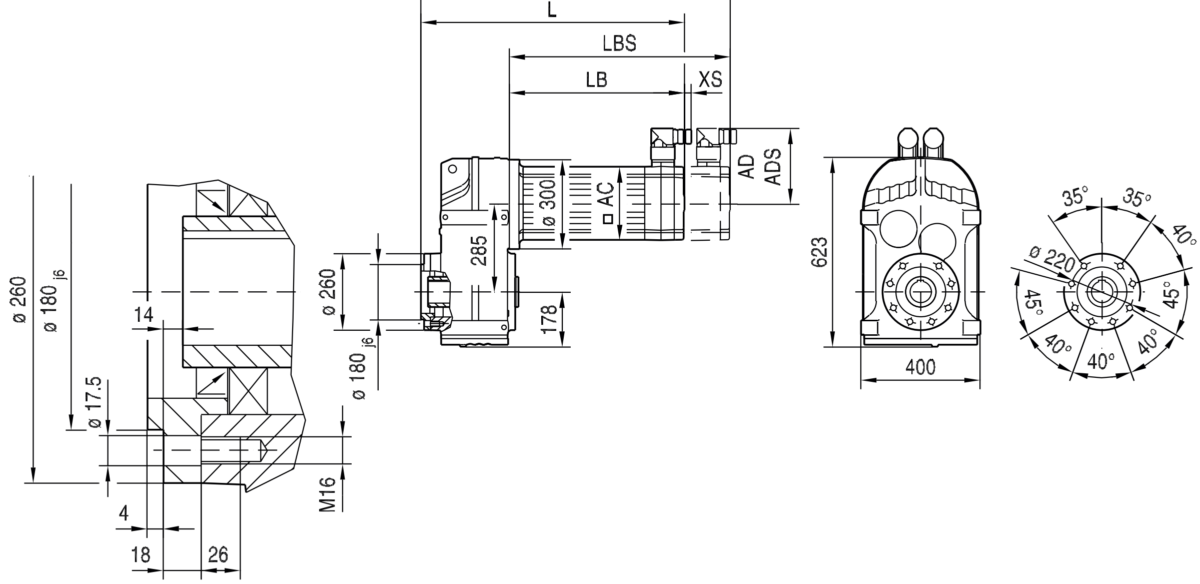
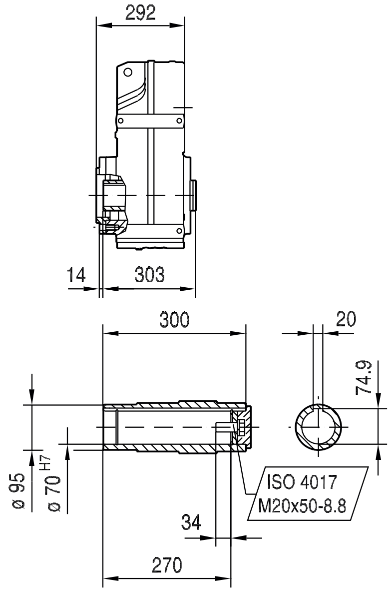
42 045 02 07

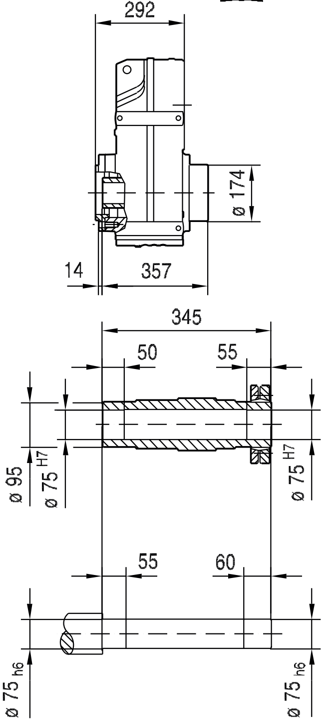
FAZ97..



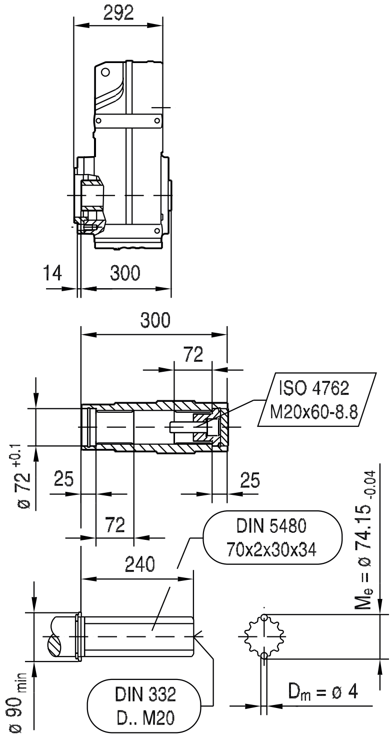
FAZ97..



FHZ97..
FHZ97/R.. → 6.3



FVZ97..



(→ 194)	CMP..										
	80S	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**	**112H**	**112E**
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	479	513	581	512	552	632	629	672	760	803	846
LS	557	591	659	608	648	728	741	784	872	915	958
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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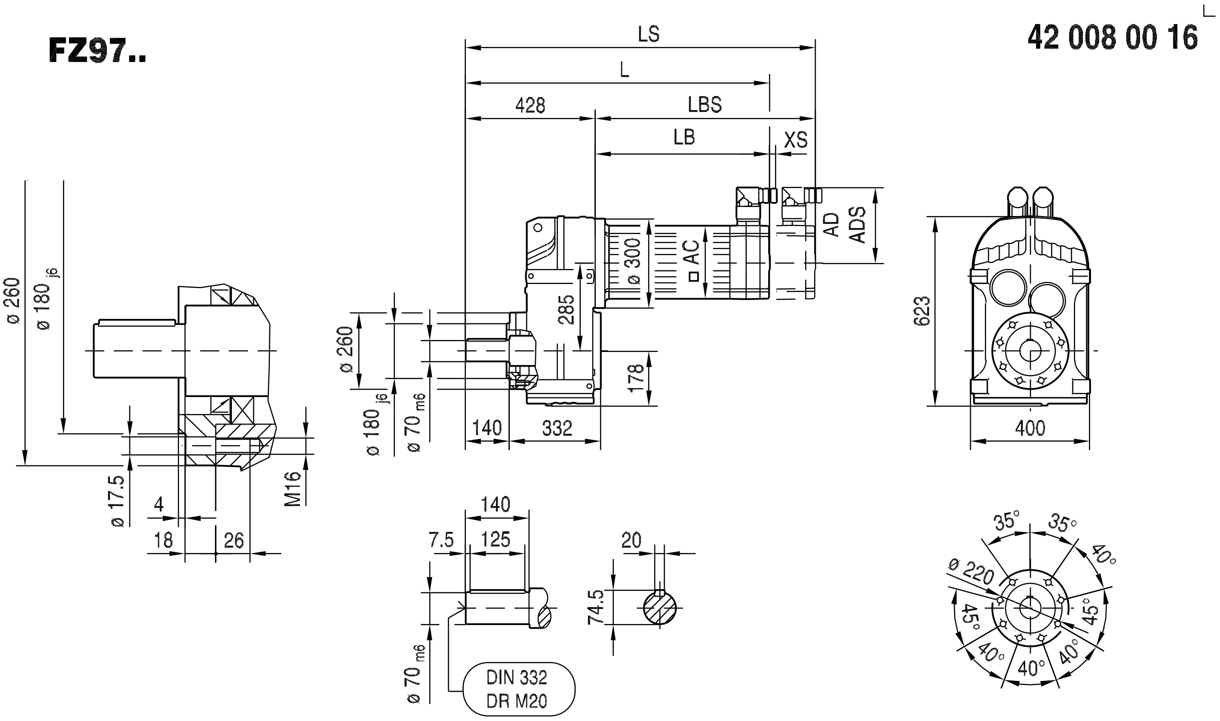

(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	615	649	717	648	688	768	765	808	896	939	982
LS	693	727	795	744	784	864	877	920	1008	1051	1094
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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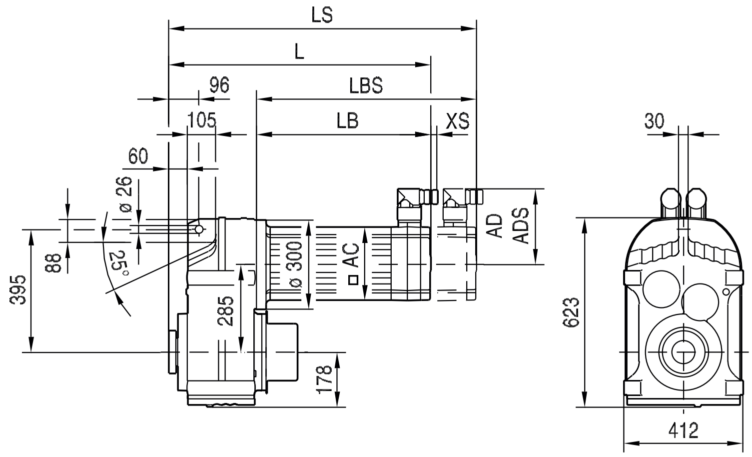
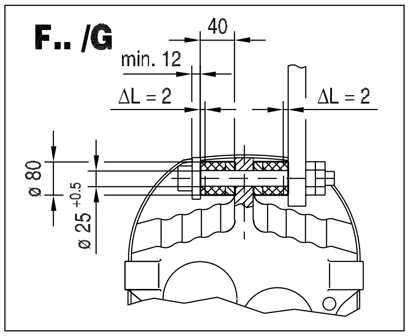
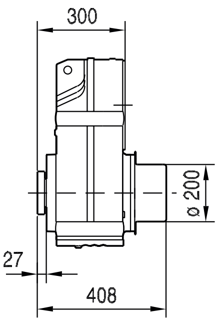
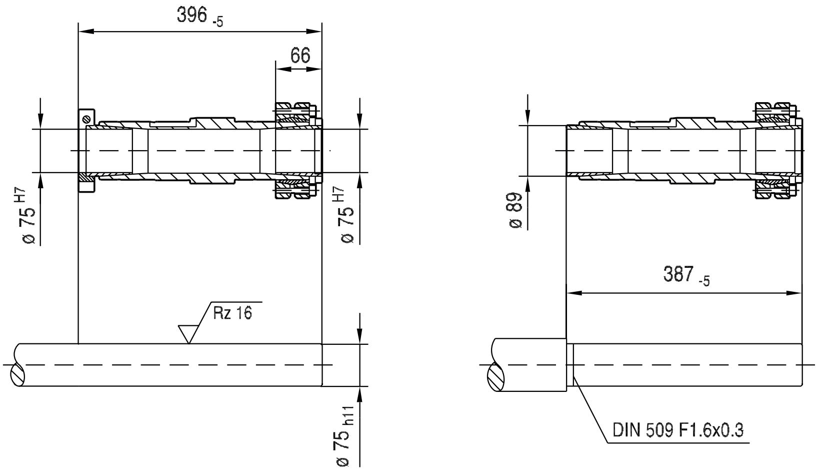
FT97..

42 046 04 07









(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	487	521	589	520	560	640	637	680	768	811	854
LS	565	599	667	616	656	736	749	792	880	923	966
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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9.2.9 F107..

F107, M_{aDyn} Nm									7840 Nm
	CMP								
i	80L	100S	100M	100L	112S	112M	112L	112H	112E
2									
5.03							1090	1310	1560
6.22	645		650	1070	530	820	1350	1620	1930
7.40	765	490	775	1280	630	970	1610	1930	2290
8.37	860	550	870	1450	710	1100	1820	2190	2590
9.69	1000	640	1010	1680	820	1270	2110	2530	3000
9.96							2170	2600	3090
12.33	1270		1290	2130	1050	1620	2690	3220	3820
14.67	1520	970	1530	2540	1250	1930	3200	3840	4550
16.58	1720	1090	1730	2870	1410	2180	3610	4340	5140
19.20	1990	1270	2010	3320	1630	2530	4190	5020	5950
21.76	2250	1440	2270	3770	1850	2870	4740	5690	6750
25.14	2600	1660	2630	4360	2140	3310	5480	6580	7800
27.57	2860	1820	2880	4780	2350	3630	6010	7220	8550
33.79	3500	2230	3530	5860	2880	4450	7370	8840	
3									
31.80	3230		3260	5400	2650	4100	6790	8150	>8860
37.61	3820	2440	3850	6380	3140	4850	8030	>8860	>8860
43.03	4370	2790	4410	7300	3590	5550	>8860	>8860	>8860
50.73	5150	3290	5200	8610	4240	6550	>8860	>8860	>8860
58.12	5970	3810	6020	>8860	4900	7580	>8860	>8860	>8860
67.62	6940	4430	7010	>8860	5710	8820	>8860	>8860	>8860
74.52	7650	4880	7720	>8860	6290	>8860	>8860	>8860	>8860
83.99	8620	5500	8700	>8860	7090	>8860	>8860	>8860	
88.49	>8860	5740	>8860	>8860	7390	>8860	>8860	>8860	>8860
92.47	>8860	6060	>8860	>8860	7810	>8860	>8860	>8860	
101.38	>8860	6570	>8860	>8860	8470	>8860	>8860	>8860	>8860
117.94	>8860	7650	>8860	>8860	>8860	>8860	>8860	>8860	>8860
129.97	>8860	8430	>8860	>8860	>8860	>8860	>8860	>8860	>8860
146.49	>8860	>8860	>8860	>8860	>8860	>8860	>8860	>8860	
161.28	>8860	>8860	>8860	>8860	>8860	>8860	>8860	>8860	
178.64	>8860	>8860	>8860	>8860	>8860	>8860			
199.31	>8860	>8860	>8860	>8860	>8860	>8860			
215.37		>8860							
254.40		>8860							

(→ 190)

F107, m kg									
	CMP								
s	80L	100S	100M	100L	112S	112M	112L	112H	112E
2	240	245	245	255	255	265	280	290	300
3	250	250	255	265	265	275	290	300	310
FAF: + 21 kg / F: + 17 kg / FF: + 44 kg									

CMP..	i	n_{epk} min⁻¹	η %	c_{TG} FA Nm/'	FAF Nm/'	F Nm/'	FF Nm/'	φ /R '
FA107 2	5.03	2797	97	1359	1359	722	666	7
	6.22	3197	97	1359	1359	722	666	7
	7.40	3597	97	1359	1359	722	666	7
	8.37	3924	97	1359	1359	722	666	7
	9.69	4378	97	1359	1359	722	666	7
	9.96	2797	97	1612	1612	788	722	5
	12.33	3197	97	1612	1612	788	722	5
	14.67	3597	97	1612	1612	788	722	5
	16.58	3924	97	1612	1612	788	722	5
	19.20	4378	97	1612	1612	788	722	5
	21.76	4500	97	1612	1612	788	722	5
	25.14	4500	97	1612	1612	788	722	5
	27.57	4500	97	1612	1612	788	722	5
	33.79	4500	97	1612	1612	788	722	5
FA107 3	31.80	3197	95	1806	1806	832	758	6
	37.61	3597	95	1806	1806	832	758	6
	43.03	3924	95	1806	1806	832	758	6
	50.73	4378	95	1806	1806	832	758	6
	58.12	4500	96	1806	1806	832	758	6
	67.62	4500	96	1806	1806	832	758	6
	74.52	4500	96	1806	1806	832	758	6
	83.99	4500	96	1806	1806	832	758	6
	88.49	4378	95	1823	1823	836	761	5
	92.47	4500	96	1806	1806	832	758	6
	101.38	4500	95	1823	1823	836	761	5
	117.94	4500	95	1823	1823	836	761	5
	129.97	4500	95	1823	1823	836	761	5
	146.49	4500	95	1823	1823	836	761	5
	161.28	4500	95	1823	1823	836	761	5
	178.64	4500	95	1823	1823	836	761	5
	199.31	4500	95	1823	1823	836	761	5
	215.37	4500	94	1823	1823	836	761	5
	254.40	4500	94	1823	1823	836	761	5

CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min⁻¹	J_G 10^{-4} kg*m²	F_{Ramax} FA N	FAF N	F N	FF N	F_{Rapk} FA N	FAF N	F N	FF N
FA107 2	5.03 1)	4600	6240	7820	417	439	4520	39000	16400	19200	65000	65000	52500	55300
	6.22	4600	6240	7820	498	311	6920	42600	19000	22200	65000	65000	52500	55300
	7.40	4600	6240	7820	541	236	8400	45800	21300	24800	65000	65000	52500	55300
	8.37	4800	6240	8160	490	195	8720	47400	22000	25600	65000	65000	52500	55300
	9.69	4910	6240	8340	485	154	9670	50000	23500	27300	65000	65000	52500	55300
	9.96 1)	6500	8860	11000	171	280	6200	47000	21500	25300	65000	65000	46500	45600
	12.33	7000	8860	11900	138	209	6580	49800	22600	26600	65000	65000	46500	45600
	14.67	7680	8860	13000	102	164	6050	51500	22400	26500	65000	65000	46500	45600
	16.58	7840	8860	13300	97	138	6870	53800	23900	28200	65000	65000	46500	45600
	19.20	7840	8860	13300	94	112	8600	57400	26500	31200	65000	65000	46500	45600
	21.76	7840	8860	13300	92	92	10100	60600	28800	33800	65000	65000	46500	45600
	25.14	7840	8860	13300	88	76	12000	64500	31500	36800	65000	65000	46500	45600
	27.57	7840	8860	13300	87	66	13200	65000	33300	38800	65000	65000	46500	45600
	33.79	7400	8860	12500	104	43	17700	65000	38300	44900	65000	65000	46500	45600

CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	F_{Ramax} FA N	F_{Ramax} FAF N	F_{Ramax} F N	F_{Ramax} FF N	F_{Rapk} FA N	F_{Rapk} FAF N	F_{Rapk} F N	F_{Rapk} FF N
FA107 3	31.80	7680	8860	13000	69	125	15800	65000	36500	42700	65000	65000	46500	45600
	37.61	7680	8860	13000	74	94	18300	65000	39500	46300	65000	65000	46500	45600
	43.03	7680	8860	13000	79	77	20300	65000	42000	49000	65000	65000	46500	45600
	50.73	7680	8860	13000	85	62	23000	65000	45100	51100	65000	65000	46500	45600
	58.12	7680	8860	13000	88	51	25300	65000	47800	51100	65000	65000	46500	45600
	67.62	7680	8860	13000	92	42	28000	65000	49800	51100	65000	65000	46500	45600
	74.52	7680	8860	13000	94	37	29900	65000	49800	51100	65000	65000	46500	45600
	83.99	7680	8860	13000	83	31	32200	65000	49800	51100	65000	65000	46500	45600
	88.49	7680	8860	13000	79	56	33200	65000	49800	51100	65000	65000	46500	45600
	92.47	7680	8860	13000	76	27	34100	65000	49800	51100	65000	65000	46500	45600
	101.38	7680	8860	13000	69	47	36000	65000	49800	51100	65000	65000	46500	45600
	117.94	7680	8860	13000	59	39	39300	65000	49800	51100	65000	65000	46500	45600
	129.97	7680	8860	13000	54	34	41400	65000	49800	51100	65000	65000	46500	45600
	146.49	7680	8860	13000	48	29	44200	65000	49800	51100	65000	65000	46500	45600
	161.28	7680	8860	13000	43	25	46600	65000	49800	51100	65000	65000	46500	45600
	178.64	7680	8860	13000	39	19	49100	65000	49800	51100	65000	65000	46500	45600
	199.31	7680	8860	13000	35	16	52000	65000	49800	51100	65000	65000	46500	45600
	215.37	7680	8860	13000	33	15	54000	65000	49800	51100	65000	65000	46500	45600
	254.40	7680	8860	13000	28	12	58600	65000	49800	51100	65000	65000	46500	45600

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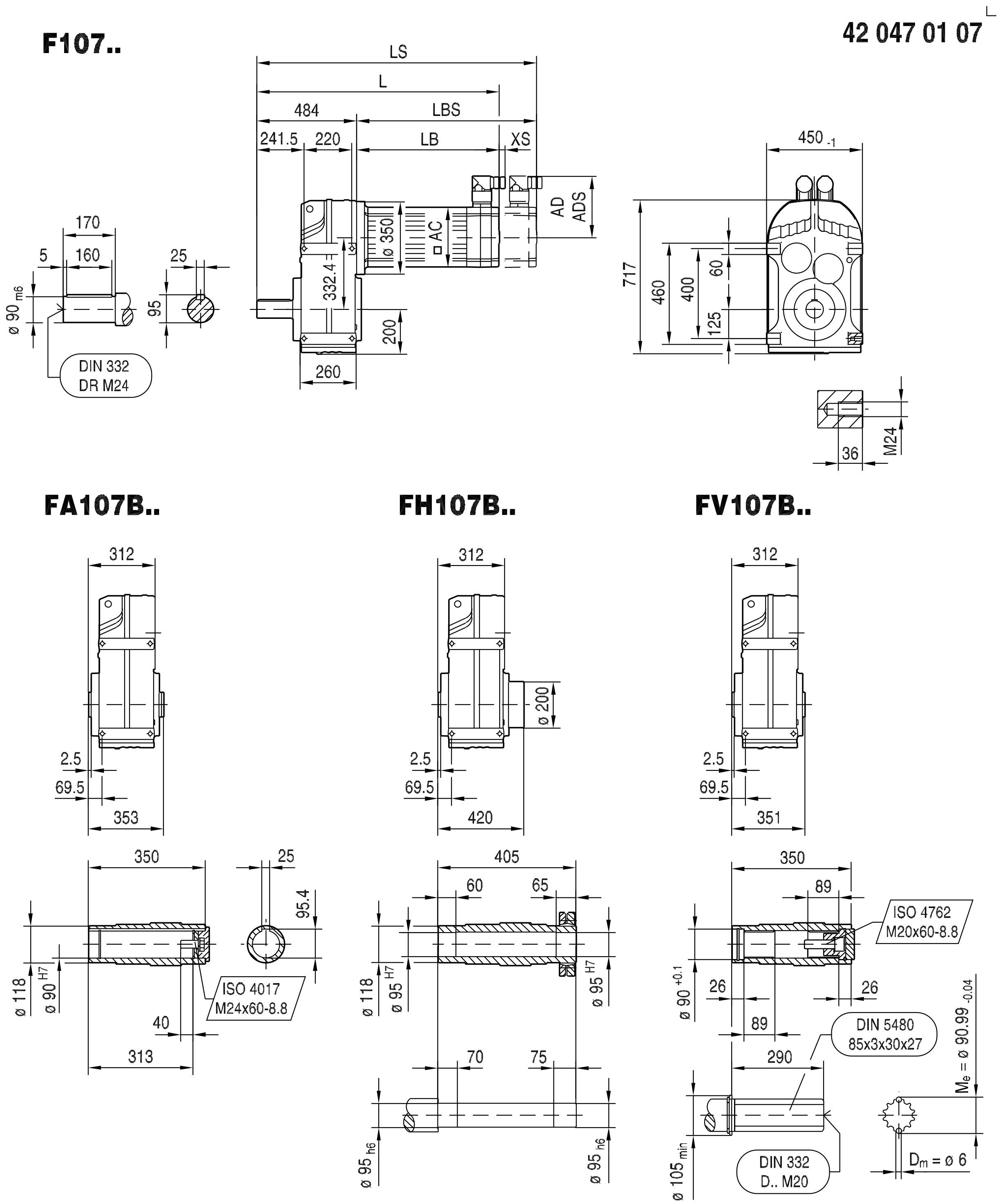

(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	768	698	738	818	815	858	946	989	1032
LS	846	794	834	914	927	970	1058	1101	1144
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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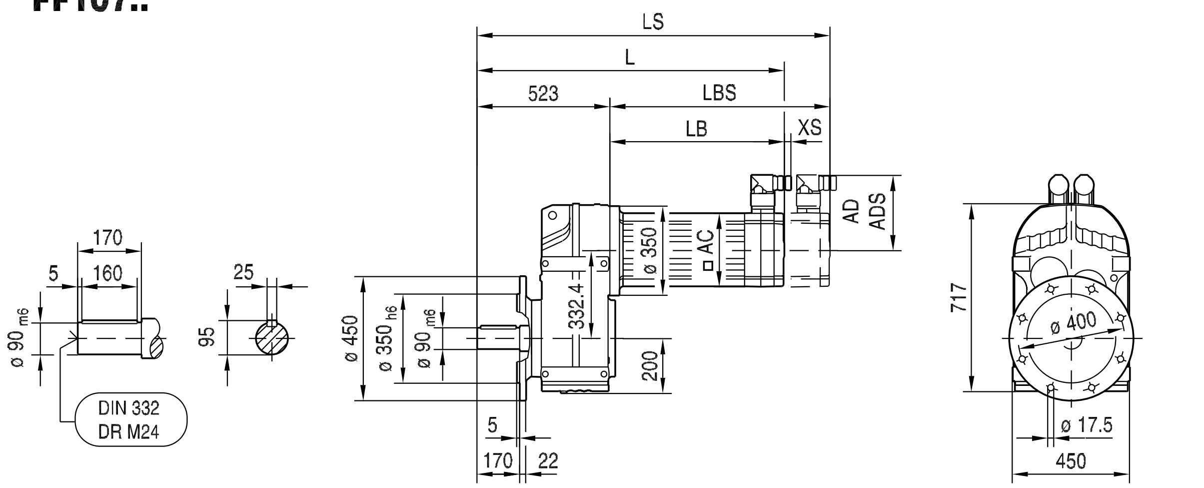
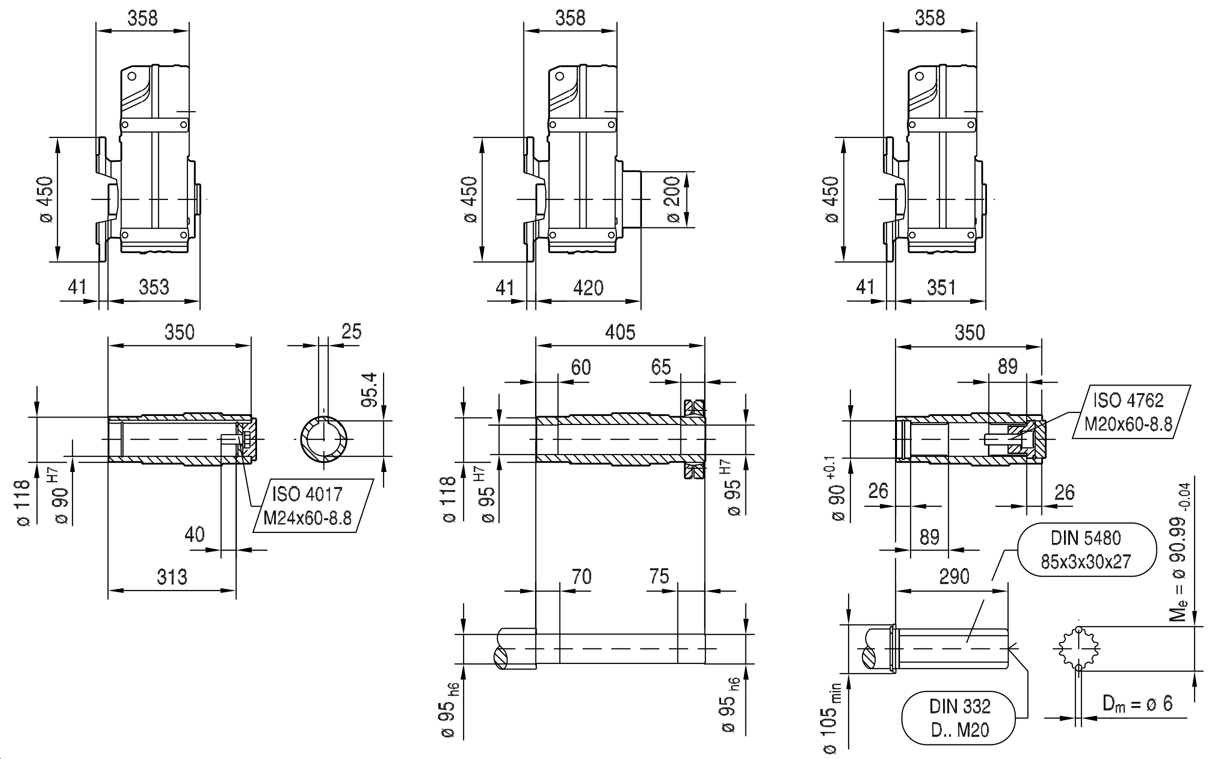
42 048 01 07

FF107..



FAF107.. FHF107.. FVF107..



(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	807	737	777	857	854	897	985	1028	1071
LS	885	833	873	953	966	1009	1097	1140	1183
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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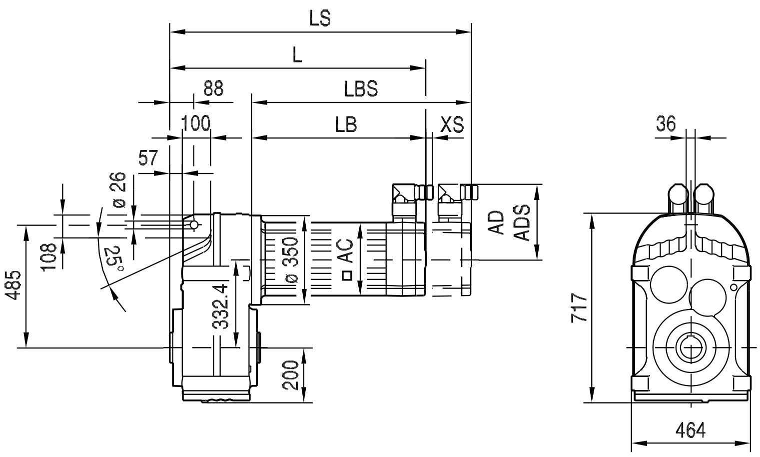
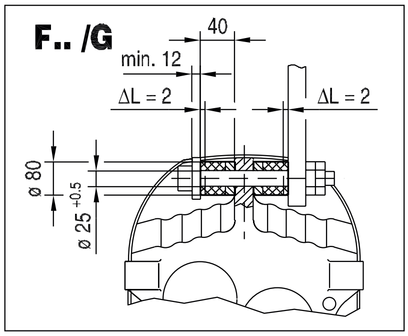
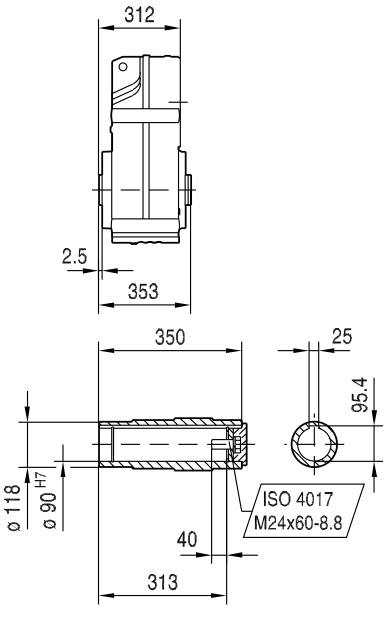
42 049 02 07

FA107..

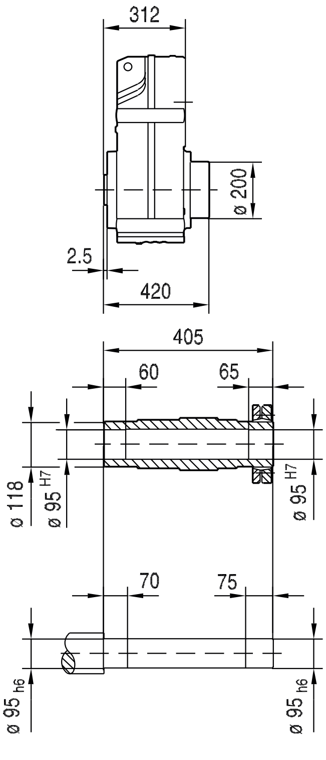




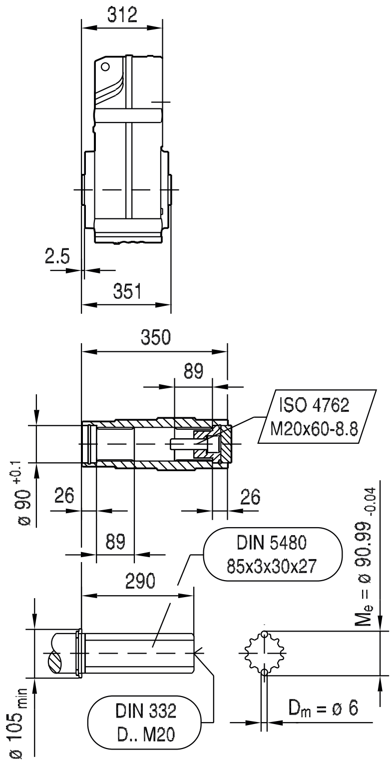
FA107..



FH107..



FV107..



(→ 194)	CMP..								
	80L	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**	**112H**	**112E**
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	596	526	566	646	643	686	774	817	860
LS	674	622	662	742	755	798	886	929	972
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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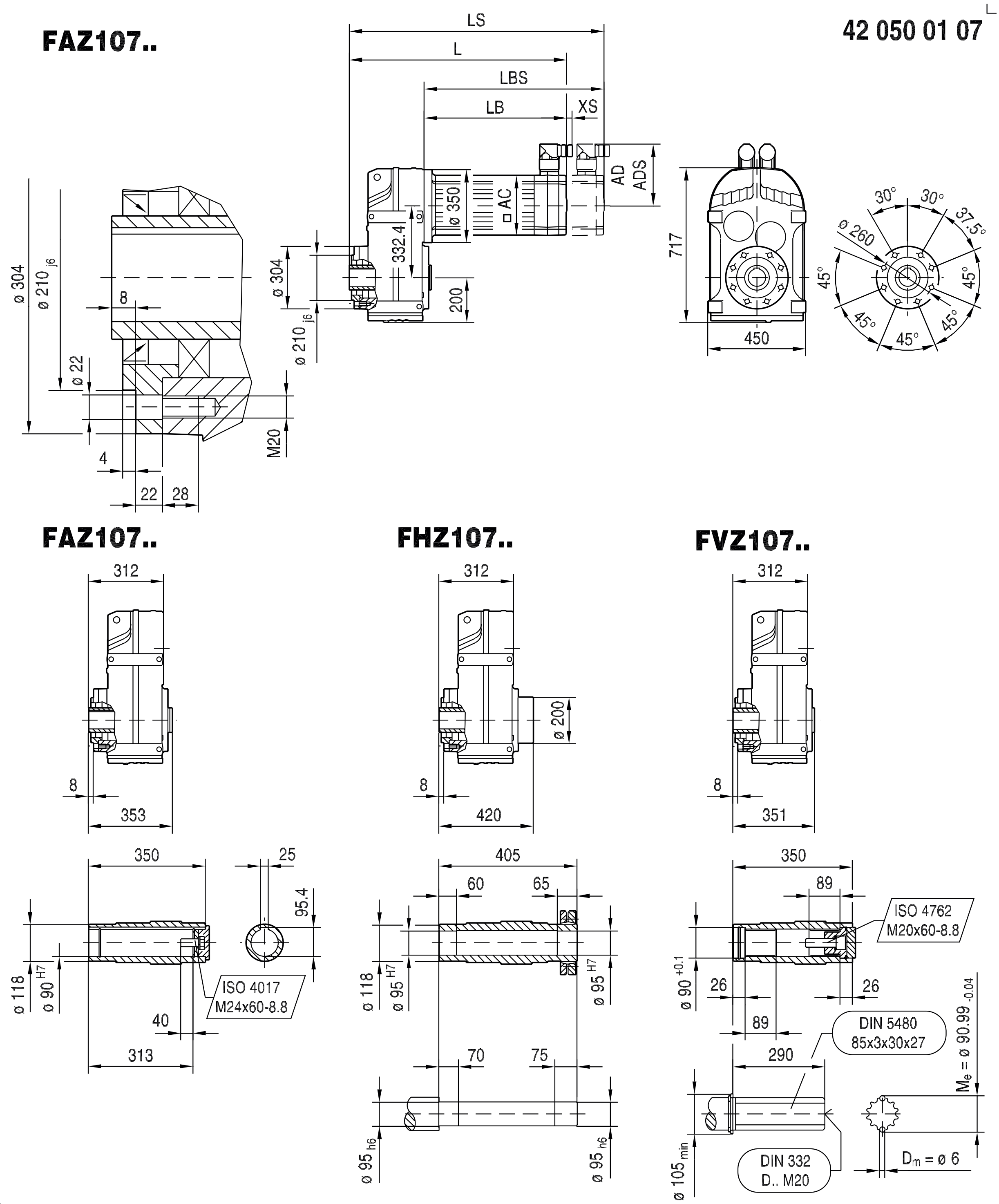

(→ 194)	CMP..								
	80L	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**	**112H**	**112E**
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	596	526	566	646	643	686	774	817	860
LS	674	622	662	742	755	798	886	929	972
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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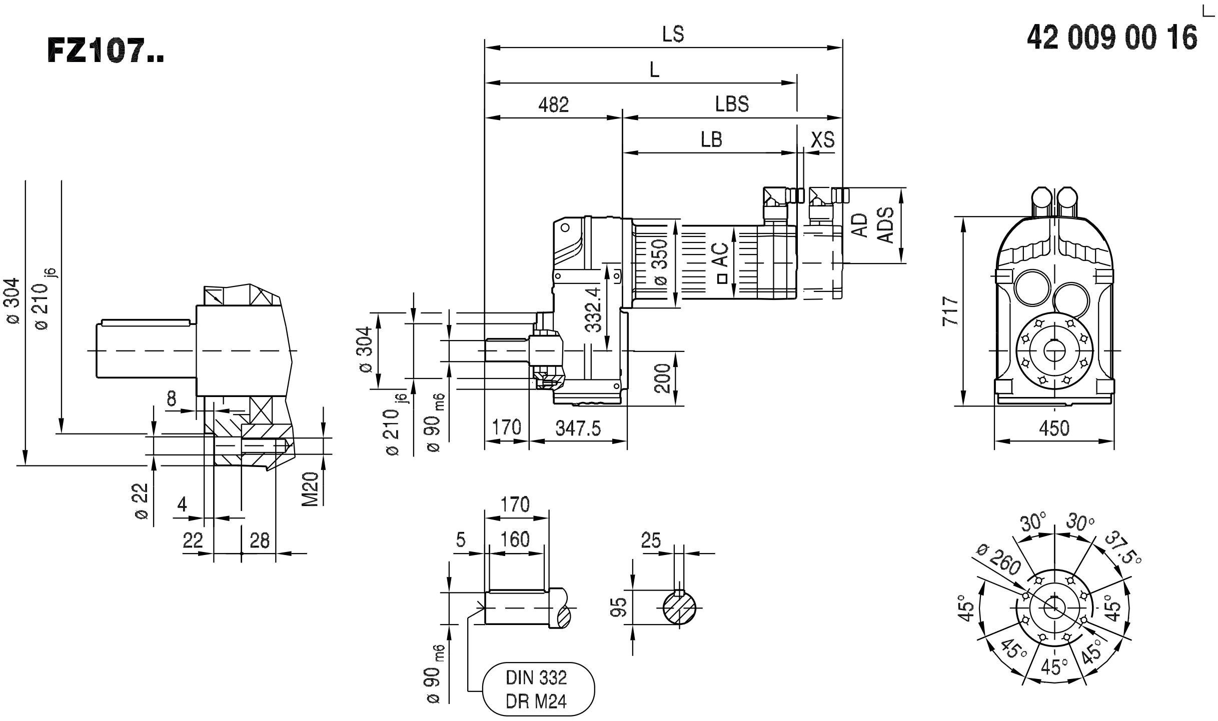

(→ 194)	CMP..								
	80L	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**	**112H**	**112E**
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	766	696	736	816	813	856	944	987	1030
LS	844	792	832	912	925	968	1056	1099	1142
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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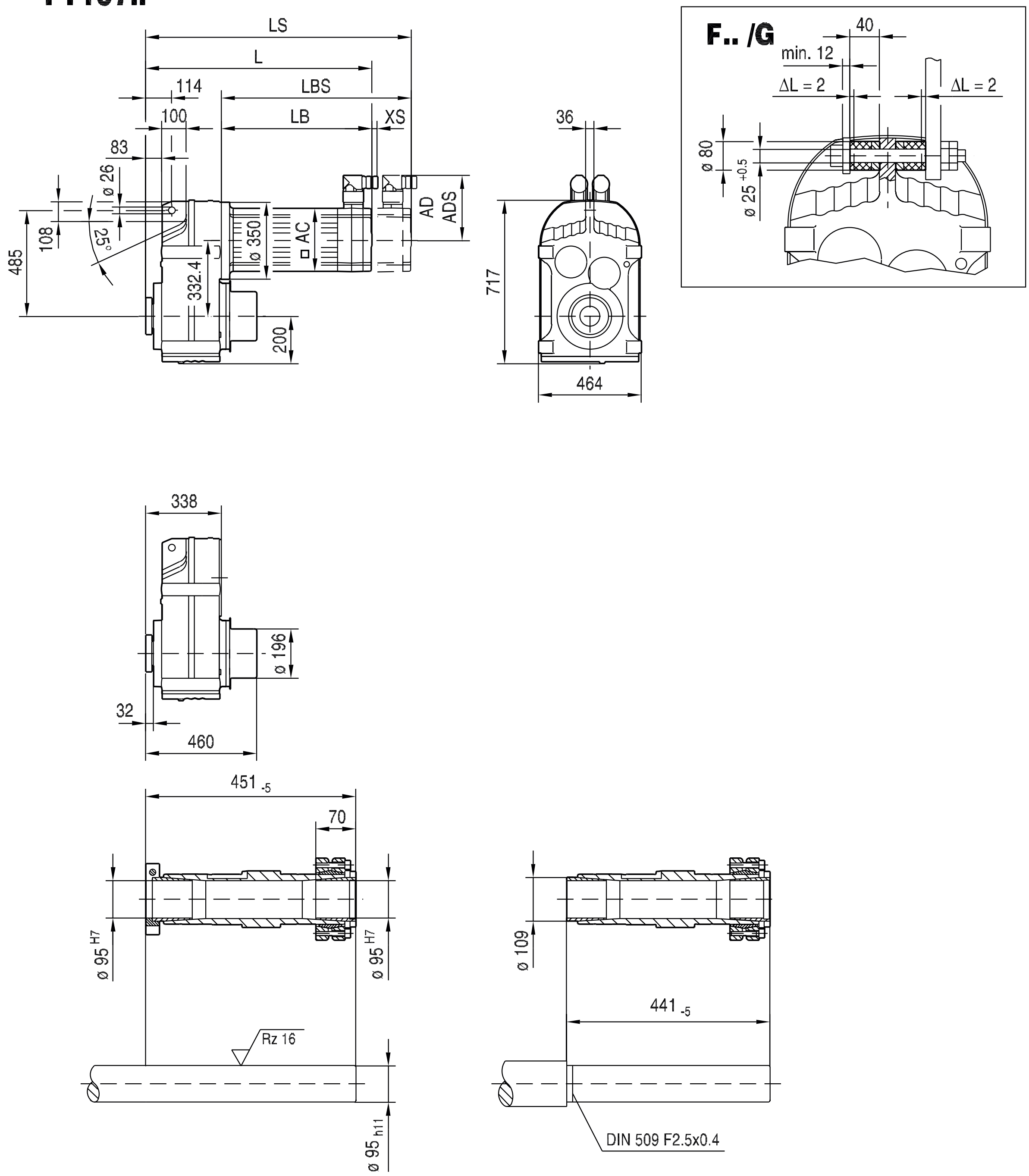
FT107..

42 051 04 07



(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	622	552	592	672	669	712	800	843	886
LS	700	648	688	768	781	824	912	955	998
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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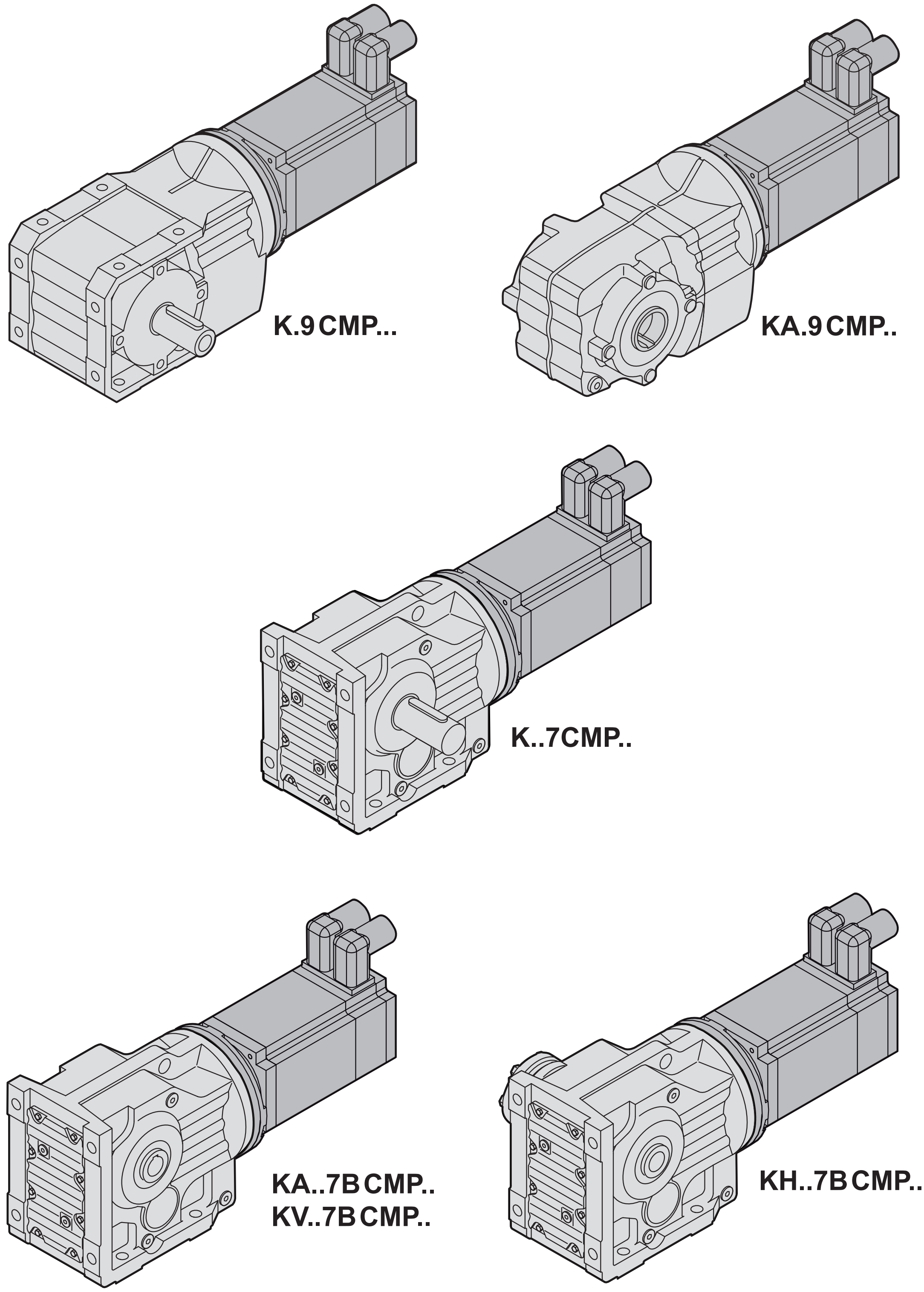
10 Helical-bevel gearmotors – K.. gear units

10.1 K..CMP.. designs



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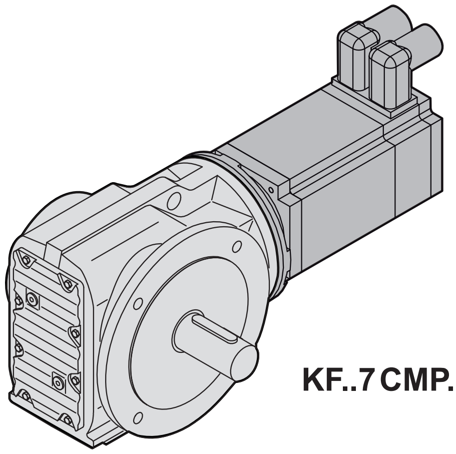
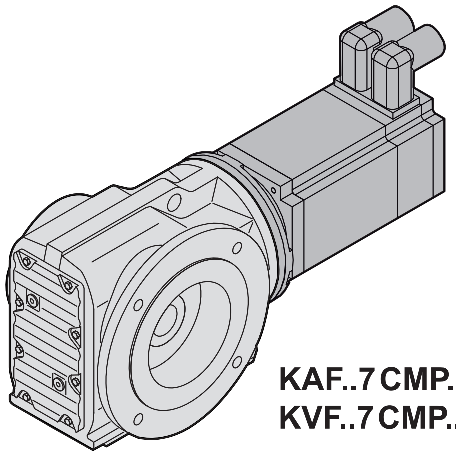
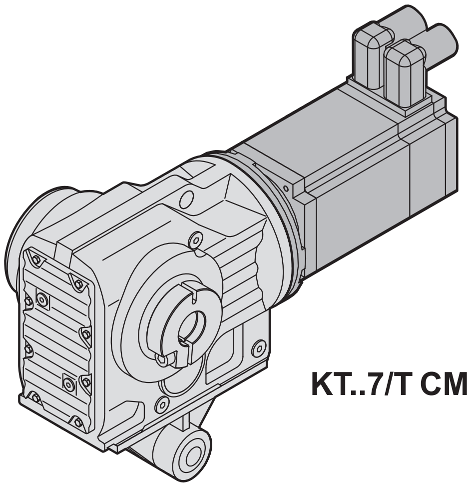


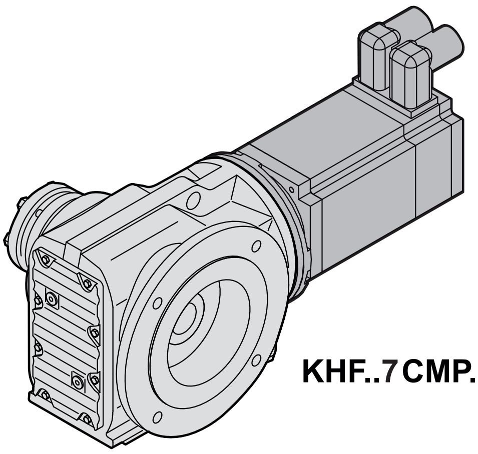
KF..7 CMP..



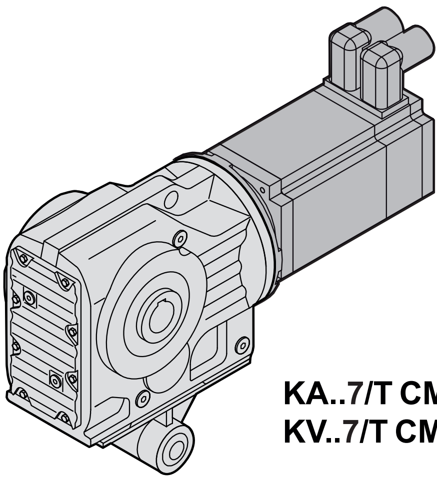
KAF..7 CMP..
KVF..7 CMP..



KT..7/T CMP..

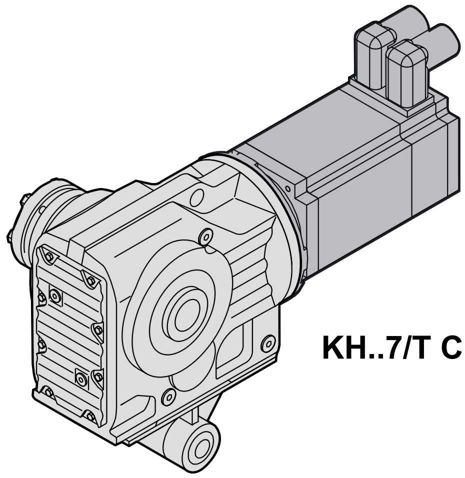


KHF..7 CMP..

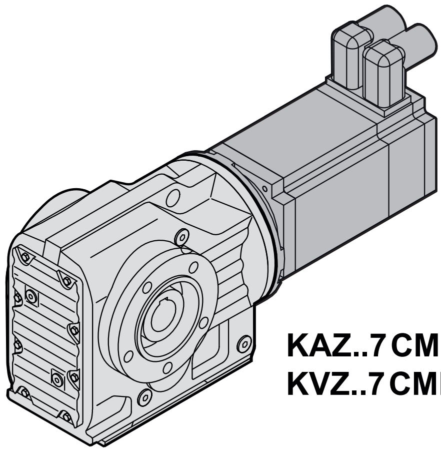


KA..7/T CMP..
KV..7/T CMP..

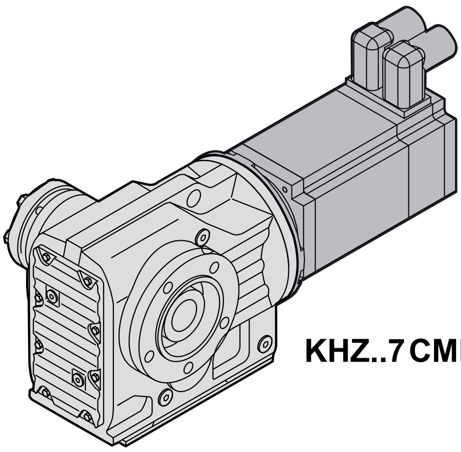
15705960203



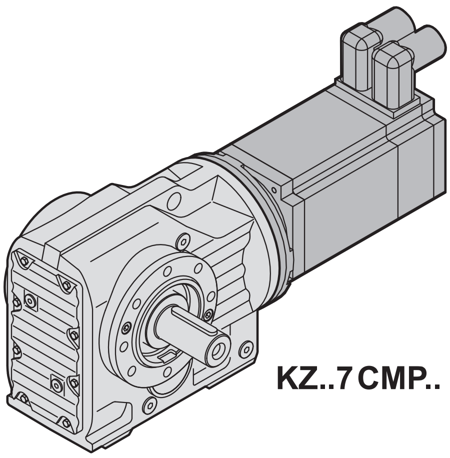
KH..7/T CMP..



KAZ..7 CMP..
KVZ..7 CMP..



KHZ..7 CMP..



KZ..7 CMP..

15705962635

10.2 K19–107..CMP.. selection tables and dimension sheets

10.2.1 K19..

K19, M_{aDyn} Nm							80 Nm
				CMP			
i	40M	50S	50M	50L	63S	63M	71S
				2			
4.50	17	23	45	67	48	>88	84
5.16	19	26	52	77	56	>88	>88
5.54	20	28	55	83	60	>88	>88
6.41	24	32	64	>88	69	>88	>88
6.91	25	35	69	>88	74	>88	>88
8.09	30	41	81		87		
9.58	35	48					
10.32	38	52	>83	>83	>83	>83	>83
11.84	43	59	>86	>86	>86	>86	>86
12.70	46	63	>88	>88	>88	>88	>88
14.69	54	73	>88	>88	>88	>88	>88
15.84	58	79	>88	>88	>88	>88	>88
18.55	68	>88	>88		>88		
21.98	80	>88					
24.06	88	>88					
26.88							
27.16	>66	>66	>66	>66	>66	>66	>66
29.14							
29.29	>67	>67	>67	>67	>67	>67	>67
31.74							
34.29	>70	>70	>70		>70		
40.63	>73	>73					
44.48	>75	>75					
49.69							
53.88							
58.68							

(→ 190)

K19, m kg							
				CMP			
s	40M	50S	50M	50L	63S	63M	71S
2	5.9	7.6	8.5	9.4	9.7	11	13
KF: + 0.30 kg / KA: + -0.45 kg / KAF: + -- kg							

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CMP..				c_{TG}			
		n_{epk}	η	K	KF	KA	KAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
K19 2	4.50	4500	97	5.1	4.4	8.5	8.5
	5.16	4500	97	5.1	4.4	8.5	8.5
	5.54	4500	97	5.1	4.4	8.5	8.5
	6.41	4500	97	5.1	4.4	8.5	8.5
	6.91	4500	97	5.1	4.4	8.5	8.5
	8.09	4500	97	5.1	4.5	8.6	8.6
	9.58	4500	97	5.1	4.5	8.6	8.6
	10.32	4500	96	6.2	5.2	12	12
	11.84	4500	96	6.2	5.2	12	12
	12.70	4500	96	5.1	4.5	8.6	8.6
	14.69	4500	96	6.2	5.2	12	12
	15.84	4500	96	6.2	5.2	12	12
	18.55	4500	96	6.2	5.2	12	12
	21.98	4500	96	6.2	5.2	12	12
	24.06	4500	96	6.2	5.2	12	12
	26.88	4500	96	6.2	5.2	12	12
	27.16	4500	91	6.2	5.2	12	12
	29.14	4500	96	6.2	5.2	12	12
	29.29	4500	91	6.2	5.2	12	12
	31.74	4500	96	6.2	5.2	12	12
	34.29	4500	91	6.2	5.2	12	12
	40.63	4500	91	6.2	5.2	12	12
	44.48	4500	91	6.2	5.2	12	12
	49.69	4500	91	6.2	5.2	12	12
	53.88	4500	91	6.2	5.2	12	12
	58.68	4500	91	6.2	5.2	12	12

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	kg*m²	N	N	N	N	N	N	N	N
K19 2	4.50	80	88	132	433	0.38	2010	1620	2500	2500	4190	3630	4500	4500
	5.16	80	88	132	424	0.30	2140	1720	2650	2650	4190	3630	4500	4500
	5.54	80	88	132	419	0.27	2200	1780	2730	2730	4190	3630	4500	4500
	6.41	80	88	132	410	0.21	2340	1890	2900	2900	4190	3630	4500	4500
	6.91	80	88	132	407	0.18	2420	1950	3000	3000	4190	3630	4500	4500
	8.09	80	88	132	399	0.14	2590	2080	3200	3200	4190	3630	4500	4500
	9.58	63	69	104	731	0.11	2910	2340	3600	3600	4340	3670	4500	4500
	10.32	76	83	124	102	0.22	2720	2190	3370	3370	4230	3610	4500	4500
	11.84	79	86	129	90	0.18	2850	2300	3530	3530	4210	3600	4500	4500
	12.70	80	88	132	83	0.16	2930	2360	3630	3630	4190	3600	4500	4500
	14.69	80	88	132	82	0.13	3110	2510	3860	3860	4190	3600	4500	4500
	15.84	80	88	132	81	0.12	3210	2590	3980	3980	4190	3600	4500	4500
	18.55	80	88	132	81	0.092	3430	2760	4250	4250	4190	3600	4500	4500
	21.98	80	88	132	81	0.072	3680	2960	4500	4500	4190	3600	4500	4500
	24.06	80	88	132	81	0.063	3820	3080	4500	4500	4190	3600	4500	4500
	26.88	80	88	132	80	0.054	3990	3220	4500	4500	4190	3600	4500	4500
	27.16	60	66	99	38	0.13	4090	3290	4500	4500	4360	3630	4500	4500
	29.14	80	88	132	80	0.048	4120	3320	4500	4500	4190	3600	4500	4500
	29.29	61	67	100	36	0.11	4200	3380	4500	4500	4350	3630	4500	4500
	31.74	80	88	132	80	0.042	4260	3440	4500	4500	4190	3600	4500	4500
	34.29	64	70	105	31	0.090	4370	3570	4500	4500	4330	3620	4500	4500
	40.63	67	73	110	27	0.071	4350	3630	4500	4500	4310	3610	4500	4500
	44.48	69	75	112	24	0.062	4340	3620	4500	4500	4290	3600	4500	4500
	49.69	70	77	116	22	0.053	4330	3620	4500	4500	4280	3600	4500	4500
	53.88	70	77	116	22	0.047	4330	3620	4500	4500	4280	3600	4500	4500
	58.68	70	77	116	22	0.042	4330	3620	4500	4500	4280	3600	4500	4500

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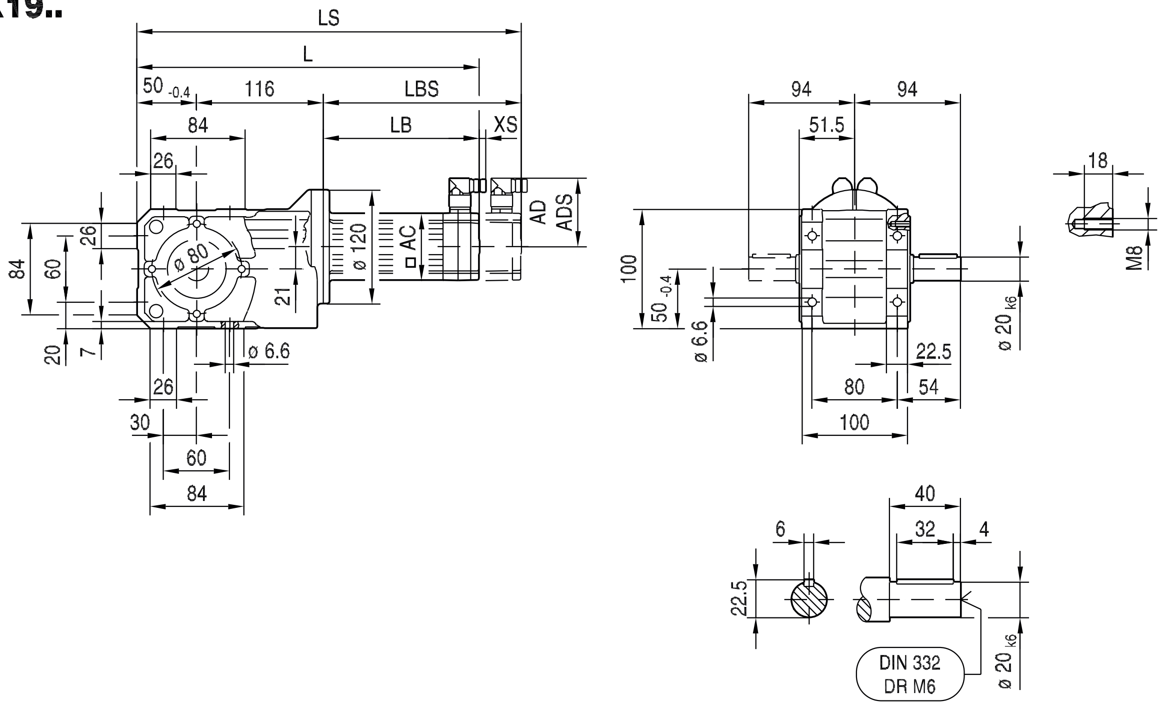
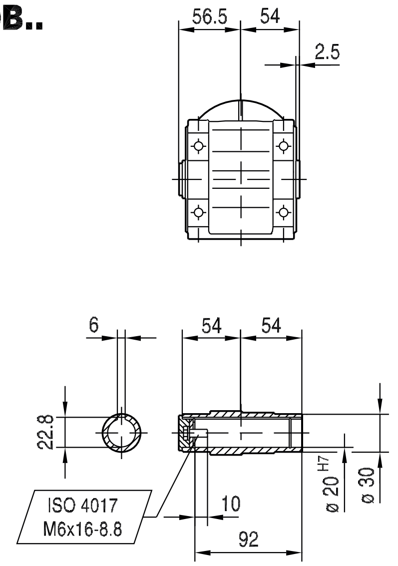
33 069 01 15

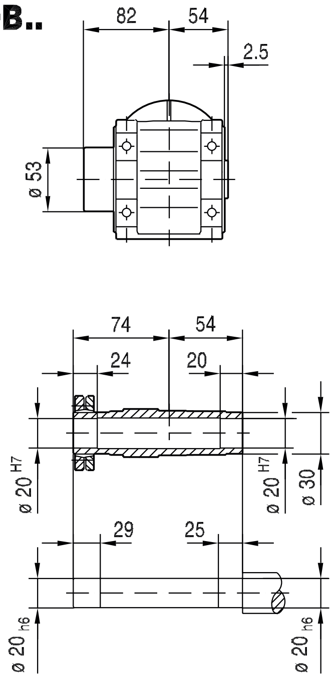
K19..



KA19B..



KH19B..



(→ 194)	CMP..							
	40M	50S	50M	50L	63S	63M	71S	
AC	57	73	73	73	88	88	116	
AD	78	86	86	86	92	92	102	
ADS	78	86	86	86	92	92	104	
L	309	311	350	389	346	396	338	
LS	339	340	379	418	374	424	403	
LB	143	145	184	223	180	230	172	
LBS	173	174	213	252	208	258	237	
XS	19	18	18	18	14	14	11	

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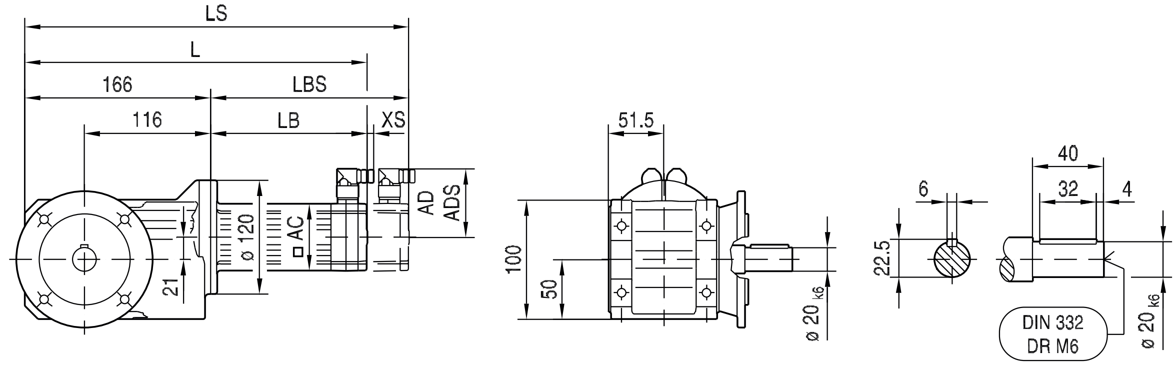
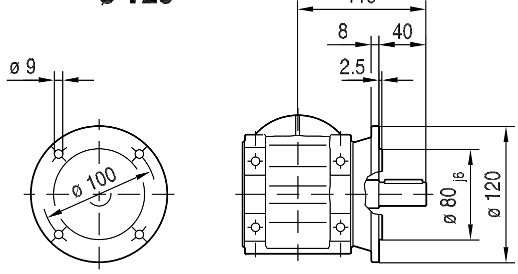
33 070 00 15

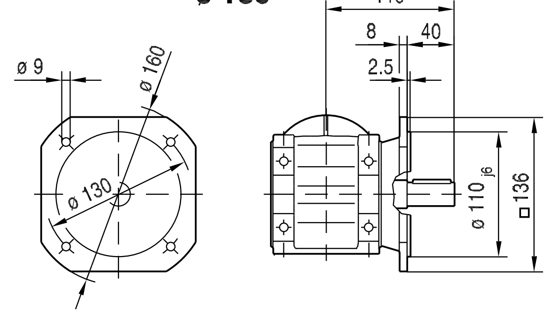
KF19B..



ø 120

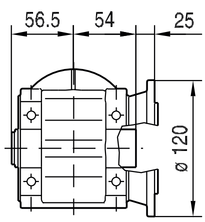


ø 160

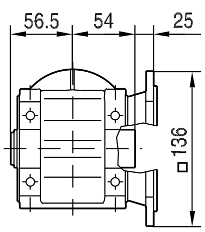


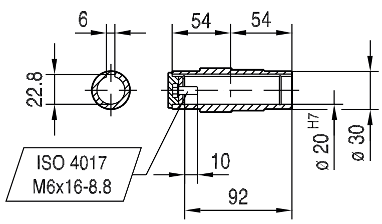
KAF19B..

ø 120



ø 160





(→ 194)	CMP..							
	40M	50S	50M	50L	63S	63M	71S	
AC	57	73	73	73	88	88	116	
AD	78	86	86	86	92	92	102	
ADS	78	86	86	86	92	92	104	
L	309	311	350	389	346	396	338	
LS	339	340	379	418	374	424	403	
LB	143	145	184	223	180	230	172	
LBS	173	174	213	252	208	258	237	
XS	19	18	18	18	14	14	11	

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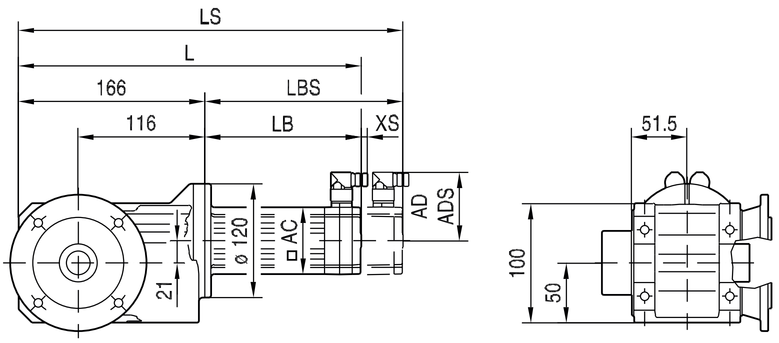
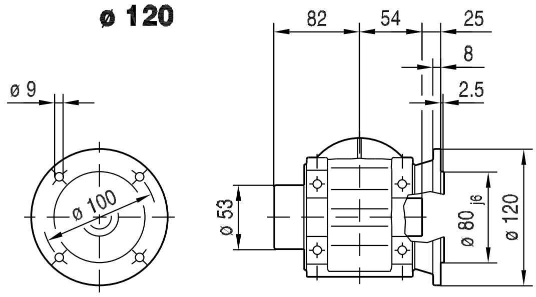
33 071 01 15

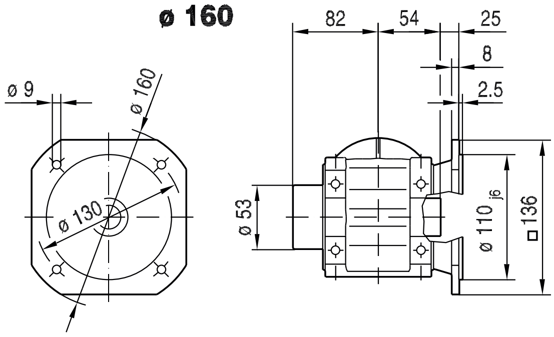
KHF19B..

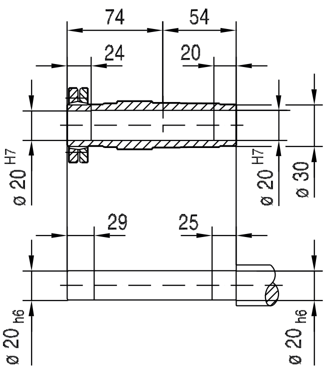


ø 120



ø 160

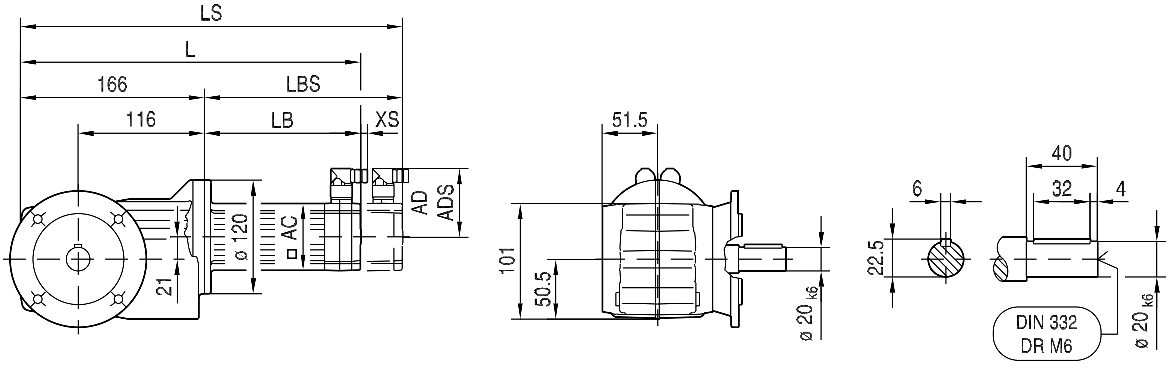




(→ 194)	CMP..							
	40M	50S	50M	50L	63S	63M	71S	
AC	57	73	73	73	88	88	116	
AD	78	86	86	86	92	92	102	
ADS	78	86	86	86	92	92	104	
L	309	311	350	389	346	396	338	
LS	339	340	379	418	374	424	403	
LB	143	145	184	223	180	230	172	
LBS	173	174	213	252	208	258	237	
XS	19	18	18	18	14	14	11	

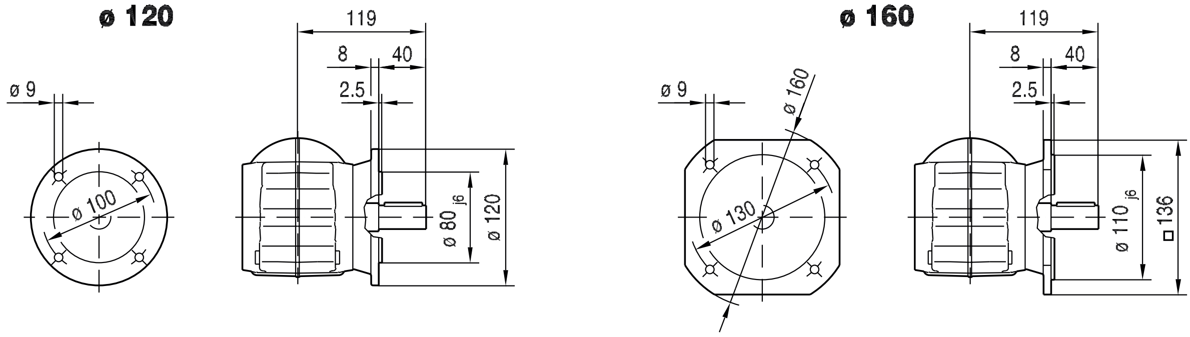
33 072 00 15

KF19..



ø 120

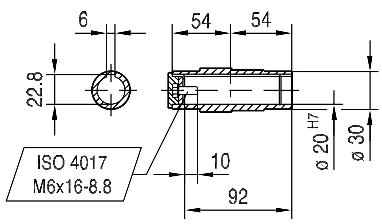
ø 160



KAF19..

ø 120

ø 160



(→ 194)	CMP..							
	40M	50S	50M	50L	63S	63M	71S	
AC	57	73	73	73	88	88	116	
AD	78	86	86	86	92	92	102	
ADS	78	86	86	86	92	92	104	
L	309	311	350	389	346	396	338	
LS	339	340	379	418	374	424	403	
LB	143	145	184	223	180	230	172	
LBS	173	174	213	252	208	258	237	
XS	19	18	18	18	14	14	11	

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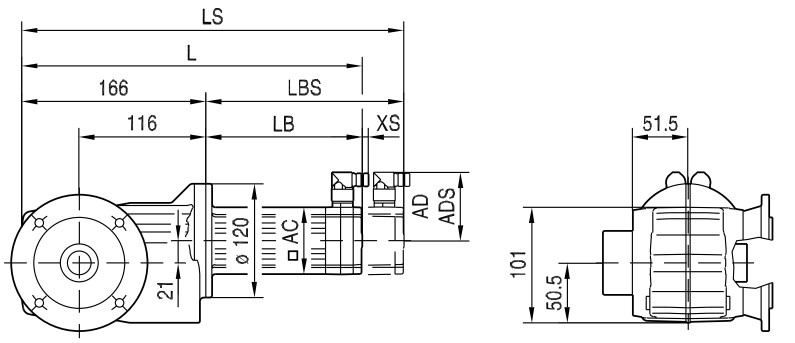
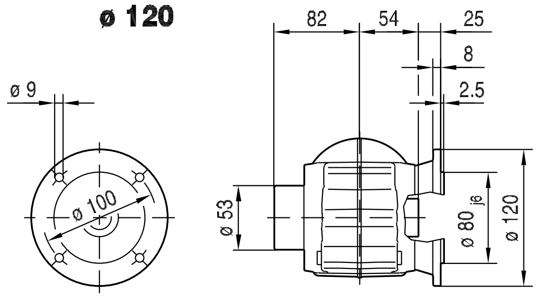
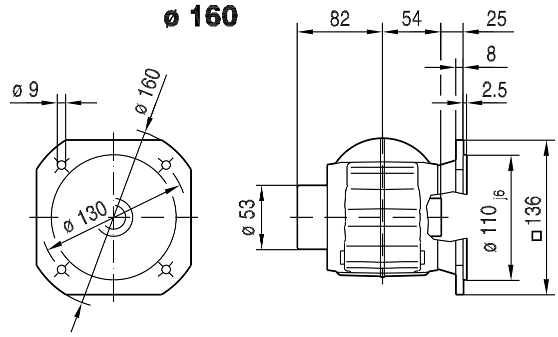
KHF19..

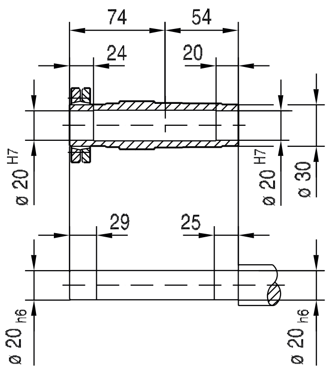


ø 120



ø 160





(→ 194)	CMP..							
	40M	50S	50M	50L	63S	63M	71S	
AC	57	73	73	73	88	88	116	
AD	78	86	86	86	92	92	102	
ADS	78	86	86	86	92	92	104	
L	309	311	350	389	346	396	338	
LS	339	340	379	418	374	424	403	
LB	143	145	184	223	180	230	172	
LBS	173	174	213	252	208	258	237	
XS	19	18	18	18	14	14	11	

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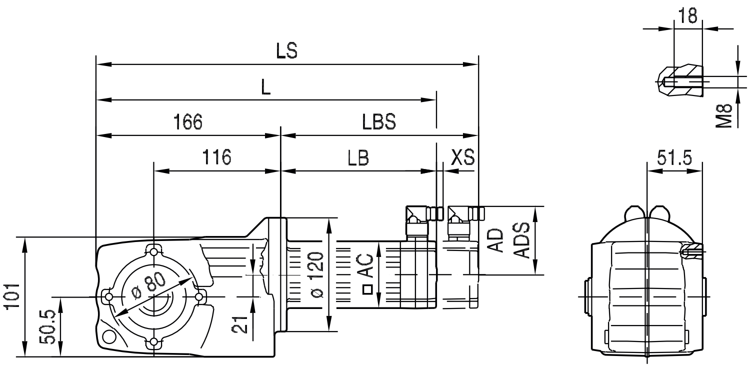
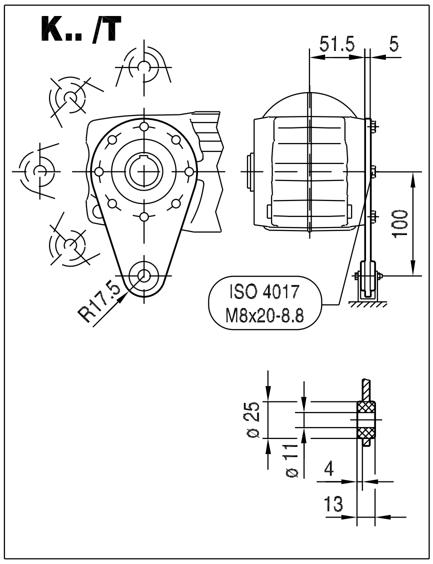
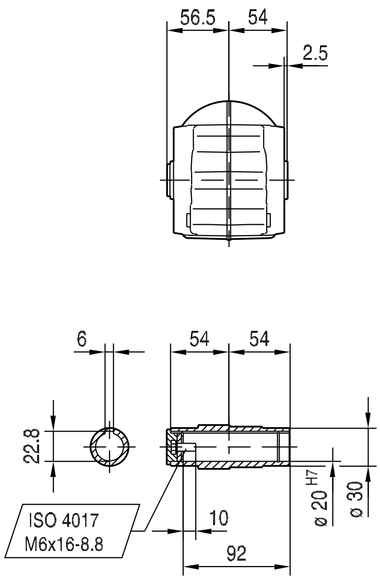
33 074 01 15

KA19..

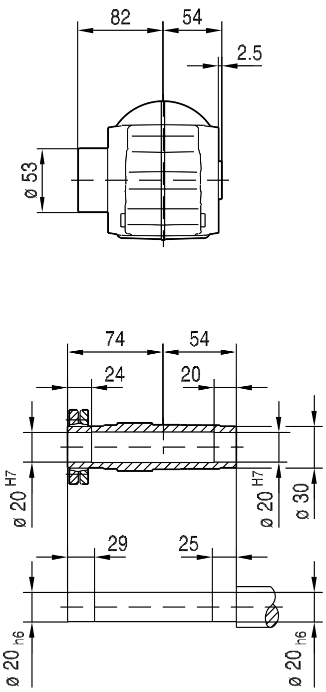




KA19..



KH19..



(→ 194)	CMP..							
	40M	50S	50M	50L	63S	63M	71S	
AC	57	73	73	73	88	88	116	
AD	78	86	86	86	92	92	102	
ADS	78	86	86	86	92	92	104	
L	309	311	350	389	346	396	338	
LS	339	340	379	418	374	424	403	
LB	143	145	184	223	180	230	172	
LBS	173	174	213	252	208	258	237	
XS	19	18	18	18	14	14	11	

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10.2.2 K29..

K29, M_{aDyn} Nm								130 Nm
	CMP							
i	50S	50M	50L	63S	63M	63L	71S	71M
	2							
3.19	16	32	48	34	66	94	59	95
3.92	20	39	59	42	81	116	73	117
5.10	26	51	76	55	106	>121	95	>121
5.75	29	57	86	62	119	>123	107	>123
6.95	35	69	104	75	>123	>123	>123	>123
7.48	37	74	111	80	>135	>135	>135	>135
8.53	43	85	127	92	>134		>134	
9.17	46	91	136	98	>143	>143	>143	>143
9.90	50	99		107				
11.94	60	118	>143	127	>143	>143	>143	>143
13.47	67	133	>143	>143	>143	>143	>143	>143
16.29	81	>143	>143	>143	>143	>143	>143	>143
19.99	100	>143	>143	>143	>143		>143	
22.08	104	>115	>115	>115	>115	>115	>115	>115
23.19	116	>143		>143				
24.91	118	>119	>119	>119	>119	>119	>119	>119
27.23	136							
29.69	>143							
30.11	>126	>126	>126	>126	>126	>126	>126	>126
33.15								
35.83								
36.96	>134	>134	>134	>134	>134		>134	
38.90								
42.87	>140	>140		>140				
50.35	>143							
54.89	>143							
61.28								
66.25								
71.93								

(→ 190)

K29, m kg								
	CMP							
s	50S	50M	50L	63S	63M	63L	71S	71M
2	9.4	10	11	11	13	14	14	16
KF: + 1.0 kg / KA: + -0.45 kg / KAF: + 0.35 kg								

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CMP..				c_{TG}			
		n_{epk}	η	K	KF	KA	KAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
K29 2	3.19	4500	97	8.3	7.4	16	16
	3.92	4500	97	8.3	7.4	16	16
	5.10	4500	97	8.4	7.5	17	17
	5.75	4500	97	8.4	7.5	17	17
	6.95	4500	97	8.4	7.5	17	17
	7.48	4500	96	10	8.8	25	25
	8.53	4500	97	8.4	7.5	17	17
	9.17	4500	96	10	8.8	25	25
	9.90	4500	97	8.4	7.5	17	17
	11.94	4500	96	10	8.8	25	25
	13.47	4500	96	10	8.8	25	25
	16.29	4500	96	10	8.8	25	25
	19.99	4500	96	10	8.8	25	25
	22.08	4500	91	8.6	7.6	18	18
	23.19	4500	96	10	8.8	25	25
	24.91	4500	91	8.6	7.6	18	18
	27.23	4500	96	10	8.8	25	25
	29.69	4500	96	10	8.8	25	25
	30.11	4500	91	8.6	7.6	18	18
	33.15	4500	96	10	8.8	25	25
	35.83	4500	96	10	8.8	25	25
	36.96	4500	92	8.6	7.6	18	18
	38.90	4500	95	10	8.8	25	25
	42.87	4500	91	8.6	7.6	18	18
	50.35	4500	91	8.6	7.6	18	18
	54.89	4500	91	8.6	7.6	18	18
	61.28	4500	91	8.6	7.6	18	18
	66.25	4500	91	8.6	7.6	18	18
	71.93	4500	91	8.6	7.6	18	18

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
K29 2	3.19	110	121	182	1082	1.6	1830	1200	1860	1860	5070	6000	6000	6000
	3.92	126	138	205	722	1.1	1910	1240	1920	1920	5030	6000	6000	6000
	5.10	110	121	182	1080	0.68	2260	1500	2320	2320	5070	6000	6000	6000
	5.75	112	123	184	1030	0.55	2370	1580	2440	2440	5070	6000	6000	6000
	6.95	112	123	184	1007	0.39	2580	1720	2660	2660	5070	6000	6000	6000
	7.48	123	135	200	138	0.74	2300	1480	2300	2300	4980	6000	6000	6000
	8.53	122	134	200	755	0.27	2740	1830	2830	2830	5040	6000	6000	6000
	9.17	130	143	210	112	0.55	2470	1600	2480	2480	4960	6000	6000	6000
	9.90	110	121	182	707	0.21	3000	2020	3120	3120	5070	6000	6000	6000
	11.94	130	143	210	112	0.37	2810	1830	2840	2840	4960	6000	6000	6000
	13.47	130	143	210	111	0.30	2970	1950	3010	3010	4960	6000	6000	6000
	16.29	130	143	210	111	0.22	3240	2140	3300	3300	4960	6000	6000	6000
	19.99	130	143	210	111	0.16	3550	2350	3640	3640	4960	6000	6000	6000
	22.08	105	115	172	47	0.33	3820	2560	3950	3950	5020	6000	6000	6000
	23.19	130	143	210	110	0.12	3790	2520	3900	3900	4960	6000	6000	6000
	24.91	109	119	178	42	0.27	3980	2660	4120	4120	5010	6000	6000	6000
	27.23	130	143	210	110	0.098	4060	2710	4190	4190	4960	6000	6000	6000
	29.69	130	143	210	110	0.086	4210	2820	4360	4360	4960	6000	6000	6000
	30.11	115	126	189	35	0.20	4250	2850	4400	4400	4990	6000	6000	6000
	33.15	130	143	210	110	0.073	4410	2960	4580	4580	4960	6000	6000	6000
	35.83	130	143	210	110	0.065	4560	3060	4740	4740	4960	6000	6000	6000
	36.96	122	134	200	28	0.14	4560	3060	4730	4730	4960	6000	6000	6000
	38.90	130	143	210	110	0.057	4720	3170	4910	4910	4960	6000	6000	6000
	42.87	128	140	210	24	0.11	4790	3210	4970	4970	4940	6000	6000	6000
	50.35	130	143	210	22	0.090	4980	3430	5300	5300	4930	6000	6000	6000
	54.89	130	143	210	23	0.079	4980	3560	5510	5510	4930	6000	6000	6000
	61.28	130	143	210	23	0.068	4980	3730	5770	5770	4930	6000	6000	6000
	66.25	130	143	210	22	0.060	4980	3860	5970	5970	4930	6000	6000	6000
	71.93	130	143	210	23	0.053	4980	4000	6000	6000	4930	6000	6000	6000

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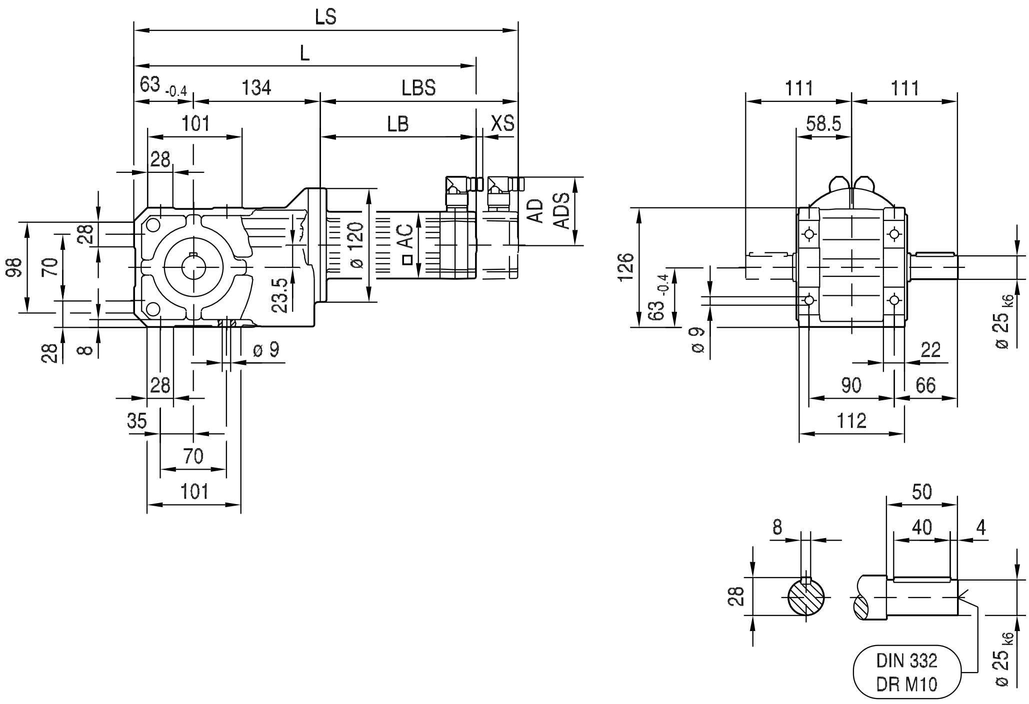
K29..



(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	342	381	420	377	427	480	369	397
LS	371	410	449	405	455	509	434	462
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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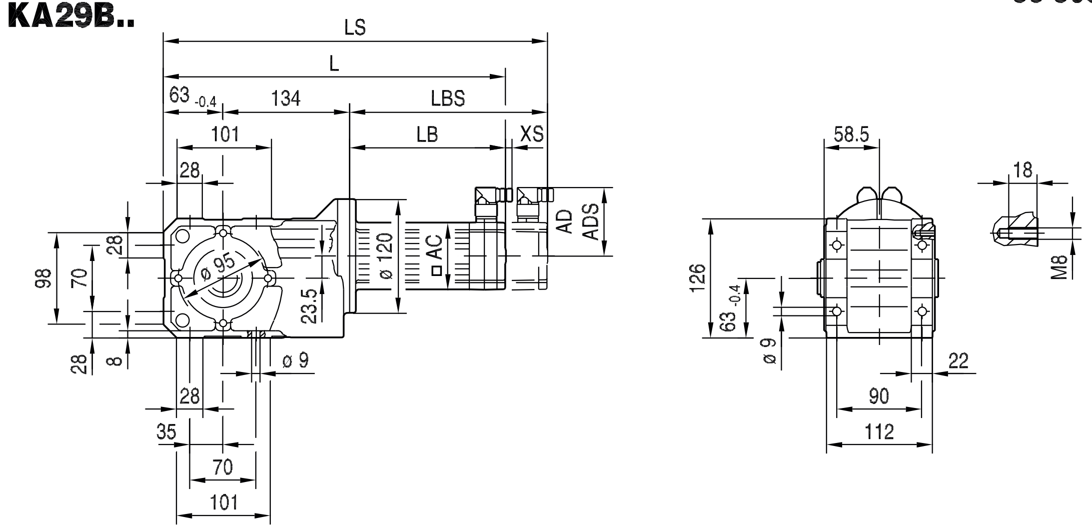
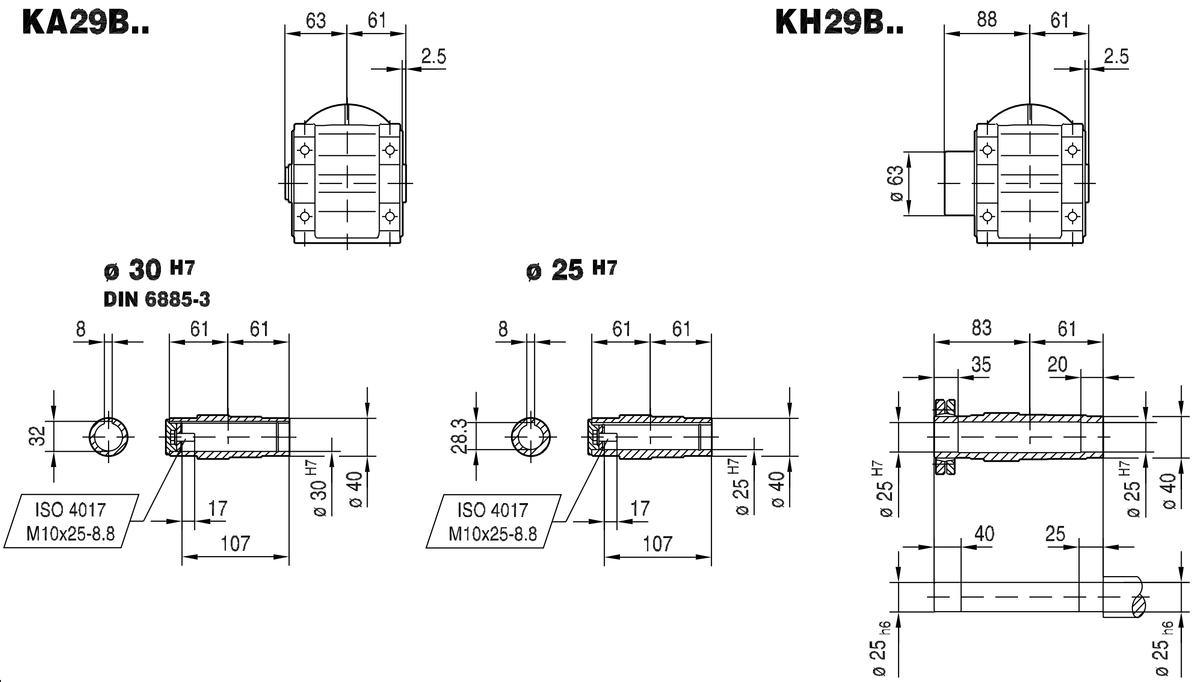
33 365 01 15





(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	342	381	420	377	427	480	369	397
LS	371	410	449	405	455	509	434	462
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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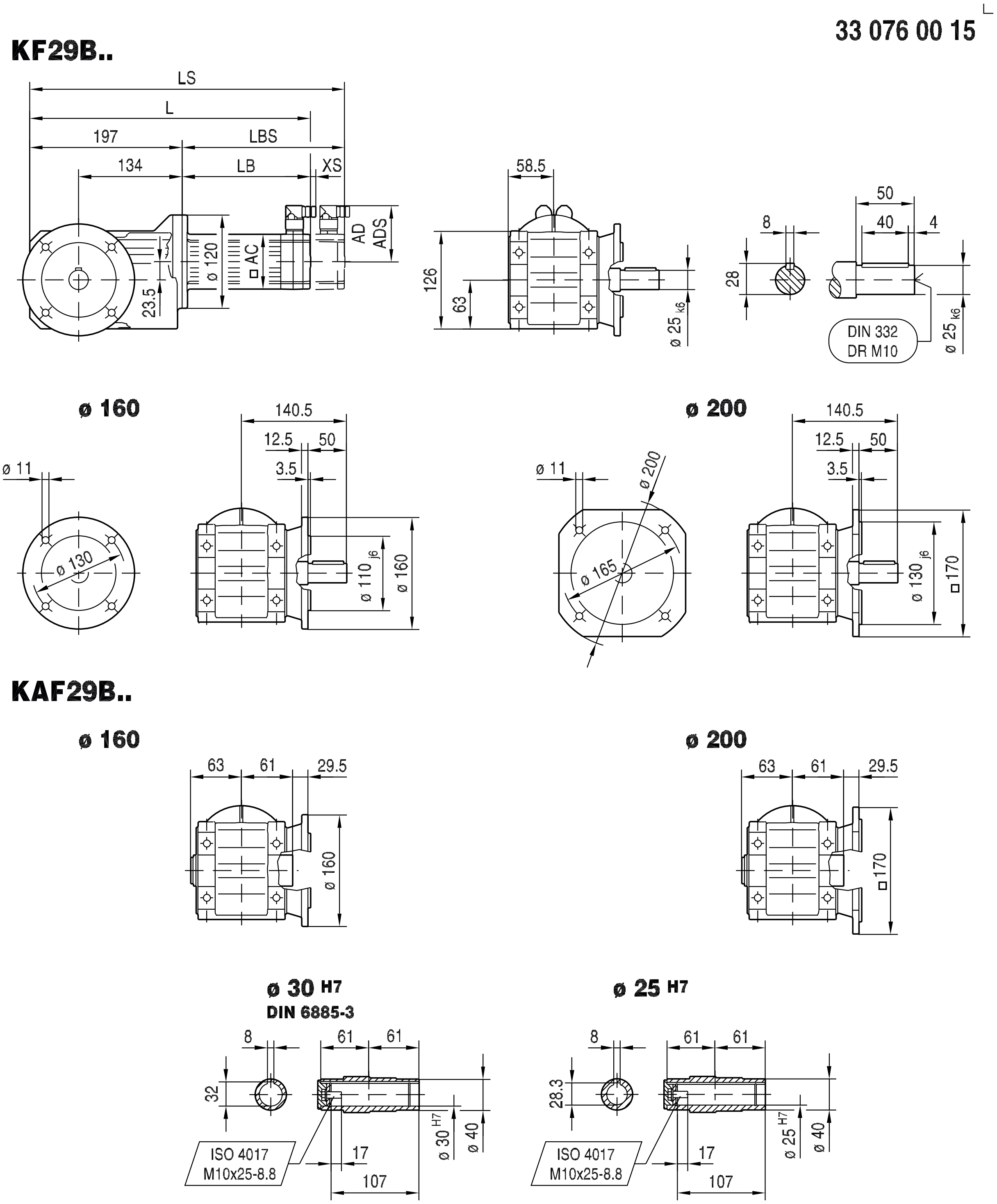

(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	342	381	420	377	427	480	369	397
LS	371	410	449	405	455	509	434	462
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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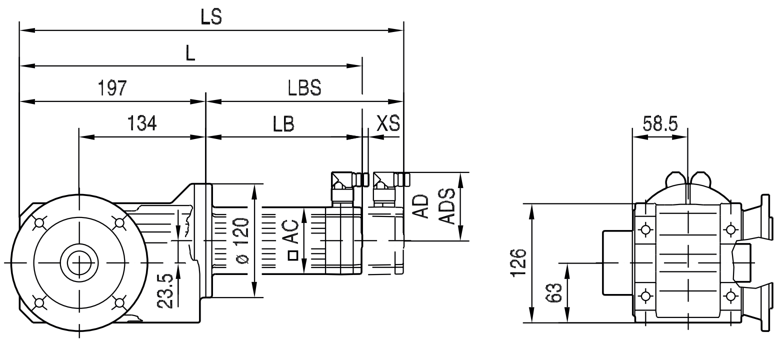
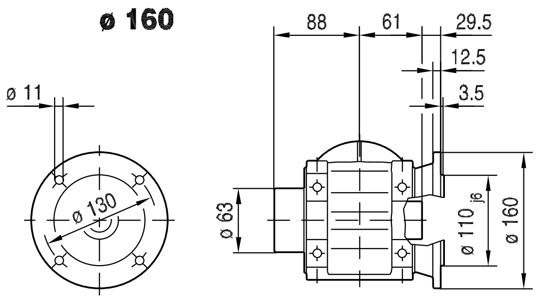
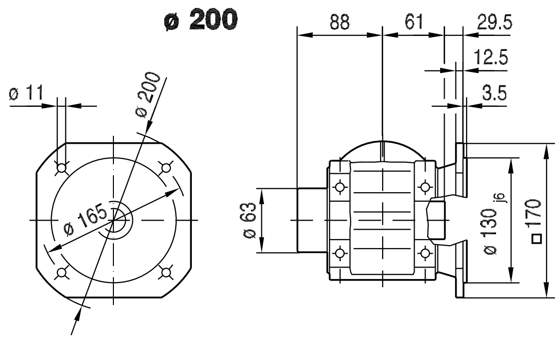
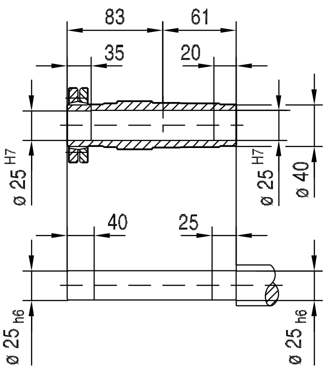
33 077 01 15

KHF29B..









(→ 🗎 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	342	381	420	377	427	480	369	397
LS	371	410	449	405	455	509	434	462
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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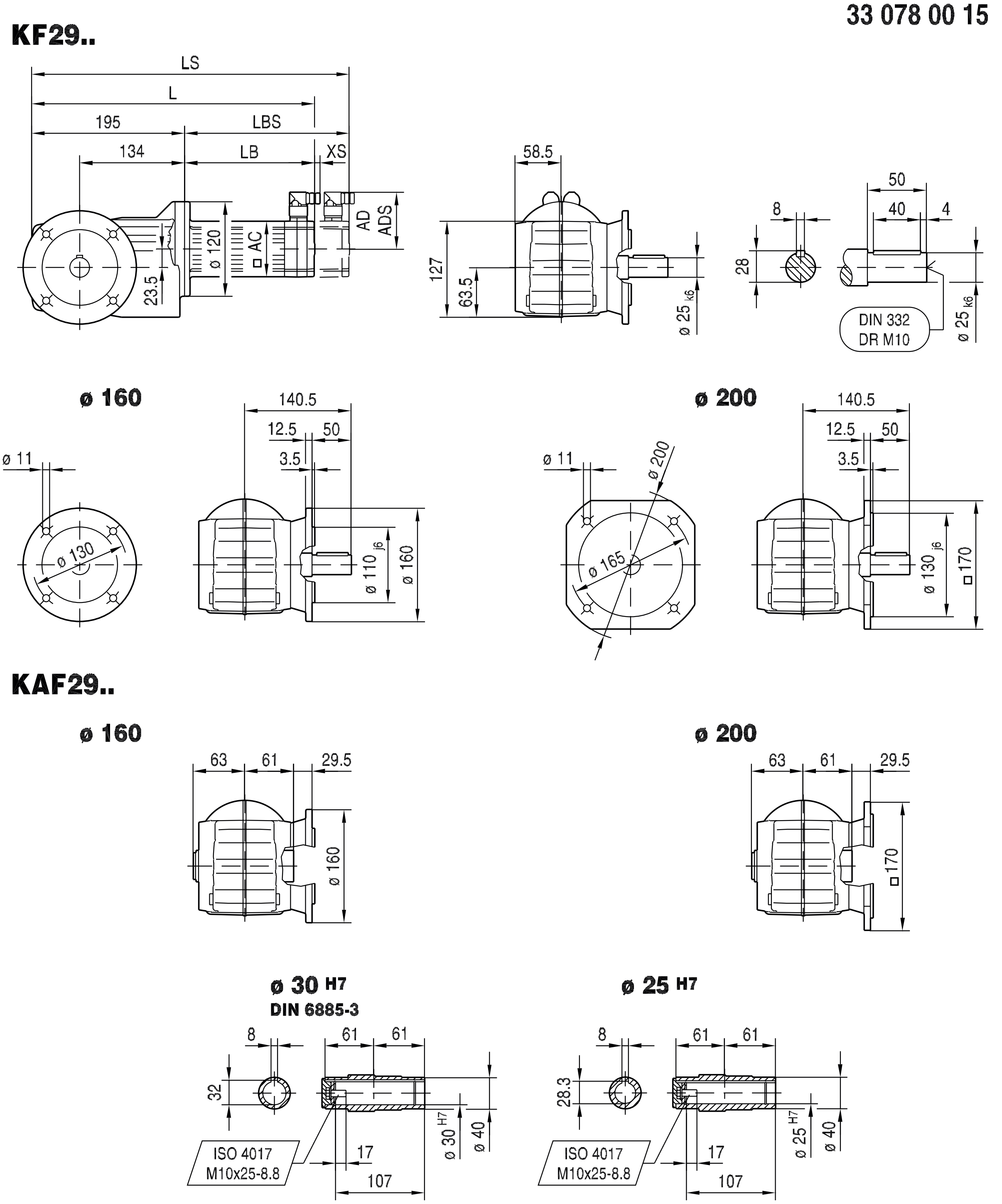
33 078 00 15



(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	340	379	418	375	425	478	367	395
LS	369	408	447	403	453	507	432	460
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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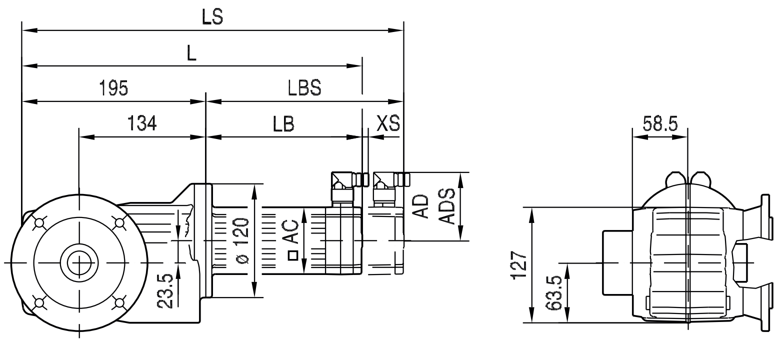
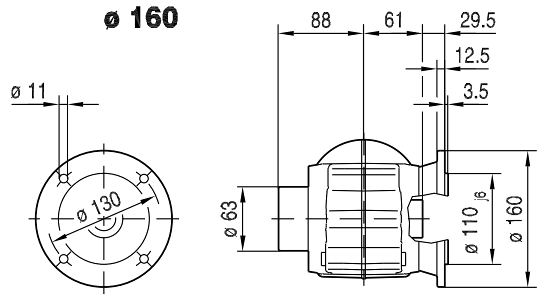
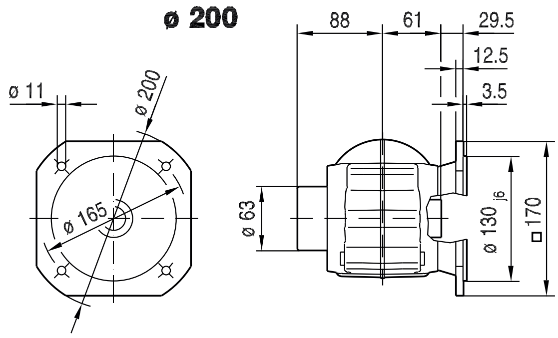
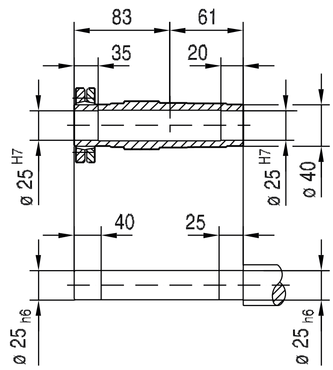
KHF29..

33 079 01 15









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(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	340	379	418	375	425	478	367	395
LS	369	408	447	403	453	507	432	460
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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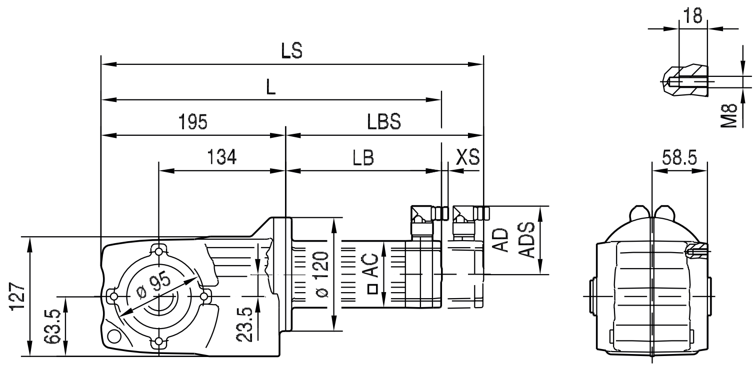
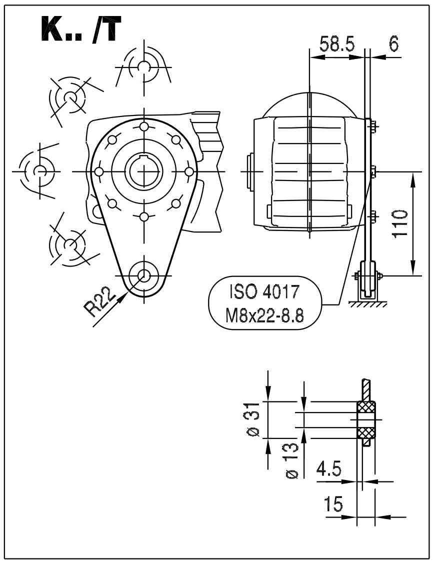
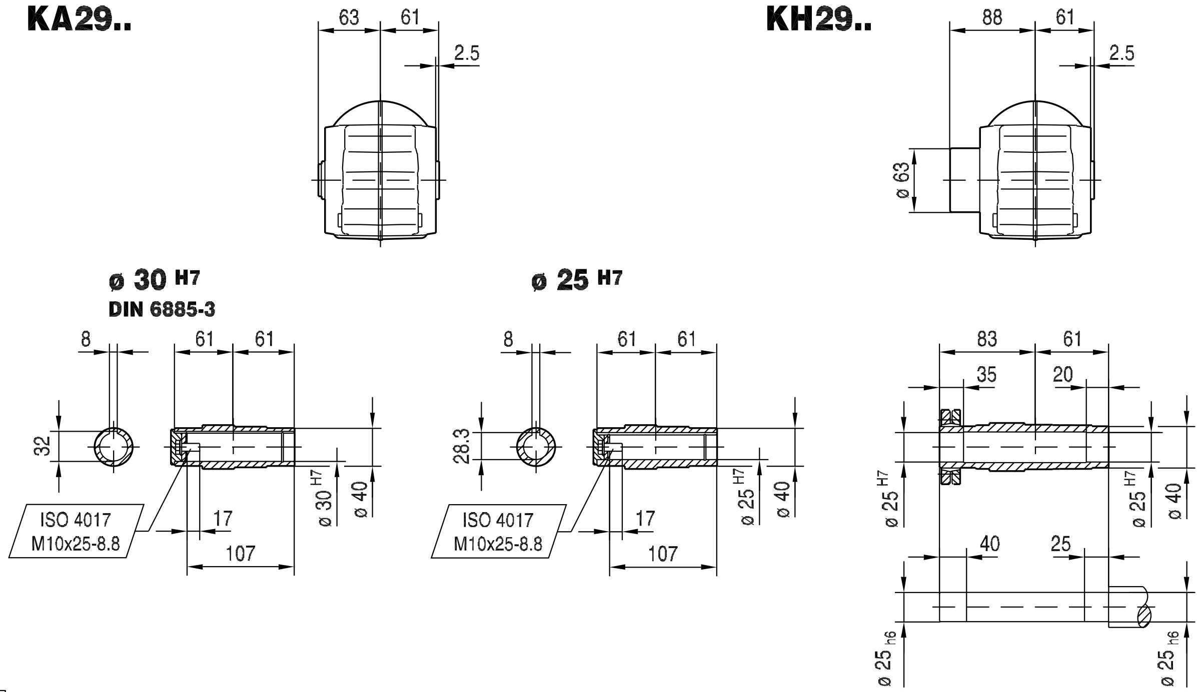
33 080 01 15

KA29..





KA29.. **KH29..**



(→ 🗎 194)	CMP..							
	50S	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	340	379	418	375	425	478	367	395
LS	369	408	447	403	453	507	432	460
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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10.2.3 K37..

K37, M_{aDyn} Nm					CMP					200 Nm
i	40M	50S	50M	50L	63S	63M	63L	71S	71M	80S
					3					
3.98	15	20	39	59	42	82	116	73	118	105
5.36	20	27	53	79	57	110	156	99	158	142
6.37	23	32	63	94	68	131	186	117	188	168
6.80	25	34	67	101	72	140	198	125	>199	180
7.96	29	40	79	118	85	164	>199	147	>199	>199
8.91	33	44	88	132	95	183	>199	164	>199	>199
10.49	38	52	104	155	112	>199	>199	193	>199	>199
12.14	44	61	120	179	129	>199		>199		
13.08	48	65	129	193	139	>240	>240	>240	>240	>240
15.31	56	76	151	225	163	>240	>240	>240	>240	>240
17.15	63	86	170	>240	183	>240	>240	>240	>240	>240
20.19	74	101	200	>240	215	>240	>240	>240	>240	>240
23.36	85	117	230	>240	>240	>240		>240		
24.99	91	125	>240	>240	>240	>240		>240		
28.83	105	144	>240		>240					
29.96	107	146	>230	>230	>230	>230	>230	>230	>230	>230
35.57	127	174	>230	>230	>230	>230	>230	>230	>230	>230
37.97	136	186	>230	>230	>230	>230	>230	>230	>230	>230
44.46	159	215	>230	>230	>230	>230	>230	>230	>230	>230
49.79	178	>230	>230	>230	>230	>230	>230	>230	>230	>230
58.60	205	>230	>230	>230	>230	>230	>230	>230	>230	>230
67.80	>230	>230	>230	>230	>230	>230		>230		
72.54	>230	>230	>230	>230	>230	>230		>230		
83.69	>230	>230	>230		>230					
97.81	>230	>230								
106.38	>230	>230								

(→ 190)

K37, m kg					CMP					
s	40M	50S	50M	50L	63S	63M	63L	71S	71M	80S
3	13	15	16	17	17	19	20	20	22	28
KF: + 2.3 kg / KA: + -0.25 kg / KAF: + 1.5 kg										

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CMP..				c_{TG}				φ
		n_{epk}	η	K	KF	KA	KAF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
K37 3	3.98	4500	96	13	13	29	29	13
	5.36	4500	96	13	13	29	29	13
	6.37	4500	96	13	13	29	29	13
	6.80	4500	96	13	13	29	29	13
	7.96	4500	96	13	13	29	29	13
	8.91	4500	96	13	13	29	29	12
	10.49	4500	96	13	13	29	29	12
	12.14	4500	96	13	13	29	29	12
	13.08	4500	96	17	17	63	63	9
	15.31	4500	96	17	17	63	63	8
	17.15	4500	96	17	17	63	63	8
	20.19	4500	96	17	17	63	63	8
	23.36	4500	96	17	17	63	63	8
	24.99	4500	96	17	17	63	63	8
	28.83	4500	96	17	17	63	63	8
	29.96	4500	94	18	19	85	85	7
	35.57	4500	94	18	19	85	85	7
	37.97	4500	94	18	19	85	85	7
	44.46	4500	94	18	19	85	85	7
	49.79	4500	94	18	19	85	85	7
	58.60	4500	94	18	19	85	85	7
	67.80	4500	94	18	19	85	85	7
	72.54	4500	94	18	19	85	85	7
	83.69	4500	93	18	19	85	85	7
	97.81	4500	93	18	19	85	85	7
	106.38	4500	93	18	19	85	85	7

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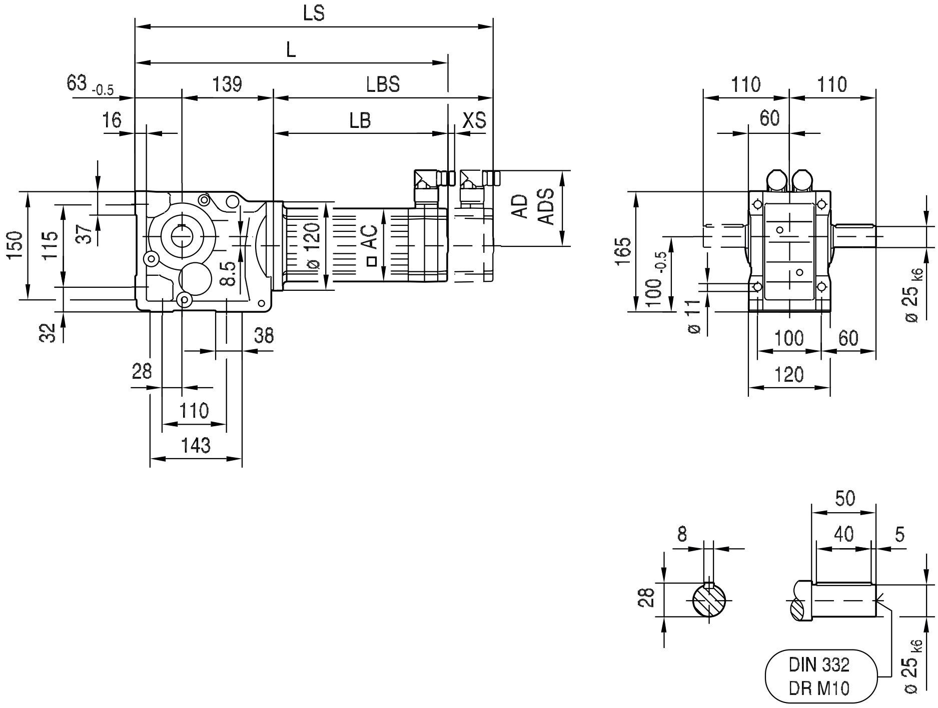
CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
K37 3	3.98	125	187	210	377	2.6	1660	2130	2310	2310	5780	5710	7000	7000
	5.36	140	199	235	317	1.7	1810	2340	2530	2530	5650	5640	7000	7000
	6.37	145	199	245	314	1.3	1950	2500	2720	2720	5650	5640	7000	7000
	6.80	150	199	255	294	1.1	1980	2540	2760	2760	5650	5640	7000	7000
	7.96	155	199	260	276	0.85	2110	2700	2940	2940	5650	5640	7000	7000
	8.91	160	199	270	258	0.70	2200	2810	3070	3070	5650	5640	7000	7000
	10.49	160	199	270	276	0.51	2410	3030	3340	3340	5650	5640	7000	7000
	12.14	160	199	270	297	0.40	2600	3240	3600	3600	5650	5640	7000	7000
	13.08	165	240	280	420	1.0	2650	3310	3660	3660	4100	4100	7000	7000
	15.31	175	240	295	346	0.76	2780	3480	3850	3850	4100	4100	7000	7000
	17.15	180	240	305	315	0.62	2900	3630	4020	4020	4100	4100	7000	7000
	20.19	185	240	315	287	0.46	3110	3870	4300	4300	4100	4100	7000	7000
	23.36	195	240	330	240	0.37	3260	4060	4510	4510	4100	4100	7000	7000
	24.99	200	240	340	220	0.33	3330	4150	4600	4600	4100	4100	7000	7000
	28.83	200	240	340	222	0.26	3580	4420	4940	4940	4100	4100	7000	7000
	29.96	200	230	340	157	0.76	3650	4500	5030	5030	5140	5140	7000	7000
	35.57	200	230	340	157	0.60	3970	4860	5460	5460	5140	5140	7000	7000
	37.97	200	230	340	158	0.54	4100	5000	5630	5630	5140	5140	7000	7000
	44.46	200	230	340	157	0.42	4420	5350	6060	6060	5140	5140	7000	7000
	49.79	200	230	340	141	0.36	4660	5610	6380	6380	5140	5140	7000	7000
	58.60	200	230	340	119	0.27	5020	5630	6860	6860	5140	5140	7000	7000
	67.80	200	230	340	103	0.23	5360	5630	7000	7000	5140	5140	7000	7000
	72.54	200	230	340	96	0.21	5520	5630	7000	7000	5140	5140	7000	7000
	83.69	200	230	340	84	0.17	5640	5630	7000	7000	5140	5140	7000	7000
	97.81	200	230	340	72	0.13	5640	5630	7000	7000	5140	5140	7000	7000
	106.38	200	230	340	66	0.12	5640	5630	7000	7000	5140	5140	7000	7000

33 009 00 07

K37..



(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	345	347	386	425	382	432	485	374	402
LS	375	376	415	454	410	460	514	439	467
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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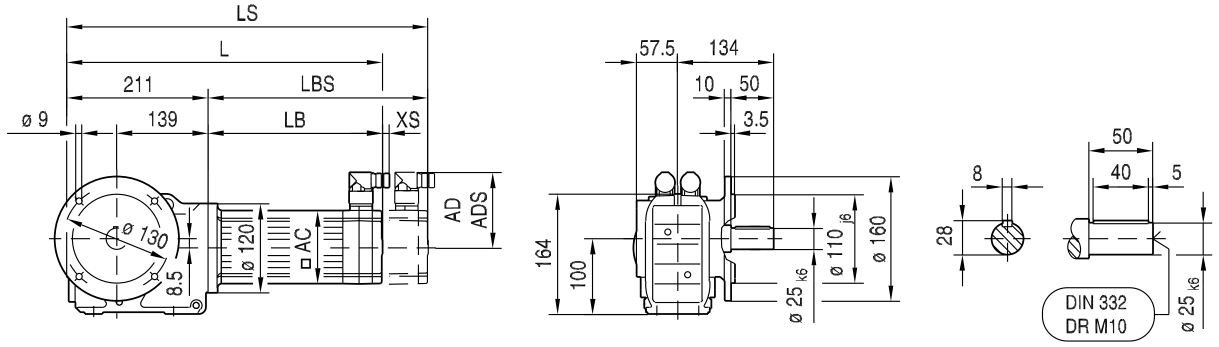
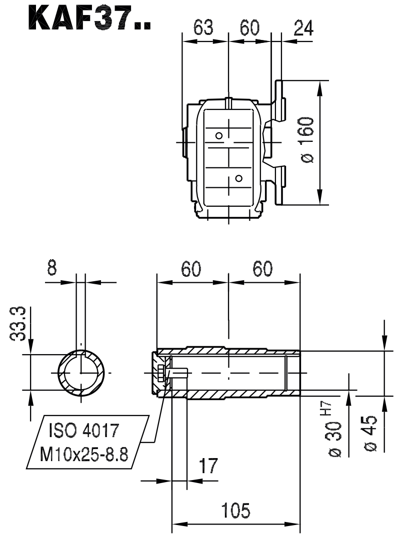
33 010 01 07

KF37..



10

KAF37..



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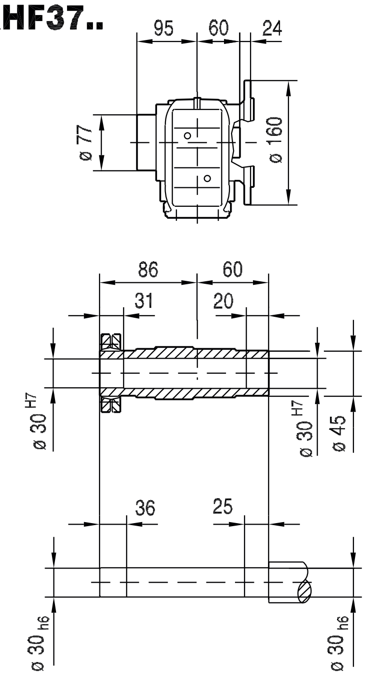

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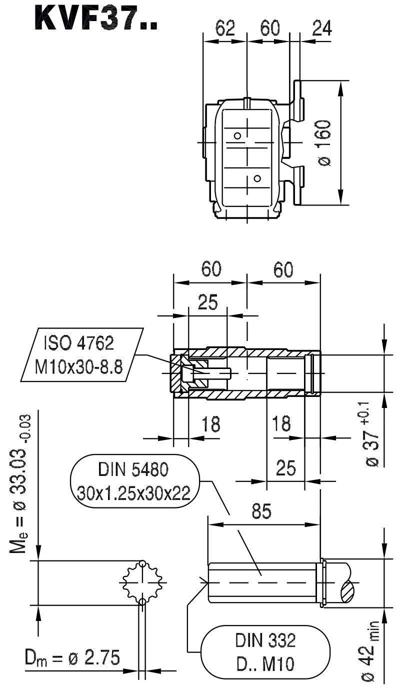

(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	354	356	395	434	391	441	494	383	411
LS	384	385	424	463	419	469	523	448	476
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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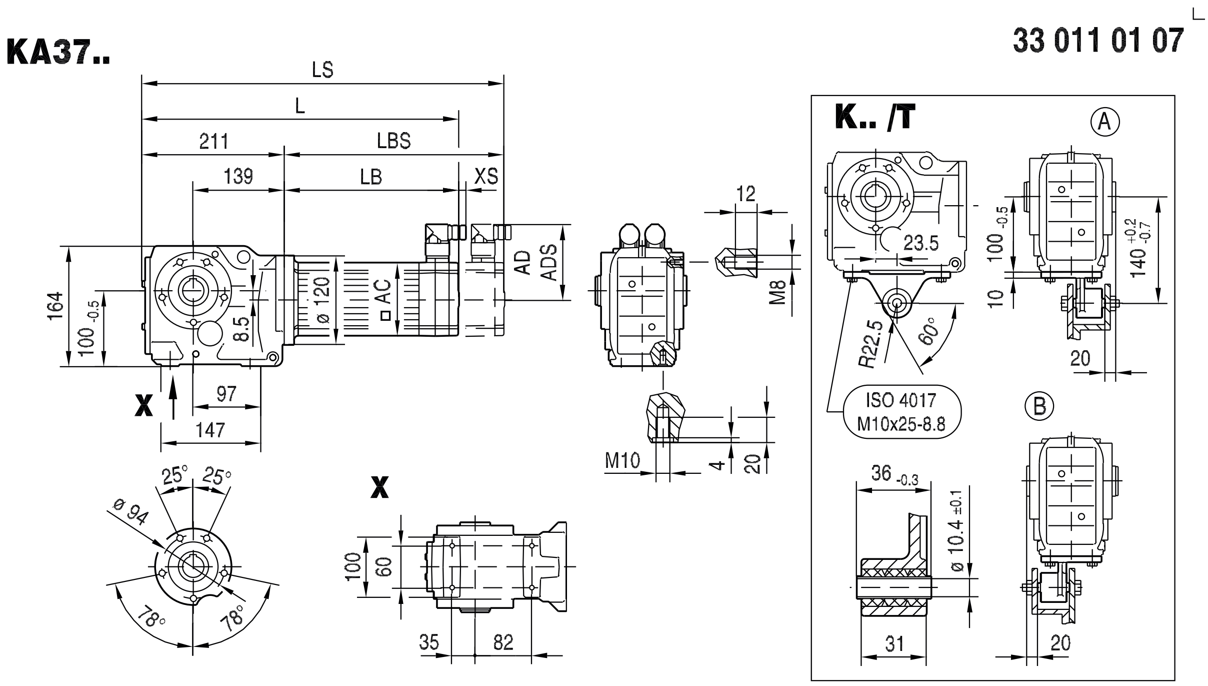

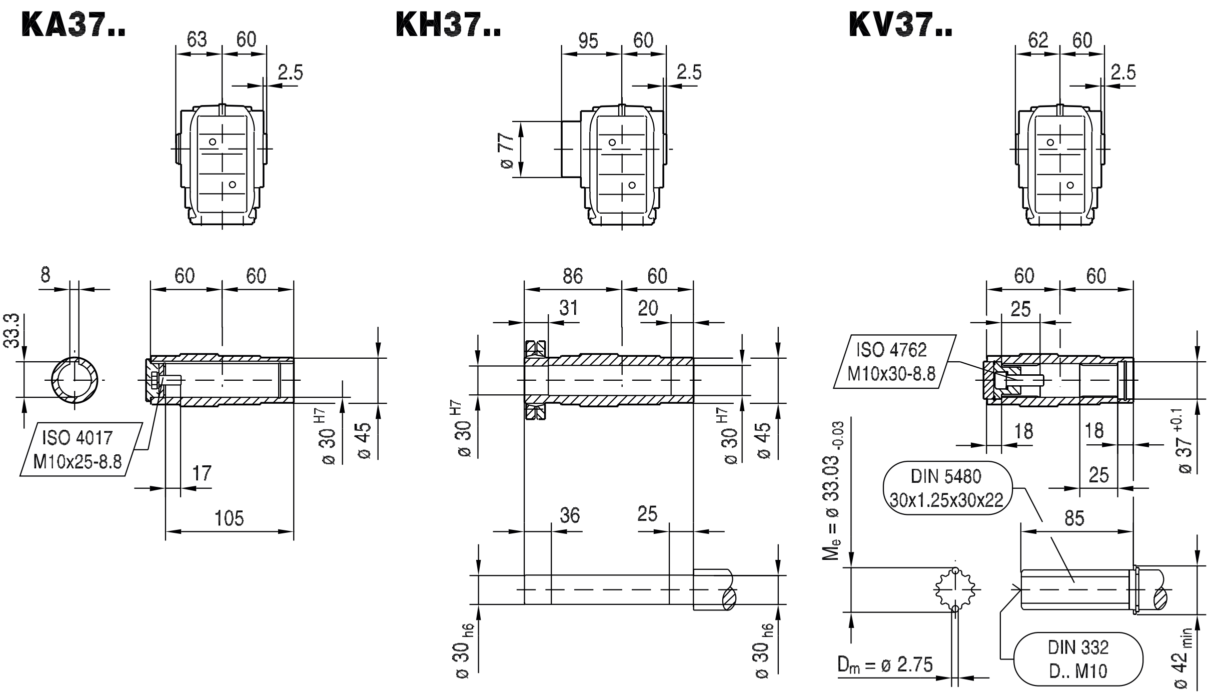

(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	354	356	395	434	391	441	494	383	411
LS	384	385	424	463	419	469	523	448	476
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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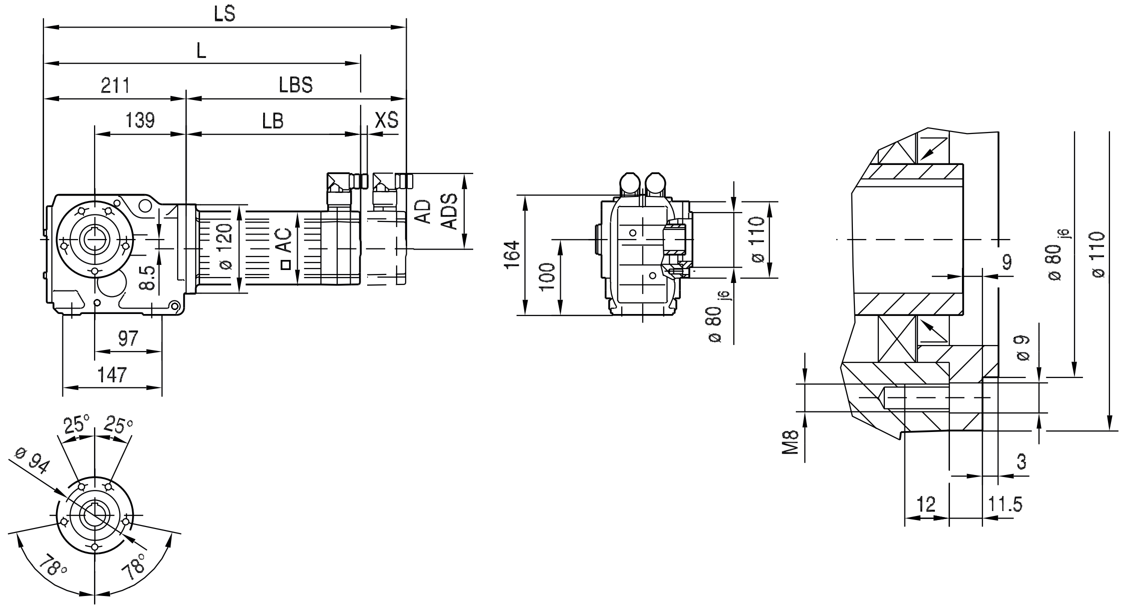
KAZ37..

33 012 01 07



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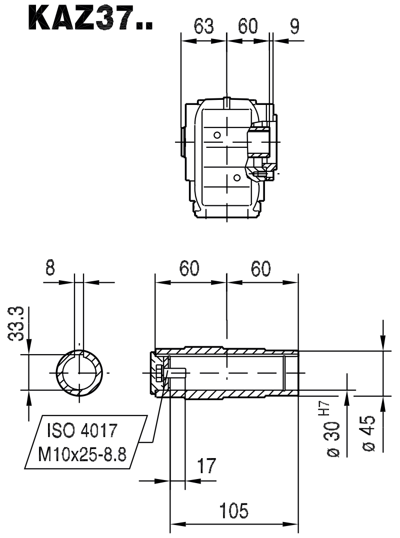

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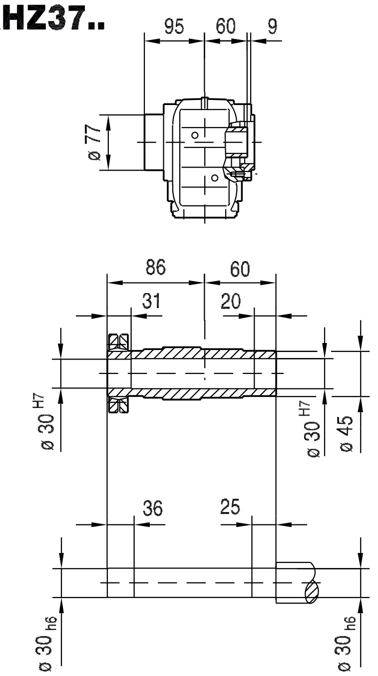

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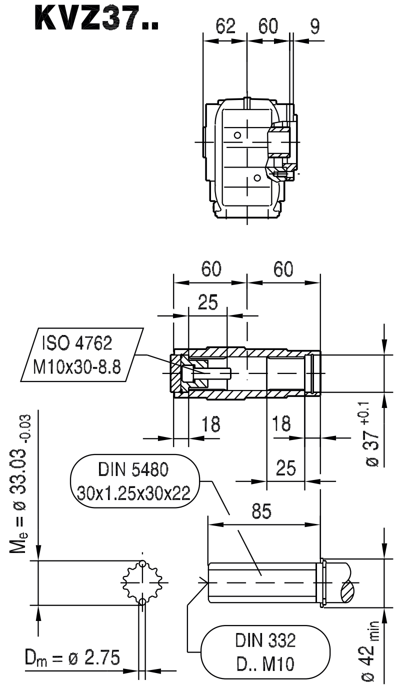

(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	354	356	395	434	391	441	494	383	411
LS	384	385	424	463	419	469	523	448	476
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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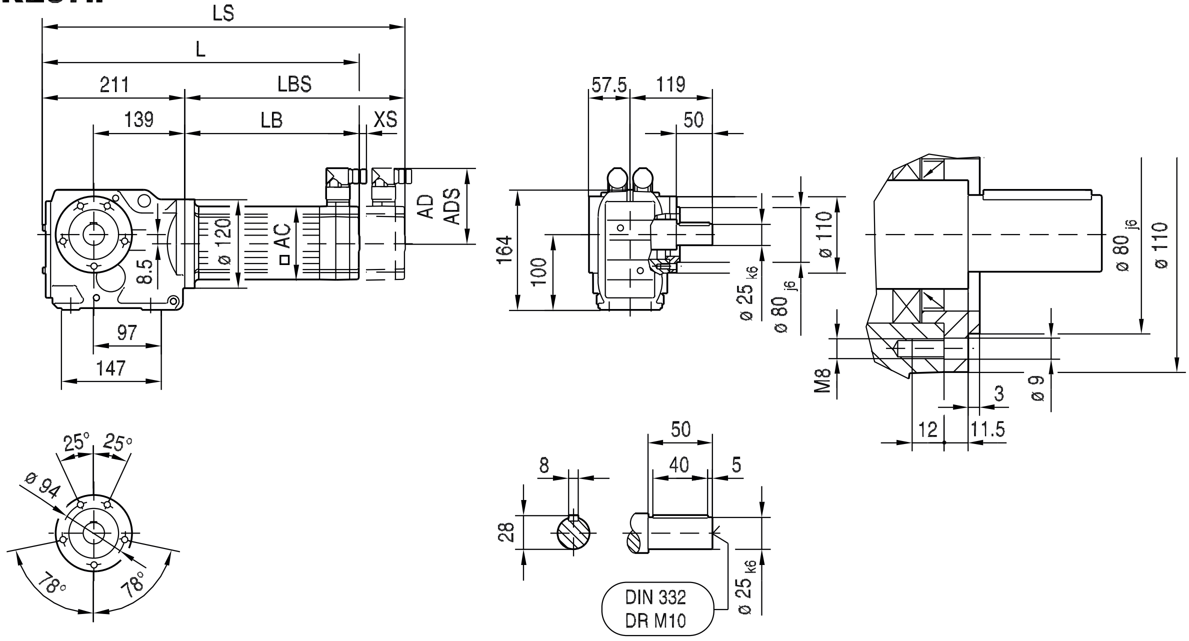
KZ37..

33 003 00 16



(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	354	356	395	434	391	441	494	383	411
LS	384	385	424	463	419	469	523	448	476
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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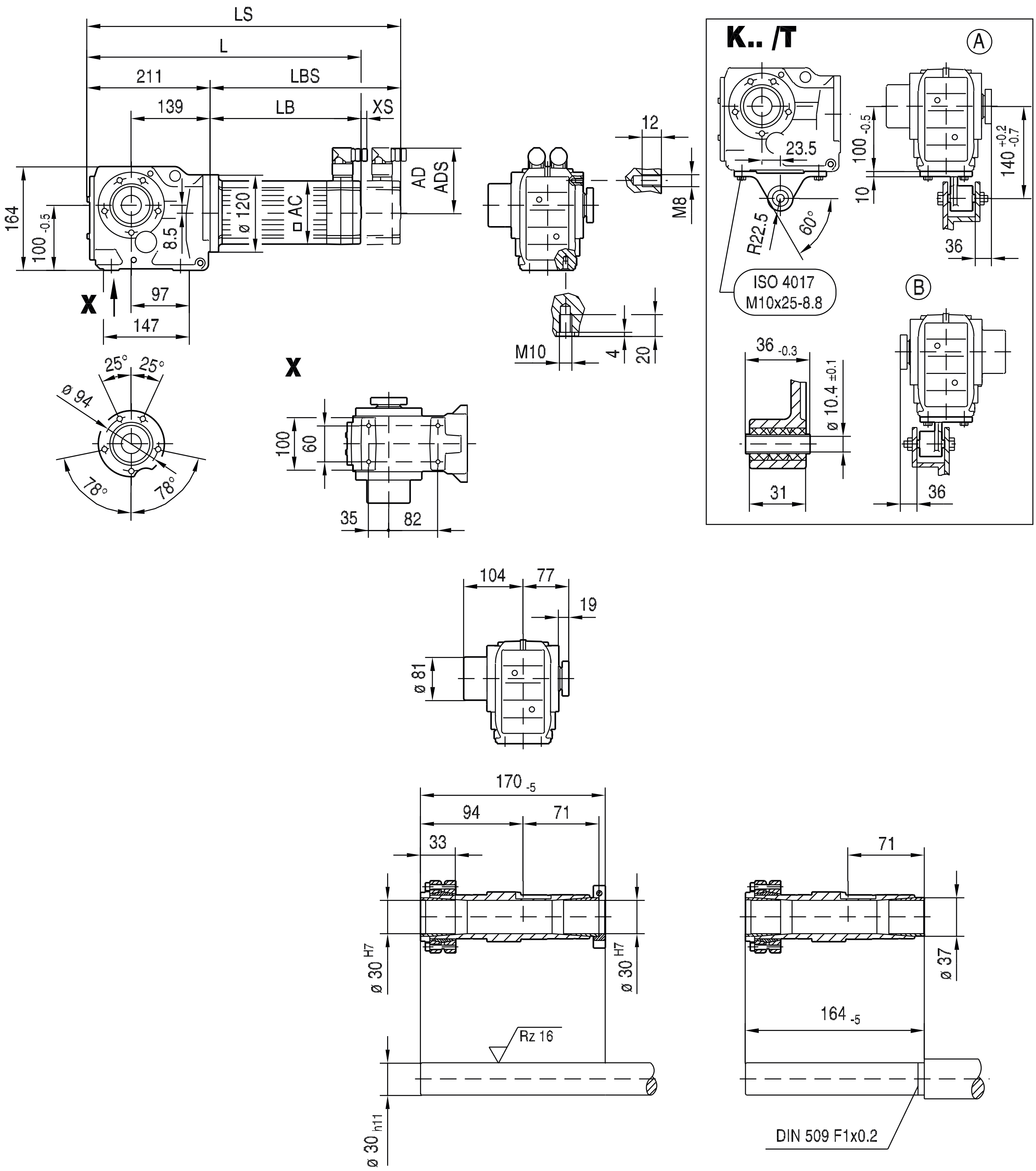
KT37..

33 013 02 07



(→ 194)	CMP..								
	40M	50S	50M	50L	63S	63M	63L	71S	71M
AC	57	73	73	73	88	88	88	116	116
AD	78	86	86	86	92	92	92	102	102
ADS	78	86	86	86	92	92	92	104	104
L	354	356	395	434	391	441	494	383	411
LS	384	385	424	463	419	469	523	448	476
LB	143	145	184	223	180	230	283	172	200
LBS	173	174	213	252	208	258	312	237	265
XS	19	18	18	18	14	14	14	11	11

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10.2.4 K39..

K39, M_{aDyn} Nm										300 Nm
	CMP									
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
					2					
2.81		27	41	30	57	81	51	82	125	112
3.94		39	58	42	81	115	73	116	177	159
4.52	23	45	67	48	93	132	83	134	200	183
5.22	26	52	77	56	107	152	96	154	235	210
5.75	29	57	85	61	118	168	106	170	255	230
6.75	34	67	100	72	139	197	124	200	300	270
7.15	36	71	106	76	147	205	132	210	320	285
8.12	41	80	120	87	167	235	150	240	365	325
9.00	45	89	133	96	185	260	166	265	>385	360
10.61	53	105	157	113	215	305	196	310		
12.09	60	120	179	129	245		220			
12.73	64	126	188	136	260		230			
13.44		126	188	136	260	370	230	375	>405	>405
15.44	73	145	215	156	300	>410	265	>410	>410	>410
17.83	84	167	245	180	345	>410	310	>410	>410	>410
19.62	93	184	270	198	380	>410	340	>410	>410	>410
23.04	109	215	320	230	>410	>410	400	>410	>410	>410
24.40	115	225	340	245	>410	>410	>410	>410	>410	>410
27.73	131	255	385	280	>410	>410	>410	>410	>410	>410
30.72	145	285	>410	310	>410	>410	>410	>410	>410	>410
36.22	171	335	>410	365	>410	>410	>410	>410		
41.28	195	385	>410	>410	>410		>410			
43.45	205	405	>410	>410	>410		>410			
49.69	235	>410		>410						
58.24	275									

(→ 190)

K39, m kg										
	CMP									
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
2	20	21	22	22	24	25	25	27	29	32
KF: + 1.5 kg / KA: + -1.0 kg / KAF: + 0.50 kg										

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CMP..				c_{TG}			
		n_{epk}	η	K	KF	KA	KAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
K39 2	2.81	4500	95	15	14	30	30
	3.94	4500	96	15	14	30	30
	4.52	4500	96	15	14	30	30
	5.22	4500	96	15	14	30	30
	5.75	4500	96	15	14	30	30
	6.75	4500	96	15	14	30	30
	7.15	4500	96	15	14	30	30
	8.12	4500	96	15	14	30	30
	9.00	4500	96	15	14	30	30
	10.61	4500	96	15	14	37	37
	12.09	4500	96	15	14	37	37
	12.73	4500	96	15	14	37	37
	13.44	4500	91	20	19	67	67
	15.44	4500	91	20	19	67	67
	17.83	4500	91	20	19	67	67
	19.62	4500	91	20	19	67	67
	23.04	4500	91	20	19	67	67
	24.40	4500	91	20	19	67	67
	27.73	4500	91	20	19	67	67
	30.72	4500	91	20	19	67	67
	36.22	4500	91	20	19	67	67
	41.28	4500	91	20	19	67	67
	43.45	4500	91	20	19	67	67
	49.69	4500	91	20	19	67	67
	58.24	4500	91	20	19	67	67

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CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400	M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
K39 2	2.81	170	255	285	811	7.9	2870	2460	2180	2180	7500	6260	7500	7500
	3.94	215	320	365	378	4.6	3070	2630	2260	2260	7500	6180	7500	7500
	4.52	240	360	405	257	3.6	3130	2680	1730	1730	7500	6130	7500	7500
	5.22	260	390	440	192	2.9	3240	2770	960	960	7500	6090	7500	7500
	5.75	275	410	465	158	2.5	3300	2830	290	290	7470	6060	7500	7500
	6.75	300	435	510	130	2.0	3430	2940	0	0	7300	6020	7500	7500
	7.15	300	435	510	129	1.8	3530	3020	157	157	7300	6020	7500	7500
	8.12	300	385	510	193	1.4	3760	3220	2080	2080	7500	6090	7500	7500
	9.00	300	385	510	192	1.2	3950	3380	2860	2860	7500	6090	7500	7500
	10.61	285	370	485	218	0.91	4360	3730	3250	3250	7500	6110	7500	7500
	12.09	255	295	430	464	0.65	4790	4110	3700	3700	7500	6210	7500	7500
	12.73	250	295	425	463	0.58	4930	4220	3830	3830	7500	6210	7500	7500
	13.44	270	405	455	27	2.6	4160	3560	2830	2830	7500	5980	7500	7500
	15.44	280	410	475	26	2.2	4380	3750	2990	2990	7490	5960	7500	7500
	17.83	290	410	490	25	1.8	4630	3960	3180	3180	7490	5960	7500	7500
	19.62	295	410	500	25	1.5	4820	4120	3330	3330	7490	5960	7500	7500
	23.04	300	410	510	24	1.3	5180	4440	3630	3630	7490	5960	7500	7500
	24.40	300	410	510	24	1.2	5330	4560	3760	3760	7490	5960	7500	7500
	27.73	300	410	510	24	0.95	5670	4860	4070	4070	7490	5960	7500	7500
	30.72	300	410	510	24	0.82	5960	5100	4320	4320	7490	5960	7500	7500
	36.22	300	410	510	23	0.65	6440	5520	4740	4740	7490	5960	7500	7500
	41.28	300	410	510	23	0.44	6840	5860	5100	5100	7490	5960	7500	7500
	43.45	300	410	510	23	0.39	7000	6000	5240	5240	7490	5960	7500	7500
	49.69	300	410	510	23	0.32	7440	6150	5630	5630	7490	5960	7500	7500
	58.24	300	410	510	23	0.26	7500	6150	6110	6110	7490	5960	7500	7500

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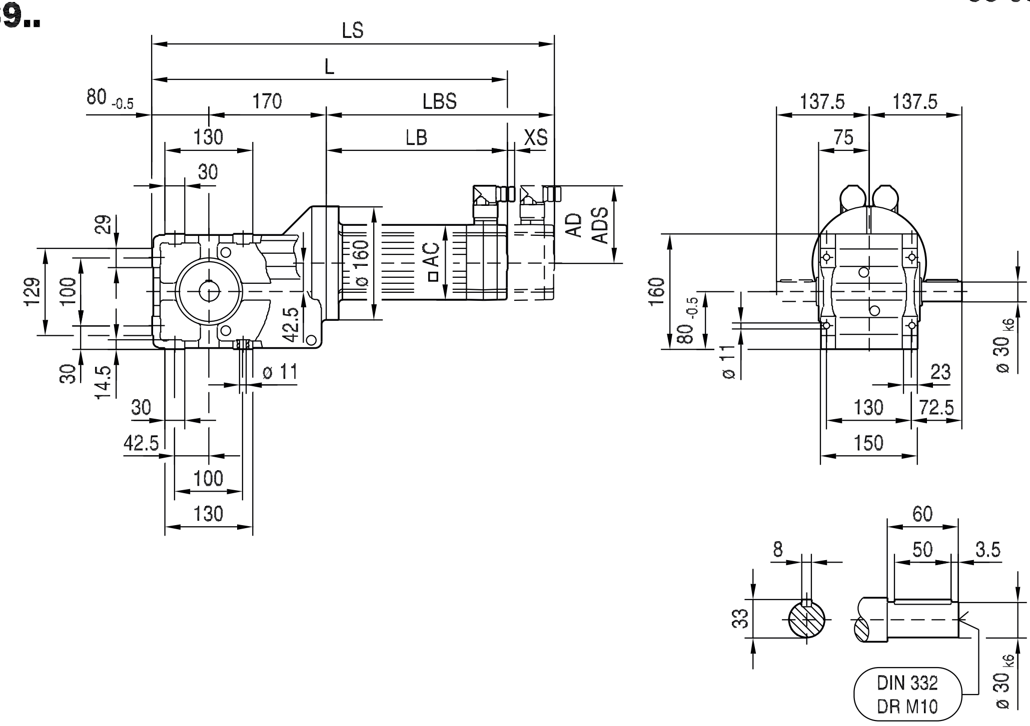
33 036 00 15

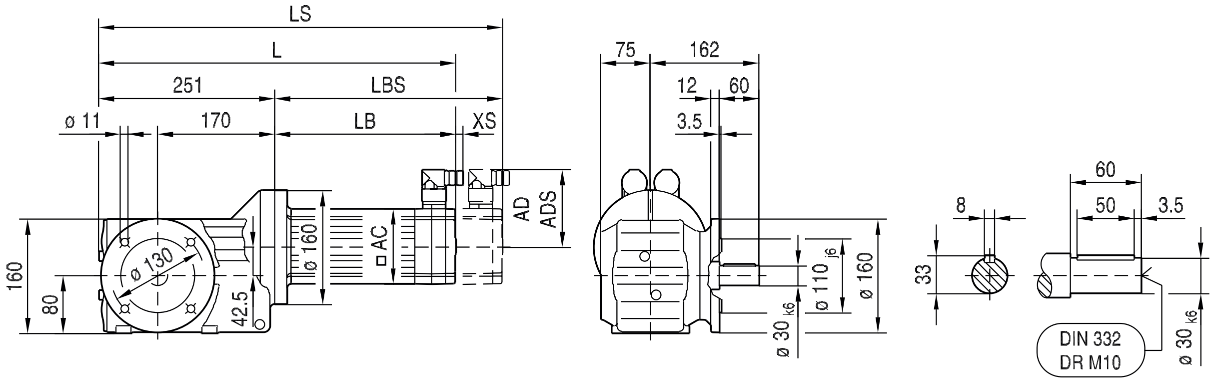
K39..



(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	389	428	467	423	473	523	416	441	491	456
LS	418	457	496	452	502	552	481	506	556	534
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

33 037 01 15

KF39..



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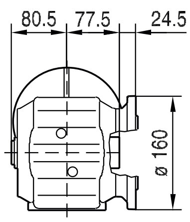
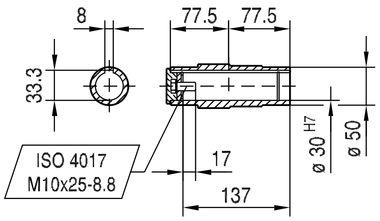
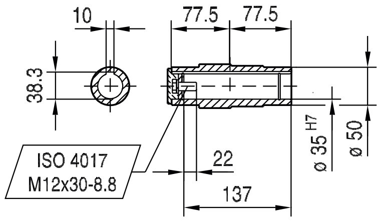


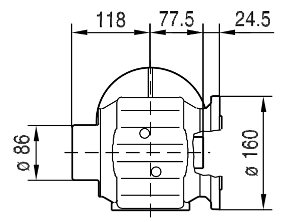
ø 30 H7

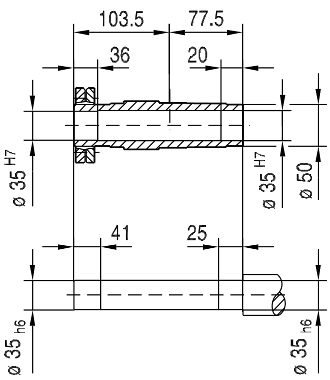


ø 35 H7



KHF39..





(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	390	429	468	424	474	524	417	442	492	457
LS	419	458	497	453	503	553	482	507	557	535
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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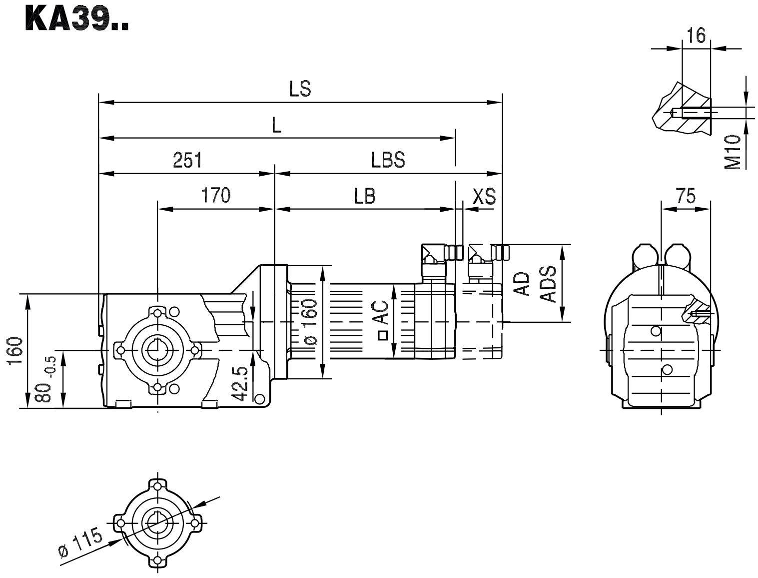
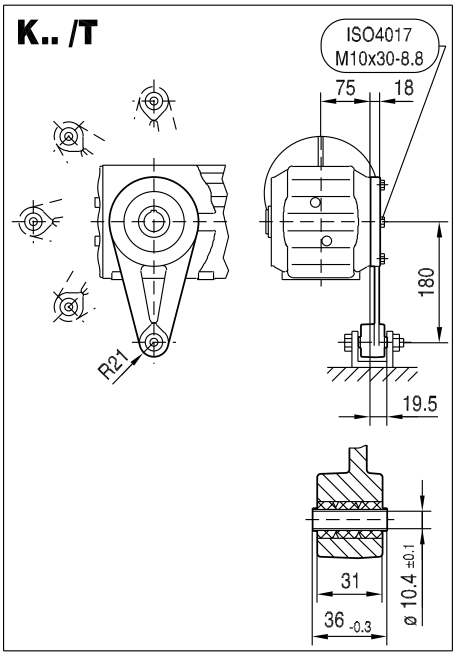
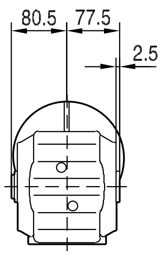
KA39..

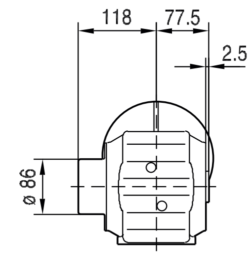




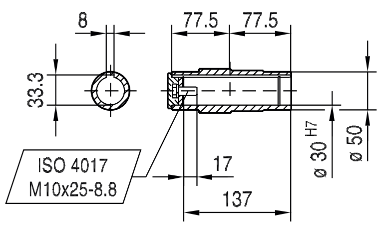
KA39..



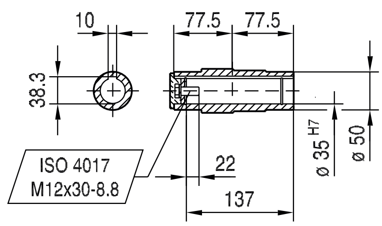
KH39..

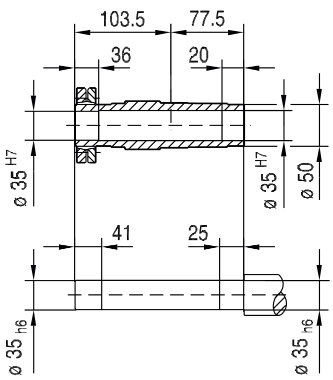


ø 30 H7



ø 35 H7





(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	390	429	468	424	474	524	417	442	492	457
LS	419	458	497	453	503	553	482	507	557	535
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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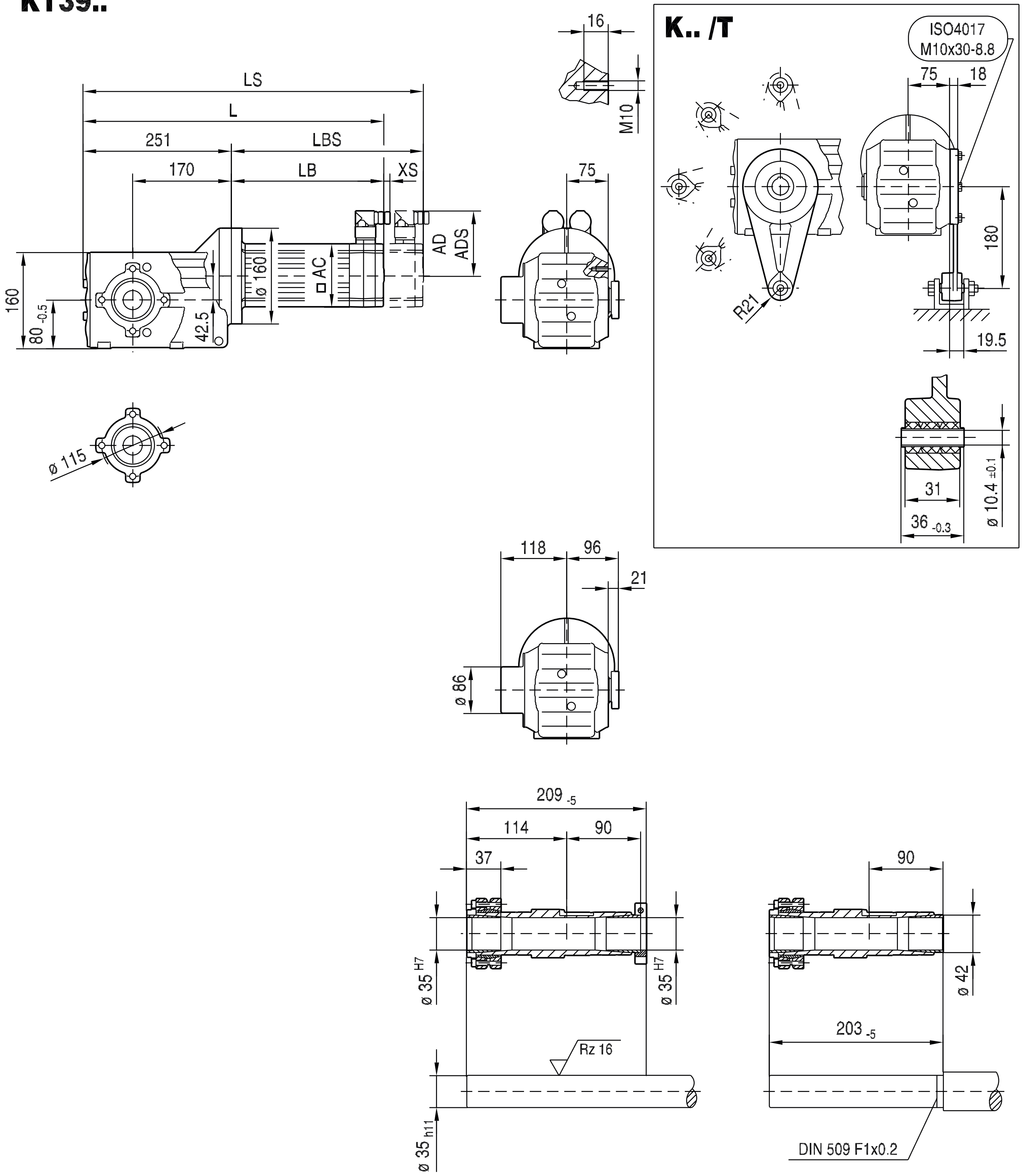
KT39..



(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	390	429	468	424	474	524	417	442	492	457
LS	419	458	497	453	503	553	482	507	557	535
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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10.2.5 K47..

K47, M_{aDyn} Nm											400 Nm
	CMP										
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
						3					
4.64		46	69	49	95	135	86	137	205	188	189
5.81	29	57	86	62	119	170	107	172	260	230	235
6.58	33	65	97	70	135	192	121	195	295	265	265
7.36	37	73	109	78	151	210	136	215	>310	295	300
8.56	43	85	127	91	176	245	158	250	>310	>310	>310
9.10	45	90	135	97	187	265	168	265	>310	>310	>310
10.56	53	104	156	113	215	305	195	310	>315	>315	>315
11.77	59	116	174	125	240	>315	215	>315	>315	>315	>315
12.19	61	121	180	130	250	355	220	360	>435	>435	>435
13.65	68	135	200	145	280	395	250	400	>435	>435	>435
15.86	79	157	230	169	325	>435	290	>435	>435	>435	>435
16.86	84	167	245	180	345	>435	310	>435	>435	>435	>435
19.58	98	194	285	205	400	>435	360	>435	>435	>435	>435
21.81	109	215	320	230	>435	>435	400	>435	>435	>435	>435
24.06	120	235	355	255	>435		>435				
25.91	129	255	380	275	>435	>435	>435	>435			
29.32	146	285	430	310	>435		>435				
31.30	156	305	>435	330	>435		>435				
35.39	173	340	>435	365	>435	>435	>435	>435	>435	>435	>435
39.61	194	380	>435	410	>435	>435	>435	>435	>435	>435	>435
46.03	220	>435	>435	>435	>435	>435	>435	>435	>435	>435	>435
48.95	235	>435	>435	>435	>435	>435	>435	>435	>435	>435	>435
56.83	275	>435	>435	>435	>435	>435	>435	>435	>435	>435	>435
63.30	305	>435	>435	>435	>435	>435	>435	>435	>435	>435	>435
69.84	340	>435	>435	>435	>435		>435				
75.20	365	>435	>435	>435	>435	>435	>435	>435			
85.12	415	>435	>435	>435	>435		>435				
90.86	>435	>435	>435	>435	>435		>435				
104.37	>435	>435		>435							
121.48	>435										
131.87	>435										

(→ 190)

K47, m kg											
	CMP										
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
3	21	22	23	23	25	26	27	28	30	33	35
KF: + 3.2 kg / KA: + -0.85 kg / KAF: + 2.0 kg											

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CMP..				c_{TG}				φ
		n_{epk}	η	K	KF	KA	KAF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
	4.64	4500	96	26	23	50	50	12
	5.81	4500	96	26	23	50	50	12
	6.58	4500	96	26	23	50	50	12
	7.36	4500	96	26	23	50	50	11
	8.56	4500	96	26	23	50	50	11
	9.10	4500	96	26	23	50	50	11
	10.56	4500	96	26	23	50	50	11
	11.77	4500	96	26	23	50	50	10
	12.19	4500	96	33	29	90	90	8
	13.65	4500	96	33	29	90	90	8
	15.86	4500	96	33	29	90	90	8
	16.86	4500	96	33	29	90	90	8
	19.58	4500	96	33	29	90	90	8
	21.81	4500	96	33	29	90	90	8
K47	24.06	4500	96	33	29	90	90	8
3	25.91	4500	96	33	29	90	90	8
	29.32	4500	96	33	29	90	90	8
	31.30	4500	96	33	29	90	90	7
	35.39	4500	94	36	32	117	117	7
	39.61	4500	94	36	32	117	117	7
	46.03	4500	94	36	32	117	117	7
	48.95	4500	94	36	32	117	117	7
	56.83	4500	94	36	32	117	117	7
	63.30	4500	94	36	32	117	117	6
	69.84	4500	94	36	32	117	117	6
	75.20	4500	94	36	32	117	117	6
	85.12	4500	94	36	32	117	117	6
	90.86	4500	94	36	32	117	117	6
	104.37	4500	93	36	32	117	117	6
	121.48	4500	93	36	32	117	117	6
	131.87	4500	93	36	32	117	117	6

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg{*}m^2$	N	N	N	N	N	N	N	N
K47 3	4.64	205	300	345	302	4.4	2980	2970	2040	2040	7060	7060	10000	10000
	5.81	230	305	390	258	3.6	3140	3140	2100	2100	7020	7020	10000	10000
	6.58	240	310	405	228	2.8	3270	3270	2190	2190	6970	6970	10000	10000
	7.36	250	310	425	217	2.3	3380	3390	2270	2270	6970	6970	10000	10000
	8.56	270	310	455	175	1.8	3500	3520	2310	2310	6970	6970	10000	10000
	9.10	280	310	475	165	1.6	3540	3560	2310	2310	6970	6970	10000	10000
	10.56	280	315	475	170	1.2	3830	3840	2580	2580	6920	6920	10000	10000
	11.77	280	315	475	178	1.0	4060	4050	2770	2770	6920	6920	10000	10000
	12.19	350	435	595	279	2.4	3720	3770	2330	2330	900	900	10000	10000
	13.65	360	435	610	249	2.0	3890	3940	2450	2450	900	900	10000	10000
	15.86	380	435	645	208	1.6	4080	4130	2570	2570	900	900	10000	10000
	16.86	380	435	645	214	1.4	4220	4270	2690	2690	900	900	10000	10000
	19.58	400	435	680	179	1.1	4440	4480	2820	2820	900	900	10000	10000
	21.81	400	435	680	179	0.91	4710	4740	3070	3070	900	900	10000	10000
	24.06	400	435	680	179	0.75	4970	4990	3300	3300	900	900	10000	10000
	25.91	400	435	680	178	0.68	5170	5180	3470	3470	900	900	10000	10000
	29.32	400	435	680	177	0.55	5520	5500	3780	3780	900	900	10000	10000
	31.30	400	435	680	179	0.50	5700	5680	3940	3940	900	900	10000	10000
	35.39	400	435	680	93	1.3	5920	5920	4270	4270	900	900	10000	10000
	39.61	400	435	680	96	1.1	5920	5920	4580	4580	900	900	10000	10000
	46.03	400	435	680	100	0.88	5920	5920	5000	5000	900	900	10000	10000
	48.95	400	435	680	100	0.80	5920	5920	5190	5190	900	900	10000	10000
	56.83	400	435	680	104	0.64	5920	5920	5640	5640	900	900	10000	10000
	63.30	400	435	680	104	0.54	5920	5920	5990	5990	900	900	10000	10000
	69.84	400	435	680	100	0.45	5920	5920	6320	6320	900	900	10000	10000
	75.20	400	435	680	93	0.42	5920	5920	6570	6570	900	900	10000	10000
	85.12	400	435	680	82	0.35	5920	5920	7000	7000	900	900	10000	10000
	90.86	400	435	680	77	0.32	5920	5920	7240	7240	900	900	10000	10000
	104.37	400	435	680	67	0.26	5920	5920	7760	7760	900	900	10000	10000
	121.48	400	435	680	58	0.21	5920	5920	8360	8360	900	900	10000	10000
	131.87	400	435	680	53	0.18	5920	5920	8700	8700	900	900	10000	10000

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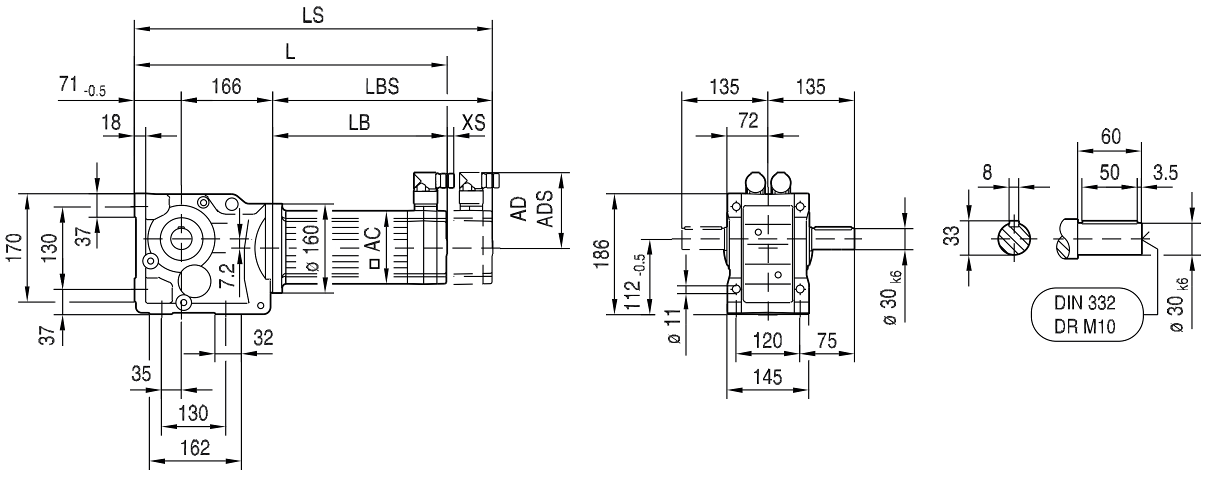
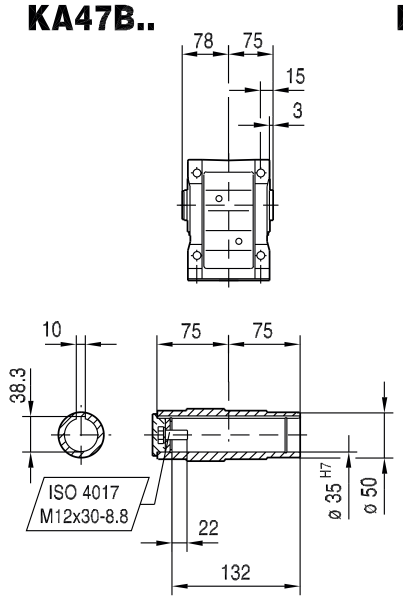
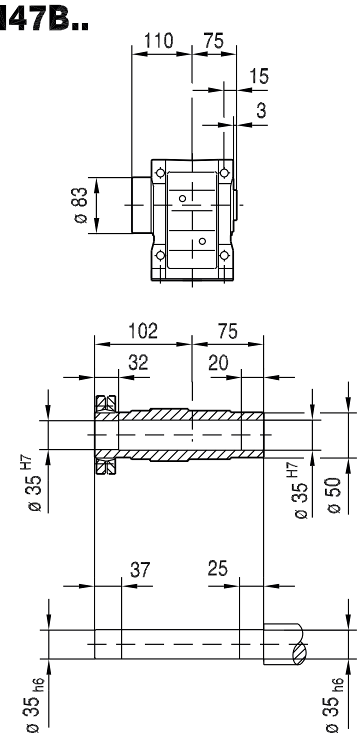
K47..



KA47B..



KH47B..



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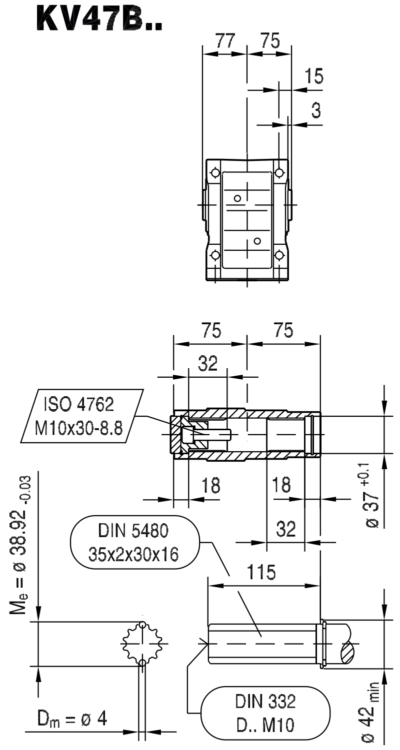

(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	376	415	454	410	460	510	403	428	478	443
LS	405	444	483	439	489	539	468	493	543	521
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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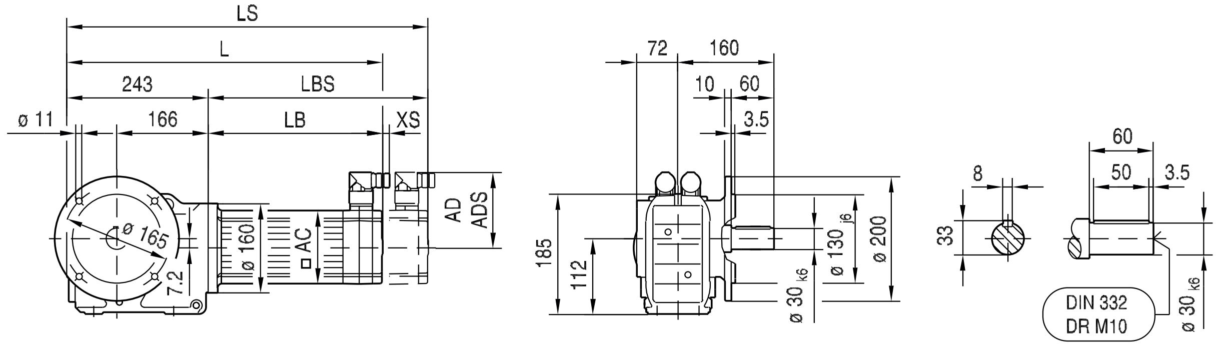
KF47..



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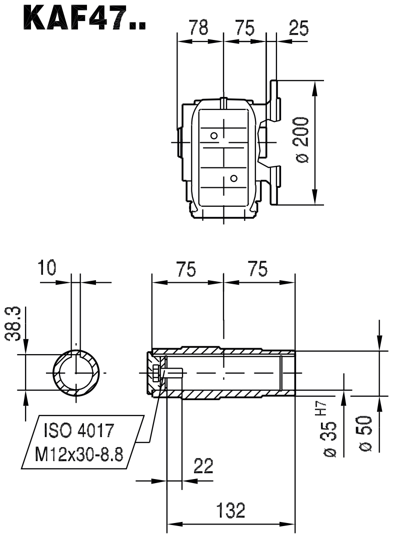

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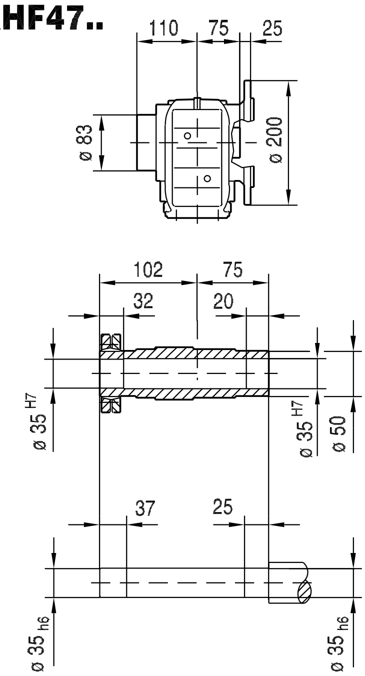

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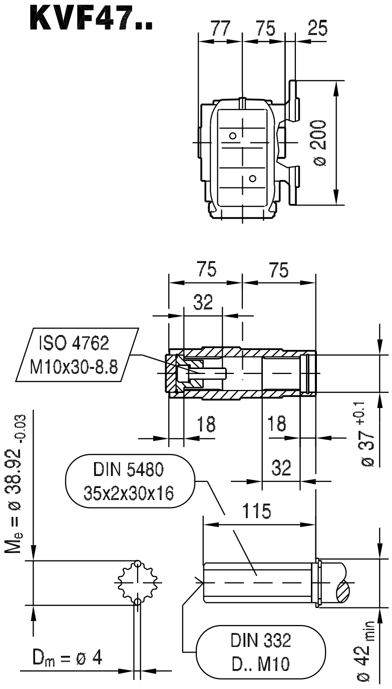

(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	382	421	460	416	466	516	409	434	484	449
LS	411	450	489	445	495	545	474	499	549	527
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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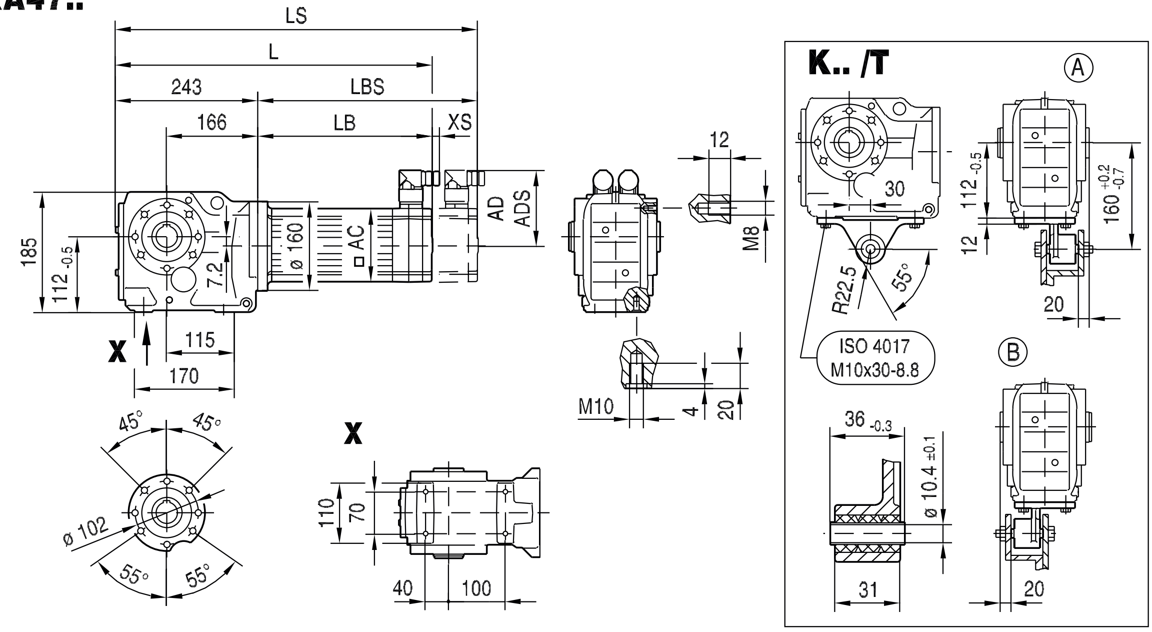
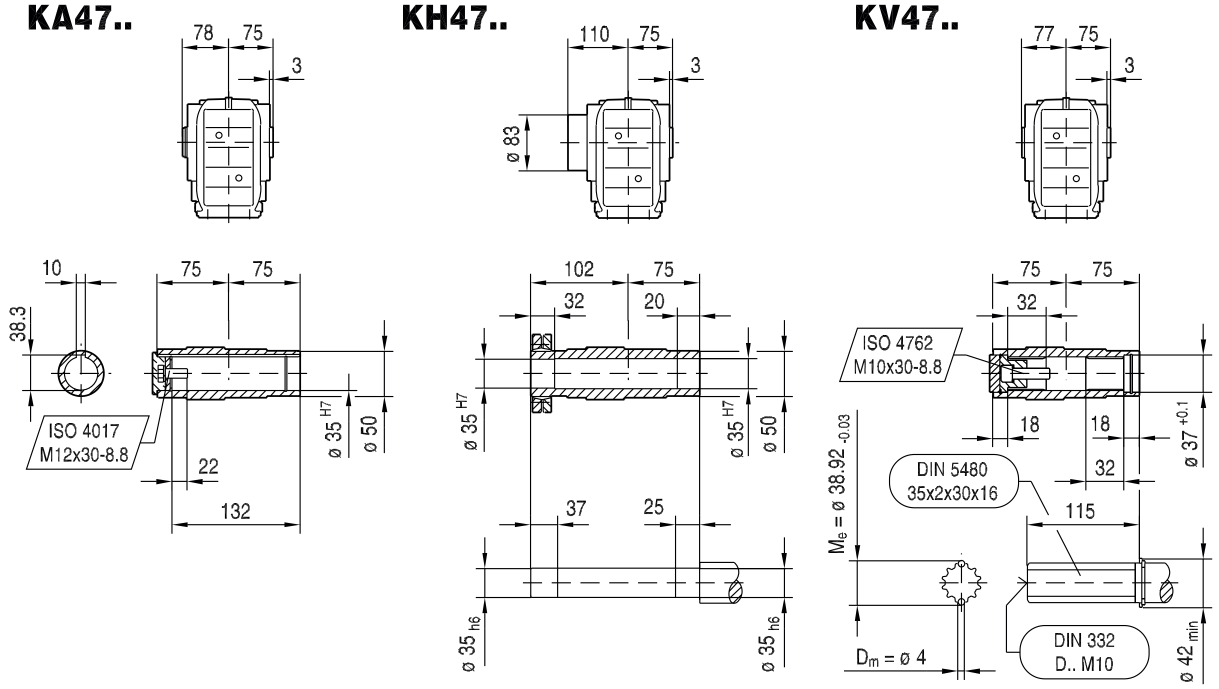
KA47.. 33 016 02 07



KA47.. KH47.. KV47..



(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	382	421	460	416	466	516	409	434	484	449
LS	411	450	489	445	495	545	474	499	549	527
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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KAZ47..

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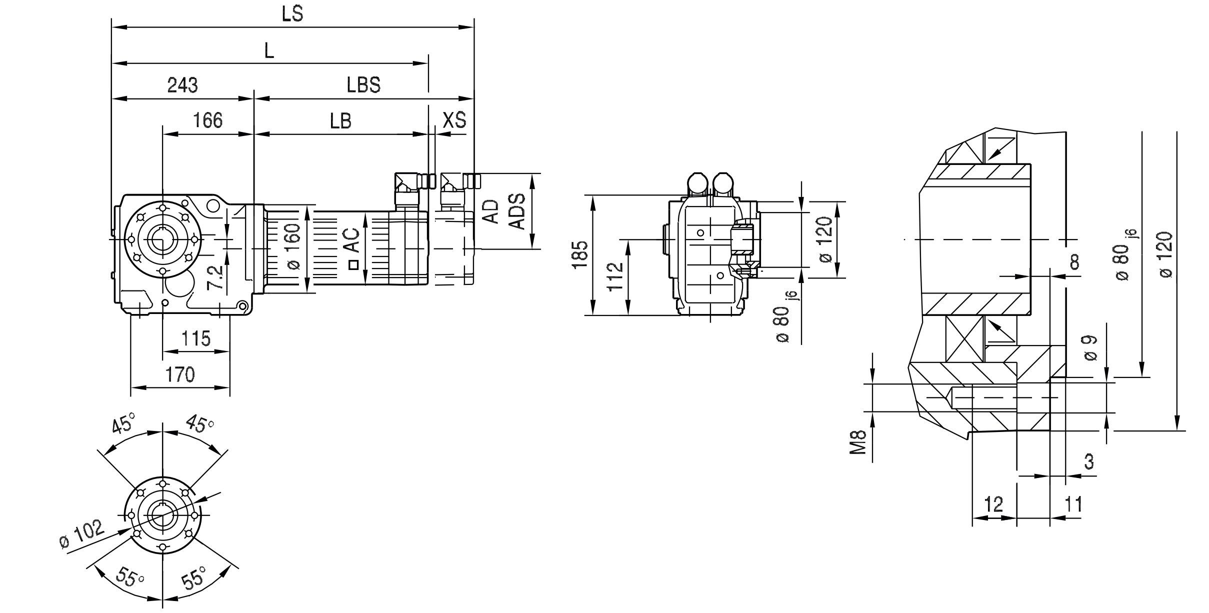
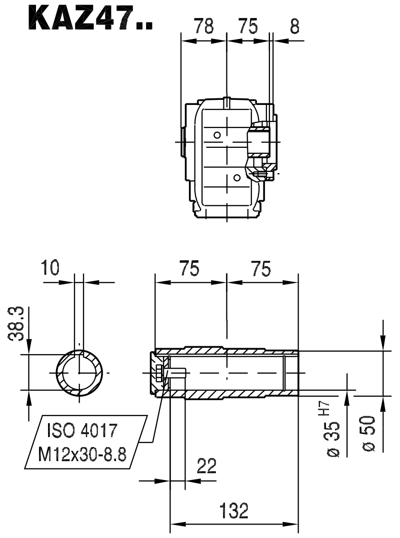


KAZ47..



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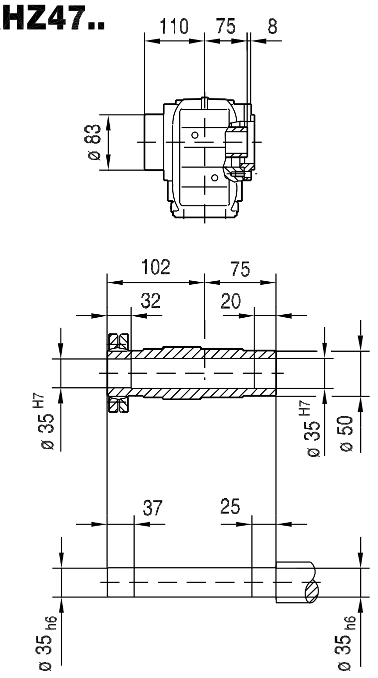
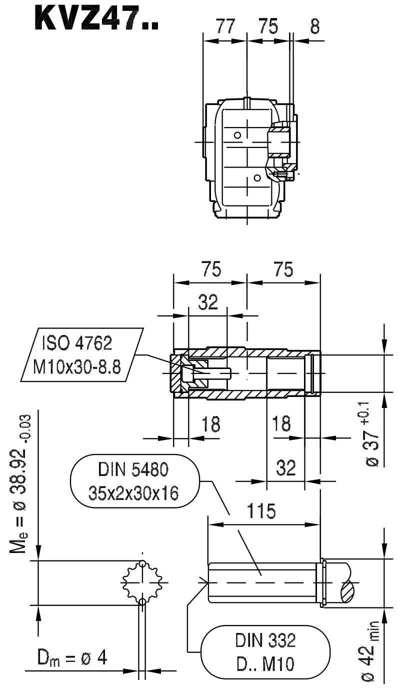


KVZ47..



(→ 🗎 194)	CMP..									
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AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	382	421	460	416	466	516	409	434	484	449
LS	411	450	489	445	495	545	474	499	549	527
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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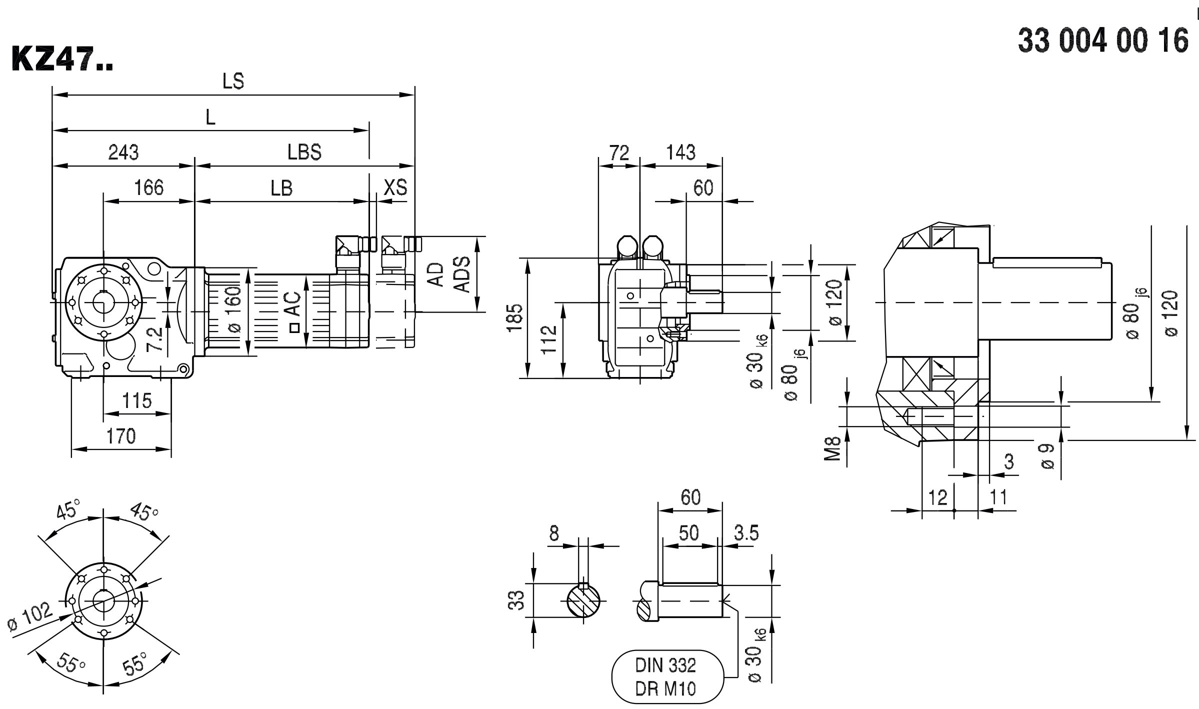
KZ47..

33 004 00 16



(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	382	421	460	416	466	516	409	434	484	449
LS	411	450	489	445	495	545	474	499	549	527
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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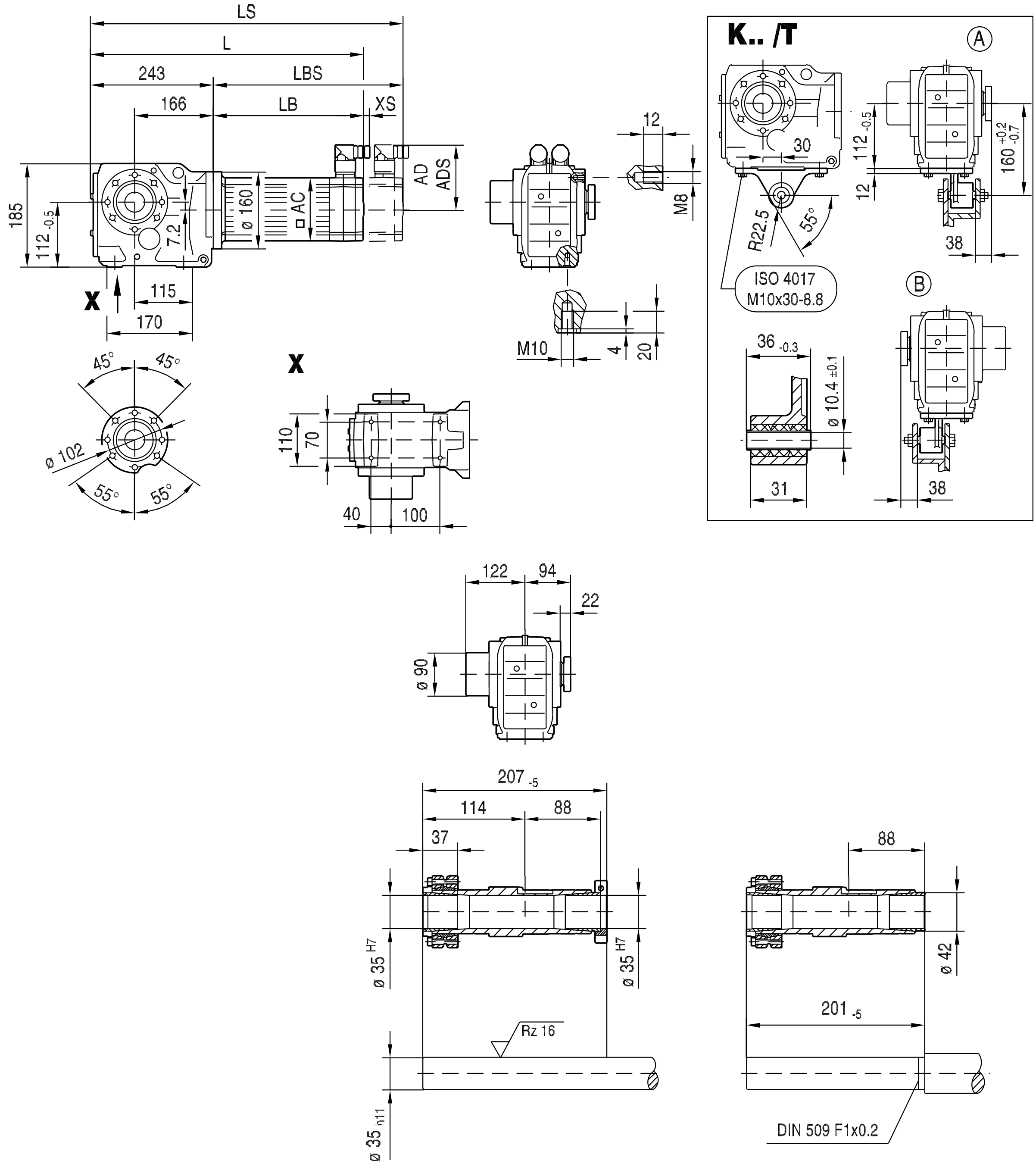
KT47..

33 018 03 07



(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	382	421	460	416	466	516	409	434	484	449
LS	411	450	489	445	495	545	474	499	549	527
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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10.2.6 K49..

K49, M_{aDyn} Nm									500 Nm
	CMP								
i	63S	63M	63L	71S	71M	71L	80S	80M	100S
					2				
4.00	43	82	117	74	118	180	162	240	260
4.69	50	96	137	86	139	210	190	280	305
5.29	56	109	154	98	156	235	210	315	345
5.99	64	123	175	110	177	265	240	355	390
6.83	73	140	199	126	200	305	275	410	445
7.58	81	156	220	140	220	340	305	455	495
8.66	92	178	250	160	255	385	350	520	565
9.14	97	188	265	168	270	410	365	545	595
10.42	111	210	300	192	305	465	420		
11.37	121	230	330	205	335	510	455		
13.38	137	260	370	235	375	575	515	>605	>605
15.67	160	305	435	275	440	>605	>605	>605	>605
17.67	180	345	490	310	500	>605	>605	>605	>605
20.03	200	390	560	350	565	>605	>605	>605	>605
22.83	230	445	>605	400	>605	>605	>605	>605	>605
25.34	255	495	>605	445	>605	>605	>605	>605	>605
28.95	295	565	>605	510	>605	>605	>605	>605	>605
30.55	310	600	>605	535	>605	>605	>605	>605	>605
34.81	355	>605	>605	>605	>605	>605	>605		
37.98	385	>605	>605	>605	>605	>605	>605		
44.44	450	>605	>605	>605	>605				
50.29	510	>605		>605					
52.94	540	>605		>605					
60.27	>605								
70.19									
75.20									

(→ 🗎 190)

K49, m kg									
	CMP								
s	63S	63M	63L	71S	71M	71L	80S	80M	100S
2	33	35	36	38	40	42	43	45	50
KF: + 1.7 kg / KA: + -2.8 kg / KAF: + 2.1 kg									

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CMP..				c_{TG}			
	i	n_{epk} min^{-1}	η %	K Nm/'	KF Nm/'	KA Nm/'	KAF Nm/'
K49 2	4.00	4500	96	27	26	77	77
	4.69	4500	96	27	26	77	77
	5.29	4500	96	27	26	77	77
	5.99	4500	96	27	26	77	77
	6.83	4500	96	27	26	77	77
	7.58	4500	96	27	26	77	77
	8.66	4500	96	27	26	77	77
	9.14	4500	96	27	26	77	77
	10.42	4500	96	27	26	77	77
	11.37	4500	96	27	26	77	77
	13.38	4500	92	35	32	48	48
	15.67	4500	92	35	32	48	48
	17.67	4500	92	35	32	48	48
	20.03	4500	92	35	32	48	48
	22.83	4500	92	35	32	48	48
	25.34	4500	92	35	32	48	48
	28.95	4500	92	35	32	48	48
	30.55	4500	92	35	32	48	48
	34.81	4500	92	35	32	48	48
	37.98	4500	92	35	32	48	48
	44.44	4500	92	35	32	48	48
	50.29	4500	92	35	32	48	48
	52.94	4500	92	35	32	48	48
	60.27	4500	91	35	32	48	48
	70.19	4500	91	35	32	48	48
	75.20	4500	91	35	32	48	48

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	kg*m^2	N	N	N	N	N	N	N	N
K49 2	4.00	440	605	745	218	11	3110	2390	0	0	9000	9000	9000	9000
	4.69	465	605	790	217	8.8	3270	2600	0	0	9000	9000	9000	9000
	5.29	485	605	820	217	7.2	3400	2770	0	0	9000	9000	9000	9000
	5.99	500	605	850	219	5.9	3570	3030	0	0	9000	9000	9000	9000
	6.83	500	605	850	218	4.8	3840	3250	0	0	9000	9000	9000	9000
	7.58	500	605	850	218	4.1	4050	3440	1030	1030	9000	9000	9000	9000
	8.66	500	605	850	218	3.3	4340	3680	3790	3790	9000	9000	9000	9000
	9.14	500	605	850	218	3.1	4460	3780	3910	3910	9000	9000	9000	9000
	10.42	480	585	810	238	2.4	4860	4120	4330	4330	9000	9000	9000	9000
	11.37	495	605	840	218	2.1	5000	4240	4450	4450	9000	9000	9000	9000
	13.38	470	605	795	46	6.5	4320	3660	3510	3510	9000	9000	9000	9000
	15.67	490	605	830	45	5.2	4590	3890	3750	3750	9000	9000	9000	9000
	17.67	500	605	850	44	4.4	4860	4120	3990	3990	9000	9000	9000	9000
	20.03	500	605	850	43	3.7	5220	4420	4350	4350	9000	9000	9000	9000
	22.83	500	605	850	43	3.1	5610	4750	4750	4750	9000	9000	9000	9000
	25.34	500	605	850	42	2.8	5940	5030	5070	5070	9000	9000	9000	9000
	28.95	500	605	850	42	2.3	6370	5400	5510	5510	9000	9000	9000	9000
	30.55	500	605	850	42	2.1	6550	5550	5690	5690	9000	9000	9000	9000
	34.81	500	605	850	42	1.7	7000	5930	6140	6140	9000	9000	9000	9000
	37.98	500	605	850	41	1.5	7310	6200	6450	6450	9000	9000	9000	9000
	44.44	500	605	850	41	1.2	7900	6690	7040	7040	9000	9000	9000	9000
	50.29	500	605	850	41	0.83	8380	7100	7530	7530	9000	9000	9000	9000
	52.94	500	605	850	41	0.75	8590	7280	7730	7730	9000	9000	9000	9000
	60.27	500	605	850	41	0.61	9000	7740	8280	8280	9000	9000	9000	9000
	70.19	445	605	755	40	0.50	9000	8630	9000	9000	9000	9000	9000	9000
	75.20	475	605	800	41	0.43	9000	8720	9000	9000	9000	9000	9000	9000

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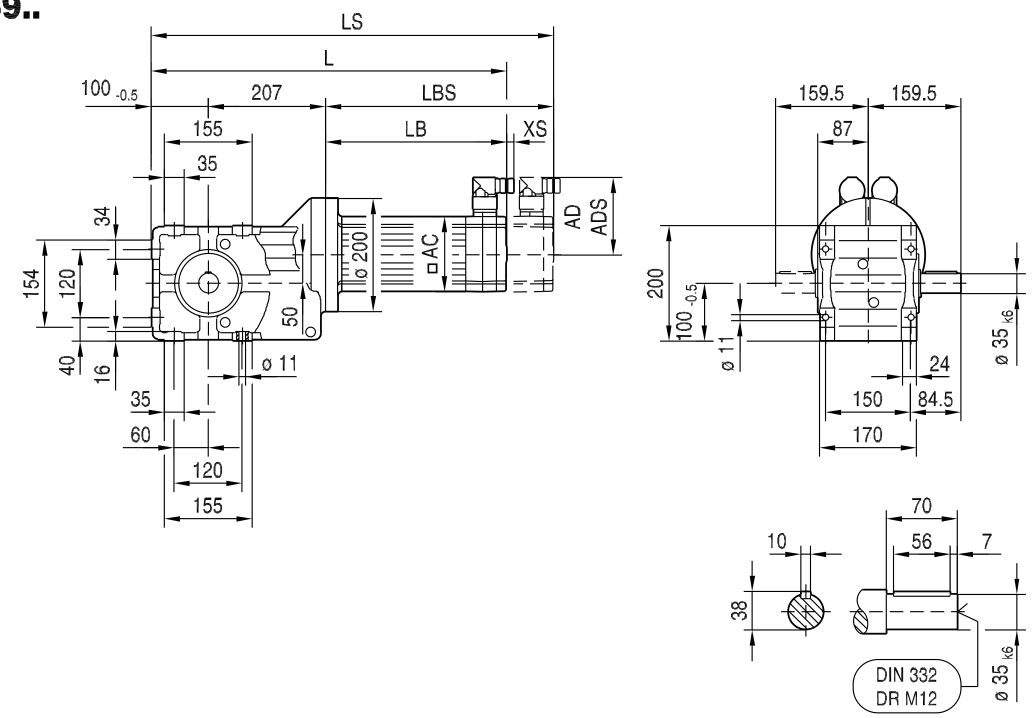
10

33 040 00 15

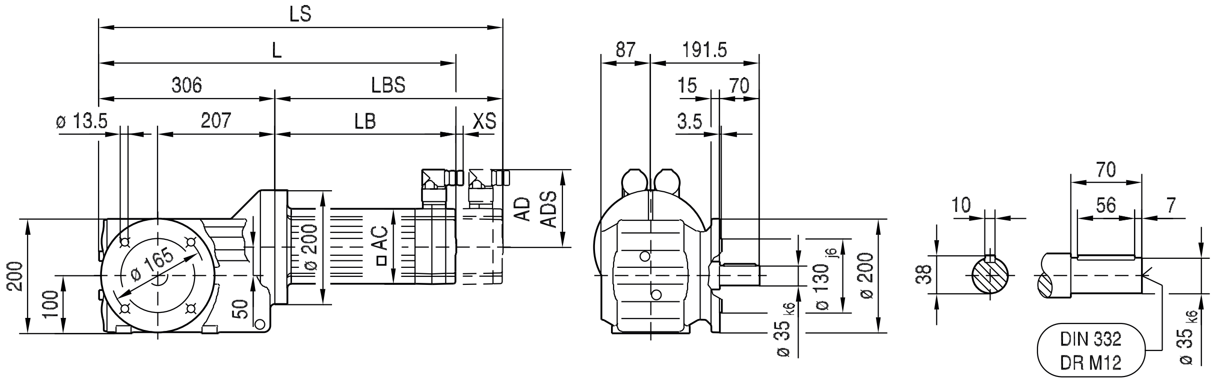
K49..



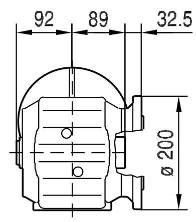
(→ 194)	CMP..								
	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	88	88	88	116	116	116	137	137	162
AD	92	92	92	102	102	102	134	134	146
ADS	92	92	92	104	104	104	137	137	147
L	474	524	574	465	490	540	505	539	537
LS	503	553	603	530	555	605	583	617	633
LB	167	217	267	158	183	233	198	232	230
LBS	196	246	296	223	248	298	276	310	326
XS	14	14	14	11	11	11	37	37	37

33 041 02 15

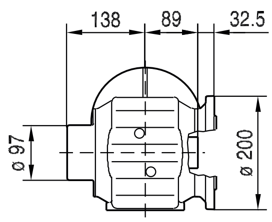
KF49..



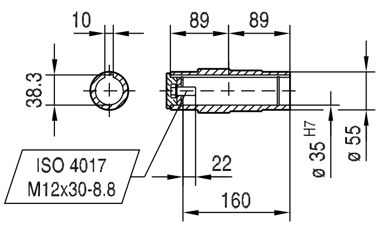
KAF49..



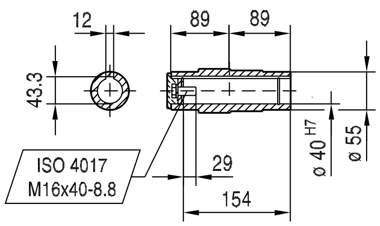
KHF49..

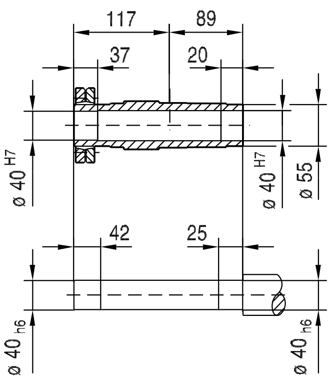


ø 35 H7



ø 40 H7





(→ 194)	CMP..								
	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	88	88	88	116	116	116	137	137	162
AD	92	92	92	102	102	102	134	134	146
ADS	92	92	92	104	104	104	137	137	147
L	473	523	573	464	489	539	504	538	536
LS	502	552	602	529	554	604	582	616	632
LB	167	217	267	158	183	233	198	232	230
LBS	196	246	296	223	248	298	276	310	326
XS	14	14	14	11	11	11	37	37	37

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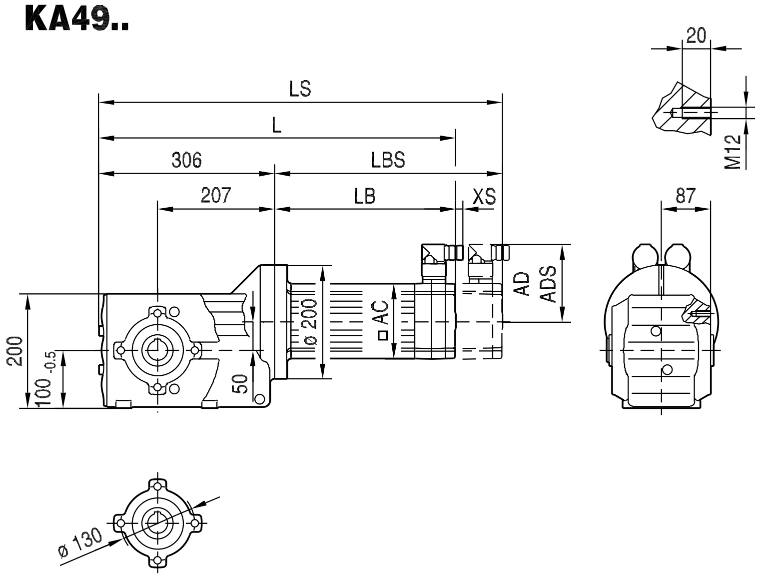
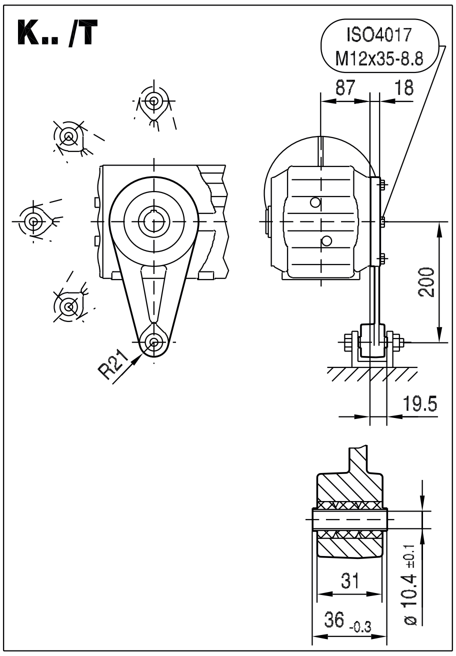
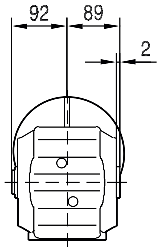
33 042 02 15

KA49..

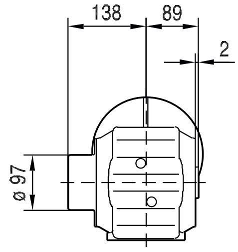




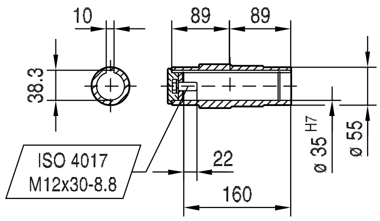
KA49..



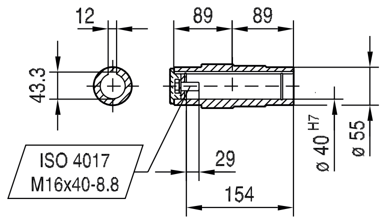
KH49..

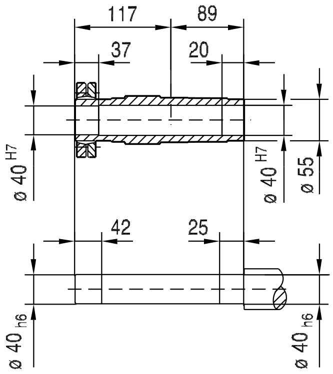


ø 35 H7



ø 40 H7





(→ 194)	CMP..								
	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	88	88	88	116	116	116	137	137	162
AD	92	92	92	102	102	102	134	134	146
ADS	92	92	92	104	104	104	137	137	147
L	473	523	573	464	489	539	504	538	536
LS	502	552	602	529	554	604	582	616	632
LB	167	217	267	158	183	233	198	232	230
LBS	196	246	296	223	248	298	276	310	326
XS	14	14	14	11	11	11	37	37	37

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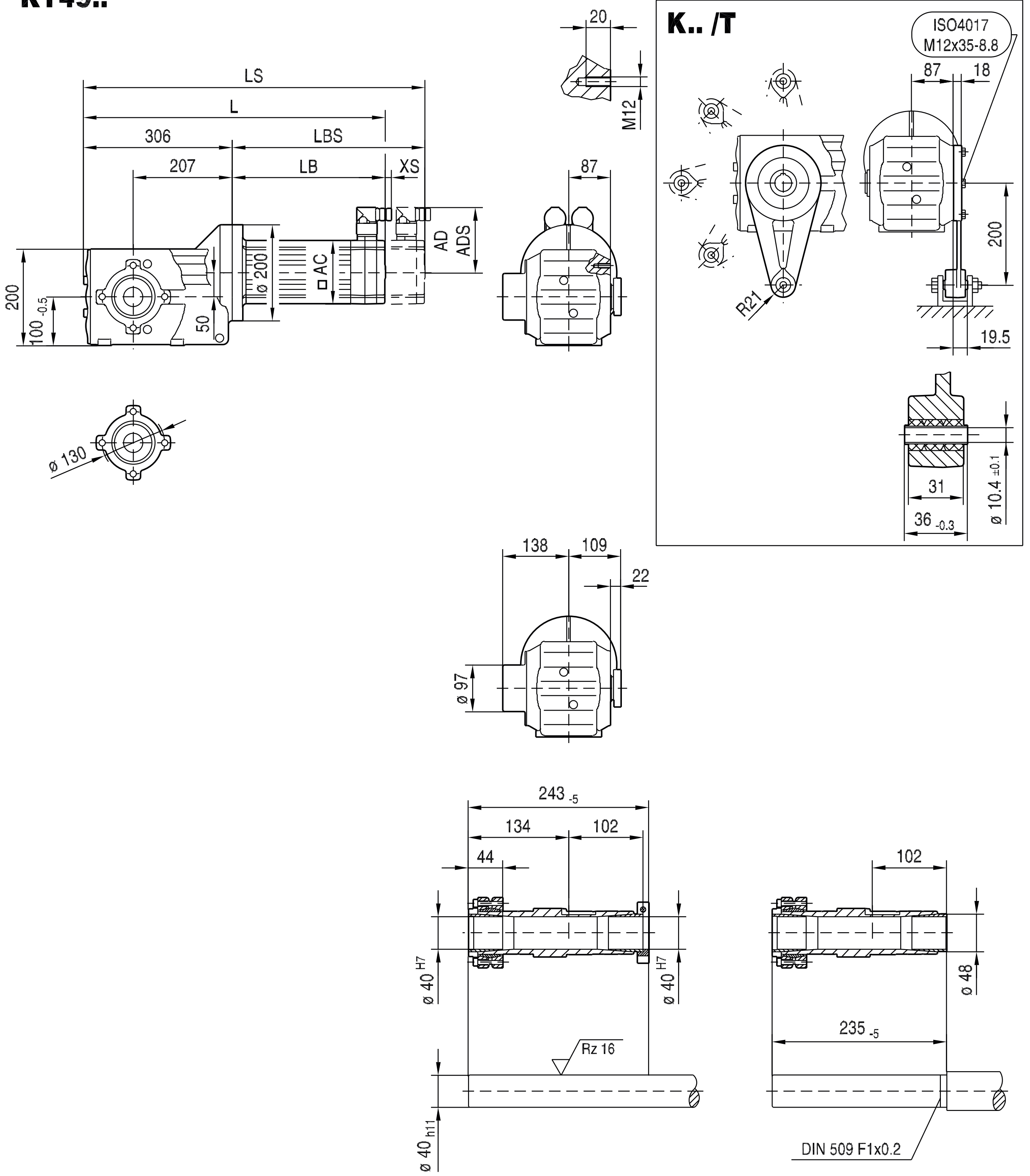
33 043 01 15

KT49..



(→ 🗎 194)	CMP..								
	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	88	88	88	116	116	116	137	137	162
AD	92	92	92	102	102	102	134	134	146
ADS	92	92	92	104	104	104	137	137	147
L	473	523	573	464	489	539	504	538	536
LS	502	552	602	529	554	604	582	616	632
LB	167	217	267	158	183	233	198	232	230
LBS	196	246	296	223	248	298	276	310	326
XS	14	14	14	11	11	11	37	37	37

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10.2.7 K57..

K57, M_{aDyn} Nm													600 Nm
							CMP						
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
							3						
4.69		46	69	50	96	137	86	139	210	190	280	305	365
6.57		65	97	70	135	192	121	194	295	265	390	430	>515
7.55	38	75	112	80	155	220	139	220	335	305	450	495	>545
8.71	43	86	129	93	179	250	161	255	390	350	520	570	>585
9.59	48	95	142	102	197	275	177	280	430	385	575	>585	>585
11.26	56	111	166	120	230	325	205	330	505	455	>585	>585	>585
11.92	60	118	176	127	240	345	215	350	535	480	>585	>585	>585
13.25		131	196	141	270	385	240	390	595	535	>665	>665	>665
15.22	76	150	225	162	310	440	280	450	>665	615	>665	>665	>665
17.57	88	174	255	187	360	510	320	515	>665	>665	>665	>665	>665
19.34	97	191	285	205	395	560	355	570	>665	>665	>665	>665	>665
22.71	113	220	335	240	465	660	415	>665	>665	>665	>665	>665	>665
24.05	120	235	355	255	490	>665	440	>665	>665	>665	>665	>665	>665
27.34	136	270	400	290	560	>665	500	>665	>665	>665			
30.28	151	295	445	320	620	>665	555	>665	>665	>665			
35.70	178	350	525	380	>665	>665	655	>665					
38.49	188	370	555	400	>665	>665	>665	>665	>665	>665	>665	>665	>665
44.43	215	430	640	460	>665	>665	>665	>665	>665	>665	>665	>665	>665
48.89	235	470	>665	510	>665	>665	>665	>665	>665	>665	>665	>665	>665
57.42	280	555	>665	595	>665	>665	>665	>665	>665	>665	>665	>665	>665
60.81	295	585	>665	630	>665	>665	>665	>665	>665	>665	>665	>665	>665
69.12	335	>665	>665	>665	>665	>665	>665	>665	>665	>665			
76.56	370	>665	>665	>665	>665	>665	>665	>665	>665	>665			
90.26	440	>665	>665	>665	>665	>665	>665	>665					
102.88	500	>665	>665	>665	>665		>665						
108.29	525	>665	>665	>665	>665		>665						
123.85	595	>665		>665									
145.14	>665												

(→ 190)

K57, m kg													
							CMP						
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
3	27	28	29	29	31	32	32	34	36	39	41	47	64
KF: + 4.7 kg / KA: + -2.1 kg / KAF: + 3.6 kg													

CMP..	i	n_{epk} min^{-1}	η %	c_{TG} K Nm/'	KF Nm/'	KA Nm/'	KAF Nm/'	φ /R '
K57 3	4.69	4045	96	34	33	81	81	11
	6.57	4500	96	34	33	81	81	10
	7.55	4500	96	34	33	81	81	10
	8.71	4500	96	34	33	81	81	10
	9.59	4500	96	34	33	81	81	10
	11.26	4500	96	34	33	81	81	9
	11.92	4500	96	34	33	81	81	9
	13.25	4500	96	41	39	135	135	7
	15.22	4500	96	41	39	135	135	7
	17.57	4500	96	41	39	135	135	7
	19.34	4500	96	41	39	135	135	7
	22.71	4500	96	41	39	135	135	7
	24.05	4500	96	41	39	135	135	7
	27.34	4500	96	41	39	135	135	7
	30.28	4500	96	41	39	135	135	7
	35.70	4500	96	41	39	135	135	7
	38.49	4500	94	43	40	150	150	6
	44.43	4500	94	43	40	150	150	6
	48.89	4500	94	43	40	150	150	6
	57.42	4500	94	43	40	150	150	6
	60.81	4500	94	43	40	150	150	6
	69.12	4500	94	43	40	150	150	6
	76.56	4500	94	43	40	150	150	6
	90.26	4500	94	43	40	150	150	6
	102.88	4500	94	43	40	150	150	6
	108.29	4500	94	43	40	150	150	6
	123.85	4500	93	43	40	150	150	6
	145.14	4500	93	43	40	150	150	6

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
K57 3	4.69	300	450	510	320	9.0	3800	3980	2580	2580	8520	8520	11500	11500
	6.57	345	515	585	244	5.6	4180	4400	2800	2800	7990	8110	11500	11500
	7.55	365	545	620	225	4.4	4360	4580	2900	2900	7740	7920	11500	11500
	8.71	390	585	660	195	3.5	4520	4760	2980	2980	7420	7660	11500	11500
	9.59	405	585	685	177	3.0	4650	4900	3050	3050	7420	7660	11500	11500
	11.26	415	585	705	178	2.3	4990	5250	3340	3340	7420	7660	11500	11500
	11.92	415	585	705	176	2.1	5150	5400	3470	3470	7420	7660	11500	11500
	13.25	510	665	860	226	4.8	5190	5350	3240	3240	4700	4700	11500	11500
	15.22	535	665	910	197	3.8	5430	5600	3390	3390	4700	4700	11500	11500
	17.57	555	665	940	171	3.0	5740	5910	3610	3610	4700	4700	11500	11500
	19.34	575	665	970	155	2.6	5910	6080	3710	3710	4700	4700	11500	11500
	22.71	600	665	1020	132	2.0	6280	6460	3970	3970	4700	4700	11500	11500
	24.05	600	665	1020	133	1.9	6480	6650	4140	4140	4700	4700	11500	11500
	27.34	600	665	1020	132	1.5	6930	7090	4550	4550	4700	4700	11500	11500
	30.28	600	665	1020	132	1.2	7300	7460	4880	4880	4700	4700	11500	11500
	35.70	600	665	1020	134	0.95	7630	7720	5440	5440	4700	4700	11500	11500
	38.49	600	665	1020	70	2.3	7630	7720	5710	5710	4700	4700	11500	11500
	44.43	600	665	1020	72	1.9	7630	7720	6240	6240	4700	4700	11500	11500
	48.89	600	665	1020	74	1.6	7630	7720	6610	6610	4700	4700	11500	11500
	57.42	600	665	1020	75	1.3	7630	7720	7260	7260	4700	4700	11500	11500
	60.81	600	665	1020	76	1.2	7630	7720	7490	7490	4700	4700	11500	11500
	69.12	600	665	1020	77	0.98	7630	7720	8040	8040	4700	4700	11500	11500
	76.56	600	665	1020	78	0.85	7630	7720	8500	8500	4700	4700	11500	11500
	90.26	600	665	1020	78	0.67	7630	7720	9260	9260	4700	4700	11500	11500
	102.88	600	665	1020	68	0.46	7630	7720	9900	9900	4700	4700	11500	11500
	108.29	600	665	1020	65	0.41	7630	7720	10200	10200	4700	4700	11500	11500
	123.85	600	665	1020	57	0.33	7630	7720	10900	10900	4700	4700	11500	11500
	145.14	600	665	1020	48	0.27	7630	7720	11500	11500	4700	4700	11500	11500

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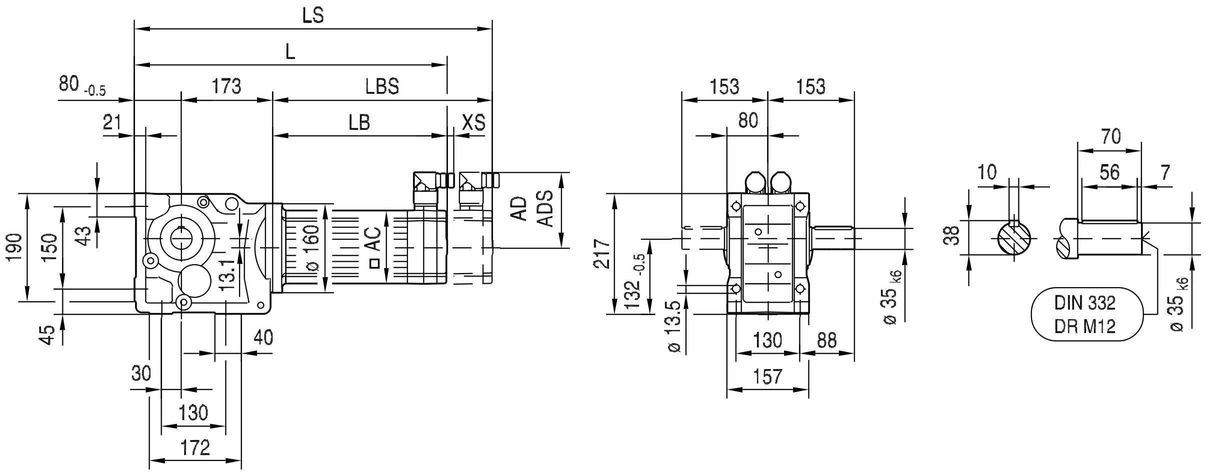
K57..



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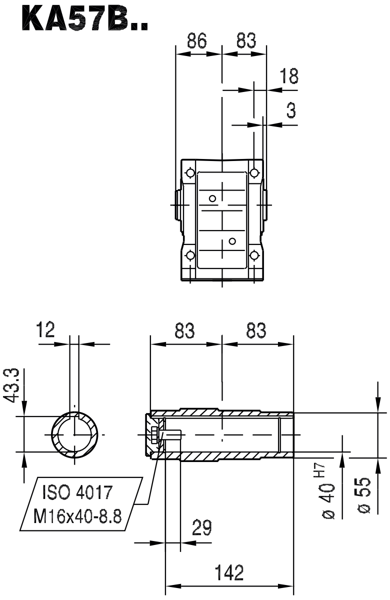

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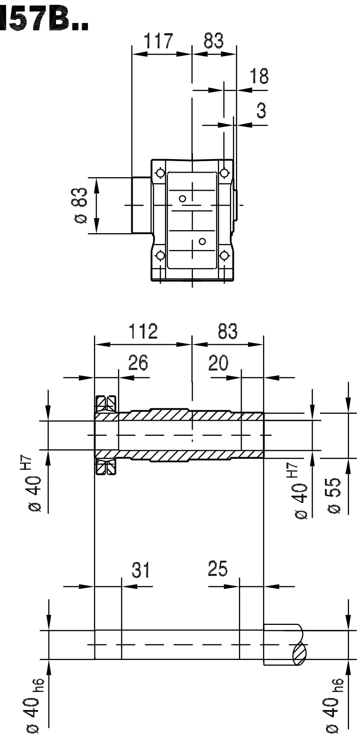

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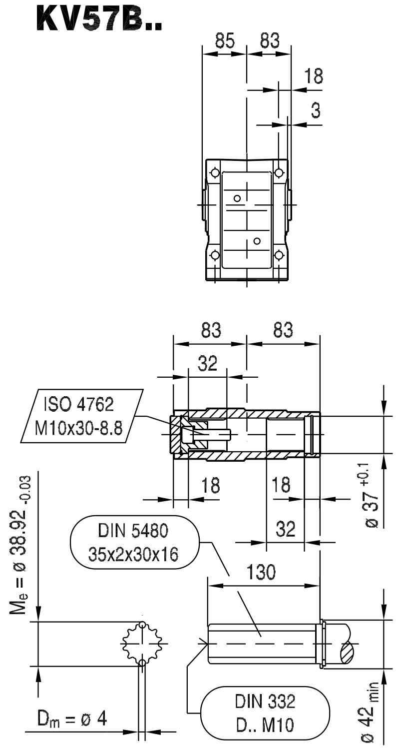

(→ 194)	CMP..											
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AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	392	431	470	426	476	526	419	444	494	459	497	495
LS	421	460	499	455	505	555	484	509	559	537	575	591
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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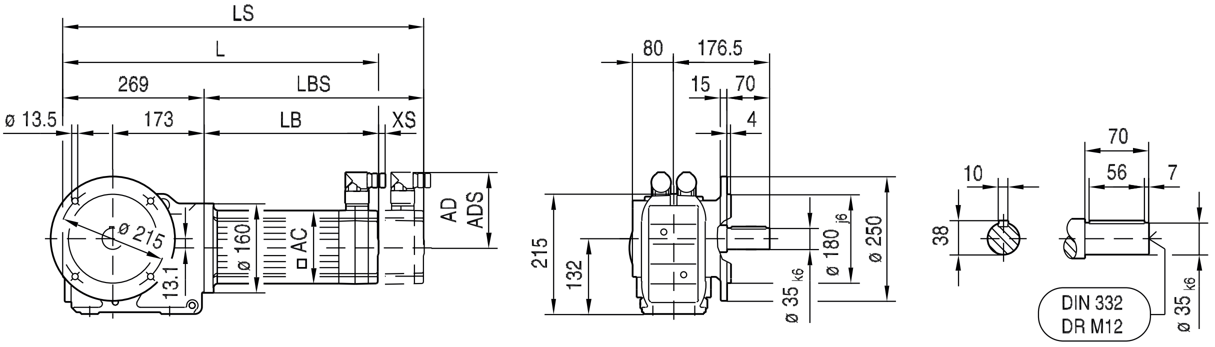
KF57..



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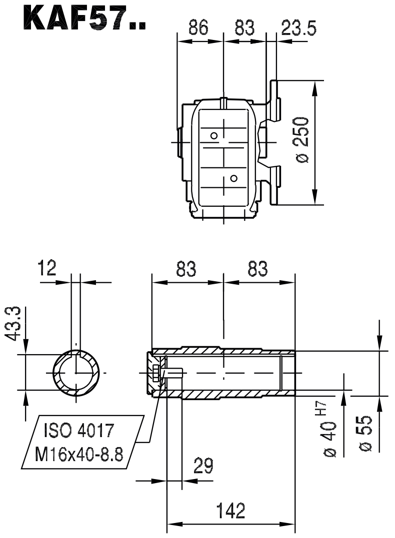

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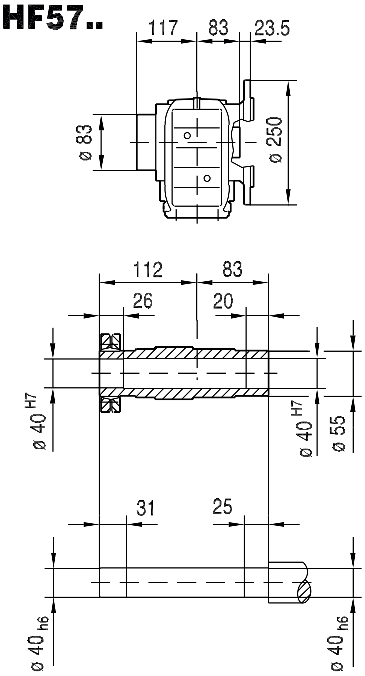

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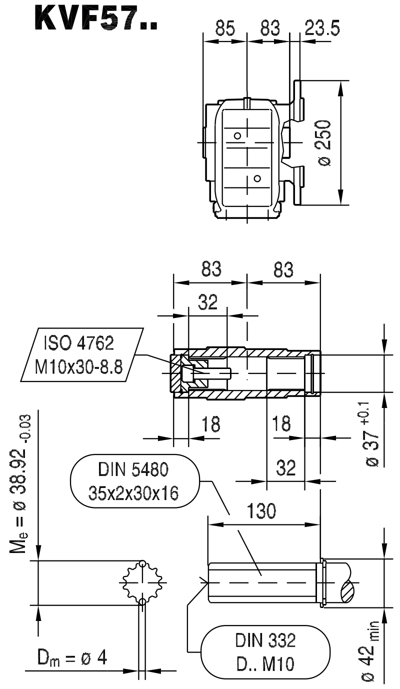

(→ 🗎 194)	CMP..											
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AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	408	447	486	442	492	542	435	460	510	475	513	511
LS	437	476	515	471	521	571	500	525	575	553	591	607
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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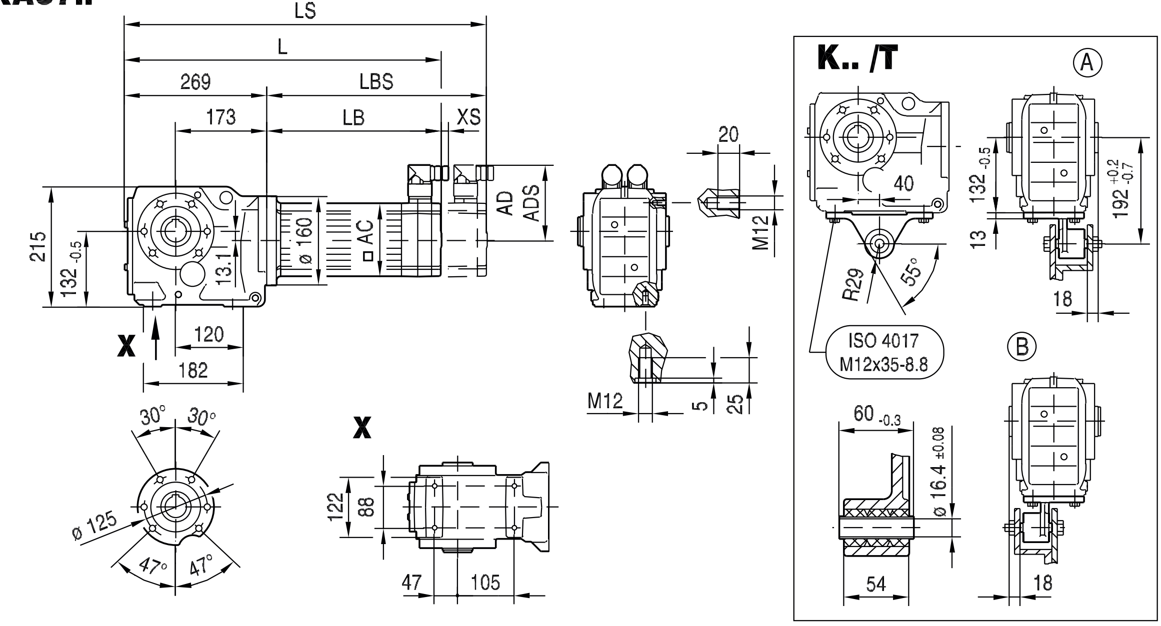
KA57..

33 021 01 07



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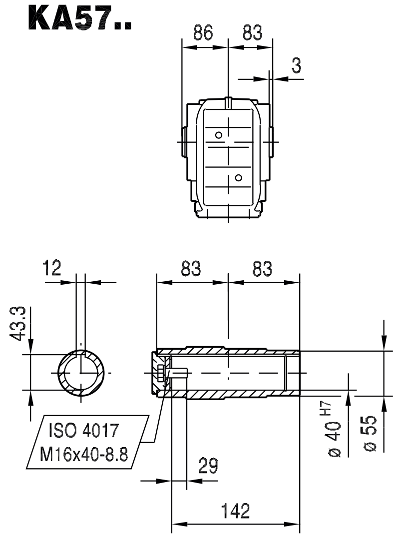

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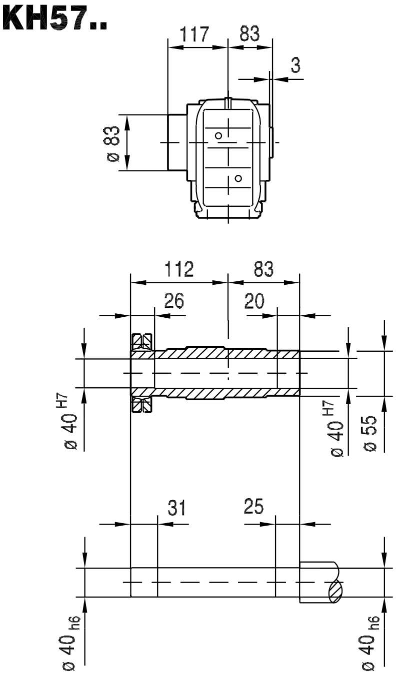

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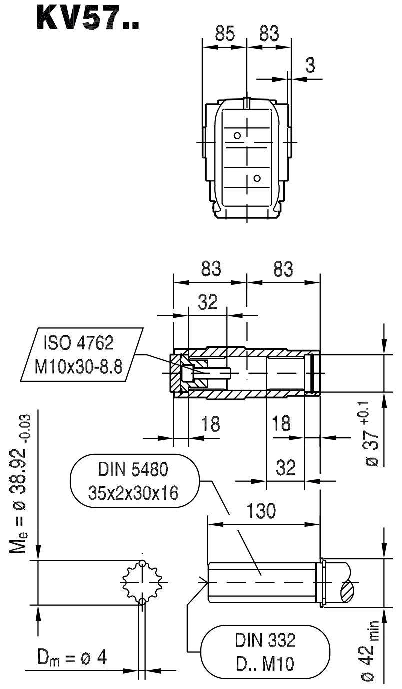

(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	408	447	486	442	492	542	435	460	510	475	513	511
LS	437	476	515	471	521	571	500	525	575	553	591	607
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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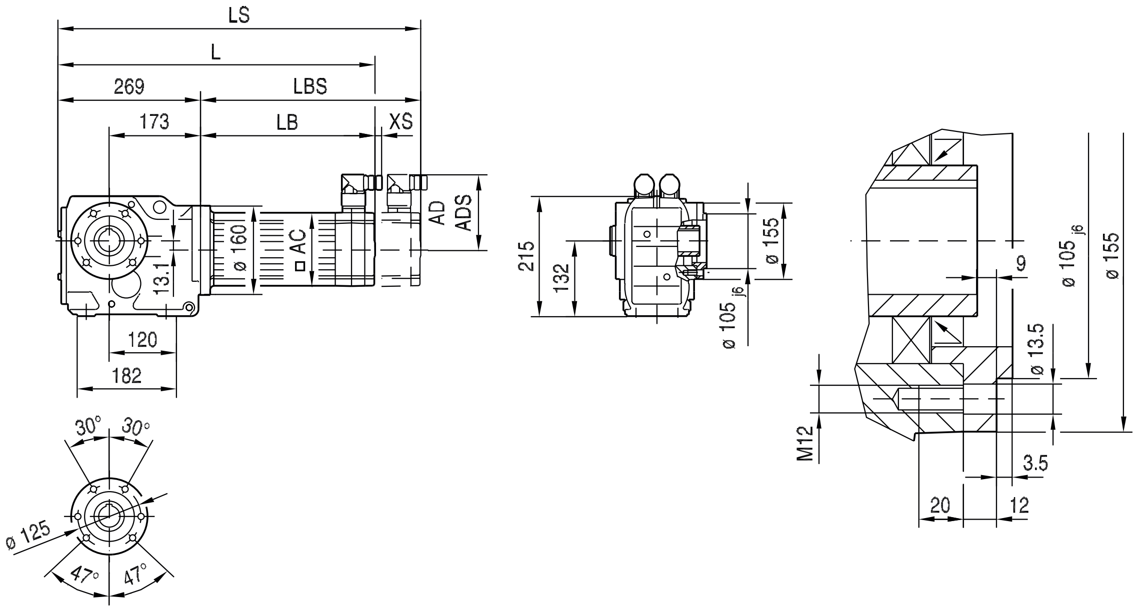
KAZ57.. 33 022 00 07



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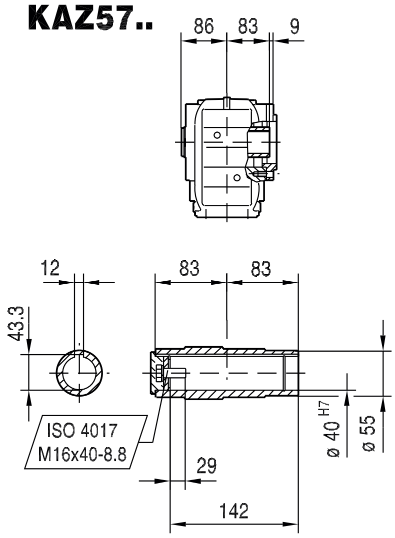

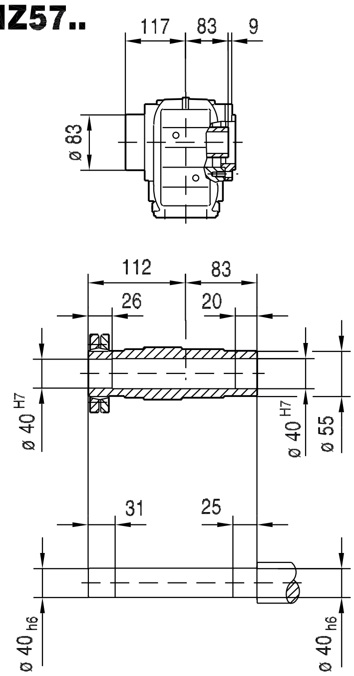

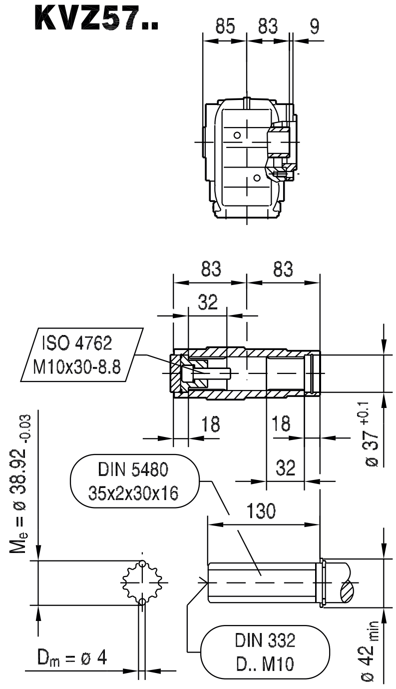

(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	408	447	486	442	492	542	435	460	510	475	513	511
LS	437	476	515	471	521	571	500	525	575	553	591	607
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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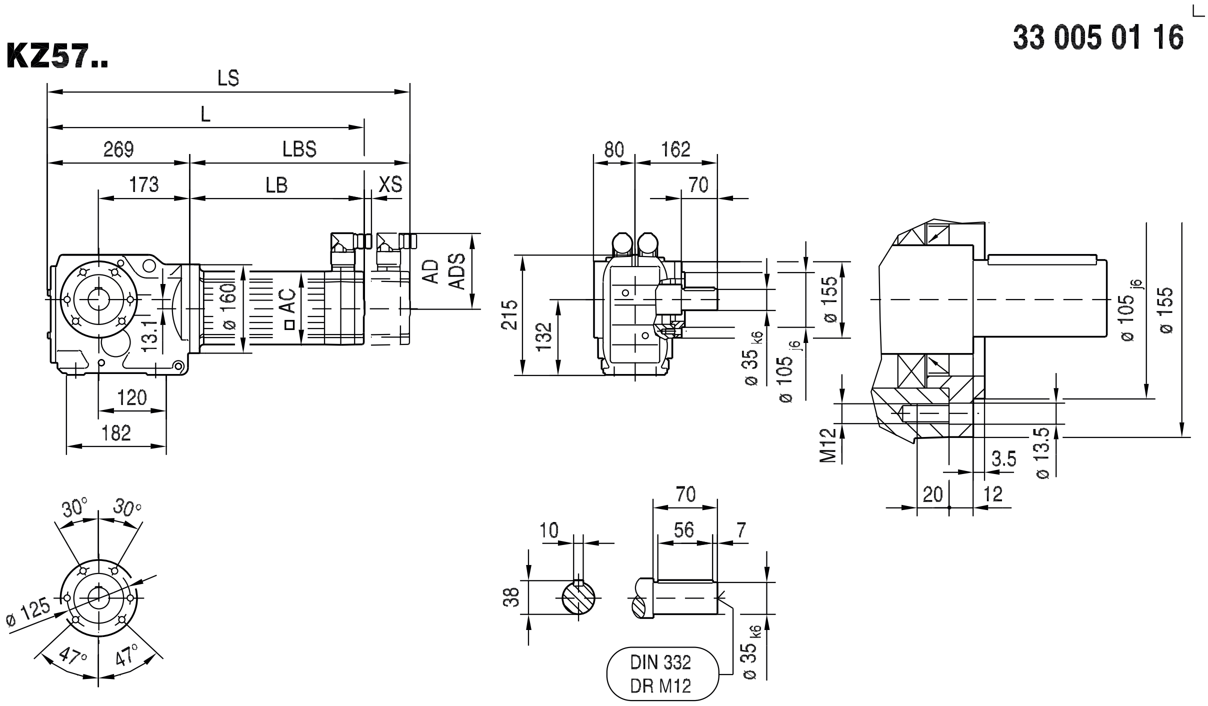

(→ 🗎 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	408	447	486	442	492	542	435	460	510	475	513	511
LS	437	476	515	471	521	571	500	525	575	553	591	607
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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KT57..

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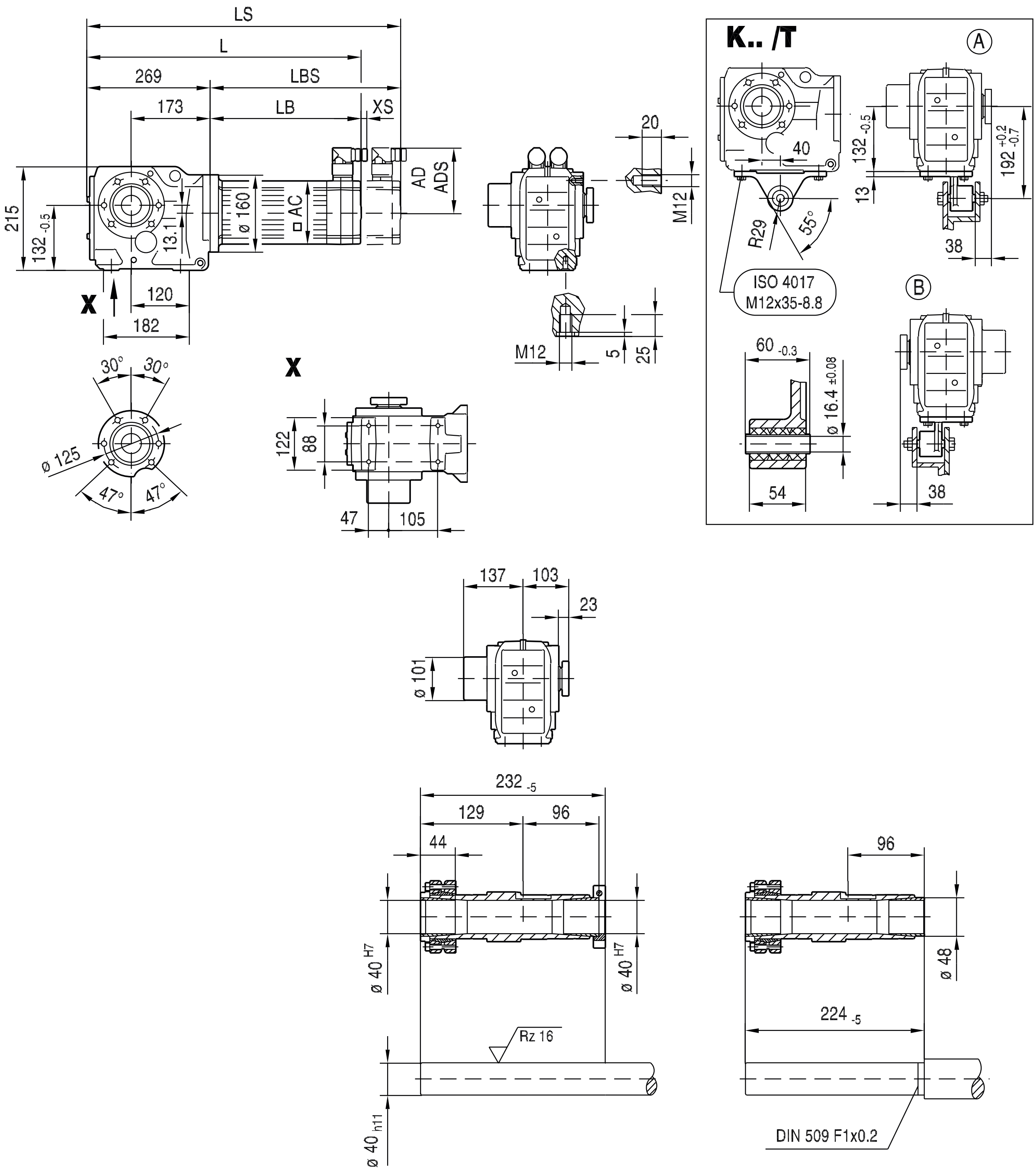

(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	408	447	486	442	492	542	435	460	510	475	513	511
LS	437	476	515	471	521	571	500	525	575	553	591	607
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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10.2.8 K67..

K67, M_{aDyn} Nm																	820 Nm
	CMP																
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
	3																
5.20		51	77	55	107	152	96	154	230	210	310		340				
7.28		72	108	78	150	210	134	215	325	290	435	>630	475	>630	>630	615	>630
8.37	42	83	124	89	172	240	154	245	375	335	500	>660	545	>660	>660	>660	>660
9.66	48	96	143	103	198	280	178	285	430	390	580	>685	630	>685	>685	>685	>685
10.63	53	105	157	113	215	310	196	310	475	425	635		>690				
12.48	62	123	185	133	255	360	230	365	560	500	>695		>695				
13.22		131	195	141	270	385	240	390	595	530	790	>920	860	>920	>920	>920	>920
15.19	76	150	220	162	310	440	275	445	680	610	910	>920	>920	>920	>920	>920	>920
17.54	88	173	255	187	360	510	320	515	785	705	>920	>920	>920	>920	>920	>920	>920
19.30	96	191	285	205	395	560	355	570	860	780	>920		>920				
22.66	113	220	335	240	465	660	415	670	>920	910	>920		>920				
24.00	120	235	350	255	490	700	440	705	>920	>920	>920		>920				
27.28	136	265	400	290	560	795	500	800	>920	>920							
30.22	151	295	445	320	620	880	555	890	>920	>920							
35.62	178	350	525	375	730	>920	655	>920									
38.39	188	370	555	400	770	>920	690	>920	>920	>920	>920	>920	>920	>920	>920	>920	>920
44.32	215	425	640	460	890	>920	795	>920	>920	>920	>920	>920	>920	>920	>920	>920	>920
48.77	235	470	705	505	>920	>920	880	>920	>920	>920	>920		>920				
57.28	275	550	820	595	>920	>920	>920	>920	>920	>920	>920		>920				
60.66	295	585	870	630	>920	>920	>920	>920	>920	>920	>920		>920				
68.95	340	670	>920	725	>920	>920	>920	>920	>920	>920							
76.37	375	745	>920	800	>920	>920	>920	>920	>920	>920							
90.04	440	870	>920	>920	>920	>920	>920	>920									
102.62	500	>920	>920	>920	>920		>920										
108.03	525	>920	>920	>920	>920		>920										
123.54	600	>920		>920													
144.79	705																

(→ 190)

K67, m kg																	
	CMP																
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
3	33	34	35	35	37	38	38	40	42	45	47	51	53	57	66	70	78
KF: + 5.6 kg / KA: + -2.7 kg / KAF: + 3.0 kg																	

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CMP..				c_{TG}				φ
		n_{epk}	η	K	KF	KA	KAF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
K67 3	5.20	3862	96	58	54	96	96	10
	7.28	4500	96	58	54	96	96	9
	8.37	4500	96	58	54	96	96	9
	9.66	4500	96	58	54	96	96	9
	10.63	4500	96	58	54	96	96	9
	12.48	4500	96	58	54	96	96	9
	13.22	4500	96	73	66	146	146	8
	15.19	4500	96	73	66	146	146	8
	17.54	4500	96	73	66	146	146	7
	19.30	4500	96	73	66	146	146	7
	22.66	4500	96	73	66	146	146	7
	24.00	4500	96	73	66	146	146	7
	27.28	4500	96	73	66	146	146	7
	30.22	4500	96	73	66	146	146	7
	35.62	4500	96	73	66	146	146	7
	38.39	4500	94	77	70	165	165	6
	44.32	4500	94	77	70	165	165	6
	48.77	4500	94	77	70	165	165	6
	57.28	4500	94	77	70	165	165	6
	60.66	4500	94	77	70	165	165	6
	68.95	4500	95	77	70	165	165	6
	76.37	4500	95	77	70	165	165	6
	90.04	4500	94	77	70	165	165	6
	102.62	4500	94	77	70	165	165	6
	108.03	4500	94	77	70	165	165	6
	123.54	4500	94	77	70	165	165	6
	144.79	4500	94	77	70	165	165	6

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CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
K67 3	5.20	350	525	595	192	11	9860	10000	2450	2450	12300	12300	13000	13000
	7.28	420	630	710	206	6.3	10700	10900	2480	2480	11700	11700	13000	13000
	8.37	440	660	745	179	4.9	11100	11400	2590	2590	11500	11500	13000	13000
	9.66	480	685	810	155	3.8	11500	11700	2550	2550	11400	11400	13000	13000
	10.63	500	690	850	141	3.2	11800	12000	2590	2590	11300	11300	13000	13000
	12.48	530	695	900	120	2.5	12300	12300	2710	2710	11300	11300	13000	13000
	13.22	670	920	1130	113	5.6	11500	11500	2420	2420	9310	9310	13000	13000
	15.19	700	920	1190	105	4.4	11300	11300	2550	2550	9310	9310	13000	13000
	17.54	740	920	1250	97	3.4	11000	11000	2630	2630	9310	9310	13000	13000
	19.30	760	920	1290	93	2.9	10800	10800	2740	2740	9310	9310	13000	13000
	22.66	780	920	1320	93	2.2	10700	10700	3070	3070	9310	9310	13000	13000
	24.00	800	920	1360	88	2.0	10500	10500	3090	3090	9310	9310	13000	13000
	27.28	820	920	1390	84	1.6	10300	10300	3340	3340	9310	9310	13000	13000
	30.22	820	920	1390	86	1.3	10300	10300	3680	3680	9310	9310	13000	13000
	35.62	820	920	1390	90	1.0	10300	10300	4260	4260	9310	9310	13000	13000
	38.39	800	920	1360	52	2.4	10500	10500	4690	4690	9310	9310	13000	13000
	44.32	820	920	1390	50	1.9	10300	10300	5070	5070	9310	9310	13000	13000
	48.77	820	920	1390	49	1.7	10300	10300	5440	5440	9310	9310	13000	13000
	57.28	820	920	1390	52	1.4	10300	10300	6100	6100	9310	9310	13000	13000
	60.66	820	920	1390	53	1.2	10300	10300	6340	6340	9310	9310	13000	13000
	68.95	820	920	1390	52	1.0	10300	10300	6900	6900	9310	9310	13000	13000
	76.37	820	920	1390	54	0.87	10300	10300	7360	7360	9310	9310	13000	13000
	90.04	820	920	1390	54	0.68	10300	10300	8140	8140	9310	9310	13000	13000
	102.62	820	920	1390	56	0.47	10300	10300	8800	8800	9310	9310	13000	13000
	108.03	820	920	1390	56	0.42	10300	10300	9060	9060	9310	9310	13000	13000
	123.54	820	920	1390	56	0.34	10300	10300	9770	9770	9310	9310	13000	13000
	144.79	820	920	1390	48	0.28	10300	10300	10700	10700	9310	9310	13000	13000

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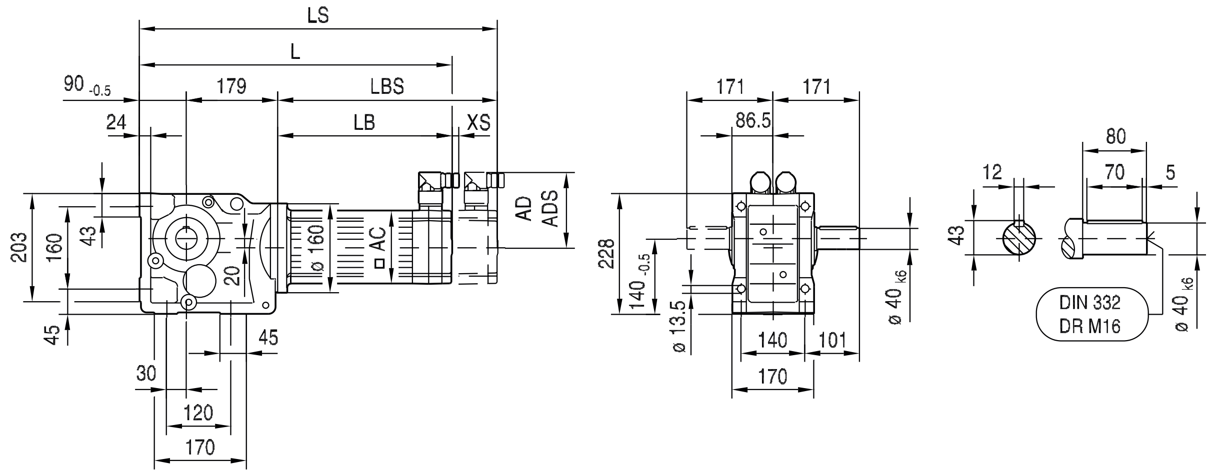
33 024 01 07

K67..



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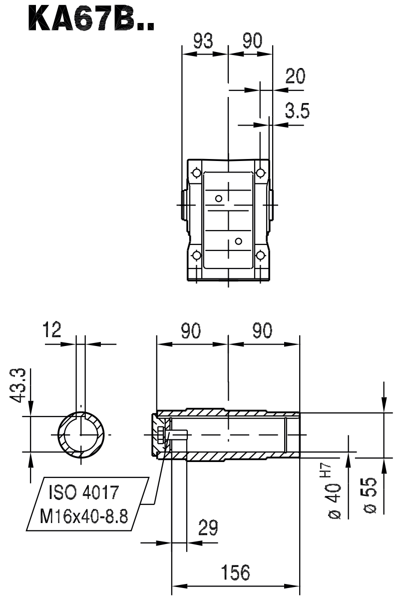
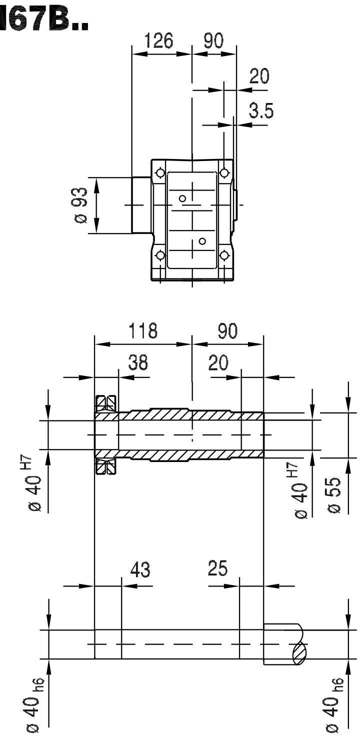
KA67B..



KH67B..



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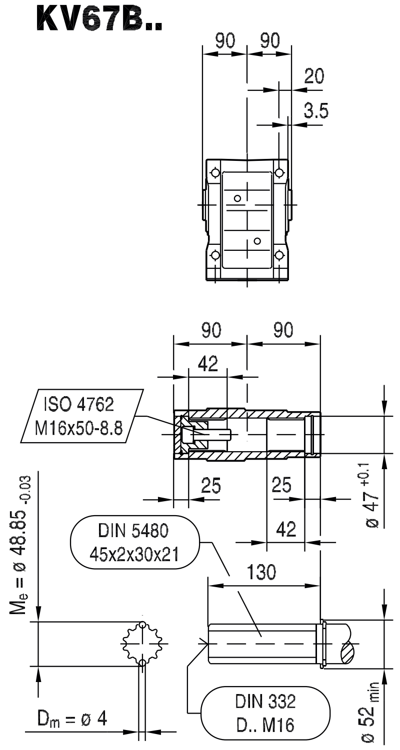

(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	408	447	486	442	492	542	435	460	510	475	513	577	511	548	628	625	659
LS	437	476	515	471	521	571	500	525	575	553	591	655	607	644	724	737	771
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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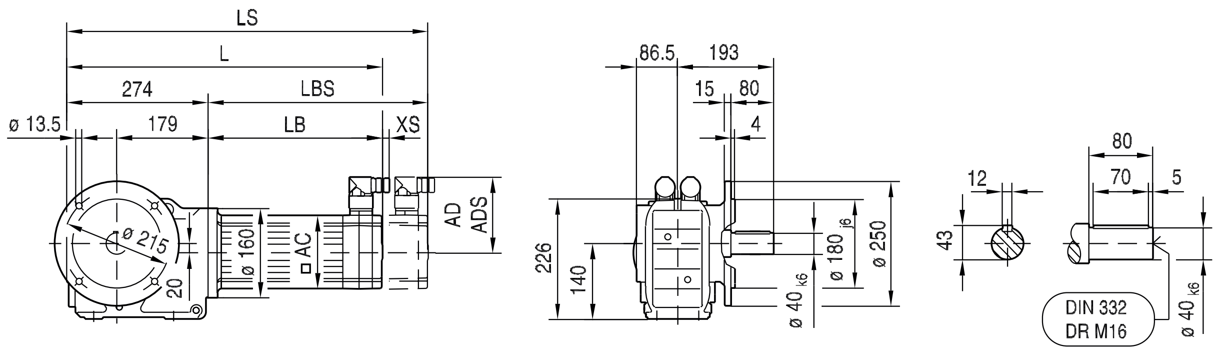
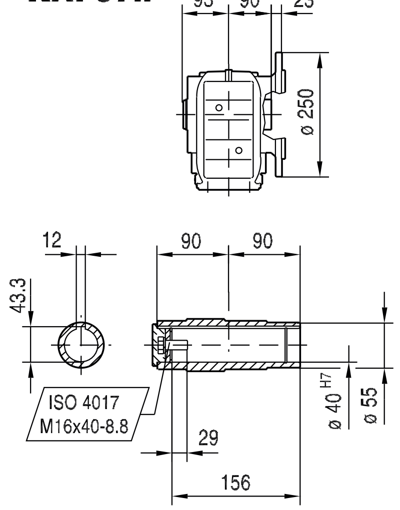
33 025 02 07

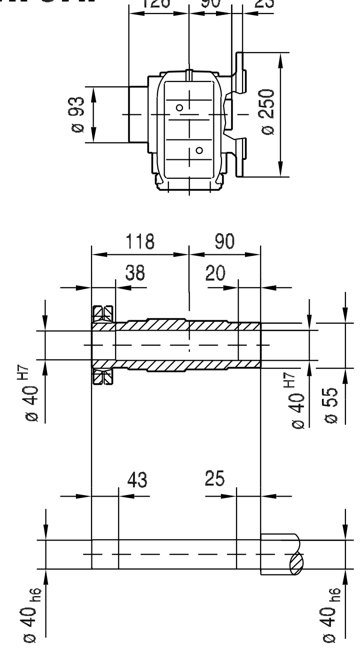
KF67..



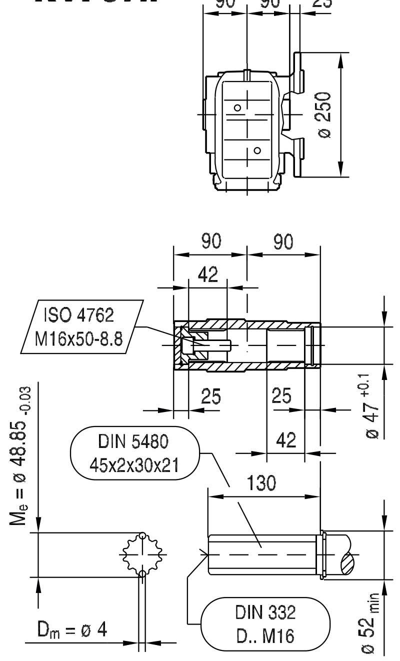
KAF67..



KHF67..



KVF67..



(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	413	452	491	447	497	547	440	465	515	480	518	582	516	553	633	630	664
LS	442	481	520	476	526	576	505	530	580	558	596	660	612	649	729	742	776
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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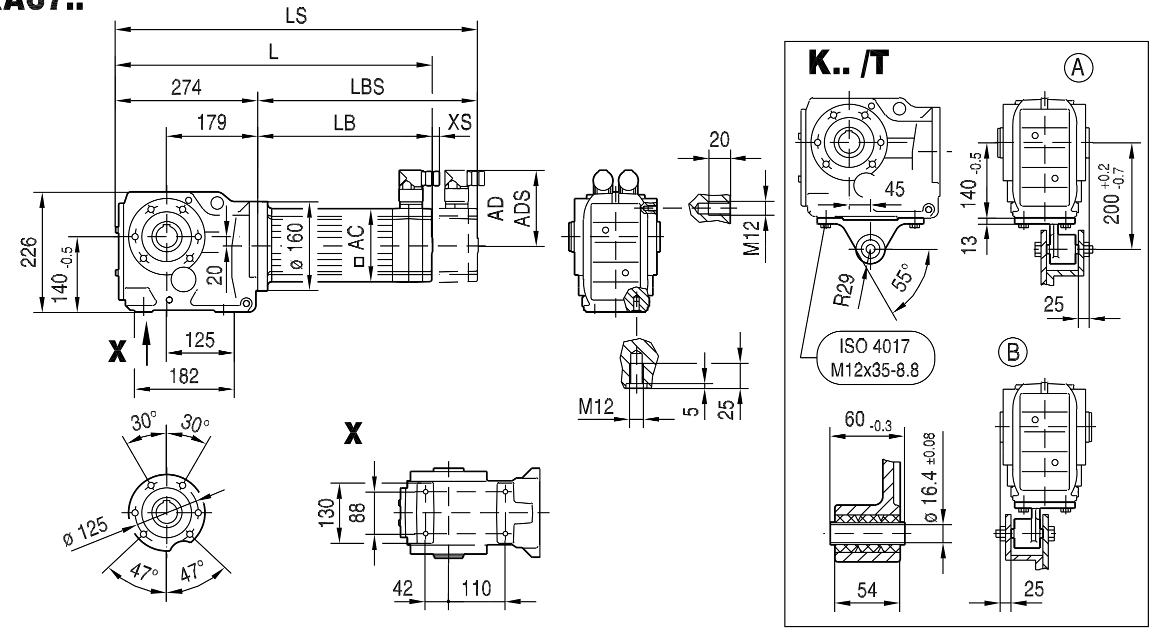
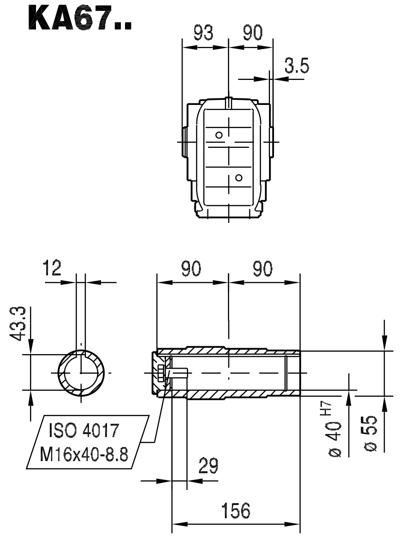
KA67..

33 026 02 07

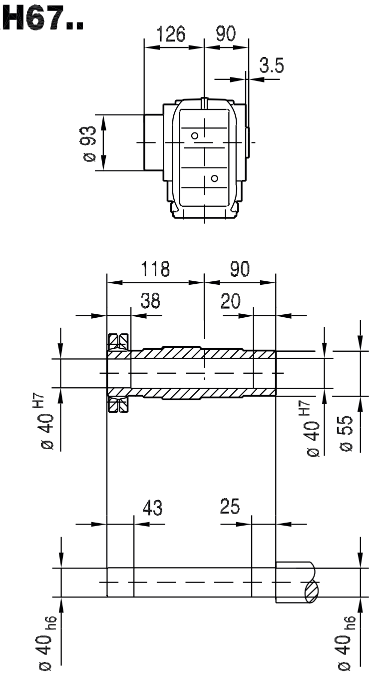


10

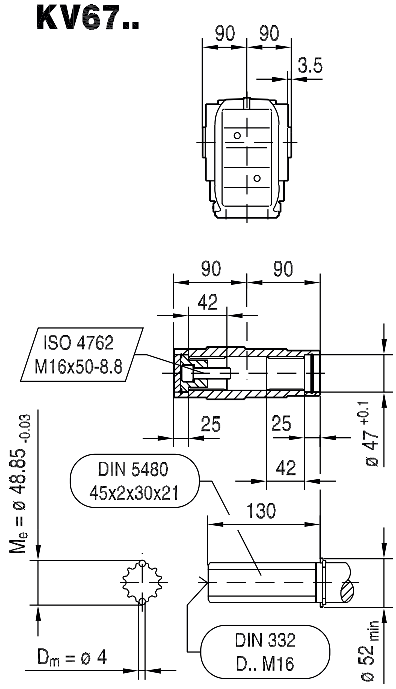
KA67..



KH67..



KV67..



(→ 🗎 194)	CMP..																
	50S	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	413	452	491	447	497	547	440	465	515	480	518	582	516	553	633	630	664
LS	442	481	520	476	526	576	505	530	580	558	596	660	612	649	729	742	776
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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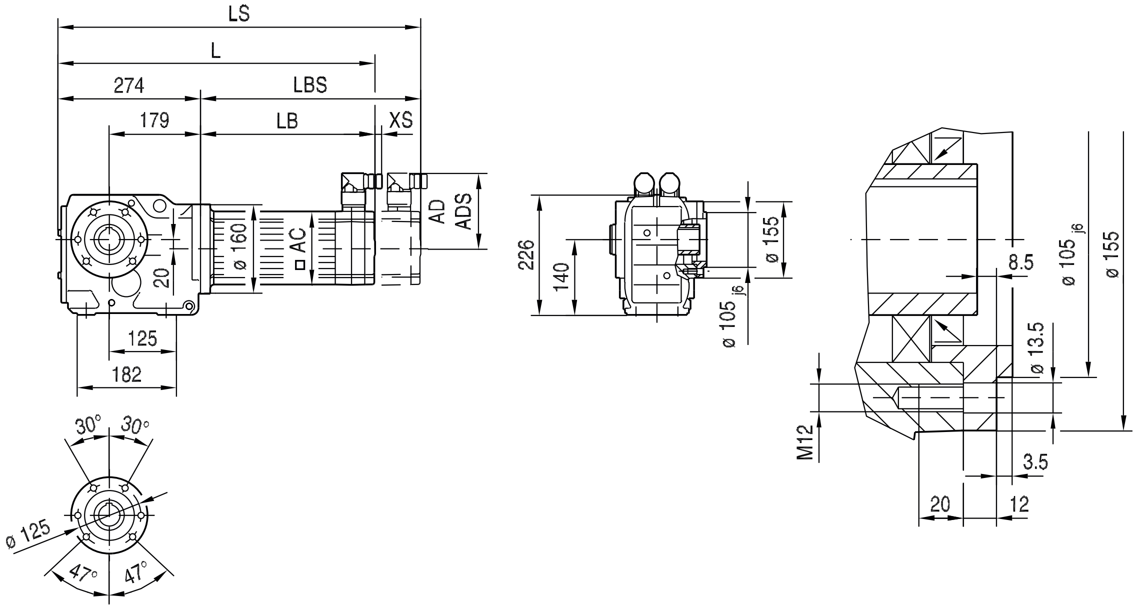
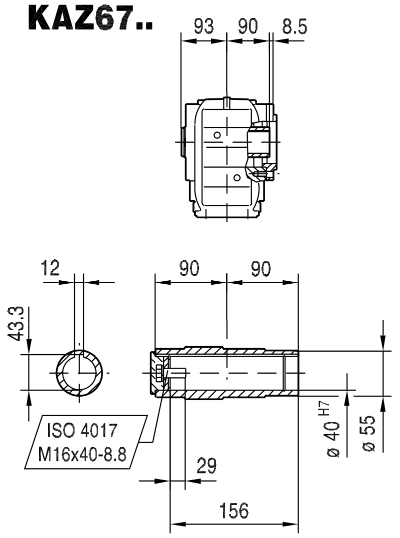
KAZ67.. **33 027 02 07**



KAZ67..



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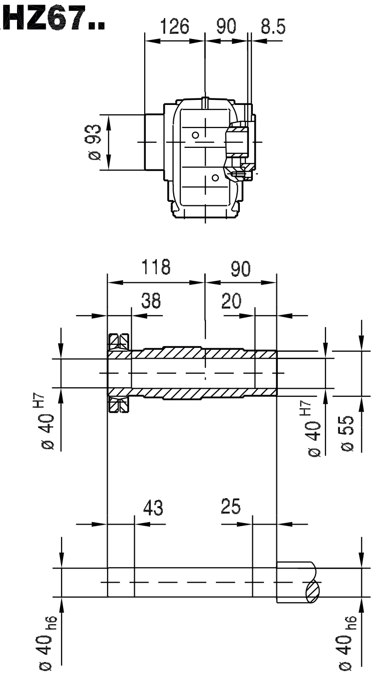

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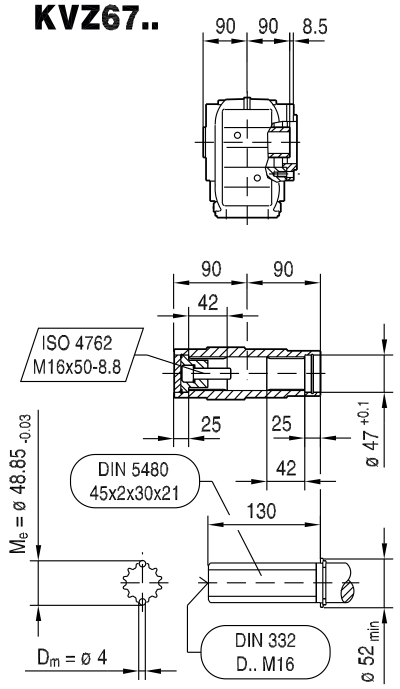

(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	413	452	491	447	497	547	440	465	515	480	518	582	516	553	633	630	664
LS	442	481	520	476	526	576	505	530	580	558	596	660	612	649	729	742	776
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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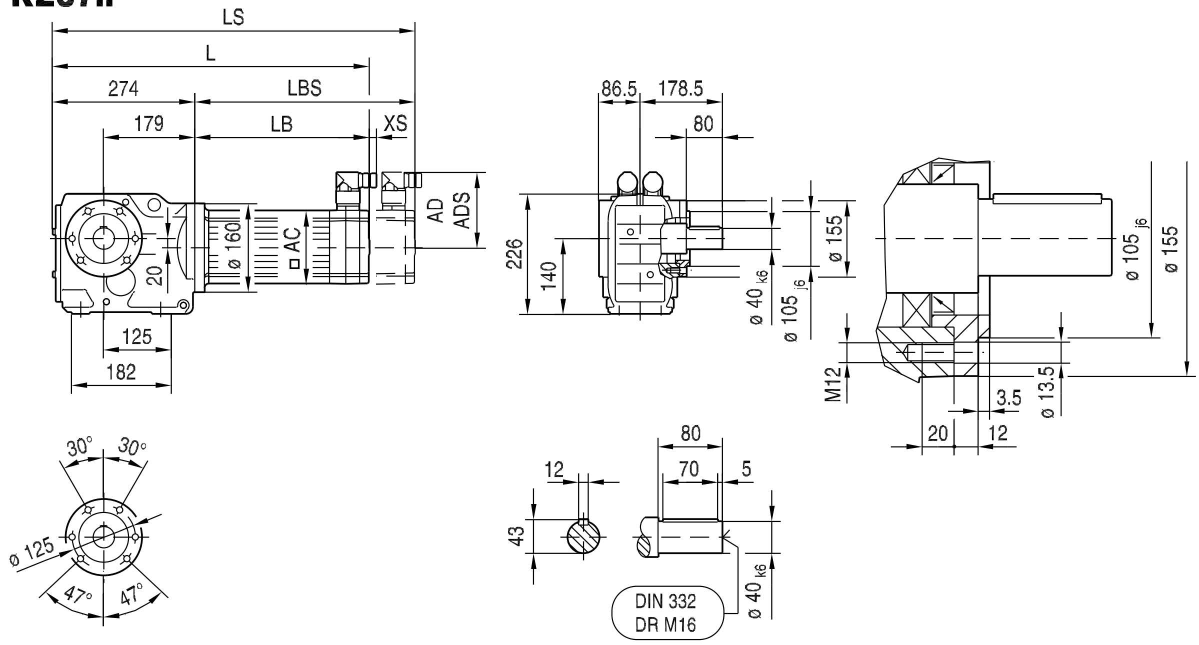
KZ67..

33 006 00 16



(→ 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	413	452	491	447	497	547	440	465	515	480	518	582	516	553	633	630	664
LS	442	481	520	476	526	576	505	530	580	558	596	660	612	649	729	742	776
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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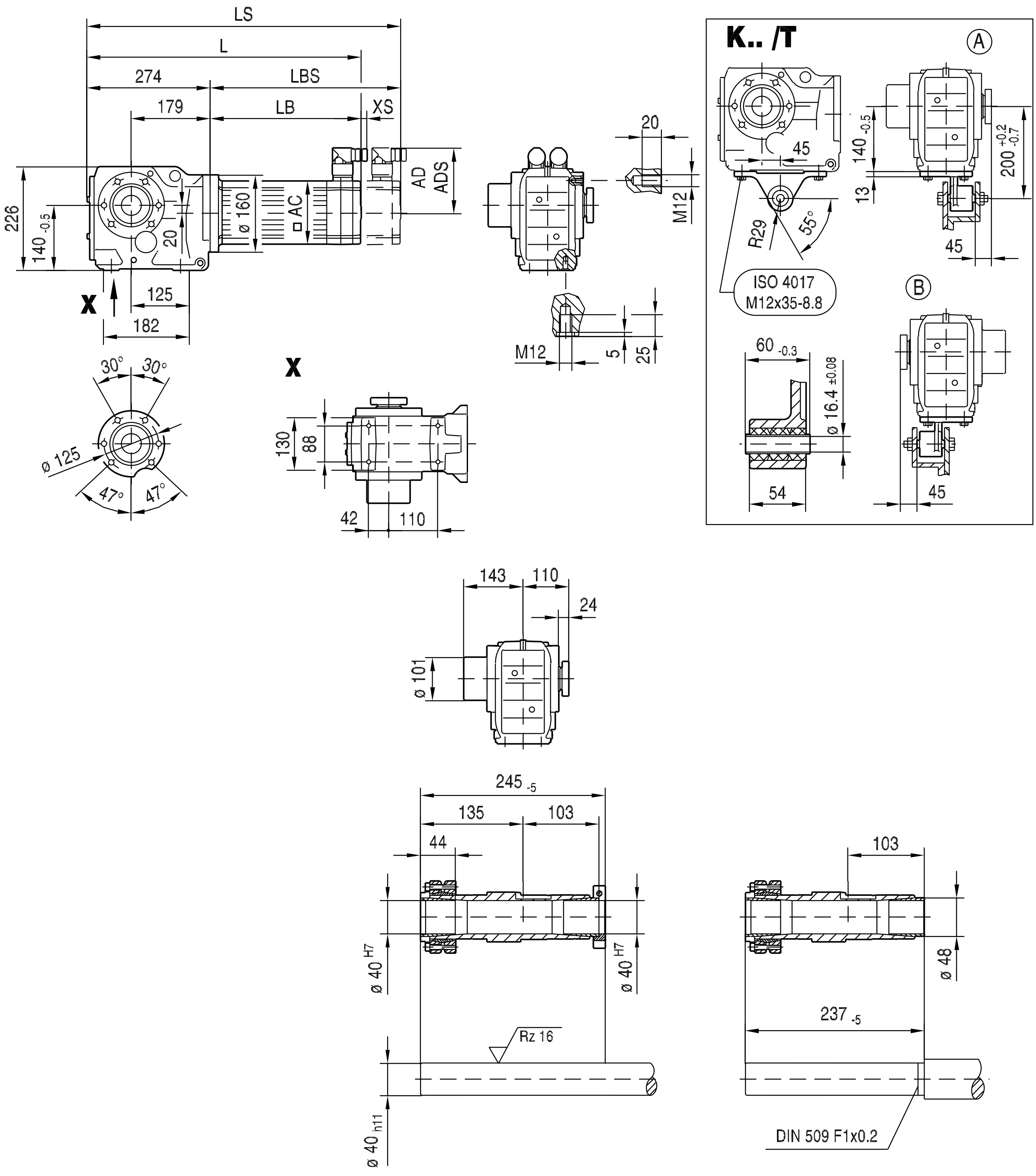
KT67..

33 028 03 07



(→ 🗎 194)	CMP..																
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M
AC	73	73	73	88	88	88	116	116	116	137	137	137	162	162	162	205	205
AD	86	86	86	92	92	92	102	102	102	134	134	134	146	146	146	177	177
ADS	86	86	86	92	92	92	104	104	104	137	137	137	147	147	147	177	177
L	413	452	491	447	497	547	440	465	515	480	518	582	516	553	633	630	664
LS	442	481	520	476	526	576	505	530	580	558	596	660	612	649	729	742	776
LB	139	178	217	173	223	273	166	191	241	206	244	308	242	279	359	356	390
LBS	168	207	246	202	252	302	231	256	306	284	322	386	338	375	455	468	502
XS	18	18	18	14	14	14	11	11	11	37	37	37	37	37	37	32	32

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10.2.9 K77..

K77, M_{aDyn} Nm															1550 Nm
	CMP														
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
								3							
7.24	77	149	210	133	210	325	290	435	740	470	750	>1150	610	940	>1150
8.48	90	174	245	156	250	380	340	505	870	555	870	>1160	715	1100	>1160
9.56	102	196	275	176	280	430	385	570	980	625	990	>1160	800	>1160	>1160
10.84	116	220	315	200	320	485	435	650	1110	710	1120	>1170	910	>1170	
12.36	132	250	360	225	365	555	495	740	>1170	810	>1170	>1170	1040	>1170	
13.52	144	275	390	245	395	605	545	810	1380	880	1400	>1550	1140	>1550	>1550
15.84	169	325	460	290	465	710	640	950	>1550	1030	>1550	>1550	1330	>1550	>1550
17.87	190	365	520	325	525	800	720	1070	>1550	1170	>1550	>1550	1500	>1550	>1550
20.25	215	415	590	370	595	910	810	1210	>1550	1320	>1550	>1550	>1550	>1550	
23.08	245	470	670	425	680	1030	930	1380	>1550	1510	>1550	>1550	>1550	>1550	
25.62	270	525	745	470	755	1150	1030	1530		>1550					
29.27	310	600	850	535	860	1310	1180	>1550		>1550					
30.89	325	630	900	565	910	1390	1240	>1550		>1550					
35.20	375	720	1020	645	1040	>1550	1420								
38.39	405	785	1120	705	1130	>1550	>1550								
40.04	420	810	1150	730	1170	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550
45.16	475	910	1300	820	1320	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550
51.18	535	1040	1470	930	1490	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
58.34	615	1180	>1550	1060	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
64.75	680	1310	>1550	1180	>1550	>1550	>1550	>1550		>1550					
73.99	780	1500	>1550	1340	>1550	>1550	>1550	>1550		>1550					
78.07	820	>1550	>1550	1420	>1550	>1550	>1550	>1550		>1550					
88.97	930	>1550	>1550	>1550	>1550	>1550	>1550								
97.05	1020	>1550	>1550	>1550	>1550	>1550	>1550								
113.56	1180	>1550	>1550	>1550	>1550										
128.52	1340	>1550		>1550											
135.28	1410	>1550		>1550											
154.02	>1550														
179.37															
192.18															

(→ 🗎 190)

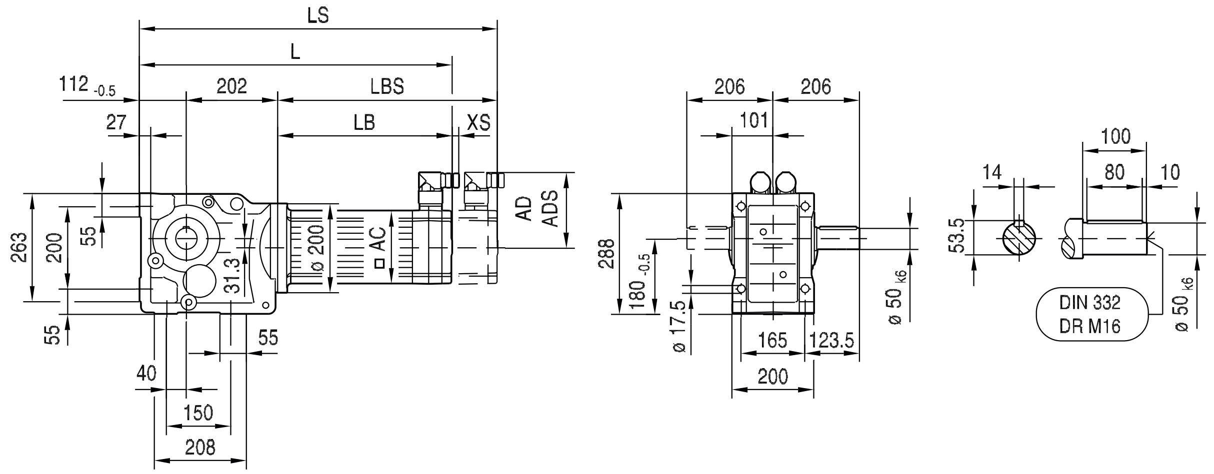
K77, m kg															
	CMP														
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
3	59	60	62	64	65	67	69	71	75	75	80	88	95	105	120
KF: + 8.2 kg / KA: + -7.5 kg / KAF: + 0.40 kg															

CMP..	i	n_{epk} min^{-1}	η %	c_{TG} K Nm/'	c_{TG} KF Nm/'	c_{TG} KA Nm/'	c_{TG} KAF Nm/'	φ /R '
	7.24	4500	96	110	91	188	188	8
	8.48	4500	96	110	91	188	188	8
	9.56	4500	96	110	91	188	188	8
	10.84	4500	96	110	91	188	188	8
	12.36	4500	96	110	91	188	188	8
	13.52	4500	96	141	112	300	300	7
	15.84	4500	96	141	112	300	300	6
	17.87	4500	96	141	112	300	300	6
	20.25	4500	96	141	112	300	300	6
	23.08	4500	96	141	112	300	300	6
	25.62	4500	96	141	112	300	300	6
	29.27	4500	96	141	112	300	300	6
	30.89	4500	96	141	112	300	300	6
	35.20	4500	96	141	112	300	300	6
K77	38.39	4500	96	141	112	300	300	6
3	40.04	4500	95	150	118	348	348	6
	45.16	4500	95	150	118	348	348	6
	51.18	4500	95	150	118	348	348	6
	58.34	4500	95	150	118	348	348	6
	64.75	4500	95	150	118	348	348	5
	73.99	4500	95	150	118	348	348	5
	78.07	4500	95	150	118	348	348	5
	88.97	4500	95	150	118	348	348	5
	97.05	4500	95	150	118	348	348	5
	113.56	4500	94	150	118	348	348	5
	128.52	4500	94	150	118	348	348	5
	135.28	4500	94	150	118	348	348	5
	154.02	4500	94	150	118	348	348	5
	179.37	4500	94	150	118	348	348	5
	192.18	4500	93	150	118	348	348	5

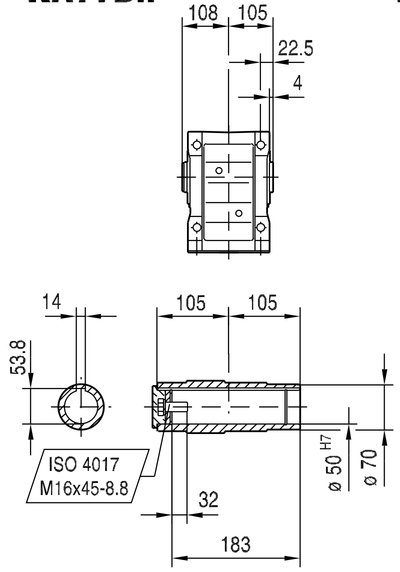
CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400	M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg{*}m^2$	N	N	N	N	N	N	N	N
K77 3	7.24	820	1150	1390	207	17	13100	13800	2490	2490	17700	17700	20000	20000
	8.48	890	1160	1510	177	13	13500	14300	2430	2430	17600	17700	20000	20000
	9.56	940	1160	1590	157	10	13900	14700	2430	2430	17600	17700	20000	20000
	10.84	990	1170	1680	138	8.2	14400	15200	2460	2460	17600	17700	20000	20000
	12.36	1000	1170	1700	121	6.5	15100	16000	2820	2820	17600	17700	20000	20000
	13.52	1340	1550	2270	155	15	14800	15800	1850	1850	15400	16600	20000	20000
	15.84	1400	1550	2380	145	11	15500	16600	2030	2030	15400	16600	20000	20000
	17.87	1450	1550	2460	140	9.0	16100	16900	2160	2160	15400	16600	20000	20000
	20.25	1500	1550	2550	128	7.2	15700	16800	2330	2330	15400	16600	20000	20000
	23.08	1550	1550	2630	126	5.8	15400	16600	2550	2550	15400	16600	20000	20000
	25.62	1550	1550	2630	133	5.0	15400	16600	2990	2990	15400	16600	20000	20000
	29.27	1550	1550	2630	137	4.0	15400	16600	3590	3590	15400	16600	20000	20000
	30.89	1550	1550	2630	142	3.6	15400	16600	3840	3840	15400	16600	20000	20000
	35.20	1550	1550	2630	142	2.9	15400	16600	4460	4460	15400	16600	20000	20000
	38.39	1500	1550	2550	159	2.5	15700	16800	5210	5210	15400	16600	20000	20000
	40.04	1550	1550	2630	37	6.0	15400	16600	5100	5100	15400	16600	20000	20000
	45.16	1550	1550	2630	33	4.9	15400	16600	5720	5720	15400	16600	20000	20000
	51.18	1550	1550	2630	29	4.1	15400	16600	6390	6390	15400	16600	20000	20000
	58.34	1550	1550	2630	31	3.3	15400	16600	7130	7130	15400	16600	20000	20000
	64.75	1550	1550	2630	31	3.0	15400	16600	7740	7740	15400	16600	20000	20000
	73.99	1550	1550	2630	31	2.4	15400	16600	8550	8550	15400	16600	20000	20000
	78.07	1550	1550	2630	32	2.3	15400	16600	8890	8890	15400	16600	20000	20000
	88.97	1550	1550	2630	33	1.9	15400	16600	9730	9730	15400	16600	20000	20000
	97.05	1550	1550	2630	32	1.6	15400	16600	10300	10300	15400	16600	20000	20000
	113.56	1550	1550	2630	33	1.3	15400	16600	11400	11400	15400	16600	20000	20000
	128.52	1550	1550	2630	33	0.90	15400	16600	12300	12300	15400	16600	20000	20000
	135.28	1550	1550	2630	33	0.81	15400	16600	12700	12700	15400	16600	20000	20000
	154.02	1550	1550	2630	33	0.66	15400	16600	13700	13700	15400	16600	20000	20000
	179.37	1450	1550	2460	39	0.53	16100	16900	15600	15600	15400	16600	20000	20000
	192.18	1450	1550	2460	36	0.46	16100	16900	16200	16200	15400	16600	20000	20000

33 029 01 07

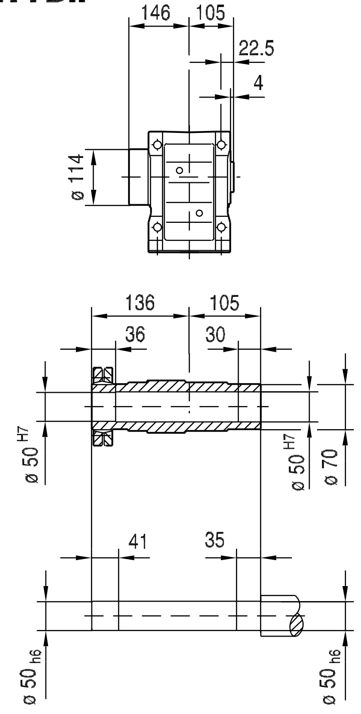
K77..



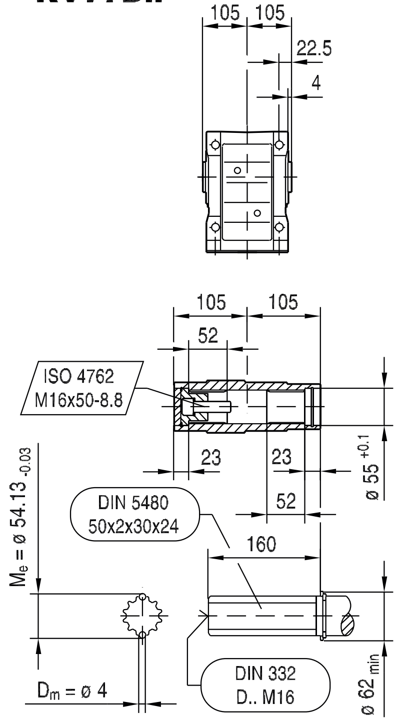
KA77B..



KH77B..



KV77B..



(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	481	531	581	472	497	547	512	546	614	544	584	664	661	704	792
LS	510	560	610	537	562	612	590	624	692	640	680	760	773	816	904
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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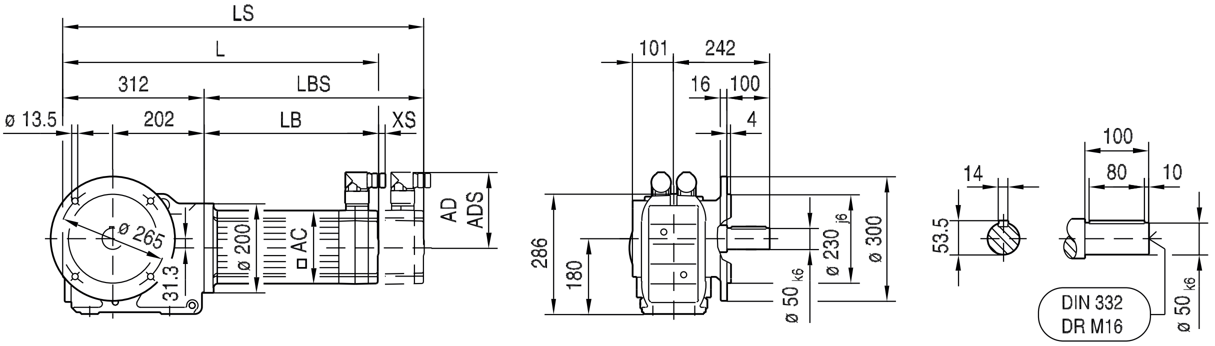
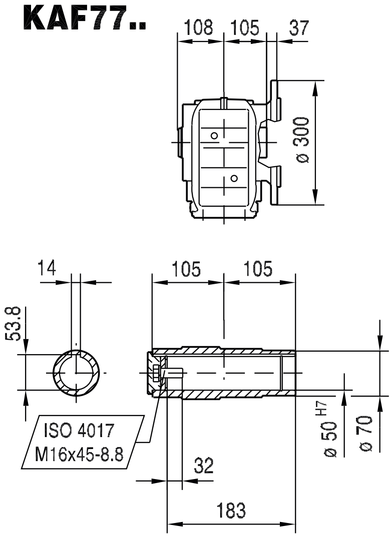
33 030 01 07

KF77..

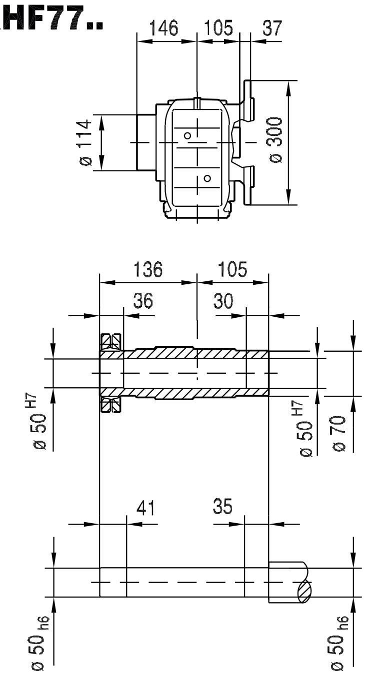


10

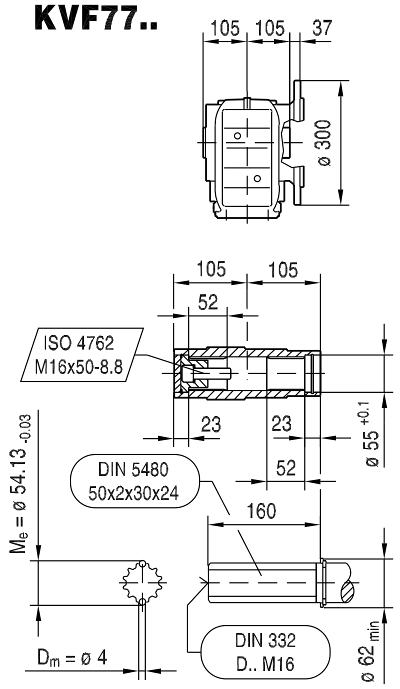
KAF77..



KHF77..



KVF77..



(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	479	529	579	470	495	545	510	544	612	542	582	662	659	702	790
LS	508	558	608	535	560	610	588	622	690	638	678	758	771	814	902
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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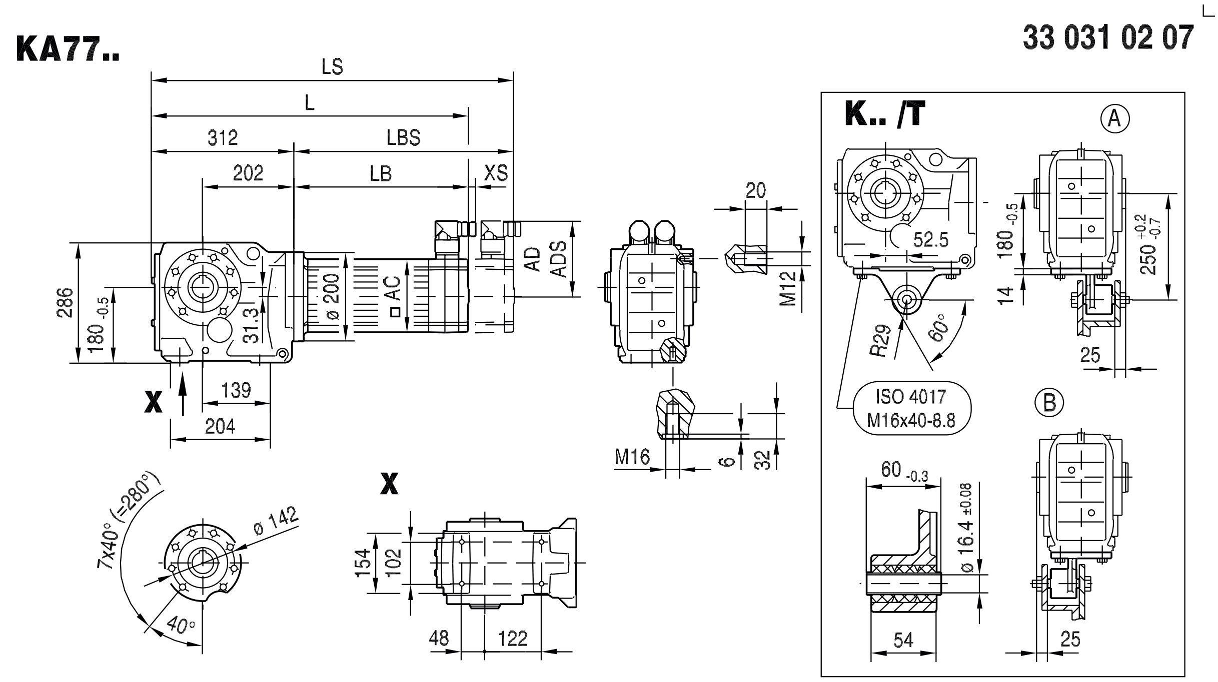

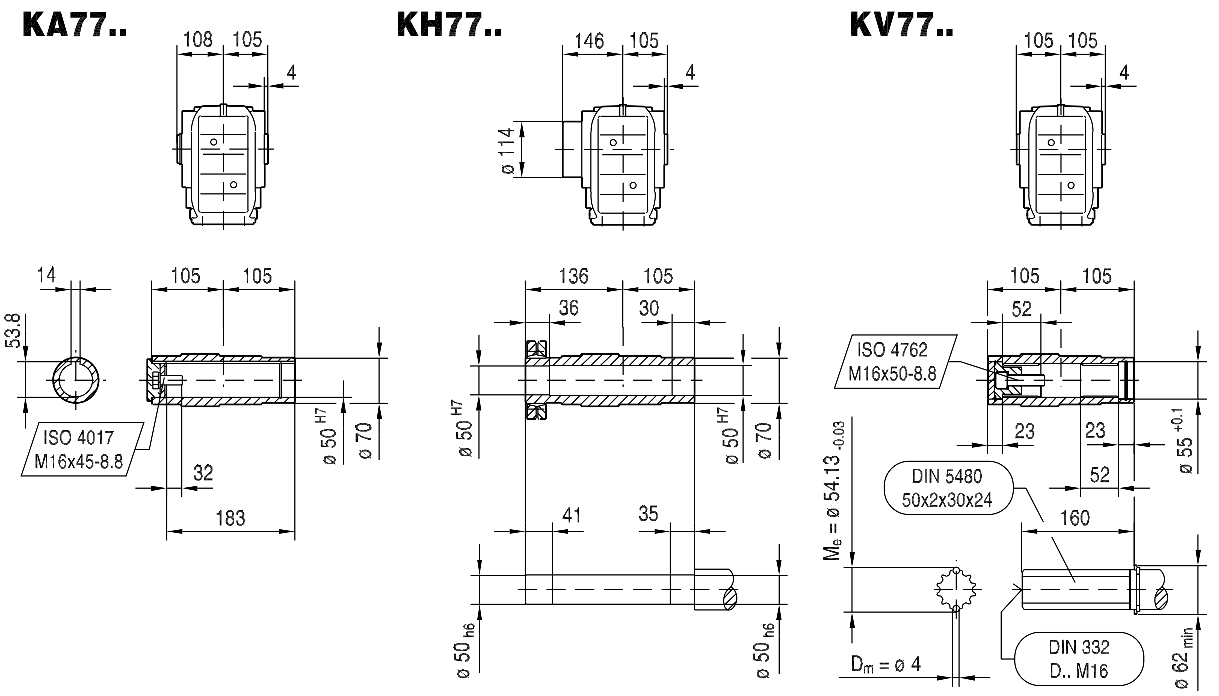

(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	479	529	579	470	495	545	510	544	612	542	582	662	659	702	790
LS	508	558	608	535	560	610	588	622	690	638	678	758	771	814	902
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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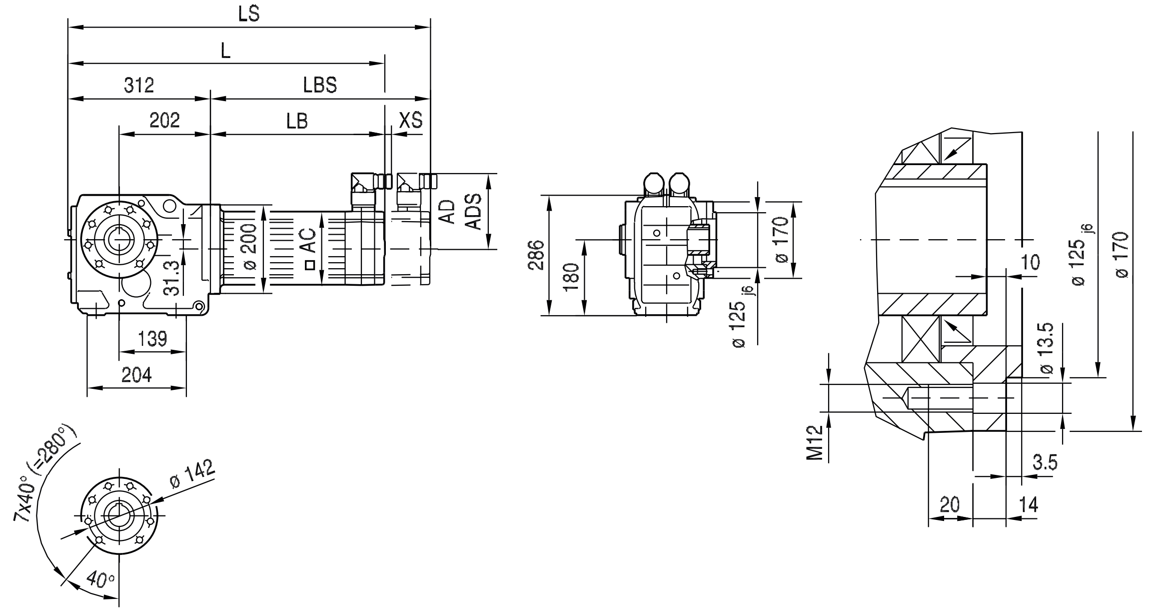
KAZ77.. 33 032 01 07



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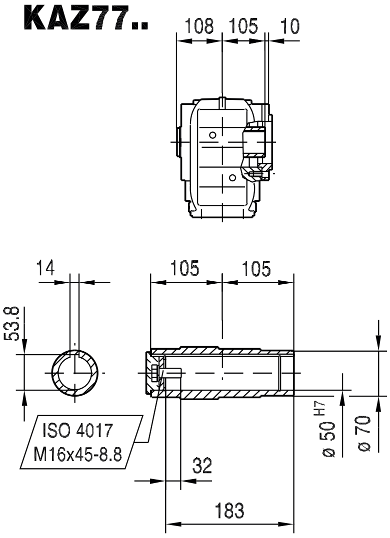

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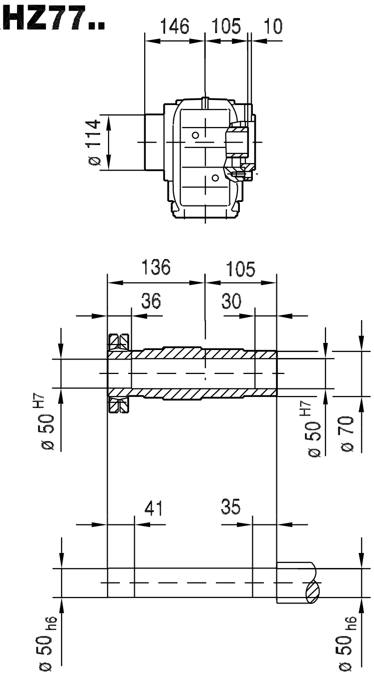

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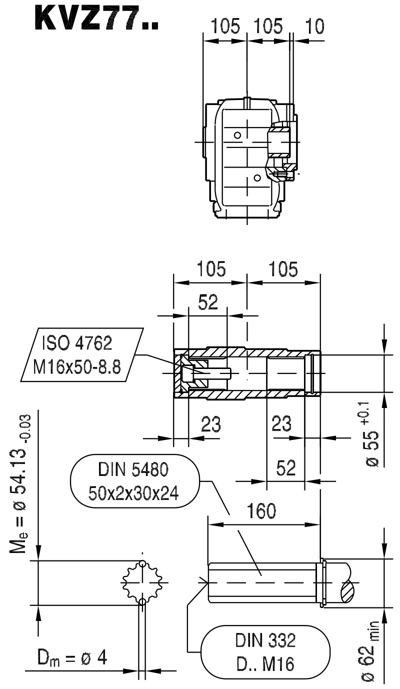

(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	479	529	579	470	495	545	510	544	612	542	582	662	659	702	790
LS	508	558	608	535	560	610	588	622	690	638	678	758	771	814	902
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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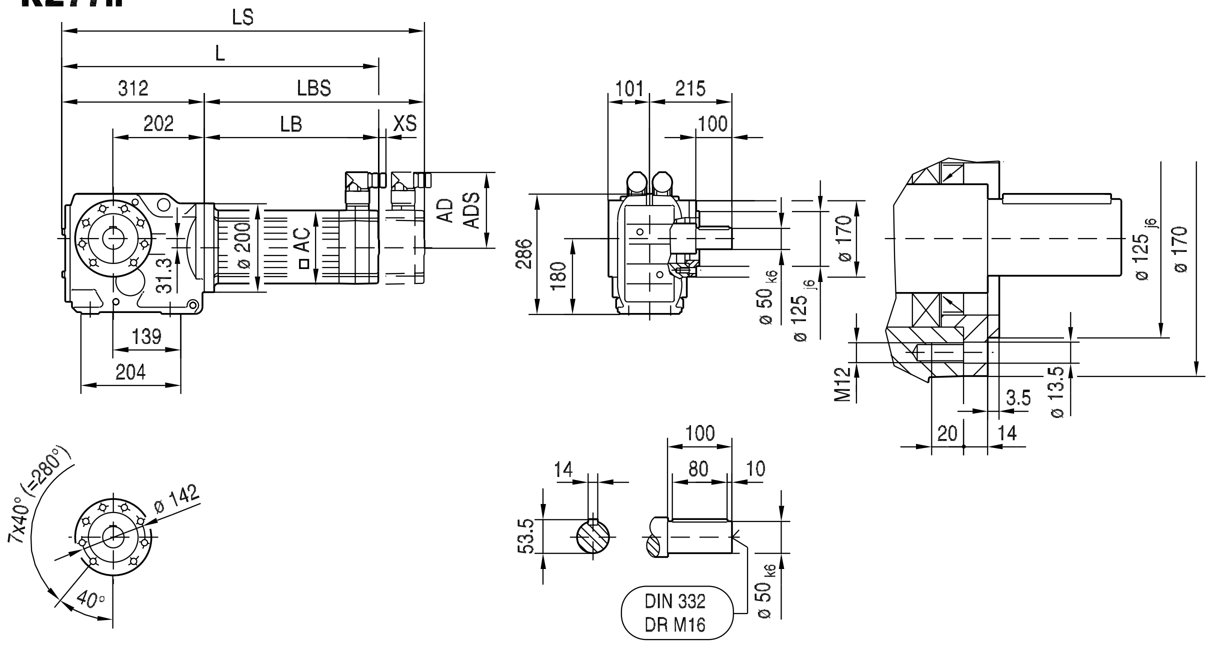
KZ77.. 33 007 00 16



(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	479	529	579	470	495	545	510	544	612	542	582	662	659	702	790
LS	508	558	608	535	560	610	588	622	690	638	678	758	771	814	902
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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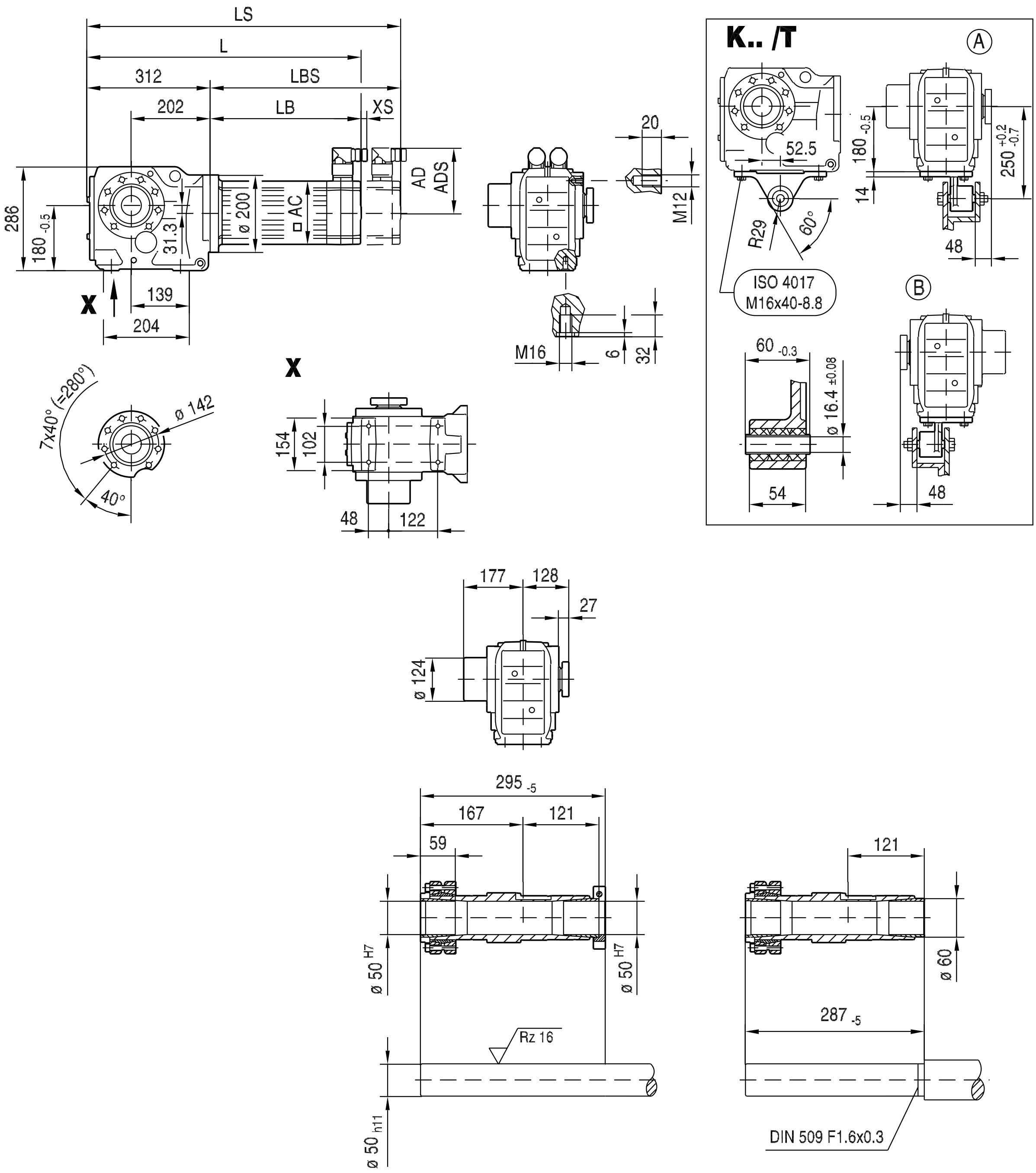
KT77..

33 033 03 07



(→ 194)	CMP..														
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	479	529	579	470	495	545	510	544	612	542	582	662	659	702	790
LS	508	558	608	535	560	610	588	622	690	638	678	758	771	814	902
LB	167	217	267	158	183	233	198	232	300	230	270	350	347	390	478
LBS	196	246	296	223	248	298	276	310	378	326	366	446	459	502	590
XS	14	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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10.2.10 K87..

K87, M_{aDyn} Nm														2700 Nm
	CMP													
i	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
	3													
7.21					430	740	470	745	1230	605	940	1550	1860	>1950
8.29		245	370	335	495	850	540	850	1420	700	1080	1790	>2100	>2100
10.00		295	450	400	600	1020	655	1030	1710	840	1300	2160	>2240	>2240
11.17	205	330	500	450	670	1140	730	1150	1910	940	1450	>2250	>2250	>2250
12.56					750	1290	820	1300	2150	1060	1630	2710	>3000	>3000
14.45		425	650	580	860	1480	940	1490	2480	1220	1880	3120	>3150	>3150
16.00	290	470	720	645	960	1640	1040	1650	>2270	1350	2080			
17.42		515	780	700	1040	1780	1140	1800	2990	1470	2270	>3240	>3240	>3240
19.45	355	575	870	785	1160	1990	1270	2010	>3240	1640	2530	>3240	>3240	>3240
22.41	410	660	1000	900	1340	2300	1460	2320	>3240	1890	2920	>3240	>3240	
24.92	455	735	1120	1000	1490	2550	1630	2580	>3240	2100	>3240	>3240	>3240	
27.88	510	820	1250	1120	1670	2860	1820	2890	>3240	2350	>3240			
31.39	575	920	1410	1260	1880	3220	2050	>3240	>3240	2650	>3240			
36.52		1060	1620	1460	2170	>3240	2360	>3240	>3240	3050	>3240	>3240	>3240	>3240
44.02		1280	1960	1760	2610	>3240	2850	>3240	>3240	>3240	>3240	>3240	>3240	>3240
49.16	890	1430	2190	1960	2920	>3240	3180	>3240	>3240	>3240	>3240	>3240	>3240	>3240
56.64	1030	1650	2520	2260	>3240	>3240	>3240	>3240	>3240	>3240	>3240	>3240	>3240	
63.00	1140	1840	2800	2510	>3240	>3240	>3240	>3240	>3240	>3240	>3240	>3240	>3240	
70.46	1280	2060	3130	2810	>3240	>3240	>3240	>3240	>3240	>3240	>3240			
79.34	1440	2320	>3240	3170	>3240	>3240	>3240	>3240	>3240	>3240	>3240			
86.34	1570	2520	>3240	>3240	>3240		>3240							
102.71	1870	3000	>3240	>3240	>3240		>3240							
115.82	2110	>3240	>3240	>3240										
126.91	2310	>3240	>3240	>3240										
147.32	2650	>3240												
164.34	2960													
174.19	3140													
197.37														

(→ 190)

K87, m kg														
	CMP													
s	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
3	100	100	105	105	110	115	110	115	125	130	140	155	165	170
KF: + 9.2 kg / KA: + -12 kg / KAF: + 1.1 kg														

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CMP..				c_{TG}				φ
		n_{epk}	η	K	KF	KA	KAF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
	7.21	4378	96	169	156	411	411	7
	8.29	4500	96	169	156	411	411	7
	10.00	4500	96	169	156	411	411	7
	11.17	4500	96	169	156	411	411	7
	12.56	4378	96	198	181	640	640	6
	14.45	4500	96	198	181	640	640	6
	16.00	4500	96	169	156	411	411	6
	17.42	4500	96	198	181	640	640	6
	19.45	4500	96	198	181	640	640	6
	22.41	4500	96	198	181	640	640	6
	24.92	4500	96	198	181	640	640	6
	27.88	4500	96	198	181	640	640	6
	31.39	4500	96	198	181	640	640	6
K87	36.52	4500	95	207	188	744	744	6
3	44.02	4500	95	207	188	744	744	6
	49.16	4500	95	207	188	744	744	5
	56.64	4500	95	207	188	744	744	5
	63.00	4500	95	207	188	744	744	5
	70.46	4500	95	207	188	744	744	5
	79.34	4500	95	207	188	744	744	5
	86.34	4500	95	207	188	744	744	5
	102.71	4500	95	207	188	744	744	5
	115.82	4500	95	207	188	744	744	5
	126.91	4500	95	207	188	744	744	5
	147.32	4500	94	207	188	744	744	5
	164.34	4500	94	207	188	744	744	5
	174.19	4500	94	207	188	744	744	5
	197.37	4500	94	207	188	744	744	5

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CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} K N	F_{Ramax} KF N	F_{Ramax} KA N	F_{Ramax} KAF N	F_{Rapk} K N	F_{Rapk} KF N	F_{Rapk} KA N	F_{Rapk} KAF N
K87 3	7.21	1300	1950	2210	250	46	13200	15100	4970	4970	28100	27000	30000	30000
	8.29	1400	2100	2380	205	35	13500	15600	4960	4960	27900	26900	30000	30000
	10.00	1500	2240	2550	180	26	14200	16400	5210	5210	27800	26700	30000	30000
	11.17	1500	2250	2550	188	22	14900	17100	5770	5770	27800	26700	30000	30000
	12.56	2000	3000	3400	223	42	14800	17000	5030	5030	26900	25900	30000	30000
	14.45	2100	3150	3570	201	32	15300	17700	5240	5240	26700	25700	30000	30000
	16.00	1800	2270	3060	119	12	16000	18500	5810	5810	27700	26700	30000	30000
	17.42	2200	3240	3740	189	24	16300	18800	5770	5770	26500	25600	30000	30000
	19.45	2300	3240	3910	170	20	16800	19300	5890	5890	26500	25600	30000	30000
	22.41	2300	3240	3910	178	16	17900	20600	6790	6790	26500	25600	30000	30000
	24.92	2500	3240	4250	140	14	18000	20700	6390	6390	26500	25600	30000	30000
	27.88	2600	3240	4420	122	12	18500	21400	6600	6600	26500	25600	30000	30000
	31.39	2700	3240	4590	108	9.6	19200	22100	6900	6900	26500	25600	30000	30000
	36.52	2500	3240	4250	41	20	21400	24500	9140	9140	26500	25600	30000	30000
	44.02	2600	3240	4420	39	16	22800	26000	10100	10100	26500	25600	30000	30000
	49.16	2700	3240	4590	35	14	23500	26300	10400	10400	26500	25600	30000	30000
	56.64	2700	3240	4590	35	11	25000	26300	11600	11600	26500	25600	30000	30000
	63.00	2700	3240	4590	35	9.8	26200	26300	12600	12600	26500	25600	30000	30000
	70.46	2700	3240	4590	35	8.4	27300	26300	13700	13700	26500	25600	30000	30000
	79.34	2700	3240	4590	37	7.1	27300	26300	14800	14800	26500	25600	30000	30000
	86.34	2700	3240	4590	37	6.3	27300	26300	15700	15700	26500	25600	30000	30000
	102.71	2700	3240	4590	38	4.9	27300	26300	17500	17500	26500	25600	30000	30000
	115.82	2700	3240	4590	38	4.0	27300	26300	18800	18800	26500	25600	30000	30000
	126.91	2700	3240	4590	39	3.5	27300	26300	19900	19900	26500	25600	30000	30000
	147.32	2700	3240	4590	39	2.8	27300	26300	21600	21600	26500	25600	30000	30000
	164.34	2700	3240	4590	39	1.8	27300	26300	23000	23000	26500	25600	30000	30000
	174.19	2700	3240	4590	39	1.6	27300	26300	23700	23700	26500	25600	30000	30000
	197.37	2700	3240	4590	35	1.3	27300	26300	25400	25400	26500	25600	30000	30000

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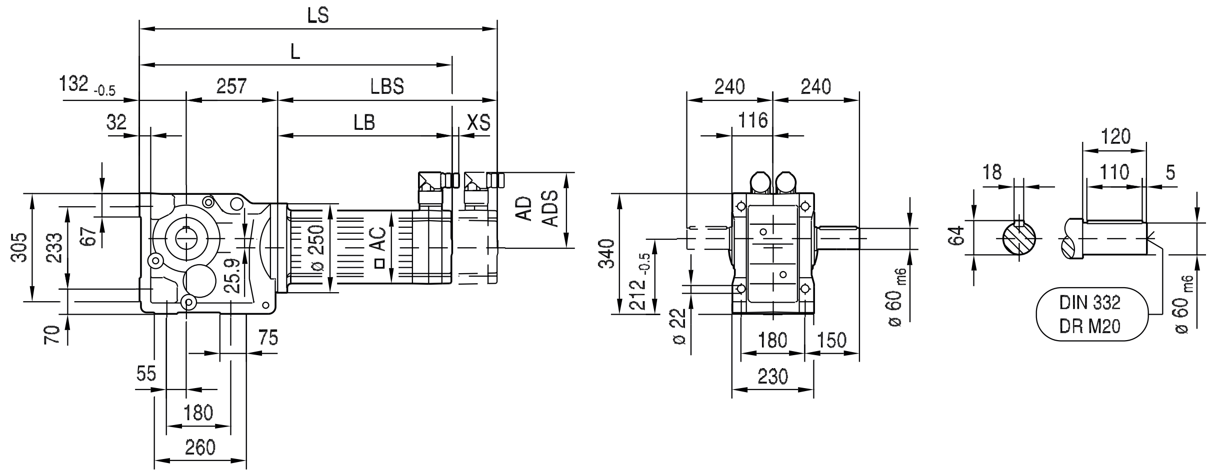
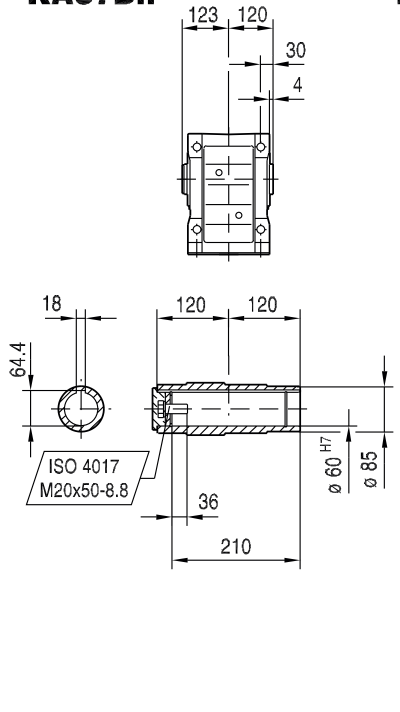
33 034 01 07

K87..

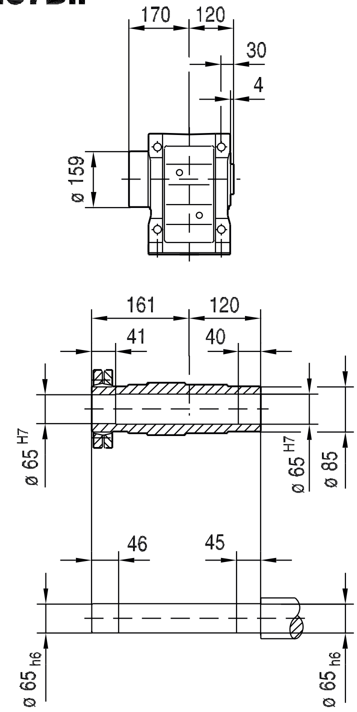


10

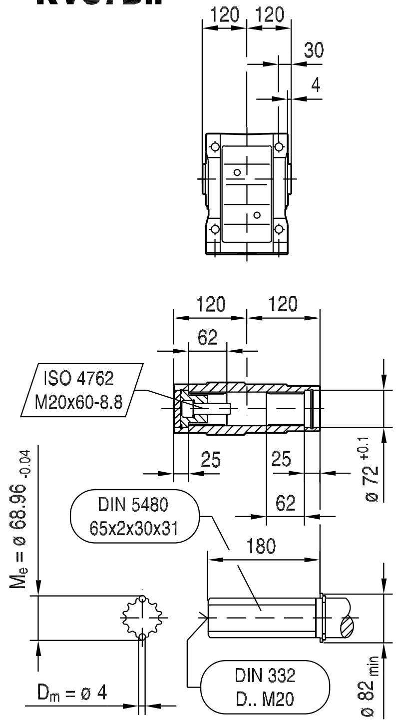
KA87B..



KH87B..



KV87B..



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	543	568	618	582	616	684	614	654	734	731	774	862	905	948
LS	608	633	683	660	694	762	710	750	830	843	886	974	1017	1060
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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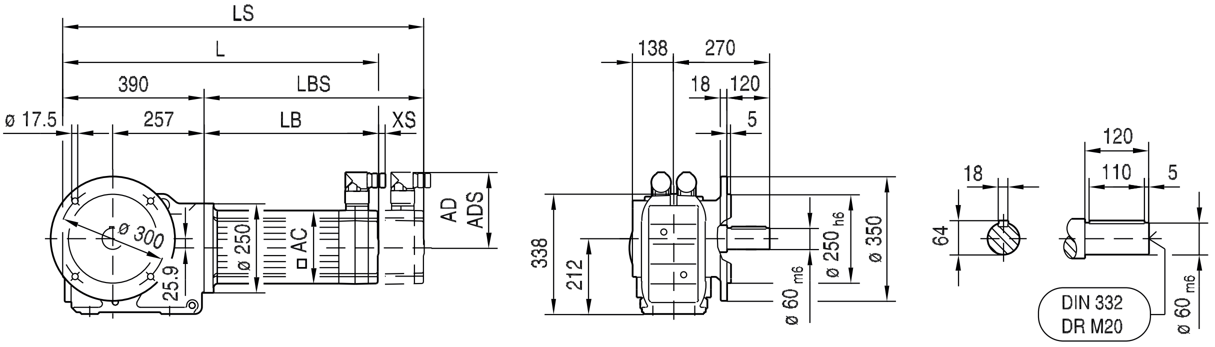
33 035 01 07

KF87..



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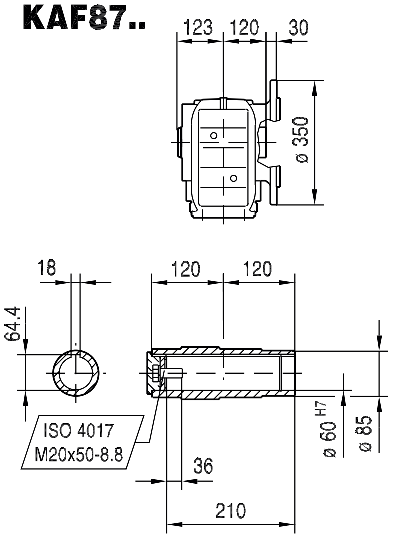

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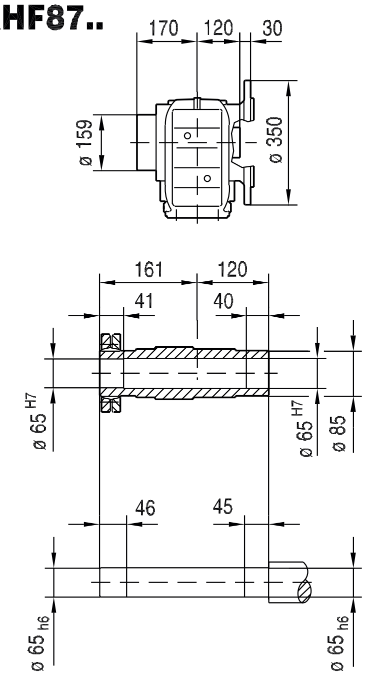

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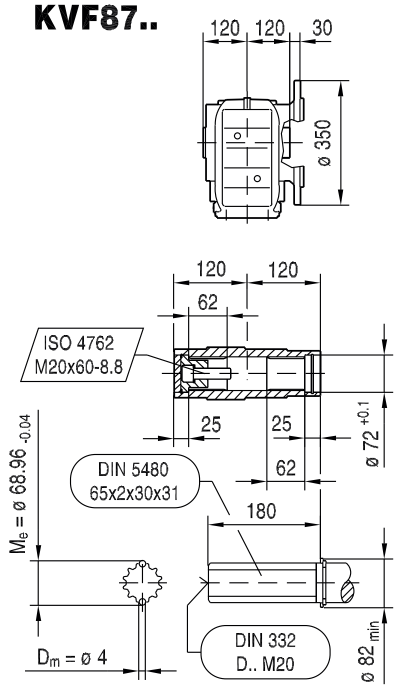

(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	544	569	619	583	617	685	615	655	735	732	775	863	906	949
LS	609	634	684	661	695	763	711	751	831	844	887	975	1018	1061
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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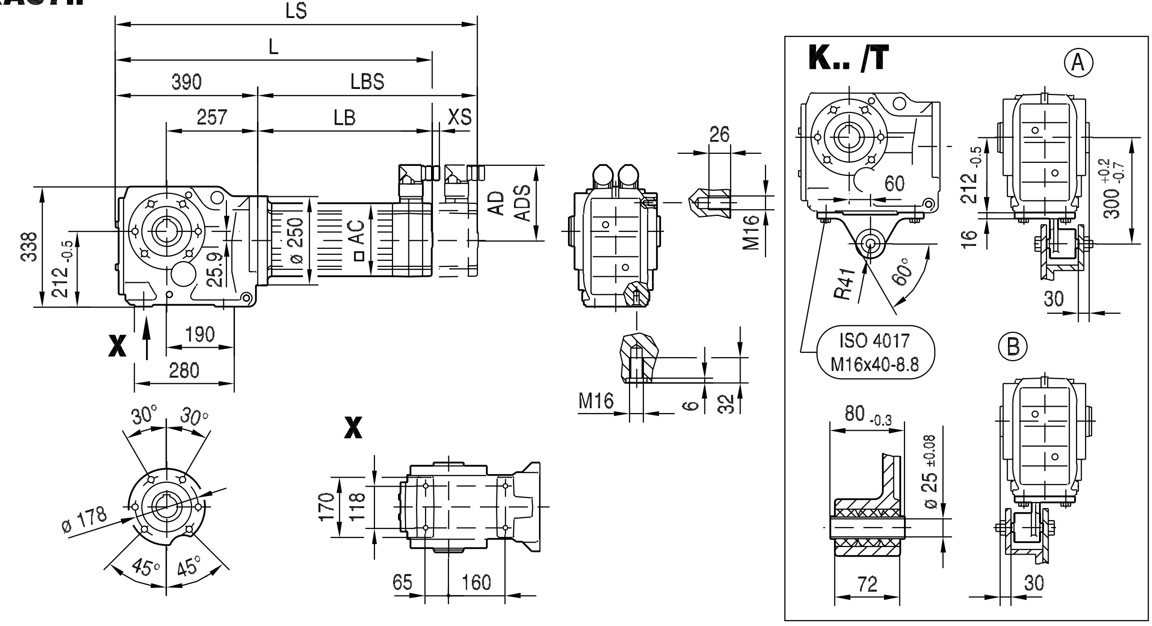
KA87..

33 036 02 07



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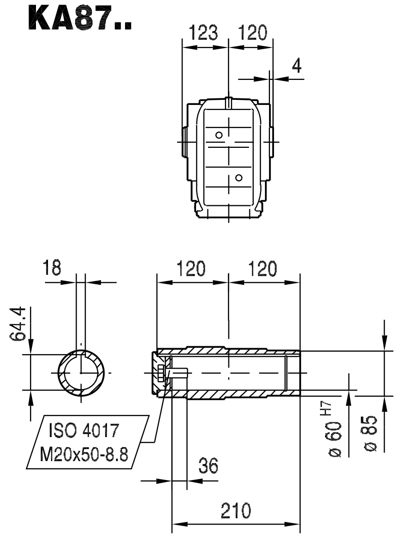

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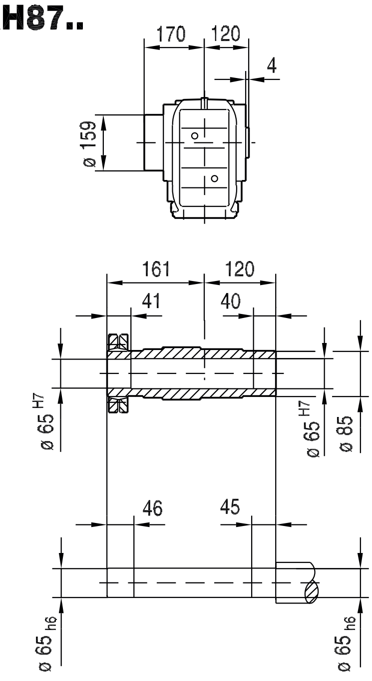

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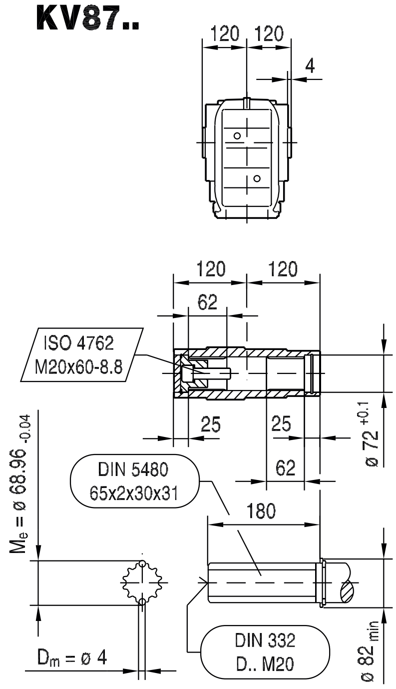

(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	544	569	619	583	617	685	615	655	735	732	775	863	906	949
LS	609	634	684	661	695	763	711	751	831	844	887	975	1018	1061
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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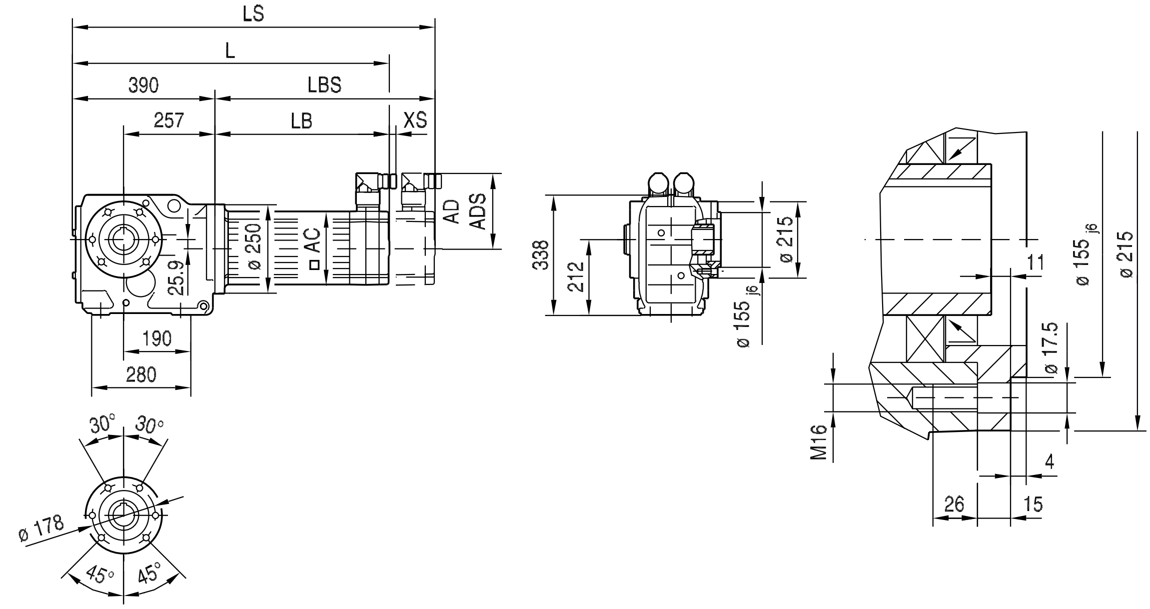
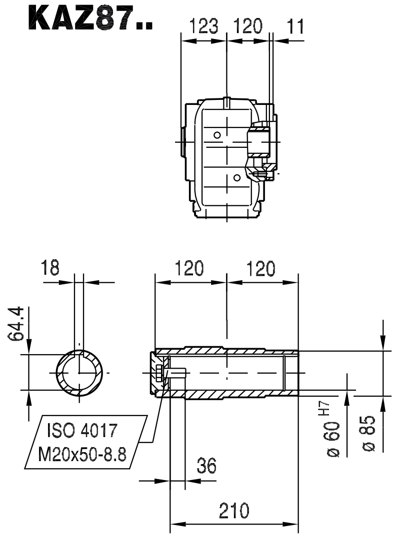
KAZ87..

33 037 01 07



KAZ87..



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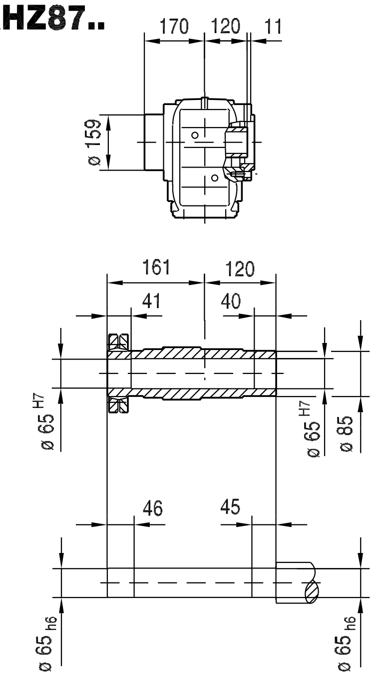

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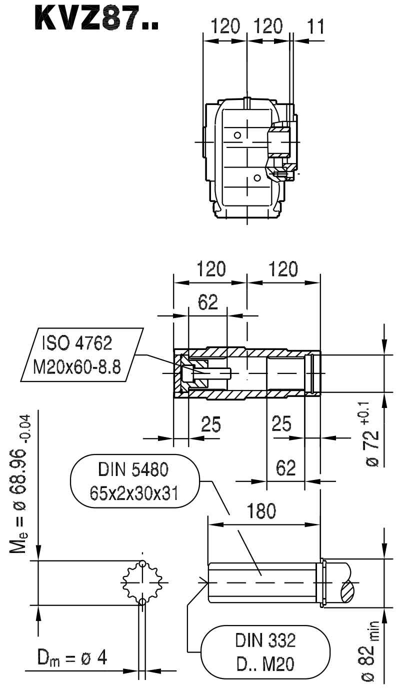

(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	544	569	619	583	617	685	615	655	735	732	775	863	906	949
LS	609	634	684	661	695	763	711	751	831	844	887	975	1018	1061
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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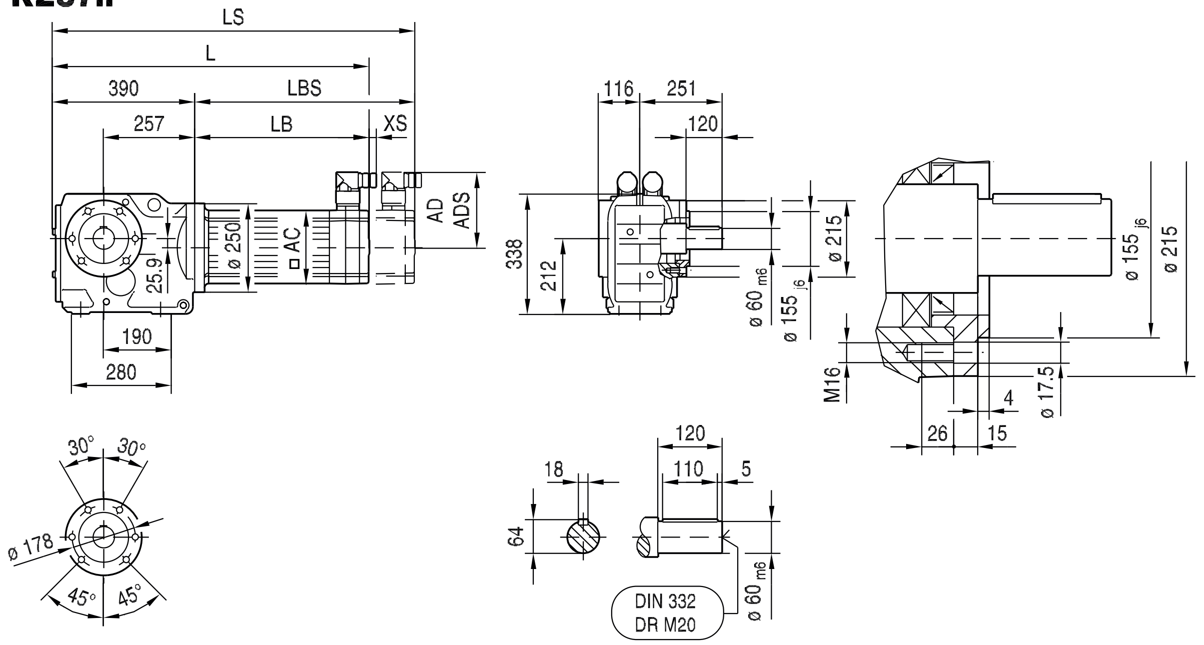
KZ87..

33 008 00 16



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	544	569	619	583	617	685	615	655	735	732	775	863	906	949
LS	609	634	684	661	695	763	711	751	831	844	887	975	1018	1061
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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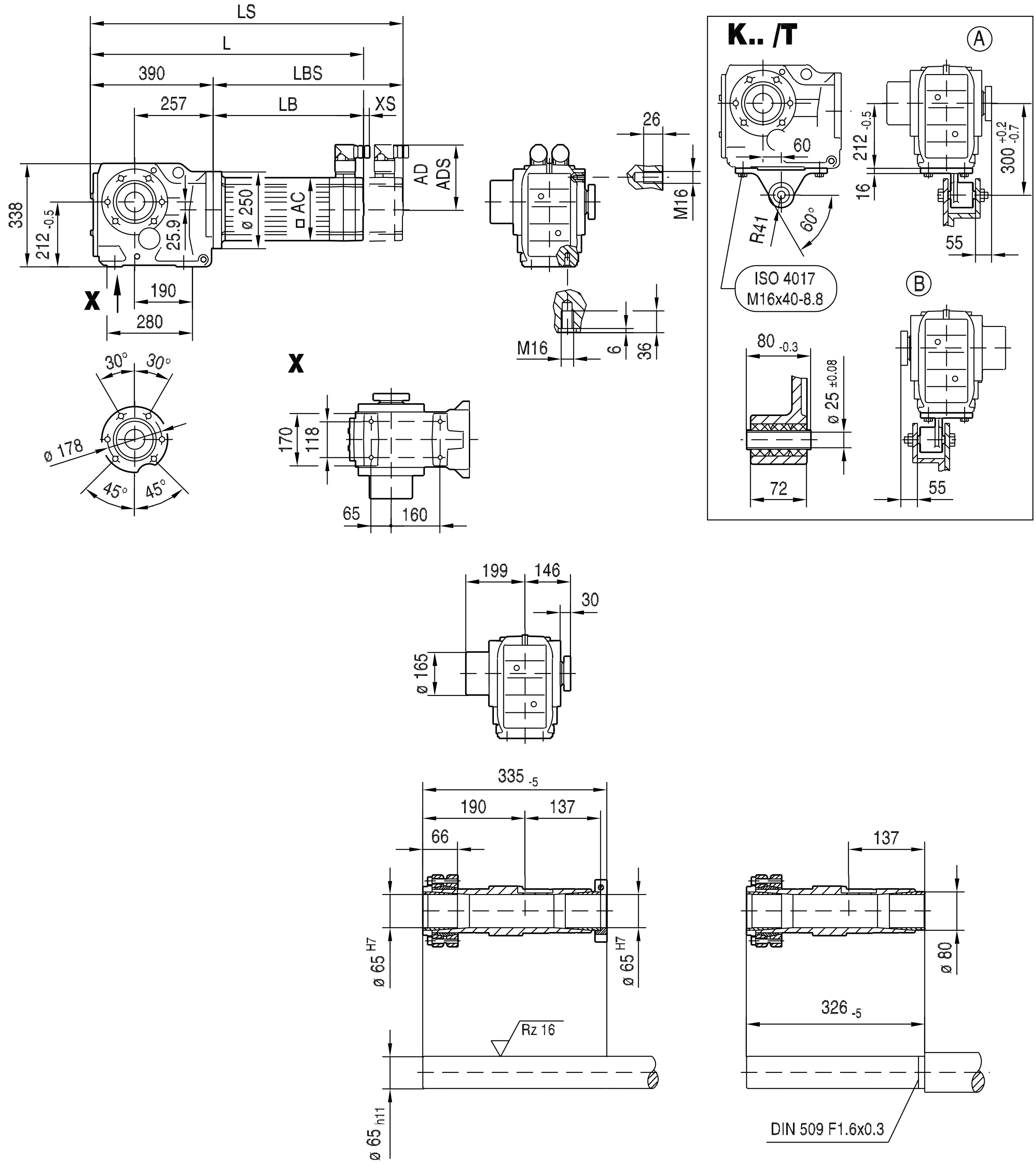
KT87..

33 038 03 07



(→ 194)	CMP..													
	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	116	116	116	137	137	137	162	162	162	205	205	205	205	205
AD	102	102	102	134	134	134	146	146	146	177	177	213	213	213
ADS	104	104	104	137	137	137	147	147	147	177	177	213	213	213
L	544	569	619	583	617	685	615	655	735	732	775	863	906	949
LS	609	634	684	661	695	763	711	751	831	844	887	975	1018	1061
LB	154	179	229	193	227	295	225	265	345	342	385	473	516	559
LBS	219	244	294	271	305	373	321	361	441	454	497	585	628	671
XS	11	11	11	37	37	37	37	37	37	32	32	49	49	49

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10.2.11 K97..

K97, M_{aDyn} Nm											4300 Nm
	CMP										
i	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
3											
7.54		450	770	490	780	1290	635	980	1620	1950	2310
8.71		520	890	570	900	1490	735	1130	1880	2250	2670
10.41		625	1060	680	1070	1780	870	1350	2240	2690	3190
11.99		720	1230	785	1240	2050	1010	1560	2580	3100	3680
13.85		830	1420	900	1430	2370	1170	1800	2990	3580	4250
16.56		990	1700	1080	1710	2840	1390	2160	3570	4290	>4710
18.96	765	1130	1940	1240	1960	3250	1600	2470	4090	>4710	>4710
22.37	900	1340	2290	1460	2310	3830	1880	2920	>4710	>4710	>4710
24.75	1000	1480	2540	1620	2560	4240	2090	3230	>4710	>4710	>4710
27.91	1120	1670	2860	1830	2890	>4710	2350	3640	>4710	>4710	
30.82	1240	1850	3160	2020	3190	>4710	2600	4020	>4710	>4710	
34.23	1380	2050	3510	2240	3540	>4710	2890	4460			
38.30	1540	2300	3930	2510	3970	>4710	3230	>4710			
41.87		2430	4160	2650	4200	>4710	3420	>4710	>4710	>4710	>4710
47.93	1890	2820	>4710	3070	>4710	>4710	3960	>4710	>4710	>4710	>4710
56.55	2230	3320	>4710	3630	>4710	>4710	4670	>4710	>4710	>4710	>4710
62.55	2470	3680	>4710	4010	>4710	>4710	>4710	>4710	>4710	>4710	>4710
70.54	2790	4150	>4710	4520	>4710	>4710	>4710	>4710	>4710	>4710	
77.89	3080	4580	>4710	>4710	>4710	>4710	>4710	>4710	>4710	>4710	
86.52	3420	>4710	>4710	>4710	>4710	>4710	>4710	>4710			
96.80	3830	>4710	>4710	>4710	>4710	>4710	>4710	>4710			
105.13	4160	>4710		>4710							
123.93	>4710	>4710		>4710							
140.28	>4710										
153.21	>4710										
176.05											

(→ 🗎 190)

K97, m kg											
	CMP										
s	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
3	165	170	170	175	180	185	190	195	215	220	230
KF: + 20 kg / KA: + -18 kg / KAF: + 6.7 kg											

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CMP..				c_{TG}				φ
	i	n_{epk} min^{-1}	η %	K Nm/'	KF Nm/'	KA Nm/'	KAF Nm/'	/R '
K97 3	7.54	3597	96	264	237	581	581	10
	8.71	3924	96	264	237	581	581	10
	10.41	4378	96	264	237	581	581	10
	11.99	3597	96	301	267	791	791	8
	13.85	3924	96	301	267	791	791	8
	16.56	4378	96	301	267	791	791	8
	18.96	4500	96	301	267	791	791	8
	22.37	4500	96	301	267	791	791	8
	24.75	4500	96	301	267	791	791	8
	27.91	4500	96	301	267	791	791	8
	30.82	4500	96	301	267	791	791	7
	34.23	4500	96	301	267	791	791	7
	38.30	4500	96	301	267	791	791	7
	41.87	4378	93	314	278	892	892	7
	47.93	4500	94	314	278	892	892	7
	56.55	4500	94	314	278	892	892	7
	62.55	4500	94	314	278	892	892	7
	70.54	4500	94	314	278	892	892	7
	77.89	4500	94	314	278	892	892	7
	86.52	4500	94	314	278	892	892	7
	96.80	4500	94	314	278	892	892	7
	105.13	4500	94	314	278	892	892	7
	123.93	4500	94	314	278	892	892	7
	140.28	4500	94	314	278	892	892	7
	153.21	4500	94	314	278	892	892	7
	176.05	4500	94	314	278	892	892	7

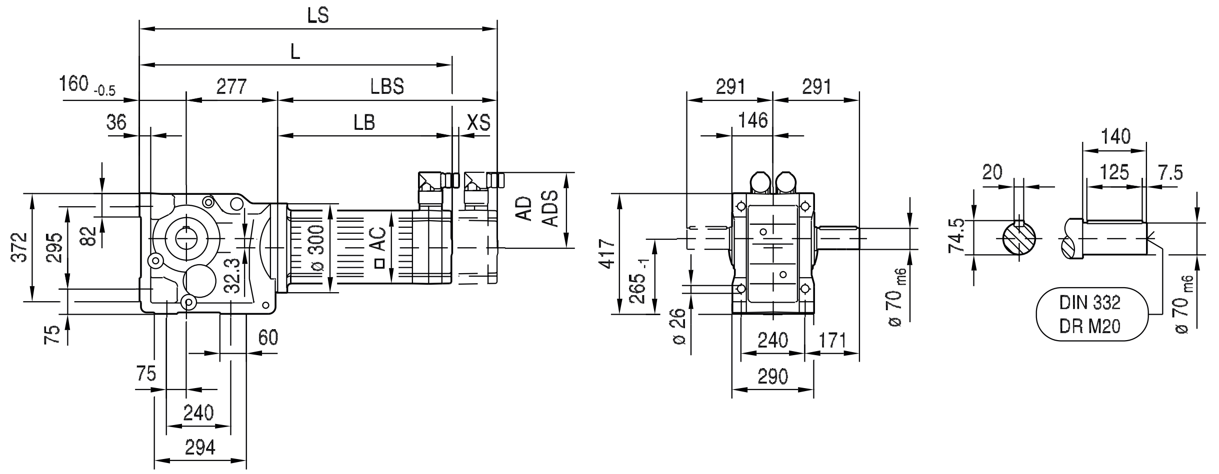
10

CMP.. n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	F_{Ramax}				F_{Rapk}			
							K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
K97 3	7.54[1)]	2400	3560	4080	279	120	15700	18100	10200	10200	40000	39300	40000	40000
	8.71[1)]	2660	3590	4520	218	94	15800	18200	9930	9930	40000	39300	40000	40000
	10.41	2870	3610	4870	183	71	16400	19000	10300	10300	40000	39300	40000	40000
	11.99[1)]	3890	4710	6610	167	115	16200	18800	9100	9100	40000	38300	40000	40000
	13.85[1)]	4300	4710	7310	130	91	16100	18900	8520	8520	40000	38300	40000	40000
	16.56	4300	4710	7310	139	69	17800	20700	10300	10300	40000	38300	40000	40000
	18.96	4300	4710	7310	148	55	19100	22100	11700	11700	40000	38300	40000	40000
	22.37	4300	4710	7310	156	43	20900	24000	13500	13500	40000	38300	40000	40000
	24.75	4300	4710	7310	166	37	22000	25200	14700	14700	40000	38300	40000	40000
	27.91	4300	4710	7310	168	30	23300	26600	16100	16100	40000	38300	40000	40000
	30.82	4300	4710	7310	172	26	24500	27800	17300	17300	40000	38300	40000	40000
	34.23	4300	4710	7310	178	22	25700	29200	18600	18600	40000	38300	40000	40000
	38.30	4300	4710	7310	183	18	27100	30700	20100	20100	40000	38300	40000	40000
	41.87	4300	4710	7310	36	42	28300	31900	21300	21300	40000	38300	40000	40000
	47.93	4300	4710	7310	31	35	30000	33800	23300	23300	40000	38300	40000	40000
	56.55	4300	4710	7310	30	28	32300	36300	25700	25700	40000	38300	40000	40000
	62.55	4300	4710	7310	30	25	33800	37800	27300	27300	40000	38300	40000	40000
	70.54	4300	4710	7310	31	21	35600	38700	29200	29200	40000	38300	40000	40000
	77.89	4300	4710	7310	32	18	37100	38700	30900	30900	40000	38300	40000	40000
	86.52	4300	4710	7310	32	16	38800	38700	32700	32700	40000	38300	40000	40000
	96.80	4300	4710	7310	33	13	40000	38700	34700	34700	40000	38300	40000	40000
	105.13	4300	4710	7310	33	12	40000	38700	36300	36300	40000	38300	40000	40000
	123.93	4300	4710	7310	33	9.3	40000	38700	39500	39500	40000	38300	40000	40000
	140.28	4300	4710	7310	34	5.9	40000	38700	40000	40000	40000	38300	40000	40000
	153.21	4300	4710	7310	34	5.2	40000	38700	40000	40000	40000	38300	40000	40000
	176.05	4300	4710	7310	34	4.0	40000	38700	40000	40000	40000	38300	40000	40000

1) (→ 🗎 190)

33 039 01 07

K97..



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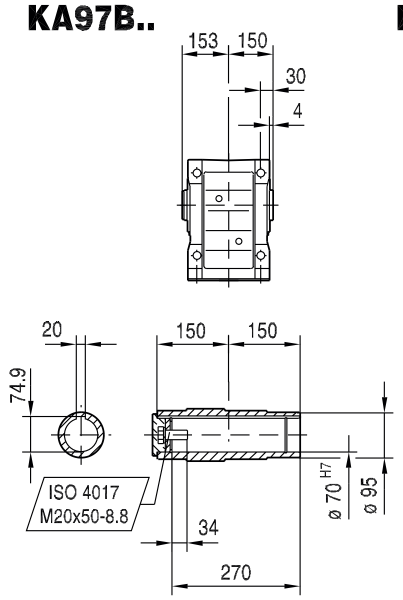
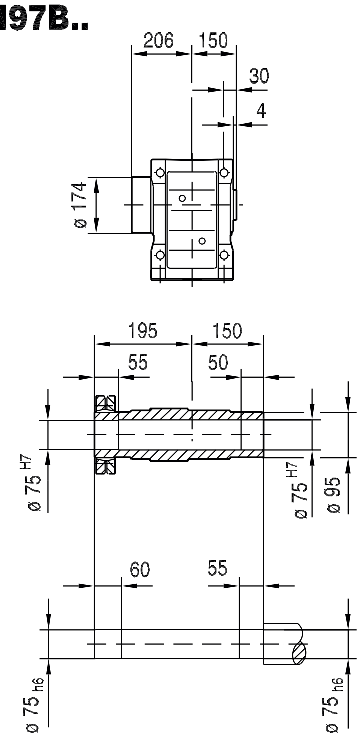
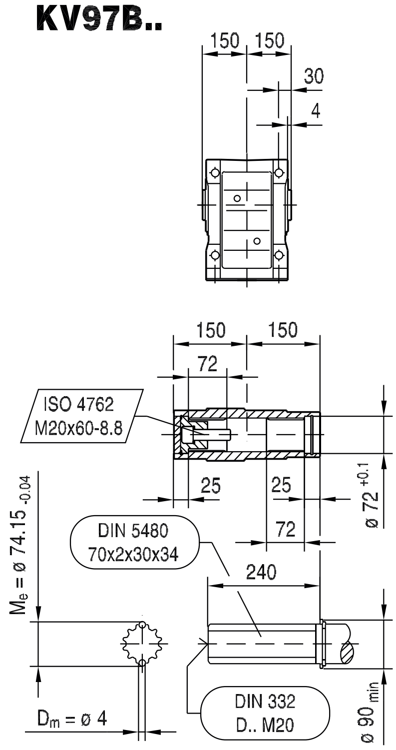


KH97B..



KV97B..



(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	624	658	726	657	697	777	774	817	905	948	991
LS	702	736	804	753	793	873	886	929	1017	1060	1103
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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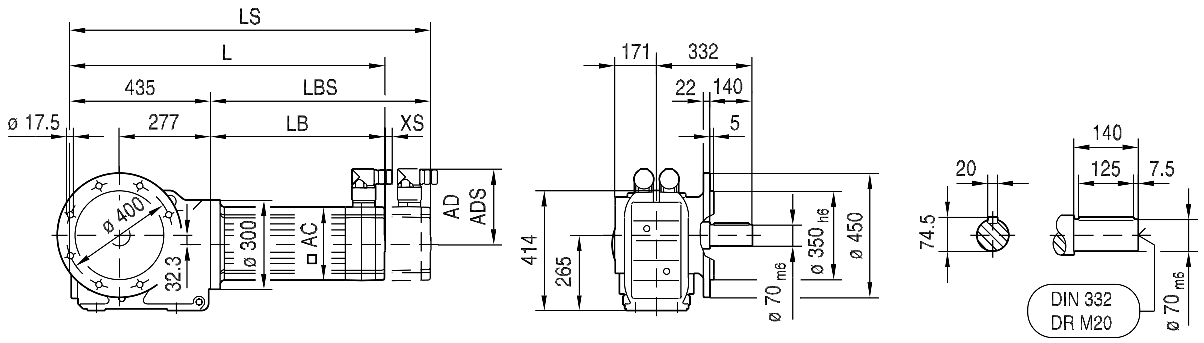
33 040 02 07

KF97..



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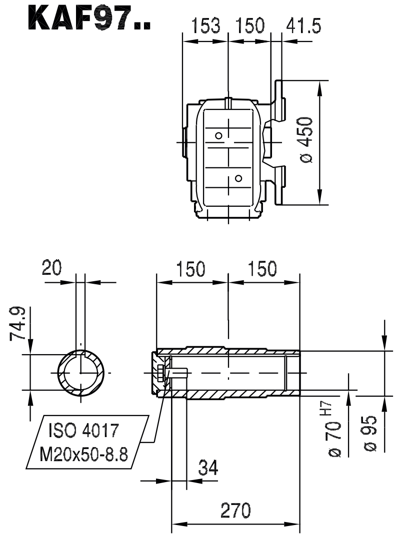
KAF97..



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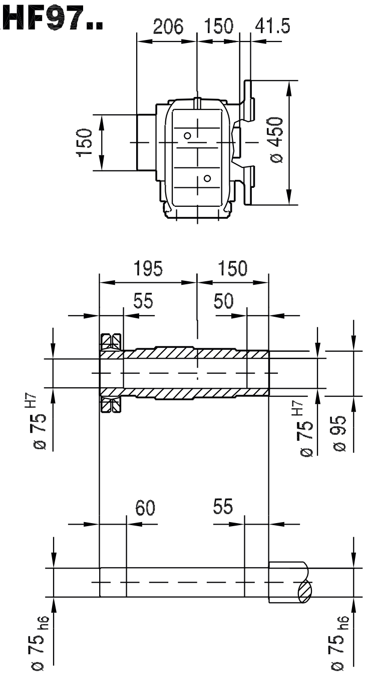

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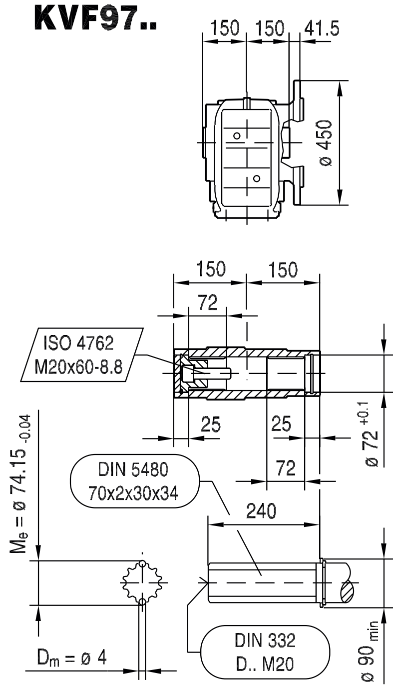

(→ 194)	CMP..										
	80S	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**	**112H**	**112E**
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	622	656	724	655	695	775	772	815	903	946	989
LS	700	734	802	751	791	871	884	927	1015	1058	1101
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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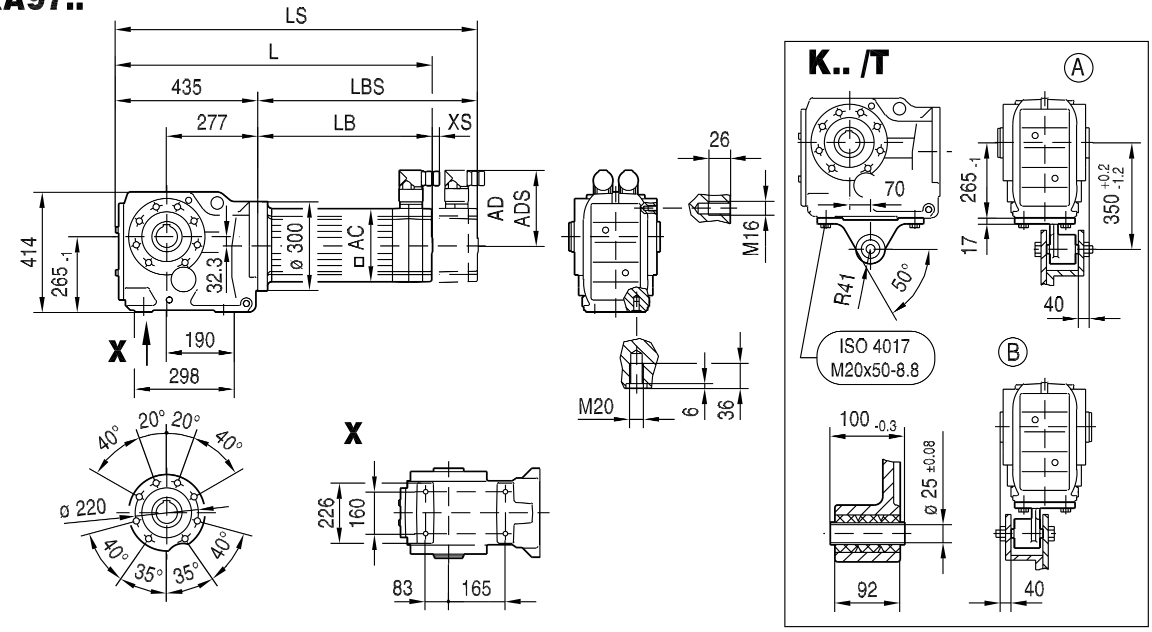
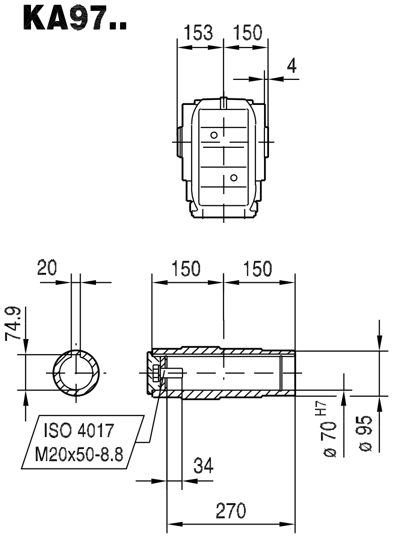
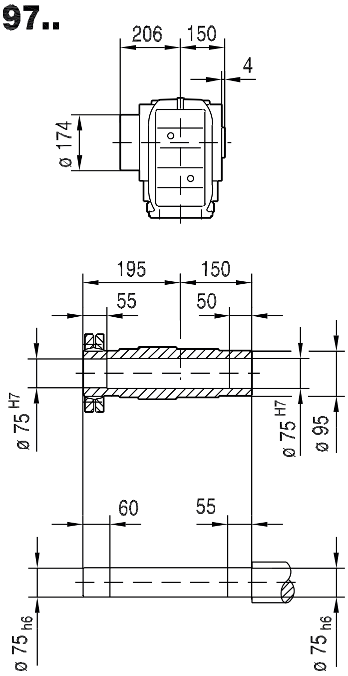
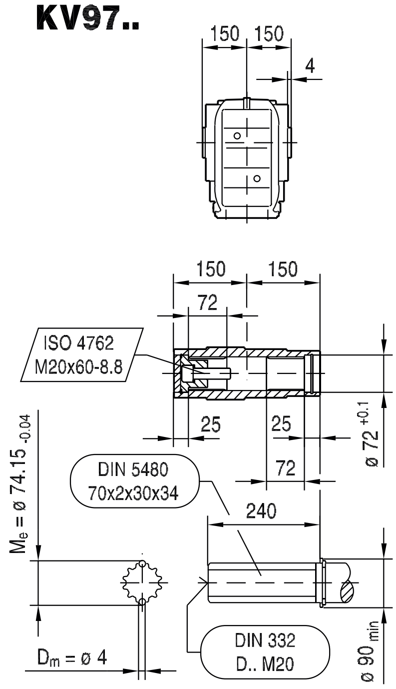
KA97.. **33 041 02 07**



KA97.. **KH97..** **KV97..**







(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	622	656	724	655	695	775	772	815	903	946	989
LS	700	734	802	751	791	871	884	927	1015	1058	1101
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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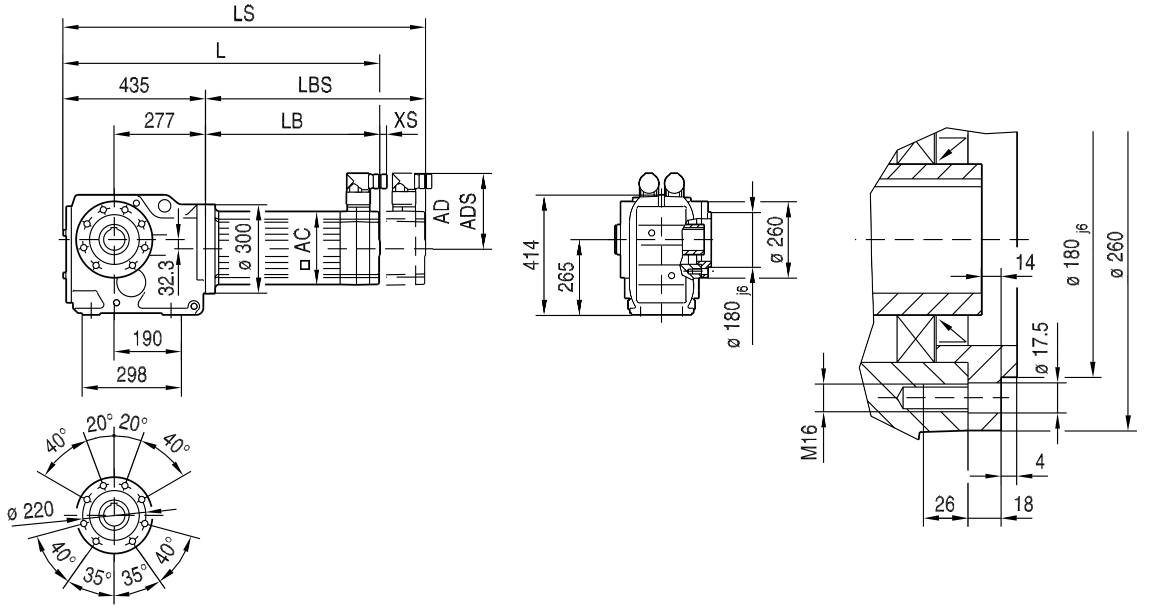
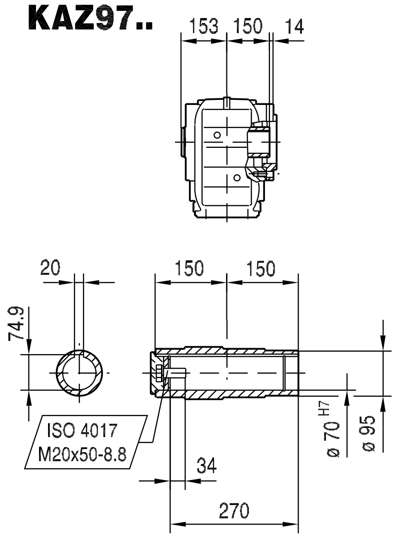
KAZ97..

33 042 01 07

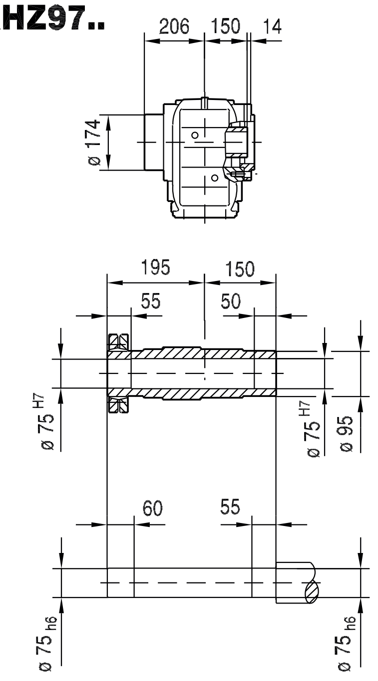


10

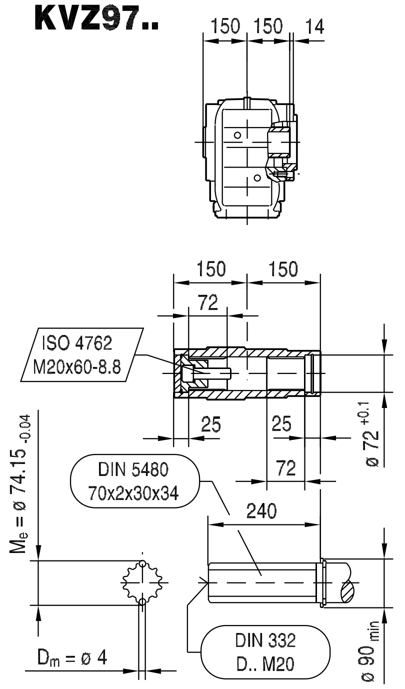
KAZ97..



KHZ97..



KVZ97..



(→ 194)	CMP..										
	80S	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**	**112H**	**112E**
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	622	656	724	655	695	775	772	815	903	946	989
LS	700	734	802	751	791	871	884	927	1015	1058	1101
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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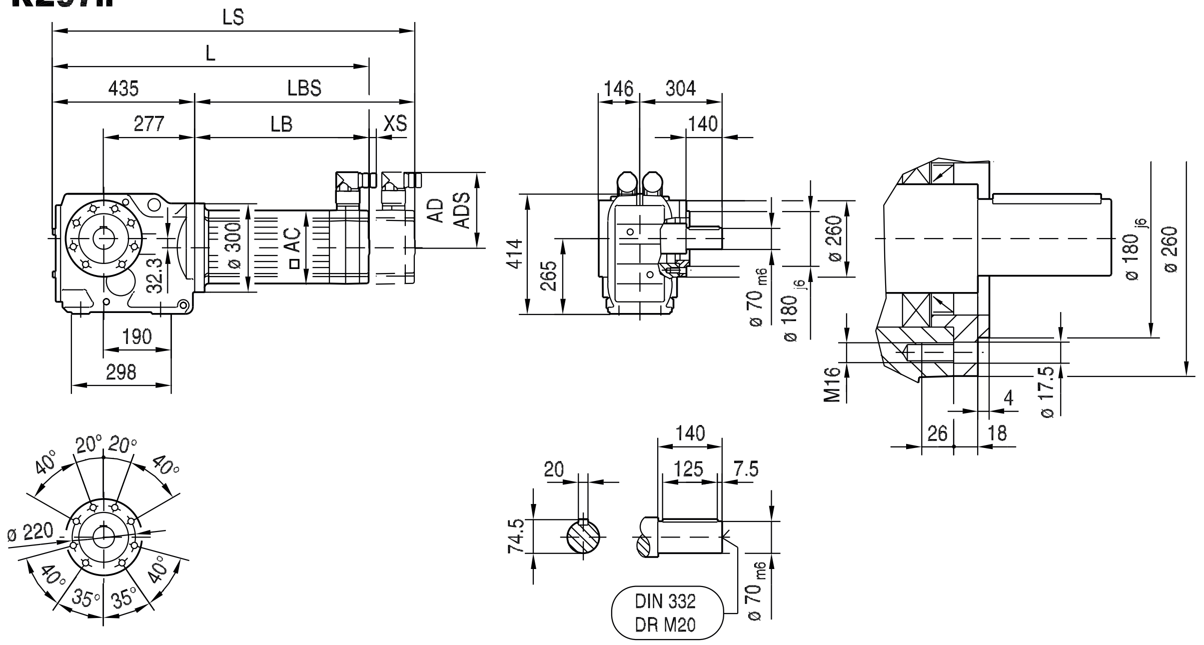
KZ97..

33 009 00 16



(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	622	656	724	655	695	775	772	815	903	946	989
LS	700	734	802	751	791	871	884	927	1015	1058	1101
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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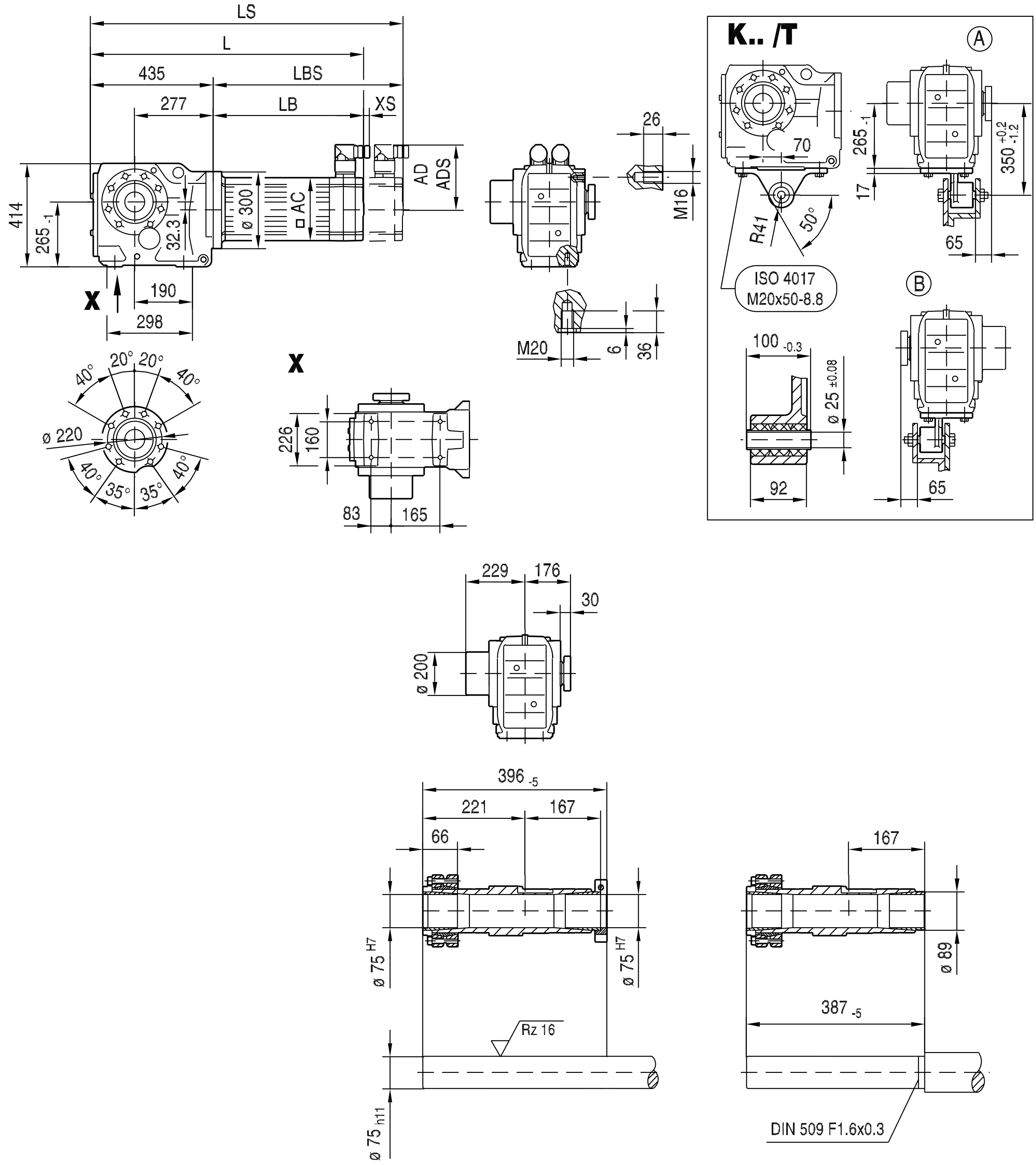
KT97.. 33 043 03 07



10

(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	622	656	724	655	695	775	772	815	903	946	989
LS	700	734	802	751	791	871	884	927	1015	1058	1101
LB	187	221	289	220	260	340	337	380	468	511	554
LBS	265	299	367	316	356	436	449	492	580	623	666
XS	37	37	37	37	37	37	32	32	49	49	49

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10.2.12 K107..

K107, M_{aDyn} Nm									8000 Nm
	CMP								
i	80L	100S	100M	100L	112S	112M	112L	112H	112E
3									
7.35	750		760	1260	620	950	1580	1900	2250
8.69	890	565	900	1490	730	1130	1870	2250	2660
9.94	1020	650	1030	1700	830	1290	2140	2570	3050
11.73	1200	765	1210	2010	990	1530	2530	3040	3600
13.43	1370	880	1390	2300	1130	1750	2900	3480	4120
14.64	1500	950	1510	2510	1230	1910	3160	3790	4490
16.75	1720	1090	1730	2870	1410	2180	3610	4340	5140
19.74	2020	1290	2040	3380	1660	2570	4260	5110	6060
22.62	2320	1480	2340	3880	1910	2950	4880	5860	6940
26.32	2700	1720	2720	4510	2220	3430	5680	6820	8080
29.00	2970	1900	3000	4970	2440	3780	6260	7510	>8400
31.28	3140		3170	5250	2580	3990	6610	7930	>9090
32.69	3350	2140	3380	5610	2760	4260	7060	>8430	
37.00	3720	2370	3750	6210	3060	4730	7820	>9090	>9090
42.33	4250	2710	4290	7110	3500	5410	8950	>9090	>9090
49.90	5010	3200	5060	8380	4120	6370	>9090	>9090	>9090
57.17	5750	3670	5800	>9090	4720	7300	>9090	>9090	>9090
66.52	6690	4270	6750	>9090	5500	8500	>9090	>9090	>9090
73.30	7370	4700	7440	>9090	6060	>9090	>9090	>9090	>9090
82.61	8300	5300	8380	>9090	6830	>9090	>9090	>9090	
90.96	>9090	5830	>9090	>9090	7520	>9090	>9090	>9090	
100.75	>9090	6460	>9090	>9090	8330	>9090			
112.41	>9090	7210	>9090	>9090	>9090	>9090			
121.46		7790							
143.47		>9090							

(→ 190)

K107, m kg									
	CMP								
s	80L	100S	100M	100L	112S	112M	112L	112H	112E
3	285	285	290	300	300	310	325	335	340
KF: + 12 kg / KA: + -27 kg / KAF: + -3.2 kg									

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CMP..				c_{TG}				φ
	i	n_{epk} min^{-1}	η %	K Nm/'	KF Nm/'	KA Nm/'	KAF Nm/'	/R '
	7.35	3197	96	519	488	862	862	9
	8.69	3597	96	519	488	862	862	9
	9.94	3924	96	519	488	862	862	9
	11.73	4378	96	519	488	862	862	9
	13.43	4500	96	519	488	862	862	9
	14.64	3597	96	661	612	1341	1341	7
	16.75	3924	96	661	612	1341	1341	7
	19.74	4378	96	661	612	1341	1341	6
	22.62	4500	96	661	612	1341	1341	6
	26.32	4500	96	661	612	1341	1341	6
	29.00	4500	96	661	612	1341	1341	6
K107	31.28	3197	94	730	670	1660	1660	6
3	32.69	4500	96	661	612	1341	1341	6
	37.00	3597	94	730	670	1660	1660	6
	42.33	3924	94	730	670	1660	1660	6
	49.90	4378	94	730	670	1660	1660	6
	57.17	4500	94	730	670	1660	1660	6
	66.52	4500	94	730	670	1660	1660	6
	73.30	4500	94	730	670	1660	1660	6
	82.61	4500	94	730	670	1660	1660	6
	90.96	4500	94	730	670	1660	1660	6
	100.75	4500	94	730	670	1660	1660	6
	112.41	4500	94	730	670	1660	1660	6
	121.46	4500	94	730	670	1660	1660	6
	143.47	4500	94	730	670	1660	1660	6

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	kg*m²	N	N	N	N	N	N	N	N
K107 3	7.35[1)]	3600	4720	6120	286	231	24400	28500	9900	47100	65000	65000	65000	65000
	8.69	4070	4780	6910	207	170	24600	29100	9270	48300	65000	65000	65000	65000
	9.94	4190	4840	7120	201	136	25800	30500	10000	50500	65000	65000	65000	65000
	11.73	4300	4910	7310	196	104	27500	32300	11100	53500	65000	65000	65000	65000
	13.43	4300	4940	7310	201	82	29200	34200	12600	56500	65000	65000	65000	65000
	14.64	6890	8060	11700	123	163	19500	23000	6180	51700	65000	65000	65000	65000
	16.75	7050	8160	11900	119	131	21000	24800	7080	54200	65000	65000	65000	65000
	19.74	7200	8270	12200	117	100	23200	27300	8440	57700	65000	65000	65000	65000
	22.62	7200	8320	12200	124	80	25800	30300	10100	61200	65000	65000	65000	65000
	26.32	7200	8370	12200	129	63	28800	33600	12100	65000	65000	65000	65000	65000
	29.00	7200	8400	12200	134	54	30700	35800	13400	65000	65000	65000	65000	65000
	31.28[1)]	6800	9090	11500	48	112	34200	39700	16100	65000	65000	65000	65000	65000
	32.69	7200	8430	12200	138	45	33200	38600	15100	65000	65000	65000	65000	65000
	37.00	7200	9090	12200	41	86	35800	41500	17000	65000	65000	65000	65000	65000
	42.33	7360	9090	12500	38	72	37900	44000	18400	65000	65000	65000	65000	65000
	49.90	7840	9090	13300	30	58	39300	45600	19200	65000	65000	65000	65000	65000
	57.17	8000	9090	13600	30	48	41700	48400	20900	65000	65000	65000	65000	65000
	66.52	8000	9090	13600	30	40	45400	52500	23600	65000	65000	65000	65000	65000
	73.30	8000	9090	13600	30	35	47900	55300	25400	65000	65000	65000	65000	65000
	82.61	8000	9090	13600	30	29	50900	58700	27700	65000	65000	65000	65000	65000
	90.96	8000	9090	13600	31	25	53500	61600	29600	65000	65000	65000	65000	65000
	100.75	8000	9090	13600	32	20	56200	64700	31700	65000	65000	65000	65000	65000
	112.41	8000	9090	13600	32	17	59300	65000	34000	65000	65000	65000	65000	65000
	121.46	8000	9090	13600	32	15	61500	65000	35700	65000	65000	65000	65000	65000
	143.47	8000	9090	13600	32	12	65000	65000	39600	65000	65000	65000	65000	65000

[1)] (→ 190)

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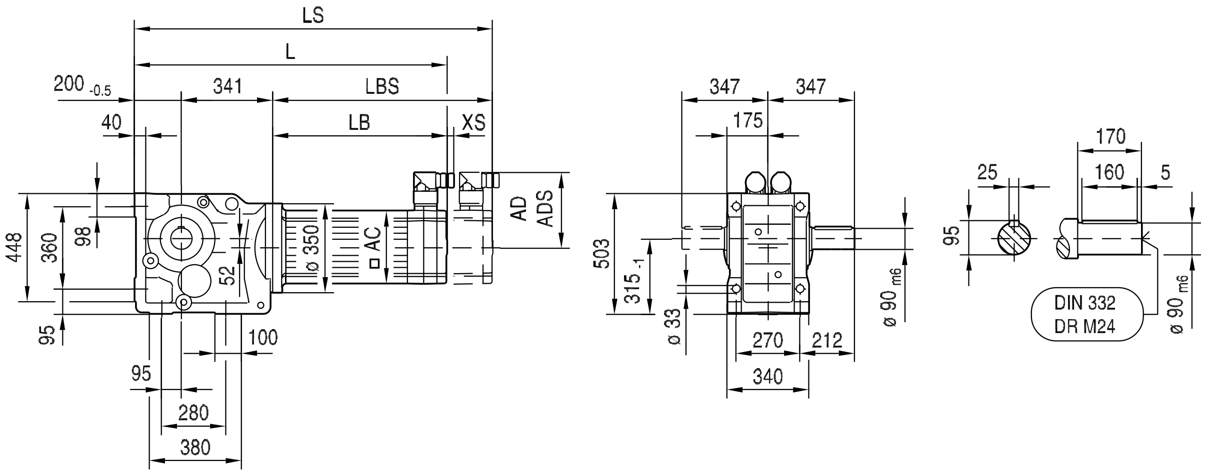
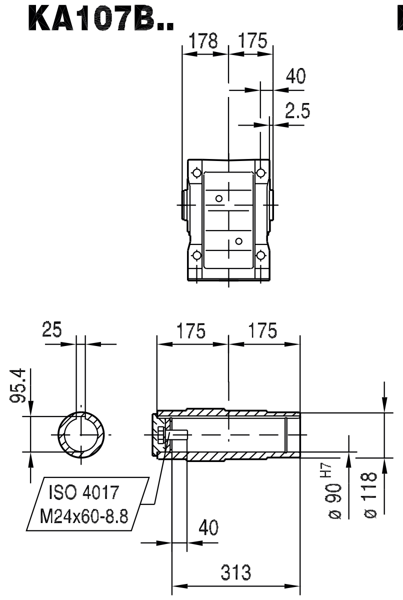
33 044 01 07

K107..

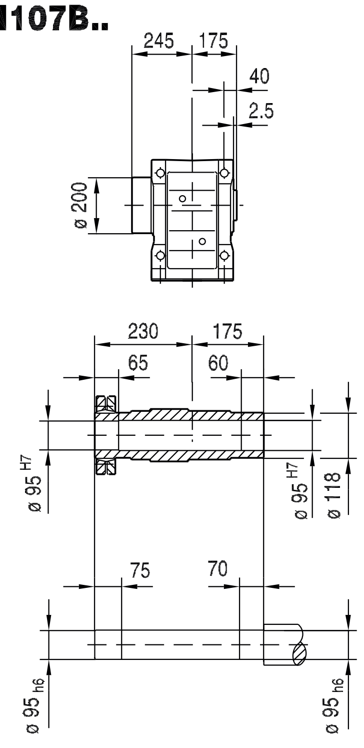


10

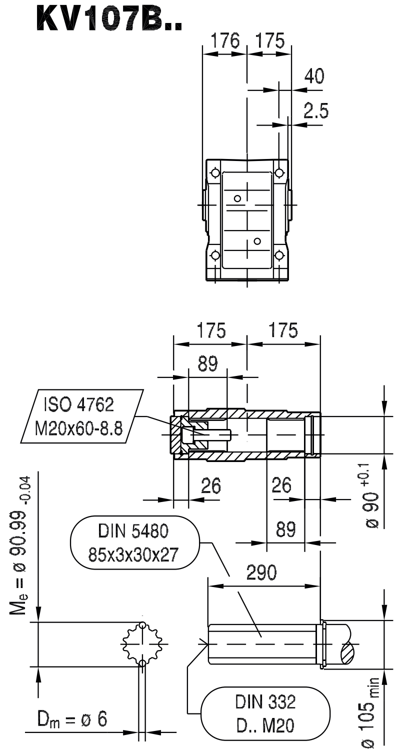
KA107B..



KH107B..



KV107B..



(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	825	755	795	875	872	915	1003	1046	1089
LS	903	851	891	971	984	1027	1115	1158	1201
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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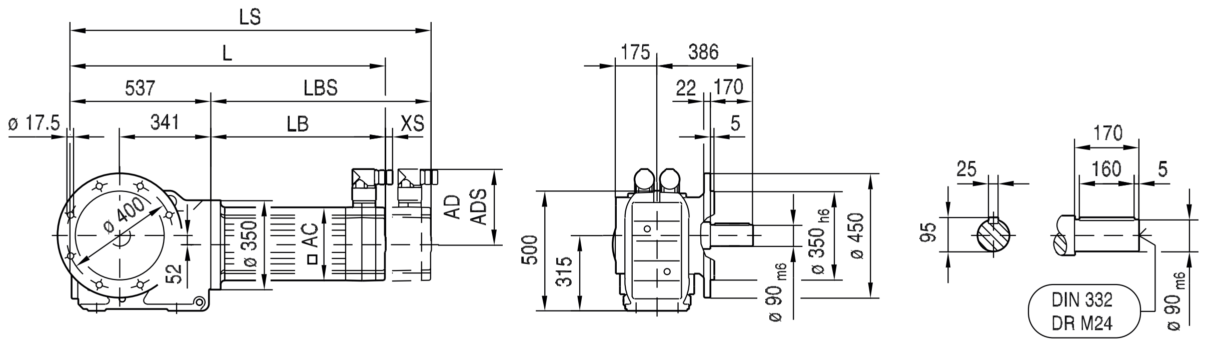
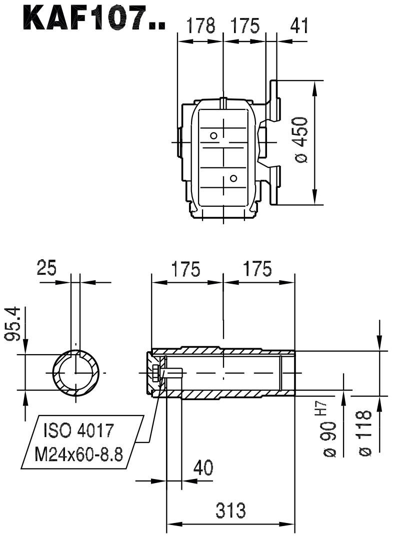
33 045 01 07

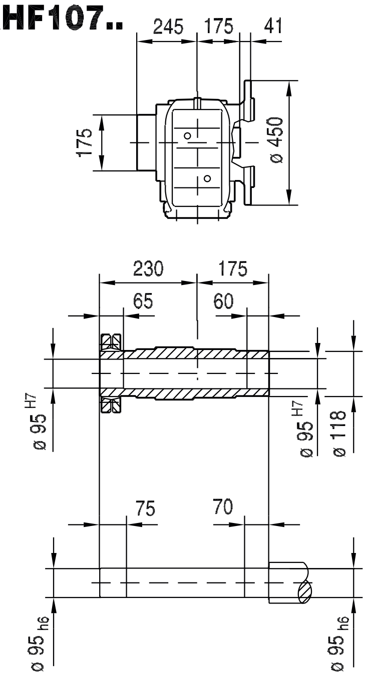
KF107..



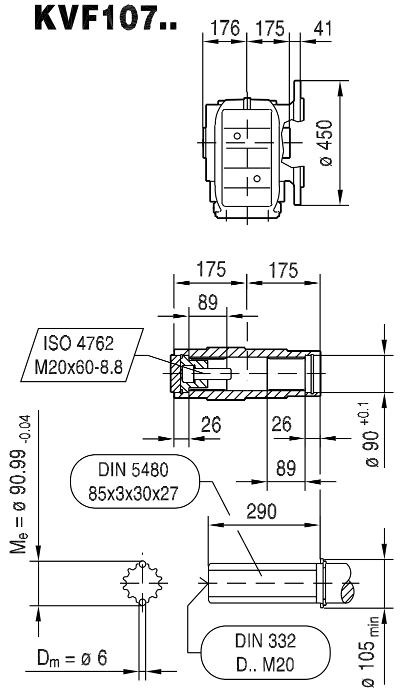
KAF107..



KHF107..



KVF107..



(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	821	751	791	871	868	911	999	1042	1085
LS	899	847	887	967	980	1023	1111	1154	1197
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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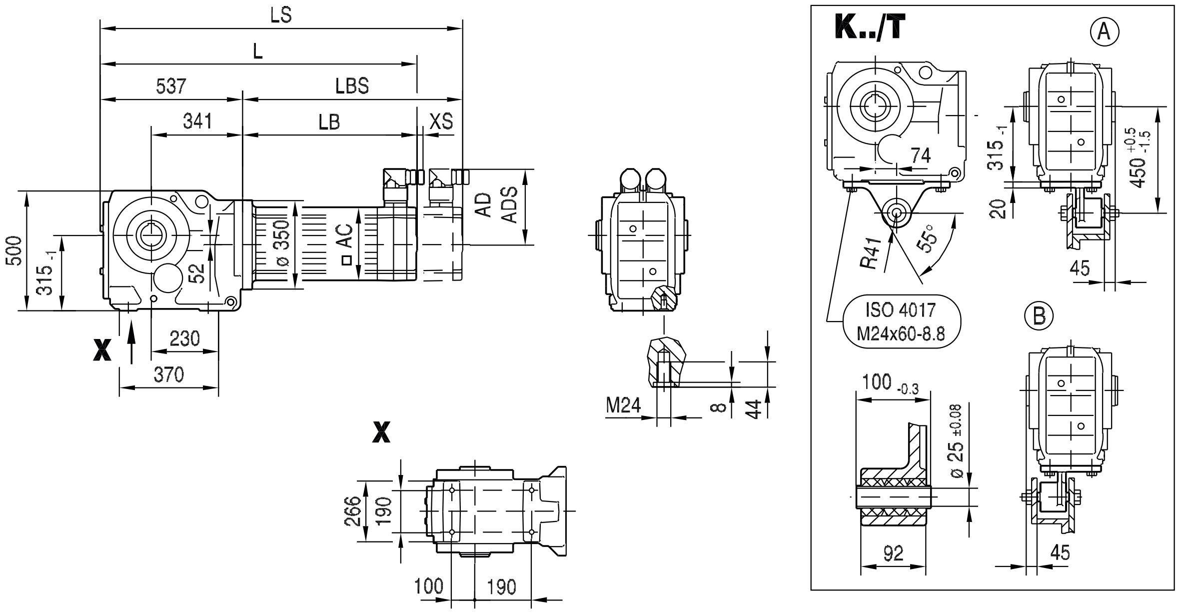
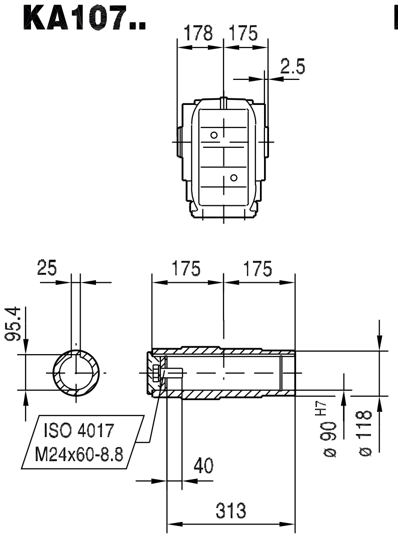
33 046 02 07

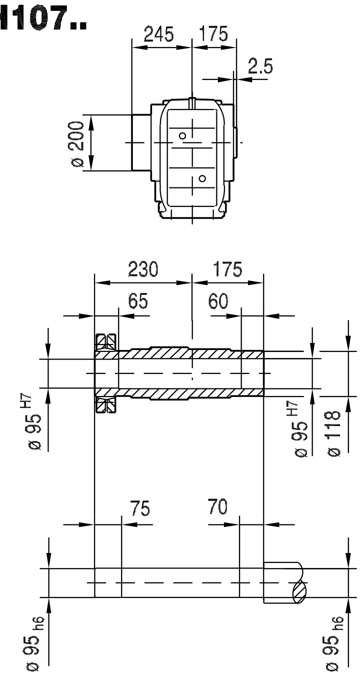
KA107..



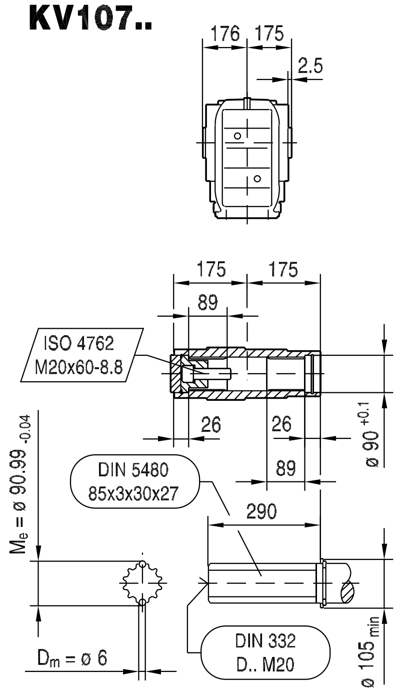
KA107..



KH107..



KV107..



(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	821	751	791	871	868	911	999	1042	1085
LS	899	847	887	967	980	1023	1111	1154	1197
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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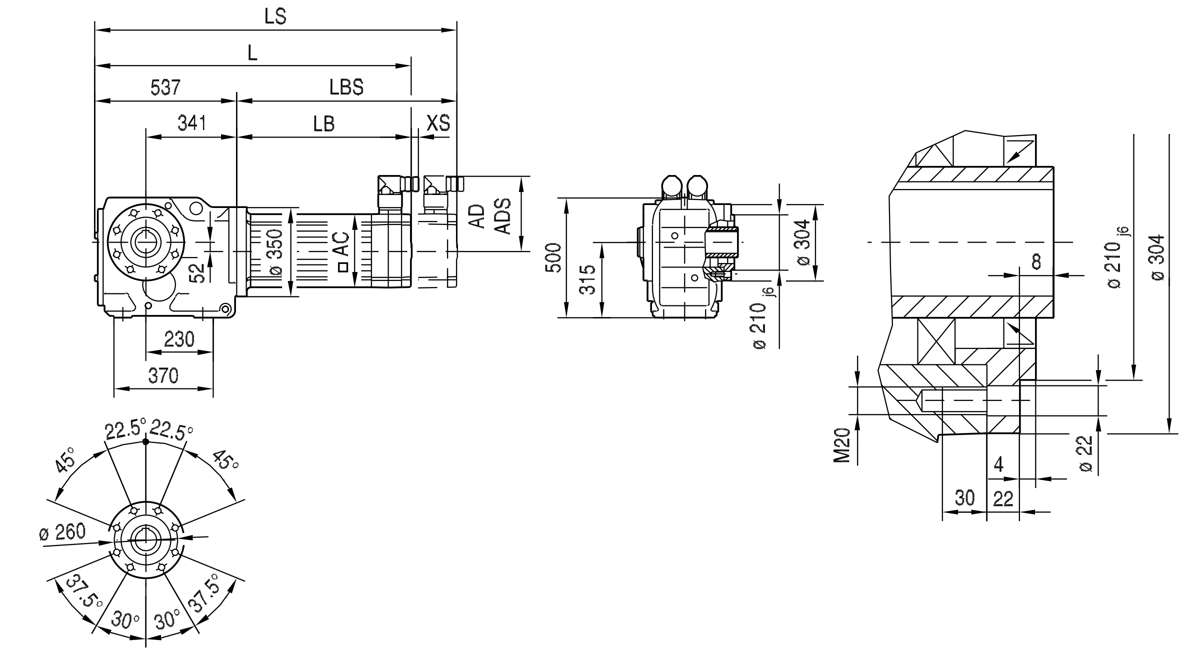
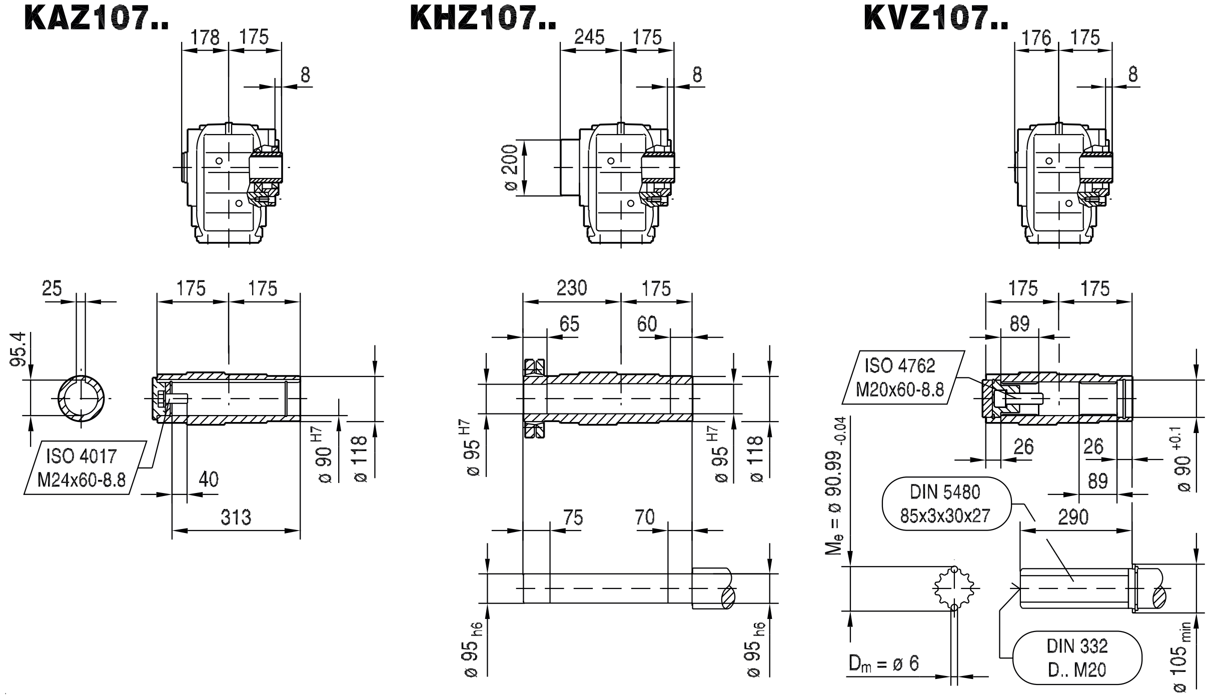
33 047 02 07

KAZ107..



KAZ107.. **KHZ107..** **KVZ107..**



(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	821	751	791	871	868	911	999	1042	1085
LS	899	847	887	967	980	1023	1111	1154	1197
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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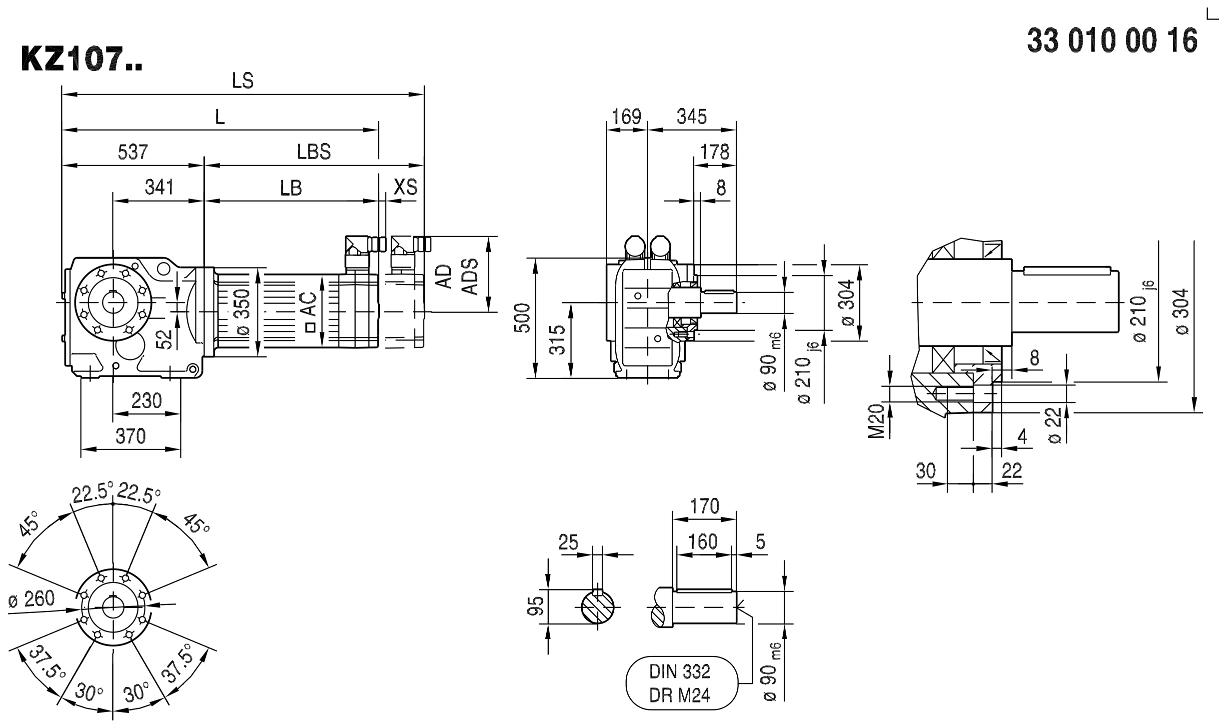

(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	821	751	791	871	868	911	999	1042	1085
LS	899	847	887	967	980	1023	1111	1154	1197
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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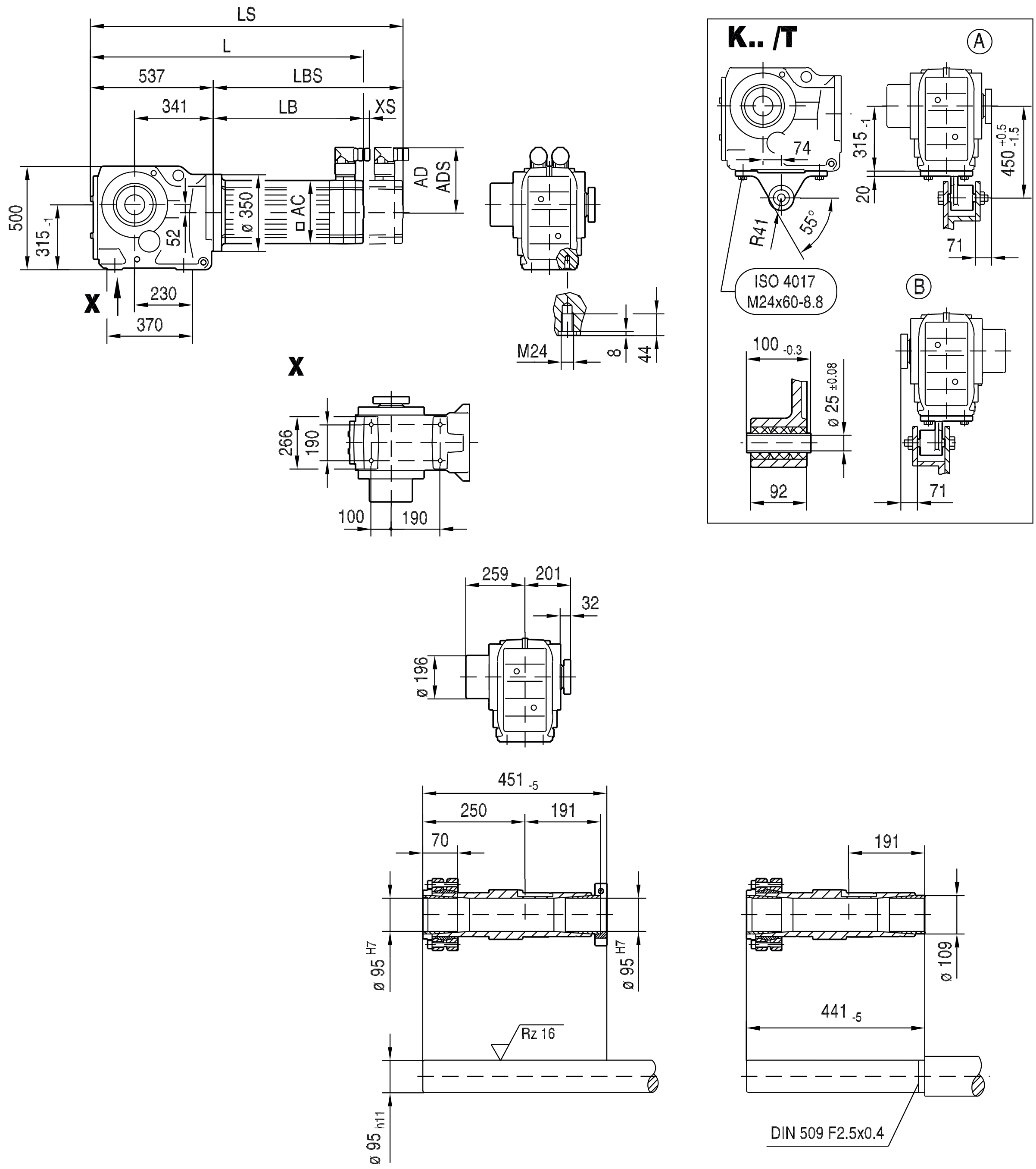
KT107..

33 048 04 07



(→ 194)	CMP..								
	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	162	162	162	205	205	205	205	205
AD	134	146	146	146	177	177	213	213	213
ADS	137	147	147	147	177	177	213	213	213
L	821	751	791	871	868	911	999	1042	1085
LS	899	847	887	967	980	1023	1111	1154	1197
LB	284	214	254	334	331	374	462	505	548
LBS	362	310	350	430	443	486	574	617	660
XS	37	37	37	37	32	32	49	49	49

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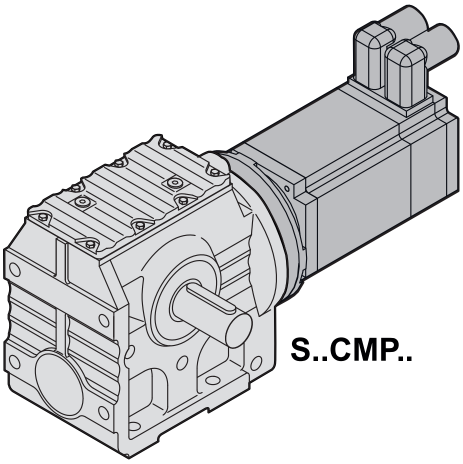
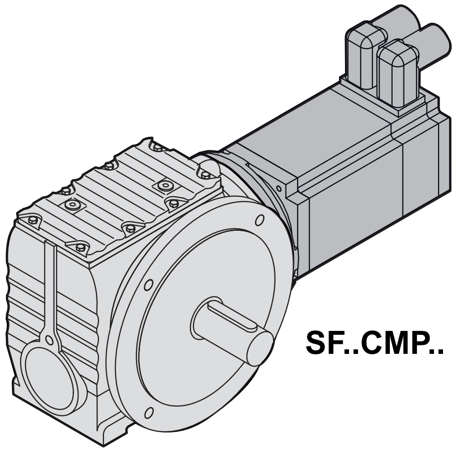
11 Helical-worm gearmotors – S.. gear units

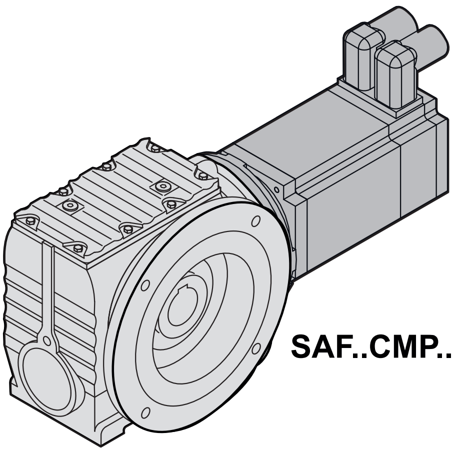
11.1 S..CMP.. designs



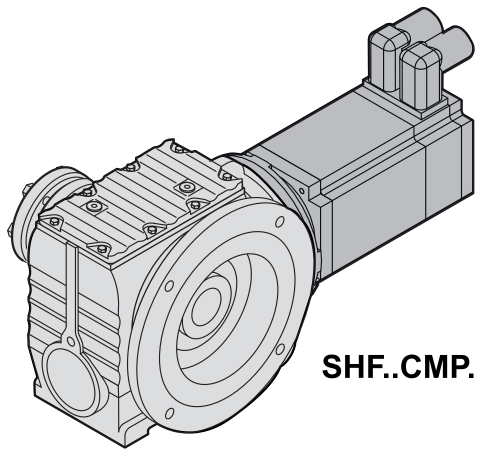
S..CMP..



SF..CMP..

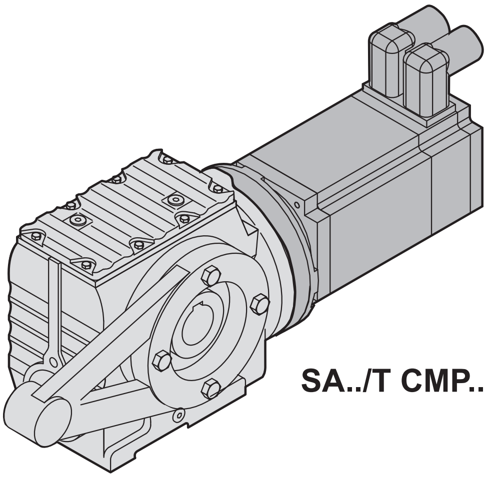


SAF..CMP..

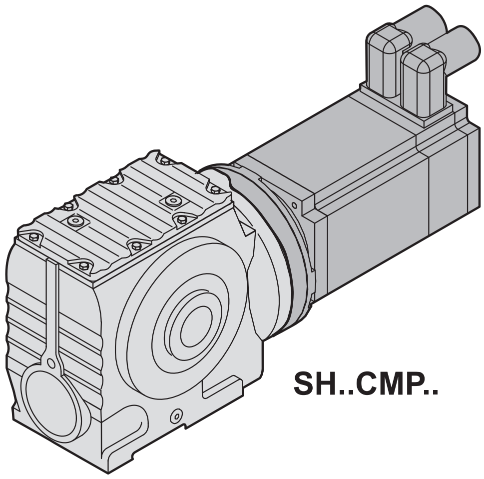


SHF..CMP..

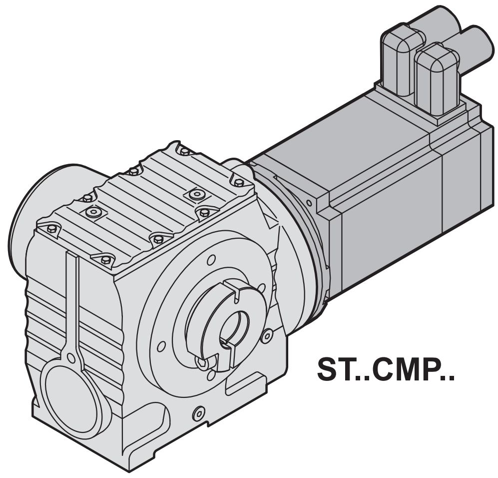
15705972363



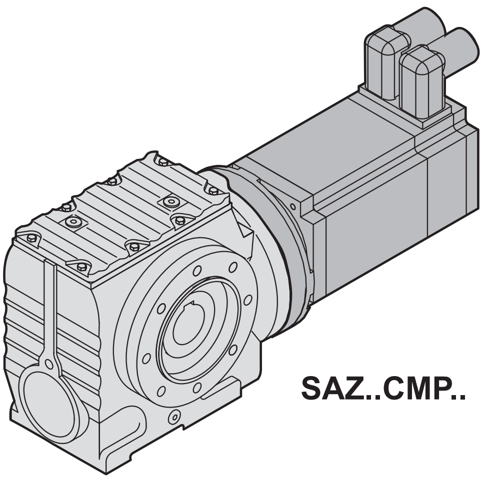
SA../T CMP..



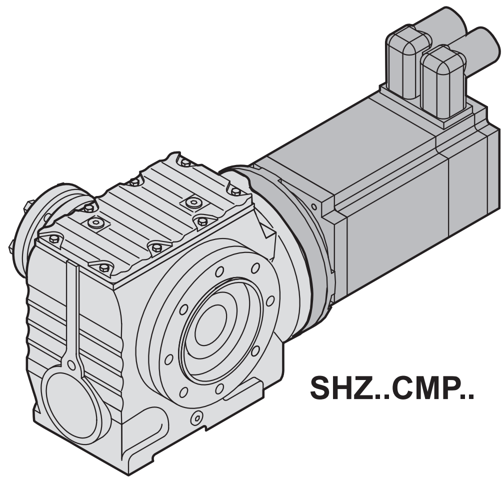
SH..CMP..



ST..CMP..



SAZ..CMP..



SHZ..CMP..

15705974795

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11.2 S37–67..CMP.. selection tables and dimension sheets

11.2.1 S37..

S37, M_{aDyn} Nm						92 Nm
	CMP					
i	50S	50M	50L	63S	63M	71S
			2			
3.97	18	36	>48	39	>48	>48
4.86	22	44	>49	47	>49	>49
5.38	25	49	>51	>51	>51	>51
6.33	29	>52	>52	>52	>52	>52
6.80	31	>60	>60	>60	>60	>60
8.00	36	>61	>61	>61	>61	>61
9.02	40	>62	>62	>62	>62	>62
10.23	46	>63	>63	>63	>63	>63
10.91	49	>64	>64	>64	>64	>64
12.48	55	>64	>64	>64	>64	>64
13.39	59	>65	>65	>65	>65	>65
15.53	>66	>66		>66		
18.24	>67					
19.13	78	>93	>93	>93	>93	>93
19.89	>68					
22.50	90	>95	>95	>95	>95	>95
25.38	>96	>96	>96	>96	>96	>96
28.76	>97	>97	>97	>97	>97	>97
30.68	>98	>98	>98	>98	>98	>98
35.10	>99	>99	>99	>99	>99	>99
37.66	>100	>100	>100	>100	>100	>100
43.68	>101	>101		>101		
51.30	>103					
55.93	>104					

(→ 🗎 190)

S37, m kg						
	CMP					
s	50S	50M	50L	63S	63M	71S
2	9.7	11	12	12	13	15
SF: + 1.3 kg / SA: + -0.25 kg / SAF: + 1.3 kg						

CMP..				c_{TG}			
		n_{epk}	η	S	SF	SA	SAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
	3.97	4500	88	-	-	-	-
	4.86	4500	88	-	-	-	-
	5.38	4500	88	-	-	-	-
	6.33	4500	87	-	-	-	-
	6.80	4500	87	-	-	-	-
	8.00	4500	86	-	-	-	-
	9.02	4500	86	-	-	-	-
	10.23	4500	86	-	-	-	-
	10.91	4500	86	-	-	-	-
	12.48	4500	85	-	-	-	-
	13.39	4500	85	-	-	-	-
S37	15.53	4500	84	-	-	-	-
2	18.24	4500	84	-	-	-	-
	19.13	4500	78	-	-	-	-
	19.89	4500	84	-	-	-	-
	22.50	4500	77	-	-	-	-
	25.38	4500	76	-	-	-	-
	28.76	4500	76	-	-	-	-
	30.68	4500	76	-	-	-	-
	35.10	4500	75	-	-	-	-
	37.66	4500	75	-	-	-	-
	43.68	4500	74	-	-	-	-
	51.30	4500	73	-	-	-	-
	55.93	4500	73	-	-	-	-

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	S	SF	SA	SAF	S	SF	SA	SAF
	i	Nm	Nm	Nm	min^{-1}	kg*m²	N	N	N	N	N	N	N	N
	3.97[1)]	32	48	72	277	0.92	1400	1570	2010	2010	3000	3000	4000	4000
	4.86[1)]	33	49	74	226	0.67	1520	1700	2180	2180	3000	3000	4000	4000
	5.38[1)]	34	51	76	204	0.59	1570	1760	2260	2260	3000	3000	4000	4000
	6.33[1)]	35	52	78	174	0.44	1670	1870	2400	2400	3000	3000	4000	4000
	6.80[1)]	43	60	90	29	0.47	1630	1840	2360	2360	3000	3000	4000	4000
	8.00[1)]	45	61	77	25	0.36	1730	1950	2500	2500	3000	3000	4000	4000
	9.02[1)]	46	62	78	22	0.30	1810	2040	2610	2610	3000	3000	4000	4000
	10.23[1)]	47	63	80	20	0.24	1900	2140	2740	2740	3000	3000	4000	4000
	10.91[1)]	48	64	82	18	0.22	1940	2190	2800	2800	3000	3000	4000	4000
	12.48[1)]	48	64	82	16	0.18	2060	2320	2970	2970	3000	3000	4000	4000
	13.39[1)]	49	65	83	15	0.16	2110	2370	3040	3040	3000	3000	4000	4000
S37	15.53	50	66	85	13	0.13	2240	2510	3220	3220	3000	3000	4000	4000
2	18.24	52	67	88	11	0.10	2380	2660	3410	3410	3000	3000	4000	4000
	19.13[1)]	71	93	121	10	0.43	2380	2670	3420	3420	3000	3000	4000	4000
	19.89	52	68	88	10	0.090	2470	2760	3540	3540	3000	3000	4000	4000
	22.50[1)]	73	95	124	9	0.32	2530	2840	3630	3630	3000	3000	4000	4000
	25.38[1)]	74	96	126	8	0.27	2660	2980	3810	3810	3000	3000	4000	4000
	28.76[1)]	75	97	128	7	0.22	2800	3000	4000	4000	3000	3000	4000	4000
	30.68[1)]	76	98	129	16	0.20	2860	3000	4000	4000	3000	3000	4000	4000
	35.10[1)]	78	99	133	14	0.16	3000	3000	4000	4000	3000	3000	4000	4000
	37.66[1)]	79	100	134	13	0.15	3000	3000	4000	4000	3000	3000	4000	4000
	43.68	81	101	138	16	0.12	3000	3000	4000	4000	3000	3000	4000	4000
	51.30	81	103	138	14	0.090	3000	3000	4000	4000	3000	3000	4000	4000
	55.93	81	104	138	13	0.080	3000	3000	4000	4000	3000	3000	4000	4000

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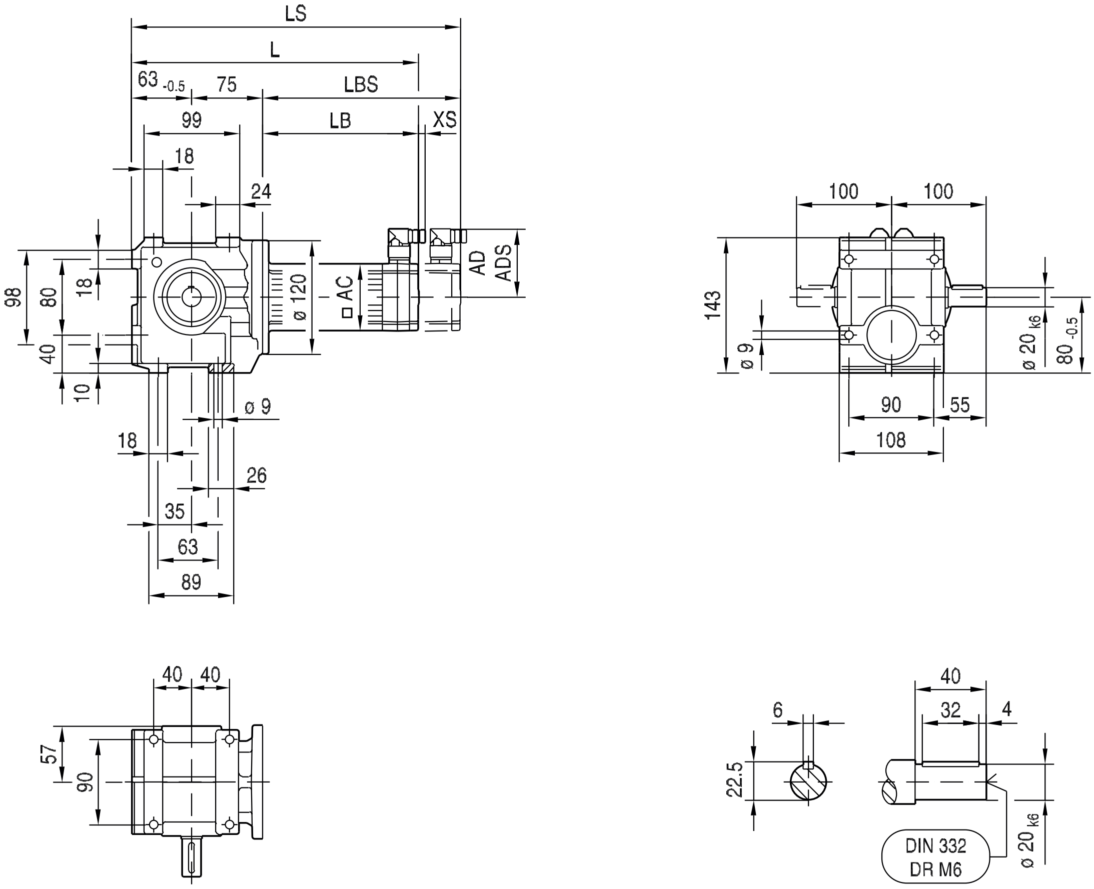
02 018 00 17

S37..



(→ 🗎 194)	CMP..							
	50S	50M	50L	63S	63M	71S		
AC	73	73	73	88	88	116		
AD	86	86	86	92	92	102		
ADS	86	86	86	92	92	104		
L	283	322	361	318	368	310		
LS	312	351	390	346	396	375		
LB	145	184	223	180	230	172		
LBS	174	213	252	208	258	237		
XS	18	18	18	14	14	11		

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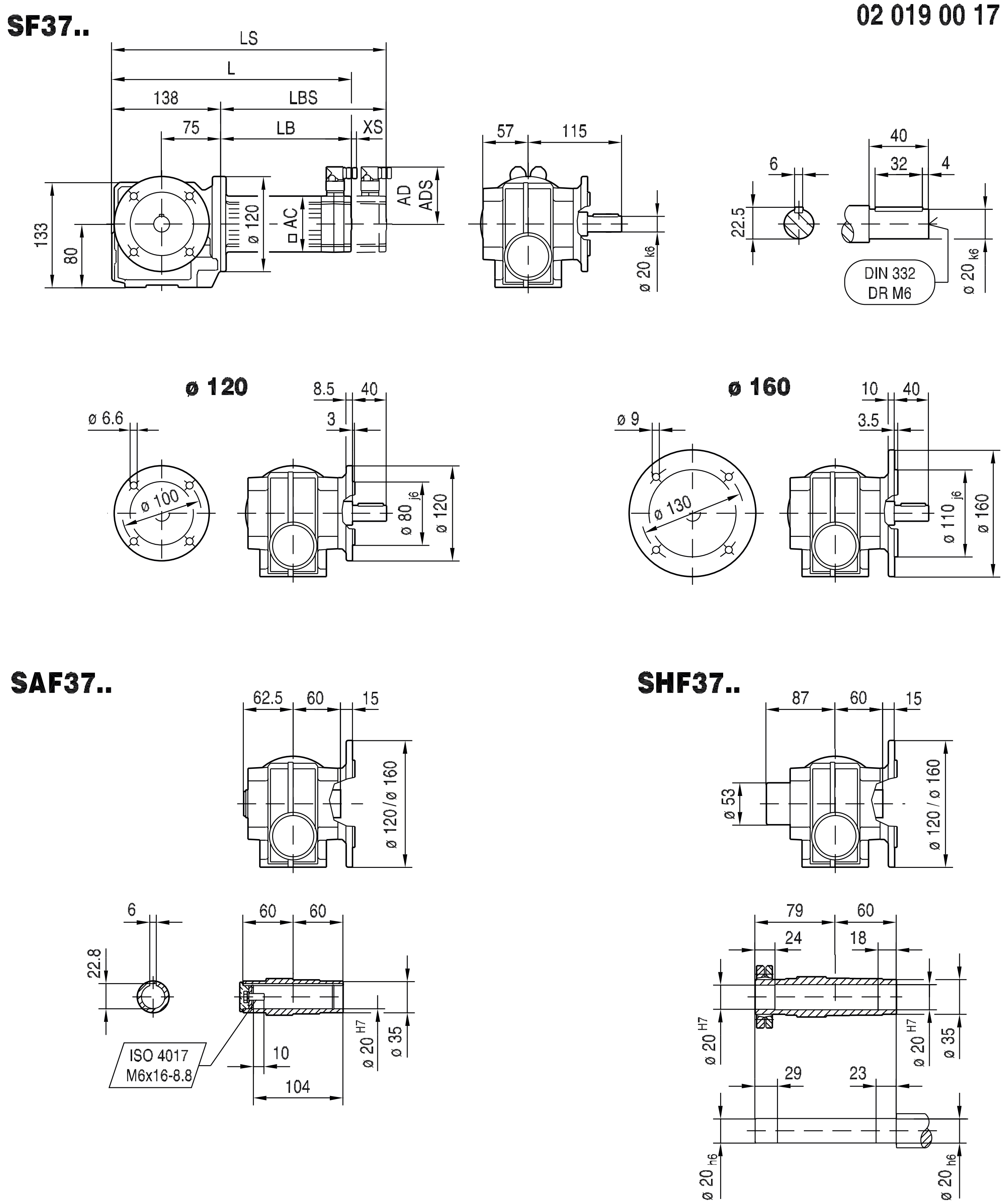
02 019 00 17



(→ 🗎 194)	CMP..							
	50S	50M	50L	63S	63M	71S		
AC	73	73	73	88	88	116		
AD	86	86	86	92	92	102		
ADS	86	86	86	92	92	104		
L	283	322	361	318	368	310		
LS	312	351	390	346	396	375		
LB	145	184	223	180	230	172		
LBS	174	213	252	208	258	237		
XS	18	18	18	14	14	11		

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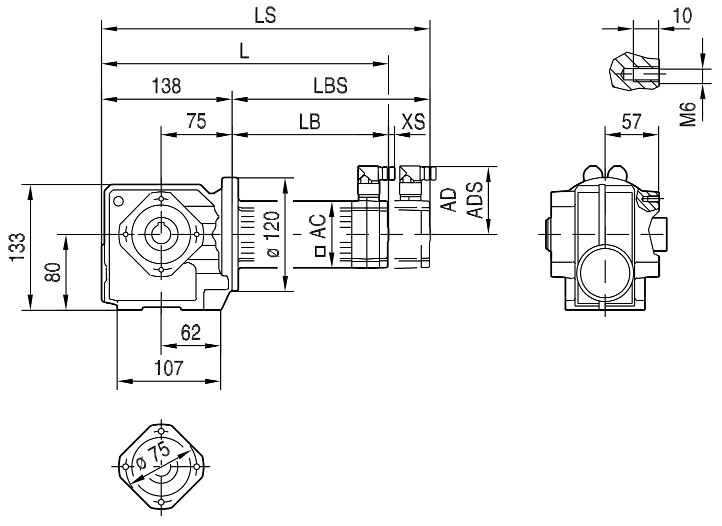
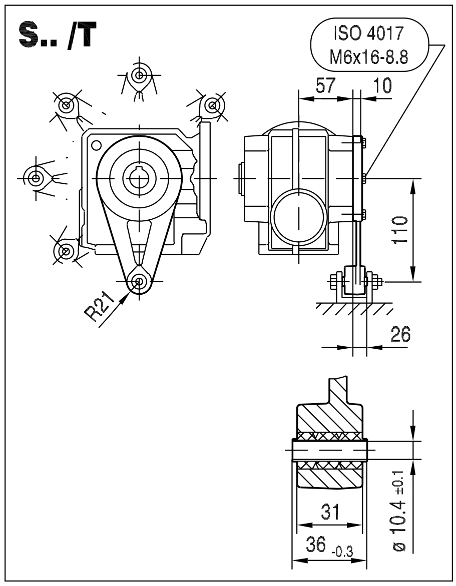
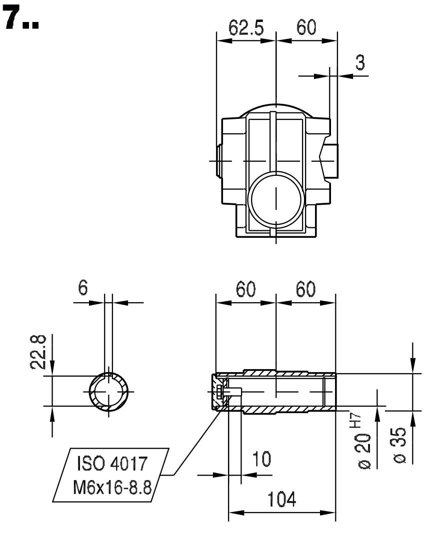
02 020 00 17

SA37..

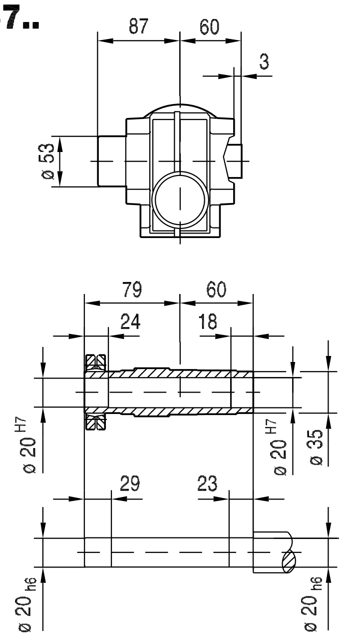




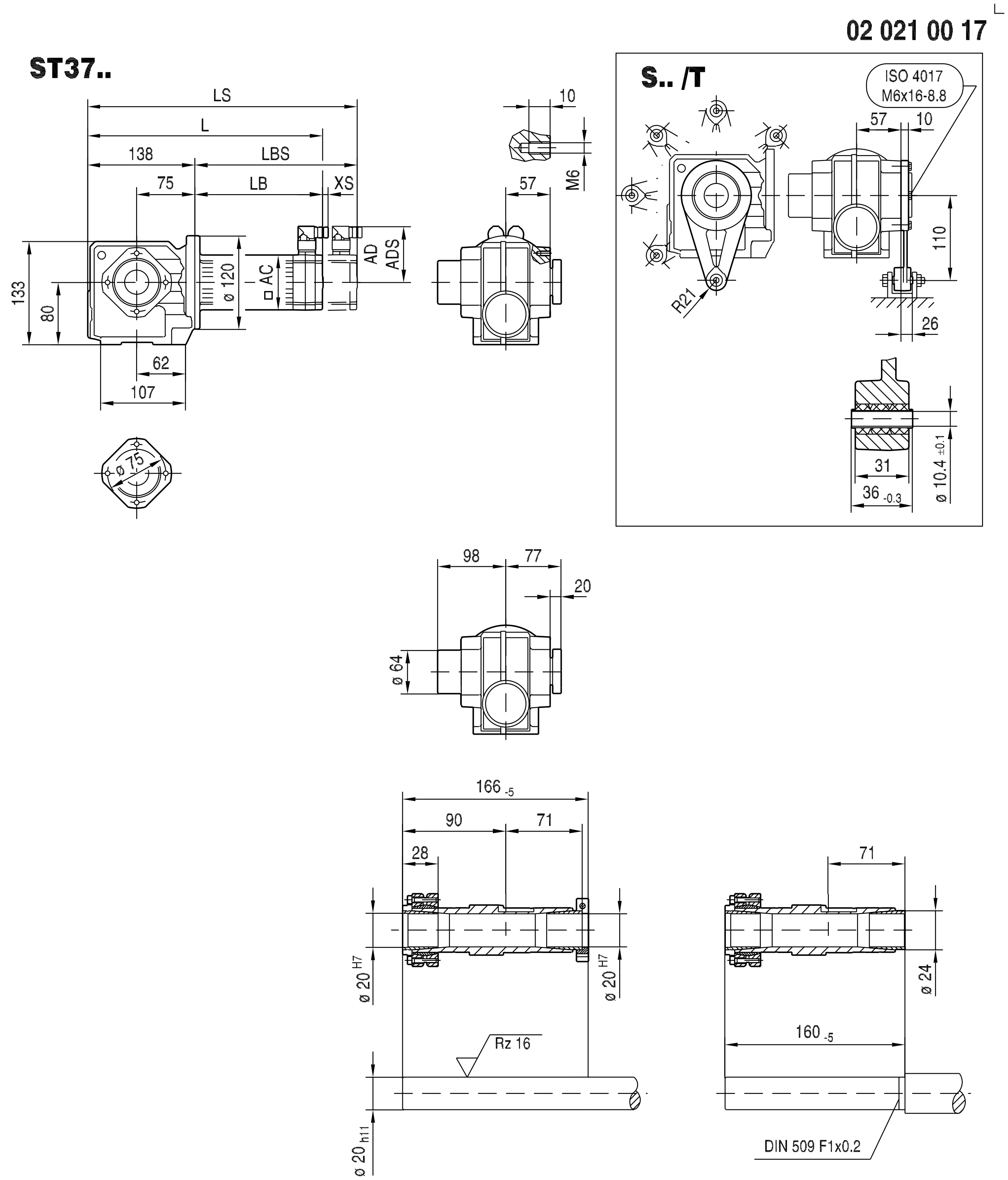
SA37..



SH37..



(→ 194)	CMP..							
	50S	50M	50L	63S	63M	71S		
AC	73	73	73	88	88	116		
AD	86	86	86	92	92	102		
ADS	86	86	86	92	92	104		
L	283	322	361	318	368	310		
LS	312	351	390	346	396	375		
LB	145	184	223	180	230	172		
LBS	174	213	252	208	258	237		
XS	18	18	18	14	14	11		



(→ 🗎 194)	CMP..							
	50S	50M	50L	63S	63M	71S		
AC	73	73	73	88	88	116		
AD	86	86	86	92	92	102		
ADS	86	86	86	92	92	104		
L	283	322	361	318	368	310		
LS	312	351	390	346	396	375		
LB	145	184	223	180	230	172		
LBS	174	213	252	208	258	237		
XS	18	18	18	14	14	11		

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11.2.2 S47..

S47, M_{aDyn} Nm				CMP					170 Nm
i	50S	50M	50L	63S	63M	63L	71S	71M	80S
					2				
4.00	19	37	55	40	>72	>72	69	>72	>72
4.76	22	44	66	48	>87	>87	82	>87	>87
5.39	25	49	74	53	>97	>97	92	>97	>97
6.40	30	59	88	63	>114	>114	109	>114	>114
6.83	32	63	94	67	>117	>117	117	>117	>117
7.28	33	65	98	70	>129	>129	122	>129	>129
8.64	39	77	116	83	>146	>146	144	>146	>146
9.23	42	83	124	89	>146	>146	>146	>146	>146
10.80	49	97	145	104	>145	>145	>145	>145	>145
12.10	55	108	>145	117	>145	>145	>145	>145	>145
14.24	64	126	>144	136	>144	>144	>144	>144	>144
16.47	74	>144	>144	>144	>144		>144		
17.62	79	>144	>144	>144	>144		>144		
19.54		159	>184	171	>184	>184	>184	>184	>184
20.33	90	>143		>143					
23.20	95	189	>200	>200	>200	>200	>200	>200	>200
24.77	102	200	>205	>205	>205	>205	>205	>205	>205
29.00	118	>215	>215	>215	>215	>215	>215	>215	>215
32.48	130	>215	>215	>215	>215	>215	>215	>215	>215
38.23	153	>215	>215	>215	>215	>215	>215	>215	>215
44.22	175	>210	>210	>210	>210		>210		
47.32	185	>210	>210	>210	>210		>210		
54.59	>210	>210		>210					
63.80	>210								
69.39	>210								

(→ 190)

S47, m kg				CMP					
s	50S	50M	50L	63S	63M	63L	71S	71M	80S
2	13	14	15	15	16	18	18	19	25
SF: + 3.6 kg / SA: + 1.1 kg / SAF: + 2.8 kg									

11

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CMP..				c_{TG}			
		n_{epk}	η	S	SF	SA	SAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
S47 2	4.00	4500	90	-	-	-	-
	4.76	4500	90	-	-	-	-
	5.39	4500	89	-	-	-	-
	6.40	4500	89	-	-	-	-
	6.83	4500	89	-	-	-	-
	7.28	4500	87	-	-	-	-
	8.64	4500	87	-	-	-	-
	9.23	4500	87	-	-	-	-
	10.80	4500	87	-	-	-	-
	12.10	4500	87	-	-	-	-
	14.24	4500	86	-	-	-	-
	16.47	4500	86	-	-	-	-
	17.62	4500	86	-	-	-	-
	19.54	4500	79	-	-	-	-
	20.33	4500	85	-	-	-	-
	23.20	4500	79	-	-	-	-
	24.77	4500	79	-	-	-	-
	29.00	4500	78	-	-	-	-
	32.48	4500	77	-	-	-	-
	38.23	4500	77	-	-	-	-
	44.22	4500	76	-	-	-	-
	47.32	4500	75	-	-	-	-
	54.59	4500	75	-	-	-	-
	63.80	4500	74	-	-	-	-
	69.39	4500	73	-	-	-	-

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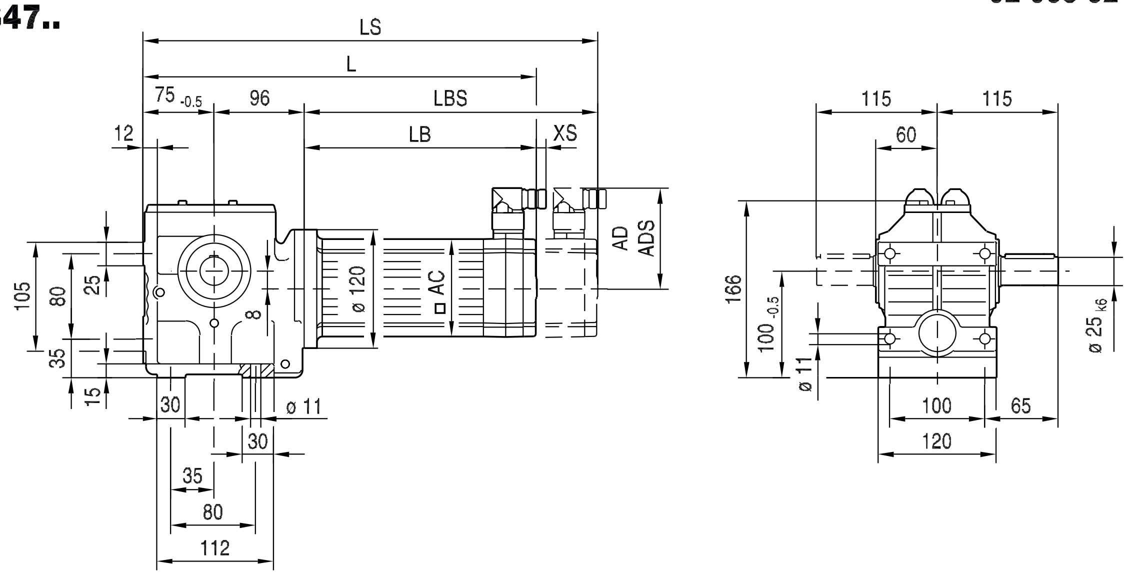
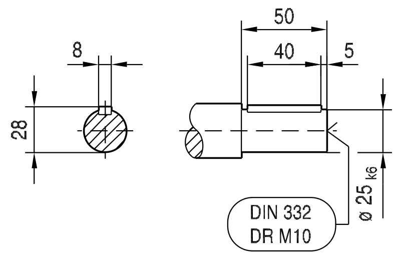
CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		**M_{amax}**	**M_{apk}**	**$M_{aNotaus}$**	**n_{ak}**	**J_G 10^{-4}**	**S**	**SF**	**SA**	**SAF**	**S**	**SF**	**SA**	**SAF**
	i	**Nm**	**Nm**	**Nm**	**min^{-1}**	**kg*m²**	**N**	**N**	**N**	**N**	**N**	**N**	**N**	**N**
S47 2	4.00[1]	61	72	108	225	2.5	1980	2420	2740	2740	5680	6160	7000	7000
	4.76[1]	72	87	130	231	1.8	2010	2490	2780	2780	5610	6100	7000	7000
	5.39[1]	74	97	146	204	1.5	2110	2600	2920	2920	5560	6050	7000	7000
	6.40[1]	76	114	171	172	1.1	2260	2780	3120	3120	5470	5970	7000	7000
	6.83[1]	78	117	176	161	1.0	2300	2840	3190	3190	5460	5960	7000	7000
	7.28[1]	103	129	175	27	1.1	2110	2690	2940	2940	5410	5910	7000	7000
	8.64[1]	109	146	185	23	0.83	2230	2840	3110	3110	5310	5820	7000	7000
	9.23[1]	109	146	185	22	0.74	2310	2930	3210	3210	5310	5820	7000	7000
	10.80[1]	109	145	185	19	0.57	2500	3150	3480	3480	5310	5820	7000	7000
	12.10[1]	109	145	185	17	0.47	2650	3310	3670	3670	5310	5820	7000	7000
	14.24[1]	110	144	187	14	0.35	2850	3540	3950	3950	5320	5830	7000	7000
	16.47	110	144	187	12	0.28	3060	3770	4230	4230	5320	5830	7000	7000
	17.62	110	144	187	11	0.26	3160	3880	4360	4360	5320	5830	7000	7000
	19.54[1]	144	184	245	10	0.94	3370	4120	4660	4660	5220	5720	7000	7000
	20.33	110	143	187	10	0.20	3370	4130	4650	4650	5320	5830	7000	7000
	23.20[1]	152	200	255	9	0.72	3570	4360	4940	4940	5130	5630	7000	7000
	24.77[1]	155	205	260	8	0.65	3650	4460	5050	5050	5100	5600	7000	7000
	29.00[1]	155	215	260	7	0.49	3920	4760	5420	5420	5030	5530	7000	7000
	32.48[1]	155	215	260	6	0.41	4120	4990	5690	5690	5030	5530	7000	7000
	38.23[1]	155	215	260	5	0.31	4420	5330	6100	6100	5030	5530	7000	7000
	44.22[1]	155	210	260	5	0.25	4710	5660	6490	6490	5060	5570	7000	7000
	47.32[1]	155	210	260	4	0.23	4850	5810	6680	6680	5060	5570	7000	7000
	54.59	155	210	260	9	0.18	5150	5870	7000	7000	5060	5570	7000	7000
	63.80	155	210	260	8	0.15	5370	5870	7000	7000	5060	5570	7000	7000
	69.39	155	210	260	7	0.13	5370	5870	7000	7000	5060	5570	7000	7000

[1] (→ 190)

02 005 02 07

S47..





(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	316	355	394	351	401	454	343	371
LS	345	384	423	379	429	483	408	436
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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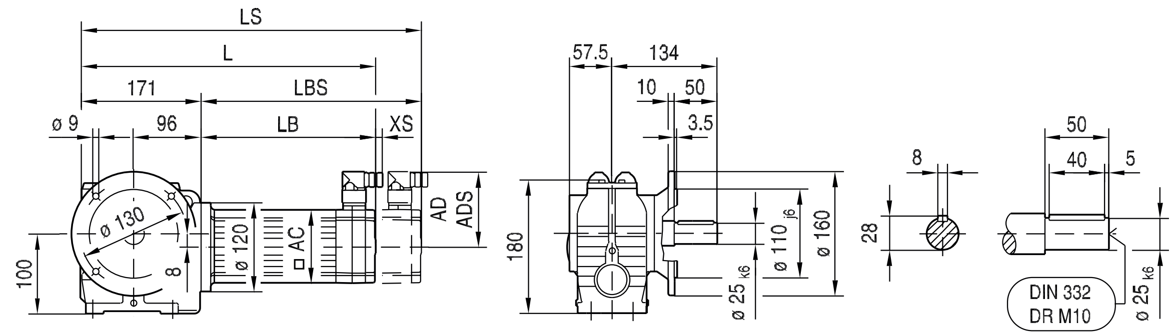
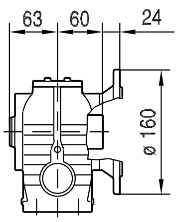
02 006 03 07

SF47..



SAF47..



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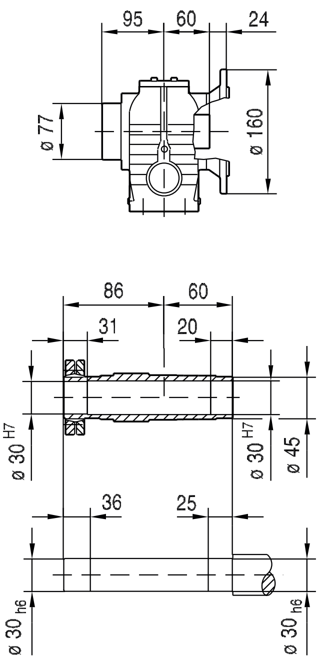
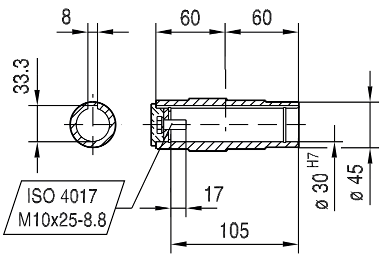
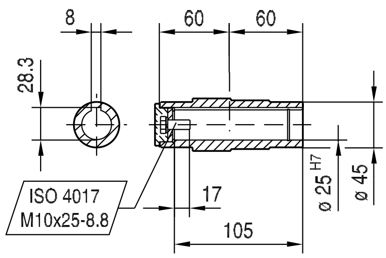


ø 30 H7



ø 25 H7



(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	316	355	394	351	401	454	343	371
LS	345	384	423	379	429	483	408	436
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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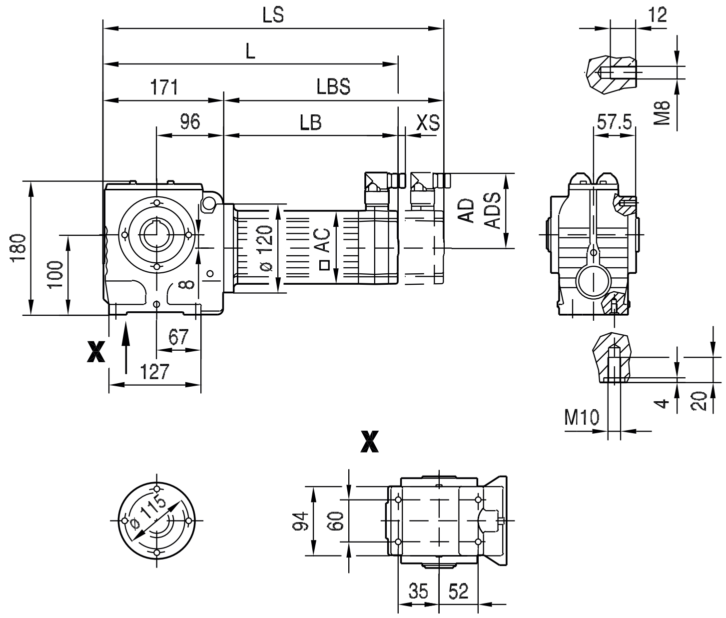
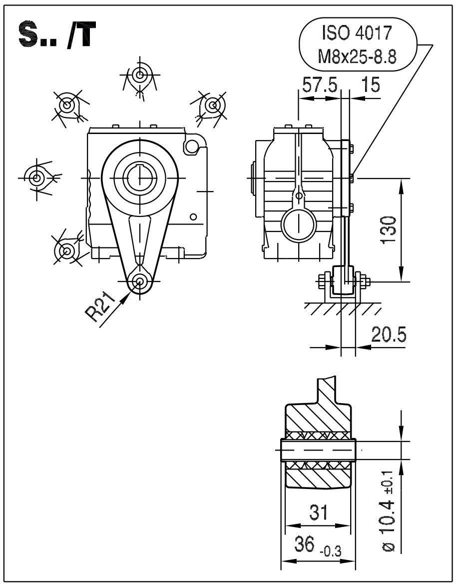
02 007 03 07

SA47..





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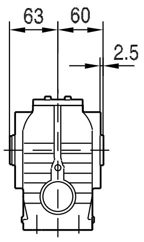

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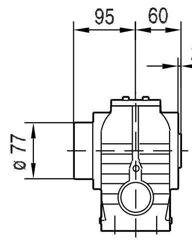
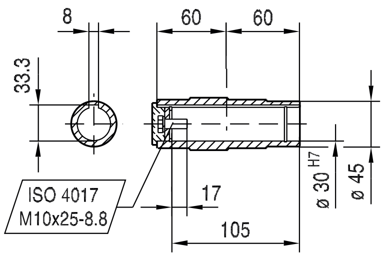
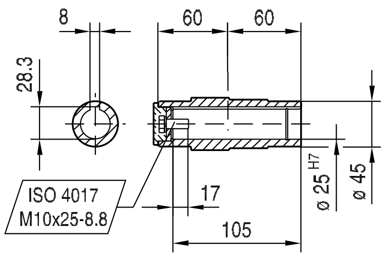
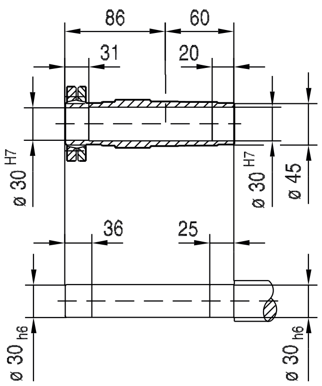


ø 30 H7



ø 25 H7





(→ 🗎 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	316	355	394	351	401	454	343	371
LS	345	384	423	379	429	483	408	436
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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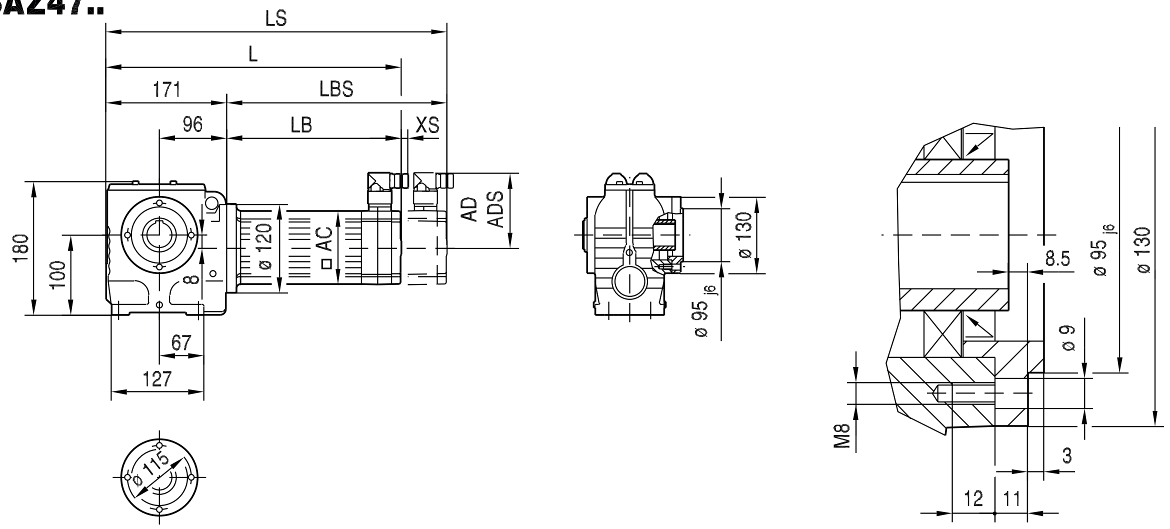
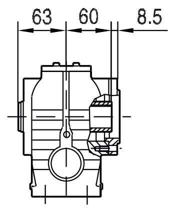
SAZ47..

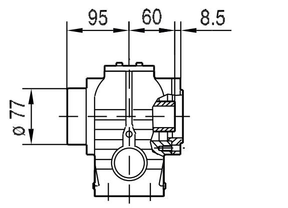
02 008 03 07



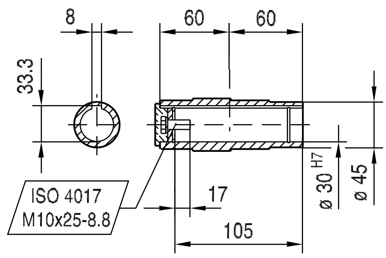
SAZ47..



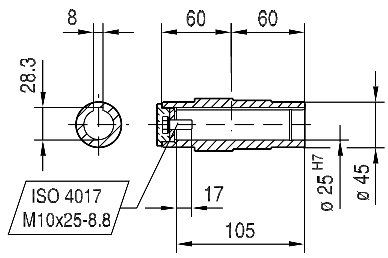
SHZ47..

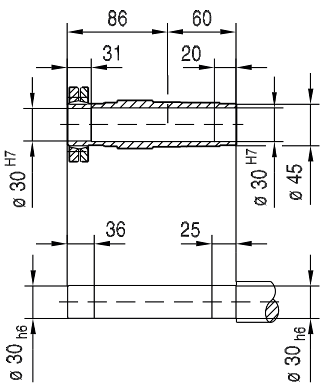


ø 30 H7



ø 25 H7

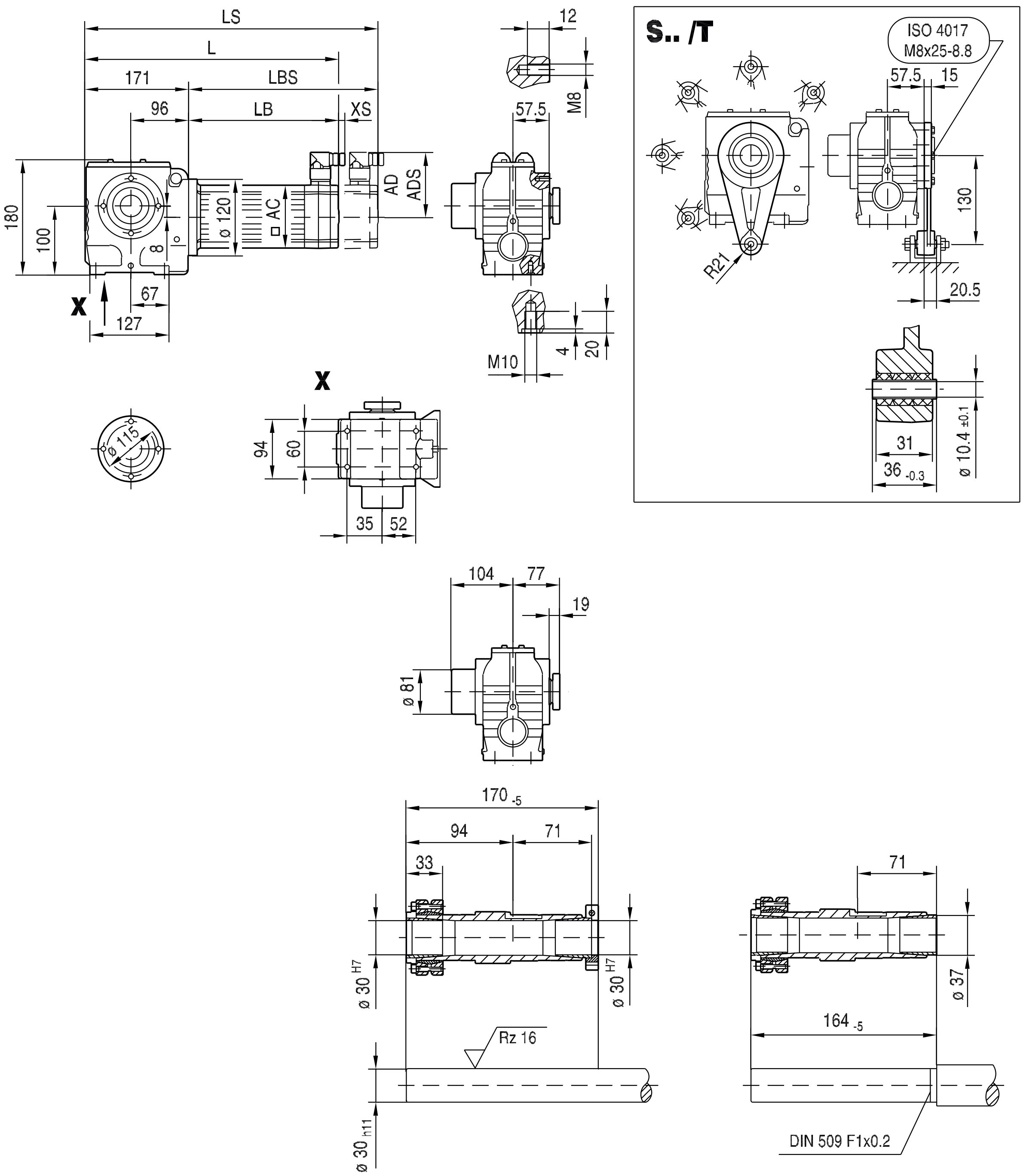




(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	316	355	394	351	401	454	343	371
LS	345	384	423	379	429	483	408	436
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

02 009 04 07

ST47..



(→ 🗎 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	316	355	394	351	401	454	343	371
LS	345	384	423	379	429	483	408	436
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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11.2.3 S57..

S57, M_{aDyn} Nm											295 Nm
	CMP										
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
2											
4.00	19	37	55	40	77	>106	69	>106	>106	>106	>106
4.76	22	44	66	48	92	>126	82	>126	>126	>126	>126
5.39	25	50	75	54	104	>142	93	>142	>142	>142	>142
6.40	30	59	88	63	122	>147	109	>147	>147	>147	>147
6.83	32	63	94	67	130	>150	117	>150	>150	>150	>150
7.28	34	67	100	72	139	>183	124	>183	>183	>183	>183
8.64	40	78	117	84	163	>210	146	>210	>210	>210	>210
9.23	42	84	125	90	174	>220	156	>220	>220	>220	>220
10.80	49	98	146	105	200	>220	182	>220	>220	>220	>220
12.10	55	110	164	118	>220	>220	200	>220	>220	>220	>220
14.24	64	128	191	138	>220	>220	>220	>220			
16.47	75	148	>220	159	>220		>220				
17.62	79	156	>215	168	>215		>215				
19.54		163	240	176	>270	>270	>270	>270	>270	>270	>270
20.33	91	180		194							
23.20	98	194	285	205	>315	>315	>315	>315	>315	>315	>315
24.77	103	200	305	215	>330	>330	>330	>330	>330	>330	>330
29.00	121	235	355	255	>360	>360	>360	>360	>360	>360	>360
32.48	133	260	>365	280	>365	>365	>365	>365	>365	>365	>365
38.23	155	305	>365	330	>365	>365	>365	>365			
44.22	179	355	>365	>365	>365		>365				
47.32	189	>365	>365	>365	>365		>365				
54.59	215	>365		>365							
63.80	250										
69.39	270										

(→ 🗎 190)

S57, m kg											
	CMP										
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
2	17	17	18	19	20	22	22	23	25	29	31
SF: + 3.8 kg / SA: + -0.30 kg / SAF: + 2.6 kg											

CMP..				c_{TG}			
		n_{epk}	η	S	SF	SA	SAF
	i	min⁻¹	%	Nm/'	Nm/'	Nm/'	Nm/'
S57 2	4.00	4500	90	-	-	-	-
	4.76	4500	90	-	-	-	-
	5.39	4500	90	-	-	-	-
	6.40	4500	89	-	-	-	-
	6.83	4500	89	-	-	-	-
	7.28	4500	89	-	-	-	-
	8.64	4500	88	-	-	-	-
	9.23	4500	88	-	-	-	-
	10.80	4500	88	-	-	-	-
	12.10	4500	88	-	-	-	-
	14.24	4500	87	-	-	-	-
	16.47	4500	87	-	-	-	-
	17.62	4500	86	-	-	-	-
	19.54	4500	81	-	-	-	-
	20.33	4500	86	-	-	-	-
	23.20	4500	81	-	-	-	-
	24.77	4500	80	-	-	-	-
	29.00	4500	80	-	-	-	-
	32.48	4500	79	-	-	-	-
	38.23	4500	78	-	-	-	-
	44.22	4500	78	-	-	-	-
	47.32	4500	77	-	-	-	-
	54.59	4500	77	-	-	-	-
	63.80	4500	76	-	-	-	-
	69.39	4500	75	-	-	-	-

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	S	SF	SA	SAF	S	SF	SA	SAF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
S57 2	4.00[1]	88	106	159	275	4.5	3380	3320	2730	2730	8170	8170	10000	10000
	4.76[1]	93	126	189	231	3.3	3590	3520	2900	2900	8110	8110	10000	10000
	5.39[1]	95	142	210	204	2.6	3760	3690	3040	3040	8060	8060	10000	10000
	6.40[1]	98	147	220	172	1.9	4010	3930	3250	3250	8040	8040	10000	10000
	6.83[1]	100	150	225	161	1.7	4100	4010	3330	3330	8030	8030	10000	10000
	7.28[1]	146	183	245	27	1.7	3790	3770	2620	2620	7880	7880	10000	10000
	8.64[1]	166	210	280	23	1.3	3900	3890	2430	2430	7730	7730	10000	10000
	9.23[1]	169	220	285	22	1.1	3990	3980	2530	2530	7660	7660	10000	10000
	10.80[1]	169	220	285	19	0.85	4290	4270	3000	3000	7680	7680	10000	10000
	12.10[1]	169	220	285	17	0.70	4520	4490	3360	3360	7680	7680	10000	10000
	14.24	169	220	285	14	0.51	4860	4820	3810	3810	7680	7680	10000	10000
	16.47	168	220	285	12	0.40	5200	5130	4120	4120	7680	7680	10000	10000
	17.62	168	215	285	11	0.36	5350	5280	4260	4260	7710	7710	10000	10000
	19.54[1]	215	270	365	26	1.3	5720	5620	4610	4610	7300	7300	10000	10000
	20.33	168	215	285	10	0.28	5690	5600	4560	4560	7710	7710	10000	10000
	23.20[1]	245	315	415	9	0.95	5930	5840	4710	4710	6950	6950	10000	10000
	24.77[1]	245	330	415	8	0.85	6100	6000	4870	4870	6800	6800	10000	10000
	29.00[1]	245	360	415	7	0.65	6520	6410	5250	5250	6470	6470	10000	10000
	32.48[1]	245	365	415	6	0.54	6840	6710	5540	5540	6380	6380	10000	10000
	38.23[1]	245	365	415	5	0.39	7320	7170	5970	5970	6380	6380	10000	10000
	44.22[1]	245	365	415	11	0.32	7520	7520	6380	6380	6380	6380	10000	10000
	47.32[1]	245	365	415	11	0.28	7520	7520	6580	6580	6380	6380	10000	10000
	54.59	245	365	415	9	0.23	7520	7520	7000	7000	6380	6380	10000	10000
	63.80	245	360	415	8	0.18	7520	7520	7500	7500	6470	6470	10000	10000
	69.39	245	360	415	7	0.15	7520	7520	7770	7770	6470	6470	10000	10000

[1] (→ 190)

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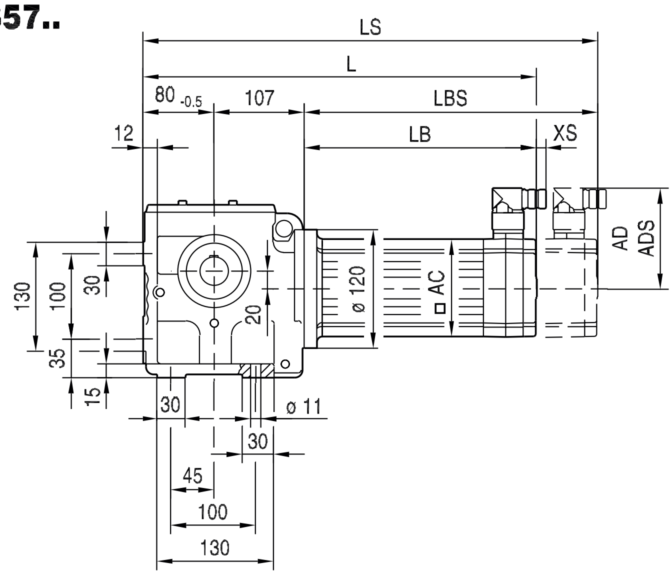
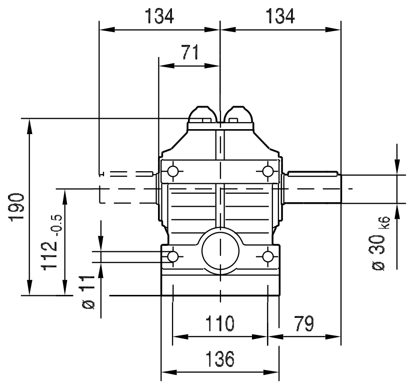
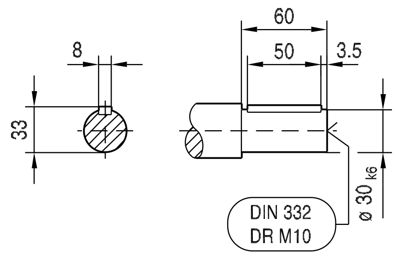
S57..



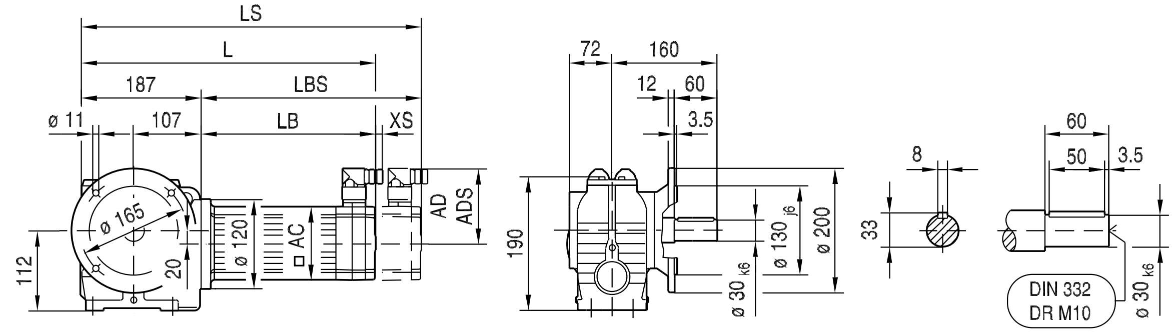




(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	332	371	410	367	417	470	359	387	434	399
LS	361	400	439	395	445	499	424	452	499	477
LB	145	184	223	180	230	283	172	200	247	212
LBS	174	213	252	208	258	312	237	265	312	290
XS	18	18	18	14	14	14	11	11	11	37

02 011 01 07

SF57..



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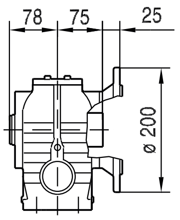
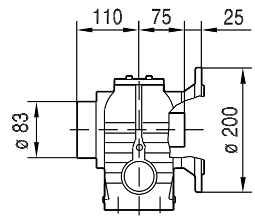
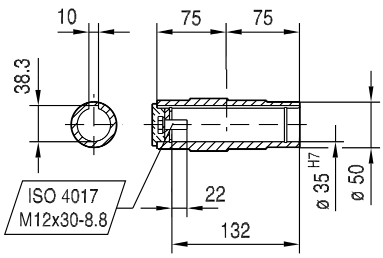


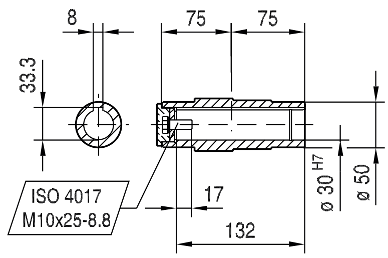
SHF57..

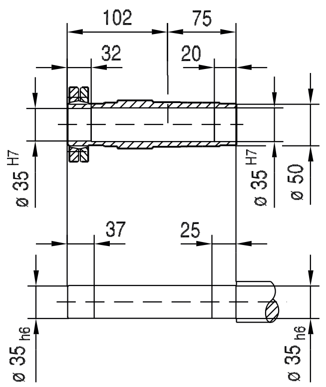


ø 35 H7



ø 30 H7





(→ 🗎 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	332	371	410	367	417	470	359	387	434	399
LS	361	400	439	395	445	499	424	452	499	477
LB	145	184	223	180	230	283	172	200	247	212
LBS	174	213	252	208	258	312	237	265	312	290
XS	18	18	18	14	14	14	11	11	11	37

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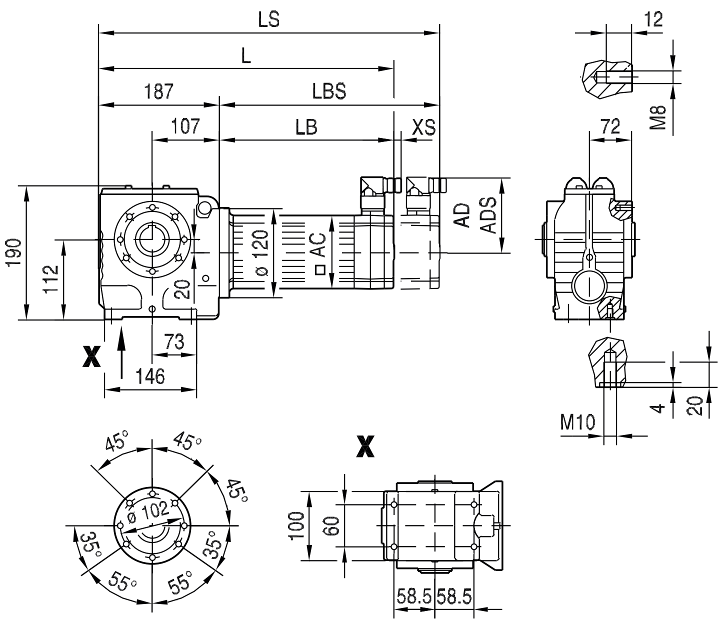
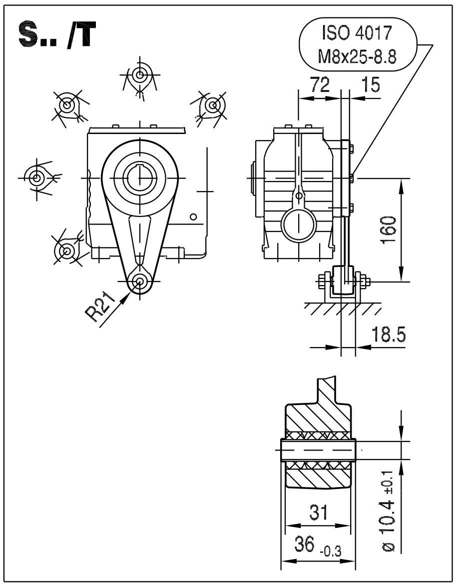
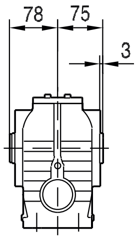
SA57..

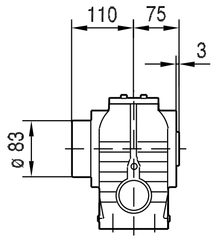




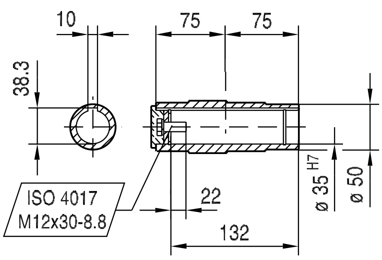
SA57..



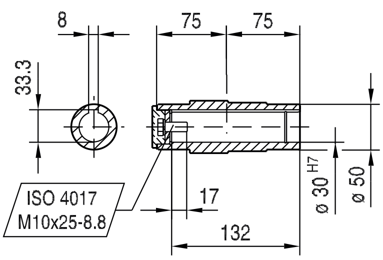
SH57..

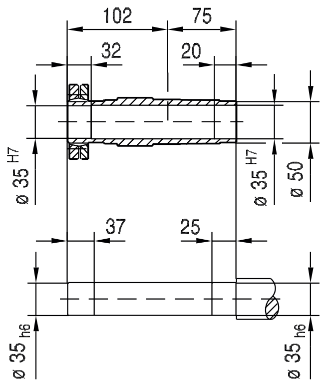


ø 35 H7



ø 30 H7





(→ 194)	CMP..									
	50S	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	332	371	410	367	417	470	359	387	434	399
LS	361	400	439	395	445	499	424	452	499	477
LB	145	184	223	180	230	283	172	200	247	212
LBS	174	213	252	208	258	312	237	265	312	290
XS	18	18	18	14	14	14	11	11	11	37

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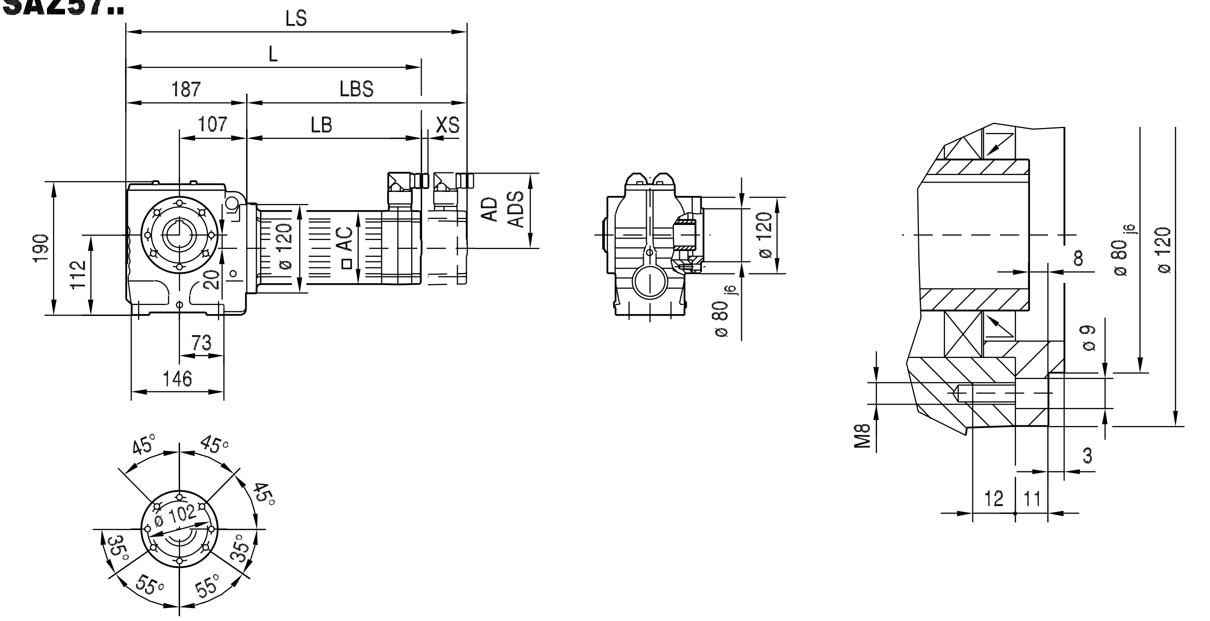
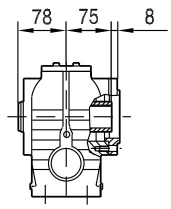
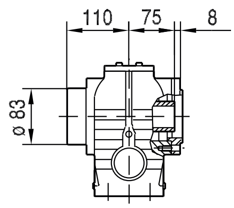
SAZ57..



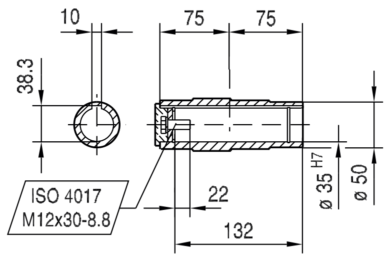
SAZ57..



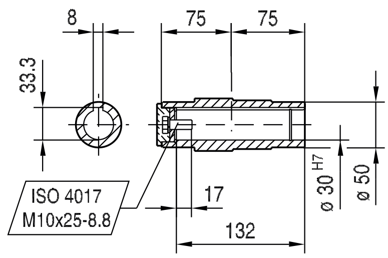
SHZ57..

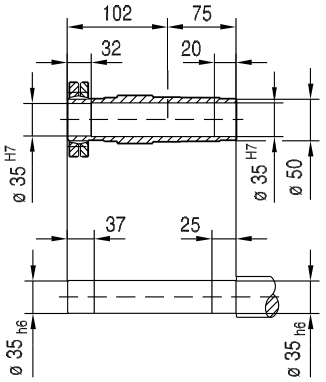


ø 35 H7



ø 30 H7





(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	332	371	410	367	417	470	359	387	434	399
LS	361	400	439	395	445	499	424	452	499	477
LB	145	184	223	180	230	283	172	200	247	212
LBS	174	213	252	208	258	312	237	265	312	290
XS	18	18	18	14	14	14	11	11	11	37

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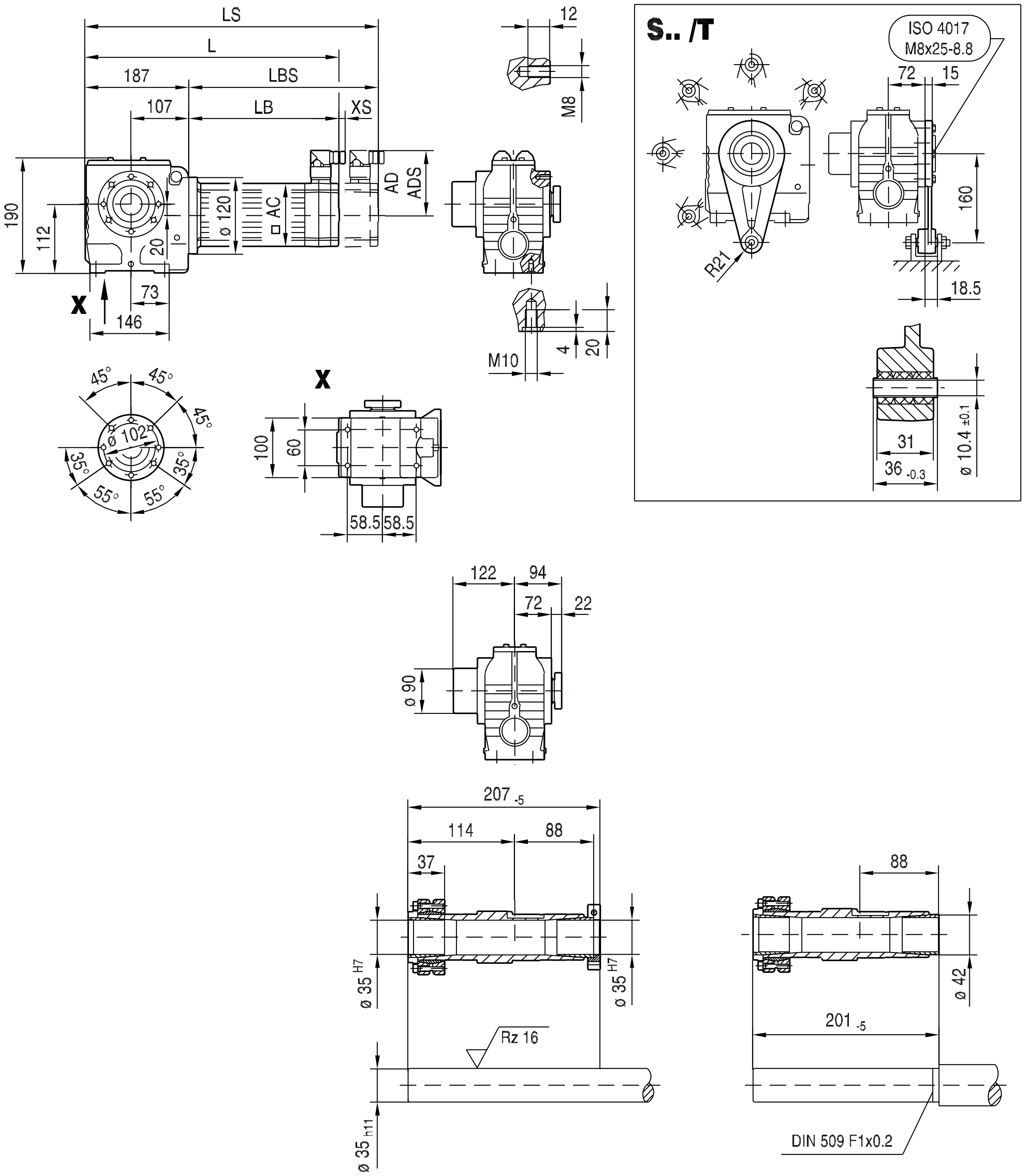
ST57..



(→ 🗎 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	332	371	410	367	417	470	359	387	434	399
LS	361	400	439	395	445	499	424	452	499	477
LB	145	184	223	180	230	283	172	200	247	212
LBS	174	213	252	208	258	312	237	265	312	290
XS	18	18	18	14	14	14	11	11	11	37

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11.2.4 S67..

S67, M_{aDyn} Nm						CMP							520 Nm
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
							2						
7.56		69	104	75	144	200	129	205	315	280	>375	>375	>375
8.69	40	80	119	86	166	235	148	235	360	325	>420	>420	>420
10.03	46	92	137	99	191	270	171	270	415	375	>450	>450	>450
11.03	51	101	151	109	210	295	188	300	>455	410	>455	>455	>455
12.96	60	119	178	128	245	350	220	355	>455	>455	>455	>455	>455
13.73	64	126	188	136	260	370	230	375	>455	>455	>455	>455	>455
15.60	71	141	210	152	290	415	260	420	>455	>455			
17.28	79	157	230	169	325	>455	290	>455	>455	>455			
20.30									>490	>490	>490	>490	>490
20.37	92	183	270	197	375	>450	340	>450					
23.22	105	205	310	220	430		385						
23.33						>515		>515	>515	>515	>515	>515	>515
24.44	111	215	325	235	>450		405						
26.93	113	220	335	240	465	>535	415	>535	>535	>535	>535	>535	>535
29.63	125	245	365	265	510	>550	460	>550	>550	>550	>550	>550	>550
34.80	145	285	425	305	>575	>575	530	>575	>575	>575	>575	>575	>575
36.85	153	300	450	325	>580	>580	565	>580	>580	>580	>580	>580	>580
41.89	174	345	515	370	>595	>595	>595	>595	>595	>595			
46.40	191	375	560	405	>610	>610	>610	>610	>610	>610			
54.70	220	435	>625	470	>625	>625	>625	>625					
62.35	250	500	>640	535	>640		>640						
65.63	265	525	>645	565	>645		>645						
75.06	300	595		640									

(→ 190)

S67, m kg						CMP							
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
2	27	28	29	29	31	32	32	34	36	39	41	47	64

SF: + 6.5 kg / SA: + 1.0 kg / SAF: + 5.5 kg

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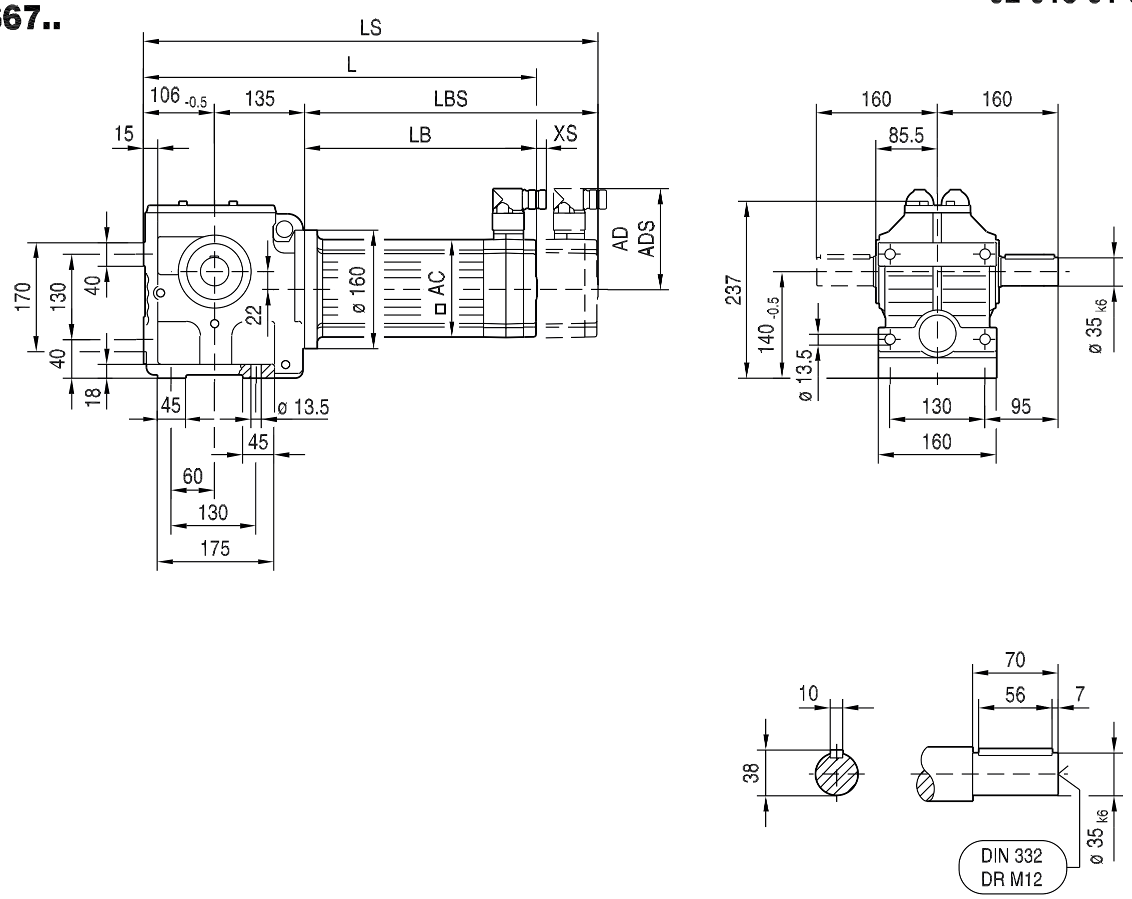
CMP..				c_{TG}			
		n_{epk}	η	S	SF	SA	SAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
S67 2	7.56	4500	89	-	-	-	-
	8.69	4500	89	-	-	-	-
	10.03	4500	89	-	-	-	-
	11.03	4500	89	-	-	-	-
	12.96	4500	89	-	-	-	-
	13.73	4500	89	-	-	-	-
	15.60	4500	88	-	-	-	-
	17.28	4500	88	-	-	-	-
	20.30	4500	82	-	-	-	-
	20.37	4500	87	-	-	-	-
	23.22	4500	87	-	-	-	-
	23.33	4500	82	-	-	-	-
	24.44	4500	87	-	-	-	-
	26.93	4500	81	-	-	-	-
	29.63	4500	81	-	-	-	-
	34.80	4500	80	-	-	-	-
	36.85	4500	80	-	-	-	-
	41.89	4500	80	-	-	-	-
	46.40	4500	79	-	-	-	-
	54.70	4500	78	-	-	-	-
	62.35	4500	78	-	-	-	-
	65.63	4500	78	-	-	-	-
	75.06	4500	77	-	-	-	-

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	S	SF	SA	SAF	S	SF	SA	SAF
	i	Nm	Nm	Nm	min^{-1}	kg*m^2	N	N	N	N	N	N	N	N
S67 2	7.56[1)]	295	375	500	26	5.4	3220	3890	2540	2540	9740	9740	12000	12000
	8.69[1)]	335	420	570	23	4.3	2860	3590	2020	2020	9460	9460	12000	12000
	10.03[1)]	340	450	575	20	3.3	3290	4050	2480	2480	9250	9250	12000	12000
	11.03[1)]	340	455	575	18	2.8	3660	4430	2890	2890	9210	9210	12000	12000
	12.96[1)]	340	455	575	15	2.2	4310	5110	3610	3610	9210	9210	12000	12000
	13.73[1)]	340	455	575	15	2.0	4510	5310	3870	3870	9210	9210	12000	12000
	15.60	340	455	575	13	1.5	4820	5640	4480	4480	9210	9210	12000	12000
	17.28	340	455	575	12	1.3	5080	5910	4990	4990	9210	9210	12000	12000
	20.30[1)]	425	490	720	10	4.0	5760	6650	6090	6090	8940	8940	12000	12000
	20.37	340	450	575	34	0.99	5520	6360	5700	5700	9250	9250	12000	12000
	23.22	340	450	575	47	0.71	5890	6740	6110	6110	9250	9250	12000	12000
	23.33[1)]	480	515	810	9	3.2	5810	6800	6120	6120	8720	8720	12000	12000
	24.44	340	450	575	45	0.63	6040	6900	6270	6270	9250	9250	12000	12000
	26.93[1)]	480	535	810	7	2.6	6240	7240	6590	6590	8540	8540	12000	12000
	29.63[1)]	480	550	810	7	2.2	6540	7540	6920	6920	8390	8390	12000	12000
	34.80[1)]	480	575	810	14	1.8	7060	8080	7490	7490	8140	8140	12000	12000
	36.85[1)]	480	580	810	14	1.6	7250	8280	7710	7710	8080	8080	12000	12000
	41.89[1)]	480	595	810	12	1.3	7690	8740	8200	8200	7920	7920	12000	12000
	46.40[1)]	480	610	810	11	1.1	8060	9020	8600	8600	7740	7740	12000	12000
	54.70	480	625	810	9	0.84	8670	9020	9280	9280	7560	7560	12000	12000
	62.35	480	640	810	8	0.59	9020	9020	9850	9850	7370	7370	12000	12000
	65.63	480	645	810	8	0.53	9020	9020	10100	10100	6930	7300	12000	12000
	75.06	480	655	810	7	0.43	9020	9020	10700	10700	5930	7170	12000	12000

[1)] (→ 🗎 190)

02 015 01 07

S67..



(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	380	419	458	414	464	514	407	432	482	447	485	483
LS	409	448	487	443	493	543	472	497	547	525	563	579
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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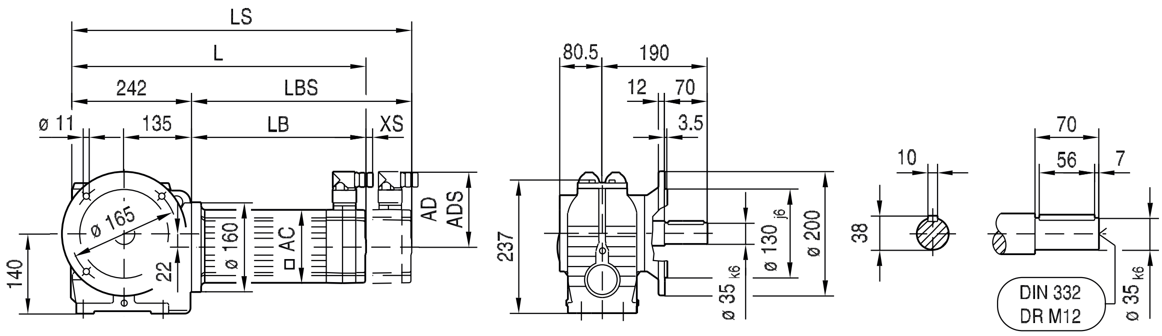
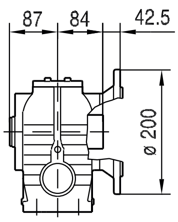
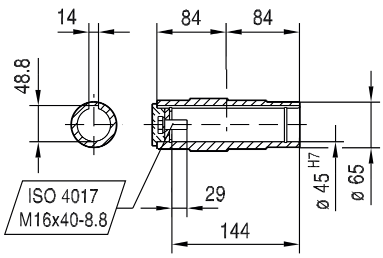
SF67..



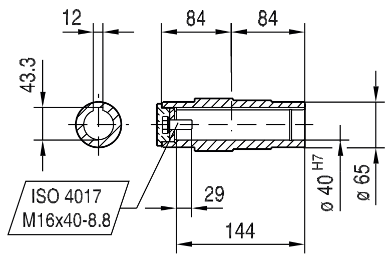
SAF67..



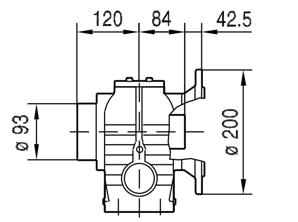
ø 45 H7

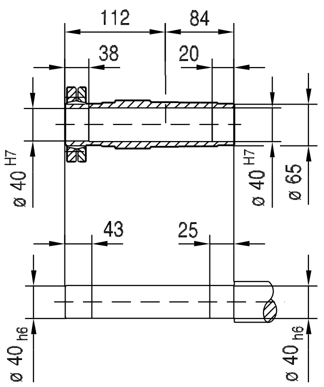


ø 40 H7



SHF67..





(→ 🗎 194)	CMP..											
	50S	**50M**	**50L**	**63S**	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**100S**
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	381	420	459	415	465	515	408	433	483	448	486	484
LS	410	449	488	444	494	544	473	498	548	526	564	580
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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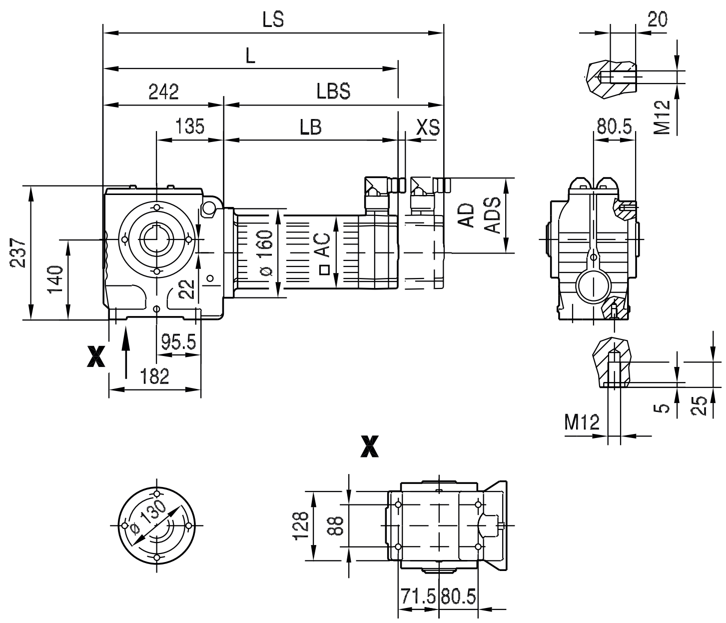
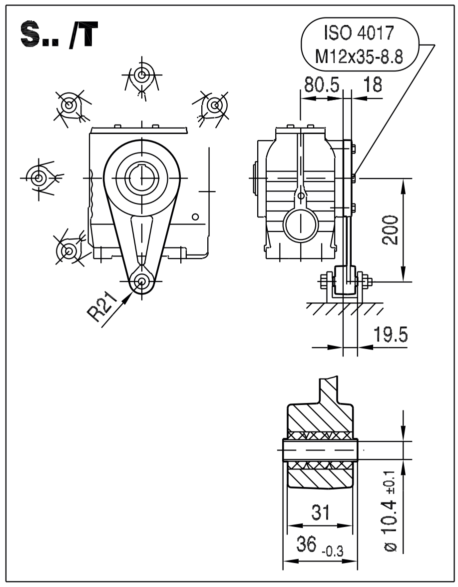
02 017 03 07

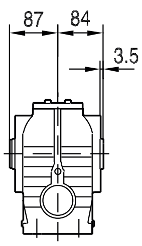
SA67..



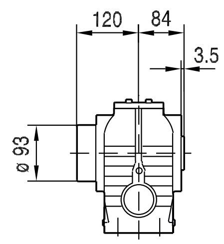


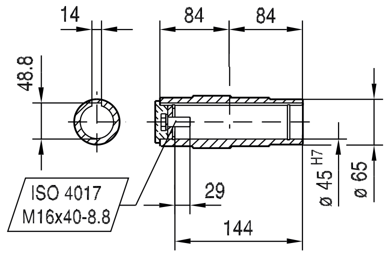
11

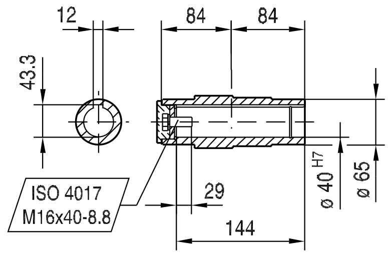
SA67..

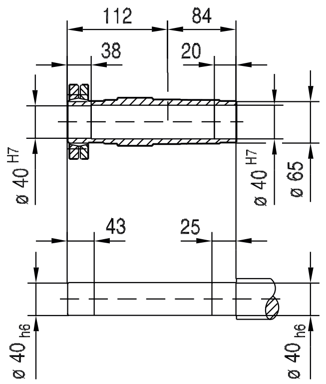


SH67..









(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	381	420	459	415	465	515	408	433	483	448	486	484
LS	410	449	488	444	494	544	473	498	548	526	564	580
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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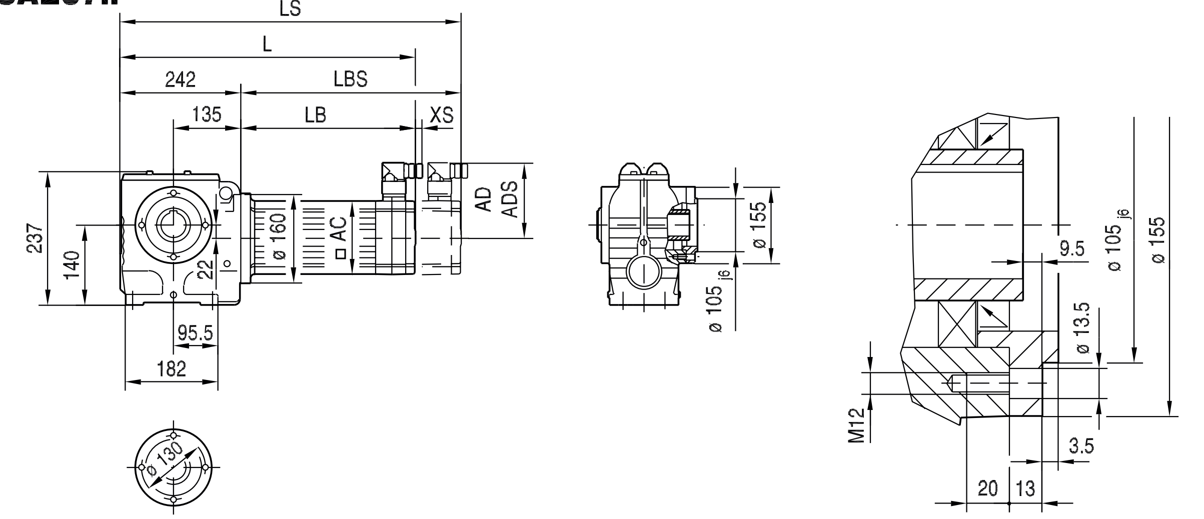
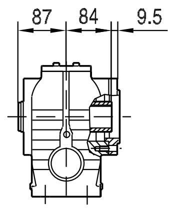
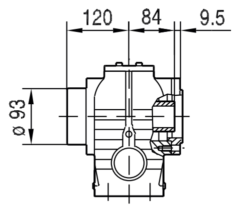
SAZ67..



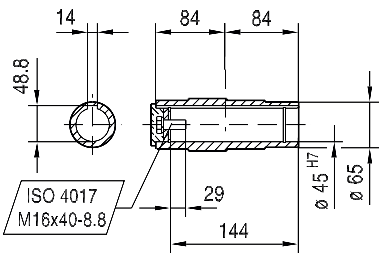
SAZ67..



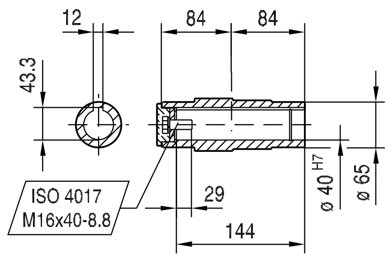
SHZ67..

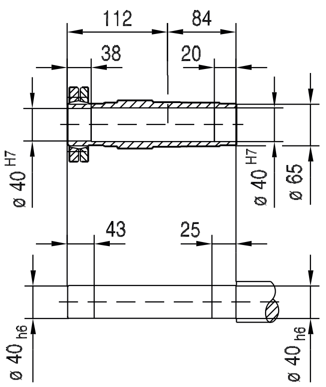


ø 45 H7



ø 40 H7





(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	381	420	459	415	465	515	408	433	483	448	486	484
LS	410	449	488	444	494	544	473	498	548	526	564	580
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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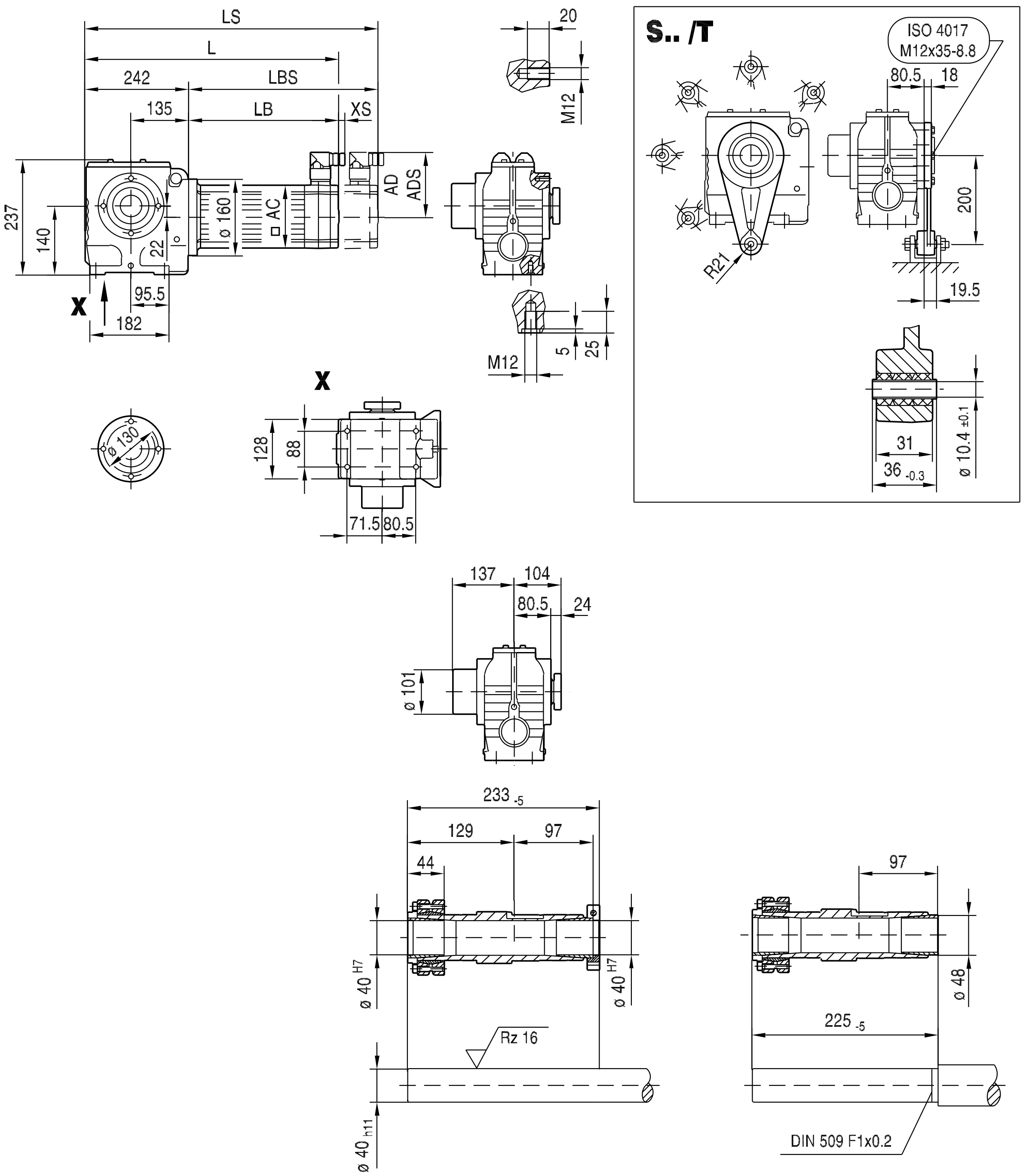
ST67..



(→ 🗎 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	381	420	459	415	465	515	408	433	483	448	486	484
LS	410	449	488	444	494	544	473	498	548	526	564	580
LB	139	178	217	173	223	273	166	191	241	206	244	242
LBS	168	207	246	202	252	302	231	256	306	284	322	338
XS	18	18	18	14	14	14	11	11	11	37	37	37

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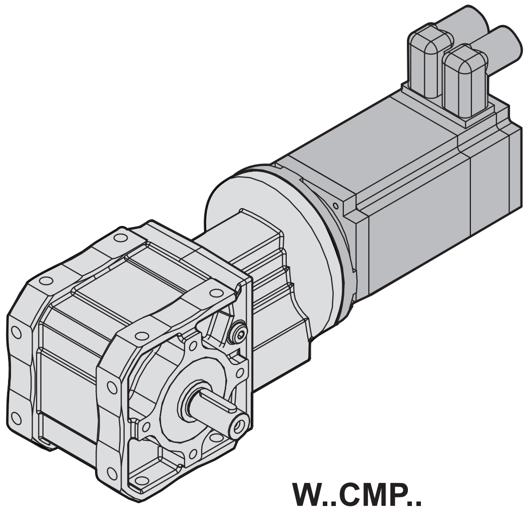
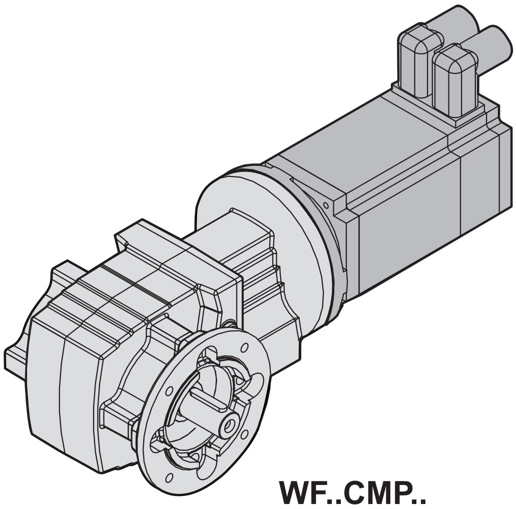
12 SPIROPLAN® gearmotor – W gear units

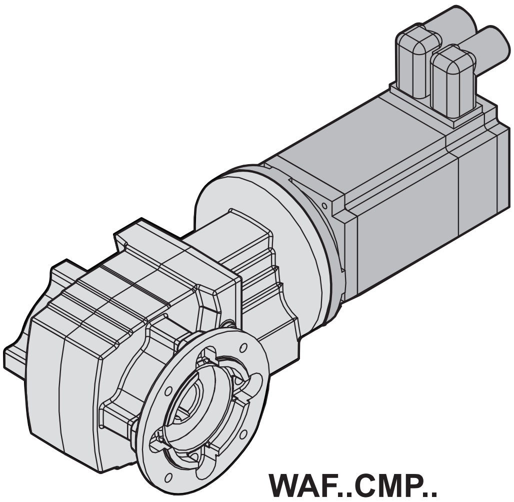
12.1 W..CMP.. designs



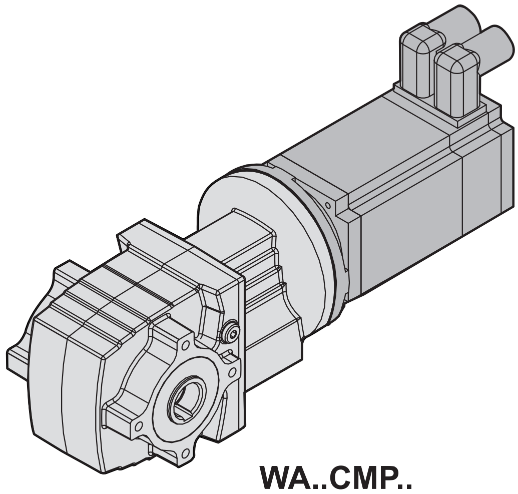
W..CMP..



WF..CMP..



WAF..CMP..



WA..CMP..

15705977227

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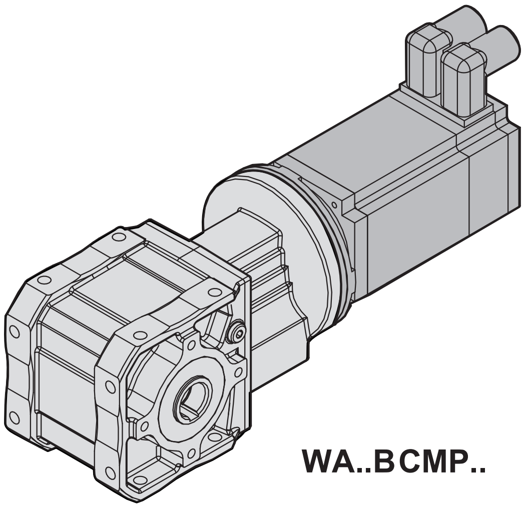
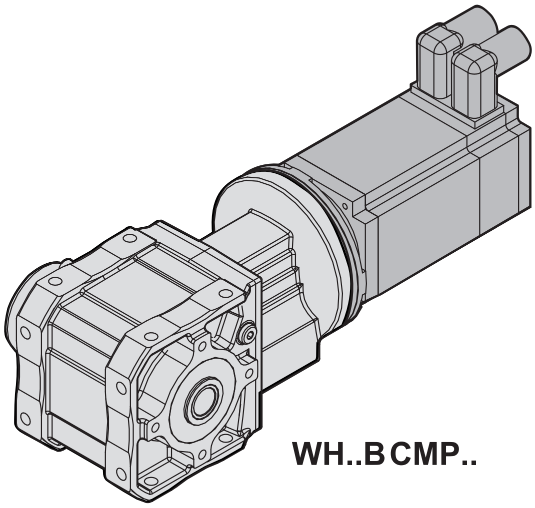
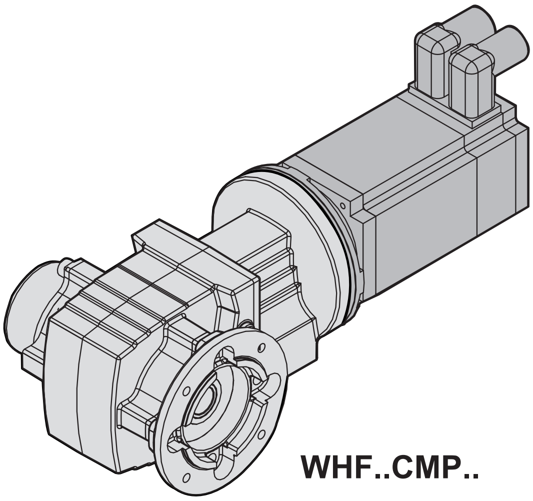


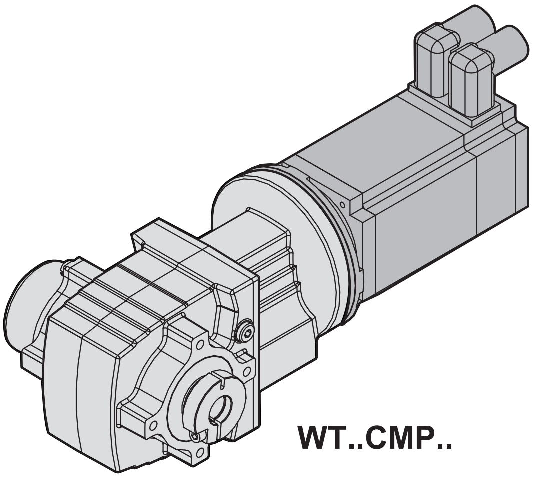
WA..BCMP..



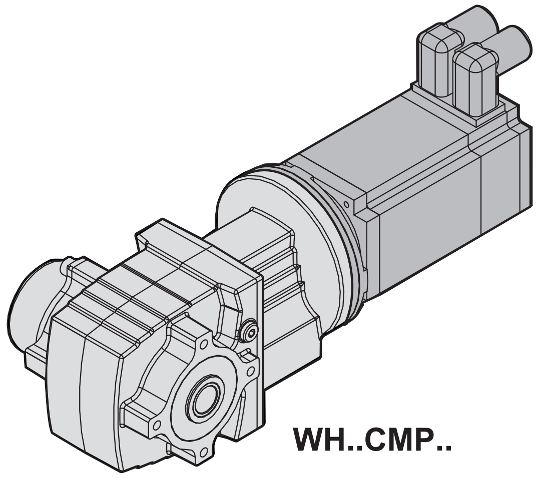
WH..BCMP..



WHF..CMP..



WT..CMP..



WH..CMP..

15705979659

12.2 W10–47..CMP.. selection tables and dimension sheets

12.2.1 W10

W10, M_{aDyn} Nm		25 Nm
	CMP	
i	40M	40M/BK
	1	
6.57	>12	>12
8.20	>12	>12
10.25	>13	>13
14.33	>22	>22
16.50	>20	>20
19.50	>25	>25
24.50	>25	>25
27.50	>24	>24
32.50	>25	
39.00	>25	
48.00	>25	
60.00	>25	
75.00	>25	

(→ 190)

W10, m kg	
	CMP
s	40M
1	3.8
WF: + 0.20 kg / WA: + - kg / WAF: + 0.20 kg	

CMP..				c_{TG}			
		n_{epk}	η	W	WF	WA	WAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
W10 1	6.57	4500	91	-	-	-	-
	8.20	4500	88	-	-	-	-
	10.25	4500	86	-	-	-	-
	14.33	4500	80	-	-	-	-
	16.50	4500	78	-	-	-	-
	19.50	4500	74	-	-	-	-
	24.50	4500	68	-	-	-	-
	27.50	4500	65	-	-	-	-
	32.50	4500	62	-	-	-	-
	39.00	4500	57	-	-	-	-
	48.00	4500	51	-	-	-	-
	60.00	4500	45	-	-	-	-
	75.00	4500	41	-	-	-	-

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CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	W	WF	WA	WAF	W	WF	WA	WAF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
W10 1	6.57	10	12	15	685	0.058	1740	1370	1800	1800	1800	1800	1800	1800
	8.20	10	12	15	549	0.041	1800	1460	1800	1800	1800	1800	1800	1800
	10.25	10	13	15	439	0.030	1800	1570	1800	1800	1800	1800	1800	1800
	14.33	18	22	25	314	0.020	1800	1670	1800	1800	1800	1800	1800	1800
	16.50	16	20	24	273	0.019	1800	1780	1800	1800	1800	1800	1800	1800
	19.50	20	25	25	231	0.017	1800	1800	1800	1800	1800	1800	1800	1800
	24.50	20	25	25	184	0.015	1800	1800	1800	1800	1800	1800	1800	1800
	27.50	20	24	25	164	0.016	1800	1800	1800	1800	1800	1800	1800	1800
	32.50	20	25	25	138	0.012	1800	1800	1800	1800	1800	1800	1800	1800
	39.00	20	25	25	115	0.011	1800	1800	1800	1800	1800	1800	1800	1800
	48.00	20	25	25	94	0.014	1800	1800	1800	1800	1800	1800	1800	1800
	60.00	20	25	25	75	0.015	1800	1800	1800	1800	1800	1800	1800	1800
	75.00	20	25	25	60	0.015	1800	1800	1800	1800	1800	1800	1800	1800

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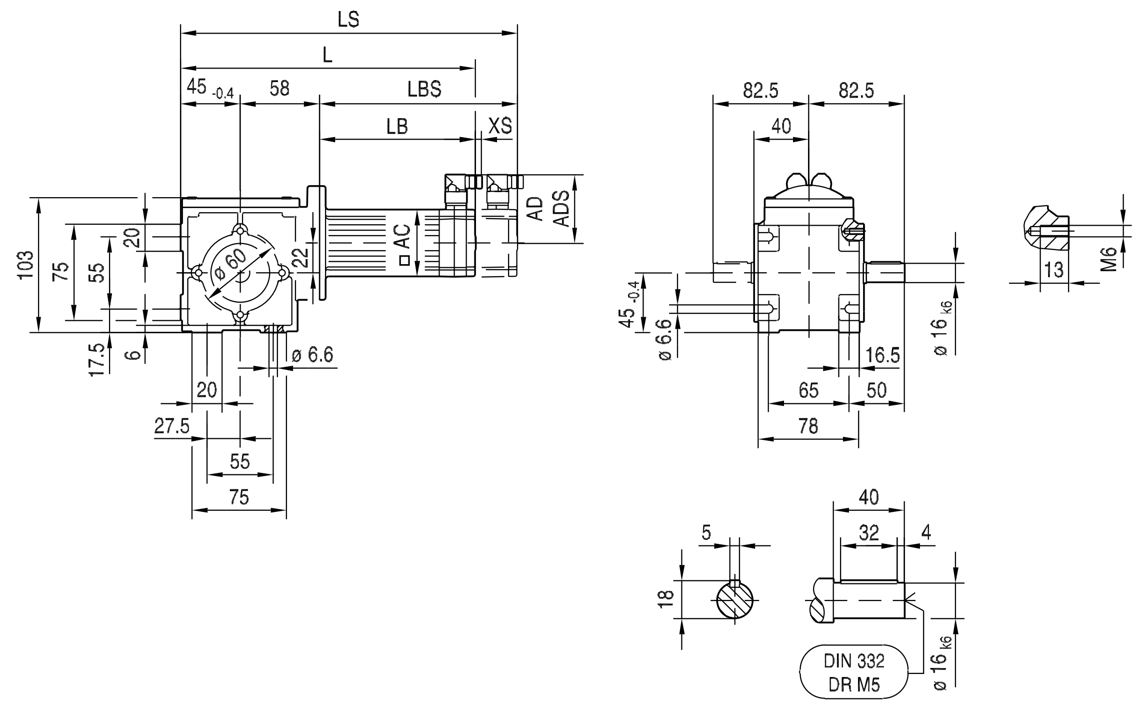
W10.. 20 022 00 07



(→ 194)	CMP..							
	40M							
AC	57							
AD	78							
ADS	78							
L	239							
LS	269							
LB	136							
LBS	166							
XS	19							

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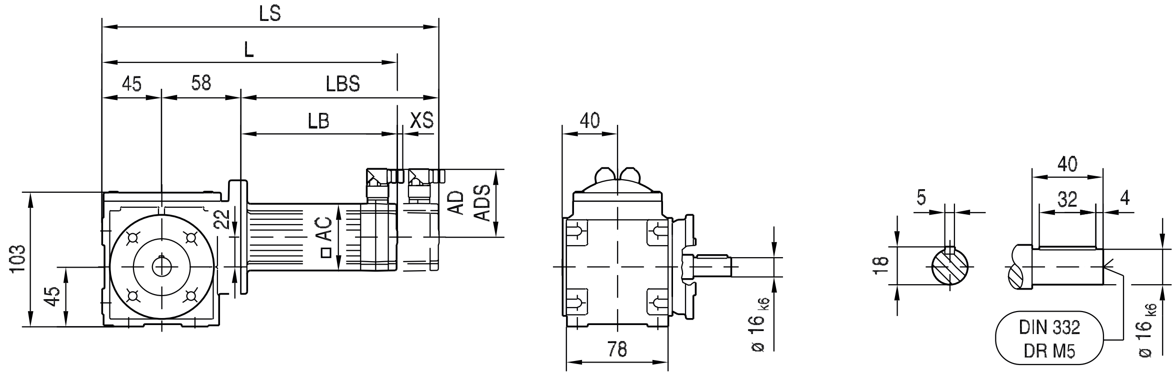
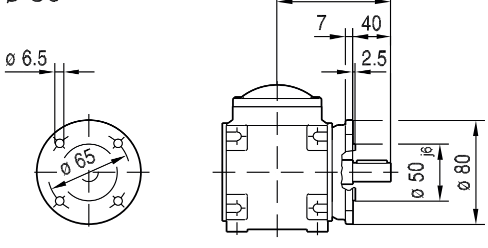
WF10..

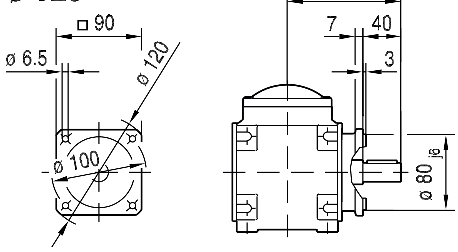
20 023 01 07



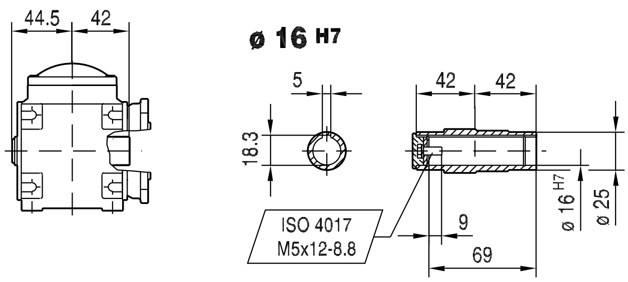
ø 80



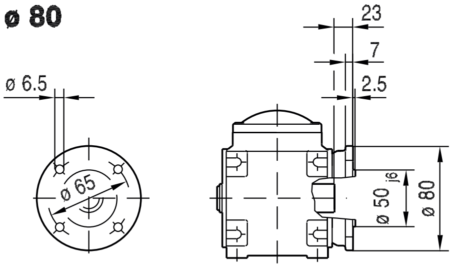
ø 120



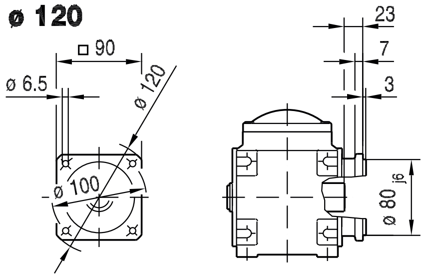
WAF10..



ø 80



ø 120



(→ 🗎 194)	CMP..							
	40M							
AC	57							
AD	78							
ADS	78							
L	239							
LS	269							
LB	136							
LBS	166							
XS	19							

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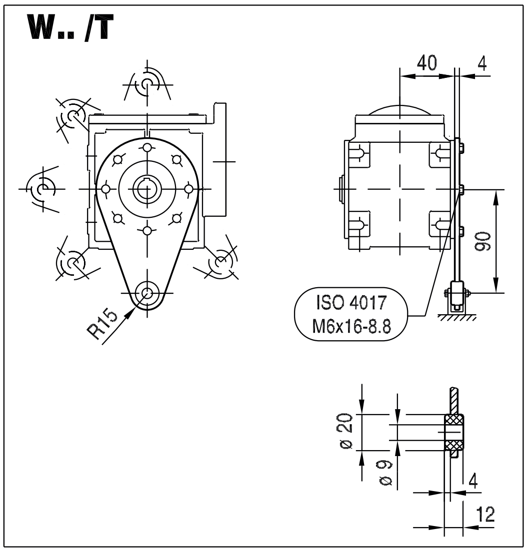
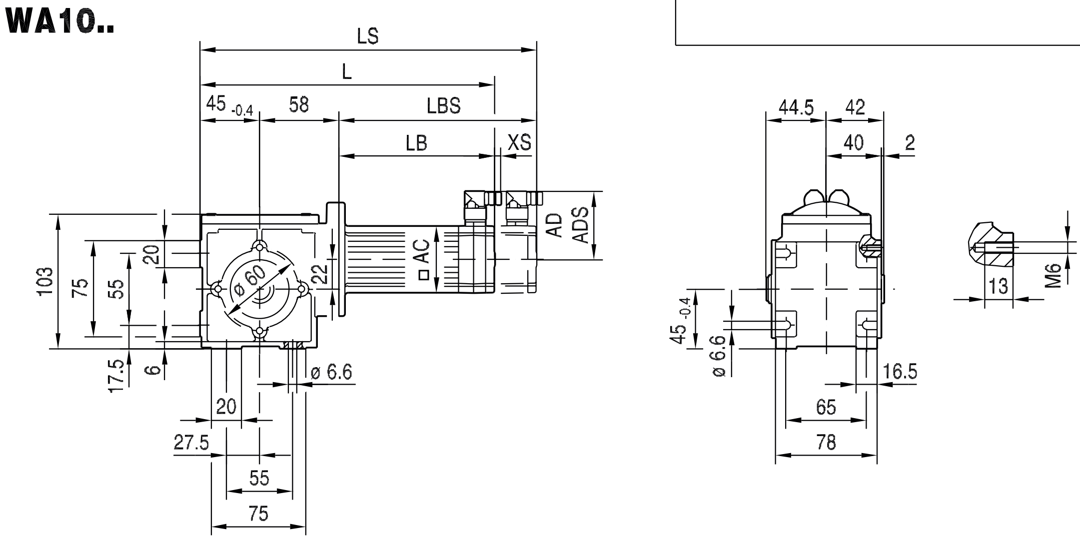
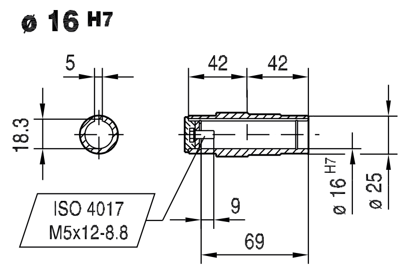
20 024 01 07







(→ 194)	CMP..							
	40M							
AC	57							
AD	78							
ADS	78							
L	239							
LS	269							
LB	136							
LBS	166							
XS	19							

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12.2.2 W20

W20, M_{aDyn} Nm								40 Nm
	CMP							
i	50S	50S/BK	50M	50M/BK	63S	63S/BK	63M	63M/BK
				1				
6.57	>20		>20		>20		>20	
8.20	>20		>20		>20		>20	
10.25	>25		>25		>25		>25	
14.33	>30		>30		>30		>30	
16.50	>30		>30		>30		>30	
19.50	>35		>35		>35		>35	
24.50	>40		>40		>40		>40	
27.50	>40		>40		>40		>40	
32.50	>40		>40		>40		>40	
39.00	>40		>40		>40		>40	
48.00	>40		>40		>40		>40	
60.00	>40		>40		>40		>40	
75.00	>40		>40		>40		>40	

(→ 190)

W20, m kg				
	CMP			
s	50S	50M	63S	63M
1	6.2	7.5	8.5	10
WF: + 0.15 kg / WA: + -0.25 kg / WAF: + -0.25 kg				

CMP..				c_{TG}			
		n_{epk}	η	W	WF	WA	WAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
W20 1	6.57	4500	91	-	-	-	-
	8.20	4500	87	-	-	-	-
	10.25	4500	84	-	-	-	-
	14.33	4500	80	-	-	-	-
	16.50	4500	76	-	-	-	-
	19.50	4500	73	-	-	-	-
	24.50	4500	68	-	-	-	-
	27.50	4500	67	-	-	-	-
	32.50	4500	67	-	-	-	-
	39.00	4500	57	-	-	-	-
	48.00	4500	51	-	-	-	-
	60.00	4500	44	-	-	-	-
	75.00	4500	41	-	-	-	-

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CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	W	WF	WA	WAF	W	WF	WA	WAF
	i	Nm	Nm	Nm	min^{-1}	kg*m²	N	N	N	N	N	N	N	N
W20 1	6.57	16	20	24	685	0.21	1740	1330	2180	2180	2200	2200	2200	2200
	8.20	16	20	24	549	0.20	1830	1400	2200	2200	2200	2200	2200	2200
	10.25	20	25	30	439	0.17	1920	1480	2200	2200	2200	2200	2200	2200
	14.33	25	30	37	314	0.14	2110	1620	2200	2200	2200	2200	2200	2200
	16.50	25	30	37	273	0.15	2200	1680	2200	2200	2200	2200	2200	2200
	19.50	29	35	43	231	0.14	2200	1750	2200	2200	2200	2200	2200	2200
	24.50	33	40	50	184	0.13	2200	1850	2200	2200	2200	2200	2200	2200
	27.50	33	40	50	164	0.12	2200	1940	2200	2200	2200	2200	2200	2200
	32.50	33	40	50	138	0.12	2200	2080	2200	2200	2200	2200	2200	2200
	39.00	33	40	50	115	0.12	2200	2200	2200	2200	2200	2200	2200	2200
	48.00	33	40	50	94	0.13	2200	2200	2200	2200	2200	2200	2200	2200
	60.00	33	40	50	75	0.13	2200	2200	2200	2200	2200	2200	2200	2200
	75.00	33	40	50	60	0.12	2200	2200	2200	2200	2200	2200	2200	2200

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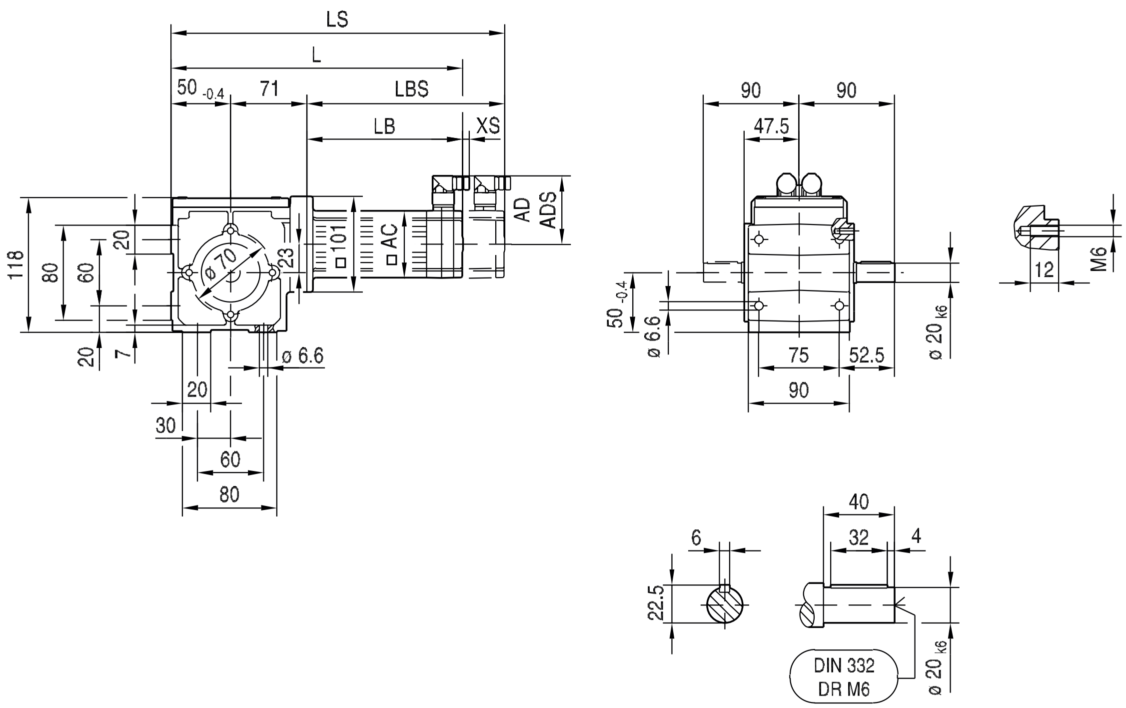
W20..

20 025 01 07



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(→ 194)	CMP..							
	50S	50M	63S	63M				
AC	73	73	88	88				
AD	86	86	92	92				
ADS	86	86	92	92				
L	259	298	277	327				
LS	288	327	306	356				
LB	138	177	156	206				
LBS	167	206	185	235				
XS	18	18	14	14				

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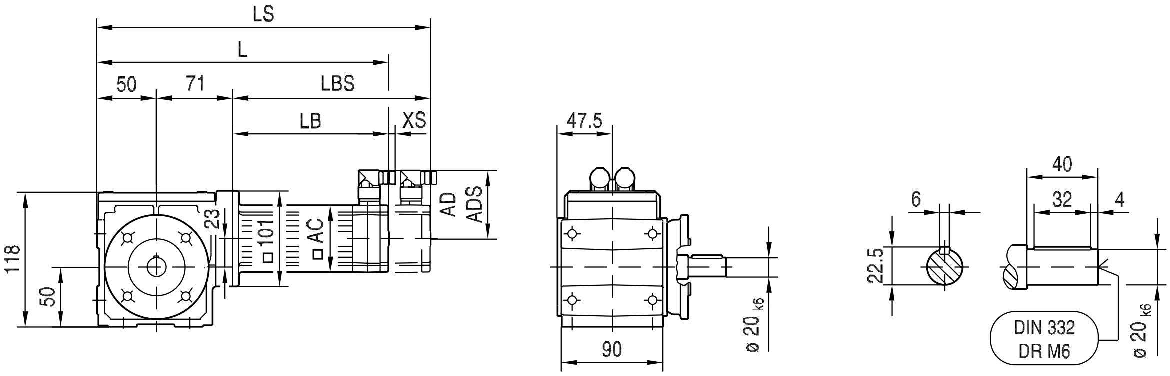
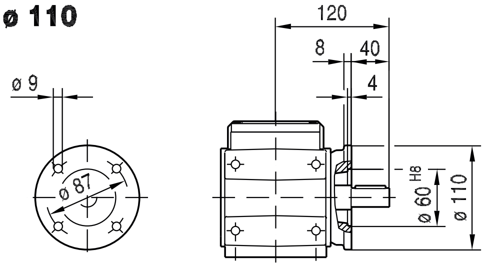
WF20..

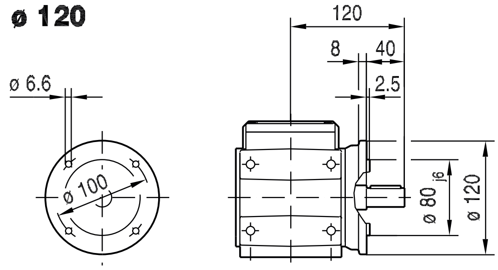
20 026 00 07



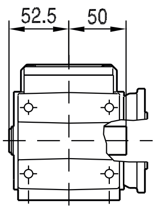
ø 110



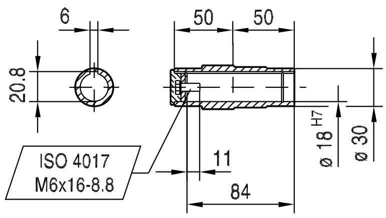
ø 120



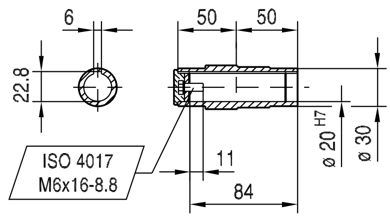
WAF20..



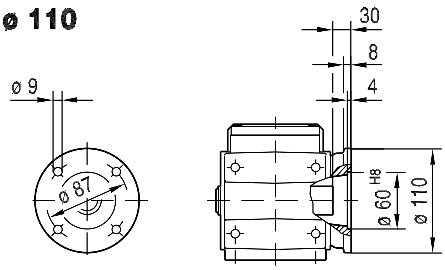
ø 18 H7



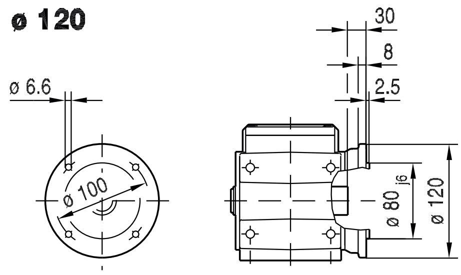
ø 20 H7



ø 110



ø 120



(→ 194)	CMP..							
	50S	50M	63S	63M				
AC	73	73	88	88				
AD	86	86	92	92				
ADS	86	86	92	92				
L	259	298	277	327				
LS	288	327	306	356				
LB	138	177	156	206				
LBS	167	206	185	235				
XS	18	18	14	14				

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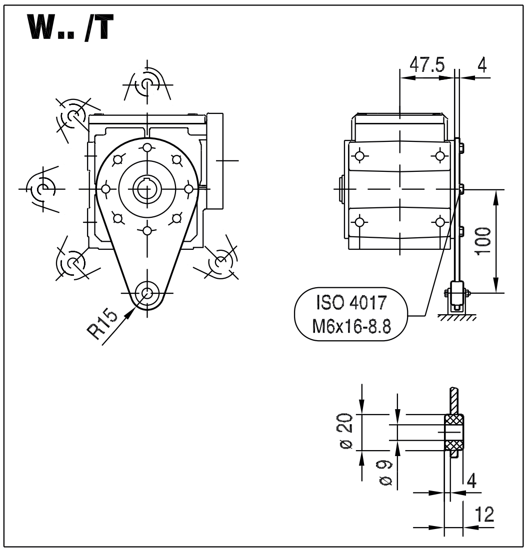
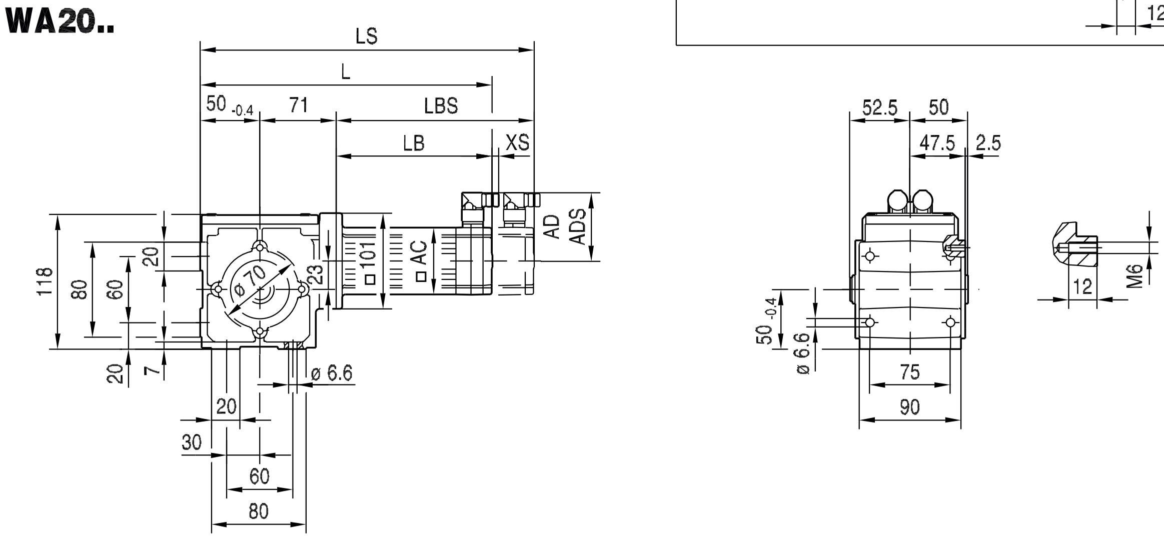
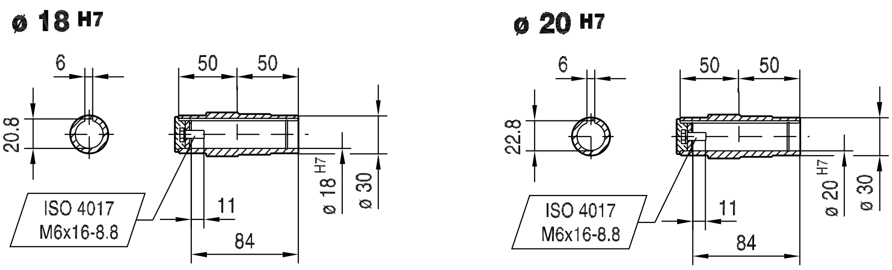
20 027 02 07







(→ 194)	CMP..							
	50S	50M	63S	63M				
AC	73	73	88	88				
AD	86	86	92	92				
ADS	86	86	92	92				
L	259	298	277	327				
LS	288	327	306	356				
LB	138	177	156	206				
LBS	167	206	185	235				
XS	18	18	14	14				

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12.2.3 W30

W30, M_{aDyn} Nm								70 Nm
	CMP							
i	50S	50S/BK	50M	50M/BK	63S	63S/BK	63M	63M/BK
				1				
6.57	32		>40		>40		>40	
8.20	38		>40		>40		>40	
10.25	46		>50		>50		>50	
14.33	>60		>60		>60		>60	
16.33	>60		>60		>60		>60	
19.50	>70		>70		>70		>70	
24.50	>70		>70		>70		>70	
27.50	>70		>70		>70		>70	
32.50	>70		>70		>70		>70	
39.00	>70		>70		>70		>70	
48.00	>70		>70		>70		>70	
60.00	>70		>70		>70		>70	
75.00	>70		>70		>70		>70	

(→ 190)

W30, m kg				
	CMP			
s	50S	50M	63S	63M
1	8.6	9.9	11	13
WF: + 0.40 kg / WA: + -0.30 kg / WAF: + - kg				

CMP..				c_{TG}			
	i	n_{epk} min^{-1}	η %	W Nm/'	WF Nm/'	WA Nm/'	WAF Nm/'
W30 1	6.57	4500	93	-	-	-	-
	8.20	4500	89	-	-	-	-
	10.25	4500	87	-	-	-	-
	14.33	4500	83	-	-	-	-
	16.33	4500	80	-	-	-	-
	19.50	4500	78	-	-	-	-
	24.50	4500	73	-	-	-	-
	27.50	4500	70	-	-	-	-
	32.50	4500	64	-	-	-	-
	39.00	4500	63	-	-	-	-
	48.00	4500	57	-	-	-	-
	60.00	4500	52	-	-	-	-
	75.00	4500	45	-	-	-	-

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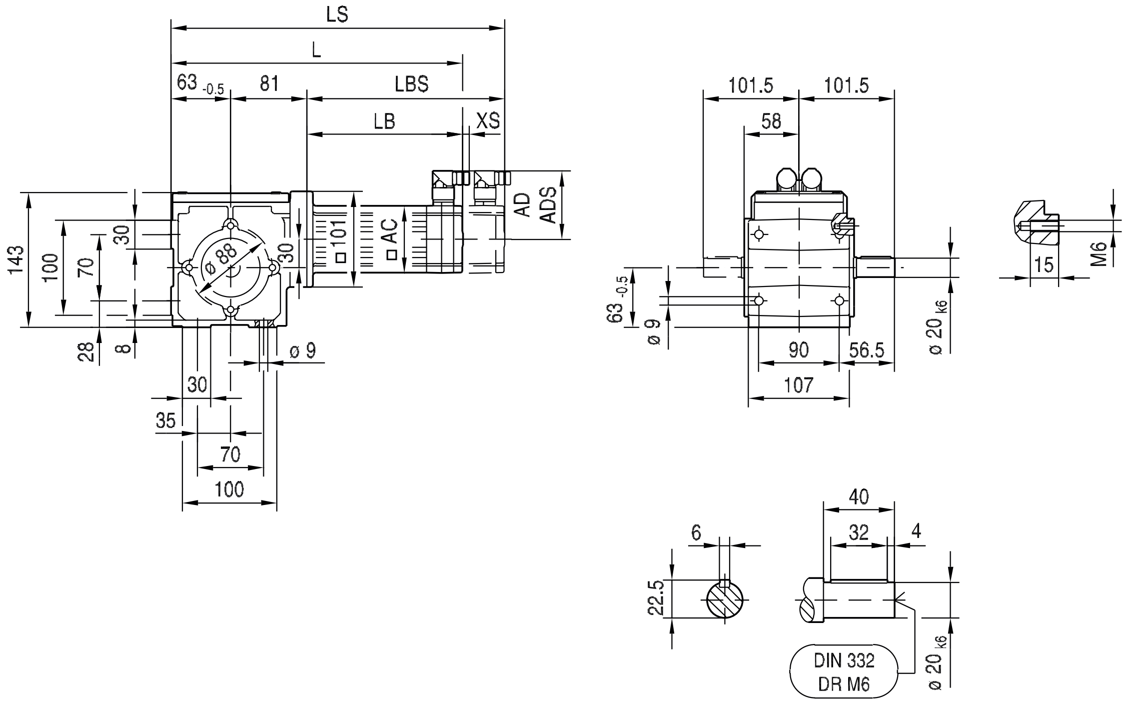
CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	W	WF	WA	WAF	W	WF	WA	WAF
	i	Nm	Nm	Nm	min^{-1}	kg*m^2	N	N	N	N	N	N	N	N
W30 1	6.57	33	40	50	685	0.64	2640	2280	3000	3000	3000	3000	3000	3000
	8.20	33	40	50	549	0.51	2810	2430	3000	3000	3000	3000	3000	3000
	10.25	41	50	61	439	0.44	2970	2570	3000	3000	3000	3000	3000	3000
	14.33	50	60	75	314	0.37	3000	2810	3000	3000	3000	3000	3000	3000
	16.33	50	60	75	276	0.36	3000	2940	3000	3000	3000	3000	3000	3000
	19.50	58	70	87	231	0.34	3000	3000	3000	3000	3000	3000	3000	3000
	24.50	58	70	87	184	0.32	3000	3000	3000	3000	3000	3000	3000	3000
	27.50	58	70	87	164	0.33	3000	3000	3000	3000	3000	3000	3000	3000
	32.50	58	70	87	138	0.31	3000	3000	3000	3000	3000	3000	3000	3000
	39.00	58	70	87	115	0.31	3000	3000	3000	3000	3000	3000	3000	3000
	48.00	58	70	87	94	0.31	3000	3000	3000	3000	3000	3000	3000	3000
	60.00	58	70	87	75	0.30	3000	3000	3000	3000	3000	3000	3000	3000
	75.00	58	70	87	60	0.30	3000	3000	3000	3000	3000	3000	3000	3000

W30.. **20 028 00 07**



(→ 194)	CMP..							
	50S	50M	63S	63M				
AC	73	73	88	88				
AD	86	86	92	92				
ADS	86	86	92	92				
L	283	322	301	351				
LS	312	351	329	379				
LB	139	178	157	207				
LBS	168	207	186	236				
XS	18	18	14	14				

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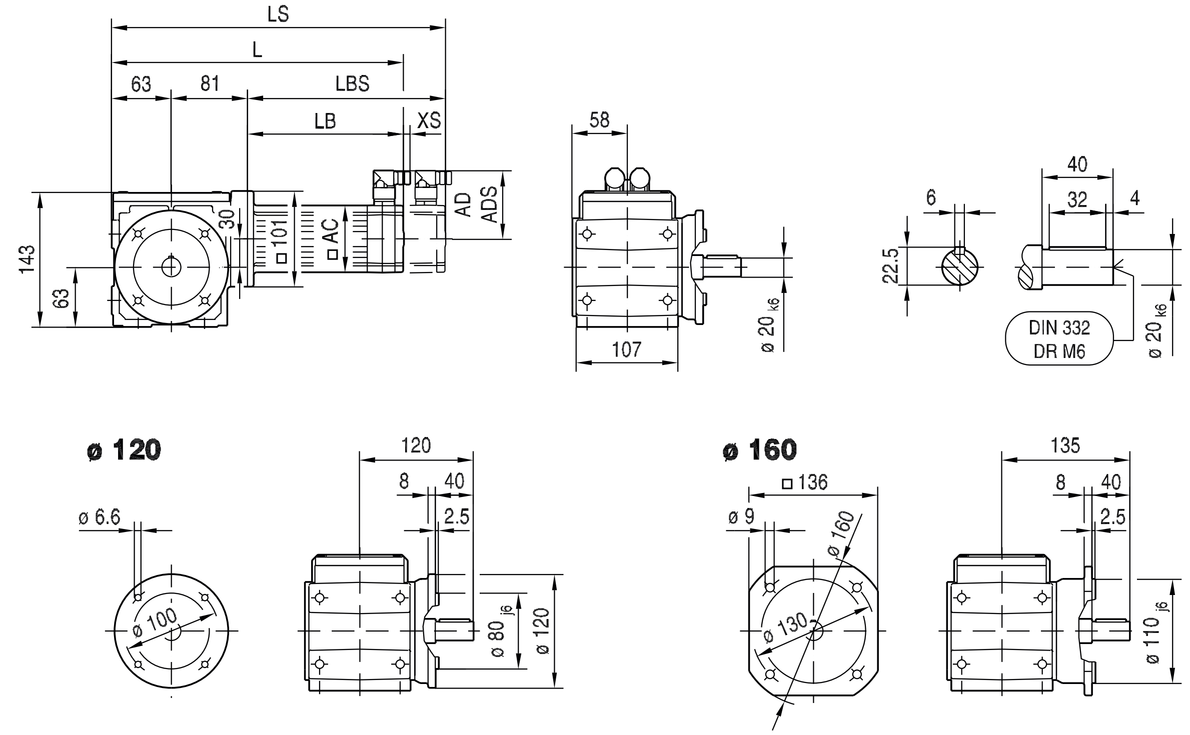
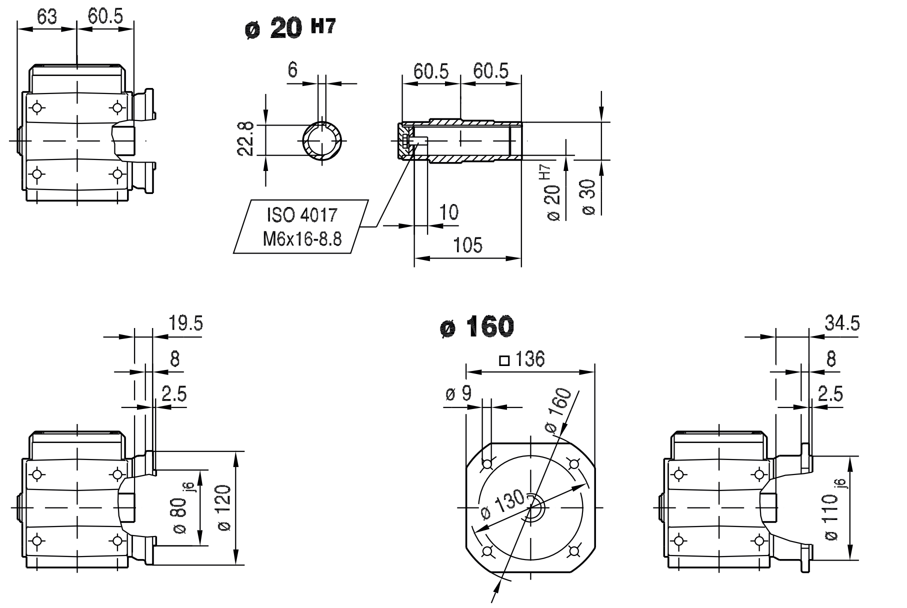
WF30..

20 029 00 07



WAF30..



(→ 194)	CMP..							
	50S	50M	63S	63M				
AC	73	73	88	88				
AD	86	86	92	92				
ADS	86	86	92	92				
L	283	322	301	351				
LS	312	351	329	379				
LB	139	178	157	207				
LBS	168	207	186	236				
XS	18	18	14	14				

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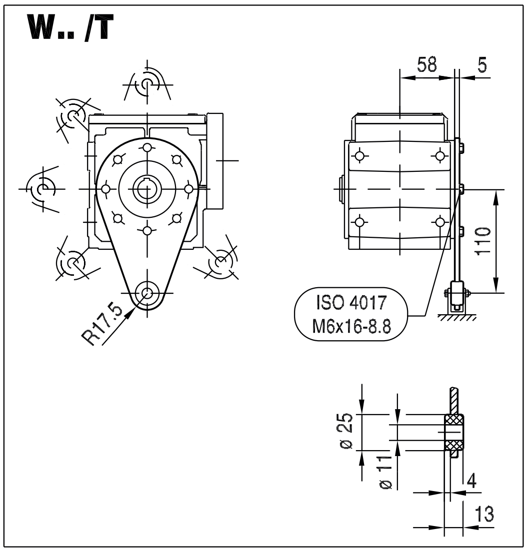
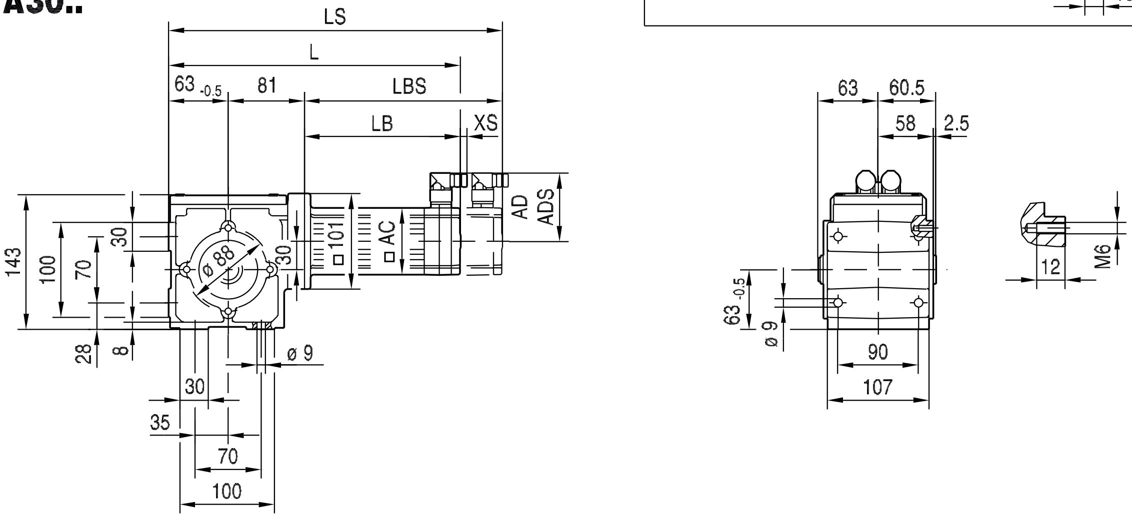
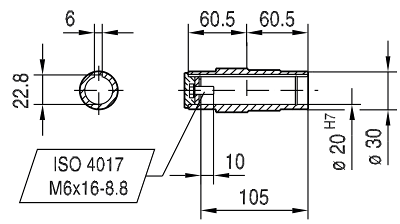
20 030 01 07



WA30..



ø 20 H7



(→ 194)	CMP..							
	50S	50M	63S	63M				
AC	73	73	88	88				
AD	86	86	92	92				
ADS	86	86	92	92				
L	283	322	301	351				
LS	312	351	329	379				
LB	139	178	157	207				
LBS	168	207	186	236				
XS	18	18	14	14				

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12.2.4 W37

W37, M_{aDyn} Nm									110 Nm
	CMP								
i	50S	50M	50L	63S	63M	63L	71S	71M	80S
2									
3.20	15	31	46	33	64	>70	57	>70	>70
3.93	19	37	56	40	>70	>70	69	>70	>70
5.11	24	48	>70	52	>70	>70	>70	>70	>70
5.77	28	55	>70	59	>70	>70	>70	>70	>70
6.97	33	66	>70	>70	>70	>70	>70	>70	>70
8.55	40	>70	>70	>70	>70		>70		
9.92	47	>70		>70					
10.67	48	>90	>90	>90	>90	>90	>90	>90	>90
11.65	55								
12.70	60								
13.89	62	>90	>90	>90	>90	>90	>90	>90	>90
15.67	70	>90	>90	>90	>90	>90	>90	>90	>90
18.94	84	>90	>90	>90	>90	>90	>90	>90	>90
21.33	84	>110	>110	>110	>110	>110	>110	>110	>110
23.25	>90	>90	>90	>90	>90		>90		
26.96	>90	>90		>90					
27.78	107	>110	>110	>110	>110	>110	>110	>110	>110
31.33	>110	>110	>110	>110	>110	>110	>110	>110	>110
31.67	>90								
34.52	>90								
37.88	>110	>110	>110	>110	>110	>110	>110	>110	>110
46.49	>110	>110	>110	>110	>110		>110		
53.92	>110	>110		>110					
63.33	>110								
69.05	>110								

(→ 190)

W37, m kg									
	CMP								
s	50S	50M	50L	63S	63M	63L	71S	71M	80S
2	9.2	10	11	11	13	14	14	16	22
WF: + - kg / WA: + - kg / WAF: + - kg									

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CMP..				c_{TG}			
		n_{epk}	η	W	WF	WA	WAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
W37 2	3.20	4500	93	-	-	-	-
	3.93	4500	92	-	-	-	-
	5.11	4500	92	-	-	-	-
	5.77	4500	92	-	-	-	-
	6.97	4500	92	-	-	-	-
	8.55	4500	91	-	-	-	-
	9.92	4500	91	-	-	-	-
	10.67	4500	87	-	-	-	-
	11.65	4500	91	-	-	-	-
	12.70	4500	91	-	-	-	-
	13.89	4500	86	-	-	-	-
	15.67	4500	86	-	-	-	-
	18.94	4500	85	-	-	-	-
	21.33	4500	76	-	-	-	-
	23.25	4500	84	-	-	-	-
	26.96	4500	83	-	-	-	-
	27.78	4500	74	-	-	-	-
	31.33	4500	73	-	-	-	-
	31.67	4500	82	-	-	-	-
	34.52	4500	81	-	-	-	-
	37.88	4500	72	-	-	-	-
	46.49	4500	70	-	-	-	-
	53.92	4500	69	-	-	-	-
	63.33	4500	67	-	-	-	-
	69.05	4500	67	-	-	-	-

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CMP.. n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	F_{Ramax} W N	F_{Ramax} WF N	F_{Ramax} WA N	F_{Ramax} WAF N	F_{Rapk} W N	F_{Rapk} WF N	F_{Rapk} WA N	F_{Rapk} WAF N
W37 2	3.20	58	70	98	2188	2.3	2220	2350	2050	2050	3830	3830	5000	5000
	3.93	58	70	98	1781	1.6	2410	2550	2240	2240	3830	3830	5000	5000
	5.11	58	70	98	1370	0.96	2680	2820	2490	2490	3830	3830	5000	5000
	5.77	58	70	98	1213	0.77	2810	2950	2620	2620	3830	3830	5000	5000
	6.97	58	70	98	1004	0.54	3020	3170	2830	2830	3830	3830	5000	5000
	8.55	58	70	98	819	0.37	3270	3420	3070	3070	3830	3830	5000	5000
	9.92	58	70	98	706	0.28	3460	3620	3250	3250	3830	3830	5000	5000
	10.67	75	90	127	150	0.80	2880	3140	2530	2530	3610	3610	5000	5000
	11.65	58	70	98	601	0.21	3680	3830	3460	3460	3830	3830	5000	5000
	12.70	58	70	98	551	0.18	3800	3830	3580	3580	3830	3830	5000	5000
	13.89	75	90	127	151	0.52	3250	3510	2890	2890	3610	3610	5000	5000
	15.67	75	90	127	147	0.42	3430	3610	3070	3070	3610	3610	5000	5000
	18.94	75	90	127	148	0.30	3610	3610	3360	3360	3610	3610	5000	5000
	21.33	91	110	154	66	0.71	3320	3320	2940	2940	3320	3320	5000	5000
	23.25	75	90	127	146	0.21	3610	3610	3690	3690	3610	3610	5000	5000
	26.96	75	90	127	145	0.16	3610	3610	3950	3950	3610	3610	5000	5000
	27.78	91	110	154	50	0.46	3320	3320	3400	3400	3320	3320	5000	5000
	31.33	91	110	154	45	0.38	3320	3320	3620	3620	3320	3320	5000	5000
	31.67	75	90	127	145	0.13	3610	3610	4240	4240	3610	3610	5000	5000
	34.52	75	90	127	145	0.11	3610	3610	4410	4410	3610	3610	5000	5000
	37.88	91	110	154	37	0.27	3320	3320	3990	3990	3320	3320	5000	5000
	46.49	91	110	154	32	0.19	3320	3320	4410	4410	3320	3320	5000	5000
	53.92	91	110	154	32	0.15	3320	3320	4730	4730	3320	3320	5000	5000
	63.33	91	110	154	36	0.12	3320	3320	5000	5000	3320	3320	5000	5000
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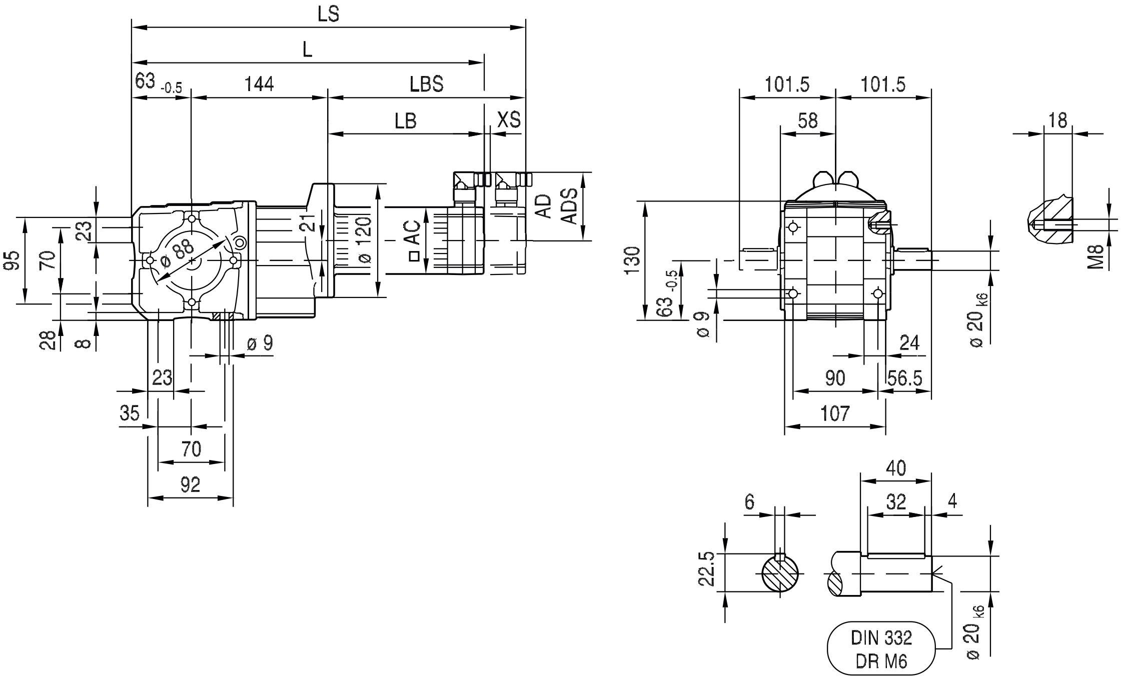
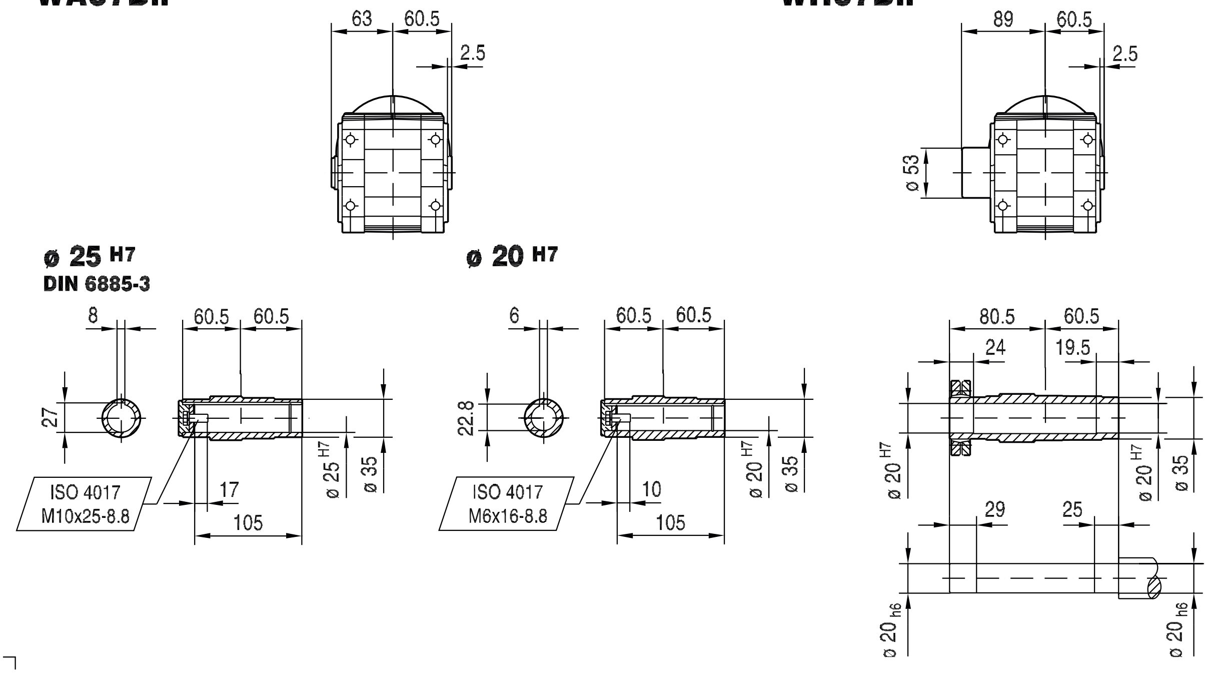
20 031 00 07

W37..



WA37B..

WH37B..



(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	352	391	430	387	437	490	379	407
LS	381	420	459	415	465	519	444	472
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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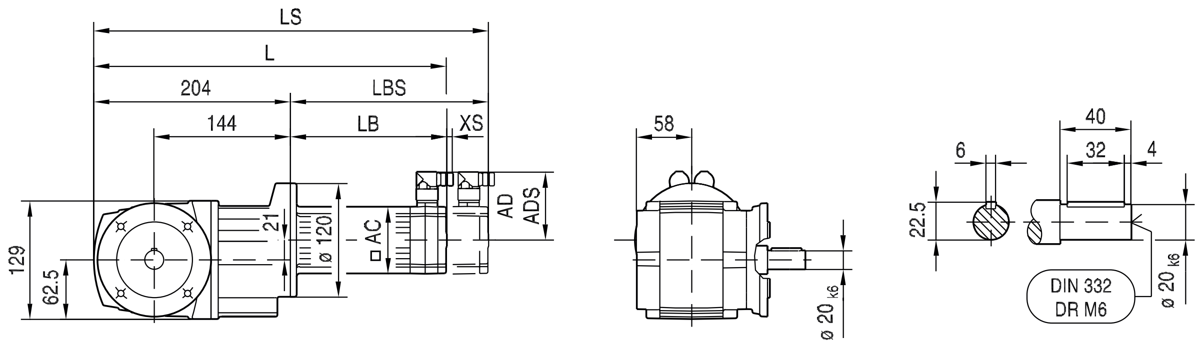
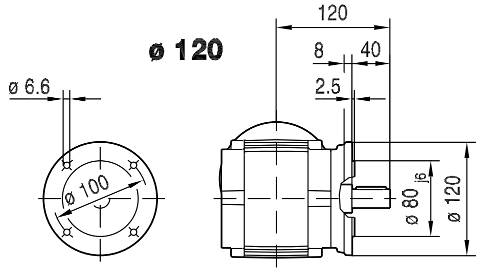
20 032 01 07

WF37..

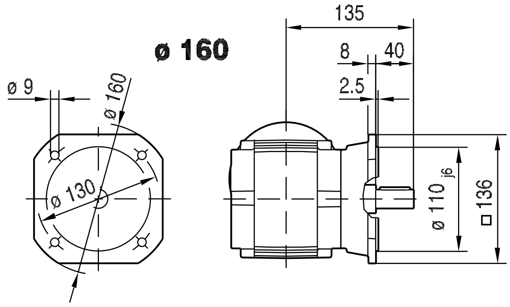


12

ø 120

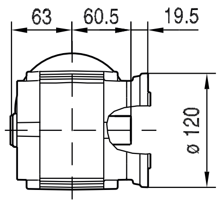


ø 160

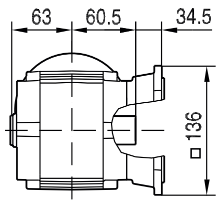


WAF37..

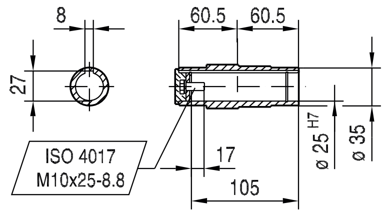
ø 120



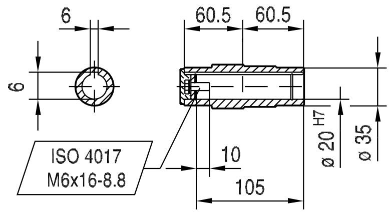
ø 160



ø 25 H7
DIN 6885-3



ø 20 H7



(→ 🗎 194)	CMP..							
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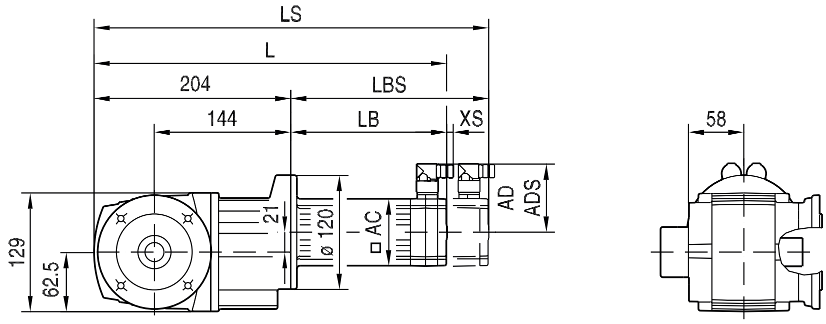
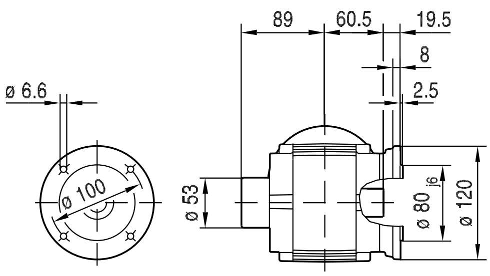
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	349	388	427	384	434	487	376	404
LS	378	417	456	412	462	516	441	469
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

20 033 01 07

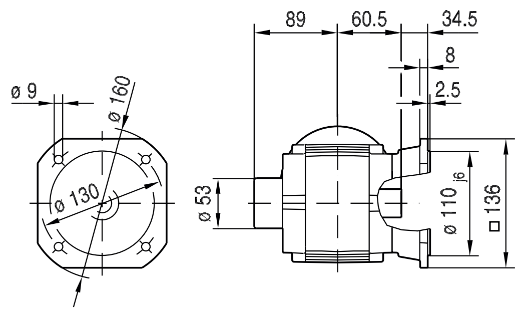
WHF37..

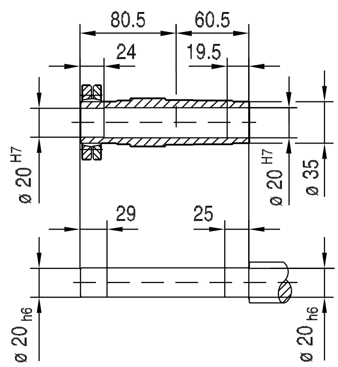


ø 120



ø 160





(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	349	388	427	384	434	487	376	404
LS	378	417	456	412	462	516	441	469
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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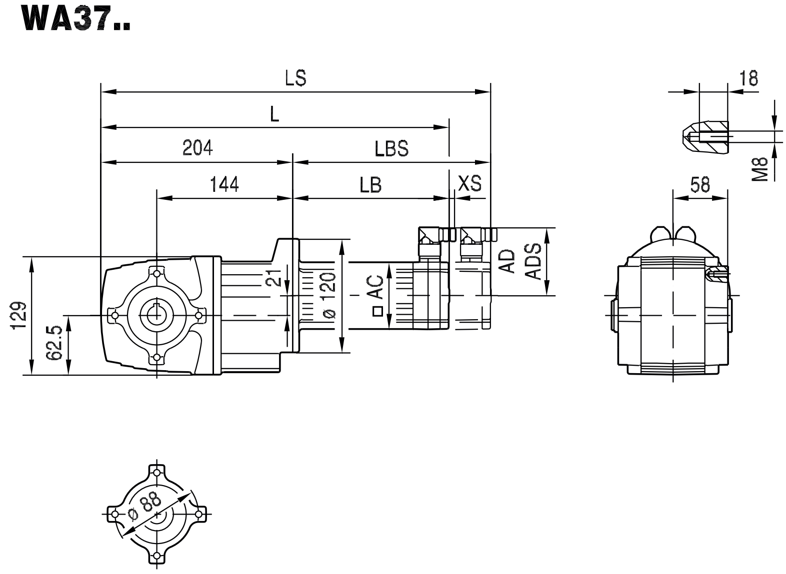
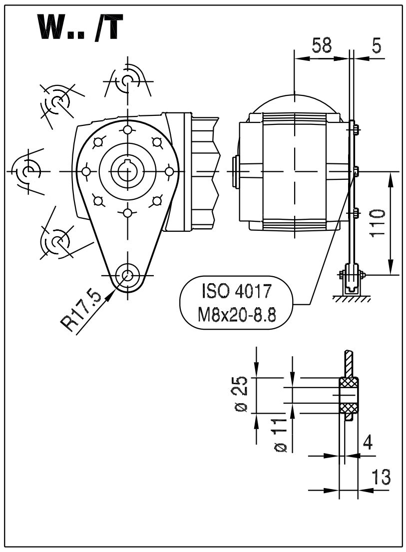
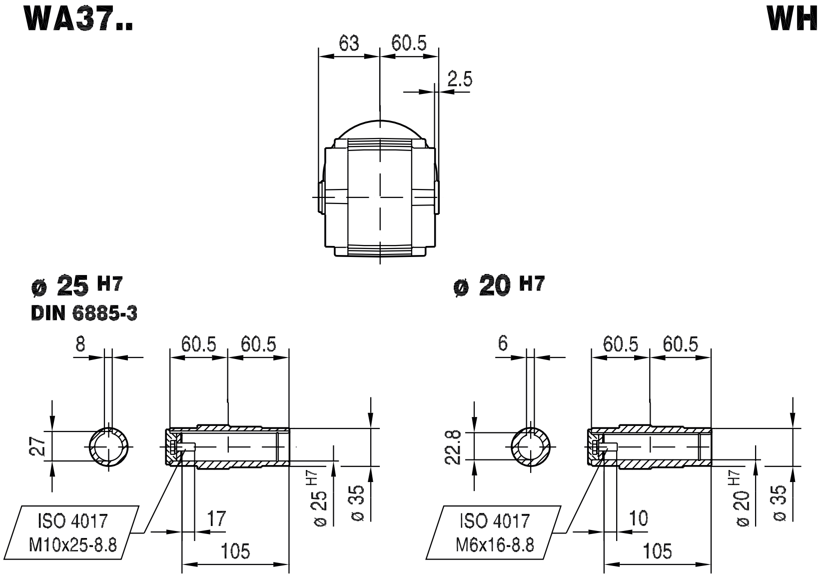
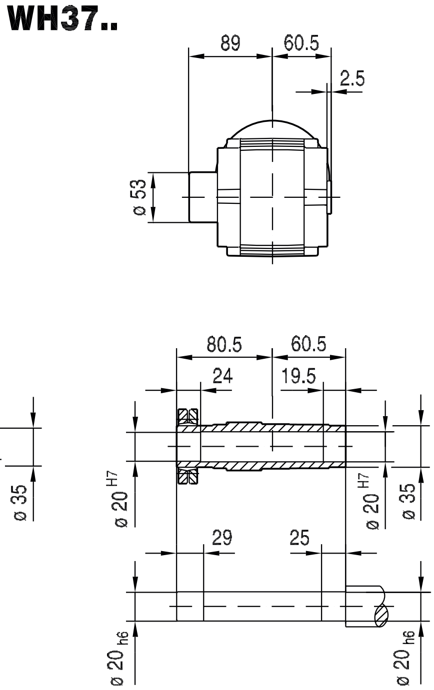
20 034 02 07









(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	349	388	427	384	434	487	376	404
LS	378	417	456	412	462	516	441	469
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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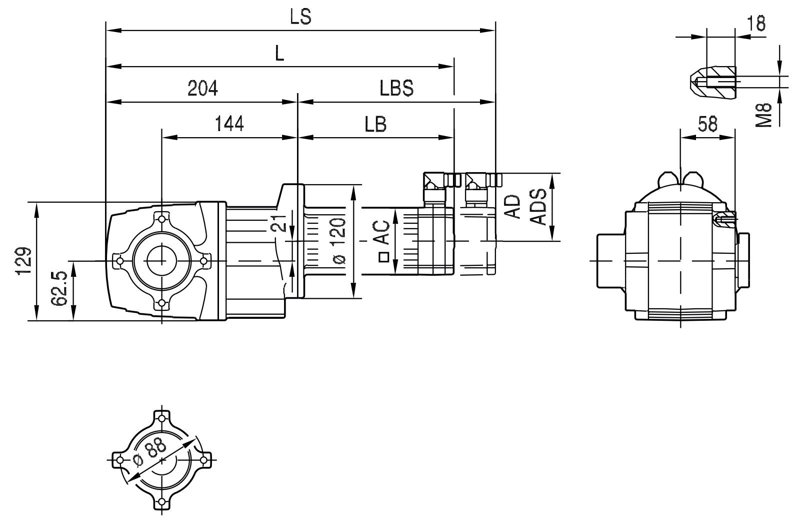
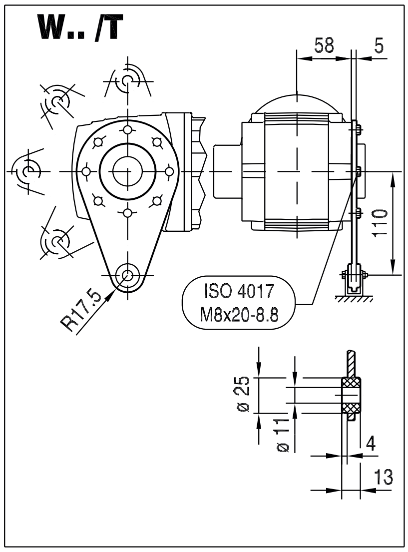
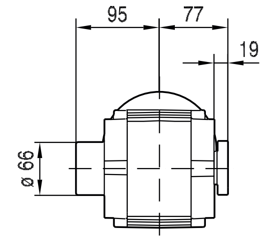
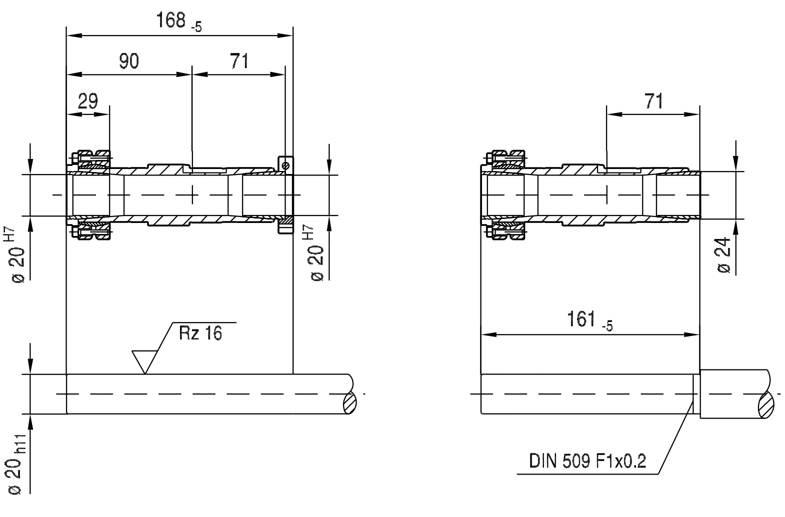
20 035 03 07

WT37..









(→ 194)	CMP..							
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AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	349	388	427	384	434	487	376	404
LS	378	417	456	412	462	516	441	469
LB	145	184	223	180	230	283	172	200
LBS	174	213	252	208	258	312	237	265
XS	18	18	18	14	14	14	11	11

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12.2.5 W47

W47, M_{aDyn} Nm										180 Nm
	CMP									
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
2										
3.27	16	32	48	34	66	94	60	96	>110	>110
3.89	19	38	57	41	79	>110	71	>110	>110	>110
4.40	22	43	64	46	89	>110	80	>110	>110	>110
5.23	26	51	77	55	106	>110	95	>110	>110	>110
5.58	28	55	82	59	>110	>110	102	>110	>110	>110
6.53	32	63	95	68	>110	>110	>110	>110	>110	>110
7.32	36	71	106	76	>110	>110	>110	>110	>110	>110
8.61	42	83	>110	90	>110	>110	>110	>110		
9.96	49	96	>110	104	>110		>110			
10.66	52	103	>110	>110	>110		>110			
11.32	52	103	153	111	>160	>160	>160	>160	>160	>160
12.30	59	>110		>110						
13.44	62	122	>160	131	>160	>160	>160	>160	>160	>160
14.35	65	129	>160	139	>160	>160	>160	>160	>160	>160
16.80	76	151	>160	>160	>160	>160	>160	>160	>160	>160
18.82	84	>160	>160	>160	>160	>160	>160	>160	>160	>160
22.15	99	>160	>160	>160	>160	>160	>160	>160		
25.07	103	>180	>180	>180	>180	>180	>180	>180	>180	>180
25.62	113	>160	>160	>160	>160		>160			
26.76	110	>180	>180	>180	>180	>180	>180	>180	>180	>180
27.41	121	>160	>160	>160	>160		>160			
31.33	127	>180	>180	>180	>180	>180	>180	>180	>180	>180
31.62	138	>160		>160						
35.09	141	>180	>180	>180	>180	>180	>180	>180	>180	>180
41.30	163	>180	>180	>180	>180	>180	>180	>180		
47.78	>180	>180	>180	>180	>180		>180			
51.12	>180	>180	>180	>180	>180		>180			
58.98	>180	>180		>180						
68.93	>180									
74.98	>180									

(→ 190)

W47, m kg										
	CMP									
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
2	15	16	16	17	18	20	20	21	23	26
WF: + 0.50 kg / WA: + -1.5 kg / WAF: + -0.70 kg										

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CMP..				c_{TG}			
		n_{epk}	η	W	WF	WA	WAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
W47 2	3.27	4500	95	-	-	-	-
	3.89	4500	95	-	-	-	-
	4.40	4500	95	-	-	-	-
	5.23	4500	95	-	-	-	-
	5.58	4500	95	-	-	-	-
	6.53	4500	94	-	-	-	-
	7.32	4500	94	-	-	-	-
	8.61	4500	94	-	-	-	-
	9.96	4500	94	-	-	-	-
	10.66	4500	94	-	-	-	-
	11.32	4500	88	-	-	-	-
	12.30	4500	93	-	-	-	-
	13.44	4500	88	-	-	-	-
	14.35	4500	87	-	-	-	-
	16.80	4500	87	-	-	-	-
	18.82	4500	86	-	-	-	-
	22.15	4500	86	-	-	-	-
	25.07	4500	79	-	-	-	-
	25.62	4500	85	-	-	-	-
	26.76	4500	79	-	-	-	-
	27.41	4500	85	-	-	-	-
	31.33	4500	78	-	-	-	-
	31.62	4500	84	-	-	-	-
	35.09	4500	77	-	-	-	-
	41.30	4500	76	-	-	-	-
	47.78	4500	75	-	-	-	-
	51.12	4500	74	-	-	-	-
	58.98	4500	73	-	-	-	-
	68.93	4500	72	-	-	-	-
	74.98	4500	71	-	-	-	-

CMP..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	W	WF	WA	WAF	W	WF	WA	WAF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	N	N	N	N	N	N	N	N
W47 2	3.27	91	110	154	2141	8.3	2660	3170	2440	2440	7070	7960	8000	8000
	3.89	91	110	154	1799	5.9	2860	3390	2640	2640	7070	7960	8000	8000
	4.40	91	110	154	1591	4.7	3020	3560	2790	2790	7070	7960	8000	8000
	5.23	91	110	154	1338	3.3	3240	3810	3010	3010	7070	7960	8000	8000
	5.58	91	110	154	1254	2.9	3320	3900	3090	3090	7070	7960	8000	8000
	6.53	91	110	154	1072	2.1	3540	4140	3310	3310	7070	7960	8000	8000
	7.32	91	110	154	956	1.7	3710	4330	3470	3470	7070	7960	8000	8000
	8.61	91	110	154	813	1.2	3960	4600	3720	3720	7070	7960	8000	8000
	9.96	91	110	154	703	0.96	4190	4860	3950	3950	7070	7960	8000	8000
	10.66	91	110	154	657	0.84	4300	4980	4060	4060	7070	7960	8000	8000
	11.32	133	160	225	292	1.6	3460	4350	2980	2980	6650	7720	8000	8000
	12.30	91	110	154	569	0.65	4550	5250	4300	4300	7070	7960	8000	8000
	13.44	133	160	225	171	1.2	3760	4680	3280	3280	6650	7720	8000	8000
	14.35	133	160	225	453	1.1	3880	4810	3400	3400	6650	7720	8000	8000
	16.80	133	160	225	286	0.77	4180	5140	3690	3690	6650	7720	8000	8000
	18.82	133	160	225	197	0.63	4410	5390	3920	3920	6650	7720	8000	8000
	22.15	133	160	225	307	0.46	4750	5770	4250	4250	6650	7720	8000	8000
	25.07	150	180	255	68	0.93	4430	5610	3800	3800	6400	7580	8000	8000
	25.62	133	160	225	195	0.37	5070	6120	4570	4570	6650	7720	8000	8000
	26.76	150	180	255	67	0.82	4580	5770	3940	3940	6400	7580	8000	8000
	27.41	133	160	225	157	0.33	5220	6290	4720	4720	6650	7720	8000	8000
	31.33	150	180	255	54	0.60	4950	6180	4310	4310	6400	7580	8000	8000
	31.62	133	160	225	221	0.26	5560	6660	5050	5050	6650	7720	8000	8000
	35.09	150	180	255	125	0.49	5230	6490	4580	4580	6400	7580	8000	8000
	41.30	150	180	255	77	0.36	5650	6950	4990	4990	6400	7580	8000	8000
	47.78	150	180	255	48	0.29	6040	7380	5380	5380	6400	7580	8000	8000
	51.12	150	180	255	102	0.26	6230	7580	5570	5570	6400	7580	8000	8000
	58.98	150	180	255	66	0.21	6400	7580	5980	5980	6400	7580	8000	8000
	68.93	150	180	255	41	0.16	6400	7580	6450	6450	6400	7580	8000	8000
	74.98	150	180	255	32	0.14	6400	7580	6710	6710	6400	7580	8000	8000

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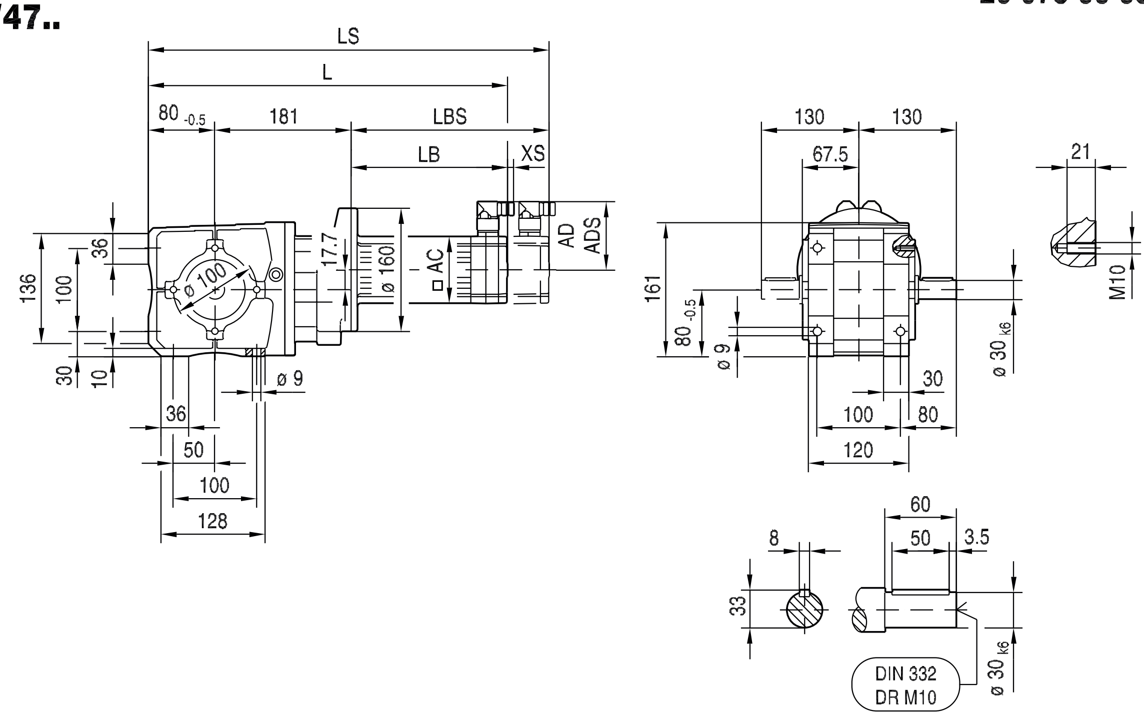
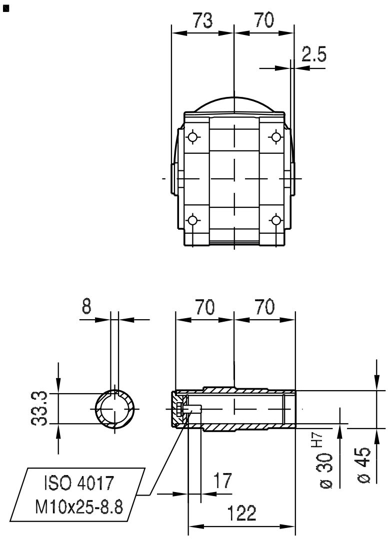
20 075 00 09

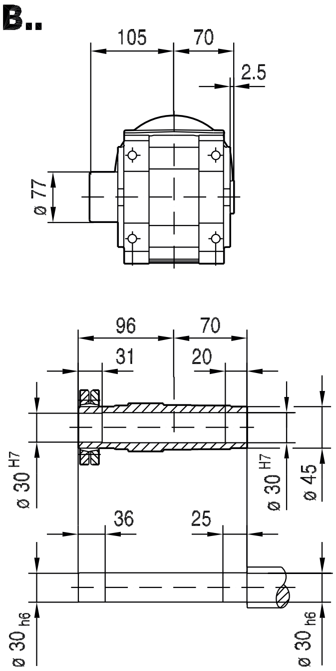
W47..



WA47B..



WH47B..



(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	400	439	478	434	484	534	427	452	502	467
LS	429	468	507	463	513	563	492	517	567	545
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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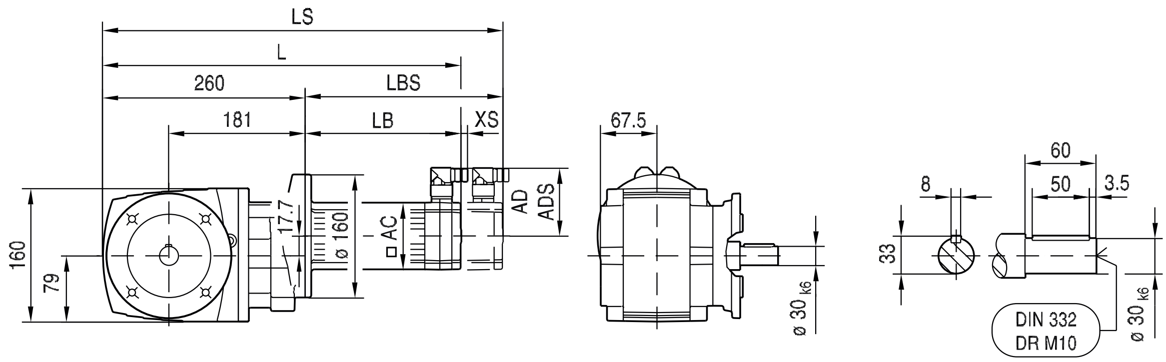
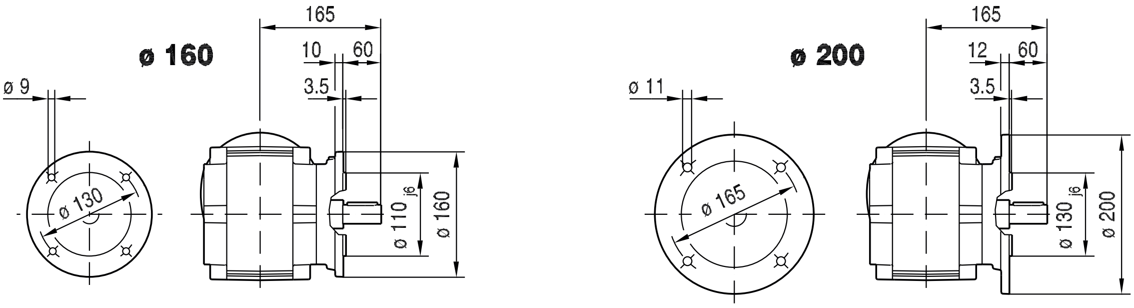
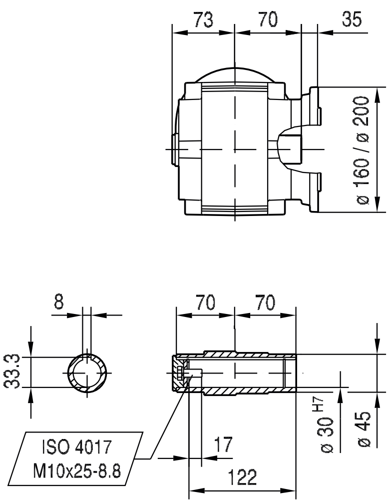
20 076 01 09

WF47..

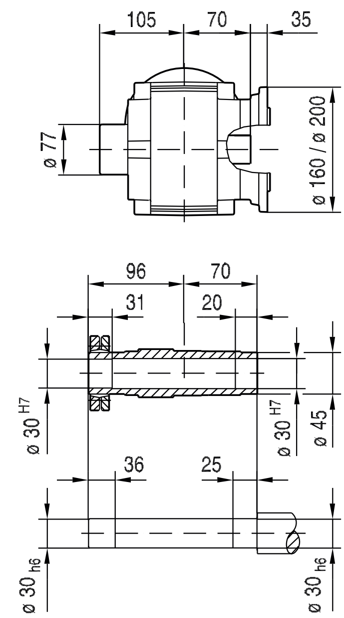




WAF47..



WHF47..



(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	399	438	477	433	483	533	426	451	501	466
LS	428	467	506	462	512	562	491	516	566	544
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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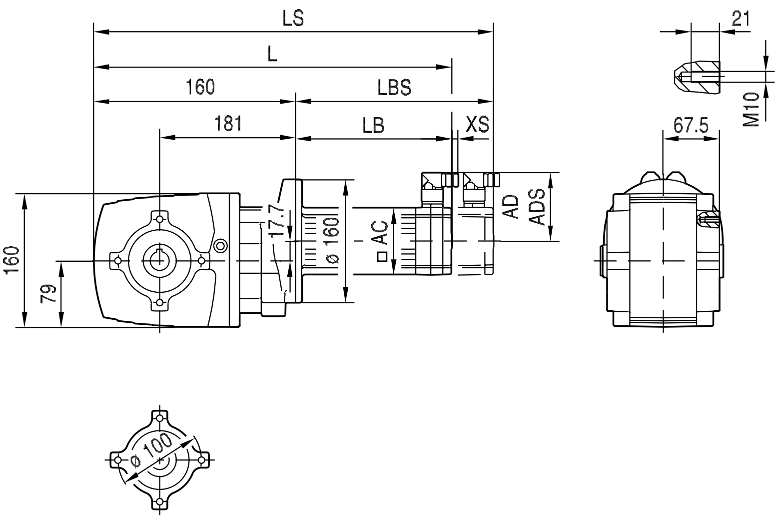
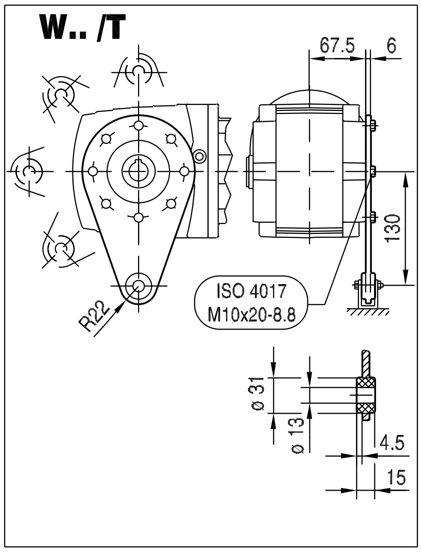
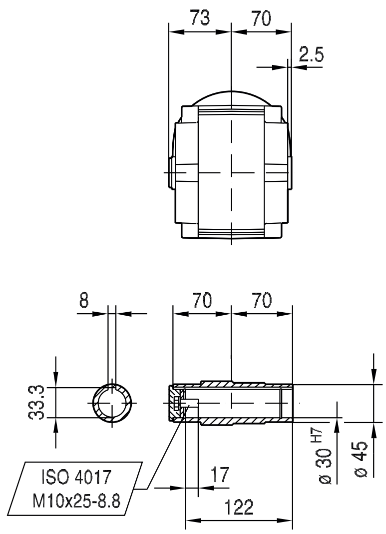
20 077 02 09

WA47..

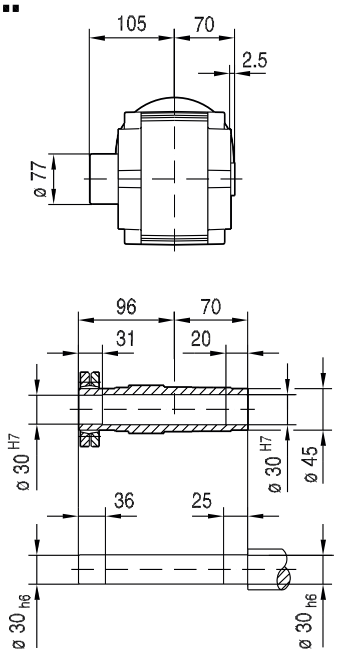




WA47..



WH47..



(→ 🗎 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	399	438	477	433	483	533	426	451	501	466
LS	428	467	506	462	512	562	491	516	566	544
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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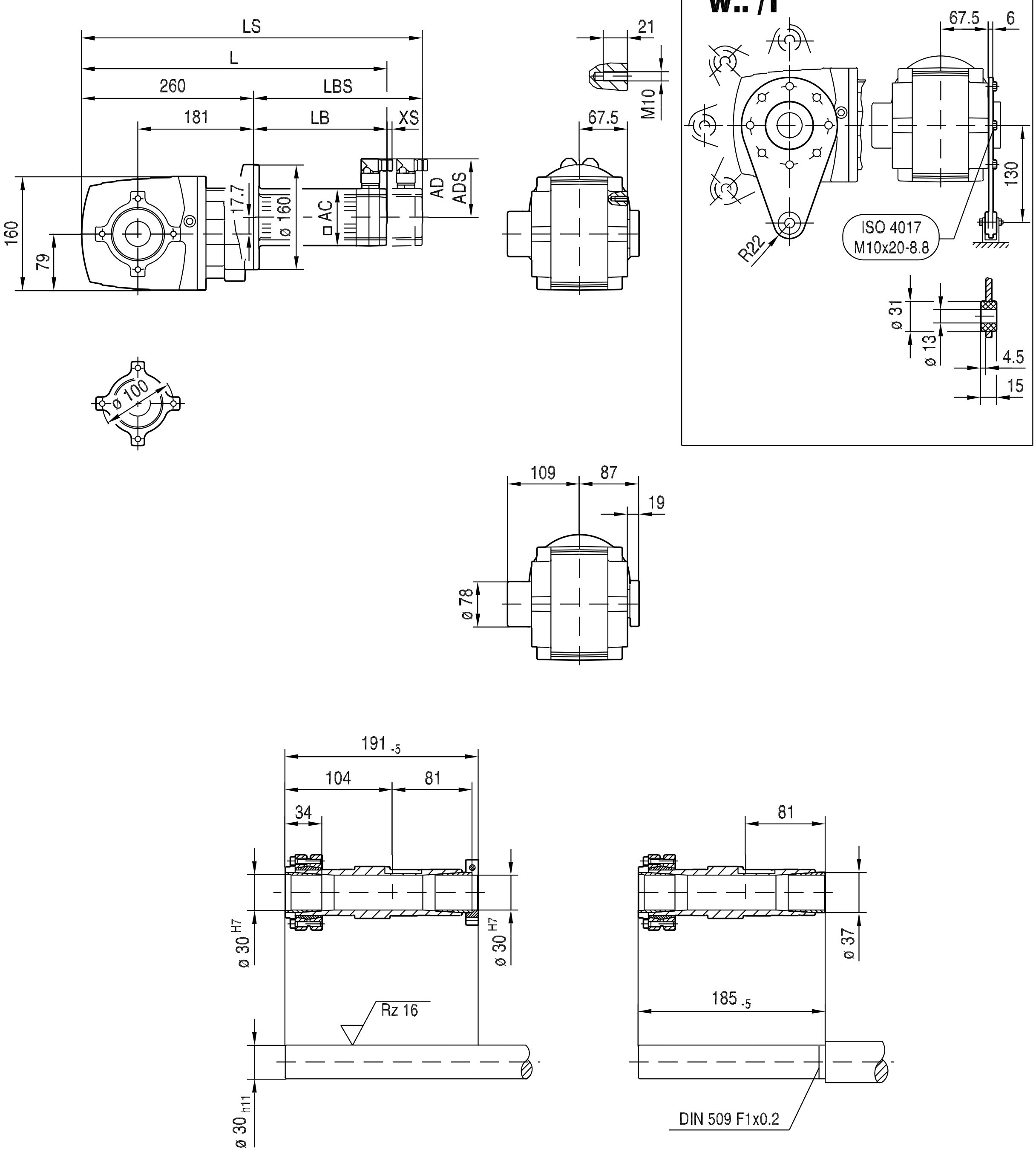
20 078 04 09

WT47..



12

(→ 194)	CMP..									
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S
AC	73	73	73	88	88	88	116	116	116	137
AD	86	86	86	92	92	92	102	102	102	134
ADS	86	86	86	92	92	92	104	104	104	137
L	399	438	477	433	483	533	426	451	501	466
LS	428	467	506	462	512	562	491	516	566	544
LB	139	178	217	173	223	273	166	191	241	206
LBS	168	207	246	202	252	302	231	256	306	284
XS	18	18	18	14	14	14	11	11	11	37

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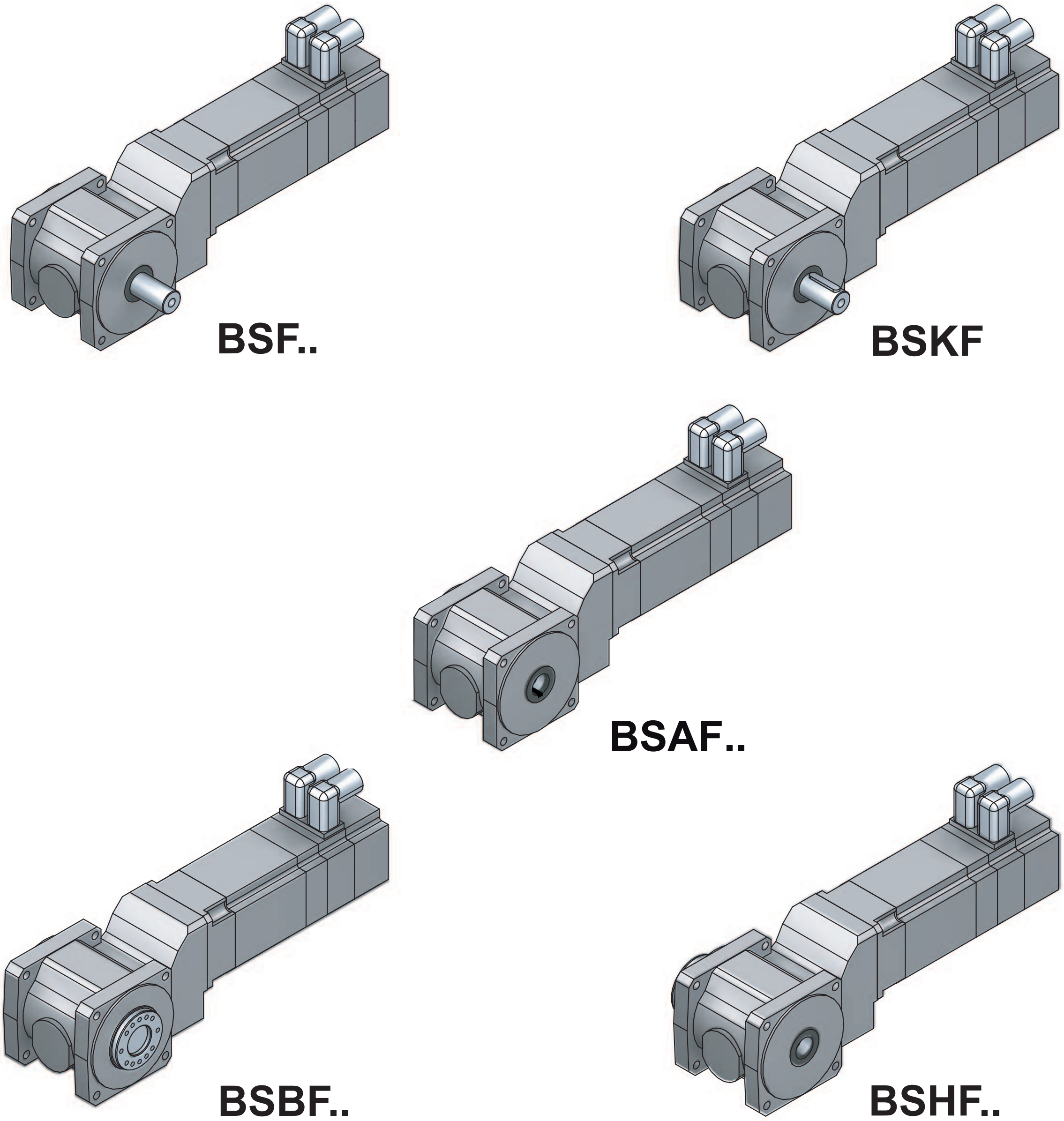
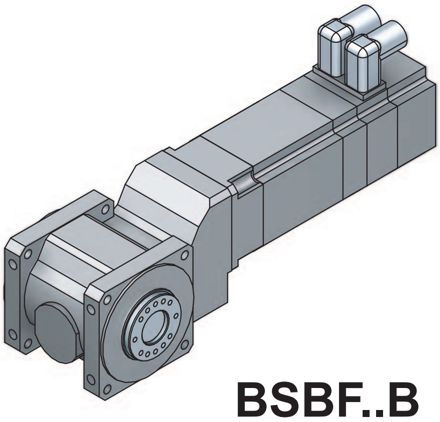
13 Helical-bevel gearmotors – BS.F.. gear units

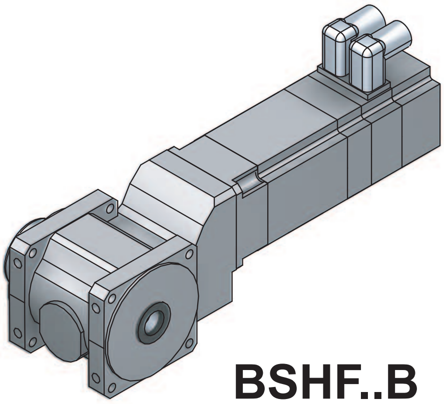
13.1 BS.F..CMP.. designs



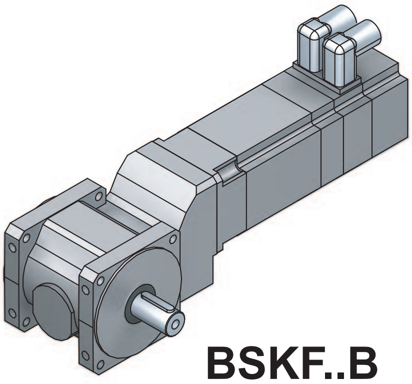
15705796875



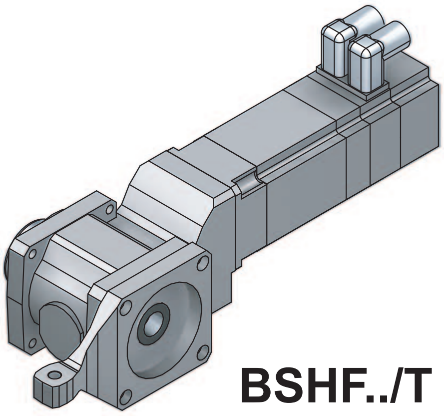
BSBF..B



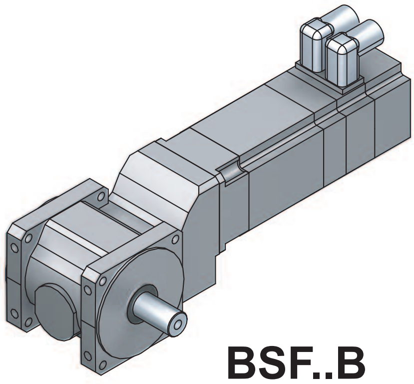
BSHF..B



BSKF..B



BSHF../T



BSF..B

15705799307

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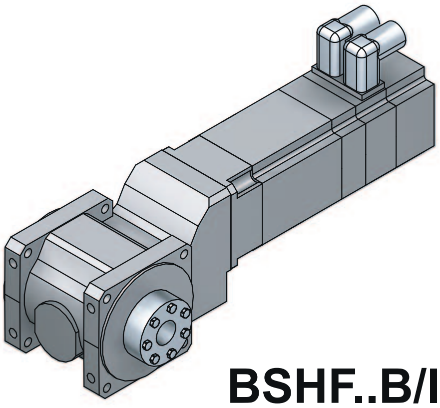
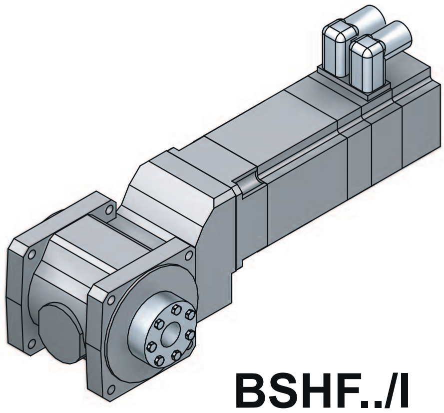
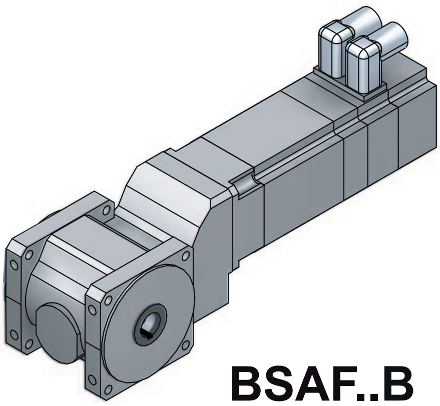


BSHF..B/I



BSHF../I



BSAF..B

17824497035

13.2 BS.F202–802/CMP.. selection tables and dimension sheets

13.2.1 BS.F202

BSF202, M_{aDyn} Nm				40 Nm
	CMP			
i	50S	50M	50L	63S
	2			
3.00	15	29	39	31
4.00	20	39	53	42
6.00	29	58	>60	>60
8.00	39	>60	>60	>60
10.00	47	>51	>51	>51
15.00	>51	>51	>51	>51
20.00	>51	>51	>51	>51
25.00	>51			

(→ 192)

BSF202, m kg				
	CMP			
s	50S	50M	50L	63S
2	7.2	8.1	9.0	8.5
BSBF: + - kg / BSHF: + - kg				

CMP..				M1			M2;M4			M3;M5-6			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
BSF202 2	3.00	4500	94	4.10	-0.011	77457	14.47	-0.020	66498	6.12	-0.013	75323	6	3	-
	4.00	4500	94	4.26	-0.014	76815	20.11	-0.028	60846	7.52	-0.017	73532	6	3	-
	6.00	4500	94	4.50	-0.019	75905	30.66	-0.042	51203	10.05	-0.024	70662	6	3	-
	8.00	4500	94	4.70	-0.022	75309	37.13	-0.052	46240	12.10	-0.029	68596	6	3	-
	10.00	4500	90	3.31	-0.057	47656	52.73	-0.146	26432	19.70	-0.083	39837	6	3	-
	15.00	4500	90	4.09	-0.076	46683	56.52	-0.189	28536	31.62	-0.125	34857	6	3	-
	20.00	4500	90	3.77	-0.089	46508	53.03	-0.210	32477	42.49	-0.161	30764	6	3	-
	25.00	4500	91	3.67	-0.098	46334	47.99	-0.221	36133	51.81	-0.191	27469	6	3	-

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	c_T BSF Nm/'	c_T BSBF Nm/'	c_T BSHF Nm/'	F_{Ramax} BSF N	F_{Ramax} BSBF N	F_{Rapk} BSF N	F_{Rapk} BSBF N
BSF202 2	3.00	40	60	90	767	0.76	2.1	2.3	2.3	2680	2970	4200	4200
	4.00	40	60	90	775	0.47	2.2	2.4	2.4	3000	3330	4200	4200
	6.00	40	60	90	783	0.23	2.2	2.5	2.5	3500	3880	4200	4200
	8.00	40	60	90	875	0.14	2.3	2.5	2.5	3900	4200	4200	4200
	10.00	40	51	77	320	0.27	4.1	4.7	4.7	4150	4200	4200	4200
	15.00	40	51	77	327	0.14	4.2	4.8	4.7	4200	4200	4200	4200
	20.00	40	51	77	350	0.091	4.2	4.8	4.7	4200	4200	4200	4200
	25.00	40	51	77	280	0.066	4.2	4.8	4.8	4200	4200	4200	4200

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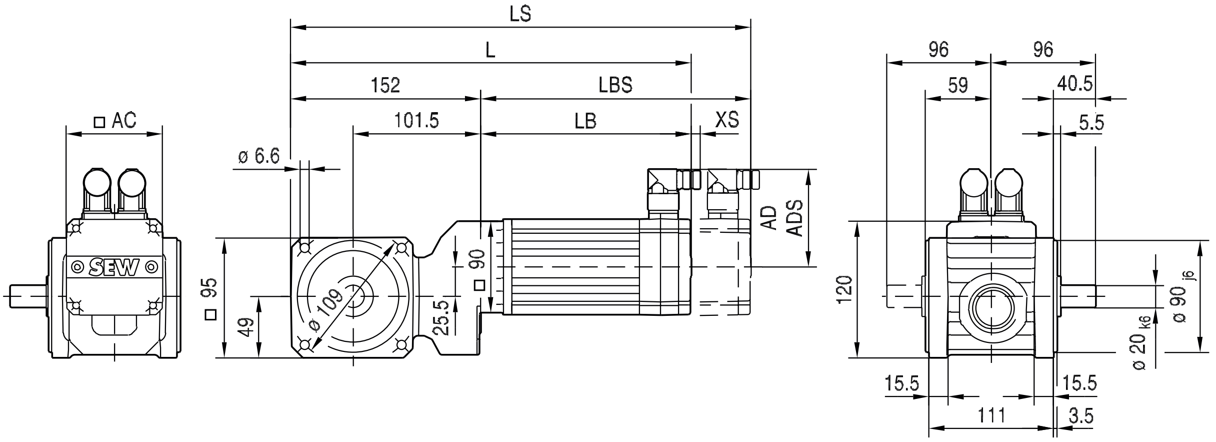
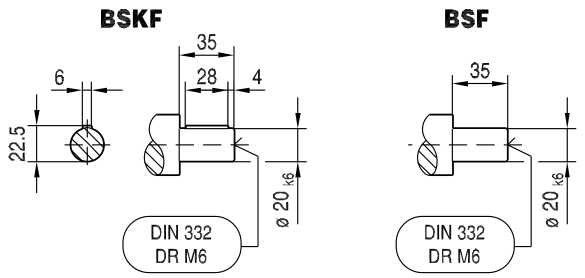
BSF202..

55 002 01 06





(→ 194)	CMP..							
	50S	50M	63S					
AC	73	73	88					
AD	86	86	92					
ADS	86	86	92					
L	298	337	333					
LS	326	365	361					
LB	146	185	181					
LBS	175	214	210					
XS	18	18	14					

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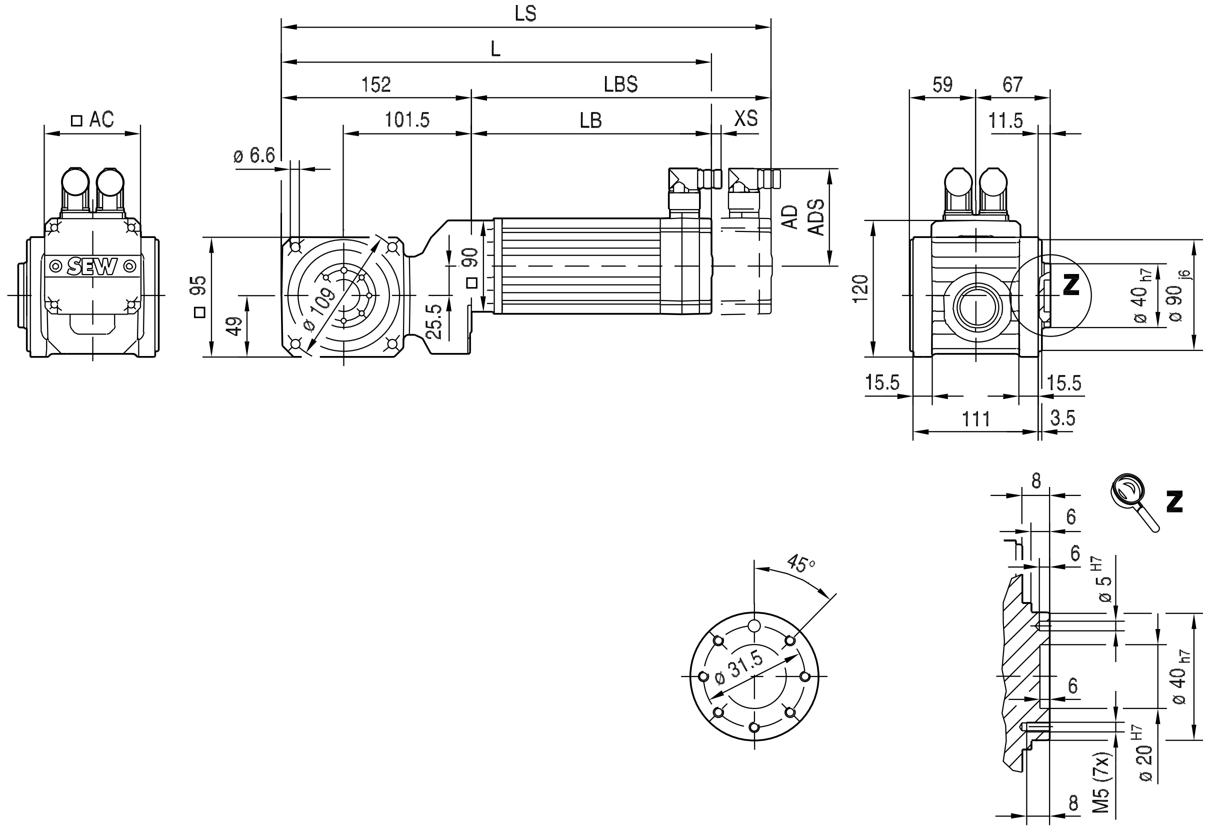
BSBF202..

55 003 01 06



13

(→ 📄 194)	CMP..							
	50S	50M	63S					
AC	73	73	88					
AD	86	86	92					
ADS	86	86	92					
L	298	337	333					
LS	326	365	361					
LB	146	185	181					
LBS	175	214	210					
XS	18	18	14					

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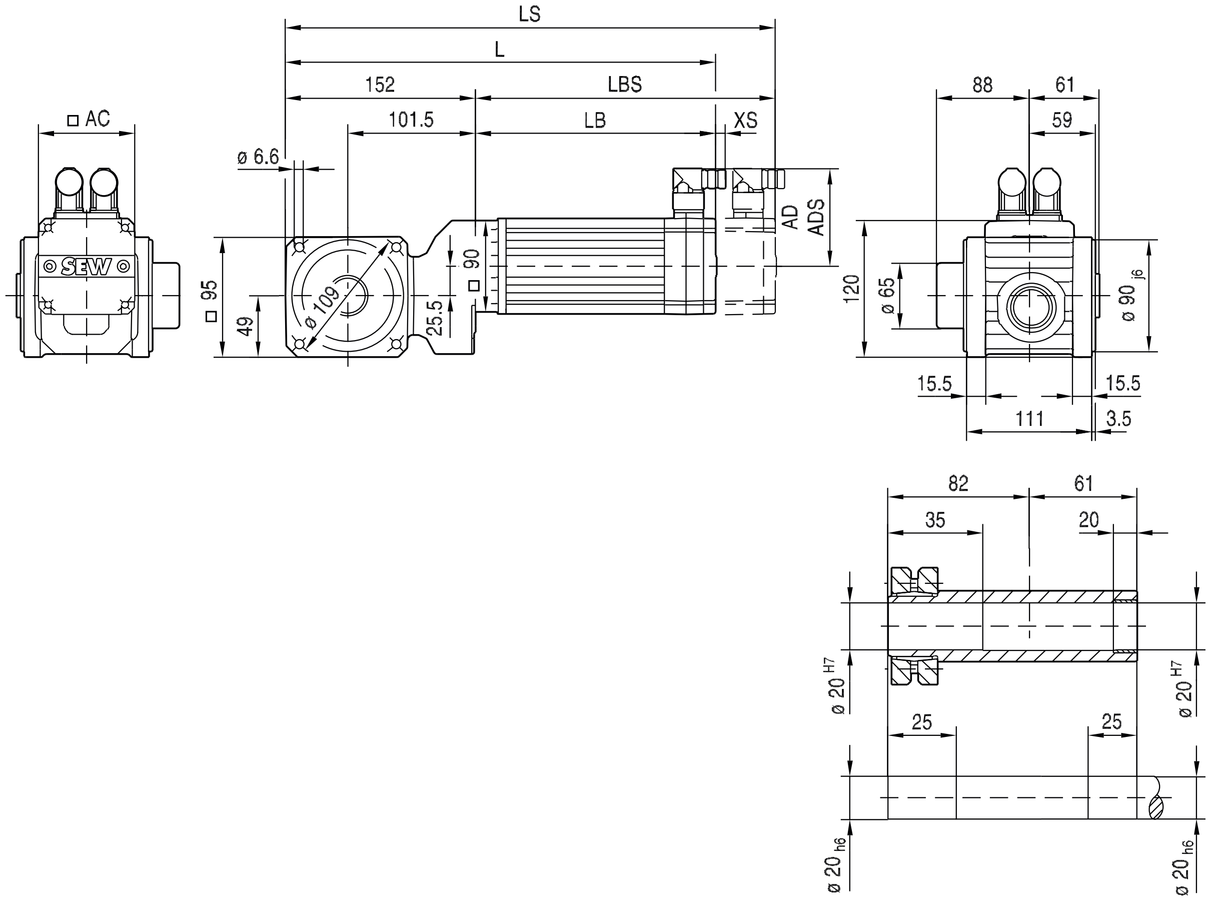
BSHF202..

55 004 01 06



(→ 194)	CMP..								
	50S	50M	63S						
AC	73	73	88						
AD	86	86	92						
ADS	86	86	92						
L	298	337	333						
LS	326	365	361						
LB	146	185	181						
LBS	175	214	210						
XS	18	18	14						

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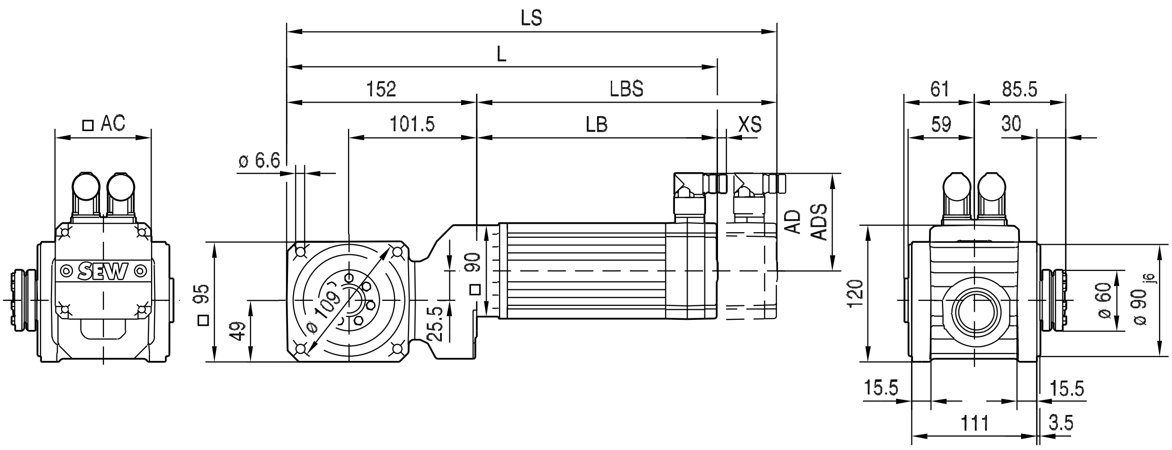
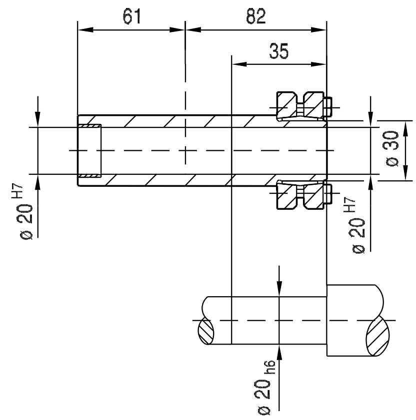
BSHF202/I..

55 005 01 06





(→ 194)	CMP..							
	50S	50M	63S					
AC	73	73	88					
AD	86	86	92					
ADS	86	86	92					
L	298	337	333					
LS	326	365	361					
LB	146	185	181					
LBS	175	214	210					
XS	18	18	14					

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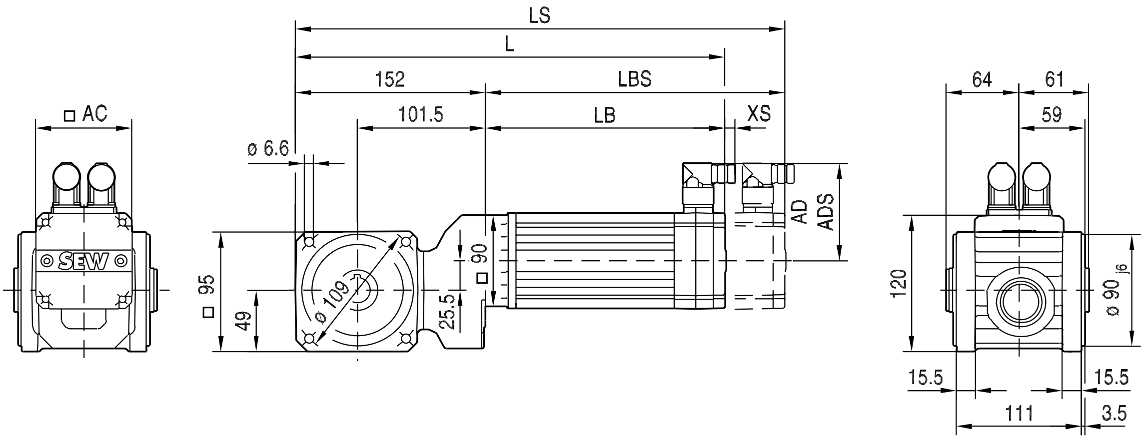
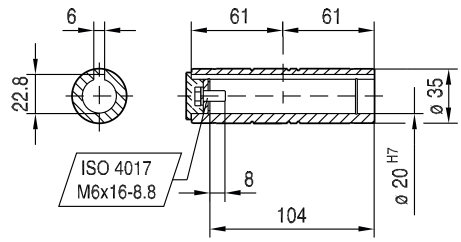
BSAF202..

55 015 01 07





(→ 194)	CMP..							
	50S	50M	63S					
AC	73	73	88					
AD	86	86	92					
ADS	86	86	92					
L	298	337	333					
LS	326	365	361					
LB	146	185	181					
LBS	175	214	210					
XS	18	18	14					

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13.2.2 BS.F302..

BSF302, M_{aDyn} Nm									80 Nm
					CMP				
i	50S	50M	50L	50L	63S	63M	63L	71S	71M
					2				
3.00			43			60	86	54	87
4.00	20	39	58	53	42	80	>114	72	>114
6.00	29	58	87	79	63	>120	>120	108	>120
8.00	39	77	116	105	83	>120		>120	
10.00	47	94	>108	>108	101	>108	>108	>108	>108
15.00	71	>112	>112	>112	>112	>112	>112	>112	>112
20.00	95	>112	>112	>112	>112	>112		>112	
25.00	>112	>112		>112	>112				
30.00	>112								

(→ 192)

BSF302, m kg									
					CMP				
s	50S	50M	50L	50L	63S	63M	63L	71S	71M
2	9.2	10	11	11	10	12	13	15	16
BSBF: + 0.35 kg / BSHF: + -0.10 kg									

CMP..				M1			M2;M4			M3;M5-6			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
BSF302 2	3.00	4500	94	10.61	-0.020	101982	29.34	-0.039	87407	16.53	-0.026	97370	6	3	-
	4.00	4500	94	11.44	-0.025	100944	39.04	-0.054	80239	20.24	-0.034	94323	6	3	-
	6.00	4500	94	12.77	-0.033	99436	48.54	-0.075	75064	26.76	-0.048	89388	6	3	-
	8.00	4500	94	13.72	-0.038	98463	54.94	-0.091	72074	31.93	-0.059	85770	6	3	-
	10.00	4500	91	17.47	-0.106	60873	82.08	-0.261	41142	61.94	-0.192	43856	6	3	-
	15.00	4500	91	23.30	-0.146	58348	101.6	-0.363	38252	94.43	-0.295	33419	6	3	-
	20.00	4500	91	28.02	-0.176	56577	122.0	-0.451	33554	108.9	-0.358	30285	6	3	-
	25.00	4500	91	30.93	-0.198	55589	137.5	-0.520	30171	119.7	-0.407	28099	6	3	-
	30.00	4500	91	33.58	-0.216	54719	149.6	-0.574	27671	128.0	-0.446	26539	6	3	-

CMP.. n_e = 1500							c_T			F_{Ramax}		F_{Rapk}	
	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	BSF Nm/'	BSBF Nm/'	BSHF Nm/'	BSF N	BSBF N	BSF N	BSBF N
BSF302 2	3.00	68	102	153	500	1.6	3.7	4.1	4.0	4520	4980	4920	6000
	4.00	76	114	171	375	0.97	4.0	4.4	4.3	4960	5460	4750	6000
	6.00	80	120	180	283	0.48	4.2	4.7	4.6	5160	6000	4660	6000
	8.00	80	120	180	313	0.29	4.4	4.8	4.7	5160	6000	4660	6000
	10.00	72	108	162	150	0.55	6.9	7.8	7.8	5230	6000	4840	6000
	15.00	80	112	168	107	0.29	6.9	7.8	7.7	5160	6000	4780	6000
	20.00	80	112	168	110	0.19	6.9	7.8	7.8	5160	6000	4780	6000
	25.00	80	112	168	108	0.13	7.0	7.9	7.8	5160	6000	4780	6000
	30.00	80	112	168	117	0.10	7.0	7.9	7.8	5160	6000	4780	6000

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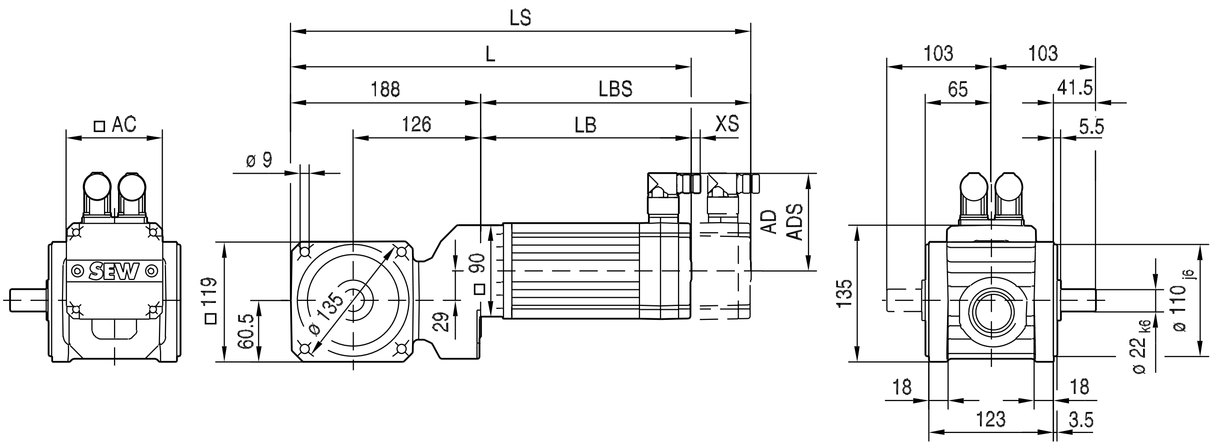
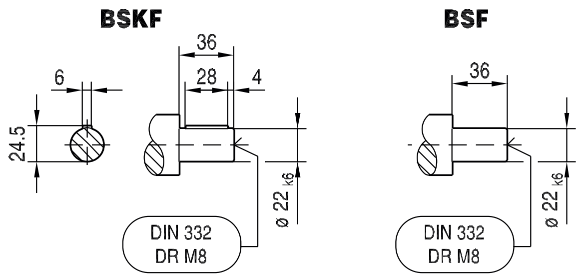
BSF302..

55 006 00 06





(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	334	373	412	369	419	469	360	385
LS	363	402	441	397	447	497	425	450
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

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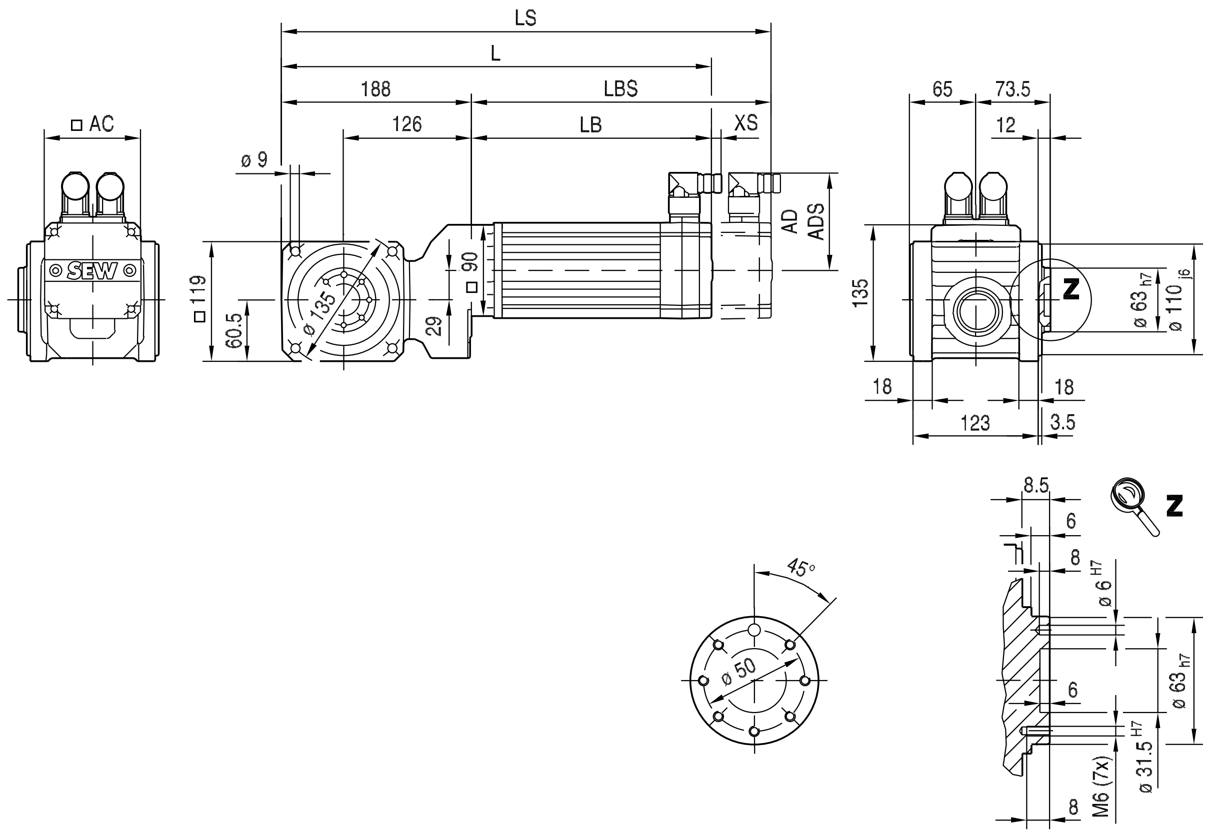
BSBF302..

55 007 01 06



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(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	334	373	412	369	419	469	360	385
LS	363	402	441	397	447	497	425	450
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

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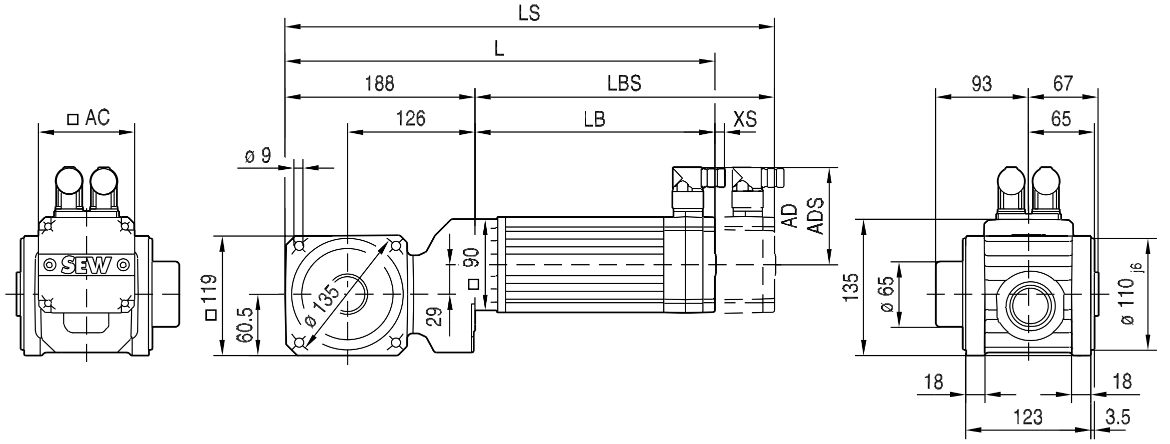
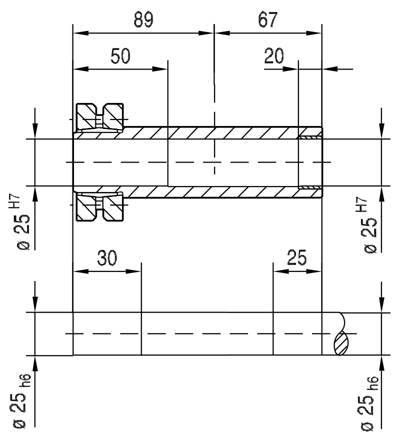
BSHF302..

55 008 00 06





(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	334	373	412	369	419	469	360	385
LS	363	402	441	397	447	497	425	450
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

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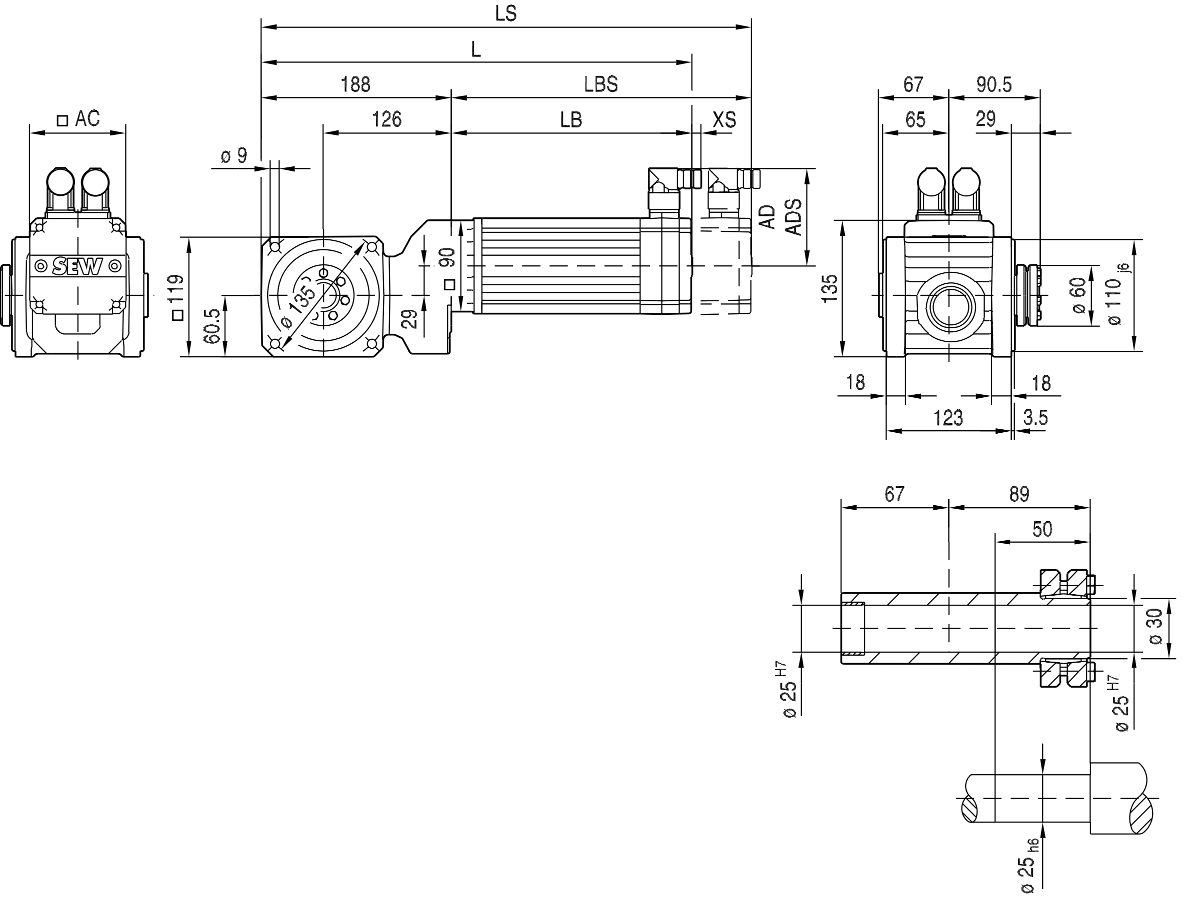
BSHF302/I..

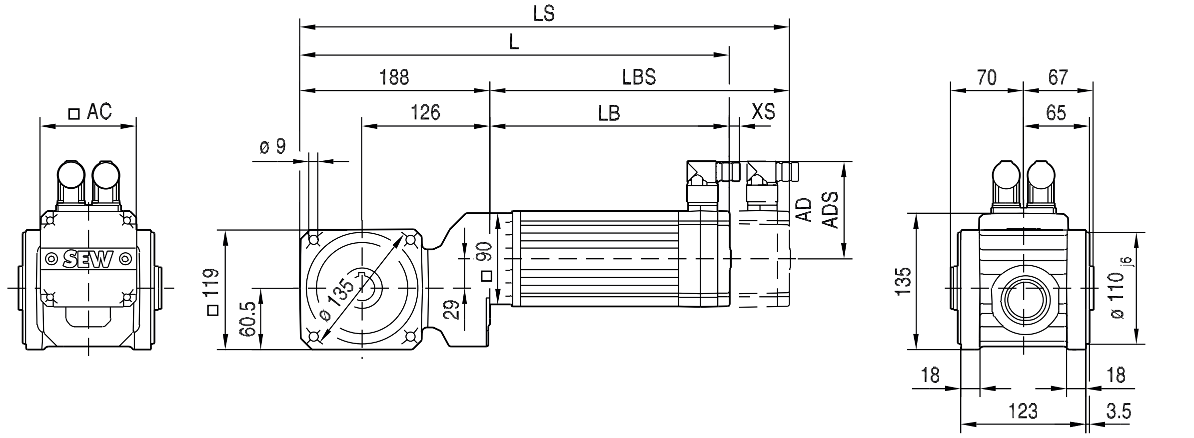
55 009 01 06

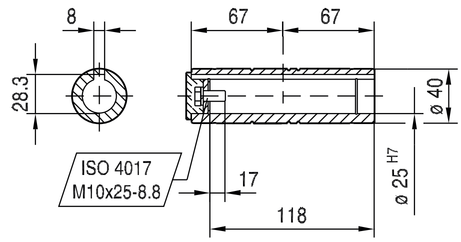


(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	334	373	412	369	419	469	360	385
LS	363	402	441	397	447	497	425	450
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

BSAF302..

55 016 01 07





(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	334	373	412	369	419	469	360	385
LS	363	402	441	397	447	497	425	450
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

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13.2.3 BS.F402

BSF402, M_{aDyn} Nm												160 Nm
	CMP											
i	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
						2						
3.00						86		87	132	119	177	>183
4.00		39	58	42	80	114	72	116	176	158	>200	>200
6.00	29	58	87	63	121	171	108	174	>205	>205	>205	>205
8.00	39	77	116	83	161	>210	144	>210				
10.00		93	139	100	>186	>186	173	>186	>186	>186	>186	>186
15.00	71	141	>210	152	>210	>210	>210	>210	>210	>210	>210	>210
20.00	95	187	>220	200	>220	>220	>220	>220				
25.00	118	>225	>225	>225	>225		>225					
30.00	142	>225		>225								

(→ 192)

BSF402, m kg												
	CMP											
s	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
2	13	14	15	15	17	18	19	21	23	26	28	33
BSBF: + 0.50 kg / BSHF: + -0.60 kg												

CMP..				M1			M2;M4			M3;M5-6			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
BSF402 2	3.00	4500	94	16.64	-0.042	136375	23.96	-0.064	131323	16.80	-0.043	134151	6	3	-
	4.00	4500	94	17.96	-0.052	135265	27.92	-0.082	129034	18.77	-0.053	132596	6	3	-
	6.00	4500	94	19.78	-0.066	133791	33.62	-0.110	126042	21.69	-0.070	130498	6	3	-
	8.00	4500	94	21.09	-0.077	132801	37.83	-0.131	124010	23.79	-0.082	129114	6	3	-
	10.00	4500	90	22.39	-0.211	82904	53.97	-0.374	74730	28.11	-0.227	79870	6	3	-
	15.00	4500	91	29.19	-0.282	80694	74.18	-0.523	70371	37.70	-0.308	77196	6	3	-
	20.00	4500	91	34.34	-0.335	79192	89.99	-0.638	67275	45.42	-0.370	75192	6	3	-
	25.00	4500	91	38.33	-0.375	78100	101.1	-0.725	65289	51.01	-0.417	73859	6	3	-
	30.00	4500	91	41.83	-0.407	77194	110.3	-0.794	63679	55.87	-0.455	72752	6	3	-

CMP.. n_e = 1500							c_T			F_{Ramax}		F_{Rapk}	
	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	BSF Nm/'	BSBF Nm/'	BSHF Nm/'	BSF N	BSBF N	BSF N	BSBF N
BSF402 2	3.00	122	183	275	500	5.2	7.3	8.9	8.5	6600	7580	9050	10800
	4.00	136	200	300	375	3.2	7.7	9.6	9.0	7250	8330	8970	10800
	6.00	156	205	305	250	1.5	8.1	10	9.6	8300	9530	8940	10800
	8.00	160	210	315	188	0.92	8.3	11	9.9	9140	10600	8920	10800
	10.00[1)]	124	186	275	150	1.9	11	15	14	9270	10800	9040	10800
	15.00	140	210	315	100	1.0	11	16	14	9220	10800	8920	10800
	20.00	152	220	330	75	0.62	11	16	14	9170	10800	8870	10800
	25.00	160	225	335	64	0.45	11	16	14	9140	10800	8840	10800
	30.00	160	225	335	60	0.34	11	16	15	9140	10800	8840	10800

[1)] (→ 192)

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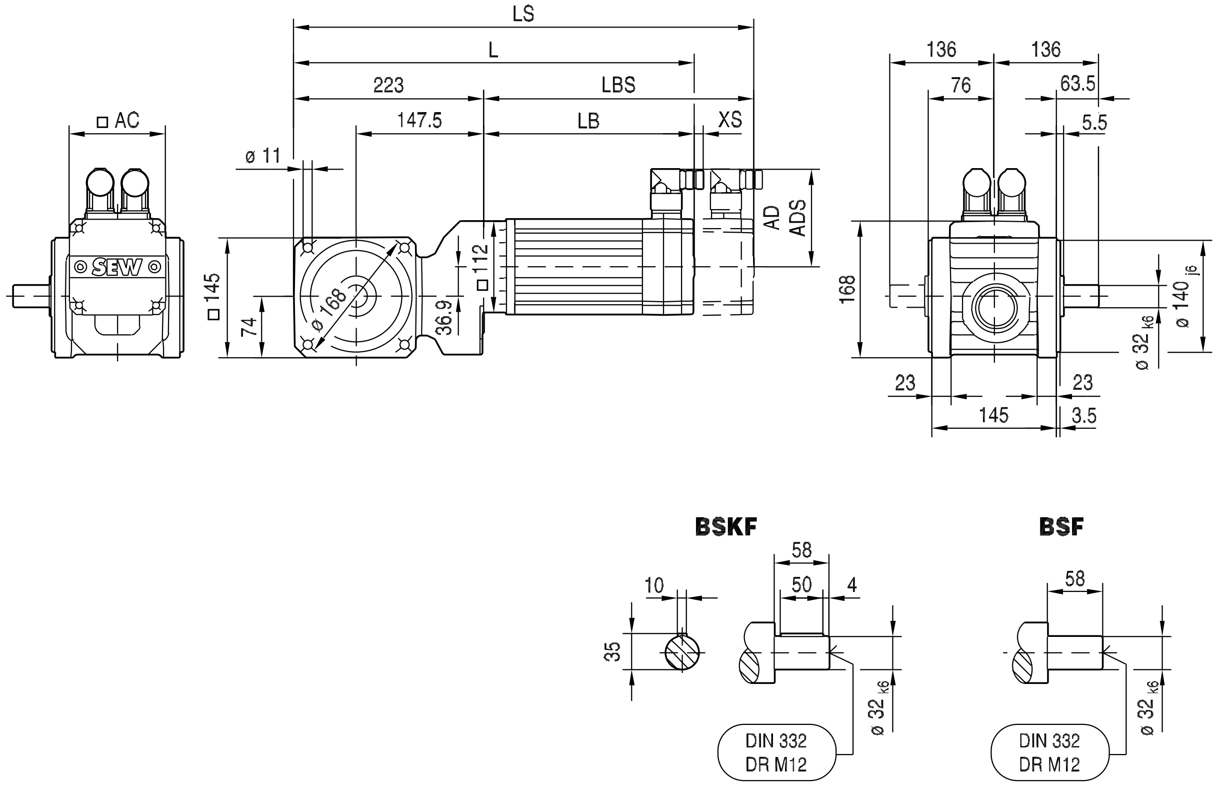
BSF402.. 55 010 01 06



(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	364	403	442	399	449	499	390	415	465	430	465	462
LS	393	432	471	428	478	527	455	480	530	507	542	559
LB	141	180	219	176	226	276	168	193	243	207	242	240
LBS	170	209	248	205	255	305	233	258	308	285	320	336
XS	18	18	18	14	14	14	11	11	11	37	37	37

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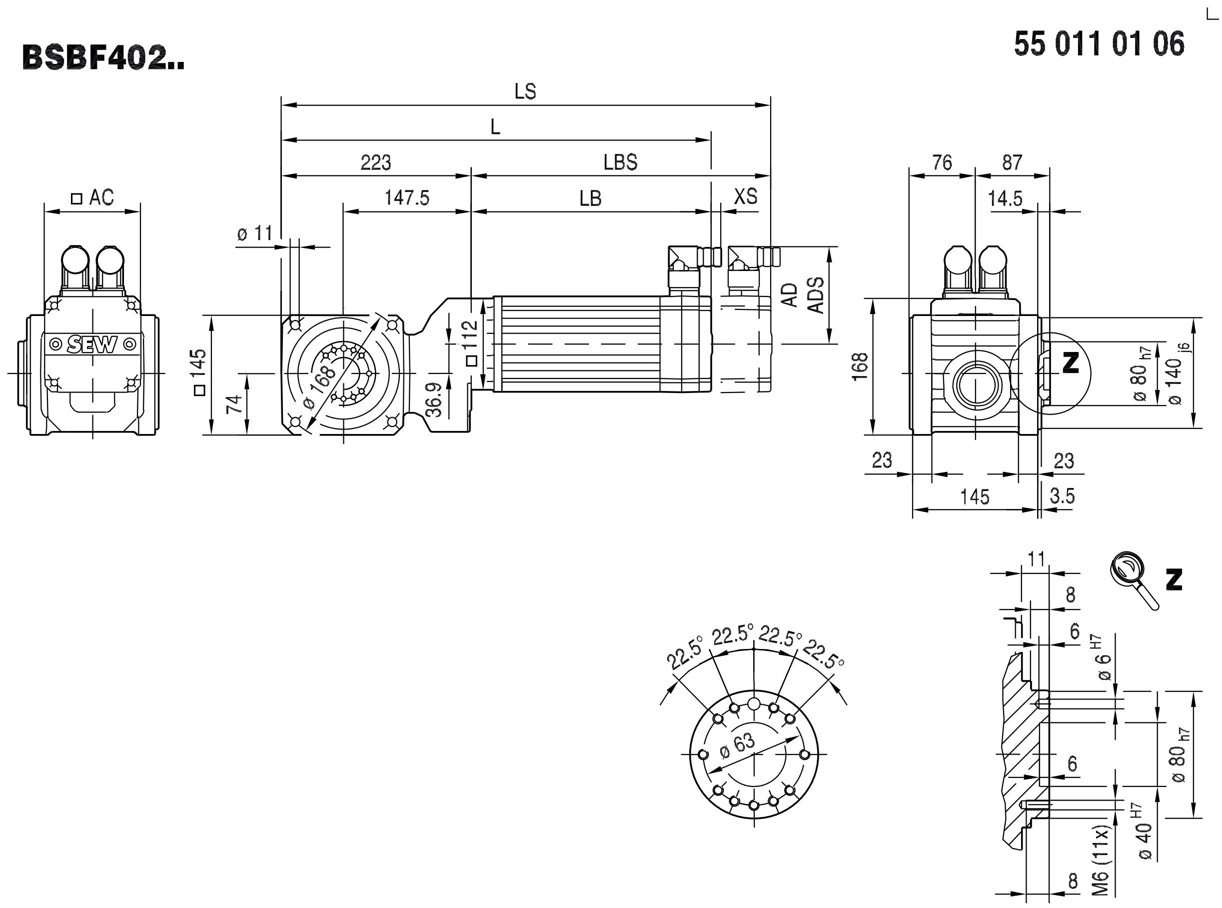

(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	364	403	442	399	449	499	390	415	465	430	465	462
LS	393	432	471	428	478	527	455	480	530	507	542	559
LB	141	180	219	176	226	276	168	193	243	207	242	240
LBS	170	209	248	205	255	305	233	258	308	285	320	336
XS	18	18	18	14	14	14	11	11	11	37	37	37

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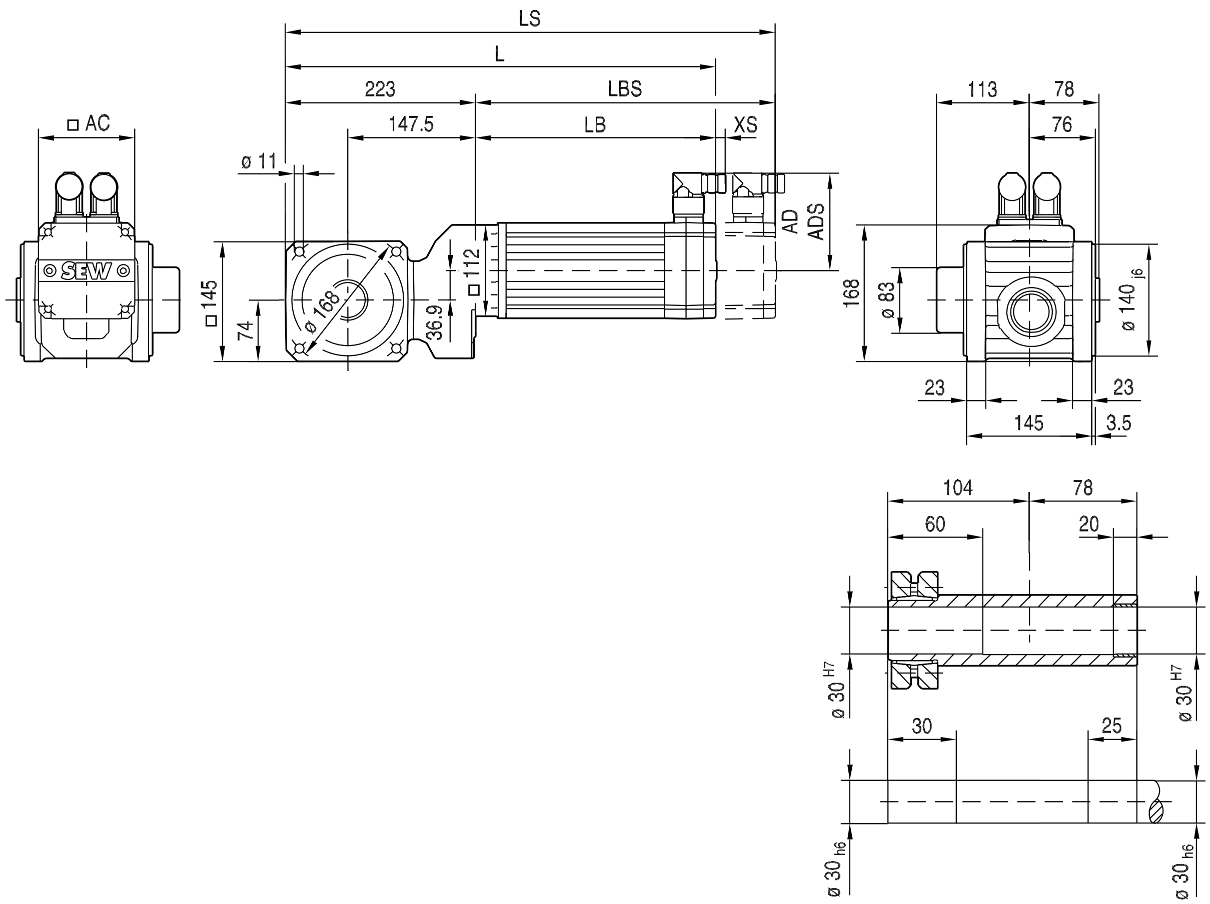
BSHF402..

55 012 00 06



(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	364	403	442	399	449	499	390	415	465	430	465	462
LS	393	432	471	428	478	527	455	480	530	507	542	559
LB	141	180	219	176	226	276	168	193	243	207	242	240
LBS	170	209	248	205	255	305	233	258	308	285	320	336
XS	18	18	18	14	14	14	11	11	11	37	37	37

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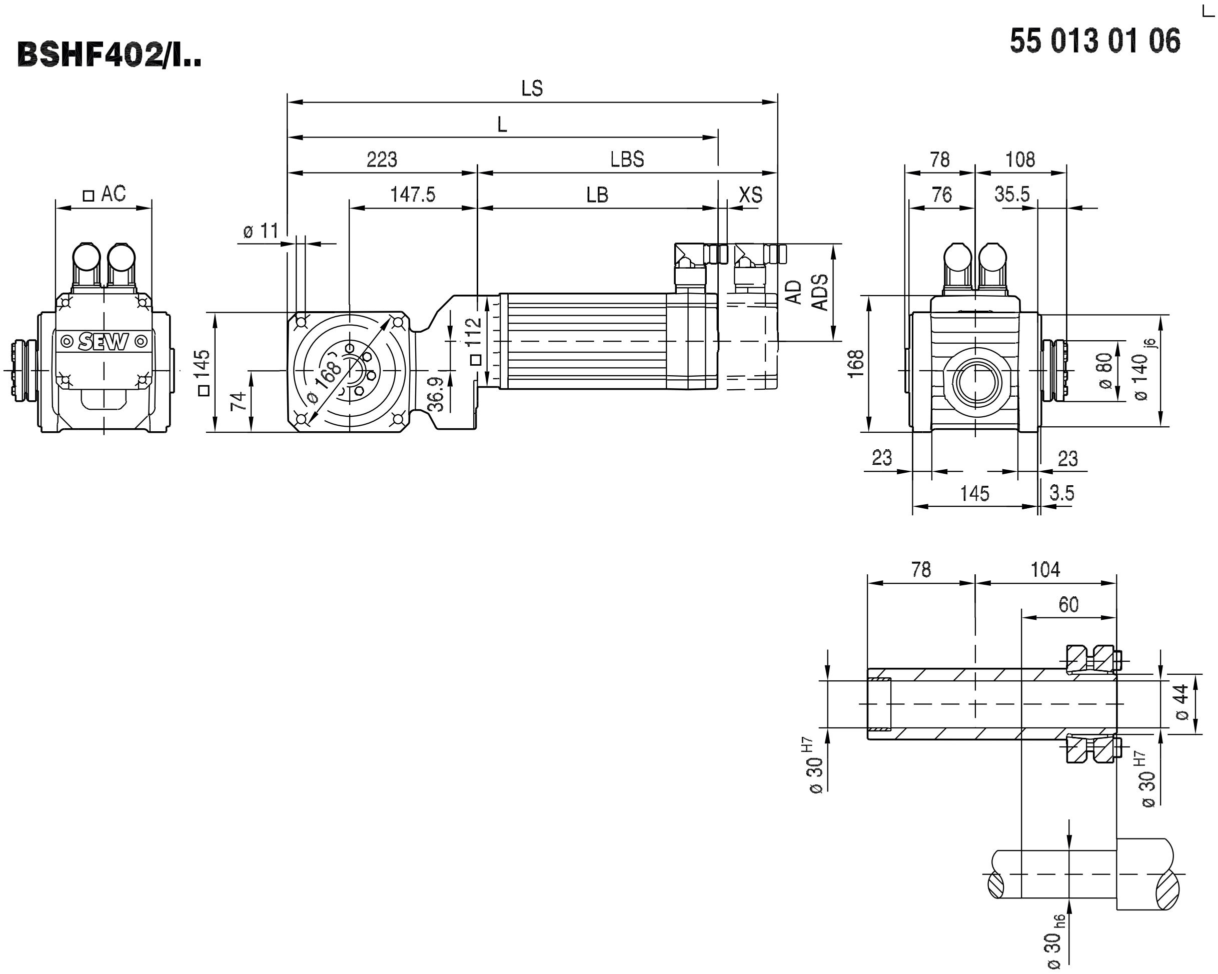

(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	364	403	442	399	449	499	390	415	465	430	465	462
LS	393	432	471	428	478	527	455	480	530	507	542	559
LB	141	180	219	176	226	276	168	193	243	207	242	240
LBS	170	209	248	205	255	305	233	258	308	285	320	336
XS	18	18	18	14	14	14	11	11	11	37	37	37

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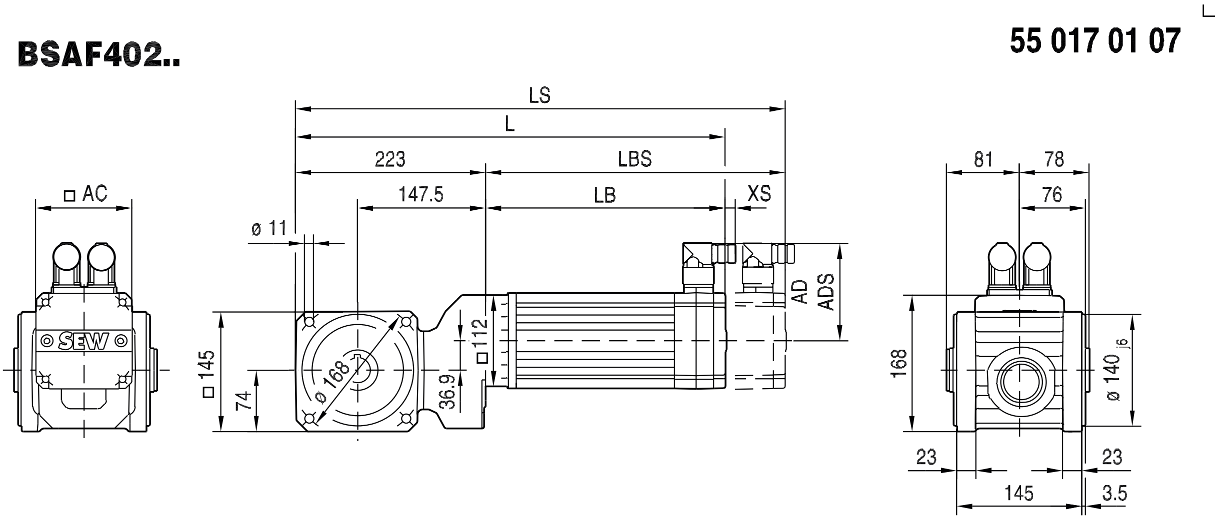

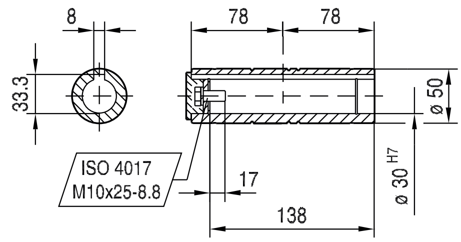

(→ 194)	CMP..											
	50S	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	73	73	73	88	88	88	116	116	116	137	137	162
AD	86	86	86	92	92	92	102	102	102	134	134	146
ADS	86	86	86	92	92	92	104	104	104	137	137	147
L	364	403	442	399	449	499	390	415	465	430	465	462
LS	393	432	471	428	478	527	455	480	530	507	542	559
LB	141	180	219	176	226	276	168	193	243	207	242	240
LBS	170	209	248	205	255	305	233	258	308	285	320	336
XS	18	18	18	14	14	14	11	11	11	37	37	37

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13.2.4 BS.F502

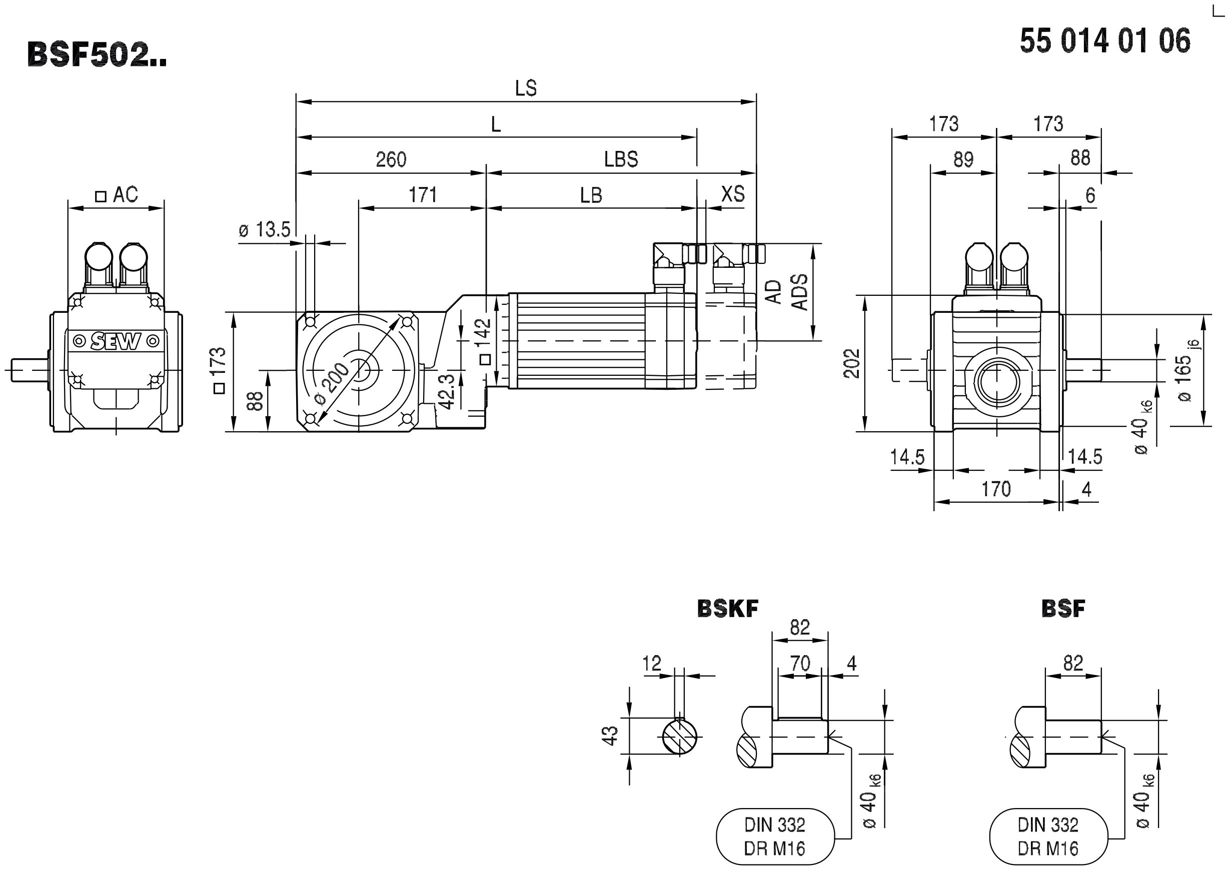
BSF502, M_{aDyn} Nm										320 Nm
	CMP									
i	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
					2					
3.00								177	193	230
4.00		80	114	72	116	176	158	235	255	305
6.00	63	121	171	108	174	260	235	350	385	>410
8.00	83	161	225	144	230	350	315			
10.00		195	275	175	280	>375	>375	>375	>375	>375
12.00	125	240		215						
15.00	152	290	>375	260	>375	>375	>375	>375	>375	>375
20.00	200	>375	>375	345	>375	>375	>375			
25.00	250	>375	>375	>375	>375					
30.00	300	>375		>375						
35.00	350									

(→ 🗎 192)

BSF502, m kg										
	CMP									
s	63S	63M	63L	71S	71M	71L	80S	80M	100S	112S
2	33	34	36	37	38	41	43	45	50	68
BSBF: + 0.40 kg / BSHF: + -1.0 kg										

CMP..				M1			M2;M4			M3;M5-6			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
BSF502 2	3.00	4500	94	21.29	-0.055	184165	18.47	-0.081	183632	32.71	-0.077	180058	6	3	-
	4.00	4500	94	20.57	-0.065	183623	16.99	-0.097	182939	34.95	-0.094	178708	6	3	-
	6.00	4500	94	19.77	-0.080	182775	14.92	-0.121	181967	37.60	-0.120	177200	6	3	-
	8.00	4500	94	19.26	-0.090	182213	13.39	-0.137	181401	39.07	-0.138	176411	6	3	-
	10.00	4500	91	-6.62	-0.203	120320	-17.47	-0.316	119454	22.51	-0.334	115909	6	3	-
	12.00	4500	94	18.42	-0.103	181624	11.52	-0.158	180702	40.77	-0.162	175563	6	3	-
	15.00	4500	91	-8.98	-0.257	119313	-22.97	-0.403	118384	27.69	-0.441	114160	6	3	-
	20.00	4500	91	-10.77	-0.295	118759	-26.04	-0.466	117558	31.72	-0.518	112896	6	3	-
	25.00	4500	91	-11.48	-0.324	118189	-28.42	-0.511	117063	34.29	-0.575	112134	6	3	-
	30.00	4500	91	-12.28	-0.345	117868	-30.16	-0.546	116700	36.58	-0.620	111510	6	3	-
	35.00	4500	91	-12.89	-0.362	117623	-31.46	-0.574	116419	38.29	-0.655	111052	6	3	-

CMP.. n_e = 1500							c_T			F_{Ramax}		F_{Rapk}	
	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	BSF Nm/'	BSBF Nm/'	BSHF Nm/'	BSF N	BSBF N	BSF N	BSBF N
BSF502 2	3.00	310	385	575	533	12	23	27	25	10100	12100	12000	14400
	4.00	320	400	600	450	7.3	25	31	27	11100	13400	11900	14400
	6.00	320	410	615	450	3.6	27	33	30	12200	14400	11900	14400
	8.00	320	420	630	450	6.2	28	35	31	12200	14400	11800	14400
	10.00	250	375	560	500	4.0	31	35	33	12300	14400	12000	14400
	12.00	320	410	615	417	1.1	28	36	31	12200	14400	11900	14400
	15.00	250	375	560	467	2.1	32	36	34	12300	14400	12000	14400
	20.00	250	375	560	350	1.3	32	37	35	12300	14400	12000	14400
	25.00	250	375	560	280	0.92	33	37	35	12300	14400	12000	14400
	30.00	250	375	560	233	0.70	33	37	35	12300	14400	12000	14400
	35.00	250	375	560	200	0.56	32	37	35	12300	14400	12000	14400



(→ 194)	CMP..								
	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	88	88	88	116	116	116	137	137	162
AD	92	92	92	102	102	102	134	134	146
ADS	92	92	92	104	104	104	137	137	147
L	429	478	528	420	445	495	459	493	491
LS	457	507	557	485	510	560	537	571	587
LB	169	218	268	160	185	235	199	233	231
LBS	197	247	297	225	250	300	277	311	327
XS	14	14	14	11	11	11	37	37	37

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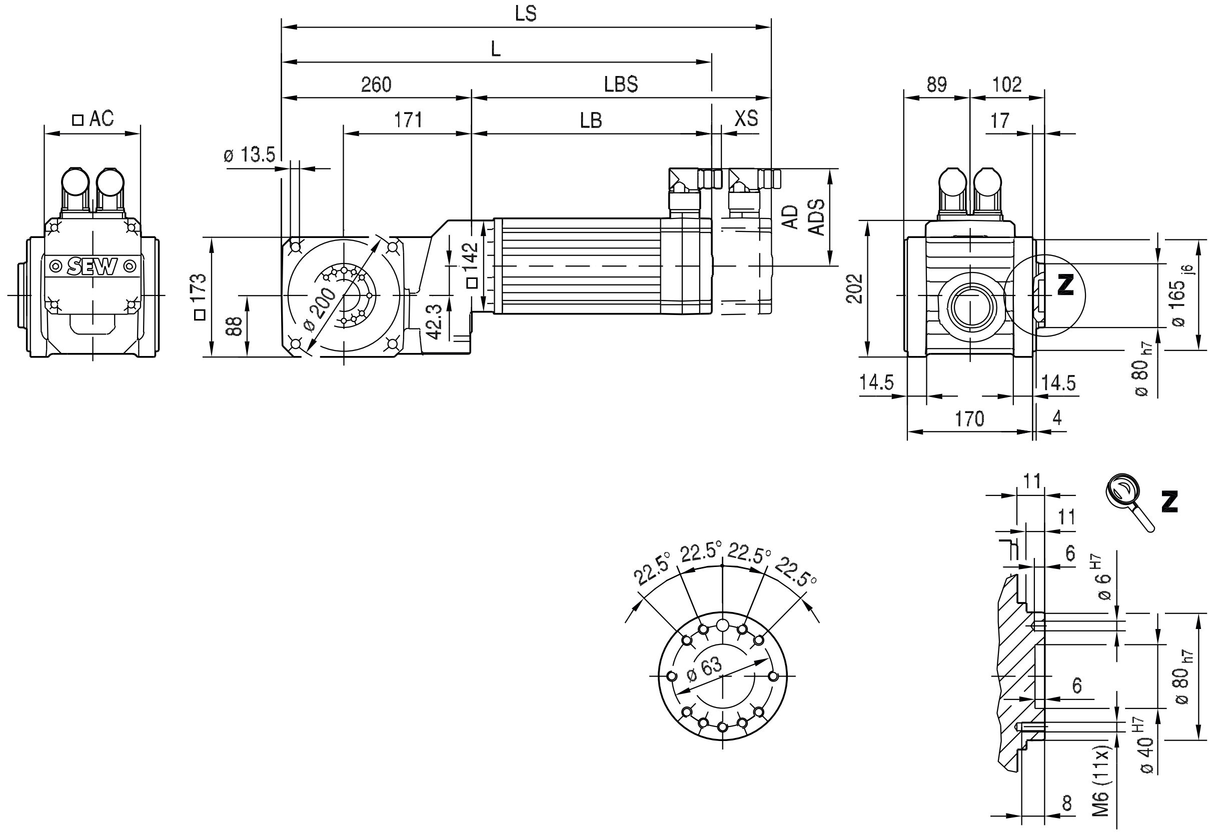
BSBF502..

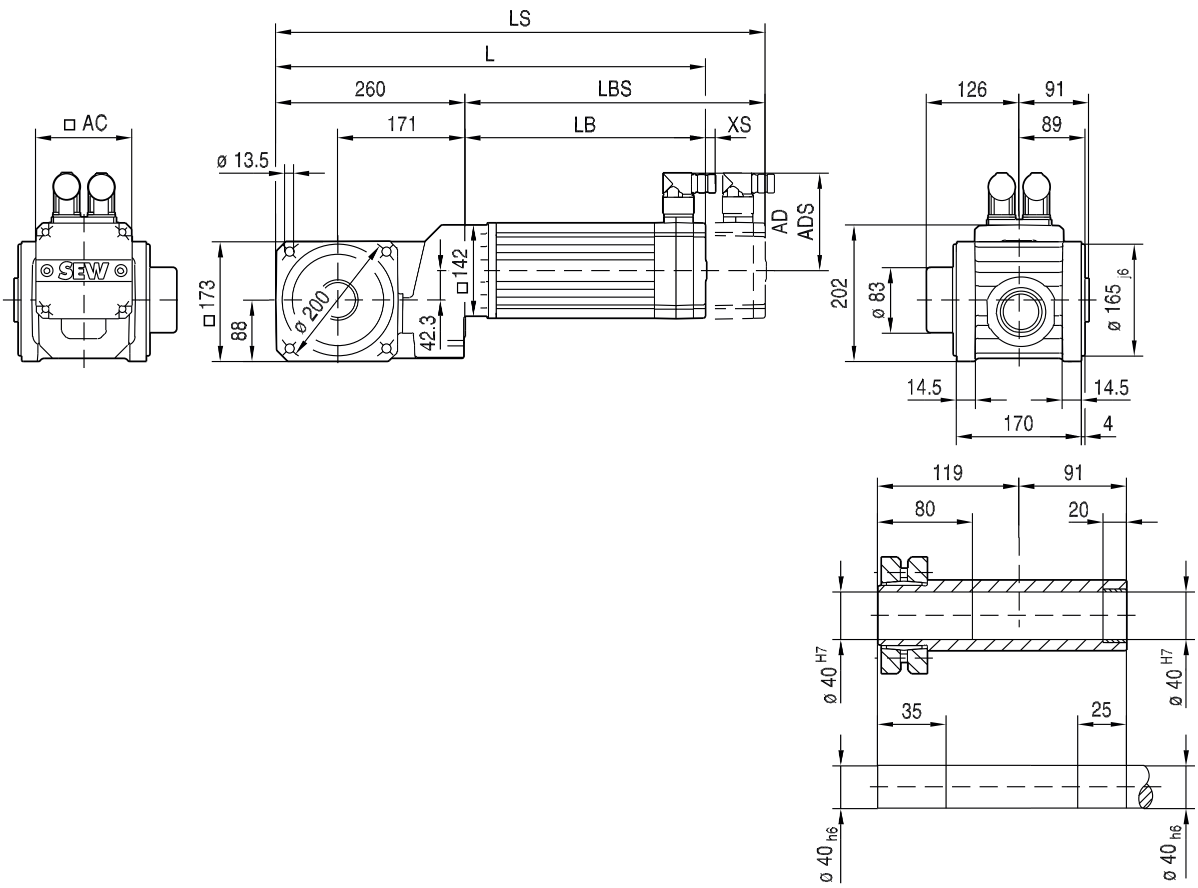
55 015 01 06



(→ 194)	CMP..								
	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	88	88	88	116	116	116	137	137	162
AD	92	92	92	102	102	102	134	134	146
ADS	92	92	92	104	104	104	137	137	147
L	429	478	528	420	445	495	459	493	491
LS	457	507	557	485	510	560	537	571	587
LB	169	218	268	160	185	235	199	233	231
LBS	197	247	297	225	250	300	277	311	327
XS	14	14	14	11	11	11	37	37	37

BSHF502..

55 016 00 06



(→ 194)	CMP..								
	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	88	88	88	116	116	116	137	137	162
AD	92	92	92	102	102	102	134	134	146
ADS	92	92	92	104	104	104	137	137	147
L	429	478	528	420	445	495	459	493	491
LS	457	507	557	485	510	560	537	571	587
LB	169	218	268	160	185	235	199	233	231
LBS	197	247	297	225	250	300	277	311	327
XS	14	14	14	11	11	11	37	37	37

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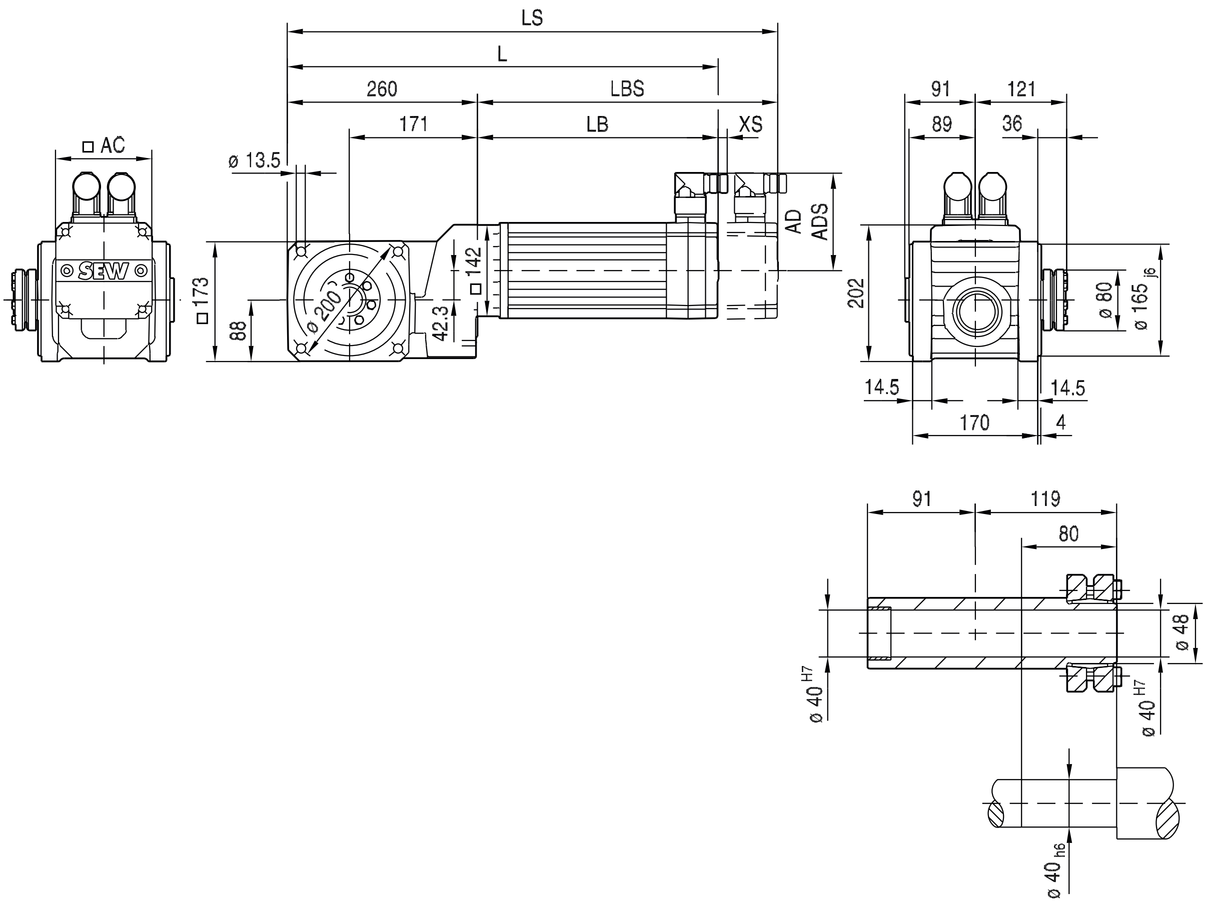
BSHF502/I..

55 017 01 06



(→ 194)	CMP..								
	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	88	88	88	116	116	116	137	137	162
AD	92	92	92	102	102	102	134	134	146
ADS	92	92	92	104	104	104	137	137	147
L	429	478	528	420	445	495	459	493	491
LS	457	507	557	485	510	560	537	571	587
LB	169	218	268	160	185	235	199	233	231
LBS	197	247	297	225	250	300	277	311	327
XS	14	14	14	11	11	11	37	37	37

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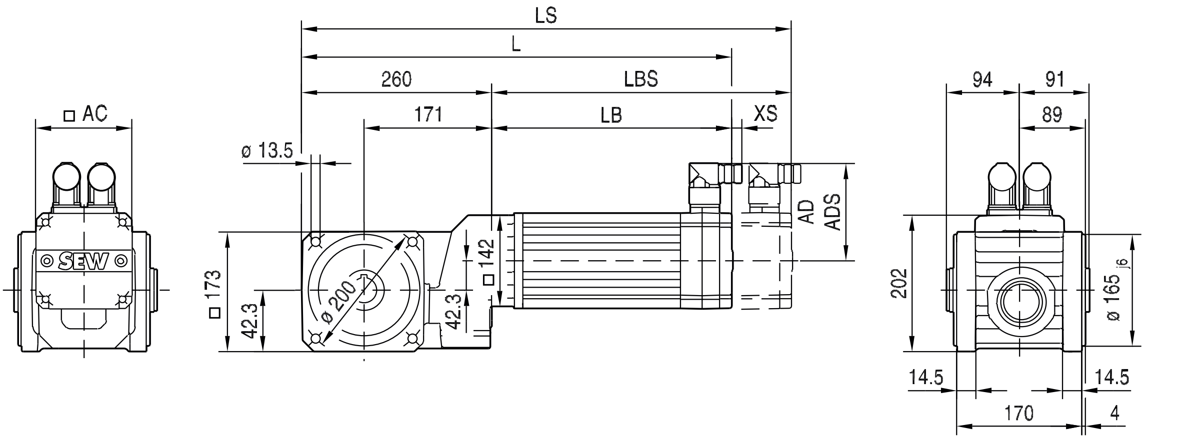
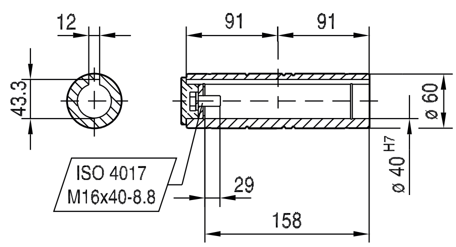
BSAF502..

55 018 01 07





(→ 194)	CMP..								
	63S	63M	63L	71S	71M	71L	80S	80M	100S
AC	88	88	88	116	116	116	137	137	162
AD	92	92	92	102	102	102	134	134	146
ADS	92	92	92	104	104	104	137	137	147
L	429	478	528	420	445	495	459	493	491
LS	457	507	557	485	510	560	537	571	587
LB	169	218	268	160	185	235	199	233	231
LBS	197	247	297	225	250	300	277	311	327
XS	14	14	14	11	11	11	37	37	37

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13.2.5 BS.F602

BSF602, M_{aDyn} Nm														640 Nm
	CMP													
i	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
							2							
3.00								300		300	500	245	380	630
4.00		114		116	176	158	235	400	255	405	670	330	510	>715
6.00	121	171	108	174	260	235	350	600	385	605	>800	495	765	
8.00	161	225	144	230	350	315	470		510					
10.00		275		280	425	380	565	>750	620	>750	>750	>750	>750	>750
12.00	240	340	215	345										
15.00	290	410	260	420	640	570	>750	>750	>750	>750	>750	>750	>750	
20.00	385	550	345	560	>750	>750	>750		>750					
25.00	485	690	435	700	>750	>750								
30.00	580	>750	520	>750										
35.00	680		610											
40.00	>750		695											

(→ 192)

BSF602, m kg														
	CMP													
s	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
2	51	53	54	55	58	60	62	66	67	71	80	85	93	110
BSBF: + 0.30 kg / BSHF: + -2.9 kg														

CMP..				M1			M2;M4			M3;M5-6			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
BSF602 2	3.00	4500	94	-1.22	-0.060	258182	17.38	-0.144	253939	36.73	-0.132	247267	6	3	-
	4.00	4500	94	-3.35	-0.071	257389	17.94	-0.178	252543	42.42	-0.166	244809	6	3	-
	6.00	4500	94	-6.35	-0.086	256315	18.50	-0.230	250689	50.09	-0.218	241723	6	3	-
	8.00	4500	94	-8.40	-0.097	255637	18.73	-0.267	249529	54.77	-0.255	239958	6	3	-
	10.00	4500	91	-47.50	-0.236	167324	-14.52	-0.678	162357	41.59	-0.662	155420	6	3	-
	12.00	4500	94	-11.01	-0.111	254840	18.58	-0.314	248244	60.30	-0.303	237995	6	3	-
	15.00	4500	91	-55.05	-0.294	166158	-15.40	-0.892	160319	47.82	-0.869	154910	6	3	-
	20.00	4500	91	-60.08	-0.333	165439	-17.90	-1.036	159395	52.82	-1.018	154092	6	3	-
	25.00	4500	91	-63.71	-0.362	164961	-18.71	-1.146	158560	57.42	-1.130	153134	6	3	-
	30.00	4500	91	-66.47	-0.383	164630	-19.57	-1.230	158019	60.84	-1.217	152406	6	3	-
	35.00	4500	91	-68.08	-0.402	164287	-20.31	-1.295	157620	64.77	-1.290	151662	6	3	-
	40.00	4500	91	-69.66	-0.415	164073	-20.99	-1.347	157322	67.10	-1.346	151214	6	3	-

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CMP..							c_T			F_{Ramax}		F_{Rapk}	
n_e = 1500		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	BSF	BSBF	BSHF	BSF	BSBF	BSF	BSBF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	Nm/'	Nm/'	Nm/'	N	N	N	N
BSF602 2	3.00[1]	505	700	1050	500	35	45	49	49	15200	17400	24000	24000
	4.00[1]	575	715	1070	375	21	47	52	52	16500	18900	24000	24000
	6.00	610	800	1200	250	10	50	56	55	18800	21500	24000	24000
	8.00	640	780	1170	213	6.2	52	58	58	20600	23600	24000	24000
	10.00[1]	520	750	1120	200	9.9	76	90	87	22400	24000	24000	24000
	12.00	640	775	1160	258	2.9	54	60	60	23700	24000	24000	24000
	15.00[1]	520	750	1120	187	5.3	77	92	89	24000	24000	24000	24000
	20.00	520	750	1120	190	3.5	74	88	85	24000	24000	24000	24000
	25.00	520	750	1120	192	2.5	76	90	86	24000	24000	24000	24000
	30.00	520	750	1120	193	1.7	74	88	85	24000	24000	24000	24000
	35.00	520	750	1120	200	1.4	73	87	83	24000	24000	24000	24000
	40.00	520	750	1120	175	1.1	74	87	84	24000	24000	24000	24000

[1] (→ 🗎 192)

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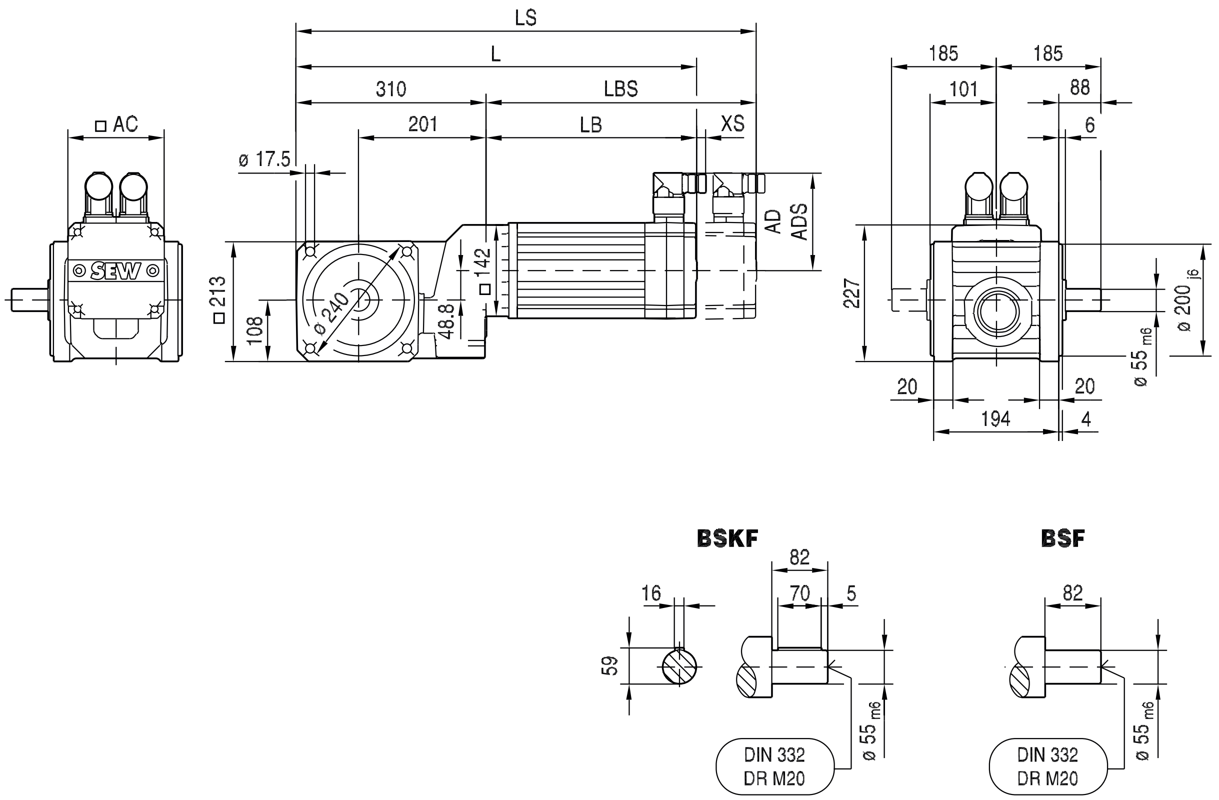
SEW EURODRIVE

BSF602..

55 018 02 06



(→ 🗎 194)	CMP..													
	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	528	578	470	495	545	509	543	606	541	576	656	649	692	780
LS	557	607	535	560	610	587	621	684	637	672	752	770	813	901
LB	218	268	160	185	235	199	233	296	231	266	346	339	382	470
LBS	247	297	225	250	300	277	311	374	327	362	442	460	503	591
XS	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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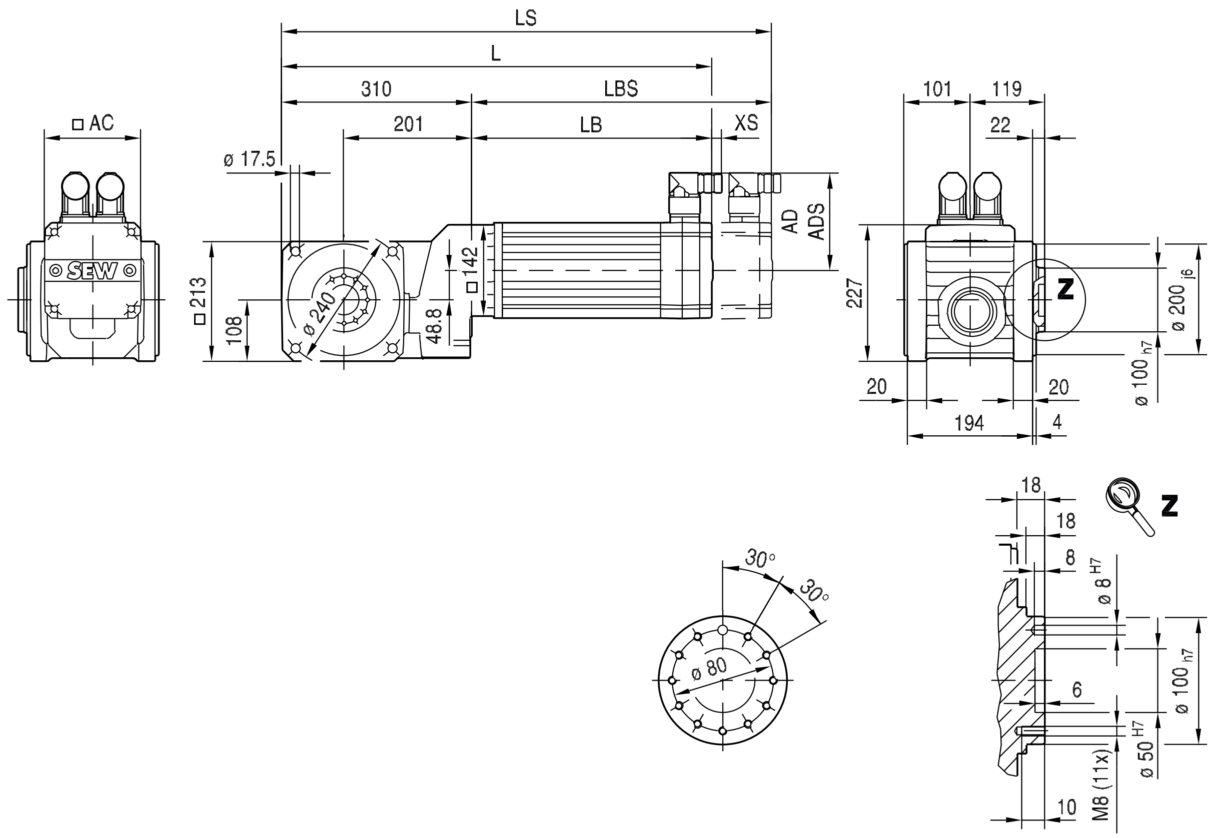
BSBF602.. 55 019 02 06



(→ 194)	CMP..													
	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	528	578	470	495	545	509	543	606	541	576	656	649	692	780
LS	557	607	535	560	610	587	621	684	637	672	752	770	813	901
LB	218	268	160	185	235	199	233	296	231	266	346	339	382	470
LBS	247	297	225	250	300	277	311	374	327	362	442	460	503	591
XS	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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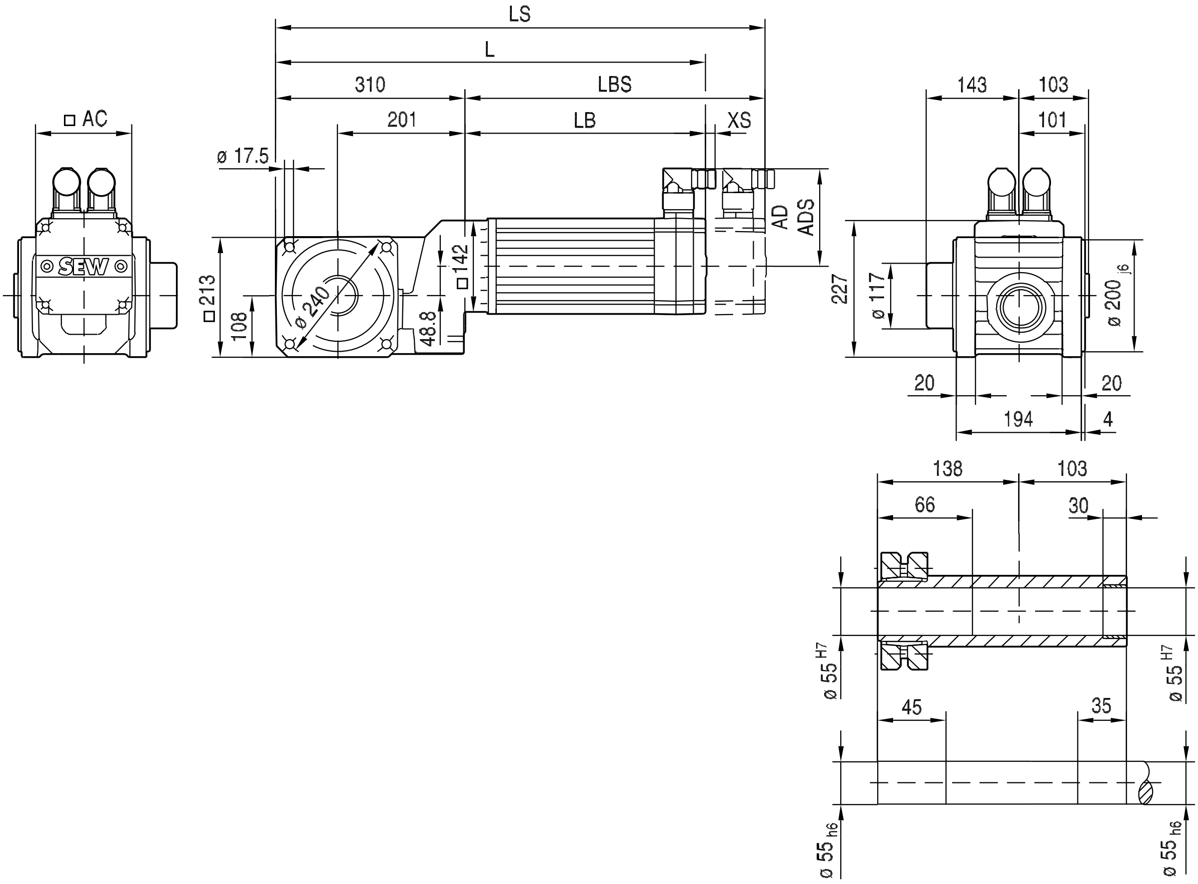
BSHF602..

55 020 01 06



(→ 194)	CMP..													
	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	528	578	470	495	545	509	543	606	541	576	656	649	692	780
LS	557	607	535	560	610	587	621	684	637	672	752	770	813	901
LB	218	268	160	185	235	199	233	296	231	266	346	339	382	470
LBS	247	297	225	250	300	277	311	374	327	362	442	460	503	591
XS	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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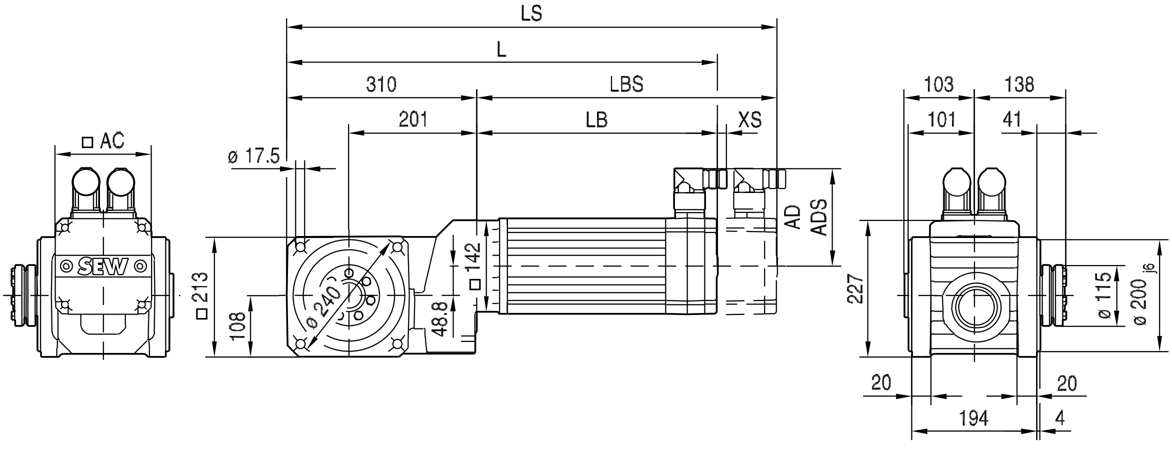
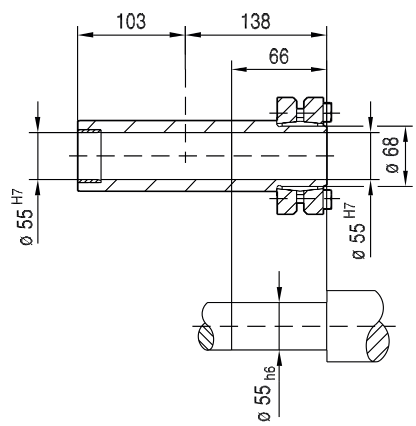
BSHF602/I.. 55 021 02 06





(→ 194)	CMP..													
	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	528	578	470	495	545	509	543	606	541	576	656	649	692	780
LS	557	607	535	560	610	587	621	684	637	672	752	770	813	901
LB	218	268	160	185	235	199	233	296	231	266	346	339	382	470
LBS	247	297	225	250	300	277	311	374	327	362	442	460	503	591
XS	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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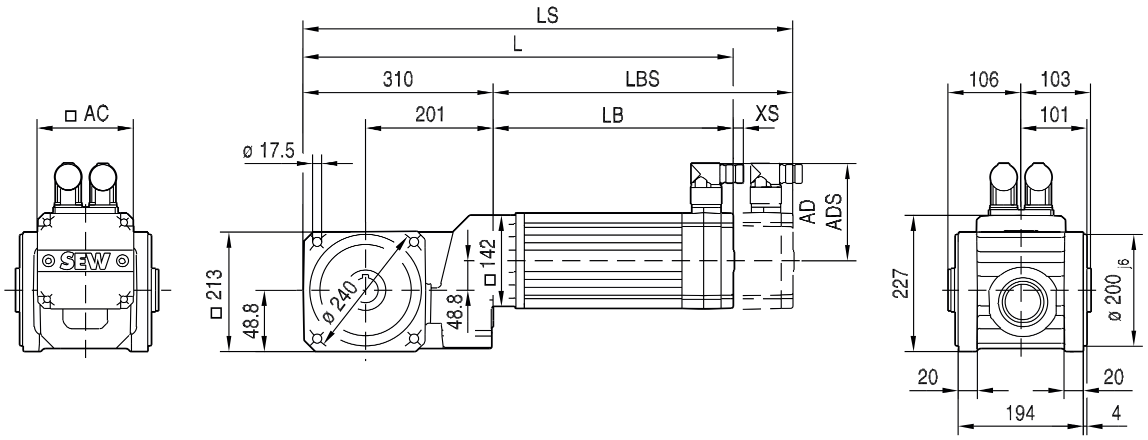
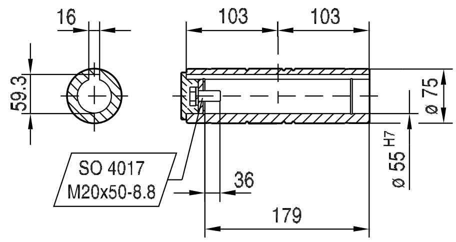
BSAF602..

55 019 02 07





(→ 🗎 194)	CMP..													
	63M	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**	**112S**	**112M**	**112L**
AC	88	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	92	104	104	104	137	137	137	147	147	147	177	177	213
L	528	578	470	495	545	509	543	606	541	576	656	649	692	780
LS	557	607	535	560	610	587	621	684	637	672	752	770	813	901
LB	218	268	160	185	235	199	233	296	231	266	346	339	382	470
LBS	247	297	225	250	300	277	311	374	327	362	442	460	503	591
XS	14	14	11	11	11	37	37	37	37	37	37	32	32	49

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13.2.6 BS.F802

BSF802, M_{aDyn} Nm	CMP											1500 Nm
i	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H
						2						
4.00					400		405	670	330	510	840	1010
6.00		260	235	350	600	385	605	1000	495	765	1260	1520
8.00	230	350	315	470	800	510	810	1340	660	1020	1690	>1910
10.00					970		980	1620	800	1230	>1680	>1680
12.00	345	525	470	705		770						
15.00		640	570	850	1460	930	1470	>1680	1200	>1680	>1680	>1680
20.00	560	850	765	1130	>1680	1240	>1680	>1680	1600	>1680	>1680	>1680
25.00	700	1060	950	1420	>1680	1550	>1680	>1680	>1680	>1680		
30.00	840	1280	1140	>1680		>1680						
35.00	980	1490	1340									
40.00	1120	>1680	1530									

(→ 192)

BSF802, m kg	CMP											
s	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H
2	83	85	88	91	95	96	100	110	115	120	135	145

BSBF: + 1.1 kg / BSHF: + -3.5 kg

CMP..				M1			M2;M4			M3;M5-6			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
BSF802 2	4.00	4500	94	36.53	-0.257	380872	85.55	-0.552	372271	94.47	-0.447	370986	6	3	-
	6.00	4500	94	38.78	-0.322	379127	97.23	-0.720	369115	110.3	-0.584	367673	6	3	-
	8.00	4500	94	40.01	-0.368	378029	104.5	-0.839	367166	120.4	-0.682	365688	6	3	-
	10.00	4500	91	-23.29	-0.920	247749	61.41	-2.162	238512	91.96	-1.769	237008	6	3	-
	12.00	4500	94	41.33	-0.427	376719	112.5	-0.993	364991	131.8	-0.808	363576	6	3	-
	15.00	4500	91	-23.52	-1.178	245862	79.26	-2.866	235221	119.0	-2.352	233398	6	3	-
	20.00	4500	91	-23.77	-1.359	244661	87.97	-3.354	233524	136.4	-2.767	231226	6	3	-
	25.00	4500	91	-24.68	-1.491	243925	94.41	-3.718	232349	148.6	-3.076	229783	6	3	-
	30.00	4500	91	-25.17	-1.592	243363	99.42	-3.997	231420	158.0	-3.315	228644	6	3	-
	35.00	4500	91	-25.61	-1.671	242945	102.3	-4.214	230843	165.1	-3.503	227831	6	3	-
	40.00	4500	91	-26.02	-1.735	242626	107.0	-4.402	230135	170.8	-3.656	227184	6	3	-

CMP..							c_T			F_{Ramax}		F_{Rapk}	
n_e = 1500		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	BSF	BSBF	BSHF	BSF	BSBF	BSF	BSBF
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	Nm/'	Nm/'	Nm/'	N	N	N	N
BSF802 2	4.00[1]	1240	1860	2790	425	70	95	112	103	29600	34800	36000	36000
	6.00	1370	1910	2860	267	34	106	126	115	33500	36000	36000	36000
	8.00	1500	1910	2860	225	21	107	128	117	36000	36000	36000	36000
	10.00[1]	1220	1680	2520	190	32	149	193	170	36000	36000	36000	36000
	12.00	1500	1910	2860	167	11	114	139	126	36000	36000	36000	36000
	15.00[1]	1220	1680	2520	180	18	154	202	176	36000	36000	36000	36000
	20.00	1220	1680	2520	190	12	154	202	176	36000	36000	36000	36000
	25.00	1220	1680	2520	180	8.5	157	207	180	36000	36000	36000	36000
	30.00	1220	1680	2520	180	6.5	157	208	181	36000	36000	36000	36000
	35.00	1220	1680	2520	191	5.1	156	205	178	36000	36000	36000	36000
	40.00	1220	1680	2520	175	4.2	156	206	179	36000	36000	36000	36000

[1] (→ 192)

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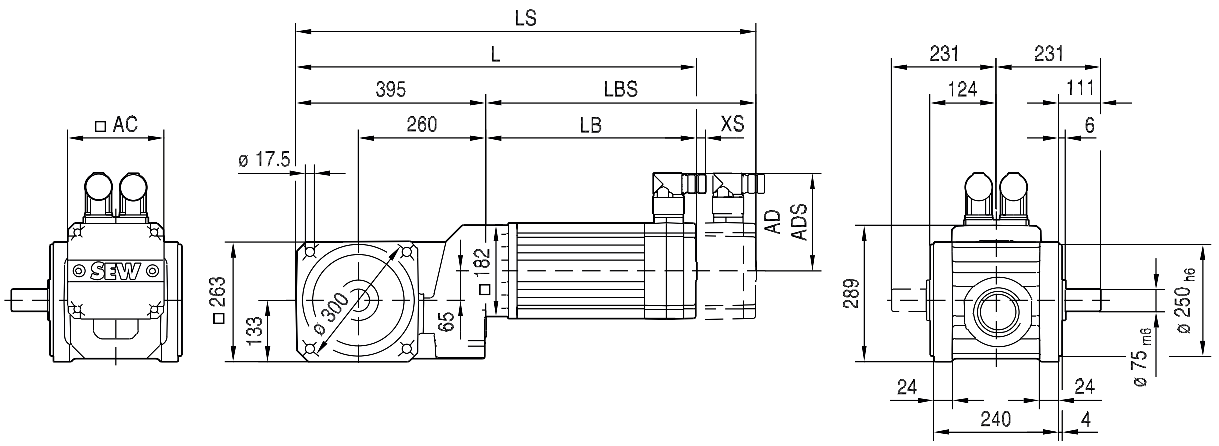
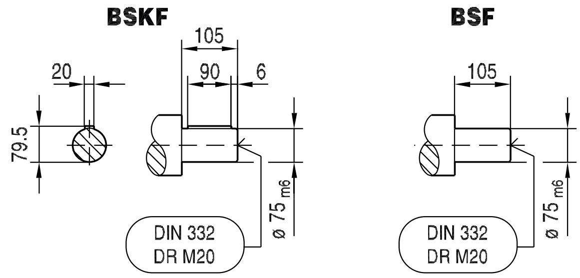
BSF802..

55 022 02 06





(→ 194)	CMP..											
	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H
AC	116	116	137	137	137	162	162	162	205	205	205	205
AD	102	102	134	134	134	146	146	146	177	177	213	213
ADS	104	104	137	137	137	147	147	147	177	177	213	213
L	576	626	590	624	687	622	657	737	730	773	861	904
LS	641	691	668	702	765	718	753	833	851	894	982	1025
LB	181	231	195	229	292	227	262	342	335	378	466	509
LBS	246	296	273	307	370	323	358	438	456	499	587	630
XS	11	11	37	37	37	37	37	37	32	32	49	49

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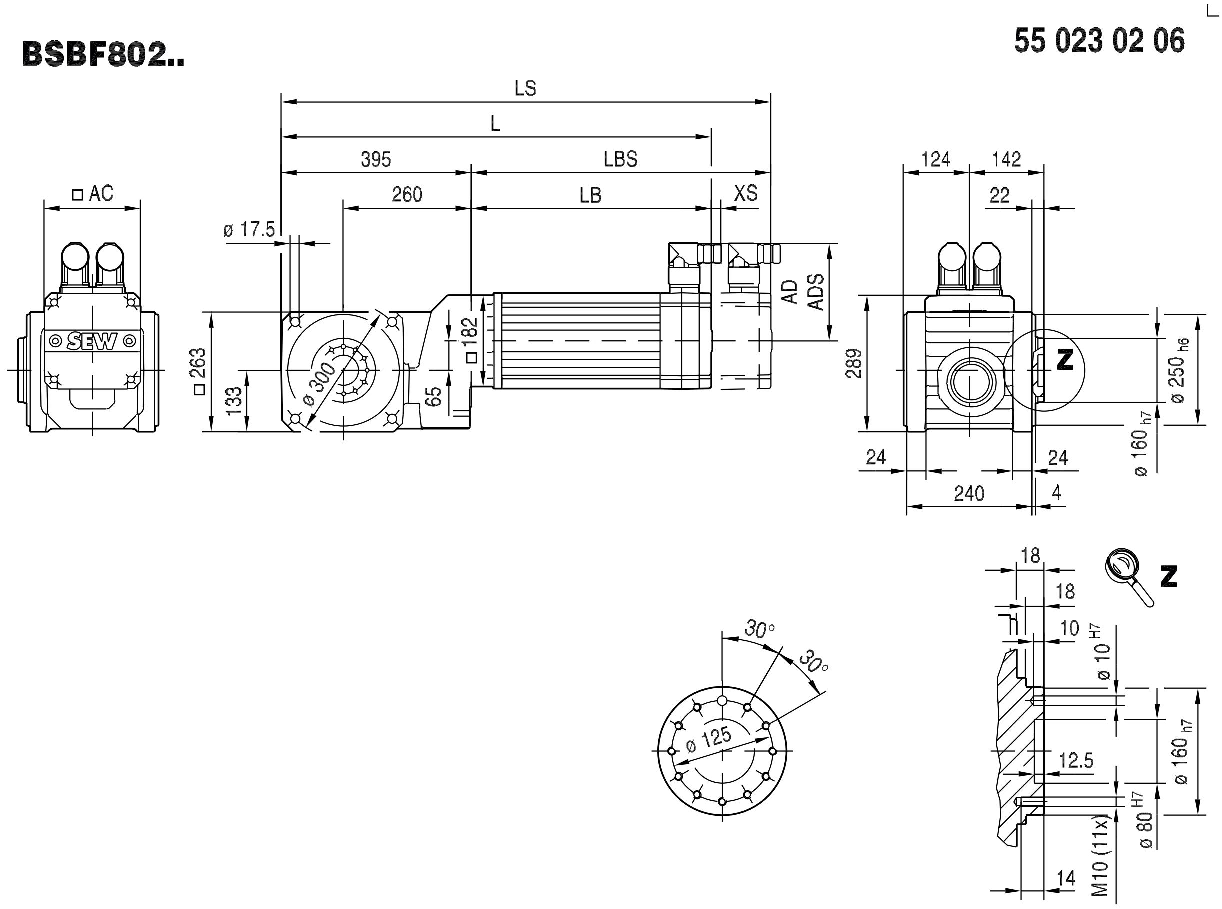

(→ 194)	CMP..											
	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H
AC	116	116	137	137	137	162	162	162	205	205	205	205
AD	102	102	134	134	134	146	146	146	177	177	213	213
ADS	104	104	137	137	137	147	147	147	177	177	213	213
L	576	626	590	624	687	622	657	737	730	773	861	904
LS	641	691	668	702	765	718	753	833	851	894	982	1025
LB	181	231	195	229	292	227	262	342	335	378	466	509
LBS	246	296	273	307	370	323	358	438	456	499	587	630
XS	11	11	37	37	37	37	37	37	32	32	49	49

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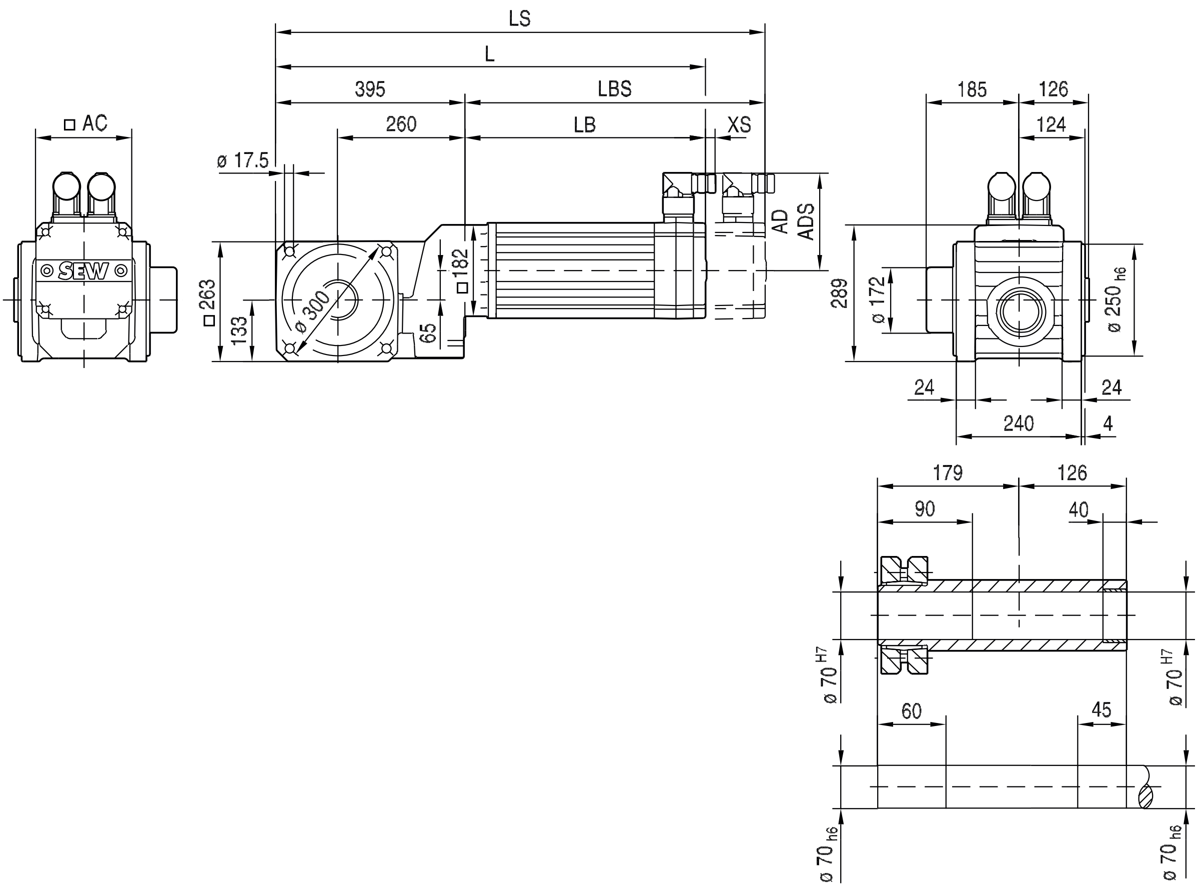
BSHF802..

55 024 01 06



(→ 194)	CMP..											
	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H
AC	116	116	137	137	137	162	162	162	205	205	205	205
AD	102	102	134	134	134	146	146	146	177	177	213	213
ADS	104	104	137	137	137	147	147	147	177	177	213	213
L	576	626	590	624	687	622	657	737	730	773	861	904
LS	641	691	668	702	765	718	753	833	851	894	982	1025
LB	181	231	195	229	292	227	262	342	335	378	466	509
LBS	246	296	273	307	370	323	358	438	456	499	587	630
XS	11	11	37	37	37	37	37	37	32	32	49	49

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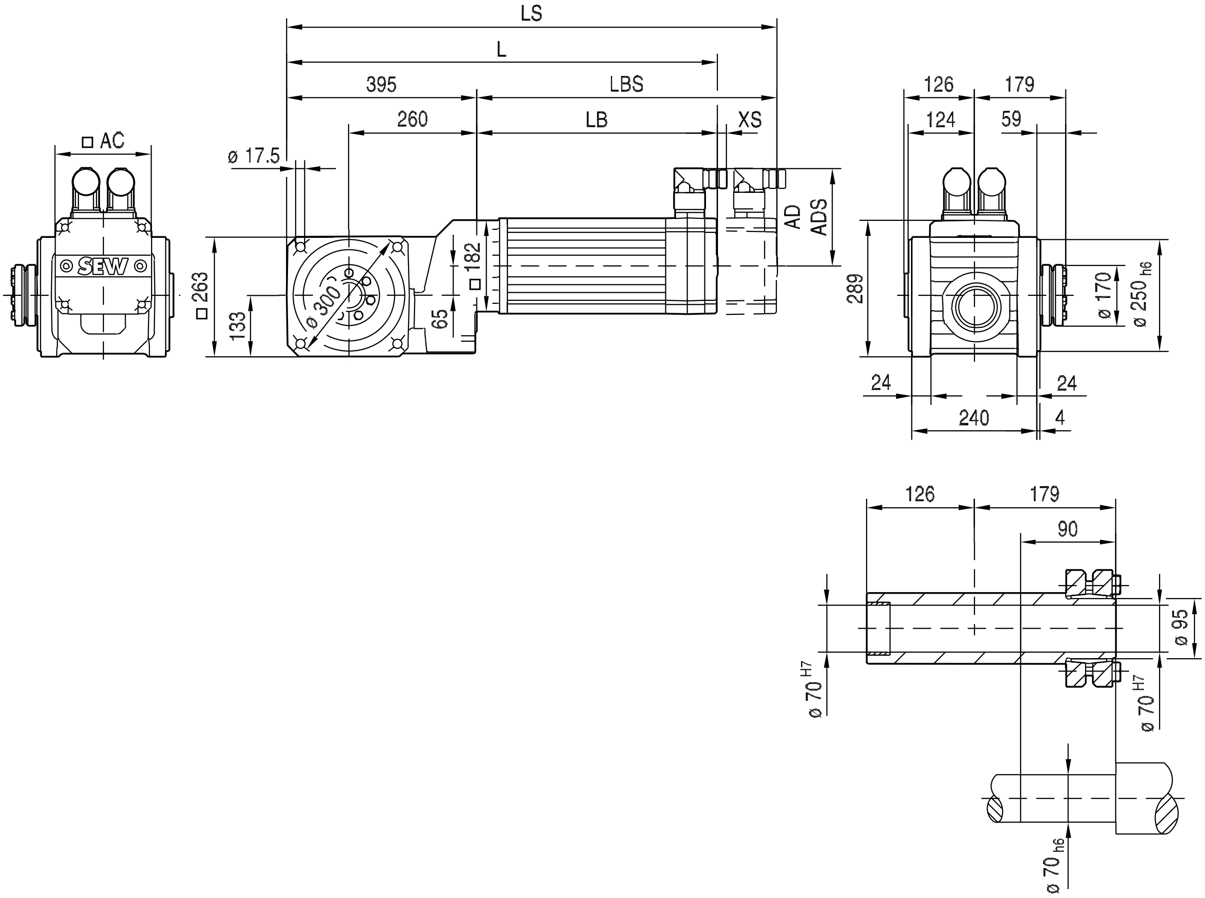
BSHF802/I..

55 025 02 06



(→ 194)	CMP..											
	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H
AC	116	116	137	137	137	162	162	162	205	205	205	205
AD	102	102	134	134	134	146	146	146	177	177	213	213
ADS	104	104	137	137	137	147	147	147	177	177	213	213
L	576	626	590	624	687	622	657	737	730	773	861	904
LS	641	691	668	702	765	718	753	833	851	894	982	1025
LB	181	231	195	229	292	227	262	342	335	378	466	509
LBS	246	296	273	307	370	323	358	438	456	499	587	630
XS	11	11	37	37	37	37	37	37	32	32	49	49

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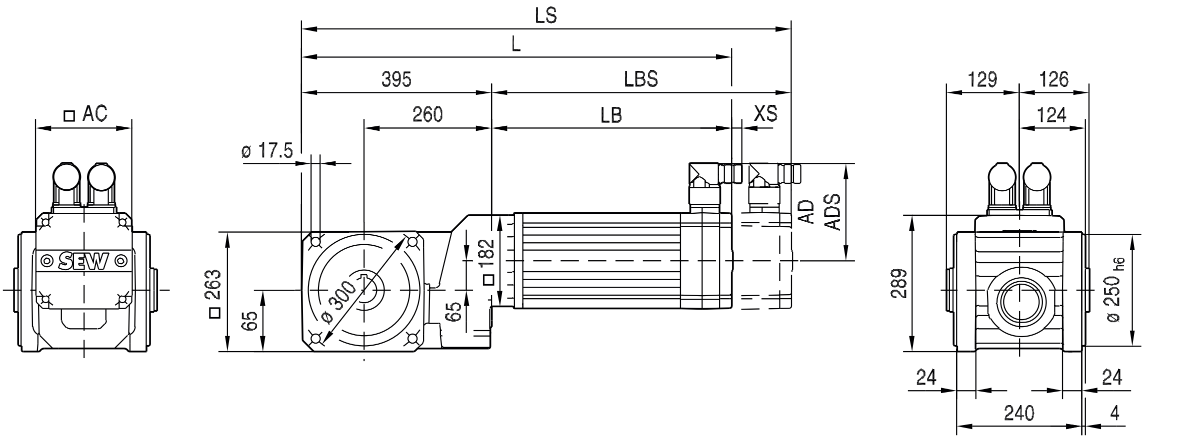
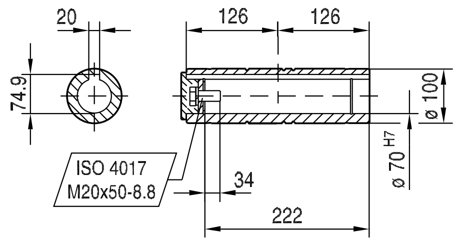
BSAF802..

55 020 02 07





(→ 194)	CMP..											
	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H
AC	116	116	137	137	137	162	162	162	205	205	205	205
AD	102	102	134	134	134	146	146	146	177	177	213	213
ADS	104	104	137	137	137	147	147	147	177	177	213	213
L	576	626	590	624	687	622	657	737	730	773	861	904
LS	641	691	668	702	765	718	753	833	851	894	982	1025
LB	181	231	195	229	292	227	262	342	335	378	466	509
LBS	246	296	273	307	370	323	358	438	456	499	587	630
XS	11	11	37	37	37	37	37	37	32	32	49	49

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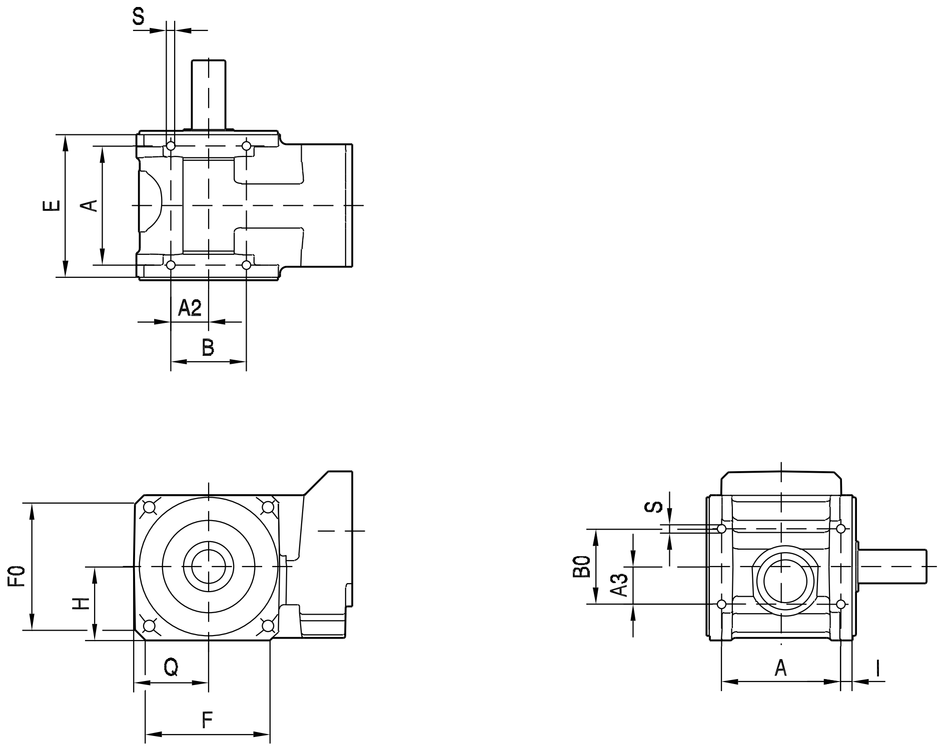
13.3 Dimension sheet front-end mounting

BS..B

55 037 00 03



	E	A	S	A2	B	F	H	Q	F0	B0	A3	I
BS..202B	111	96	M8x14	30	60	80	47-0.3	47-0.3	78	60	30	7.5
BS..302B	123	105	M10x18	37.5	75	101	58.5-0.3	58.5-0.3	98.5	75	37.5	9
BS..402B	145	120	M12x22	46.5	93	127	72-0.3	72-0.3	125	93	46.5	12.5
BS..502B	170	142	M12x16	45	90	151	86-0.5	86-0.5	151	90	45	14
BS..602B	194	160	M16x20	50	100	182	106-0.5	106-0.5	183	100	50	17
BS..802B	240	186	M20x25	65	130	239	131-0.5	131-0.5	237	130	65	27

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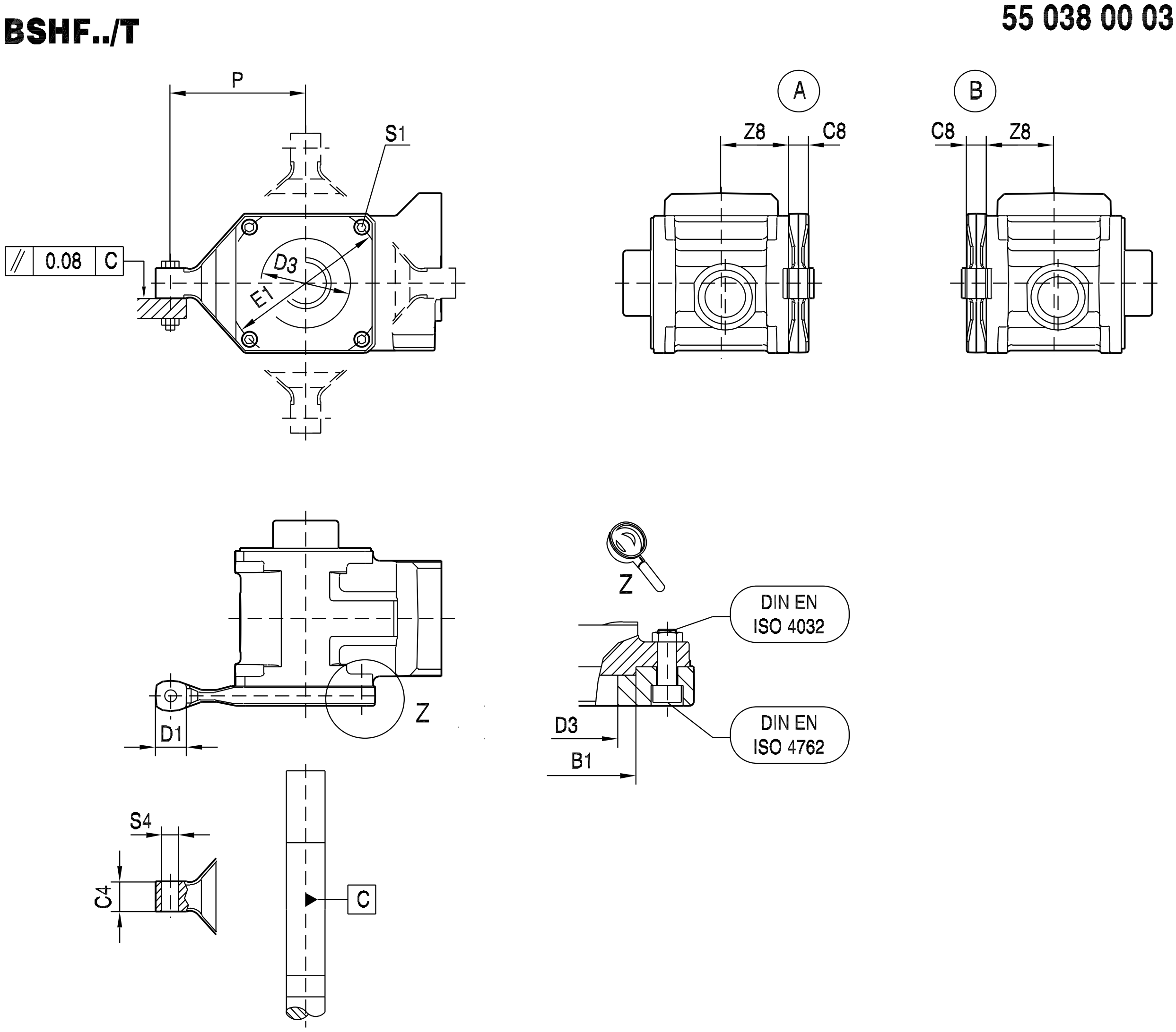
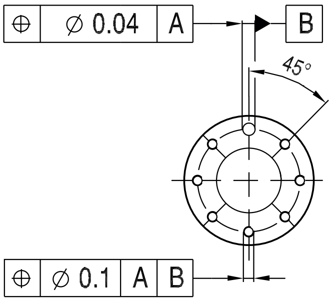
13.4 Torque arm dimension sheet



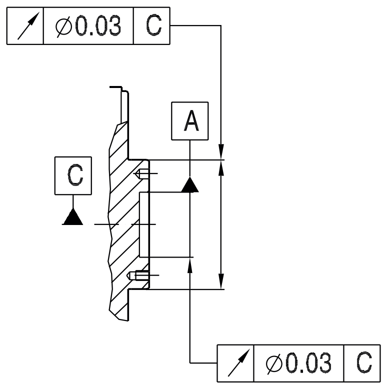
	P	B1	E1	D3	Z8	C8	D1	S4	C4	S1							
BSHF202/T	110	90	109	75	55.5	18	34	14	20	M6x35							
BSHF302/T	140	110	135	90	61.5	20	38	14	24	M8x40							
BSHF402/T	158	140	168	115	72.5	22	38	14	28	M10x45							
BSHF502/T	170	165	200	140	85	25	38	14	38	M12x40							
BSHF602/T	198	200	240	140	97	35	58	22	50	M16x55							
BSHF802/T	278	250	300	195	120	34	58	22	70	M16x55							

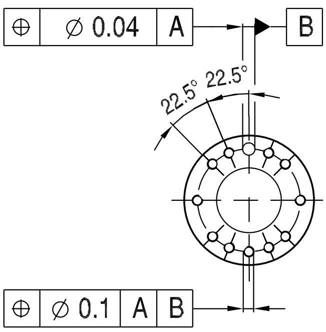
13.5 Dimension sheet tolerances and chamfers of flange block gear units

55 035 02 03

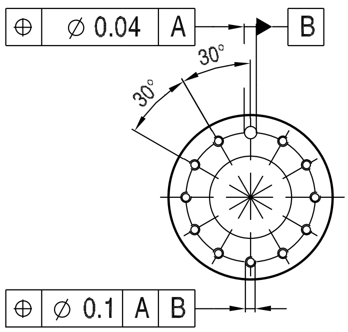


BSBF202 **PSBF221/222**
BSBF302 **PSBF321/322**



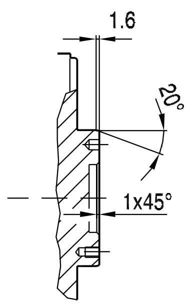


BSBF402 **PSBF521/522**
BSBF502



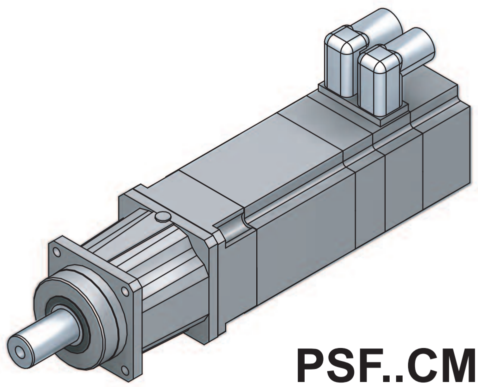
BSBF602 **PSBF621/622**
BSBF802 **PSBF721/722**
PSBF821/822

55 036 00 03

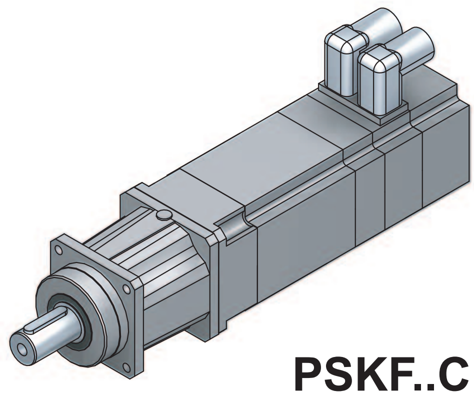


14 Planetary gearmotor – PSF../PSBF.. gear units

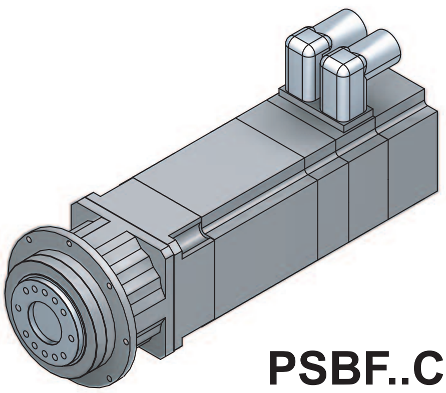
14.1 PSF../PSBF..CMP.. designs



PSF..CMP..



PSKF..CMP..



PSBF..CMP..

15705967499

14.2 PSF121–922..CMP.. selection tables and dimension sheets

14.2.1 PSF121

PSF121, M_{aDyn} Nm				25 Nm
	CMP			
i	40M	50S	50M	50L
	1			
3.00		15	31	>36
4.00	15	21	>38	>38
5.00	19	26	>35	>35
7.00	26	36		
10.00	>26			

(→ 192)

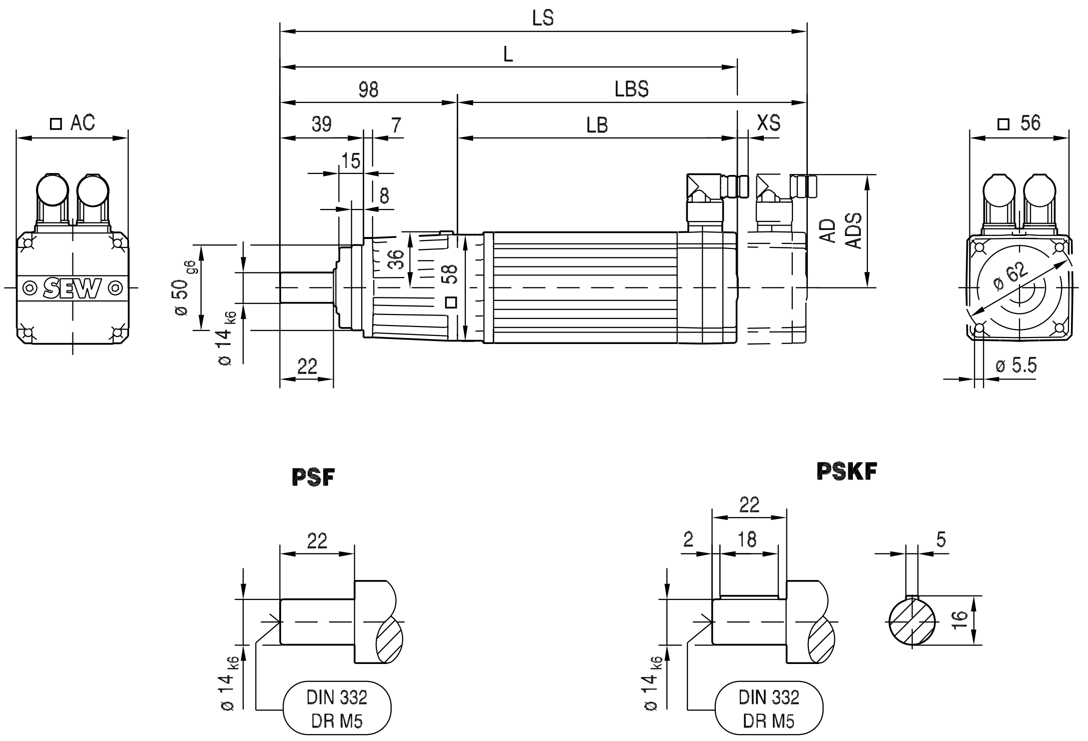
PSF121, m kg				
	CMP			
s	40M	50S	50M	50L
1	3.0	3.7	4.6	5.5

CMP..				M1;M3;M5-6			M2			M4			φ		
		n_{epk}	η	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2		/R	/M
	i	min^{-1}	%										'	'	'
PSF121 1	3.00	8000	99	68.00	-0.058	0	77.00	-0.082	0	78.00	-0.101	0	8	4	2
	4.00	8000	99	94.00	-0.086	0	106.0	-0.120	0	104.0	-0.142	0	8	4	2
	5.00	8000	99	96.00	-0.096	0	109.0	-0.130	0	108.0	-0.141	0	8	4	2
	7.00	8000	99	107.0	-0.126	0	120.0	-0.164	0	118.0	-0.191	0	8	4	2
	10.00	8000	99	107.0	-0.155	0	121.0	-0.198	0	129.0	-0.253	0	8	4	2

CMP..							c_T	F_{Ramax}	F_{Rapk}
n_e = 1500		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	PSF	PSF	PSF
	i	Nm	Nm	Nm	min^{-1}	kg*m²	Nm/'	N	N
PSF121 1	3.00	20	36	54	2333	0.088	2.1	2000	1900
	4.00	25	38	57	1750	0.044	2.2	1980	1890
	5.00	25	35	53	1400	0.029	2.2	1980	1910
	7.00	25	37	56	1000	0.015	2.0	1980	1900
	10.00	25	26	39	700	0.008	1.5	1980	1970

57 026 00 06

PSF121..



(→ 🗎 194)	CMP..							
	40M	50S	50M	50L				
AC	57	73	73	73				
AD	78	86	86	86				
ADS	78	86	86	86				
L	254	255	294	333				
LS	284	284	323	362				
LB	156	157	196	235				
LBS	186	186	225	264				
XS	19	18	18	18				

14.2.2 PSF122

PSF122, M_{aDyn} Nm				25 Nm
	CMP			
i	40M	50S	50M	50L
	2			
16.00	>38	>38	>38	>38
20.00	>35	>35	>35	>35
25.00	>35	>35	>35	>35
28.00	>33	>33		
35.00	>35	>35		
40.00	>32			
49.00	>37	>37		
70.00	>37			
100.00	>26			

(→ 192)

PSF122, m kg				
	CMP			
s	40M	50S	50M	50L
2	3.5	4.3	5.2	6.1

CMP..				M1;M3;M5-6			M2			M4			φ		
		n_{epk}	η	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2		/R	/M
	i	min^{-1}	%										'	'	'
PSF122 2	16.00	8000	98	213	-0.552	0	242	-0.875	0	247	-0.949	0	10	6	3
	20.00	8000	98	248	-0.780	0	283	-1.252	0	288	-1.334	0	10	6	3
	25.00	8000	98	255	-0.886	0	289	-1.358	0	293	-1.441	0	10	6	3
	28.00	8000	98	215	-0.745	0	241	-1.058	0	246	-1.133	0	10	6	3
	35.00	8000	98	269	-1.141	0	299	-1.612	0	303	-1.696	0	10	6	3
	40.00	8000	98	234	-1.048	0	258	-1.365	0	263	-1.442	0	10	6	3
	49.00	8000	98	379	-2.207	0	419	-3.106	0	422	-3.214	0	10	6	3
	70.00	8000	98	415	-3.147	0	450	-4.047	0	453	-4.156	0	10	6	3
	100.00	8000	98	472	-5.053	0	519	-6.612	0	522	-6.733	0	10	6	3

CMP..							c_T	F_{Ramax}	F_{Rapk}
n_e = 1500		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	PSF	PSF	PSF
	i	Nm	Nm	Nm	min^{-1}	kg*m²	Nm/'	N	N
PSF122 2	16.00	25	38	57	438	0.037	2.0	1980	1890
	20.00	25	35	53	350	0.024	2.0	1980	1910
	25.00	25	35	53	280	0.024	1.9	1980	1910
	28.00	25	33	50	250	0.013	1.9	1980	1930
	35.00	25	35	53	200	0.012	1.9	1980	1910
	40.00	25	32	48	175	0.006	1.8	1980	1930
	49.00	25	37	56	143	0.012	1.8	1980	1900
	70.00	25	37	56	100	0.006	1.7	1980	1900
	100.00	25	26	39	70	0.006	1.4	1980	1970

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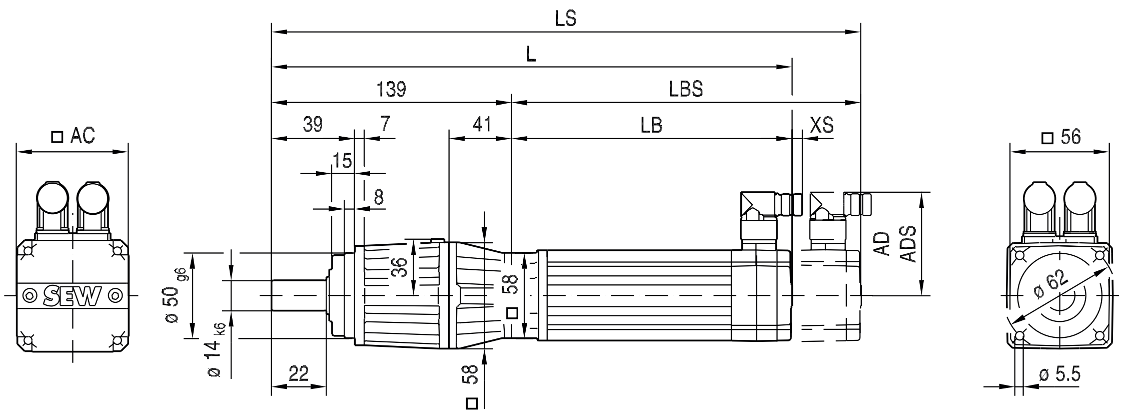
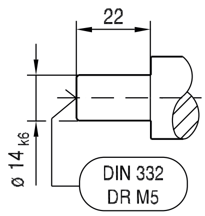
57 027 00 06

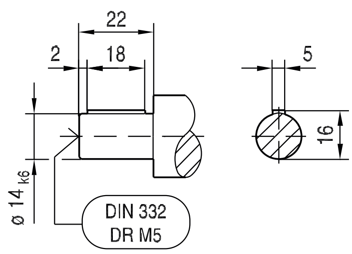
PSF122..



PSF



PSKF



(→ 194)	CMP..							
	40M	50S	50M	50L				
AC	57	73	73	73				
AD	78	86	86	86				
ADS	78	86	86	86				
L	295	296	335	374				
LS	325	325	364	403				
LB	156	157	196	235				
LBS	186	186	225	264				
XS	19	18	18	18				

14.2.3 PSF221

PSF221, M_{aDyn} Nm					55 Nm
	CMP				
i	50S	50M	50L	63S	63M
			1		
3.00	15	31	46	33	64
4.00	21	41	61	44	85
5.00	26	51	76	55	>80
7.00	36	71	>85	77	>85
10.00	51				

(→ 🗎 192)

PSF221, m kg					
	CMP				
s	50S	50M	50L	63S	63M
1	4.3	5.2	6.1	6.6	8.1

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSF221 1	3.00	7500	99	109.0	-0.092	0	126.0	-0.144	0	129.0	-0.181	0	6	3	1
	4.00	7500	99	153.0	-0.134	0	179.0	-0.210	0	181.0	-0.258	0	6	3	1
	5.00	7500	99	153.0	-0.142	0	179.0	-0.218	0	179.0	-0.264	0	6	3	1
	7.00	7500	99	169.0	-0.177	0	196.0	-0.260	0	202	-0.325	0	6	3	1
	10.00	7500	99	158.0	-0.197	0	183.0	-0.276	0	201	-0.377	0	6	3	1

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m^2	c_T PSF Nm/'	F_{Ramax} PSF N	F_{Rapk} PSF N
PSF221 1	3.00	40	65	98	2333	0.23	3.6	2870	2440
	4.00	55	85	128	1750	0.12	3.7	2680	1720
	5.00	55	80	120	1400	0.077	3.7	2680	1950
	7.00	55	85	128	1000	0.041	3.5	2680	1720
	10.00	55	62	93	700	0.020	2.8	2680	2520

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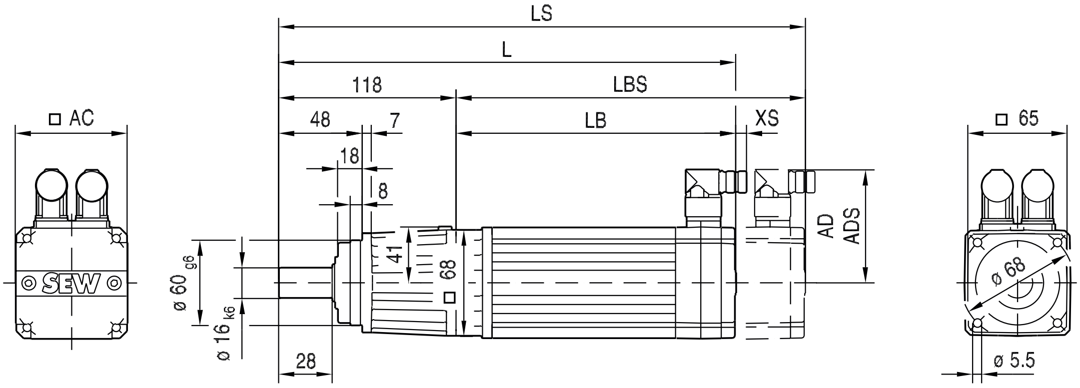
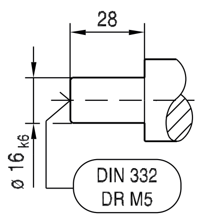
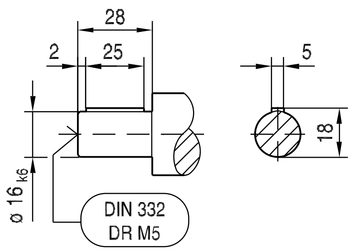
57 028 00 06

PSF221..







14

(→ 194)	CMP..							
	50S	50M	50L	63S	63M			
AC	73	73	73	88	88			
AD	86	86	86	92	92			
ADS	86	86	86	92	92			
L	269	308	347	304	354			
LS	298	337	376	333	383			
LB	151	190	229	186	236			
LBS	180	219	258	215	265			
XS	18	18	18	14	14			

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14.2.4 PSF222

PSF222, M_{aDyn} Nm				55 Nm
	CMP			
i	40M	50S	50M	50L
		2		
16.00	60	82	>85	>85
20.00	74	>80	>80	>80
25.00	>80	>80	>80	>80
28.00	>83	>83		
35.00	>80	>80		
40.00	>79			
49.00	>85	>85		
70.00	>85			
100.00	>62			

(→ 192)

PSF222, m kg				
	CMP			
s	40M	50S	50M	50L
2	4.3	5.1	6.0	6.9

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSF222 2	16.00	8000	98	395	-0.931	0	420	-1.392	0	428	-1.540	0	8	4	2
	20.00	8000	98	464	-1.314	0	494	-1.981	0	501	-2.143	0	8	4	2
	25.00	8000	98	470	-1.459	0	500	-2.116	0	506	-2.280	0	8	4	2
	28.00	8000	98	407	-1.253	0	431	-1.700	0	438	-1.852	0	8	4	2
	35.00	8000	98	487	-1.823	0	515	-2.476	0	522	-2.643	0	8	4	2
	40.00	8000	98	408	-1.599	0	429	-2.013	0	436	-2.159	0	8	4	2
	49.00	8000	98	705	-3.590	0	741	-4.860	0	747	-5.073	0	8	4	2
	70.00	8000	98	731	-4.806	0	762	-5.996	0	767	-6.205	0	8	4	2
	100.00	8000	98	804	-7.451	0	847	-9.401	0	851	-9.629	0	8	4	2

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSF Nm/'	F_{Ramax} PSF N	F_{Rapk} PSF N
PSF222 2	16.00	55	85	128	438	0.042	3.2	2680	1720
	20.00	55	80	120	350	0.028	3.3	2680	1950
	25.00	55	80	120	280	0.026	3.2	2680	1950
	28.00	55	83	125	250	0.014	3.1	2680	1820
	35.00	55	80	120	200	0.013	3.1	2680	1950
	40.00	55	79	119	175	0.007	2.8	2680	1990
	49.00	55	85	128	143	0.013	3.1	2680	1720
	70.00	55	85	128	100	0.006	2.9	2680	1720
	100.00	55	62	93	70	0.006	2.5	2680	2520

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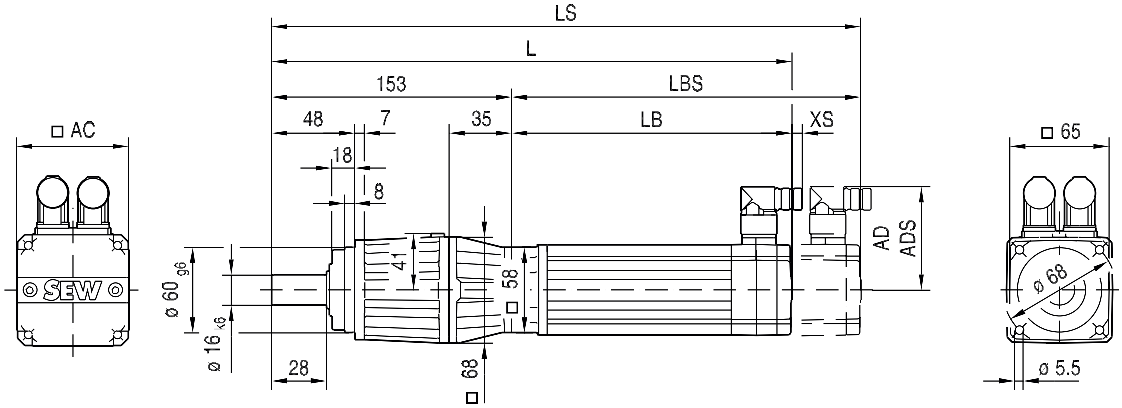
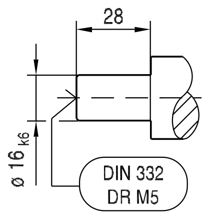
57 029 00 06

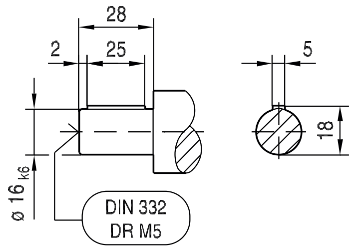
PSF222..



PSF



PSKF



(→ 194)	CMP..							
	40M	50S	50M	50L				
AC	57	73	73	73				
AD	78	86	86	86				
ADS	78	86	86	86				
L	309	310	349	388				
LS	339	339	378	417				
LB	156	157	196	235				
LBS	186	186	225	264				
XS	19	18	18	18				

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14.2.5 PSF321

PSF321, M_{aDyn} Nm								110 Nm
	CMP							
i	50S	50M	50L	63S	63M	63L	71S	71M
				1				
3.00		31	46	33	64	90	57	91
4.00	21	41	61	44	85	120	76	122
5.00	26	51	76	55	106	150	95	152
7.00	36	71	107	77	148	>168	133	>168
10.00	51	102	>121	110				

(→ 🗎 192)

PSF321, m kg								
	CMP							
s	50S	50M	50L	63S	63M	63L	71S	71M
1	6.7	7.6	8.5	8.0	9.5	11	12	13

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSF321 1	3.00	7000	99	205	-0.222	0	234	-0.327	0	288	-0.595	0	6	3	1
	4.00	7000	99	276	-0.316	0	312	-0.455	0	387	-0.833	0	6	3	1
	5.00	7000	99	290	-0.355	0	328	-0.501	0	414	-0.930	0	6	3	1
	7.00	7000	99	296	-0.418	0	335	-0.581	0	422	-1.036	0	6	3	1
	10.00	7000	99	269	-0.477	0	302	-0.617	0	374	-1.016	0	6	3	1

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	c_T PSF Nm/'	F_{Ramax} PSF N	F_{Rapk} PSF N
PSF321 1	3.00[1)]	85	125	188	2333	0.69	11	4380	5280
	4.00	110	170	255	1750	0.35	12	4770	4420
	5.00	110	169	250	1400	0.22	12	5100	4450
	7.00	110	168	250	1000	0.12	10	5480	4470
	10.00	110	121	182	700	0.059	7.6	5480	5330

1) (→ 🗎 192)

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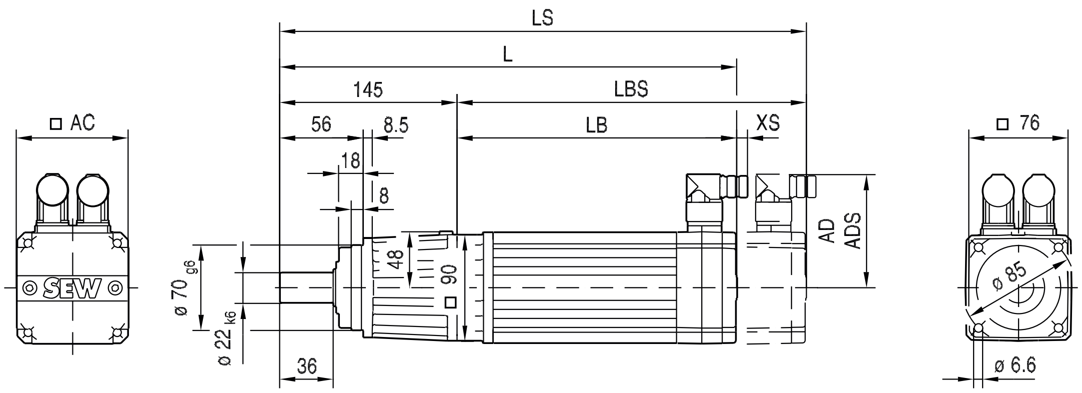
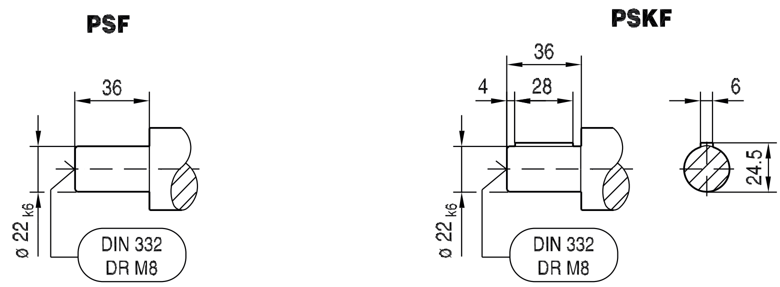
57 030 00 06

PSF321..





14

(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	291	330	369	326	376	426	318	343
LS	320	359	398	355	405	455	383	408
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

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14.2.6 PSF322

PSF322, M_{aDyn} Nm					110 Nm
	CMP				
i	50S	50M	50L	63S	63M
			2		
16.00	82	>153	>153	>153	>153
20.00	102	>169	>169	>169	>169
25.00	127	>169	>169	>169	>169
28.00	143	>145	>145	>145	>145
35.00	>169	>169	>169	>169	>169
40.00	>142				
49.00	>168	>168	>168	>168	>168
70.00	>168				
100.00	>121				

(→ 192)

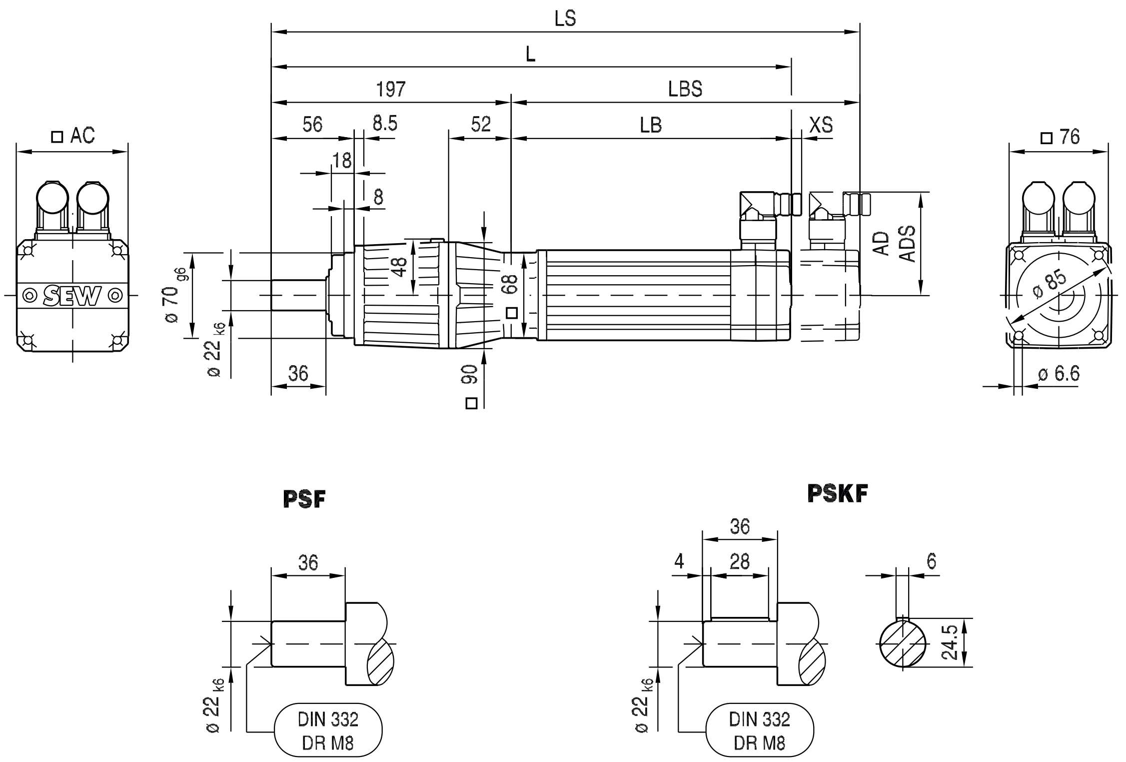
PSF322, m kg					
	CMP				
s	50S	50M	50L	63S	63M
2	7.2	8.1	9.0	9.4	11

CMP..				M1;M3;M5-6			M2			M4			φ		
		n_{epk}	η	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2		/R	/M
	i	min^{-1}	%										'	'	'
PSF322 2	16.00	7500	98	693	-1.590	0	736	-2.502	0	753	-2.875	0	8	4	2
	20.00	7500	98	935	-2.542	0	985	-4.030	0	999	-4.477	0	8	4	2
	25.00	7500	98	940	-2.681	0	989	-4.156	0	1003	-4.608	0	8	4	2
	28.00	7500	98	680	-1.829	0	724	-2.717	0	742	-3.091	0	8	4	2
	35.00	7500	98	954	-3.070	0	1004	-4.550	0	1018	-5.010	0	8	4	2
	40.00	7500	98	682	-2.172	0	722	-3.022	0	739	-3.390	0	8	4	2
	49.00	7500	98	1301	-5.595	0	1359	-8.341	0	1370	-8.888	0	8	4	2
	70.00	7500	98	1320	-6.848	0	1373	-9.478	0	1383	-10.018	0	8	4	2
	100.00	7500	98	1388	-10.042	0	1455	-14.090	0	1464	-14.638	0	8	4	2

CMP..							c_T	F_{Ramax}	F_{Rapk}
n_e = 1500		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	PSF	PSF	PSF
	i	Nm	Nm	Nm	min^{-1}	kg*m²	Nm/'	N	N
PSF322 2	16.00	110	153	230	438	0.042	9.0	5480	4800
	20.00	110	169	250	350	0.028	9.4	5480	4450
	25.00	110	169	250	280	0.026	9.2	5480	4450
	28.00	110	145	215	250	0.014	8.8	5480	4950
	35.00	110	169	250	200	0.013	9.0	5480	4450
	40.00	110	142	210	175	0.007	7.7	5480	5000
	49.00	110	168	250	143	0.013	8.7	5480	4470
	70.00	110	168	250	100	0.006	8.1	5480	4470
	100.00	110	121	182	70	0.006	6.4	5480	5330

57 031 00 06

PSF322..



(→ 194)	CMP..							
	50S	50M	50L	63S	63M			
AC	73	73	73	88	88			
AD	86	86	86	92	92			
ADS	86	86	86	92	92			
L	348	387	426	383	433			
LS	377	416	455	412	462			
LB	151	190	229	186	236			
LBS	180	219	258	215	265			
XS	18	18	18	14	14			

14.2.7 PSF521

PSF521, M_{aDyn} Nm											300 Nm
	CMP										
i	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
						1					
3.00								139	125	186	>280
4.00				85	120	76	122	186	167	245	>385
5.00	51	76	55	106	150	95	152	230	205	305	>375
7.00	71	107	77	148	210	133	210	325	290	>360	
10.00	102	152	110	210	>270	190	>270				

(→ 🗎 192)

PSF521, m kg											
	CMP										
s	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
1	10	11	12	13	15	16	17	19	22	24	28

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSF521 1	3.00	6000	99	445	-0.542	0	515	-0.834	0	676	-1.697	0	6	3	1
	4.00	6000	99	626	-0.806	0	736	-1.274	0	955	-2.483	0	6	3	1
	5.00	6000	99	633	-0.860	0	747	-1.345	0	964	-2.554	0	6	3	1
	7.00	6000	99	670	-1.029	0	805	-1.596	0	1024	-2.855	0	6	3	1
	10.00	6000	99	651	-1.253	0	752	-1.709	0	937	-2.831	0	6	3	1

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSF Nm/'	F_{Ramax} PSF N	F_{Rapk} PSF N
PSF521 1	3.00[1)]	180	280	420	2333	2.7	29	6150	9540
	4.00[1)]	300	385	575	1750	1.4	32	6700	8680
	5.00	300	375	560	1400	0.92	32	7170	8780
	7.00	300	360	540	1000	0.48	28	7930	8920
	10.00	270	270	405	700	0.24	20	8820	9610

1) (→ 🗎 192)

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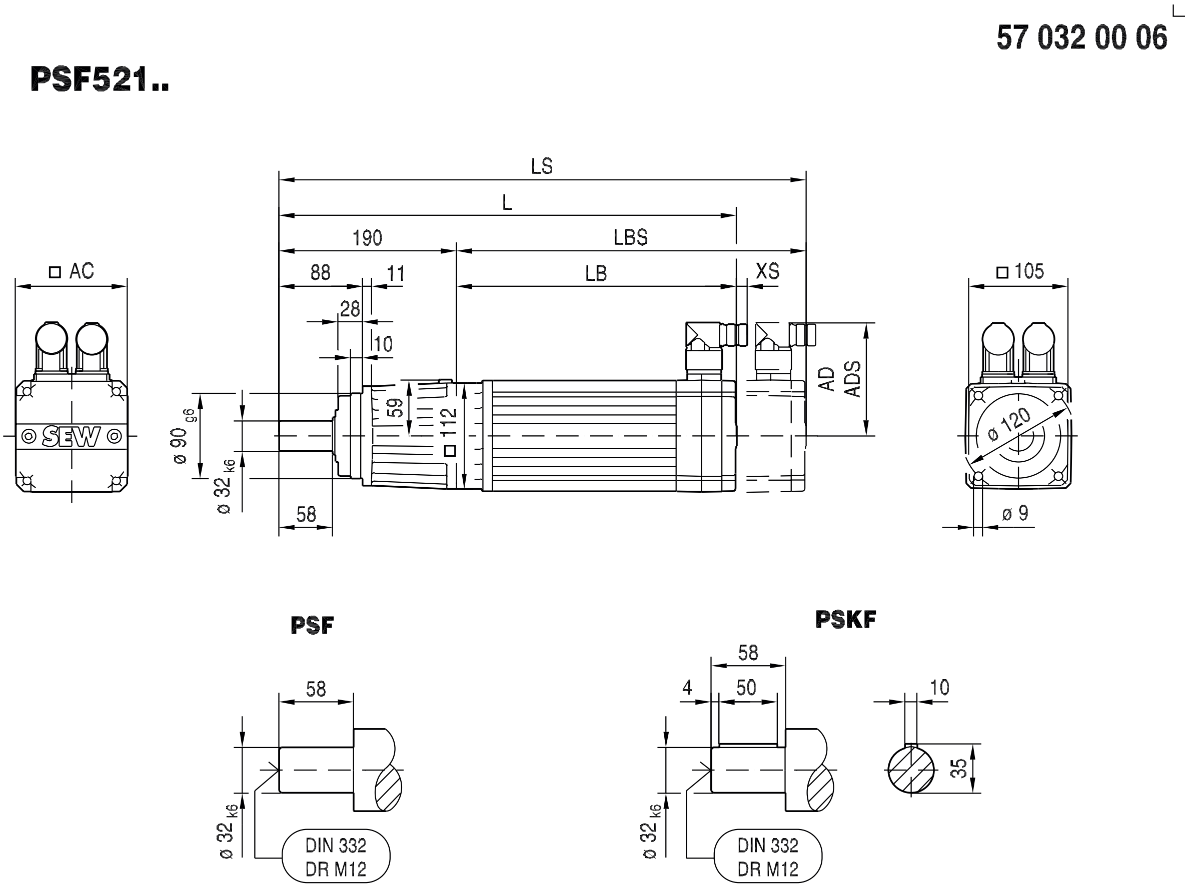

(→ 194)	CMP..										
	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
AC	73	73	88	88	88	116	116	116	137	137	137
AD	86	86	92	92	92	102	102	102	134	134	134
ADS	86	86	92	92	92	104	104	104	137	137	137
L	370	409	366	416	466	357	382	432	397	432	499
LS	399	438	394	444	494	422	447	497	474	509	576
LB	180	219	176	226	276	168	193	243	207	242	309
LBS	209	248	205	255	305	233	258	308	285	320	387
XS	18	18	14	14	14	11	11	11	37	37	37

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14.2.8 PSF522

PSF522, M_{aDyn} Nm								300 Nm
	CMP							
i	50S	50M	50L	63S	63M	63L	71S	71M
	2							
16.00	82	162	240	174	335	>385	300	>385
20.00	102	200	300	215	>375	>375	>375	>375
25.00	127	250	>375	270	>375	>375	>375	>375
28.00	143	280	>385	300	>385	>385	>385	>385
35.00	178	350	>375	>375	>375	>375	>375	>375
40.00	200	>385	>385	>385				
49.00	245	>360	>360	>360	>360	>360	>360	>360
70.00	355	>360	>360	>360				
100.00	>270	>270	>270	>270				

(→ 192)

PSF522, m kg								
	CMP							
s	50S	50M	50L	63S	63M	63L	71S	71M
2	13	14	15	14	16	17	18	20

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSF522 2	16.00	7000	98	1693	-4.596	0	1768	-6.918	0	1799	-7.953	0	8	4	2
	20.00	7000	98	2049	-6.570	0	2137	-10.008	0	2165	-11.165	0	8	4	2
	25.00	7000	98	2067	-7.064	0	2156	-10.472	0	2185	-11.648	0	8	4	2
	28.00	7000	98	1725	-5.702	0	1795	-7.950	0	1826	-8.993	0	8	4	2
	35.00	7000	98	2088	-8.253	0	2170	-11.570	0	2198	-12.735	0	8	4	2
	40.00	7000	98	2113	-8.808	0	2196	-12.031	0	2200	-12.202	0	8	4	2
	49.00	7000	98	2800	-14.817	0	2911	-20.955	0	2936	-22.376	0	8	4	2
	70.00	7000	98	2835	-18.631	0	2927	-24.316	0	2948	-25.681	0	8	4	2
	100.00	7000	98	2975	-17.931	0	3121	-27.884	0	3141	-29.379	0	8	4	2

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m^2	c_T PSF Nm/'	F_{Ramax} PSF N	F_{Rapk} PSF N
PSF522 2	16.00	300	385	575	431	0.38	24	9400	8680
	20.00	300	375	560	350	0.24	25	9400	8780
	25.00	300	375	560	280	0.23	25	9400	8780
	28.00	300	385	575	250	0.13	23	9400	8680
	35.00	300	375	560	200	0.12	24	9400	8780
	40.00	300	385	575	175	0.064	19	9400	8680
	49.00	300	360	540	143	0.11	23	9400	8920
	70.00	300	360	540	100	0.055	20	9400	8920
	100.00	270	270	405	70	0.052	17	9610	9610

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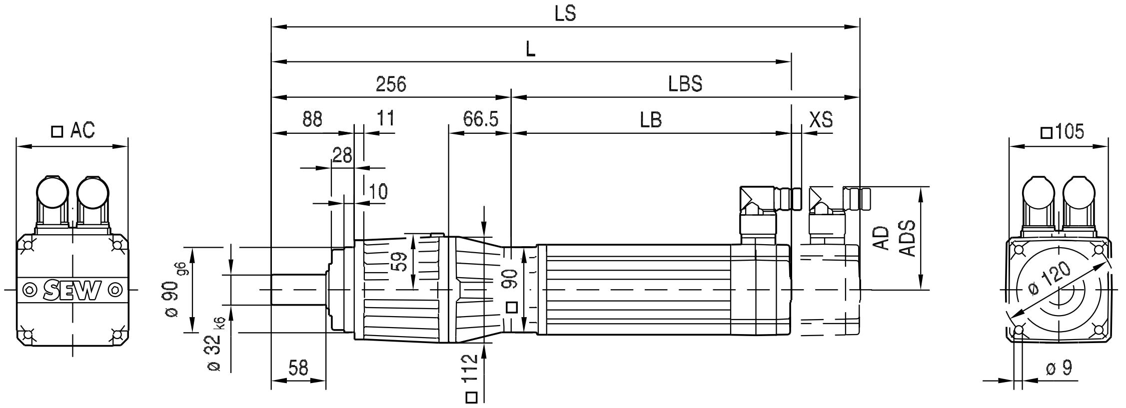
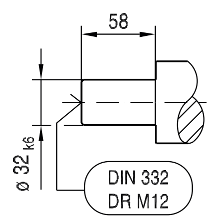
57 033 00 06

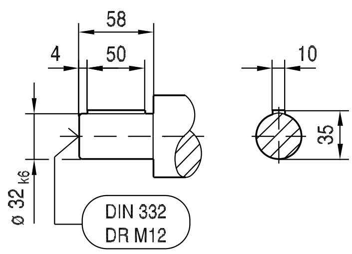
PSF522..



PSF



PSKF



14

(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	402	441	480	437	487	537	429	454
LS	431	470	509	466	516	566	494	519
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

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14.2.9 PSF621

PSF621, M_{aDyn} Nm													600 Nm
	CMP												
i	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
							1						
4.00				186	167	245	420	270	425	705	345	535	>745
5.00	150		152	230	205	305	525	335	530	>700	435	670	>700
7.00	210		210	325	290	430	>660	470	>660		605		
10.00	300	190	300	460	415	>500		>500					

(→ 🗎 192)

PSF621, m kg													
	CMP												
s	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
1	23	25	26	28	31	33	37	38	42	51	56	64	80

CMP..				M1;M3;M5-6			M2			M4			φ		
		n_{epk}	η	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2		/R	/M
	i	min^{-1}	%										'	'	'
PSF621 1	4.00	6000	99	1186	-1.675	0	1399	-2.659	0	1830	-5.404	0	4	2	1
	5.00	6000	99	1176	-1.751	0	1402	-2.761	0	1836	-5.516	0	4	2	1
	7.00	6000	99	1290	-2.268	0	1505	-3.257	0	1948	-6.140	0	4	2	1
	10.00	6000	99	1059	-1.739	0	1306	-2.710	0	1764	-5.445	0	4	2	1

CMP..							c_T	F_{Ramax}	F_{Rapk}
n_e = 1500		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	PSF	PSF	PSF
	i	Nm	Nm	Nm	min^{-1}	kg*m^2	Nm/'	N	N
PSF621 1	4.00[1]	570	745	1110	1750	4.4	57	13400	13400
	5.00[1]	595	700	1050	1400	2.9	56	13900	13500
	7.00	600	660	990	1000	1.5	50	13900	13700
	10.00	500	500	750	700	0.74	38	14200	14200

1) (→ 🗎 192)

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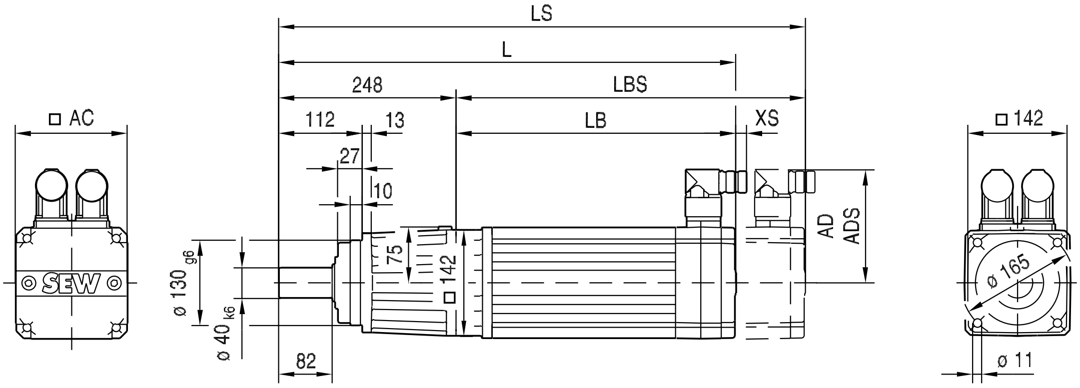
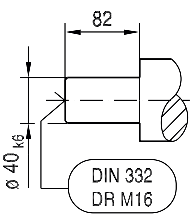
57 034 01 06

PSF621..

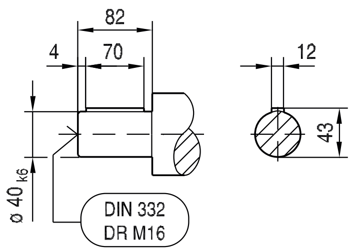


14

PSF



PSKF



(→ 🗎 194)	CMP..											
	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	104	104	104	137	137	137	147	147	147	177	177	213
L	516	408	433	483	447	481	544	479	514	594	587	630	718
LS	545	473	498	548	525	559	622	575	610	690	708	751	839
LB	268	160	185	235	199	233	296	231	266	346	339	382	470
LBS	297	225	250	300	277	311	374	327	362	442	460	503	591
XS	14	11	11	11	37	37	37	37	37	37	32	32	49

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14.2.10 PSF622

PSF622, M_{aDyn} Nm											600 Nm
	CMP										
i	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
2											
16.00				335	475	300	480	735	660	>745	>745
20.00				415	595	375	600	>700	>700	>700	>700
25.00	250	375	270	520	>700	470	>700	>700	>700	>700	>700
28.00	280	420	300	585	>745	525	>745	>745	>745	>745	
35.00	350	525	380	>700	>700	655	>700	>700	>700	>700	
40.00	400	600	435	>745	>745	>745	>745				
49.00	490	>660	530	>660	>660	>660	>660	>660	>660	>660	
70.00	>660	>660	>660	>660	>660	>660	>660				
100.00	>500	>500	>500	>500	>500	>500	>500				

(→ 192)

PSF622, m kg											
	CMP										
s	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
2	24	25	25	27	28	29	31	33	36	38	42

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSF622 2	16.00	6000	98	3293	-10.831	0	3456	-16.701	0	3522	-19.230	0	6	3	1
	20.00	6000	98	3862	-15.068	0	4060	-23.639	0	4119	-26.381	0	6	3	1
	25.00	6000	98	3882	-15.952	0	4077	-24.400	0	4137	-27.172	0	6	3	1
	28.00	6000	98	3364	-13.110	0	3525	-18.875	0	3593	-21.462	0	6	3	1
	35.00	6000	98	3947	-18.429	0	4142	-26.831	0	4203	-29.636	0	6	3	1
	40.00	6000	98	4123	-20.365	0	4308	-29.086	0	4315	-29.467	0	6	3	1
	49.00	6000	98	5210	-32.632	0	5478	-48.160	0	5532	-51.505	0	6	3	1
	70.00	6000	98	5151	-30.585	0	5408	-46.036	0	5460	-49.332	0	6	3	1
	100.00	6000	98	5704	-46.981	0	6059	-72.179	0	6105	-75.729	0	6	3	1

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSF Nm/'	F_{Ramax} PSF N	F_{Rapk} PSF N
PSF622 2	16.00	600	745	1110	306	1.4	48	13900	13400
	20.00	600	700	1050	230	0.95	49	13900	13500
	25.00	600	700	1050	228	0.89	48	13900	13500
	28.00	600	745	1110	250	0.50	45	13900	13400
	35.00	600	700	1050	200	0.47	46	13900	13500
	40.00	600	745	1110	175	0.25	39	13900	13400
	49.00	600	660	990	143	0.44	43	13900	13700
	70.00	600	660	990	100	0.22	40	13900	13700
	100.00	500	500	750	70	0.21	33	14200	14200

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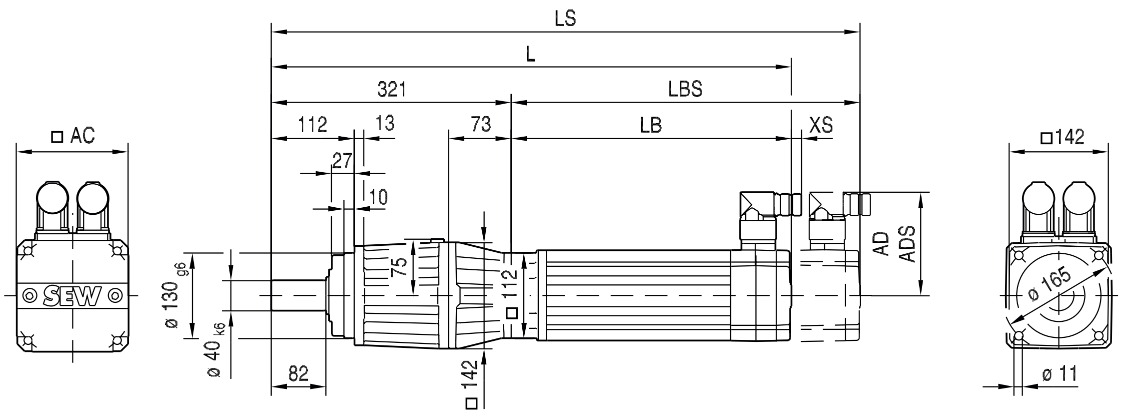
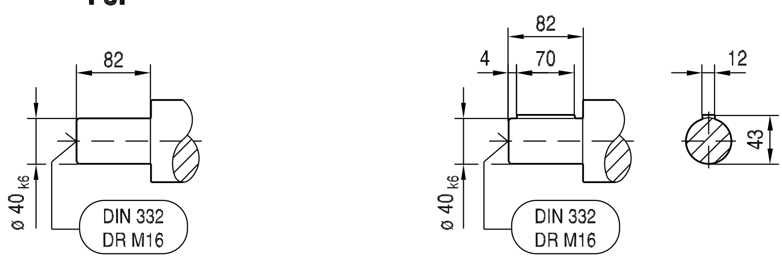
57 035 00 06

PSF622..





(→ 194)	CMP..										
	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
AC	73	73	88	88	88	116	116	116	137	137	137
AD	86	86	92	92	92	102	102	102	134	134	134
ADS	86	86	92	92	92	104	104	104	137	137	137
L	501	540	497	547	597	489	514	564	528	563	630
LS	530	569	526	576	626	554	579	629	606	641	708
LB	180	219	176	226	276	168	193	243	207	242	309
LBS	209	248	205	255	305	233	258	308	285	320	387
XS	18	18	14	14	14	11	11	11	37	37	37

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14.2.11 PSF721

PSF721, M_{aDyn} Nm											1000 Nm
	CMP										
i	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
						1					
4.00			420		425	705	345	535	890	1060	1260
5.00			525		530	880	435	670	1110	1330	>1540
7.00	290	430	740	470	745	1230	605	940	>1380		
10.00	415	615	>1050	675	>1050		870				

(→ 🗎 192)

PSF721, m kg											
	CMP										
s	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
1	45	48	52	53	57	65	70	78	94	100	110

CMP..				M1;M3;M5-6			M2			M4			φ		
		n_{epk}	η	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2		/R	/M
	i	min^{-1}	%										'	'	'
PSF721 1	4.00	4500	99	2288	-3.437	0	2722	-5.815	0	3473	-11.679	0	4	2	1
	5.00	4500	99	2309	-3.570	0	2746	-5.951	0	3503	-11.878	0	4	2	1
	7.00	4500	99	2377	-4.171	0	2811	-6.427	0	3629	-12.643	0	4	2	1
	10.00	4500	99	2233	-4.553	0	2602	-6.455	0	3361	-12.221	0	4	2	1

CMP..							c_T	F_{Ramax}	F_{Rapk}
n_e = 1000		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	PSF	PSF	PSF
	i	Nm	Nm	Nm	min^{-1}	kg*m^2	Nm/'	N	N
PSF721 1	4.00[1)]	1000	1550	2320	1750	13	146	25700	34800
	5.00[1)]	1000	1540	2310	1400	8.6	143	27500	34500
	7.00	1000	1380	2070	1000	4.5	125	30400	35000
	10.00	1000	1050	1570	700	2.2	91	33800	35800

1) (→ 🗎 192)

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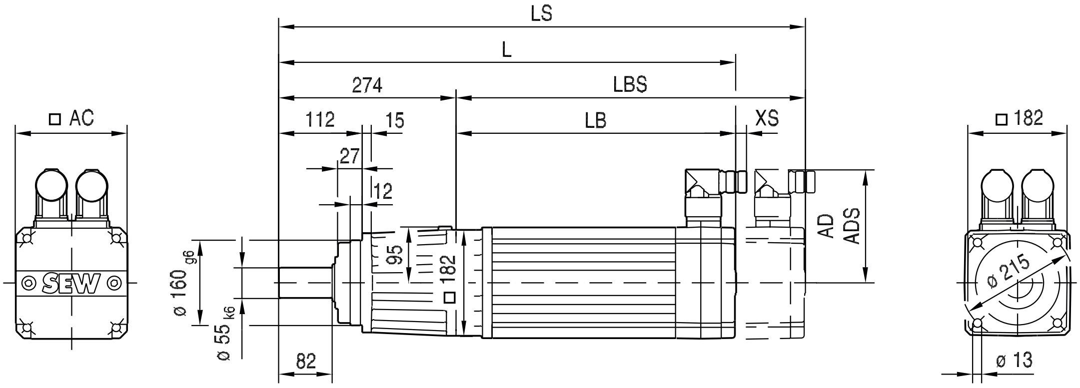
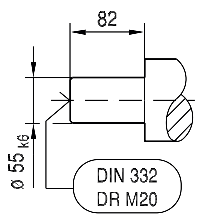
57 036 01 06

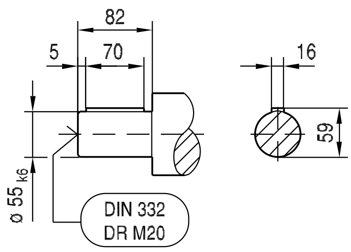
PSF721..



PSF



PSKF



14

(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	469	503	566	501	536	616	609	652	740	783	826
LS	547	581	644	597	632	712	730	773	861	904	947
LB	195	229	292	227	262	342	335	378	466	509	552
LBS	273	307	370	323	358	438	456	499	587	630	673
XS	37	37	37	37	37	37	32	32	49	49	49

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14.2.12 PSF722

PSF722, M_{aDyn} Nm										1000 Nm
	CMP										
i	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
2											
16.00				335	475	300	480	735	660	980	>1470
20.00				415	595	375	600	910	820	1220	>1540
25.00	250	375	270	520	740	470	750	1140	1030	1530	>1540
28.00	280	420	300	585	830	525	840	1280	1150	>1350	
35.00	350	525	380	730	1040	655	1050	>1540	1440	>1540	
40.00	400	600	435	830	>1080	750	>1080				
49.00	490	735	530	1020	>1380	920	>1380	>1380	>1380	>1380	
70.00	705	1050	760	>1380	>1380	1310	>1380				
100.00	1000	>1050	>1050	>1050	>1050	>1050	>1050				

(→ 192)

PSF722, m kg											
	CMP										
s	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
2	39	40	40	42	43	44	45	48	51	53	57

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSF722 2	16.00	6000	98	6248	-18.724	0	6419	-27.393	0	6540	-33.764	0	6	3	1
	20.00	6000	98	8093	-27.896	0	8287	-41.591	0	8390	-49.074	0	6	3	1
	25.00	6000	98	8111	-29.118	0	8302	-42.577	0	8406	-50.110	0	6	3	1
	28.00	6000	98	5856	-20.036	0	6035	-27.957	0	6166	-34.034	0	6	3	1
	35.00	6000	98	8173	-32.581	0	8369	-46.040	0	8472	-53.380	0	6	3	1
	40.00	6000	98	7985	-33.347	0	8188	-47.251	0	8195	-47.773	0	6	3	1
	49.00	6000	98	10281	-53.310	0	10553	-76.611	0	10647	-85.056	0	6	3	1
	70.00	6000	98	10349	-63.944	0	10585	-85.795	0	10671	-94.005	0	6	3	1
	100.00	6000	98	10932	-92.849	0	11268	-126.5	0	11344	-134.5	0	6	3	1

CMP.. n_e = 1000	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSF Nm/'	F_{Ramax} PSF N	F_{Rapk} PSF N
PSF722 2	16.00	1000	1470	2200	181	2.0	104	36400	35100
	20.00	1000	1540	2310	345	1.3	109	35900	34500
	25.00	1000	1540	2310	280	1.1	106	35900	34500
	28.00	1000	1350	2020	168	0.68	90	36400	35500
	35.00	1000	1540	2310	200	0.58	95	35900	34500
	40.00	1000	1080	1620	140	0.33	71	36400	36200
	49.00	1000	1380	2070	143	0.50	93	35900	35000
	70.00	1000	1380	2070	100	0.25	80	35900	35000
	100.00	1000	1050	1570	70	0.22	69	35900	35800

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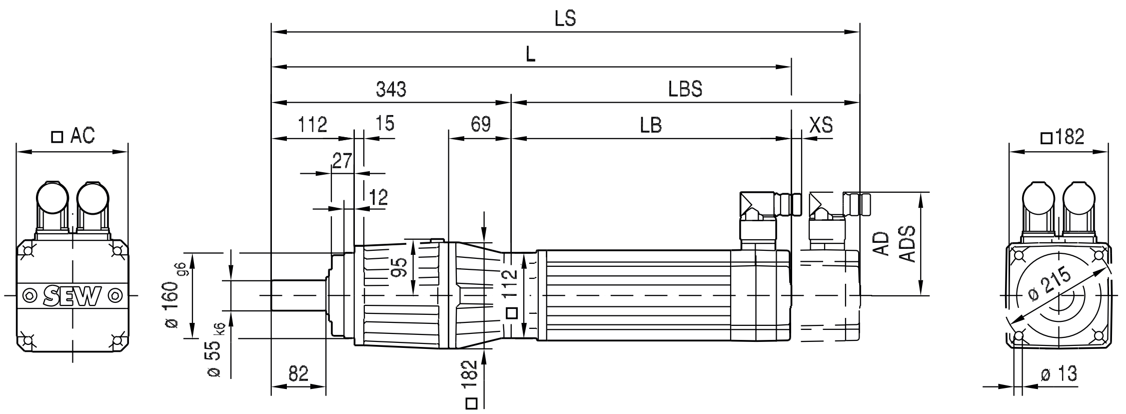
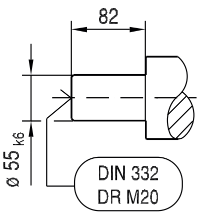
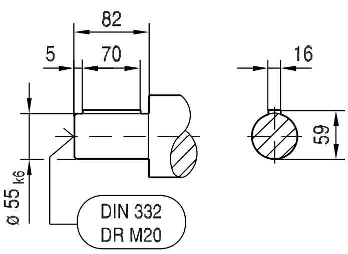
57 037 00 06

PSF722..







(→ 194)	CMP..										
	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
AC	73	73	88	88	88	116	116	116	137	137	137
AD	86	86	92	92	92	102	102	102	134	134	134
ADS	86	86	92	92	92	104	104	104	137	137	137
L	523	562	519	569	619	511	536	586	550	585	652
LS	552	591	548	598	648	576	601	651	628	663	730
LB	180	219	176	226	276	168	193	243	207	242	309
LBS	209	248	205	255	305	233	258	308	285	320	387
XS	18	18	14	14	14	11	11	11	37	37	37

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14.2.13 PSF822

PSF822, M_{aDyn} Nm													1750 Nm
	CMP												
i	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
2													
16.00				735	660	980	1670	1070	1690	>2500	1370	2130	>2500
20.00				910	820	1220	2090	1330	2110	>2500	1720	>2500	>2500
25.00	740		750	1140	1030	1530	>2500	1670	>2500	>2500	2150	>2500	>2500
28.00	830		840	1280	1150	1710	>2500	1870	>2500		2410		
35.00	1040		1050	1600	1440	2140	>2500	2340	>2500		>2500		
40.00	1190	750	1200	1830	1650	>2000		>2000					
49.00	1450		1470	2250	2020	>2740	>2740	>2740	>2740		>2740		
70.00	2080	1310	2110	>2740	>2740	>2740		>2740					
100.00	>2060	1880	>2060	>2060	>2060	>2060		>2060					

(→ 192)

PSF822, m kg													
	CMP												
s	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
2	63	64	66	68	71	73	77	78	82	91	95	105	120

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min⁻¹	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSF822 2	16.00	6000	98	10695	-37.174	0	11011	-53.950	0	11241	-66.852	0	6	3	1
	20.00	6000	98	13255	-52.892	0	13621	-78.213	0	13824	-92.932	0	6	3	1
	25.00	6000	98	13291	-55.363	0	13651	-80.228	0	13855	-95.019	0	6	3	1
	28.00	6000	98	10831	-43.173	0	11147	-59.459	0	11389	-72.680	0	6	3	1
	35.00	6000	98	13415	-62.268	0	13778	-86.692	0	13987	-101.5	0	6	3	1
	40.00	6000	98	15109	-61.565	0	15482	-92.709	0	15500	-94.299	0	6	3	1
	49.00	6000	98	20265	-122.3	0	20717	-172.3	0	20886	-191.9	0	6	3	1
	70.00	6000	98	20427	-148.5	0	20821	-194.2	0	20976	-213.2	0	6	3	1
	100.00	6000	98	22241	-222.4	0	22779	-293.8	0	22915	-313.1	0	6	3	1

CMP.. n_e = 1000	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min⁻¹	J_G 10^{-4} kg*m²	c_T PSF Nm/'	F_{Ramax} PSF N	F_{Rapk} PSF N
PSF822 2	16.00	1750	2500	3750	225	7.1	298	51400	61700
	20.00	1750	2500	3750	265	4.6	314	54900	61700
	25.00	1750	2500	3750	268	3.9	302	58700	61700
	28.00	1750	2500	3750	161	2.4	254	60700	61700
	35.00	1750	2500	3750	200	2.0	270	62800	61700
	40.00	1750	2000	3000	168	1.2	183	62800	62500
	49.00	1750	2740	4110	143	1.7	278	62800	61200
	70.00	1750	2740	4110	100	0.83	223	62800	61200
	100.00	1750	2060	3090	70	0.75	207	62800	62400

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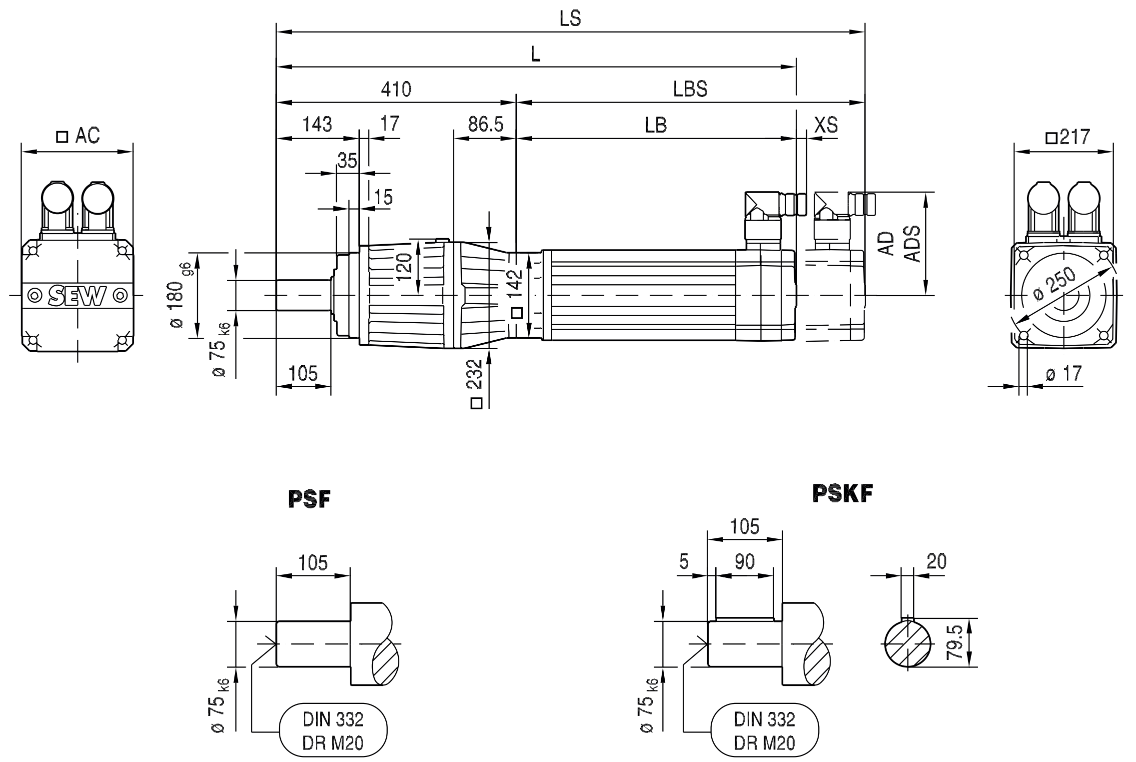
PSF822..



(→ 194)	CMP..											
	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	104	104	104	137	137	137	147	147	147	177	177	213
L	679	570	595	645	610	644	707	641	676	756	750	793	881
LS	707	635	660	710	687	721	784	737	772	852	871	914	1002
LB	268	160	185	235	199	233	296	231	266	346	339	382	470
LBS	297	225	250	300	277	311	374	327	362	442	460	503	591
XS	14	11	11	11	37	37	37	37	37	37	32	32	49

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14.2.14 PSF922

PSF922, M_{aDyn} Nm											3000 Nm
	CMP										
i	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
	2										
16.00			1670		1690	2800	1370	2130	3520	>4200	>4200
20.00			2090		2110	3500	1720	2660	>4200	>4200	>4200
25.00			2620		2640	>4200	2150	3330	>4200	>4200	>4200
28.00	1150	1710	2930	1870	2960	>4200	2410	3730	>4200		
35.00	1440	2140	3670	2340	3700	>4200	3010	>4200	>4200		
40.00	1650	2450	4190	2670	>4200		3440				
49.00	2020	3000	>3310	3270	>3310	>3310	>3310	>3310	>3310		
70.00	2880	>4200	>4200	>4200	>4200		>4200				
100.00	>3230	>3230	>3230	>3230	>3230		>3230				

(→ 192)

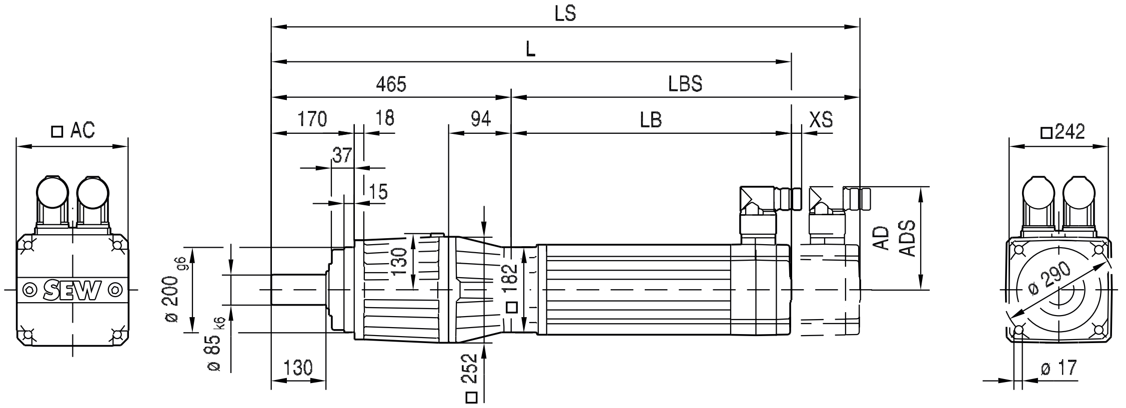
PSF922, m kg											
	CMP										
s	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
2	93	96	100	100	105	115	120	125	140	150	160

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSF922 2	16.00	4500	98	18019	-87.313	0	18512	-122.2	0	18760	-140.6	0	6	3	1
	20.00	4500	98	22195	-112.3	0	22797	-168.0	0	23014	-189.1	0	6	3	1
	25.00	4500	98	22223	-114.6	0	22823	-170.0	0	23043	-191.3	0	6	3	1
	28.00	4500	98	18152	-93.738	0	18665	-128.8	0	18922	-147.4	0	6	3	1
	35.00	4500	98	22344	-122.4	0	22965	-178.1	0	23196	-199.8	0	6	3	1
	40.00	4500	98	24315	-124.5	0	24942	-190.8	0	24966	-193.5	0	6	3	1
	49.00	4500	98	24944	-168.2	0	25916	-260.1	0	26129	-281.5	0	6	3	1
	70.00	4500	98	31109	-237.7	0	31884	-343.4	0	32073	-370.4	0	6	3	1
	100.00	4500	98	34499	-356.5	0	35563	-527.1	0	35722	-554.0	0	6	3	1

CMP.. n_e = 1000	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSF Nm/'	F_{Ramax} PSF N	F_{Rapk} PSF N
PSF922 2	16.00	3000	4200	6300	250	17	398	55000	81600
	20.00	3000	4200	6300	250	11	420	58800	81600
	25.00	3000	4200	6300	248	9.5	417	62800	81600
	28.00	3000	4200	6300	250	5.7	368	65000	81600
	35.00	3000	4200	6300	200	5.0	389	69500	81600
	40.00	3000	4200	6300	175	2.8	289	72300	81600
	49.00	3000	3310	4960	143	4.4	400	76900	82900
	70.00	3000	4200	6300	100	2.2	341	83300	81600
	100.00	3000	3230	4840	70	2.0	317	83300	83000

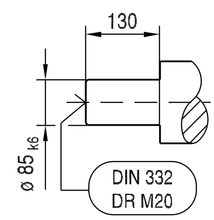
57 050 01 06

PSF922..

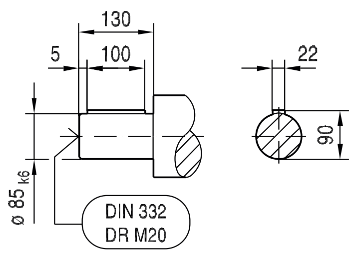


14

PSF



PSKF



(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	660	694	757	692	727	807	800	843	931	974	1017
LS	738	772	835	788	823	903	921	964	1052	1095	1138
LB	195	229	292	227	262	342	335	378	466	509	552
LBS	273	307	370	323	358	438	456	499	587	630	673
XS	37	37	37	37	37	37	32	32	49	49	49

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14.3 PSBF221–822..CMP.. selection tables and dimension sheets

14.3.1 PSBF221

PSBF221, M_{aDyn} Nm					55 Nm
	CMP				
i	50S	50M	50L	63S	63M
	1				
5.00	26	51	76	55	>80
7.00	36	71	>85	77	>85
10.00	51				

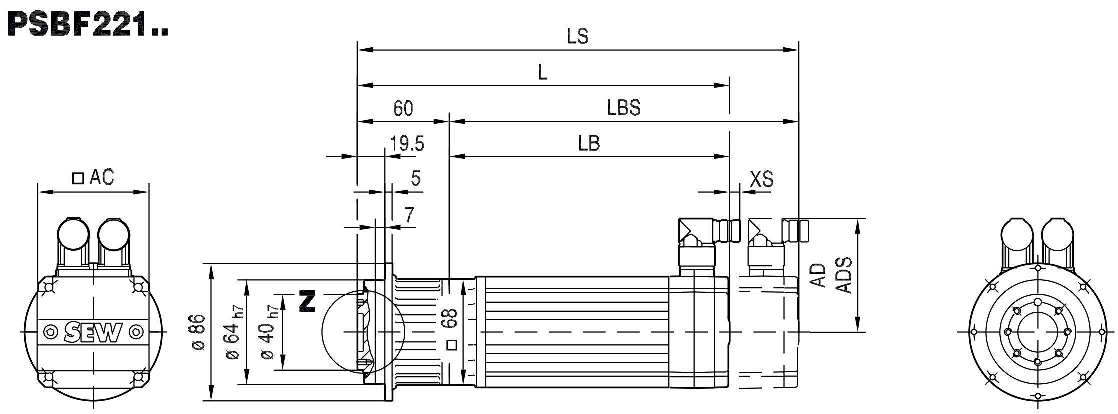
	(→ 🗎 192)

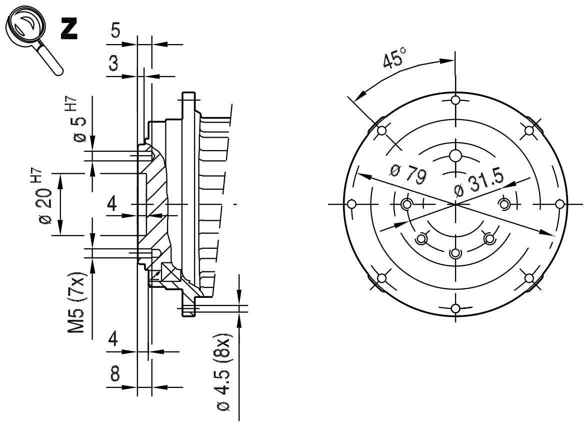
PSBF221, m kg					
	CMP				
s	50S	50M	50L	63S	63M
1	3.8	4.7	5.6	6.1	7.6

CMP..				M1;M3;M5-6			M2			M4			φ		
		n_{epk}	η	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2		/R	/M
	i	min^{-1}	%										'	'	'
PSBF221 1	5.00	7500	99	159.0	-0.210	0	191.0	-0.298	0	235	-0.521	0	6	3	1
	7.00	7500	99	176.0	-0.256	0	210	-0.355	0	264	-0.627	0	6	3	1
	10.00	7500	99	169.0	-0.292	0	199.0	-0.378	0	257	-0.664	0	6	3	1

CMP..							c_T	F_{Ramax}	F_{Rapk}
n_e = 1500		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	PSBF	PSBF	PSBF
	i	Nm	Nm	Nm	min^{-1}	kg*m²	Nm/'	N	N
PSBF221 1	5.00	55	80	120	1400	0.10	16	1530	5000
	7.00	55	85	128	1000	0.054	14	1720	5000
	10.00	55	62	93	700	0.026	7.3	1930	5000

57 038 01 06





14

(→ 194)	CMP..							
	50S	50M	50L	63S	63M			
AC	73	73	73	88	88			
AD	86	86	86	92	92			
ADS	86	86	86	92	92			
L	211	250	289	246	296			
LS	240	279	318	274	324			
LB	151	190	229	186	236			
LBS	180	219	258	215	265			
XS	18	18	18	14	14			

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14.3.2 PSBF222

PSBF222, M_{aDyn} Nm				55 Nm
	CMP			
i	40M	50S	50M	50L
	2			
20.00	74	>80	>80	>80
25.00	>80	>80	>80	>80
35.00	>80	>80		
49.00	>85	>85		
70.00	>85			
100.00	>62			

(→ 192)

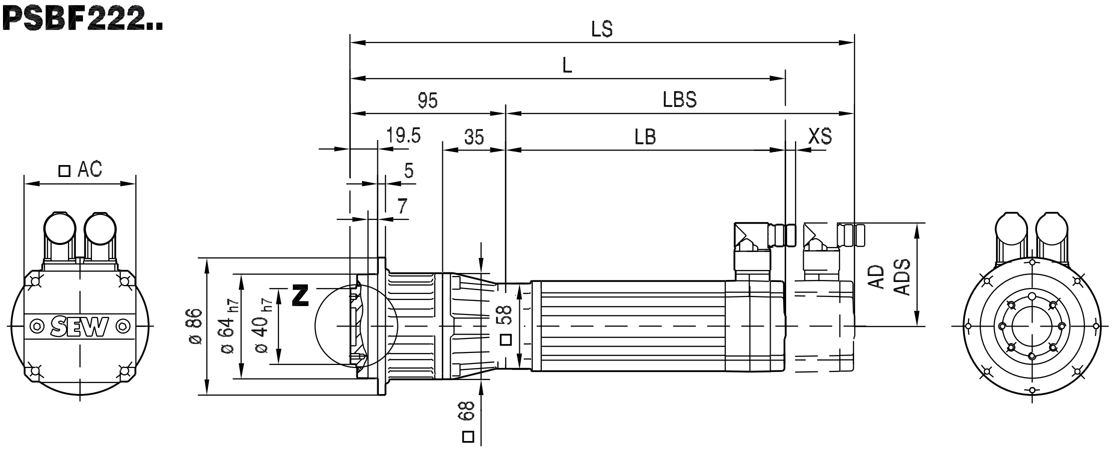
PSBF222, m kg				
	CMP			
s	40M	50S	50M	50L
2	3.6	4.4	5.3	6.2

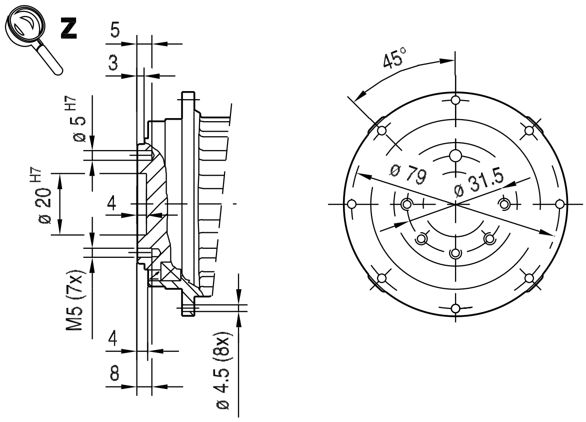
CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSBF222 2	20.00	8000	98	467	-1.519	0	494	-2.141	0	503	-2.381	0	8	4	2
	25.00	8000	98	474	-1.678	0	499	-2.287	0	509	-2.530	0	8	4	2
	35.00	8000	98	490	-2.072	0	515	-2.672	0	524	-2.920	0	8	4	2
	49.00	8000	98	707	-3.982	0	740	-5.188	0	747	-5.494	0	8	4	2
	70.00	8000	98	731	-5.276	0	760	-6.392	0	766	-6.690	0	8	4	2
	100.00	8000	98	803	-8.062	0	843	-9.932	0	849	-10.245	0	8	4	2

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	c_T PSBF Nm/'	F_{Ramax} PSBF N	F_{Rapk} PSBF N
PSBF222 2	20.00	55	80	120	350	0.041	10	2430	5000
	25.00	55	80	120	280	0.027	9.8	2620	5000
	35.00	55	80	120	200	0.014	9.0	2930	5000
	49.00	55	85	128	143	0.013	9.1	3280	5000
	70.00	55	85	128	100	0.006	7.7	3700	5000
	100.00	55	62	93	70	0.006	5.3	4160	5000

57 039 01 06

PSBF222..





(→ 194)	CMP..							
	40M	50S	50M	50L				
AC	57	73	73	73				
AD	78	86	86	86				
ADS	78	86	86	86				
L	250	252	291	330				
LS	280	281	320	359				
LB	156	157	196	235				
LBS	186	186	225	264				
XS	19	18	18	18				

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14.3.3 PSBF321

PSBF321, M_{aDyn} Nm								110 Nm
	CMP							
i	50S	50M	50L	63S	63M	63L	71S	71M
				1				
5.00	26	51	76	55	106	150	95	152
7.00	36	71	107	77	148	>168	133	>168
10.00	51	102	>121	110				

(→ 🗎 192)

PSBF321, m kg								
	CMP							
s	50S	50M	50L	63S	63M	63L	71S	71M
1	6.7	7.6	8.5	8.0	9.5	11	12	13

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSBF321 1	5.00	7000	99	362	-0.643	0	418	-0.819	0	634	-2.212	0	6	3	1
	7.00	7000	99	385	-0.780	0	413	-0.871	0	610	-2.203	0	6	3	1
	10.00	7000	99	362	-0.853	0	367	-0.862	0	539	-2.051	0	6	3	1

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSBF Nm/'	F_{Ramax} PSBF N	F_{Rapk} PSBF N
PSBF321 1	5.00[1)]	110	169	250	1400	0.51	39	8580	25000
	7.00	110	168	250	1000	0.27	29	9500	25000
	10.00	110	121	182	700	0.13	14	10600	25000

1) (→ 🗎 192)

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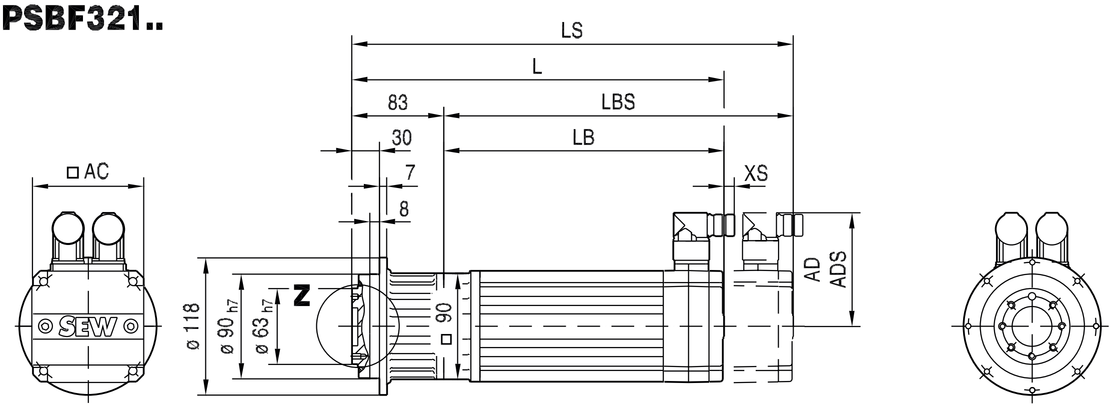
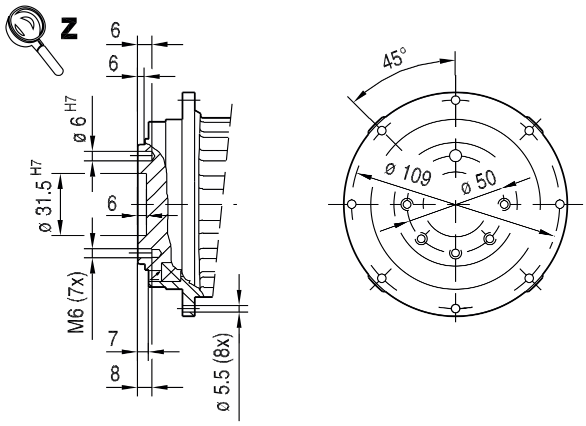
57 040 01 06

PSBF321..





14

(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	229	268	307	264	314	364	256	281
LS	258	297	336	293	343	393	321	346
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

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14.3.4 PSBF322

PSBF322, M_{aDyn} Nm					110 Nm
	CMP				
i	50S	50M	50L	63S	63M
			2		
15.00	76	151	>169	163	>169
20.00	102	>169	>169	>169	>169
25.00	127	>169	>169	>169	>169
35.00	>169	>169	>169	>169	>169
49.00	>168	>168	>168	>168	>168
70.00	>168				
100.00	>121				

(→ 192)

PSBF322, m kg					
	CMP				
s	50S	50M	50L	63S	63M
2	7.2	8.1	9.0	9.4	11

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSBF322 2	15.00	7500	98	933	-2.783	0	970	-3.971	0	1002	-5.071	0	8	4	2
	20.00	7500	98	960	-2.938	0	1006	-4.181	0	1048	-5.382	0	8	4	2
	25.00	7500	98	964	-3.075	0	1010	-4.302	0	1052	-5.516	0	8	4	2
	35.00	7500	98	980	-3.450	0	1027	-4.682	0	1069	-5.916	0	8	4	2
	49.00	7500	98	1323	-5.930	0	1380	-8.336	0	1411	-9.721	0	8	4	2
	70.00	7500	98	1342	-7.094	0	1394	-9.397	0	1423	-10.766	0	8	4	2
	100.00	7500	98	1409	-10.070	0	1478	-13.758	0	1501	-15.039	0	8	4	2

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	c_T PSBF Nm/'	F_{Ramax} PSBF N	F_{Rapk} PSBF N
PSBF322 2	15.00	110	169	250	453	0.26	20	11900	25000
	20.00	110	169	250	350	0.14	21	13000	25000
	25.00	110	169	250	280	0.088	21	13900	25000
	35.00	110	169	250	200	0.047	20	15400	25000
	49.00	110	168	250	143	0.042	18	17000	25000
	70.00	110	168	250	100	0.020	16	18900	25000
	100.00	110	121	182	70	0.019	11	21100	25000

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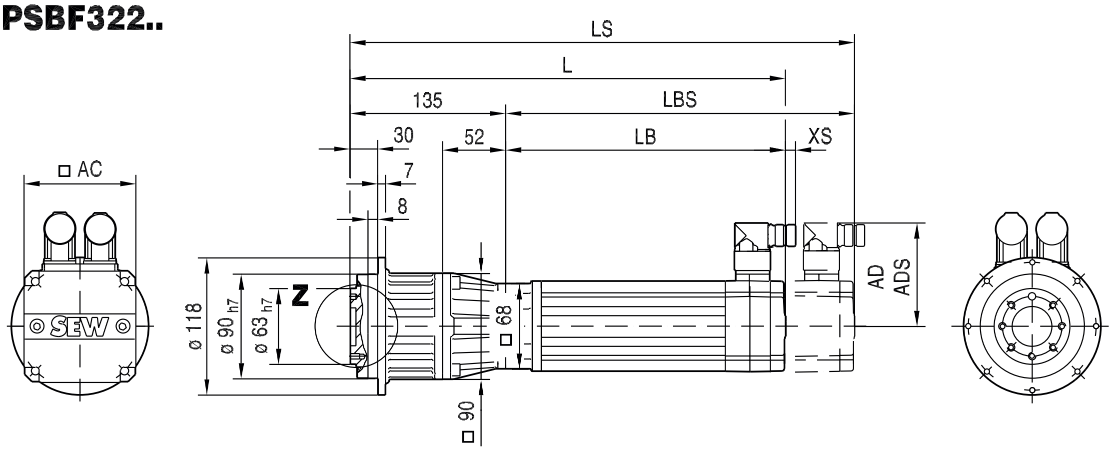
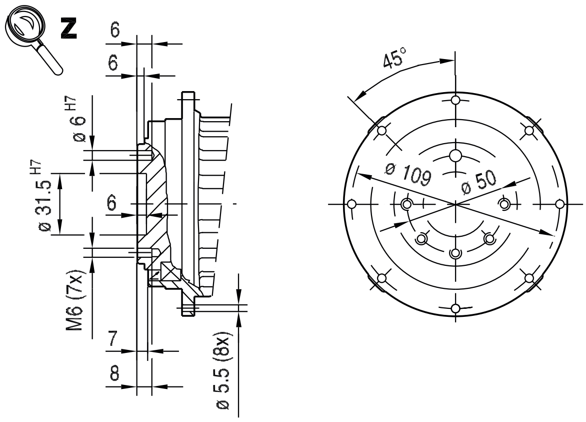
57 041 01 06

PSBF322..





(→ 194)	CMP..							
	50S	50M	50L	63S	63M			
AC	73	73	73	88	88			
AD	86	86	86	92	92			
ADS	86	86	86	92	92			
L	286	325	364	321	371			
LS	315	354	393	350	400			
LB	151	190	229	186	236			
LBS	180	219	258	215	265			
XS	18	18	18	14	14			

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14.3.5 PSBF521

PSBF521, M_{aDyn} Nm											300 Nm
						CMP					
i	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
						1					
5.00	51	76	55	106	150	95	152	230	205	305	>375
7.00	71	107	77	148	210	133	210	325	290	>360	
10.00	102	152	110	210	>270	190	>270				

(→ 🗎 192)

PSBF521, m kg											
						CMP					
s	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
1	9.2	10	10	12	13	15	16	18	21	23	27

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min⁻¹	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSBF521 1	5.00	6000	99	839	-1.942	0	872	-2.081	0	1276	-5.286	0	6	3	1
	7.00	6000	99	918	-2.315	0	929	-2.360	0	1357	-5.801	0	6	3	1
	10.00	6000	99	842	-2.345	0	851	-2.380	0	1241	-5.571	0	6	3	1

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min⁻¹	J_G 10^{-4} kg*m²	c_T PSBF Nm/'	F_{Ramax} PSBF N	F_{Rapk} PSBF N
PSBF521 1	5.00[1)]	300	375	560	1400	1.3	118	13900	40000
	7.00[1)]	300	360	540	1000	0.68	72	15400	40000
	10.00	270	270	405	700	0.34	37	17200	40000

1) (→ 🗎 192)

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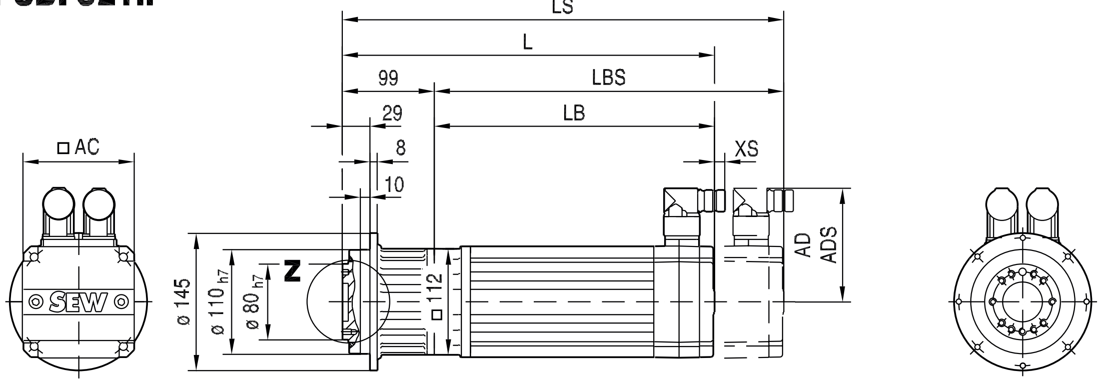
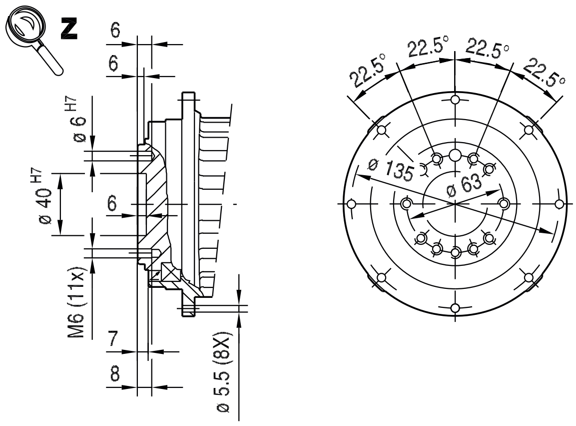
57 042 01 06

PSBF521..





(→ 194)	CMP..										
	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
AC	73	73	88	88	88	116	116	116	137	137	137
AD	86	86	92	92	92	102	102	102	134	134	134
ADS	86	86	92	92	92	104	104	104	137	137	137
L	279	318	275	325	375	266	291	341	306	341	408
LS	308	347	303	353	403	331	356	406	383	418	485
LB	180	219	176	226	276	168	193	243	207	242	309
LBS	209	248	205	255	305	233	258	308	285	320	387
XS	18	18	14	14	14	11	11	11	37	37	37

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14.3.6 PSBF522

PSBF522, M_{aDyn} Nm								300 Nm
	CMP							
i	50S	50M	50L	63S	63M	63L	71S	71M
	2							
15.00		151	225	163	310	>375	280	>375
20.00	102	200	300	215	>375	>375	>375	>375
25.00	127	250	>375	270	>375	>375	>375	>375
35.00	178	350	>375	>375	>375	>375	>375	>375
49.00	245	>360	>360	>360	>360	>360	>360	>360
70.00	355	>360	>360	>360				
100.00	>270	>270	>270	>270				

(→ 192)

PSBF522, m kg								
	CMP							
s	50S	50M	50L	63S	63M	63L	71S	71M
2	12	12	13	13	14	16	17	18

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSBF522 2	15.00	7000	98	2038	-7.344	0	2102	-10.231	0	2158	-12.916	0	8	4	2
	20.00	7000	98	2079	-7.805	0	2155	-10.789	0	2225	-13.692	0	8	4	2
	25.00	7000	98	2097	-8.326	0	2175	-11.275	0	2247	-14.224	0	8	4	2
	35.00	7000	98	2117	-9.522	0	2189	-12.390	0	2257	-15.308	0	8	4	2
	49.00	7000	98	2825	-16.351	0	2929	-21.956	0	2987	-25.338	0	8	4	2
	70.00	7000	98	2857	-20.154	0	2943	-25.327	0	2993	-28.579	0	8	4	2
	100.00	7000	98	2994	-19.407	0	3135	-28.846	0	3180	-32.112	0	8	4	2

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSBF Nm/'	F_{Ramax} PSBF N	F_{Rapk} PSBF N
PSBF522 2	15.00	300	375	560	407	0.75	58	19400	40000
	20.00	300	375	560	350	0.37	58	21100	40000
	25.00	300	375	560	280	0.24	58	22600	40000
	35.00	300	375	560	200	0.13	52	25000	40000
	49.00	300	360	540	143	0.12	45	27600	40000
	70.00	300	360	540	100	0.057	37	30800	40000
	100.00	270	270	405	70	0.053	27	34200	40000

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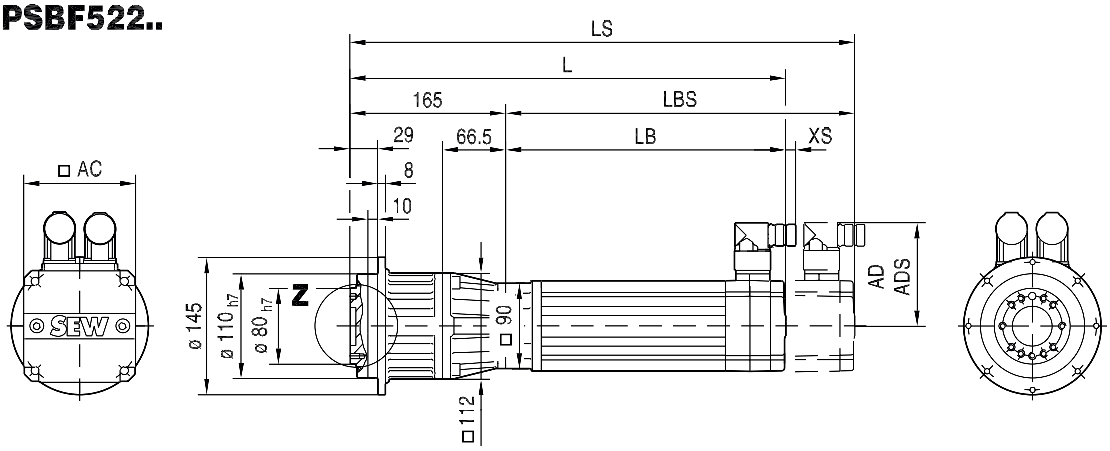
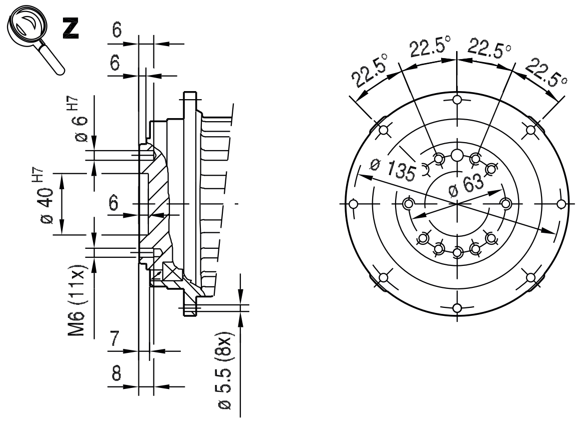
57 043 01 06

PSBF522..





(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	311	350	389	346	396	446	338	363
LS	340	379	418	375	425	475	403	428
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

14.3.7 PSBF621

PSBF621, M_{aDyn} Nm													600 Nm
	CMP												
i	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
1													
5.00	150		152	230	205	305	525	335	530	>700	435	670	>700
7.00	210		210	325	290	430	>660	470	>660		605		
10.00	300	190	300	460	415	>500		>500					

(→ 🗎 192)

PSBF621, m kg													
	CMP												
s	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
1	18	20	21	23	26	28	32	33	37	46	51	59	75

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSBF621 1	5.00	6000	99	1579	-4.671	0	1568	-4.531	0	2356	-12.492	0	4	2	1
	7.00	6000	99	1672	-5.256	0	1660	-5.100	0	2504	-13.665	0	4	2	1
	10.00	6000	99	1583	-5.464	0	1571	-5.304	0	2370	-13.526	0	4	2	1

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	c_T PSBF Nm/'	F_{Ramax} PSBF N	F_{Rapk} PSBF N
PSBF621 1	5.00[1)]	595	700	1050	1400	4.3	288	20800	60000
	7.00[1)]	600	660	990	1000	2.2	183	23000	60000
	10.00[1)]	500	500	750	700	1.1	85	25500	60000

1) (→ 🗎 192)

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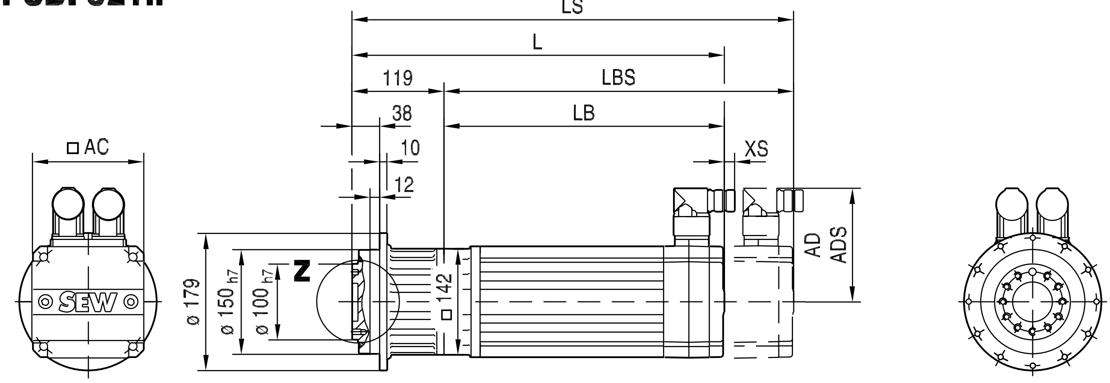
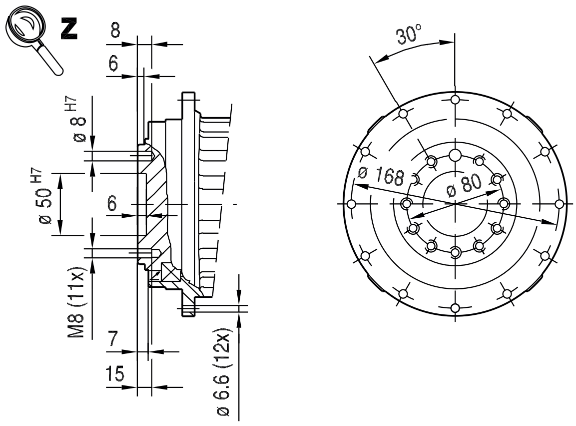
PSBF621..





(→ 📄 194)	CMP..												
	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	104	104	104	137	137	137	147	147	147	177	177	213
L	387	279	304	354	318	352	415	350	385	465	458	501	589
LS	416	344	369	419	396	430	493	446	481	561	579	622	710
LB	268	160	185	235	199	233	296	231	266	346	339	382	470
LBS	297	225	250	300	277	311	374	327	362	442	460	503	591
XS	14	11	11	11	37	37	37	37	37	37	32	32	49

14.3.8 PSBF622

PSBF622, M_{aDyn} Nm											600 Nm
	CMP										
i	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
2											
20.00				415	595	375	600	>700	>700	>700	>700
25.00	250	375	270	520	>700	470	>700	>700	>700	>700	>700
35.00	350	525	380	>700	>700	655	>700	>700	>700	>700	
49.00	490	>660	530	>660	>660	>660	>660	>660	>660	>660	
70.00	>660	>660	>660	>660	>660	>660	>660				
100.00	>500	>500	>500	>500	>500	>500	>500				

(→ 🗎 192)

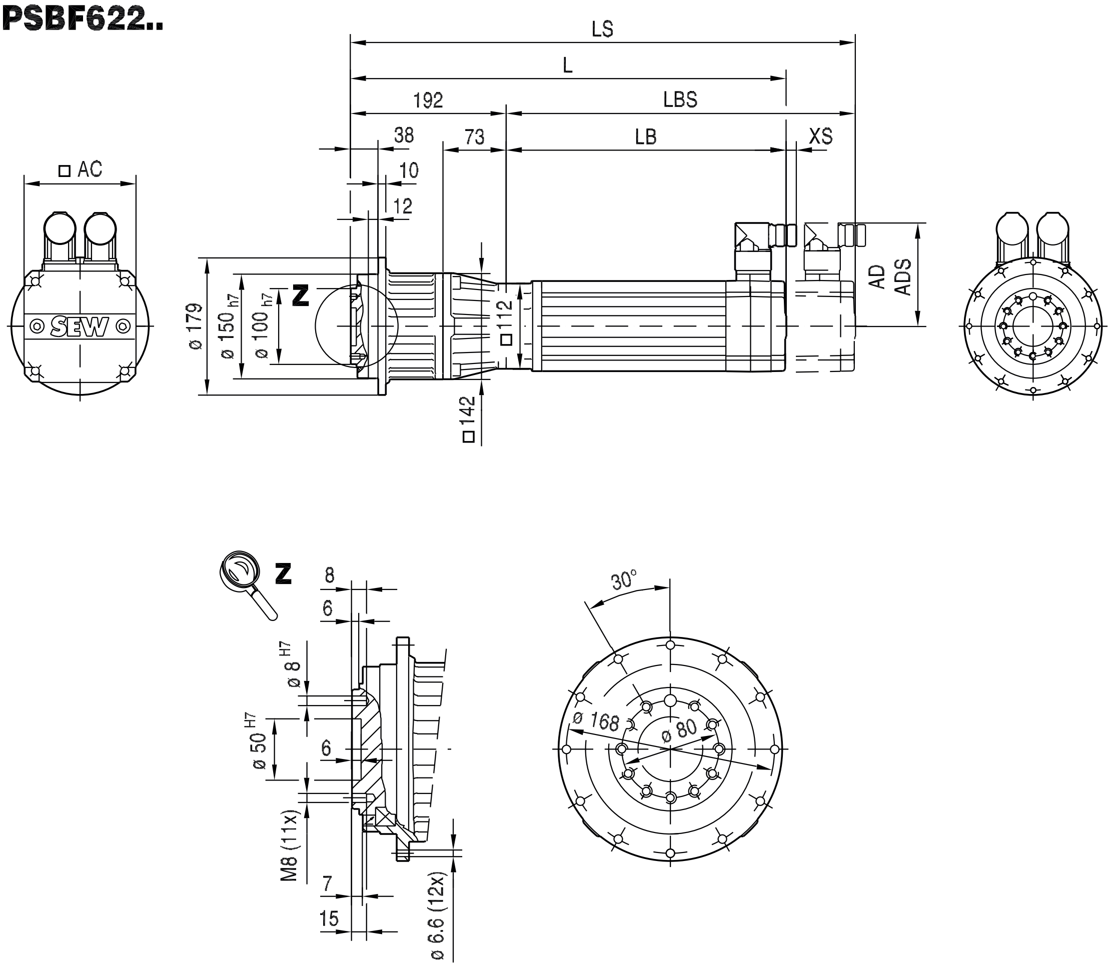
PSBF622, m kg											
	CMP										
s	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
2	19	20	20	22	23	24	26	28	31	33	37

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSBF622 2	20.00	6000	98	3897	-18.893	0	4060	-26.650	0	4207	-34.292	0	6	3	1
	25.00	6000	98	3918	-19.907	0	4077	-27.517	0	4226	-35.274	0	6	3	1
	35.00	6000	98	3981	-22.636	0	4141	-30.187	0	4296	-38.193	0	6	3	1
	49.00	6000	98	5229	-38.287	0	5462	-53.035	0	5589	-61.817	0	6	3	1
	70.00	6000	98	5169	-36.038	0	5393	-50.729	0	5512	-59.214	0	6	3	1
	100.00	6000	98	5704	-53.384	0	6024	-78.200	0	6122	-86.622	0	6	3	1

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg{*}m^2$	c_T PSBF Nm/'	F_{Ramax} PSBF N	F_{Rapk} PSBF N
PSBF622 2	20.00	600	700	1050	230	1.4	161	31500	60000
	25.00	600	700	1050	228	0.94	156	33600	60000
	35.00	600	700	1050	200	0.49	133	37200	60000
	49.00	600	660	990	143	0.45	115	41200	60000
	70.00	600	660	990	100	0.22	95	45800	60000
	100.00	500	500	750	70	0.21	63	51000	60000

57 045 01 06

PSBF622..



(→ 194)	CMP..										
	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
AC	73	73	88	88	88	116	116	116	137	137	137
AD	86	86	92	92	92	102	102	102	134	134	134
ADS	86	86	92	92	92	104	104	104	137	137	137
L	372	411	368	418	468	360	385	435	399	434	501
LS	401	440	397	447	497	425	450	500	477	512	579
LB	180	219	176	226	276	168	193	243	207	242	309
LBS	209	248	205	255	305	233	258	308	285	320	387
XS	18	18	14	14	14	11	11	11	37	37	37

14.3.9 PSBF721

PSBF721, M_{aDyn} Nm											1000 Nm
	CMP										
i	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
	1										
5.00			525		530	880	435	670	1110	1330	>1540
7.00	290	430	740	470	745	1230	605	940	>1380		
10.00	415	615	>1050	675	>1050		870				

(→ 192)

PSBF721, m kg											
	CMP										
s	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
1	43	45	49	50	54	63	67	75	91	99	110

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSBF721 1	5.00	4500	99	3146	-11.023	0	3105	-10.615	0	4606	-29.465	0	4	2	1
	7.00	4500	99	3229	-11.678	0	3186	-11.261	0	4833	-31.395	0	4	2	1
	10.00	4500	99	2967	-11.293	0	2926	-10.898	0	4509	-29.998	0	4	2	1

CMP.. n_e = 1000	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSBF Nm/'	F_{Ramax} PSBF N	F_{Rapk} PSBF N
PSBF721 1	5.00[1]	1000	1540	2310	1400	26	538	37900	120000
	7.00[1]	1000	1380	2070	1000	13	398	41900	120000
	10.00[1]	1000	1050	1570	700	6.6	197	46600	120000

[1] (→ 192)

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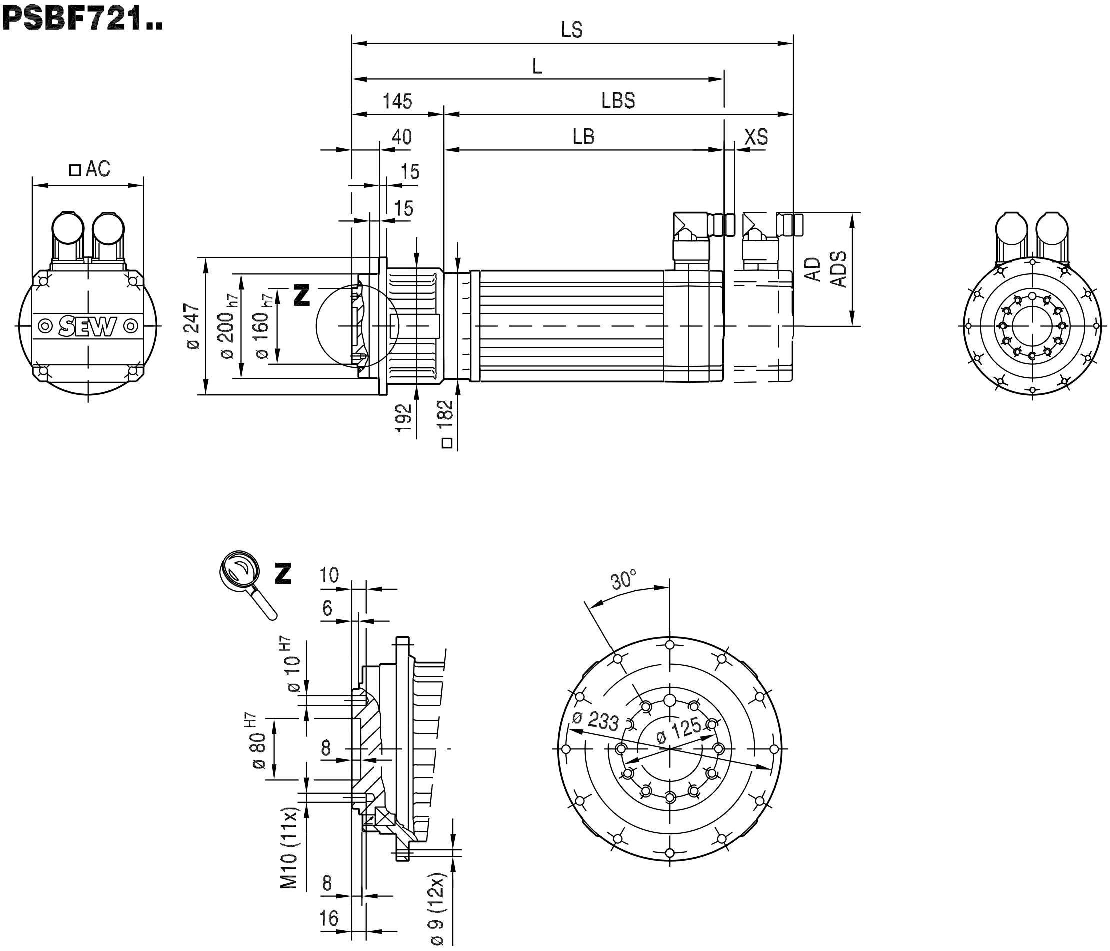
57 075 03 07

PSBF721..



(→ 194)	CMP..										
	80S	80M	80L	100S	100M	100L	112S	112M	112L	112H	112E
AC	137	137	137	162	162	162	205	205	205	205	205
AD	134	134	134	146	146	146	177	177	213	213	213
ADS	137	137	137	147	147	147	177	177	213	213	213
L	340	374	437	372	407	487	480	523	611	654	697
LS	418	452	515	468	503	583	601	644	732	775	818
LB	195	229	292	227	262	342	335	378	466	509	552
LBS	273	307	370	323	358	438	456	499	587	630	673
XS	37	37	37	37	37	37	32	32	49	49	49

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14.3.10 PSBF722

PSBF722, M_{aDyn} Nm — 1000 Nm

i	CMP 50M	CMP 50L	CMP 63S	CMP 63M	CMP 63L	CMP 71S	CMP 71M	CMP 71L	CMP 80S	CMP 80M	CMP 80L
2											
20.00				415	595	375	600	910	820	1220	>1540
25.00	250	375	270	520	740	470	750	1140	1030	1530	>1540
35.00	350	525	380	730	1040	655	1050	>1540	1440	>1540	
49.00	490	735	530	1020	>1380	920	>1380	>1380	>1380	>1380	
70.00	705	1050	760	>1380	>1380	1310	>1380				
100.00	1000	>1050	>1050	>1050	>1050	>1050	>1050				

(→ 192)

PSBF722, m kg

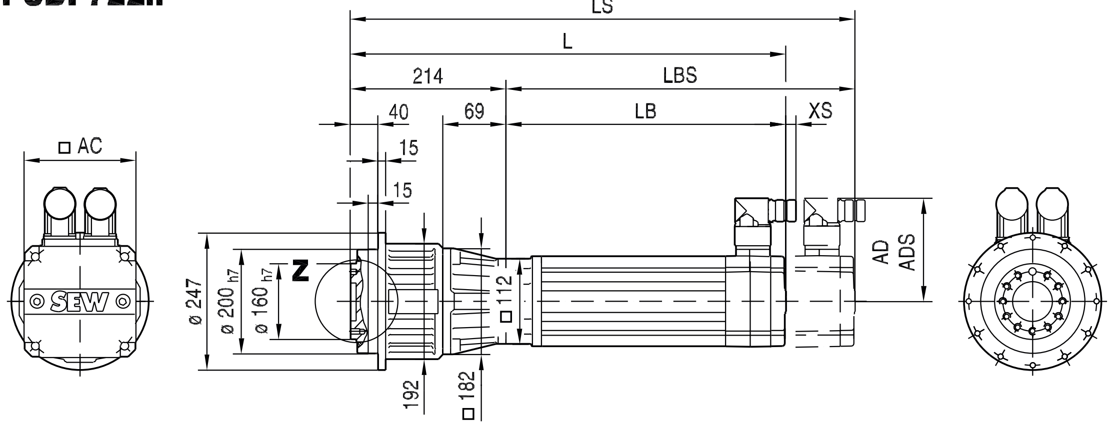
s	CMP 50M	CMP 50L	CMP 63S	CMP 63M	CMP 63L	CMP 71S	CMP 71M	CMP 71L	CMP 80S	CMP 80M	CMP 80L
2	36	37	37	39	40	41	43	45	48	50	54

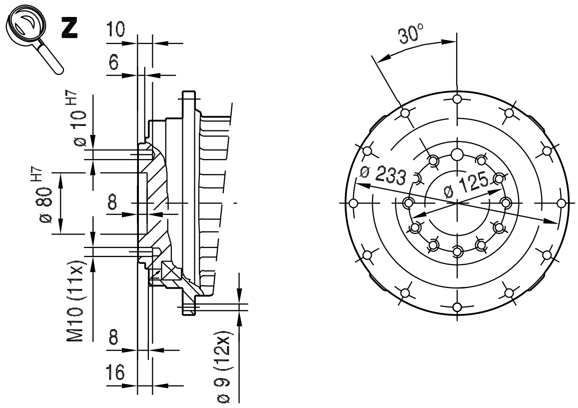
CMP..	i	n_{epk} min^{-1}	η %	M1;M3;M5-6 a_0	M1;M3;M5-6 a_1	M1;M3;M5-6 a_2	M2 a_0	M2 a_1	M2 a_2	M4 a_0	M4 a_1	M4 a_2	φ '	φ /R '	φ /M '
PSBF722 2	20.00	6000	98	8201	-40.081	0	8338	-50.500	0	8601	-72.114	0	6	3	1
	25.00	6000	98	8220	-41.515	0	8354	-51.672	0	8618	-73.383	0	6	3	1
	35.00	6000	98	8283	-45.319	0	8419	-55.313	0	8692	-77.194	0	6	3	1
	49.00	6000	98	10373	-68.840	0	10589	-88.838	0	10826	-112.5	0	6	3	1
	70.00	6000	98	10428	-80.084	0	10616	-98.782	0	10833	-122.1	0	6	3	1
	100.00	6000	98	10988	-110.3	0	11275	-141.5	0	11459	-163.0	0	6	3	1

CMP.. n_e = 1000	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSBF Nm/'	F_{Ramax} PSBF N	F_{Rapk} PSBF N
PSBF722 2	20.00	1000	1540	2310	345	2.9	245	57400	120000
	25.00	1000	1540	2310	280	1.9	243	61400	120000
	35.00	1000	1540	2310	200	0.98	218	67900	120000
	49.00	1000	1380	2070	143	0.72	201	75100	120000
	70.00	1000	1380	2070	100	0.35	156	83600	120000
	100.00	1000	1050	1570	70	0.29	123	93100	120000

57 076 02 07

PSBF722..





(→ 194)

	CMP..										
	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M	80L
AC	73	73	88	88	88	116	116	116	137	137	137
AD	86	86	92	92	92	102	102	102	134	134	134
ADS	86	86	92	92	92	104	104	104	137	137	137
L	394	433	390	440	490	382	407	457	421	456	523
LS	423	462	419	469	519	447	472	522	499	534	601
LB	180	219	176	226	276	168	193	243	207	242	309
LBS	209	248	205	255	305	233	258	308	285	320	387
XS	18	18	14	14	14	11	11	11	37	37	37

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14.3.11 PSBF822

PSBF822, M_{aDyn} Nm													1750 Nm
	CMP												
i	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
							2						
20.00				910	820	1220	2090	1330	2110	>2500	1720	>2500	>2500
25.00	740		750	1140	1030	1530	>2500	1670	>2500	>2500	2150	>2500	>2500
35.00	1040		1050	1600	1440	2140	>2500	2340	>2500		>2500		
49.00	1450		1470	2250	2020	>2740	>2740	>2740	>2740		>2740		
70.00	2080	1310	2110	>2740	>2740	>2740		>2740					
100.00	>2060	1880	>2060	>2060	>2060	>2060		>2060					

(→ 192)

PSBF822, m kg													
	CMP												
s	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
2	55	57	58	60	63	65	69	70	74	83	88	96	110

CMP..				M1;M3;M5-6			M2			M4			φ		
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'	/R '	/M '
PSBF822 2	20.00	6000	98	13381	-73.939	0	13638	-94.005	0	14142	-137.6	0	6	3	1
	25.00	6000	98	13416	-76.823	0	13668	-96.396	0	14173	-140.0	0	6	3	1
	35.00	6000	98	13536	-84.489	0	13791	-103.7	0	14311	-147.5	0	6	3	1
	49.00	6000	98	20337	-155.7	0	20689	-199.9	0	21098	-255.8	0	6	3	1
	70.00	6000	98	20476	-184.1	0	20785	-224.2	0	21170	-279.7	0	6	3	1
	100.00	6000	98	22237	-264.3	0	22686	-331.9	0	23004	-384.6	0	6	3	1

CMP.. n_e = 1000	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m^2	c_T PSBF Nm/'	F_{Ramax} PSBF N	F_{Rapk} PSBF N
PSBF822 2	20.00	1750	2500	3750	265	6.8	636	94200	180000
	25.00	1750	2500	3750	268	4.4	605	100700	180000
	35.00	1750	2500	3750	200	2.3	490	111400	180000
	49.00	1750	2740	4110	143	1.8	514	123200	180000
	70.00	1750	2740	4110	100	0.91	354	137100	180000
	100.00	1750	2060	3090	70	0.78	315	152600	180000

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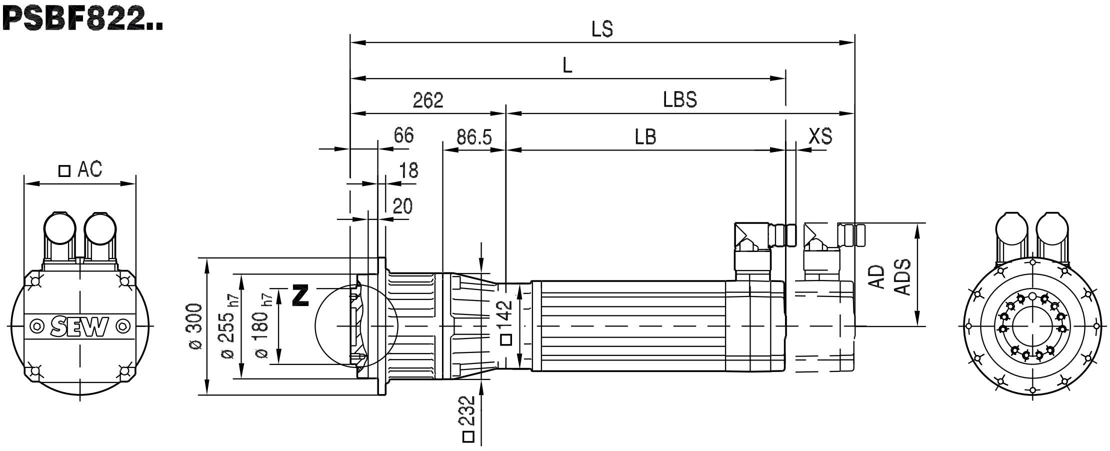
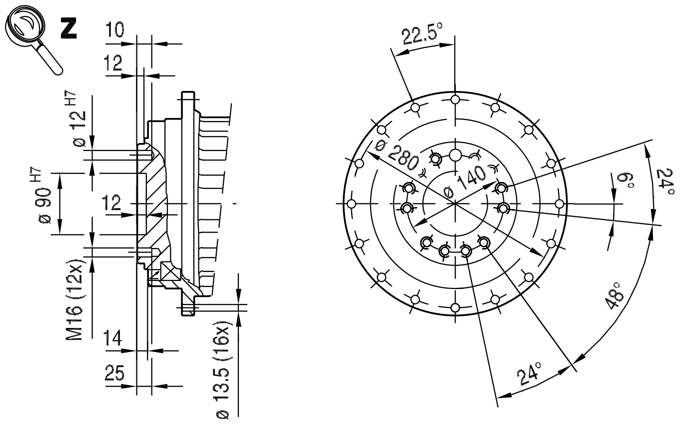
57 051 02 06

PSBF822..





14

(→ 🗎 194)	CMP..												
	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	116	116	116	137	137	137	162	162	162	205	205	205
AD	92	102	102	102	134	134	134	146	146	146	177	177	213
ADS	92	104	104	104	137	137	137	147	147	147	177	177	213
L	530	421	446	496	461	495	558	492	527	607	601	644	732
LS	558	486	511	561	538	572	635	588	623	703	722	765	853
LB	268	160	185	235	199	233	296	231	266	346	339	382	470
LBS	297	225	250	300	277	311	374	327	362	442	460	503	591
XS	14	11	11	11	37	37	37	37	37	37	32	32	49

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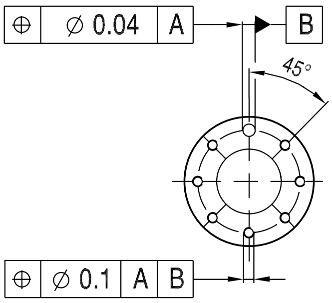
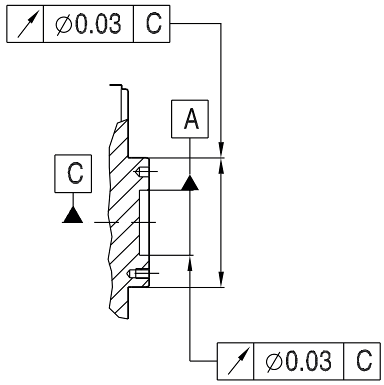
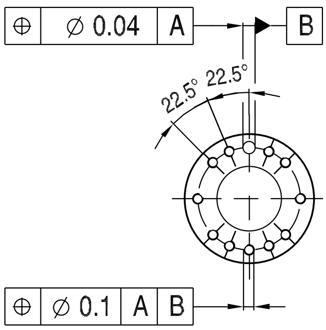
14.4 Dimension sheet tolerances and chamfers of flange block gear units

55 035 02 03

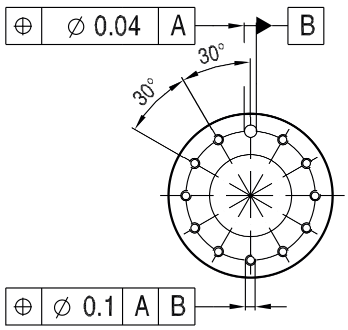




BSBF202 PSBF221/222
BSBF302 PSBF321/322

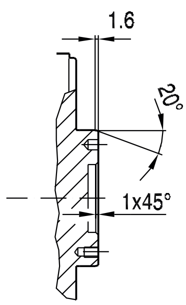


BSBF402 PSBF521/522
BSBF502



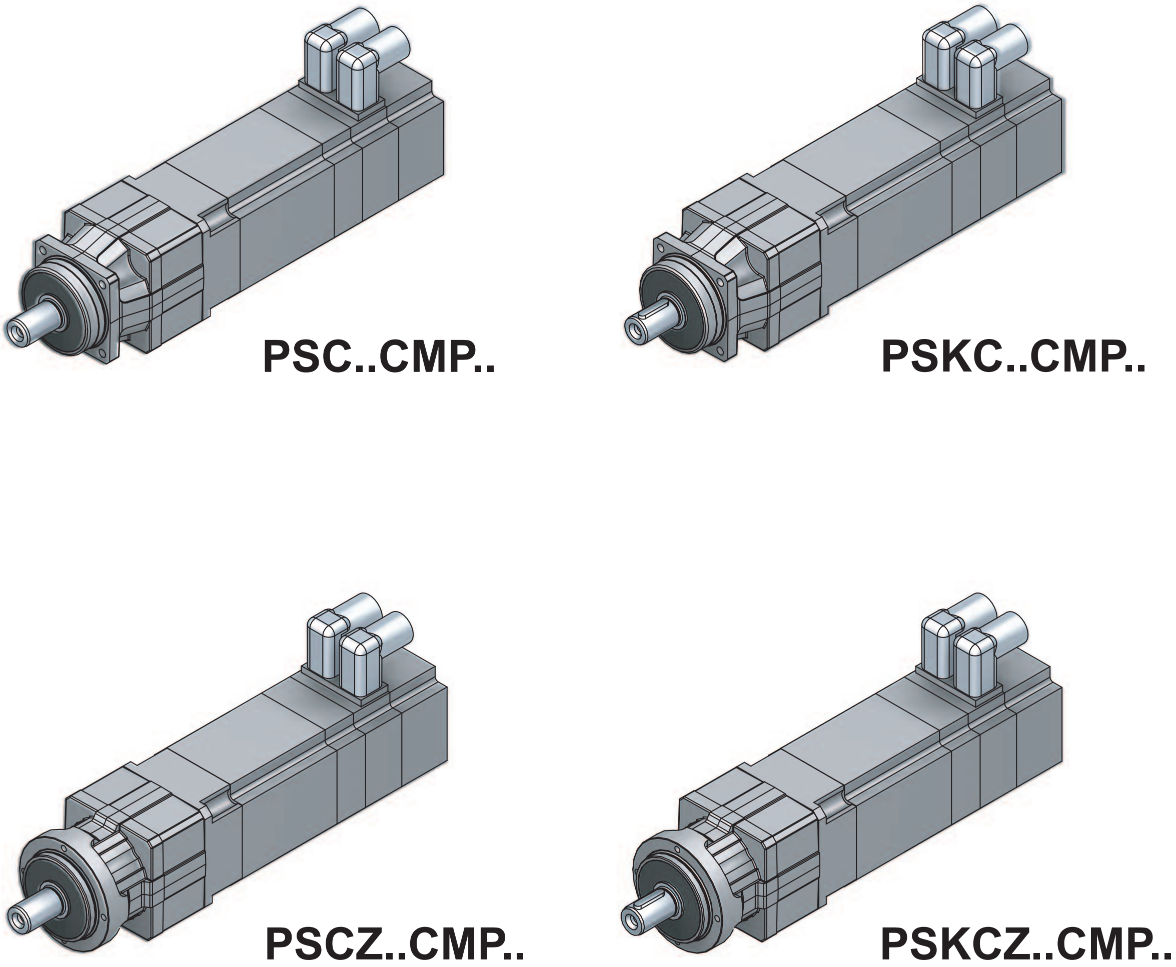
BSBF602 PSBF621/622
BSBF802 PSBF721/722
PSBF821/822

55 036 00 03



15 Planetary gearmotors – PS.C.. gear units

15.1 PS.C..CMP.. designs



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15.2 PS.C221–622..CMP.. selection tables and dimension sheets

15.2.1 PSC221

PSC221, M_{aDyn} Nm							35 Nm
				CMP			
i	40M	50S	50M	50L	63S	63M	63L
				1			
3.00	11	15	31	>40	33	>40	>40
5.00	19	26	>42	>42	>42	>42	>42
7.00	26	36	>39	>39	>39	>39	
10.00	>37	>37					

(→ 192)

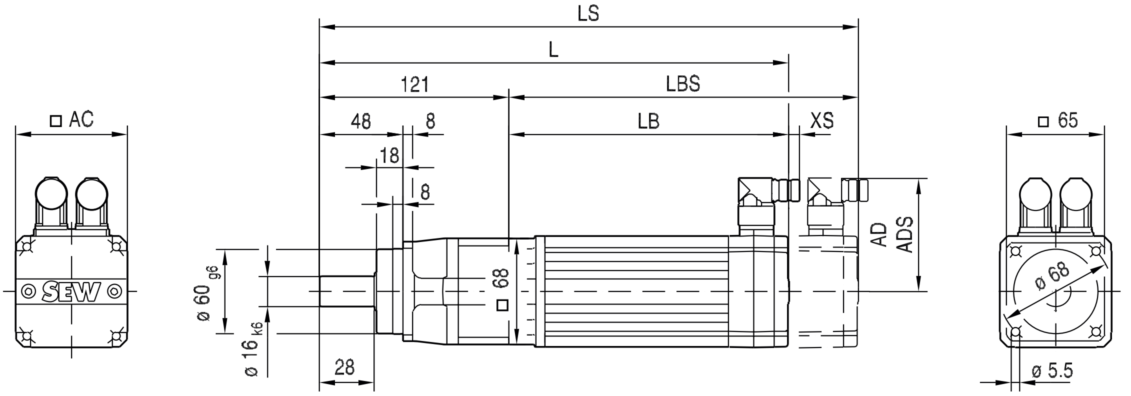
PSC221, m kg							
				CMP			
s	40M	50S	50M	50L	63S	63M	63L
1	3.2	4.0	5.0	5.9	6.3	7.8	9.3

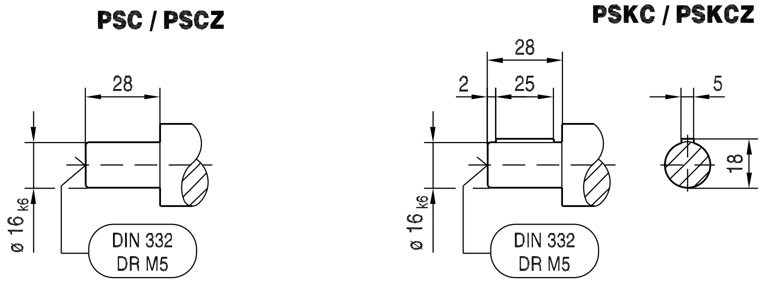
CMP..				M1;M3;M5-6			M2			M4			φ
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'
PSC221 1	3.00	7000	99	101.0	-0.093	0	106.0	-0.104	0	109.0	-0.110	0	10
	5.00	7000	99	160.0	-0.181	0	163.0	-0.190	0	167.0	-0.200	0	10
	7.00	7000	99	186.0	-0.257	0	187.0	-0.264	0	186.0	-0.267	0	10
	10.00	7000	99	158.0	-0.178	0	161.0	-0.184	0	164.0	-0.194	0	10

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSC Nm/'	F_{Ramax} PSC N	F_{Rapk} PSC N
PSC221 1	3.00	29	40	60	1500	0.17	3.5	1170	2000
	5.00	34	42	63	720	0.058	3.4	1390	2000
	7.00	32	39	59	800	0.030	3.3	1550	2000
	10.00	30	37	56	700	0.014	2.9	1750	2000

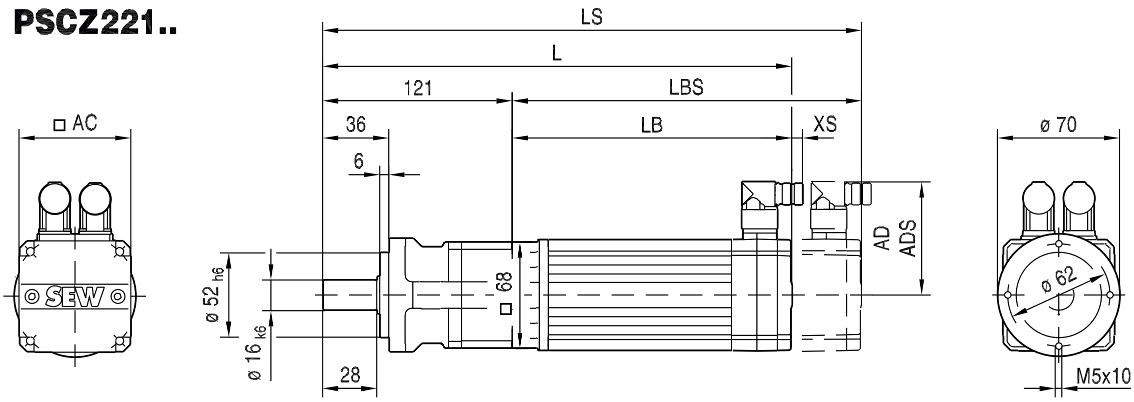
57 031 01 07

PSC221..





PSCZ221..



15

(→ 194)	CMP..						
	40M	50S	50M	50L	63S	63M	63L
AC	57	73	73	73	88	88	88
AD	78	86	86	86	92	92	92
ADS	78	86	86	86	92	92	92
L	270	272	311	350	307	357	407
LS	300	301	340	379	336	386	435
LB	149	151	190	229	186	236	286
LBS	179	180	219	258	215	265	315
XS	19	18	18	18	14	14	14

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15.2.2 PSC222

PSC222, M_{aDyn} Nm							35 Nm
	CMP						
i	40M	50S	50M	50L	63S	63M	63L
				2			
15.00	>40	>40	>40	>40	>40	>40	>40
21.00	>40	>40	>40	>40	>40	>40	
25.00	>42	>42	>42	>42	>42	>42	>42
30.00	>40	>40					
35.00	>42	>42	>42	>42	>42	>42	
49.00	>39	>39	>39	>39	>39	>39	
50.00	>42	>42					
70.00	>39	>39					
100.00	>37	>37					

(→ 192)

PSC222, m kg							
	CMP						
s	40M	50S	50M	50L	63S	63M	63L
2	3.8	4.7	5.6	6.5	7.0	8.5	10.0

CMP..				M1;M3;M5-6			M2			M4			φ
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'
PSC222 2	15.00	7000	98	197.0	-0.680	0	196.0	-0.693	0	197.0	-0.703	0	15
	21.00	7000	98	217	-0.912	0	216	-0.924	0	217	-0.935	0	15
	25.00	7000	98	367	-2.040	0	366	-2.086	0	367	-2.099	0	15
	30.00	7000	98	197.0	-0.676	0	196.0	-0.685	0	197.0	-0.695	0	15
	35.00	7000	98	408	-2.785	0	406	-2.828	0	407	-2.842	0	15
	49.00	7000	98	547	-5.185	0	545	-5.269	0	545	-5.285	0	15
	50.00	7000	98	367	-2.025	0	366	-2.062	0	367	-2.075	0	15
	70.00	7000	98	491	-3.754	0	490	-3.827	0	491	-3.841	0	15
	100.00	7000	98	628	-6.809	0	627	-6.948	0	627	-6.962	0	15

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSC Nm/'	F_{Ramax} PSC N	F_{Rapk} PSC N
PSC222 2	15.00	29	40	60	467	0.057	2.9	2000	2000
	21.00	29	40	60	333	0.030	2.9	2000	2000
	25.00	34	42	63	280	0.053	3.0	2000	2000
	30.00	29	40	60	233	0.014	2.8	2000	2000
	35.00	34	42	63	200	0.027	3.0	2000	2000
	49.00	32	39	59	143	0.027	2.9	2000	2000
	50.00	34	42	63	140	0.013	2.9	2000	2000
	70.00	32	39	59	100	0.013	2.8	2000	2000
	100.00	30	37	56	70	0.013	2.6	2000	2000

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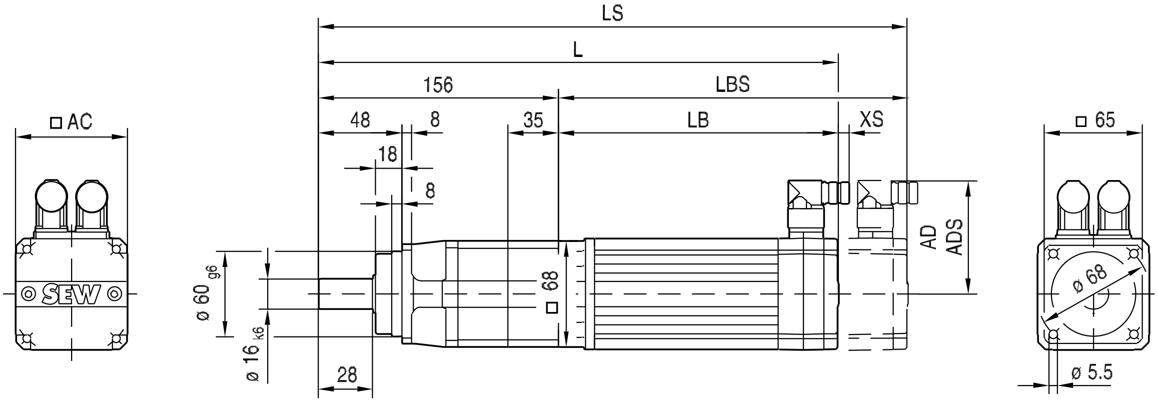
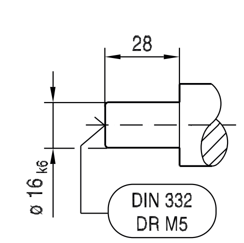
57 032 01 07

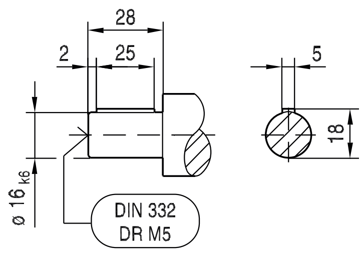
PSC222..



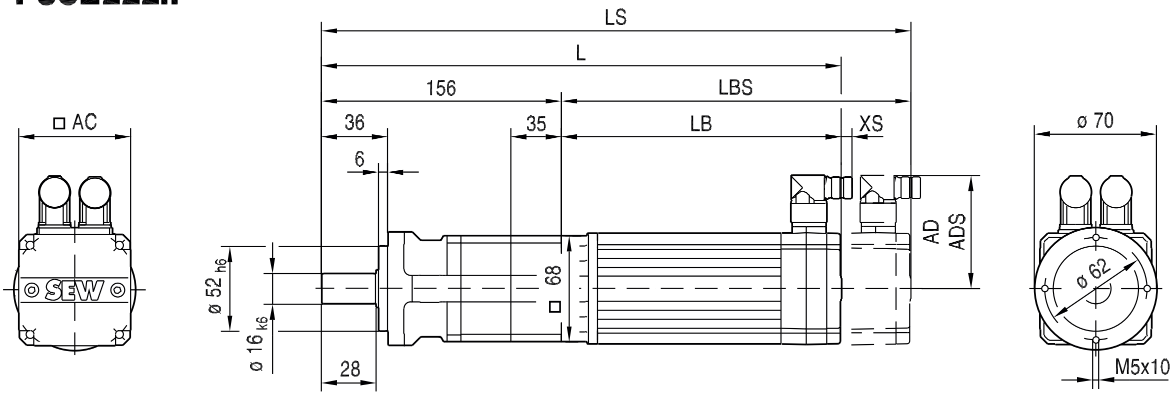
PSC / PSCZ



PSKC / PSCKZ



PSCZ222..



(→ 194)	CMP..							
	40M	50S	50M	50L	63S	63M	63L	
AC	57	73	73	73	88	88	88	
AD	78	86	86	86	92	92	92	
ADS	78	86	86	86	92	92	92	
L	305	307	346	385	342	392	442	
LS	335	336	375	414	370	420	470	
LB	149	151	190	229	186	236	286	
LBS	179	180	219	258	215	265	315	
XS	19	18	18	18	14	14	14	

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15.2.3 PSC321

PSC321, M_{aDyn} Nm								74 Nm
	CMP							
i	50S	50M	50L	63S	63M	63L	71S	71M
	1							
3.00	15	31	46	33	64	>86	57	>86
5.00	26	51	76	55	>91	>91	>91	>91
7.00	36	71	>85	77	>85	>85	>85	>85
10.00	51	>81	>81	>81				

(→ 192)

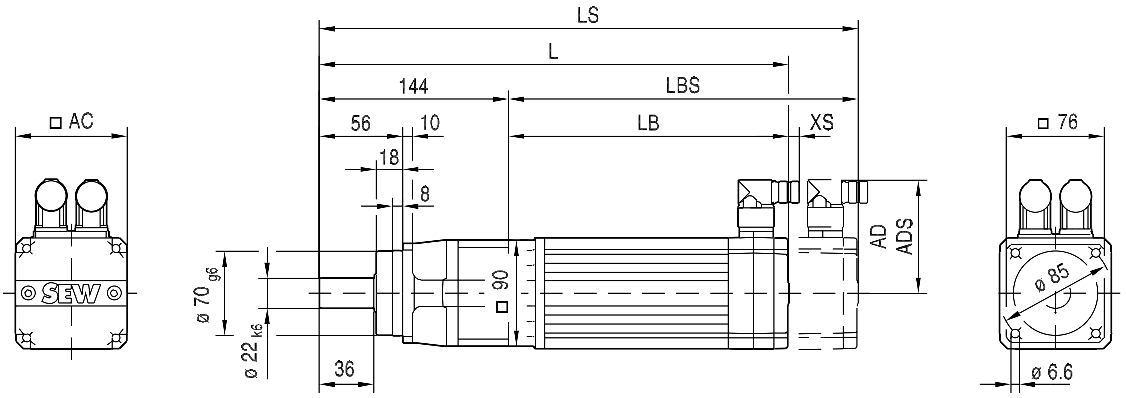
PSC321, m kg								
	CMP							
s	50S	50M	50L	63S	63M	63L	71S	71M
1	6.4	7.3	8.2	7.8	9.2	11	12	13

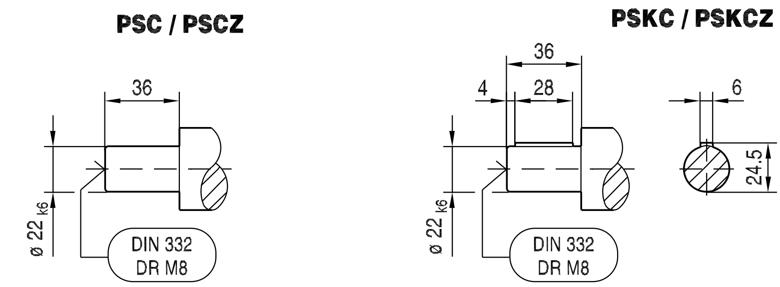
CMP..				M1;M3;M5-6			M2			M4			φ
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'
PSC321 1	3.00	6500	99	183.0	-0.184	0	190.0	-0.201	0	191.0	-0.212	0	10
	5.00	6500	99	257	-0.296	0	262	-0.308	0	264	-0.324	0	10
	7.00	6500	99	257	-0.341	0	261	-0.350	0	259	-0.360	0	10
	10.00	6500	99	247	-0.395	0	251	-0.406	0	251	-0.418	0	10

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSC Nm/'	F_{Ramax} PSC N	F_{Rapk} PSC N
PSC321 1	3.00	62	86	129	633	0.52	10	1710	4000
	5.00	74	91	136	300	0.17	11	2030	4000
	7.00	69	85	128	329	0.092	10	2270	4000
	10.00	66	81	122	360	0.045	8.6	2560	4000

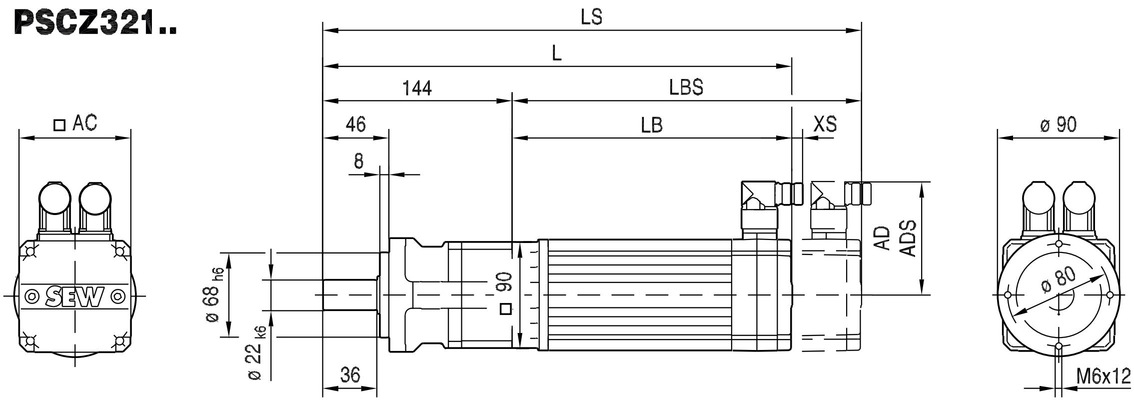
57 033 01 07

PSC321..





PSCZ321..



(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	290	329	368	325	375	425	316	341
LS	319	358	397	354	404	454	381	406
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

15.2.4 PSC322

PSC322, M_{aDyn} Nm								76 Nm
	CMP							
i	50S	50M	50L	63S	63M	63L	71S	71M
	2							
15.00	76	>86	>86	>86	>86	>86	>86	>86
21.00	>86	>86	>86	>86	>86	>86	>86	>86
25.00	>91	>91	>91	>91	>91	>91	>91	>91
30.00	>86	>86	>86	>86				
35.00	>91	>91	>91	>91	>91	>91	>91	>91
49.00	>85	>85	>85	>85	>85	>85	>85	>85
50.00	>91	>91	>91	>91				
70.00	>85	>85	>85	>85				
100.00	>81	>81	>81	>81				

(→ 192)

PSC322, m kg								
	CMP							
s	50S	50M	50L	63S	63M	63L	71S	71M
2	7.8	8.7	9.6	9.2	11	12	13	15

CMP..				M1;M3;M5-6			M2			M4			φ
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'
PSC322 2	15.00	6500	98	351	-1.198	0	350	-1.211	0	352	-1.237	0	15
	21.00	6500	98	365	-1.430	0	364	-1.442	0	366	-1.468	0	15
	25.00	6500	98	638	-3.473	0	638	-3.535	0	640	-3.569	0	15
	30.00	6500	98	380	-1.800	0	379	-1.814	0	381	-1.841	0	15
	35.00	6500	98	665	-4.185	0	664	-4.242	0	665	-4.277	0	15
	49.00	6500	98	844	-7.356	0	843	-7.465	0	844	-7.501	0	15
	50.00	6500	98	692	-5.309	0	691	-5.366	0	692	-5.402	0	15
	70.00	6500	98	882	-9.390	0	881	-9.501	0	882	-9.537	0	15
	100.00	6500	98	1114	-16.842	0	1113	-17.057	0	1113	-17.091	0	15

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSC Nm/'	F_{Ramax} PSC N	F_{Rapk} PSC N
PSC322 2	15.00	62	86	129	467	0.16	8.3	2930	4000
	21.00	62	86	129	333	0.085	8.1	3280	4000
	25.00	74	91	136	280	0.15	9.0	3470	4000
	30.00	62	86	129	233	0.042	7.7	3690	4000
	35.00	74	91	136	200	0.078	8.9	3880	4000
	49.00	69	85	128	143	0.076	8.6	4000	4000
	50.00	74	91	136	140	0.038	8.5	4000	4000
	70.00	69	85	128	100	0.037	8.3	4000	4000
	100.00	66	81	122	70	0.037	7.3	4000	4000

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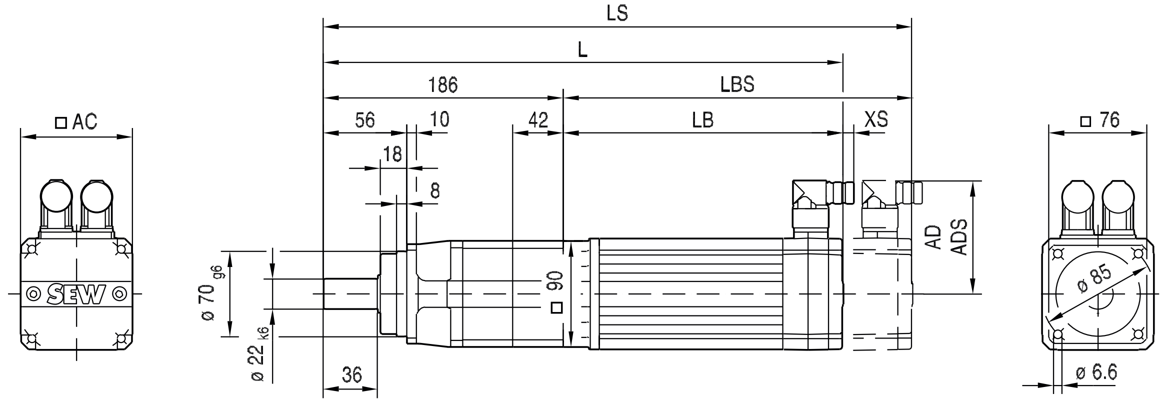
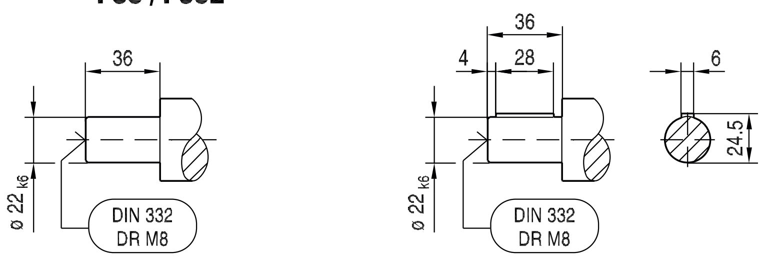
PSC322..



PSC / PSCZ

PSKC / PSCKZ



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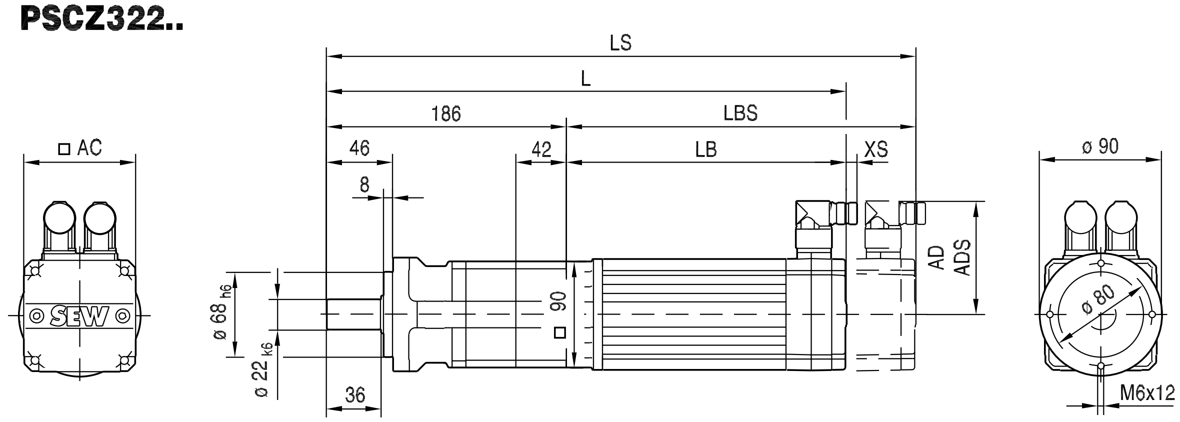

15

(→ 194)	CMP..							
	50S	50M	50L	63S	63M	63L	71S	71M
AC	73	73	73	88	88	88	116	116
AD	86	86	86	92	92	92	102	102
ADS	86	86	86	92	92	92	104	104
L	332	371	410	367	417	467	358	383
LS	361	400	439	395	445	495	423	448
LB	146	185	224	181	231	281	173	198
LBS	175	214	253	210	260	310	238	263
XS	18	18	18	14	14	14	11	11

15.2.5 PSC521

PSC521, M_{aDyn} Nm										181 Nm
	CMP									
i	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
1										
3.00	31	46	33	64	90	57	91	139	125	186
5.00	51	76	55	106	150	95	152	>220	205	>220
7.00	71	107	77	148	>205	133	>205	>205	>205	>205
10.00	102	152	110	>199	>199	190	>199			

(→ 190)

PSC521, m kg										
	CMP									
s	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
1	10	11	11	13	14	15	17	19	22	24

CMP..				M1;M3;M5-6			M2			M4			φ
	i	n_{epk} min⁻¹	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'
PSC521 1	3.00	6000	99	403	-0.446	0	417	-0.486	0	416	-0.508	0	10
	5.00	6000	99	593	-0.735	0	606	-0.769	0	602	-0.797	0	10
	7.00	6000	99	652	-0.910	0	664	-0.940	0	651	-0.956	0	10
	10.00	6000	99	720	-1.181	0	747	-1.257	0	743	-1.300	0	10

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSC Nm/'	F_{Ramax} PSC N	F_{Rapk} PSC N
PSC521 1	3.00	147	200	305	900	2.1	27	2900	6750
	5.00	181	220	330	360	0.85	28	3440	6750
	7.00	169	205	310	414	0.37	26	3850	6750
	10.00	161	199	295	440	0.18	22	4330	6750

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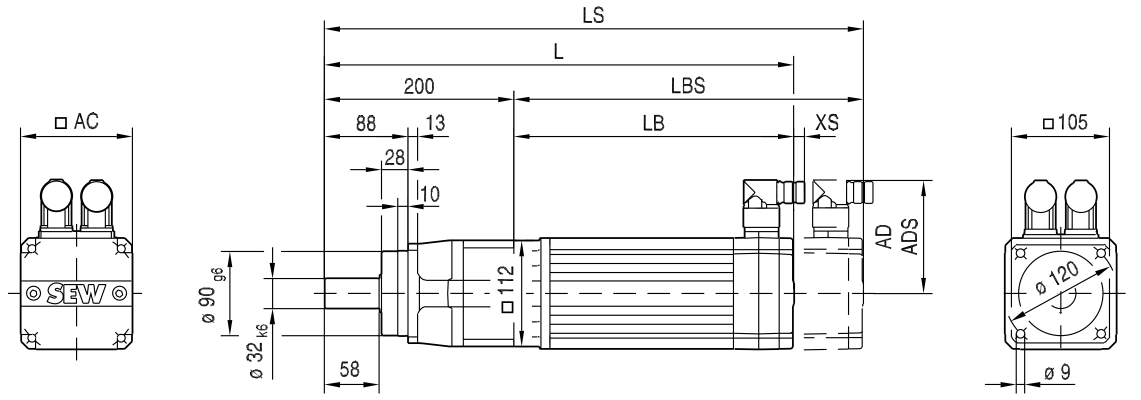
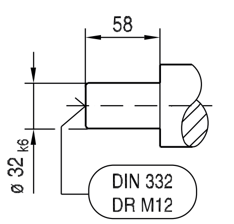
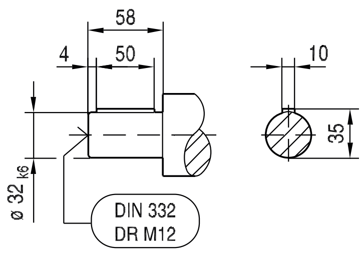
PSC521..



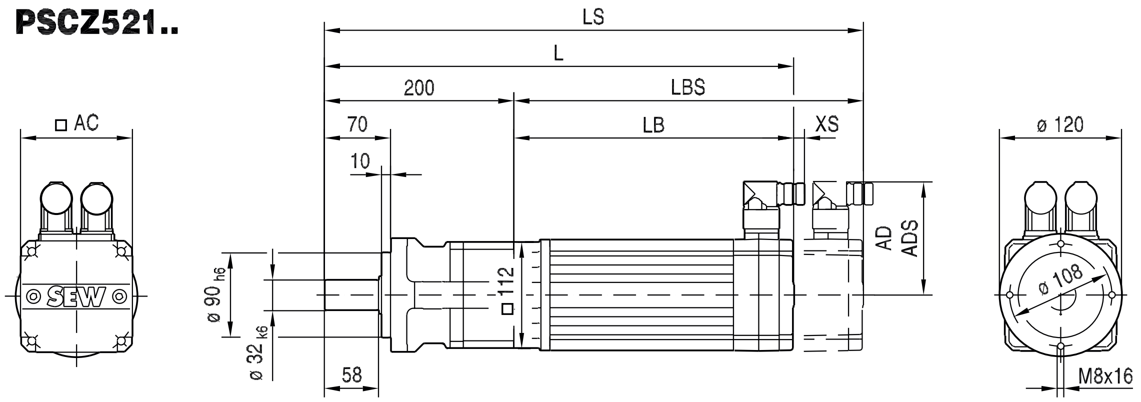
PSC / PSCZ



PSKC / PSKCZ



PSCZ521..



(→ 194)	CMP..									
	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
AC	73	73	88	88	88	116	116	116	137	137
AD	86	86	92	92	92	102	102	102	134	134
ADS	86	86	92	92	92	104	104	104	137	137
L	381	420	377	427	477	368	393	443	407	442
LS	409	448	405	455	505	433	458	508	485	520
LB	180	219	176	226	276	168	193	243	207	242
LBS	209	248	205	255	305	233	258	308	285	320
XS	18	18	14	14	14	11	11	11	37	37

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15.2.6 PSC522

PSC522, M_{aDyn} Nm										181 Nm
	CMP									
i	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
					2					
15.00	151	>200	163	>200	>200	>200	>200	>200	>200	>200
21.00	>200	>200	>200	>200	>200	>200	>200	>200	>200	>200
25.00	>220	>220	>220	>220	>220	>220	>220	>220	>220	>220
30.00	>200	>200	>200	>200	>200	>200	>200			
35.00	>220	>220	>220	>220	>220	>220	>220	>220	>220	>220
49.00	>205	>205	>205	>205	>205	>205	>205	>205	>205	>205
50.00	>220	>220	>220	>220	>220	>220	>220			
70.00	>205	>205	>205	>205	>205	>205	>205			
100.00	>199	>199	>199	>199	>199	>199	>199			

(→ 190)

PSC522, m kg										
	CMP									
s	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
2	13	14	14	16	17	18	20	22	25	27

CMP..				M1;M3;M5-6			M2			M4			φ
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'
PSC522 2	15.00	6000	98	805	-3.101	0	803	-3.130	0	808	-3.195	0	15
	21.00	6000	98	846	-3.659	0	843	-3.684	0	848	-3.751	0	15
	25.00	6000	98	1507	-9.199	0	1506	-9.346	0	1510	-9.435	0	15
	30.00	6000	98	900	-4.554	0	898	-4.592	0	903	-4.663	0	15
	35.00	6000	98	1591	-10.994	0	1589	-11.130	0	1593	-11.223	0	15
	49.00	6000	98	2118	-20.220	0	2115	-20.486	0	2119	-20.586	0	15
	50.00	6000	98	1701	-13.874	0	1699	-14.030	0	1703	-14.129	0	15
	70.00	6000	98	2269	-25.618	0	2267	-25.936	0	2270	-26.043	0	15
	100.00	6000	98	3031	-48.542	0	3029	-49.177	0	3031	-49.290	0	15

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg*m²	c_T PSC Nm/'	F_{Ramax} PSC N	F_{Rapk} PSC N
PSC522 2	15.00	147	200	305	467	0.81	21	4960	6750
	21.00	147	200	305	333	0.35	21	5550	6750
	25.00	181	220	330	280	0.76	23	5880	6750
	30.00	147	200	305	233	0.17	20	6250	6750
	35.00	181	220	330	200	0.32	23	6580	6750
	49.00	169	205	310	143	0.31	22	6750	6750
	50.00	181	220	330	140	0.16	22	6750	6750
	70.00	169	205	310	100	0.15	22	6750	6750
	100.00	161	199	295	70	0.15	19	6750	6750

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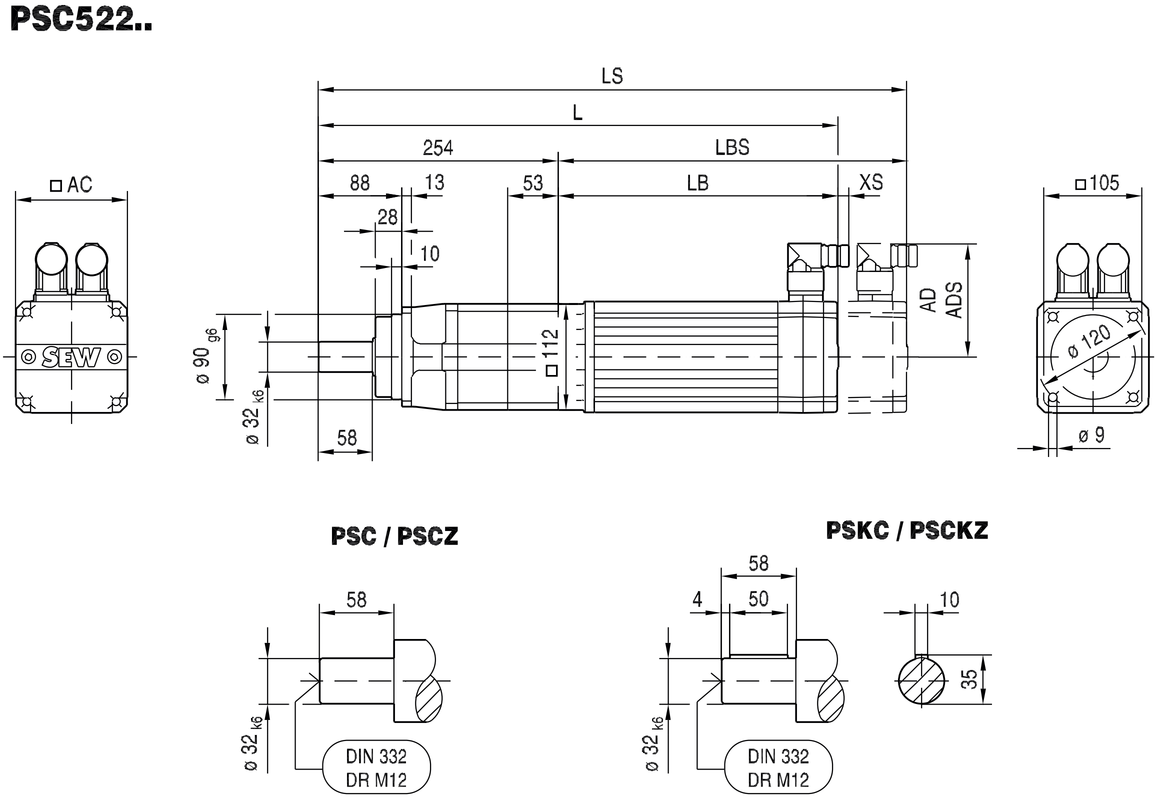

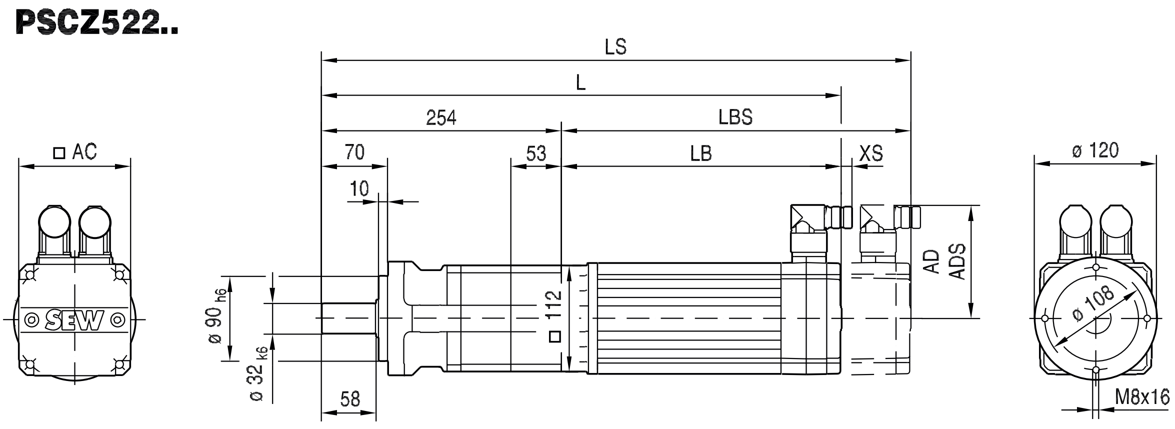

15

(→ 194)	CMP..									
	50M	50L	63S	63M	63L	71S	71M	71L	80S	80M
AC	73	73	88	88	88	116	116	116	137	137
AD	86	86	92	92	92	102	102	102	134	134
ADS	86	86	92	92	92	104	104	104	137	137
L	434	473	430	480	530	421	446	496	461	496
LS	463	502	458	508	558	486	511	561	538	573
LB	180	219	176	226	276	168	193	243	207	242
LBS	209	248	205	255	305	233	258	308	285	320
XS	18	18	14	14	14	11	11	11	37	37

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15.2.7 PSC621

PSC621, M_{aDyn} Nm												345 Nm
	CMP											
i	63L	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
	1											
5.00	150	152	230	205	305	>425	335	>425	>425	>425	>425	>425
7.00	210	210	325	290	>395	>395	>395	>395		>395		
10.00	300	300	>380	>380	>380		>380					

(→ 190)

PSC621, m kg												
	CMP											
s	63L	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
1	19	22	24	27	29	33	34	38	47	52	60	76

CMP..				M1;M3;M5-6			M2			M4			φ
	i	n_{epk} min^{-1}	η %	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	'
PSC621 1	5.00	5000	99	1028	-1.462	0	1050	-1.528	0	1024	-1.567	0	10
	7.00	5000	99	1139	-1.828	0	1163	-1.895	0	1164	-2.016	0	10
	10.00	5000	99	1034	-1.584	0	1052	-1.625	0	1046	-1.715	0	10

CMP.. n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aNotaus}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} $kg*m^2$	c_T PSC Nm/'	F_{Ramax} PSC N	F_{Rapk} PSC N
PSC621 1	5.00	345	425	640	820	2.2	60	5390	11000
	7.00	320	395	595	929	1.2	55	6030	11000
	10.00	305	380	565	700	0.58	46	6790	11000

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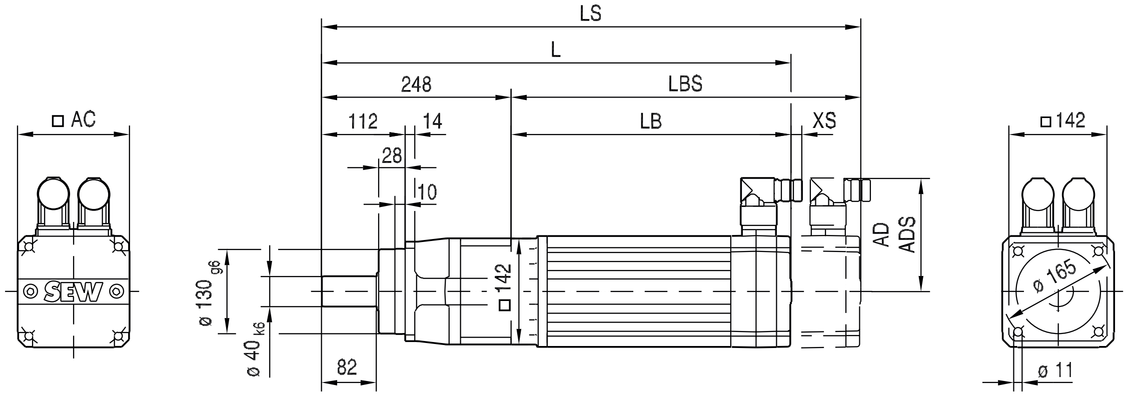
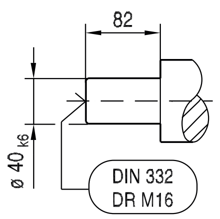
57 037 02 07

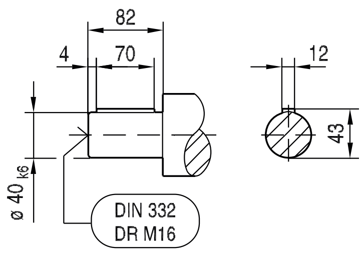
PSC621..



PSC / PSCZ

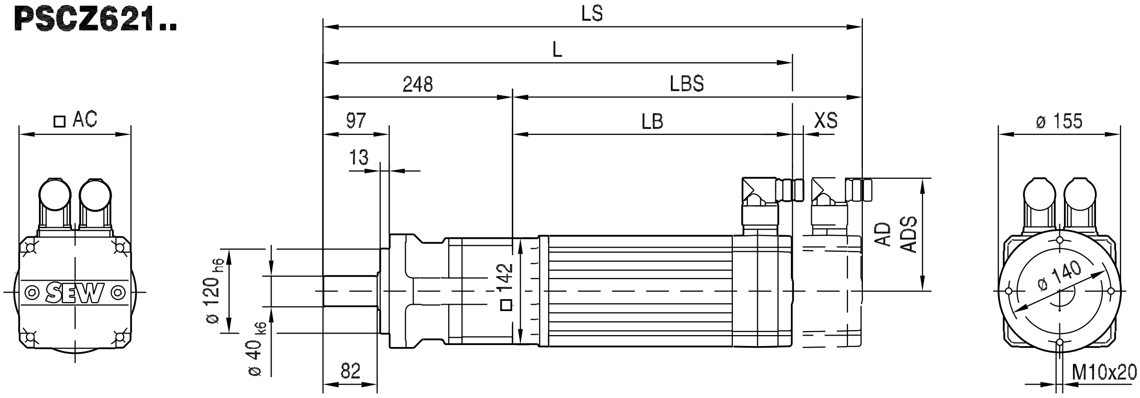


PSKC / PSKCZ



15

PSCZ621..



(→ 194)	CMP..											
	63L	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	116	116	137	137	137	162	162	162	205	205	205
AD	92	102	102	134	134	134	146	146	146	177	177	213
ADS	92	104	104	137	137	137	147	147	147	177	177	213
L	516	432	482	447	481	544	478	513	593	587	630	718
LS	545	497	547	524	558	621	575	610	690	708	751	839
LB	268	185	235	199	233	296	231	266	346	339	382	470
LBS	297	250	300	277	311	374	327	362	442	460	503	591
XS	14	11	11	37	37	37	37	37	37	32	32	49

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15.2.8 PSC622

PSC622, M_{aDyn} Nm											345 Nm
	CMP										
i	63L	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
						2						
25.00	>425	>425	>425	>425	>425	>425	>425	>425	>425	>425	>425	>425
35.00	>425	>425	>425	>425	>425	>425	>425	>425		>425		
49.00	>395	>395	>395	>395	>395	>395	>395	>395		>395		
50.00	>425	>425	>425	>425	>425		>425					
70.00	>395	>395	>395	>395	>395		>395					
100.00	>380	>380	>380	>380	>380		>380					

(→ 190)

PSC622, m kg												
	CMP											
s	63L	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
2	25	27	29	32	34	38	39	43	52	57	65	81

CMP..				M1;M3;M5-6			M2			M4			φ
		n_{epk}	η	a_0	a_1	a_2	a_0	a_1	a_2	a_0	a_1	a_2	
	i	min^{-1}	%										'
PSC622 2	25.00	5000	98	2766	-19.666	0	2776	-20.238	0	2785	-20.459	0	15
	35.00	5000	98	2918	-23.494	0	2930	-24.135	0	2939	-24.384	0	15
	49.00	5000	98	3883	-43.212	0	3897	-44.342	0	3905	-44.613	0	15
	50.00	5000	98	2825	-21.646	0	2828	-22.031	0	2838	-22.275	0	15
	70.00	5000	98	3755	-39.658	0	3762	-40.489	0	3770	-40.750	0	15
	100.00	5000	98	4863	-72.797	0	4873	-74.329	0	4877	-74.574	0	15

CMP..							c_T	F_{Ramax}	F_{Rapk}
n_e = 1500		M_{amax}	M_{apk}	$M_{aNotaus}$	n_{ak}	J_G 10^{-4}	PSC	PSC	PSC
	i	Nm	Nm	Nm	min^{-1}	$kg*m^2$	Nm/'	N	N
PSC622 2	25.00	345	425	640	280	1.8	51	9220	11000
	35.00	345	425	640	200	0.96	51	10300	11000
	49.00	320	395	595	143	0.94	48	11000	11000
	50.00	345	425	640	140	0.48	49	11000	11000
	70.00	320	395	595	100	0.46	47	11000	11000
	100.00	305	380	565	70	0.46	41	11000	11000

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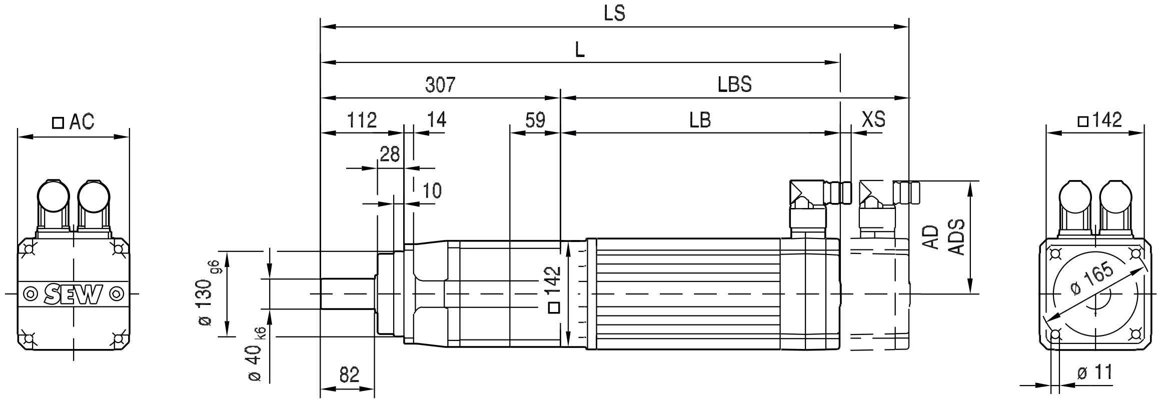
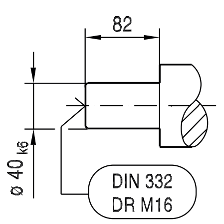
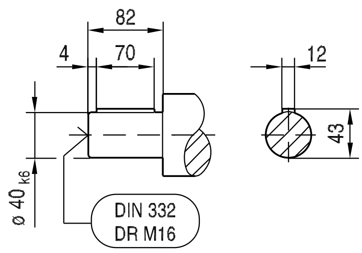
PSC622..



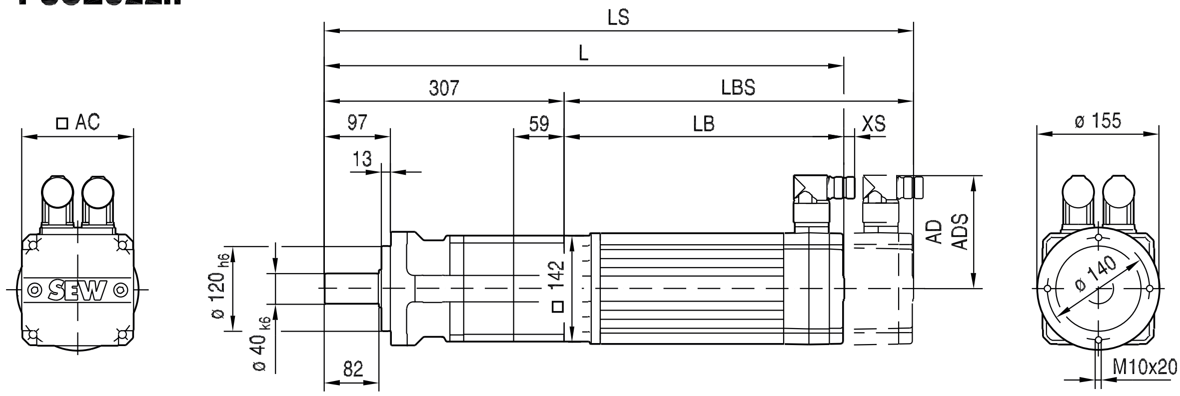
PSC / PSCZ



PSKC / PSCKZ



PSCZ622..



(→ 194)	CMP..											
	63L	71M	71L	80S	80M	80L	100S	100M	100L	112S	112M	112L
AC	88	116	116	137	137	137	162	162	162	205	205	205
AD	92	102	102	134	134	134	146	146	146	177	177	213
ADS	92	104	104	137	137	137	147	147	147	177	177	213
L	575	492	542	506	540	603	538	573	653	646	689	777
LS	604	556	606	584	618	681	634	669	749	767	810	898
LB	268	185	235	199	233	296	231	266	346	339	382	470
LBS	297	250	300	277	311	374	327	362	442	460	503	591
XS	14	11	11	37	37	37	37	37	37	32	32	49

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16 Main technical data of the servomotors

16.1 Key to the technical data

n_N	Rated speed
M_0	Standstill torque (thermal continuous torque at low speeds)
I_0	Standstill current
M_{pk}	Dynamic limit torque
I_{max}	Maximum permitted motor current
M_{0VR}	Standstill torque with forced cooling fan
I_{0VR}	Standstill current with forced cooling fan
J_{mot}	Mass moment of inertia of the motor
J_{bmot}	Mass moment of inertia of the brakemotor
$M_{1m,100°C}$	Maximum dynamic braking torque in case of emergency off
M_{1max}	Minimal averaged dynamic braking torque in case of emergency off at 100 °C
$M_{2, 20 °C}$	Nominal torque for slipping brake disk (relative speed between brake disk and friction surface: 1 m/s) at 20 °C
$M_{4,100 °C}$	Minimum holding torque at 100 °C
W_{max1}	Maximum permitted braking work per braking operation
W_{max2}	Maximum permitted braking work per braking operation with optional braking torque
L_1	Inductance between connection phase and star point
R_1	Resistance between connection phase and star point
V_{p0} cold	Internal voltage at 1000 min^{-1}
m_{mot}	Mass of the motor
m_{bmot}	Mass of the brakemotor

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16.2 CMP40 – CMP112, 400 V

Information on motors

n_N min^{-1}	Motor	M_0 Nm	I_0 A	M_{pk} Nm	I_{max} A	M_{0VR} Nm	I_{0VR} A	m kg	J_{mot} $10^{-4}kgm^2$	L_1 mH	R_1 Ω	V_{p0}cold V
2000	CMP71S	6.4	3.4	19.2	17	8.7	4.6	7	3.13	33.5	3.48	128
	CMP71M	9.4	5	30.8	26	13.7	7.3	8.4	4.17	21.6	1.87	127
	CMP71L	13.1	6.3	46.9	39	21	10.1	11.4	6.27	16.2	1.2	142
	CMP80S	13.4	6.9	42.1	33	18.5	9.5	12.8	9	15.3	1.1	133
	CMP80M	18.7	9.3	62.6	48	27	13.4	16.5	12.1	10.5	0.689	136
	CMP80L	27.5	12.5	107	72	44	20	21.4	18.3	7.58	0.438	149
	CMP100S	25.5	13.3	68.3	49	36	18.8	19.8	20.3	8.51	0.439	130
	CMP100M	31	14.7	108	69	47	22.3	24.8	27.2	6.63	0.302	141
	CMP100L	47	21.8	178.8	113	70	32.5	34.6	40.9	4.17	0.169	145
	CMP112S	30	14.3	88	51	43	21	38.4	74	8.63	0.38	143
	CMP112M	45	21	136	74	68	32	46.2	103	5.82	0.212	147
	CMP112L	69	33	225	124	109	52	62.6	163	3.33	0.105	145
	CMP112H	83	38	270	148	123	57	70.4	193	2.85	0.0846	149
	CMP112E	95	44.5	320	175	150	71	78.2	222	2.34	0.066	146
3000	CMP40S	0.5	1.2	1.9	6.1	-	-	1.3	0.1	23	11.9	27.5
	CMP40M	0.8	0.95	3.8	6	-	-	1.6	0.15	45.9	19.9	56.3
	CMP50S	1.3	0.96	5.2	5.1	1.7	1.25	2.3	0.42	71.2	22.5	86.3
	CMP50M	2.4	1.68	10.3	9.6	3.5	2.45	3.3	0.67	38.3	9.96	90.3
	CMP50L	3.3	2.2	15.4	13.6	4.8	3.2	4.1	0.92	30.4	7.42	98.2
	CMP63S	2.9	2.15	11.1	12.9	4	3	4	1.15	36.4	6.8	90.1
	CMP63M	5.3	3.6	21.4	21.6	7.5	5.1	5.7	1.92	21.8	3.56	100
	CMP63L	7.1	4.95	30.4	29.7	10.3	7.2	7.5	2.69	14.2	2.07	99.9
	CMP71S	6.4	4.9	19.2	25	8.7	6.7	7	3.13	15.7	1.48	87.5
	CMP71M	9.4	7.5	30.8	39	13.7	10.9	8.4	4.17	9.72	0.809	85.3
	CMP71L	13.1	9.4	46.9	58	21	15.1	11.4	6.27	7.34	0.559	95.7
	CMP80S	13.4	10	42.1	47	18.5	13.8	12.8	9	7.2	0.544	91.1
	CMP80M	18.7	13.4	62.6	69	27	19.3	16.5	12.1	5.03	0.344	94.3
	CMP80L	27.5	18.7	107	107	44	30	21.4	18.3	3.37	0.21	99.2
	CMP100S	25.5	19.6	68.3	73	36	27.5	19.8	20.3	3.91	0.214	88
	CMP100M	31	21.8	108	102	47	33	24.8	27.2	3.04	0.142	95.5
	CMP100L	47	32.3	178.8	167	70	48	34.6	40.9	1.9	0.0809	98
	CMP112S	30	21	88	74	43	30.5	38.4	74	4.04	0.177	97.5
	CMP112M	45	32	136	113	68	49	46.2	103	2.49	0.0896	96.1
	CMP112L	69	49	225	183	109	77	62.6	163	1.53	0.048	98
	CMP112H	83	57	270	220	123	84	70.4	193	1.29	0.0388	100
	CMP112E	95	65	320	255	150	104	78.2	222	1.09	0.031	99.8

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n_N min^{-1}	Motor	M_0 Nm	I_0 A	M_{pk} Nm	I_{max} A	M_{0VR} Nm	I_{0VR} A	m kg	J_{mot} $10^{-4}kgm^2$	L_1 mH	R_1 Ω	V_{p0}cold V
4500	CMP40S	0.5	1.2	1.9	6.1	-	-	1.3	0.1	23	11.9	27.5
	CMP40M	0.8	0.95	3.8	6	-	-	1.6	0.15	45.9	19.9	56.3
	CMP50S	1.3	1.32	5.2	7	1.7	1.7	2.3	0.42	37.2	11.6	62.4
	CMP50M	2.4	2.3	10.3	13.1	3.5	3.35	3.3	0.67	20.7	5.29	66.3
	CMP50L	3.3	3.15	15.4	19.5	4.8	4.6	4.1	0.92	14.6	3.57	68
	CMP63S	2.9	3.05	11.1	18.3	4	4.2	4	1.15	18.3	3.35	63.9
	CMP63M	5.3	5.4	21.4	32.4	7.5	7.6	5.7	1.92	9.79	1.48	67
	CMP63L	7.1	6.9	30.4	41.4	10.3	10	7.5	2.69	7.21	1.07	71.1
	CMP71S	6.4	7.3	19.2	38	8.7	9.9	7	3.13	7.07	0.719	58.7
	CMP71M	9.4	10.9	30.8	57	13.7	15.9	8.4	4.17	4.54	0.384	58.3
	CMP71L	13.1	14.1	46.9	87	21	22.5	11.4	6.27	3.26	0.241	63.8
	CMP80S	13.4	15.3	42.1	73	18.5	21	12.8	9	3.06	0.221	59.4
	CMP80M	18.7	20.1	62.6	103	27	29	16.5	12.1	2.24	0.148	62.9
	CMP80L	27.5	27.8	107	159	44	44.5	21.4	18.3	1.54	0.0855	67
	CMP100S	25.5	30	68.3	111	36	42.5	19.8	20.3	1.68	0.0857	57.7
	CMP100M	31	33.1	108	154	47	50	24.8	27.2	1.32	0.065	62.9
	CMP100L	47	48.4	178.8	251	70	72	34.6	40.9	0.844	0.038	65.3
	CMP112S	30	31.5	88	112	43	45.5	38.4	74	1.78	0.0801	64.7
	CMP112M	45	47	136	168	68	72	46.2	103	1.14	0.0412	65
	CMP112L	69	73	225	275	107	114	62.6	163	0.68	0.0213	65.3
	CMP112H	83	86	270	335	123	128	70.4	193	0.557	0.0165	65.9
	CMP112E	95	98	320	385	150	156	78.2	222	0.484	0.0134	66.5
6000	CMP40S	0.5	1.2	1.9	6.1	-	-	1.3	0.1	23	11.9	27.5
	CMP40M	0.8	1.1	3.8	6.9	-	-	1.6	0.15	34	15	48.5
	CMP50S	1.3	1.7	5.2	9	1.7	2.2	2.3	0.42	22.5	7.11	48.5
	CMP50M	2.4	3	10.3	17.1	3.5	4.4	3.3	0.67	12	3.21	50.5
	CMP50L	3.3	4.2	15.4	26	4.8	6.1	4.1	0.92	8.2	1.91	51
	CMP63S	2.9	3.9	11.1	23.4	4	5.4	4	1.15	11.2	2.1	50
	CMP63M	5.3	6.9	21.4	41.4	7.5	9.8	5.7	1.92	5.9	0.92	52
	CMP63L	7.1	9.3	30.4	55.8	10.3	13.5	7.5	2.69	4	0.62	53
	CMP71S	6.4	9.6	19.2	50	8.7	13.1	7	3.13	4.13	0.395	44.9
	CMP71M	9.4	14.7	30.8	76	13.7	21.5	8.4	4.17	2.53	0.206	43.5
	CMP71L	13.1	18.8	46.9	115	21	30	11.4	6.27	1.84	0.145	47.9
	CMP80S	13.4	20	42.1	95	18.5	27.5	12.8	9	1.8	0.136	45.6
	CMP80M	18.7	26.4	62.6	135	27	38	16.5	12.1	1.3	0.0873	47.9
	CMP80L	27.5	37.6	107	215	44	60	21.4	18.3	0.843	0.0507	49.6

16.3 CMP40 – CMP100, 230 V

Information on motors

n_N min^{-1}	Motor	M_0 Nm	I_0 A	M_{pk} Nm	I_{max} A	M_{0VR} Nm	I_{0VR} A	m kg	J_{mot} $10^{-4}kgm^2$	L_1 mH	R_1 Ω	V_{p0}cold V
3000	CMP40S	0.5	1.2	1.9	6.1	-	-	1.3	0.1	23	11.9	27.5
	CMP40M	0.8	1.5	3.8	9	-	-	1.6	0.15	18.4	7.85	35.7
	CMP50S	1.3	1.64	5.2	9.8	-	-	2.3	0.42	24.3	7.39	50.4
	CMP50M	2.4	2.84	10.3	17.05	-	-	3.3	0.67	13.5	3.41	53.7
	CMP50L	3.3	3.84	15.4	23.1	-	-	4.1	0.92	9.79	2.34	55.7
	CMP63S	2.9	3.61	11.1	21.65	-	-	4	1.15	13	2.56	54
	CMP63M	5.3	6.35	21.4	38.1	-	-	5.7	1.92	7.09	1.12	57
	CMP63L	7.1	8.76	30.4	52.59	-	-	7.5	2.69	4.47	0.655	56
	CMP71S	6.4	8.7	19.2	44	8.7	11.8	7	3.13	5.03	0.483	49.5
	CMP71M	9.4	13.1	30.8	68	13.7	19.1	8.4	4.17	3.17	0.26	48.7
	CMP71L	13.1	16.8	46.9	103	21	27	11.4	6.27	2.31	0.163	53.7
	CMP80S	13.4	17.7	42.1	83	18.5	24.5	12.8	9	2.3	0.166	51.5
	CMP80M	18.7	23.5	62.6	121	27	34	16.5	12.1	1.64	0.113	53.9
	CMP80L	27.5	32.5	107	186	44	52	21.4	18.3	1.11	0.0728	57
	CMP100S	25.5	34.2	68.3	127	-	-	19.8	20.3	1.29	0.0664	50.5
	CMP100M	31	40	108	187	-	-	24.8	27.2	0.904	0.0445	52.1
4500	CMP40S	0.5	1.2	1.9	6.1	-	-	1.3	0.1	23	11.9	27.5
	CMP40M	0.8	1.5	3.8	9	-	-	1.6	0.15	18.4	7.85	35.7
	CMP50S	1.3	2.29	5.2	13.75	-	-	2.3	0.42	12.3	3.73	35.9
	CMP50M	2.4	4.025	10.3	24.2	-	-	3.3	0.67	6.75	1.68	37.9
	CMP50L	3.3	5.53	15.4	33.2	-	-	4.1	0.92	4.73	1.14	38.7
	CMP63S	2.9	5.25	11.1	31.5	-	-	4	1.15	6.18	1.09	37.1
	CMP63M	5.3	9.78	21.4	58.7	-	-	5.7	1.92	2.99	0.462	37
	CMP63L	7.1	12.01	30.4	72.07	-	-	7.5	2.69	2.38	0.339	40.9
	CMP71S	6.4	12.8	19.2	67	8.7	17.4	7	3.13	2.29	0.226	33.4
	CMP71M	9.4	19.2	30.8	101	13.7	28	8.4	4.17	1.46	0.127	33.1
	CMP80S	13.4	27	42.1	129	18.5	37	12.8	9	0.983	0.0698	33.7
	CMP80M	18.7	35	62.6	180	27	51	16.5	12.1	0.73	0.051	35.9
	CMP100S	25.5	54.5	68.3	200	-	-	19.8	20.3	0.509	0.0268	31.7
6000	CMP40S	0.5	1.36	1.9	6.8	-	-	1.3	0.1	17.9	9.19	24.3
	CMP40M	0.8	1.91	3.8	11.5	-	-	1.6	0.15	11.2	4.83	27.8
	CMP50S	1.3	3.07	5.2	18.45	-	-	2.3	0.42	6.85	2	26.8
	CMP50M	2.4	5.25	10.3	31.5	-	-	3.3	0.67	3.97	1.03	29
	CMP50L	3.3	7.6	15.4	45.4	-	-	4.1	0.92	2.53	0.596	28.3
	CMP63S	2.9	6.78	11.1	40.7	-	-	4	1.15	3.69	0.668	28.7
	CMP63M	5.3	12.06	21.4	72.36	7.5	17.04	5.7	1.92	1.96	0.296	30
	CMP71S	6.4	17	19.2	89	8.7	23	7	3.13	1.32	0.124	25.3
	CMP80S	13.4	35.5	42.1	168	18.5	48.5	12.8	9	0.575	0.0416	25.7

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16.4 CMP40 – CMP63 with BK brake

Information on brakemotors

n_n min^{-1}	Motor	M_0 Nm	M_{pk} Nm	Brake	m_{bmot} kg	J_{bmot} $10^{-4}kgm^2$	$M_{4.100°C}$ Nm	$M_{1m,100°C}$ Nm	M_{1max} Nm
3000 4500 6000	CMP40S	0.5	1.9	BK01	1.6	0.19	1.9	1.4	3.4
	CMP40M	0.8	3.8	BK01	1.9	0.24	1.9	1.4	3.4
	CMP50S	1.3	5.2	BK02	2.7	0.53	2.4	1.9	5.3
	CMP50M	2.4	10.3	BK02	3.7	0.78	2.4	1.9	5.3
	CMP50L	3.3	15.4	BK04	4.6	1.33	3.9	2.4	7
	CMP63S	2.9	11.1	BK03	4.6	1.54	3.8	2	7.9
	CMP63M	5.3	21.4	BK07	6.5	2.49	7.1	3.9	12.8
	CMP63L	7.1	30.4	BK07	8.3	3.26	7.1	3.9	12.8

16.5 CMP71 – CMP100 with BP brake

Information on brakemotors

n min^{-1}	Motor	M_0 Nm	M_{pk} Nm	Brake	m_{bmot} kg	J_{bmot} $10^{-4}kgm^2$	$M_{2.20°C}$ Nm	$M_{4.100°C}$ Nm	$M_{1m,100°C}$ Nm
2000 3000 4500	CMP71S	6.4	19.2	BP1	9	3.53	7	4.2	2.8
	CMP71M	9.4	30.8	BP1	10.4	4.59	14	8.4	5.6
	CMP71L	13.1	46.9	BP1	13.4	6.69	14	8.4	5.6
	CMP80S	13.4	42.1	BP3	16.8	10.3	16	9.6	6.4
	CMP80M	18.7	62.6	BP3	20.5	13.4	31	18.6	12.4
	CMP80L	27.5	107	BP3	25.4	19.6	31	18.6	12.4
	CMP100S	25.5	68.3	BP5	22.8	22	24	14.4	9.6
	CMP100M	31	108	BP5	27.8	29	47	28.2	18.8
	CMP100L	47	178.8	BP5	37.6	42.7	47	28.2	18.8

n min^{-1}	Motor	M_0 Nm	M_{pk} Nm	Brake	m_{bmot} kg	J_{bmot} $10^{-4}kgm^2$	$M_{2.20°C}$ Nm	$M_{4.100°C}$ Nm	$M_{1m,100°C}$ Nm
6000	CMP71S	6.4	19.2	BP1	9	3.53	7	4.2	2.8
	CMP71M	9.4	30.8	BP1	10.4	4.59	14	8.4	5.6
	CMP71L	13.1	46.9	BP1	13.4	6.69	14	8.4	5.6
	CMP80S	13.4	42.1	BP3	16.8	10.3	16	9.6	6.4
	CMP80M	18.7	62.6	BP3	20.5	13.4	31	18.6	12.4
	CMP80L	27.5	107	BP3	25.4	19.6	31	18.6	12.4

16.6 CMP112 with BY brake

Information on brakemotors

n min^{-1}	Motor	M_0 Nm	M_{pk} Nm	Brake	m_{bmot} kg	J_{bmot} $10^{-4}kgm^2$	$M_{2.20°C}$ Nm	$M_{4.100°C}$ Nm	$M_{1m,100°C}$ Nm
2000 3000 4500	CMP112S	30	88	BY14	60.3	102	70	42	49
	CMP112M	45	136	BY14	68.1	132	100	60	70
	CMP112L	69	225	BY14	84.5	192	140	84	98
	CMP112H	83	270	BY14	92.3	221	140	84	98
	CMP112E	95	320	BY14	100	251	140	84	98

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16.7 CMPZ71 – CMPZ100, 400 V

n_N min^{-1}	Motor	M_0 Nm	I_0 A	M_{pk} Nm	I_{max} A	M_{0VR} Nm	I_{0VR} A	m kg	J_{mot} $10^{-4}kgm^2$	L_1 mH	R_1 Omega	V_{p0}cold V	Δ LB[1] mm
	CMPZ71S	6.4	3.4	19.2	17	8.7	4.6	8.6	9.32	33.5	3.48	128	62.6
	CMPZ71M	9.4	5	30.8	26	13.7	7.3	10	10.4	21.6	1.87	127	62.6
	CMPZ71L	13.1	6.3	46.9	39	21	10.1	13	12.5	16.2	1.2	142	62.6
	CMPZ80S	13.4	6.9	42.1	33	18.5	9.5	15.8	27.2	15.3	1.1	133	75.3
2000	CMPZ80M	18.7	9.3	62.6	48	27	13.4	19.5	30.3	10.5	0.689	136	75.3
	CMPZ80L	27.5	12.5	107	72	44	20	24.4	36.5	7.58	0.438	149	75.3
	CMPZ100S	25.5	13.3	68.3	49	36	18.8	24.2	79.8	8.51	0.439	130	96.2
	CMPZ100M	31	14.7	108	69	47	22.3	29.2	86.7	6.63	0.302	141	96.2
	CMPZ100L	47	21.8	178.8	113	70	32.5	39	100	4.17	0.169	145	96.2
	CMPZ71S	6.4	4.9	19.2	25	8.7	6.7	8.6	9.32	15.7	1.48	87.5	62.6
	CMPZ71M	9.4	7.5	30.8	39	13.7	10.9	10	10.4	9.72	0.809	85.3	62.6
	CMPZ71L	13.1	9.4	46.9	58	21	15.1	13	12.5	7.34	0.559	95.7	62.6
	CMPZ80S	13.4	10	42.1	47	18.5	13.8	15.8	27.2	7.2	0.544	91.1	75.3
3000	CMPZ80M	18.7	13.4	62.6	69	27	19.3	19.5	30.3	5.03	0.344	94.3	75.3
	CMPZ80L	27.5	18.7	107	107	44	30	24.4	36.5	3.37	0.21	99.2	75.3
	CMPZ100S	25.5	19.6	68.3	73	36	27.5	24.2	79.8	3.91	0.214	88	96.2
	CMPZ100M	31	21.8	108	102	47	33	29.2	86.7	3.04	0.142	95.5	96.2
	CMPZ100L	47	32.3	178.8	167	70	48	39	100	1.9	0.0809	98	96.2
	CMPZ71S	6.4	7.3	19.2	38	8.7	9.9	8.6	9.32	7.07	0.719	58.7	62.6
	CMPZ71M	9.4	10.9	30.8	57	13.7	15.9	10	10.4	4.54	0.384	58.3	62.6
	CMPZ71L	13.1	14.1	46.9	87	21	22.5	13	12.5	3.26	0.241	63.8	62.6
	CMPZ80S	13.4	15.3	42.1	73	18.5	21	15.8	27.2	3.06	0.221	59.4	75.3
4500	CMPZ80M	18.7	20.1	62.6	103	27	29	19.5	30.3	2.24	0.148	62.9	75.3
	CMPZ80L	27.5	27.8	107	159	44	44.5	24.4	36.5	1.54	0.0855	67	75.3
	CMPZ100S	25.5	30	68.3	111	36	42.5	24.2	79.8	1.68	0.0857	57.7	96.2
	CMPZ100M	31	33.1	108	154	47	50	29.2	86.7	1.32	0.065	62.9	96.2
	CMPZ100L	47	48.4	178.8	251	70	72	39	100	0.844	0.038	65.3	96.2
	CMPZ71S	6.4	9.6	19.2	50	8.7	13.1	8.6	9.32	4.13	0.395	44.9	62.6
	CMPZ71M	9.4	14.7	30.8	76	13.7	21.5	10	10.4	2.53	0.206	43.5	62.6
6000	CMPZ71L	13.1	18.8	46.9	115	21	30	13	12.5	1.84	0.145	47.9	62.6
	CMPZ80S	13.4	20	42.1	95	18.5	27.5	15.8	27.2	1.8	0.136	45.6	75.3
	CMPZ80M	18.7	26.4	62.6	135	27	38	19.5	30.3	1.3	0.0873	47.9	75.3
	CMPZ80L	27.5	37.6	107	215	44	60	24.4	36.5	0.843	0.0507	49.6	75.3

1) Additional length from CMPZ.. motor to the corresponding CMP.. motor

16.8 CMPZ71 – CMPZ100, 230 V

Information on motors

n_N min^{-1}	Motor	M_0 Nm	I_0 A	M_{pk} Nm	I_{max} A	M_{0VR} Nm	I_{0VR} A	m kg	J_{mot} 10^{-4}kgm^2	L_1 mH	R_1 Omega	V_{p0}cold V	Δ LB[1)] mm
3000	CMPZ71S	6.4	8.7	19.2	44	8.7	11.8	8.6	9.32	5.03	0.483	49.5	62.6
	CMPZ71M	9.4	13.1	30.8	68	13.7	19.1	10	10.4	3.17	0.26	48.7	62.6
	CMPZ71L	13.1	16.8	46.9	103	21	27	13	12.5	2.31	0.163	53.7	62.6
	CMPZ80S	13.4	17.7	42.1	83	18.5	24.5	15.8	27.2	2.3	0.166	51.5	75.3
	CMPZ80M	18.7	23.5	62.6	121	27	34	19.5	30.3	1.64	0.113	53.9	75.3
	CMPZ80L	27.5	32.5	107	186	44	52	24.4	36.5	1.11	0.0728	57	75.3
	CMPZ100S	25.5	34.2	68.3	127	-	-	24.2	79.8	1.29	0.0664	50.5	96.2
	CMPZ100M	31	40	108	187	-	-	29.2	86.7	0.904	0.0445	52.1	96.2
4500	CMPZ71S	6.4	12.8	19.2	67	8.7	17.4	8.6	9.32	2.29	0.226	33.4	62.6
	CMPZ71M	9.4	19.2	30.8	101	13.7	28	10	10.4	1.46	0.127	33.1	62.6
	CMPZ80S	13.4	27	42.1	129	18.5	37	15.8	27.2	0.983	0.0698	33.7	75.3
	CMPZ80M	18.7	35	62.6	180	27	51	19.5	30.3	0.73	0.051	35.9	75.3
	CMPZ100S	25.5	54.5	68.3	200	-	-	24.2	79.8	0.509	0.0268	31.7	96.2
6000	CMPZ71S	6.4	17	19.2	89	8.7	23	8.6	9.32	1.32	0.124	25.3	62.6
	CMPZ80S	13.4	35.5	42.1	168	18.5	48.5	15.8	27.2	0.575	0.0416	25.7	62.6

1) Additional length from CMPZ.. motor to the corresponding CMP.. motor

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16.9 CMPZ71 – CMPZ100 with BY brake

Information on brakemotors

n_N min^{-1}	Motor	M_0 Nm	M_{pk} Nm	Brake	m_{bmot} kg	J_{bmot} 10^{-4}kgm^2	$M_{2.20°C}$ Nm	$M_{4.100°C}$ Nm	$M_{1m,100°C}$ Nm	Δ LBS[1)] mm
2000 3000 4500	CMPZ71S	6.4	19.2	BY2	11.2	11	14	8.4	9.8	58.5
	CMPZ71M	9.4	30.8	BY2	12.6	12.1	20	12	14	58.5
	CMPZ71L	13.1	46.9	BY2	15.6	14.2	20	12	14	58.5
	CMPZ80S	13.4	42.1	BY4	20.8	31	28	16.8	19.6	62.4
	CMPZ80M	18.7	62.6	BY4	24.5	34.1	40	24	28	62.4
	CMPZ80L	27.5	107	BY4	29.4	40.3	40	24	28	62.4
	CMPZ100S	25.5	68.3	BY8	34.7	84.2	55	33	38.5	61.1
	CMPZ100M	31	108	BY8	39.7	91.1	80	48	56	61.1
	CMPZ100L	47	178.8	BY8	49.5	105	80	48	56	61.1

1) Additional length from CMPZ../BY brakemotor to the corresponding CMP../BP brakemotor

n_N min^{-1}	Motor	M_0 Nm	M_{pk} Nm	Brake	m_{bmot} kg	J_{bmot} 10^{-4}kgm^2	$M_{2.20°C}$ Nm	$M_{4.100°C}$ Nm	$M_{1m,100°C}$ Nm	Δ LBS[1)] mm
6000	CMPZ71S	6.4	19.2	BY2	11.2	11	14	8.4	9.8	58.5
	CMPZ71M	9.4	30.8	BY2	12.6	12.1	20	12	14	58.5
	CMPZ71L	13.1	46.9	BY2	15.6	14.2	20	12	14	58.5

1) Additional length from CMPZ../BY brakemotor to the corresponding CMP../BP brakemotor

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Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Ludwigshafen	SEW-EURODRIVE GmbH & Co KG c/o BASF SE Gebäude W130 Raum 101 67056 Ludwigshafen	Tel. +49 7251 75 3759 Fax +49 7251 75 503759 dc-ludwigshafen@sew-eurodrive.de
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Drive Service Hotline / 24 Hour Service			0 800 SEWHELP 0 800 7394357
Technical Offices	Augsburg	SEW-EURODRIVE GmbH & Co KG August-Wessels-Straße 27 86156 Augsburg	Tel. +49 821 22779-10 Fax +49 821 22779-50 tb-augsburg@sew-eurodrive.de
	Lake Con- stance	SEW-EURODRIVE GmbH & Co KG Dornierstraße 4 88677 Markdorf	Tel. +49 7544 96590-90 Fax +49 7544 96590-99 tb-bodensee@sew-eurodrive.de
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	Dortmund	SEW-EURODRIVE GmbH & Co KG Hildastraße 8 44145 Dortmund	Tel. +49 231 229028-10 Fax +49 231 229028-20 tb-dortmund@sew-eurodrive.de
	Dresden	SEW-EURODRIVE GmbH & Co KG Hauptstraße 32 01445 Radebeul	Tel. +49 351 26338-0 Fax +49 351 26338-38 tb-dresden@sew-eurodrive.de
	Erfurt	SEW-EURODRIVE GmbH & Co KG Dubliner Straße 12 99091 Erfurt	Tel. +49 361 21709-70 Fax +49 361 21709-79 tb-erfurt@sew-eurodrive.de
	Güstrow	SEW-EURODRIVE GmbH & Co KG Glasewitzer Chaussee 33 B 18273 Güstrow P.O. Box Postfach 1216 – D-18262 Güstrow	Tel. +49 3843 8557-80 Fax +49 3843 8557-88 tb-guestrow@sew-eurodrive.de
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	Hannover / Garbsen	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Str.40-42 30823 Garbsen	Tel. +49 5137 8798-10 Fax +49 5137 8798-50 tb-hannover@sew-eurodrive.de
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	Koblenz	SEW-EURODRIVE GmbH & Co KG Bahnstraße 17a 56743 Mendig	Tel. +49 2652 9713-30 Fax +49 2652 9713-40 tb-koblenz@sew-eurodrive.de
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	Münster	SEW-EURODRIVE GmbH & Co KG Hafenplatz 4 48155 Münster	Tel. +49 251 41475-11 Fax +49 251 41475-50 tb-muenster@sew-eurodrive.de
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	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911
Service Competence Center	Southern England	SEW-EURODRIVE Ltd. Unit 41 Easter Park Benyon Road Silchester Reading Berkshire RG7 2PQ	Tel. +44 1189 701-699 Fax +44 1189 701-021
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	Scotland	SEW-EURODRIVE Ltd. No 37 Enterprise House Springkerse Business Park Stirling FK7 7UF	Tel. +44 17 8647-8730 Fax +44 17 8645-0223
	Northern Ireland	Heyn Engineering (NI) Ltd. 1 Corry Place, Belfast, BT3 9AH	Tel. +44 02890350022 Fax +44 02890350012 http://www.heyn.co.uk info@heyn.co.uk
Greece			
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Technical Office	Thessaloniki	Christ. Boznos & Son S.A. Asklipiou 26 562 24 Evosmos, Thessaloniki	Tel. +30 2 310 7054-00 Fax +30 2 310 7055-15 info@boznos.gr

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Sales	Reykjavik	Varma & Vélaverk ehf. Knarrarvogi 4 104 Reykjavík	Tel. +354 585 1070 Fax +354 585)1071 http://www.varmaverk.is vov@vov.is

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	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35 628700 Fax +91 21 35 628715 salespune@seweurodriveindia.com
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	Bangalore	SEW-EURODRIVE India Private Limited # C-104, 3rd Block, KSSIDC Complex, Electronic City. Bangalore – 560100, Karnataka	Tel. +91 80 28522662 / 28522663 salesbangalore@seweurodriveindia.com
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	Bellary	SEW-EURODRIVE India Private Limited Door no-56/279 Ward No-15, Sindhigi compound, Near Raghavendra talkies, Bellary-583101, Karnataka	Tel. +91 77609 88668 salesbellary@seweurodriveindia.com
	Chandigarh	SEW-EURODRIVE India Private Limited #699, Type -3, Power Colony, Chandigarh - Rupnagar Highway Rupnagar - 140001, Punjab	Tel. +91 81462 67606 saleschandigarh@seweurodriveindia.com
	Chennai	SEW-EURODRIVE India Private Limited 2nd Floor, Josmans Complex, No. 5, McNichols Road, Chetpet Chennai - 600031, Tamil Nadu	Tel. +91 44 42849812 / 13 / 14 / 15 Fax +91 44 42849816 saleschennai@seweurodriveindia.com
	Kochi	SEW-EURODRIVE India Private Limited House No: 30/1168 A Kaniyampuzha Road Vyttila Post Office Cochin – 682019, Kerala	Tel. +91 98951 30375 salescochin@seweurodriveindia.com

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Hyderabad	SEW-EURODRIVE India Private Limited 408, 4th Floor, Meridian Place Green Park Road, Amerpeet Hyderabad - 500016, Telangana	Tel. +91 40 23414698 Fax +91 40 23413884 saleshyderabad@seweurodriveindia.com
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	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com

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Drive Center	Bologna	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via della Grafica, 47 40064 Ozzano dell'Emilia (Bo)	Tel. +39 051 65-23-801 Fax +39 02 96 980 499 bologna@sew-eurodrive.it
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	Turin	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Filiale Torino c.so Unione Sovietica 612/15 - int. C 10135 Torino	Tel. +39 011 3473780 Fax +39 02 96 980 799 torino@sew-eurodrive.it
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Ivory Coast			
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	Osaka	SEW-EURODRIVE JAPAN CO., LTD Higobashi Shimizu Bldg. 10th flor 1-3-7 Tosabori, Nishi-ku Osaka, 550-0001	Tel. +81 6 6444--8330 Fax +81 6 6444--8338 osaka@sew-eurodrive.co.jp
	Tokio	SEW-EURODRIVE JAPAN CO., LTD Renai Partire Shiodome 5th floor 2-18-3 Higashi-Shinbashi, Minato-Ku, Tokyo 105-0021	Tel. +81 3 3239-0469 Fax +81 3 3239-0943 tokyo@sew-eurodrive.co.jp
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	Oskemen	SEW-EURODRIVE LLP 181/3, Abai avenue, 070005, Oskemen	Tel. +7 (7212) 913 748 Fax +7 (7212) 913 748 oskemen@sew-eurodrive.kz
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Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com
Lebanon			
Sales (Lebanon)	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
Sales (Jordan, Kuwait , Saudi Arabia, Syria)	Beirut	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com
Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
representation: Belgium			
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Malaysia			
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Namibia			
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Netherlands			
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New Zealand			
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	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
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Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L De la Victoria 112, Esquina nueva Asunción Departamento Central Fernando de la Mora, Barrio Bernardino	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
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Philippines			
Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
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	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
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	Daejeon	SEW-EURODRIVE KOREA CO., LTD. No.302 Hongin officetel, 28, Daehak-ro, Yuseong-gu, Daejeon, Zip 305-710	Tel. +82 42 828-6461 Fax +82 42 828-6463
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Sales	Manzini	C G Trading Co. (Pty) Ltd PO Box 2960 Manzini M200	Tel. +268 2 518 6343 Fax +268 2 518 5033 engineering@cgtrading.co.sz
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	Central Switzerland, Aargau	Armin Pfister Stierenweid 4950 Huttwil, BE	Tel. +41 62 962 54 55 Fax +41 62 962 54 56
	Zürich, Ticino	Gian-Michele Muletta Fischerstrasse 61 8132 Egg bei Zürich	Tel. +41 44 994 81 15 Fax +41 44 994 81 16
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	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz info@sew.co.tz
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	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Wellford	SEW-EURODRIVE INC. 148/150 Finch Rd. Wellford, S.C. 29385	IGLogistics@seweurodrive.com
	Additional addresses for service provided on request!		
Uzbekistan			
Technical Office	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
Vietnam			
Sales	Ho Chi Minh City	Nam Trung Co., Ltd Huế - South Vietnam / Construction Materials 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 khanh-nguyen@namtrung.com.vn http://www.namtrung.com.vn
	Hanoi	MICO LTD Quảng Trị - North Vietnam / All sectors except Construction Materials 8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam	Tel. +84 4 39386666 Fax +84 4 3938 6888 nam_ph@micogroup.com.vn http://www.micogroup.com.vn

22316612/EN – 04/2017

Inquiry/order

Customer data:

Company: ____________________ Customer no.: ____________________
Department: ____________________
Name: ____________________ Phone: ____________________
Street/P.O. box: ____________________ Fax: ____________________
____________________ Email: ____________________
Zip code/city: ____________________

Contact at SEW:

Name: ____________________ Phone: ____________________
Technical office: ____________________ Fax: ____________________

Technical data:

Quantity: ________ Desired delivery date: ____________________
Catalog designation: ____________________

Gear unit type:

☐ Helical gear units ☐ Parallel-shaft helical gear units ☐ Helical-bevel gear unit ☐ Helical-worm gear unit ☐ Spiroplan® gear units
☐ Double gear units ☐ Servo gear units ☐ Variable-speed gear unit ☐ Electrified monorail system ☐ Miscellaneous: _____

Output speed: _________ 1/min **Output torque:** ________ Nm

Cycles/hour: ____________ c/h **Cyclic duration factor:** S ________ / ________ % cdf

☐ 1-shift operation ☐ 2-shift operation ☐ 3-shift operation
☐ Regular ☐ Irregular ☐ Very irregular

Mounting position: [1)]

M1 ☐ M2 ☐ M3 ☐ M4 ☐ M5 ☐ M6 ☐ Pivoted ☐

Housing form:

☐ Foot-mounted ☐ Flange (bore) ☐ Flange (thread)
☐ Torque arm ☐ Miscellaneous: ____________________

Shaft design:

☐ Solid shaft with key ☐ Shrink disk Shaft/hollow shaft Ø :__________ mm
☐ Hollow shaft with key ☐ TorqLOC® Flange Ø : __________ mm

Shaft position (for right-angle gear units):

☐ A | ☐ B | ☐ AB

Terminal box position:

☐ 0°(R) ☐ 90°(B) | ☐ 180°(L) | ☐ 270°(T)

Cable entry:

☐X ☐1 | ☐2 | ☐3

Degree of protection:

IP65 ☐ IP66 ☐

Surface/corrosion protection:

KS ☐ OS1 ☐ OS2 ☐ OS3 ☐ OS4 ☐

Line voltage: ____________ V

Control range: ________________

Required options:

☐ Brake: Voltage _______ V Braking torque: ______ Nm
☐ Manual brake release: ☐ HR
☐ Forced cooling fan: ____
☐ Motor protection: ☐ TF or ☐ PK
☐ Encoder: ____________________
☐ Plug connector connection: ____________________
☐ Inverter: ____________________
☐ RAL 9005 or ☐ RAL ____________

Further options:

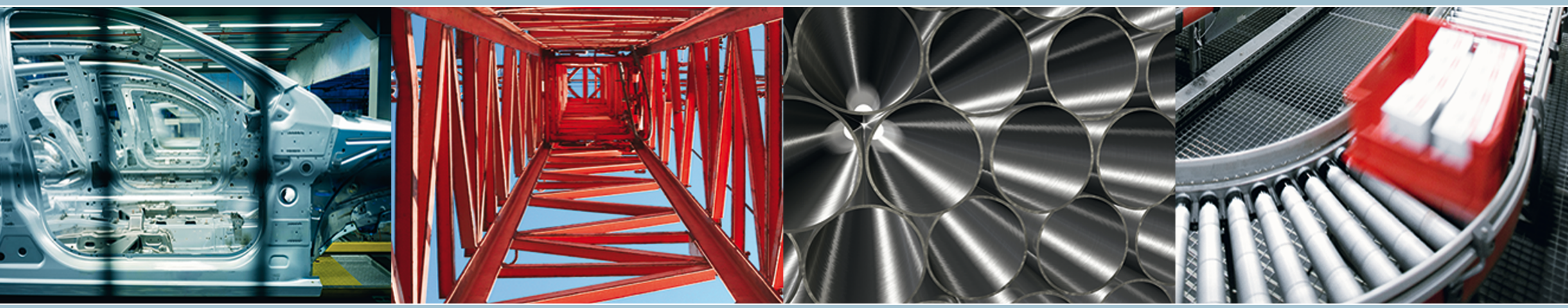
Special ambient conditions:

Temperature: from ______ °C to ______ °C | ☐ Operation outdoors | ☐ Installation altitude >1000m above NN
Further environmental conditions: ____________________

Miscellaneous: ____________________

1) see back

Place, date ____________________ **Signature:** ____________________



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Driving the world

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