SEW EURODRIVE

Catalog

CM3C63 – CM3C100 Synchronous Servo Gearmotors
with R, F, K, S, W and BS.F Gear Units

Edition 05/2021

29133866/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 reliable products with regard to functionality and investment.

Products and services from SEW-EURODRIVE are represented in all important industries of our time. We also show this presence with subsidiaries and production plants all over the world, as well as with our service, which we see as an integrative part of our portfolio that extends SEW-EURODRIVE's high quality standards.

1.1.2 Always the right drive solution

With the broad product range of SEW-EURODRIVE, which also includes mechatronic drive units, frequency inverters, controllers, software and communication in addition to the tried-and-tested modular system for gearmotors, it is possible to implement the perfect drive solution for every application.

Gear units and motors

Using the modular system, gearmotors can be individually assembled according to the required speed and torque ranges, the available space and the ambient conditions. Gear units and gearmotors offering a unique and finely tuned power range and the best economic prerequisites to face any drive challenge.

Motors by SEW-EURODRIVE can be mounted directly or via adapter to SEW-EURODRIVE gear units. They meet all global requirements in terms of 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.

Inverter

The proven inverter series MOVITRAC®, MOVIDRIVE® and MOVIAXIS® enhance the gearmotors, forming a combination that blends in perfectly with the existing range of SEW-EURODRIVE systems.

Modular automation system

With its brand MOVI-C®, SEW-EURODRIVE launches a new generation of drive and automation technology. MOVI-C® is the modular automation system that allows for the highest level of system and machine automation. It comprises drive technology, motion control, control technology and visualization.

MOVIDRIVE® modular is the modular application inverter for all types of applications, ranging from simple open-loop speed control to servo drives with kinematic model. MOVIDRIVE® modular can be supplemented by connecting MOVIDRIVE® system single-axis units. These possess functionalities comparable to those of axis modules, but have their own line connection. Especially in the upper power range, MOVIDRIVE® system complements the modular application inverter.

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MOVIDRIVE® modular and MOVIDRIVE® system are intended for operation at the MOVI-C® CONTROLLER, the controller from SEW-EURODRIVE. They offer a powerful clock-synchronous connection via the integrated EtherCAT®/SBus^{PLUS} communication interface. Other EtherCAT® stations from SEW-EURODRIVE or other manufacturers can be controlled and diagnosed by the MOVI-C® CONTROLLER.

The MOVISUITE® engineering software with its unique operating philosophy is above all MOVI-C® hardware and software components. MOVISUITE® was developed with a focus on systematically shortening the startup time and covers the entire engineering process, from planning to diagnostics.

Decentralized drive technology

For economical, decentralized installations, SEW-EURODRIVE offers components from decentralized drive technology, 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 decentralized drive technology portfolio is complemented by the 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.

The smart energy management system MOVI-DPS® enhances the modular product range of SEW-EURODRIVE. With MOVI-DPS®, SEW-EURODRIVE offers the perfect combination: Conserving resources. Reducing costs.

MOVI-DPS® allows for stable power grids, no power failures, and consequently reliable system availability. MOVI-DPS® is convincing in both, mobile and stationary applications. In addition, MOVI-DPS® can be combined with other systems, such as the contactless energy transfer system MOVITRANS®, resulting in further important synergy effects.

Industrial gear units

Power, quality and sturdy design combined in one standard product: With high torque levels, industrial gear units from SEW-EURODRIVE realize major movements. The modular concept will once again provide optimum adaptation of industrial gear units to meet a wide range of different applications.

Individual system solutions with MAXOLUTION®

MAXOLUTION® from SEW-EURODRIVE provides individual system solutions in all areas of system and machine automation. From electromechanical drives, controllers and communication to visualization and the contactless energy transfer system MOVITRANS® up to a comprehensive service portfolio, MAXOLUTION® offers all modules required to design customer-specific solutions for machines and systems.

MAXOLUTION® combines individual products of the proven modular system with innovative system components to form individual system solutions that perfectly match the requirements of the specific application – "powered by SEW-EURODRIVE".

Safe – flexible – effective: safetyDRIVE

Guaranteeing the safety of all employees and preventing work accidents while ensuring trouble-free production processes are demands placed on all production areas. safetyDRIVE, the comprehensive safety concept, allows you to implement your machines "safely," in accordance with the currently valid guidelines. With controllers that meet the respective requirement of the safety categories or performance levels and that monitor instead of shut down.

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All of our drive and frequency inverters provide the function that safely stops the electrical power to the motor (STO). The MOVISAFE® components complete the product range – integrated into the inverter as DFS..B or DCS..B option cards or modular as UCS..B safety modules. The decentralized MOVIFIT® and MOVIPRO® drive controllers with integrated safety functions are ready for use in decentralized installations.

The functionally safe motor options allow for implementing safety functions in safety-related applications. Safety encoders are used to implement safety functions with respect to speed, direction of rotation, standstill, and relative position. Safety brakes can implement safety functions with respect to decelerating and stopping.

1.1.3 Your ideal partner

Its global presence, extensive product portfolio 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.

For detailed information on the entire product range of SEW-EURODRIVE, refer to our website www.sew-eurodrive.com. The website provides information about components, system solutions, services, and industries. Online Support provides access to a wide range of documents and tools such as the product configurator and various selection aids, as well as all documentation available for download in various languages.

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1.2 Documentation

1.2.1 Content of this documentation

This "Synchronous Servo Gearmotors CM3C63 – CM3C100" catalog describes the following SEW-EURODRIVE product groups in detail:

- The combination of CM3C.. synchronous servomotors mounted directly to the following gear units:
  - R, F, K, S, W gear units
  - BS.F gear units

The descriptions include:

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

1.2.2 Additional documentation

In addition to this catalog, you can order or download other documents 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**.

1.3 Product names and trademarks

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

1.4 Copyright notice

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2 Product description

2.1 General information

2.1.1 Premium Sine Seal oil seal

SEW-EURODRIVE uses special sealing systems to protect systems against leaking lubricant, gear units against outside dirt, and the motor against oil leaking from the gear unit. The **Premium Sine Seal** especially developed for SEW-EURODRIVE is available as an option apart from conventional oil seals.

The Premium Sine Seal has a significantly longer service life due to the sinusoidal sealing lip. In addition, the oil seal can be used in the same position on the shaft when servicing is required, as it does not cause running-in on the shaft. The special shape of the sealing lip means that the contact area on the rotating shaft is larger, which improves both heat dissipation and the transfer of lubricant at the sealing surface.

Advantages at a glance:

- Wear on the sealing lip reduced by approx. 50%.
- Service life increased by a factor of 2 (compared to commercially available systems) and therefore longer maintenance intervals.
- No run-in or wear on the shaft, which means that the oil seal can be replaced at the same position.
- Increased safety against leakage and higher system availability.

The Premium Sine Seal is integrated in CM3C.. synchronous servomotors as standard. The oil seal is optionally available for CMP.. motors as well as DR.., DRN.., DR2S.. and DAS.. asynchronous motor in combination with standard gear units and servo gear units from SEW-EURODRIVE.

2.1.2 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 when configuring gear units and gearmotors, see chapter "Operating conditions" (→ 🗎 68).

2.1.3 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, which is the reason that no universally applicable information can be provided. For recommended lubricant fill quantities depending on the mounting position, refer to the chapter "Lubricant fill quantities" (→ 🗎 137). For the exact weight, refer to the quotation or the order confirmation.

2.1.4 Speeds

The quoted output speeds of the gearmotors are recommended values. You can calculate the rated output speed based on the rated motor speed and the gear unit reduction ratio. Please note that the actual output speed depends on the motor load and the supply system conditions.

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2.1.5 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.

2.1.6 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.

2.1.7 Painting

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

Type	Painting
Synchronous gearmotor with R.., F.., K.., S.., W.. and BS.F.. gear units	RAL 9005 black

Special paintings are available on request.

2.1.8 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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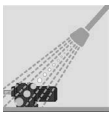
OS surface protection

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	Example applications
Standard		Suitable for machines and systems in buildings and rooms indoors with neutral atmospheres. Based on corrosivity category[3)]: • C1 (negligible)	• Machines and systems in the automotive industry • Transport systems in logistics • Conveyor belts at airports
OS1		Suitable for environments prone to condensation and atmospheres with low humidity or contamination, such as applications outdoors under roof or with protection device. Based on corrosivity category[3)]: • C2 (low)	• Systems in saw mills • Hall gates • Agitators and mixers
OS2		Suitable for environments with high humidity or moderate atmospheric contamination, such as applications outdoors subject to direct weathering. Based on corrosivity category[3)]: • C3 (moderate)	• Applications in amusement parks • Cable cars and chairlifts • Applications in gravel plants • Systems in nuclear power plants
OS3		Suitable for environments with high humidity and occasionally severe atmospheric and chemical contamination. Occasional acidic or caustic wet cleaning. Also for applications in coastal areas with moderate salt load. Based on 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. Based on 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

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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[1)]	FKM oil seal	High quality material	Drives subject to chemical contamination
R, F, K, S, W	Coating 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 BS.F802 gear units, FKM oil seals are used as standard.

NOCO® fluid

As standard, SEW-EURODRIVE supplies NOCO® fluid protection and lubricant with every hollow-shaft gear unit. Use NOCO® fluid when installing gear units with hollow shafts. Using this fluid can help 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 order NOCO® fluid also 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 food grade according to NSF-H1. You can recognize the food compatibility of NOCO® fluid by the NSF-H1 designation on the packaging.

2.1.9 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.

2.1.10 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.

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2.1.11 Gear units and gearmotors for agitators and mixers

A special design variant of the helical gear, parallel-shaft and helical-bevel gear units are gear units and gearmotors equipped with an extended output bearing hub (RM../FM../FAM../KM.. and KAM..). These units are designed especially for agitator and mixer applications and allow for high bending moments as well as overhung and axial loads. The remaining data corresponds to that of standard gear units and gearmotors. For further information on gear unit and gearmotor designs for agitators and mixers, refer to chapter "Agitator designs" (→ 🗎 21).

2.1.12 Brakemotors

Motors and gearmotors are supplied with mechanical brake integrated in the motor on request. The brakes from SEW-EURODRIVE are divided into the following 2 categories:

- Type 1: BK.. permanent magnet holding brake (CM3C63 – 100 and CMP40 – 63)

  The BK.. brake is a permanent-magnet holding brake with emergency off function that releases electrically and closes by the force of the permanent magnetic field. Equipped with the typical properties of a holding brake for highly dynamic servomotors, the BK.. brake is particularly suitable for applications with high switching frequencies.

- Type 2: Spring-loaded holding brake BZ.. with increased working capacity (CM3C63 – 100)

  The DC-operated electromagnetic disk brake BZ.. is designed as 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.

In the event of a power interruption, both brake types are applied automatically and in this way fulfill 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.

Direct brake control is also possible if the brakes of type 1 are operated on MOVIAXIS® servo inverters or MOVIDRIVE® inverters. 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 brakes from SEW-EURODRIVE, refer to the "Project Planning for BK.., BP.., BR.., BY.., BZ... Brakes" manual and the "Synchronous Servomotors CM3C63 – CM3C100" catalog.

2.1.13 Motor design without encoder

The motors 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.

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2.1.14 Extended storage

Design

SEW-EURODRIVE recommends the "extended storage" gear unit design for storage periods longer than 9 months. A VCI corrosion inhibitor (**v**olatile **c**orrosion **i**nhibitors) is added to the lubricant of these gear units. 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, and BS.F gear units, the extended storage option is not available.

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 for long-term storage

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 • and shocks	Up to 4 years with regular inspection of the packaging and humidity indicator (rel. humidity < 50%)
	open	• Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 50 °C, relative humidity < 50%) • 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 • and shocks	Up to 3 years with regular inspection of the packaging and humidity 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) Packaging must be carried out by an experienced company using packaging material specifically suited for the application.

2) SEW-EURODRIVE recommends to store the gear units according to the mounting position.

2.1.15 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 replaces 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 the technical data and part numbers of the DUO10A oil aging sensor, refer to chapter "Information on oil aging sensor /DUO10A" (→ 🗎 176).

/DUV40A vibration monitoring system

The DUV40A vibration monitoring system is used to detect damage of gear units and gearmotors early (e.g. bearing damage or imbalances). Permanent broadband frequency-selective monitoring of the gearmotor is used for this purpose. Apart from the vibration analysis, additional measured values of up to 3 signal encoders can be de-

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tected, recorded and analyzed. The additional signals can be used as reference values for signal analysis e.g. to trigger event-based measuring tasks. After the analysis and depending on alarm limits defined during rated operation of the drive (teach-in mode), the system can switch outputs and display the state using LEDs.

Configuration and visualization of the DUV40A system are realized via the SmartWeb software. If you use several DUV40A systems, you can control them via the SmartUtility Light software centrally from one PC.

If you purchase the full version of the SmartUtility, you can analyze measurement data in the SmartUtility Viewer and download configurations or upload them onto other devices.

For information on the scope of delivery, part number and technical data, refer to chapter "Information on the /DUV40A vibration monitoring system" (→ 🗎 178).

2.1.16 Oil expansion tank

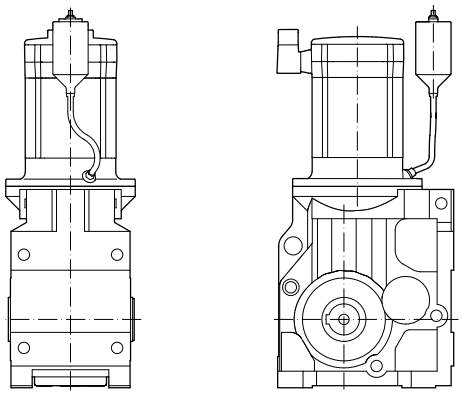
The oil fill level for gear units in mounting position M4 has technical reasons. In case of unfavorable circumstances, oil may leak from the breather valve of these gear units. Use an oil expansion tank to reliably avoid oil from leaking. The oil expansion tank provides additional space for the lubricant to expand.

In case of gear units and gearmotors of size 107 and larger, an oil expansion tank is always required for operation in mounting position M4.

SEW-EURODRIVE recommends using an oil expansion tank for gear units and gearmotors in mounting position M4, in the following cases:

- For input speeds > 2000 min^{-1}
- For sizes 77 – 97 and input speeds > 1800 min^{-1}

The following schematic figure shows a CM3C.. servo gearmotor with an oil expansion tank.



34102492427

The oil expansion tank is provided as assembly kit. Direct mounting to the drive is not possible with every servo gearmotor, depending on the respective motor option. Contact SEW-EURODRIVE. If space is limited, the oil expansion tank must be attached to nearby system components.

INFORMATION

Transverse acceleration is not permitted for gear units with expansion tank with fixed piping for third party motors and servomotors.

For further information, contact your SEW-EURODRIVE sales representative.

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2.1.17 Explosion protection according to ATEX (in preparation)

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-protected gear units, gearmotors, options and accessories in accordance with the EU Directive "ATEX" 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
- In preparation: Motors in II3GD design for use in zones 2 and 22
- In preparation: Motors in II3G design for use in zone 2

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2.1.18 International markets

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

CE	CE mark to state compliance with European guidelines, such as the Low Voltage Directive.
UR	UR logo to confirm that UL (Underwriters Laboratory) is informed about the registered components; register number by UL: E189357
MC170602 CSA	CSA mark to confirm the market conformity of the Canadian Standard Association (CSA)
EAC	EAC mark (EurAsian Conformity) Confirms compliance with the technical regulations of the economic and customs union of Russia, Belarus, Kazakhstan, Armenia.
	CEL mark showing energy efficiency in the Chinese grade classification.
UA.TR. 013	UA.TR mark to confirm compliance with the technical regulations of the country Ukraine.
	CMIM logo to confirm compliance with technical regulations of the country Morocco.
Ex	In preparation: ATEX mark to state compliance with the European Directive 2014/34/EU.

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

2.2.1 Operating temperatures

INFORMATION

For information on churning losses and thermal rating, refer to chapter "Churning losses and thermal rating" (→ 🗎 57).

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

Gear units

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

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

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 deep-freeze range and 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

Motors of the CM3C.. 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 selection tables. The rotational clearance for the output shaft is specified without load (max. 1% of the rated output torque) with blocked gear unit input side. The specified values have a tolerance of ±2 angular minutes. For further information, refer to chapter "Dimension sheet information" (→ 🗎 187).

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

2.2.3 Agitator designs

All gear units in agitator design are equipped with an extended bearing hub especially suitable for mixing and agitating applications. Agitator gear units are based on 3 proven standard gear unit series by SEW-EURODRIVE. Almost any agitating, mixing, blending or kneading application from a wide range of industries is covered by one of the agitator designs of the gear unit.

For project planning, contact SEW-EURODRIVE.

Advantages of agitator gear units:

- FEM-optimized housing and a special agitator flange for particularly high permitted overhung loads
- No additional bearing for the agitator shaft required
- Shaft and flange dimensions are compatible with standard dimensions.
- Many options and design variants for optimal adaptation to the application
- Gear units/gearmotors also available in explosion-protected design
- Worldwide service from SEW-EURODRIVE

	Helical gear units RM.. series (2 and 3 stages)	Parallel-shaft helical gear units FM../FAM.. series (2 and 3 stages)	Helical-bevel gear units KM../KAM.. series 3 stages
Sizes	57 / 67 / 77 / 87 / 97 / 107 / 127 / 137 / 147 / 167	67 / 77 / 87 / 97 / 107 / 127 / 157	67 / 77 / 87 / 97 / 107 / 127 / 157
Gear unit ratio i	4.29 – 289.74	3.87 – 281.71	5.20 – 197.37
Maximum output torque in Nm	450 – 20000	820 – 20000	820 – 20000
Maximum permitted output overhung load in N	4000 – 120000	35000 – 135000	20000 – 135000

Available options:

- Double oil seal on the output side for additional protection against leakage
- Grease nipple for relubrication of output shaft bearings
- The gear units use series housings and series gearing components. The special flange is bolted to the output end of the standard gear unit.
- Energy efficiency classes IE1 – IE4 for gearmotors
- Motor power range of 0.12 to 200 kW
- Motor adapter AM.. for mounting IEC and NEMA motors

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Also available for the FM../FAM... and KM../KAM.. series:

- Reinforced bearings also opposite the output end. These increase the permitted overhung load, particularly for high output speeds and low gear ratios.
- Drywell design with leak sensor prevents the product from being contaminated by leaking lubricant.

2.2.4 SPIROPLAN® gearmotors

SPIROPLAN® gearmotors are robust, single- and two-stage right-angle gearmotors with SPIROPLAN® gearing. The difference to 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 shaft height to both makes for a number of mounting options.

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

2.2.5 Components on the input side

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

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

Refer to the "Gear Units" catalog for more information.

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2.3 General product description – BS.F 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" (→ 🗎 57).

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

BS.F helical gear units ensure a low rotational clearance even in the standard versions. The rotational clearance can optionally be further reduced (/R) for all types. 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) with blocked gear unit input side.

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.

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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, output shaft with key
RXF..	Single-stage B5 flange-mounted design, output shaft with key
R..	Foot-mounted design, output shaft with key
R..F	Foot- and B5 flange-mounted design, output shaft with key
RF..	B5 flange-mounted design, output shaft with key
RZ..	B14 flange-mounted design, output shaft with key
RM..	B5 flange-mounted design with extended bearing hub, output shaft with key

3.1.2 Parallel-shaft helical gear units

Designation	Description
F..	Foot-mounted design, output shaft with key
FA..B	Foot-mounted design, hollow shaft with keyway
FH..B	Foot-mounted design, hollow shaft with shrink disk
FV..B	Foot-mounted design, splined hollow shaft to DIN 5480
FF..	B5 flange-mounted design, output shaft with key
FAF..	B5 flange-mounted design, hollow shaft with keyway
FHF..	B5 flange-mounted design, hollow shaft with shrink disk
FVF..	B5 flange-mounted design, splined hollow shaft to DIN 5480
FA..	Hollow shaft with keyway
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, output shaft with key
FAZ..	B14 flange-mounted design, hollow shaft with keyway
FHZ..	B14 flange-mounted design, hollow shaft with shrink disk
FVZ..	B14 flange-mounted design, splined hollow shaft to DIN 5480
FM..	B5 flange-mounted design with extended bearing hub, output shaft with key
FAM..	B5 flange-mounted design with extended bearing hub, hollow shaft with keyway

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3.1.3 Helical-bevel gear units

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

3.1.4 Helical-worm gear units

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

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Designation	Description
SHZ..	B14 flange-mounted design and hollow shaft with shrink disk

3.1.5 SPIROPLAN® gear units

Designation	Description
W..	Foot-mounted design, output shaft with key
WF..	B5 flange-mounted design, output shaft with key
WAF..	B5 flange-mounted design and hollow shaft with keyway
WA..	Hollow shaft with keyway
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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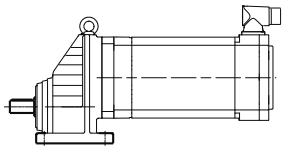
3.2 Gearmotor designs – R, F, K, S, W gear units

INFORMATION

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

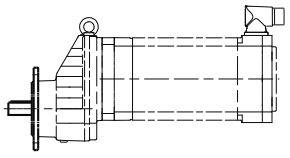
3.2.1 Helical gearmotors

The following designs of helical gearmotors are available:



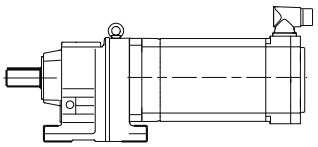
RX..CM3C..

Single-stage, helical gearmotor in foot-mounted design



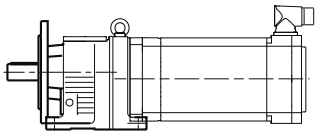
RXF..CM3C..

Single-stage helical gearmotor in B5 flange-mounted design



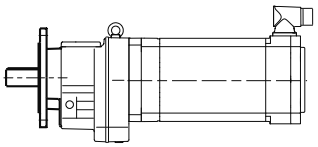
R..CM3C..

Helical gearmotor in foot-mounted design



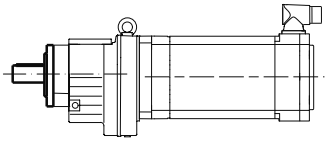
R..F CM3C..

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



RF..CM3C..

Helical gearmotor in B5 flange-mounted design



RZ..CM3C..

Helical gearmotor in B14 flange-mounted design

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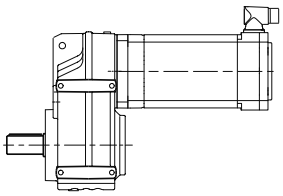
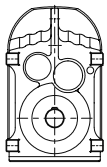
3.2.2 Parallel-shaft helical gearmotors

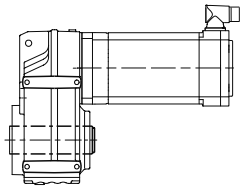
The following designs of parallel-shaft helical gearmotors are available:

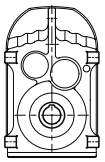




F..CM3C..

Parallel-shaft helical gearmotor in foot-mounted design



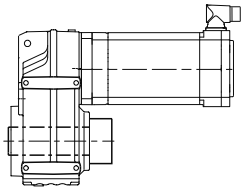


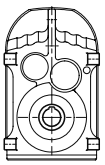
FA..B CM3C..

Parallel-shaft helical gearmotor in foot-mounted design with hollow shaft

FV..B CM3C..

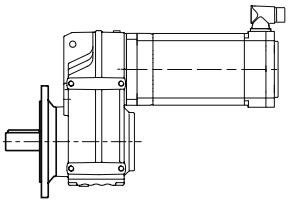
Parallel-shaft helical gearmotor in foot-mounted design with splined hollow shaft to DIN 5480

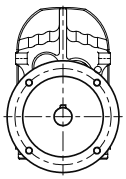




FH..B CM3C..

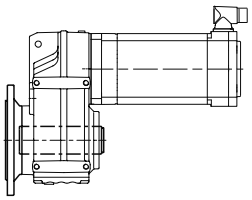
Parallel-shaft helical gearmotor in foot-mounted design with hollow shaft and shrink disk

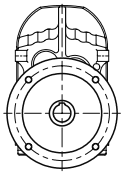




FF..CM3C..

Parallel-shaft helical gearmotor in B5 flange-mounted design



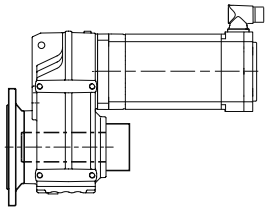


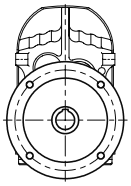
FAF..CM3C..

Parallel-shaft helical gearmotor in B5 flange-mounted design with hollow shaft

FVF..CM3C..

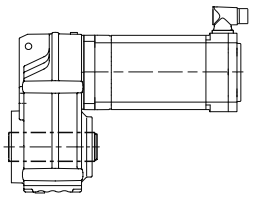
Parallel-shaft helical gearmotor in B5 flange-mounted design with splined hollow shaft to DIN 5480

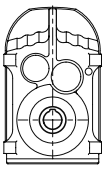




FHF..CM3C..

Parallel-shaft helical gearmotor in B5 flange-mounted design with hollow shaft and shrink disk





FA..CM3C..

Parallel-shaft helical gearmotor with hollow shaft

FV..CM3C..

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

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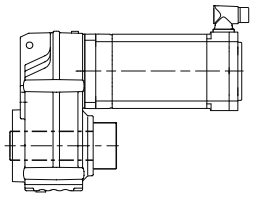
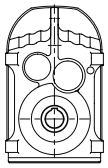
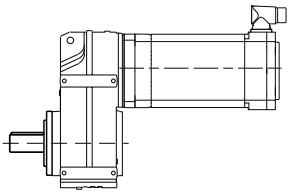
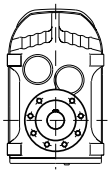



FH..CM3C..

Parallel-shaft helical gearmotor with hollow shaft and shrink disk

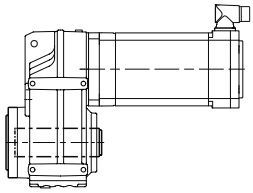
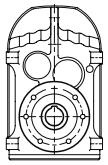
FT..CM3C..

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

FZ..CM3C..

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

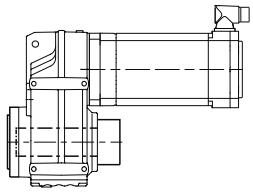
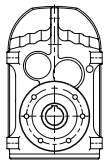



FAZ..CM3C..

Parallel-shaft helical gearmotor in B14 flange-mounted design with hollow shaft

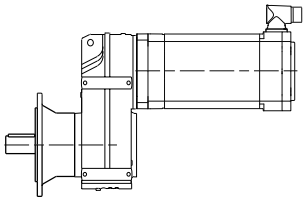
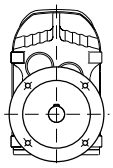
FVZ..CM3C..

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

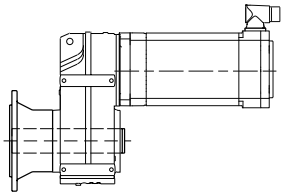
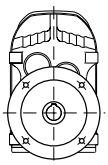
FHZ..CM3C..

Parallel-shaft helical gearmotor in B14 flange-mounted design with hollow shaft and shrink disk

FM..CM3C..

Parallel-shaft helical gearmotor in B5 flange-mounted design with extended bearing hub, output shaft with key

FAM..CM3C..

Parallel-shaft helical gearmotor in B5 flange-mounted design with extended bearing hub and hollow shaft

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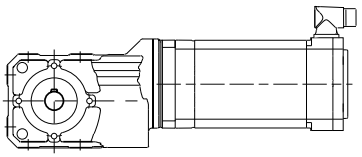
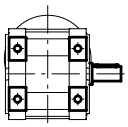
3.2.3 Helical-bevel gearmotors, gear unit sizes K..19 and K..29

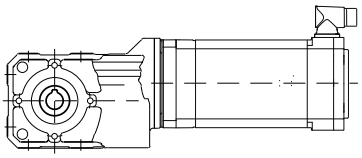
The following designs of helical-bevel gearmotors with gear units of size K..9 are available:

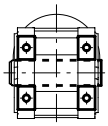




K19 CM3C.., K29 CM3C..

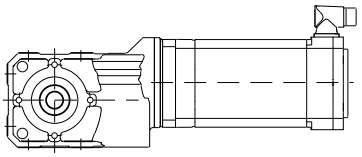
Helical-bevel gearmotor in foot-mounted design

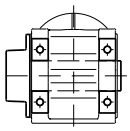




KA19B CM3C.., KA29B CM3C..

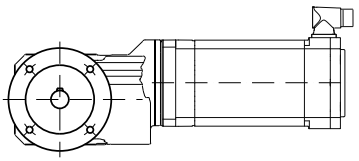
Helical-bevel gearmotor in foot-mounted design with hollow shaft

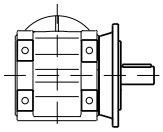




KH19B CM3C.., KH29B CM3C..

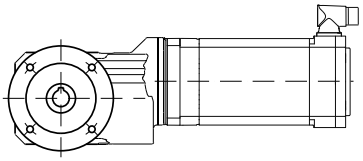
Helical-bevel gearmotor in foot-mounted design with hollow shaft and shrink disk

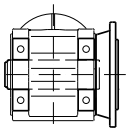




KF19B CM3C.., KF29B CM3C..

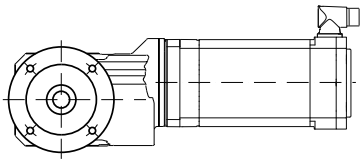
Foot-mounted helical-bevel gearmotor in B5 flange-mounted design

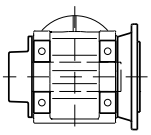




KAF19B CM3C.., KAF29B CM3C..

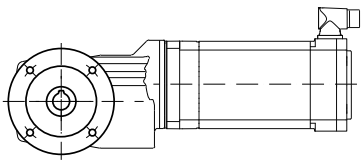
Foot-mounted helical-bevel gearmotor in B5 flange-mounted design with hollow shaft

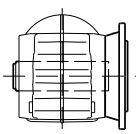




KHF19B CM3C.., KHF29B CM3C..

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





KF19 CM3C.., KF29 CM3C..

Helical-bevel gearmotor in B5 flange-mounted design

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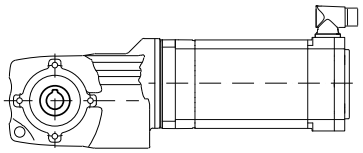
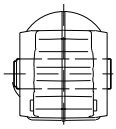
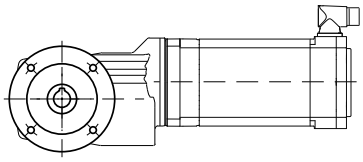
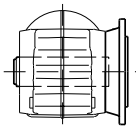




KA19 CM3C.., KA29 CM3C..

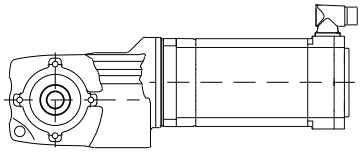
Helical-bevel gearmotor with hollow shaft

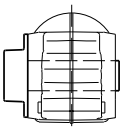




KAF19 CM3C.., KAF29 CM3C..

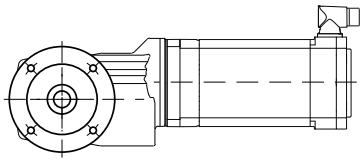
Helical-bevel gearmotor in B5 flange-mounted design with hollow shaft

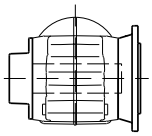




KH19 CM3C.., KH29 CM3C..

Helical-bevel gearmotor with hollow shaft and shrink disk



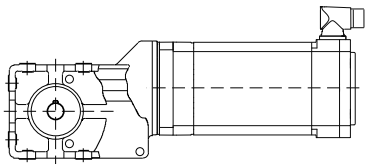


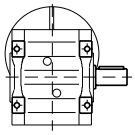
KHF19 CM3C.., KHF29 CM3C..

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

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

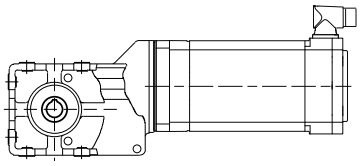
The following designs of helical-bevel gearmotors with gear units of size K..9 are available:

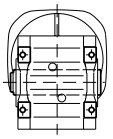




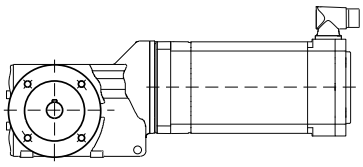
K39 CM3C.., K49 CM3C..

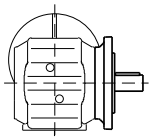
Helical-bevel gearmotor in foot-mounted design





KA39B CM3C.., KA49B CM3C..





KF39 CM3C.., KF49 CM3C..

Helical-bevel gearmotor in B5 flange-mounted design

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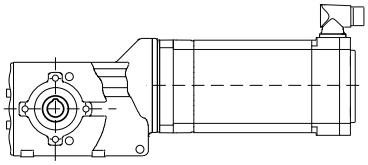
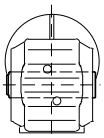
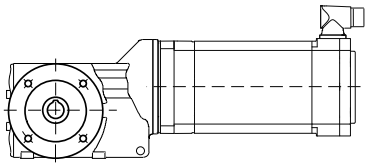
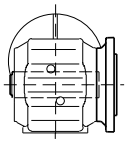



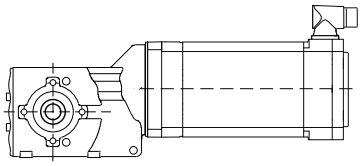
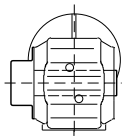
KA39 CM3C.., KA49 CM3C..

Helical-bevel gearmotor with hollow shaft

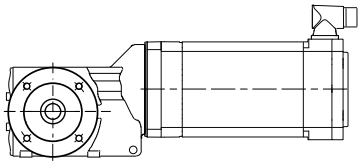
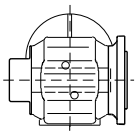
KAF39 CM3C.., KAF49 CM3C..

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

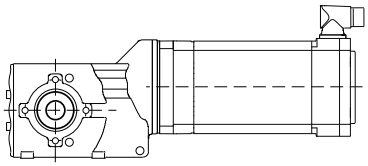
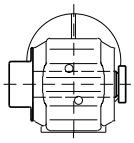
KH39 CM3C.., KH49 CM3C..

Helical-bevel gearmotor with hollow shaft and shrink disk

KHF39 CM3C.., KHF49 CM3C..

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

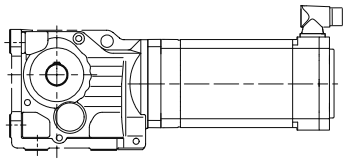
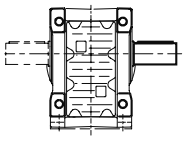



KT39 CM3C.., KT49 CM3C..

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 CM3C..

Helical-bevel gearmotor in foot-mounted design

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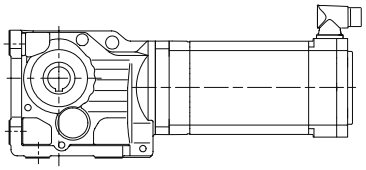
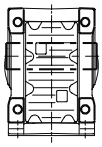


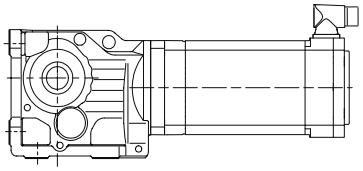


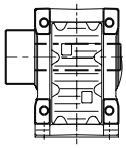
KA..7B CM3C..

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

KV..7B CM3C..

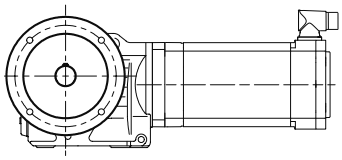
Helical-bevel gearmotor in foot-mounted design with splined hollow shaft according to DIN 5480

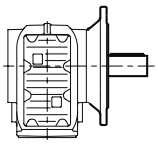




KH..7B CM3C..

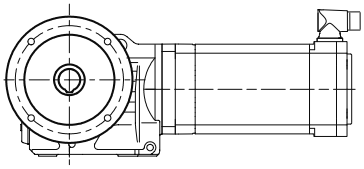
Helical-bevel gearmotor in foot-mounted design with hollow shaft and shrink disk

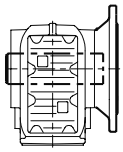




KF..7 CM3C..

Helical-bevel gearmotor in B5 flange-mounted design



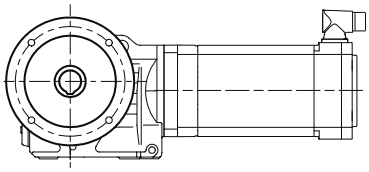


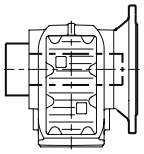
KAF..7 CM3C..

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

KVF..7 CM3C..

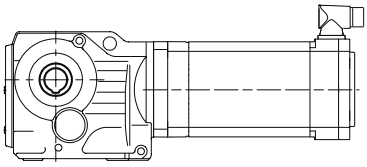
Helical-bevel gearmotor in B5 flange-mounted design with splined hollow shaft to DIN 5480

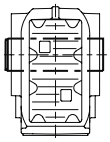




KHF..7 CM3C..

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



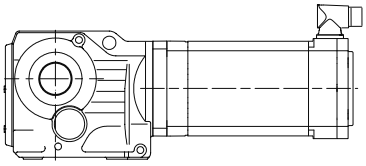


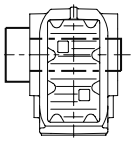
KA..7 CM3C..

Helical-bevel gearmotor with hollow shaft

KV..7 CM3C..

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





KH..7 CM3C..

Helical-bevel gearmotor with hollow shaft and shrink disk

KT..7 CM3C..

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

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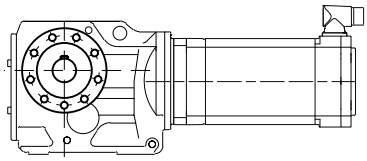
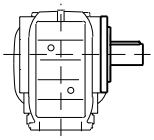
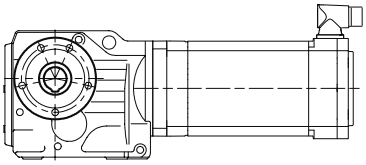
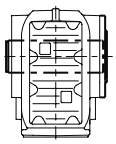



KZ..7 CM3C..

Helical-bevel gearmotor in B14 flange-mounted design.

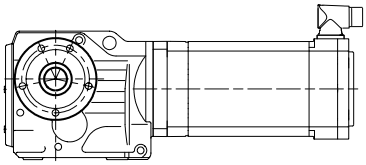
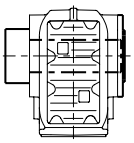



KAZ..7 CM3C..

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

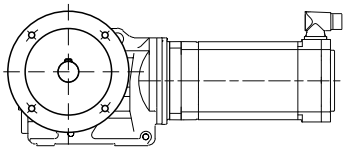
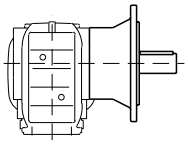
KVZ..7 CM3C..

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

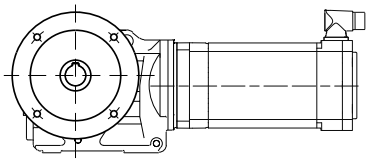
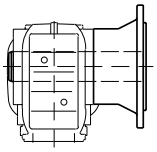
KHZ..7 CM3C..

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

KM..7 CM3C..

Helical-bevel gearmotor in B5 flange-mounted design with extended bearing hub, output shaft with key

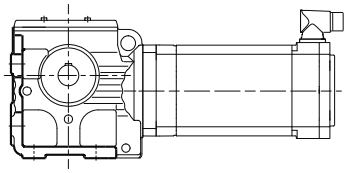
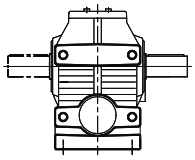



KAM..7 CM3C..

Helical-bevel gearmotor in B5 flange-mounted design with extended bearing hub and hollow shaft

3.2.6 Helical-worm gearmotors

The following designs of helical-worm gearmotors are available:

S..CM3C..

Helical-worm gearmotor in foot-mounted design

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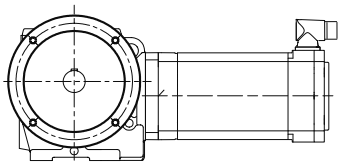
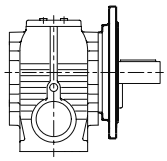
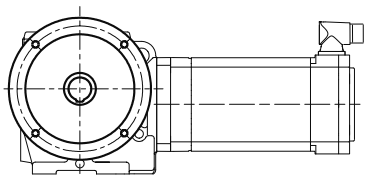
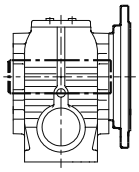



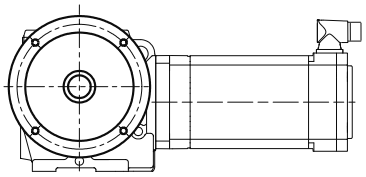
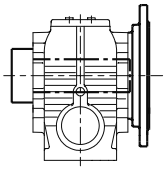
SF..CM3C..

Helical-worm gearmotor in B5 flange-mounted design

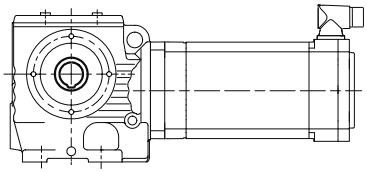
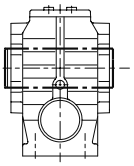
SAF..CM3C..

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

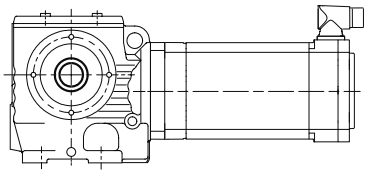
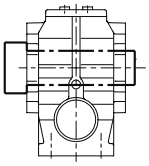
SHF..CM3C..

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

SA..CM3C..

Helical-worm gearmotor with hollow shaft

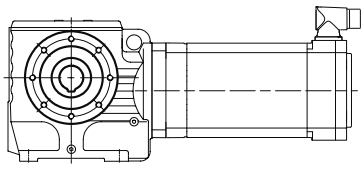
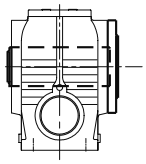



SH..CM3C..

Helical-worm gearmotor with hollow shaft and shrink disk

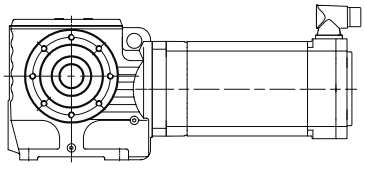
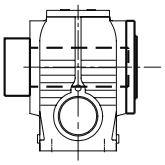
ST..CM3C..

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

SAZ..CM3C..

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

SHZ..CM3C..

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

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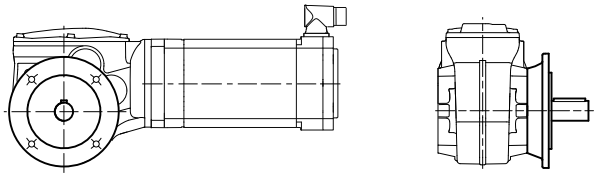
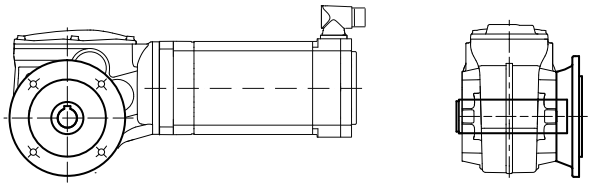
3.2.7 SPIROPLAN® gearmotors, gear unit sizes W..29 and W..39

The following designs of SPIROPLAN® gearmotors with gear units of sizes W..29 and W..39 are available:



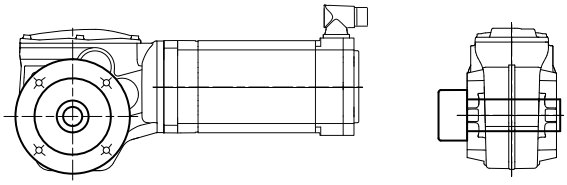
WF29 CM3C.., WF39 CM3C..

SPIROPLAN® gearmotor in B5 flange mounted design



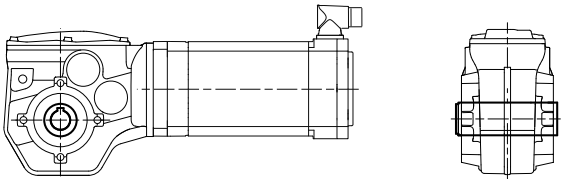
WAF29 CM3C.., WAF39 CM3C..

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



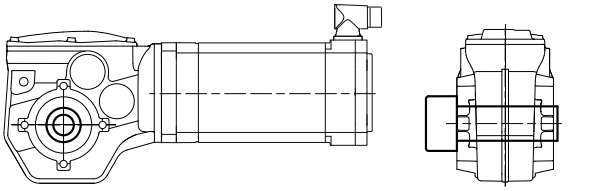
WHF29 CM3C.., WHF39 CM3C..

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



WA29 CM3C.., WA39 CM3C..

SPIROPLAN® gearmotor with hollow shaft



WH29 CM3C.., WH39 CM3C..

SPIROPLAN® gearmotor with hollow shaft and shrink disk

WT29 CM3C.., WT39 CM3C..

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

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3.3 Designs and options – BS.F 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 Options

BS.F gear units

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

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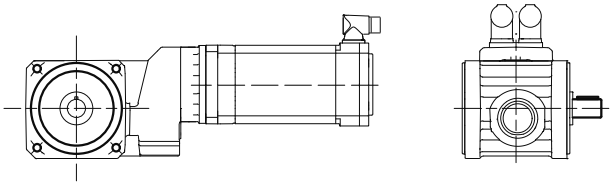
3.4 Gearmotor designs – BS.F gear units

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:

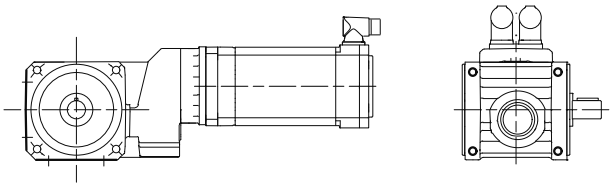


BSF..CM3C..

Gearmotor with solid shaft (smooth), B5 output flange

BSKF.. CM3C..

Gearmotor with solid shaft and key, B5 output flange

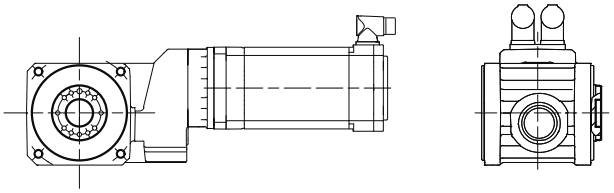


BSF..B CM3C..

Gearmotor with solid shaft and front-end mounting

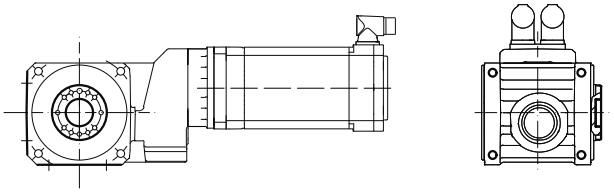
BSKF..B CM3C..

Gearmotor with solid shaft, key and front-end mounting



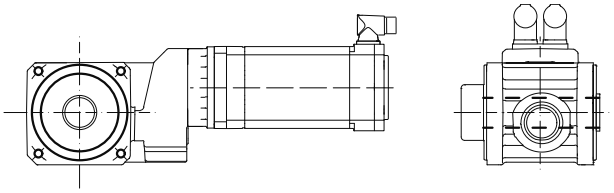
BSBF..CM3C..

Gearmotor with flange block shaft, B5 output flange



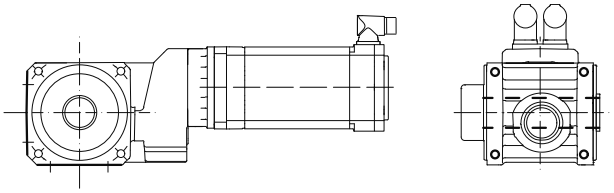
BSBF..B CM3C..

Gearmotor with flange block shaft and front-end mounting



BSHF..CM3C..

Gearmotor with hollow shaft and shrink disk, B5 output flange



BSHF..B CM3C..

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

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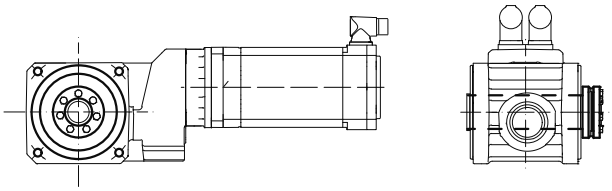
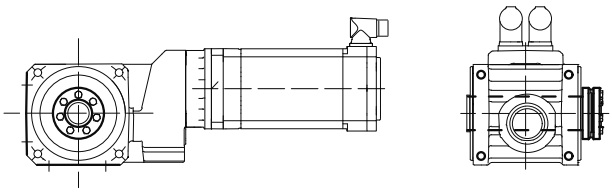


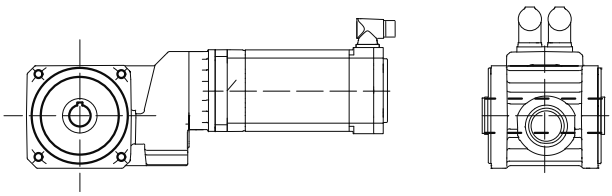
BSHF../I CM3C..

Gearmotor with hollow shaft and shrink disk at the output end



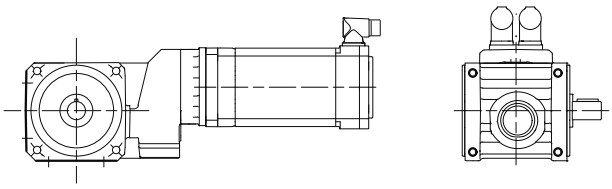
BSHF..B /I CM3C..

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



BSAF..CM3C..

Gearmotor with hollow shaft and keyway, B5 output flange



BSAF..B CM3C..

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

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3.5 Designs and options of CM3C.. servomotors

3.5.1 Designation of CM3C.. motors

Designation	
CM3C..	CM3C.. series (medium inertia)
63, 71, 80, 100	Sizes
S, M, L	Lengths - S (short) - M (medium) - L (long)
-20, -30, -45, -60	Speed classes: -20 = 2000 min^{-1} -30 = 3000 min^{-1} -45 = 4500 min^{-1} -60 = 6000 min^{-1}
A	System voltage: A = 400 V
-N, -K, -P, -E	Shaft design: -N = Shaft without key -K = Shaft with key -P = Shaft with pinion shaft end -E = Shaft with push-in pinion

3.5.2 Brake and manual brake release

Designation	
/BK	Permanent-magnet holding brake
/BZ[1], /BZD[1, 2]	Spring-loaded holding brake with increased working capacity
/HR[3]	Manual brake release, re-engaging

1) Also available in design for functional safety.
2) For a direct DC voltage supply.
3) Available for /BZ and /BZD only.

3.5.3 Encoders

Designation	
/RH1M	Single-turn encoder, medium class, resolver (standard)
/AK0H[1]	Multi-turn encoder, high class, HIPERFACE®
/EZ2Z	Single-turn encoder, medium class, MOVILINK® DDI
/AZ2Z	Multi-turn encoder, medium class, MOVILINK® DDI
/EZ4Z[1, 2]	Single-turn encoder, high class, MOVILINK® DDI

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Designation	
/AZ4Z[1, 2]	Multi-turn encoder, high class, MOVILINK® DDI

1) Also available as a version for functional safety (in preparation).
2) In preparation.

3.5.4 Thermal monitoring

Designation	
/PK	PT1000 temperature sensor

3.5.5 Plug connector

Designation	
/SM1	M23 motor plug connector, socket on motor side only, pluggable motor and encoder cables
/SMB	M40 motor plug connector, socket on motor side only, pluggable motor and encoder cables
/SB1	M23 brakemotor plug connector, socket on motor side only, pluggable motor and encoder cables
/SBB	M40 brakemotor plug connector, socket on motor side only, pluggable motor and encoder cables (standard)
/SD1	M23 hybrid plug connector motor/brakemotor (power and data) for MOVILINK® DDI, socket on motor side
/SDB	M40 hybrid plug connector motor/brakemotor (power and data) for MOVILINK® DDI, socket on motor side
/KK	Terminal box for CM3C63 – 100, pluggable motor and encoder cable

3.5.6 Ventilation

Designation	
/VR	Forced cooling fan[1)]

1) In preparation.

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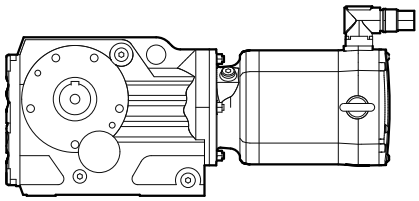
3.6 Type designation of a servo gearmotor



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A servo gearmotor with MOVILINK® DDI interface, temperature sensor, encoder and plug connector, for example, has the following type designation:

Example: KA37CM3C71S-30A-P/DI/PK/AZ2Z/SD1		
Gear unit type	**KA**	Helical-bevel gear unit with hollow shaft with keyway (shaft-mounted design)
Gear unit size	**37**	
Motor series	**CM3C**	CM3C synchronous servo-motor (medium inertia)
Size	**71**	
Length	**S**	S = Short
Speed class	**-30**	-30 = 3000 min^{-1}
System voltage	**A**	A = 400 V
Shaft design	**-P**	P = Shaft with pinion shaft end
Interface	**/DI**	DI = Digital motor integration with MOVILINK® DDI interface
Temperature measuring	**/PK**	PK = PT1000 temperature sensor
Encoder	**/AZ2Z**	AZ2Z = multi-turn encoder, MOVILINK® DDI
Connection variant	**/SD1**	SD1 = Motor plug connector, M23, socket on the motor side only, hybrid plug connector for motor and communication

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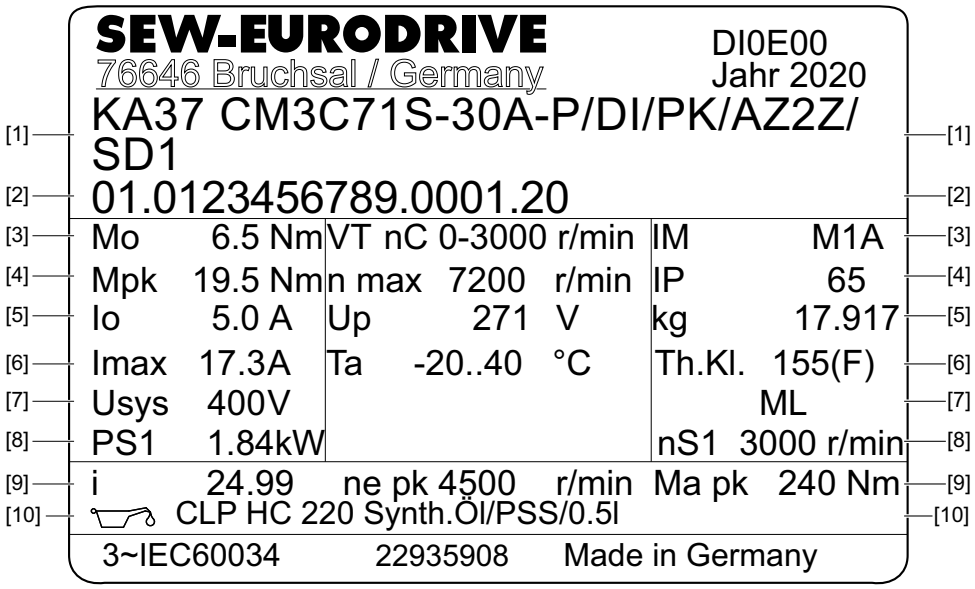
3.7 Nameplates of servo gearmotors

The following figure shows the 1st nameplate of a CM3C.. servo gearmotor:



Line	Information
[1]	• Type designation
[2]	• Serial number
[3]	• Standstill torque • Variable torque • Rated speed • Mounting position
[4]	• Dynamic limit torque of the servomotor • Maximum permitted speed • Degree of protection according to IEC 60034-5
[5]	• Standstill current • Voltage at the open terminals of the motor at rated speed • Mass
[6]	• Maximum permitted current • Ambient temperature • Thermal class
[7]	• System voltage, voltage of the supplying inverter • Braking torque • TENV (Totally Enclosed Non-Ventilated)
[8]	• Rated power continuous duty • Rated speed continuous duty
[9]	• Gear ratio • Peak speed, input end • Peak torque, output end
[10]	• Oil type and oil fill volume

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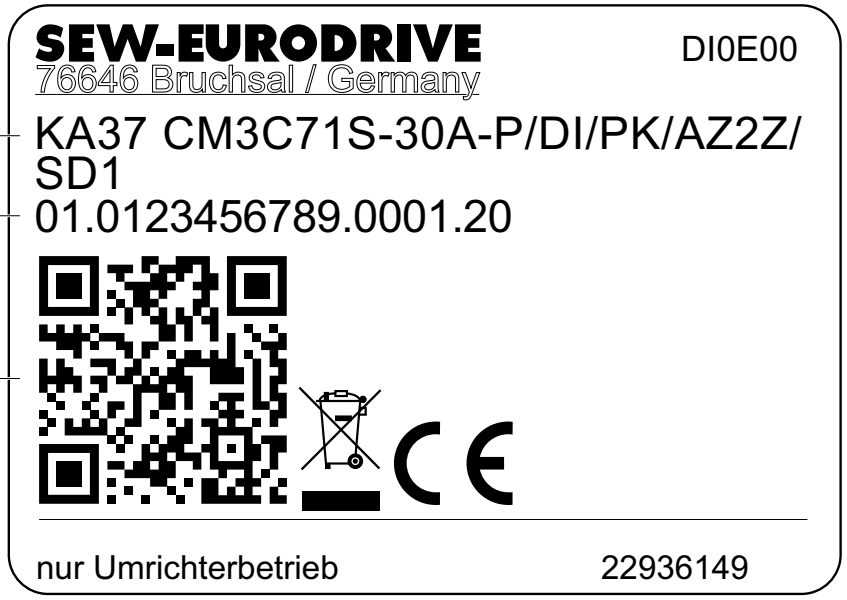
The following figure shows the second nameplate of the CM3C.. gearmotor:



Line	Information
[1]	• Type designation
[2]	• Serial number
[3]	• Product label with QR code. The QR code can be scanned. You will be redirected to the digital services of SEW-EURODRIVE. There, you have access to product-specific data, documents and further services.

The following table contains an explanation of other markings that might be shown on the nameplate or attached to the motor.

CE	CE mark to state compliance with European guidelines, such as the Low Voltage Directive.
FS 02	FS logo with 2-digit number for identification of installed functional safety motor options
	UR logo to confirm that UL (Underwriters Laboratory) is informed about the registered components; register number by UL: E189357
MC170602	CSA mark to confirm the market conformity of the Canadian Standard Association (CSA)
EAC	EAC mark (EurAsian Conformity) Confirms compliance with the technical regulations of the economic and customs union of Russia, Belarus, Kazakhstan, Armenia.
UA.TR. 013	UA.TR mark to confirm compliance with the technical regulations of the country Ukraine.

	Motors and accessories may fall within the scope of the country-specific application of the WEEE Directive. Dispose of the product and of it's accessories according to the national regulations of your country.

INFORMATION

The nameplate for servo gearmotors is attached to the servomotor.

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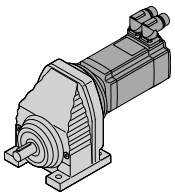
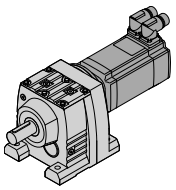
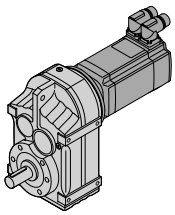
3.8 Overview of servo gearmotors

3.8.1 Axially parallel gear units

Gear unit type			RX..	R..	F..
Technical data:					
Figure					
Peak torque	M_{apk}	Nm	90 – 1150	51 – 7000	163 – 8860
Max. continuous torque	M_{amax}	Nm	69 – 830	50 – 6000	130 – 7840
Max. input speed	n_{epk}	min^{-1}	up to 4500	up to 4500	up to 4500
Peak overhung load	F_{Rapk}	N	4210 – 30000	1530 – 43000	4500 – 65000
Gear ratio range	i		1.3 – 8.65	3.21 – 289.74	3.77 – 281.71
Option with reduced backlash	/R		–	X	X
Option with minimized backlash	/M		–	–	–
Mechanical data:					
Hollow shaft			–	–	X
Foot mounting			X	X	–
Flange block			–	–	–
B5 flange			X	X	X
B14 flange			–	X	X

X = available, – = not available

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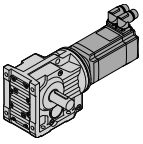
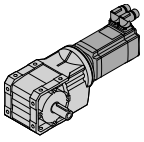
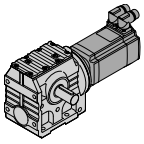
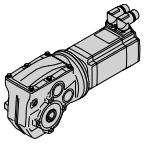
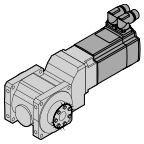
3.8.2 Right-angle gear unit

Gear unit type			K..7	K..9	S../S..p	W.29/W.39	BS.F..
Technical data:							
Figure							
Peak torque	M_{apk}	Nm	240 – 9090	88 – 605	104 – 740	156 – 240	60 – 1910
Max. continuous torque	M_{amax}	Nm	200 – 8000	80 – 500	92 – 720	130 – 200	40 – 1500
Max. input speed	n_{epk}	min^{-1}	4 500	4 500	4 500	4 500	4 500
Peak overhung load	F_{Rapk}	N	7000 – 65000	4500 – 9000	3000 – 12000	5000 – 8000	4200 – 36000
Gear ratio range	i		3.98 – 197.37	2.81 – 75.20	3.97 – 75.06	4.68 – 210.49	3 – 40
Option with reduced backlash	/R		X	–	–	–	X
Option with minimized backlash	/M		–	–	–	–	–
Mechanical data:							
Hollow shaft			X	X	X	X	X
Foot mounting			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 Engineering – Practical Implementation

- Project Planning for Drives

Technical data for motors and gear units

- "CM3C63 – CM3C100 Synchronous Servomotors" 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
- "Project Planning for BK.., BP.., BR.., BY.., BZ. Brakes" manual

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 documentation "Drive Engineering – Practical Implementation, Project Planning" or the SEW-Workbench project planning software for assistance.

Selecting the correct drive

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

Application data

For the project planning of a drive, the data of the application must be known or are based on the customer's specifications.

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

Designation	Meaning	Unit
C_{TG}	Torsional rigidity of the gear unit in Nm per angular minute	Nm/ ’
φ	Rotational clearance in angular minutes	’
η	Gear unit efficiency for M_{apk}	
η_L	Efficiency of the application	
F_A	Axial load (tension and compression) on the output shaft	N
F_R	Overhung load on the output shaft	N
F_{Rapk}	Maximum permitted overhung load at the output shaft for short-time duty (load application point is the middle of the shaft end)	N
F_{Ramax}	Maximum permitted overhung load at the output shaft for continuous duty (load application point is the middle of the shaft end)	N
F_{Repk}	Maximum permitted overhung load at the input shaft for short-time duty (load application point is the middle of the shaft end)	N

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Designation	Meaning	Unit
F_{Remax}	Maximum permitted overhung load at the input shaft for continuous duty (load application point is the middle of the shaft end)	N
F_{Rakub}	Cubic overhung load at cubic torque M_{akub}	N
F_Z	Transmission element factor for overhung load	
h	Installation altitude	m above sea level asl
i	Gear unit ratio	
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
M_0	Standstill torque (thermal continuous torque at low speeds)	Nm
M_{aDyn}	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_{akub}	Effective torque for bearing testing calculated in project planning	Nm
M_{amax}	Maximum permitted output torque for continuous duty	Nm
M_{apk}	Maximum permitted torque for short-time duty	Nm
$M_{aEmergOff}$	Maximum permitted emergency stop torque, max. 1000 emergency stops	Nm
M_{ath}	Effective torque for thermal testing calculated in project planning	Nm
M_B	Nominal 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 occurring torque of the application	Nm
n_{apk}	Maximum permitted output speed for short-time duty	min^{-1}
n_{epk}	Maximum permitted input speed for short-time duty	min^{-1}
n_{em}	Mean input speed	min^{-1}
n_{am}	Mean output speed	min^{-1}
n_{ak}	Breakpoint speed (output)	min^{-1}
n_{max}	Maximum occurring speed of the application	min^{-1}
n_N	Rated speed	min^{-1}
P_B	Braking power	W
P_{Bpk}	Peak braking power	W
P_{Beff}	Effective braking power	W
P_{B_tn}	Braking power in section t_n	W
S.., ..% cdf	Duty type and cyclic duration factor (cdf) or exact load cycle can be entered	
T_{amb}	Ambient temperature	°C
U_{sys}	System voltage, voltage of the supplying inverter	V

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Designation	Meaning	Unit
U_B	Operating voltage of the brake	V

4.2.1 Determining the application data

The data of the machine to be driven (mass, speed, setting range, etc.) is required to configure the drive correctly.

This data helps to determine the required power, torque and speed. Refer to the publication "Drive Engineering – Practical Implementation/Drive Planning" or the "SEW-Workbench" project planning tool from SEW-EURODRIVE for assistance.

4.2.2 Selecting the correct drive

The appropriate drive can be selected once the power and speed of the drive have been calculated and with regard to mechanical requirements.

4.3 Project planning procedure

The following flow diagram shows 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.

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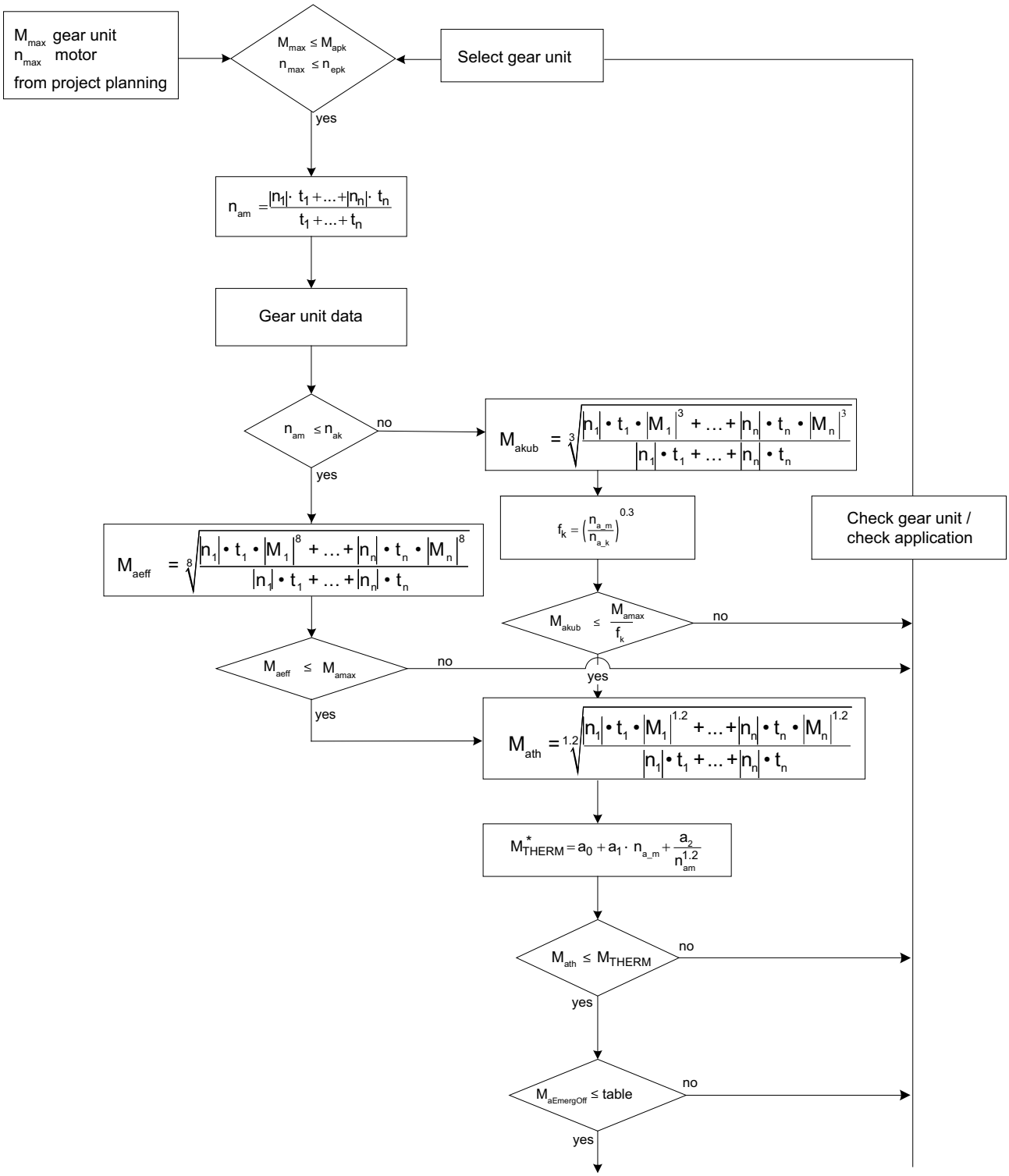
4.3.1 Project planning procedure for servo gear units

For an explanation of the used formula symbols, refer to chapter "Drive and gear unit selection data" (→ 🗎 49).



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

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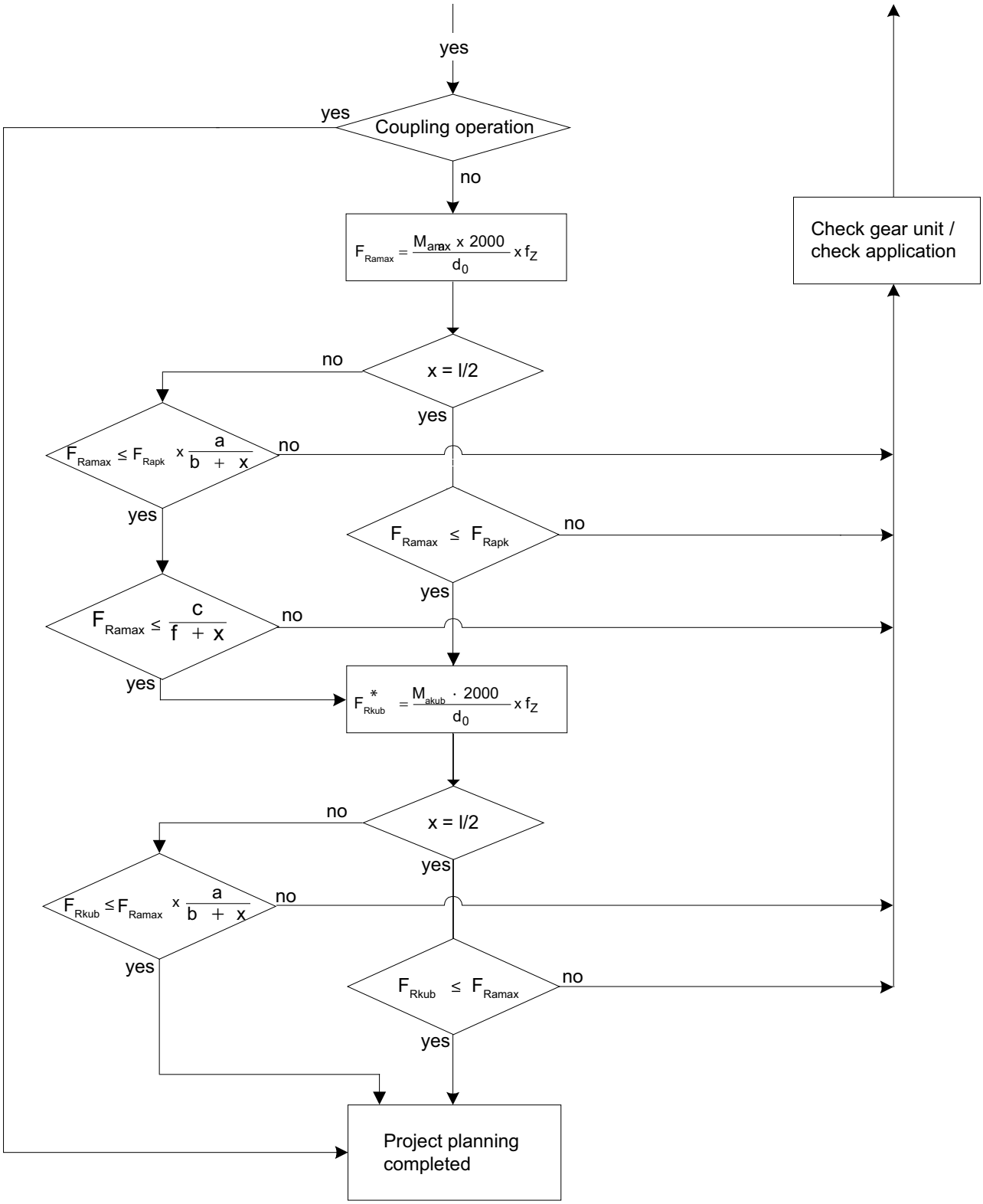

* For drive types with pretension (toothed belts, flat belts, narrow belts, and pinion/ gear rack), the cubic overhung load (F_{R_Kub}) is equal to the maximum overhung load (F_{R_max}).

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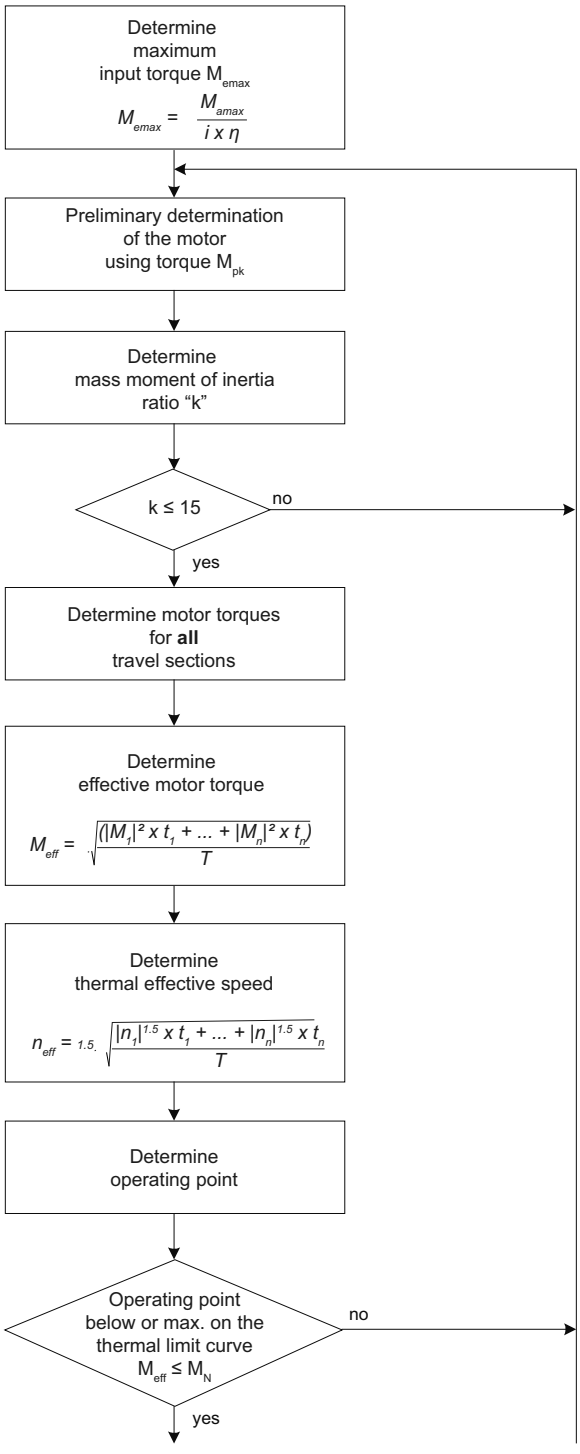
4.3.2 Project planning procedure for servomotors

For an explanation of the used formula symbols, refer to chapter "Drive and gear unit selection data" (→ 🗎 49).



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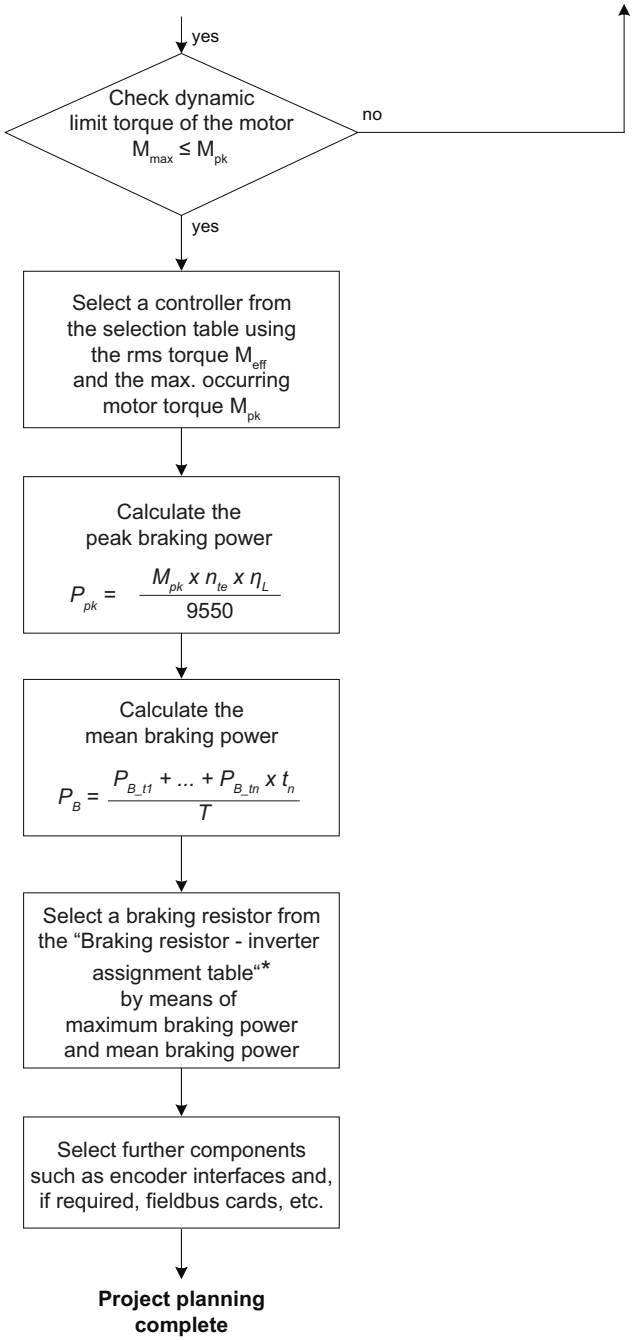

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* Product manuals of the application inverters of the MOVI-C®, MOVIDRIVE® B, MOVIAXIS® brand.

For further information on the project planning for brakes, refer to the "Project Planning for BK.., BP.., BR.., BY.., BZ.. Brakes" manual.

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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 as 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" (→ 🗎 57).

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 gear units

The gearing of helical-worm gear units generates a high proportion of sliding friction. This is the reason why these gear units have higher tooth friction losses and lower efficiencies than R, F, K or W..9 gear units.

Other factors influencing the efficiency:

- Gear ratio of the helical-worm gear 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 gear units produces an efficiency of $\eta' = 2 - 1/\eta$, which is significantly less favorable than the forward efficiency η. The helical-worm gear unit is statically self-locking if the forward efficiency is $\eta \leq 0.5$. 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 gear units is not permitted as the sole safety function for hoists.

Run-in phase

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

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During the running-in phase, the nominal efficiency of the gear unit is reduced by the respective 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%

The run-in phase usually lasts 48 hours. Helical-worm gear units achieve their nominal efficiency values when the following conditions have been met:

- 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.

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" (→ 🗎 83).
- 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" (→ 🗎 183)).

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" (→ 🗎 57)) 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_{em} or mean output speed n_{am} each in min^{-1}
- Effective motor torque M_{eff} in Nm

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- Input motor power P_{Mot} in kW
- Mounting position M1 – M6 or pivoting angle

Installation site:

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

Installation situation:

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

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

Determining the overhung load

When determining the resulting overhung load, the type of transmission element mounted on the shaft end must be considered. 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

Transmission element factor at low temperatures

For temperatures < -30 °C, observe a transmission element factor f_{Z1} = 1.2.

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

$$F_R = \frac{M_{max} \times 2000}{d_0} \times f_Z \times f_{Z1}$$

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F_R = Overhung load [F_R] = N
M_{max} = Torque [M_{max}] = Nm
f_Z = Transmission element factor
f_{Z1} = Transmission element factor f_{Z1} = 1.2 for ambient temperatures < -30 °C.
For ambient temperatures ≥ -30 °C, f_{Z1} = 1
d_0 = Overhung load determined by diameter of installed transmission element [d] = mm

Permitted overhung load F_{Ra}

The following important information refers to the overhung load value F_{Ra} in the relevant tables of this catalog:

F_{Ra} is calculated from the nominal bearing service life L_{10h} (according to ISO 281). For special operating conditions, the permitted overhung loads can be determined based on the modified bearing service life L_{na}. Consult SEW-EURODRIVE in this case.

The permitted overhung load is influenced by the direction of rotation and the force application angle. The values F_{Ra} listed in the catalog are based on the least favorable conditions.

The permitted overhung loads F_{Ra} 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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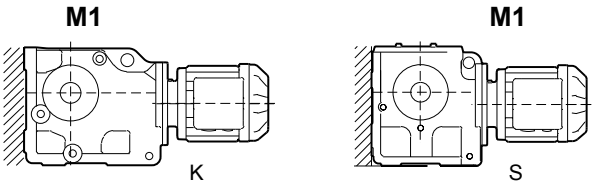
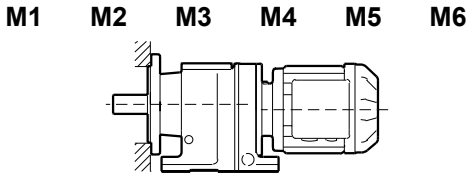
The overhung load data refers to a force application at the center of the output shaft 0.5 × l. With right-angle gear units, the application point is assumed to be at the A-side.

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.

Reduced permitted overhung load

The following table shows the cases in which the overhung load must be limited:

Mounting surface	Gear units	Mounting position	Restriction
	K37 – K107 S37 – S97	M1	Maximally 50% of the overhung load F_{Ra} specified in the selection tables is permitted in the case of mounting at the front-end (shaded areas).
	R07F – R87F	M1 – M6	For all foot-mounted/flange-mounted gear units (R..F) with torque transmission via the flange connection, a maximum of 50% of the overhung load F_{Ra} specified in the selection tables is permitted.

Higher permitted overhung loads

Exactly considering the force application angle γ 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.

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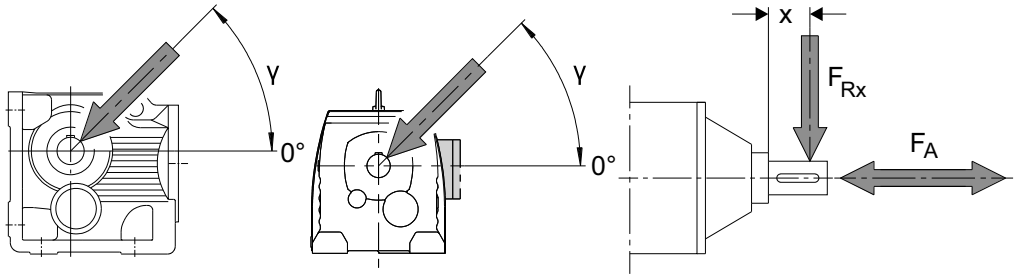
Definition of the force application

Force application is defined according to the following figure:



γ	=	Force application angle	[γ] = °
F_{Rx}	=	Permitted overhung load at distance x	[F_{Rx}] = N
F_A	=	Permitted axial force	[F_A] = N

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 helical 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 side: 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.

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_{Rb} (according to bearing service life) and F_{Rw} (according to shaft strength) is the permitted value for the overhung load at distance x. Note that the calculations apply to M_{amax}. The permitted overhung load values F_{Ramax} specified in the data tables apply to force application at 0.5 × l (solid shaft).

The following conditions must be met:

F_{Rb} according to bearing service life: $$F_{Rb} = F_{Ramax} \times \frac{a}{b + X}$$

F_{Rw} according to shaft strength: $$F_{Rw} = \frac{c}{f + X}$$

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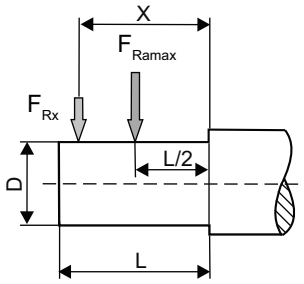
F_{Rx}	Permitted overhung load at distance x	$[F_{Rx}]$ = N
F_{Ramax}	Permitted overhung load	$[F_{Ramax}]$ = N
X	Distance from the shaft shoulder to the force application point	[X] = mm
a, b, f	Gear unit constants for overhung load conversion	[a, b, f] = mm
c	Gear unit constant for overhung load conversion	[c] = Nmm



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	4.93×10^6	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

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Gear unit type	a mm	b mm	c Nmm	f mm	D mm	L mm
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
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

Values for designs not listed are available on request.

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4.5 Project planning notes – BS.F gear units

4.5.1 Efficiency of the servo gear units

General

The efficiency of gear units is mainly determined by gearing friction 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).

INFORMATION

For **BS.F servo gear units**, the **shaft shoulder** may **be used** as a stop for transmission elements (belt pulley, pinion gear, etc.) when mounting input and output elements.

INFORMATION

For information on churning losses and thermal rating, refer to chapter "Churning losses and thermal rating" (→ 🗎 57).

4.5.2 Overhung loads and axial forces – BS.F gear units

Determining the overhung load

When determining the resulting overhung load, the type of transmission element mounted on the shaft end must be considered. 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

Permitted overhung load

The permitted overhung loads are determined taking into account the rolling bearing calculation of the nominal bearing service life L_{H10} (according to ISO 281).

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

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INFORMATION

The data refer to the radial force acting midway on the shaft end (with right-angle gear units on the A-side output). The most unfavorable conditions are assumed for the force application angle γ and the direction of rotation.

INFORMATION

Reduction of overhung loads

Only 50% of the F_{Ramax} and F_{Rapk} 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.

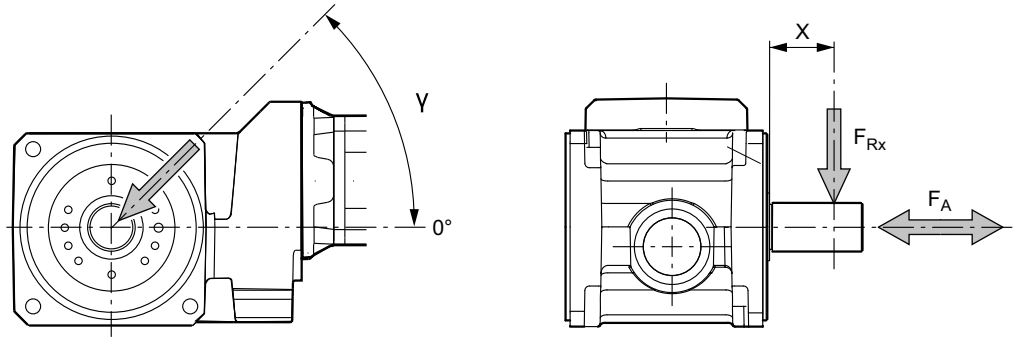
Higher permitted overhung loads

Accurate consideration of the force application angle γ and the direction of rotation can allow for higher overhung load than specified in the selection tables.

Contact SEW-EURODRIVE in this case.

Definition of the force application

The force application is defined according to the following figure:



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Permitted axial forces

If no overhung load is present, 50% of the overhung load according to the selection tables is permitted as axial force F_A (tension or compression).

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_{Rxb} (according to bearing service life) and F_{Rxw} (according to shaft strength) is the permitted value for the overhung load at distance x. Note that the calculations apply to M_{amax}. The permitted overhung load values F_{Ramax} and F_{Rapk} specified in the data tables apply to force application at 0.5 × l (solid shaft) or force application at the shaft end face (front end surface of the hollow shaft or front end of the flange block shaft with BSBF and PSBF gear units).

The following conditions must be met:

F_{Rb} according to bearing service life: $$F_{Rb} = F_{Ramax} \times \frac{a}{b + X}$$

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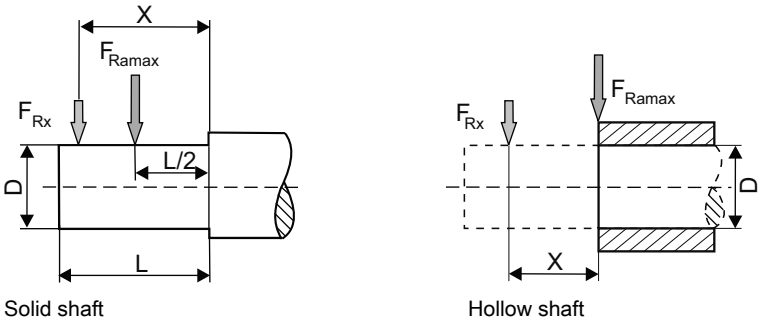
F_{Rw} according to shaft strength: $$F_{Rw} = \frac{c}{f + X}$$

F_{Rx}	Permitted overhung load at distance x	$[F_{R_x}]$ = N
F_{Ramax}	Permitted overhung load	$[F_{R_a_max}]$ = N
X	Distance from the shaft shoulder to the force application point	[X] = mm
a, b, f	Gear unit constants for overhung load conversion	[a, b, f] = mm
c	Gear unit constant for overhung load conversion	[c] = Nmm



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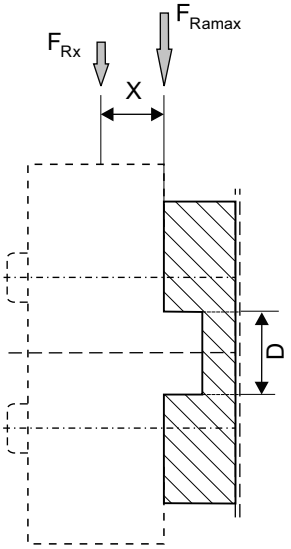

Flange block shaft

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	-	–	–	–

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BSF/BS.F gear units	Size	a mm	b mm	c Nmm	f mm	D mm	L mm
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	-	–	–	–

Values for designs not listed are available on request.

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4.6 Project planning notes – CM3C.. motors

4.6.1 Operating conditions

Ambient temperature and installation altitude

The performance data of CM3C.. motors apply according to IEC 60034 (EN 60034) for the following ambient conditions:

- Ambient temperature -20 °C to +40 °C
- Installation altitude up to 1000 m above sea level

If the specified limit values are exceeded, the performance data of the motors must be reduced. For further information, refer to chapter "Derating for increased ambient temperature and installation altitude" (→ 🗎 68).

For operating conditions as low as -40 °C, the motors can be provided with suitable measures. In these cases, the temperature range of -40 °C to +10 °C is indicated accordingly on the nameplate.

Other thermal influencing factors

Besides the ambient temperature and/or installation altitude the thermal capacity of the servomotor is also influenced by the mounting conditions. If the mounting conditions deviate from the specified rated flange information (Information on the technical data – Conditions), e.g. in case of thermally insulated mounting to the application, it might be necessary to reduce the motor's performance data. For further information, please contact SEW-EURODRIVE.

Derating for increased ambient temperature and installation altitude

If you operate CM3C.. motors within the ambient temperature range of +40 °C to +60 °C or at an installation altitude between 1000 m and 4000 m, then you must adjust the operating points. Contact SEW-EURODRIVE in case of deviating ambient conditions.

The effective operating point with regard to installation altitude and increased ambient temperature results from the factor f_{AU} in the following table, as well as from the correlation:

$$M_{AU,eff} = \frac{1}{\sqrt{f_{AU}}} \times M_{eff}$$

$$n_{AU,eff} = \frac{1}{K_e \times f_{AU}} \times n_{eff}$$

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M_{eff}	=	Effective motor torque based on the load profile	$[M_{eff}]$ = Nm
$M_{AU,eff}$	=	Effective torque based on the load profile taking into account the installation altitude and/or increased ambient temperature	$[M_{AU,eff}]$ = Nm
n_{eff}	=	Mean thermal motor speed based on the load profile	$[n_{eff}]$ = min^{-1}
$n_{AU,eff}$	=	Effective rotational speed based on the load profile taking into account the installation altitude and/or increased ambient temperature	$[\eta_{AU}]$ = min^{-1}
f_{AU}	=	Derating factor for installation altitude and/or increased ambient temperature	$[f_{AU}]$ = 1
K_e	=	Encoder factor for resolvers = 1, for electronic encoders (e.g. HIPERFACE® encoders) = 0.9	$[K_e]$ = 1

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Derating factor f_{AU} depending on the installation altitude and ambient temperature

f_{AU}	40 °C	+45° C	50 °C	55 °C	60 °C
1000 m	1	0.95	0.9	0.86	0.81
2000 m	0.9	0.86	0.81	0.77	0.73
3000 m	0.8	0.76	0.72	0.69	0.65
4000 m	0.7	0.67	0.63	0.6	0.57

Example of a motor with the following conditions:

- Ambient temperature 50 °C
- Installation altitude 3000 m
- Resolver
- From the configuration or load profile: M_{eff} = 5 Nm and n_{eff} = 1500 min^{-1}

The previous table determines the derating factor: f_{AU} = 0.72.

The effective operating point, taking into account the installation altitude and ambient temperature, is therefore as follows:

$$M_{AU,eff} = \frac{1}{\sqrt{0.72}} \times 5Nm = 5.89Nm$$

$$n_{AU,eff} = \frac{1}{1 \times 0.72} \times 1500min^{-1} = 2083min^{-1}$$

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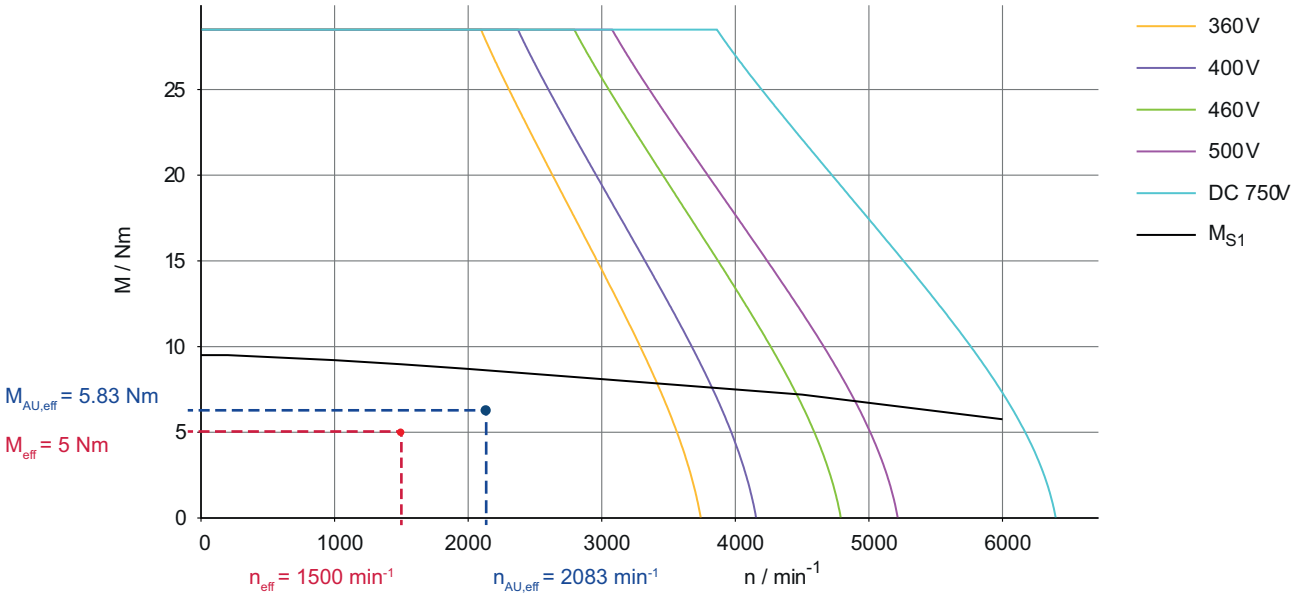
If this point is below the MS1 characteristic of the motor, you can operate the motor continuously under the described conditions.



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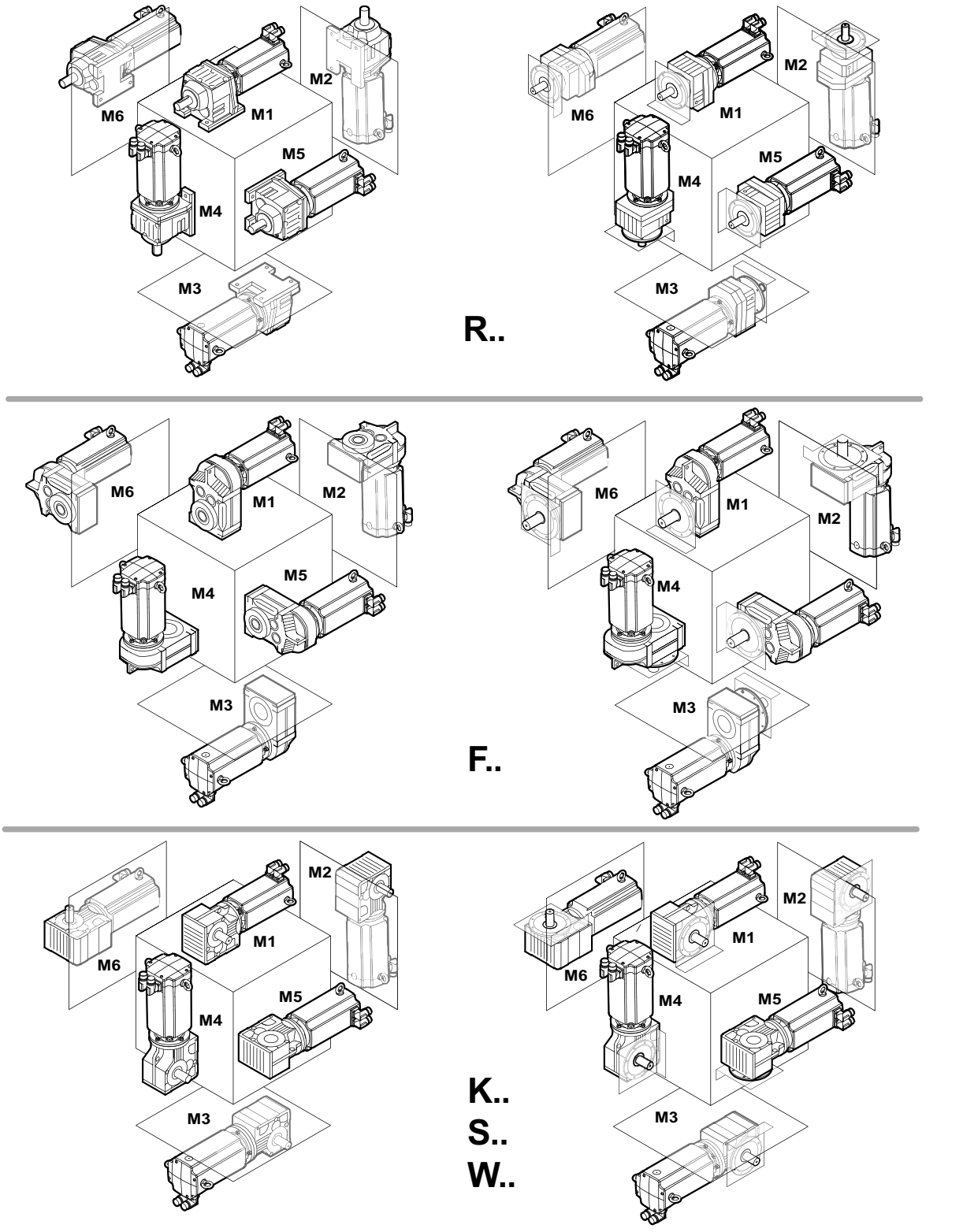
Cold storage application

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.

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 to M6:



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5.2 Change of mounting position

Observe 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 drive's operating mode, an oil expansion tank might be necessary (see chapter "Oil expansion tank" (→ 🗎 17)).
- For helical-bevel gearmotors: Contact SEW-EURODRIVE if you want to change to mounting position M5 or M6.
- For helical-worm gearmotors: Contact SEW-EURODRIVE if you want to change to mounting position M2 or M3.
- For helical gearmotors: Contact SEW-EURODRIVE if you want to change to mounting position M2.
- 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.

5.3 Gear unit in pivoted mounting position (dynamic)

The dynamic pivoted mounting position is available on request for gear units of the types R..7, F..7, K..7, K..9, S..7 and SPIROPLAN® W..9.

In the pivoted mounting position, the gear units are delivered with the maximum required oil fill quantity and sealed with oil screw plugs. The gear unit can be pivoted during operation to the mounting positions required by the customer.

5.4 Gear unit in pivoted mounting position (stationary)

The stationary pivoted mounting position is available for all gear units of the type R..7, F..7, K..7, K..9, S..7 and SPIROPLAN® W..9.

In the stationary pivoted mounting position, the gear units are delivered with the oil fill quantity required for this pivoted mounting position and sealed with oil screw plugs. For gear units with stationary pivoted mounting position, replace the highest screw plug with the supplied breather valve before startup.

5.5 Mounting position MX

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

Before startup, make adjustments dependent on the mounting position for gear units in mounting position MX.

In the mounting position MX, the gear units are delivered with the maximum required oil fill quantity 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" (→ 🗎 137)). Customers will also have to mount the enclosed breather valve at the proper location depending on the mounting position, see chapter "Mounting position sheets" (→ 🗎 83).

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5.5.1 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.

5.6 Variable mounting position

The variable mounting position is available on request for gear units of the types K..7, K..9, S..7 and SPIROPLAN® W..9.

Before startup, make adjustments dependent on the mounting position for gear units in the variable mounting position.

In the variable mounting position, the gear units are delivered with the maximum required oil fill quantity of the mentioned mounting positions and sealed with oil screw plugs. A breather valve is included with each drive. The enclosed breather valve must be mounted in the proper location depending on the mounting position, see chapter "Mounting position sheets" (→ 🗎 83).

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

As shown in the mounting position sheets in chapter "Mounting position sheets" (→ 🗎 83), the position of the breather valve and oil drain plug depends on the mounting position of the gear unit.

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

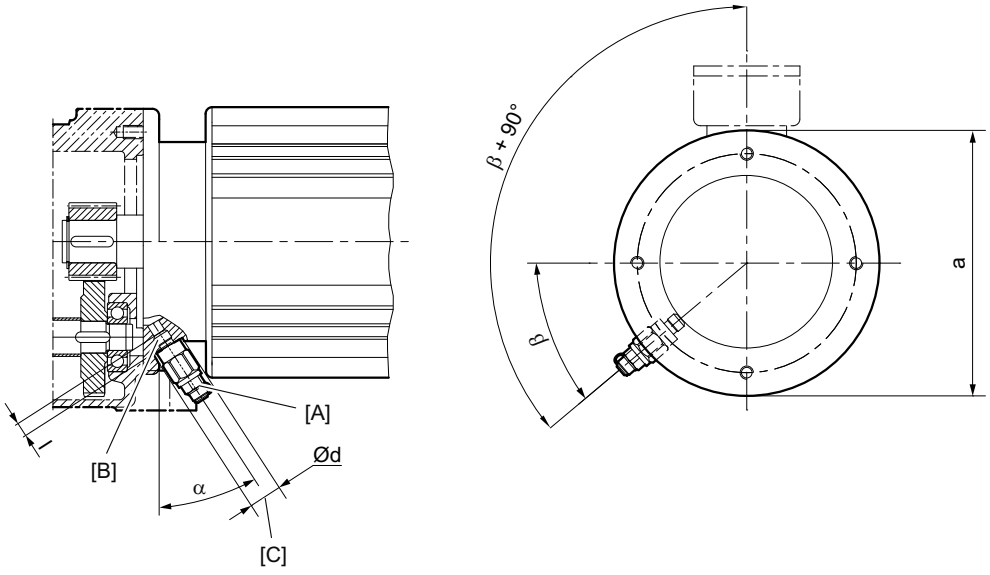
Mounting position	Breather valve position	Oil drain plug position
M1, M3, M5, M6	In the gear unit housing	In the gear unit housing
M4	**In the motor flange**	In the gear unit housing
M2	In the gear unit housing	**In the motor flange**

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" (→ 🗎 83) 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.



17193640459

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

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5.7.1 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.

Motor type CM3C..	Flange designation		a	α	β	Gear units	Thread designation	Ø d	l
	Old	New	mm	°	°			mm	mm
CM3C63	LIA105	FG85 D105	105	26	45	R.., F..,K.., S.., W.. gear units	M10 × 1	15	9
	LIA120	FG100 D120	120	0	45		M10 × 1	15	9
	LIA160	FG130 D160	160	30	45		M10 × 1	15	9
	Q90	FG104 Q90	90	17	90	BS.F gear units	M10 × 1	15	9
	Q112	FG130 Q112	112	35	90		M10 × 1	15	9
CM3C71	LIA120	FG100 D120	120	0	45	R.., F..,K.. gear units S.., W..	M10 × 1	14.5	9
	LIA160	FG130 D160	160	0	45		M10 × 1	14.5	9
	LIA200	FG165 D200	200	33	45		M12 × 1.5	18	12
	LIA250	FG215 D250	250	90	90		M12 × 1.5	18	12
	Q90	FG104 Q90	90	25	90	BS.F gear units	M10 × 1	16	9
	Q112	FG130 Q112	112	0	90		M10 × 1	16	9
	Q142	FG165 Q142	142	48	90		M10 × 1	15	9
CM3C80	LIA160	FG130 D160	160	0	45	R.., F..,K.., S.., W.. gear units	M10 × 1	14.5	9
	LIA200	FG165 D200	200	33	45		M12 × 1.5	18	12
	LIA250	FG215 D250	250	33	45		M12 × 1.5	18	12
	LIA300	FG265 D300	300	90	90		M22 × 1.5	28	19.9
	Q112	FG130 Q112	112	25	90	BS.F gear units	M10 × 1	15	9
	Q142	FG165 Q142	142	0	90		M10 × 1	15	9
	Q182	FG215 Q182	182	60	90		M10 × 1	15	9
CM3C100	LIA160	FG130 D160	160	22	45	R.., F..,K.., S.. gear units	M10 × 1	15	9
	LIA200	FG165 D200	200	0	45		M12 × 1.5	18	9
	LIA250	FG215 D250	250	33	45		M12 × 1.5	18	12
	LIA300	FG265 D300	300	90	90		M22 × 1.5	28	19.9
	LIA350	FG300 D350	350	90	90		M22 × 1.5	28	18.5

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

INFORMATION

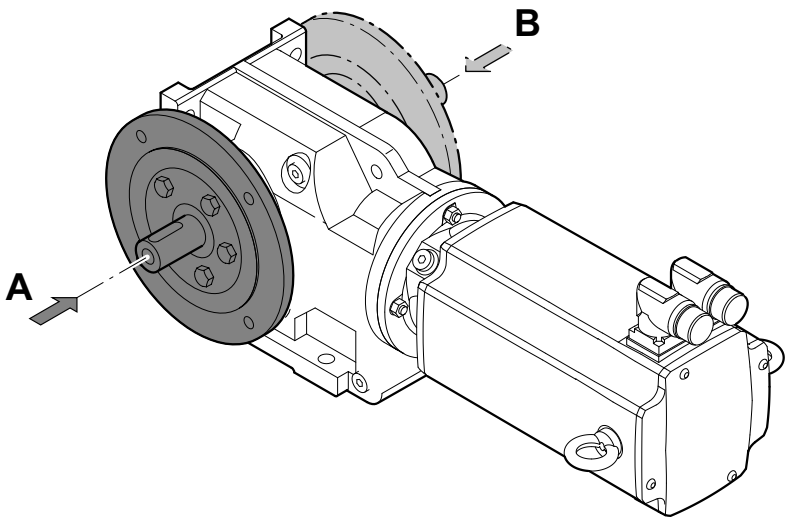
The following order information is required for gear units or gearmotors in addition to the mounting position to exactly determine the drive design.

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

5.8.1 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



34102614027

5.8.2 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 opposite the A-side.

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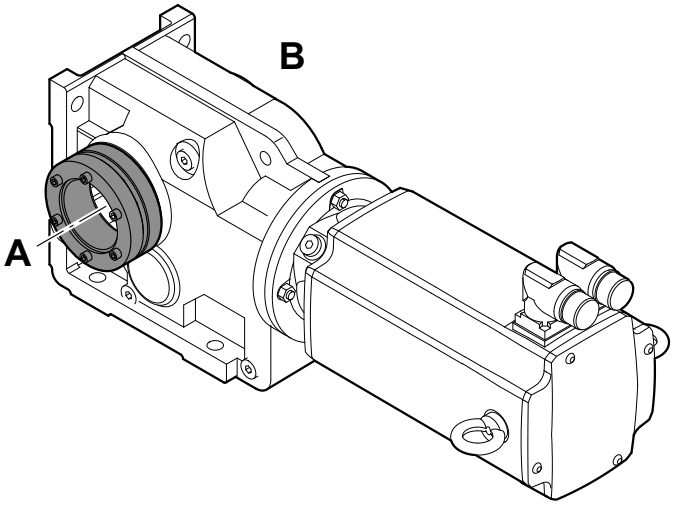
In shaft-mounted right-angle gear units, the designation "output side" is equivalent to the designation "position of the output shaft" used for right-angle gear units with solid shaft.



34102610443

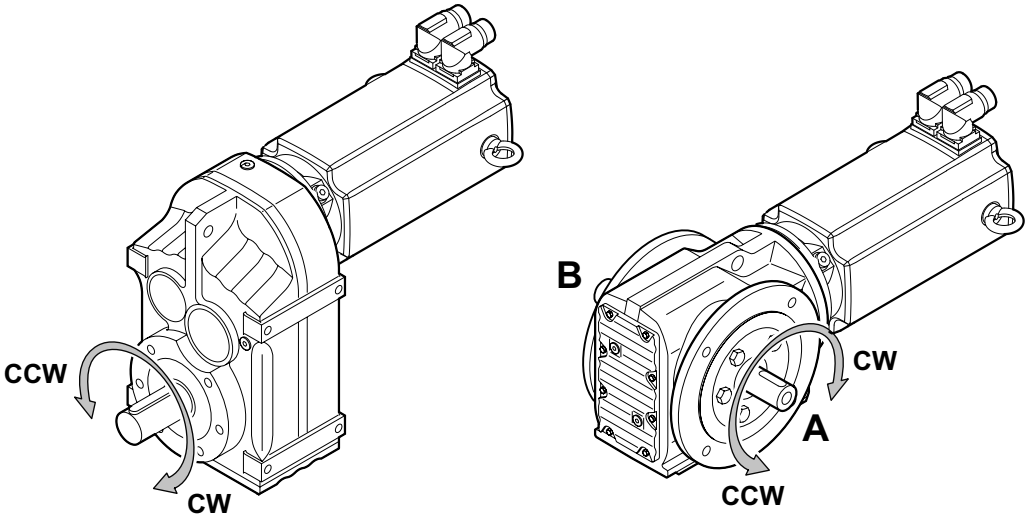
INFORMATION

For the permitted mounting surfaces (= hatched area), refer to the mounting position sheets (→ 🗎 83).

5.8.3 Direction of rotation of the output shaft

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

- Clockwise (CW) = rotating clockwise
- Counterclockwise (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.

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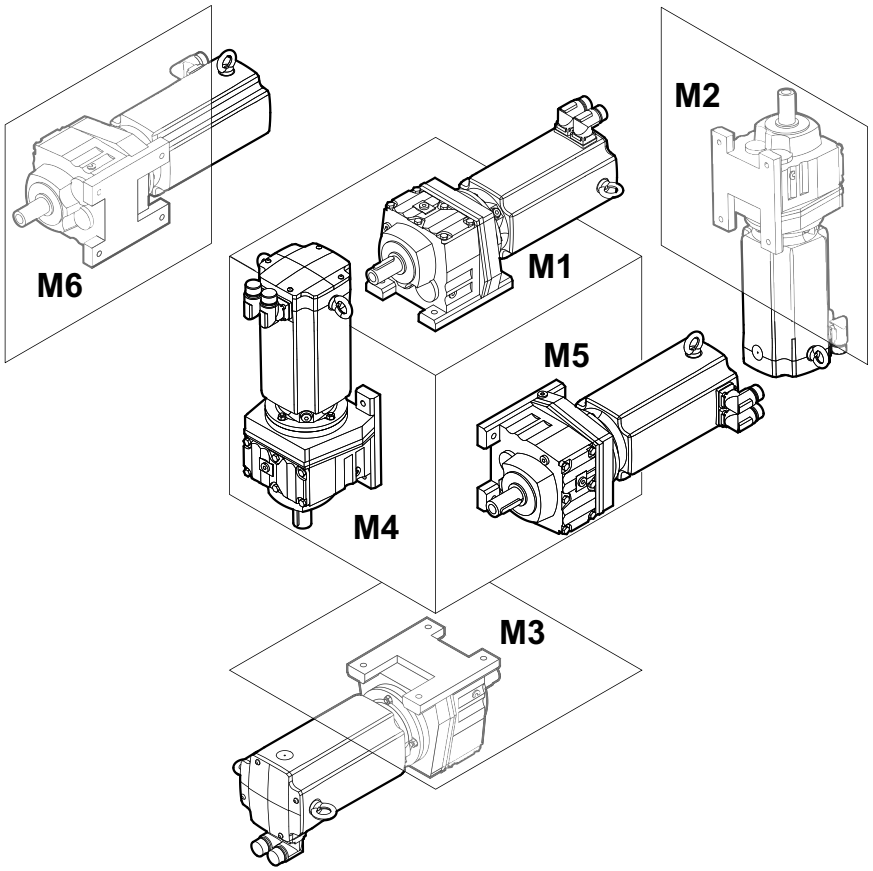
5.9 General information on mounting positions – BS.F gear units

5.9.1 Mounting position designations

The following illustration shows the SEW-EURODRIVE mounting positions M1 to M6 for BS.F.. gear units.



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5.10 Order information for servo gearmotors – BS.F 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.

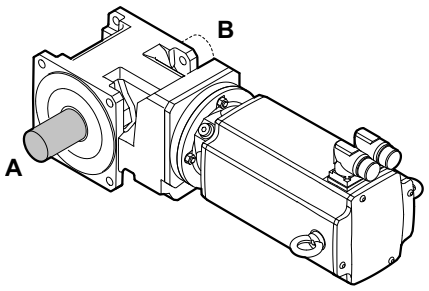
5.10.1 Definition of A and B-sides of output shafts

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 end
	B-side	–	Mounting via B5 flange on the B end
BSHF..	A-side	B-side	Mounting via B5 flange on the A end
	B-side	A-side	Mounting via B5 flange on the B end
BSHF.. /I	A-side	A-side	Mounting via B5 flange on the A end
	B-side	B-side	Mounting via B5 flange on the B end
BSAF..	A-side	–	Mounting via B5 flange on the A end
	B-side	–	Mounting via B5 flange on the B end
BSF../BSKF..	AB	–	Mounting via B5 flange on the A- and/or B-side

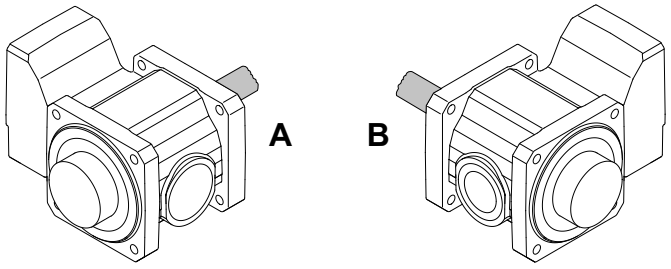
For BS.F.. helical-bevel gear units, the position of the output shaft A, B or AB (see the following figure) must be specified.

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



34102603275

BSHF



15455375499

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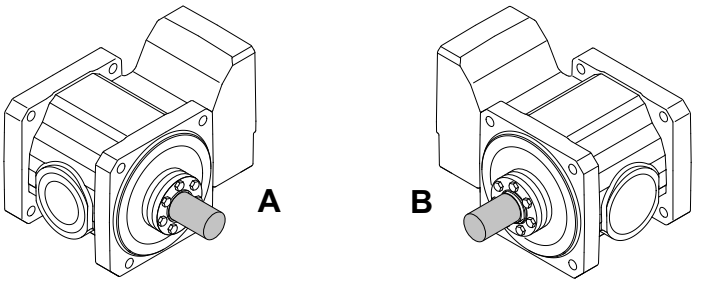
BSHF../I



15455377931

5.10.2 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" (→ 🗎 76).

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5.11 Order information for servomotors

5.11.1 Connection with plug connector

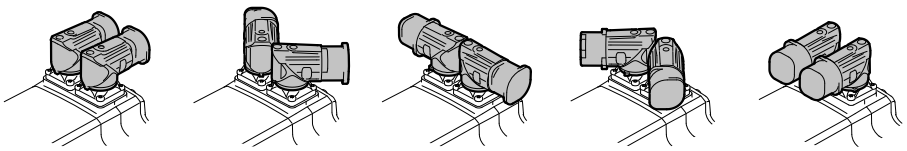
Connecting the two-cable technology

As standard, the power supply with or without brake supply is connected to motor via the quick-lock (SpeedTec) SM./SB. plug connector system.

In the basic version, SEW-EURODRIVE delivers electric motors with a connector on the motor end and without mating connector. The encoder system is connected using a separate 12-pin round circular connector (M23).

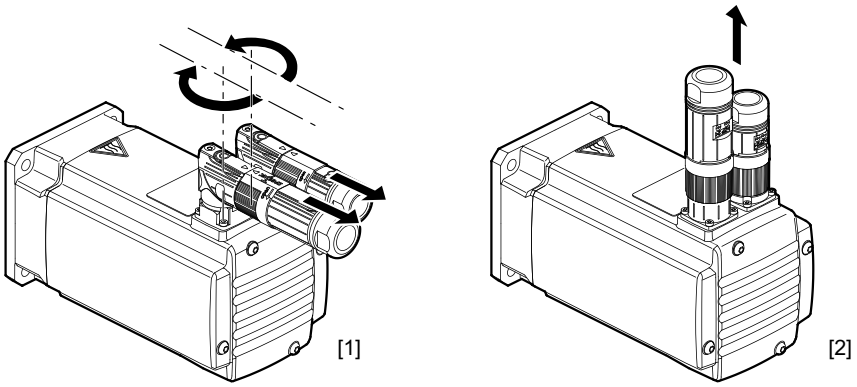
The mating connectors can be ordered separately or together with the motor.

The right-angle plug connectors SM1/SB1 and SMB/SBB can be rotated to achieve any required position. The following figure shows examples of the differently adjusted plug connectors SM1/SB1, SMB/SBB:



29125640203

The position defined for straight connectors is "radial". Radial plug connectors [2] are optional:



32769028491

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

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

Connector position		Plug connector	
		SM1/SB1	SMB/SBB
Radial		X	X
adjustable	Steplessly adjustable positions	X	X

X Available

– Not available

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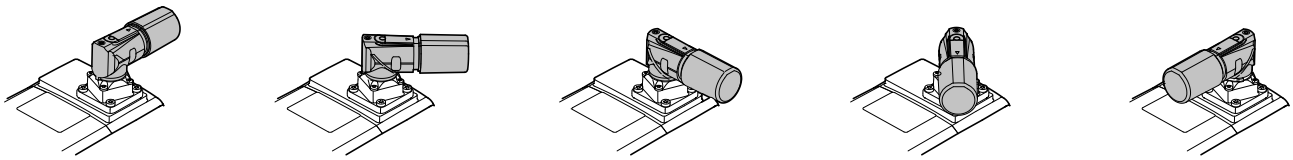
Connecting single-cable technology

Using the fully digital MOVILINK® DDI interface from SEW-EURODRIVE allows you to connect CM3C.. synchronous servomotors using single-cable technology. With this technology, all data of the motor, such as encoder data, temperature data, startup data, and data of further sensors is digitally transferred via a hybrid cable.

The right-angle SD1/SDB plug connectors can be rotated to achieve the required positions:



9007231550278027

5.11.2 Connection with terminal box

Position of terminal box and cable entry

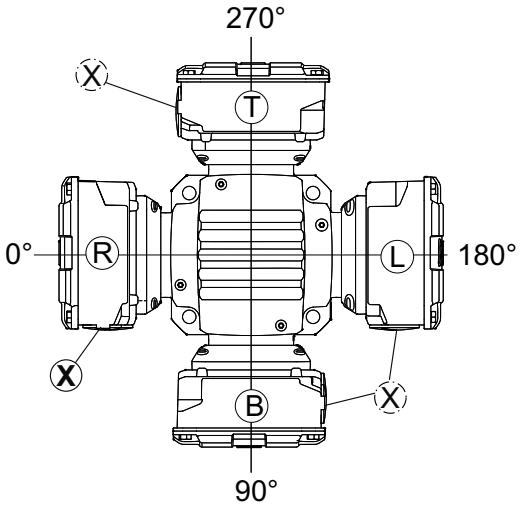
Product standard EN 60034 specifies the following designations for the position of the terminal box facing towards the output shaft (A-side):

- R (right)
- B (bottom)
- L (left)
- T (top)

This designation applies to motors without a gear unit in mounting position B3 (= M1).

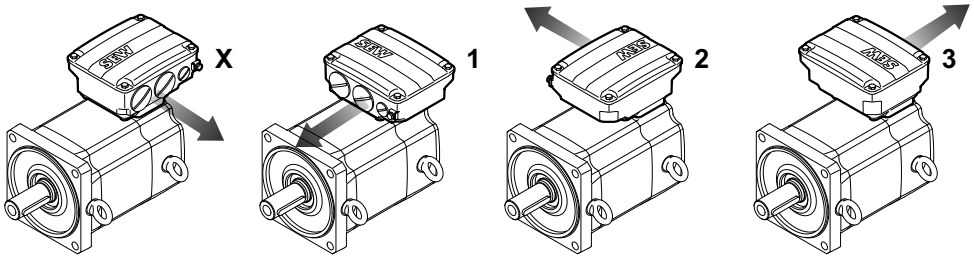
The position of the motor terminal box has so far been specified with 0°, 90°, 180° or 270° as viewed onto the fan guard (B-side). For gearmotors, the previous designation is maintained.

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



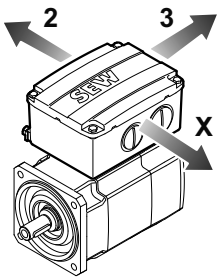
32761029643

The cable entry position is specified with X, 1, 2, 3. As standard, the terminal box is delivered in 270° design with cable entry "X".



9007228568864651

As depicted below, only terminal box position "X" is available for motor size CM3C63. Cable entry is possible from 3 sides.



9007228568088587

Observe that the terminal box position is defined when ordering the motor. The terminal box must not be turned afterwards. Contact SEW-EURODRIVE, if required.

5.11.3 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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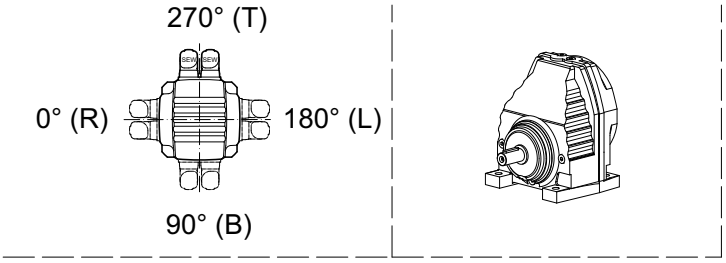
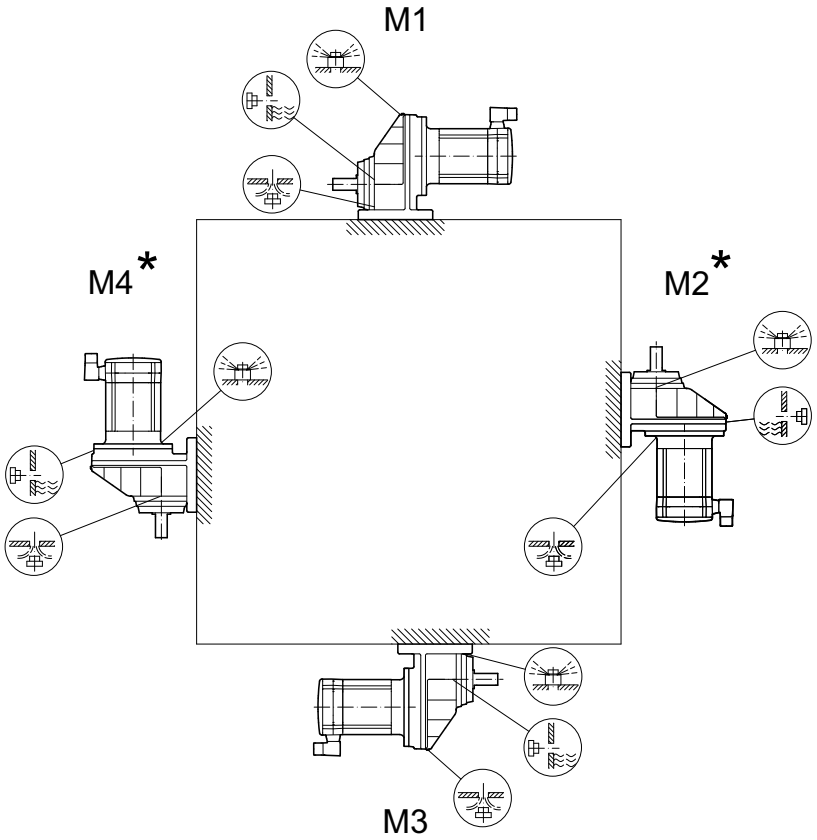
5.12 Mounting position sheets

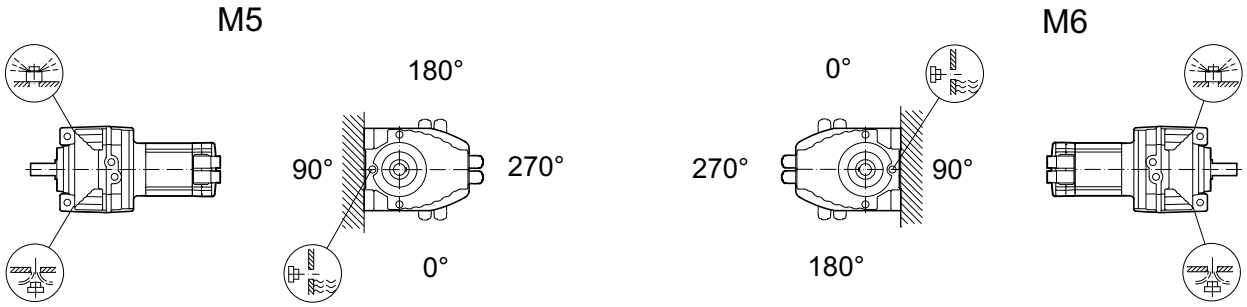
5.12.1 Mounting positions of helical gearmotors R

RX57-RX107

01 001 00 20



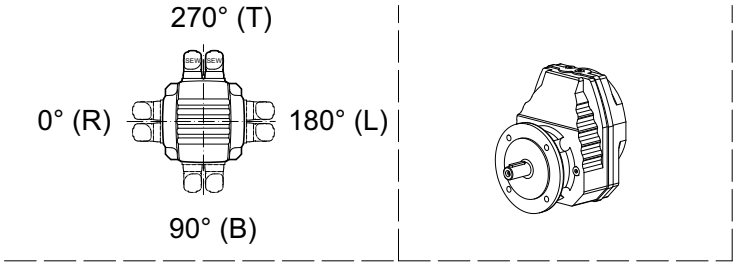


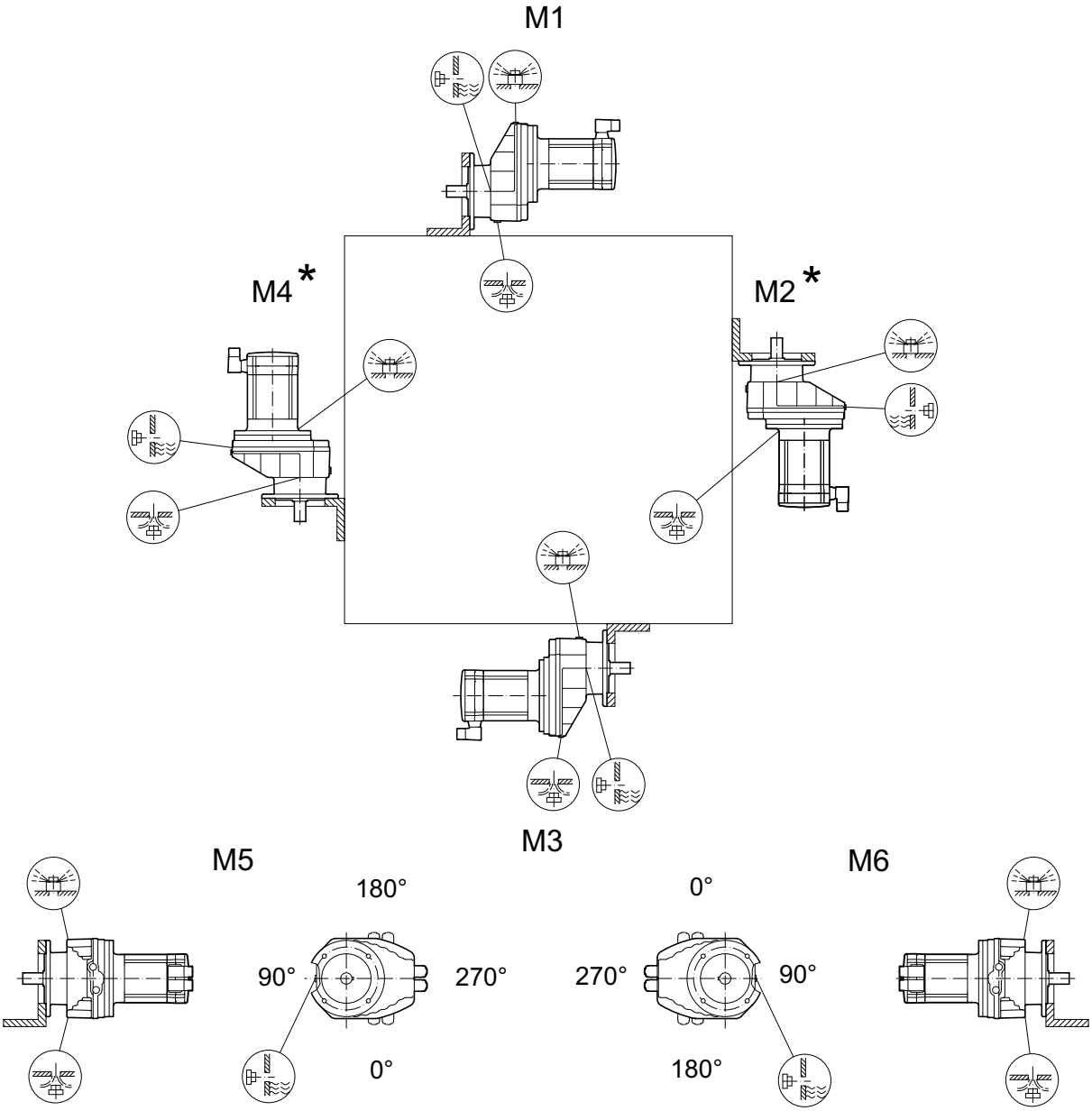


* (→ 🗎 57)

RXF57-RXF107

01 002 00 20





* (→ 🗎 57)

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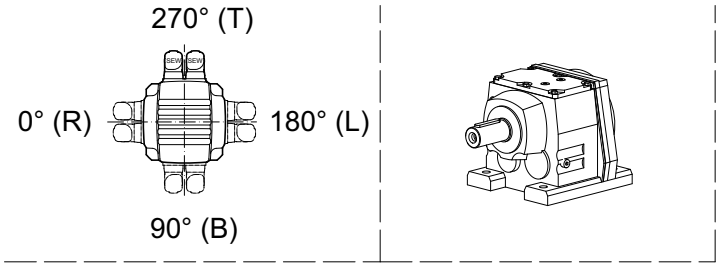
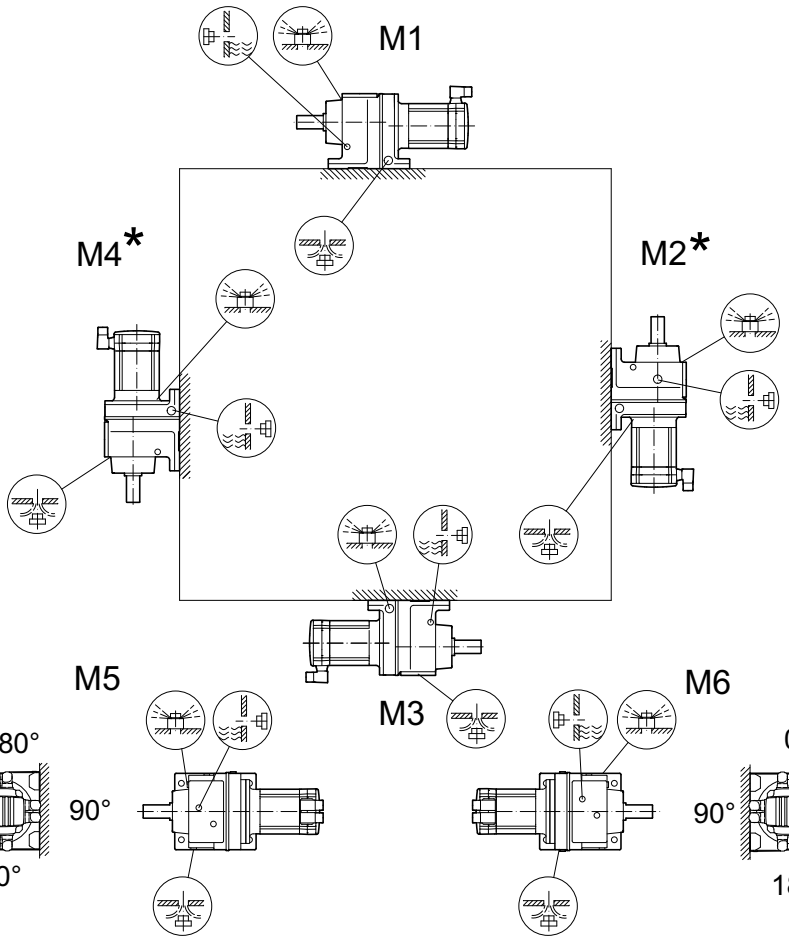
R07-R127



01 003 00 20



R07		M1, M2 , M3 , M5 , M6
R17, R27		M1, M3 , M5 , M6
R07, R17, R27		
R47, R57		M5

* (→ 🗎 57)

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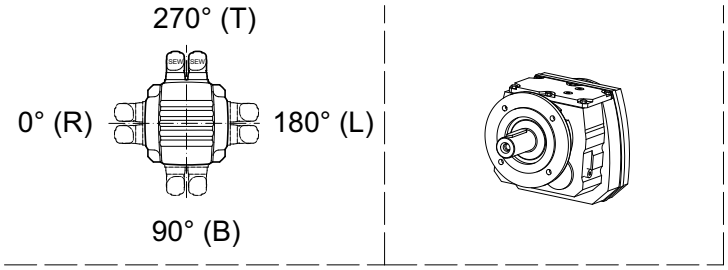
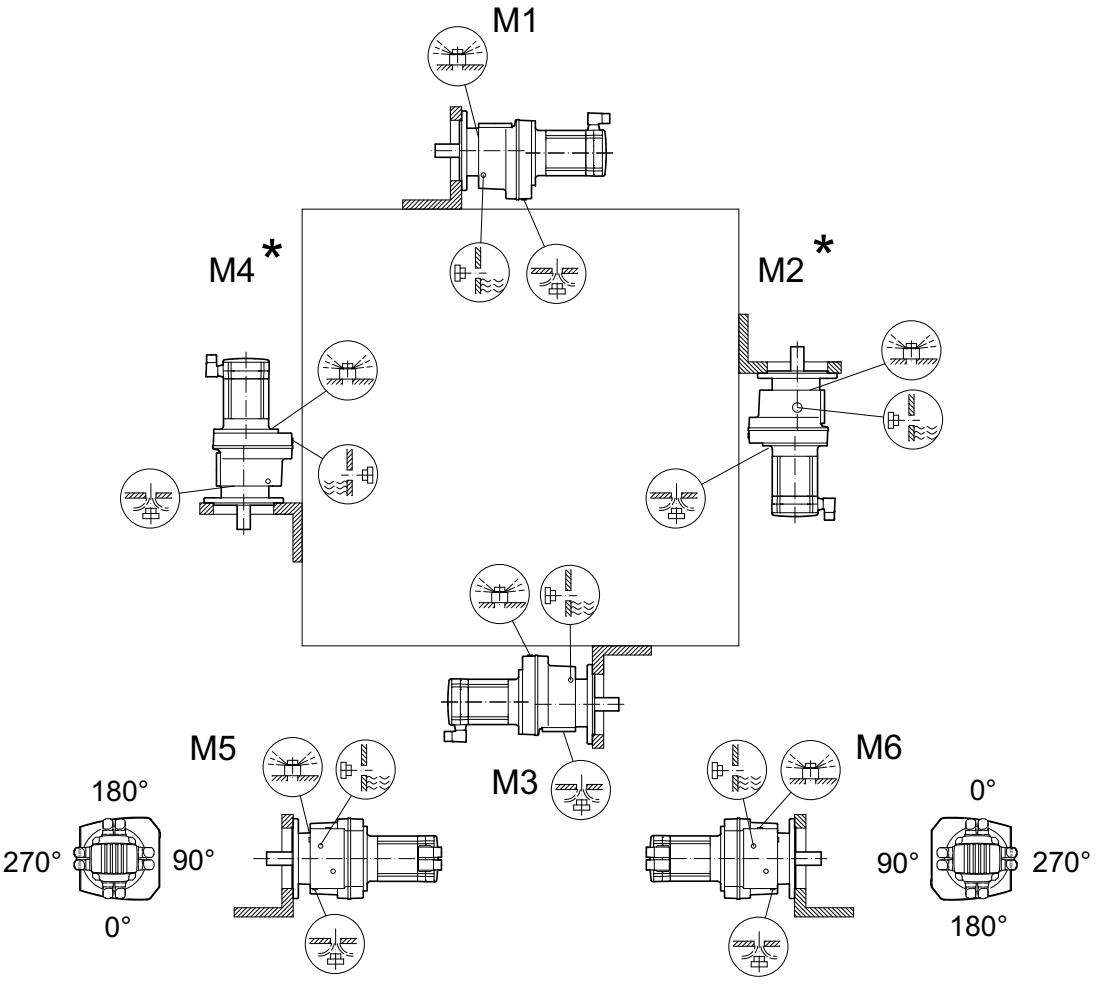
RF07-RF127, RZ07-87

01 004 00 20





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

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

RF/RZ07, 17, 27

RF/RZ47, 57 M5

* (→ 57)

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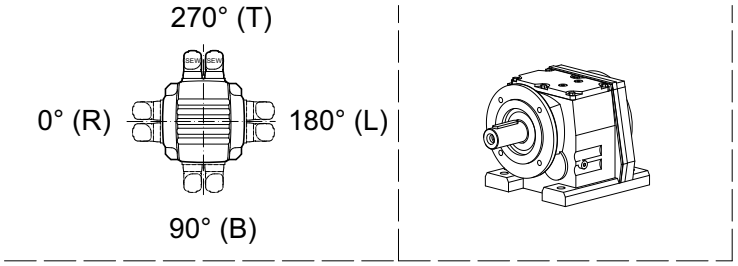
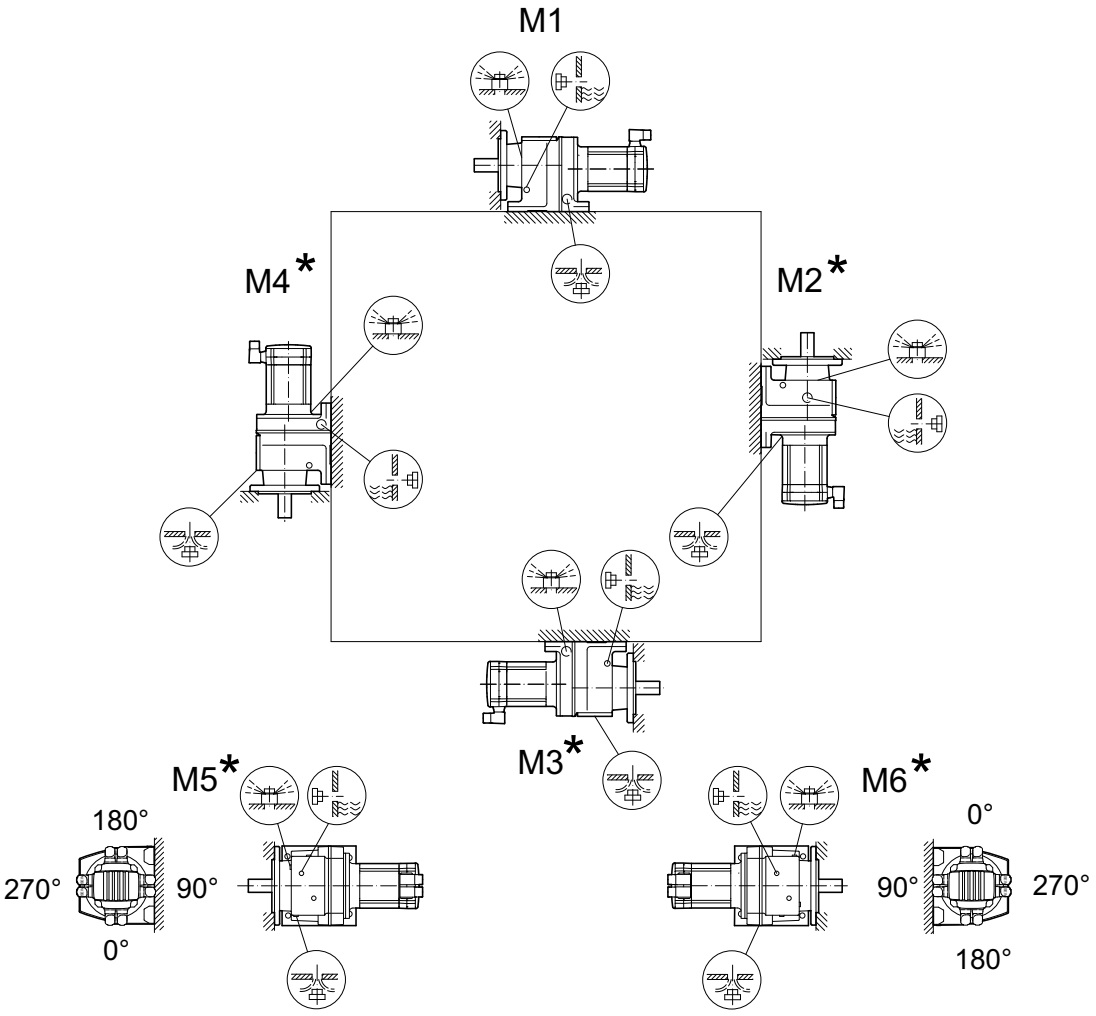
R07F-R87F



01 005 00 20



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

* (→ 🗎 57)

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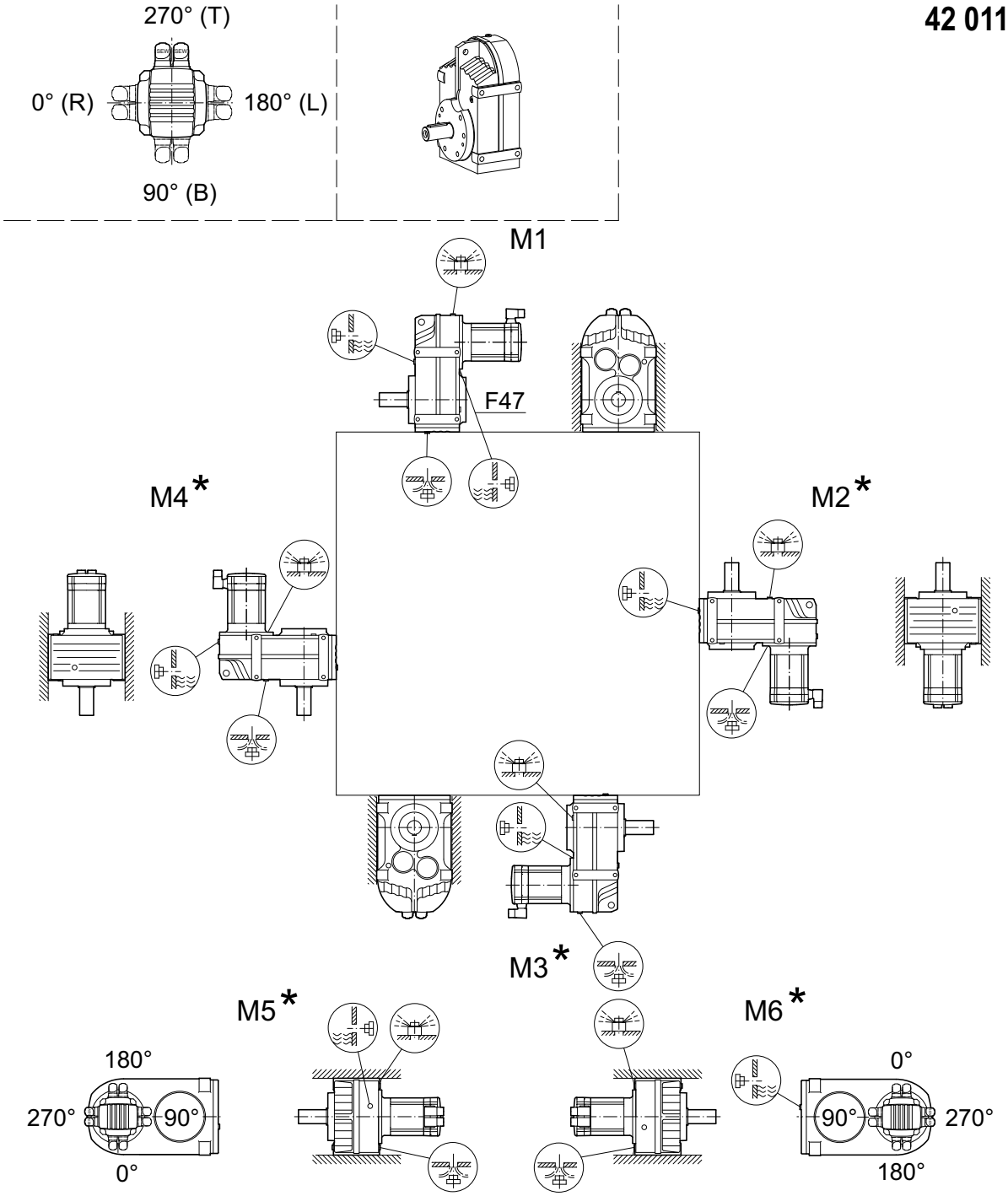
5.12.2 Mounting positions of parallel-shaft helical gearmotors F

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

42 011 00 20



F..27 M1, M3, M5, M6

F..27 M1 - M6

F..27 M1, M3, M5, M6

* (→ 57)

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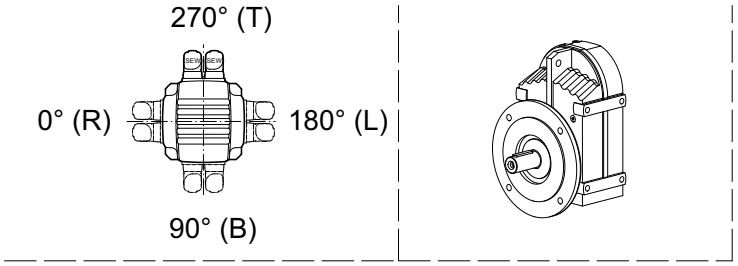
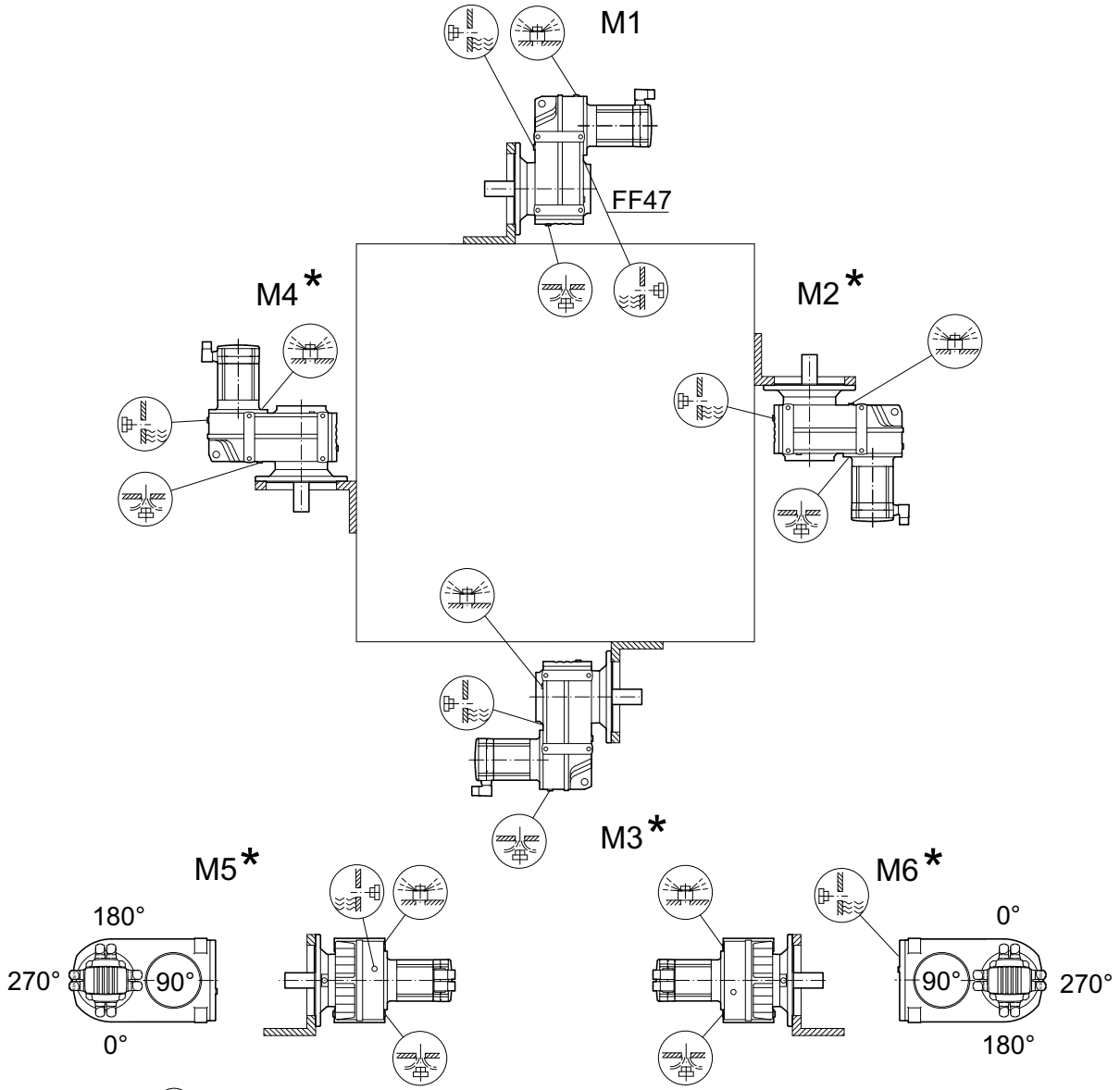
FF/FAF/FHF/FZ/FAZ/FHZ27-107, FVF/FVZ27-107

42 012 00 20





F..27 M1, M3, M5, M6

F..27 M1 - M6

F..27 M1, M3, M5, M6

* (→ 57)

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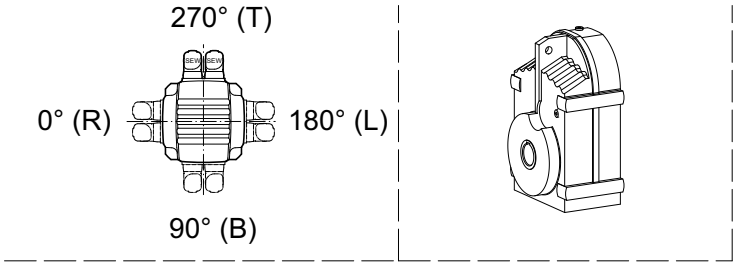
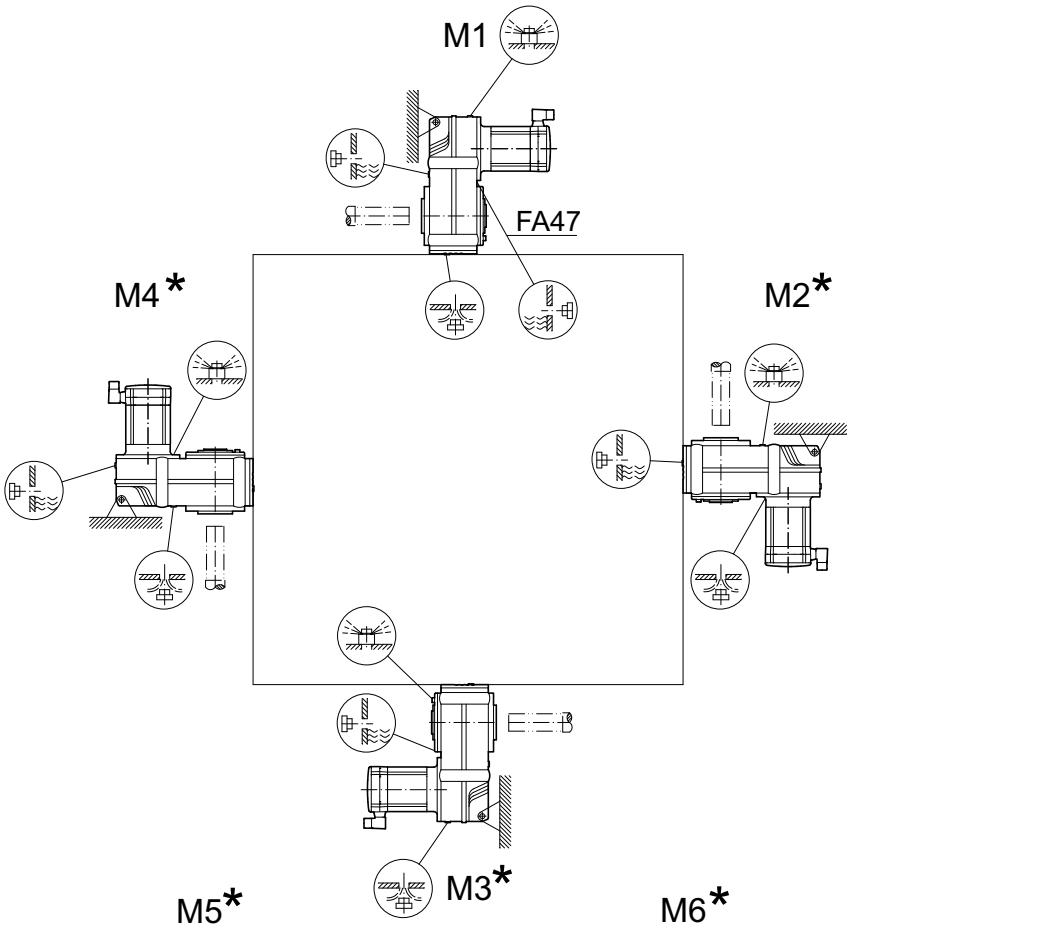
FA/FH27-157, FV27-107, FT37-97

42 013 00 20





F..27 M1, M3, M5, M6

F..27 M1 - M6

F..27 M1, M3, M5, M6

* (→ 57)

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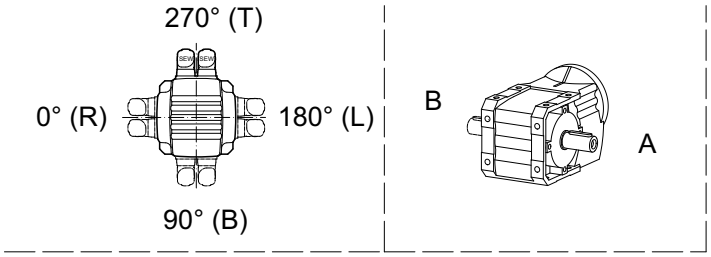
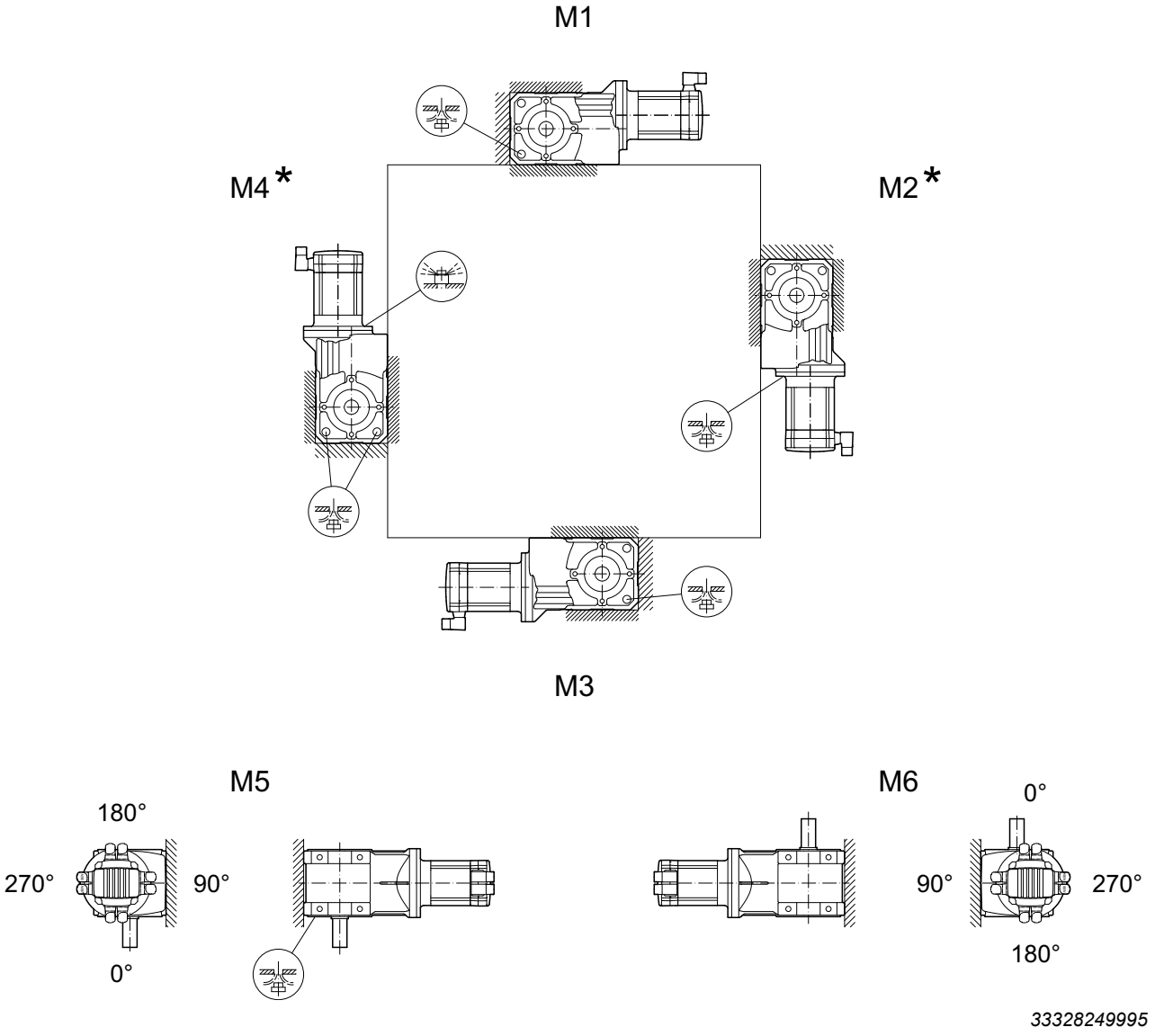
5.12.3 Mounting positions of helical-bevel gearmotors K

K/KA..B/KH19B-29B



33 014 00 20



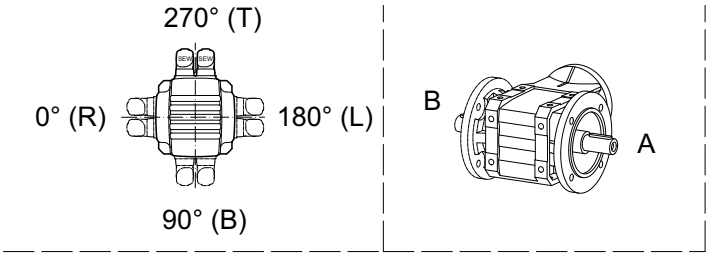
33328249995

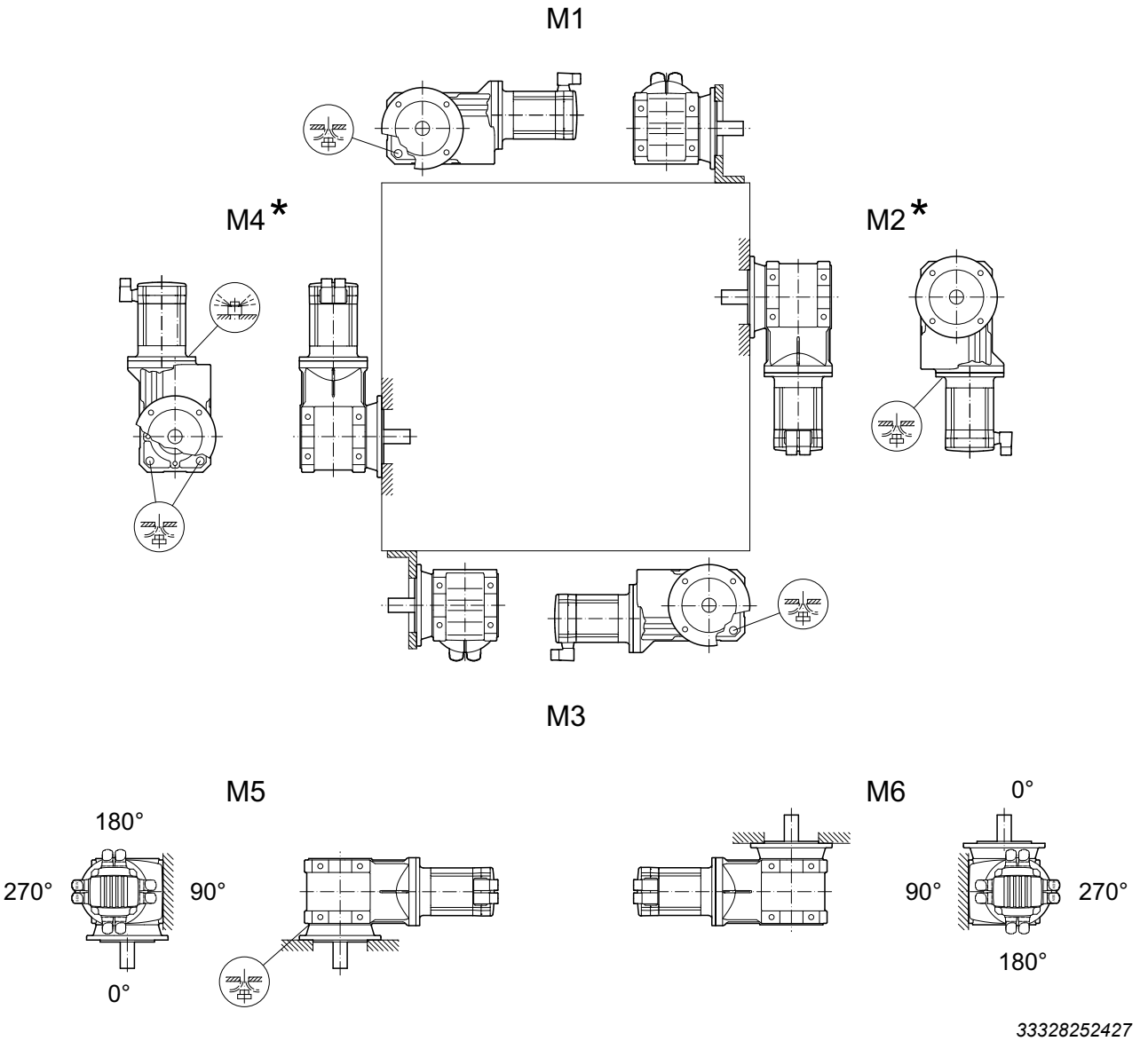
* (→ 🗎 57)

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

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

33 015 00 20





33328252427

* (→ 🗎 57)

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

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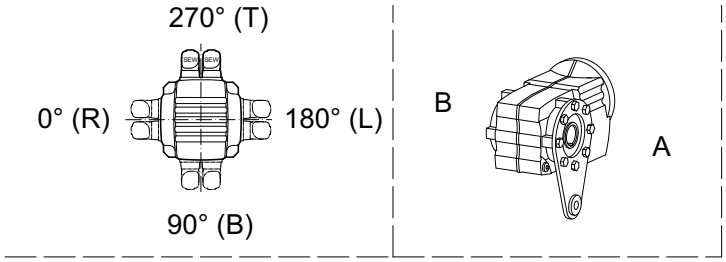
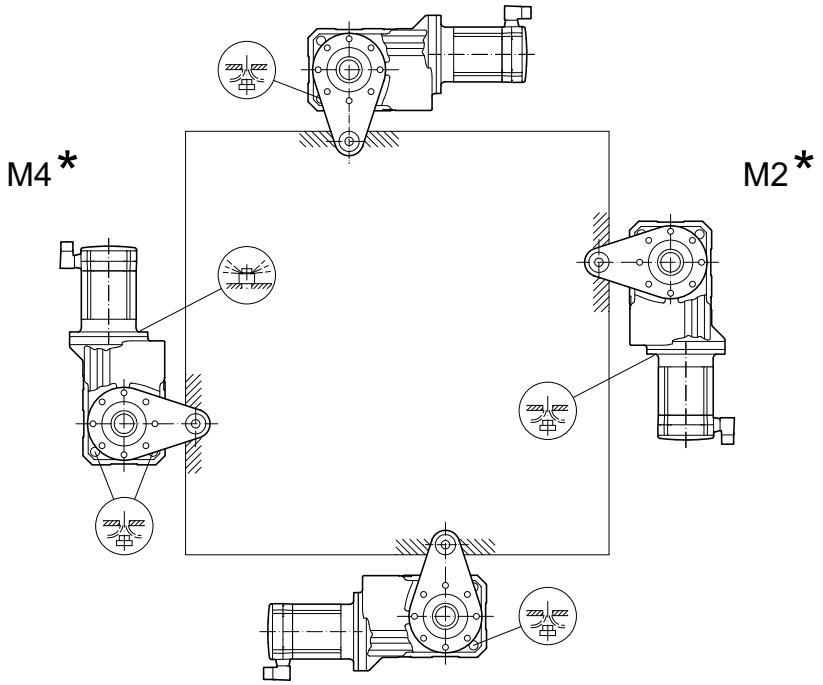
KA..B/KH19B-29

33 016 00 20

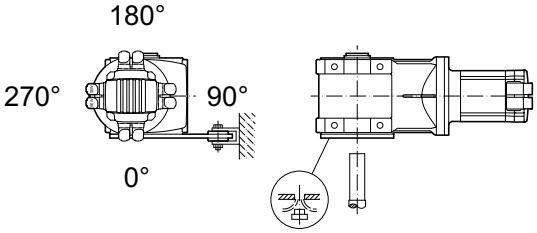


M1

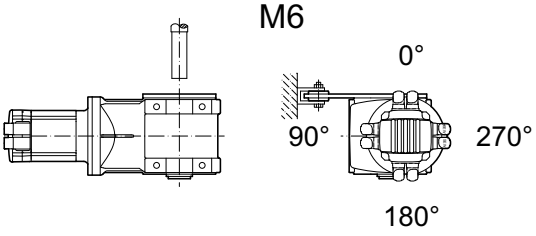


M3

M5



M6



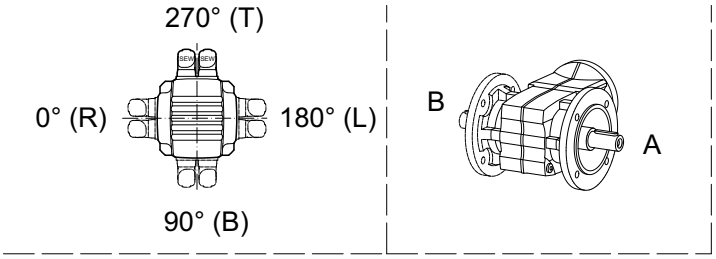
33328254859

* (→ 🗎 57)

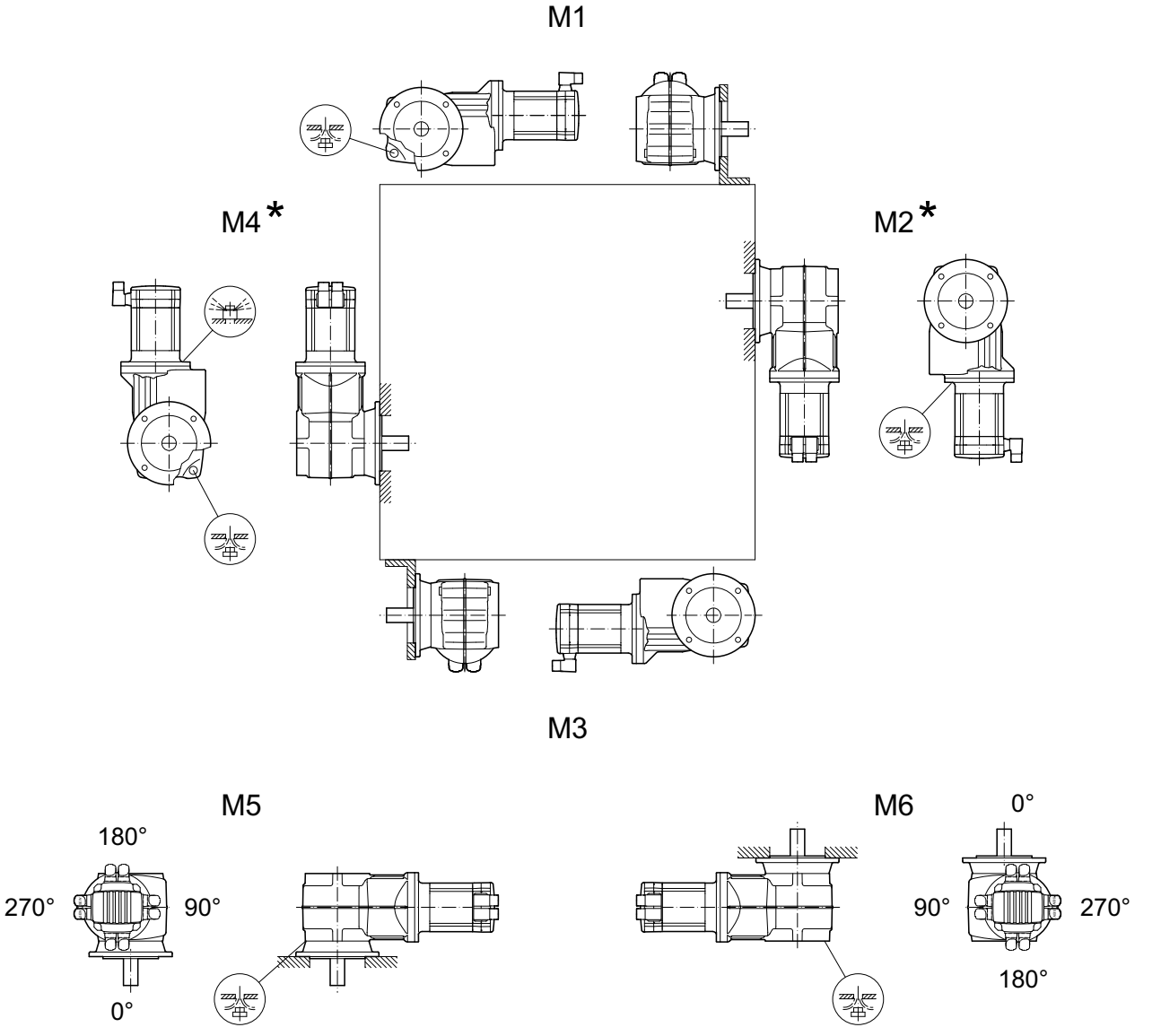
Observe the notes in chapter "Overhung and axial loads of R, F, K, S, and W gear units" (→ 🗎 59).

29133866/EN – 05/2021

KF/KAF/KHF19-29



33 017 00 20



33328257291

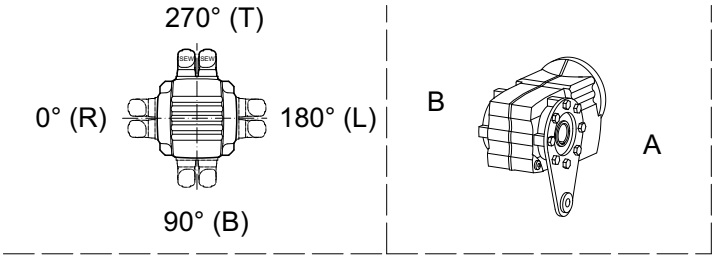
* (→ 🗎 57)

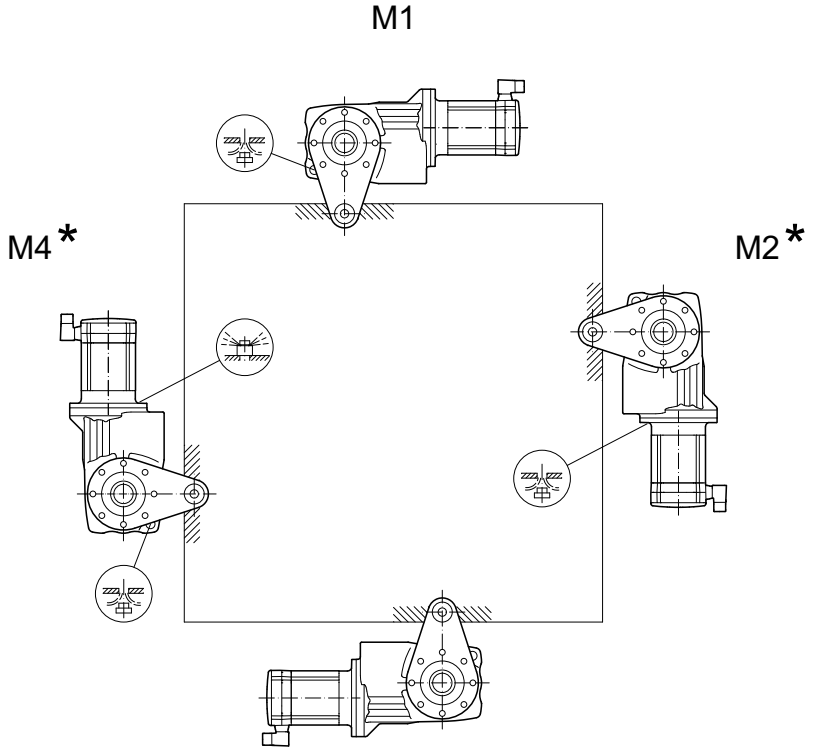
Observe the notes in chapter "Overhung and axial loads of R, F, K, S, and W gear units" (→ 🗎 59).

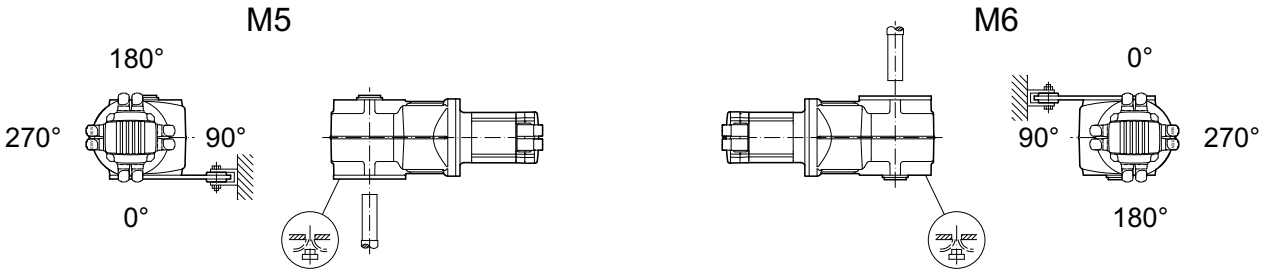
29133866/EN – 05/2021

KA/KH/KT19-29

33 018 00 20





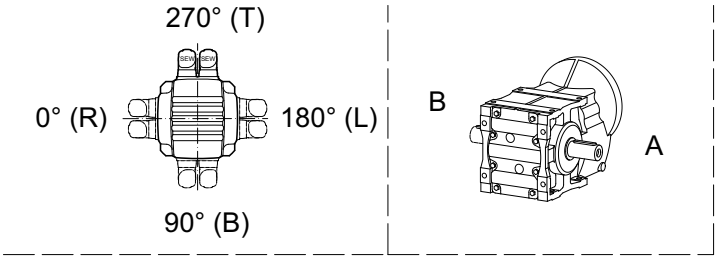


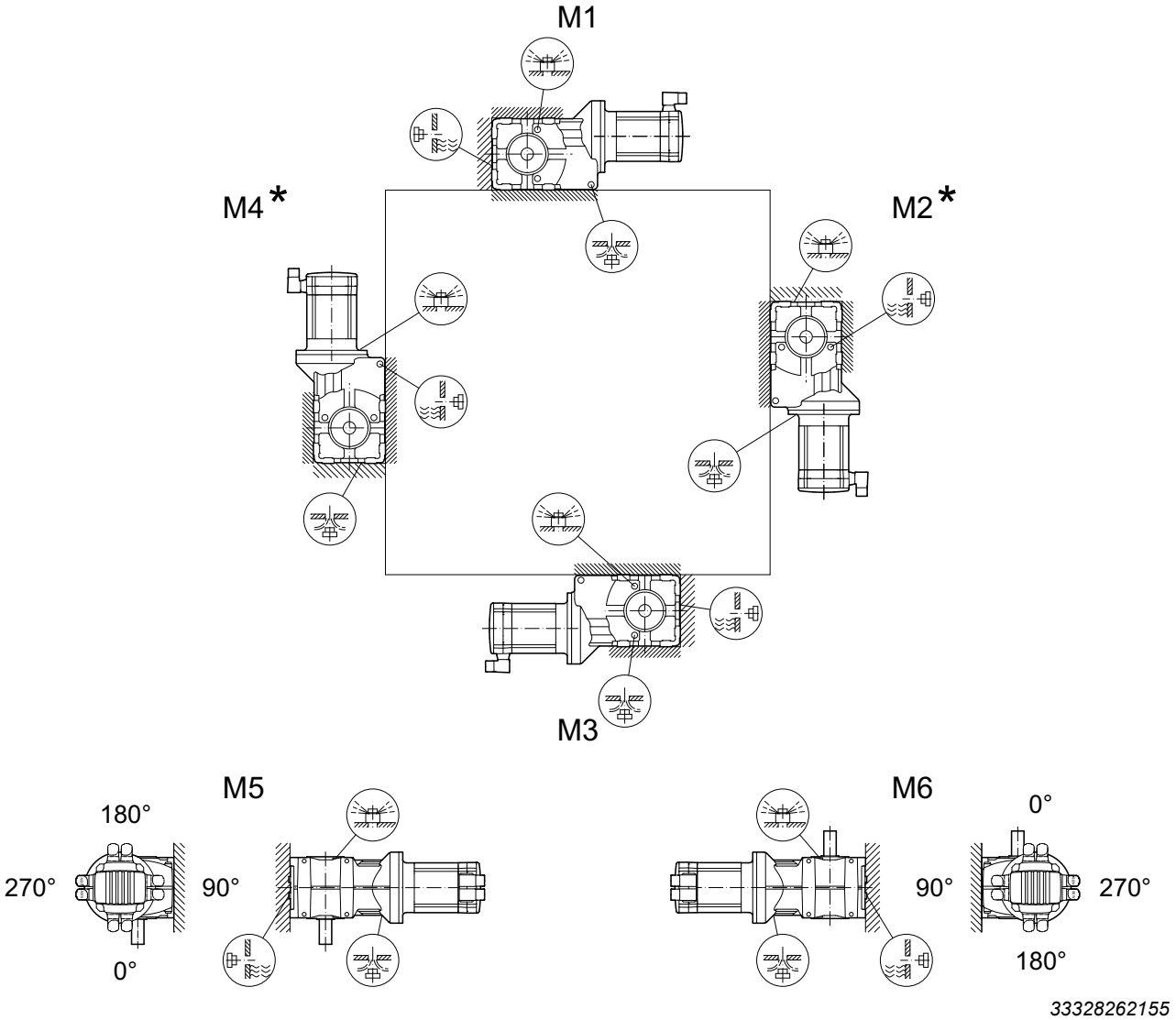
33328259723

* (→ 🗎 57)

K/KA..B39-49

33 019 00 20





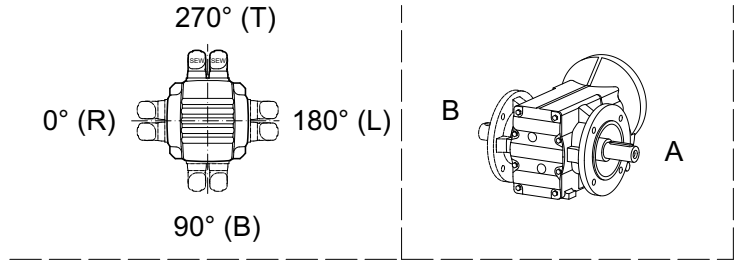
33328262155

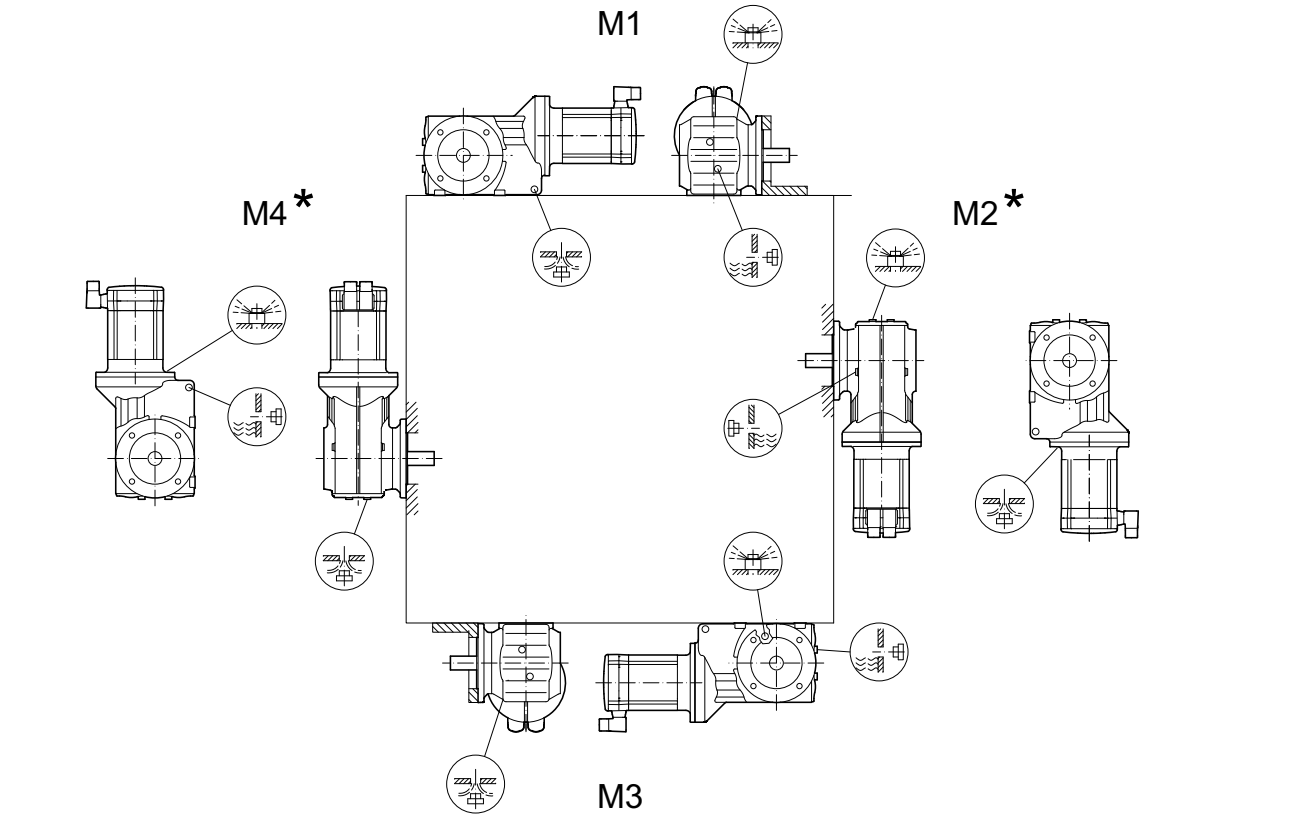
* (→ 57)

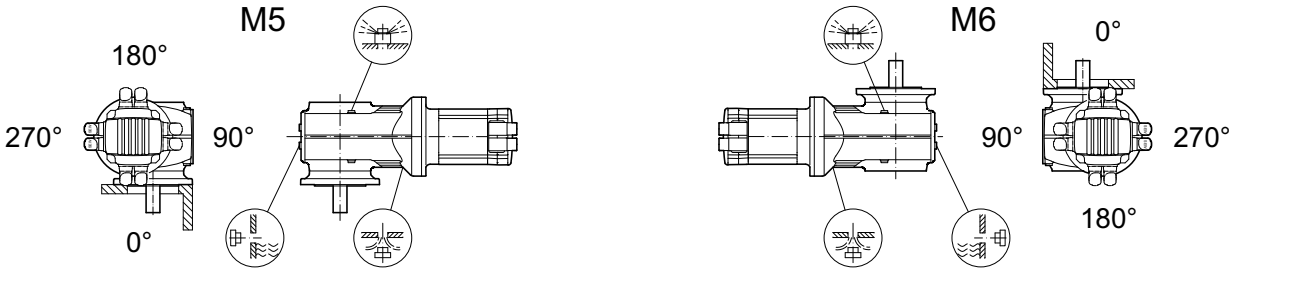
29133866/EN – 05/2021

KF/KAF/KHF39-49

33 020 00 20







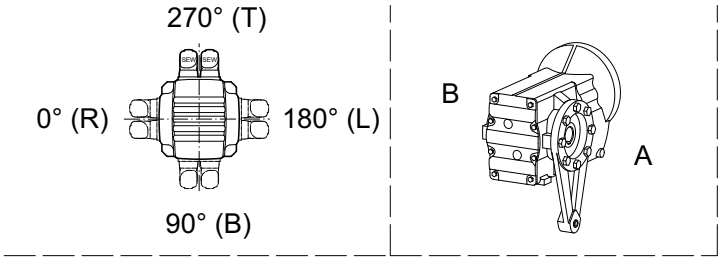
33328264587

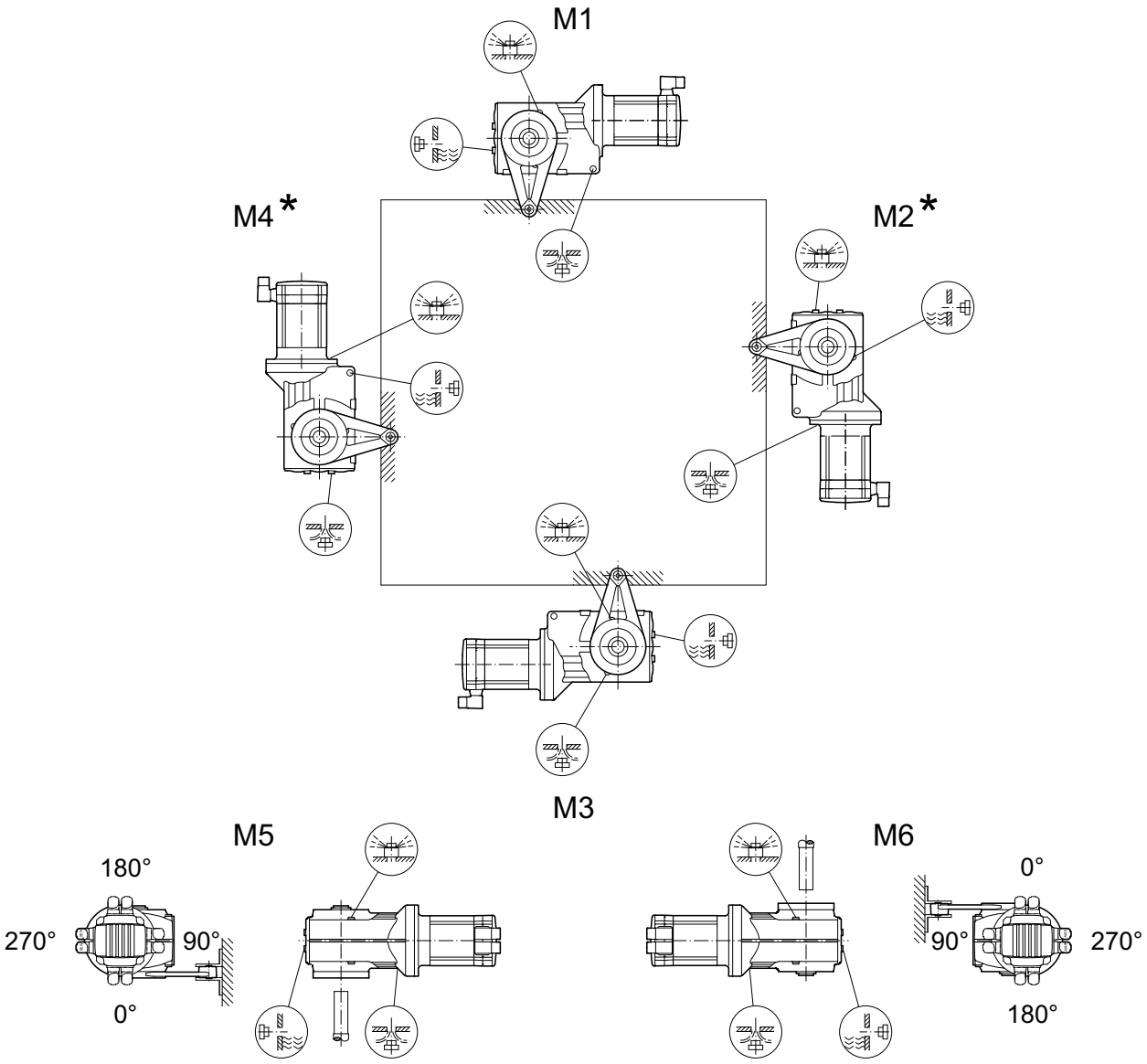
* (→ 🗎 57)

29133866/EN – 05/2021

KA/KH/KT39-49

33 021 00 20





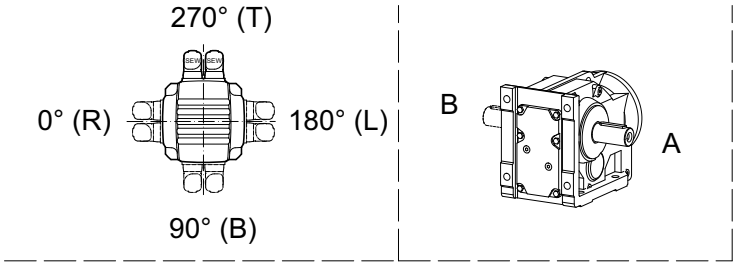
33328267019

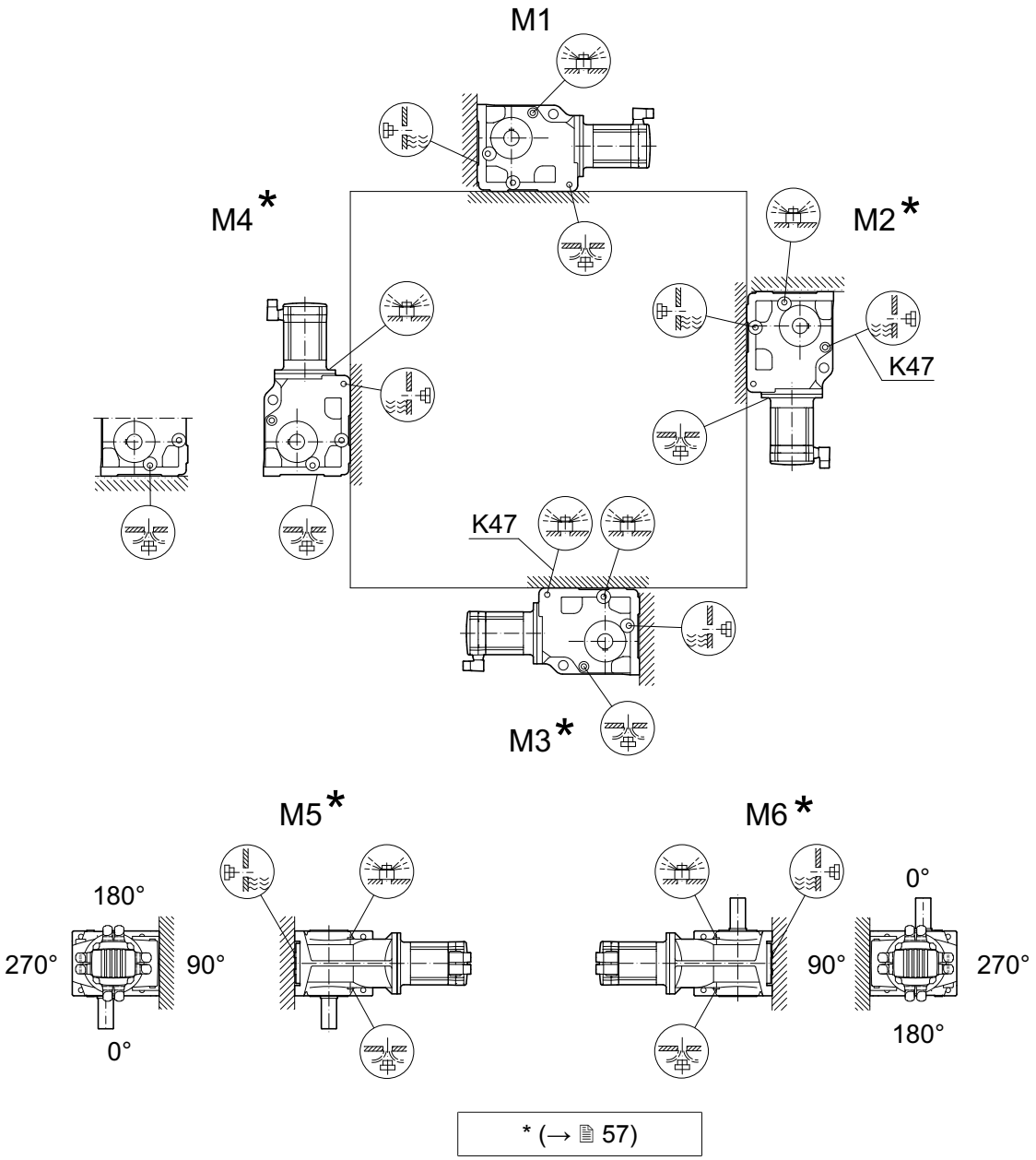
* (→ 57)

29133866/EN – 05/2021

K37-107/KA..B/KH37B-107B, KV37B-107B

33 022 00 20





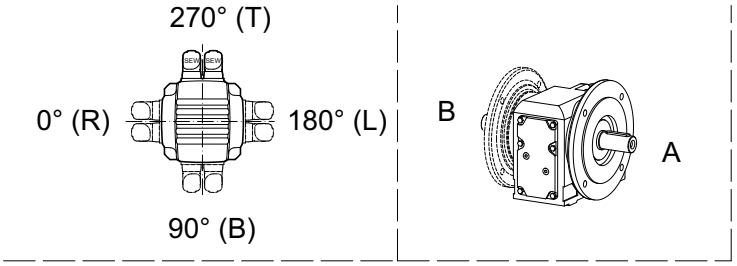
* (→ 🗎 57)

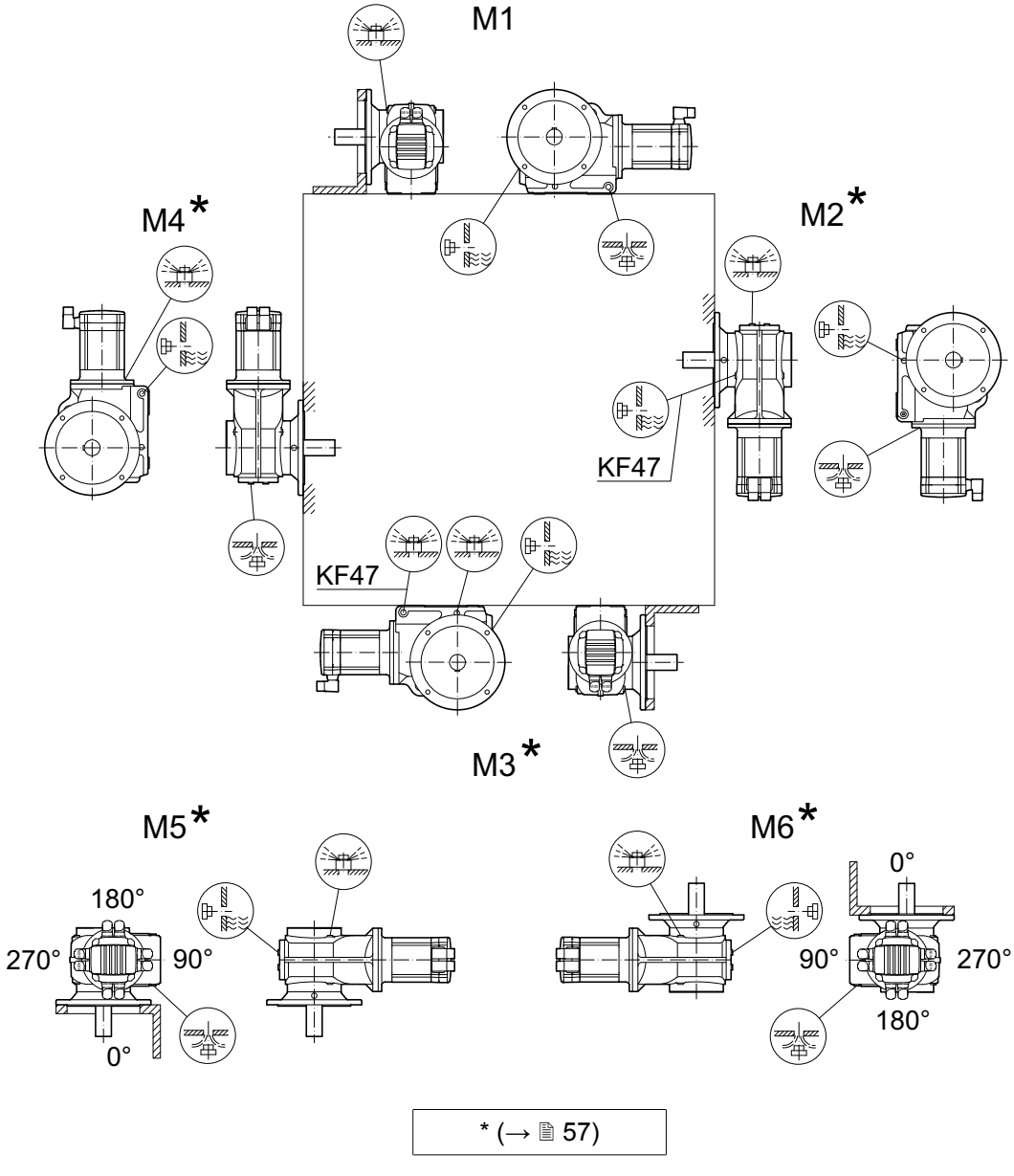
Observe the notes in chapter "Overhung and axial loads of R, F, K, S, and W gear units" (→ 🗎 59).

29133866/EN – 05/2021

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

33 023 00 20



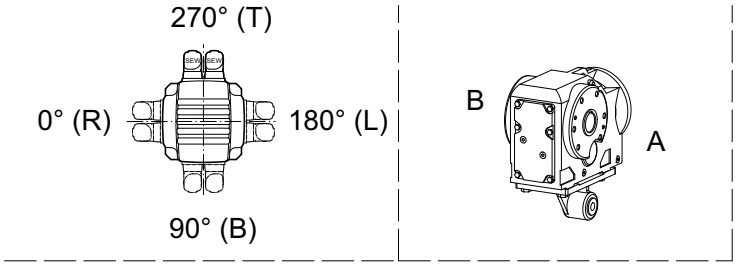


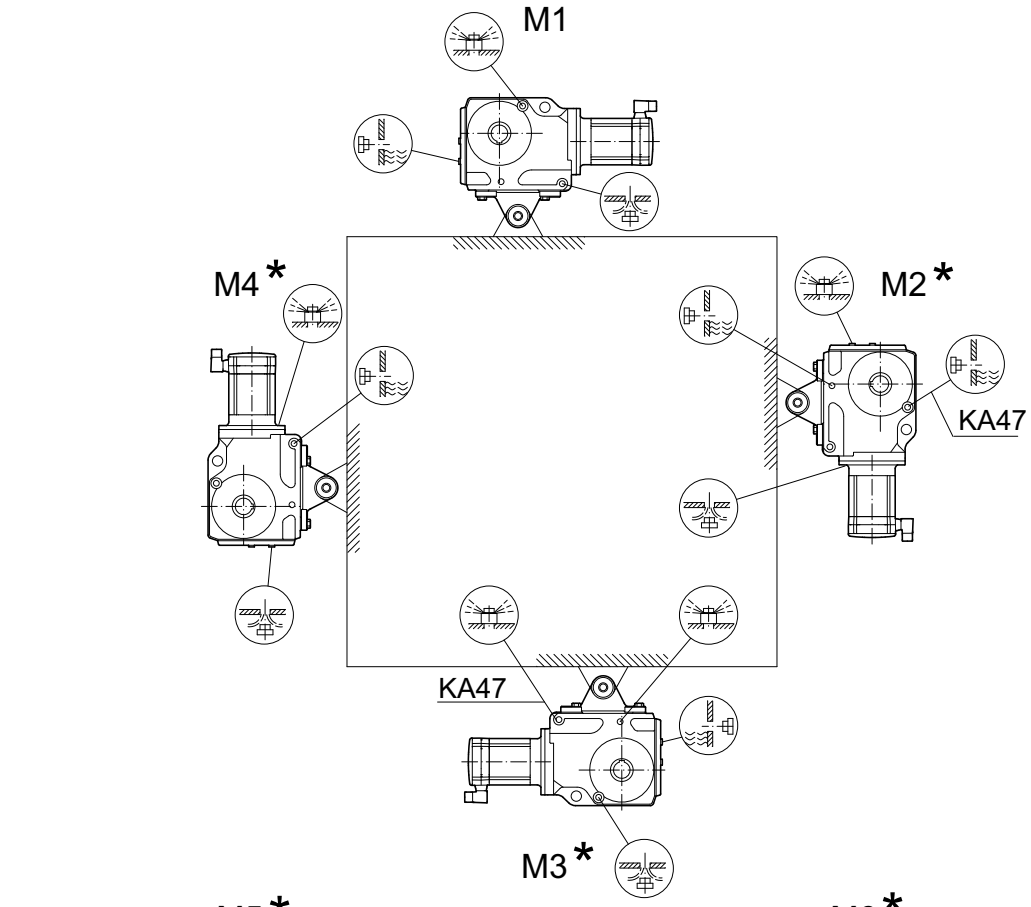
* (→ 57)

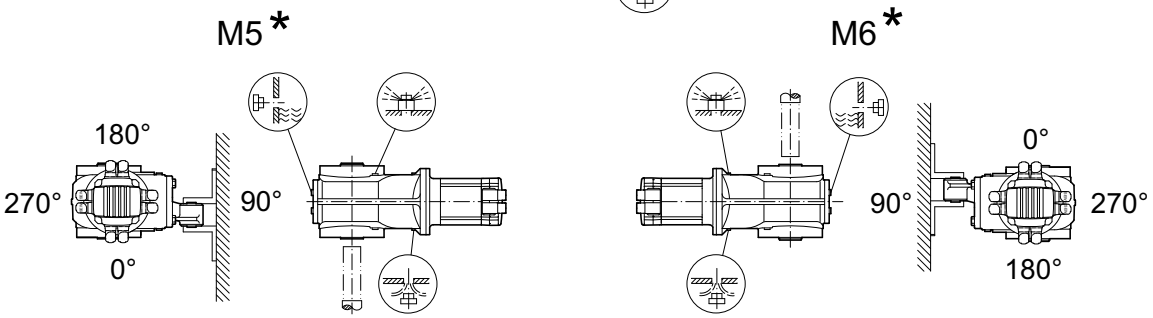
29133866/EN – 05/2021

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

33 024 00 20





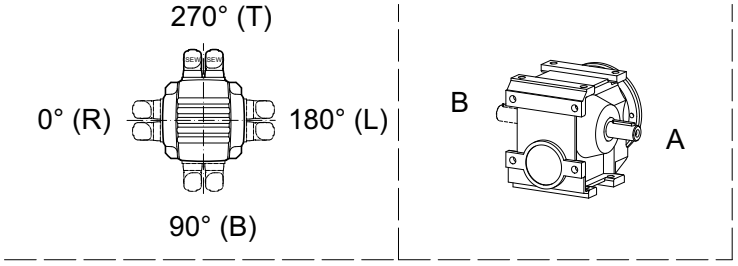


* (→ 57)

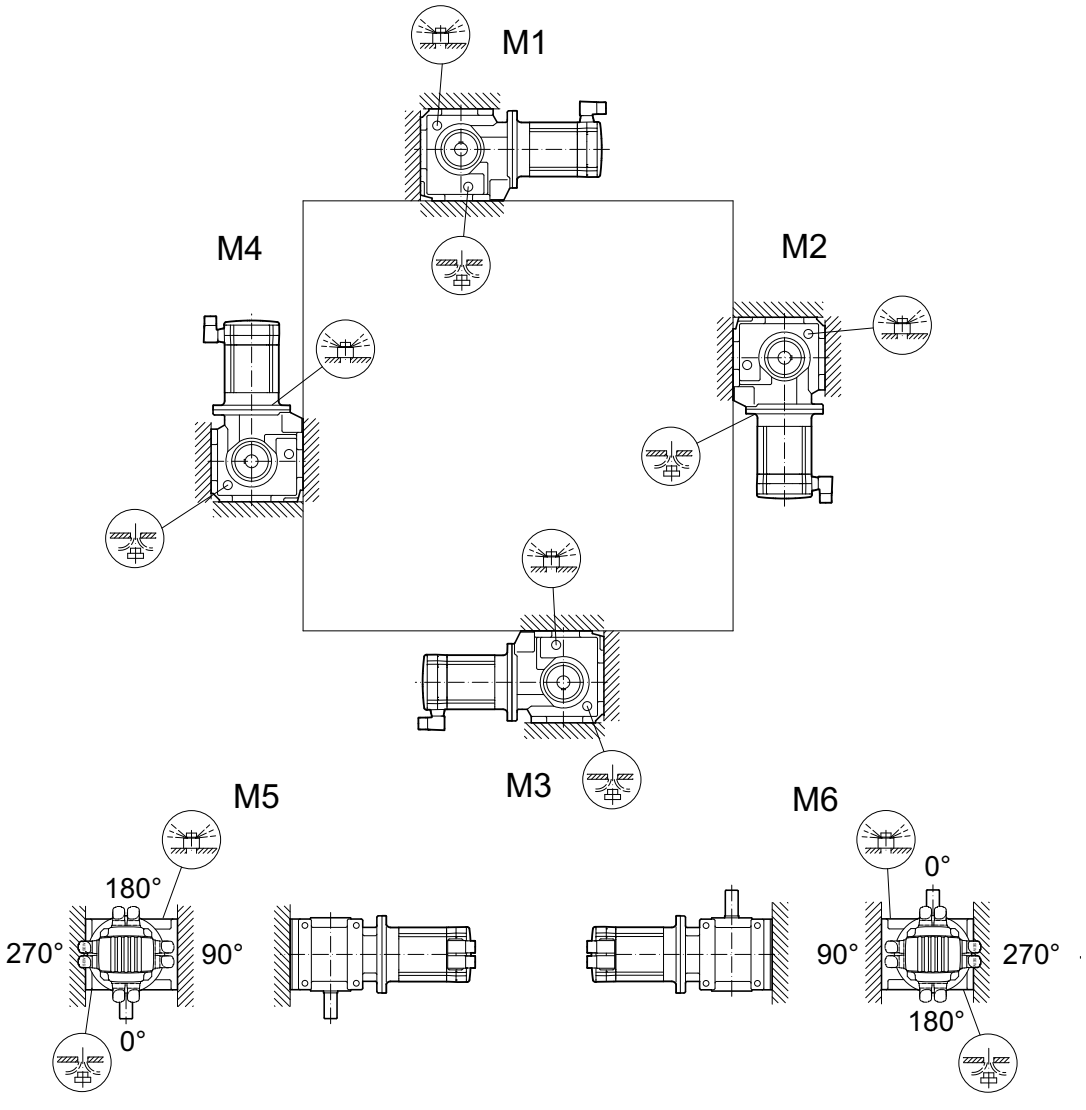
29133866/EN – 05/2021

5.12.4 Mounting positions of helical-worm gearmotors S

S37



02 001 00 20



* (→ 🗎 57)

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

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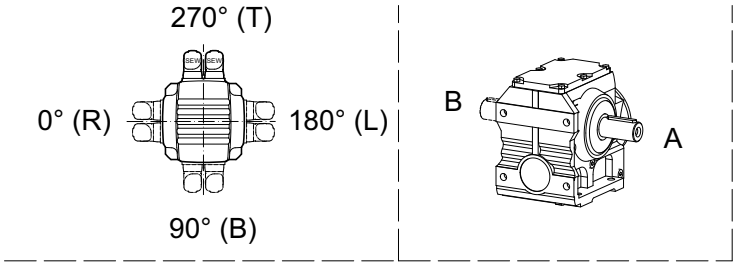
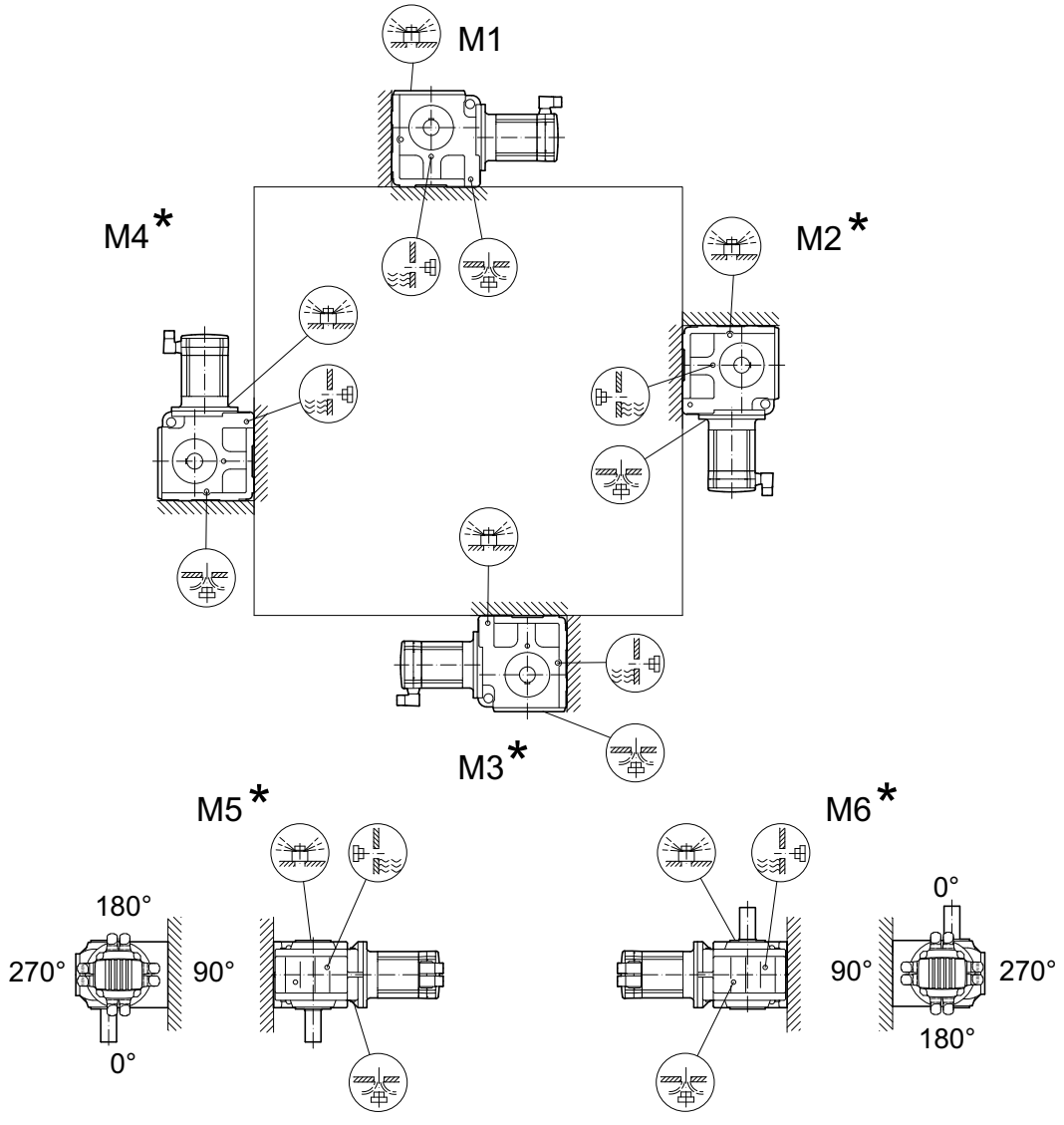
S47-S97



02 002 00 20



* (→ 🗎 57)

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

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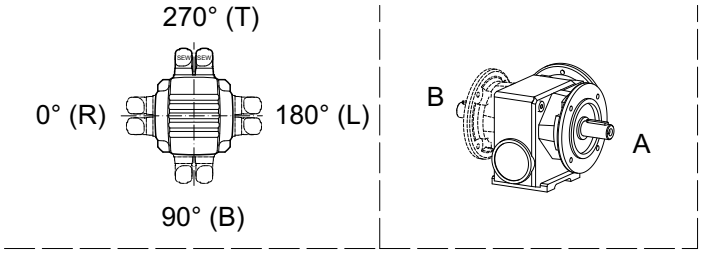
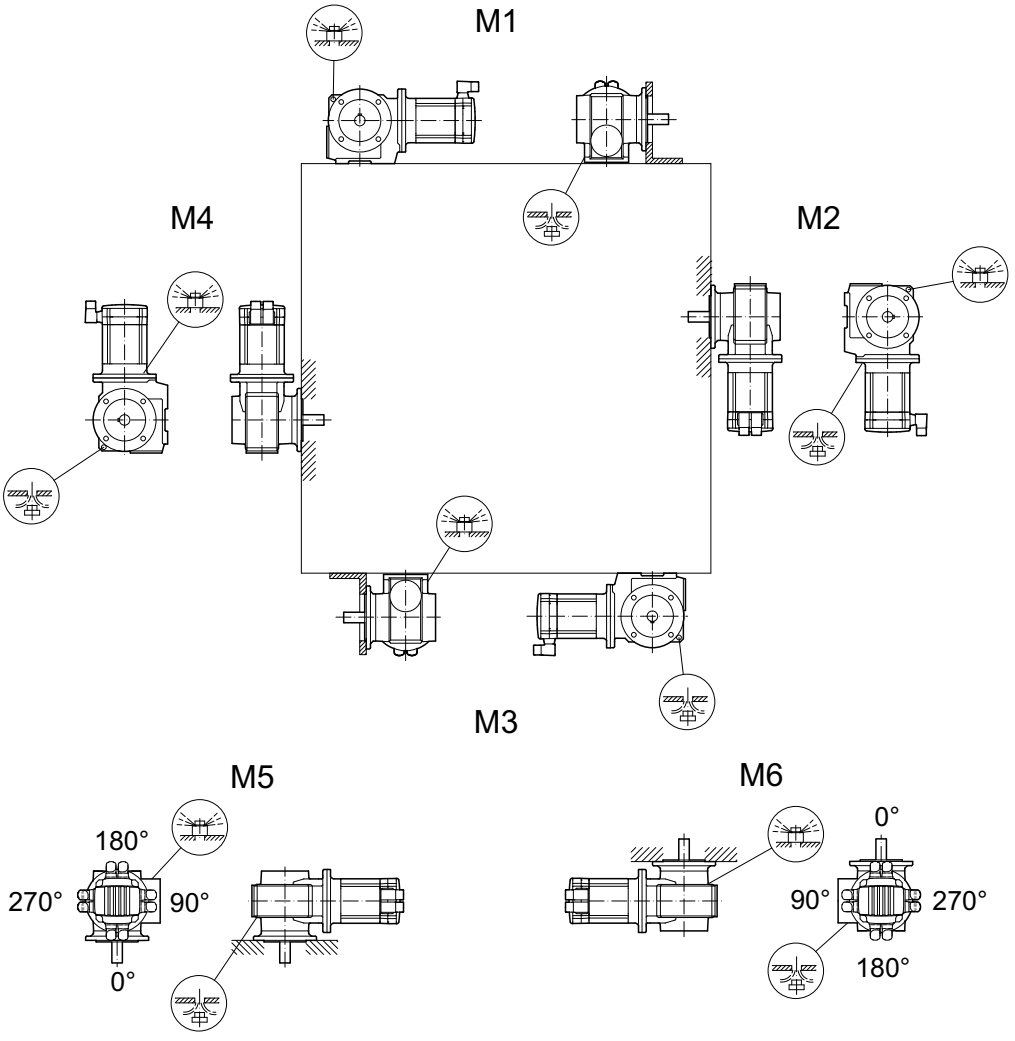
SF/SAF/SHF37



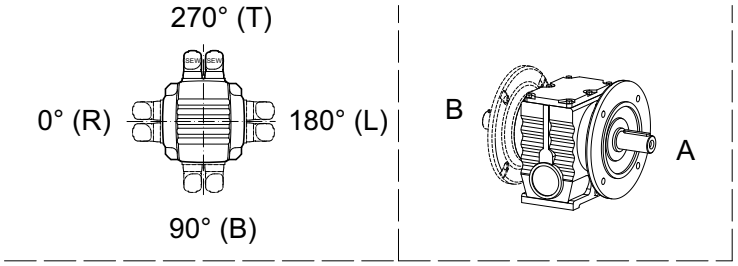
02 003 00 20

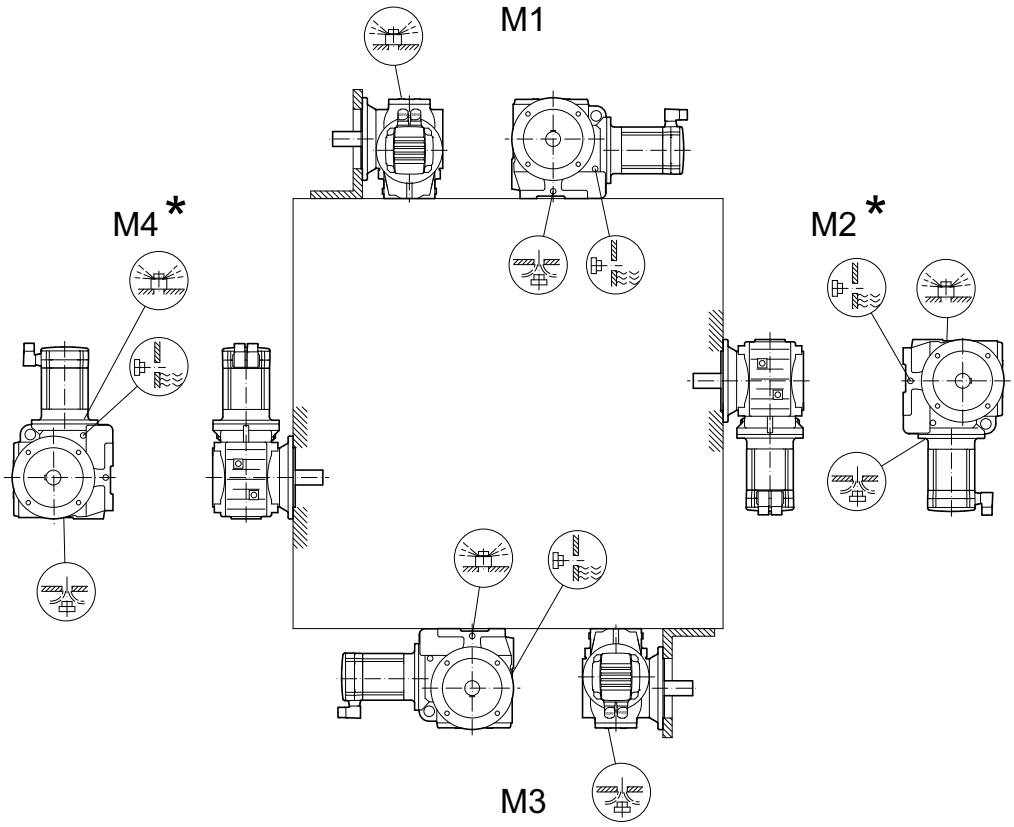


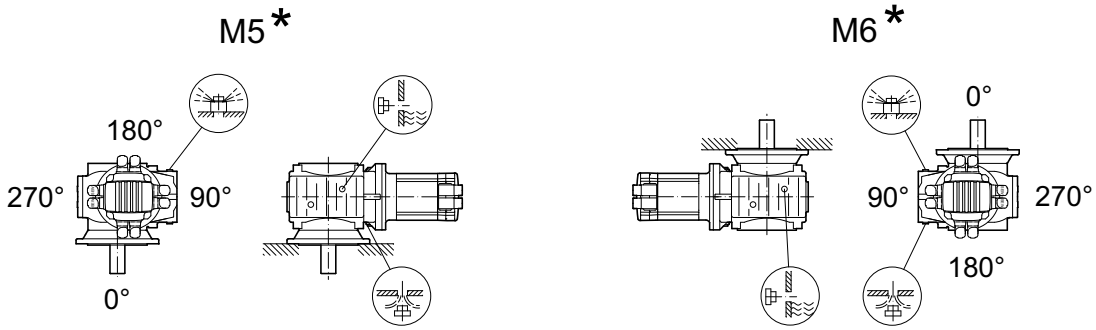
29133866/EN – 05/2021

SF/SAF/SHF/SAZ/SHZ47-97

02 004 00 20



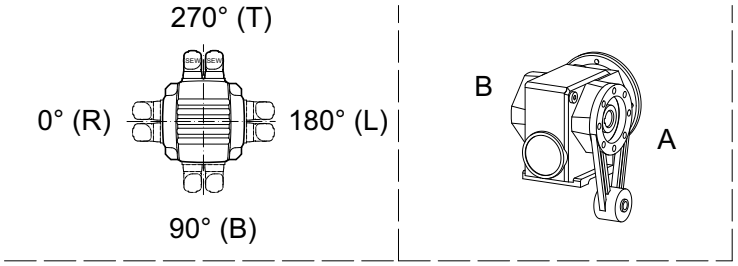




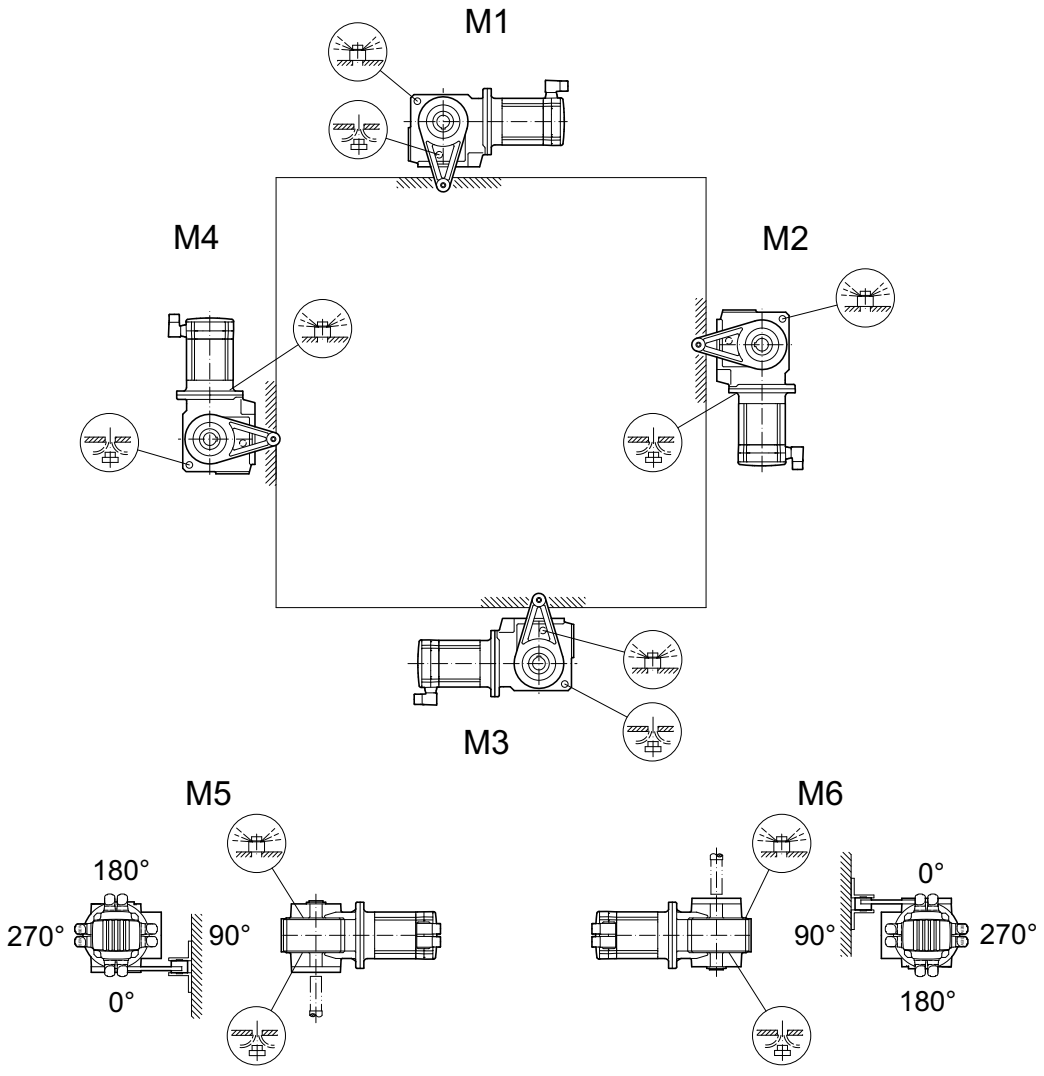
* (→ 57)

29133866/EN – 05/2021

SA/SH/ST37

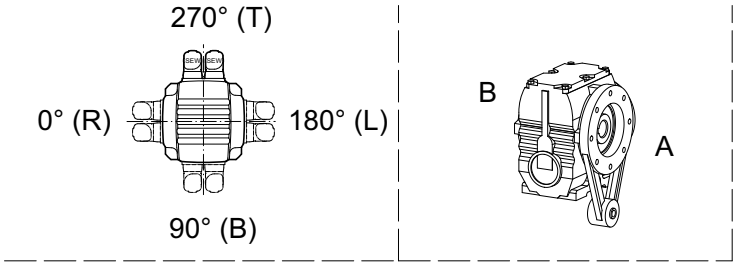


02 005 00 20

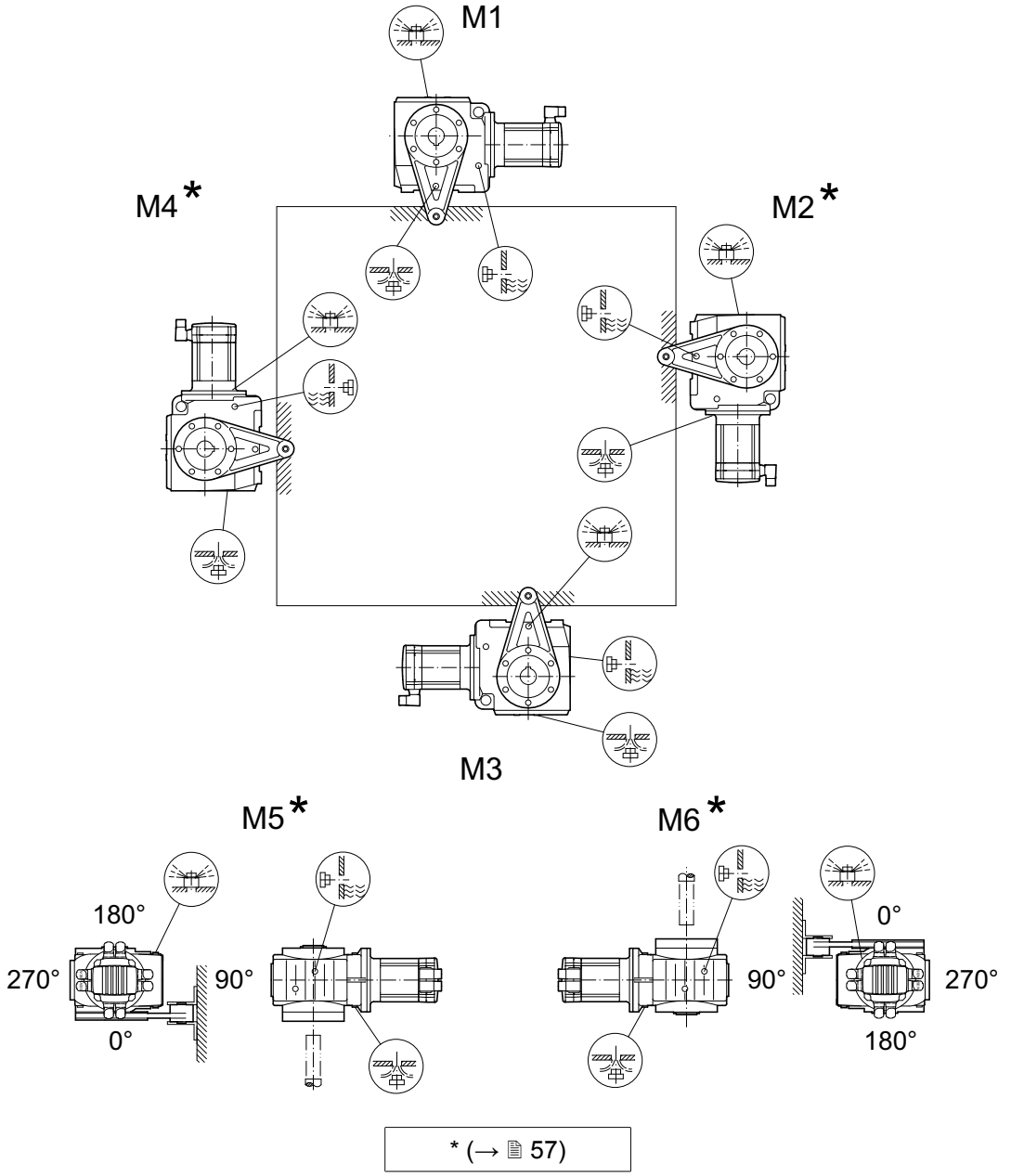


29133866/EN – 05/2021

SA/SH/ST47-97



02 006 00 20



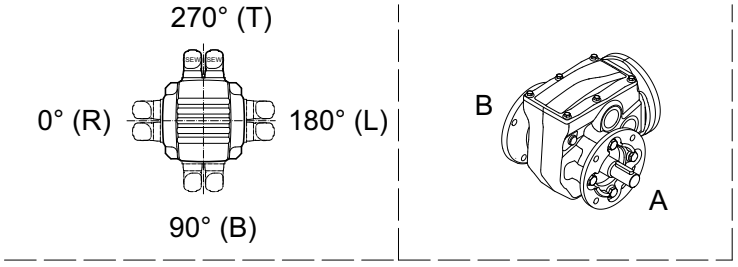
* (→ 57)

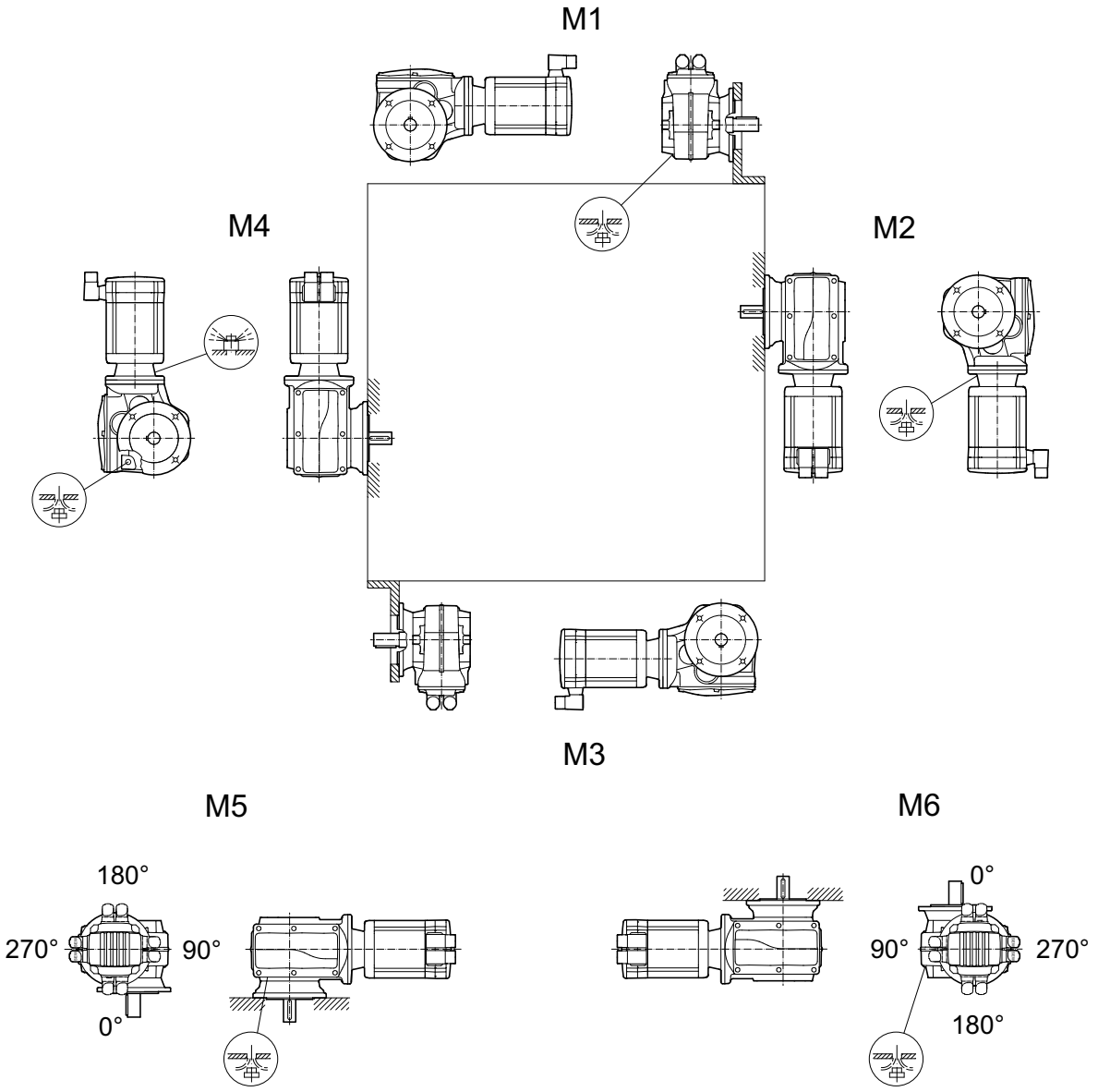
29133866/EN – 05/2021

5.12.5 Mounting positions of SPIROPLAN® gearmotors W

WF, WAF, WHF29-39

20 133 00 20

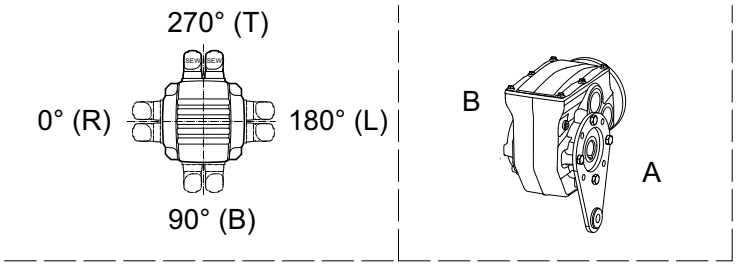


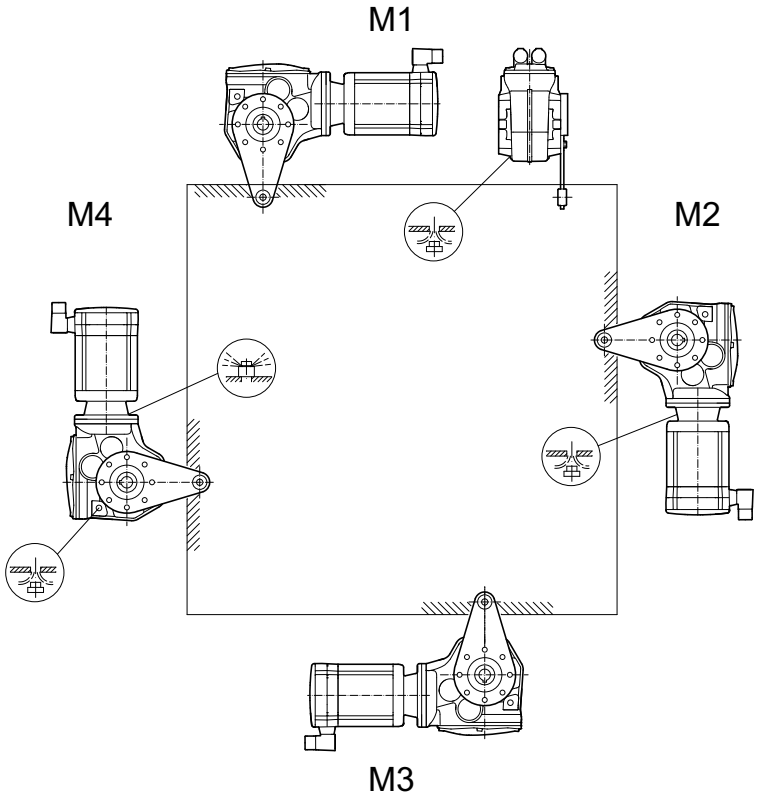


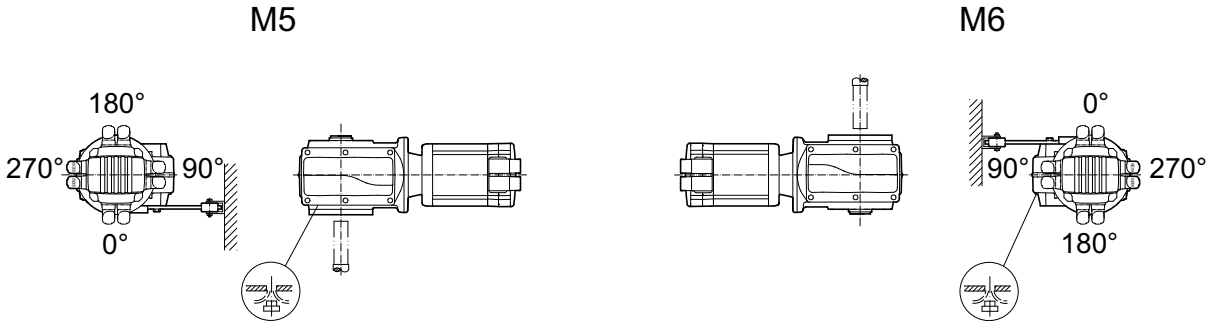
29133866/EN – 05/2021

WA, WH, WT29-39

20 134 00 20





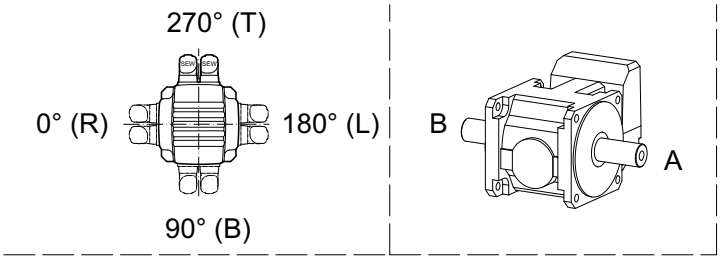


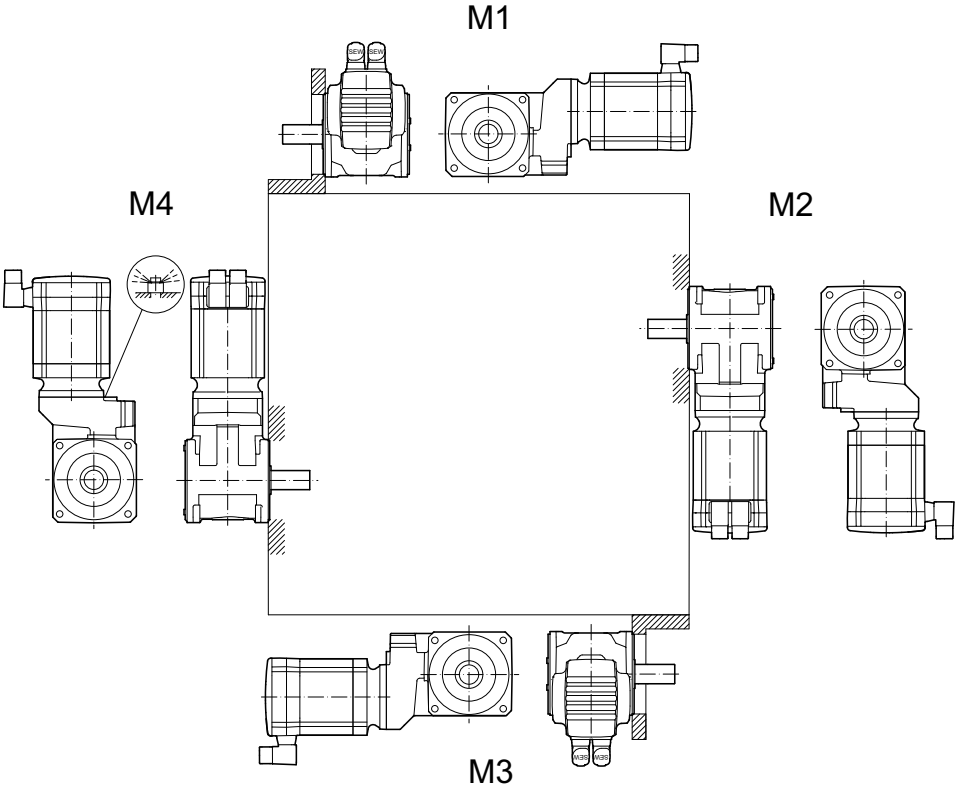
29133866/EN – 05/2021

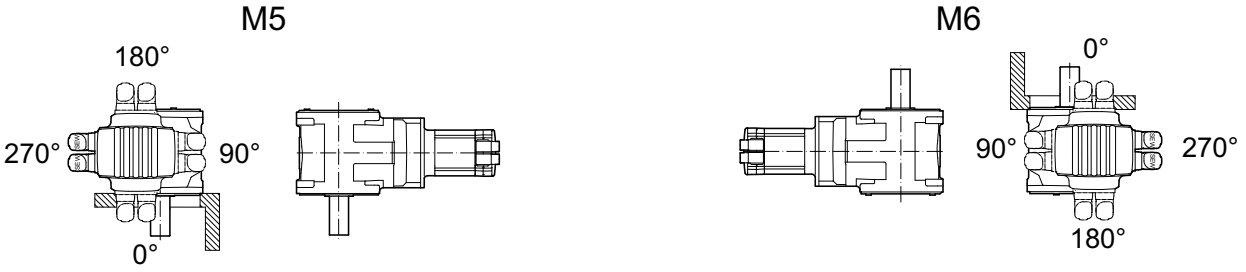
5.12.6 Mounting positions of BS.F helical-bevel gearmotors

BSF202-802

55 001 00 20



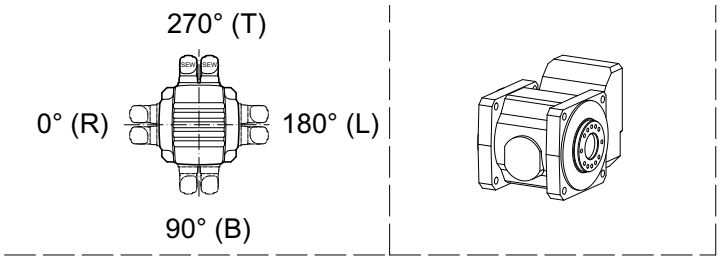


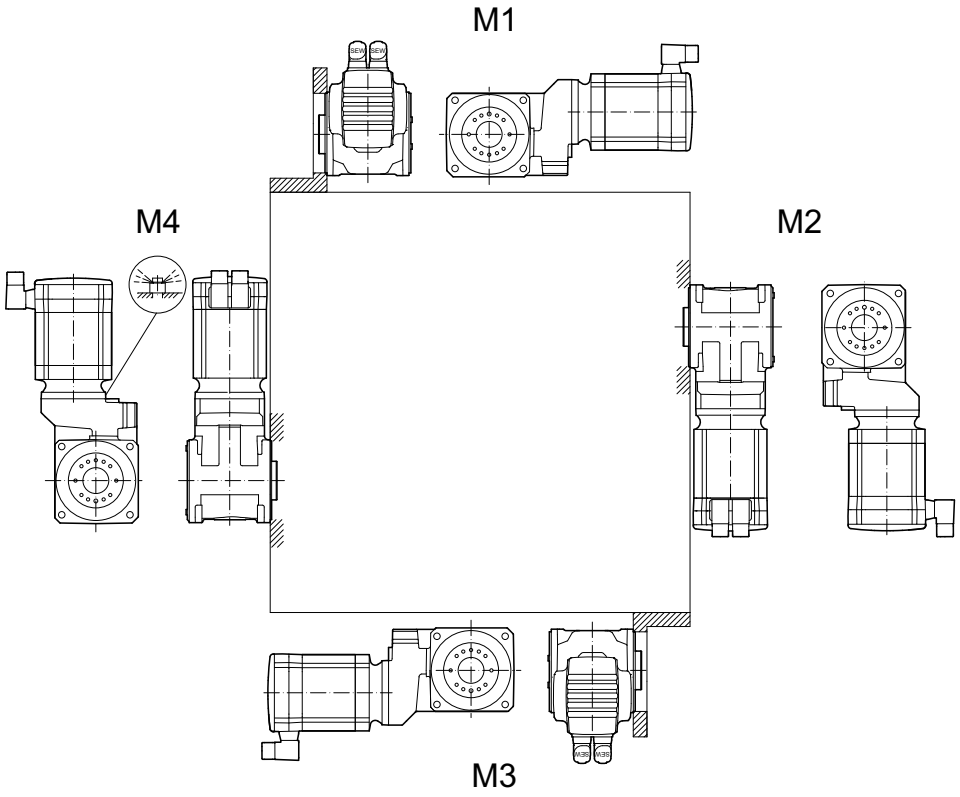


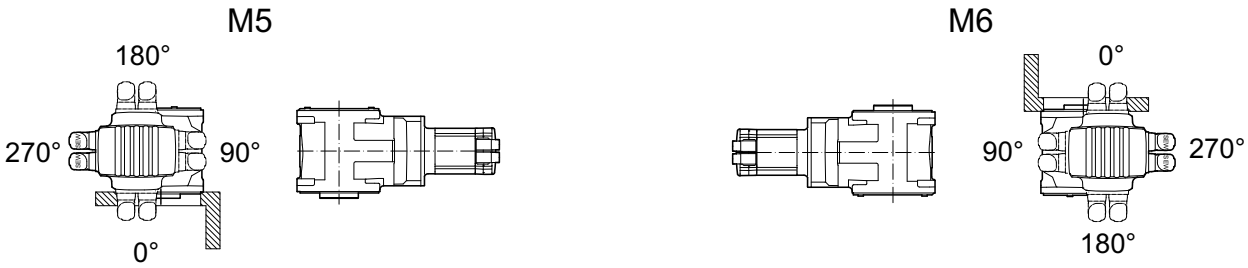
29133866/EN – 05/2021

BSBF202-802

55 002 00 20







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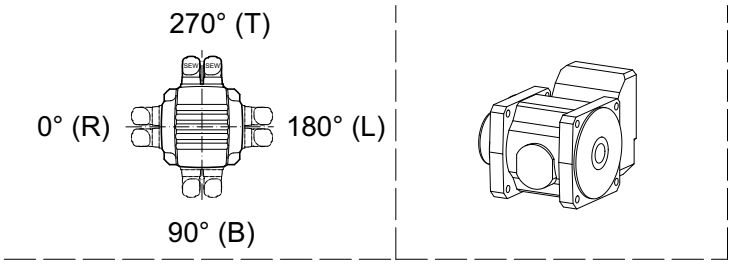

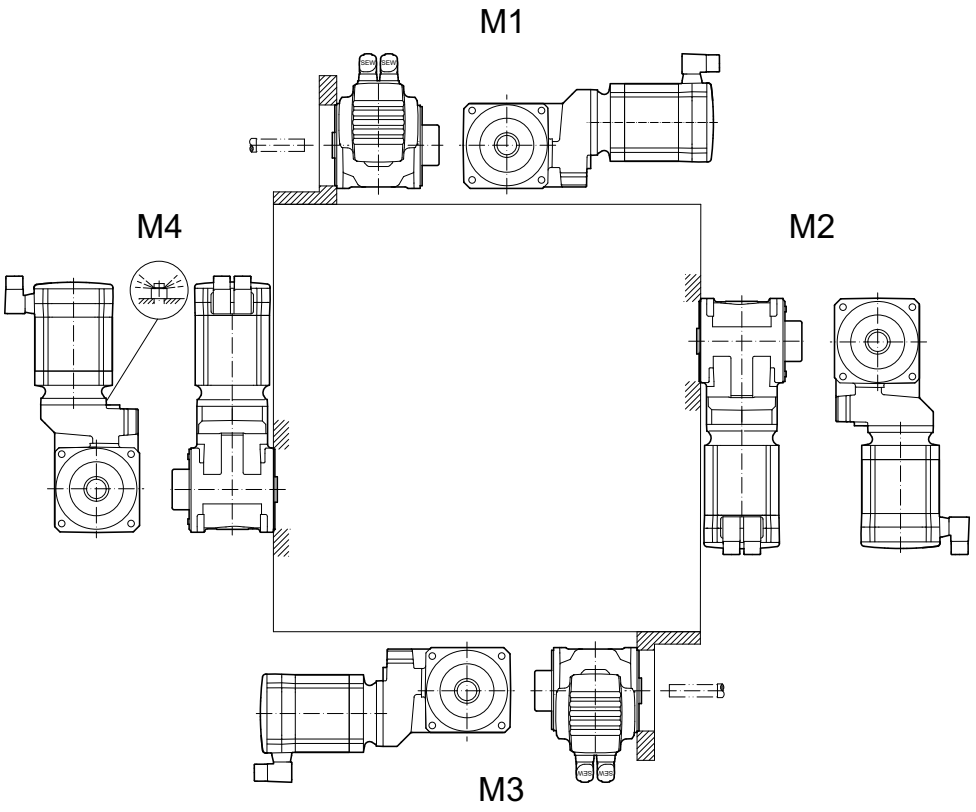

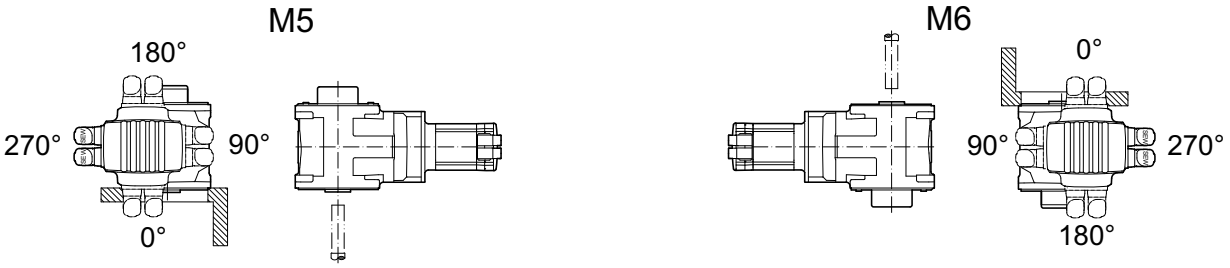

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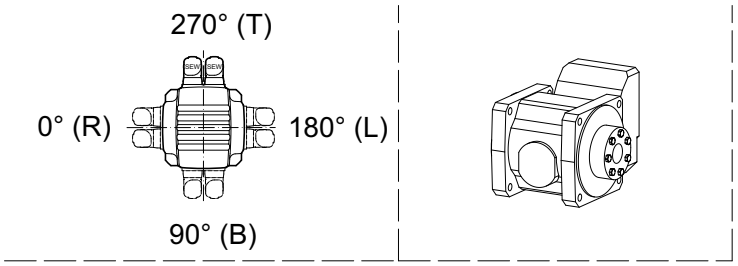

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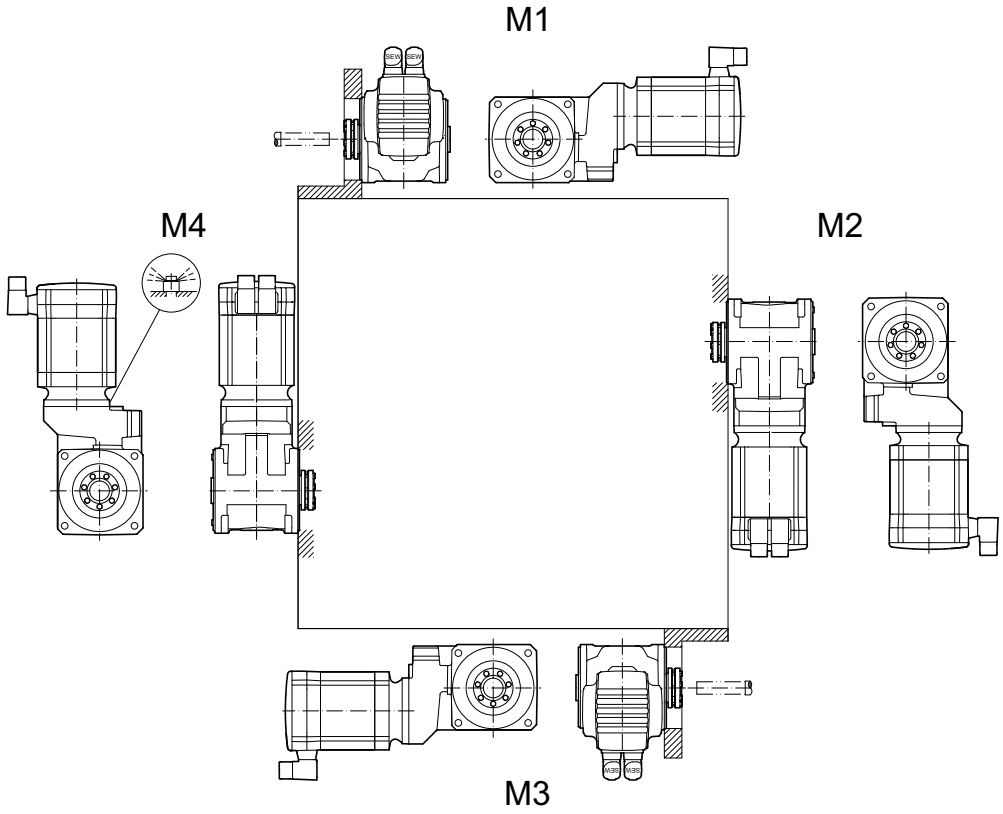

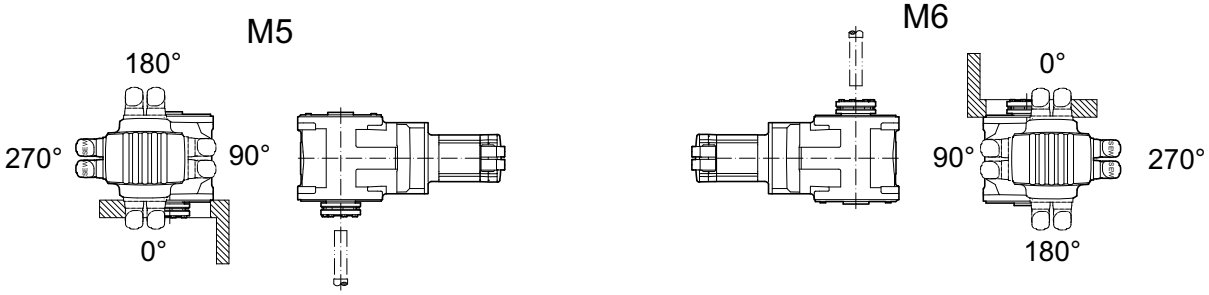

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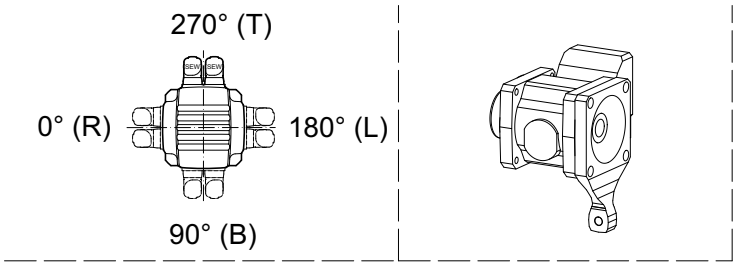

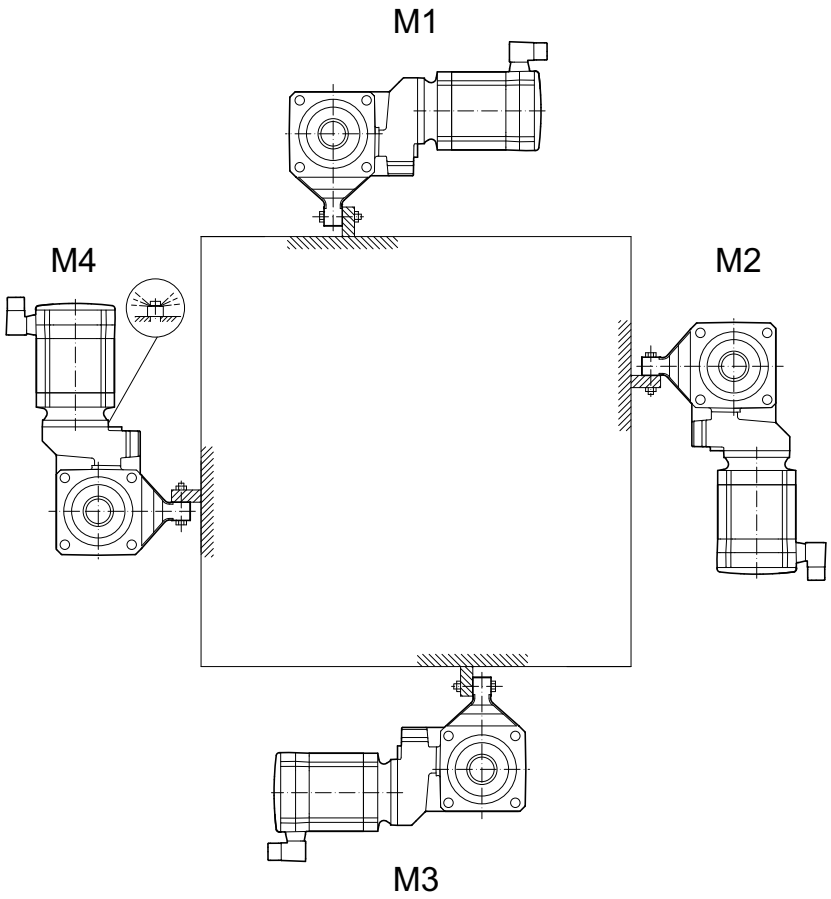

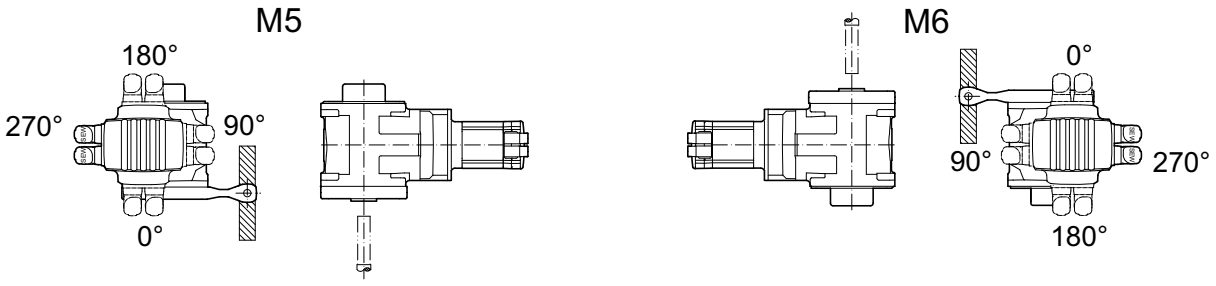

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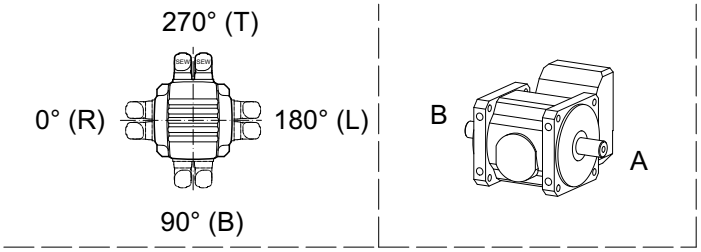

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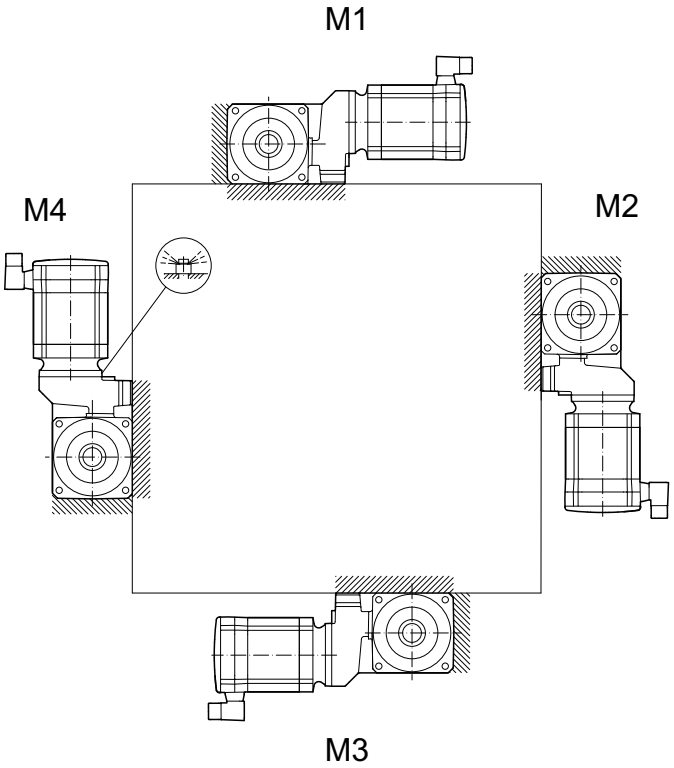

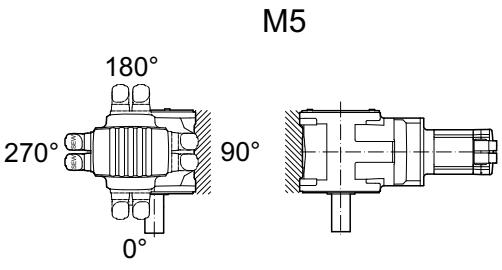

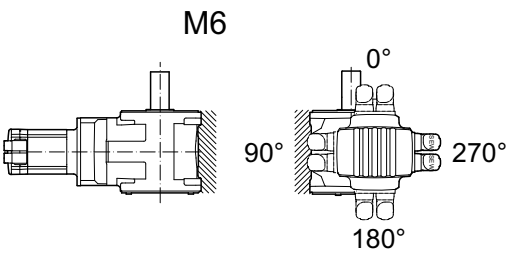

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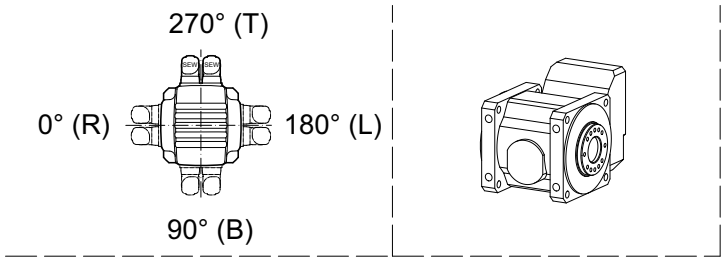

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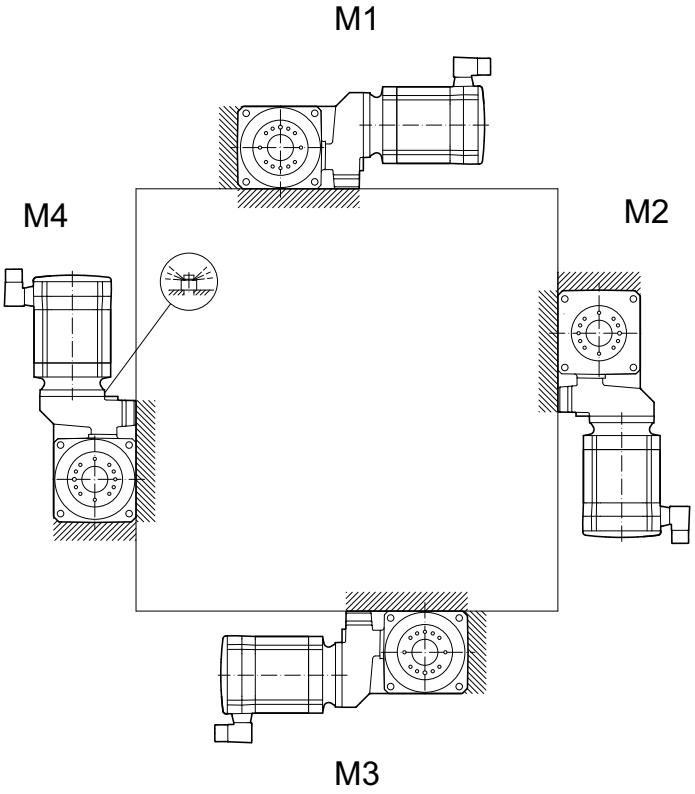

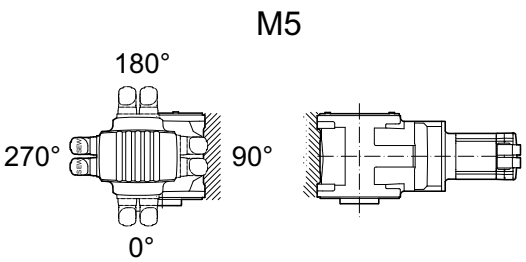

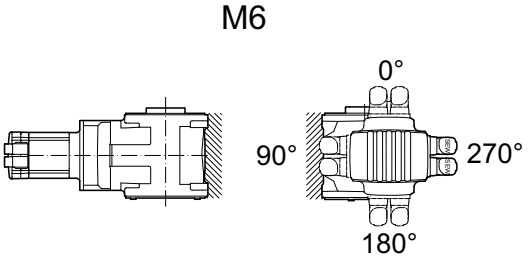

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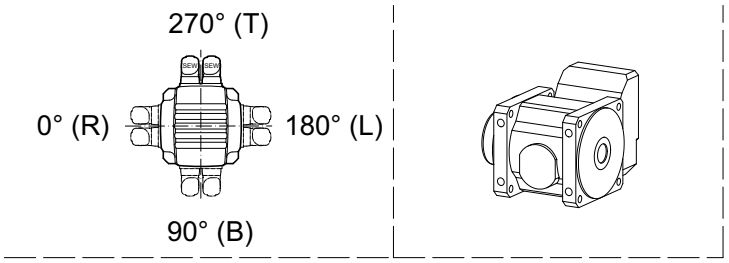

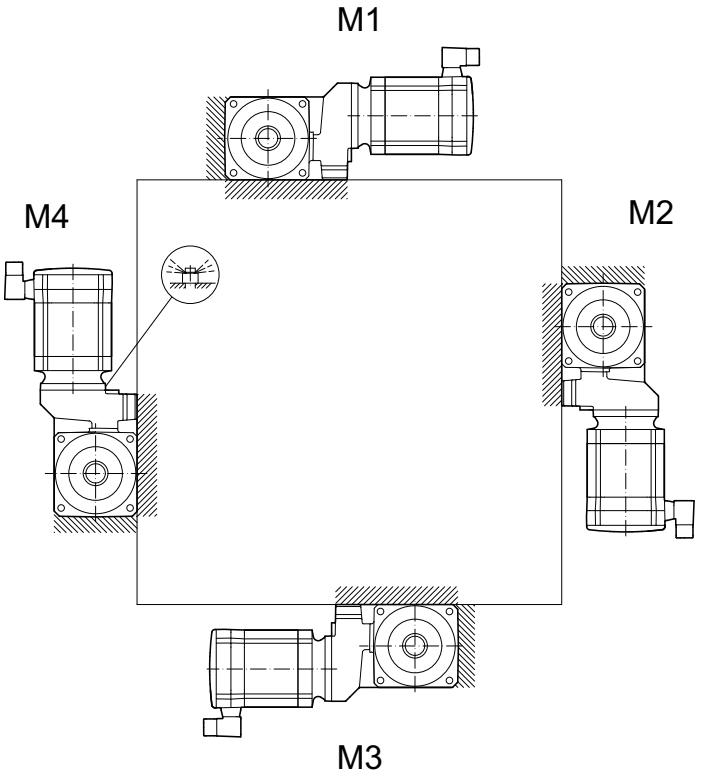

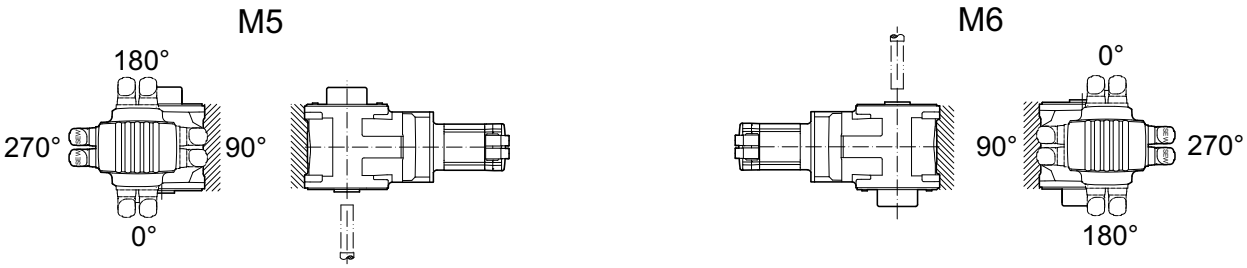

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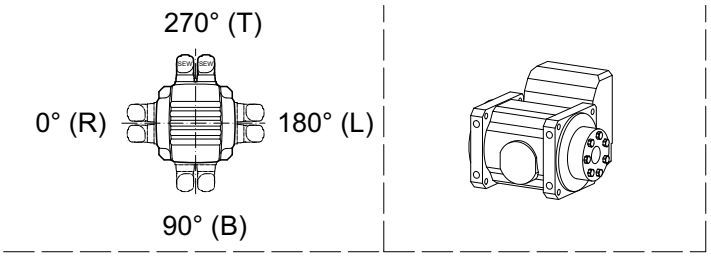

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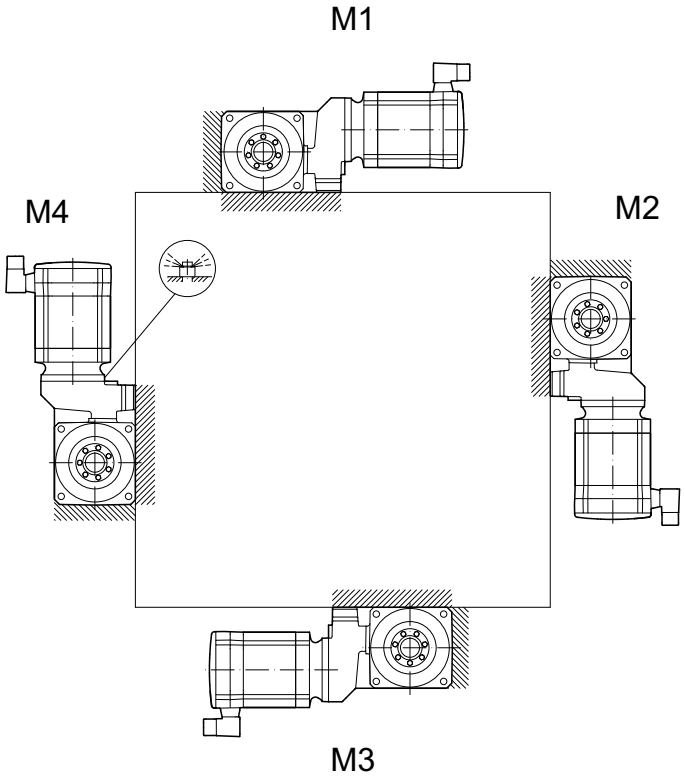

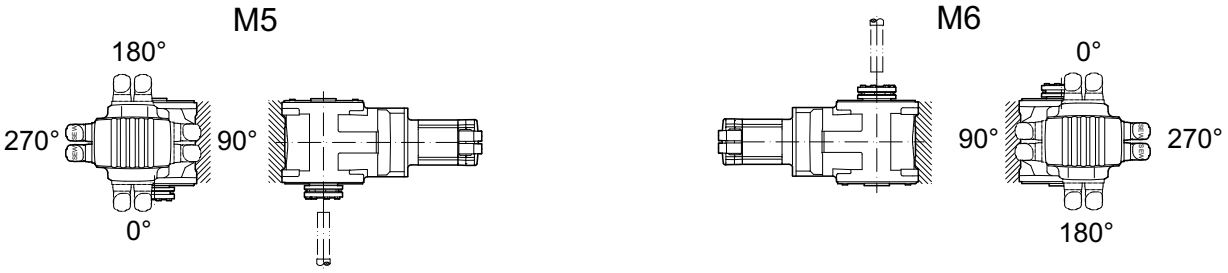

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6 Design and operating notes

6.1 Lubricants

INFORMATION

BS.F helical-bevel gear units from SEW-EURODRIVE are supplied only with synthetic lubricants.

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

6.1.1 Premium lubricants from SEW-EURODRIVE

SEW GearOil – lubricant for gear units

With decades of experience in gear unit development and construction, as well as numerous customer applications, SEW-EURODRIVE has extensive tribological knowledge. Based on this knowledge and the results of long-term testing, SEW-EURODRIVE has developed a special formula for its own premium gear unit oil – SEW GearOil. It provides optimum protection for gear units from SEW-EURODRIVE.

By using high-quality base materials and additives as well as the appropriate logistics, SEW-EURODRIVE ensures the highest level of quality.

SEW GearOil increases the performance of all gear units, that is of standard, servo and industrial gear units. The premium gear oil reduces the friction between gears by creating a very good lubrication film. This increases the service life of lubricant and wear parts, such as seals and bearings. The high damage force level of the SEW GearOil Base mineral lubricant (damage force level 14) improves protection from fretting on the gearing. At the same time, SEW GearOil increases the efficiency of the gear unit and protects it from corrosion and damaging oil foaming. The "self-cleaning" properties of the lubricants prevent deposits as they bind water and dirt particles.

You can optionally select SEW GearOil as the initial filling for gear units and gearmotors. The premium gear oil can be ordered in cans or barrels for service and maintenance purposes. In an unopened packing unit, SEW GearOil can be stored for up to 6 years.

Refer to the following table for the quantities that can be ordered as well as for the corresponding part numbers:

SEW GearOil Base	Can 1 liter	Can 5 liters	Can 20 liters	Barrel 205 liters	IBC 1000 liters
SEW GearOil Base 150 E1			03287866	03287742	03096750
SEW GearOil Base 220 E1	03044130	03044084	03287858	03287734	03096688
SEW GearOil Base 320 E1			03287831	03287726	03096742
SEW GearOil Base 460 E1			03287823	03287718	03096734
SEW GearOil Base 680 E1			03287815	03287696	03096726
SEW GearOil Base 680 S E1			03287807	03287688	03096718

SEW GearOil Poly	Can 1 liter	Can 5 liters	Can 20 liters	Barrel 205 liters
SEW GearOil Poly 150 E1		03099296		03099172

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SEW GearOil Poly	Can 1 liter	Can 5 liters	Can 20 liters	Barrel 205 liters
SEW GearOil Poly 220 E1	03044211	03099288		03099164
SEW GearOil Poly 460 E1		03099261		03099148
SEW GearOil Poly 460 W E1		03096599	03287750	03287645
SEW GearOil Poly 150 H1 E1		03099253		03099121
SEW GearOil Poly 220 H1 E1		03099237		03099113
SEW GearOil Poly 460 H1 E1	03044165	03287076	03288099	03287068

SEW GearOil Synth	Can 1 liter	Can 5 liters	Can 20 liters	Barrel 205 liters
SEW GearOil Synth 150 E1		03042545	03042413	03042308
SEW GearOil Synth 220 E1	03044270	03042537	03042405	03042294
SEW GearOil Synth 320 E1		03042529	03042391	03042286
SEW GearOil Synth 460 E1		03042510	03042383	03042278
SEW GearOil Synth 680 E1		03042502	03042375	03042251
SEW GearOil Synth 220 H1 E1		03042596	03042464	03042340
SEW GearOil Synth 460 H1 E1	03044319	03042588	03042456	03042332

= Lubricant suitable for the food and feed industry

For additional information on using SEW GearOil lubricants and on the most important technical properties, refer to the lubricant tables in chapter "Lubrication table (017512004)" (→ 🗎 122). Technical data sheets and safety data sheets are available from SEW-EURODRIVE on request.

SEW Grease – bearing grease

SEW Grease HL 2 E1 consists of optimally matched product components. The calcium sulfonate complex lubricating grease is based on a semi-synthetic base oil. In combination with an optimized additive package, the SEW Grease HL 2 E1 has extraordinary mechanical characteristics. The powerful lubricant provides high thermal and mechanical stability for all friction points (bearings and seals) which are subjected to high levels of stress in the gear unit and the seals in the motor. This minimizes sealing ring wear and reduces the risk of premature roller bearing failure.

The premium bearing grease SEW Grease HL 2 H1 E1 is available for use in the food processing industry.

Key advantages:

- Good corrosion and wear protection
- Wide service temperature range
- Optimum water resistance
- Resistant to aging
- High thermal and mechanical stability

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Trade name	Packaging unit	Order number
SEW Grease HL 2 E1	500 g cartridge	03041476
SEW Grease HL 2 H1 E1		03041484

6.1.2 Bearing greases

The table shows the lubricants recommended by SEW-EURODRIVE:

Area of operation	Ambient temperature	Manufacturer	Type
Standard	-40 °C to +80 °C	SEW-EURODRIVE	SEW Grease HL 2 E1[1)]
		Fuchs	Renolit CX-TOM 15[1)]
		Klüber	Petamo GHY 133 N
2)	-40 °C to +40 °C	SEW-EURODRIVE	SEW Grease HL 2 H1 E1
		Bremer & Leguil	Cassida Grease GTS 2
3)	-20 °C to +40 °C	Fuchs	Plantogel 2S

1) Bearing grease based on semi-synthetic base oil.
2) Lubricant for the food processing industry.
3) Easily biodegradable lubricant for environmentally sensitive areas.

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6.1.3 Lubrication table (017512004)

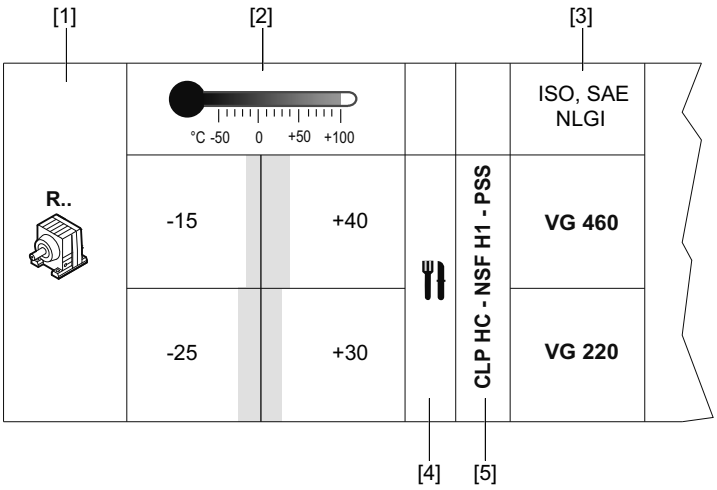
NOTICE

Damage to the gear unit due to improper lubricants.

Possible damage to property.

- The oil viscosity and type (mineral/synthetic) 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 lubricants 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 is subject to dynamic change on the part of the lubricant manufacturers. For the latest 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 range
[3] Viscosity class
[4] Note on special approvals
[5] Lubricant type

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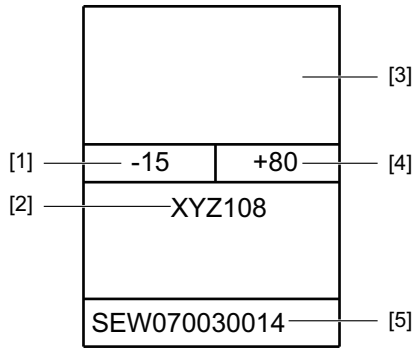
The specified ambient temperatures are guide values for selecting a suitable lubricant. The exact upper and lower temperature limits for project planning are specified in the table with the respective trade name. Bear in mind during project planning that the viscosity increases at low temperatures and that this might influence the starting behavior.

Information on the various lubricants



[1] Lowest oil sump temperature in °C, **going below this value during operation is not permitted**
[2] Trade name
[3] Manufacturer
[4] Highest oil sump temperature in °C. The service life will be considerably reduced when this temperature is exceeded. Adhere to the lubricant change intervals in chapter "Current lubricant change intervals" in the operating instructions.
[5] Approvals regarding compatibility of the lubricant with approved oil seals

Lubricant compatibility with oil seals

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 regarding elastomer compatibility.

Approved application temperature range of the oil seals

In the low temperature range, oil seals can withstand shaft deflections (e. g. through overhung load) only to a limited extent. Especially avoid or limit pulsating or changing radial displacements of the shaft. Contact SEW-EURODRIVE, if required.

Oil seal Material class	Permitted Oil sump temperature
NBR	-40 °C to +80 °C
FKM	-25 °C to +115 °C
FKM-PSS	-25 °C to +115 °C

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

Material class			Manufacturer		Material	
S	1	NBR	1	Freudenberg		72 NBR 902
			2	Trelleborg		4NV11
	2	FKM	1	Freudenberg	1	75 FKM 585
					2	75 FKM 170055
			2	Trelleborg	1	VCBVR

Examples:

S11: Only the elastomer 72NBR902 of the Freudenberg company 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 symbols used in the lubricant table and explains what they mean:

Abbreviation/symbol	Meaning
	Synthetic lubricant (marked gray)
	Mineral lubricant
CLP	Mineral oil
CLP PG	Polyglycol (PG)
CLP HC	Synthetic hydrocarbons – polyalphaolefins (PAO)
E	Ester-based oil
	Lubricant for the food processing industry and feed industry. Oils are NSF-H1 registered and compliant in accordance with FDA 21 CFR § 178.3570
	Easily biodegradable oil for environmentally sensitive areas
	Lubricant suitable for ATEX environment
1)	Helical-worm gear units with CLP-PG: Contact SEW-EURODRIVE
2)	Low-viscosity grease
3)	With appropriate measures, the gear units can be operated at ambient temperatures as low as -40 °C. Contact SEW-EURODRIVE.
Oil seal	Oil seal
PSS	Oil seal of the Premium Sine Seal type. The addendum "PSS" for the lubricant type indicates compatibility with the sealing system.

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

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

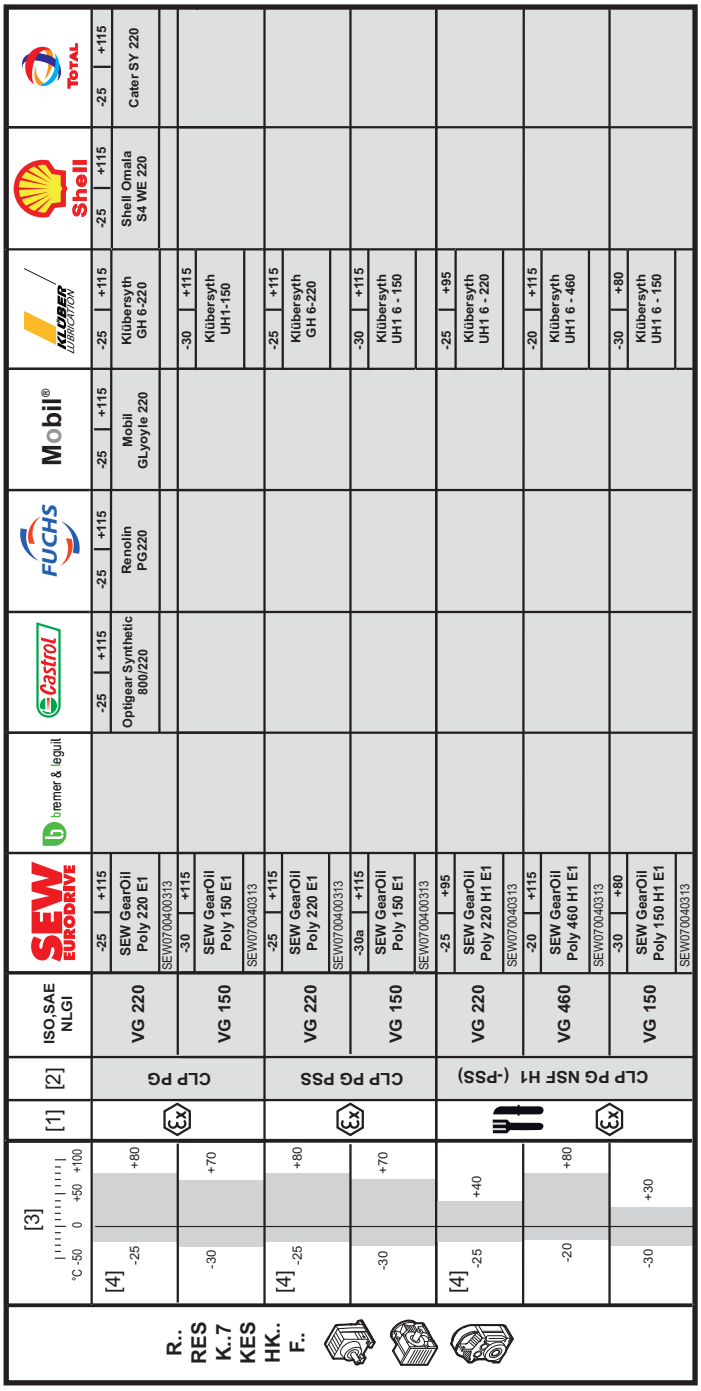
Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🗎 123).

R.. RES K..7 KES HK.. F..	[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	TOTAL
	[4] -15 +40		CLP	VG 220	-15 | +80 SEW GearOil Base 220 E1 / US1 SEW07004031**3**		-15 | +80 Optigear BM 220	-15 | +80 Renolin CLP 220 Plus SEW07004031**3**	-15 | +80 Mobilgear 600 XP 220 SEW07004031**3**	-15 | +80 Klüberoil GEM 1-220 N	-15 | +80 Shell Omala SG 220	-15 | +80 Cater EP 220
	[4] -20 +30		CLP	VG 150	-20 | +80 SEW GearOil Base 150 E1 / US1 SEW07004031**3**		-20 | +80 Optigear BM 150	-20 | +80 Renolin CLP150 Plus SEW07004031**3**	-20 | +80 Mobilgear 600 XP 150 SEW07004031**3**	-20 | +80 Klüberoil GEM 1-150 N	-20 | +80 Shell Omala SG 150	-20 | +80 Cater EP 150
	[4] -15 +40		CLP PSS	VG 220	-15 | +80 SEW GearOil Base 220 E1 / US1 SEW07004031**3**			-15 | +80 Renolin CLP 220 Plus SEW07004031**3**	-15 | +80 Mobilgear 600 XP 220 SEW07004031**3**			
	[4] -20 +30		CLP PSS	VG 150	-20 | +80 SEW GearOil Base 150 E1 / US1 SEW07004031**3**			-20 | +80 Renolin CLP150 Plus SEW07004031**3**	-20 | +80 Mobilgear 600 XP 150 SEW07004031**3**			

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 123).



[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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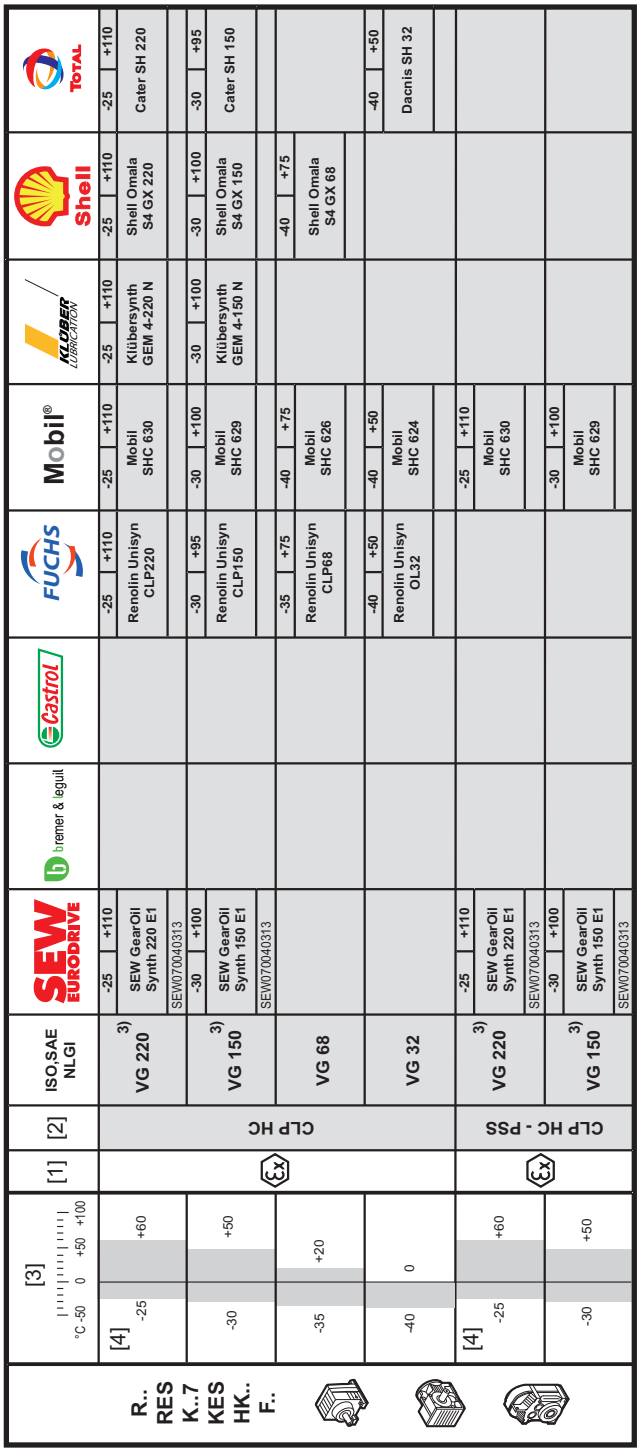
The lubricant table is valid on the day this document is published. Refer to **www.sew-eurodrive.de/lubricants** for the latest tables.

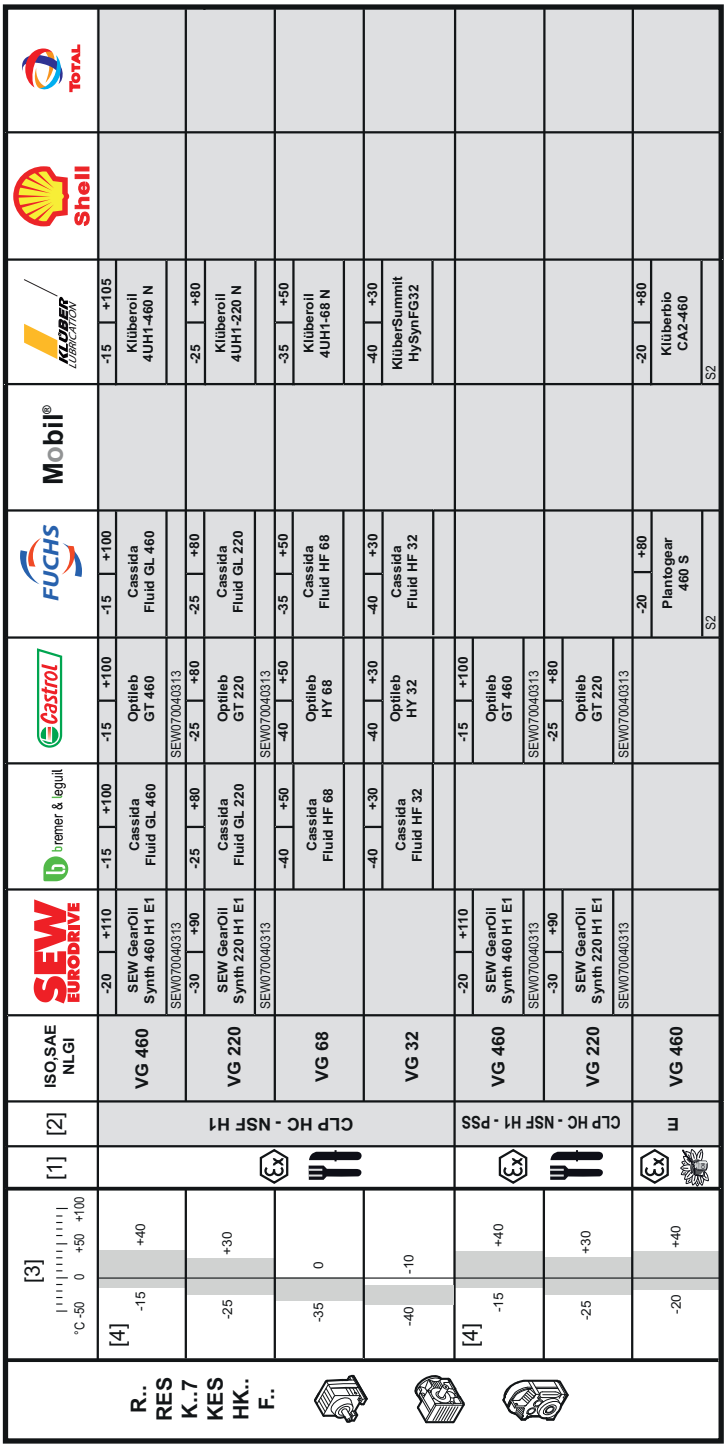
Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🖹 123).



[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 123).



[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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Lubricant table for K..9 gear units

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

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🗎 123).

K.9	[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TOTAL
[4]	-20 +60		CLP PG (-PSS)	VG 460	-20 | +95 SEW GearOil Poly 460 E1 SEW 070040313					-20 | +95 Klübersynth GH 6-460		
-15	+80			VG 680						-15 | +115 Klübersynth GH 6-680		
-25	+40			VG 220	-25 | +70 SEW GearOil Poly 220 E1 SEW 070040313					-25 | +70 Klübersynth GH 6-220		
-30	+30			VG 150	-30 | +60 SEW GearOil Poly 150 E1 SEW 070040313					-30 | +60 Klübersynth GH 6-150		
[4]	-20 +60		CLP PG - NSF H1 (-PSS)	VG 460	-20 | +95 SEW GearOil Poly 460 H1 E1 SEW 070040313					-20 | +95 Klübersynth UH1 6-460		
-15	+80			VG 680						-15 | +115 Klübersynth UH1 6-680		
-25	+40			VG 220	-25 | +70 SEW GearOil Poly 220 H1 E1 SEW 070040313					-25 | +70 Klübersynth UH1 6-220		
-30	+30			VG 150	-30 | +60 SEW GearOil Poly 150 H1 E1 SEW 070040313					-30 | +60 Klübersynth UH1 6-150		

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

Lubricant table for S.. gear units

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

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🗎 123).

S.. HS..	[3] °C -50 0 +50 +100	[1]	[2]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	TOTAL
	[4] 0 +40		CLP	VG 680	0 | +80 SEW GearOil Base 680 S E1		0 | +80 Optigear BM 680	0 | +80 Renolin CLP 680 Plus	0 | +80 Mobilgear 600 XP 680	0 | +80 Klüberoil GEM 1-680 N	0 | +80 Shell Omala SG 680	0 | +80 Carter EP 680
					SEW07004031 3			SEW07004031 3	SEW07004031 3			
	[4] -20 +25			VG 150	-20 | +65 SEW GearOil Base 150 E1 / US1		-20 | +65 Optigear BM150	-20 | +65 Renolin CLP 150 Plus	-20 | +65 Mobilgear 600 XP 150	-20 | +65 Klüberoil GEM 1-150 N	-20 | +65 Shell Omala SG 150	-20 | +65 Carter EP 150
					SEW07004031 3			SEW07004031 3	SEW07004031 3			
	[4] 0 +40		CLP - PSS	VG 680	0 | +80 SEW GearOil Base 680 S E1			0 | +80 Renolin CLP 680 Plus	0 | +80 Mobilgear 600 XP 680			
					SEW07004031 3			SEW07004031 3	SEW07004031 3			
	[4] -20 +25			VG 150	-20 | +65 SEW GearOil Base 150 E1 / US1			-20 | +65 Renolin CLP 150 Plus	-20 | +65 Mobilgear 600 XP 150			
					SEW07004031 3			SEW07004031 3	SEW07004031 3			

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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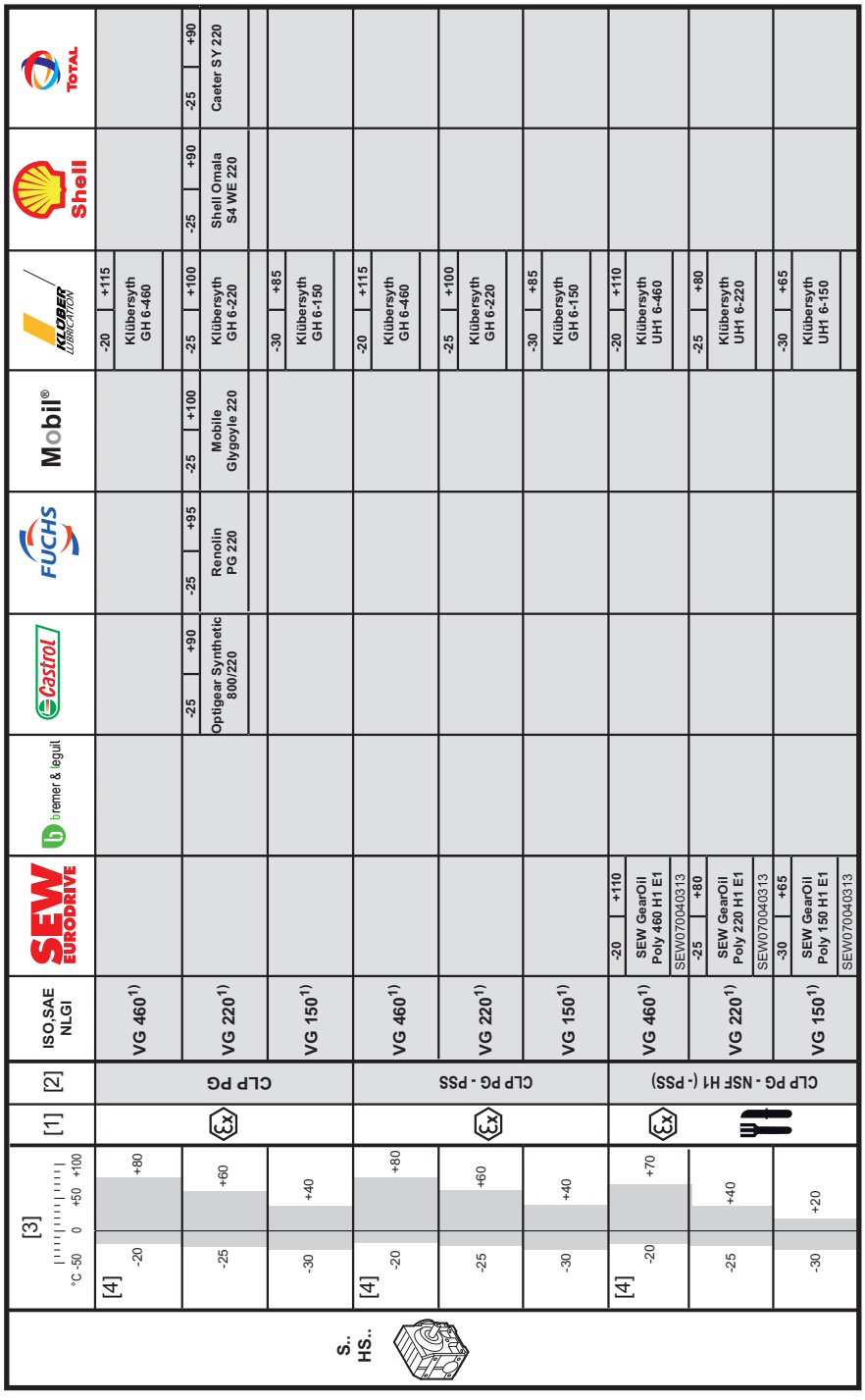
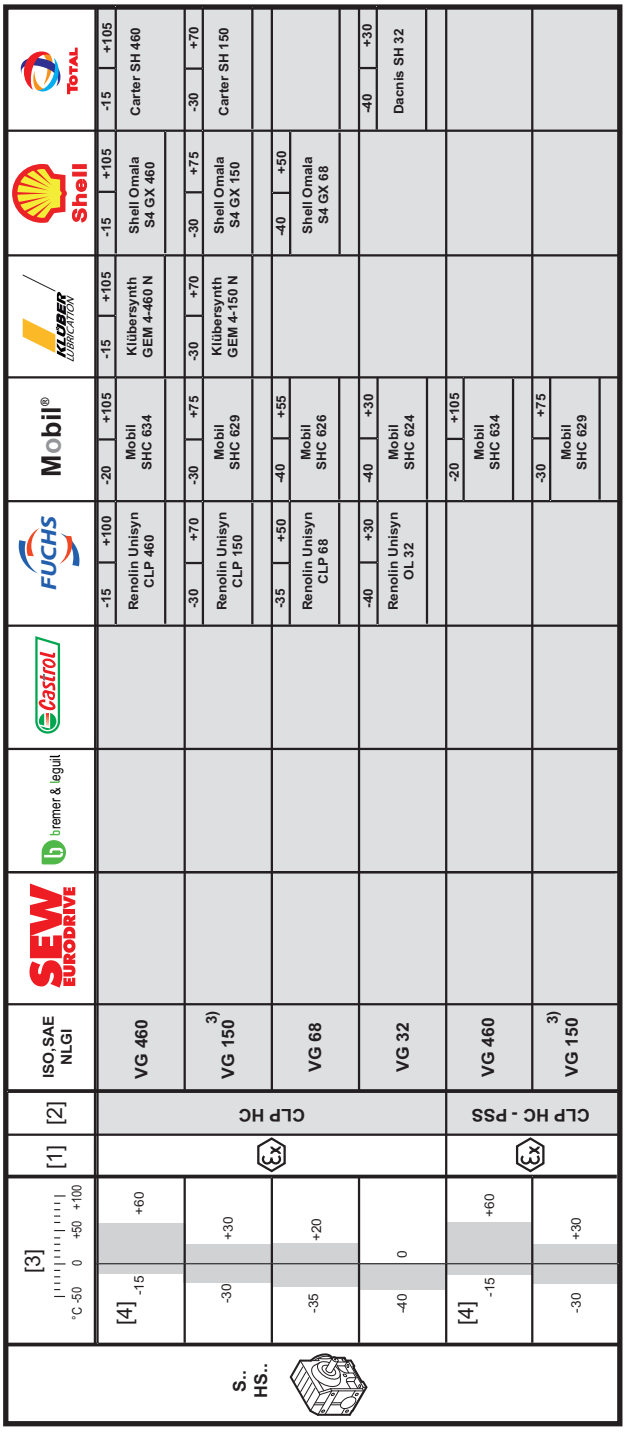
Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🖹 123).



[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 123).



S.. HS..	[3] °C -50 0 +50 +100	[1]	[2]	ISO, SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TOTAL
	[4] -15 / +60	Ex	CLP HC	VG 460				-15 / +100	-20 / +105	-15 / +105	-15 / +105	-15 / +105
								Renolin Unisyn CLP 460	Mobil SHC 634	Klübersynth GEM 4-460 N	Shell Omala S4 GX 460	Carter SH 460
	-30 / +30			VG 150 3)				-30 / +70	-30 / +75	-30 / +70	-30 / +75	-30 / +70
								Renolin Unisyn CLP 150	Mobil SHC 629	Klübersynth GEM 4-150 N	Shell Omala S4 GX 150	Carter SH 150
	-35 / +20			VG 68				-35 / +50	-40 / +55		-40 / +50	
								Renolin Unisyn CLP 68	Mobil SHC 626		Shell Omala S4 GX 68	
	-40 / 0			VG 32				-40 / +30	-40 / +30			-40 / +30
								Renolin Unisyn OL 32	Mobil SHC 624			Dacnis SH 32
	[4] -15 / +60	Ex	CLP HC - PSS	VG 460					-20 / +105			
									Mobil SHC 634			
	-30 / +30			VG 150 3)					-30 / +75			
									Mobil SHC 629			

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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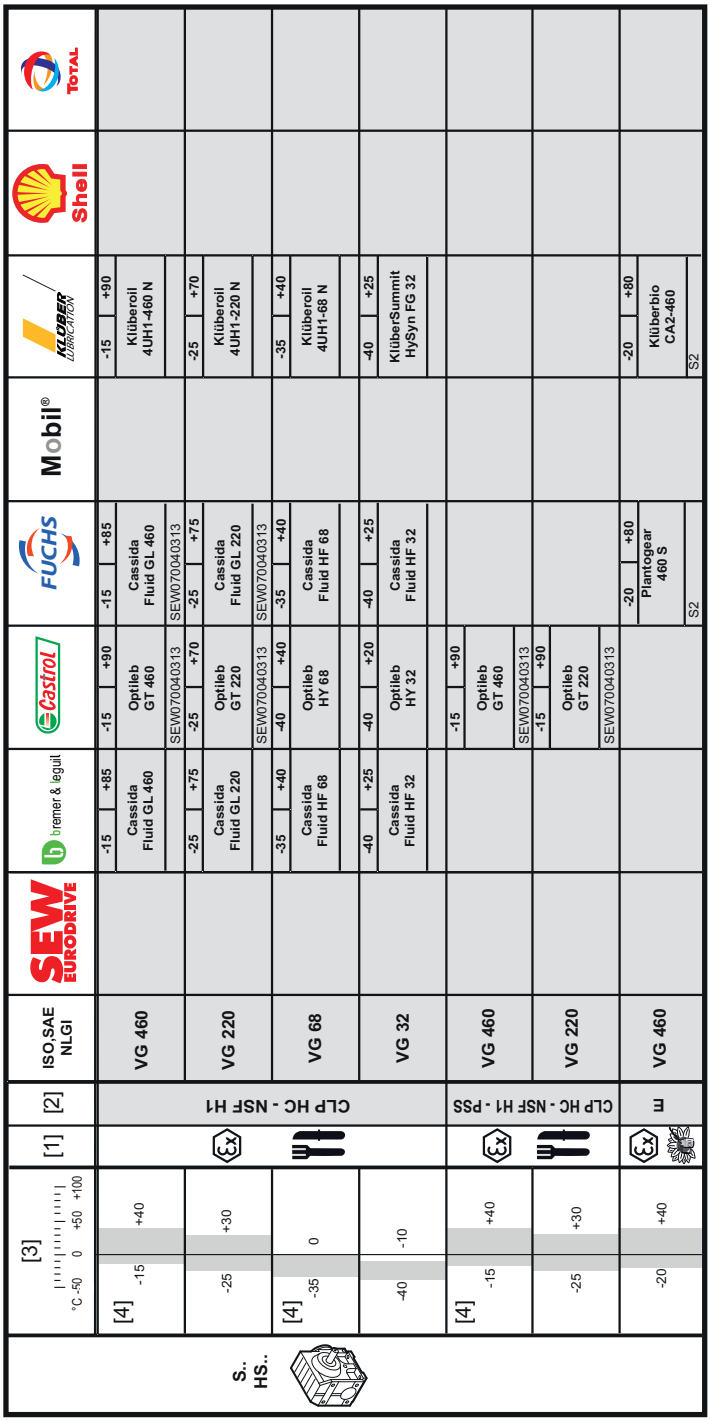
Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 123).



[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

29133866/EN – 05/2021

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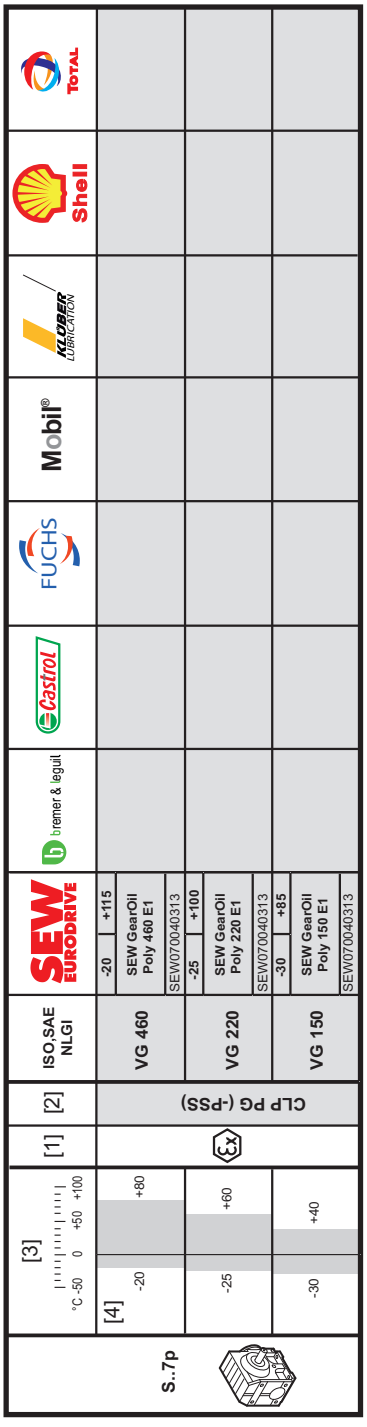
Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🗎 123).



[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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Lubricant table for W.. gear units

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

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oils seals" (→ 🗎 123).

				SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil	KLÜBER LUBRICATION	Shell	TOTAL
W.. HW..	[4] –20	[3] +60	[1]	[2] CLP PG (-PSS)	ISO,SAE NLGI VG 460	-20 | +115 SEW GearOil Poly 460 W E1 SEW07004031 3						
				CLP PG NSF H1(-PSS)	VG 460	-20 | +115 SEW GearOil Poly 460 H1 E1 SEW07004031 3			-20 | +115 Klübersynth UH1 6-460			
	–30	+20			VG 150	-30 | +65 SEW GearOil Poly 1510 H1 E1 SEW07004031 3			-30 | +65 Klübersynth UH1 6-150			
	–40	+10		API GL5	SAE 75W90 (~VG 100)			-40 | +65 Mobil Synth Gear Oil 75 W90				
W.9	[4] –25	+60		CLP PG (- PSS)	VG 220	-25 | +100 SEW GearOil Poly 220 E1 SEW07004031 3						
	–20	+80			VG 460	-20 | +115 SEW GearOil Poly 460 E1 SEW07004031 3						
	–30	+40			VG 150	-30 | +85 SEW GearOil Poly 150 E1 SEW07004031 3						

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

Lubricant table for BS.F.. gear units

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

Observe the thermal limit of the oil seal material, see chapter "Lubricant compatibility with oil seals" (→ 🗎 123).

BS F	[3] [4]	[2]	[1]	ISO,SAE NLGI	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TOTAL
	+60		CLP PG (-PSS)	VG 220	-25 | +100 SEW GearOil Poly 220 E1 SEW07000303 13					-25 | +100 Klübersynth GH 6-220		
	-25											
	+60		CLP PG NSF H1 (-PSS)	VG 460	-20 | +100 SEW GearOil Poly 460 H1 E1					-20 | +100 Klübersynth UH1 6-460		
	-20											

[1] Note on special approvals
[2] Oil type
[3] Ambient temperature range
[4] Standard

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6.1.4 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" (→ 🗎 70)) 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

Gear unit	Fill quantity in liters					
	M1[1)]	M2	M3	M4	M5	M6
R07	0.12	0.20				
R17	0.25	0.55	0.35	0.55	0.35	0.40
R27	0.25/0.40	0.70	0.50	0.70	0.50	
R37	0.30/0.95	0.85	0.95	1.05	0.75	0.95
R47	0.70/1.50	1.60	1.50	1.65	1.50	
R57	0.80/1.70	1.90	1.70	2.10	1.70	
R67	1.10/2.30	2.40	2.80	2.90	1.80	2.00
R77	1.20/3.00	3.30	3.60	3.80	2.50	3.40
R87	2.30/6.0	6.4	7.2		6.3	6.5
R97	4.60/9.8	11.7		13.4	11.3	11.7
R107	6.0/13.7	16.3	16.9	19.2	13.2	15.9

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

RF.., RZ..

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

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

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RX..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RX57	0.60	0.80	1.30		0.90	
RX67	0.80		1.70	1.90	1.10	
RX77	1.10	1.50	2.60	2.70	1.60	
RX87	1.70	2.50	4.80		2.90	
RX97	2.10	3.40	7.4	7.0	4.80	
RX107	3.90	5.6	11.6	11.9	7.7	

RXF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RXF57	0.50	0.80	1.10		0.70	
RXF67	0.70	0.80	1.50	1.40	1.00	
RXF77	0.90	1.30	2.40	2.00	1.60	
RXF87	1.60	1.95	4.90	3.95	2.90	
RXF97	2.10	3.70	7.1	6.3	4.80	
RXF107	3.10	5.7	11.2	9.3	7.2	

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	2.25	3.15	1.65	3.15	2.40	2.50
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.., FM.., FAM..

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

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Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
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
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	

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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.., KM.., KAM..

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	1.03	0.80	
S57	0.50	1.20	1.00/1.20	1.43	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	
S97	6.8	15.0	13.4/18.0	21.8	17.0	

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

SF..

Gear unit	Fill quantity in liters						
	M1	M2	M3[1)]	M4		M5	M6
				Output A or B	Output A + B		
SF37	0.25	0.40	0.50	0.55	0.6	0.40	
SF47	0.40	0.90	0.90/1.05	1.08	1.13	1.00	
SF57	0.50	1.20	1.00/1.50	1.48	1.53	1.40	
SF67	1.00	2.20	2.30/3.00	3.20	3.5	2.70	
SF77	1.90	4.10	3.90/5.8	6.5	7.2	4.90	

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Gear unit	Fill quantity in liters						
	M1	M2	M3[1)]	M4		M5	M6
				Output A or B	Output A + B		
SF87	3.80	8.0	7.1/10.1	12.0	13.2	9.1	
SF97	7.4	15.0	13.8/18.8	23.1	25.2	18.0	

1) The larger gear unit of compound 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	1.03	0.80	
S..57	0.50	1.10	1.00/1.50	1.43	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	21.0	15.7	

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

SPIROPLAN® (W) gear units

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

Gear unit	Fill quantity in liters						
	M1	M2	M3	M4		M5	M6
				2	3		
W29	0.54			0.93	0.78	0.84	
W39	0.85			1.5	1.35	1.25	

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
Up 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.

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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) with blocked gear unit input side. The specified values have a tolerance of ± 2 angular minutes.

(→ 🗎 183)

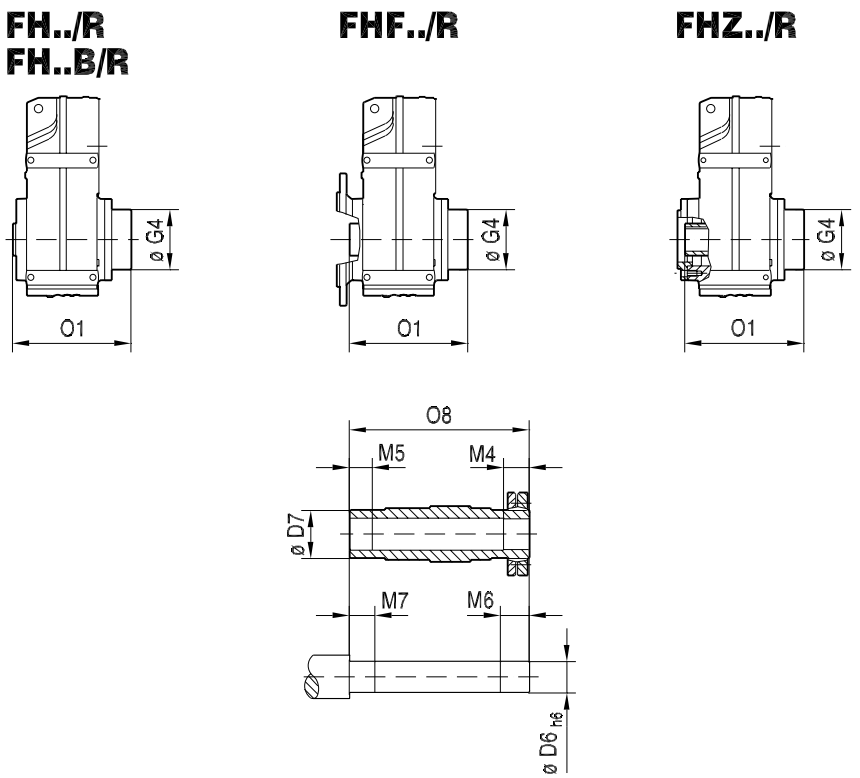
The reduced backlash design is available for the following gear units:

- Helical gear units (R) of sizes 37 to 127
- Parallel-shaft helical gear units (F) of sizes 37 to 107
- Helical-bevel gear units (only K..7) of gear unit sizes 37 to 107

With the exception of the FH.87 and FH.97 parallel-shaft helical gear units with reduced backlash, the dimensions of gear units with reduced backlash correspond to the dimensions of the standard designs.

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 disassembly.

INFORMATION

The key dimension L12 is specified for the customer and depends on the application requirements and the used materials.

See the following figure "Customer shaft with contact shoulder [A] and without contact shoulder [B].

INFORMATION

When dimensioning the keyed connection, take into account 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 using the 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".

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

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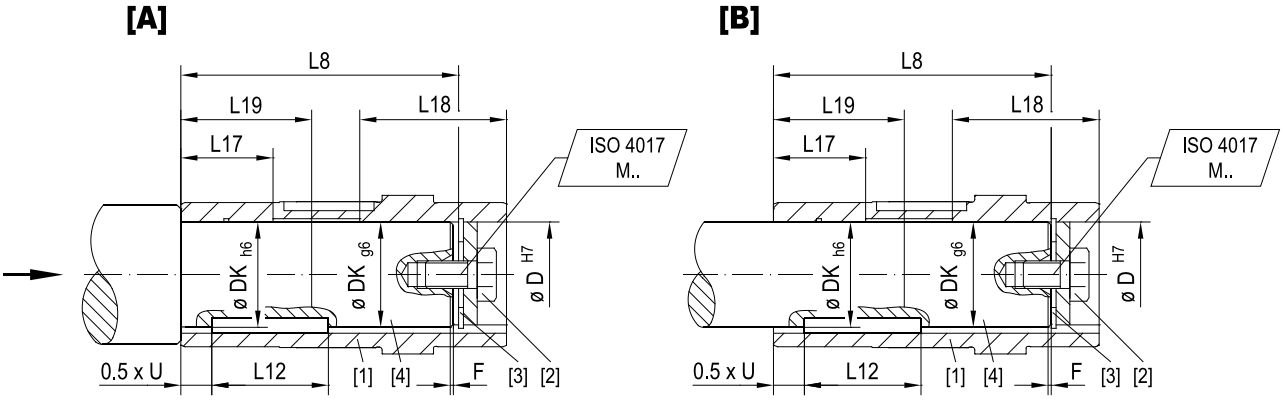

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D Hollow shaft diameter
DK Customer shaft diameter
F Shaft end chamfer
L8 Customer shaft length
L12 Key length
L17 Cylinder section length with dimension H7
L18 Cylinder section length with dimension H7
L19 The dimension should be L19 > L17 or > L18 depending on which end the customer shaft is inserted
U Key width
[1] Hollow shaft
[2] Retaining screw with washer
[3] Retaining ring
[4] Customer shaft

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

Gear unit type	D^{H7} mm	DK mm	L17 mm	L18 mm	F mm	L8 mm	MS Nm	U mm	ISO 4017 M..
WA..29	20		28	30	1	92	8	6	M6 × 16
KA..19	20		28	30	1	92	8	6	M6 × 16
FA..27	25		30	30	1	89	20	8	M10 × 25
KA..29	25		30	38	1	107	20	8	M10 × 25
WA..29	25		28	30	0.5	92	20	8	M10 × 25
WA..39	25		30	38	1	107	20	8	M10 × 25
WA..29	30		28	30	0.5	92	20	8	M10 × 25
KA..29	30		35	35	1	107	20	8	M10 × 25
WA..39	30		35	35	1	107	20	8	M10 × 25
SA..37	20		40	40	1	104	8	6	M6 × 16
FA..37, KA..37	30		39	45	1	105	20	8	M10 × 25
KA..39	30		35	45	1	137	20	8	M10 × 25

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Gear unit type	D^{H7} mm	DK mm	L17 mm	L18 mm	F mm	L8 mm	MS Nm	U mm	ISO 4017 M..
KA..39	35		35	45	1	137	20	10	M12 × 30
KA..49	35		35	45	1	160	20	10	M12 × 30
KA..49	40		35	45	1	154	40	12	M16 × 40
SA..47	25		38	38	1	105	20	8	M10 × 25
SA..47	30		39	45	1	105	20	8	M10 × 25
FA..47, KA..47	35		45	52	1	132	20	10	M12 × 30
SA..57	30		39	45	1	132	20	8	M10 × 25
SA..57	35		45	52	1	132	20	10	M12 × 30
FA..57, KA..57	40		50	60	1	142	40	12	M16 × 40
FA..67, KA..67	40		50	60	1	156	40	12	M16 × 40
FAM67, KAM67	40		50	60	1	278	40	12	M16 × 40
SA..67	40		50	60	1	144	40	12	M16 × 40
SA..67	45		50	60	1	144	40	14	M16 × 40
FA..77, KA..77	50		65	75	1	183	40	14	M16 × 45
FAM77, KAM77	50		65	75	1	309	40	14	M16 × 45
SA..77	50		63	75	1	180	40	14	M16 × 45
SA..77	60		72	90	1	180	80	18	M20 × 50
FA..87, KA..87	60		75	90	1	210	80	18	M20 × 50
FAM87, KAM87	60		75	90	1	363	80	18	M20 × 50
SA..87	60		75	90	1	220	80	18	M20 × 50
SA..87	70		90	105	2	220	80	20	M20 × 50
FA..97, KA..97	70		90	105	2	270	80	20	M20 × 50
FAM97, KAM97	70		90	105	2	422	80	20	M20 × 50
SA..97	70		90	105	2	260	80	20	M20 × 50
SA..97	90		110	125	2	255	200	25	M24 × 60
FA..107, KA..107	90		110	125	2	313	200	25	M24 × 60
FAM107, KAM107	90		110	125	2	473	200	25	M24 × 60

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

Assembly

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

- Spacer tube for installation without contact shoulder [5]
- Retaining screw for assembly [2]
- Forcing washer for disassembly [7]
- Fixed nut for disassembly [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].

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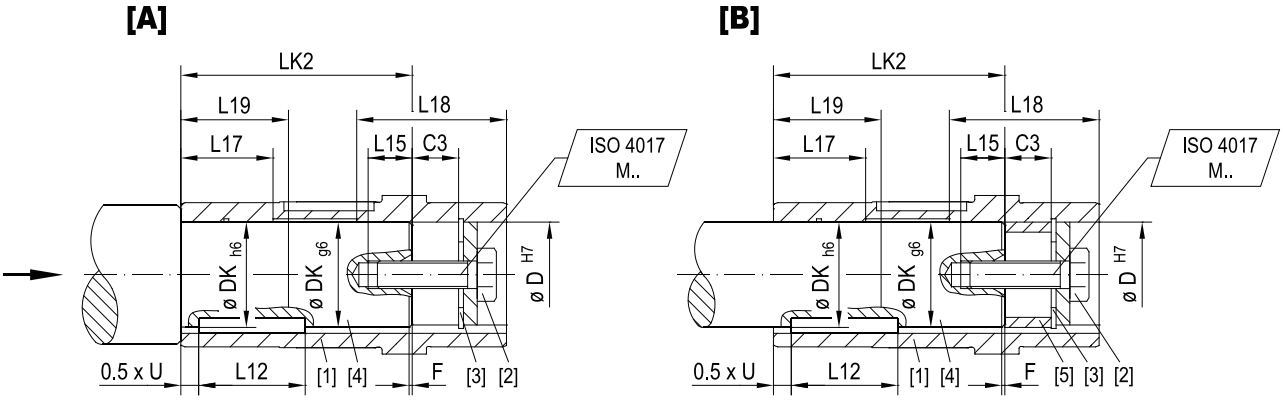

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C3 Indentation fixed nut and forcing washer
D Hollow shaft diameter
DK Customer shaft diameter
F Shaft end chamfer
L8 Customer shaft length
L12 Key length
L15 Thread depth of customer shaft
L17 Cylinder section length with dimension H7
L18 Cylinder section length with dimension H7
L19 The dimension should be L19 > L17 or > L18 depending on which end the customer shaft is inserted
LK2 Length of the customer shaft when using the optional assembly/disassembly kit
U Key width
[1] Hollow shaft
[2] Retaining screw with washer
[3] Retaining ring
[4] Customer shaft
[5] Spacer tube

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

Type	C3	D^{H7}	DK	L15	L17	L18	LK2	U	MS	ISO 4017	Part number of the assembly/disassembly kit
	mm	mm	mm	mm	mm	mm	mm	mm	Nm	M..	
FA..27	16	25		22	30	30	73	8	20	M10 × 35	06436846
FA..37	16	30		22	39	45	89	8	20	M10 × 35	06436854
FA..47	18	35		28	45	52	114	10	20	M12 × 45	06436862
FA..57	18	40		36	50	60	124	12	40	M16 × 50	06436870
FA..67	18	40		36	50	60	138	12	40	M16 × 50	06436870
FA..77	18	50		36	65	75	165	14	40	M16 × 50	06436897
FA..87	22	60		42	75	90	188	18	80	M20 × 60	06436900
FA..97	22	70		42	90	105	248	20	80	M20 × 60	06436919
FA..107	26	90		50	110	125	287	25	200	M24 × 70	06436927
FAM67	18	40		36	50	60	260	12	40	M16 × 50	06436870
FAM77	18	50		36	65	75	291	14	40	M16 × 50	06436897
FAM87	22	60		42	75	90	341	18	80	M20 × 60	06436900
FAM97	22	70		42	90	105	400	20	80	M20 × 60	06436919
FAM107	26	90		50	110	125	447	25	200	M24 × 70	06436927
KA..19	12	20		16	28	30	80	6	8	M6 × 25	06436838
KA..29	16	25		22	30	38	91	8	20	M10 × 35	06436846
KA..29	16	30		22	35	35	91	8	20	M10 × 35	06436854
KA..37	16	30		22	39	45	89	8	20	M10 × 35	06436854
KA..39	16	30		22	35	45	121	8	20	M10 × 35	06436854
KA..39	18	35		28	35	45	119	10	20	M12 × 45	06436862
KA..47	18	35		28	45	52	114	10	20	M12 × 45	06436862
KA..49	18	35		28	35	45	142	10	20	M12 × 45	06436862
KA..49	18	40		36	35	45	136	12	40	M16 × 50	06436870
KA..57	18	40		36	50	60	124	12	40	M16 × 50	06436870
KA..67	18	40		36	50	60	138	12	40	M16 × 50	06436870
KA..77	18	50		36	65	75	165	14	40	M16 × 50	06436897
KA..87	22	60		42	75	90	188	18	80	M20 × 60	06436900
KA..97	22	70		42	90	105	248	20	80	M20 × 60	06436919
KA..107	26	90		50	110	125	287	25	200	M24 × 70	06436927
KAM67	18	40		36	50	60	260	12	40	M16 × 50	06436870
KAM77	18	50		36	65	75	291	14	40	M16 × 50	06436897
KAM87	22	60		42	75	90	341	18	80	M20 × 60	06436900
KAM97	22	70		42	90	105	400	20	80	M20 × 60	06436919
KAM107	26	90		50	110	125	447	25	200	M24 × 70	06436927
SA..37	12	20		16	40	40	92	6	8	M6 × 25	06436838

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Type	C3	D^{H7}	DK	L15	L17	L18	LK2	U	MS	ISO 4017	Part number of the assembly/disassembly kit
	mm	mm	mm	mm	mm	mm	mm	mm	Nm	M..	
SA..47	16	25		22	38	38	89	8	20	M10 × 35	06436846
SA..47	16	30		22	39	45	89	8	20	M10 × 35	06436854
SA..57	16	30		22	39	45	116	8	20	M10 × 35	06436854
SA..57	18	35		28	45	52	114	10	20	M12 × 45	06436862
SA..67	18	40		36	50	60	126	12	40	M16 × 50	06436870
SA..67	18	45		36	50	60	126	14	40	M16 × 50	06436889
SA..77	18	50		36	63	75	165	14	40	M16 × 50	06436897
SA..77	22	60		42	72	90	158	18	80	M20 × 60	06436900
SA..87	22	60		42	75	90	198	18	80	M20 × 60	06436900
SA..87	22	70		42	90	105	198	20	80	M20 × 60	06436919
SA..97	22	70		42	90	105	238	20	80	M20 × 60	06436919
SA..97	26	90		50	110	125	229	25	200	M24 × 70	06436927
WA..29	12	20		16	28	30	80	6	8	M6 × 25	06436838
WA..29	16	25		22	28	30	91	8	20	M10 × 35	06436846
WA..39	16	25		22	30	38	91	8	20	M10 × 35	06436846
WA..39	16	30		22	35	35	91	8	20	M10 × 35	06436854

Disassembly

INFORMATION

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

- 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).

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

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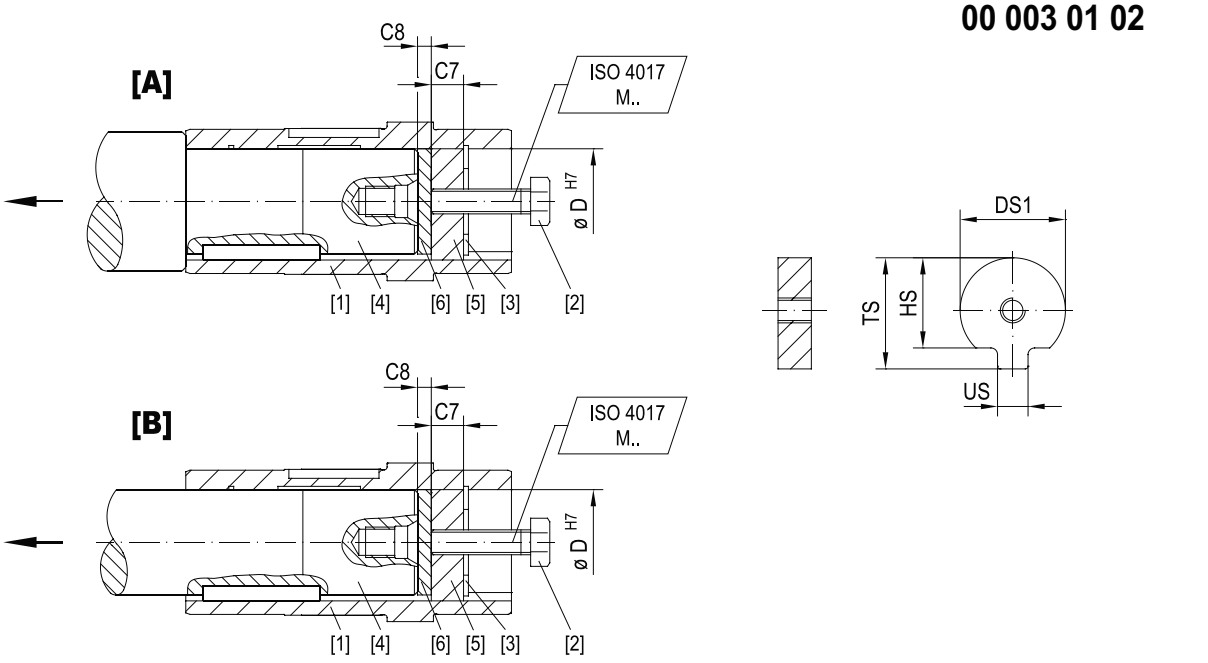

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C7 Width of fixed nut
C8 Width of forcing washer
D Hollow shaft diameter
DS1 Diameter of fixed nut
HS Height 1 fixed nut
TS Height 2 fixed nut
US Base width of fixed nut
[1] Hollow shaft
[2] Retaining screw
[3] Retaining ring
[4] Customer shaft
[5] Fixed nut for disassembly
[6] Forcing washer

Dimensions and part numbers of the assembly/disassembly kit:

Type	D^{H7} mm	C8 mm	C7 mm	HS mm	US mm	TS mm	DS1 mm	ISO 4017 M..	Part number of the assembly/disassembly kit
WA..10	16	5	5	12	4.5	18	15.7	M5 × 50	06437125
WA..20	18	5	6	13.5	5.5	20.5	17.7	M6 × 25	0643682X
KA..19, SA..37, WA..20, WA..29, WA..30	20	5	6	15.5	5.5	22.5	19.7	M6 × 25	06436838
FA..27, KA..29, SA..47,WA..29, WA..39, WA..47,	25	5	10	20	7.5	28	24.7	M10 × 35	06436846
FA..37, KA..29, KA..37, KA..39, SA..47, SA..57, WA..29, WA..39	30	5	10	25	7.5	33	29.7	M10 × 35	06436854

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Type	D^{H7} mm	C8 mm	C7 mm	HS mm	US mm	TS mm	DS1 mm	ISO 4017 M..	Part number of the assembly/disassembly kit
FA..47, KA..39, KA..47, KA..49, SA..57	35	5	12	29	9.5	38	34.7	M12 × 45	06436862
FA..57, KA..57, FA..67, KA..49, KA..67, SA..67	40	5	12	34	11.5	41.9	39.7	M16 × 50	06436870
SA..67	45	5	12	38.5	13.5	48.5	44.7	M16 × 50	06436889
FA..77, KA..77, SA..77	50	5	12	43.5	13.5	53.5	49.7	M16 × 50	06436897
FA..87, KA..87, SA..77, SA..87	60	5	16	56	17.5	64	59.7	M20 × 60	06436900
FA..97, KA..97, SA..87, SA..97	70	5	16	65.5	19.5	74.5	69.7	M20 × 60	06436919
FA..107, KA..107, SA..97	90	5	20	80	24.5	95	89.7	M24 × 70	06436927

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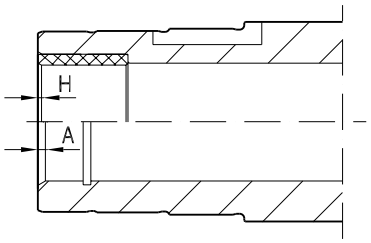
6.5 Gear units with hollow shaft

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

Gear units	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/W..29	2 × 30°	0.5 × 45°
K..29/W..39	2 × 30°	0.5 × 45°
F../K../S..37	2 × 30°	0.5 × 45°
K..39	2 × 30°	-
F../K../S..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°

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

Gear units	Design	
	with hollow shaft (A)	with hollow shaft and shrink disk (H)
BS.F202	2 × 30°	0.5 × 45°
BS.F302	2 × 30°	0.5 × 45°
BS.F402	2 × 30°	0.5 × 45°
BS.F502	2 × 30°	3 × 2°
BS.F602	2 × 30°	3 × 2°
BS.F802	2 × 30°	3 × 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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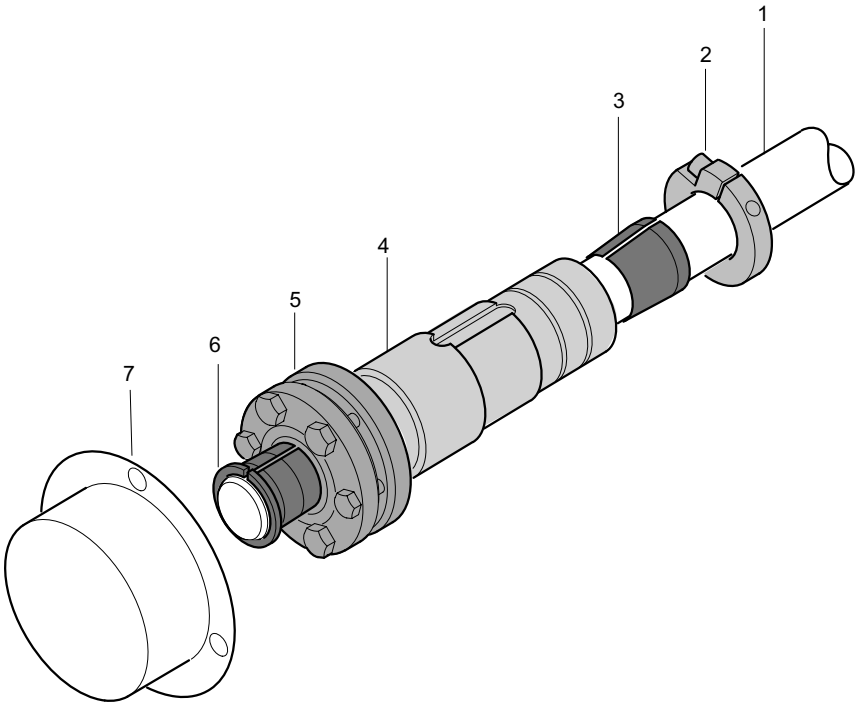
6.6 TorqLOC® mounting system for gear units with hollow shaft

6.6.1 TorqLOC® description

The TorqLOC® hollow shaft mounting system is used for achieving a non-positive connection between the customer shaft and the hollow shaft in the gear unit. This makes the TorqLOC® hollow shaft mounting system an alternative to the previous hollow shaft with shrink disk, hollow shaft with key, and splined hollow shaft.

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 safety cover
[4]	Hollow shaft in gear unit		

6.6.2 Advantages of TorqLOC®

The TorqLOC® hollow shaft mounting system is characterized by the following advantages:

- Cost saving as the customer shaft can be made from drawn material up to quality h11.
- Cost saving because different customer shaft diameters can be realized with one hollow shaft diameter and different bushings.
- Simple installation as there is no need to accommodate any shaft connections.
- Simple removal even after many hours of operation as 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 80 Nm to 8000 Nm.

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

- Parallel-shaft helical gear units in gear unit sizes 37 to 107 (FT37 – FT107)
- Helical-bevel gear units in gear unit sizes 37 to 107 (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 29 and 39 (WT29, WT39)

Available options

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

- For helical-bevel, helical-worm, and SPIROPLAN® gear units (KT.., ST.., WT.9..): Torque arm option (../T)
- For parallel-shaft helical gear units (FT..): Rubber buffer option (../G)

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6.7 Gear unit with flange block shaft

INFORMATION

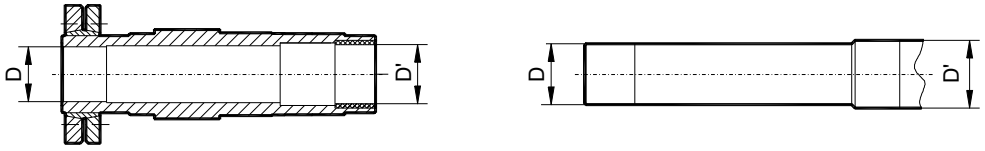
Only use screws in **strength class 12.9** to fasten the output elements onto the flange block shaft of the gear unit.

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

FH77CM3C71M with hollow shaft 50/52 mm

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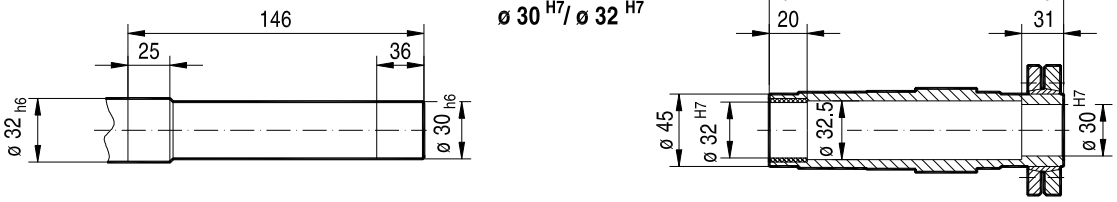
6.8.2 Parallel-shaft helical gear units with shouldered hollow shaft (dimensions in mm):

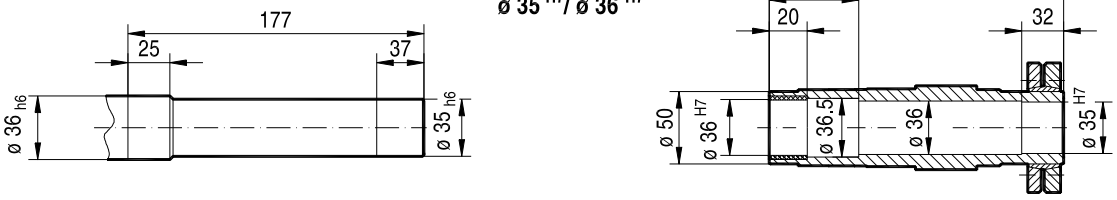
FH / FHF / FHZ37

ø 30 H7/ ø 32 H7



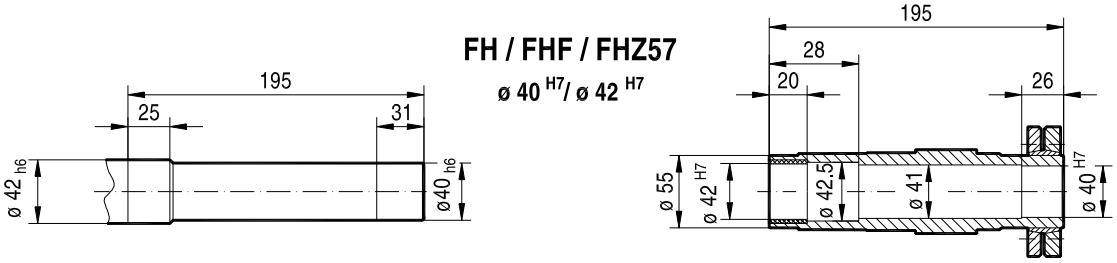
FH / FHF / FHZ47

ø 35 H7/ ø 36 H7



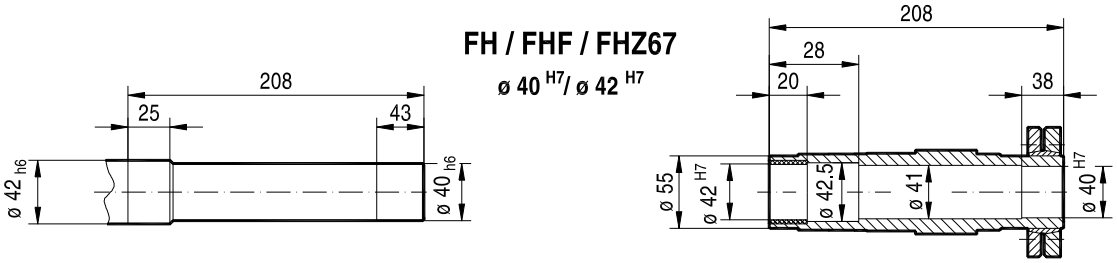
FH / FHF / FHZ57

ø 40 H7/ ø 42 H7



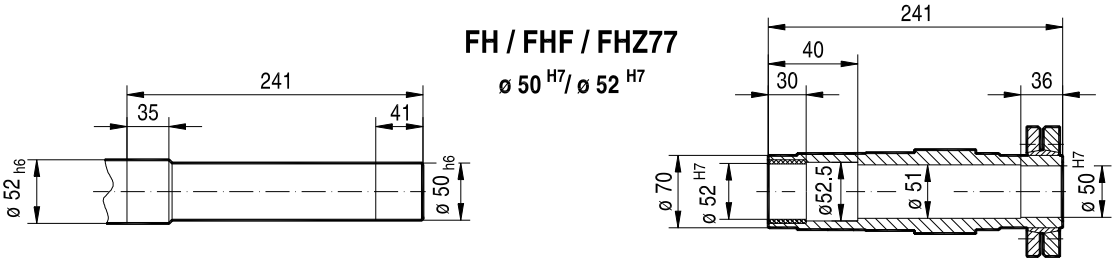
FH / FHF / FHZ67

ø 40 H7/ ø 42 H7



FH / FHF / FHZ77

ø 50 H7/ ø 52 H7



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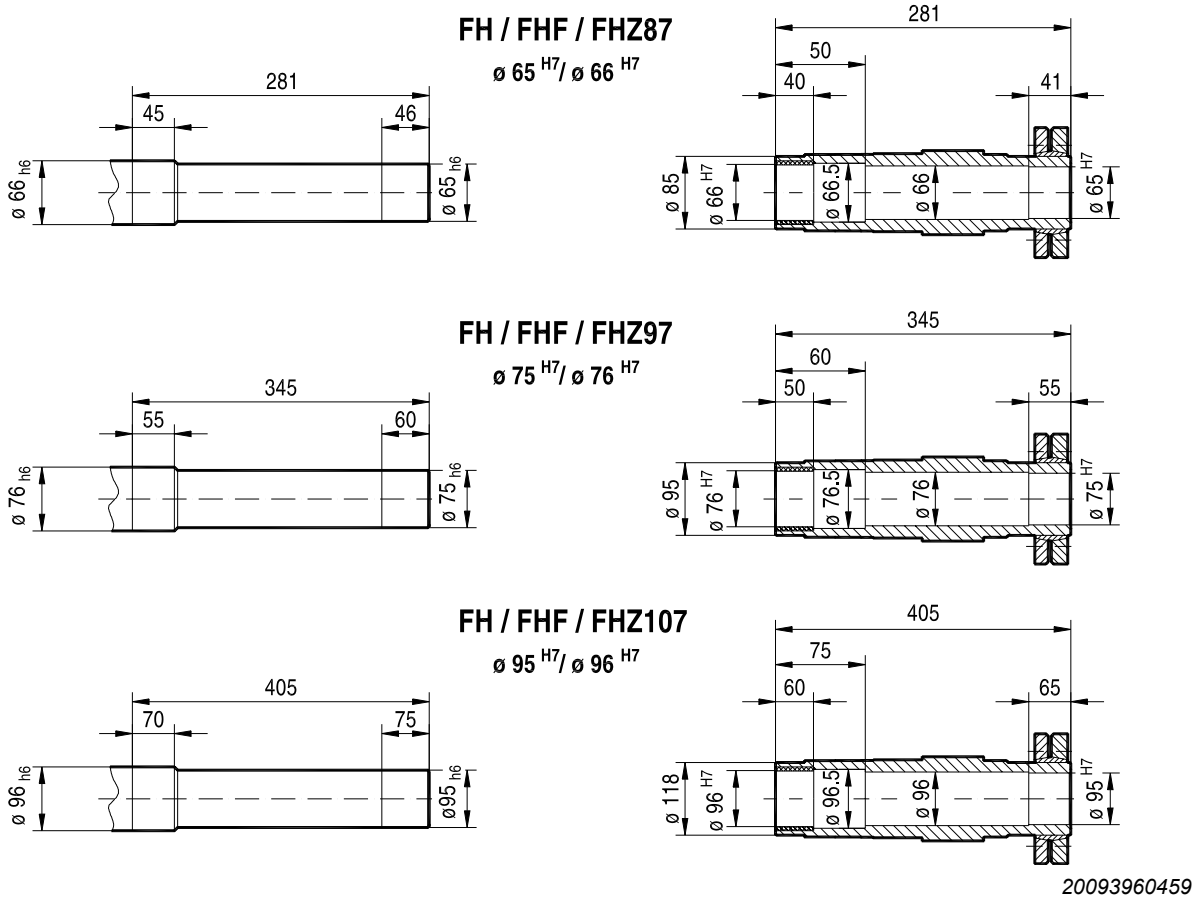

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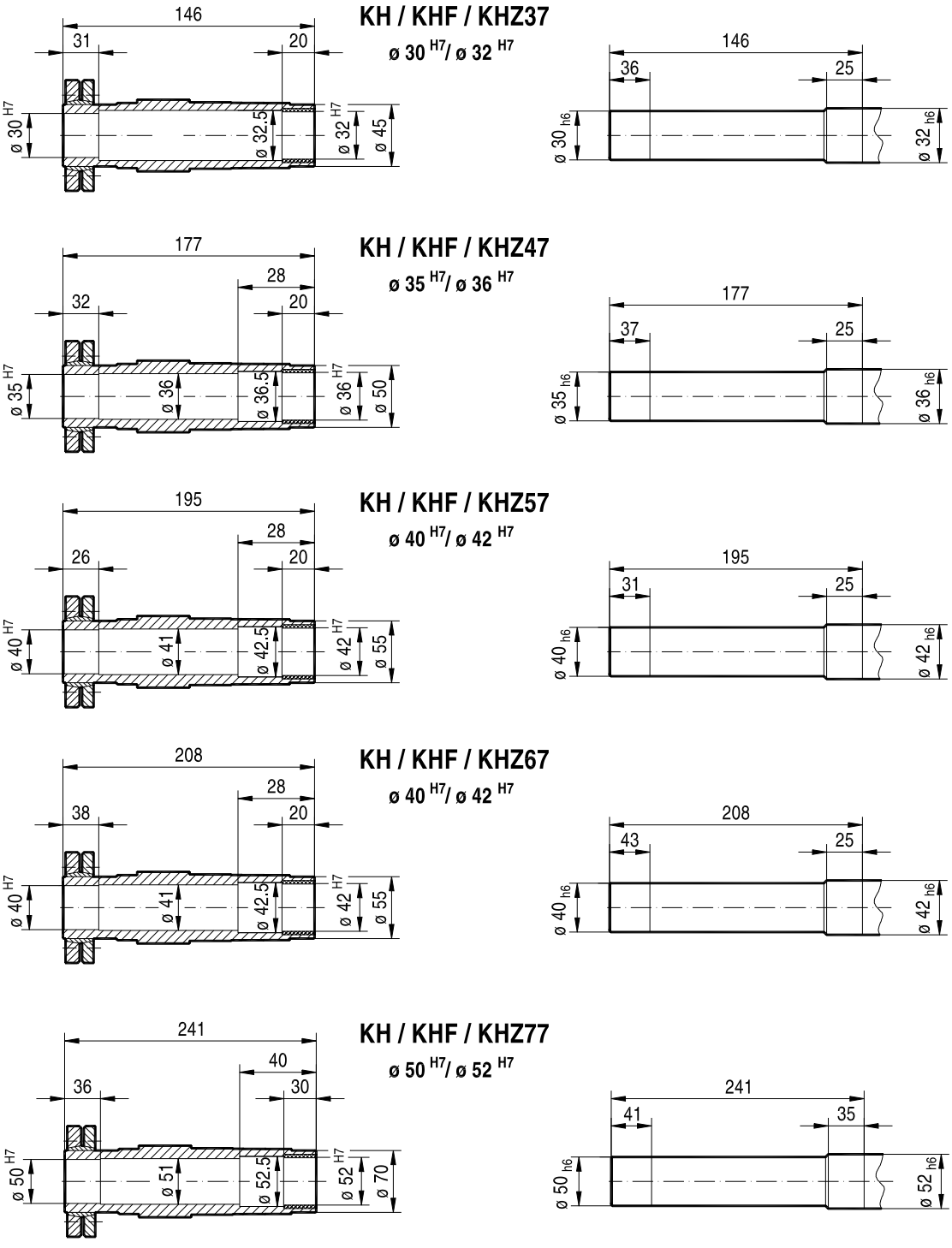
6.8.3 Helical-bevel gear units with shouldered hollow shaft (dimensions in mm):



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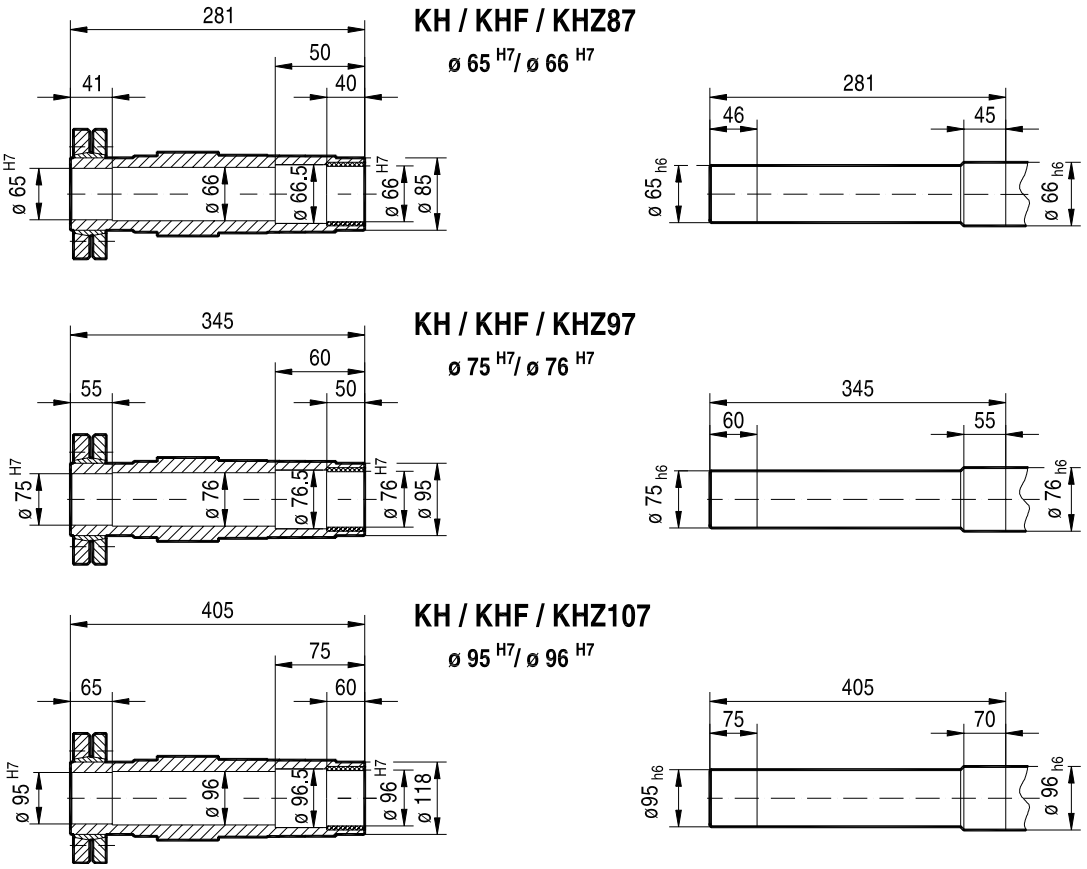
29133866/EN – 05/2021



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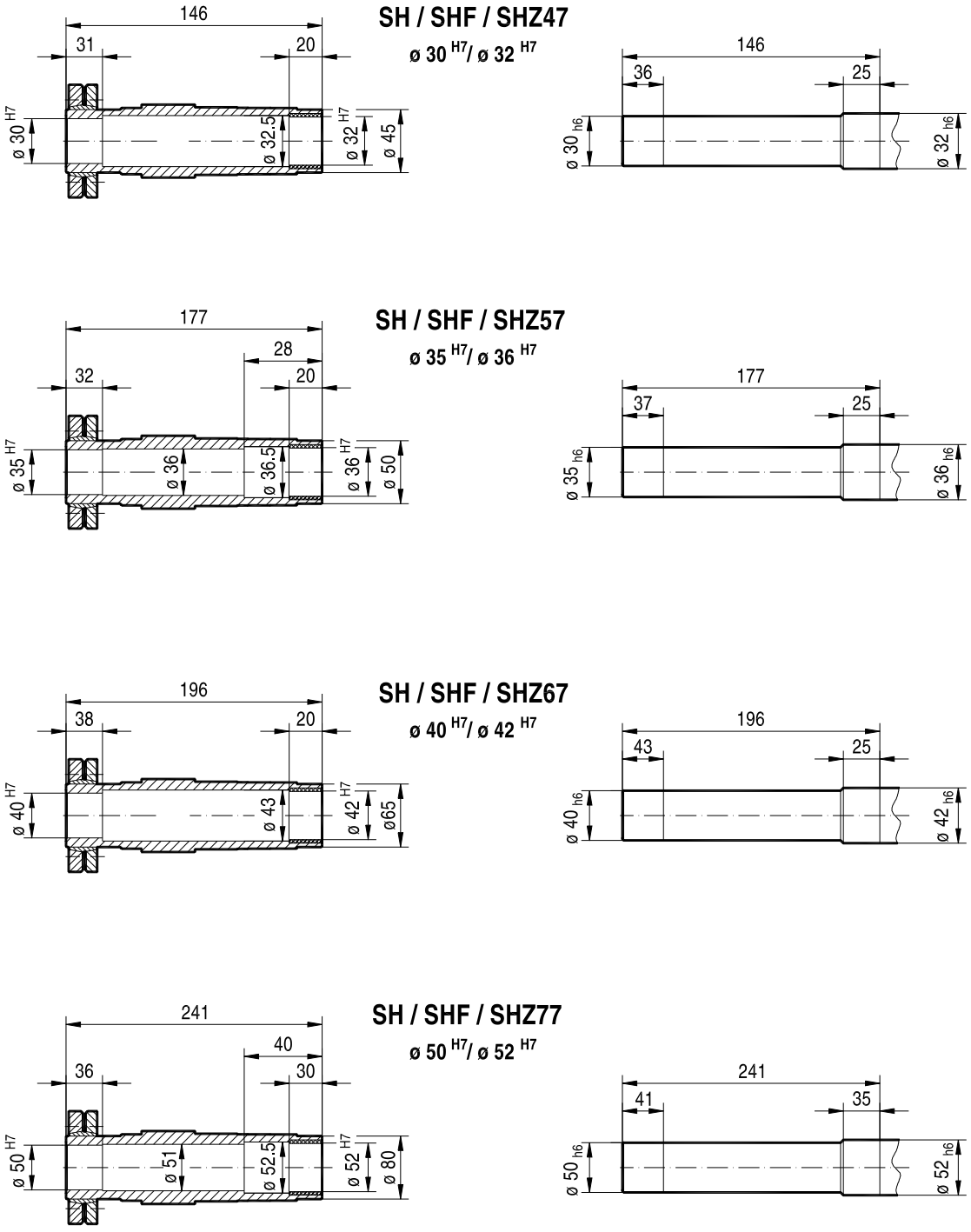
6.8.4 Helical-worm gear units with shouldered hollow shaft (dimensions in mm):



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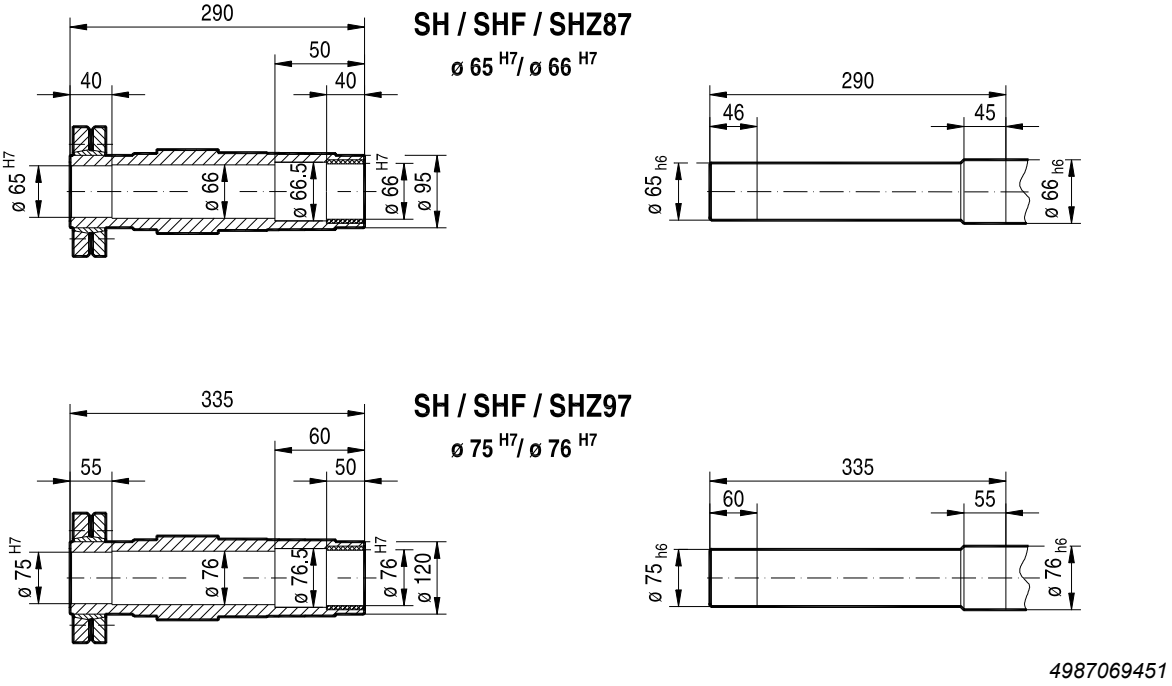

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6.9 Notes on stainless shrink disk or output shaft

Before using a stainless steel shrink disk or stainless steel output shaft, check if the ambient conditions, used chemicals and cleaning agents are compatible with the stainless steel material. For information on the material, refer to the order confirmation.

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6.10 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 units	Flange Ø mm	Strength class of the screws
RF37/R37F	120	10.9
RF47/R47F	140	
RF57/R57F	160	
FF/FAF77 KF/KAF77	250	
FM/FAM67, FM/FAM77 KM/KAM67, KM/KAM77	300	
FM/FAM87 KM/KAM87	350	
FM/FAM97 KM/KAM97	400	
RF147 FM/FAM107 KM/KAM107	450	
RF167 FM/FAM127 KM/KAM127	550	
FM/FAM157 KM/KAM157	660	
RZ37 – RZ87	60ZR – 130ZR	

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6.11 Torque arms

NOTICE

Danger due to static overdetermination if gear units with foot (e.g. KA19/29B, KA127/157B or FA127/157B) are mounted both via the torque arm and via the foot plate.

Risk of injuries and damage to property.

- The simultaneous use of the foot plates and the torque arm, especially for the KA.9B/T version, is not permitted.
- 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.

6.11.1 Standard torque arms

The following table lists the part numbers of all galvanized steel or gray cast iron torque arms available for shipment:

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

Gear units	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 units	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 units	Size	
	29	39
WA, WH, WT	10684115	10684107

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

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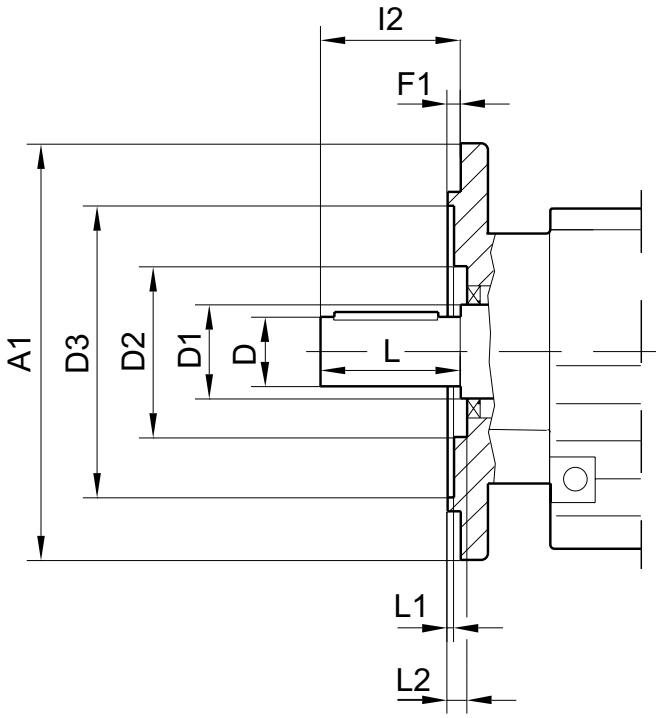
6.12 Flange contours of RF.. and R..F gear units



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
				RF	R..F					RF	R..F	
RF07, R07F	120	20	22	38	38	72	3	40	40	2	2	6
	140[1)]	20	22	38	-	85	3	40	40	2	-	6
	160[1)]	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[1)]	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[1)]	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[1)]	35	40	76	-	160	4	70	70	0.5	-	5.5

1) The flange contour protrudes from under the base surface.

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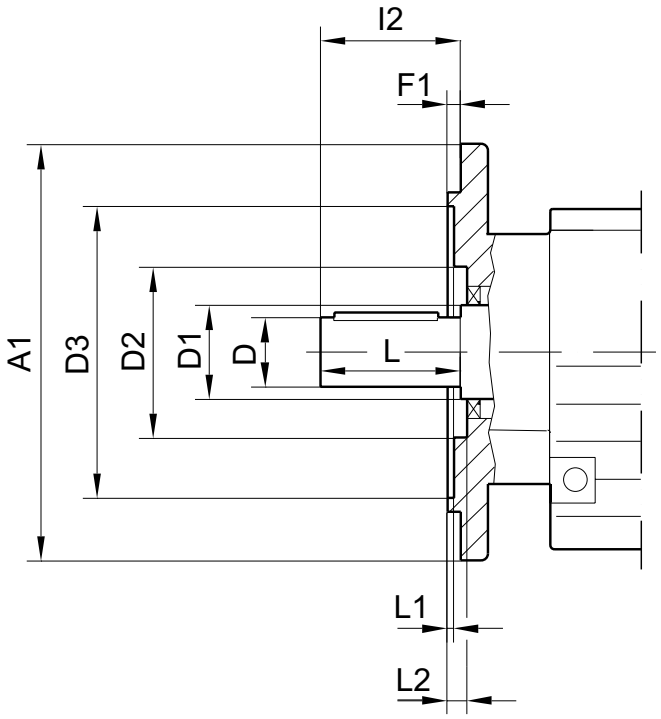

Check dimensions L1 and L2 for selection and installation of output elements.

Type	Dimensions in mm											
	A1	D	D1	D2		D3	F1	I2	L	L1		L2
				RF	R..F					RF	R..F	
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[1)]	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) The flange contour protrudes from under the base surface.

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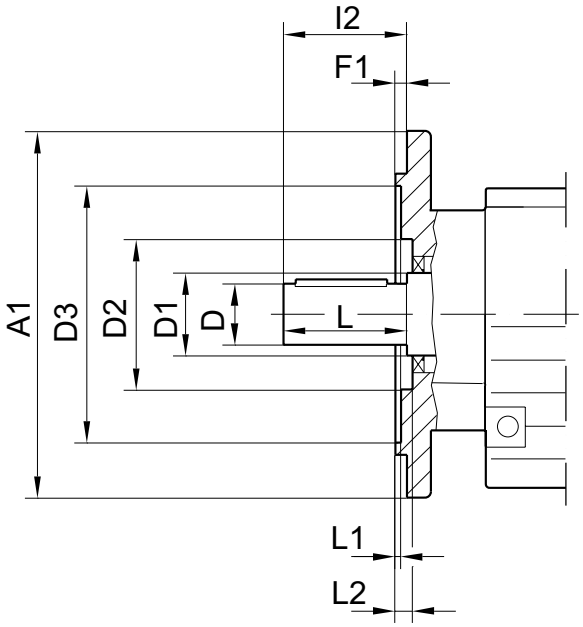
6.13 Flange contours of FF.., KF.., SF.. and WF.. gear units



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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

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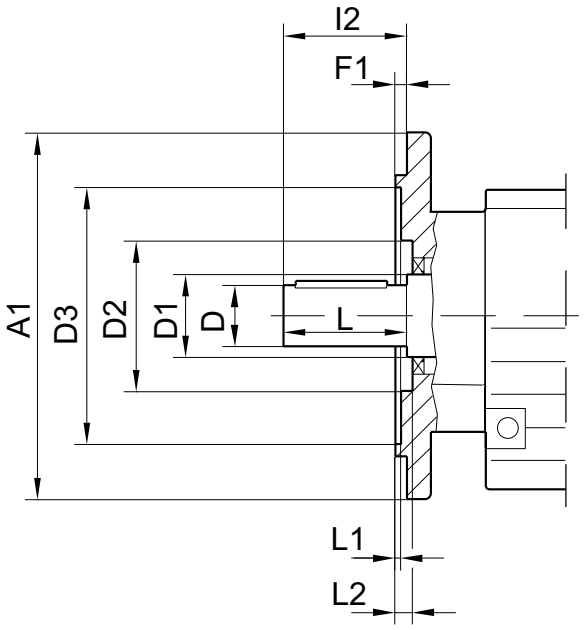

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Check dimensions L1 and L2 for selection and installation of output elements.

Type	Dimensions in mm									
	A1	D	D1	D2	D3	F1	I2	L	L1	L2
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
WF29	120	20	25	-	70	2.5	40	40	–	11.5
WF29	160	20	25	-	100	2.5	40	40	-	11.5
WF39	160	25	30	-	109	3.5	50	50	-	6.5
WF39	200	25	30	-	115	3.5	50	50	-	6.5

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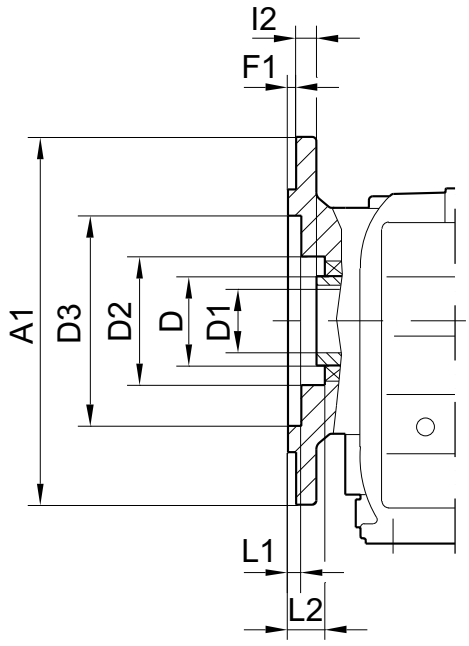
6.14 Flange contours of FAF.., KAF.., SAF.. and WAF.. gear units



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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

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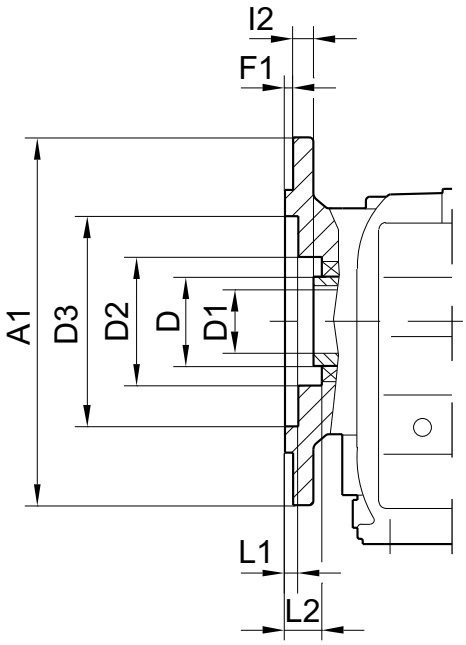

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Check dimensions L1 and L2 for selection and installation of output elements.

Type	Dimensions in mm								
	A1	D	D1	D2	D3	F1	I2	L1	L2
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
WAF29	120	30	20	60	70	2.5	25	9	25.5
WAF29	160	30	20	60	100	2.5	25	9	25.5
WAF39	160	40	25 / 30	-	105	3.5	33.5	-	6.5
WAF39	200	40	25 / 30	-	118	3.5	33.5	-	6.5

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6.15 Safety covers

6.15.1 Rotating safety cover

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 – 49 and 37 – 97
FH.., SH.., WH..	37 – 97 and W29/W39

Should you require a fixed plastic or metal safety cover for safety reasons, refer to the part numbers in the following chapters.

6.15.2 High fixed plastic safety cover

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

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

Should you require a high fixed plastic safety cover for other gear unit types or sizes for safety reasons, refer to the part numbers for ordering the cover in the following chapters.

6.15.3 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-protected gear units FH.., KH.., SH.., WH..	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.

6.15.4 Flat fixed plastic safety cover

The following gear unit types with hollow shaft can optionally be equipped with a flat fixed plastic safety cover:

Gear unit type	Sizes
FA.., FV..	27 – 97
KA..	19 – 49 and 37 – 97
KV..	37 – 97
SA..	37 – 97
WA..	29/39

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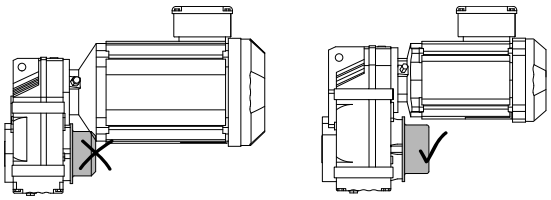
Should you require a flat fixed plastic safety cover for these gear unit types due to safety reasons, refer to the part numbers in the following chapters.

6.15.5 Motor mounting sizes and terminal box position with fixed safety cover

The size of the attached motor may be limited by the use of a high fixed safety cover for parallel-shaft helical gear units.



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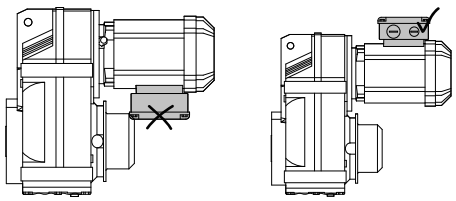

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INFORMATION

SEW-EURODRIVE recommends the terminal box position ≠ 90° for parallel-shaft helical gear units with high safety cover to simplify assembly and maintenance.

If necessary, check the configuration in the product configurator on the SEW-EURODRIVE website.

High fixed plastic safety cover

The following table shows the maximum possible motor mounting sizes, depending on the gear unit size, for a high fixed plastic safety cover:

Gear unit size	F..37	F..47	F..57	F..67	F..77	F..87	F..97
Maximum possible motor mounting sizes	71M	80M	90L	112M	132L	160L	180L

Fixed sheet metal safety cover

The following table shows the maximum possible motor sizes, depending on the gear unit size, for a high fixed sheet metal safety cover:

Gear unit size	F..37	F..47	F..57	F..67	F..77	F..87	F..97
Maximum possible motor mounting sizes	71M	71M	80M	100L	132L	160L	180L

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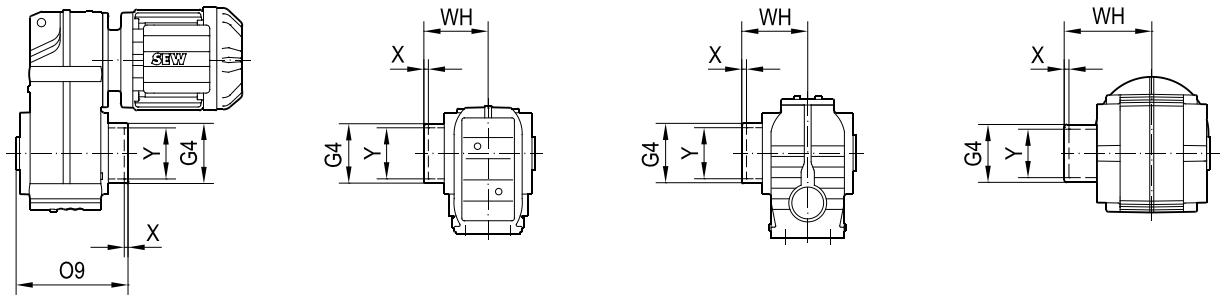
6.15.6 Part numbers and dimensions for high fixed plastic covers

00 002 00 18

FH../FA.. KH../KA.. SH../SA.. WH../WA..



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Parallel-shaft helical gearmotors	FH/FA ..27	FH/FA ..37	FH/FA ..47	FH/FA ..57	FH/FA ..67	FH/FA ..77	FH/FA ..87	FH/FA ..97
Part number	06435319	6435130	6435149	6435157	6435157	6435165	6435173	6435181
G4 in mm	58	78	88	100	100	121	164	185
O9 in mm	134	157	188.5	207.5	221.5	255	295	363.5
X in mm	0.8	2	4.5	7.5	6	6	4	6.5
Y in mm	56	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
WH 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
WH 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 for foot-mounted helical-bevel gear units with hollow shafts (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
WH 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 ..29	WH/WA ..39
Part number	10684158	10684166
G4 in mm	62	68
WH in mm	83	90
X in mm	2	4
Y in mm	50	60

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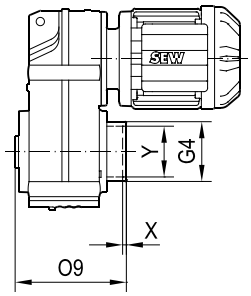
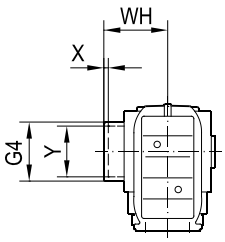
6.15.7 Part numbers and dimensions for fixed sheet metal safety covers

19 004 00 18

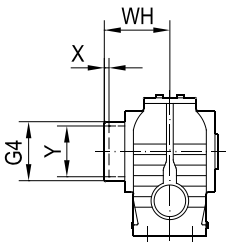
FT../FH../FA..



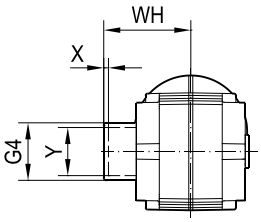
KT../KH../KA..



ST../SH../SA..



WT../WH../WA..



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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
O9 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/KH/KA ..39	KT/KH/KA ..49
Part number	10686320	10686339	10682651	10682964
G4 in mm	60	68	86	97
WH in mm	84.5	91.5	117.5	138
X in mm	1.5	1.5	1	1
Y in mm	50	60	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
WH 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 for foot-mounted helical-bevel gear units with hollow shafts (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
WH	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 ..29	WT/WH/WA ..39
Part number	10686320	29225086
G4 in mm	60	70
WH in mm	84.5	98
X in mm	1.5	1.5
Y in mm	50	67

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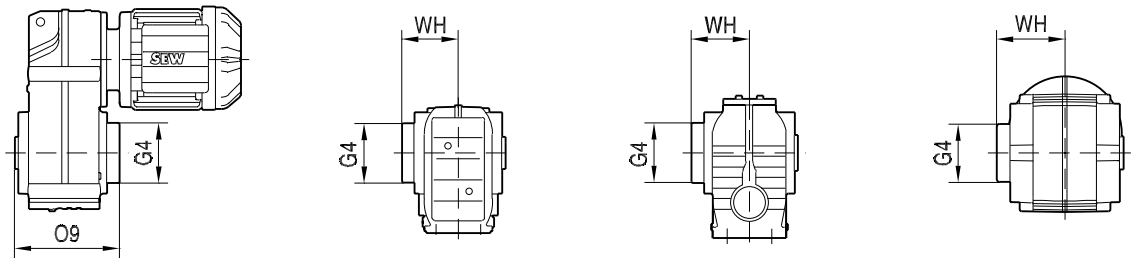
6.15.8 Part numbers and dimensions for flat fixed plastic covers

19 003 00 18

FA../FV.. KA../KV.. SA.. WA..



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Parallel-shaft helical gearmotors	FA/FV..27	FA/FV..37	FA/FV..47	FA/FV..57	FA/FV..67	FA/FV..77	FA/FV..87	FA/FV..97
Part number	10688684	10688293	10688390	10688498	10688498	10688595	10688692	10688781
G4 in mm	57.4	80.4	80.4	84.7	84.7	117.4	147.5	187.4
O9 in mm	111	134	163	179	193	223	251	313

Helical-bevel gearmotors	KA ..19	KA ..29	KA ..39	KA ..49
Part number	10688684	10688293	10688498	10688498
G4 in mm	57.4	80.4	84.7	84.7
WH in mm	63.2	73.5	90	90

Helical-bevel gearmotors[1)]	KA/KV..37	KA/KV..47	KA/KV..57	KA/KV..67	KA/KV..77	KA/KV..87	KA/KV..97
Part number	10688293	10688390	10688498	10688498	10688595	10688692	10688781
G4 in mm	80.4	80.4	84.7	84.7	117.4	147.5	187.4
WH in mm	72.5	87	95	101.5	116	131	161

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

Helical-worm gearmotors	SA ..37	SA..47	SA ..57	SA..67	SA..77	SA.. 87	SA..97
Part number	10687890	10688293	10688390	10688498	10688595	10688692	10688781
G4 in mm	57.4	80.4	80.4	84.7	117.4	147.5	187.4
WH in mm	68	72.5	87	95.5	116	135	155

SPIROPLAN® gearmotors	WA ..29	WA ..39
Part number	10688684	10688293
G4 in mm	57.4	80.4
WH in mm	63.2	73.5

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6.16 Technical data of condition monitoring

6.16.1 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		

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Designations and part numbers

Designation	Description	Part number
DUO10A	Evaluation unit (basic device)	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.

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

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

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

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Complete adapter for PT1000 sensor	Part number
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

6.16.2 Information on the /DUV40A vibration monitoring system

Scope of delivery

- Vibration SmartCheck unit with integrated SmartWeb software
- Vibration SmartCheck and SmartWeb documentation on CD-ROM
- SmartUtility Light software with user documentation on CD-ROM

Technical data

DUV40A (Diagnostic Unit Vibration)	
Housing	Glass fiber reinforced plastic
Fastening	Hexagon socket head screw M6 × 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
Voltage supply	DC 11 – 32 V or Power over Ethernet (PoE) based on 802.3af Mode A
Size	44 mm × 57 mm × 55 mm
Weight	Approx. 210 g
Degree of protection	IP 67
Operating system	Embedded Linux
Software	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 to 10 kHz Measuring range ±50 g

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Internal sensor technology	
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, rotational speed and frequency tracking

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-defined characteristic values are available.

Signal processor	
Frequency resolution	1600, 3200, 6400, or 12800 lines
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 (only envelope)	750 Hz, 1 kHz, 2 kHz (other filters on request)

Memory	
Program and data	64 MB RAM, 128 MB flash

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)

Interfaces	
Control elements	2 capacitive pushbuttons (learning mode, alarm reset, restart, factory settings)
Display elements	1 LED to display status and alarm 1 LED to acknowledge the pushbuttons 2 LEDs to display communication
Communication	Ethernet 100 Mb/s OPC UA (server) available with additional license
Electrical connections	3 polarity reversal-protected M12 plug connectors for supply, input/outputs and Ethernet

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Part numbers

	Description	Part number
Sensor	DUV40A (Diagnostic Unit Vibration)	19175892
Cables	Voltage supply cable 8-pin 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
Cables	Power/Ethernet/I-O signals in 10m and 20m	

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

	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

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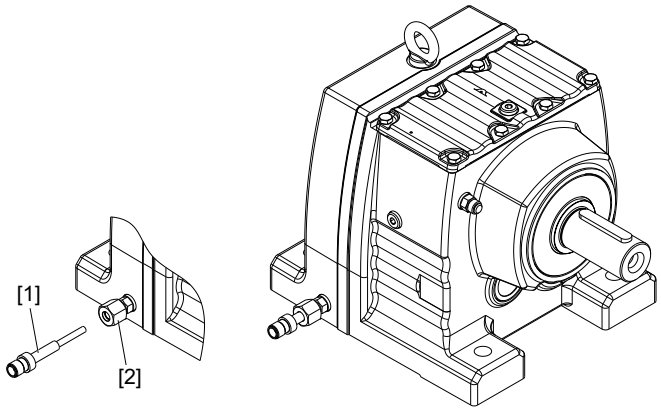
6.17 PT1000 temperature sensor

The optional PT1000 temperature sensor (part number 13438816) is used for continuously measuring the oil temperature of the gear unit.



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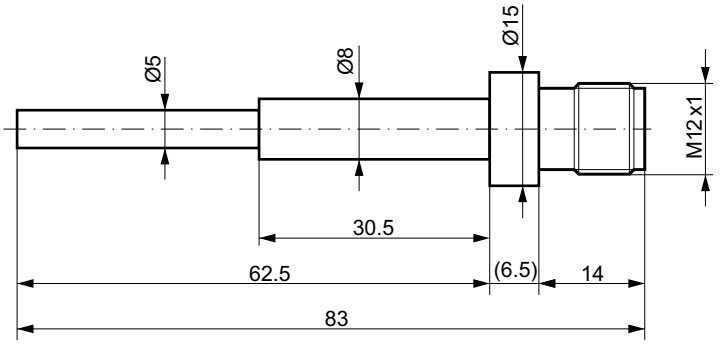
[1] Temperature sensor
[2] Adapter screw fitting

The temperature sensor [1] is delivered in mounted condition. It is attached to the gear unit by means of an adapter screw fitting [2] in the corresponding screw plug bore.

For using the temperature sensor in potentially explosive areas, observe the corresponding information in the "Explosion-Protected Gear Units" assembly and operating instructions (Mechanical installation → Optional equipment).

6.17.1 PT1000 dimension drawing



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6.17.2 PT1000 technical data

Technical Data	Value
Rod length	62.5 mm
Measuring range	-40 – 130 °C
Permitted oil temperature	-40 – 130 °C
Accuracy	± (PT1000 + 0.2 K)
Measuring element	1 × PT1000 to DIN EN 60751, class B, 4-wire connection
Dynamic response T05/T09 (s)	3/8 to DIN EN 60751

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Technical Data	Value
Ambient temperature	-25 – 80 °C
Degree of protection, protection class	IP67, III
Housing materials	V4A (1.4404)
Materials in contact with the medium	V4A (1.4404)
Port	M12 plug-in connection; gold-plated contacts

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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

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

K107, M_{aDyn} Nm			8000 Nm
		CM3C..	
i	100S	100M	100L
		3	
7.35		670	840
8.69	475	765	1000
9.94	540	900	1140
11.73	640	1030	1350
13.43	730	1120	1540

[5] [6]

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[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_{aDyn} of the drive in Nm ($M_{aDyn} = M_{apk} \times i \times \eta$)

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

K107, m kg			8000 Nm
		CM3C..	
s	100S	100M	100L
3	280	280	290
KF: + 12 kg / KA: + -27kg / KAF: + -3.2 kg			

[7] [8]

33374091531

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

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CM3C..				c_{TG}				φ
	i	n_{epk} 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

i Gear unit ratio
n_{epk} 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 '

CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aEmergOff}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg × m^2	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	10 000	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_{amax} Maximum permitted output torque for continuous duty
M_{apk} Maximum permitted output torque for short-time duty
$M_{aEmergOff}$ Maximum permitted output emergency-off torque, max. 1000 emergency stops
n_{ak} Breakpoint speed (output)
J_G Mass moment of inertia of the gear unit with reference to the input shaft
F_{R_amax} Maximum permitted overhung load at the output shaft for continuous duty, load application point is the center of the shaft end
F_{Rapk} 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" (→ 🗎 57)) 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" (→ 🗎 57)). 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]

BSF502, M_{aDyn} Nm					CM3C..			320 Nm
i	71S	71M	71L	80S	80M	80L	100S	100M
				2				
3.00						193	161	225
4.00	73	107	158	118	176	255	210	300
6.00	110	161	235	178	260	385	320	>410
8.00	147	210	315	235	350			
10.00	177	255	>375	285	>375	>375	>375	>375

[5] [6]

33374998923

[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_{aDyn} of the drive in Nm ($M_{aDyn} = M_{apk} \times i \times \eta$)

INFORMATION

For fields marked with ">...", M_{aDyn} is set to the maximum permitted torque in M_{apk} in short-time duty because the motor could overload the gear unit. The motor current I_{max} must be limited at startup.

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

BSF502, m kg					CM3C..			
s	71S	71M	71L	80S	80M	80L	100S	100M
2	34	35	38	38	40	45	44	47
BSBF: + 0.40kg /BSHF: + - 1.0 kg								

[7] [8]

33375007499

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

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CM3C..				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	-

i Gear unit ratio
n_{apk} 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 heating depending on the mounting position
φ Rotational clearance (/R = reduced rotational clearance, /M = minimized rotational clearance), specified in angular minutes '

CM3C..							c_T			F_{Ramax}		F_{Rapk}	
n_e = 1500	i	M_{amax} Nm	M_{apk} Nm	$M_{aEmergOff}$ 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	11 800	14400

i Gear unit ratio
M_{amax} Maximum permitted output torque for continuous duty
M_{apk} Maximum permitted output torque for short-time duty
$M_{aEmergOff}$ Maximum permitted output emergency-off torque, max. 1000 emergency stops
n_{ak} 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_{Ramax} Maximum permitted overhung load at the output shaft for continuous duty, load application point is the center of the shaft end
F_{Rapk} 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" (→ 🗎 57)) 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" (→ 🗎 57)). 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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7.2 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

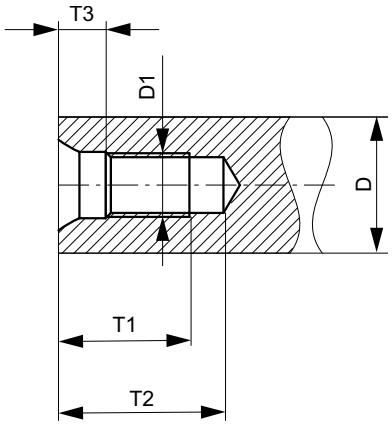
Foot-mounted gear units: Check the mounted motor because it might project below the mounting surface.

Shaft ends

Diameter tolerance:

Ø	≤ 50 mm	→ ISO k6
Ø	> 50 mm	→ ISO m6

Center holes according to DIN 332, shape DR:



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D	D1	T1 +2/0	T2 min	T3 +1/0
13 < D ≤ 16	M5	12.5	17	4
16 < D ≤ 21	M6	16	21	5
21 < D ≤ 24	M8	19	25	6
24 < D ≤ 30	M10	22	30	7.5
30 < D ≤ 38	M12	28	37	9.5
38 < D ≤ 50	M16	36	45	12

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D	D1	T1 +2/0	T2 min	T3 +1/0
50 < D ≤ 85	M20	42	53	15
85 < D ≤ 130	M24	50	63	18
130 < D ≤ 225	M30	63	85	20

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

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

For helical gear units, SPIROPLAN® gear units, AC (brake) motors and explosion-protected AC (brake) motors, up to 3 different flange dimensions are available per size. 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 eyes
	Lifting eyebolts	lifting eyes	
R..37 – R..57	—	X	—
R..67 – R..127	X	—	—

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Gear unit/motor type	Screw-on		Cast-on
	Lifting eyebolts	lifting eyes	lifting eyes
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..29/W..39	—	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 $R_z \leq 16$ µm
- Elastic limit of the customer shaft material R_e and/or $Rp_{0.2} \geq 305$ N/mm²
- Design of the customer shaft as solid shaft

For customer shafts designed 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 DIN 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.

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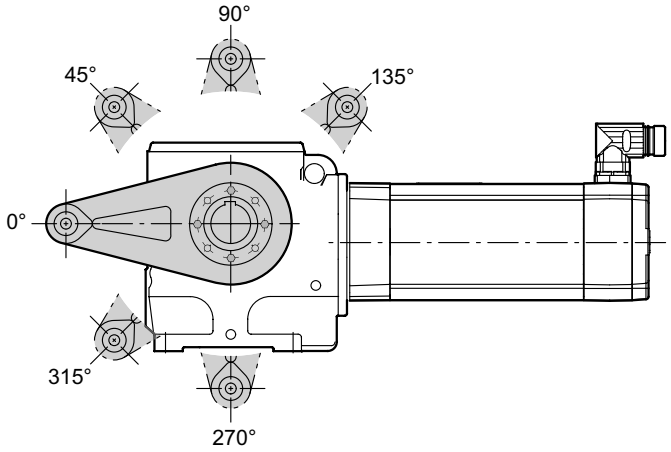
7.2.8 Torque arm position

The following illustration shows the possible torque arm positions for helical-worm gear units, 2-stage K..9 helical-bevel gear units, 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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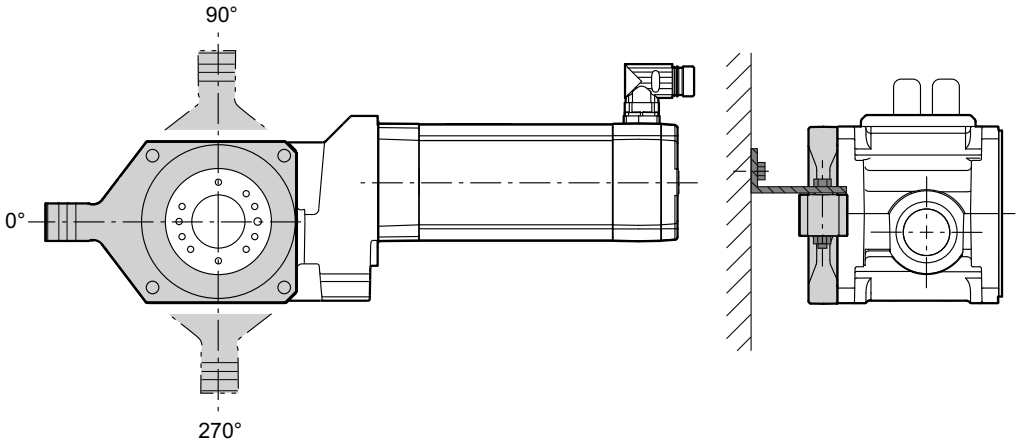
The following illustration shows the possible torque arm positions for BS.F gear units as well as the respective angles:



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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	(→ 🗎 370)
Helical-worm gearmotors	(→ 🗎 482)
SPIROPLAN® gearmotors	(→ 🗎 523)
BS.F helical-bevel gearmotors	(→ 🗎 541)

7.2.9 Tolerances and chamfers for flange block gear units

Inner centering	→ ISO H7
External centering	→ ISO h7

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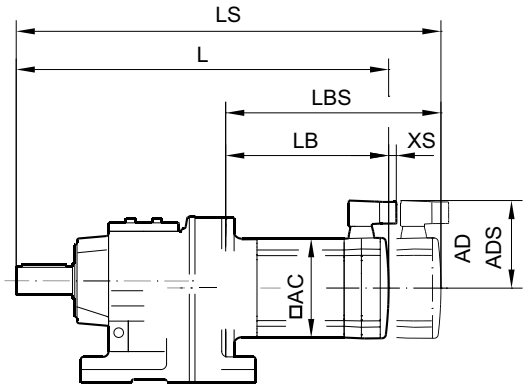
7.3 Gearmotor dimensions

7.3.1 Dimension designations of gearmotors

The dimensions of the gearmotors are described below:



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

INFORMATION

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

The specifications of the lengths for gearmotors with brake (LS/LBS) in the dimension sheets are only listed for motors with BK.. brake. For additional lengths for motors with BZ..(D) brake, refer to chapter "Dimensions for motors with BZ..(D) brake" (→ 🗎 191).

7.3.2 Dimensions for motors with BZ..(D) brake

The specifications of the lengths for gearmotors with brake (LS/LBS) in the dimension sheets are only listed for motors with BK.. brake.

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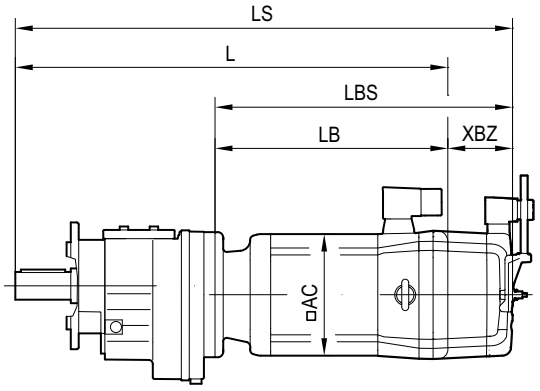
To obtain the lengths of the motors LBS with BZ.(D) brake, the length of the motor (LB) must be added to the corresponding extra length (XBZ, see table).



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Motor	XBZ additional length BZ..(D) brake mm
CM3C63	83 [1]
CM3C71	88
CM3C80	90
CM3C100	96

1) For CM3C63 motors with AK0H, EK1H or AK1H encoder, the additional length of 20 mm for the encoder is not required.

7.3.3 Motor options

The motor dimensions may change when installing motor options. Refer to the dimension drawings for the motor options in the "Synchronous Servomotors CM3C63 – CM3C100 Motors" catalog.

7.3.4 Special designs

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

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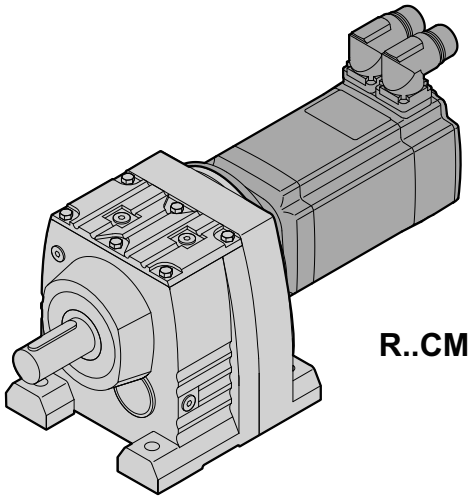
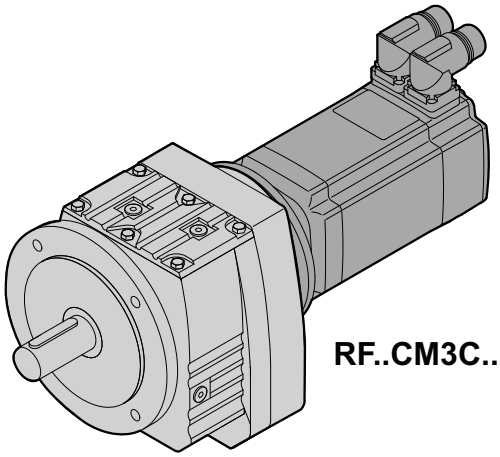
8 Helical gearmotors – R gear units

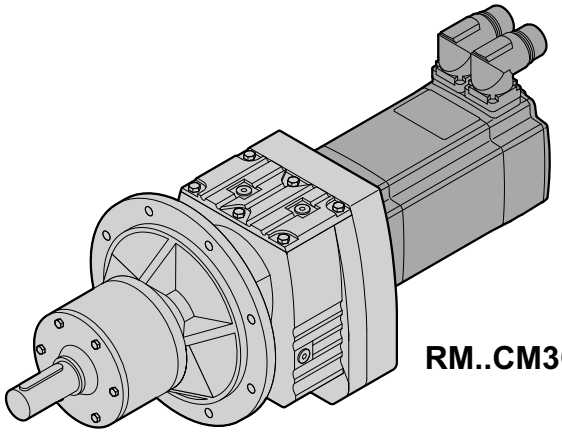
8.1 R../RX..CM3C.. designs



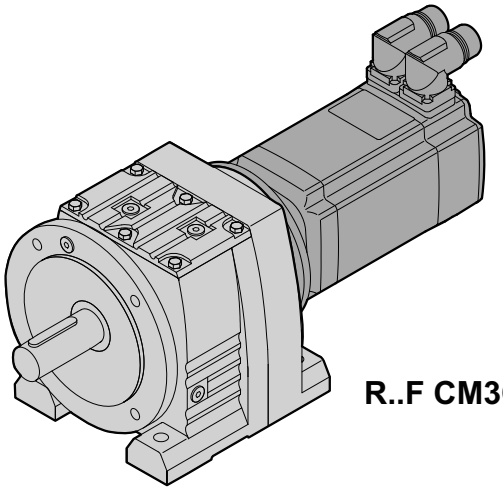
R..CM3C..



RF..CM3C..



RM..CM3C..



R..F CM3C..

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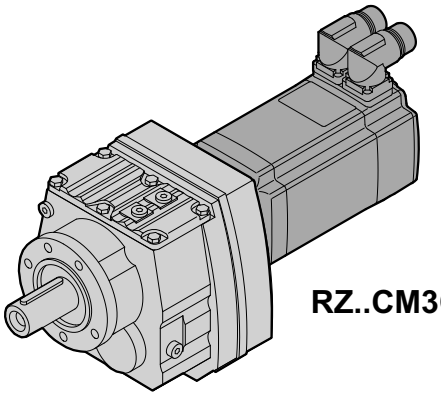
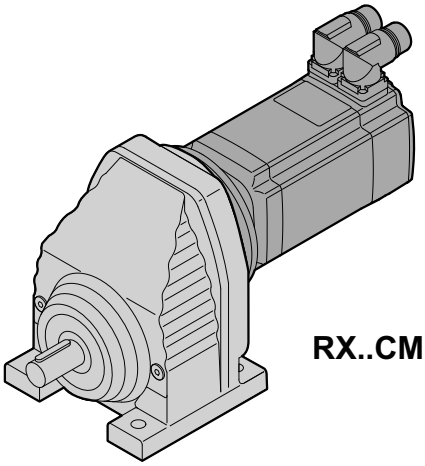
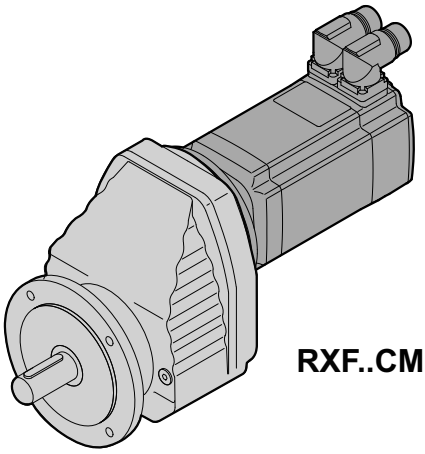


RZ..CM3C..



RX..CM3C..



RXF..CM3C..

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8.2 RX..CM3C.. selection tables and dimension sheets

8.2.1 RX57..

RX57, M_{aDyn} Nm											69 Nm
	CM3C										
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
					1						
1.30	10	18	24	24	36	53	40	59	87	72	>90
1.48	11	21	27	28	41	60	45	67	>90	82	>90
1.65	13	23	31	31	46	67	50	75	>90	>90	>90
1.92	15	27	36	36	53	79	59	88	>90	>90	>90
2.04	16	29	38	38	56	83	62	>90	>90	>90	>90
2.37	18	34	44	45	66	>90	73	>90			
2.64	20	38	49	50	73	>90	81	>90			
2.91	23	41		55							
3.14	24	45	59	60	87		>90				
3.55	28	51		67							
3.79	30	54		72							
4.35	34										
5.07											
5.50											

(→ 183)

RX57, m kg											
	CM3C										
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
1	13	14	16	15	17	20	20	22	27	26	30
RXF: + 1.9 kg											

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CM3C..				c_{TG}	
		n_{epk}	η	RX	RXF
	i	min^{-1}	%	Nm/'	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

CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	$J_G\ 10^{-4}$	RX	RXF	RX	RXF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N
RX57 1	1.30	63	90	107	1169	1.9	132	132	3940	3940
	1.48	68	90	116	1014	1.4	112	112	3950	3950
	1.65	69	90	117	1115	1.2	430	430	3960	3960
	1.92	69	90	117	1276	0.94	880	880	3970	3970
	2.04	69	90	117	1348	0.85	1070	1070	3970	3970
	2.37	69	90	117	1515	0.64	1500	1500	3980	3980
	2.64	69	90	117	1644	0.55	1810	1810	3980	3980
	2.91	67	90	114	1546	0.44	2170	2170	3980	3980
	3.14	65	90	111	1433	0.42	2320	2320	3990	3990
	3.55	69	90	117	1268	0.35	2420	2420	3990	3990
	3.79	69	90	117	1187	0.32	2480	2480	3990	3990
	4.35	68	90	116	1034	0.26	2640	2640	4000	4000
	5.07	36	54	61	888	0.21	3030	3030	4210	4210
	5.50	39	58	66	818	0.18	3100	3100	4190	4190

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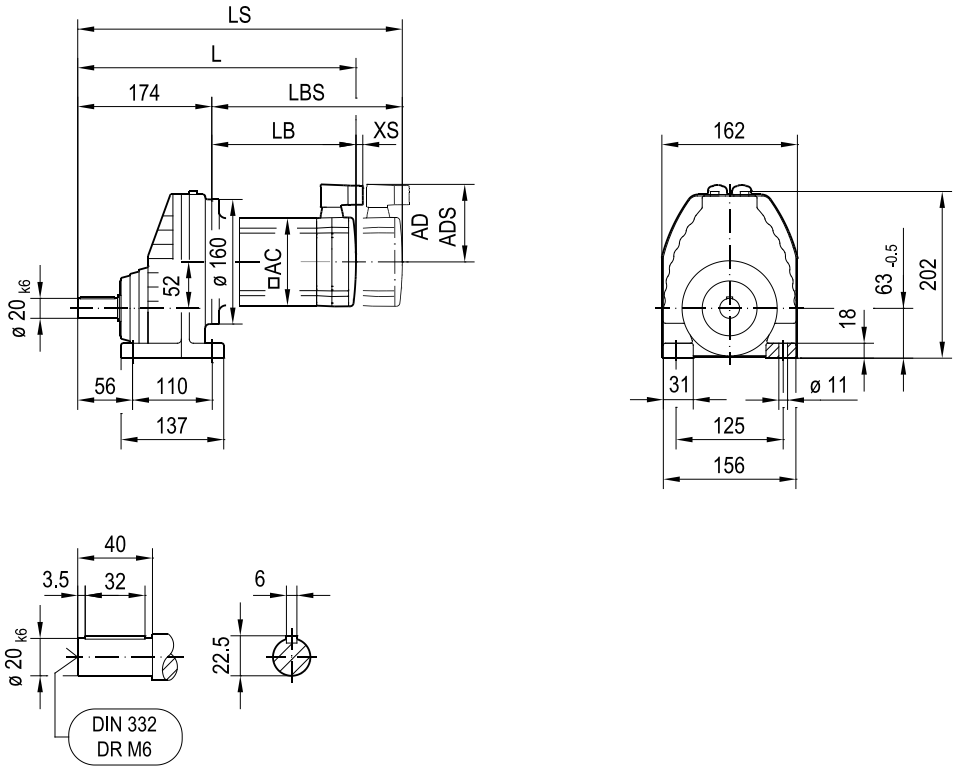
01 013 00 19

RX57..



(→ 📖 7.3)	CM3C										
	63S	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	318	356	394	355	377	422	387	413	466	417	445
LS	359	397	435	421	443	488	455	481	534	491	519
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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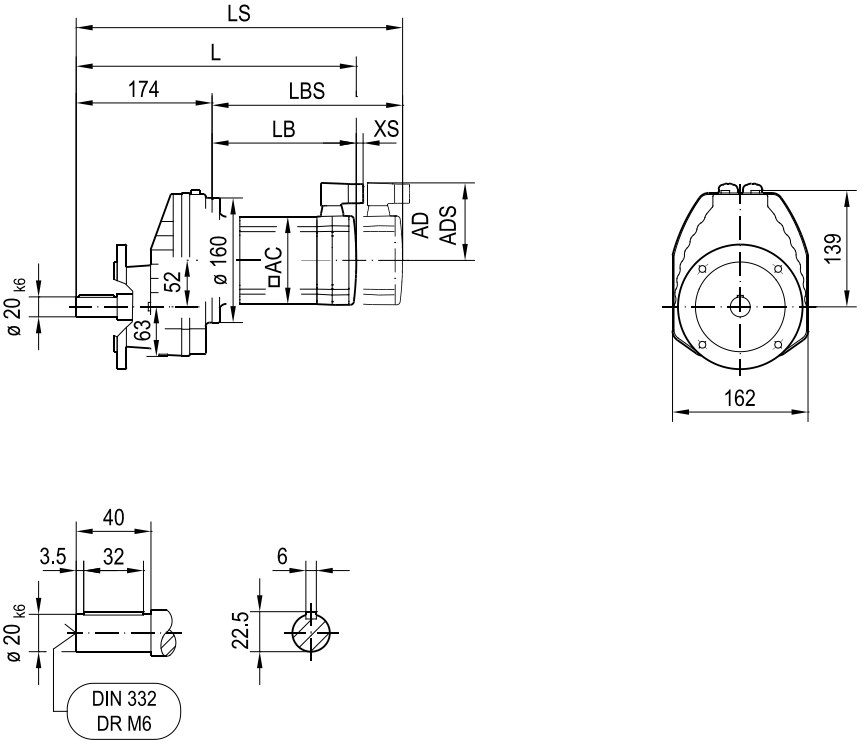
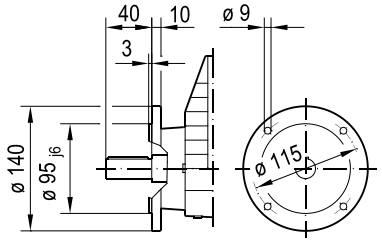
01 014 00 19

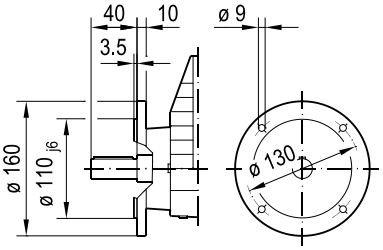
RXF57..



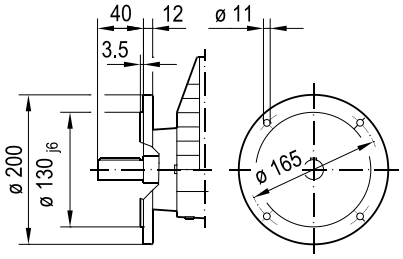
ø 140



ø 160



ø 200



(→ 📖 7.3)	CM3C										
	63S	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	318	356	394	355	377	422	387	413	466	417	445
LS	359	397	435	421	443	488	455	481	534	491	519
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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8.2.2 RX67..

RX67, M_{aDyn} Nm											134 Nm
	CM3C										
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
						1					
1.40	11	20	26	27	39	58	43	64	94	79	111
1.61	12	23	30	31	45	66	50	74	109	90	128
1.86	14	27	35	35	52	77	58	86	125	104	148
2.04	16	29	38	39	57	84	63	94	138	115	162
2.40	19	34	45	46	67	99	74	111	162	135	>163
2.54	20	36	48	49	71	105	79	117	>162	143	>162
2.89	22	41	54	55	80	118	89	132			
3.20	25	46	60	61	89	131	98	>142			
3.77	29	54	70	72	105		116				
4.30	34	61		82							
4.53	35	65		86							
5.18	41										
6.07											

(→ 183)

RX67, m kg											
	CM3C										
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
1	15	17	18	18	20	22	22	25	30	29	32
RXF: + 4.0 kg											

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CM3C..				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

CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	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	1100	3.2	205	205	5450	5450
	1.61	114	171	194	969	2.6	245	245	5380	5380
	1.86	126	187	210	828	2.1	225	225	5300	5300
	2.04	134	186	225	755	1.8	230	230	5310	5310
	2.40	123	163	205	1150	1.4	1530	1530	5460	5460
	2.54	118	162	200	1362	1.3	2000	2000	5470	5470
	2.89	106	142	180	1557	1.0	2640	2640	5590	5590
	3.20	100	142	170	1406	0.88	2800	2800	5590	5590
	3.77	87	130	148	1194	0.69	3090	3090	5660	5660
	4.30	80	109	136	1047	0.47	3300	3300	5770	5770
	4.53	82	110	139	993	0.42	3350	3350	5760	5760
	5.18	75	110	128	869	0.34	3580	3580	5760	5760
	6.07	43	64	73	741	0.28	4000	4000	5970	5970

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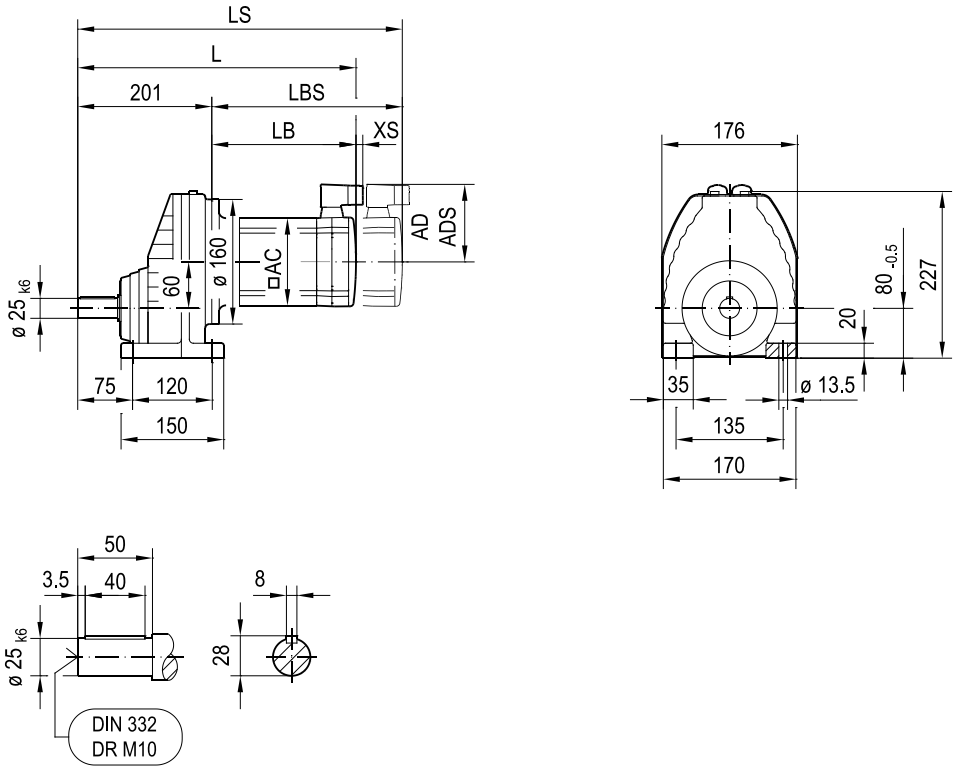
RX67..



(→ 📖 7.3)	CM3C										
	63S	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	345	383	421	382	404	449	414	440	493	444	472
LS	386	424	462	448	470	515	482	508	561	518	546
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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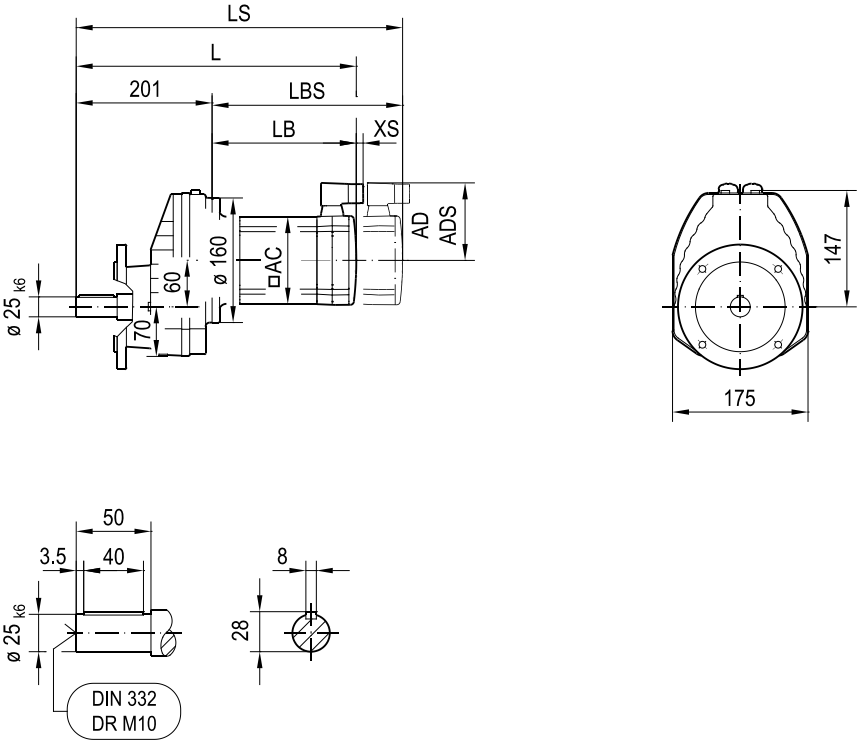
RXF67..



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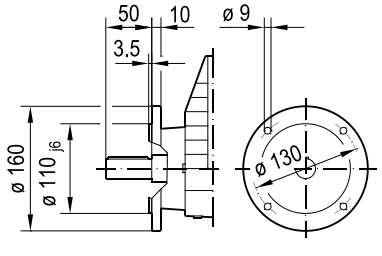

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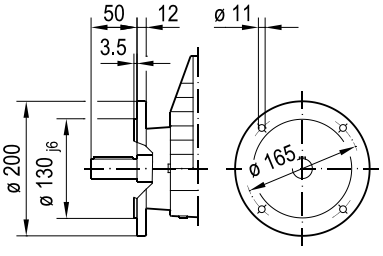

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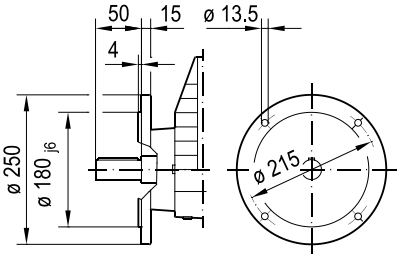

(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	345	383	421	382	404	449	414	440	493	444	472
LS	386	424	462	448	470	515	482	508	561	518	546
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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8.2.3 RX77..

RX77, M_{aDyn} Nm									215 Nm
	CM3C								
i	71S	71M	71L	80S	80M	80L	100S	100M	100L
					1				
1.42	27	39	58	43	65	95	79	111	166
1.67	32	47	69	52	77	113	94	132	198
1.88	36	53	78	58	87	127	106	149	220
2.13	41	60	88	66	98	144	120	169	250
2.43	46	68	101	75	112	164	137	193	285
2.70	52	76	112	84	125	182	152	210	
3.08	59	86	128	96	142	205	173	245	
3.25	62	90	133	100	149	215	181	255	
3.70	70	103	152	114	169				
4.04	77	112	166	124	185				
4.73	90	132		146					
5.35	102								
5.63	107								
6.41									
7.47									
8.00									

(→ 183)

RX77, m kg									
	CM3C								
s	71S	71M	71L	80S	80M	80L	100S	100M	100L
1	28	29	32	32	34	39	38	41	49
RXF: + 2.3 kg									

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CM3C..				c_{TG}	
		n_{epk}	η	RX	RXF
	i	min^{-1}	%	Nm/'	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

CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	RX	RXF	RX	RXF
	i	Nm	Nm	Nm	min^{-1}	kg×m^2	N	N	N	N
RX77 1	1.42	155	230	260	1120	7.6	240	240	10000	10000
	1.67	173	255	290	946	6.0	240	240	10000	10000
	1.88	187	280	315	840	5.0	255	255	10000	10000
	2.13	200	300	340	770	4.1	360	360	10000	10000
	2.43	215	305	365	687	3.4	425	425	10000	10000
	2.70	215	285	365	763	3.0	1030	1030	10000	10000
	3.08	193	260	325	1156	2.5	2490	2490	10000	10000
	3.25	182	260	305	1385	2.3	3140	3140	10000	10000
	3.70	153	215	260	1216	1.9	4280	4280	10000	10000
	4.04	143	210	240	1114	1.6	4490	4490	10000	10000
	4.73	123	184	205	951	1.3	4890	4890	10000	10000
	5.35	103	154	175	841	0.90	5240	5240	10000	10000
	5.63	110	165	187	799	0.81	5300	5300	10000	10000
	6.41	103	154	175	702	0.66	5600	5600	10000	10000
	7.47	53	79	90	602	0.53	6200	6200	10000	10000
	8.00	57	85	97	563	0.46	6330	6330	10000	10000

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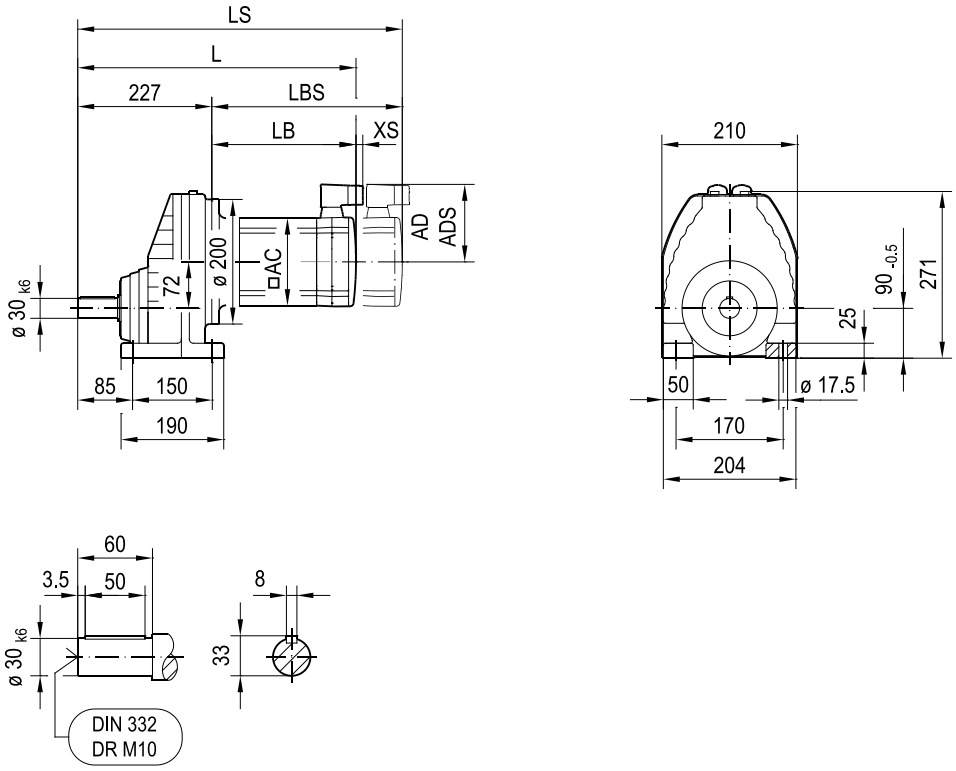
RX77..



(→ 📖 7.3)	CM3C								
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	400	422	467	432	458	511	458	486	543
LS	466	488	533	500	526	579	532	560	617
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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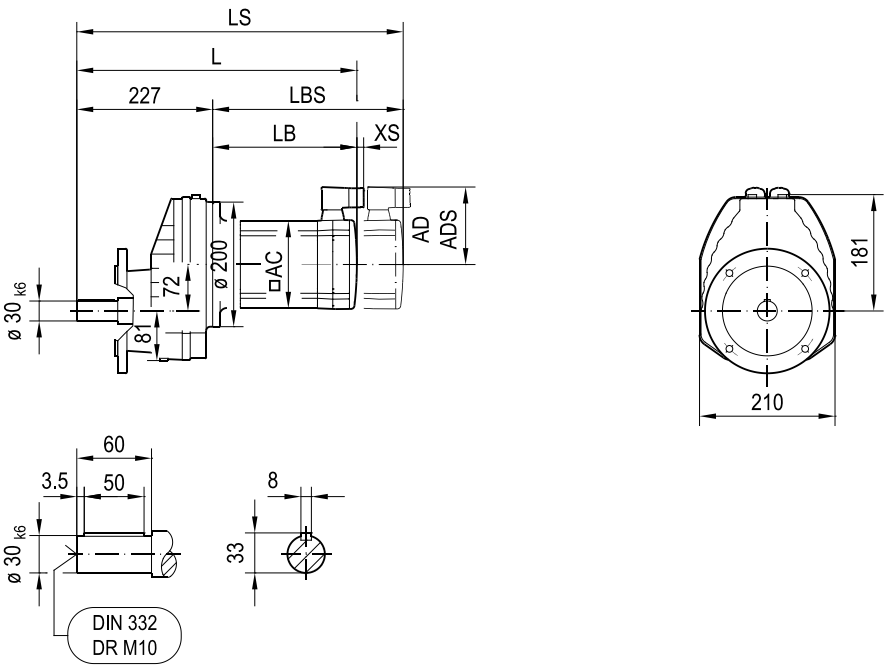
RXF77..



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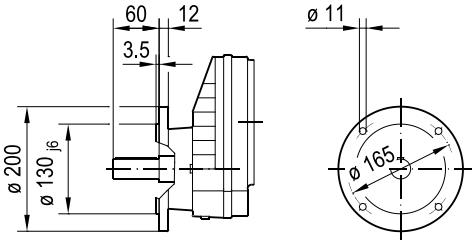

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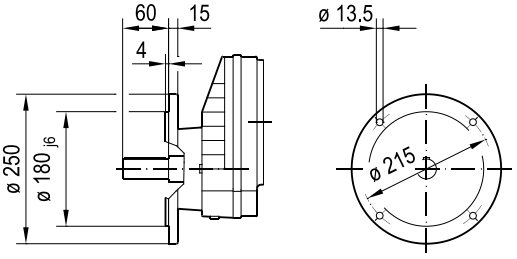

(→ 📖 7.3)	CM3C								
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	400	422	467	432	458	511	458	486	543
LS	466	488	533	500	526	579	532	560	617
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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8.2.4 RX87..

RX87, M_{aDyn} Nm									405 Nm
	CM3C								
i	71S	71M	71L	80S	80M	80L	100S	100M	100L
					1				
1.39						93	77	109	163
1.60		45	66	49	74	108	90	127	190
1.93		54	80	60	89	130	108	153	225
2.15	41	60	89	67	99	145	121	171	255
2.48	47	69	103	77	114	167	139	197	290
2.76	53	77	114	86	127	186	155	215	325
3.09	59	87	128	96	143	205	174	245	365
3.48	67	98	144	108	161	235	196	275	410
3.78	72	105	155	116	173	250	210	295	
4.50	85	125	185	138	205	300	250	350	
5.07	96	141	205	156	230				
5.56	106	155	225	171	255				
6.45	123	180		199					
7.20	137								
7.63	145								
8.65									

(→ 183)

RX87, m kg									
	CM3C								
s	71S	71M	71L	80S	80M	80L	100S	100M	100L
1	44	45	48	48	50	55	54	57	65
RXF: + 5.0 kg									

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CM3C..				c_{TG}	
		n_{epk}	η	RX	RXF
	i	min^{-1}	%	Nm/'	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

CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	RX	RXF	RX	RXF
	i	Nm	Nm	Nm	min^{-1}	kg×m^2	N	N	N	N
RX87 1	1.39	290	435	490	1029	25	74	74	12700	12700
	1.60	315	470	535	888	19	74	74	12500	12500
	1.93	355	530	600	762	15	185	185	12300	12300
	2.15	385	540	655	656	13	42	42	12300	12300
	2.48	405	540	685	633	11	470	470	12300	12300
	2.76	405	535	685	681	9.4	1200	1200	12400	12400
	3.09	405	540	685	731	8.1	2030	2030	12400	12400
	3.48	405	540	685	784	6.9	2810	2810	12400	12400
	3.78	305	455	515	1190	6.2	5050	5050	12700	12700
	4.50	290	435	490	1000	4.8	5520	5520	12800	12800
	5.07	250	375	425	888	3.9	5990	5990	13000	13000
	5.56	225	335	380	809	3.4	6330	6330	13000	13000
	6.45	192	285	325	698	2.7	6860	6860	13000	13000
	7.20	140	210	235	625	1.8	7380	7380	13000	13000
	7.63	149	220	250	590	1.6	7500	7500	13000	13000
	8.65	139	205	235	520	1.3	7890	7890	13000	13000

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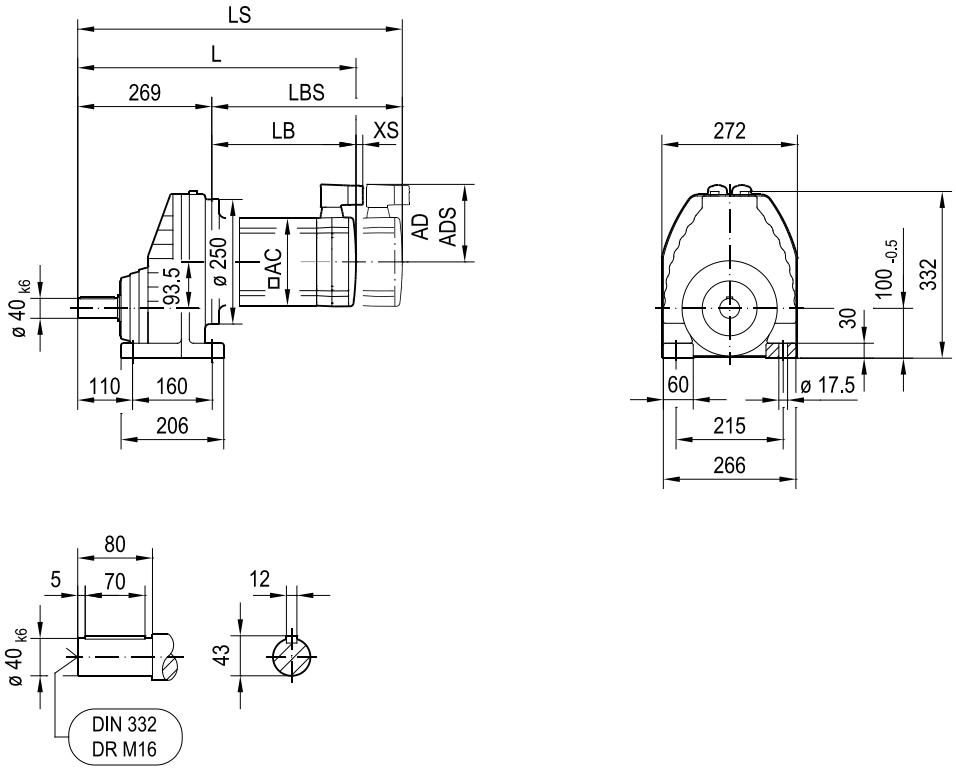
RX87..



(→ 📖 7.3)	CM3C								
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	438	460	505	469	495	548	495	523	580
LS	504	526	571	537	563	616	569	597	654
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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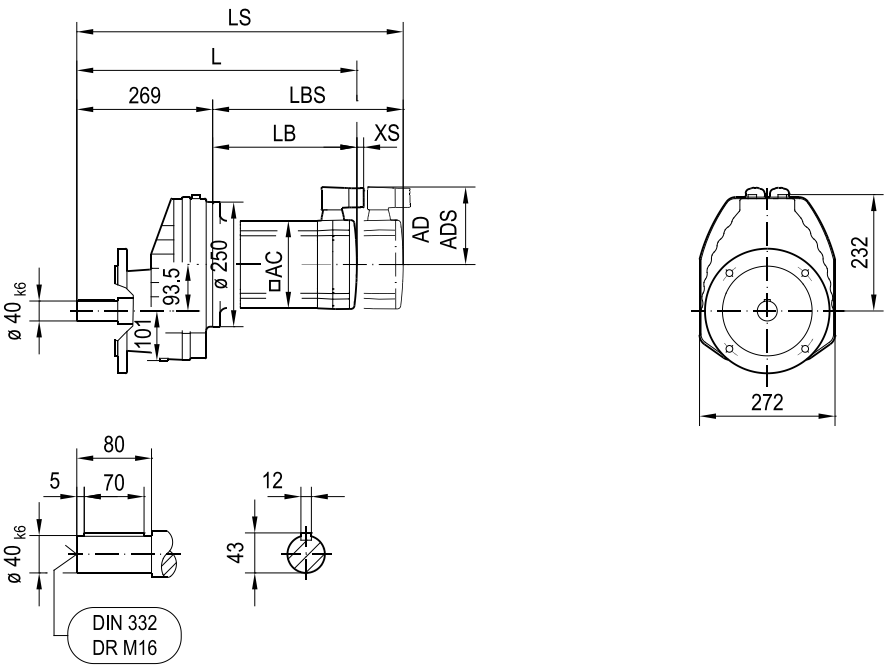
01 020 00 19

RXF87..



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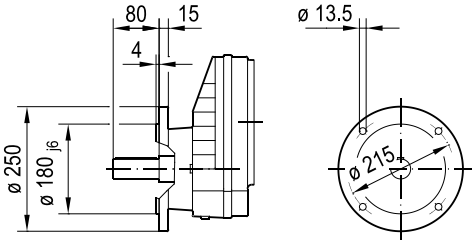

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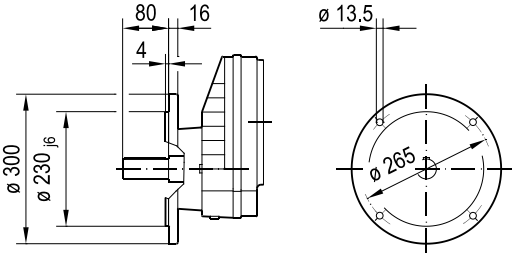

(→ 📖 7.3)	CM3C								
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	438	460	505	469	495	548	495	523	580
LS	504	526	571	537	563	616	569	597	654
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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8.2.5 RX97..

RX97, M_{aDyn} Nm						595 Nm
	CM3C					
i	80S	80M	80L	100S	100M	100L
			1			
1.42			95	79	111	166
1.64			109	91	129	192
1.96			131	109	154	230
2.24	69	103	151	126	178	265
2.64	82	122	178	148	210	310
2.92	91	135	197	164	230	345
3.30	102	152	220	186	260	390
3.64	113	168	245	205	285	430
4.04	125	187	270	225	320	475
4.52	140	205	305	255	355	535
4.91	151	225	325	270	385	
5.79	178	265	385	320	455	
6.56	200	300				
7.16	220	325				
8.23	250					

(→ 183)

RX97, m kg						
	CM3C					
s	80S	80M	80L	100S	100M	100L
1	71	73	78	77	81	88
RXF: + 8.6 kg						

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CM3C..				c_{TG}	
		n_{epk}	η	RX	RXF
	i	min^{-1}	%	Nm/'	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

CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	RX	RXF	RX	RXF
	i	Nm	Nm	Nm	min^{-1}	kg×m^2	N	N	N	N
RX97 1	1.42[1)]	455	680	770	1014	61	132	132	20000	20000
	1.64[1)]	505	755	850	860	51	51	51	20000	20000
	1.96	570	800	960	714	41	19	19	20000	20000
	2.24	595	800	1010	692	33	545	545	20000	20000
	2.64	595	800	1010	795	28	2020	2020	20000	20000
	2.92	595	800	1010	849	24	2890	2890	20000	20000
	3.30	595	800	1010	903	20	3820	3820	20000	20000
	3.64	595	800	1010	953	18	4610	4610	20000	20000
	4.04	595	800	1010	1007	15	5450	5450	20000	20000
	4.52	595	800	1010	996	13	6210	6210	20000	20000
	4.91	395	590	670	916	12	7240	7240	20000	20000
	5.79	420	630	710	777	9.2	7650	7650	20000	20000
	6.56	300	450	510	686	5.8	8510	8510	20000	20000
	7.16	260	390	440	628	5.1	8960	8960	20000	20000
	8.23	225	335	380	547	4.0	9570	9570	20000	20000

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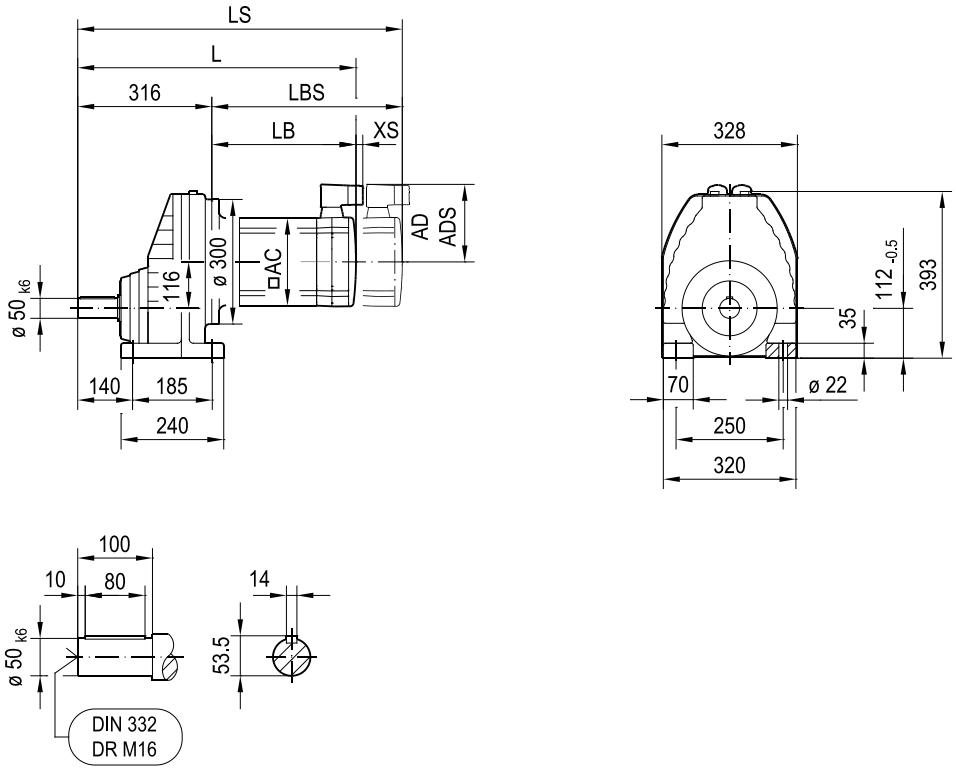
RX97..



(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	511	537	590	537	565	622		
LS	579	605	658	611	639	696		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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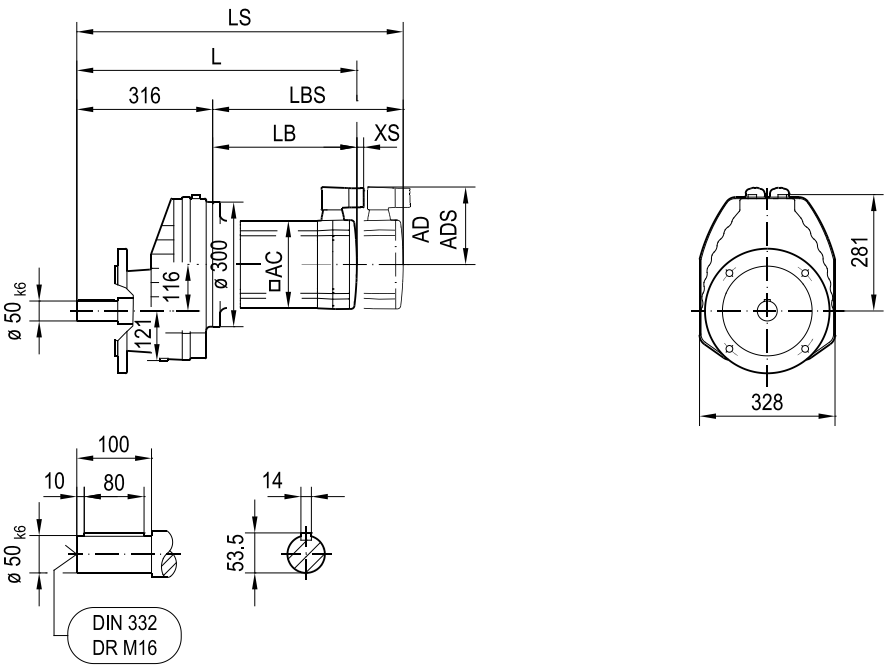
RXF97..



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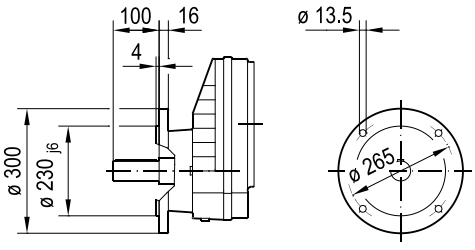
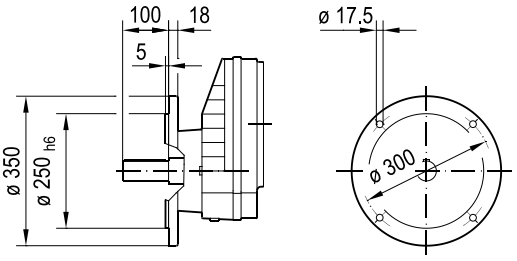


ø 350



(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	511	537	590	537	565	622		
LS	579	605	658	611	639	696		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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8.2.6 RX107..

RX107, M_{aDyn} Nm			830 Nm
	CM3C		
i	100S	100M	100L
		1	
1.44			169
1.71	95	134	200
1.95	108	153	225
2.30	128	181	270
2.64	148	210	310
3.07	173	240	360
3.38	190	265	400
3.81	210	300	450
4.20	235	330	495
4.65	260	370	550
5.19	290	410	615
5.61	310	440	
6.63	370	520	

(→ 183)

RX107, m kg			
	CM3C		
s	100S	100M	100L
1	110	110	120
RXF: + 17 kg			

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CM3C..				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

CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	RX	RXF	RX	RXF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N
RX107 1	1.44[1)]	645	960	1090	1042	111	315	315	30000	30000
	1.71[1)]	705	1050	1190	906	84	345	345	30000	30000
	1.95	765	1090	1300	805	70	420	420	30000	30000
	2.30	830	1110	1410	722	57	760	760	30000	30000
	2.64	830	1120	1410	792	47	1850	1850	30000	30000
	3.07	830	1130	1410	870	39	3300	3300	30000	30000
	3.38	830	1130	1410	920	34	4190	4190	30000	30000
	3.81	830	1140	1410	976	29	5260	5260	30000	30000
	4.20	830	1150	1410	1021	25	6140	6140	30000	30000
	4.65	695	1040	1180	968	19	7380	7380	30000	30000
	5.19	695	1040	1180	867	17	7780	7780	30000	30000
	5.61	455	680	770	802	15	9040	9040	30000	30000
	6.63	460	690	780	679	12	9660	9660	30000	30000

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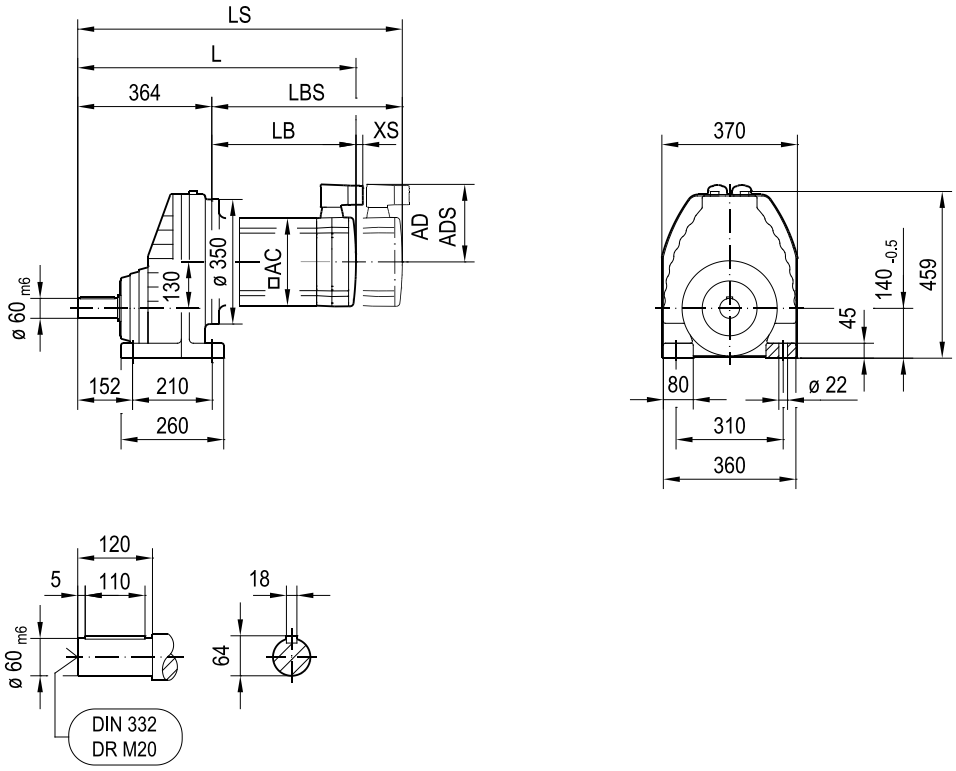
RX107..



(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	579	607	664					
LS	653	681	738					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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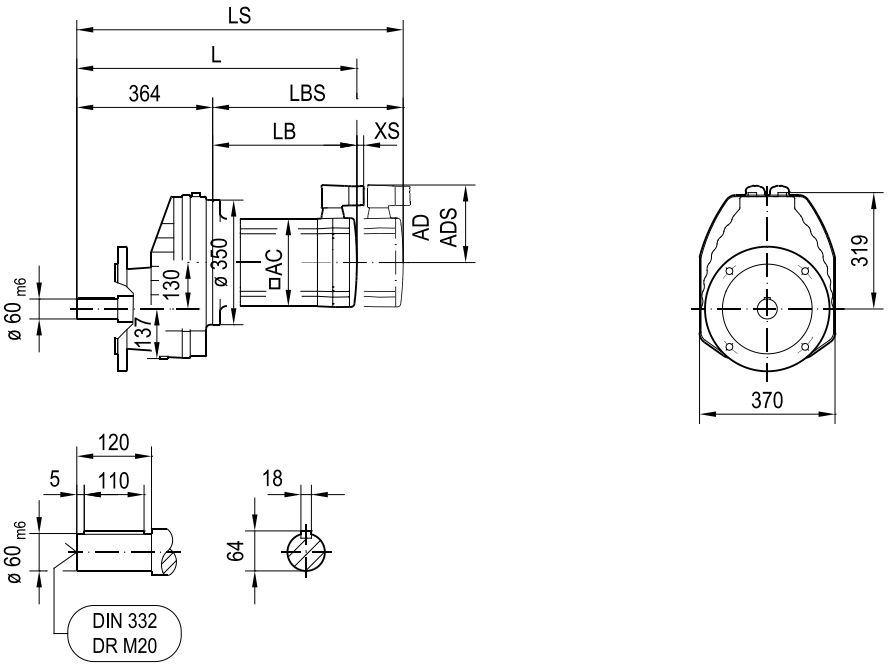
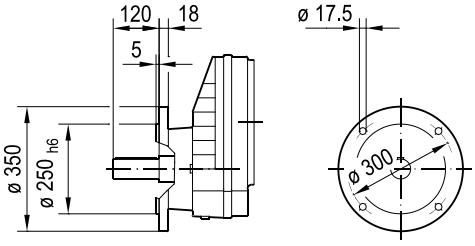
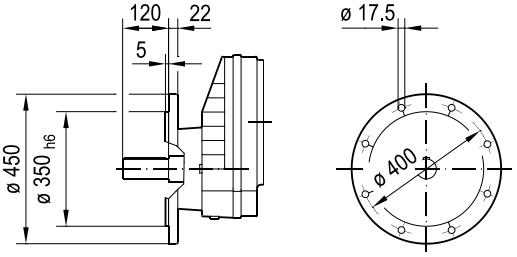
RXF107..



ø 350



ø 450



(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	579	607	664					
LS	653	681	738					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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8.3 R..CM3C.. selection tables and dimension sheets

8.3.1 R07..

R07, M_{aDyn} Nm	50 Nm
i	CM3C 63S
2	
3.21	25
3.68	28
3.95	31
4.57	35
4.92	38
5.76	45
6.83	
7.48	
7.85	>51
9.01	>51
9.67	>51
11.18	>51
12.06	>51
14.12	>51
16.73	
18.31	
3	
21.73	>51
23.32	>51
26.97	>51
29.08	>51
34.05	>51
38.51	>51
40.34	
41.31	>51
44.16	
47.78	>51
51.52	>51
60.32	>51
71.47	
78.24	

(→ 183)

R07, m kg	
s	CM3C 63S
2	5.5
3	5.7
RF: + - kg	

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CM3C..				c_{TG}		φ
		n_{epk}	η	R	RF	
	i	min^{-1}	%	Nm/'	Nm/'	'
R07 2	3.21	3872	97	2.8	2.7	41
	3.68	4439	97	2.8	2.7	40
	3.95	4500	97	2.8	2.7	40
	4.57	4500	97	2.8	2.7	39
	4.92	4500	97	2.8	2.7	38
	5.76	4500	97	2.8	2.7	38
	6.83	4500	97	2.8	2.7	38
	7.48	4500	97	2.8	2.7	38
	7.85	4500	96	3.9	3.7	28
	9.01	4500	96	3.9	3.7	27
	9.67	4500	96	3.9	3.7	27
	11.18	4500	96	3.9	3.7	27
	12.06	4500	96	3.9	3.7	27
	14.12	4500	96	3.9	3.7	27
	16.73	4500	96	3.9	3.7	26
	18.31	4500	96	3.9	3.7	26
R07 3	21.73	4500	93	4.1	3.9	29
	23.32	4500	93	4.1	3.9	29
	26.97	4500	93	4.1	3.9	29
	29.08	4500	93	4.1	3.9	29
	34.05	4500	93	4.1	3.9	29
	38.51	4500	91	4.1	3.9	28
	40.34	4500	92	4.1	3.9	29
	41.31	4500	91	4.1	3.9	28
	44.16	4500	92	4.1	3.9	29
	47.78	4500	90	4.1	3.9	27
	51.52	4500	90	4.1	3.9	27
	60.32	4500	90	4.1	3.9	27
	71.47	4500	89	4.1	3.9	27
	78.24	4500	88	4.1	3.9	27

CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	R	RF
	i	Nm	Nm	Nm	min^{-1}	kg×m^2	N	N	N	N
R07 2	3.21	31	46	53	564	0.24	495	415	1530	1250
	3.68	33	46	56	538	0.19	500	420	1530	1250
	3.95	34	46	58	514	0.17	505	425	1530	1250
	4.57	36	46	61	466	0.13	520	435	1530	1250
	4.92	37	46	63	445	0.12	530	445	1530	1250
	5.76	40	46	68	373	0.090	530	440	1530	1250
	6.83	43	46	73	316	0.070	535	450	1530	1250
	7.48	43	46	73	324	0.060	595	500	1530	1250
	7.85	49	51	83	176	0.20	645	585	1500	1220
	9.01	50	51	85	172	0.16	685	620	1500	1220
	9.67	50	51	85	175	0.14	710	645	1500	1220
	11.18	50	51	85	181	0.11	760	695	1500	1220
	12.06	50	51	85	183	0.10	790	720	1500	1220
	14.12	50	51	85	188	0.080	850	780	1500	1220
	16.73	50	51	85	194	0.060	920	840	1500	1220
	18.31	50	51	85	196	0.050	960	880	1500	1220

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CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	R	RF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N
R07 3	21.73	50	51	85	164	0.16	1040	950	1500	1220
	23.32	50	51	85	164	0.14	1080	980	1500	1220
	26.97	50	51	85	164	0.11	1150	1050	1500	1220
	29.08	50	51	85	155	0.10	1190	1080	1500	1220
	34.05	50	51	85	132	0.080	1270	1160	1500	1220
	38.51	50	51	85	117	0.14	1340	1220	1500	1220
	40.34	50	51	85	112	0.060	1370	1230	1500	1220
	41.31	50	51	85	109	0.13	1380	1230	1500	1220
	44.16	50	51	85	102	0.050	1420	1230	1500	1220
	47.78	50	51	85	94	0.10	1470	1230	1500	1220
	51.52	50	51	85	87	0.090	1510	1230	1500	1220
	60.32	50	51	85	75	0.070	1510	1230	1500	1220
	71.47	50	51	85	63	0.060	1510	1230	1500	1220
	78.24	50	51	85	58	0.050	1510	1230	1500	1220

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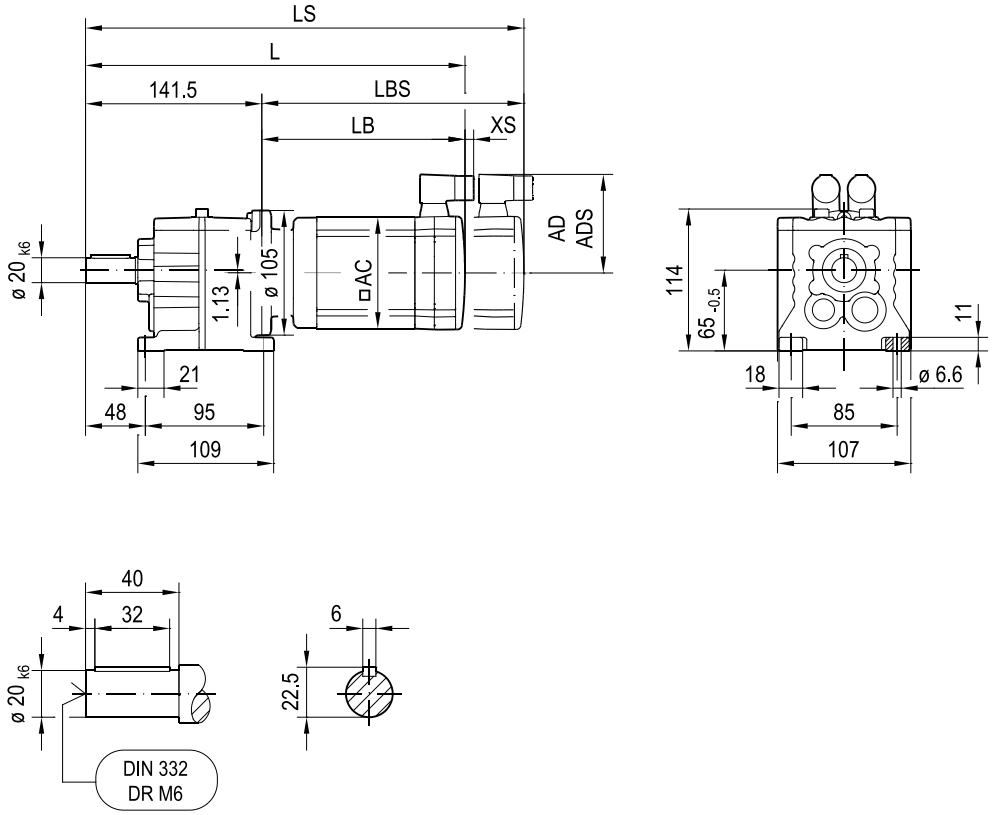
R07..



R07F..

(→ 📖 7.3)	CM3C							
	63S							
AC	92							
AD	93							
ADS	93							
L	292							
LS	333							
LB	151							
LBS	191							
XS	13							

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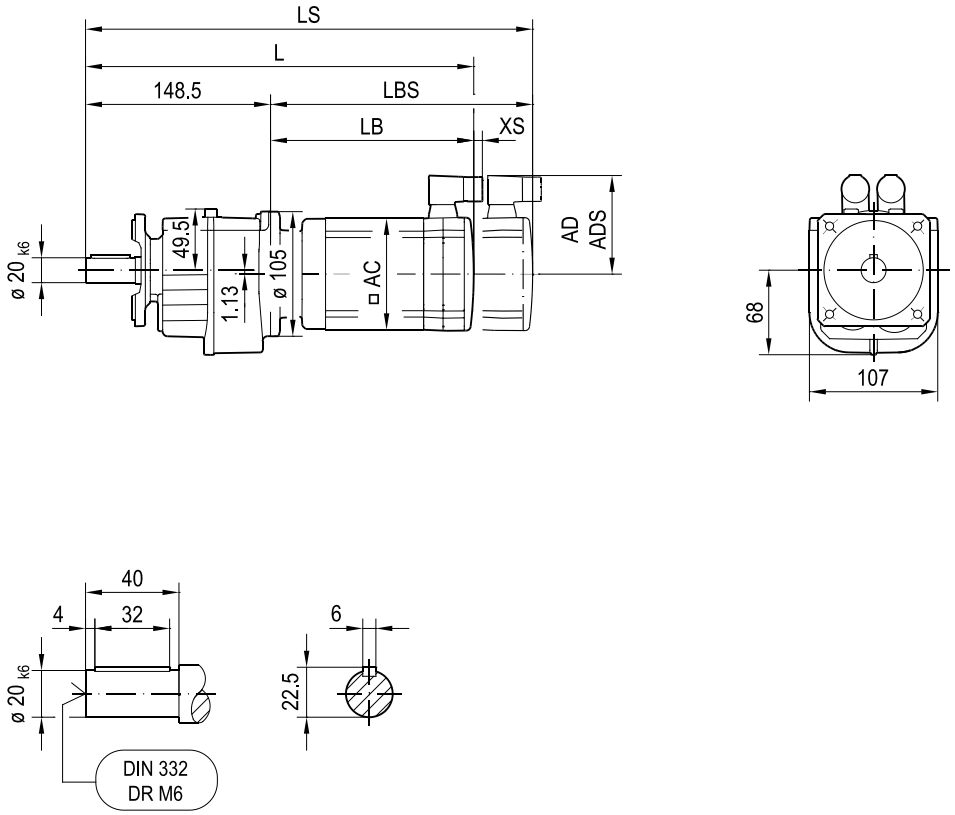
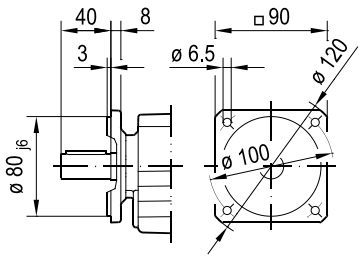
01 026 00 19

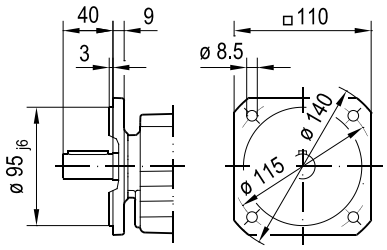
RF07..



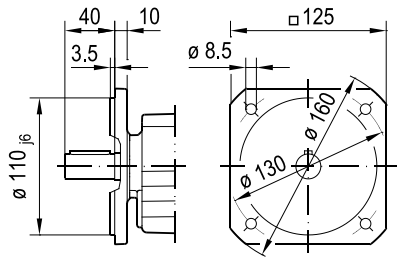
ø 120



ø 140



ø 160



(→ 📖 7.3)	CM3C 63S							
AC	92							
AD	93							
ADS	93							
L	299							
LS	340							
LB	151							
LBS	191							
XS	13							

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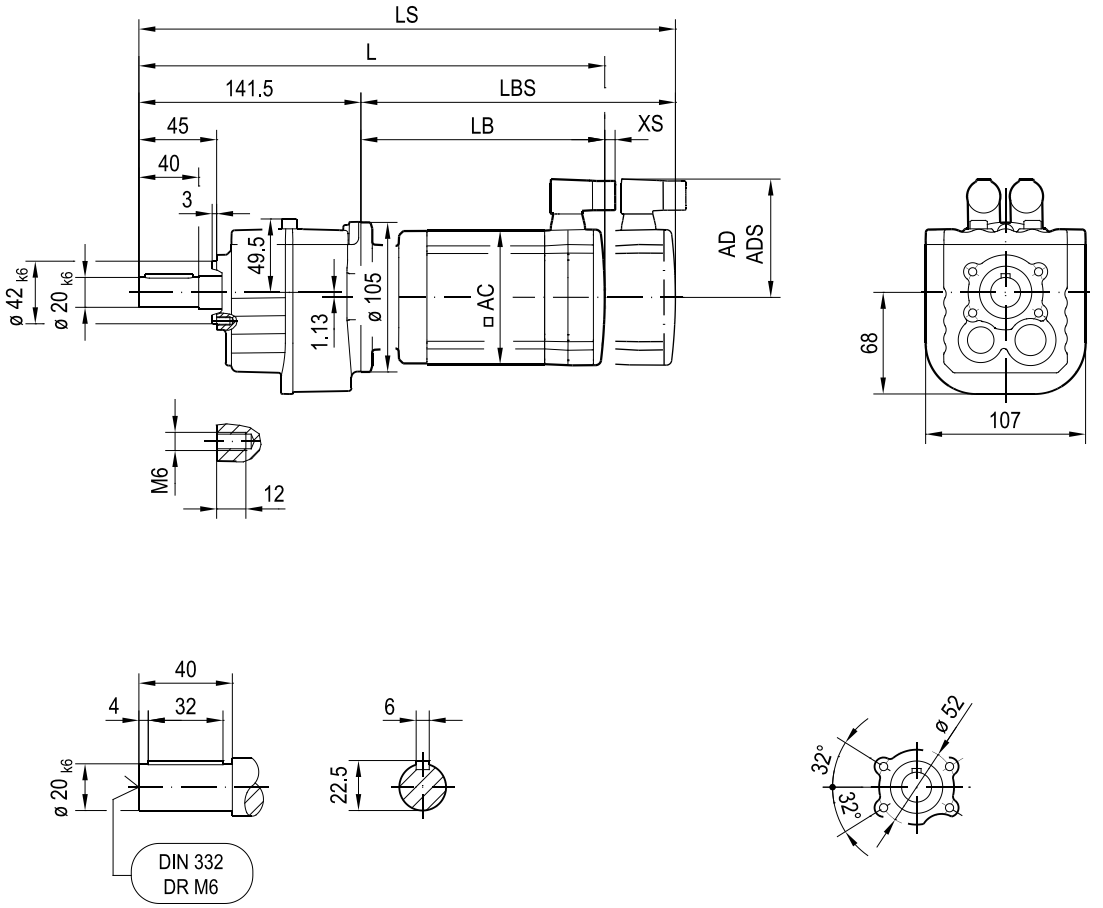
RZ07..



(→ 📖 7.3)	CM3C 63S							
AC	92							
AD	93							
ADS	93							
L	292							
LS	333							
LB	151							
LBS	191							
XS	13							

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8.3.2 R17..

R17, M_{aDyn} Nm	85 Nm
i	CM3C 63S
2	
3.83	30
4.51	35
5.09	39
5.76	45
6.15	48
7.04	55
7.55	>59
8.63	67
10.15	78
11.45	>86
12.98	>86
13.84	>86
15.84	>86
16.99	>86
19.71	>86
23.15	
25.23	
3	
24.07	>86
28.32	>86
31.94	>86
36.20	>86
38.61	>86
44.18	>86
47.44	>86
53.76	>86
57.35	>86
65.61	>86
70.39	>86
81.64	>86

	(→ 183)

R17, m kg	
s	CM3C 63S
2	6.5
3	6.8
RF: + -0.05 kg	

CM3C..				c_{TG}		φ
		n_{epk}	η	R	RF	
	i	min^{-1}	%	Nm/'	Nm/'	'
R17 2	3.83	4500	97	3.0	3.0	34
	4.51	4500	97	3.0	3.0	33
	5.09	4500	97	3.0	3.0	33
	5.76	4500	97	3.0	3.0	33
	6.15	4500	97	3.0	3.0	32
	7.04	4500	97	3.0	3.0	32
	7.55	4500	97	3.0	3.0	31
	8.63	4500	96	4.4	4.3	26
	10.15	4500	96	4.4	4.3	26
	11.45	4500	96	4.4	4.3	26
	12.98	4500	96	4.4	4.3	26
	13.84	4500	96	4.4	4.3	26
	15.84	4500	96	4.4	4.3	25
	16.99	4500	96	4.4	4.3	25
	19.71	4500	96	4.4	4.3	25
	23.15	4500	96	4.4	4.3	25
	25.23	4500	96	4.4	4.3	25
R17 3	24.07	4500	93	4.6	4.4	27
	28.32	4500	93	4.6	4.4	27
	31.94	4500	93	4.6	4.4	27
	36.20	4500	93	4.6	4.4	27
	38.61	4500	93	4.6	4.4	27
	44.18	4500	93	4.6	4.4	26
	47.44	4500	92	4.6	4.4	26
	53.76	4500	92	4.6	4.4	26
	57.35	4500	92	4.6	4.4	26
	65.61	4500	92	4.6	4.4	26
	70.39	4500	91	4.6	4.4	26
	81.64	4500	91	4.6	4.4	26

CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	R	RF
	i	Nm	Nm	Nm	min^{-1}	kg×m^2	N	N	N	N
R17 2	3.83	45	52	77	381	0.46	820	755	2500	2200
	4.51	48	54	82	324	0.35	870	795	2500	2200
	5.09	51	55	87	287	0.29	890	820	2500	2190
	5.76	53	59	90	253	0.24	930	860	2500	2180
	6.15	54	57	92	242	0.22	950	880	2500	2190
	7.04	55	58	94	237	0.18	1010	930	2500	2180
	7.55	56	59	95	229	0.16	1040	950	2500	2180
	8.63	72	86	122	169	0.39	1090	1000	1700	1510
	10.15	77	86	131	144	0.30	1140	1050	1700	1510
	11.45	81	86	138	128	0.26	1180	1080	1700	1510
	12.98	85	86	145	112	0.21	1230	1130	1700	1510
	13.84	85	86	145	111	0.20	1270	1160	1700	1510
	15.84	85	86	145	114	0.16	1350	1240	1700	1510
	16.99	85	86	145	115	0.15	1400	1280	1700	1510
	19.71	85	86	145	118	0.12	1500	1380	1700	1510
	23.15	85	86	145	121	0.090	1620	1480	1700	1510
	25.23	85	86	145	122	0.080	1680	1540	1700	1510

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CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	R	RF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N
R17 3	24.07	85	86	145	106	0.41	1650	1510	1700	1510
	28.32	85	86	145	106	0.32	1770	1560	1700	1510
	31.94	85	86	145	106	0.27	1770	1560	1700	1510
	36.20	85	86	145	106	0.22	1770	1560	1700	1510
	38.61	85	86	145	106	0.20	1770	1560	1700	1510
	44.18	85	86	145	102	0.17	1770	1560	1700	1510
	47.44	85	86	145	95	0.25	1770	1560	1700	1510
	53.76	85	86	145	84	0.21	1770	1560	1700	1510
	57.35	85	86	145	78	0.19	1770	1560	1700	1510
	65.61	85	86	145	69	0.16	1770	1560	1700	1510
	70.39	85	86	145	64	0.14	1770	1560	1700	1510
	81.64	85	86	145	55	0.11	1770	1560	1700	1510

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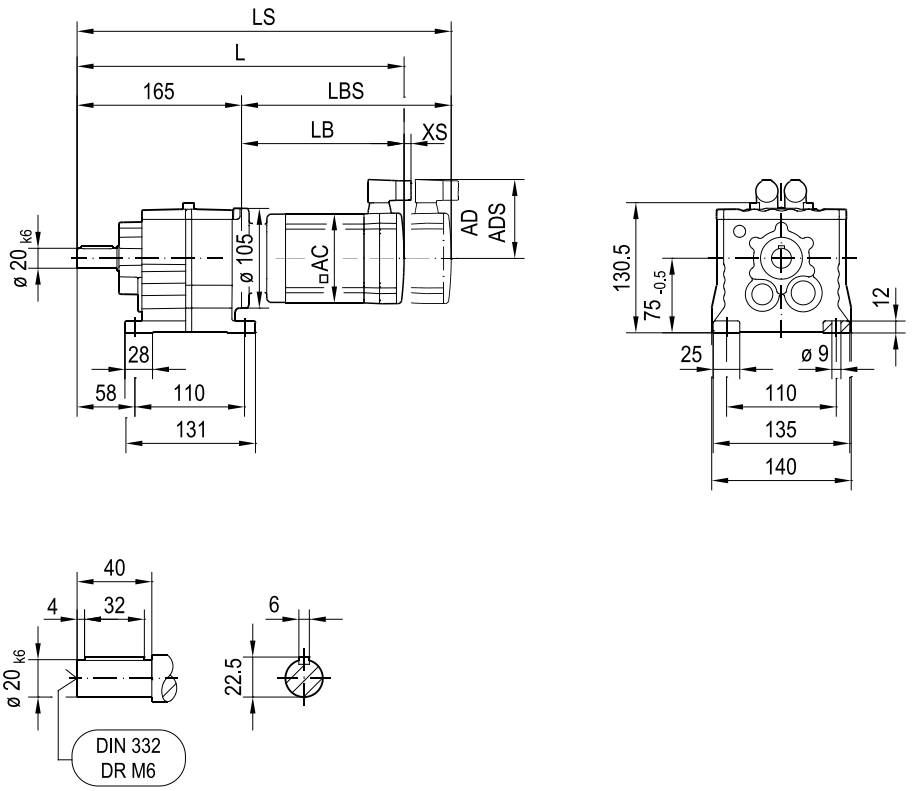
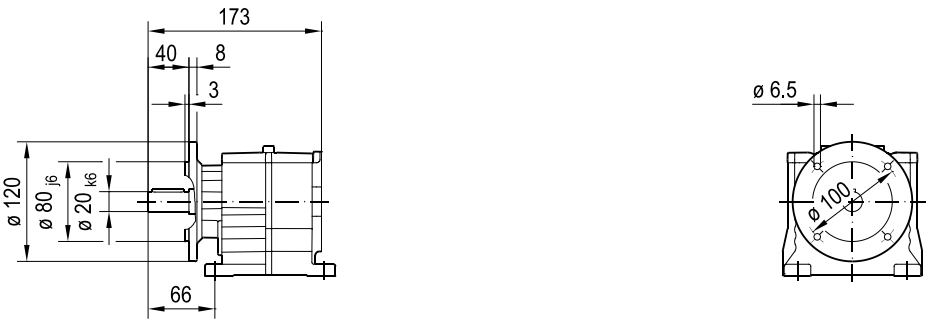
01 028 00 19

R17..



R17F..



(→ 📖 7.3)	CM3C							
	63S							
AC	92							
AD	93							
ADS	93							
L	316							
LS	356							
LB	151							
LBS	191							
XS	13							

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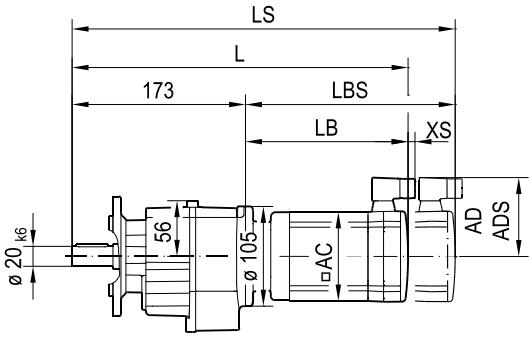
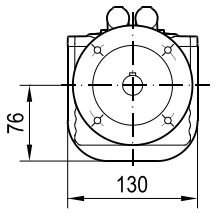
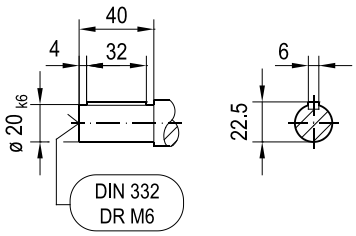
01 029 00 19

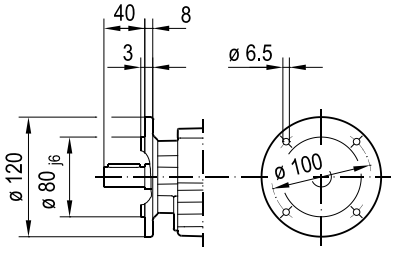
RF17..



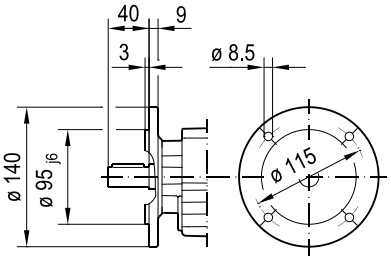




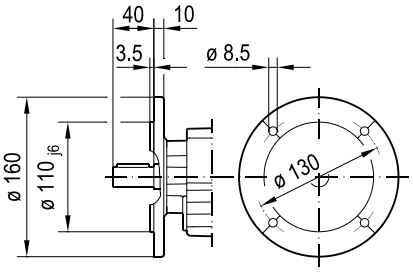
ø 120



ø 140



ø 160



(→ 📖 7.3)	CM3C 63S							
AC	92							
AD	93							
ADS	93							
L	324							
LS	364							
LB	151							
LBS	191							
XS	13							

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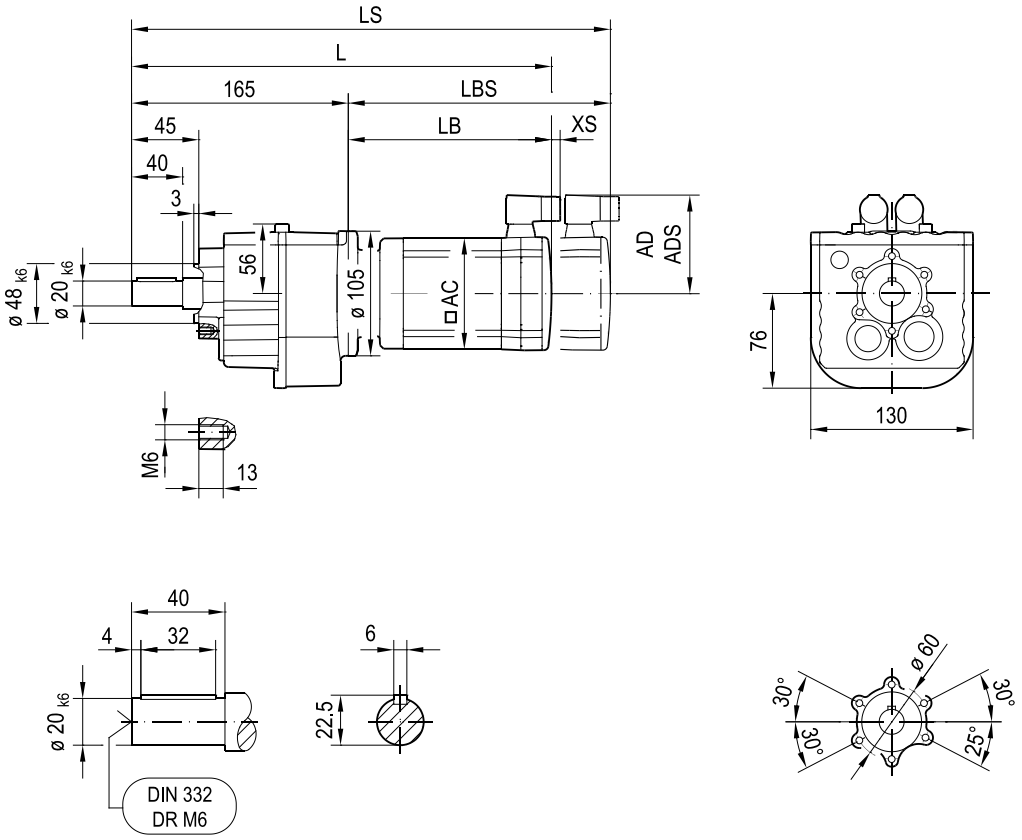
01 030 00 19

RZ17..



(→ 📖 7.3)	CM3C							
	63S							
AC	92							
AD	93							
ADS	93							
L	316							
LS	356							
LB	151							
LBS	191							
XS	13							

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8.3.3 R27..

R27, M_{aDyn} Nm								130 Nm
	CM3C							
i	63S	63M	63L	71S	71M	71L	80S	80M
				2				
3.37	26	48	62	63	93	>118	102	>118
4.00	31	57	74	75	110	>127	122	>127
4.27	33	60	79	80	118	>130	>130	>130
5.00	39	71	93	94	138	>142	>142	>142
5.60	43	79	104	105	>144	>144	>144	>144
6.59	51	93	122	124	>145		>145	
7.63	59	108		144				
8.16	64	116		>148				
9.41	73							
10.13	79	>136	>136	>136	>136	>136	>136	>136
11.86	93	>136	>136	>136	>136	>136	>136	>136
13.28	104	>136	>136	>136	>136	>136	>136	>136
15.63	122	>136	>136	>136	>136		>136	
18.08	>136	>136		>136				
19.35	>136	>136		>136				
22.32	>136							
26.09								
28.37								
				3				
24.47	>136	>136	>136	>136	>136	>136	>136	>136
28.78	>136	>136	>136	>136	>136	>136	>136	>136
32.47	>136	>136	>136	>136	>136	>136	>136	>136
36.79	>136	>136		>136				
39.25	>136	>136	>136	>136	>136		>136	
44.90	>136	>136		>136				
48.17	>136	>136		>136				
55.87	>136							
61.30	>136	>136	>136	>136	>136	>136	>136	>136
69.47	>136	>136		>136				
74.11	>136	>136	>136	>136	>136		>136	
84.78	>136	>136		>136				
90.96	>136	>136		>136				
105.49	>136							
123.91								
135.09								

(→ 183)

R27, m kg								
	CM3C							
s	63S	63M	63L	71S	71M	71L	80S	80M
2	6.9	8.2	9.6	9.8	11	14	15	17
3	7.1	8.5	9.8	10	12	14	15	17
RF: + -0.05 kg								

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CM3C..				c_{TG}		φ
		n_{epk}	η	R	RF	
	i	min^{-1}	%	Nm/'	Nm/'	'
R27 2	3.37	4500	97	7.2	7.1	31
	4.00	4500	97	7.2	7.1	31
	4.27	4500	97	7.2	7.1	31
	5.00	4500	97	7.2	7.1	30
	5.60	4500	97	7.2	7.1	30
	6.59	4500	97	7.2	7.1	29
	7.63	4500	97	7.2	7.1	29
	8.16	4500	97	7.2	7.1	29
	9.41	4500	97	7.2	7.1	28
	10.13	4500	97	9.0	8.8	21
	11.86	4500	97	9.0	8.8	21
	13.28	4500	97	9.0	8.8	21
	15.63	4500	97	9.0	8.8	21
	18.08	4500	97	9.0	8.8	20
	19.35	4500	97	9.0	8.8	20
	22.32	4500	97	9.0	8.8	20
	26.09	4500	96	9.0	8.8	20
	28.37	4500	96	9.0	8.8	20
R27 3	24.47	4500	94	9.0	8.8	22
	28.78	4500	94	9.0	8.8	22
	32.47	4500	94	9.0	8.8	22
	36.79	4500	94	9.0	8.8	22
	39.25	4500	94	9.0	8.8	22
	44.90	4500	94	9.0	8.8	22
	48.17	4500	94	9.0	8.8	22
	55.87	4500	94	9.0	8.8	22
	61.30	4500	92	9.1	8.8	21
	69.47	4500	92	9.1	8.8	21
	74.11	4500	92	9.1	8.8	21
	84.78	4500	92	9.1	8.8	21
	90.96	4500	92	9.1	8.8	21
	105.49	4500	92	9.1	8.8	21
	123.91	4500	91	9.1	8.8	21
	135.09	4500	91	9.1	8.8	21

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CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	R	RF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N
R27 2	3.37	79	118	134	433	1.1	900	790	4290	3690
	4.00	85	127	145	365	0.85	900	800	4250	3660
	4.27	87	130	148	342	0.76	920	810	4230	3640
	5.00	95	142	162	292	0.58	860	760	4180	3590
	5.60	99	144	168	261	0.48	880	775	4170	3580
	6.59	106	145	180	222	0.36	880	775	4160	3580
	7.63	112	148	190	191	0.29	900	795	4150	3570
	8.16	116	148	197	179	0.26	870	770	4150	3570
	9.41	122	149	205	155	0.21	900	795	4140	3560
	10.13	122	136	205	144	0.61	1890	1670	4210	3620
	11.86	129	136	215	123	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	126	0.24	2440	2310	4210	3620
	19.35	130	136	220	127	0.22	2510	2380	4210	3620
	22.32	130	136	220	128	0.18	2660	2520	4210	3620
	26.09	130	136	220	130	0.14	2840	2690	4210	3620
	28.37	130	136	220	131	0.12	2940	2780	4210	3620
R27 3	24.47	130	136	220	94	0.49	2760	2620	4210	3620
	28.78	130	136	220	94	0.37	2950	2800	4210	3620
	32.47	130	136	220	94	0.31	3100	2940	4210	3620
	36.79	130	136	220	94	0.25	3260	3090	4210	3620
	39.25	130	136	220	94	0.22	3350	3170	4210	3620
	44.90	130	136	220	94	0.18	3530	3340	4210	3620
	48.17	130	136	220	93	0.16	3630	3430	4210	3620
	55.87	130	136	220	81	0.13	3840	3640	4210	3620
	61.30	130	136	220	73	0.26	3980	3640	4210	3620
	69.47	130	136	220	65	0.22	4180	3640	4210	3620
	74.11	130	136	220	61	0.20	4230	3640	4210	3620
	84.78	130	136	220	53	0.16	4230	3640	4210	3620
	90.96	130	136	220	49	0.15	4230	3640	4210	3620
	105.49	130	136	220	43	0.12	4230	3640	4210	3620
	123.91	130	136	220	36	0.090	4230	3640	4210	3620
	135.09	130	136	220	33	0.080	4230	3640	4210	3620

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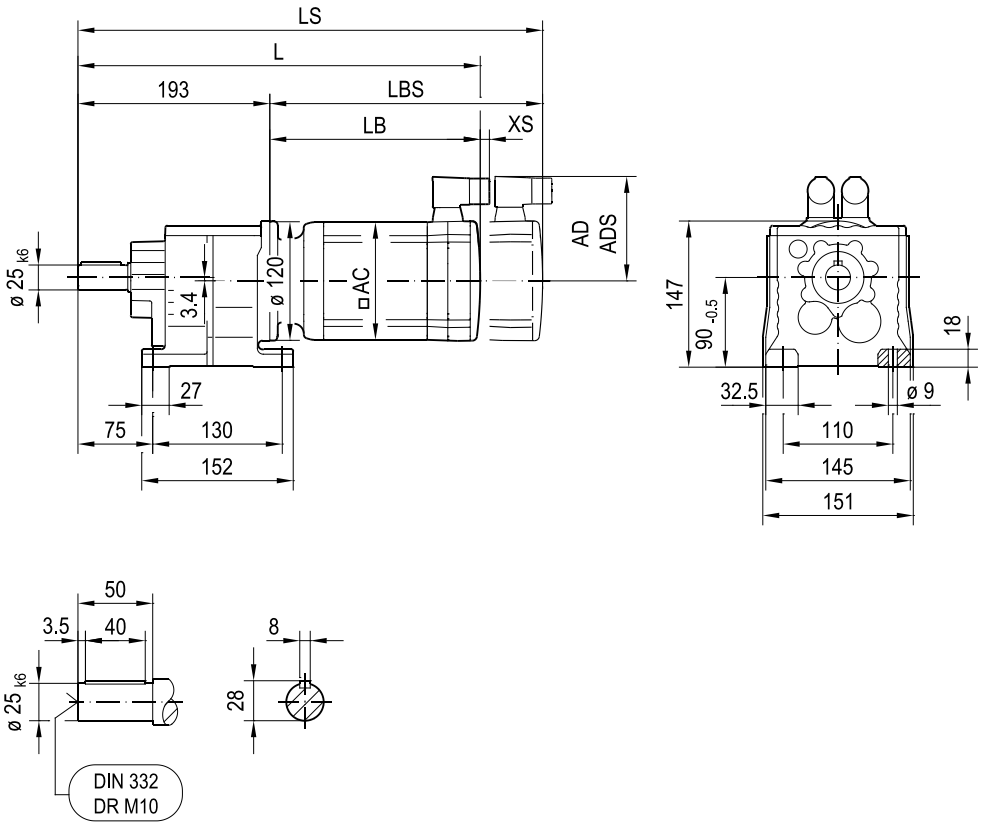
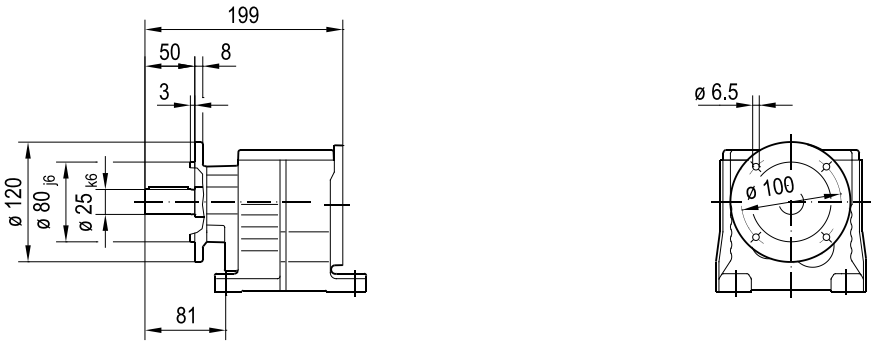
01 031 00 19

R27..



R27F..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	344	382	420	380	402	447	415	441
LS	384	422	460	446	468	513	483	509
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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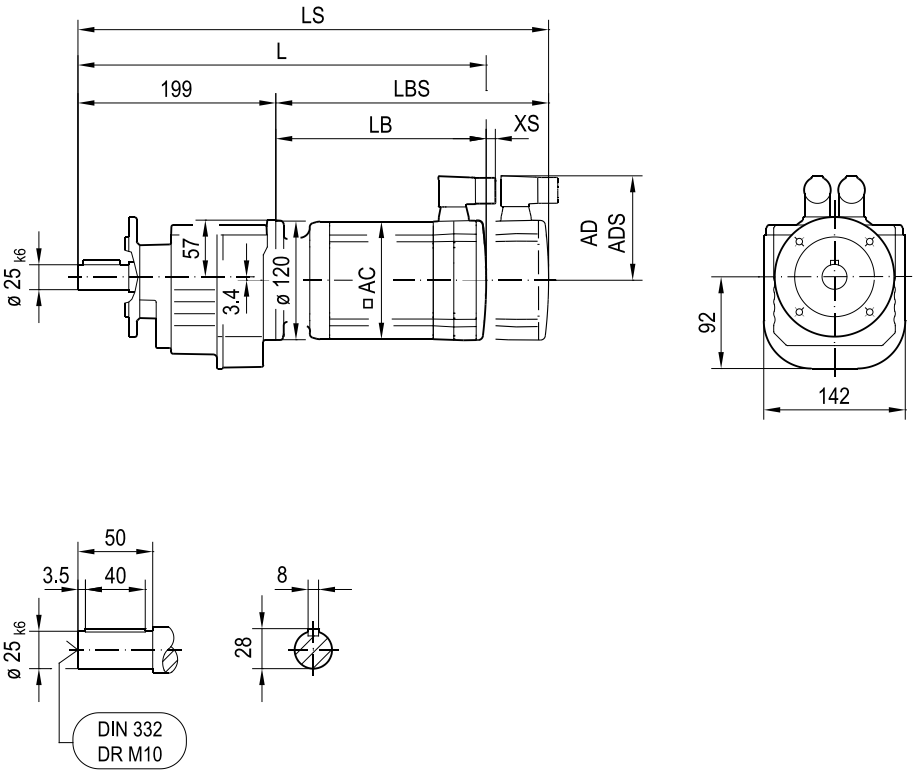
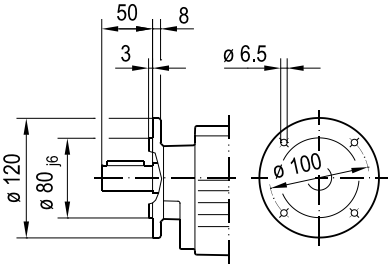
01 032 00 19

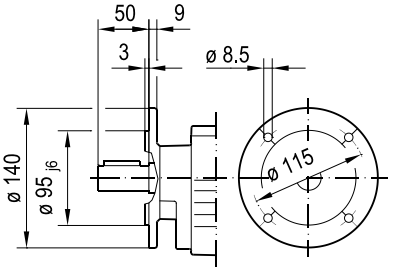
RF27..



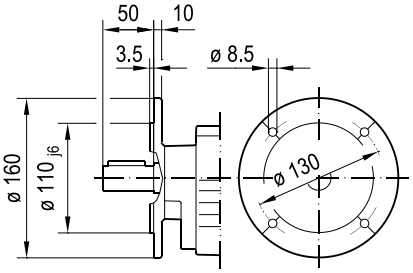
ø 120



ø 140



ø 160



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	350	388	426	386	408	453	421	447
LS	390	428	466	452	474	519	489	515
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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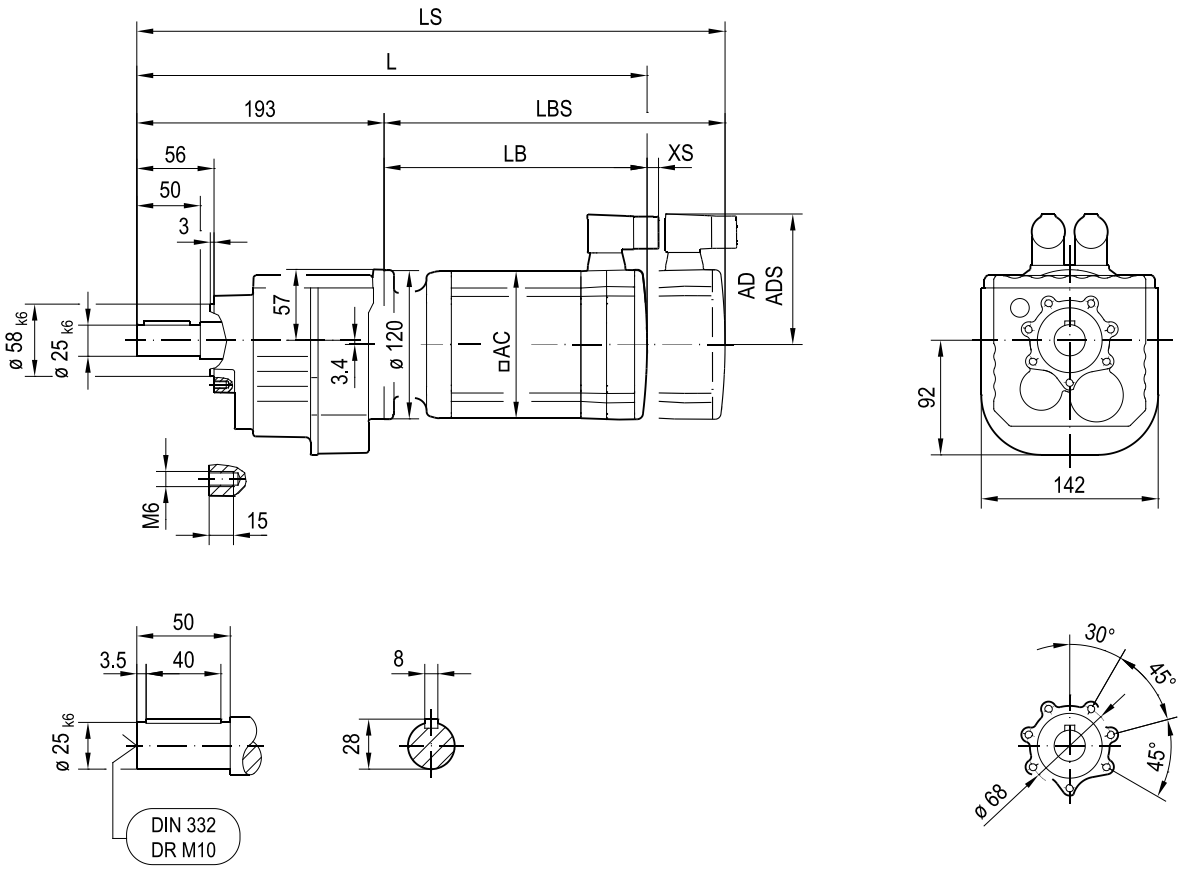
01 033 00 19

RZ27..



(→ 📖 7.3)	CM3C							
	63S	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	344	382	420	380	402	447	415	441
LS	384	422	460	446	468	513	483	509
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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8.3.4 R37..

R37, M_{aDyn} Nm								200 Nm
	CM3C							
i	63S	63M	63L	71S	71M	71L	80S	80M
				2				
3.41	26	48	63	64	94	138	104	>147
4.05	31	57	75	76	111	>153	123	>153
4.32	33	61	80	81	119	>155	131	>155
5.06	39	72	94	95	139	>156	154	>156
5.67	44	80	105	107	>156	>156	>156	>156
6.67	52	95	124	126	>166		>166	
7.97	62	113	148	150	>205	>205	>205	>205
9.47	74	135	176	179	>205	>205	>205	>205
10.11	79	144	188	191	>205	>205	>205	>205
11.83	92	168	>205	>205	>205	>205	>205	>205
13.25	104	188	>205	>205	>205	>205	>205	>205
15.60	122	>205	>205	>205	>205		>205	
18.05	141	>205		>205				
19.31	151	>205		>205				
22.27	174							
26.03								
28.32								
				3				
24.42	187	>205	>205	>205	>205	>205	>205	>205
28.73	>205	>205	>205	>205	>205	>205	>205	>205
32.40	>205	>205	>205	>205	>205	>205	>205	>205
36.72	>205	>205		>205				
39.17	>205	>205	>205	>205	>205		>205	
44.81	>205	>205		>205				
48.08	>205	>205		>205				
55.76	>205							
61.18	>205	>205	>205	>205	>205	>205	>205	>205
69.33	>205	>205		>205				
73.96	>205	>205	>205	>205	>205		>205	
84.61	>205	>205		>205				
90.77	>205	>205		>205				
105.28	>205							
123.66								
134.82								

(→ 183)

R37, m kg								
	CM3C							
s	63S	63M	63L	71S	71M	71L	80S	80M
2	13	14	15	16	17	20	21	23
3	13	14	16	16	17	20	21	23
RF: + 1.5 kg								

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CM3C..				c_{TG}		φ	
		n_{epk}	η	R	RF		/R
	i	min^{-1}	%	Nm/'	Nm/'	'	'
R37 2	3.41	3587	97	9.7	9.5	31	14
	4.05	4261	97	9.7	9.5	31	13
	4.32	4500	97	9.7	9.5	30	13
	5.06	4500	97	9.7	9.5	30	13
	5.67	4500	97	9.7	9.5	30	12
	6.67	4500	97	9.7	9.5	29	12
	7.97	4500	97	13	12	20	8
	9.47	4500	97	13	12	19	8
	10.11	4500	97	13	12	19	8
	11.83	4500	97	13	12	19	8
	13.25	4500	97	13	12	19	8
	15.60	4500	97	13	12	19	8
	18.05	4500	97	13	12	18	8
	19.31	4500	97	13	12	18	7
	22.27	4500	97	13	12	18	7
	26.03	4500	97	13	12	18	7
	28.32	4500	97	13	12	18	7
R37 3	24.42	4500	95	13	12	20	9
	28.73	4500	95	13	12	20	9
	32.40	4500	95	13	12	20	9
	36.72	4500	95	13	12	20	9
	39.17	4500	95	13	12	20	9
	44.81	4500	95	13	12	20	9
	48.08	4500	95	13	12	20	9
	55.76	4500	95	13	12	20	9
	61.18	4500	94	13	13	19	8
	69.33	4500	94	13	13	19	8
	73.96	4500	94	13	13	19	8
	84.61	4500	93	13	13	19	8
	90.77	4500	93	13	13	19	8
	105.28	4500	93	13	13	19	8
	123.66	4500	93	13	13	19	8
	134.82	4500	93	13	13	19	8

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CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	R	RF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N
R37 2	3.41	112	147	190	428	1.4	900	800	5500	5500
	4.05	122	153	205	360	1.1	840	750	5440	5440
	4.32	126	155	210	338	0.95	820	725	5430	5430
	5.06	135	156	230	289	0.72	790	700	5420	5420
	5.67	142	156	240	257	0.59	760	675	5420	5420
	6.67	144	166	245	219	0.43	1000	890	5320	5320
	7.97	156	205	265	182	0.96	1720	1520	4880	4880
	9.47	167	205	280	153	0.74	1760	1560	4880	4880
	10.11	170	205	285	143	0.66	1820	1620	4880	4880
	11.83	183	205	310	123	0.51	1810	1610	4880	4880
	13.25	190	205	320	109	0.43	1880	1670	4880	4880
	15.60	200	205	340	94	0.31	2010	1780	4880	4880
	18.05	200	205	340	96	0.26	2390	2120	4880	4880
	19.31	200	205	340	97	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	101	0.13	3690	3270	4880	4880
R37 3	24.42	200	205	340	71	0.53	3240	2870	4880	4880
	28.73	200	205	340	71	0.39	3740	3310	4880	4880
	32.40	200	205	340	72	0.31	4120	3650	4880	4880
	36.72	200	205	340	72	0.25	4540	4020	4880	4880
	39.17	200	205	340	73	0.23	4760	4220	4880	4880
	44.81	200	205	340	73	0.19	4940	4640	4880	4880
	48.08	200	205	340	73	0.17	4940	4870	4880	4880
	55.76	200	205	340	74	0.13	4940	4940	4880	4880
	61.18	200	205	340	74	0.26	4940	4940	4880	4880
	69.33	200	205	340	65	0.22	4940	4940	4880	4880
	73.96	200	205	340	61	0.20	4940	4940	4880	4880
	84.61	200	205	340	53	0.16	4940	4940	4880	4880
	90.77	200	205	340	50	0.15	4940	4940	4880	4880
	105.28	200	205	340	43	0.12	4940	4940	4880	4880
	123.66	200	205	340	36	0.090	4940	4940	4880	4880
	134.82	200	205	340	33	0.080	4940	4940	4880	4880

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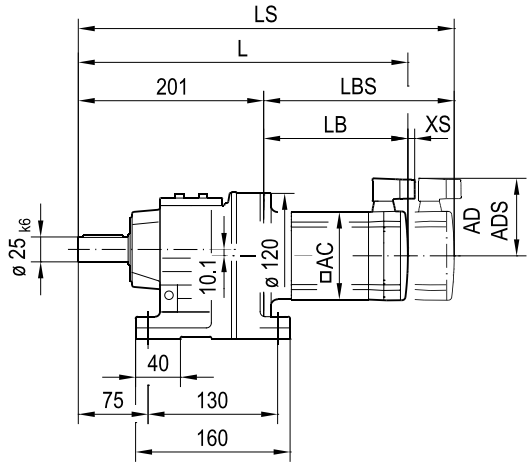
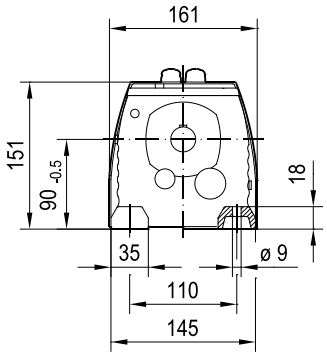
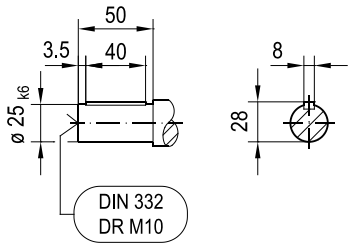
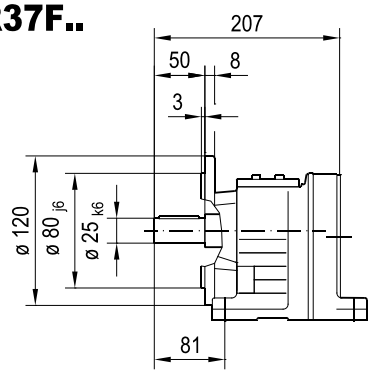
R37..

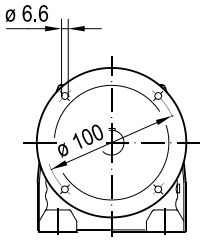






R37F..





(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	352	390	428	388	410	455	423	449
LS	392	430	468	454	476	521	491	517
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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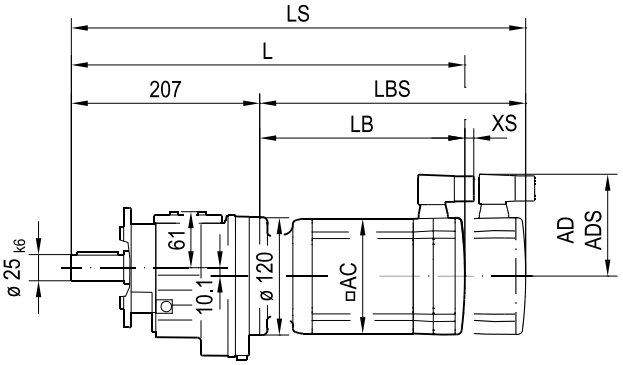
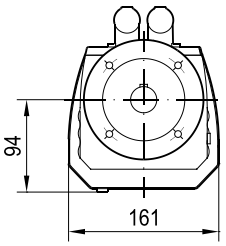
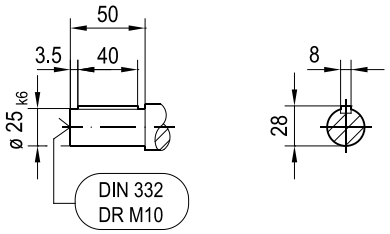
RF37..







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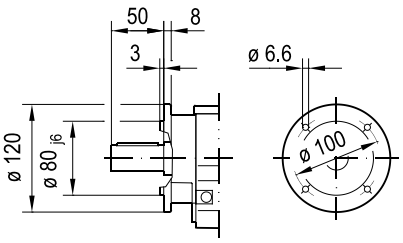

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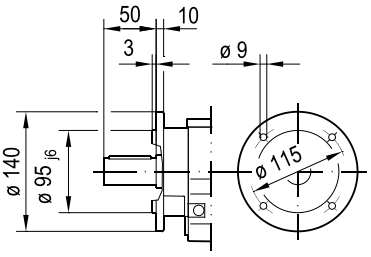

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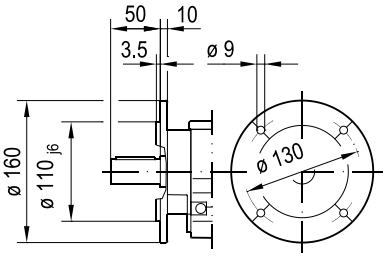

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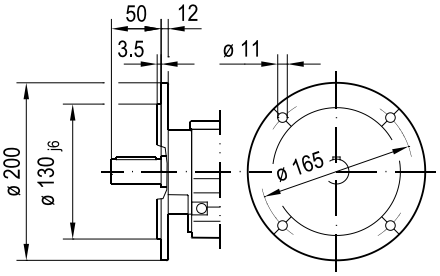

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	358	396	434	394	416	461	429	455
LS	398	436	474	460	482	527	497	523
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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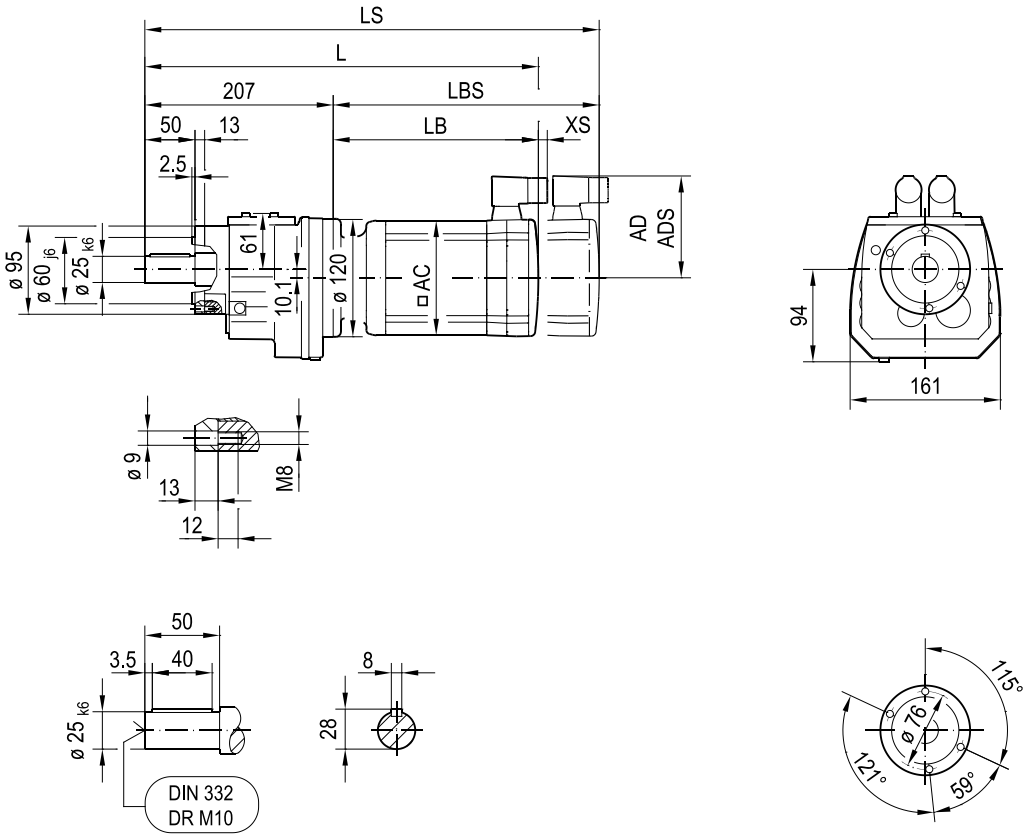
RZ37..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	358	396	434	394	416	461	429	455
LS	398	436	474	460	482	527	497	523
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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8.3.5 R47..

R47, M_{aDyn} Nm											300 Nm
	CM3C										
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
2											
3.83	30	54	71	72	105	156	117	>166	>166	>166	>166
4.34	34	61	80	82	119	>170	132	>170	>170	>170	>170
4.85	38	69	90	91	134	>175	148	>175	>175	>175	>175
5.64	44	80	105	106	155	>180	172	>180	>180	>180	>180
6.00	47	85	111	113	165	>182	>182	>182	>182	>182	>182
6.96	54	99	129	131	>187	>187	>187	>187			
7.76	60	110	144	146	>190	>190	>190	>190			
8.01	62	114	149	151	220	>300	240	>300	>300	>300	>300
9.07	71	129	168	171	250	>305	275	>305	>305	>305	>305
10.15	79	144	189	191	280	>305	>305	>305	>305	>305	>305
11.79	92	168	215	220	>305	>305	>305	>305	>305	>305	>305
12.54	98	178	230	235	>305	>305	>305	>305	>305	>305	>305
14.56	114	205	270	275	>305	>305	>305	>305			
16.22	127	230	300	>305	>305	>305	>305	>305			
17.89	140	255		>305							
19.27	151	270	>305	>305	>305		>305				
21.81	171	>305		>305							
23.28	182	>305		>305							
26.74	210										
31.12											
33.79											
3											
23.59	181	>305	>305	>305	>305		>305				
26.70	205	>305	>305	>305	>305		>305				
29.88	225	>305	>305	>305	>305		>305				
34.73	265	>305	>305	>305	>305		>305				
36.93	280	>305	>305	>305	>305		>305				
42.87	>305	>305	>305	>305	>305		>305				
47.75	>305	>305	>305	>305	>305		>305				
52.69	>305	>305		>305							
56.73	>305	>305	>305	>305	>305		>305				
64.21	>305	>305		>305							
68.54	>305	>305		>305							
76.23	>305	>305		>305							
84.90	>305	>305		>305							
93.68	>305	>305		>305							
100.86	>305	>305		>305							
114.17	>305	>305		>305							
121.87	>305	>305		>305							
139.99	>305										
162.94											
176.88											

(→ 183)

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R47, m kg											
	CM3C										
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
2	16	18	19	19	21	23	23	26	31	30	33
3	17	18	20	20	21	24	24	26	31	30	34
RF: + 0.15 kg											

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CM3C..				c_{TG}		φ	
		n_{epk}	η	R	RF		/R
	i	min^{-1}	%	Nm/'	Nm/'	'	'
R47 2	3.83	3657	97	11	11	26	11
	4.34	4144	97	11	11	26	11
	4.85	4500	97	11	11	24	10
	5.64	4500	97	11	11	24	10
	6.00	4500	97	11	11	24	10
	6.96	4500	97	11	11	24	10
	7.76	4500	97	11	11	23	10
	8.01	4500	97	15	15	18	8
	9.07	4500	97	15	15	18	8
	10.15	4500	97	15	15	17	7
	11.79	4500	97	15	15	17	7
	12.54	4500	97	15	15	17	7
	14.56	4500	97	15	15	17	7
	16.22	4500	97	15	15	17	7
	17.89	4500	97	15	15	17	7
	19.27	4500	97	15	15	17	7
	21.81	4500	97	15	15	16	7
	23.28	4500	97	15	15	16	7
	26.74	4500	97	15	15	16	7
	31.12	4500	97	15	15	16	7
	33.79	4500	97	15	15	16	7
R47 3	23.59	4500	95	15	15	18	8
	26.70	4500	95	15	15	18	8
	29.88	4500	95	15	15	18	8
	34.73	4500	95	15	15	18	8
	36.93	4500	95	15	15	18	8
	42.87	4500	95	15	15	18	8
	47.75	4500	95	15	15	18	8
	52.69	4500	95	15	15	18	8
	56.73	4500	95	15	15	18	8
	64.21	4500	95	15	15	18	8
	68.54	4500	95	15	15	18	8
	76.23	4500	94	15	15	17	7
	84.90	4500	94	15	15	17	7
	93.68	4500	94	15	15	17	7
	100.86	4500	93	15	15	17	7
	114.17	4500	93	15	15	17	7
	121.87	4500	93	15	15	17	7
	139.99	4500	93	15	15	17	7
	162.94	4500	93	15	15	17	7
	176.88	4500	93	15	15	17	7

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CM3C..							F_{Ramax}		F_{Rapk}	
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	R	RF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N
R47 2	3.83	144	166	245	415	2.6	2080	2080	5960	5960
	4.34	146	170	245	412	2.0	2190	2190	5940	5940
	4.85	150	175	255	404	1.7	2280	2280	5930	5930
	5.64	155	180	260	388	1.3	2410	2410	5920	5920
	6.00	156	182	265	390	1.2	2470	2470	5910	5910
	6.96	159	187	270	386	0.93	2620	2620	5890	5890
	7.76	163	190	275	370	0.77	2720	2720	5880	5880
	8.01	205	300	345	208	2.0	2690	2690	5420	5420
	9.07	220	305	370	173	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	129	0.95	3080	3080	5390	5390
	14.56	265	305	450	112	0.74	3230	3230	5390	5390
	16.22	275	305	465	102	0.63	3350	3350	5390	5390
	17.89	290	305	490	88	0.51	3390	3390	5390	5390
	19.27	295	305	500	85	0.48	3530	3530	5390	5390
	21.81	300	305	510	82	0.39	3710	3710	5390	5390
	23.28	300	305	510	82	0.36	3820	3820	5390	5390
	26.74	300	305	510	83	0.29	4050	4050	5390	5390
	31.12	220	305	370	145	0.23	4610	4610	5390	5390
	33.79	240	305	405	133	0.20	4680	4680	5390	5390
R47 3	23.59	300	305	510	86	1.7	3840	3840	5390	5390
	26.70	300	305	510	86	1.4	4050	4050	5390	5390
	29.88	300	305	510	86	1.2	4240	4240	5390	5390
	34.73	300	305	510	86	0.93	4520	4520	5390	5390
	36.93	300	305	510	86	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	79	0.44	5420	5420	5390	5390
	64.21	300	305	510	70	0.37	5420	5420	5390	5390
	68.54	300	305	510	66	0.33	5420	5420	5390	5390
	76.23	300	305	510	59	0.60	5420	5420	5390	5390
	84.90	300	305	510	53	0.52	5420	5420	5390	5390
	93.68	300	305	510	48	0.43	5420	5420	5390	5390
	100.86	300	305	510	45	0.41	5420	5420	5390	5390
	114.17	300	305	510	39	0.34	5420	5420	5390	5390
	121.87	300	305	510	37	0.31	5420	5420	5390	5390
	139.99	300	305	510	32	0.25	5420	5420	5390	5390
	162.94	300	305	510	28	0.20	5420	5420	5390	5390
	176.88	300	305	510	25	0.18	5420	5420	5390	5390

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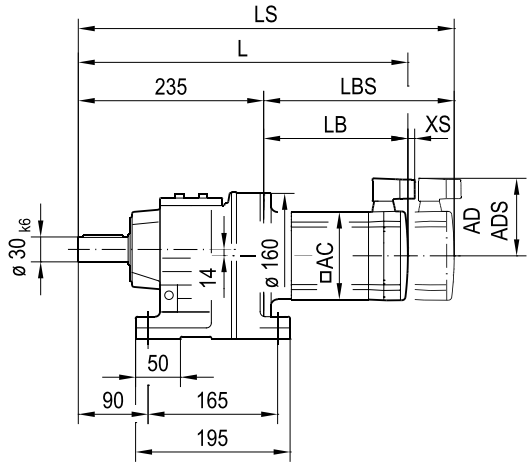
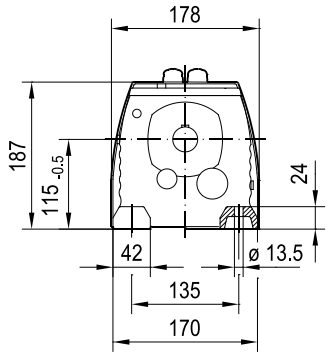
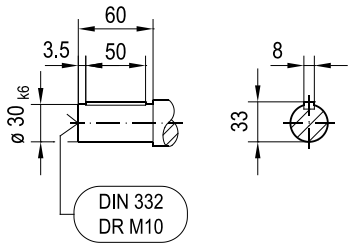
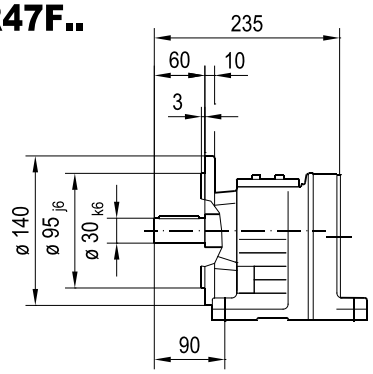
R47..

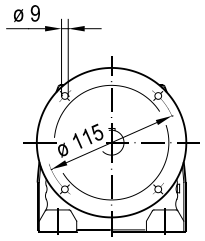






R47F..





(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	379	417	455	416	438	483	448	474	527	478	506
LS	420	458	496	482	504	549	516	542	595	552	580
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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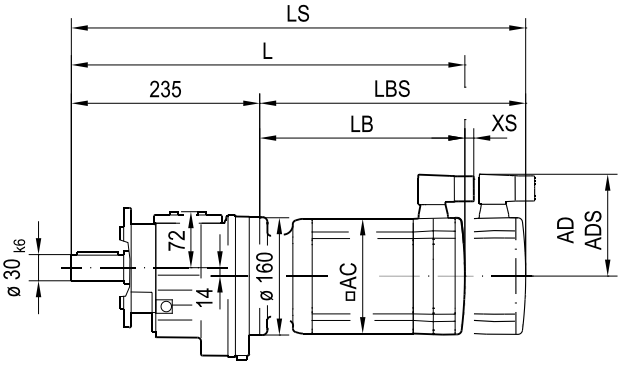
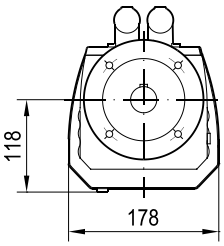
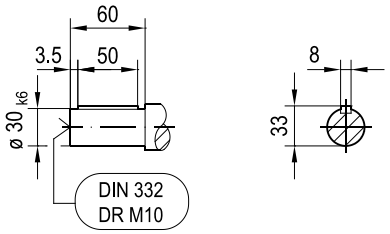
RF47..







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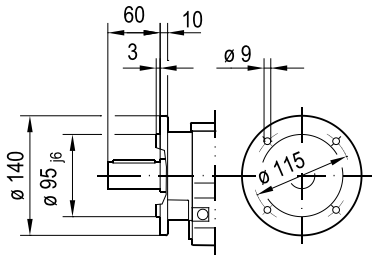

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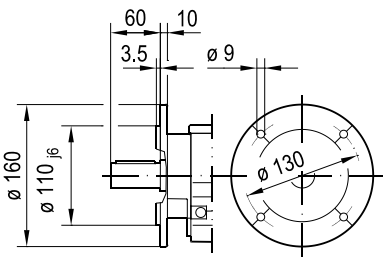

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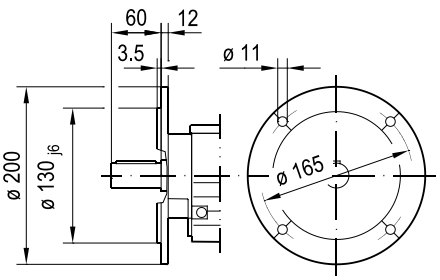

(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	379	417	455	416	438	483	448	474	527	478	506
LS	420	458	496	482	504	549	516	542	595	552	580
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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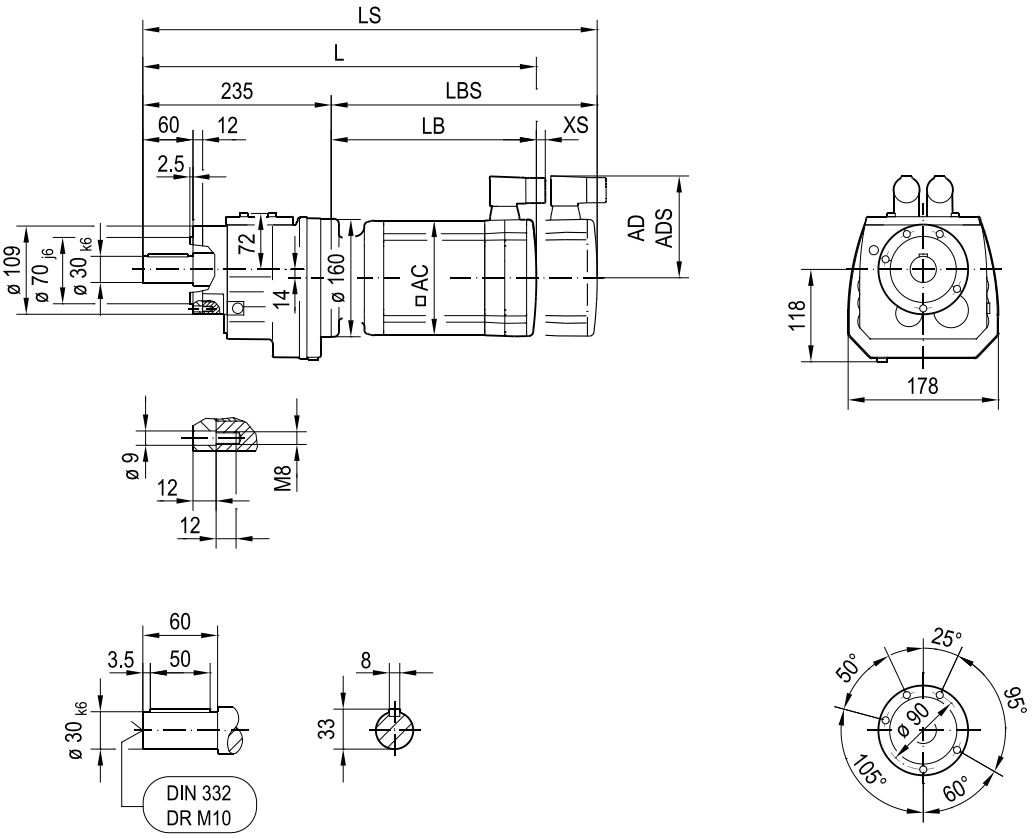
RZ47..



(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	379	417	455	416	438	483	448	474	527	478	506
LS	420	458	496	482	504	549	516	542	595	552	580
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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8.3.6 R57..

R57, M_{aDyn} Nm												450 Nm
	CM3C											
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
						2						
4.39	34	62	81	83	121	178	134	199	290	240	340	>420
5.05	39	72	94	95	139	205	154	225	335	275	390	>425
5.82	45	82	108	110	160	235	177	260	385	320	>425	>425
6.41	50	91	119	121	177	260	195	290	>425	350	>425	
7.53	59	107	140	142	205	305	230	340	>425	415	>425	
7.97	62	113	148	150	220	320	240	360	>425	>425	>425	
9.06	71	129	168	171	250	365	275	410				
9.35	73	133	174	176	255	380	285	420	>455	>455	>455	>455
10.79	84	153	200	200	295	435	325	>455	>455	>455	>455	>455
11.88	93	169	220	220	325	>455	360	>455	>455	>455	>455	
13.95	109	198	255	260	385	>455	425	>455	>455	>455	>455	
14.77	116	210	275	275	405	>455	450	>455	>455	>455	>455	
16.79	131	235	310	315	>455	>455	>455	>455				
18.60	146	265	345	350	>455	>455	>455	>455				
21.93	172	310	405	410	>455		>455					
24.99	196	355		>455								
26.31	205	375		>455								
						3						
26.97	205	375	>455	>455	>455	>455	>455	>455	>455	>455	>455	
30.18	230	420	>455	>455	>455	>455	>455	>455	>455	>455	>455	
35.07	265	>455	>455	>455	>455	>455	>455	>455	>455	>455	>455	
37.30	285	>455	>455	>455	>455	>455	>455	>455	>455	>455	>455	
43.30	330	>455	>455	>455	>455	>455	>455	>455				
48.23	370	>455	>455	>455	>455	>455	>455	>455				
53.22	405	>455		>455								
57.29	440	>455	>455	>455	>455		>455					
64.85	>455	>455		>455								
69.23	>455	>455		>455								
80.55	>455	>455	>455	>455	>455	>455	>455	>455				
89.71	>455	>455	>455	>455	>455	>455	>455	>455				
98.99	>455	>455		>455								
106.58	>455	>455	>455	>455	>455		>455					
120.63	>455	>455		>455								
128.77	>455	>455		>455								
147.92	>455											
172.17												
186.89												

(→ 🗎 183)

R57, m kg												
	CM3C											
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
2	21	23	24	24	26	28	28	30	36	35	38	46
3	22	24	25	25	26	29	29	31	36	36	39	47
RF: + 3.4 kg / RM: + 15 kg												

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CM3C..				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	22	10
	5.05	4500	97	21	21	17	22	10
	5.82	4500	97	21	21	17	21	10
	6.41	4500	97	21	21	17	21	9
	7.53	4500	97	21	21	17	20	9
	7.97	4500	97	21	21	17	20	9
	9.06	4500	97	21	21	17	20	9
	9.35	4500	97	25	25	20	16	7
	10.79	4500	97	25	25	20	16	7
	11.88	4500	97	25	25	20	16	7
	13.95	4500	97	25	25	20	16	7
	14.77	4500	97	25	25	20	16	7
	16.79	4500	97	25	25	20	16	7
	18.60	4500	97	25	25	20	16	7
	21.93	4500	97	25	25	20	15	7
	24.99	4500	97	25	25	20	15	6
	26.31	4500	97	25	25	20	15	6
R57 3	26.97	4500	95	26	26	20	17	8
	30.18	4500	95	26	26	20	17	8
	35.07	4500	95	26	26	20	17	8
	37.30	4500	95	26	26	20	17	8
	43.30	4500	95	26	26	20	17	8
	48.23	4500	95	26	26	20	17	8
	53.22	4500	95	26	26	20	17	8
	57.29	4500	95	26	26	20	17	8
	64.85	4500	95	26	26	20	17	8
	69.23	4500	95	26	26	20	17	7
	80.55	4500	94	26	26	20	16	7
	89.71	4500	94	26	26	20	16	7
	98.99	4500	94	26	26	20	16	7
	106.58	4500	94	26	26	20	16	7
	120.63	4500	94	26	26	20	16	7
	128.77	4500	94	26	26	20	16	7
	147.92	4500	94	26	26	20	16	7
	172.17	4500	93	26	26	20	16	7
	186.89	4500	93	26	26	20	16	7

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CM3C..							F_{Ramax}			F_{Rapk}		
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	RM	R	RF	RM
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N
R57 2	4.39	280	420	475	335	4.3	1900	1900	4000	7230	7230	4000
	5.05	305	425	515	291	3.4	1730	1730	4000	7210	7210	4000
	5.82	320	425	540	254	2.7	1820	1820	4000	7210	7210	4000
	6.41	335	425	570	231	2.3	1770	1770	4000	7210	7210	4000
	7.53	350	425	595	215	1.8	1950	1950	4000	7210	7210	4000
	7.97	355	425	600	206	1.6	2020	2020	4000	7210	7210	4000
	9.06	375	425	635	175	1.3	2010	2010	4000	7210	7210	4000
	9.35	370	455	625	171	2.8	3180	3180	4000	7080	7080	4000
	10.79	390	455	660	146	2.2	3330	3330	4000	7080	7080	4000
	11.88	405	455	685	131	1.9	3430	3430	4000	7080	7080	4000
	13.95	430	455	730	110	1.6	3610	3610	4000	7080	7080	4000
	14.77	435	455	740	106	1.4	3690	3690	4000	7080	7080	4000
	16.79	450	455	765	96	1.1	3860	3860	4000	7080	7080	4000
	18.60	450	455	765	96	0.94	4050	4050	4000	7080	7080	4000
	21.93	450	455	765	97	0.73	4370	4370	4000	7080	7080	4000
	24.99	450	455	765	97	0.51	4640	4640	4000	7080	7080	4000
	26.31	450	455	765	97	0.45	4750	4750	4000	7080	7080	4000
R57 3	26.97	450	455	765	62	1.5	4800	4800	4000	7080	7080	4000
	30.18	450	455	765	62	1.3	5040	5040	4000	7080	7080	4000
	35.07	450	455	765	62	0.97	5390	5390	4000	7080	7080	4000
	37.30	450	455	765	62	0.89	5530	5530	4000	7080	7080	4000
	43.30	450	455	765	62	0.70	5900	5900	4000	7080	7080	4000
	48.23	450	455	765	62	0.60	6170	6170	4000	7080	7080	4000
	53.22	450	455	765	62	0.49	6430	6430	4000	7080	7080	4000
	57.29	450	455	765	62	0.46	6630	6630	4000	7080	7080	4000
	64.85	450	455	765	62	0.38	6980	6980	4000	7080	7080	4000
	69.23	450	455	765	62	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	50	0.54	7100	7100	4000	7080	7080	4000
	98.99	450	455	765	45	0.45	7100	7100	4000	7080	7080	4000
	106.58	450	455	765	42	0.42	7100	7100	4000	7080	7080	4000
	120.63	450	455	765	37	0.35	7100	7100	4000	7080	7080	4000
	128.77	450	455	765	35	0.32	7100	7100	4000	7080	7080	4000
	147.92	450	455	765	30	0.26	7100	7100	4000	7080	7080	4000
	172.17	450	455	765	26	0.21	7100	7100	4000	7080	7080	4000
	186.89	450	455	765	24	0.18	7100	7100	4000	7080	7080	4000

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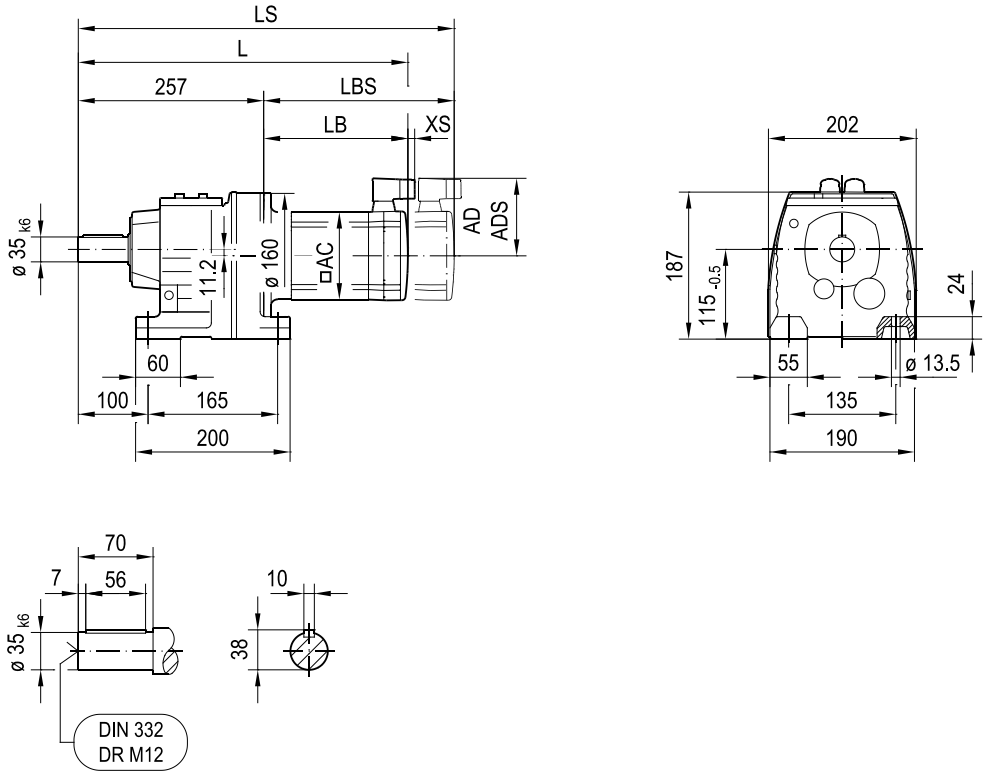
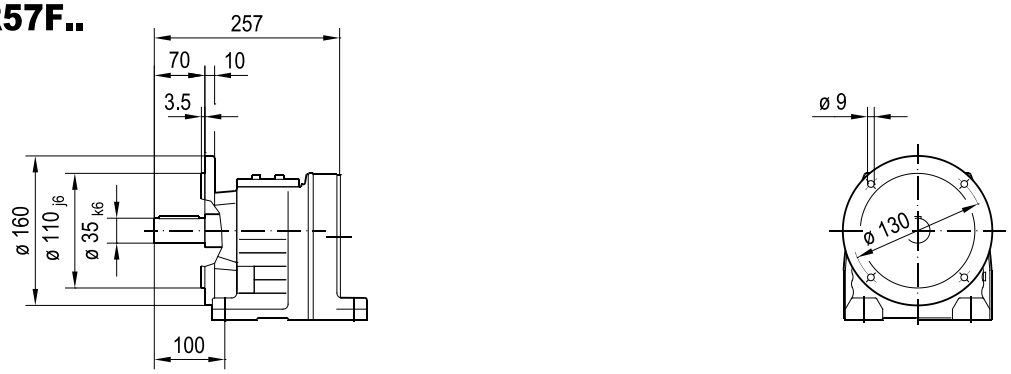
R57..



R57F..



(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	401	439	477	438	460	505	470	496	549	500	528	585
LS	442	480	518	504	526	571	538	564	617	574	602	659
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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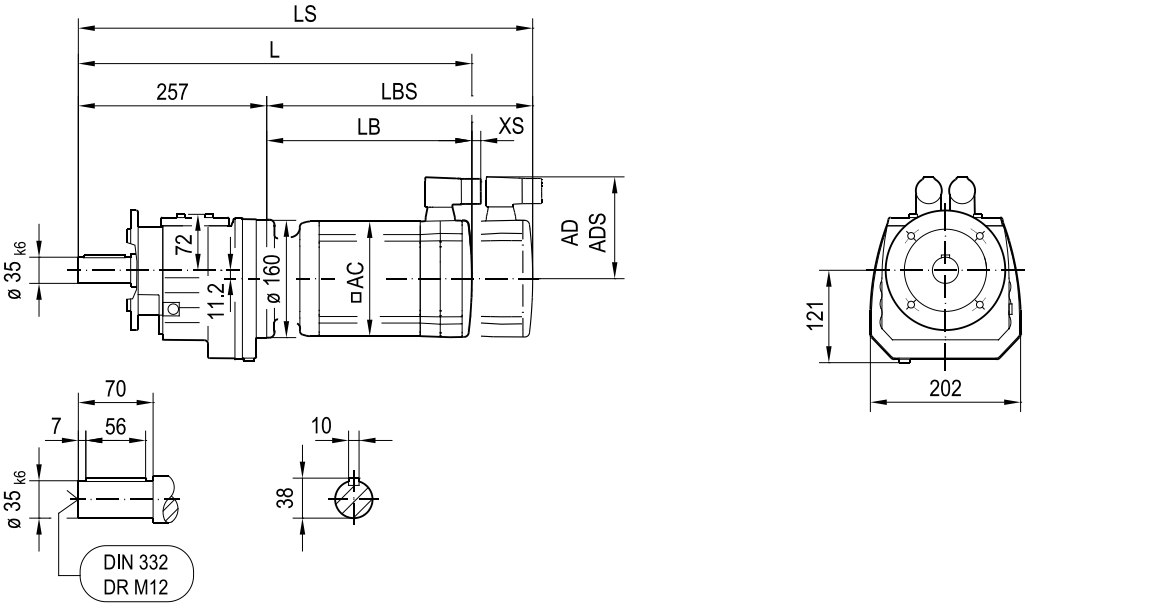
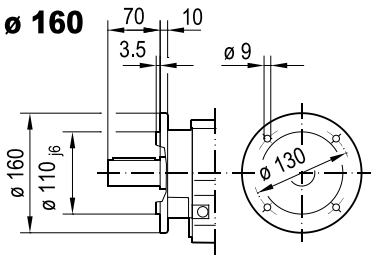
RF57..

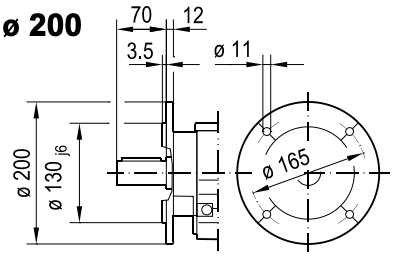
01 041 00 19



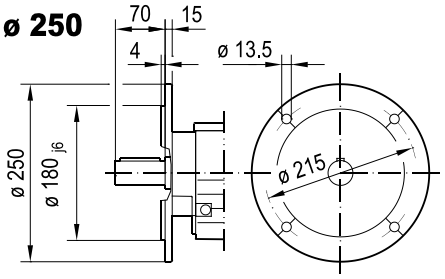
ø 160



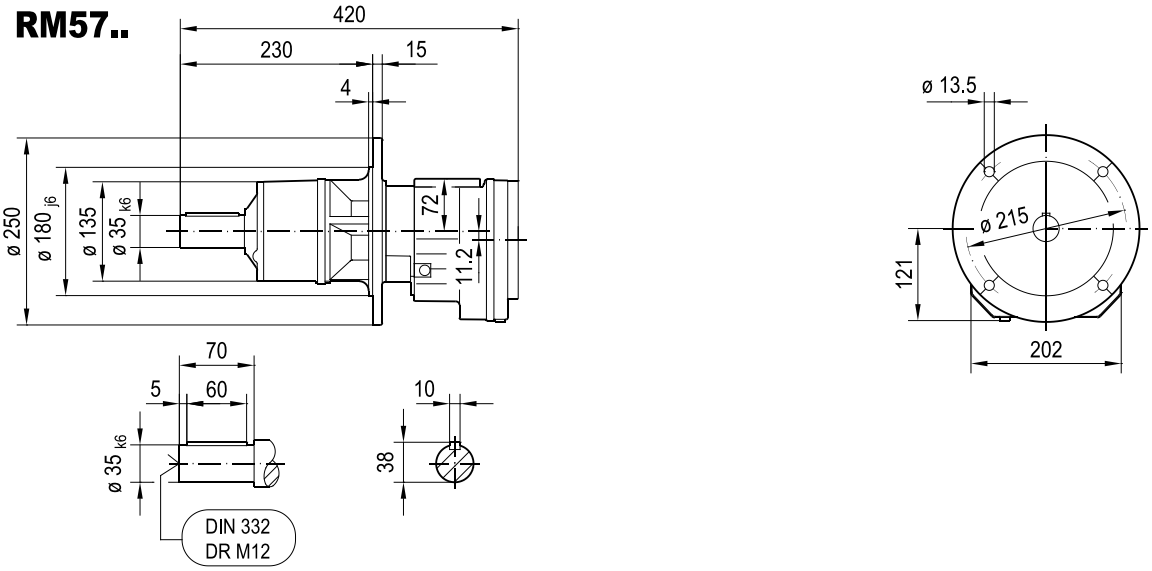
ø 200



ø 250



RM57..



(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	401	439	477	438	460	505	470	496	549	500	528	585
LS	442	480	518	504	526	571	538	564	617	574	602	659
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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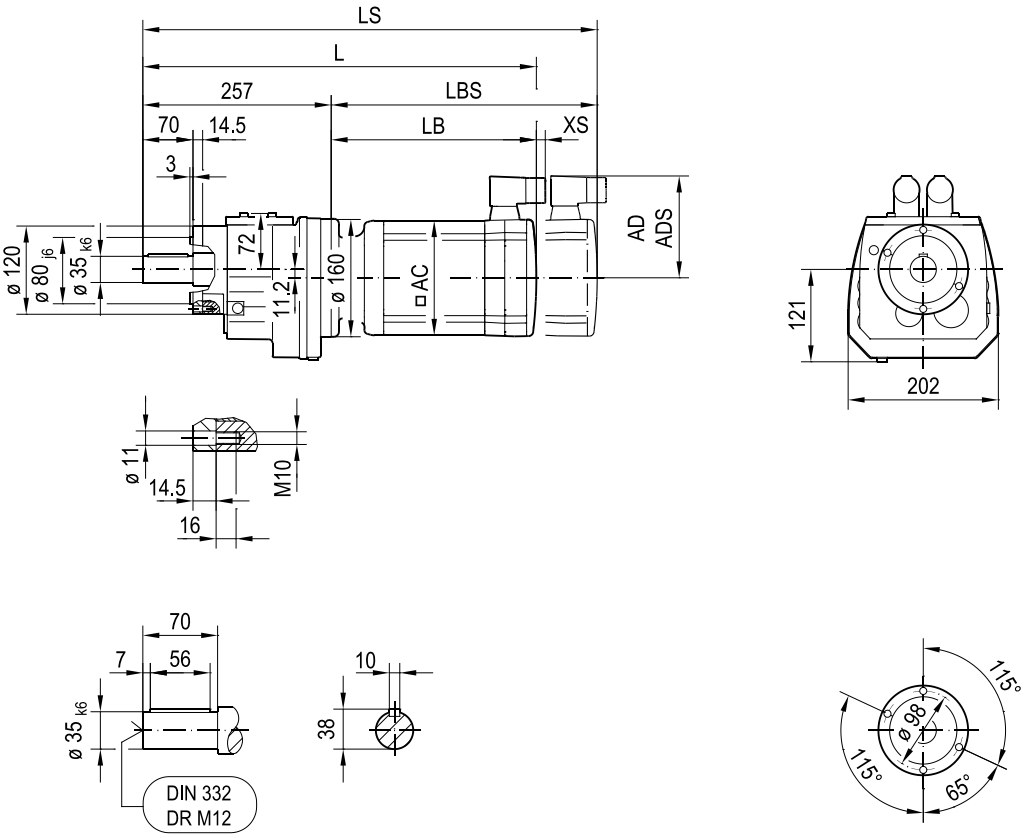
01 042 00 19

RZ57..



(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	401	439	477	438	460	505	470	496	549	500	528	585
LS	442	480	518	504	526	571	538	564	617	574	602	659
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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8.3.7 R67..

R67, M_{aDyn} Nm												600 Nm
	CM3C											
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
						2						
4.29	33	61	79	81	118	174	131	194	280	235	330	>405
4.93	38	70	91	93	136	200	150	220	325	270	380	>435
5.70	44	81	106	107	157	230	174	255	375	315	440	>465
6.27	49	89	116	118	173	255	191	280	415	345	>485	
7.36	57	104	137	139	200	295	220	330	>485	405	>485	
7.79	61	111	145	147	215	315	235	350	>485	430	>485	
8.70	68	124	162	164	240	350	265	390	575	480	>660	>660
10.00	78	142	186	189	275	405	305	450	660	550	>665	>665
11.54	90	164	210	215	315	470	350	520	>665	635	>665	>665
12.70	99	181	235	240	350	515	385	575	>665	>665	>665	
14.91	117	210	275	280	410	605	455	>665	>665	>665	>665	
15.79	124	225	290	295	435	640	480	>665	>665	>665	>665	
17.95	141	255	330	335	495	>665	545	>665				
19.89	156	280	370	375	545	>665	605	>665				
23.44	184	330	435	440	645		>665					
26.72	205	380		505								
28.13	220	400		530								
						3						
28.83	220	400	525	530	>595	>595	>595	>595	>595	>595	>595	
32.27	245	450	585	>595	>595	>595	>595	>595	>595	>595	>595	
37.50	285	520	>595	>595	>595	>595	>595	>595	>595	>595	>595	
39.88	305	555	>595	>595	>595	>595	>595	>595	>595	>595	>595	
46.29	355	>600	>600	>600	>600	>600	>600	>600				
51.56	395	>600	>600	>600	>600	>600	>600	>600				
56.89	435	>600		>600								
61.26	470	>600	>600	>600	>600		>600					
69.75	535	>660	>660	>660	>660	>660	>660	>660	>660	>660	>660	
74.17	570	>660	>660	>660	>660	>660	>660	>660	>660	>660	>660	
86.11	>660	>660	>660	>660	>660	>660	>660	>660				
95.91	>660	>660	>660	>660	>660	>660	>660	>660				
105.83	>660	>660		>660								
113.94	>660	>660	>660	>660	>660		>660					
128.97	>660	>660		>660								
137.67	>660	>660		>660								
158.14	>660											
184.07												
199.81												

(→ 183)

R67, m kg												
	CM3C											
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
2	28	29	31	31	32	35	35	37	42	41	45	52
3	29	30	32	32	33	36	36	38	43	42	46	53
RF: + 3.2 kg / RM: + 19 kg												

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CM3C..				c_{TG}			φ	
		n_{epk}	η	R	RF	RM		/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	'	'
R67 2	4.29	3700	97	24	24	22	22	10
	4.93	4252	97	24	24	22	22	9
	5.70	4500	97	24	24	22	21	9
	6.27	4500	97	24	24	22	21	9
	7.36	4500	97	24	24	22	20	8
	7.79	4500	97	24	24	22	20	8
	8.70	4500	97	32	32	28	15	7
	10.00	4500	97	32	32	28	15	7
	11.54	4500	97	32	32	28	14	7
	12.70	4500	97	32	32	28	14	6
	14.91	4500	97	32	32	28	14	6
	15.79	4500	97	32	32	28	14	6
	17.95	4500	97	32	32	28	14	6
	19.89	4500	97	32	32	28	14	6
	23.44	4500	97	32	32	28	14	6
	26.72	4500	97	32	32	28	13	6
	28.13	4500	97	32	32	28	13	6
R67 3	28.83	4500	95	33	33	29	15	7
	32.27	4500	95	33	33	29	15	7
	37.50	4500	95	33	33	29	15	7
	39.88	4500	95	33	33	29	15	7
	46.29	4500	95	33	33	29	15	7
	51.56	4500	95	33	33	29	15	7
	56.89	4500	95	33	33	29	15	7
	61.26	4500	95	33	33	29	15	7
	69.75	4500	95	33	33	29	14	7
	74.17	4500	95	33	33	29	14	7
	86.11	4500	95	33	33	29	14	6
	95.91	4500	95	33	33	29	14	6
	105.83	4500	95	33	33	29	14	6
	113.94	4500	95	33	33	29	14	6
	128.97	4500	95	33	33	29	14	6
	137.67	4500	94	33	33	29	14	6
	158.14	4500	94	33	33	29	14	6
	184.07	4500	94	33	33	29	14	6
	199.81	4500	93	33	33	29	14	6

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CM3C..							F_{Ramax}			F_{Rapk}		
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	RM	R	RF	RM
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N
R67 2	4.29	270	405	455	343	5.9	5000	5000	8720	9300	9300	9800
	4.93	290	435	490	298	4.6	5210	5210	9120	9100	9100	9760
	5.70	310	465	525	261	3.6	5450	5450	9560	8870	8870	9710
	6.27	330	485	560	236	3.0	5590	5590	9850	8710	8710	9680
	7.36	370	485	625	201	2.4	5790	5790	9850	8710	8710	9680
	7.79	380	485	645	190	2.1	5830	5830	9840	8710	8710	9680
	8.70	440	660	745	172	4.0	5960	5960	9750	5350	5350	9330
	10.00	470	665	795	151	3.2	6220	6220	9700	4700	4700	9320
	11.54	500	665	850	133	2.5	6500	6500	9660	4700	4700	9320
	12.70	520	665	880	120	2.2	6640	6640	9620	4700	4700	9320
	14.91	550	665	930	103	1.7	6980	6980	9560	4700	4700	9320
	15.79	560	665	950	97	1.6	7130	7130	9540	4700	4700	9320
	17.95	590	665	1000	85	1.2	7330	7330	9480	4700	4700	9320
	19.89	600	665	1020	77	1.0	7560	7560	9460	4700	4700	9320
	23.44	560	665	950	95	0.80	8010	8010	9540	4700	4700	9320
	26.72	540	665	910	106	0.56	8210	8210	9580	4700	4700	9320
	28.13	540	665	910	106	0.50	8210	8210	9580	4700	4700	9320
R67 3	28.83	520	595	880	51	1.5	8400	8400	9620	7620	7620	9470
	32.27	540	595	910	46	1.3	8210	8210	9580	7620	7620	9470
	37.50	570	595	960	39	1.0	7900	7900	9520	7620	7620	9470
	39.88	580	595	980	37	0.93	7790	7790	9500	7620	7620	9470
	46.29	600	600	1020	33	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	30	0.88	7560	7560	9460	5350	5350	9330
	74.17	600	660	1020	30	0.81	7560	7560	9460	5350	5350	9330
	86.11	600	660	1020	30	0.63	7560	7560	9460	5350	5350	9330
	95.91	600	660	1020	30	0.54	7560	7560	9460	5350	5350	9330
	105.83	600	660	1020	30	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	30	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	28	0.26	7560	7560	9460	5350	5350	9330
	184.07	600	660	1020	24	0.21	7560	7560	9460	5350	5350	9330
	199.81	600	660	1020	23	0.19	7560	7560	9460	5350	5350	9330

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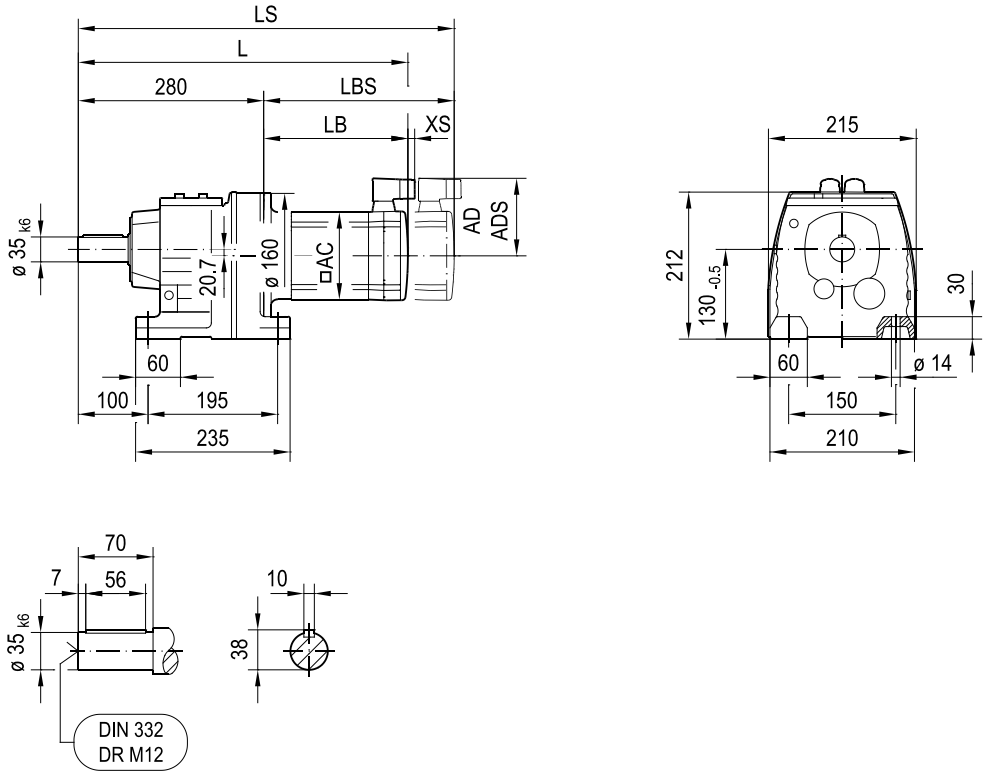
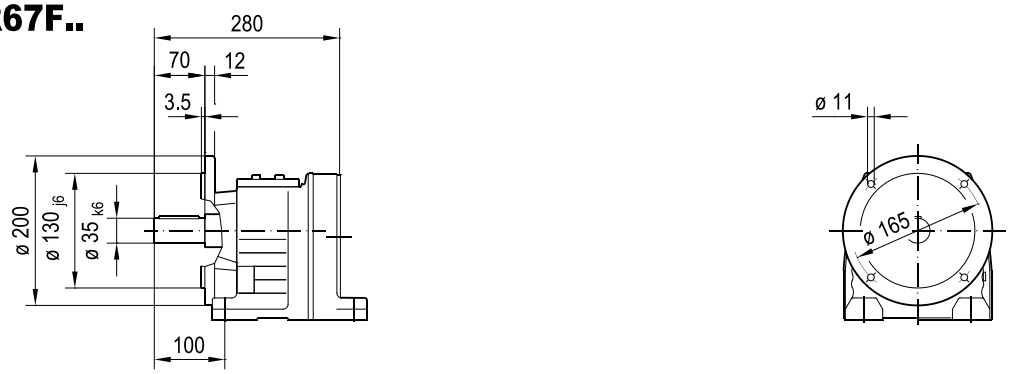
R67..



R67F..



(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	424	462	500	461	483	528	493	519	572	523	551	608
LS	465	503	541	527	549	594	561	587	640	597	625	682
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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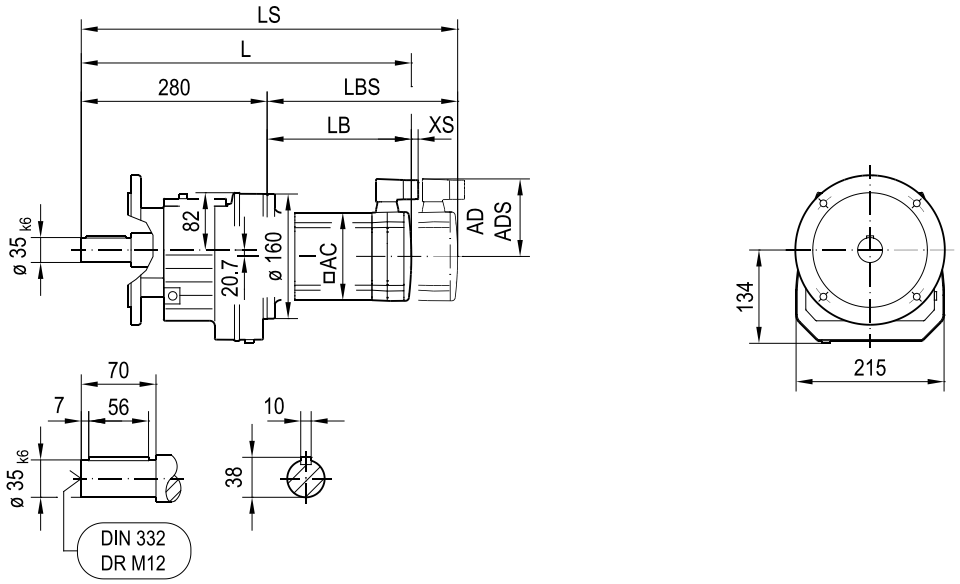
RF67..



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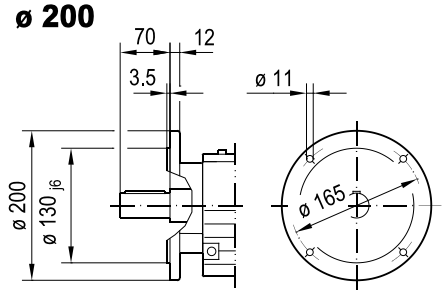

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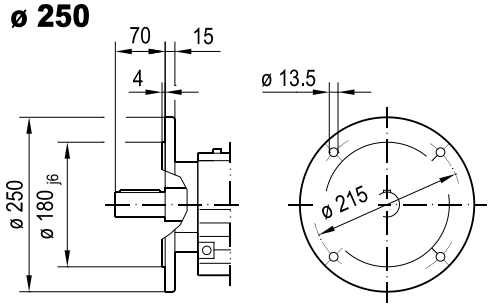
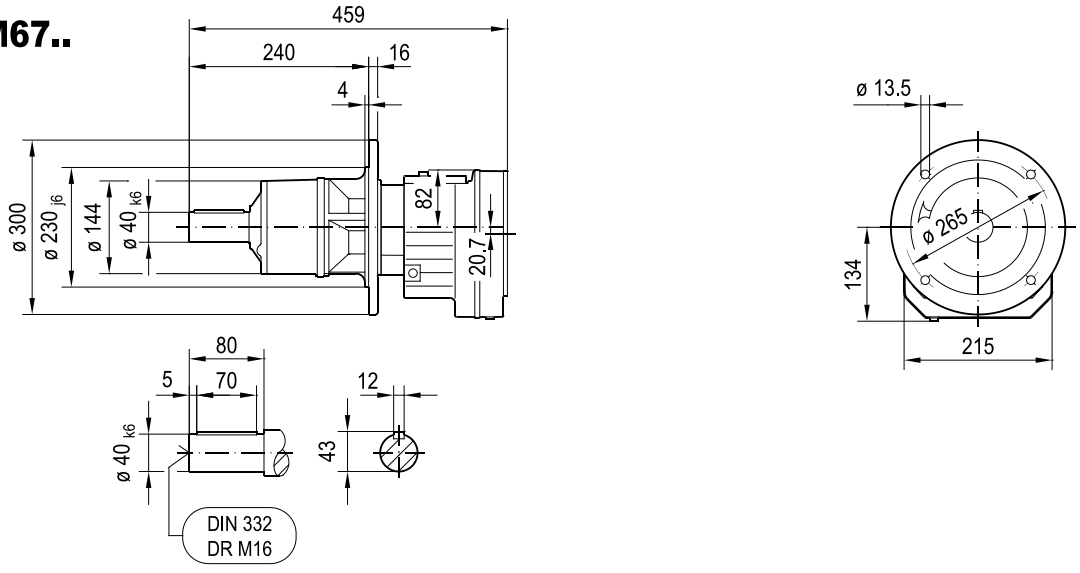


RM67..



(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	424	462	500	461	483	528	493	519	572	523	551	608
LS	465	503	541	527	549	594	561	587	640	597	625	682
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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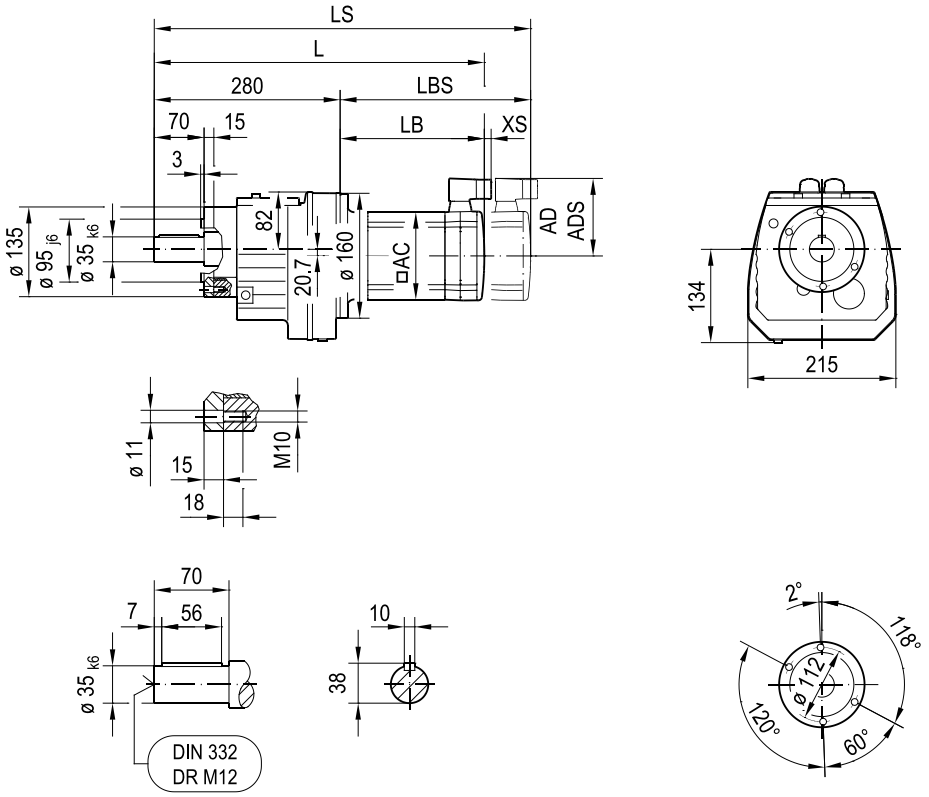
RZ67..



(→ 📖 7.3)	CM3C											
	63S	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	424	462	500	461	483	528	493	519	572	523	551	608
LS	465	503	541	527	549	594	561	587	640	597	625	682
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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8.3.8 R77..

R77, M_{aDyn} Nm									820 Nm
	CM3C								
i	71S	71M	71L	80S	80M	80L	100S	100M	100L
					2				
5.31	100	146	215	162	240	350	290	410	615
5.99	113	165	240	183	270	395	330	465	695
6.79	128	187	275	205	305	450	375	525	790
7.74	146	210	315	235	350	510	425	600	>840
8.59	162	235	345	260	385	565	470	665	
9.64	182	265	390	290	435	635	530	750	>900
10.88	205	300	440	330	490	720	600	840	>900
12.33	230	340	500	375	555	810	680	>900	>900
14.05	265	385	570	425	635	>900	775	>900	>900
15.60	295	430	635	475	705	>900	860	>900	
17.82	335	490	725	540	800	>900	>900	>900	
18.80	355	515	765	570	850	>900	>900	>900	
21.43	405	590	870	650	>900				
23.37	440	645	>900	710	>900				
					3				
25.23	470	690	>900	760	>900	>900	>900	>900	>900
29.00	540	790	>900	870	>900	>900	>900	>900	>900
33.47	625	>900	>900	>900	>900	>900	>900	>900	>900
36.83	680	>900	>900	>900	>900	>900	>900	>900	
43.26	800	>900	>900	>900	>900	>900	>900	>900	
45.81	840	>900	>900	>900	>900	>900	>900	>900	
52.07	>900	>900	>900	>900	>900				
57.68	>900	>900	>900	>900	>900				
65.77	>900	>900	>900	>900	>900	>900	>900	>900	
77.24	>900	>900	>900	>900	>900	>900	>900	>900	
81.80	>900	>900	>900	>900	>900	>900	>900	>900	
92.97	>900	>900	>900	>900	>900				
102.99	>900	>900	>900	>900	>900				
121.42	>900	>900		>900					
138.39	>900								
145.67	>900								
166.59									
195.24									

(→ 183)

R77, m kg									
	CM3C								
s	71S	71M	71L	80S	80M	80L	100S	100M	100L
2	36	38	41	41	43	48	46	50	57
3	37	39	42	42	44	49	47	51	58
RF: + 5.7 kg / RM: + 31 kg									

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CM3C..				c_{TG}			φ	
		n_{epk}	η	R	RF	RM		/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	'	'
R77 2	5.31	4500	97	42	42	46	19	8
	5.99	4500	97	42	42	46	19	8
	6.79	4500	97	42	42	46	19	8
	7.74	4500	97	42	42	46	19	8
	8.59	4500	97	42	42	46	18	7
	9.64	4500	97	51	51	58	15	7
	10.88	4500	97	51	51	58	14	6
	12.33	4500	97	51	51	58	14	6
	14.05	4500	97	51	51	58	14	6
	15.60	4500	97	51	51	58	14	6
	17.82	4500	97	51	51	58	14	6
	18.80	4500	97	51	51	58	14	6
	21.43	4500	97	51	51	58	14	6
	23.37	4500	97	51	51	58	14	6
R77 3	25.23	4500	96	53	53	61	16	7
	29.00	4500	96	53	53	61	16	7
	33.47	4500	96	53	53	61	15	7
	36.83	4500	95	53	53	61	15	7
	43.26	4500	95	53	53	61	15	7
	45.81	4500	95	53	53	61	15	7
	52.07	4500	95	53	53	61	15	7
	57.68	4500	95	53	53	61	15	7
	65.77	4500	95	53	53	61	14	7
	77.24	4500	95	53	53	61	14	6
	81.80	4500	95	53	53	61	14	6
	92.97	4500	95	53	53	61	14	6
	102.99	4500	95	53	53	61	14	6
	121.42	4500	94	53	53	61	14	6
	138.39	4500	94	53	53	61	14	6
	145.67	4500	94	53	53	61	14	6
	166.59	4500	94	53	53	61	14	6
	195.24	4500	93	53	53	61	14	6

CM3C..							F_{Ramax}			F_{Rapk}		
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	RM	R	RF	RM
	i	Nm	Nm	Nm	min^{-1}	kg×m^2	N	N	N	N	N	N
R77 2	5.31	510	765	860	275	7.7	3990	3990	12700	10400	10400	13000
	5.99	540	810	910	247	6.4	3990	3990	13000	10000	10000	13000
	6.79	580	840	980	215	5.2	3850	3850	13000	9730	9730	13000
	7.74	610	840	1030	191	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	151	6.6	6300	6300	13000	9110	9110	13000
	10.88	660	900	1120	134	5.5	6490	6490	13000	9110	9110	13000
	12.33	690	900	1170	118	4.5	6740	6740	13000	9110	9110	13000
	14.05	720	900	1220	104	3.7	7050	7050	13000	9110	9110	13000
	15.60	740	900	1250	95	3.3	7390	7390	13000	9110	9110	13000
	17.82	780	900	1320	82	2.7	7620	7620	13000	9110	9110	13000
	18.80	780	900	1320	79	2.5	7980	7980	13000	9110	9110	13000
	21.43	820	900	1390	69	2.0	8250	8250	13000	9110	9110	13000
	23.37	820	900	1390	66	1.7	8870	8870	13000	9110	9110	13000

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CM3C..							F_{Ramax}			F_{Rapk}		
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	RM	R	RF	RM
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N
R77 3	25.23	780	900	1320	60	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	54	1.6	9920	9920	13000	9110	9110	13000
	45.81	820	900	1390	54	1.4	9920	9920	13000	9110	9110	13000
	52.07	820	900	1390	55	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	39	1.6	9920	9920	13000	9110	9110	13000
	77.24	820	900	1390	39	1.3	9920	9920	13000	9110	9110	13000
	81.80	820	900	1390	39	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	39	0.86	9920	9920	13000	9110	9110	13000
	121.42	820	900	1390	37	0.68	9920	9920	13000	9110	9110	13000
	138.39	820	900	1390	33	0.46	9920	9920	13000	9110	9110	13000
	145.67	820	900	1390	31	0.42	9920	9920	13000	9110	9110	13000
	166.59	820	900	1390	27	0.34	9920	9920	13000	9110	9110	13000
	195.24	820	900	1390	23	0.27	9920	9920	13000	9110	9110	13000

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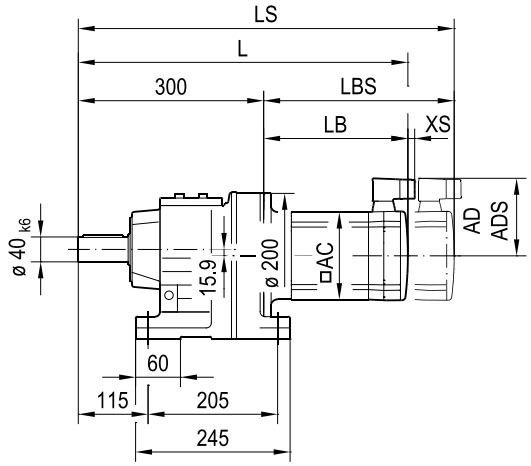
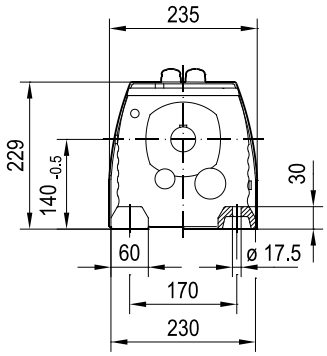
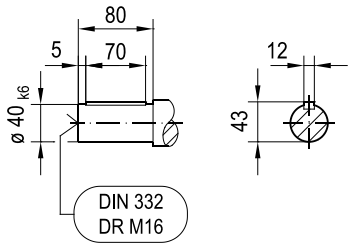
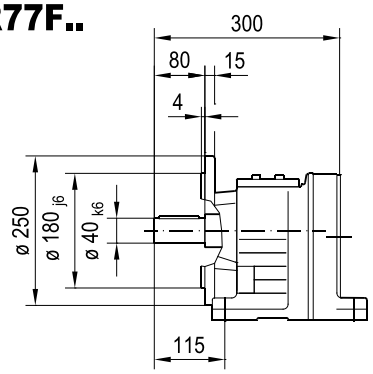
R77..

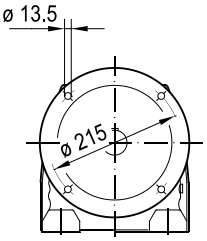






R77F..





(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	473	495	540	505	531	584	531	559	616
LS	539	561	606	573	599	652	605	633	690
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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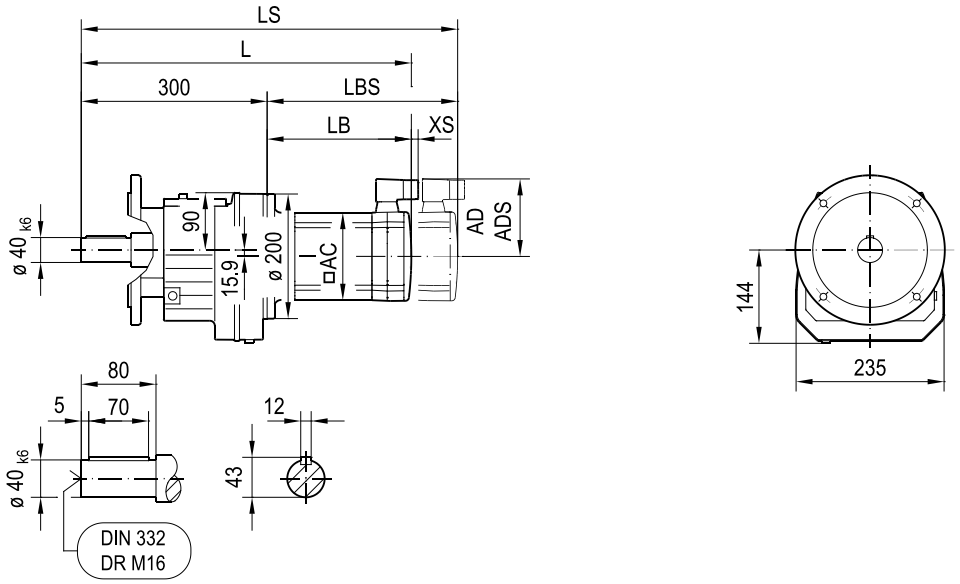
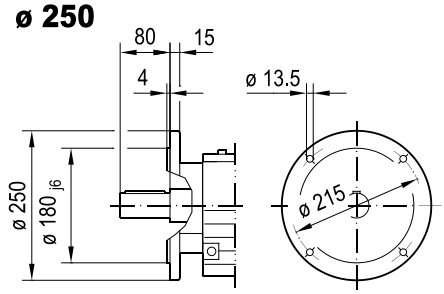
RF77..



ø 250



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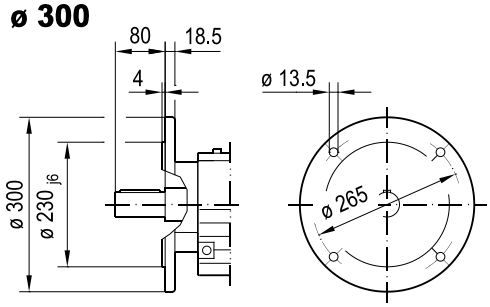
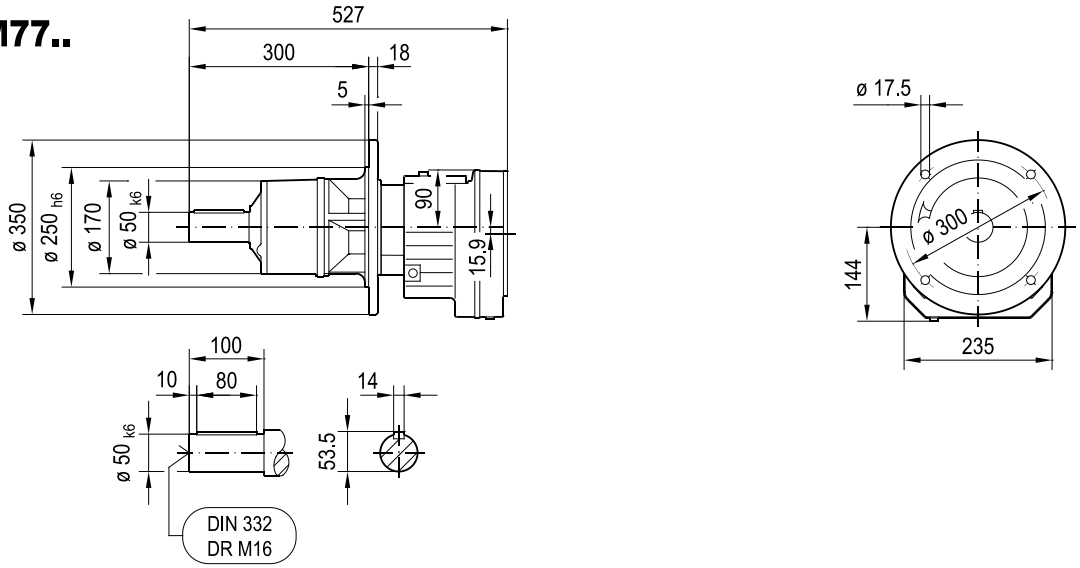


RM77..



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	473	495	540	505	531	584	531	559	616
LS	539	561	606	573	599	652	605	633	690
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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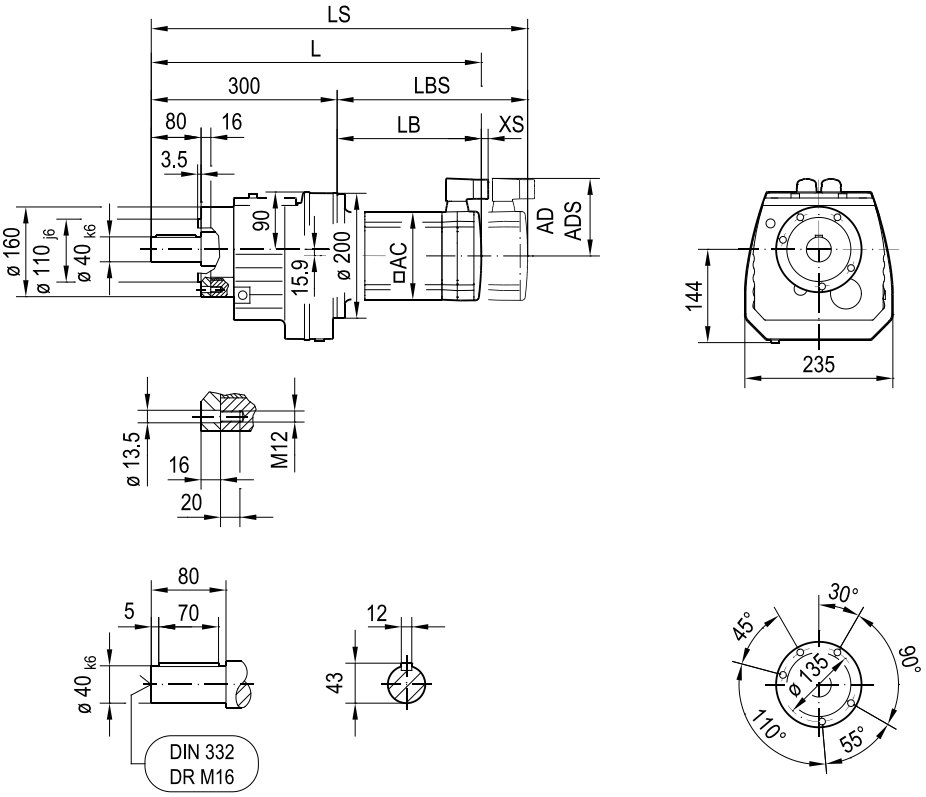
01 048 00 19

RZ77..



(→ 📖 7.3)	CM3C								
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	473	495	540	505	531	584	531	559	616
LS	539	561	606	573	599	652	605	633	690
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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8.3.9 R87..

R87, M_{aDyn} Nm									1550 Nm
	CM3C								
i	71S	71M	71L	80S	80M	80L	100S	100M	100L
2									
5.30		146	215	161	240	350	290	410	615
6.39		176	260	195	290	420	350	495	740
7.13	134	197	290	215	320	470	390	555	820
8.22	155	225	330	250	370	545	450	640	950
9.14	172	250	370	275	410	605	505	710	1060
9.90		270	400	300	445	655	545	770	1150
11.93		325	485	360	540	790	655	930	1380
13.33	250	365	540	405	605	880	735	1030	>1550
15.35	290	420	625	465	695	1010	840	1190	>1550
17.08	320	470	695	520	775	1130	940	1330	>1550
19.10	360	525	775	580	860	1260	1050	1480	>1550
21.51	405	590	870	655	970	1420	1180	>1550	>1550
23.40	440	645	950	710	1060	>1550	1290	>1550	
27.84	525	765	1130	850	1260	>1550	1530	>1550	
31.40	590	860	1270	950	1420				
34.40	650	950	1400	1050	>1550				
3									
27.88	520	760	1120	840	1250	>1550	1520	>1550	>1550
32.66	610	890	1310	980	1460	>1550	>1550	>1550	>1550
36.84	685	1000	1480	1110	>1550	>1550	>1550	>1550	>1550
41.74	780	1140	>1550	1260	>1550	>1550	>1550	>1550	>1550
47.58	890	1300	>1550	1430	>1550	>1550	>1550	>1550	>1550
52.82	980	1440	>1550	>1550	>1550	>1550	>1550	>1550	
60.35	1120	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
63.68	1190	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
72.57	1350	>1550	>1550	>1550	>1550				
81.92	1510	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550
93.38	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550
103.65	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
118.43	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
124.97	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
142.41	>1550	>1550	>1550	>1550	>1550				
155.34	>1550	>1550	>1550	>1550	>1550				
181.77	>1550	>1550		>1550					
205.71	>1550								
216.54	>1550								
246.54									

(→ 🗎 183)

R87, m kg									
	CM3C								
s	71S	71M	71L	80S	80M	80L	100S	100M	100L
2	62	63	66	66	69	74	72	76	83
3	63	65	68	68	70	75	74	77	85
RF: + 7.1 kg / RM: + 37 kg									

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CM3C..				c_{TG}			φ	
		n_{epk}	η	R	RF	RM		/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	'	'
R87 2	5.30	4500	97	76	76	78	16	7
	6.39	4500	97	76	76	78	15	7
	7.13	4500	97	76	76	78	15	7
	8.22	4500	97	76	76	78	15	7
	9.14	4500	97	76	76	78	15	6
	9.90	4500	97	93	93	96	12	6
	11.93	4500	97	93	93	96	12	6
	13.33	4500	97	93	93	96	12	6
	15.35	4500	97	93	93	96	12	6
	17.08	4500	97	93	93	96	12	6
	19.10	4500	97	93	93	96	12	6
	21.51	4500	97	93	93	96	12	6
	23.40	4500	97	93	93	96	11	6
	27.84	4500	97	93	93	96	11	6
	31.40	4500	97	93	93	96	11	5
	34.40	4500	97	93	93	96	11	5
R87 3	27.88	4500	96	97	97	99	13	7
	32.66	4500	96	97	97	99	13	7
	36.84	4500	96	97	97	99	13	7
	41.74	4500	96	97	97	99	13	7
	47.58	4500	96	97	97	99	13	7
	52.82	4500	96	97	97	99	13	6
	60.35	4500	96	97	97	99	13	6
	63.68	4500	96	97	97	99	13	6
	72.57	4500	96	97	97	99	13	6
	81.92	4500	95	97	97	100	12	6
	93.38	4500	95	97	97	100	12	6
	103.65	4500	95	97	97	100	12	6
	118.43	4500	95	97	97	100	12	6
	124.97	4500	95	97	97	100	12	6
	142.41	4500	95	97	97	100	12	6
	155.34	4500	94	97	97	100	12	6
	181.77	4500	94	97	97	100	12	6
	205.71	4500	94	97	97	100	12	6
	216.54	4500	94	97	97	100	12	6
	246.54	4500	93	97	97	100	12	6

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CM3C..							F_{Ramax}			F_{Rapk}		
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	RM	R	RF	RM
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N
R87 2	5.30	910	1270	1540	275	25	1710	1710	16600	18600	18600	20000
	6.39	1020	1270	1730	228	19	970	970	17600	18600	18600	20000
	7.13	1070	1270	1810	205	16	820	820	18300	18600	18600	20000
	8.22	1160	1270	1970	178	13	225	225	19100	18600	18600	20000
	9.14	1210	1270	2050	161	11	99	99	19800	18600	18600	20000
	9.90	1180	1550	2000	147	21	3520	3520	20000	16900	16900	19700
	11.93	1230	1550	2090	125	17	4120	4120	20000	16900	16900	19700
	13.33	1280	1550	2170	111	14	4220	4220	20000	16900	16900	19700
	15.35	1340	1550	2270	97	12	4450	4450	20000	16900	16900	19700
	17.08	1390	1550	2360	87	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	63	6.6	5000	5000	19700	16900	16900	19700
	27.84	1550	1550	2630	63	5.1	6640	6640	19700	16900	16900	19700
	31.40	1550	1550	2630	63	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	55	9.8	7370	7370	19800	16900	16900	19700
	32.66	1550	1550	2630	50	7.6	8220	8220	19700	16900	16900	19700
	36.84	1550	1550	2630	50	6.2	9470	9470	19700	16900	16900	19700
	41.74	1550	1550	2630	51	5.1	10800	10800	19700	16900	16900	19700
	47.58	1550	1550	2630	51	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	52	2.9	15200	15200	19700	16900	16900	19700
	63.68	1550	1550	2630	52	2.7	15800	15800	19700	16900	16900	19700
	72.57	1550	1550	2630	52	2.2	16900	16900	19700	16900	16900	19700
	81.92	1550	1550	2630	52	4.0	16900	16900	19700	16900	16900	19700
	93.38	1550	1550	2630	48	3.3	16900	16900	19700	16900	16900	19700
	103.65	1550	1550	2630	43	3.0	16900	16900	19700	16900	16900	19700
	118.43	1550	1550	2630	38	2.4	16900	16900	19700	16900	16900	19700
	124.97	1550	1550	2630	36	2.3	16900	16900	19700	16900	16900	19700
	142.41	1550	1550	2630	32	1.9	16900	16900	19700	16900	16900	19700
	155.34	1550	1550	2630	29	1.6	16900	16900	19700	16900	16900	19700
	181.77	1550	1550	2630	25	1.3	16900	16900	19700	16900	16900	19700
	205.71	1550	1550	2630	22	0.90	16900	16900	19700	16900	16900	19700
	216.54	1550	1550	2630	21	0.81	16900	16900	19700	16900	16900	19700
	246.54	1550	1550	2630	18	0.66	16900	16900	19700	16900	16900	19700

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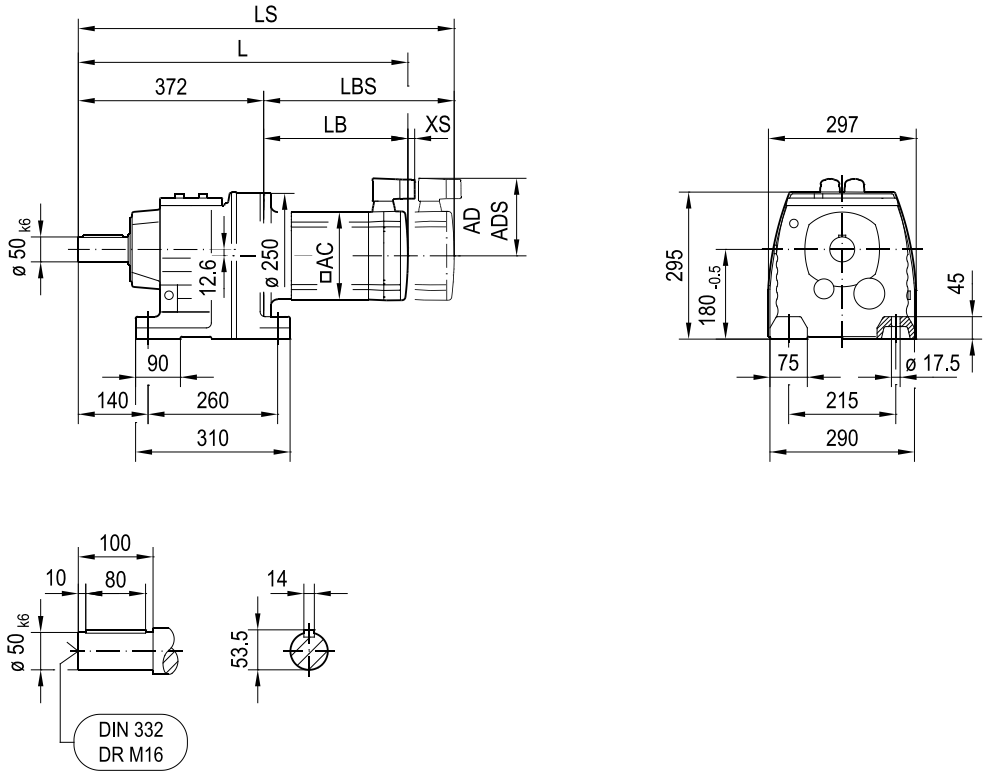
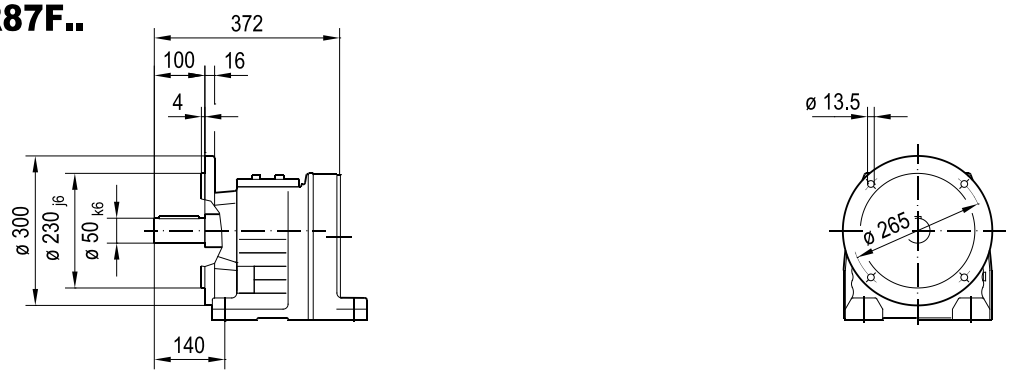
01 049 00 19

R87..



R87F..



(→ 📖 7.3)	CM3C								
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	541	563	608	572	598	651	598	626	683
LS	607	629	674	640	666	719	672	700	757
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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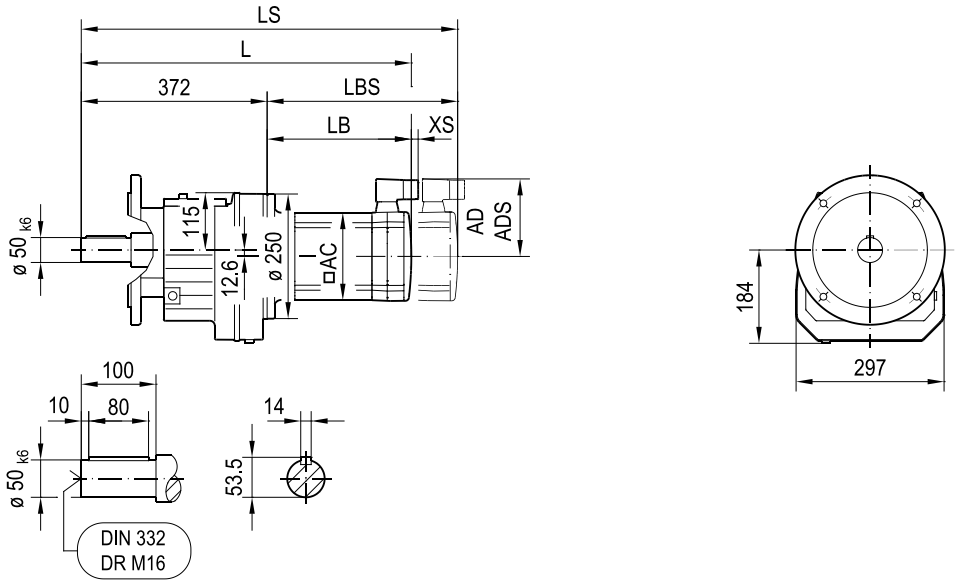
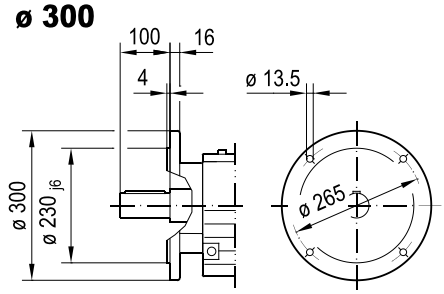
01 050 00 19

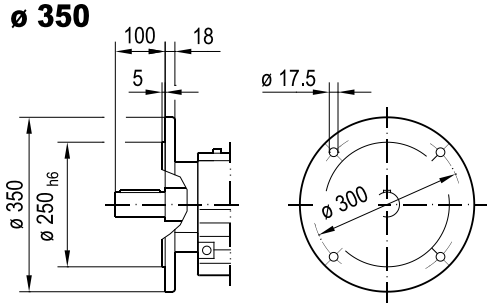
RF87..



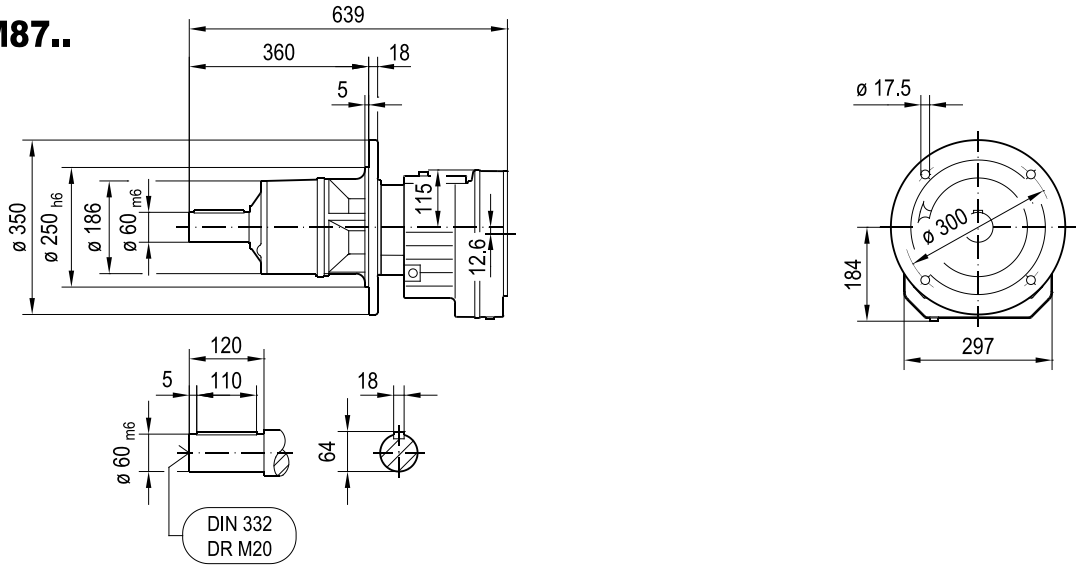
ø 300



ø 350



RM87..



(→ 📖 7.3)	CM3C								
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	541	563	608	572	598	651	598	626	683
LS	607	629	674	640	666	719	672	700	757
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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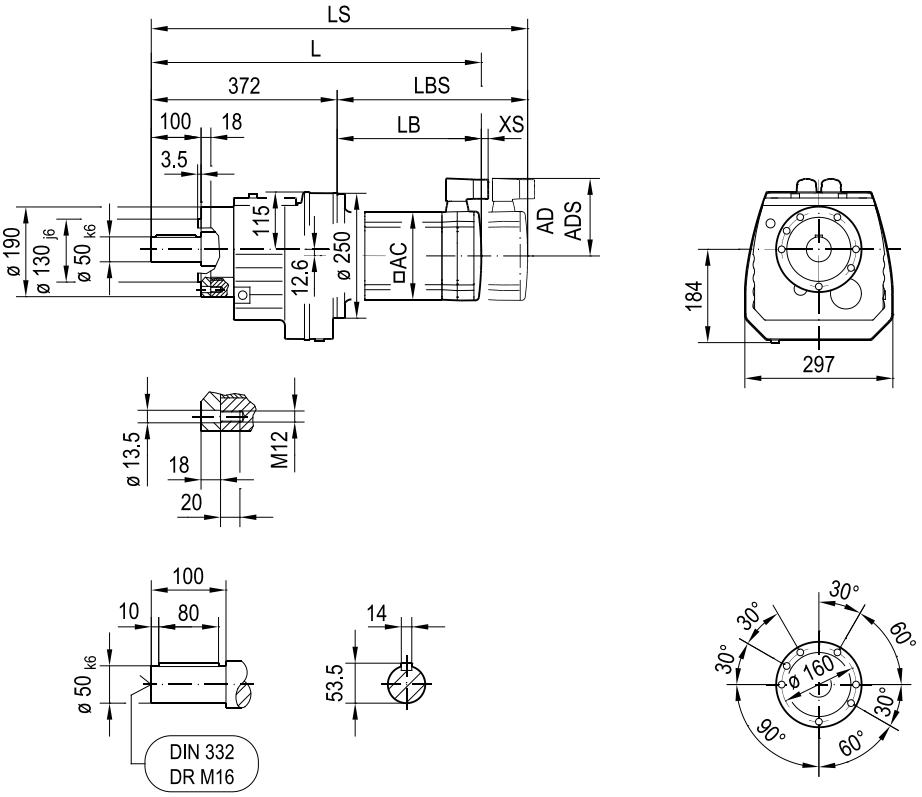
01 051 00 19

RZ87..



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	541	563	608	572	598	651	598	626	683
LS	607	629	674	640	666	719	672	700	757
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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8.3.10 R97..

R97, M_{aDyn} Nm						3000 Nm
	CM3C					
i	80S	80M	80L	100S	100M	100L
			2			
4.50			295	245	350	520
5.20			345	285	405	605
6.21			410	340	480	720
7.12	215	320	470	390	555	820
8.39	255	380	555	460	650	970
9.29	280	420	615	510	720	1080
10.83			715	595	840	1260
12.39	375	560	820	685	960	1440
14.62	445	660	970	800	1140	1700
16.17	490	730	1070	890	1260	1880
18.24	555	820	1210	1000	1420	2120
20.14	615	910	1330	1110	1570	2340
22.37	680	1010	1480	1230	1740	2600
25.03	760	1130	1660	1380	1950	2910
27.19	830	1230	1800	1500	2120	
32.05	970	1450	2120	1770	2490	
			3			
27.58	830	1230	1810	1500	2120	>3090
33.25	1000	1490	2180	1810	2560	>3090
37.13	1120	1660	2430	2030	2860	>3090
42.78	1290	1920	2800	2340	>3090	>3090
47.58	1430	2130	>3090	2600	>3090	>3090
53.21	1600	2390	>3090	2910	>3090	>3090
59.92	1810	2690	>3090	>3090	>3090	>3090
65.21	1970	2920	>3090	>3090	>3090	
72.17	2150	>3090	>3090	>3090	>3090	>3090
83.15	2480	>3090	>3090	>3090	>3090	>3090
92.48	2760	>3090	>3090	>3090	>3090	>3090
103.44	>3090	>3090	>3090	>3090	>3090	>3090
116.48	>3090	>3090	>3090	>3090	>3090	>3090
126.75	>3090	>3090	>3090	>3090	>3090	
150.78	>3090	>3090	>3090	>3090	>3090	
170.02	>3090	>3090				
186.30	>3090	>3090				
216.28	>3090					
241.25						
255.71						
289.74						

(→ 183)

R97, m kg						
	CM3C					
s	80S	80M	80L	100S	100M	100L
2	105	105	110	110	115	120
3	110	110	115	115	120	125

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R97, m kg						
	CM3C					
s	80S	80M	80L	100S	100M	100L
RF: + 17 kg / RM: + 68 kg						

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CM3C..				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	14	6
	5.20	3924	97	127	127	112	14	6
	6.21	4378	97	127	127	112	13	6
	7.12	4500	97	127	127	112	13	6
	8.39	4500	97	127	127	112	13	6
	9.29	4500	97	127	127	112	13	6
	10.83	4378	97	155	155	132	11	6
	12.39	4500	97	155	155	132	11	6
	14.62	4500	97	155	155	132	11	6
	16.17	4500	97	155	155	132	11	6
	18.24	4500	97	155	155	132	11	6
	20.14	4500	97	155	155	132	11	5
	22.37	4500	97	155	155	132	11	5
	25.03	4500	97	155	155	132	11	5
	27.19	4500	97	155	155	132	10	5
	32.05	4500	97	155	155	132	10	5
R97 3	27.58	4500	96	163	163	138	12	6
	33.25	4500	96	163	163	138	12	6
	37.13	4500	96	163	163	138	12	6
	42.78	4500	96	163	163	138	12	6
	47.58	4500	96	163	163	138	12	6
	53.21	4500	96	163	163	138	12	6
	59.92	4500	96	163	163	138	12	6
	65.21	4500	96	163	163	138	11	6
	72.17	4500	95	164	164	139	11	6
	83.15	4500	95	164	164	139	11	6
	92.48	4500	95	164	164	139	11	6
	103.44	4500	95	164	164	139	11	6
	116.48	4500	95	164	164	139	11	6
	126.75	4500	95	164	164	139	11	6
	150.78	4500	95	164	164	139	11	6
	170.02	4500	95	164	164	139	11	6
	186.30	4500	95	164	164	139	11	6
	216.28	4500	94	164	164	139	11	6
	241.25	4500	94	164	164	139	11	6
	255.71	4500	94	164	164	139	11	6
	289.74	4500	93	164	164	139	11	6

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CM3C..							F_{Ramax}			F_{Rapk}		
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	RM	R	RF	RM
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N
R97 2	4.50	1630	2440	2770	324	80	0	0	17900	24400	24400	26300
	5.20	1780	2560	3020	281	65	0	0	18700	23800	23800	26100
	6.21	1890	2560	3210	256	51	0	0	19900	23800	23800	26100
	7.12	2000	2560	3400	228	41	0	0	20800	23800	23800	26100
	8.39	2030	2560	3450	219	33	0	0	22000	23800	23800	26100
	9.29	2030	2560	3450	221	28	0	0	22800	23800	23800	26100
	10.83	2090	3090	3550	136	46	3720	3720	23700	16000	16000	24500
	12.39	2190	3090	3720	119	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	90	26	4130	4130	26200	16000	16000	24500
	18.24	2500	3090	4250	80	22	4270	4270	26100	16000	16000	24500
	20.14	2610	3090	4430	72	19	4110	4110	26000	16000	16000	24500
	22.37	2720	3090	4620	65	16	4060	4060	25800	16000	16000	24500
	25.03	2830	3090	4810	58	14	4140	4140	25700	16000	16000	24500
	27.19	2560	3090	4350	75	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	55	24	7260	7260	25900	16000	16000	24500
	33.25	2890	3090	4910	46	19	7160	7160	25600	16000	16000	24500
	37.13	3000	3090	5100	41	16	7410	7410	25400	16000	16000	24500
	42.78	3000	3090	5100	40	13	9480	9480	25400	16000	16000	24500
	47.58	3000	3090	5100	40	11	11100	11100	25400	16000	16000	24500
	53.21	3000	3090	5100	40	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	36	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	30	4.9	19800	19800	25400	16000	16000	24500
	170.02	3000	3090	5100	26	4.0	19800	19800	25400	16000	16000	24500
	186.30	3000	3090	5100	24	3.5	19800	19800	25400	16000	16000	24500
	216.28	3000	3090	5100	21	2.8	19800	19800	25400	16000	16000	24500
	241.25	3000	3090	5100	19	1.8	19800	19800	25400	16000	16000	24500
	255.71	3000	3090	5100	18	1.6	19800	19800	25400	16000	16000	24500
	289.74	3000	3090	5100	16	1.3	19800	19800	25400	16000	16000	24500

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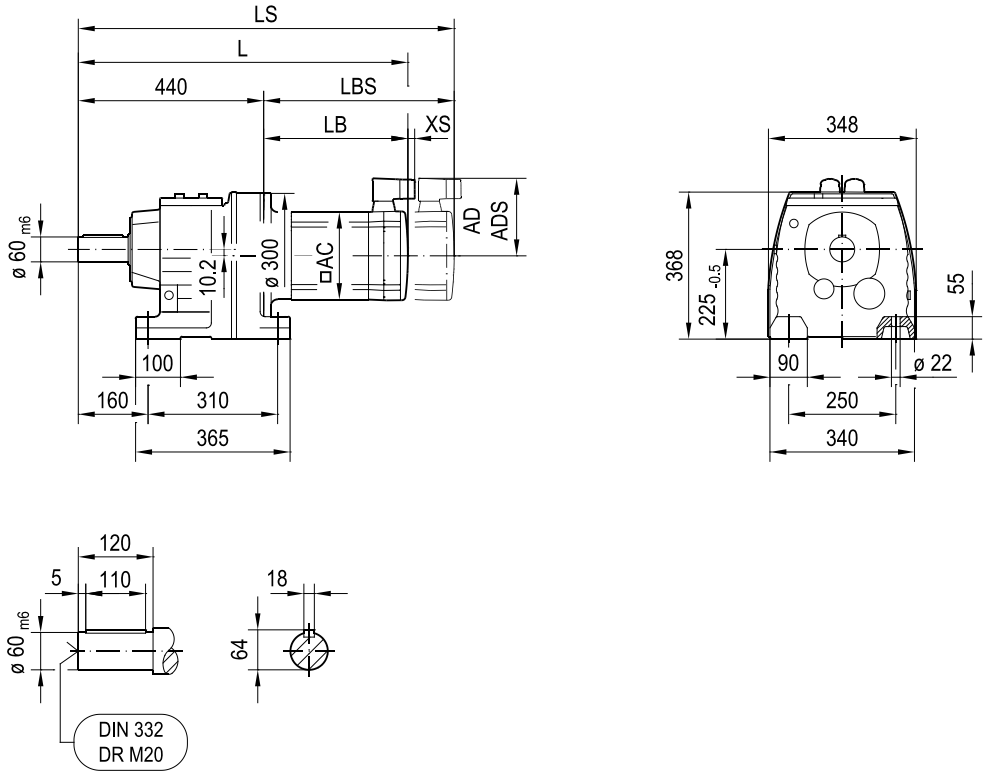
R97..



(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	635	661	714	661	689	746		
LS	703	729	782	735	763	820		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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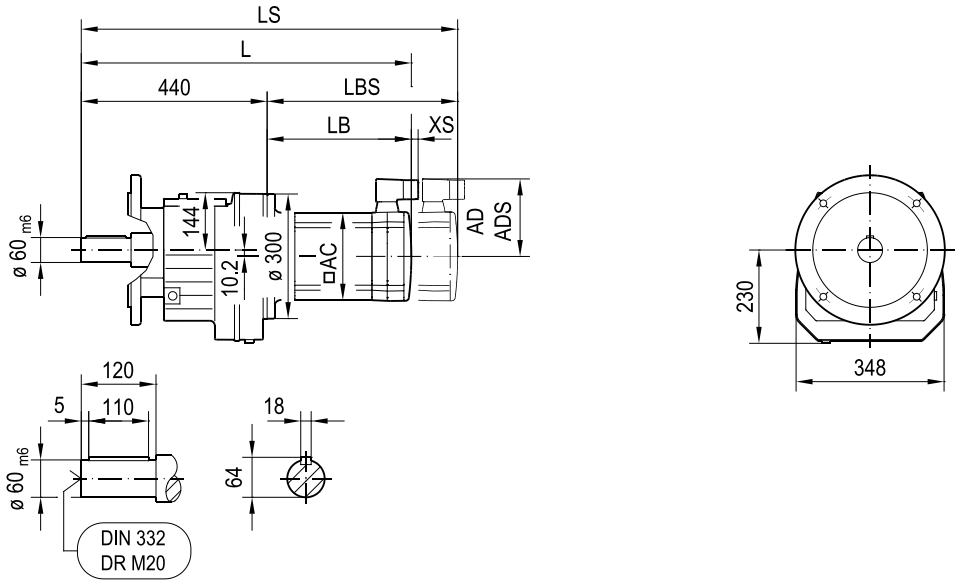
01 053 00 19

RF97..



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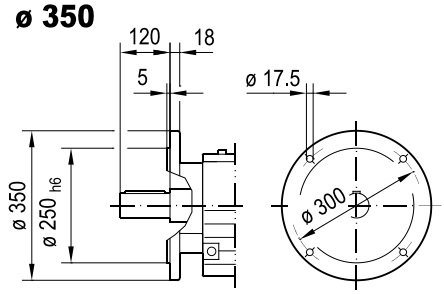

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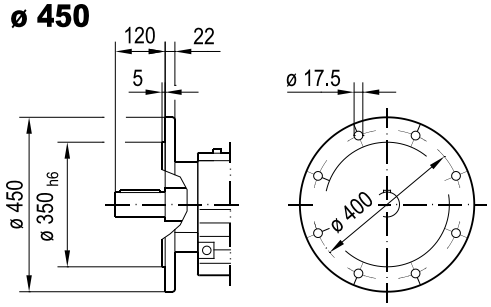
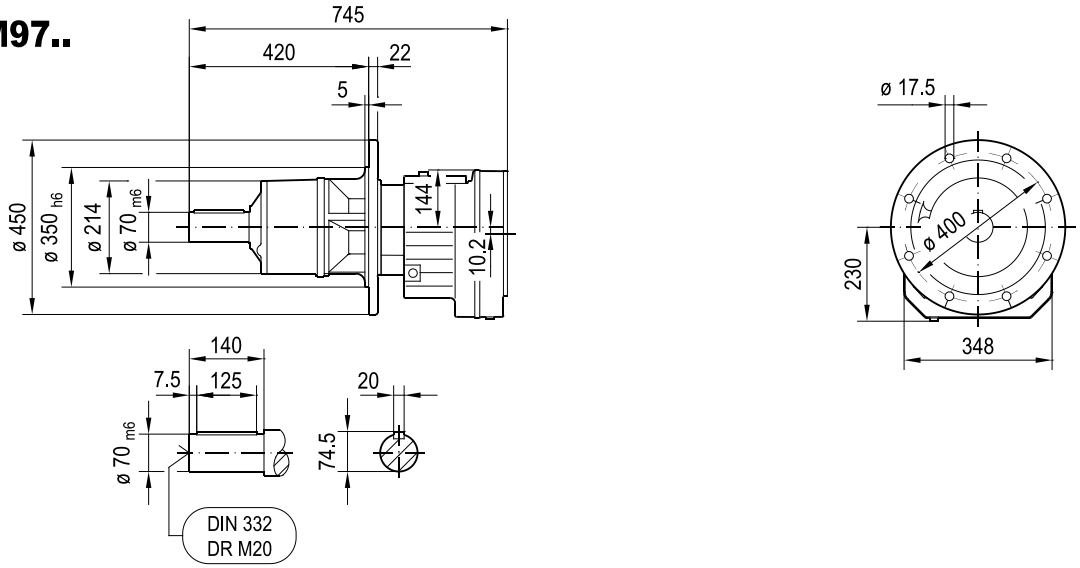


RM97..



(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	635	661	714	661	689	746		
LS	703	729	782	735	763	820		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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8.3.11 R107..

R107, M_{aDyn} Nm			4300 Nm
	CM3C		
i	100S	100M	100L
		2	
4.92			570
5.82	320	450	675
6.66	365	515	775
7.86	430	610	910
8.56			990
10.13	560	790	1170
11.59	640	900	1340
13.66	755	1060	1590
15.65	860	1220	1820
18.21	1000	1420	2110
20.07	1100	1560	2330
22.62	1250	1760	2630
24.90	1370	1940	2890
27.58	1520	2150	3210
30.77	1700	2390	3580
		3	
29.49	1590	2250	3360
35.26	1920	2720	4060
40.37	2200	3110	>4360
47.63	2600	3670	>4360
52.68	2880	4060	>4360
59.41	3250	>4360	>4360
65.60	3580	>4360	>4360
72.88	3980	>4360	>4360
78.57	4250	>4360	>4360
92.70	>4360	>4360	>4360
102.53	>4360	>4360	>4360
115.63	>4360	>4360	>4360
127.68	>4360	>4360	>4360
141.83	>4360	>4360	>4360
158.68	>4360	>4360	>4360
172.34	>4360	>4360	
203.16	>4360	>4360	
229.95			
251.15			

(→ 183)

R107, m kg			
	CM3C		
s	100S	100M	100L
2	165	165	175
3	170	175	180
RF: + 6.0 kg / RM: + 94 kg			

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CM3C..				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	12	9
	5.82	3597	97	208	208	175	12	9
	6.66	3924	97	208	208	175	12	9
	7.86	4378	97	208	208	175	12	9
	8.56	3197	97	250	250	203	10	7
	10.13	3597	97	250	250	203	9	7
	11.59	3924	97	250	250	203	9	7
	13.66	4378	97	250	250	203	9	7
	15.65	4500	97	250	250	203	9	7
	18.21	4500	97	250	250	203	9	7
	20.07	4500	97	250	250	203	9	7
	22.62	4500	97	250	250	203	9	7
	24.90	4500	97	250	250	203	9	7
	27.58	4500	97	250	250	203	9	7
	30.77	4500	97	250	250	203	9	7
R107 3	29.49	3924	95	259	259	210	10	7
	35.26	4378	96	259	259	210	10	7
	40.37	4500	96	259	259	210	10	7
	47.63	4500	96	259	259	210	10	7
	52.68	4500	96	259	259	210	10	7
	59.41	4500	96	259	259	210	10	7
	65.60	4500	96	259	259	210	10	7
	72.88	4500	96	259	259	210	10	7
	78.57	4500	95	260	260	210	9	7
	92.70	4500	95	260	260	210	9	7
	102.53	4500	95	260	260	210	9	7
	115.63	4500	95	260	260	210	9	7
	127.68	4500	95	260	260	210	9	7
	141.83	4500	95	260	260	210	9	7
	158.68	4500	95	260	260	210	9	7
	172.34	4500	95	260	260	210	9	7
	203.16	4500	94	260	260	210	9	7
	229.95	4500	94	260	260	210	9	7
	251.15	4500	94	260	260	210	9	7

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CM3C..							F_{Ramax}			F_{Rapk}		
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	RM	R	RF	RM
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N
R107 2	4.92[1)]	2900	3820	4930	480	144	11300	11300	21100	31800	31800	33500
	5.82	2970	3820	5040	517	108	12100	12100	22400	31800	31800	33500
	6.66	2970	3820	5040	589	88	12800	12800	23500	31800	31800	33500
	7.86	2970	3820	5040	557	70	13800	13800	24900	31800	31800	33500
	8.56[1)]	4300	4360	7310	248	129	11300	11300	24400	29100	29100	32100
	10.13	4300	4360	7310	245	97	12400	12400	26000	29100	29100	32100
	11.59	4300	4360	7310	243	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	240	52	15400	15400	30500	29100	29100	32100
	18.21	4300	4360	7310	239	43	16600	16600	32300	29100	29100	32100
	20.07	4300	4360	7310	224	37	17300	17300	32800	29100	29100	32100
	22.62	4300	4360	7310	199	31	18300	18300	32800	29100	29100	32100
	24.90	4300	4360	7310	181	27	19200	19200	32800	29100	29100	32100
	27.58	4300	4360	7310	163	21	20100	20100	32800	29100	29100	32100
	30.77	4300	4360	7310	146	18	21100	21100	32800	29100	29100	32100
R107 3	29.49	4300	4360	7310	87	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	88	38	23800	23800	32800	29100	29100	32100
	47.63	4300	4360	7310	89	31	25500	25500	32800	29100	29100	32100
	52.68	4300	4360	7310	85	27	26600	26600	32800	29100	29100	32100
	59.41	4300	4360	7310	76	22	28000	28000	32800	29100	29100	32100
	65.60	4300	4360	7310	69	19	29200	29200	32800	29100	29100	32100
	72.88	4300	4360	7310	62	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	44	25	29500	29500	32800	29100	29100	32100
	115.63	4300	4360	7310	39	20	29500	29500	32800	29100	29100	32100
	127.68	4300	4360	7310	35	18	29500	29500	32800	29100	29100	32100
	141.83	4300	4360	7310	32	15	29500	29500	32800	29100	29100	32100
	158.68	4300	4360	7310	28	13	29500	29500	32800	29100	29100	32100
	172.34	4300	4360	7310	26	12	29500	29500	32800	29100	29100	32100
	203.16	4300	4360	7310	22	9.2	29500	29500	32800	29100	29100	32100
	229.95	4300	4360	7310	20	5.9	29500	29500	32800	29100	29100	32100
	251.15	4300	4360	7310	18	5.1	29500	29500	32800	29100	29100	32100

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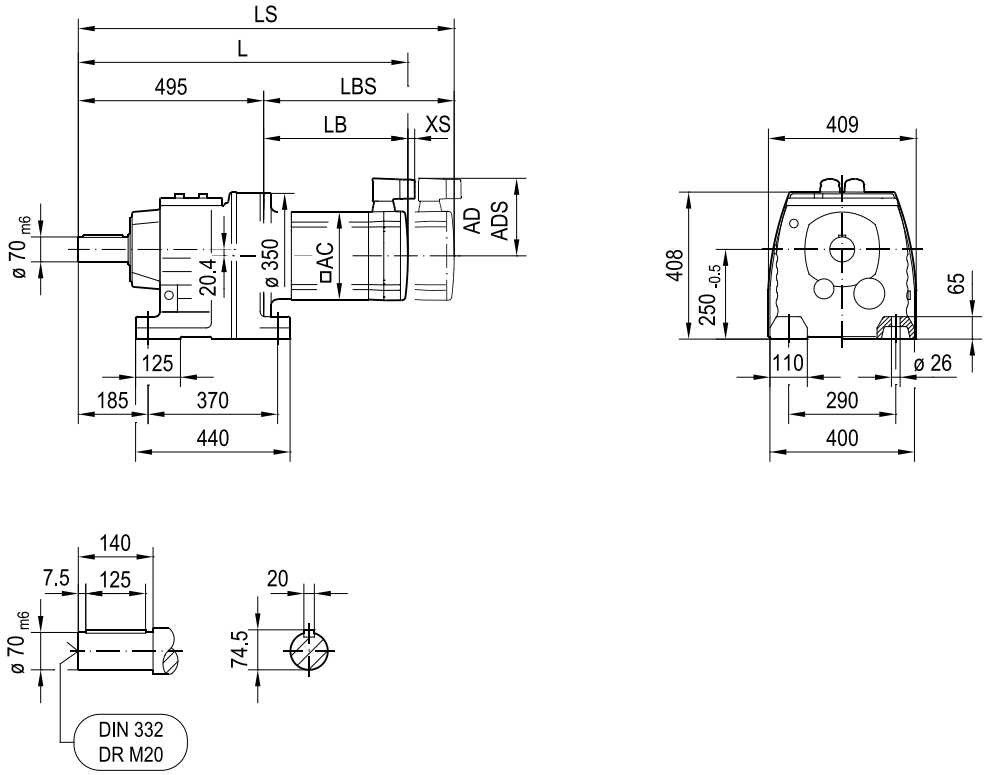
R107..



(→ 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	710	738	795					
LS	784	812	869					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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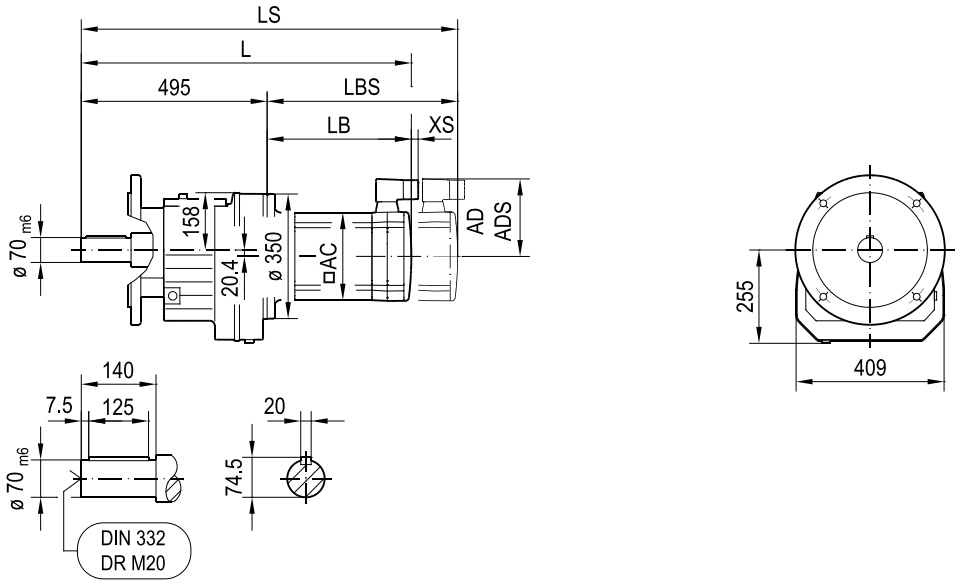
01 056 00 19

RF107..



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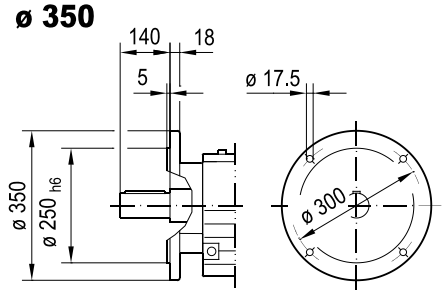

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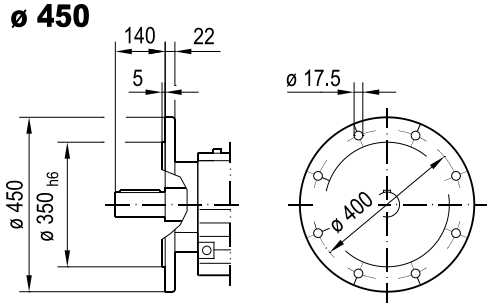
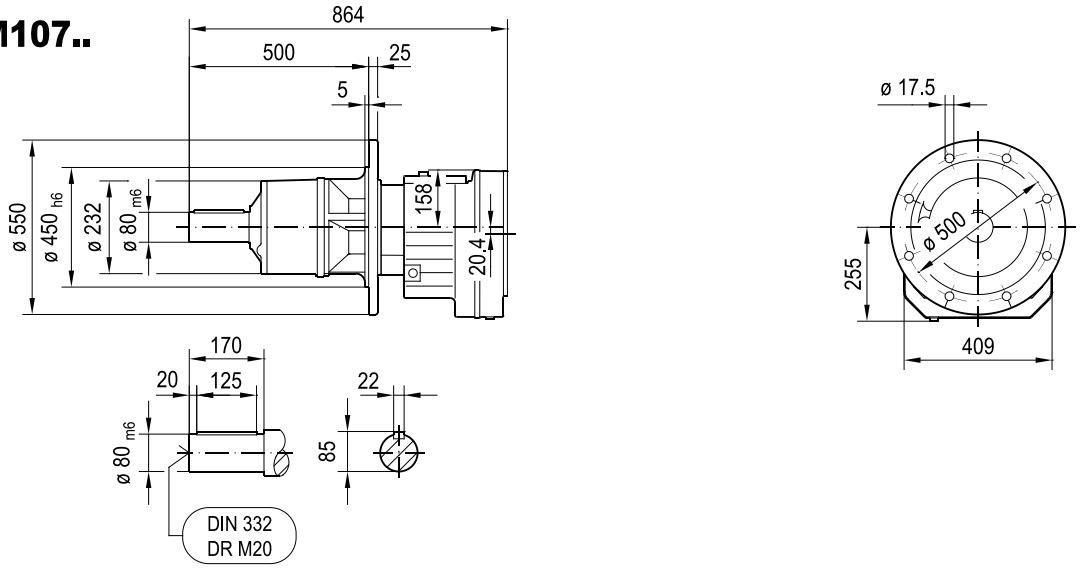


RM107..



(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	710	738	795					
LS	784	812	869					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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8.3.12 R127..

R127, M_{aDyn} Nm			6000 Nm
	CM3C		
i	100S	100M	100L
		2	
5.55			645
6.56	360	510	760
7.51	415	585	870
8.85	485	690	1030
8.96			1040
10.59	585	820	1230
12.12	670	940	1410
14.29	790	1110	1660
16.37	900	1270	1900
19.04	1050	1480	2210
20.98	1150	1630	2440
23.65	1300	1840	2750
26.04	1430	2030	3030
28.84	1590	2240	3350
32.18	1770	2500	3740
		3	
30.84	1680	2380	3550
36.88	2010	2840	4240
42.22	2310	3250	4860
49.81	2720	3840	5730
55.09	3010	4250	6340
62.13	3390	4790	>7000
68.61	3750	5290	>7000
76.21	4170	5880	>7000
82.17	4440	6270	>7000
85.26	4660	6580	>7000
96.95	5240	>7000	>7000
107.23	5800	>7000	>7000
120.92	6540	>7000	>7000
133.53	>7000	>7000	>7000
148.33	>7000	>7000	>7000
165.95	>7000	>7000	>7000
180.23	>7000	>7000	
212.46	>7000	>7000	
240.48			
262.65			

(→ 🗎 183)

R127, m kg			
	CM3C		
s	100S	100M	100L
2	210	215	220
3	225	230	240
RF: + 11 kg / RM: + 105 kg			

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CM3C..				c_{TG}			φ	
		n_{epk}	η	R	RF	RM		/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	'	'
R127 2	5.55	3196	97	338	338	286	11	8
	6.56	3596	97	353	353	297	10	8
	7.51	3923	97	363	363	304	10	8
	8.85	4378	97	372	372	311	10	8
	8.96	3196	97	486	486	386	9	7
	10.59	3596	97	498	498	394	8	6
	12.12	3923	97	505	505	399	8	6
	14.29	4378	97	512	512	403	8	6
	16.37	4500	97	517	517	406	8	6
	19.04	4500	97	521	521	408	8	6
	20.98	4500	97	522	522	409	8	6
	23.65	4500	97	522	522	409	8	6
	26.04	4500	97	523	523	410	8	6
	28.84	4500	97	520	520	407	8	6
	32.18	4500	97	522	522	409	8	6
R127 3	30.84	3923	96	567	567	436	9	7
	36.88	4378	96	569	569	437	9	7
	42.22	4500	96	569	569	437	9	7
	49.81	4500	96	570	570	438	9	7
	55.09	4500	96	571	571	438	9	7
	62.13	4500	96	570	570	438	9	7
	68.61	4500	96	571	571	438	9	7
	76.21	4500	96	570	570	438	9	7
	82.17	4500	95	575	575	441	8	6
	85.26	4500	96	571	571	438	9	7
	96.95	4500	95	575	575	441	8	6
	107.23	4500	95	575	575	441	8	6
	120.92	4500	95	575	575	441	8	6
	133.53	4500	95	575	575	441	8	6
	148.33	4500	95	575	575	441	8	6
	165.95	4500	95	575	575	441	8	6
	180.23	4500	95	575	575	441	8	6
	212.46	4500	95	575	575	441	8	6
	240.48	4500	95	575	575	440	8	6
	262.65	4500	95	575	575	440	8	6

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CM3C..							F_{Ramax}			F_{Rapk}		
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	R	RF	RM	R	RF	RM
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N
R127 2	5.55[1)]	3930	4590	6880	371	164	37600	37600	40900	43000	43000	43000
	6.56	3930	4590	6880	369	122	40200	40200	43000	43000	43000	43000
	7.51	3930	4590	6880	368	99	42400	42400	43000	43000	43000	43000
	8.85	3930	4590	6880	366	78	43000	43000	43000	43000	43000	43000
	8.96[1)]	5420	7000	10500	160	148	41400	41400	43000	43000	43000	42100
	10.59	5700	7000	10500	136	111	43000	43000	43000	43000	43000	42100
	12.12	5940	7000	10500	119	91	43000	43000	43000	43000	43000	42100
	14.29	6000	7000	10500	115	71	43000	43000	43000	43000	43000	42100
	16.37	6000	7000	10500	115	58	43000	43000	43000	43000	43000	42100
	19.04	6000	7000	10500	116	47	43000	43000	43000	43000	43000	42100
	20.98	6000	7000	10500	116	41	43000	43000	43000	43000	43000	42100
	23.65	6000	7000	10500	116	34	43000	43000	43000	43000	43000	42100
	26.04	6000	7000	10500	116	29	43000	43000	43000	43000	43000	42100
	28.84	6000	6760	10100	117	23	43000	43000	43000	43000	43000	42300
	32.18	6000	6660	9990	117	19	43000	43000	43000	43000	43000	42400
R127 3	30.84	5380	7000	10500	49	62	43000	43000	43000	43000	43000	42100
	36.88	5730	7000	10500	41	48	43000	43000	43000	43000	43000	42100
	42.22	6000	7000	10500	36	39	43000	43000	43000	43000	43000	42100
	49.81	6000	7000	10500	36	32	43000	43000	43000	43000	43000	42100
	55.09	6000	7000	10500	36	27	43000	43000	43000	43000	43000	42100
	62.13	6000	7000	10500	36	23	43000	43000	43000	43000	43000	42100
	68.61	6000	7000	10500	36	20	43000	43000	43000	43000	43000	42100
	76.21	6000	7000	10500	37	17	43000	43000	43000	43000	43000	42100
	82.17	6000	7000	10500	21	34	43000	43000	43000	43000	43000	42100
	85.26	6000	7000	10500	37	14	43000	43000	43000	43000	43000	42100
	96.95	6000	7000	10500	21	28	43000	43000	43000	43000	43000	42100
	107.23	6000	7000	10500	22	24	43000	43000	43000	43000	43000	42100
	120.92	6000	7000	10500	22	20	43000	43000	43000	43000	43000	42100
	133.53	6000	7000	10500	22	18	43000	43000	43000	43000	43000	42100
	148.33	6000	7000	10500	22	15	43000	43000	43000	43000	43000	42100
	165.95	6000	7000	10500	22	13	43000	43000	43000	43000	43000	42100
	180.23	6000	7000	10500	22	12	43000	43000	43000	43000	43000	42100
	212.46	6000	7000	10500	21	9.2	43000	43000	43000	43000	43000	42100
	240.48	6000	7000	10500	19	5.9	43000	43000	43000	43000	43000	42100
	262.65	6000	7000	10500	17	5.1	43000	43000	43000	43000	43000	42100

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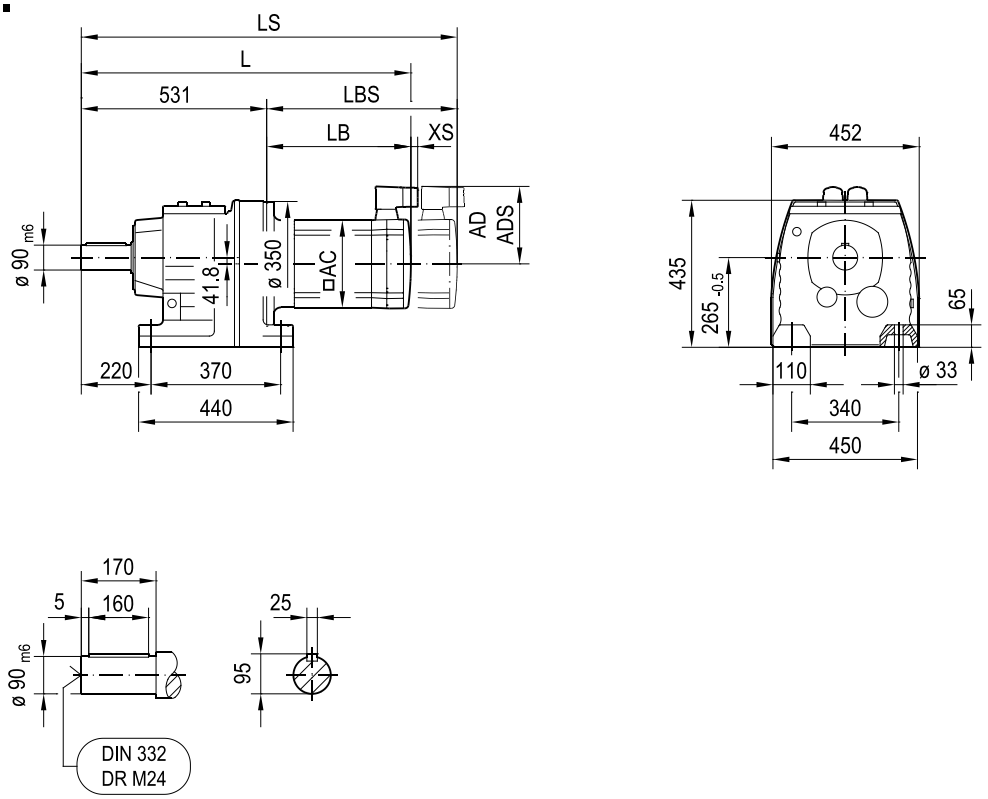
R127..



(→ 📖 7.3)	CM3C							
	100S	**100M**	**100L**					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	746	774	831					
LS	820	848	905					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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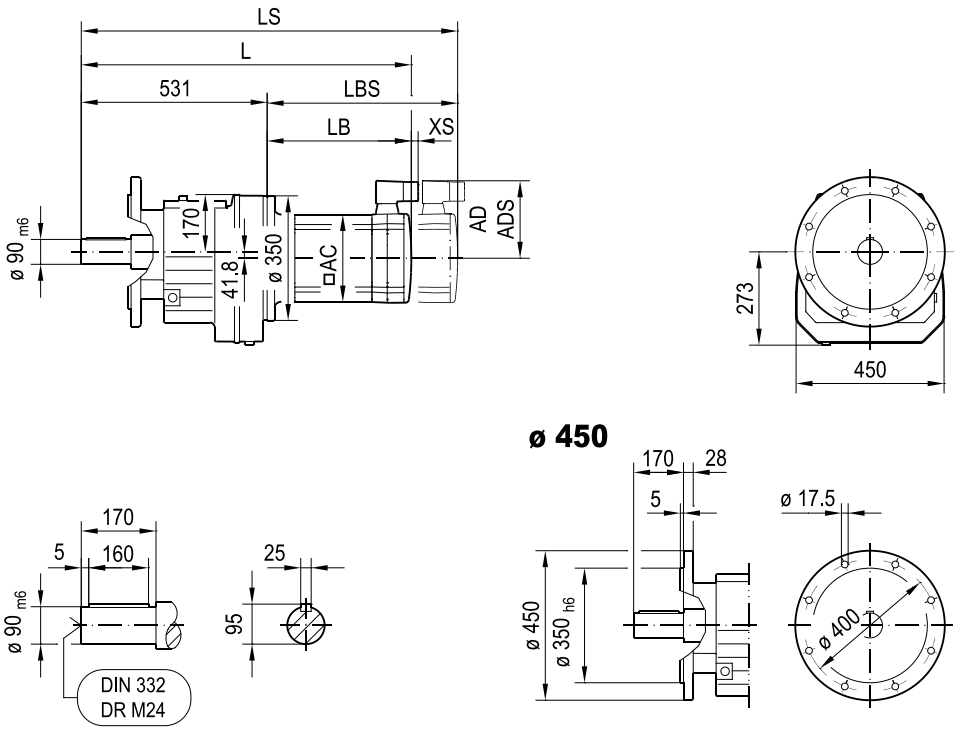
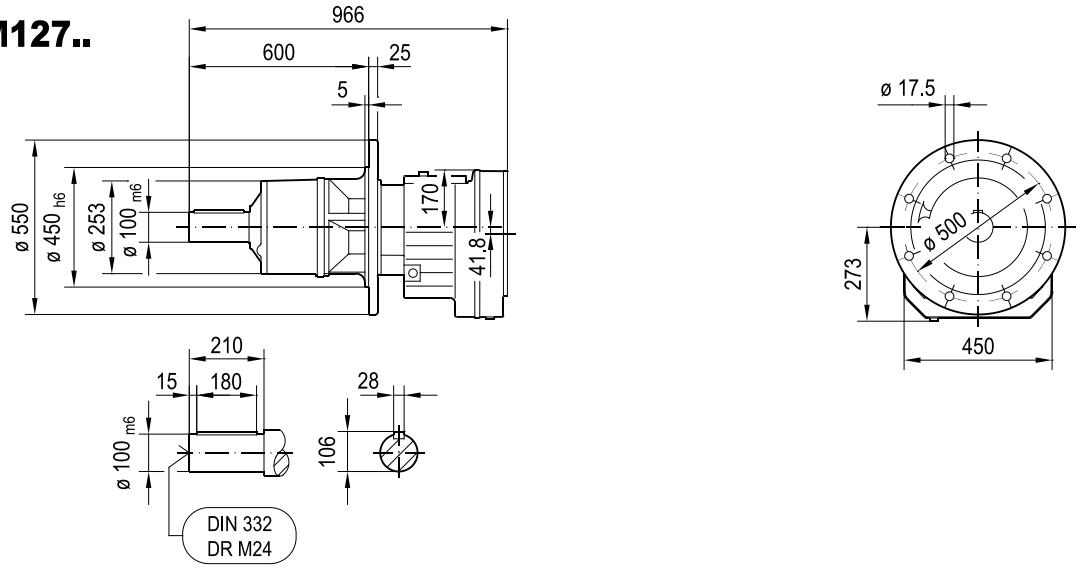
RF127..



RM127..



(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	746	774	831					
LS	820	848	905					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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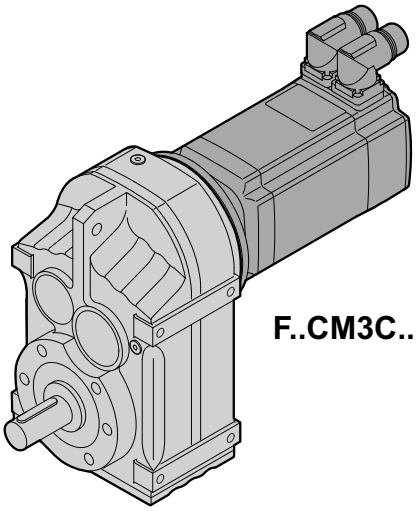
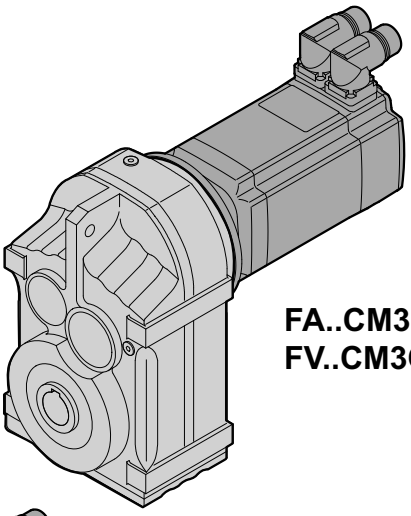
9 Parallel-shaft helical gearmotors – F.. gear units

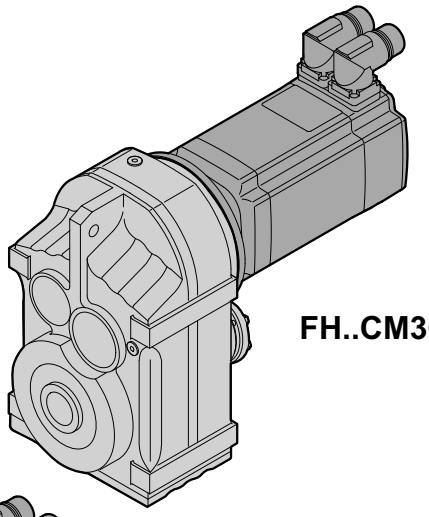
9.1 F..CM3C.. designs



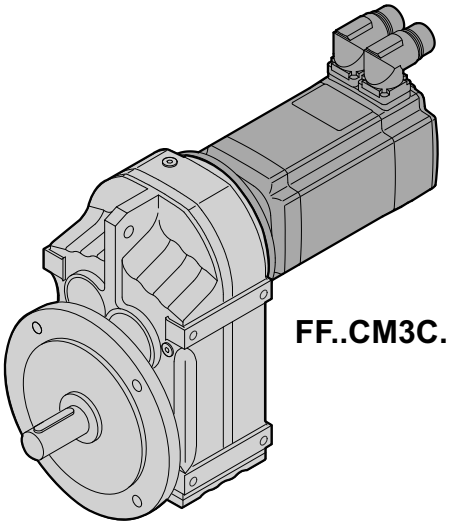
F..CM3C..



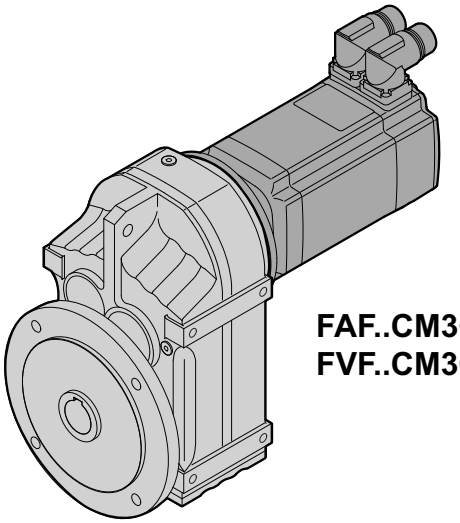
FA..CM3C..
FV..CM3C..



FH..CM3C..



FF..CM3C..



FAF..CM3C..
FVF..CM3C..

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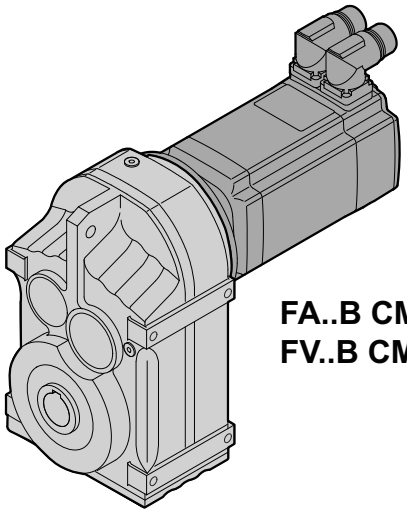
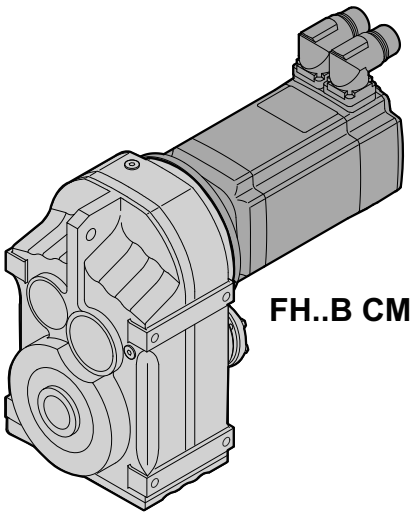
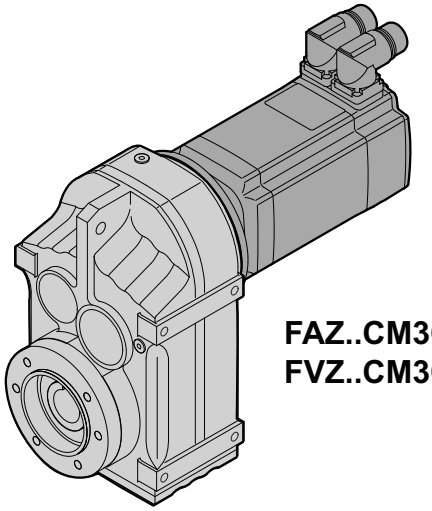


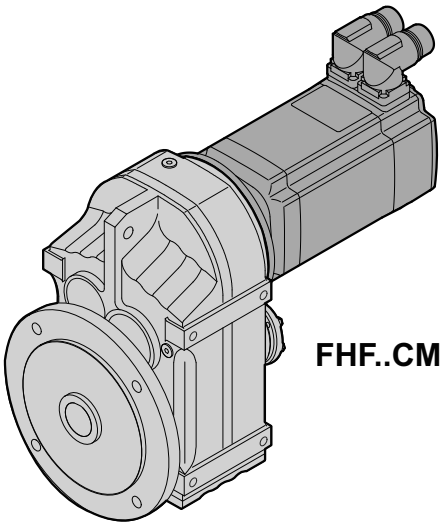
FA..B CM3C..
FV..B CM3C..



FH..B CM3C..



FAZ..CM3C..
FVZ..CM3C..



FHF..CM3C..

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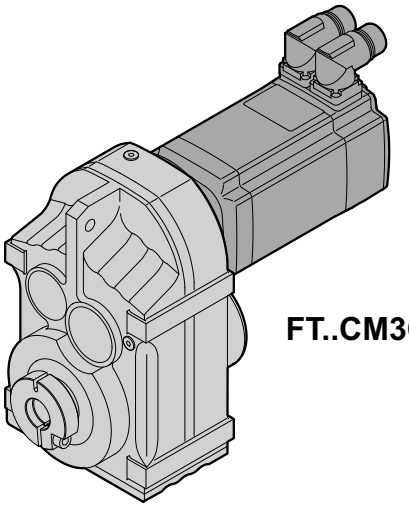
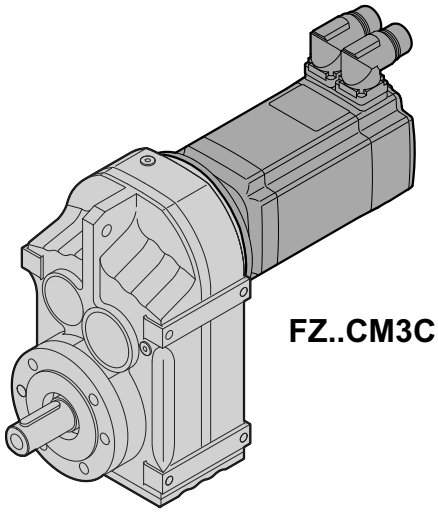
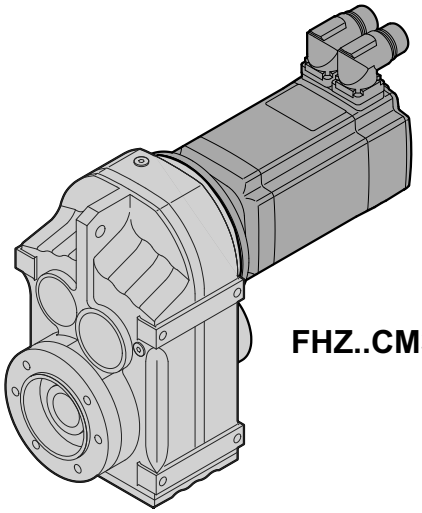


FT..CM3C..



FZ..CM3C..



FHZ..CM3C..

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9.2 F..CM3C.. selection tables and dimension sheets

9.2.1 F27..

F27, M_{aDyn} Nm						130 Nm
	CM3C					
i	63S	63M	63L	71S	71M	80S
2						
4.16	32	59	77	78	115	127
4.93	38	70	91	93	136	>144
5.27	41	75	98	99	145	>150
6.17	48	87	114	116	>163	>163
6.91	54	98	128	130	>163	>163
8.13	63	115	151	153	>163	>163
9.40	73	134		>163		
9.88	77	140	>157	>157	>157	>157
10.55	82	150	>157	>157	>157	>157
12.35	97	>157	>157	>157	>157	>157
13.84	108	>157	>157	>157	>157	>157
16.28	127	>157	>157	>157	>157	>157
18.84	148	>157		>157		
20.15	>157	>157		>157		
23.25	>157					
27.18						
29.56						
3						
33.83	>157	>157	>157	>157	>157	>157
38.33	>157	>157		>157		
40.89	>157	>157	>157	>157	>157	>157
46.78	>157	>157		>157		
50.19	>157	>157		>157		
56.62	>157	>157	>157	>157	>157	>157
63.86	>157	>157	>157	>157	>157	>157
72.37	>157	>157		>157		
77.21	>157	>157	>157	>157	>157	>157
88.32	>157	>157		>157		
94.76	>157	>157		>157		
109.90	>157					
129.09						
140.74						

(→ 183)

FA27, m kg						
	CM3C					
s	63S	63M	63L	71S	71M	80S
2	8.5	9.9	11	11	13	16
3	8.8	10	11	12	13	17
FAF: + 0.70 kg / F: + 0.50 kg / FF: + 1.3 kg						

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CM3C..				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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
FA27 2	4.16	87	130	148	365	1.4	1810	1810	1380	1180	4500	4500	4500	4500
	4.93	96	144	163	306	1.0	1860	1860	1420	1210	4500	4500	4500	4500
	5.27	100	150	170	283	0.90	1880	1880	1440	1220	4500	4500	4500	4500
	6.17	109	163	185	237	0.68	1940	1940	1480	1260	4500	4500	4500	4500
	6.91	114	163	194	219	0.56	2000	2000	1530	1300	4500	4500	4500	4500
	8.13	123	163	205	183	0.42	2080	2080	1580	1350	4500	4500	4500	4500
	9.40	130	163	220	168	0.33	2170	2170	1660	1410	4500	4500	4500	4500
	9.88	130	157	220	207	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	212	0.43	2860	2860	2180	1860	4500	4500	4500	4500
	16.28	130	157	220	214	0.32	3110	3110	2370	2020	4500	4500	4500	4500
	18.84	130	157	220	217	0.26	3340	3340	2550	2170	4500	4500	4500	4500
	20.15	130	157	220	217	0.23	3450	3450	2630	2240	4500	4500	4500	4500
	23.25	130	157	220	194	0.19	3690	3690	2820	2400	4500	4500	4500	4500
	27.18	130	157	220	166	0.15	3970	3970	3030	2580	4500	4500	4500	4500
	29.56	130	157	220	152	0.13	4120	4120	3140	2680	4500	4500	4500	4500
FA27 3	33.83	130	157	220	133	0.31	4380	4380	3340	2850	4500	4500	4500	4500
	38.33	130	157	220	117	0.26	4500	4500	3530	3010	4500	4500	4500	4500
	40.89	130	157	220	110	0.23	4500	4500	3640	3100	4500	4500	4500	4500
	46.78	130	157	220	96	0.18	4500	4500	3860	3290	4500	4500	4500	4500
	50.19	130	157	220	90	0.17	4500	4500	3980	3390	4500	4500	4500	4500
	56.62	130	157	220	79	0.31	4500	4500	4180	3570	4500	4500	4500	4500
	63.86	130	157	220	70	0.26	4500	4500	4400	3750	4500	4500	4500	4500
	72.37	130	157	220	62	0.22	4500	4500	4500	3960	4500	4500	4500	4500
	77.21	130	157	220	58	0.20	4500	4500	4500	4060	4500	4500	4500	4500
	88.32	130	157	220	51	0.16	4500	4500	4500	4290	4500	4500	4500	4500
	94.76	130	157	220	47	0.15	4500	4500	4500	4420	4500	4500	4500	4500
	109.90	130	157	220	41	0.12	4500	4500	4500	4500	4500	4500	4500	4500
	129.09	130	157	220	35	0.090	4500	4500	4500	4500	4500	4500	4500	4500
	140.74	130	157	220	32	0.080	4500	4500	4500	4500	4500	4500	4500	4500

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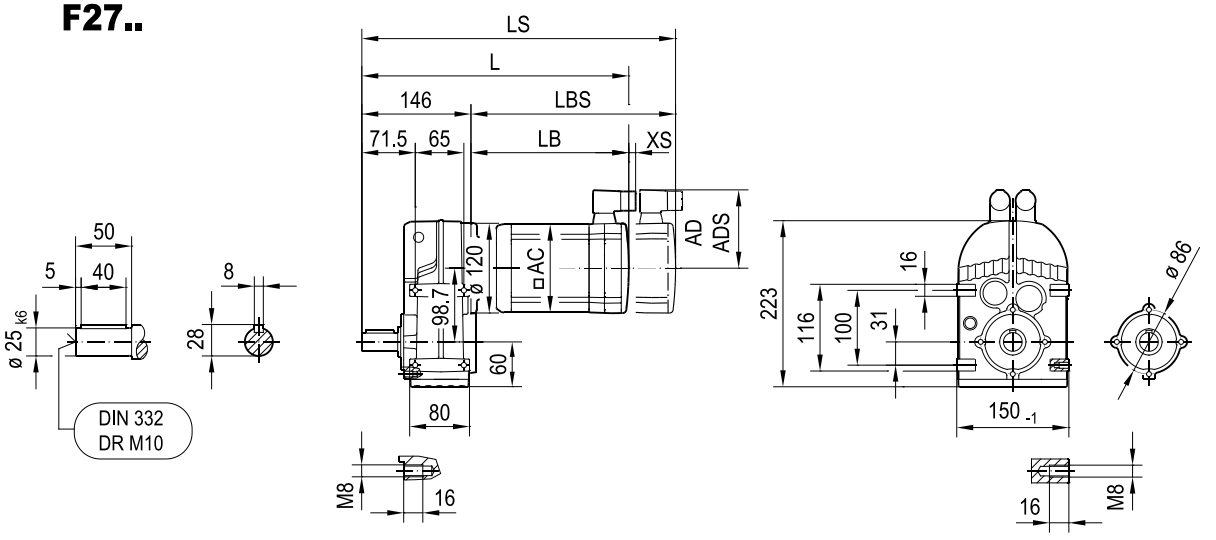
F27..



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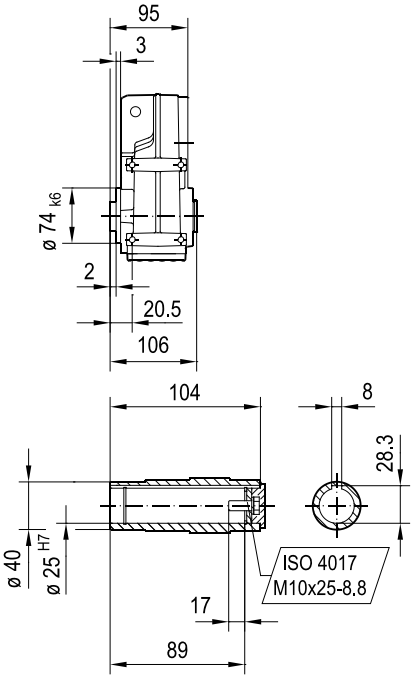
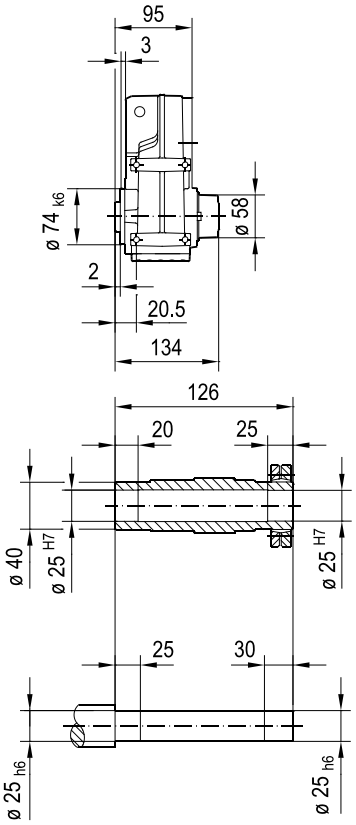
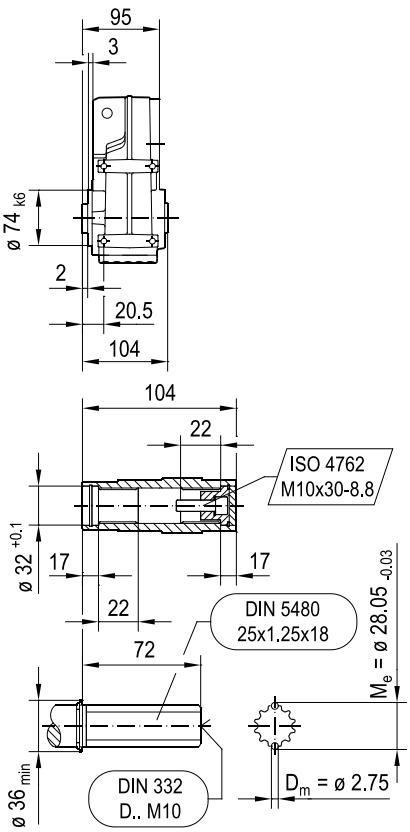


FH27B..



FV27B..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	297	335	373	333	355	368		
LS	337	375	413	399	421	436		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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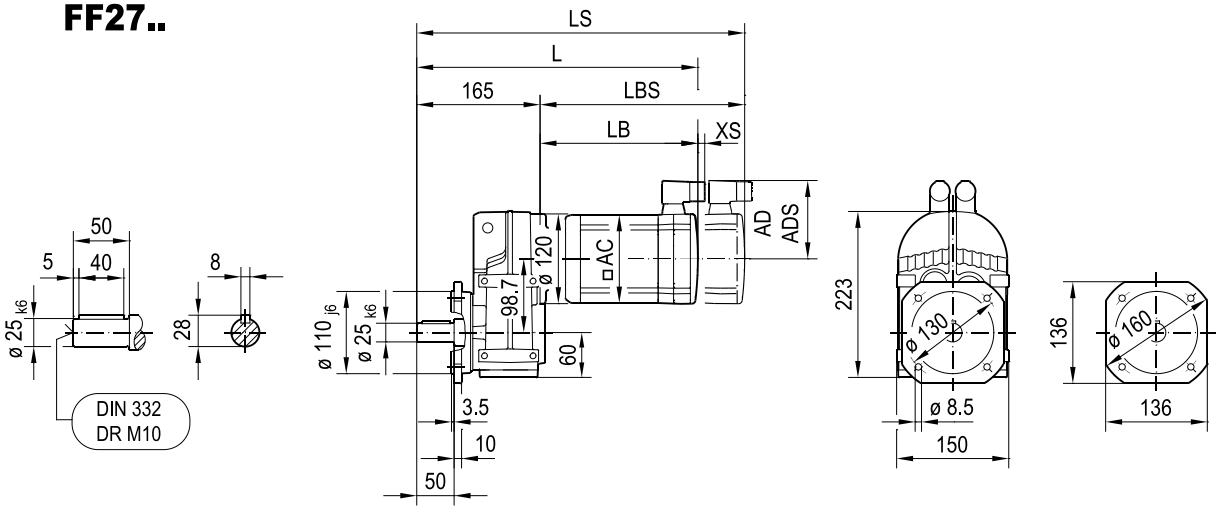
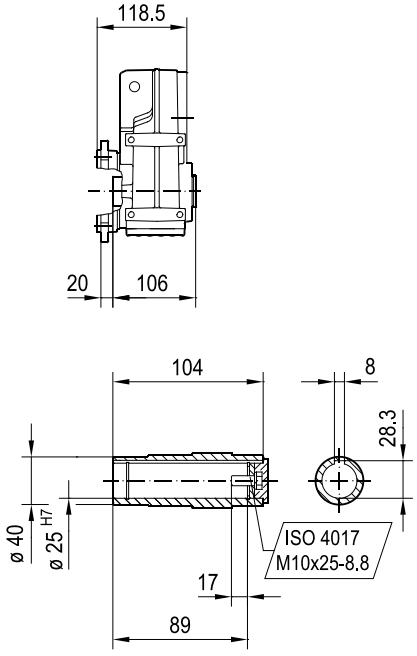
42 002 00 19

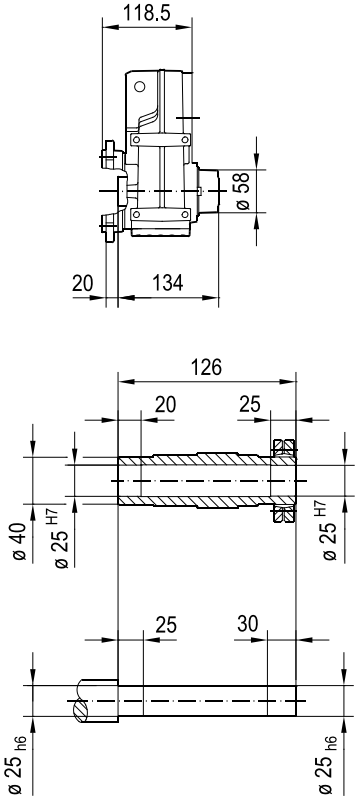
FF27..



FAF27..



FHF27..



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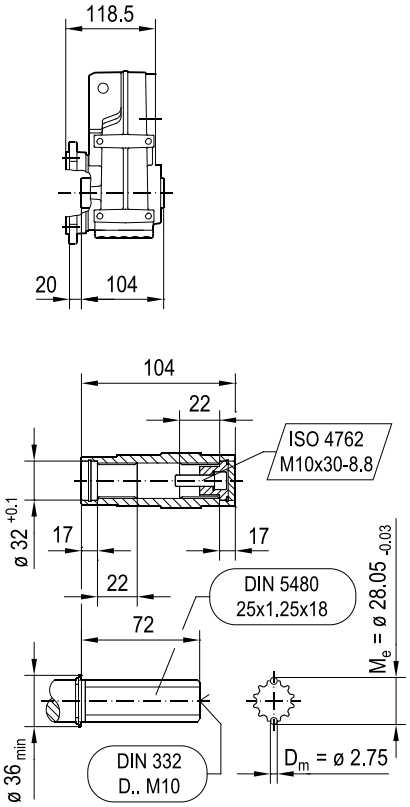

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	316	354	392	352	374	387		
LS	356	394	432	418	440	455		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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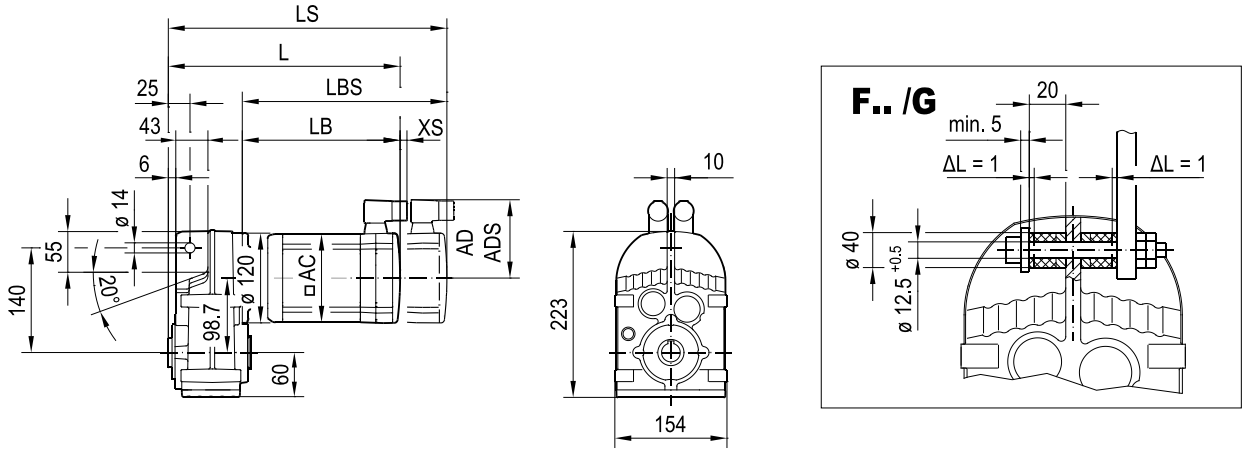
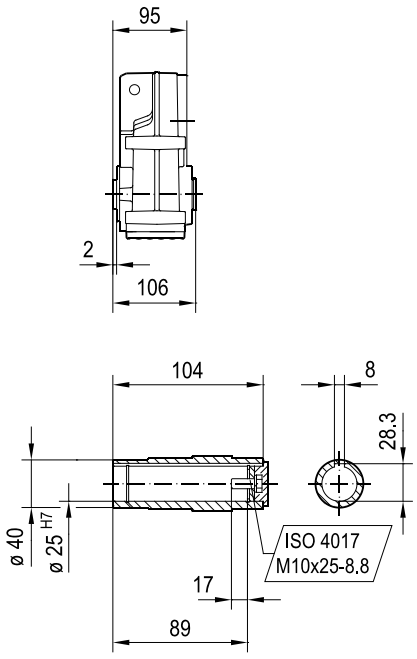
FA27..

42 003 00 19



FA27..



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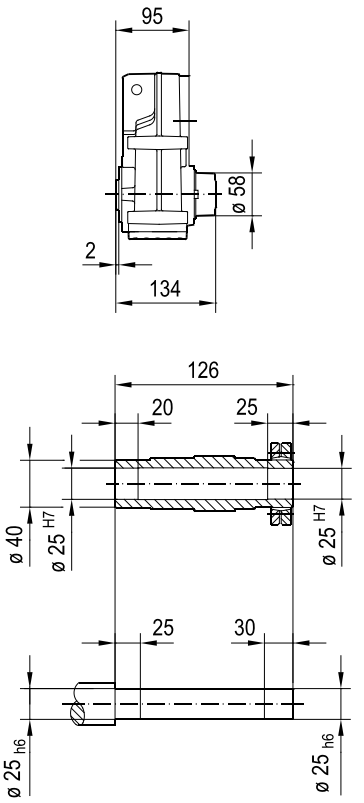

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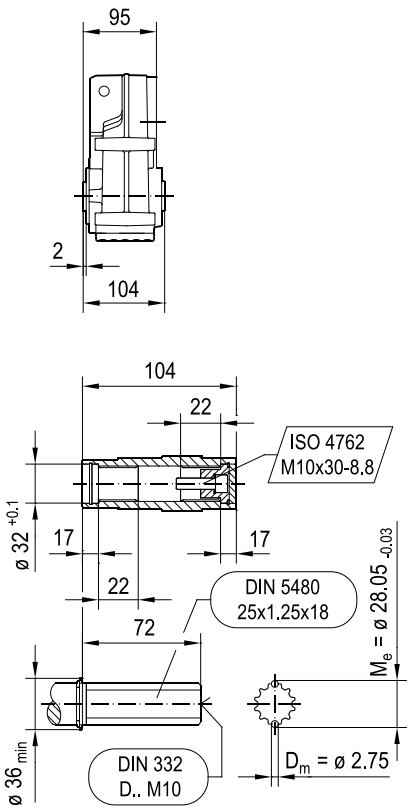

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	246	284	322	282	304	317		
LS	286	324	362	348	370	385		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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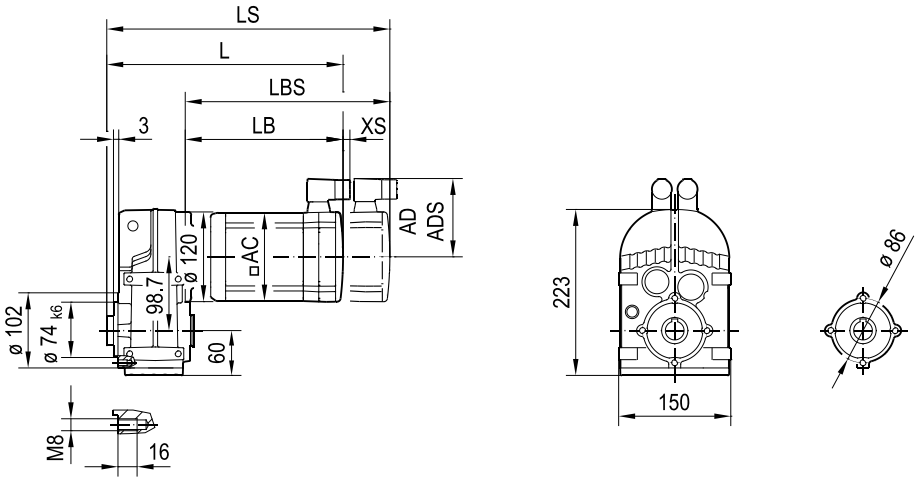
FAZ27..

42 004 00 19



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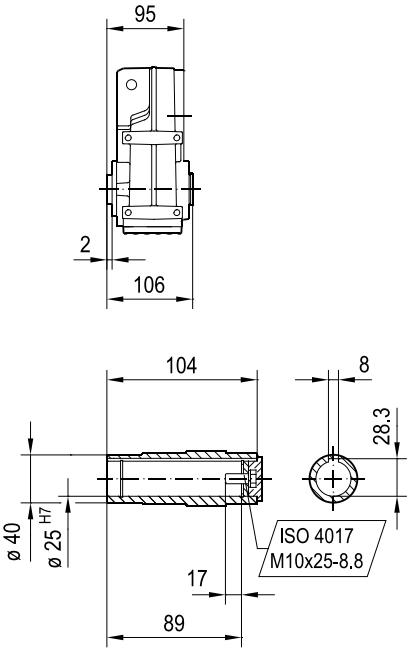

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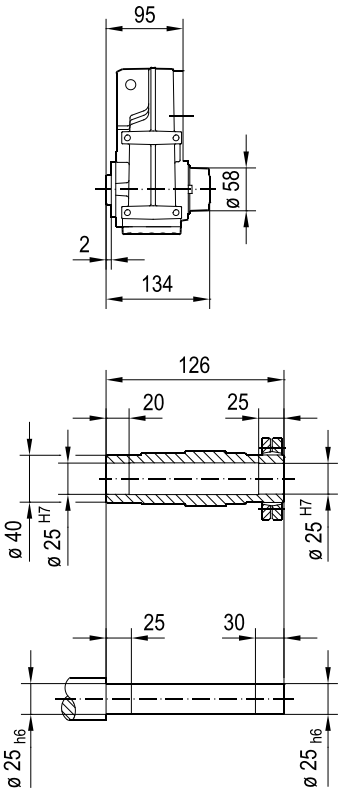

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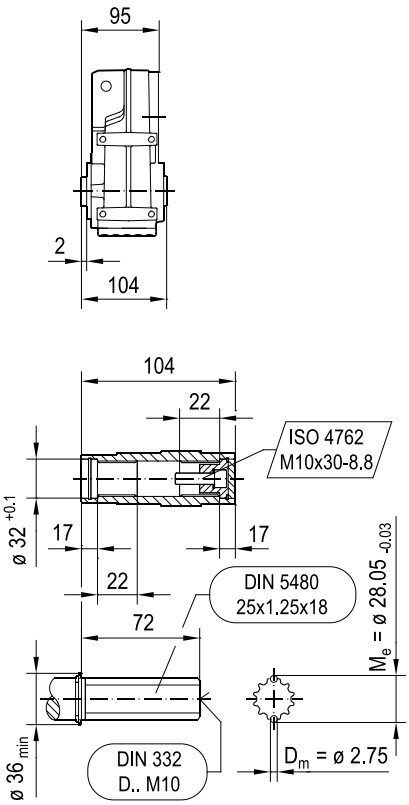

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	246	284	322	282	304	317		
LS	286	324	362	348	370	385		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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9.2.2 F37..

F37, M_{aDyn} Nm						200 Nm
	CM3C					
i	63S	63M	63L	71S	71M	80S
			2			
3.77	29	53	70	71	104	115
4.22	33	60	78	79	116	128
4.90	38	69	91	92	135	149
5.21	40	74	97	98	144	159
6.05	47	86	112	114	167	184
6.74	52	96	125	127	186	>188
7.44	58	106		140		
8.01	62	114	149	151	220	>240
8.97	70	127	167	169	>240	>240
10.42	81	148	194	197	>240	>240
11.08	87	157	205	205	>240	>240
12.87	101	183	235	>240	>240	>240
14.33	112	200	>240	>240	>240	>240
15.81	124	225		>240		
17.03	133	>240	>240	>240	>240	>240
19.27	151	>240		>240		
20.57	161	>240		>240		
23.63	185					
			3			
23.88	185	>240	>240	>240	>240	>240
28.09	215	>240	>240	>240	>240	>240
31.69	>240	>240	>240	>240	>240	>240
35.91	>240	>240		>240		
38.31	>240	>240	>240	>240	>240	>240
43.83	>240	>240		>240		
47.02	>240	>240		>240		
51.70	>240	>240	>240	>240	>240	>240
54.54	>240					
58.32	>240	>240	>240	>240	>240	>240
66.09	>240	>240		>240		
70.50	>240	>240	>240	>240	>240	>240
80.65	>240	>240		>240		
86.53	>240	>240		>240		
100.36	>240					
117.88						
128.51						

(→ 🗎 183)

FA37, m kg						
	CM3C					
s	63S	63M	63L	71S	71M	80S
2	15	16	17	18	19	23
3	15	16	18	18	19	23
FAF: + 1.5 kg / F: + 0.45 kg / FF: + 2.3 kg						

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CM3C..				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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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
FA37 2	3.77	105	157	179	467	2.8	2470	2470	1970	2220	7000	7000	4810	5860
	4.22	110	165	187	441	2.3	2550	2550	2030	2300	7000	7000	4730	5820
	4.90	120	180	200	369	1.8	2630	2630	2100	2380	7000	7000	4560	5740
	5.21	125	187	210	338	1.6	2660	2660	2120	2410	7000	7000	4470	5700
	6.05	135	188	230	286	1.2	2750	2750	2190	2510	7000	7000	4460	5700
	6.74	140	188	235	269	1.0	2850	2850	2270	2600	7000	7000	4460	5700
	7.44	145	188	245	247	0.83	2940	2940	2350	2680	7000	7000	4460	5700
	8.01	170	240	285	205	1.5	2960	2960	2360	2710	7000	7000	3610	4100
	8.97	175	240	295	191	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	152	0.94	3290	3290	2620	3020	7000	7000	3610	4100
	12.87	200	240	340	131	0.74	3450	3450	2750	3170	7000	7000	3610	4100
	14.33	200	240	340	132	0.63	3650	3650	2910	3330	7000	7000	3610	4100
	15.81	200	240	340	132	0.52	3840	3840	3070	3490	7000	7000	3610	4100
	17.03	200	240	340	133	0.48	3990	3990	3180	3610	7000	7000	3610	4100
	19.27	200	240	340	134	0.40	4250	4250	3390	3820	7000	7000	3610	4100
	20.57	200	240	340	135	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	97	0.60	4720	4720	3760	4210	7000	7000	3610	4100
	28.09	200	240	340	98	0.45	5090	5090	4060	4520	7000	7000	3610	4100
	31.69	200	240	340	98	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	97	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	87	0.34	6710	6710	4290	5670	7000	7000	3610	4100
	54.54	200	240	340	83	0.15	6860	6860	4290	5670	7000	7000	3610	4100
	58.32	200	240	340	77	0.27	7000	7000	4290	5670	7000	7000	3610	4100
	66.09	200	240	340	68	0.23	7000	7000	4290	5670	7000	7000	3610	4100
	70.50	200	240	340	64	0.21	7000	7000	4290	5670	7000	7000	3610	4100
	80.65	200	240	340	56	0.17	7000	7000	4290	5670	7000	7000	3610	4100
	86.53	200	240	340	52	0.15	7000	7000	4290	5670	7000	7000	3610	4100
	100.36	200	240	340	45	0.12	7000	7000	4290	5670	7000	7000	3610	4100
	117.88	200	240	340	38	0.10	7000	7000	4290	5670	7000	7000	3610	4100
	128.51	200	240	340	35	0.080	7000	7000	4290	5670	7000	7000	3610	4100

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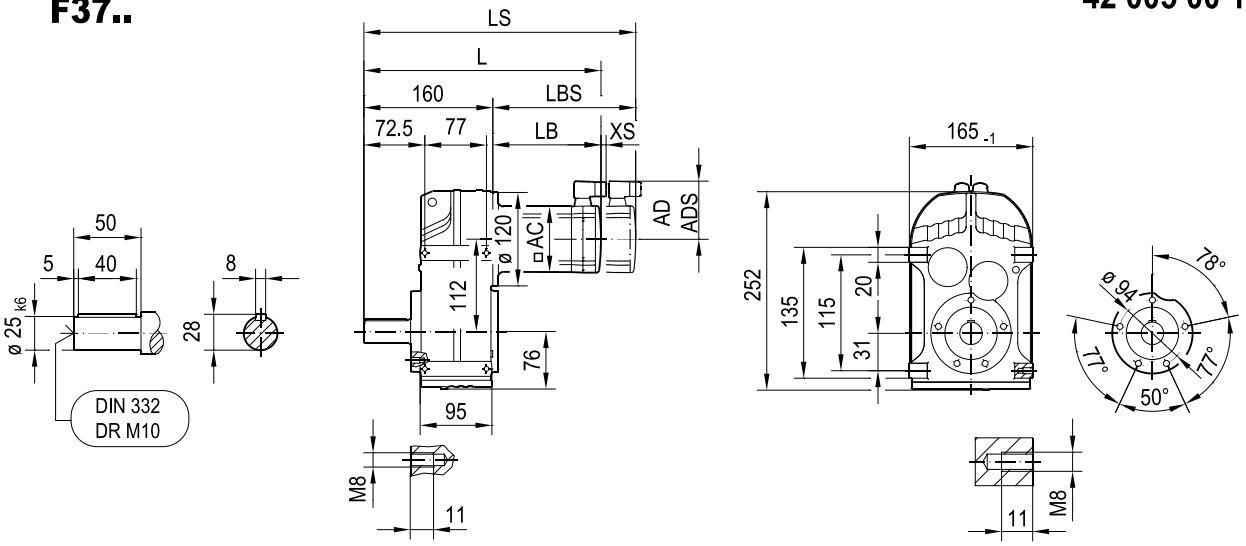
F37..

42 005 00 19



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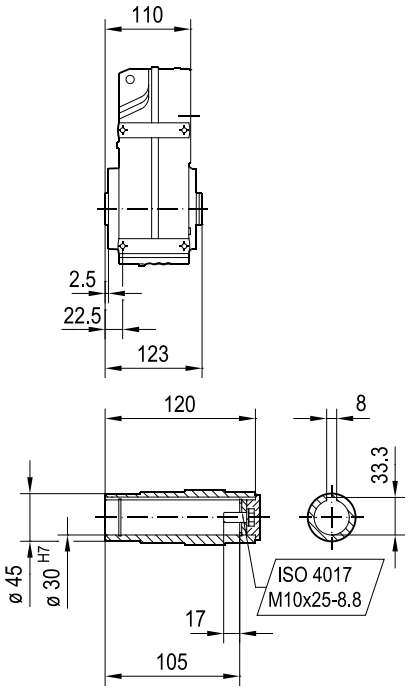

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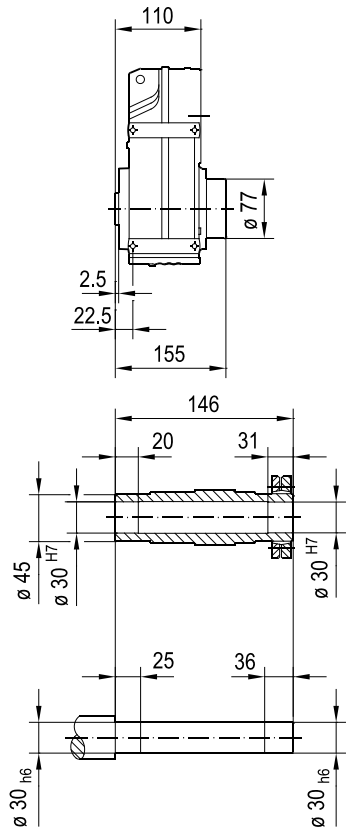

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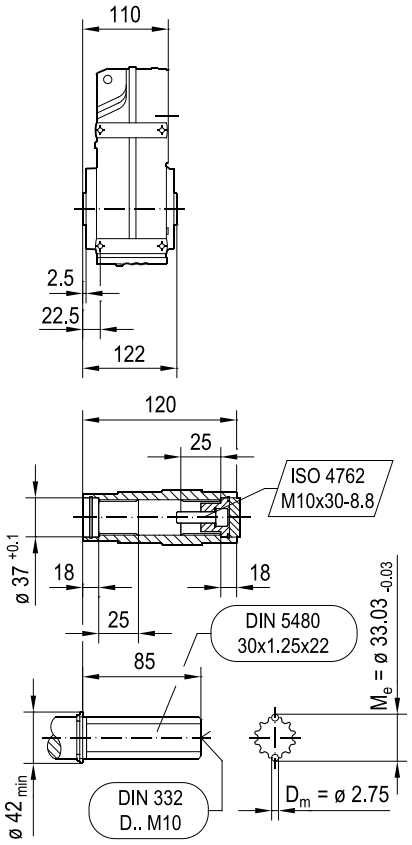

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	311	349	387	347	369	382		
LS	351	389	427	413	435	450		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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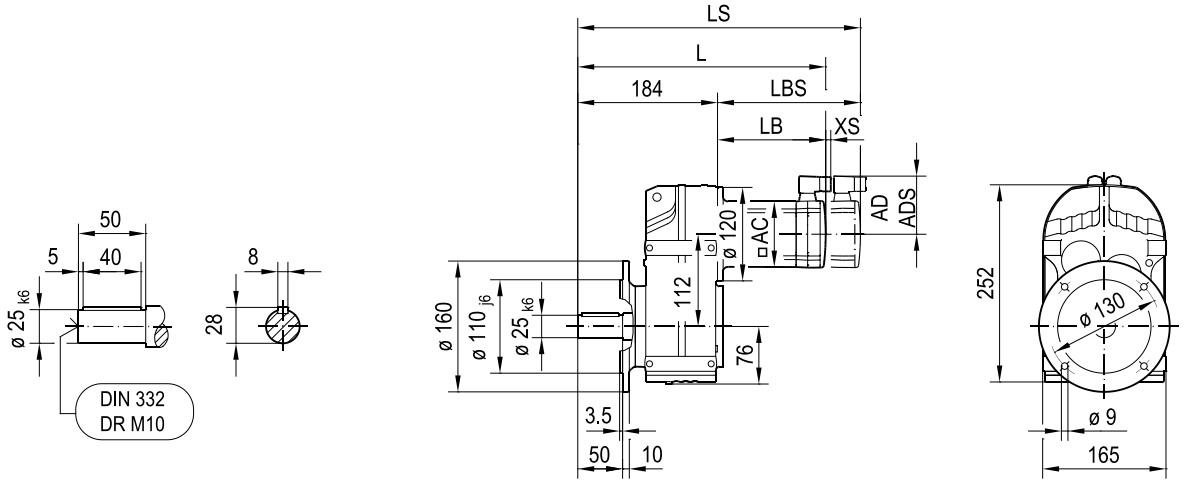
FF37..

42 006 00 19



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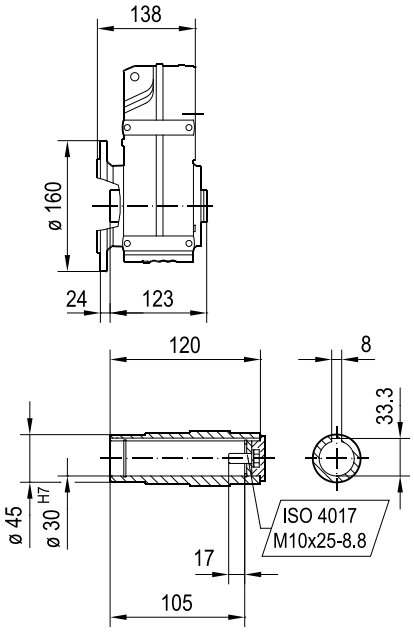

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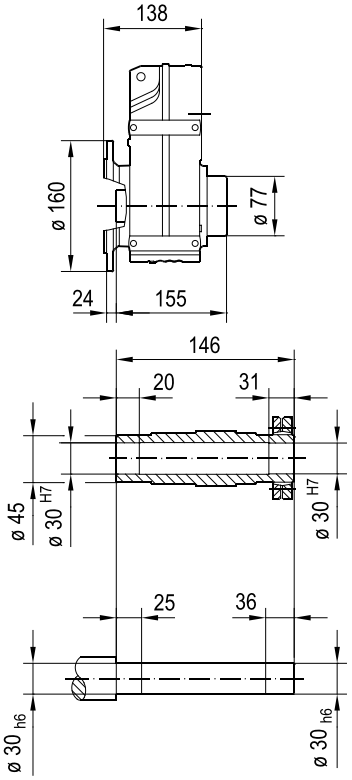

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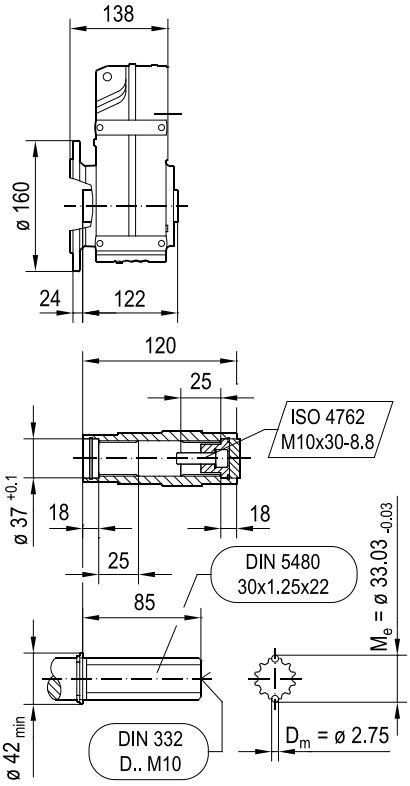

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	335	373	411	371	393	406		
LS	375	413	451	437	459	474		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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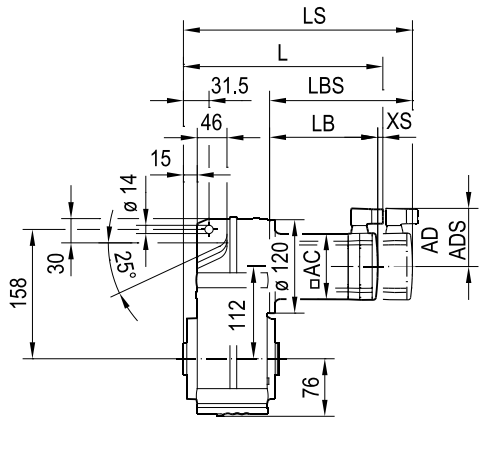
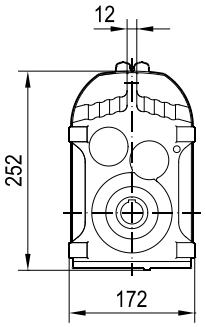
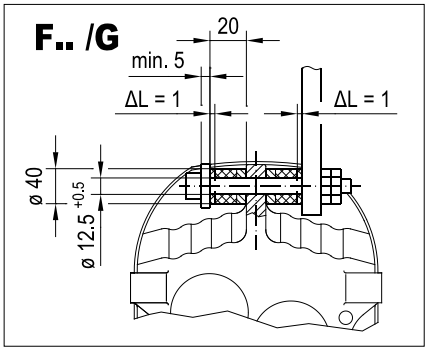
FA37..

42 007 00 19







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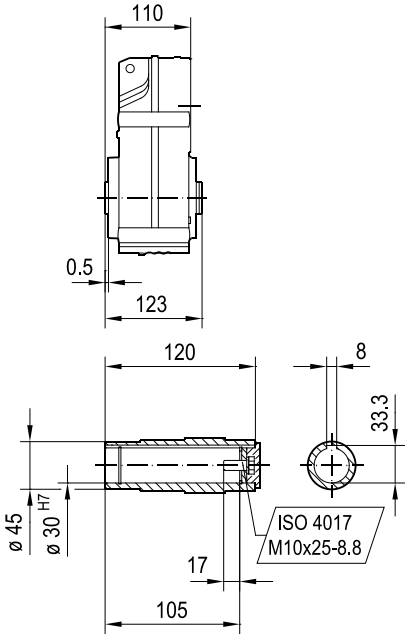

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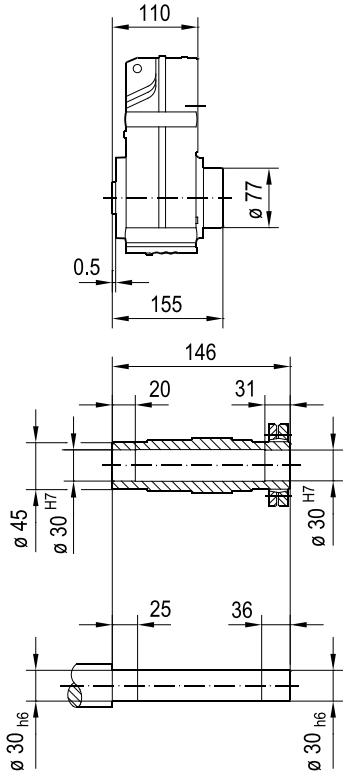

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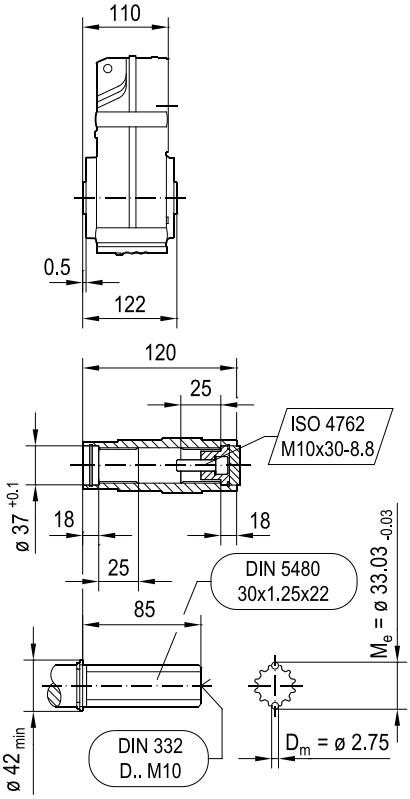

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	261	299	337	297	319	332		
LS	301	339	377	363	385	400		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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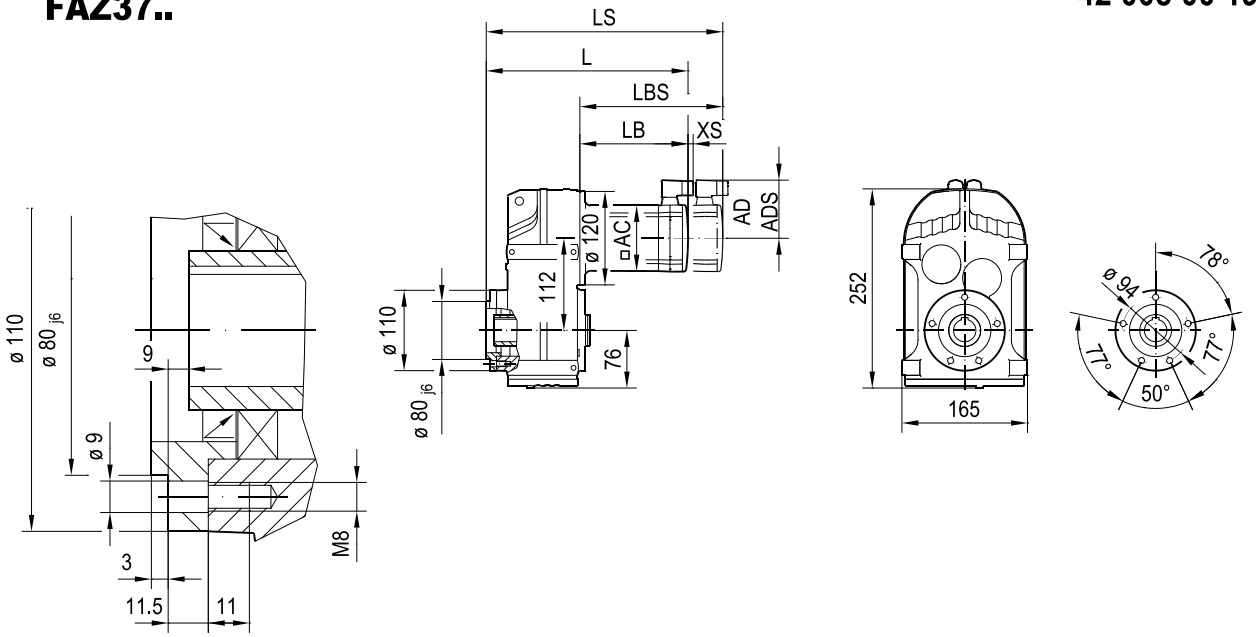
FAZ37..

42 008 00 19



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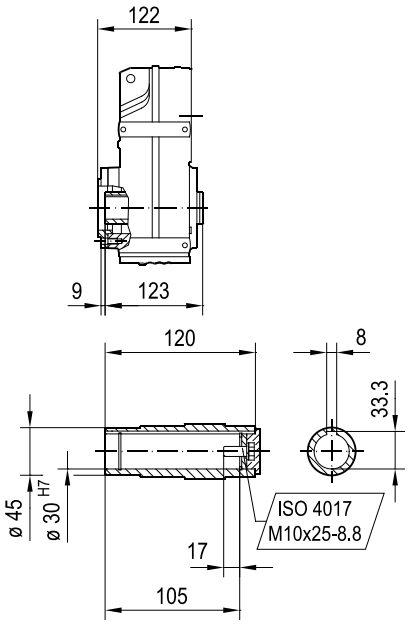
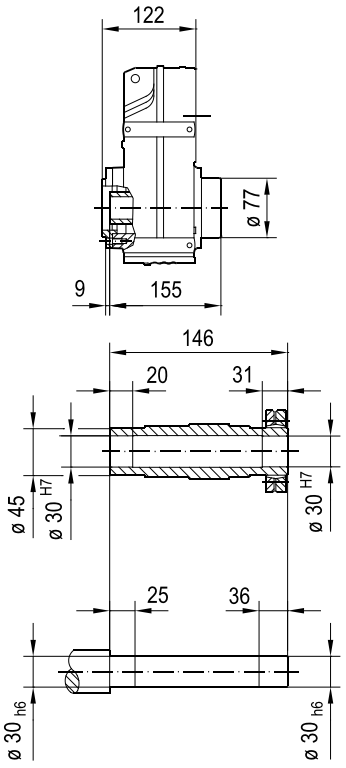
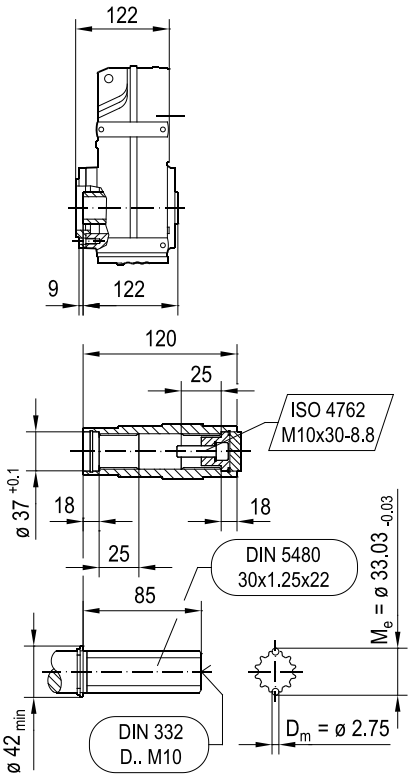


FHZ37..



FVZ37..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	273	311	349	309	331	344		
LS	313	351	389	375	397	412		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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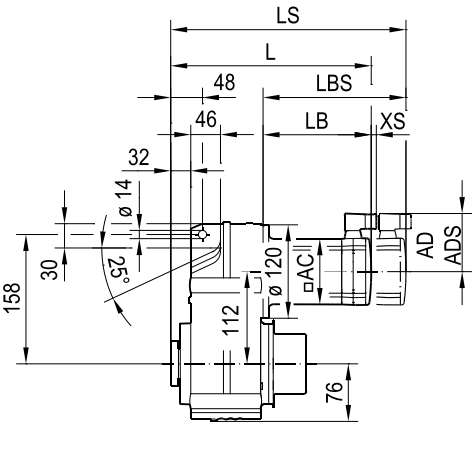
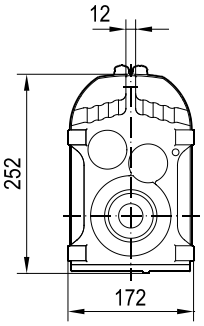
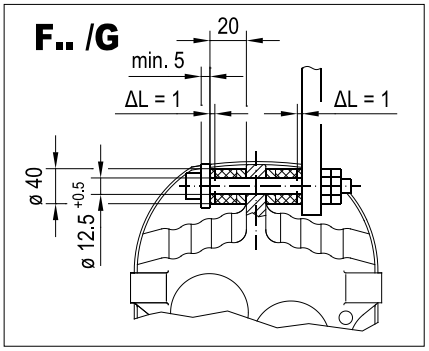
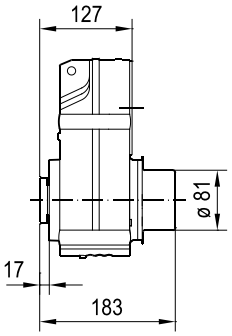
FT37..

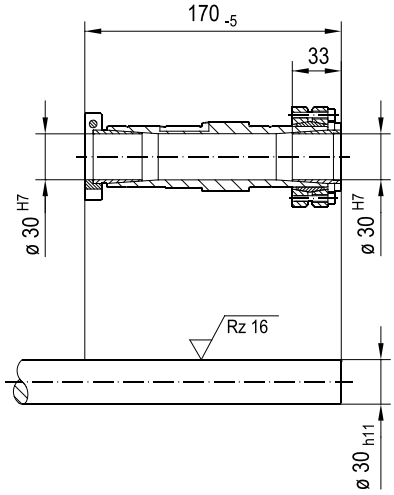
42 009 00 19

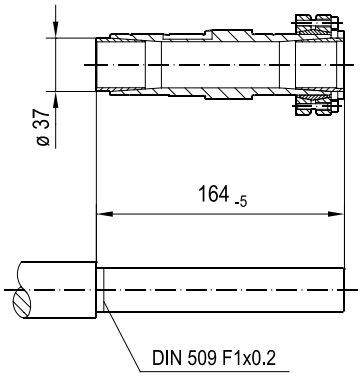












(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	278	316	354	314	336	349		
LS	318	356	394	380	402	417		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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9.2.3 F47..

F47, M_{aDyn} Nm								400 Nm
	CM3C							
i	63S	63M	63L	71S	71M	71L	80S	80M
				2				
4.99	39	71	92	94	137	200	152	225
5.76	45	82	107	108	159	230	175	260
6.34	49	90	118	119	175	255	193	285
7.44	58	106	138	140	205	300	225	335
7.88	61	112	146	149	215	320	240	355
8.96	70	127	166	169	245	365	270	405
10.97	86	156	200	205	300	>435	335	>435
12.66	99	180	235	235	345	>435	385	>435
13.93	109	198	255	260	385	>435	425	>435
16.36	128	230	300	305	>435	>435	>435	>435
17.33	136	245	320	325	>435	>435	>435	>435
19.70	154	280	365	370	>435	>435	>435	>435
21.82	171	310	405	410	>435	>435	>435	>435
25.72	200	365	>435	>435	>435		>435	
29.32	230	415		>435				
30.86	240	>435		>435				
				3				
28.88	220	405	>435	>435	>435	>435	>435	>435
34.29	265	>435	>435	>435	>435	>435	>435	>435
36.61	280	>435	>435	>435	>435	>435	>435	>435
42.86	330	>435	>435	>435	>435	>435	>435	>435
48.00	365	>435	>435	>435	>435	>435	>435	>435
56.49	430	>435	>435	>435	>435		>435	
65.36	>435	>435		>435				
68.09	>435	>435	>435	>435	>435		>435	
79.72	>435	>435	>435	>435	>435		>435	
89.29	>435	>435	>435	>435	>435		>435	
105.09	>435	>435	>435	>435	>435		>435	
121.57	>435	>435		>435				
130.07	>435	>435		>435				
150.06	>435							
175.38								
190.76								

(→ 183)

FA47, m kg								
	CM3C							
s	63S	63M	63L	71S	71M	71L	80S	80M
2	19	20	22	22	23	26	27	29
3	20	21	22	23	24	27	28	30
FAF: + 2.7 kg / F: + 0.80 kg / FF: + 3.9 kg								

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CM3C..				c_{TG}				φ
		n_{epk}	η	FA	FAF	F	FF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
FA47 2	4.99	320	435	540	341	4.4	1160	1160	2310	2410	8510	10000	900	900
	5.76	340	435	575	306	3.4	1180	1180	2390	2500	8510	10000	900	900
	6.34	350	435	595	293	2.9	1230	1230	2470	2580	8510	10000	900	900
	7.44	380	435	645	249	2.3	1190	1190	2530	2660	8510	10000	900	900
	7.88	380	435	645	256	2.1	1280	1280	2630	2750	8510	10000	900	900
	8.96	330	435	560	425	1.6	1970	1970	3250	3310	8510	10000	900	900
	10.97	400	435	680	347	2.6	2060	2060	3440	3510	8940	10000	900	900
	12.66	400	435	680	355	2.1	2320	2320	3740	3790	8940	10000	900	900
	13.93	400	435	680	323	1.8	2510	2510	3950	3990	8940	10000	900	900
	16.36	400	435	680	275	1.5	2840	2840	4320	4340	8940	10000	900	900
	17.33	400	435	680	260	1.4	2960	2960	4450	4470	8940	10000	900	900
	19.70	400	435	680	228	1.1	3230	3230	4770	4770	8940	10000	900	900
	21.82	400	435	680	206	0.96	3460	3460	5030	5020	8940	10000	900	900
	25.72	400	435	680	175	0.75	3850	3850	5460	5430	8940	10000	900	900
	29.32	400	435	680	153	0.52	4170	4170	5830	5780	8940	10000	900	900
	30.86	400	435	680	146	0.46	4300	4300	5920	5920	8940	10000	900	900
FA47 3	28.88	400	435	680	113	1.1	4130	4130	5790	5740	8940	10000	900	900
	34.29	400	435	680	113	0.85	4580	4580	5920	5920	8940	10000	900	900
	36.61	400	435	680	113	0.76	4750	4750	5920	5920	8940	10000	900	900
	42.86	400	435	680	105	0.58	5190	5190	5920	5920	8940	10000	900	900
	48.00	400	435	680	94	0.48	5520	5520	5920	5920	8940	10000	900	900
	56.49	400	435	680	80	0.36	6020	6020	5920	5920	8940	10000	900	900
	65.36	400	435	680	69	0.29	6490	6490	5920	5920	8940	10000	900	900
	68.09	400	435	680	66	0.61	6620	6620	5920	5920	8940	10000	900	900
	79.72	400	435	680	56	0.48	7160	7160	5920	5920	8940	10000	900	900
	89.29	400	435	680	50	0.40	7570	7570	5920	5920	8940	10000	900	900
	105.09	400	435	680	43	0.30	8180	8180	5920	5920	8940	10000	900	900
	121.57	400	435	680	37	0.25	8760	8760	5920	5920	8940	10000	900	900
	130.07	400	435	680	35	0.23	9040	9040	5920	5920	8940	10000	900	900
	150.06	400	435	680	30	0.18	9640	9640	5920	5920	8940	10000	900	900
	175.38	400	435	680	26	0.14	10000	10000	5920	5920	8940	10000	900	900
	190.76	400	435	680	24	0.13	10000	10000	5920	5920	8940	10000	900	900

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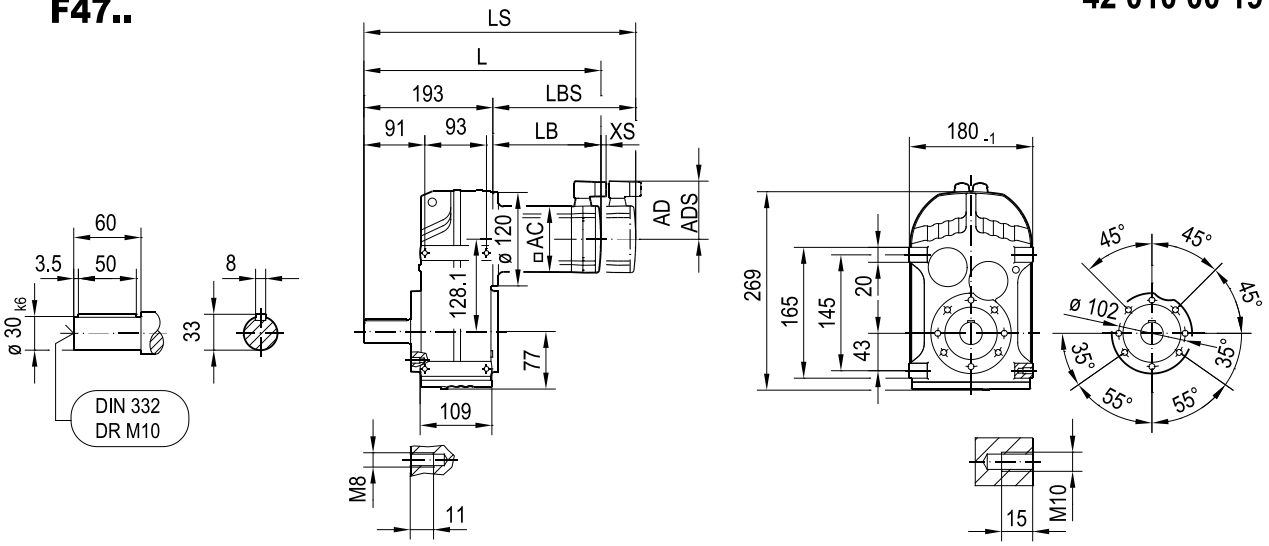
F47..

42 010 00 19



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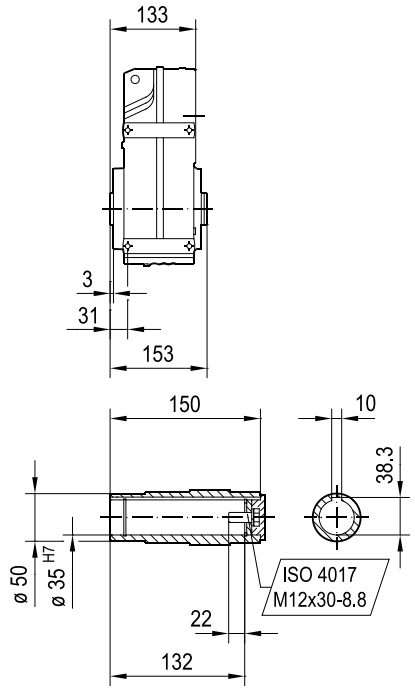

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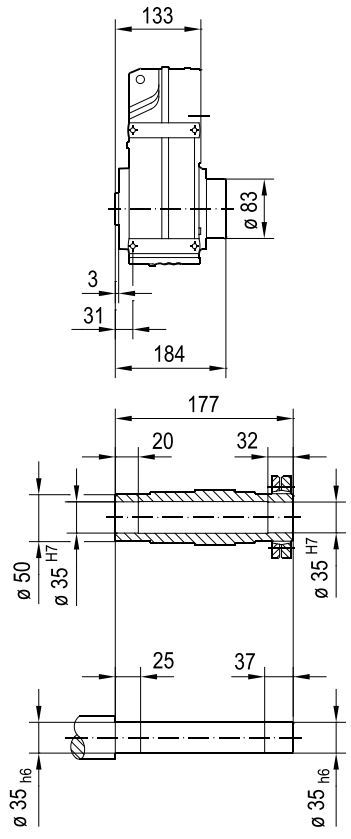

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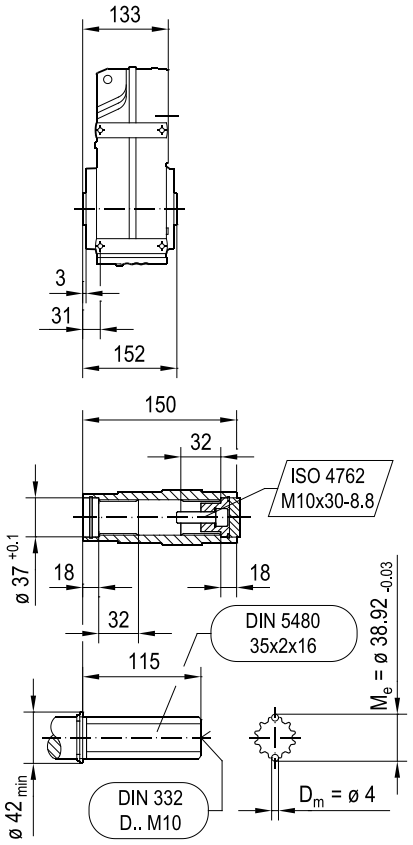

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	344	382	420	380	402	447	415	441
LS	384	422	460	446	468	513	483	509
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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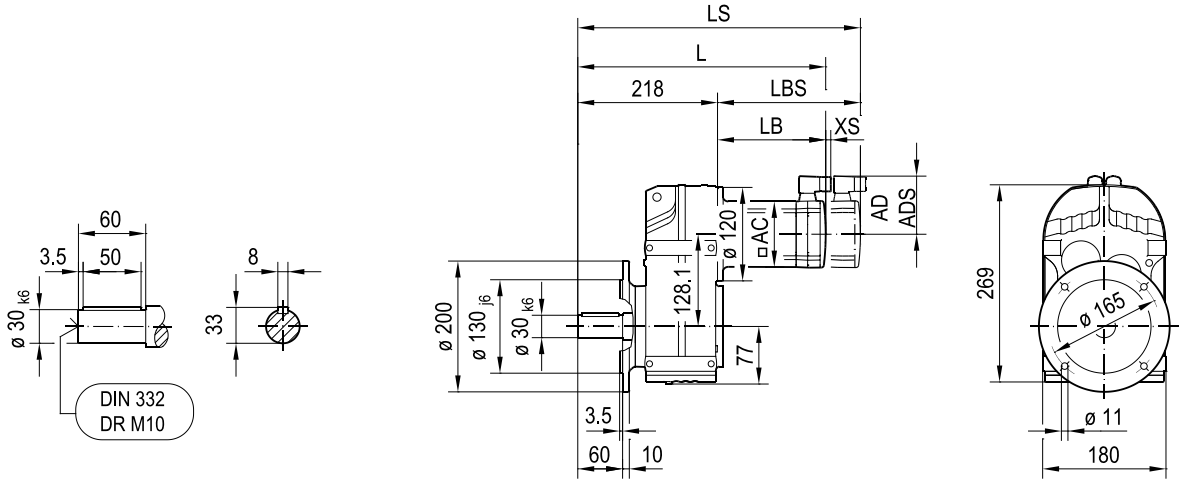
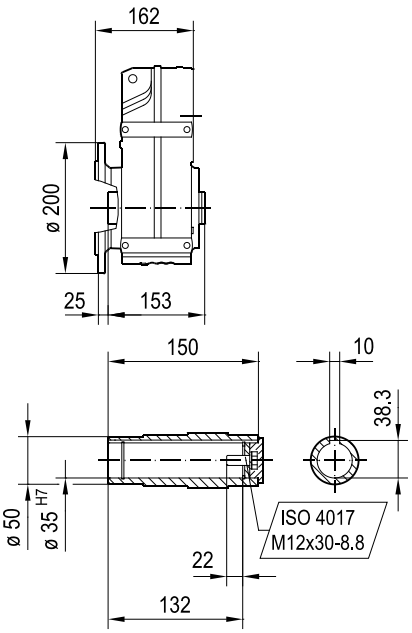
FF47..

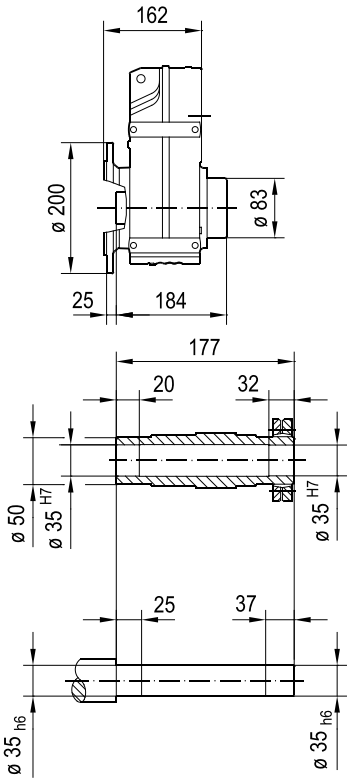
42 011 00 19



FAF47..



FHF47..



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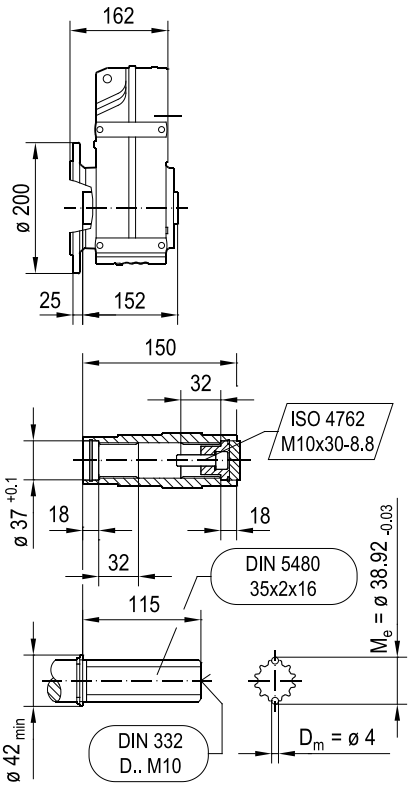

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	369	407	445	405	427	472	440	466
LS	409	447	485	471	493	538	508	534
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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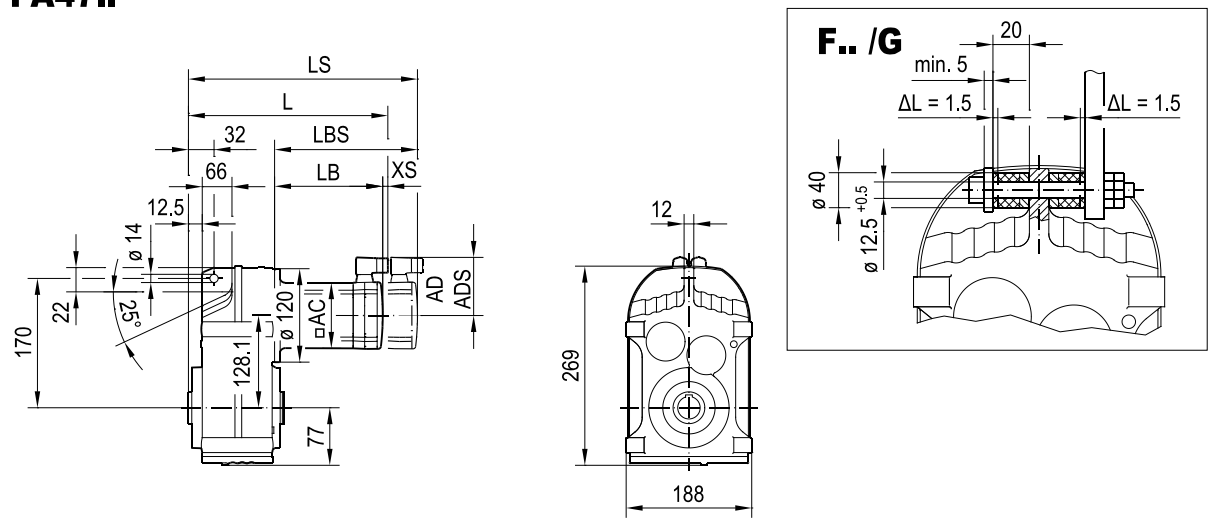
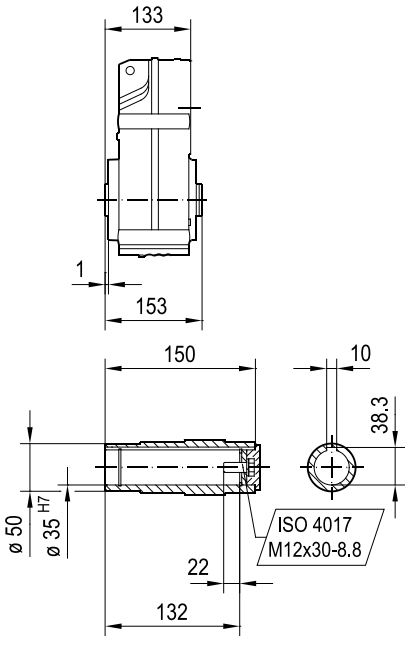
FA47..

42 012 00 19



FA47..



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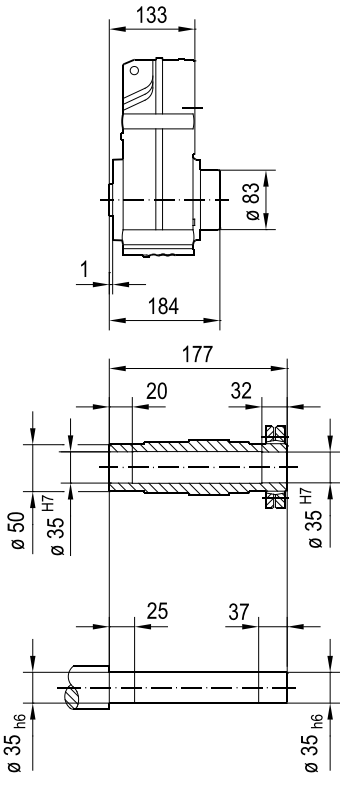
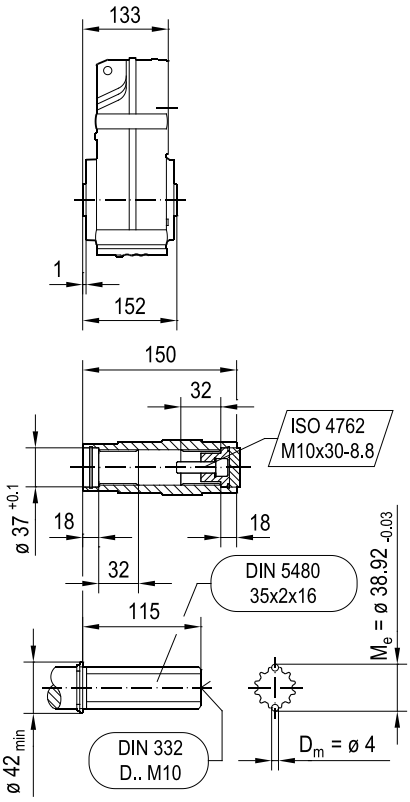


FV47..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	284	322	360	320	342	387	355	381
LS	324	362	400	386	408	453	423	449
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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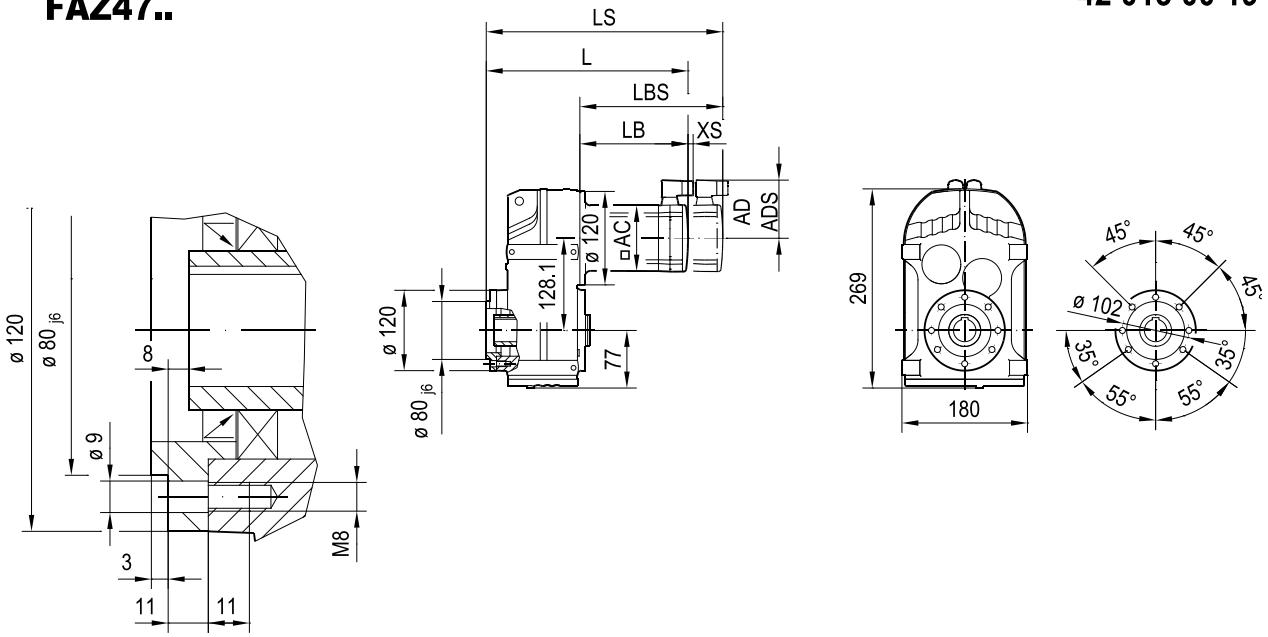
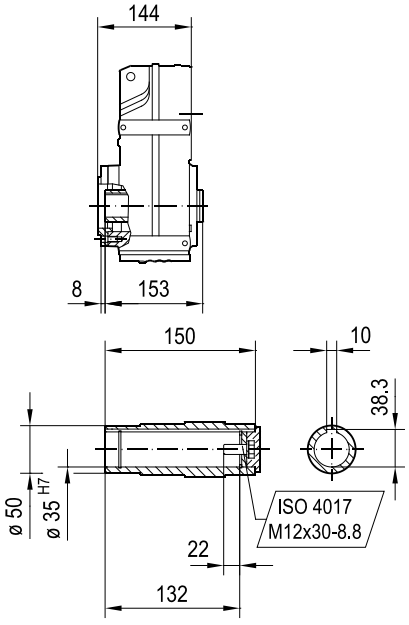
FAZ47..

42 013 00 19



FAZ47..



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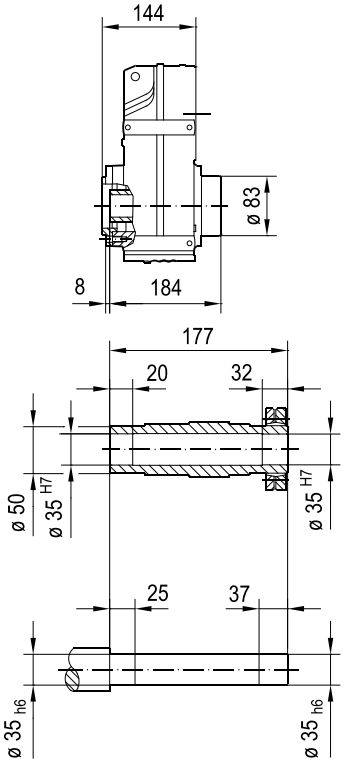
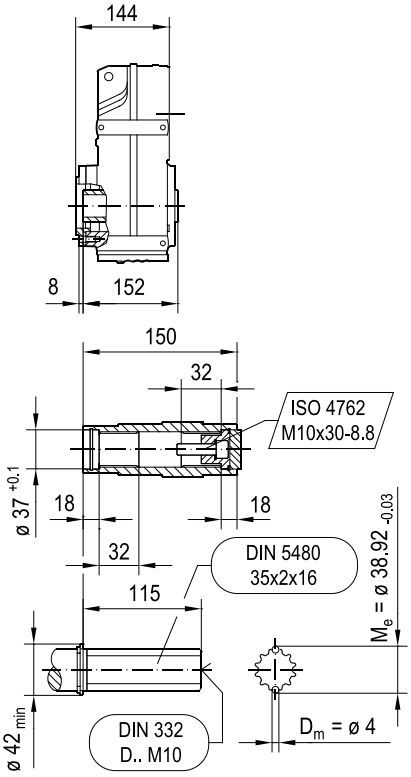


FVZ47..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	295	333	371	331	353	398	366	392
LS	335	373	411	397	419	464	434	460
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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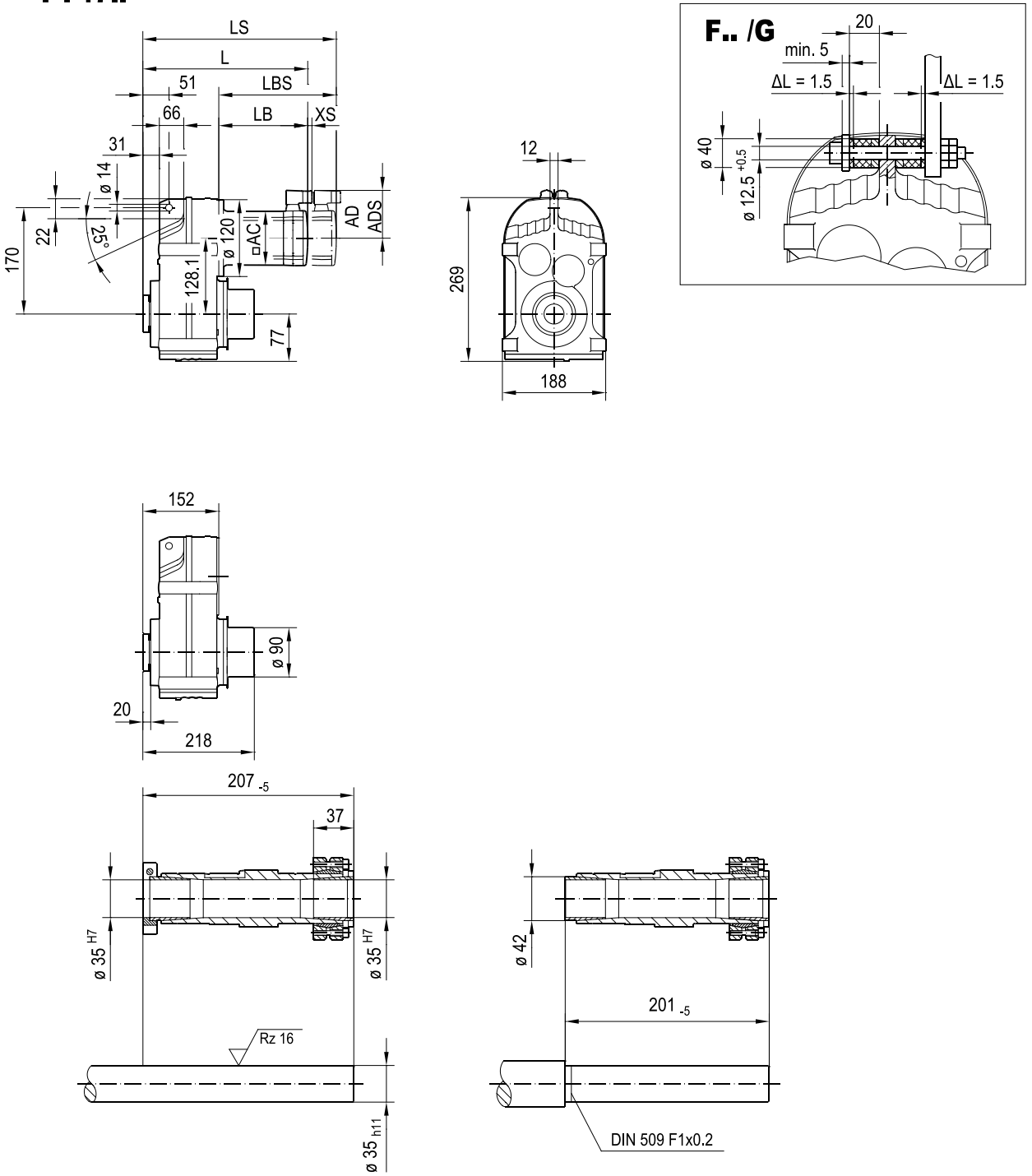
FT47..

42 014 00 19



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	303	341	379	339	361	406	374	400
LS	343	381	419	405	427	472	442	468
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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9.2.4 F57..

F57, M_{aDyn} Nm											600 Nm
	CM3C										
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
2											
5.18	40	73	96	97	143	210	158	235	340	285	400
5.98	46	85	111	113	165	240	182	270	395	330	465
6.58	51	93	122	124	181	265	200	295	435	360	>480
7.73	60	110	143	146	210	310	235	350	>480	425	>480
8.19	64	116	152	154	225	330	250	370	>485	450	>485
9.31	73	132	173	176	255	375	280	420			
10.64	83	151	198	200	290	430	325	480	>645	585	>645
12.29	96	175	225	230	335	500	375	555	>645	>645	>645
13.52	106	192	250	255	370	550	410	610	>645	>645	>645
15.88	124	225	295	300	435	>645	485	>645	>645	>645	>645
16.81	132	235	310	315	460	>645	510	>645	>645	>645	>645
19.11	150	270	355	360	525	>645	580	>645			
21.17	166	300	390	400	585	>645	>645	>645			
24.96	196	355	460	470	>645		>645				
28.45	220	405		535							
29.94	235	425		565							
34.24	265										
40.13											
3											
30.15	230	425	555	560	>645	>645	>645	>645	>645	>645	>645
35.79	275	505	>645	>645	>645	>645	>645	>645	>645	>645	>645
38.21	295	535	>645	>645	>645	>645	>645	>645	>645	>645	>645
44.73	345	630	>645	>645	>645	>645	>645	>645			
50.10	385	>645	>645	>645	>645	>645	>645	>645			
58.97	450	>645	>645	>645	>645		>645				
68.22	520	>645		>645							
72.98	560	>645		>645							
83.46	640	>645	>645	>645	>645	>645	>645	>645			
93.47	>645	>645	>645	>645	>645	>645	>645	>645			
110.01	>645	>645	>645	>645	>645		>645				
127.27	>645	>645		>645							
136.16	>645	>645		>645							
157.09	>645										
183.60											
199.70											

(→ 183)

FA57, m kg											
	CM3C										
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
2	27	28	29	29	31	34	33	36	41	40	43
3	27	29	30	30	31	34	34	36	41	41	44
FAF: + 5.5 kg / F: + 0.20 kg / FF: + 6.6 kg											

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CM3C..				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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
FA57 2	5.18	415	475	705	413	5.8	2020	2020	3460	3670	11500	11500	9910	8490
	5.98	420	475	710	460	4.5	2240	2240	3730	3940	11500	11500	9910	8490
	6.58	420	480	710	505	3.8	2430	2430	3940	4140	11500	11500	9880	8460
	7.73	420	480	710	582	2.9	2760	2760	4310	4500	11500	11500	9880	8460
	8.19	420	485	710	549	2.6	2880	2880	4450	4640	11500	11500	9840	8440
	9.31	420	460	710	483	2.0	3170	3170	4760	4950	11500	11500	10000	8580
	10.64	600	645	1020	206	3.2	2470	2470	4320	4590	11500	11500	6930	6930
	12.29	600	645	1020	208	2.6	2810	2810	4710	4970	11500	11500	6930	6930
	13.52	600	645	1020	209	2.2	3050	3050	4980	5230	11500	11500	6930	6930
	15.88	600	645	1020	212	1.8	3470	3470	5450	5690	11500	11500	6930	6930
	16.81	600	645	1020	213	1.6	3630	3630	5620	5860	11500	11500	6930	6930
	19.11	600	645	1020	214	1.3	3980	3980	6020	6260	11500	11500	6930	6930
	21.17	600	645	1020	213	1.1	4280	4280	6350	6580	11500	11500	6930	6930
	24.96	575	645	970	180	0.84	4970	4970	7060	7260	11500	11500	6930	6930
	28.45	535	645	910	158	0.59	5690	5690	7760	7930	11500	11500	6930	6930
	29.94	545	645	920	150	0.53	5790	5790	7890	8060	11500	11500	6930	6930
	34.24	500	645	850	131	0.43	6580	6580	8670	8500	11500	11500	6930	6930
	40.13	290	435	490	112	0.34	8750	8750	10500	9550	11500	11500	10400	8850
FA57 3	30.15	590	645	1000	52	1.3	5460	5460	7650	7850	11500	11500	6930	6930
	35.79	600	645	1020	50	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	51	0.64	6790	6790	9160	7900	11500	11500	6930	6930
	50.10	600	645	1020	51	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	52	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	41	0.31	10800	10800	9200	7900	11500	11500	6930	6930
	127.27	600	645	1020	35	0.26	11500	11500	9200	7900	11500	11500	6930	6930
	136.16	600	645	1020	33	0.23	11500	11500	9200	7900	11500	11500	6930	6930
	157.09	600	645	1020	29	0.19	11500	11500	9200	7900	11500	11500	6930	6930
	183.60	600	645	1020	25	0.15	11500	11500	9200	7900	11500	11500	6930	6930
	199.70	600	645	1020	23	0.13	11500	11500	9200	7900	11500	11500	6930	6930

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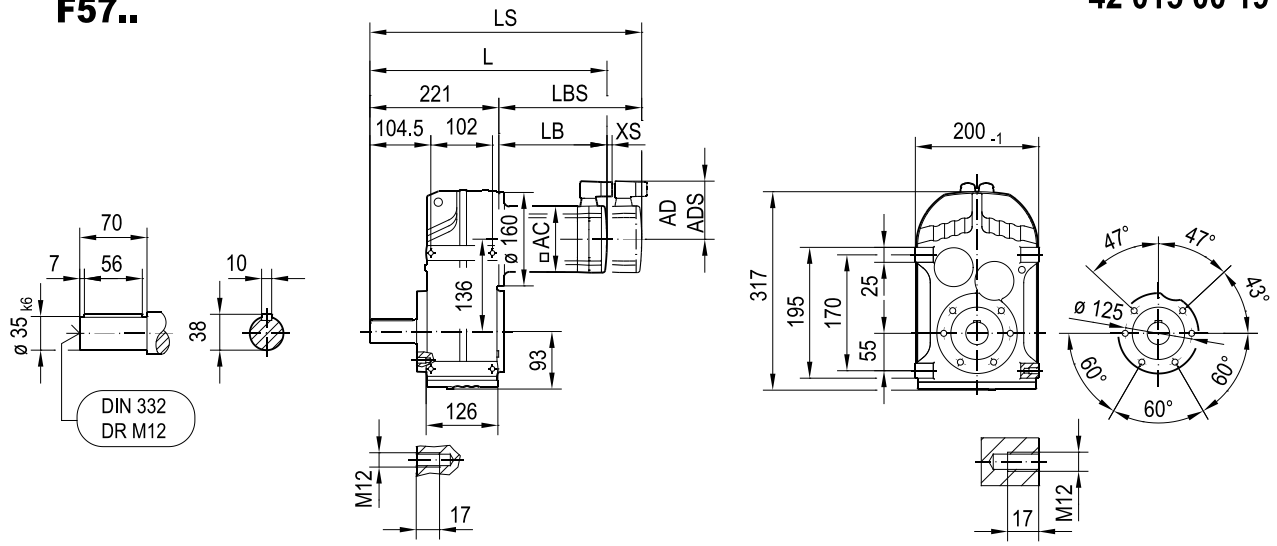
F57..

42 015 00 19



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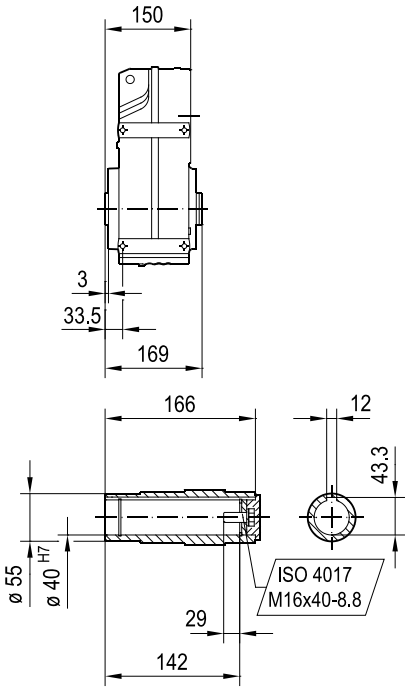

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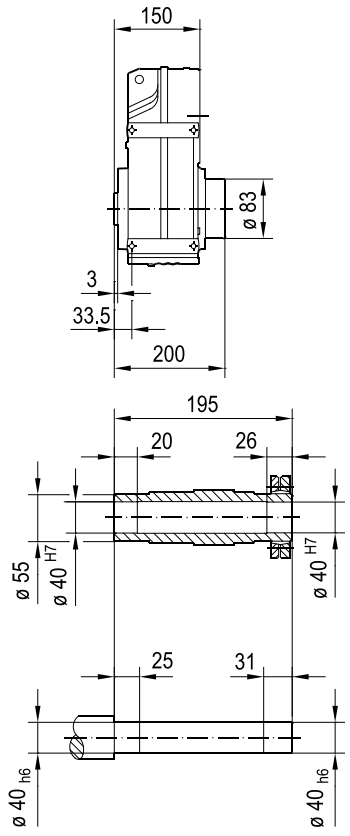

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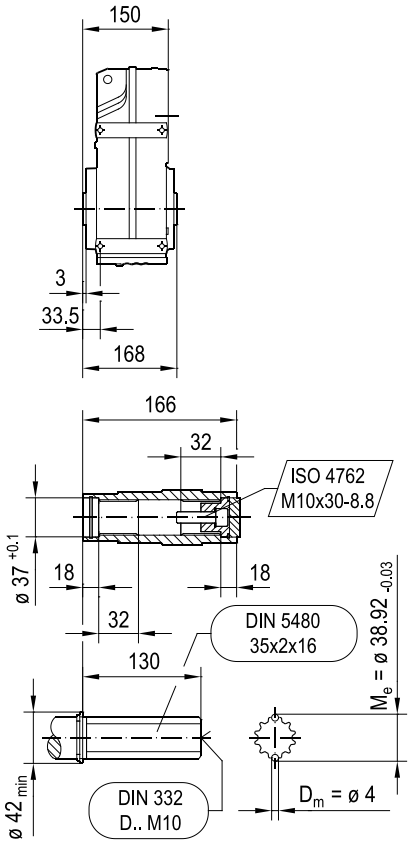
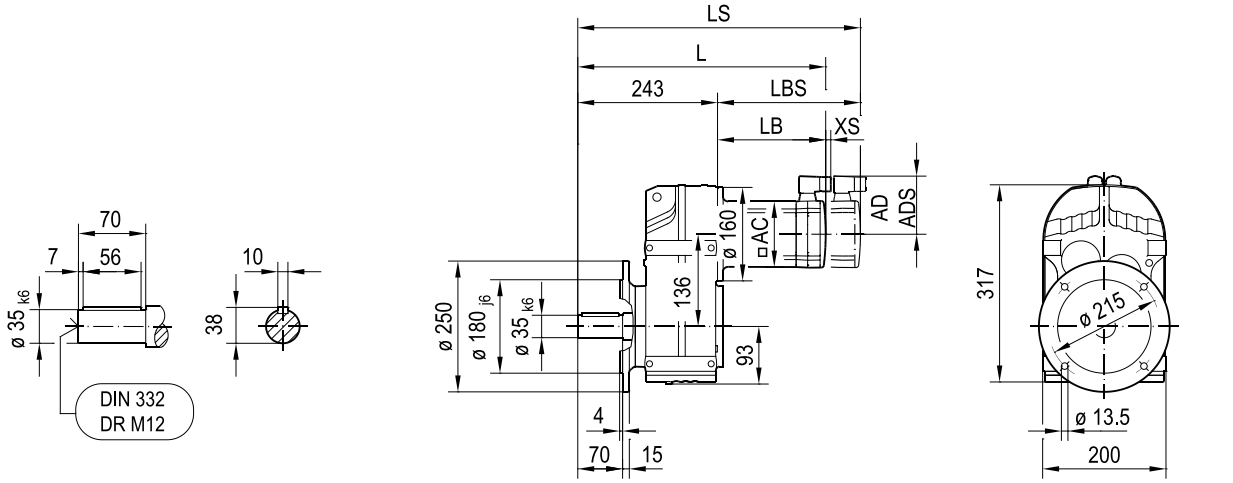


(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	365	403	441	402	424	469	434	460	513	464	492
LS	406	444	482	468	490	535	502	528	581	538	566
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

FF57..

42 016 00 19



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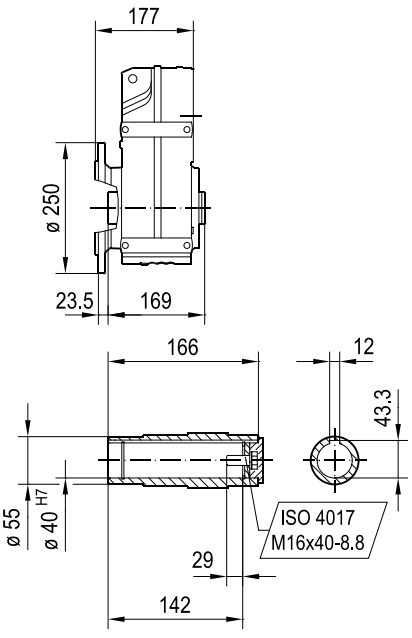

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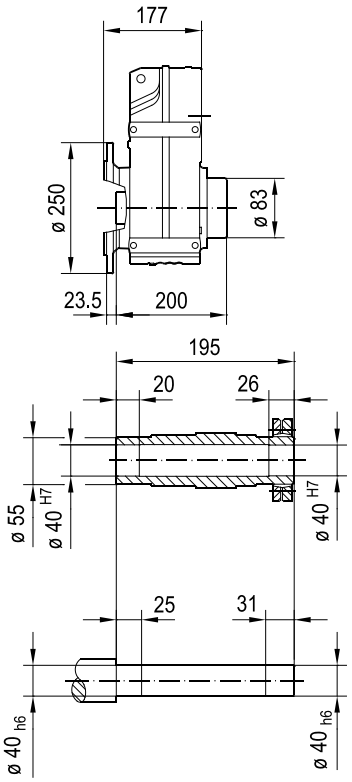

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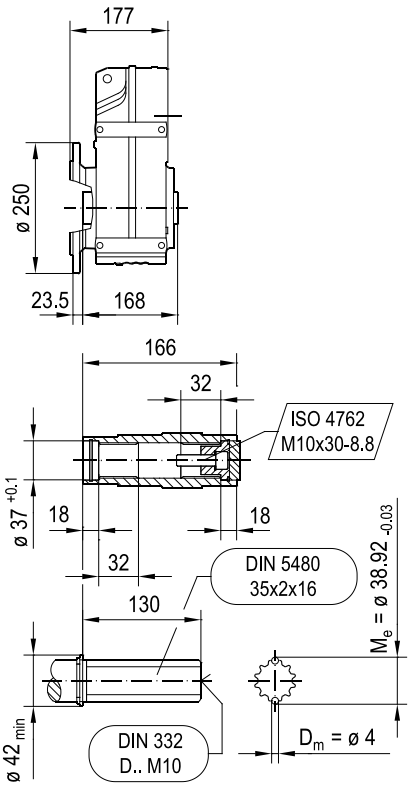

(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	387	425	463	424	446	491	456	482	535	486	514
LS	428	466	504	490	512	557	524	550	603	560	588
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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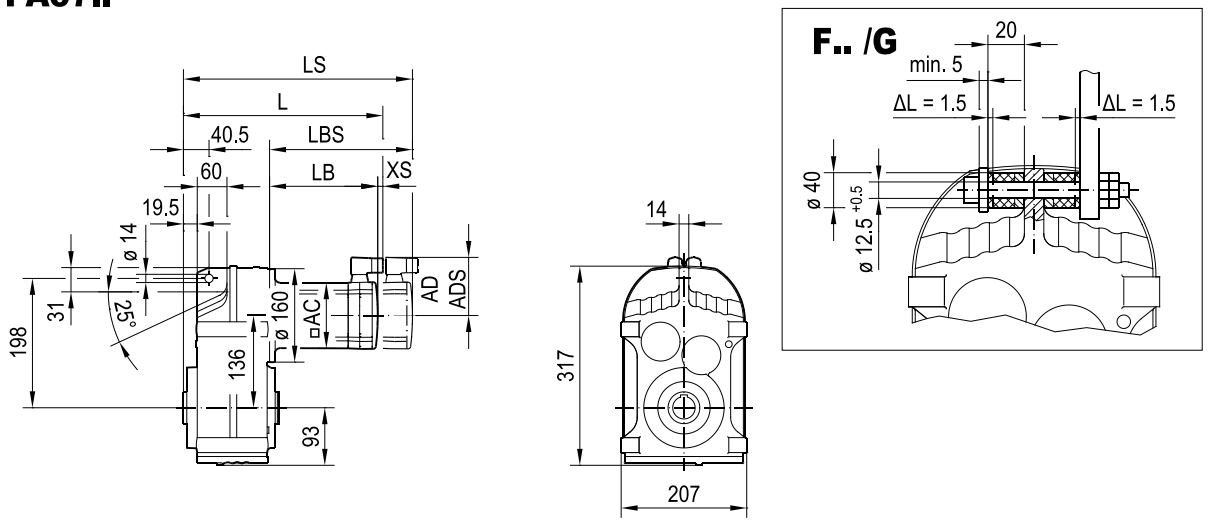
FA57..

42 017 00 19



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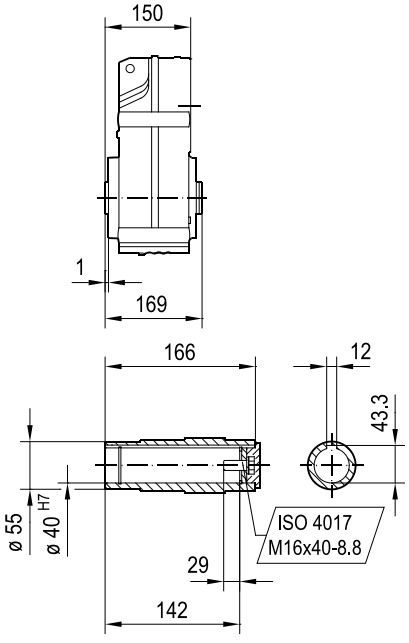

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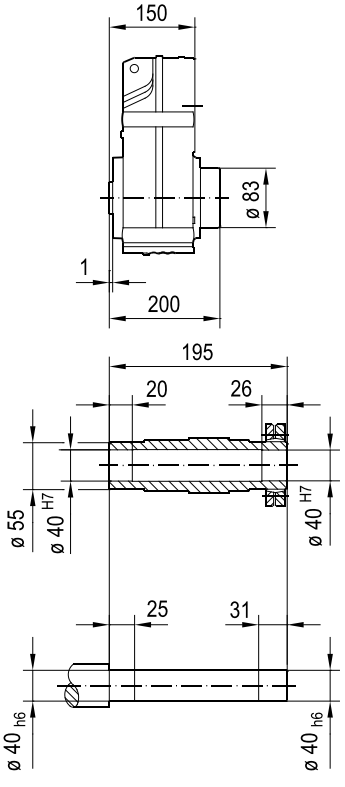

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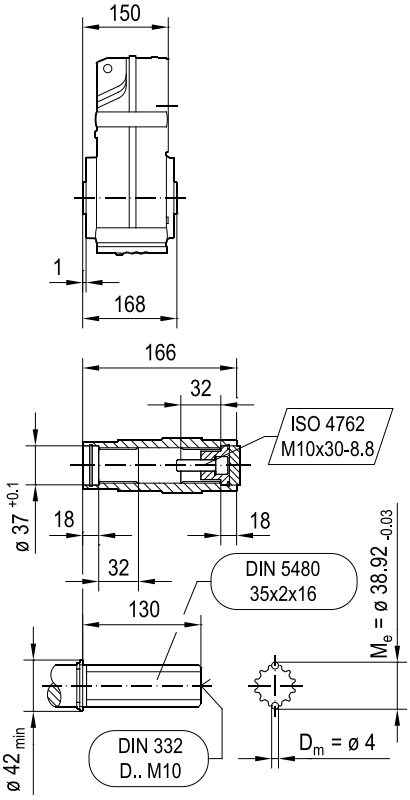

(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	294	332	370	331	353	398	363	389	442	393	421
LS	335	373	411	397	419	464	431	457	510	467	495
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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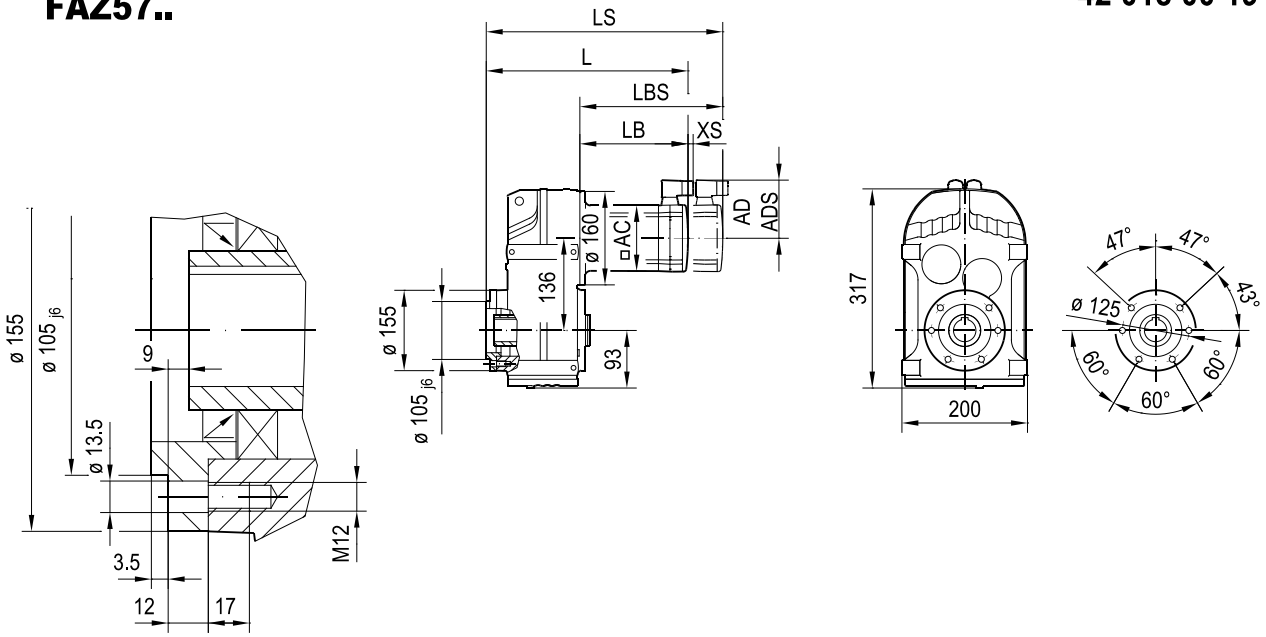
FAZ57..

42 018 00 19



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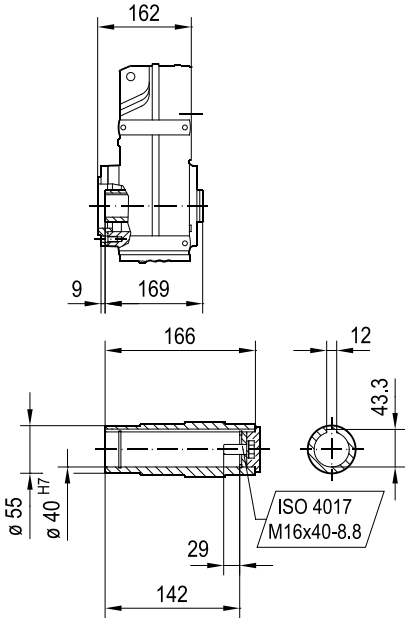

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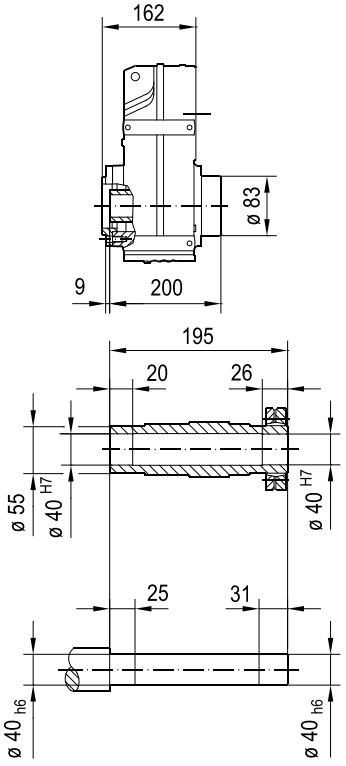

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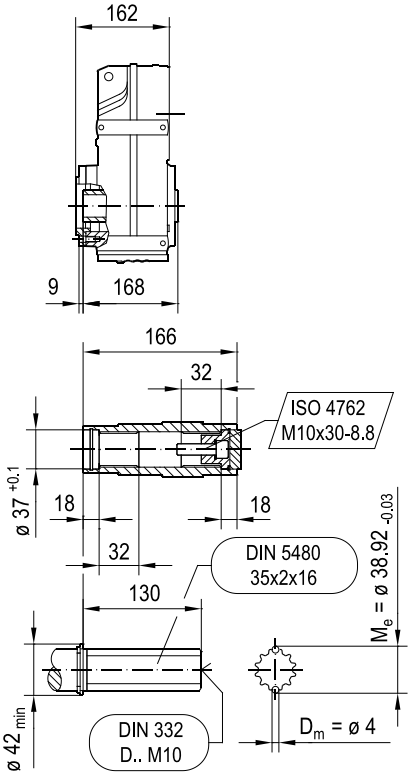

(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	306	344	382	343	365	410	375	401	454	405	433
LS	347	385	423	409	431	476	443	469	522	479	507
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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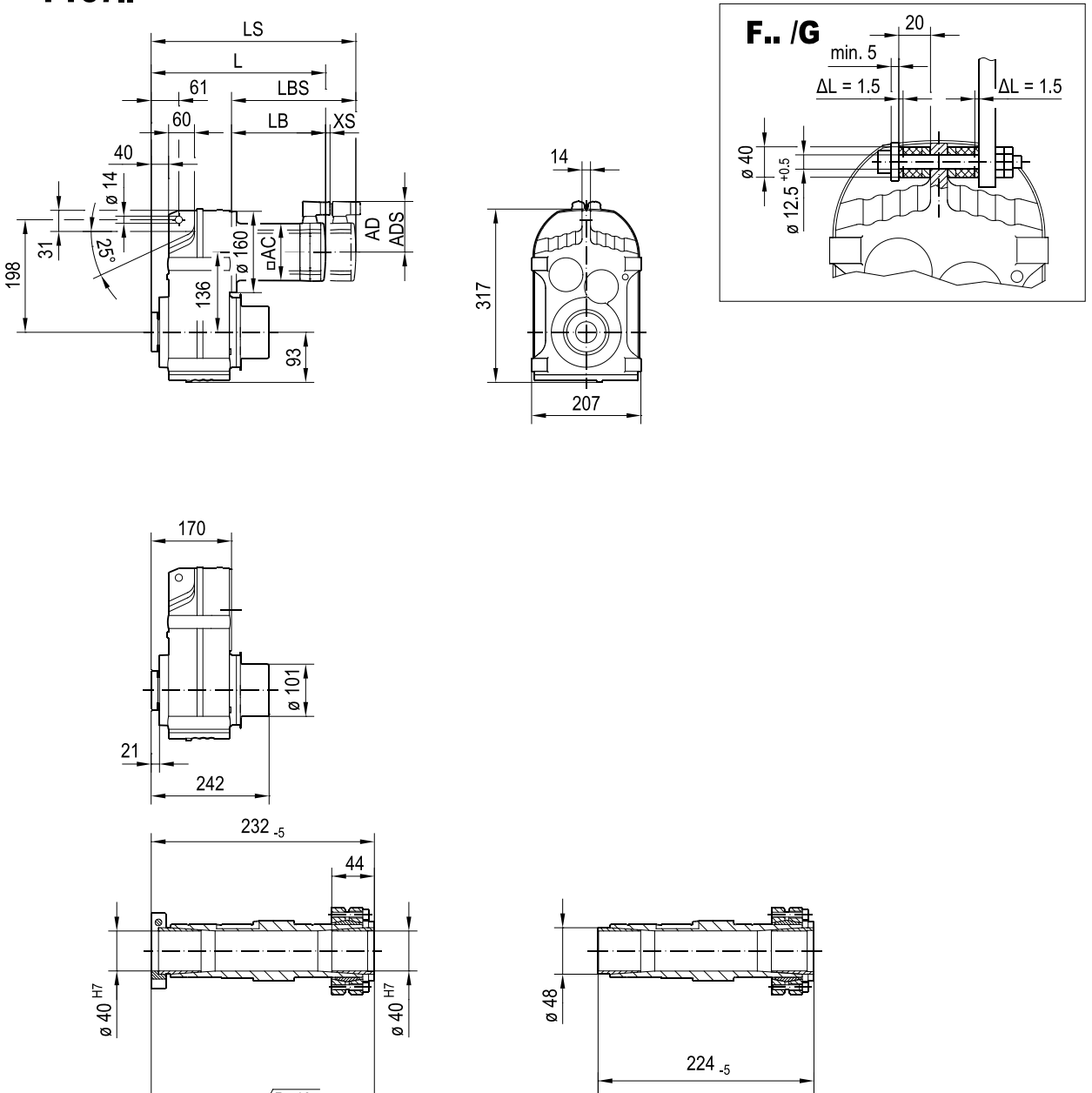
FT57..

42 019 00 19



(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	314	352	390	351	373	418	383	409	462	413	441
LS	355	393	431	417	439	484	451	477	530	487	515
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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9.2.5 F67..

F67, M_{aDyn} Nm												820 Nm
	CM3C											
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
						2						
3.97	31	56	73	75	109	161	121	180	260	215	305	460
4.66	36	66	86	88	128	189	142	210	305	255	360	540
5.25	41	74	97	99	145	210	160	235	345	290	405	610
5.95	47	85	111	113	166	240	183	270	395	330	465	695
6.78	53	96	126	128	187	275	205	305	445	370	525	>710
7.53	59	107	140	142	205	305	230	340	495	415	585	
8.60	67	122	160	162	235	350	260	390	570	475	670	
9.08	71	129	169	171	250	365	275	410	600	500	705	
9.66	75	137	179	182	265	390	295	435	640	530	750	>920
11.31	88	161	210	210	310	460	345	510	750	625	880	>920
12.76	100	181	235	240	350	515	385	575	840	705	>920	>920
14.46	113	205	265	270	395	585	440	655	>920	795	>920	>920
16.48	129	230	305	310	455	670	500	745	>920	910	>920	>920
18.29	143	260	340	345	505	745	555	830	>920	>920	>920	
20.90	164	295	385	395	575	850	635	>920	>920	>920	>920	
22.05	173	310	410	415	605	890	670	>920	>920	>920	>920	
25.13	197	355	465	475	690	>920	765	>920				
27.41	215	390	510	515	755	>920	830	>920				
32.08	250	455	595	605	880		>920					
36.30	285	515		685								
						3						
34.01	260	475	625	635	>920	>920	>920	>920	>920	>920	>920	
39.26	305	550	720	730	>920	>920	>920	>920	>920	>920	>920	
43.20	335	605	795	800	>920	>920	>920	>920	>920	>920	>920	
50.74	390	715	>920	>920	>920	>920	>920	>920	>920	>920	>920	
53.73	415	755	>920	>920	>920	>920	>920	>920	>920	>920	>920	
61.07	465	850	>920	>920	>920	>920	>920	>920				
67.65	520	>920	>920	>920	>920	>920	>920	>920				
79.76	610	>920	>920	>920	>920		>920					
90.59	695	>920	>920	>920	>920	>920	>920	>920	>920	>920	>920	
95.94	735	>920	>920	>920	>920	>920	>920	>920	>920	>920	>920	
109.04	830	>920	>920	>920	>920	>920	>920	>920				
120.79	910	>920	>920	>920	>920	>920	>920	>920				
142.40	>920	>920	>920	>920	>920		>920					
162.31	>920	>920		>920								
170.85	>920	>920		>920								
195.39	>920											
228.99												

(→ 183)

FA67, m kg												
	CM3C											
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
2	30	31	33	33	34	37	37	39	44	43	47	54
3	31	32	34	34	35	38	38	40	45	44	48	55

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FA67, m kg												
	CM3C											
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
FAF: + 6.3 kg / F: + 2.8 kg / FF: + 8.9 kg												

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CM3C..				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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
FA67 2	3.97	500	695	850	413	16	1220	1220	8390	8620	11600	13000	11300	11300
	4.66	560	700	950	337	12	1020	1020	8590	8860	11600	13000	11300	11300
	5.25	590	705	1000	309	10.0	1010	1010	8850	9140	11500	13000	11200	11200
	5.95	610	705	1030	299	8.0	1090	1090	9200	9500	11500	13000	11200	11200
	6.78	620	710	1050	304	6.3	1280	1280	9660	9950	11500	13000	11200	11200
	7.53	610	715	1030	341	5.5	1570	1570	10100	10400	11500	13000	11200	11200
	8.60	570	715	960	455	4.4	2180	2180	10900	11200	11500	13000	11200	11200
	9.08	530	715	900	496	4.0	2620	2620	11400	11600	11500	13000	11200	11200
	9.66	820	920	1390	195	8.5	1580	1580	10300	10300	11100	13000	9310	9310
	11.31	820	920	1390	211	6.7	1960	1960	10300	10300	11100	13000	9310	9310
	12.76	820	920	1390	223	5.6	2260	2260	10300	10300	11100	13000	9310	9310
	14.46	820	920	1390	236	4.6	2580	2580	10300	10300	11100	13000	9310	9310
	16.48	820	920	1390	248	3.8	2940	2940	10300	10300	11100	13000	9310	9310
	18.29	820	920	1390	246	3.4	3230	3230	10300	10300	11100	13000	9310	9310
	20.90	820	920	1390	215	2.7	3620	3620	10300	10300	11100	13000	9310	9310
	22.05	820	920	1390	204	2.5	3780	3780	10300	10300	11100	13000	9310	9310
	25.13	820	920	1390	179	2.0	4190	4190	10300	10300	11100	13000	9310	9310
	27.41	820	920	1390	164	1.7	4470	4470	10300	10300	11100	13000	9310	9310
	32.08	820	920	1390	140	1.4	5000	5000	10300	10300	11100	13000	9310	9310
	36.30	820	920	1390	124	0.98	5440	5440	10300	10300	11100	13000	9310	9310
FA67 3	34.01	740	920	1250	44	2.8	5730	5730	11000	11000	11100	13000	9310	9310
	39.26	780	920	1320	38	2.2	5980	5980	10700	10700	11100	13000	9310	9310
	43.20	820	920	1390	35	1.9	6080	6080	10300	10300	11100	13000	9310	9310
	50.74	820	920	1390	34	1.6	6710	6710	10300	10300	11100	13000	9310	9310
	53.73	820	920	1390	34	1.4	6940	6940	10300	10300	11100	13000	9310	9310
	61.07	820	920	1390	35	1.1	7480	7480	10300	10300	11100	13000	9310	9310
	67.65	820	920	1390	36	0.97	7930	7930	10300	10300	11100	13000	9310	9310
	79.76	820	920	1390	36	0.76	8680	8680	10300	10300	11100	13000	9310	9310
	90.59	820	920	1390	50	1.4	9290	9290	10300	10300	11100	13000	9310	9310
	95.94	820	920	1390	47	1.2	9570	9570	10300	10300	11100	13000	9310	9310
	109.04	820	920	1390	41	0.98	10200	10200	10300	10300	11100	13000	9310	9310
	120.79	820	920	1390	37	0.85	10800	10800	10300	10300	11100	13000	9310	9310
	142.40	820	920	1390	32	0.68	11700	11700	10300	10300	11100	13000	9310	9310
	162.31	820	920	1390	28	0.47	12400	12400	10300	10300	11100	13000	9310	9310
	170.85	820	920	1390	26	0.42	12700	12700	10300	10300	11100	13000	9310	9310
	195.39	820	920	1390	23	0.34	13000	13000	10300	10300	11100	13000	9310	9310
	228.99	820	920	1390	20	0.27	13000	13000	10300	10300	11100	13000	9310	9310

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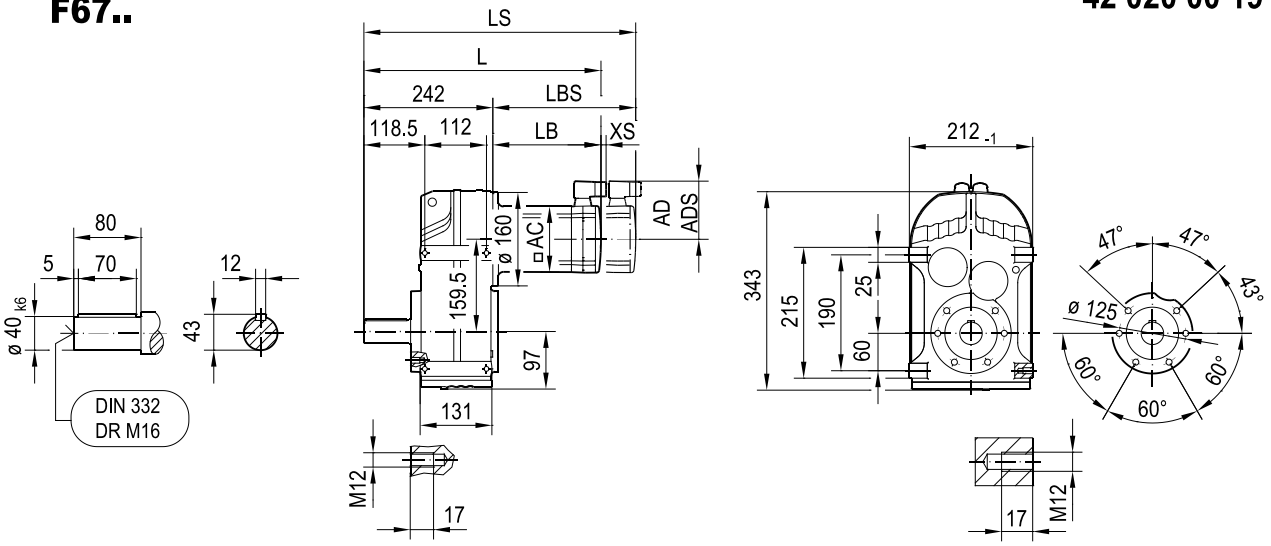
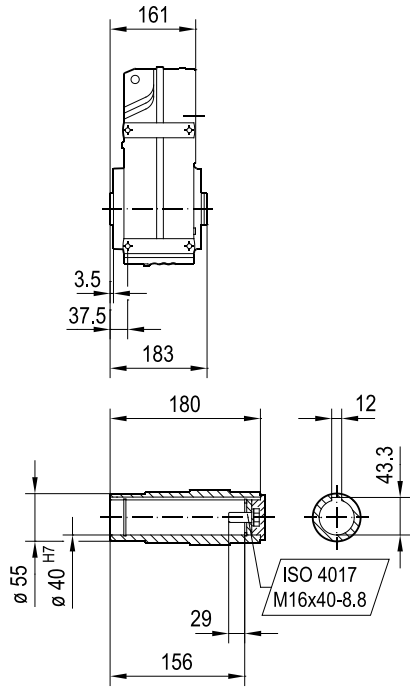
F67..

42 020 00 19



FA67B..



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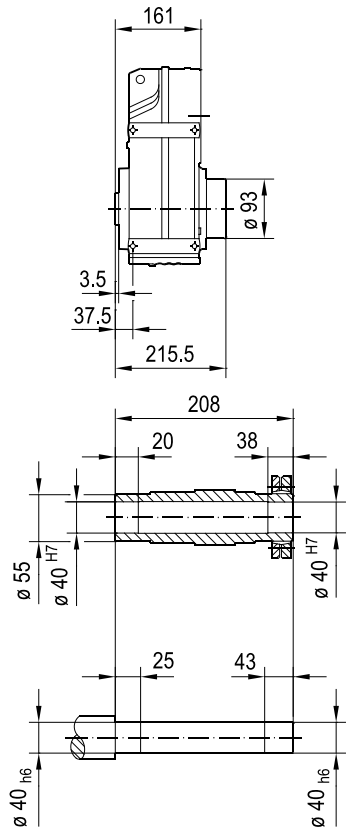

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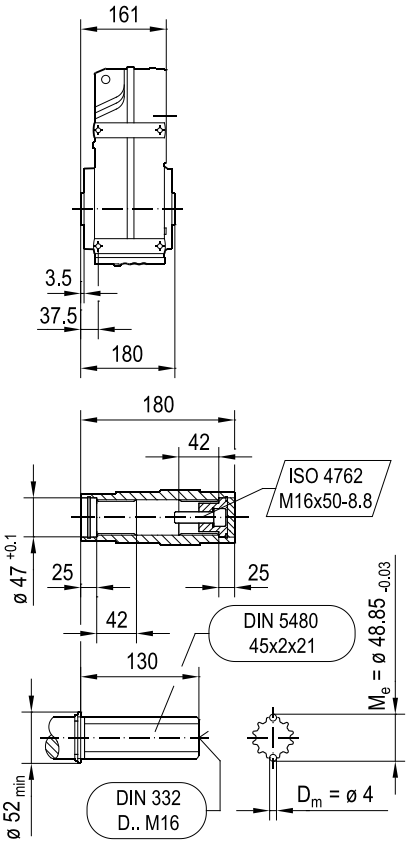

(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	386	424	462	423	445	490	455	481	534	485	513	570
LS	427	465	503	489	511	556	523	549	602	559	587	644
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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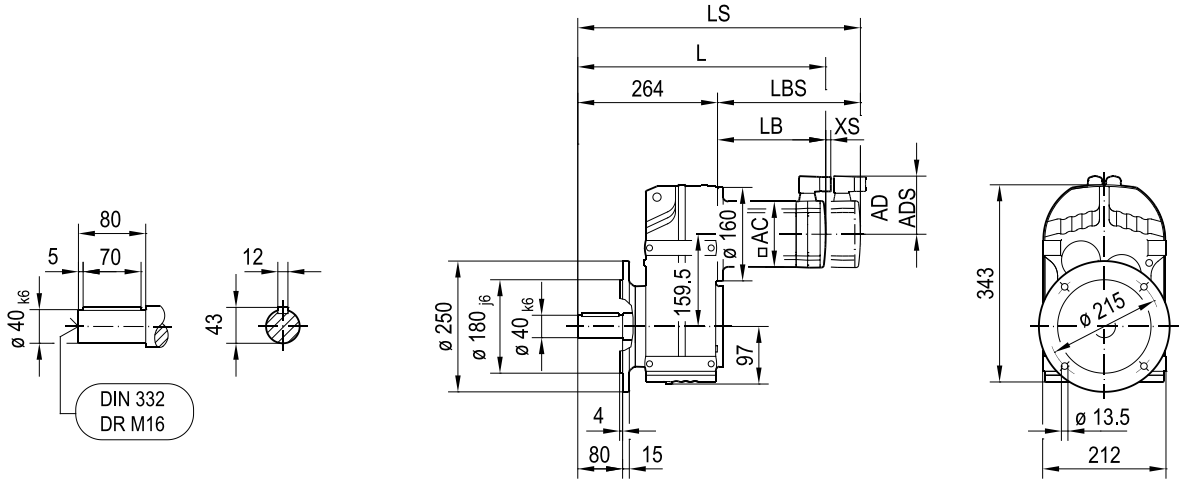
FF67..

42 021 00 19



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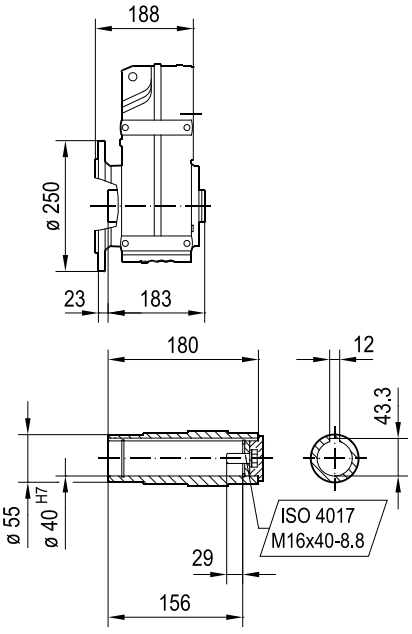

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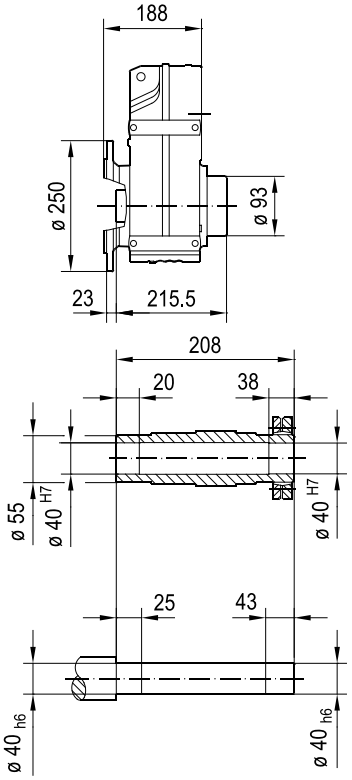

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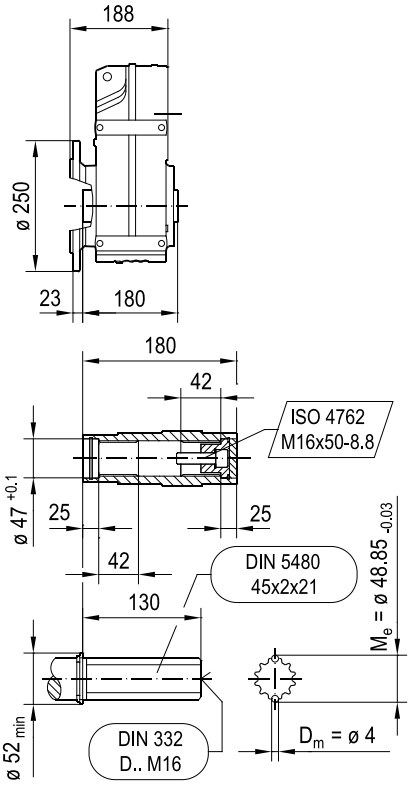

(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	408	446	484	445	467	512	477	503	556	507	535	592
LS	449	487	525	511	533	578	545	571	624	581	609	666
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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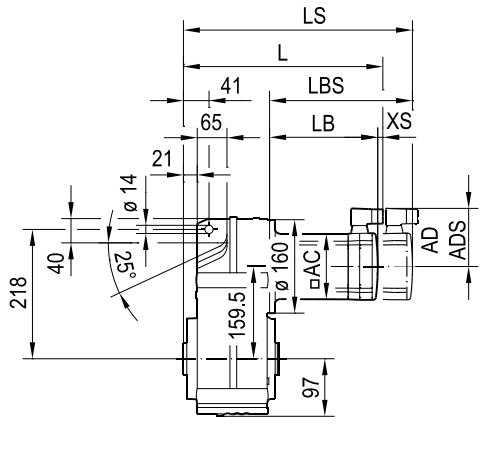
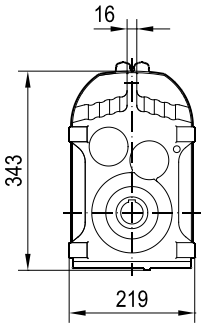
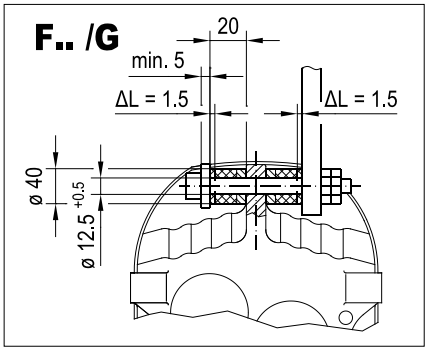
FA67..

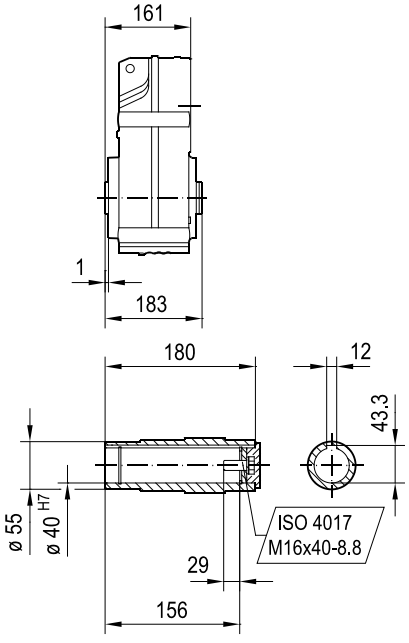
42 022 00 19







FA67..



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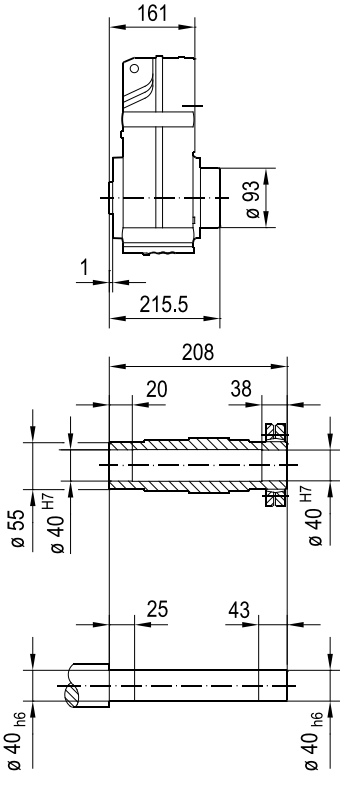
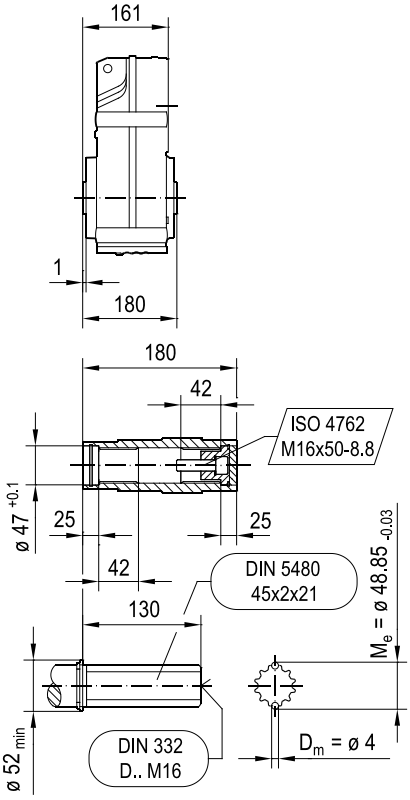


FV67..



(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	305	343	381	342	364	409	374	400	453	404	432	489
LS	346	384	422	408	430	475	442	468	521	478	506	563
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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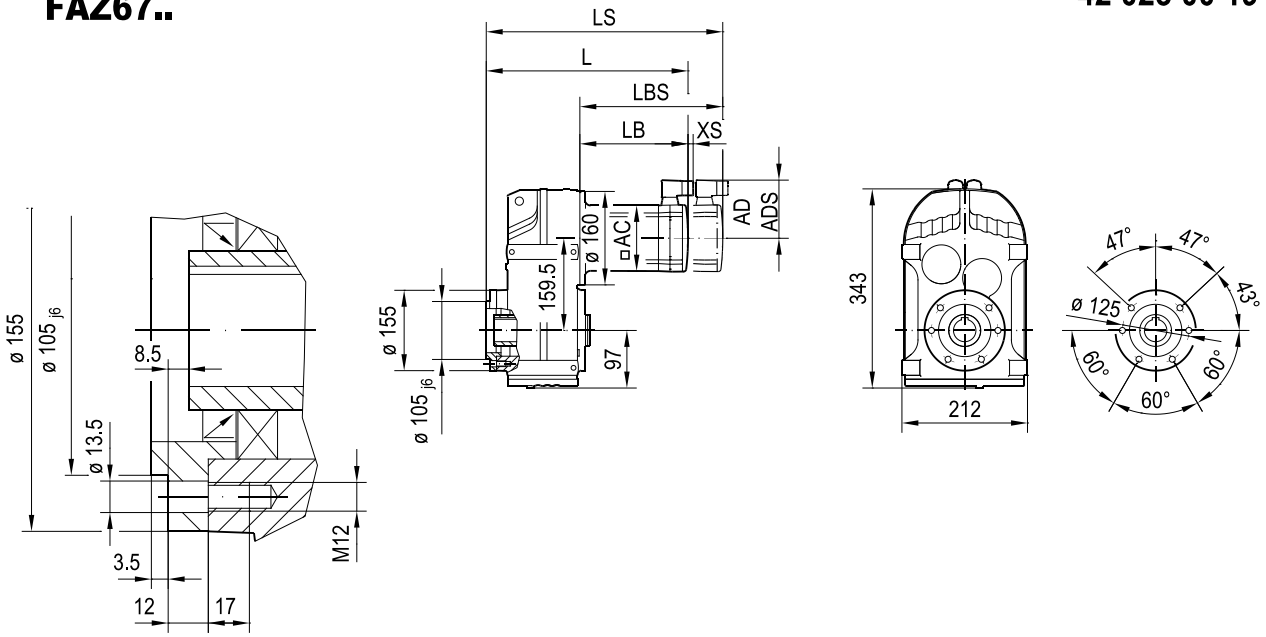
FAZ67..

42 023 00 19



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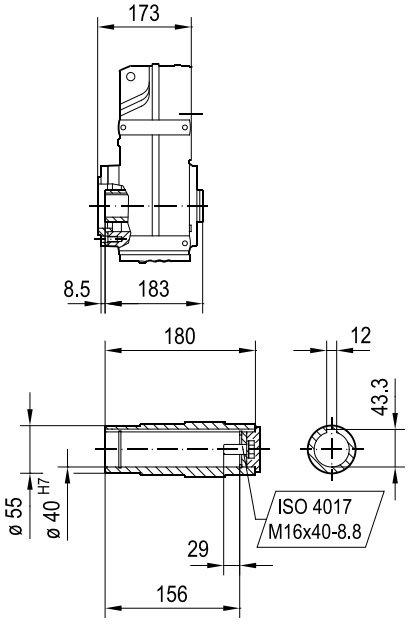

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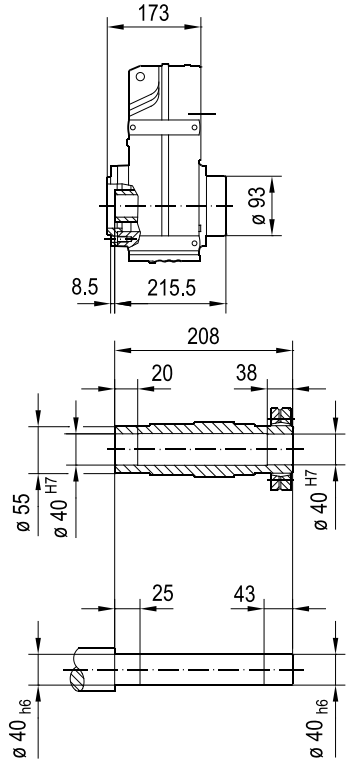

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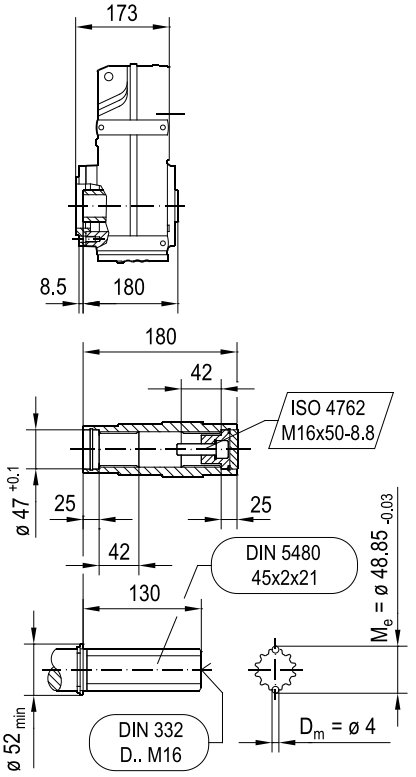

(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	317	355	393	354	376	421	386	412	465	416	444	501
LS	358	396	434	420	442	487	454	480	533	490	518	575
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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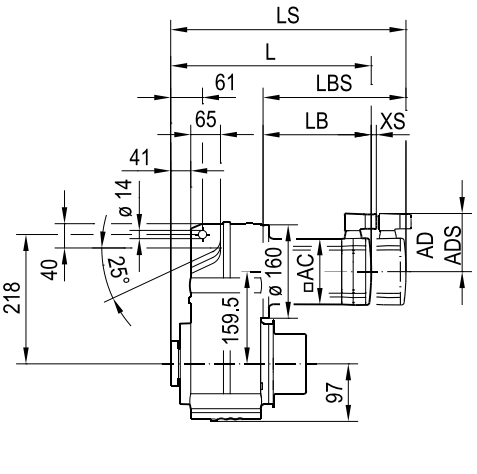
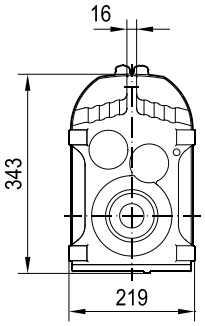
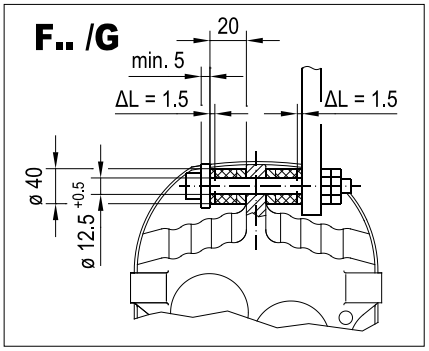
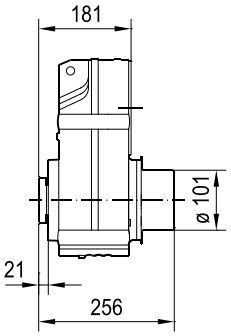
FT67..

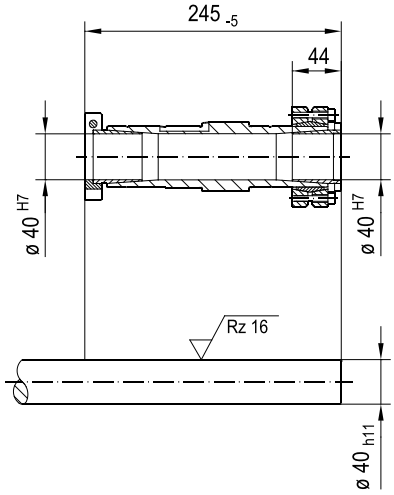
42 024 00 19

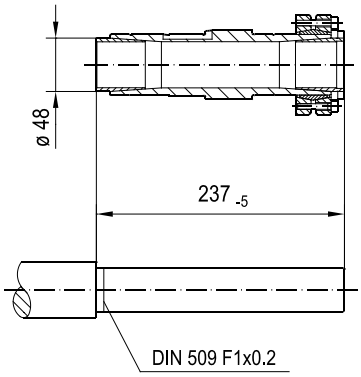












(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	325	363	401	362	384	429	394	420	473	424	452	509
LS	366	404	442	428	450	495	462	488	541	498	526	583
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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9.2.6 F77..

F77, M_{aDyn} Nm									1500 Nm
	CM3C								
i	71S	71M	71L	80S	80M	80L	100S	100M	100L
					2				
4.28		118	174	130	194	280	235	330	495
5.16		142	210	157	230	340	285	400	600
5.76	108	159	230	175	260	380	315	445	670
6.64	125	183	270	200	300	440	365	515	770
7.39	139	200	300	225	335	490	405	575	860
8.26	156	225	335	250	370	545	455	640	960
9.30	175	255	375	280	420	615	510	725	1080
10.93		300	445	330	495	725	600	850	1270
12.20	230	335	495	370	550	800	670	950	1420
14.06	265	385	570	425	635	930	775	1090	>1530
15.64	295	430	635	475	705	1030	860	1210	>1530
17.49	330	480	710	530	790	1160	960	1360	>1530
19.70	370	540	800	600	890	1300	1080	>1530	>1530
21.43	405	590	870	650	970	1420	1180	>1530	
25.50	480	700	1030	775	1150	>1530	1400	>1530	
28.75	540	790	1170	870	1300				
31.51	595	870	1280	960	1430				
36.58	690	1010		1110					
					3				
25.54	475	695	1020	770	1140	>1530	1390	>1530	>1530
29.91	555	810	1200	900	1340	>1530	>1530	>1530	>1530
33.74	630	920	1360	1020	1510	>1530	>1530	>1530	>1530
38.23	715	1040	>1530	1150	>1530	>1530	>1530	>1530	>1530
43.58	810	1190	>1530	1310	>1530	>1530	>1530	>1530	>1530
48.37	900	1320	>1530	1460	>1530	>1530	>1530	>1530	
55.27	1030	1510	>1530	>1530	>1530	>1530	>1530	>1530	
58.32	1090	>1530	>1530	>1530	>1530	>1530	>1530	>1530	
66.46	1230	>1530	>1530	>1530	>1530				
72.50	1340	>1530	>1530	>1530	>1530				
75.02	1380	>1530	>1530	>1530	>1530	>1530	>1530	>1530	
85.52	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530	
94.93	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530	
108.46	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530	
114.45	>1530	>1530	>1530	>1530	>1530	>1530	>1530	>1530	
130.42	>1530	>1530	>1530	>1530	>1530				
142.27	>1530	>1530	>1530	>1530	>1530				
166.47	>1530	>1530		>1530					
188.40	>1530								
198.31	>1530								
225.79									
262.93									
281.71									

(→ 183)

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FA77, m kg									
	CM3C								
s	71S	71M	71L	80S	80M	80L	100S	100M	100L
2	55	57	59	59	62	67	65	69	76
3	56	58	61	61	63	68	66	70	78
FAF: + 6.6 kg / F: + 3.8 kg / FF: + 14 kg									

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CM3C..				c_{TG}				φ
		n_{epk}	η	FA	FAF	F	FF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
	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
FA77	12.20	4500	97	351	351	151	118	5
2	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
	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
FA77	85.52	4500	95	394	394	158	123	6
3	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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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
FA77 2	4.28	1010	1310	1710	343	42	630	630	10200	10900	16900	20000	16900	17400
	5.16	1080	1320	1830	285	31	640	640	10700	11500	16800	20000	16800	17400
	5.76	1080	1320	1830	302	26	930	930	11300	12000	16800	20000	16800	17400
	6.64	1080	1320	1830	327	20	1310	1310	12000	12700	16800	20000	16800	17400
	7.39	1080	1330	1830	327	17	1610	1610	12500	13300	16700	20000	16800	17400
	8.26	1080	1330	1830	327	14	1940	1940	13100	13900	16700	20000	16800	17400
	9.30	1080	1330	1830	328	12	2300	2300	13800	14600	16700	20000	16800	17400
	10.93	1500	1530	2550	190	19	2080	2080	14200	15100	17500	20000	15500	17000
	12.20	1500	1530	2550	205	16	2450	2450	14900	15800	17500	20000	15500	17000
	14.06	1500	1530	2550	224	13	2940	2940	15700	16700	17500	20000	15500	17000
	15.64	1500	1530	2550	237	11	3330	3330	15700	17100	17500	20000	15500	17000
	17.49	1500	1530	2550	250	9.5	3750	3750	15700	17100	17500	20000	15500	17000
	19.70	1500	1530	2550	228	7.9	4220	4220	15700	17100	17500	20000	15500	17000
	21.43	1500	1530	2550	210	7.1	4560	4560	15700	17100	17500	20000	15500	17000
	25.50	1500	1530	2550	176	5.5	5300	5300	15700	17100	17500	20000	15500	17000
	28.75	1430	1530	2430	157	4.4	6190	6190	16200	17300	17500	20000	15500	17000
	31.51	1380	1530	2340	143	3.8	6870	6870	16500	17500	17500	20000	15500	17000
	36.58	1110	1530	1880	123	3.0	8990	8990	17900	18300	17500	20000	15500	17000
FA77 3	25.54	1450	1530	2460	60	10	5560	5560	16100	17300	17500	20000	15500	17000
	29.91	1500	1530	2550	51	7.8	6010	6010	15700	17100	17500	20000	15500	17000
	33.74	1500	1530	2550	52	6.4	6580	6580	15700	17100	17500	20000	15500	17000
	38.23	1500	1530	2550	52	5.2	7190	7190	15700	17100	17500	20000	15500	17000
	43.58	1500	1530	2550	52	4.3	7850	7850	15700	17100	17500	20000	15500	17000
	48.37	1500	1530	2550	53	3.8	8410	8410	15700	17100	17500	20000	15500	17000
	55.27	1500	1530	2550	53	3.0	9140	9140	15700	17100	17500	20000	15500	17000
	58.32	1500	1530	2550	53	2.8	9450	9450	15700	17100	17500	20000	15500	17000
	66.46	1500	1530	2550	53	2.2	10200	10200	15700	17100	17500	20000	15500	17000
	72.50	1500	1530	2550	53	1.9	10700	10700	15700	17100	17500	20000	15500	17000
	75.02	1500	1530	2550	53	4.0	11000	11000	15700	17100	17500	20000	15500	17000
	85.52	1500	1530	2550	53	3.3	11800	11800	15700	17100	17500	20000	15500	17000
	94.93	1500	1530	2550	47	3.0	12500	12500	15700	17100	17500	20000	15500	17000
	108.46	1500	1530	2550	41	2.5	13400	13400	15700	17100	17500	20000	15500	17000
	114.45	1500	1530	2550	39	2.3	13800	13800	15700	17100	17500	20000	15500	17000
	130.42	1500	1530	2550	35	1.9	14800	14800	15700	17100	17500	20000	15500	17000
	142.27	1500	1530	2550	32	1.6	15400	15400	15700	17100	17500	20000	15500	17000
	166.47	1500	1530	2550	27	1.3	16700	16700	15700	17100	17500	20000	15500	17000
	188.40	1500	1530	2550	24	0.91	17700	17700	15700	17100	17500	20000	15500	17000
	198.31	1500	1530	2550	23	0.82	18100	18100	15700	17100	17500	20000	15500	17000
	225.79	1500	1530	2550	20	0.67	19300	19300	15700	17100	17500	20000	15500	17000
	262.93	1500	1530	2550	17	0.54	20000	20000	15700	17100	17500	20000	15500	17000
	281.71	1500	1530	2550	16	0.47	20000	20000	15700	17100	17500	20000	15500	17000

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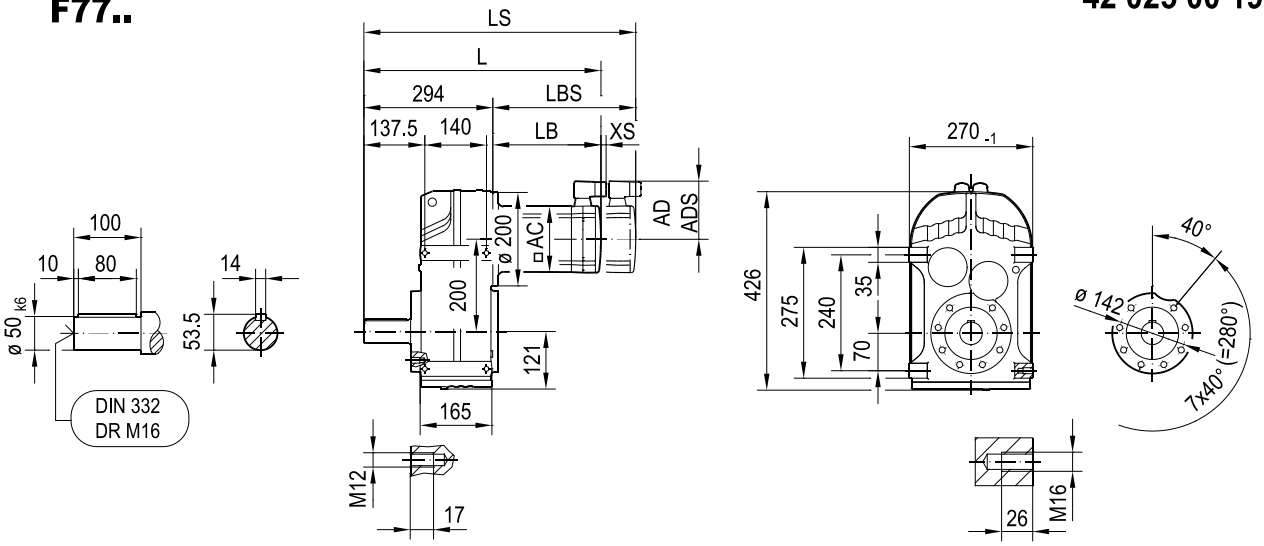
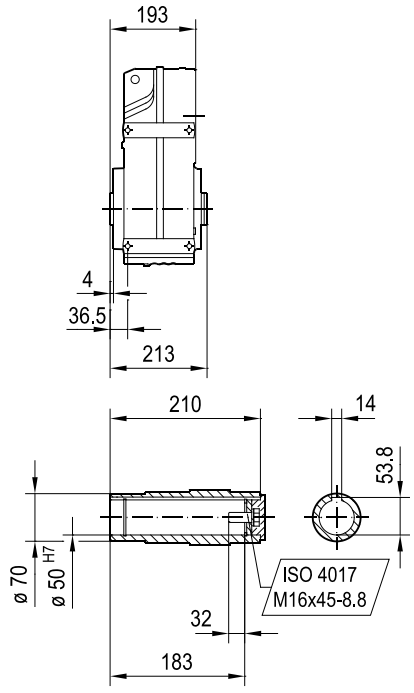
F77..

42 025 00 19



FA77B..



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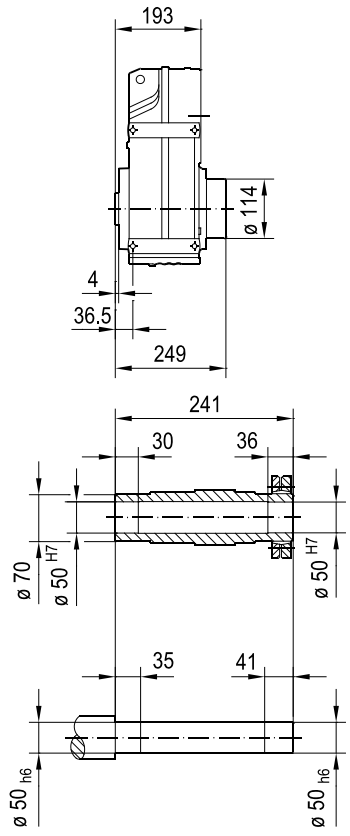

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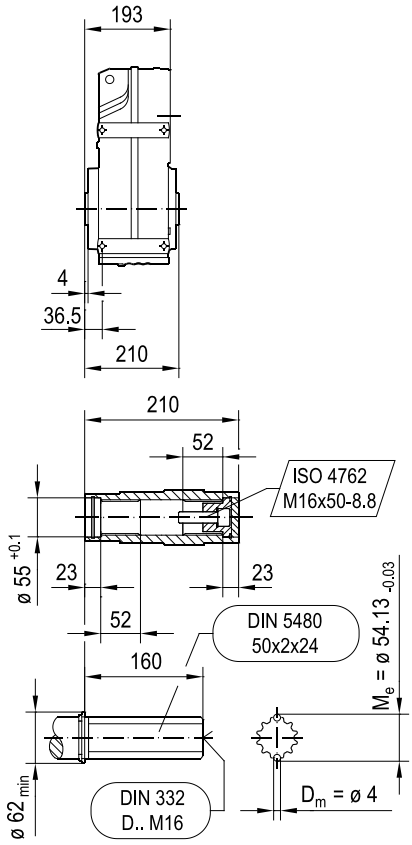

(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	467	489	534	499	525	578	525	553	610
LS	533	555	600	567	593	646	599	627	684
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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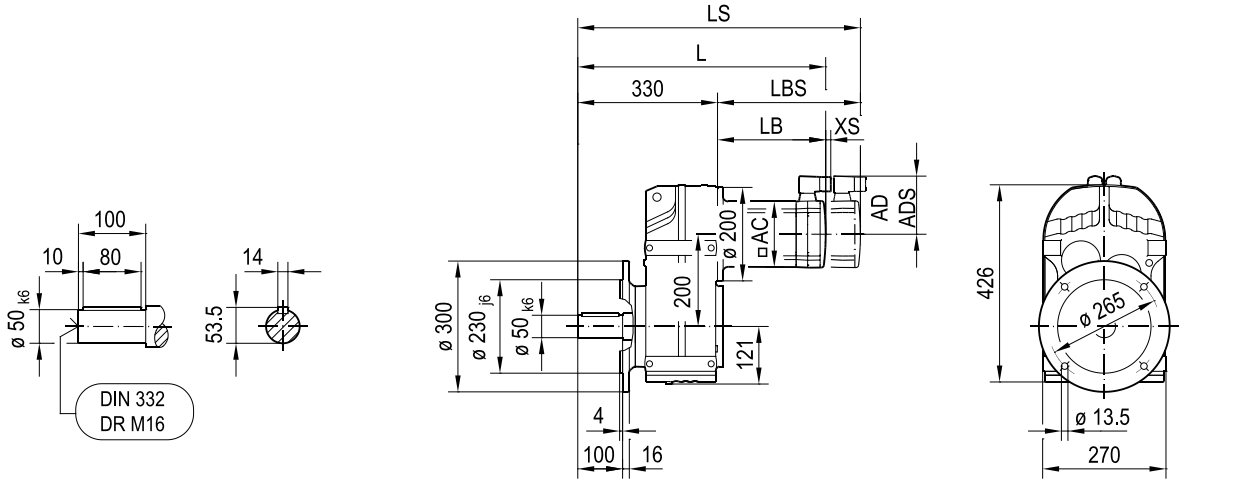
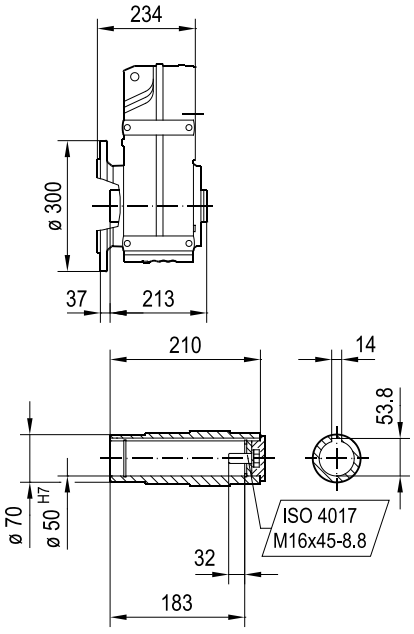
FF77..

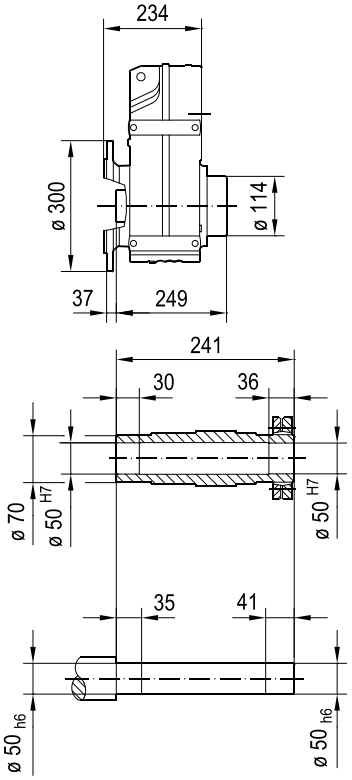
42 026 00 19



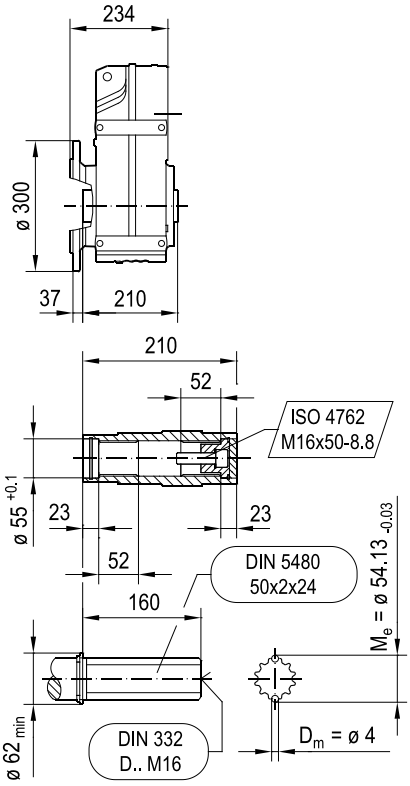
FAF77..



FHF77..



FVF77..



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	503	525	570	535	561	614	561	589	646
LS	569	591	636	603	629	682	635	663	720
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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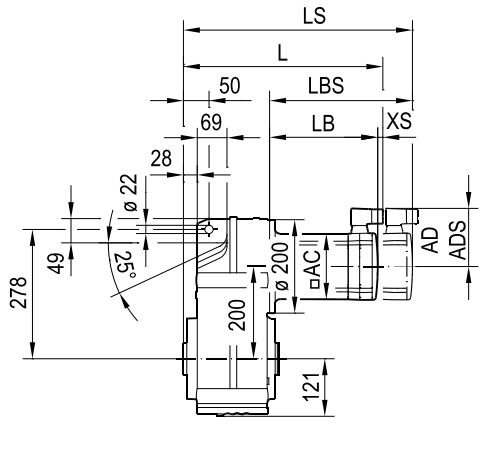
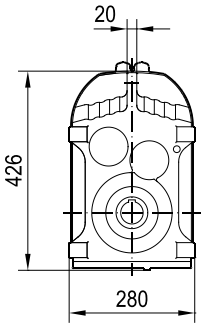
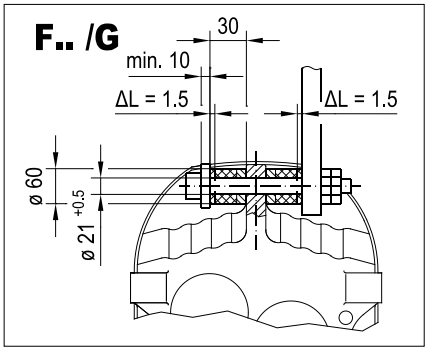
FA77..

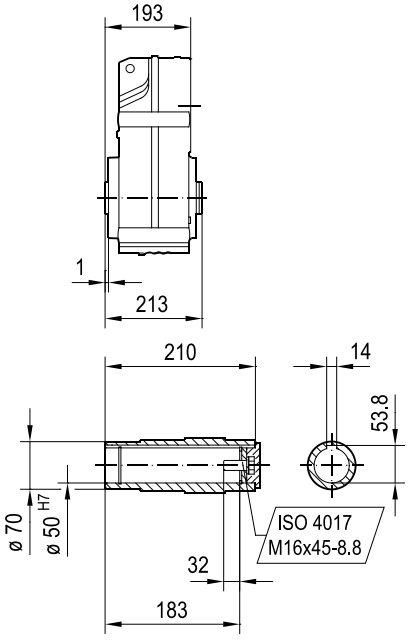
42 027 00 19







FA77..



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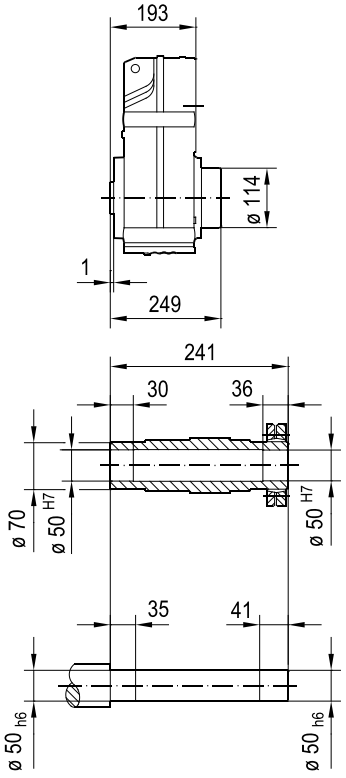
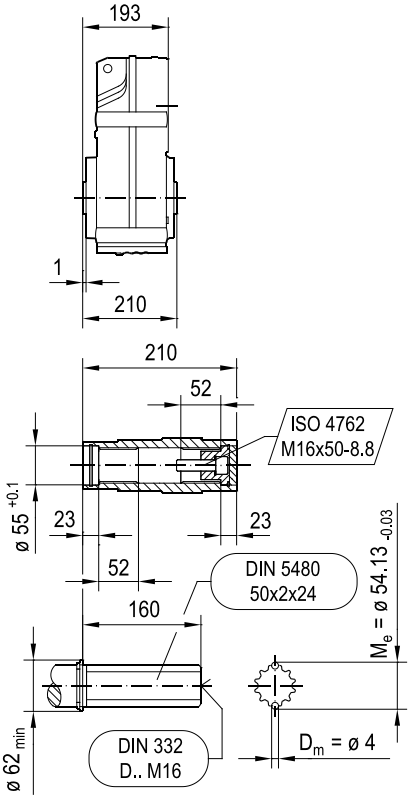


FV77..



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	366	388	433	398	424	477	424	452	509
LS	432	454	499	466	492	545	498	526	583
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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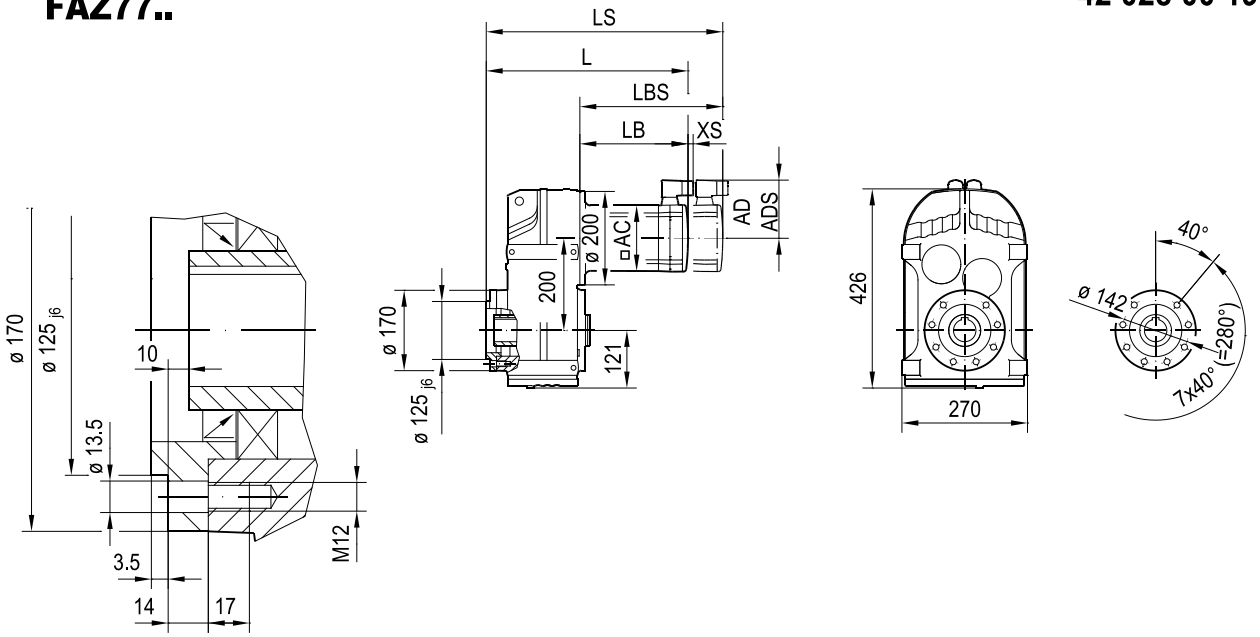
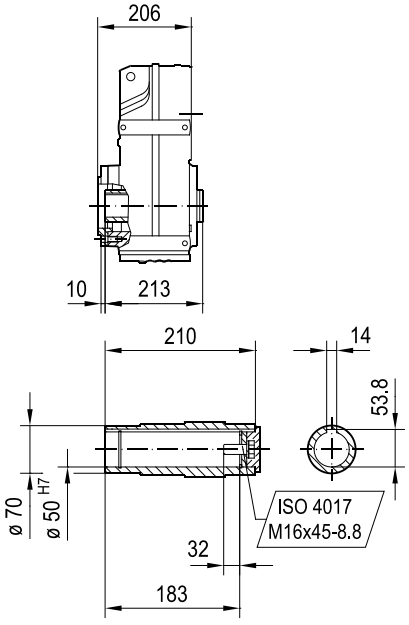
FAZ77..

42 028 00 19



FAZ77..



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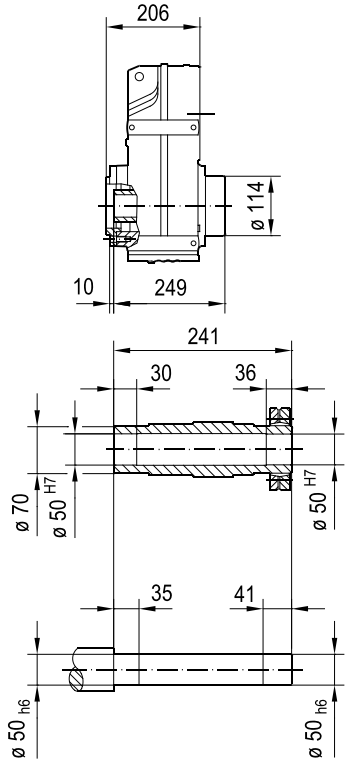
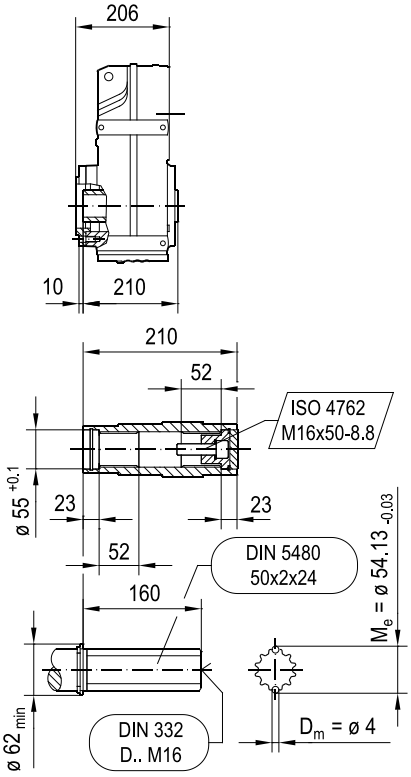


FVZ77..



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	379	401	446	411	437	490	437	465	522
LS	445	467	512	479	505	558	511	539	596
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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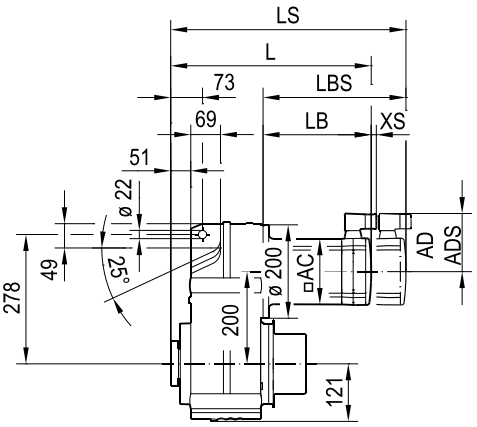
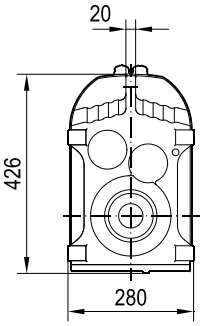
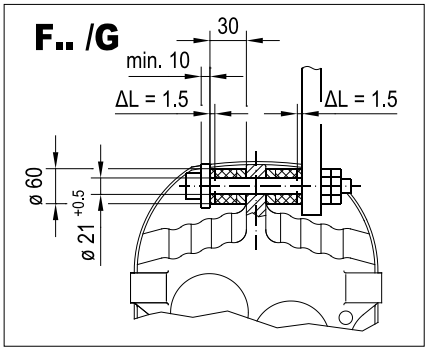
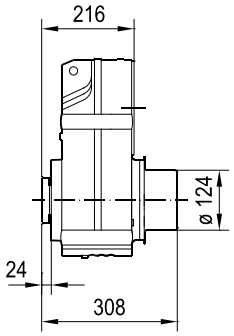
FT77..

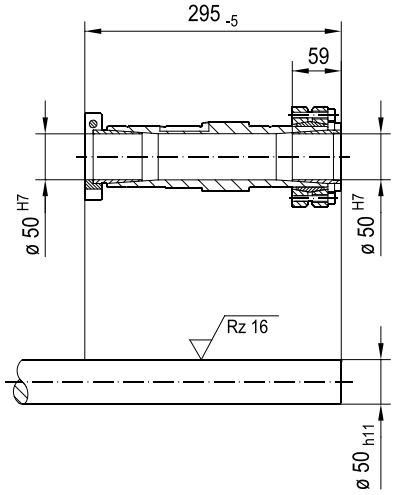
42 029 00 19

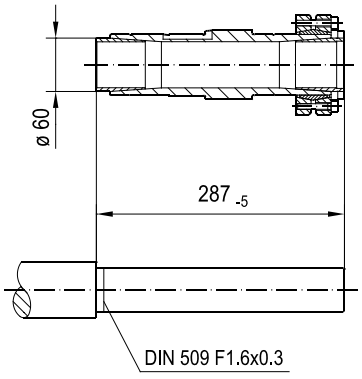












(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	389	411	456	421	447	500	447	475	532
LS	455	477	522	489	515	568	521	549	606
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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9.2.7 F87..

F87, M_{aDyn} Nm									3000 Nm
	CM3C								
i	71S	71M	71L	80S	80M	80L	100S	100M	100L
2									
4.12						270	225	320	475
4.92						325	270	380	570
5.63		155	225	172	255	370	310	435	655
6.65		183	270	200	300	440	365	515	770
7.35	139	200	295	220	330	485	405	570	850
8.29	156	225	335	250	375	550	455	645	960
9.58						635	525	745	1110
11.46						760	630	890	1330
13.12		360	530	400	595	870	725	1020	1520
15.48		425	630	470	700	1020	850	1200	1800
17.12	320	470	695	520	775	1130	940	1330	1990
19.31	365	530	785	590	870	1280	1060	1500	2240
21.32	400	585	860	650	960	1410	1170	1660	2480
23.68	445	650	960	720	1070	1570	1300	1840	2750
26.50	500	730	1070	800	1200	1750	1460	2060	3080
28.78	540	795	1170	870	1300	1900	1590	2240	
33.92	640	930	1380	1030	1530	2250	1870	2640	
3									
29.20		795	1170	880	1310	1910	1590	2250	>3090
35.19		960	1410	1060	1580	2310	1920	2710	>3090
39.30	735	1070	1580	1180	1760	2580	2150	3030	>3090
45.28	840	1230	1820	1360	2030	2970	2470	>3090	>3090
50.36	940	1370	2030	1520	2260	>3090	2750	>3090	>3090
56.75		1530	2260	1690	2520	>3090	3070	>3090	>3090
68.40		1850	2720	2040	3040	>3090	>3090	>3090	>3090
76.39	1410	2060	3040	2280	>3090	>3090	>3090	>3090	>3090
88.01	1630	2380	>3090	2630	>3090	>3090	>3090	>3090	>3090
97.89	1810	2650	>3090	2920	>3090	>3090	>3090	>3090	>3090
109.49	2020	2960	>3090	>3090	>3090	>3090	>3090	>3090	>3090
123.29	2280	>3090	>3090	>3090	>3090	>3090	>3090	>3090	>3090
134.16	2480	>3090	>3090	>3090	>3090	>3090	>3090	>3090	
159.61	2950	>3090	>3090	>3090	>3090	>3090	>3090	>3090	
179.97	>3090	>3090	>3090	>3090	>3090				
197.20	>3090	>3090	>3090	>3090	>3090				
228.93	>3090	>3090		>3090					
255.37	>3090								
270.68	>3090								

	(→ 183)

FA87, m kg									
	CM3C								
s	71S	71M	71L	80S	80M	80L	100S	100M	100L
2	92	94	97	97	99	105	105	105	115
3	95	97	100	99	100	105	105	110	115
FAF: + 13 kg / F: + 5.7 kg / FF: + 21 kg									

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CM3C..				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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
FA87 2	4.12	1460	1940	2480	357	114	3020	3020	5980	11800	30000	30000	26400	23400
	4.92	1530	1960	2600	364	85	3310	3310	6430	12600	30000	30000	26300	23400
	5.63	1530	1960	2600	400	67	3850	3850	7020	13400	30000	30000	26300	23400
	6.65	1530	1970	2600	463	52	4550	4550	7790	14400	30000	30000	26300	23400
	7.35	1530	1970	2600	497	44	5000	5000	8280	15000	30000	30000	26300	23400
	8.29	1530	1980	2600	530	36	5550	5550	8890	15800	30000	30000	26200	23300
	9.58	2880	3090	4890	153	63	275	275	5050	11000	25700	30000	16000	16000
	11.46	3000	3090	5100	128	49	575	575	5580	11800	25700	30000	16000	16000
	13.12	3000	3090	5100	117	40	1300	1300	6370	13100	25700	30000	16000	16000
	15.48	3000	3090	5100	111	32	2220	2220	7390	14700	25700	30000	16000	16000
	17.12	3000	3090	5100	108	28	2810	2810	8040	15800	25700	30000	16000	16000
	19.31	3000	3090	5100	105	23	3540	3540	8840	17000	25700	30000	16000	16000
	21.32	3000	3090	5100	103	20	4160	4160	9520	18000	25700	30000	16000	16000
	23.68	3000	3090	5100	101	17	4850	4850	10300	19100	25700	30000	16000	16000
	26.50	3000	3090	5100	99	15	5610	5610	11100	19800	25700	30000	16000	16000
	28.78	2450	3090	4160	156	13	8940	8940	13900	22500	25700	30000	16000	16000
	33.92	2610	3090	4430	133	10	9340	9340	14600	22200	25700	30000	16000	16000
FA87 3	29.20	2510	3090	4260	50	25	8740	8740	13800	22400	25700	30000	16000	16000
	35.19	2610	3090	4430	42	19	9610	9610	14900	22200	25700	30000	16000	16000
	39.30	2720	3090	4620	37	16	9910	9910	15400	22000	25700	30000	16000	16000
	45.28	2820	3090	4790	33	13	10500	10500	16200	21700	25700	30000	16000	16000
	50.36	2940	3090	4990	29	11	10800	10800	16800	21500	25700	30000	16000	16000
	56.75	3000	3090	5100	32	20	11600	11600	17700	19800	25700	30000	16000	16000
	68.40	3000	3090	5100	32	16	13300	13300	19600	19800	25700	30000	16000	16000
	76.39	3000	3090	5100	32	14	14300	14300	19800	19800	25700	30000	16000	16000
	88.01	3000	3090	5100	32	11	15800	15800	19800	19800	25700	30000	16000	16000
	97.89	3000	3090	5100	32	9.9	16900	16900	19800	19800	25700	30000	16000	16000
	109.49	3000	3090	5100	32	8.3	18100	18100	19800	19800	25700	30000	16000	16000
	123.29	3000	3090	5100	32	7.0	19400	19400	19800	19800	25700	30000	16000	16000
	134.16	3000	3090	5100	32	6.3	20400	20400	19800	19800	25700	30000	16000	16000
	159.61	3000	3090	5100	28	4.9	22500	22500	19800	19800	25700	30000	16000	16000
	179.97	3000	3090	5100	25	4.0	24100	24100	19800	19800	25700	30000	16000	16000
	197.20	3000	3090	5100	23	3.5	25300	25300	19800	19800	25700	30000	16000	16000
	228.93	3000	3090	5100	20	2.8	27300	27300	19800	19800	25700	30000	16000	16000
	255.37	3000	3090	5100	18	1.8	28900	28900	19800	19800	25700	30000	16000	16000
	270.68	3000	3090	5100	17	1.6	29800	29800	19800	19800	25700	30000	16000	16000

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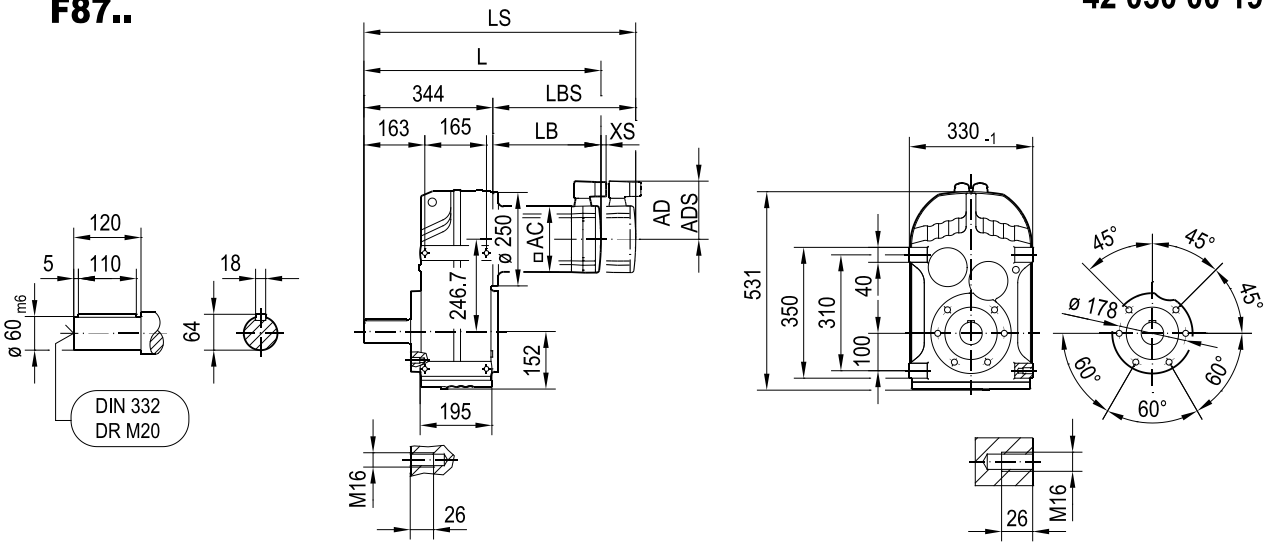
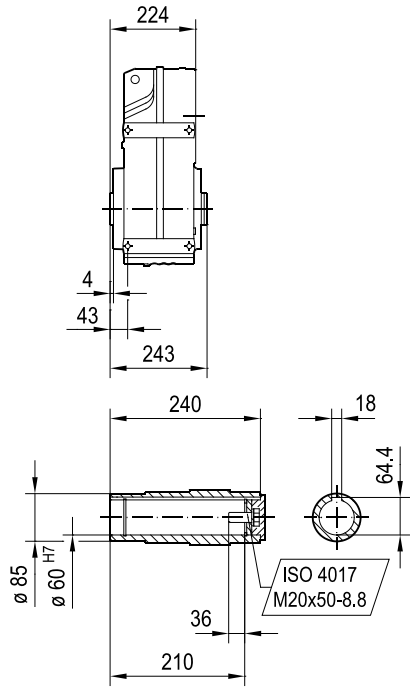
F87..

42 030 00 19

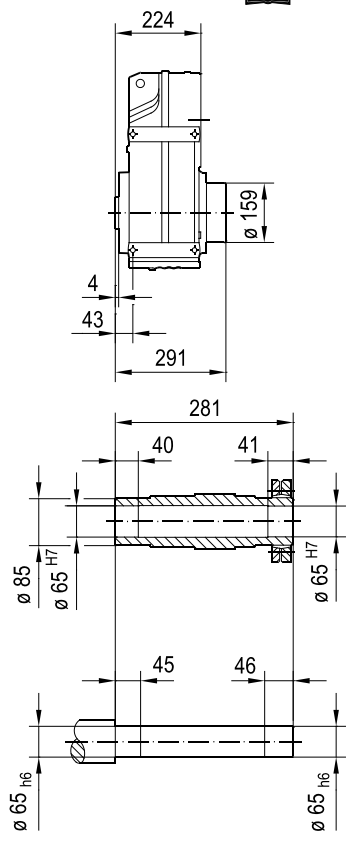


FA87B..



FH87B..

FH87B/R.. → 6.3



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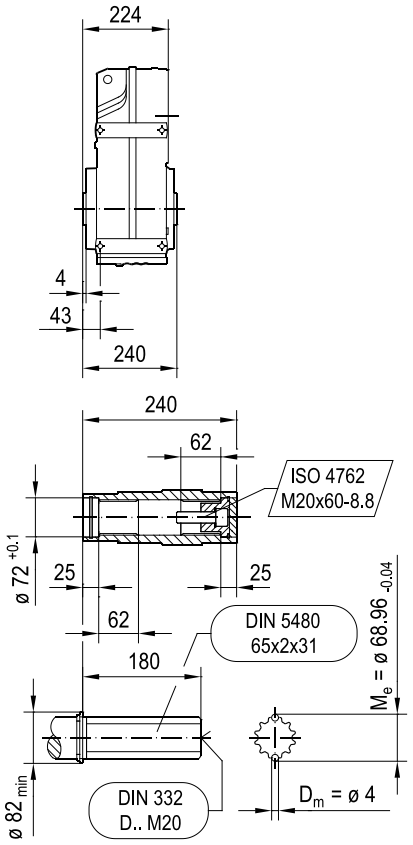

(→ 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	513	535	580	544	570	623	570	598	655
LS	579	601	646	612	638	691	644	672	729
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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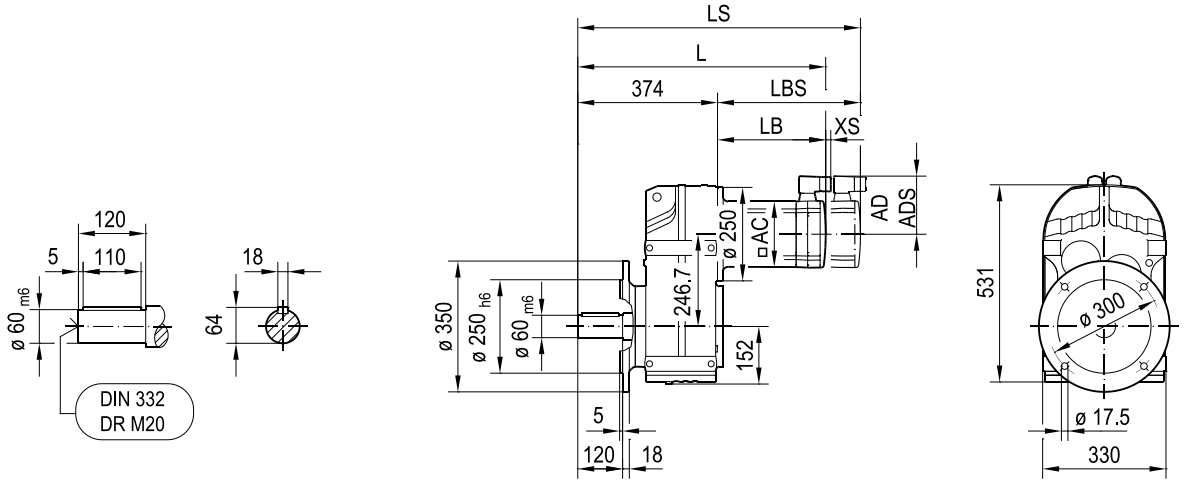
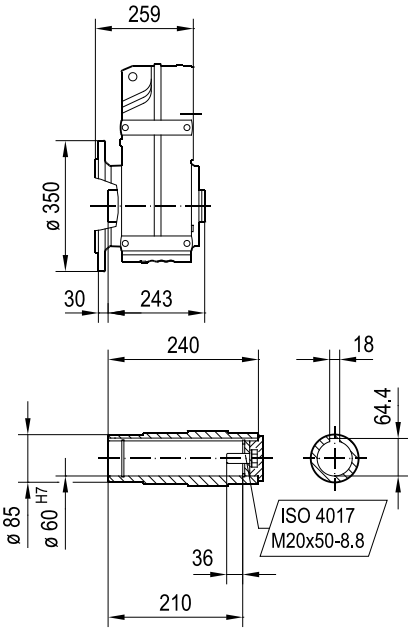
FF87..

42 031 00 19

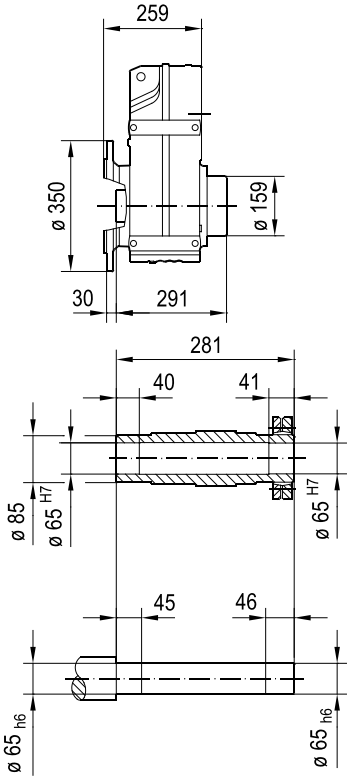


FAF87..

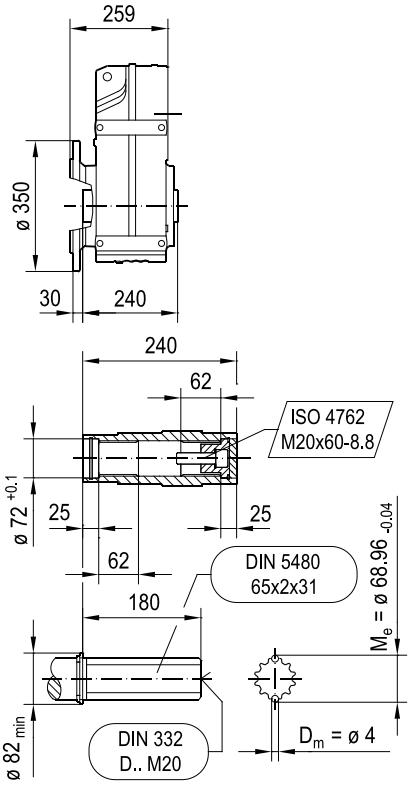


FHF87..

FHF87/R.. → 📖 6.3



FVF87..



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	543	565	610	574	600	653	600	628	685
LS	609	631	676	642	668	721	674	702	759
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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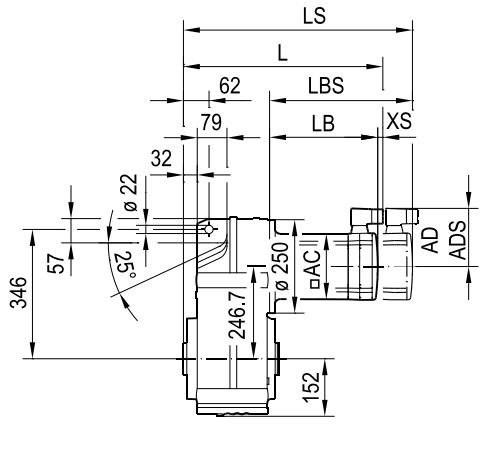
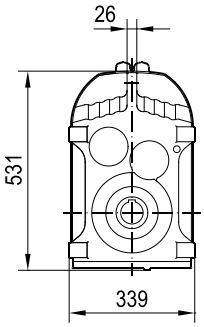
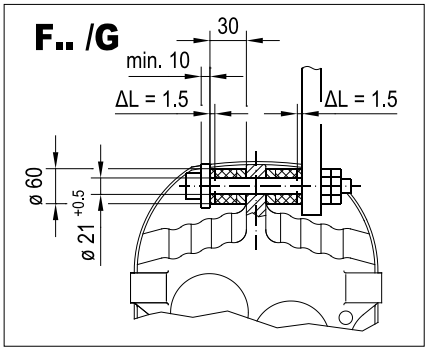
FA87..

42 032 00 19







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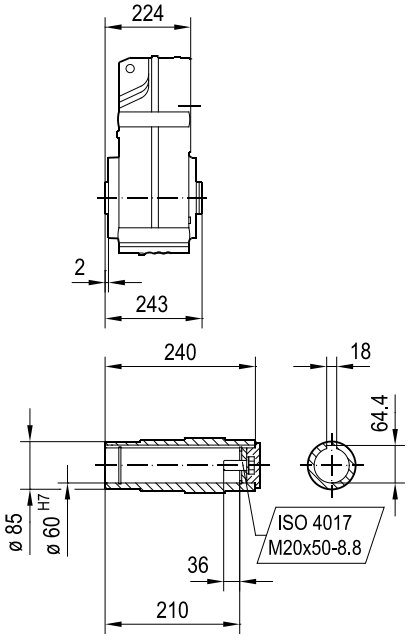
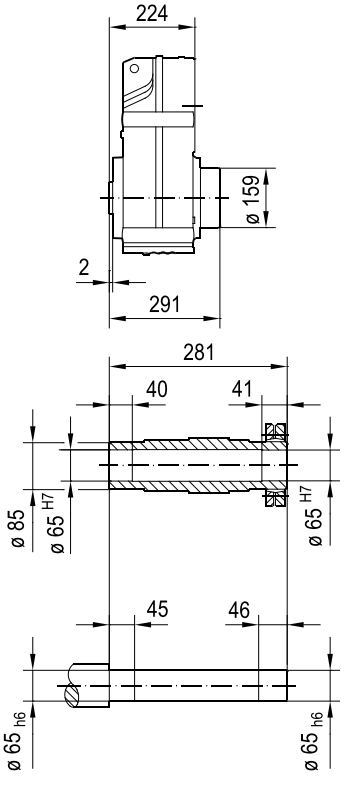
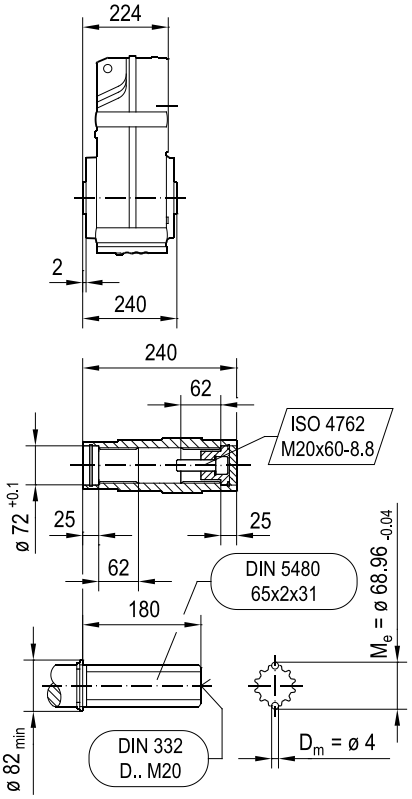


FH87..

FH87/R.. → 6.3



FV87..



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	393	415	460	424	450	503	450	478	535
LS	459	481	526	492	518	571	524	552	609
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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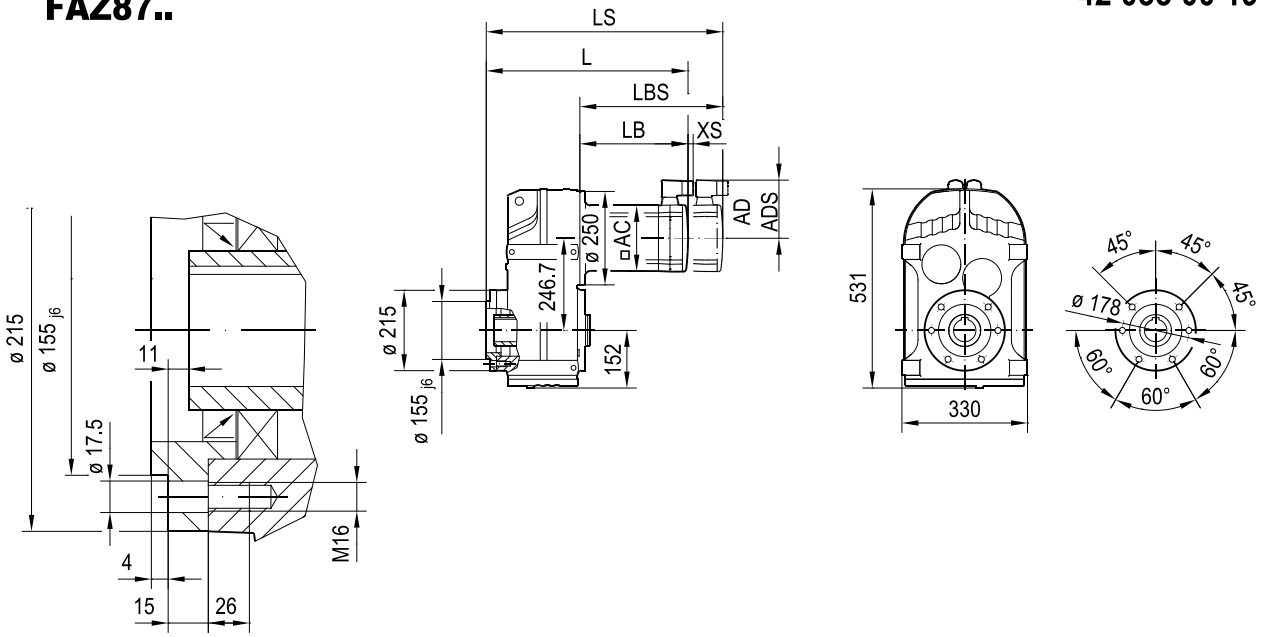
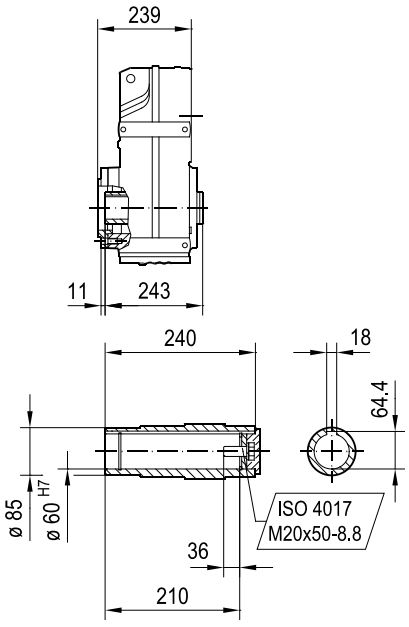
FAZ87..

42 033 00 19

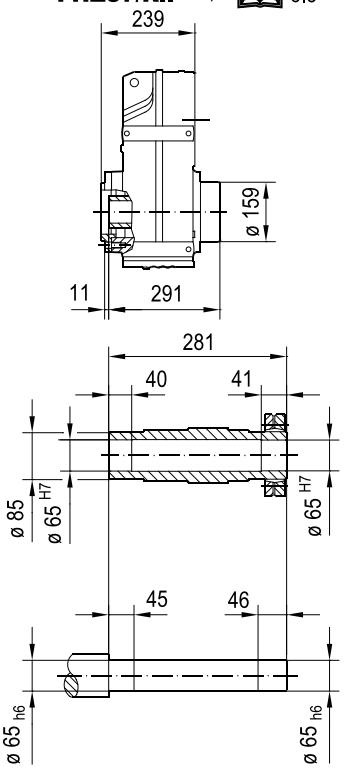


FAZ87..



FHZ87..

FHZ87/R.. → 6.3



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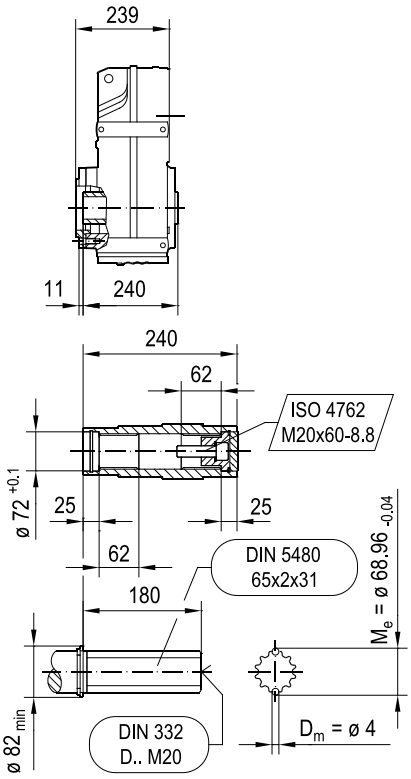

(→ 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	408	430	475	439	465	518	465	493	550
LS	474	496	541	507	533	586	539	567	624
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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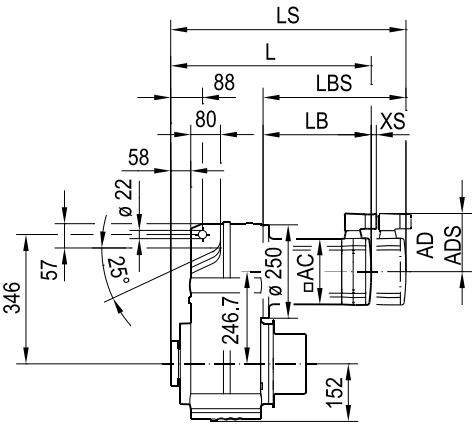
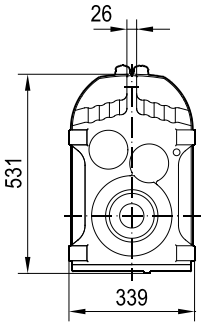
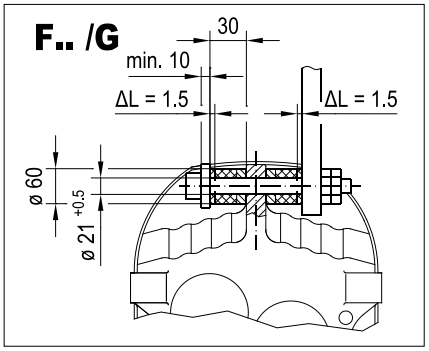
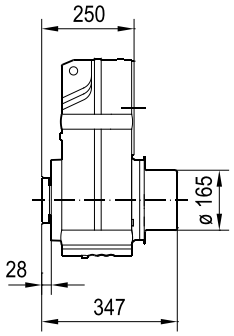
FT87..

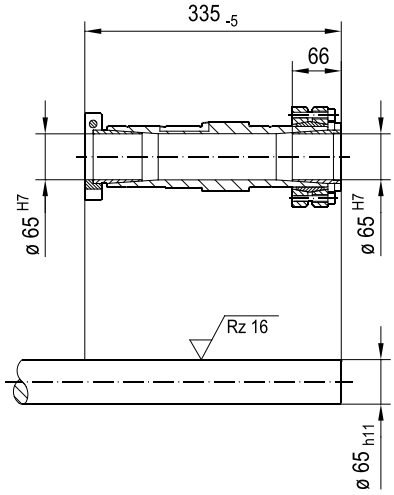
42 034 00 19

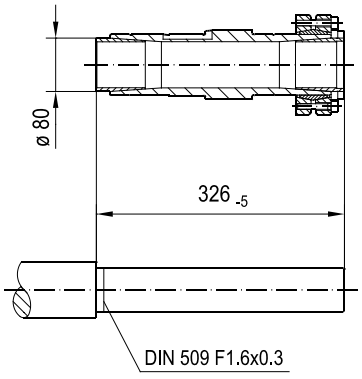












(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	419	441	486	450	476	529	476	504	561
LS	485	507	552	518	544	597	550	578	635
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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9.2.8 F97..

F97, M_{aDyn} Nm						4300 Nm
	CM3C					
i	80S	80M	80L	100S	100M	100L
			2			
3.87						450
4.57			300	250	355	530
5.23			345	285	405	605
6.17			405	340	480	715
7.07	215	320	465	390	550	820
8.22	250	370	545	450	640	950
9.06	275	410	600	500	705	1050
11.16			740	615	870	1290
12.77			840	705	990	1480
15.06			990	830	1170	1750
17.25	525	780	1140	950	1340	2000
20.07	610	910	1330	1100	1560	2330
22.11	675	1000	1460	1220	1720	2570
24.92	760	1130	1650	1370	1940	2900
27.44	830	1240	1820	1510	2130	3190
30.39	920	1370	2010	1680	2370	3530
33.91	1030	1530	2240	1870	2640	3940
36.64	1110	1660	2430	2020	2850	
43.28	1320	1960	2870	2390	3370	
			3			
32.50			2130	1770	2500	3740
38.86			2550	2120	2990	>4360
44.49	1340	1990	2920	2430	3430	>4360
52.49	1580	2350	3440	2870	4050	>4360
58.06	1750	2600	3810	3170	>4360	>4360
65.47	1970	2940	4290	3580	>4360	>4360
72.29	2180	3240	>4360	3950	>4360	>4360
75.63			>4360	4090	>4360	>4360
80.31	2400	3570	>4360	4340	>4360	>4360
86.59	2590	3840	>4360	>4360	>4360	>4360
89.85	2680	3990	>4360	>4360	>4360	>4360
97.58	2920	4330	>4360	>4360	>4360	
102.16	3050	>4360	>4360	>4360	>4360	>4360
112.99	3380	>4360	>4360	>4360	>4360	>4360
127.42	3810	>4360	>4360	>4360	>4360	>4360
140.71	4210	>4360	>4360	>4360	>4360	>4360
156.30	>4360	>4360	>4360	>4360	>4360	>4360
174.87	>4360	>4360	>4360	>4360	>4360	>4360
189.92	>4360	>4360	>4360	>4360	>4360	
223.88	>4360	>4360	>4360	>4360	>4360	
253.41	>4360	>4360				
276.77	>4360	>4360				

(→ 183)

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FA97, m kg						
	CM3C					
s	80S	80M	80L	100S	100M	100L
2	155	160	165	165	165	175
3	165	165	170	170	175	180
FAF: + 22 kg / F: + 7.5 kg / FF: + 40 kg						

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CM3C..				c_{TG}				φ
		n_{epk}	η	FA	FAF	F	FF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
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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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
FA97 2	3.87	1800	2700	3060	470	266	10300	10300	9960	16500	40000	40000	33600	30600
	4.57	2050	3000	3480	346	193	10200	10200	9950	16800	40000	40000	32900	30300
	5.23	2150	3020	3650	333	153	10700	10700	10400	17400	40000	40000	32800	30300
	6.17	2250	3030	3820	326	116	11400	11400	11100	18300	40000	40000	32800	30200
	7.07	2360	3040	4010	304	92	11900	11900	11500	19000	40000	40000	32800	30200
	8.22	2360	3050	4010	336	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	150	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	157	67	11700	11700	11900	21100	40000	40000	29700	28200
	17.25	4300	4360	7310	161	55	13100	13100	13200	22500	40000	40000	29700	28200
	20.07	4300	4360	7310	154	45	14700	14700	14600	24100	40000	40000	29700	28200
	22.11	4300	4360	7310	151	39	15700	15700	15600	25200	40000	40000	29700	28200
	24.92	4300	4360	7310	147	33	17100	17100	16800	26600	40000	40000	29700	28200
	27.44	4300	4360	7310	145	28	18200	18200	17900	27800	40000	40000	29700	28200
	30.39	4300	4360	7310	142	22	19500	19500	19000	28300	40000	40000	29700	28200
	33.91	4300	4360	7310	133	19	20900	20900	20300	28300	40000	40000	29700	28200
	36.64	3070	4360	5210	123	17	27000	27000	25500	30200	40000	40000	29700	28200
	43.28	3070	4360	5210	104	13	29300	29300	27600	30200	40000	40000	29700	28200
FA97 3	32.50	4300	4360	7310	53	60	20300	20300	19800	28300	40000	40000	29700	28200
	38.86	4300	4360	7310	53	48	22700	22700	21900	28300	40000	40000	29700	28200
	44.49	4300	4360	7310	53	39	24500	24500	23600	28300	40000	40000	29700	28200
	52.49	4300	4360	7310	53	31	26900	26900	25800	28300	40000	40000	29700	28200
	58.06	4300	4360	7310	53	27	28500	28500	27200	28300	40000	40000	29700	28200
	65.47	4300	4360	7310	53	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	53	17	33800	33800	29900	28300	40000	40000	29700	28200
	86.59	4300	4360	7310	52	34	35100	35100	29900	28300	40000	40000	29700	28200
	89.85	4300	4360	7310	50	14	35700	35700	29900	28300	40000	40000	29700	28200
	97.58	4300	4360	7310	46	13	37200	37200	29900	28300	40000	40000	29700	28200
	102.16	4300	4360	7310	44	28	38100	38100	29900	28300	40000	40000	29700	28200
	112.99	4300	4360	7310	40	25	40000	40000	29900	28300	40000	40000	29700	28200
	127.42	4300	4360	7310	35	20	40000	40000	29900	28300	40000	40000	29700	28200
	140.71	4300	4360	7310	32	18	40000	40000	29900	28300	40000	40000	29700	28200
	156.30	4300	4360	7310	29	15	40000	40000	29900	28300	40000	40000	29700	28200
	174.87	4300	4360	7310	26	13	40000	40000	29900	28300	40000	40000	29700	28200
	189.92	4300	4360	7310	24	12	40000	40000	29900	28300	40000	40000	29700	28200
	223.88	4300	4360	7310	20	9.2	40000	40000	29900	28300	40000	40000	29700	28200
	253.41	4300	4360	7310	18	5.9	40000	40000	29900	28300	40000	40000	29700	28200
	276.77	4300	4360	7310	16	5.1	40000	40000	29900	28300	40000	40000	29700	28200

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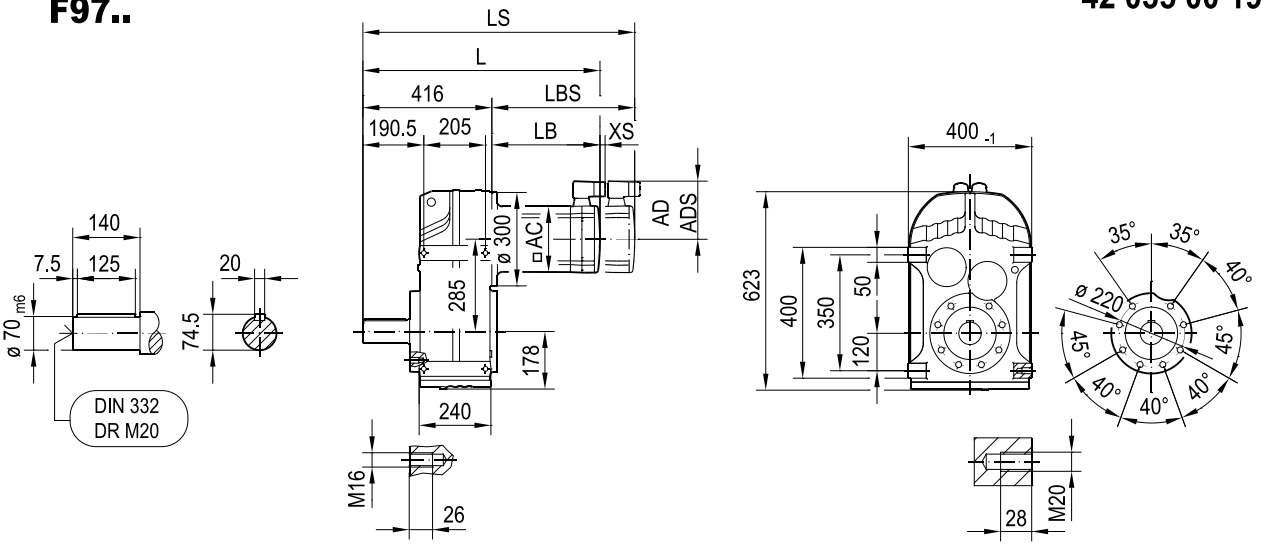
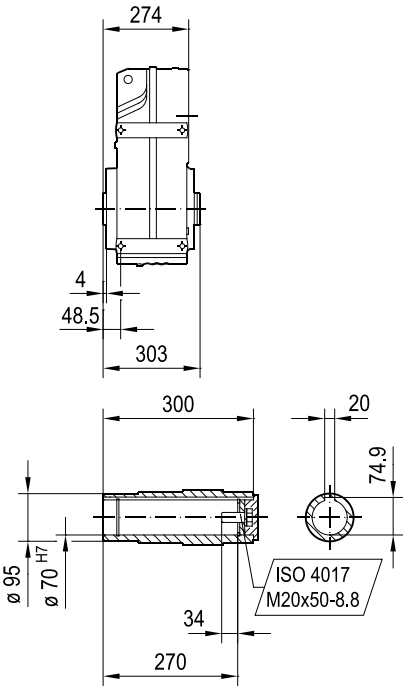
F97..

42 035 00 19

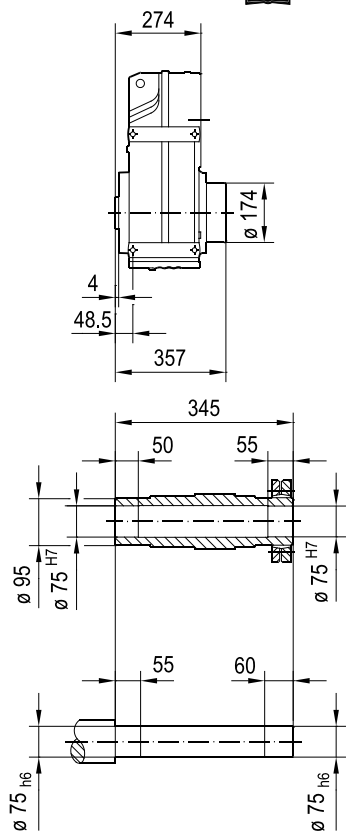


FA97B..

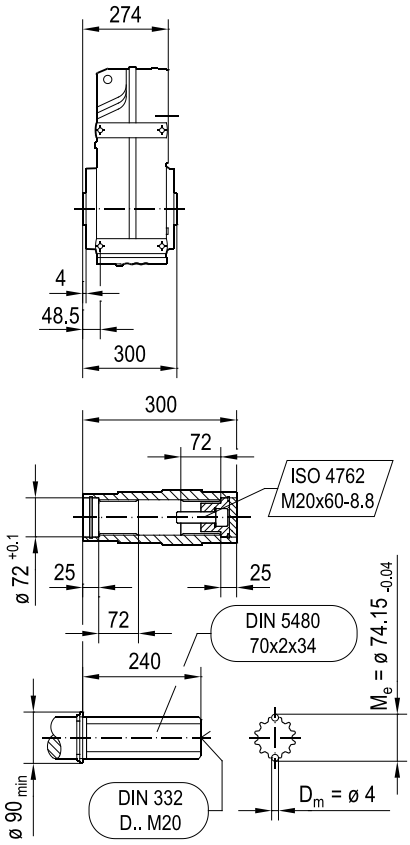


FH97B..

FH97B/R.. → 6.3



FV97B..



(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	611	637	690	637	665	722		
LS	679	705	758	711	739	796		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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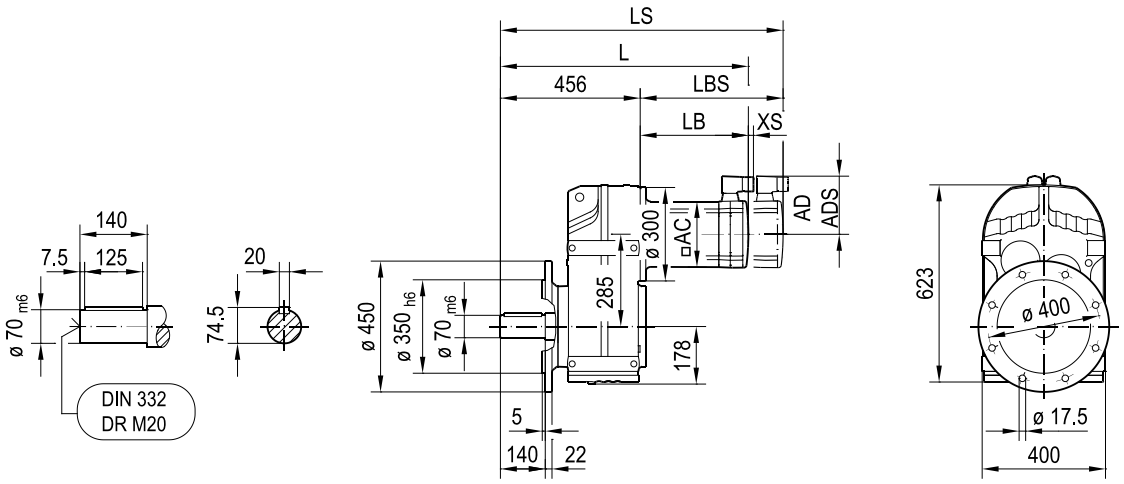
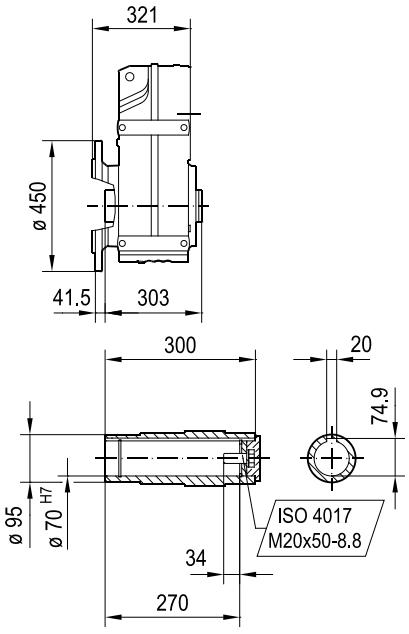
FF97..

42 036 00 19

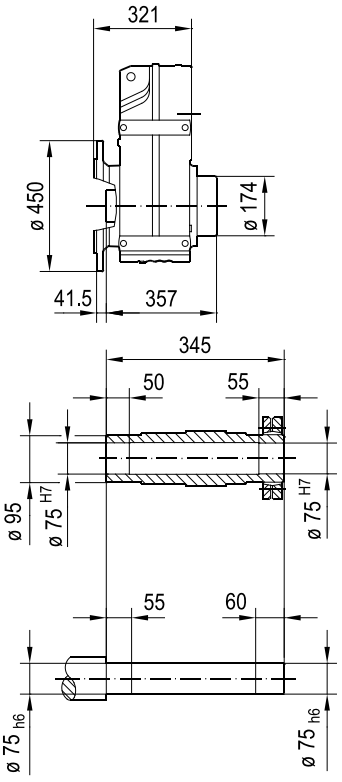


FAF97..

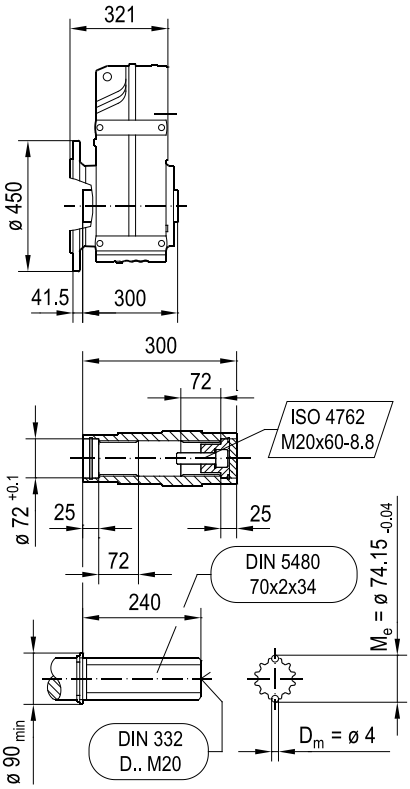


FHF97..

FHF97/R.. → 📖 6.3



FVF97..



(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	651	677	730	677	705	762		
LS	719	745	798	751	779	836		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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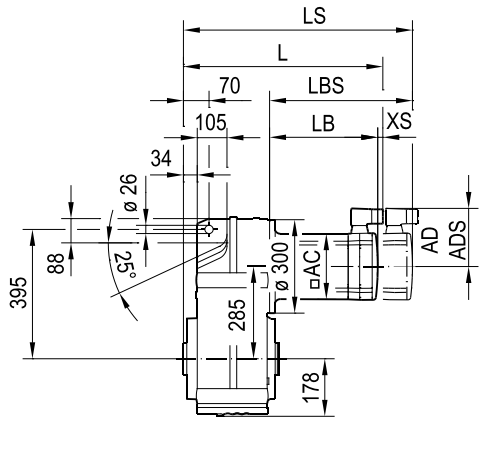
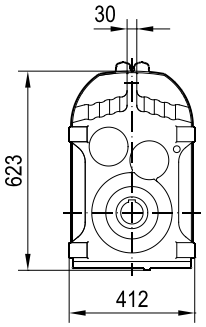
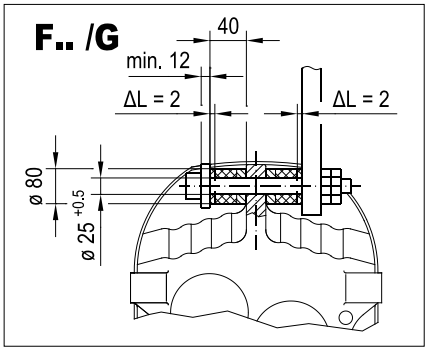
FA97..

42 037 00 19







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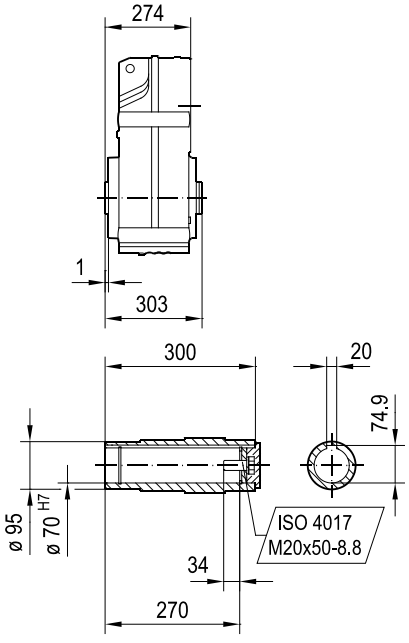
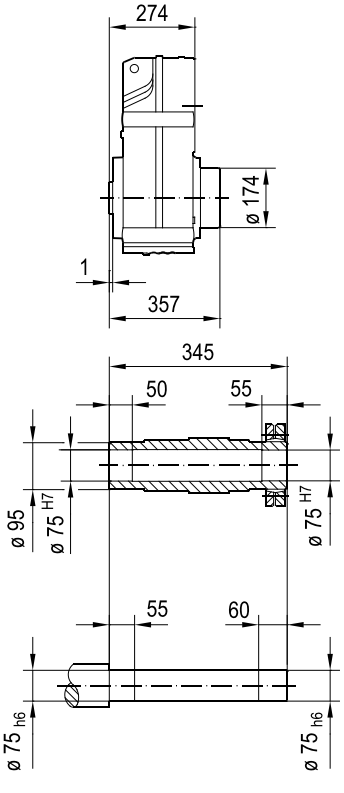


FH97..

FH97/R.. → 6.3



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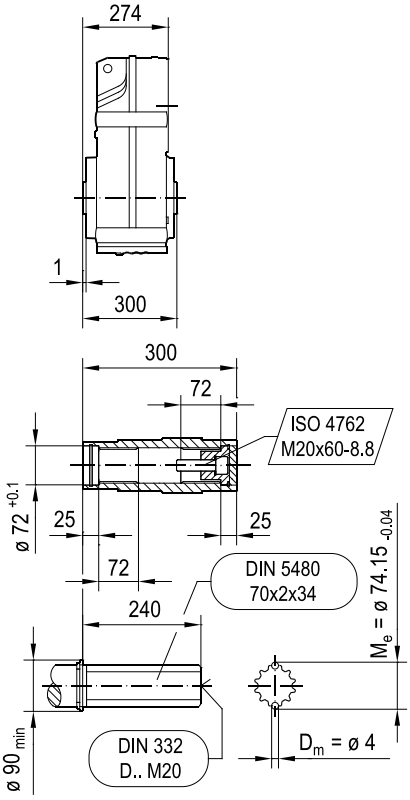

(→ 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	469	495	548	495	523	580		
LS	537	563	616	569	597	654		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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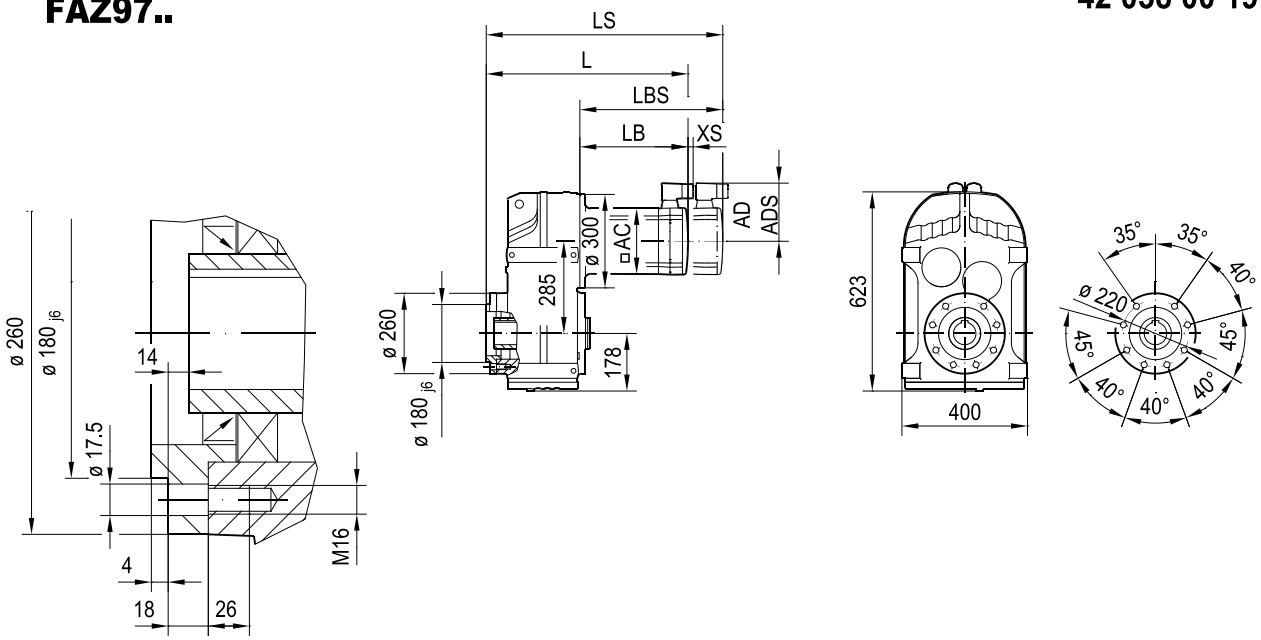
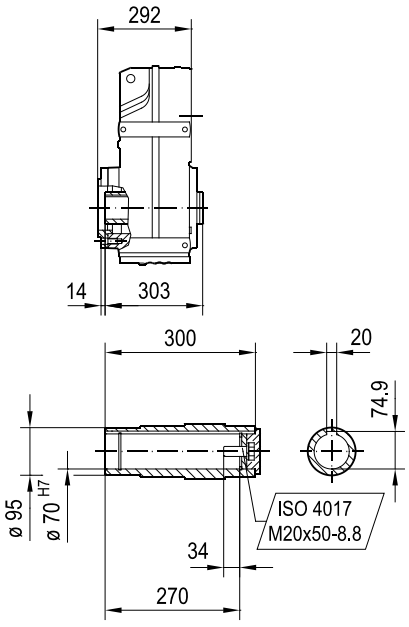
FAZ97..

42 038 00 19

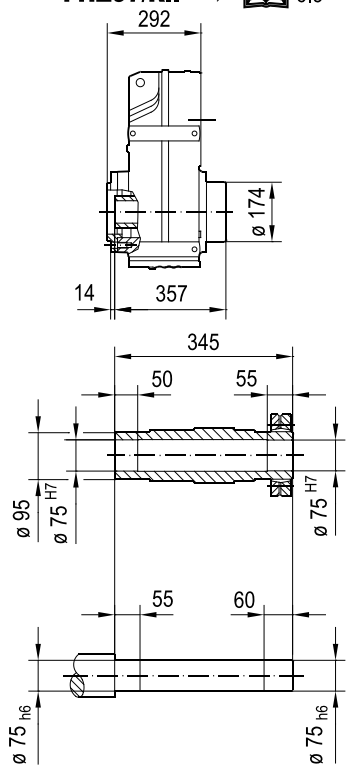


FAZ97..

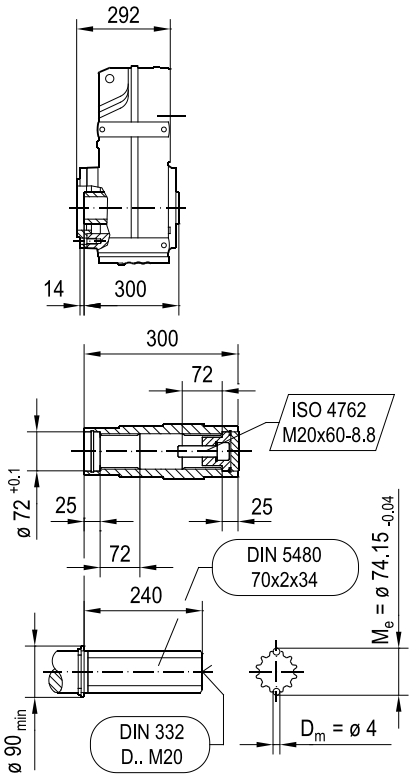


FHZ97..

FHZ97/R.. → 6.3



FVZ97..



(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	487	513	566	513	541	598		
LS	555	581	634	587	615	672		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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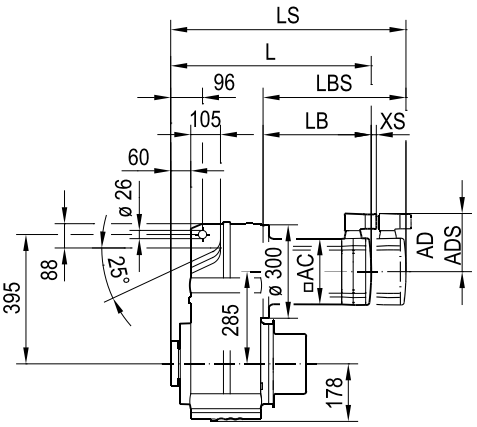
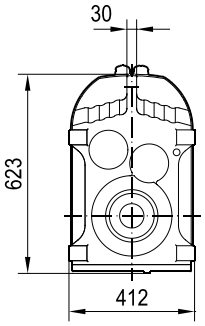
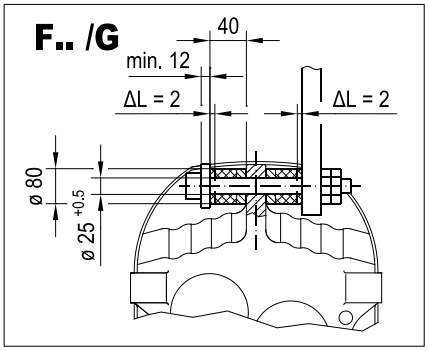
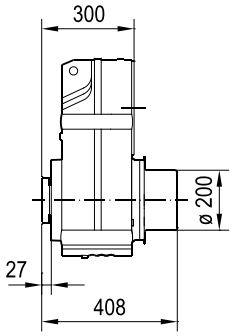
FT97..

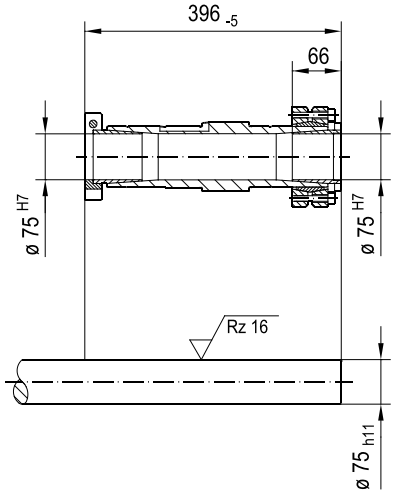
42 039 00 19

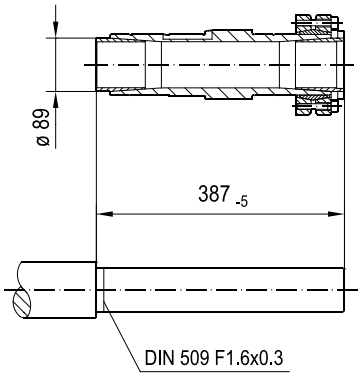












(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	495	521	574	521	549	606		
LS	563	589	642	595	623	680		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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9.2.9 F107..

F107, M_{aDyn} Nm			7840 Nm
	CM3C		
i	100S	100M	100L
		2	
5.03			
6.22			720
7.40	405	575	860
8.37	460	650	970
9.69	535	755	1120
9.96			
12.33			1430
14.67	810	1140	1700
16.58	910	1290	1920
19.20	1060	1490	2230
21.76	1200	1690	2530
25.14	1380	1960	2920
27.57	1520	2150	3200
33.79	1860	2630	3930
		3	
31.80			3620
37.61	2030	2870	4280
43.03	2330	3280	4900
50.73	2740	3870	5780
58.12	3180	4480	6690
67.62	3700	5210	7780
74.52	4070	5750	8580
83.99	4590	6480	>8860
88.49	4790	6750	>8860
92.47	5050	7130	>8860
101.38	5480	7740	>8860
117.94	6380	>8860	>8860
129.97	7030	>8860	>8860
146.49	7930	>8860	>8860
161.28	8730	>8860	>8860
178.64	>8860	>8860	>8860
199.31	>8860	>8860	>8860
215.37	>8860	>8860	
254.40	>8860	>8860	

(→ 183)

FA107, m kg			
	CM3C		
s	100S	100M	100L
2	235	235	245
3	245	245	255
FAF: + 21 kg / F: + 17 kg / FF: + 44 kg			

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CM3C..				c_{TG}				φ
		n_{epk}	η	FA	FAF	F	FF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
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

CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	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
FA107 2	5.03[1)]	4600	6240	7820	392	439	4520	39000	16400	19200	65000	65000	52500	55300
	6.22	4600	6240	7820	394	311	6920	42600	19000	22200	65000	65000	52500	55300
	7.40	4600	6240	7820	393	236	8400	45800	21300	24800	65000	65000	52500	55300
	8.37	4800	6240	8160	351	195	8720	47400	22000	25600	65000	65000	52500	55300
	9.69	4910	6240	8340	331	154	9670	50000	23500	27300	65000	65000	52500	55300
	9.96[1)]	6500	8860	11000	173	280	6200	47000	21500	25300	64500	65000	46500	45600
	12.33	7000	8860	11900	137	209	6580	49800	22600	26600	64500	65000	46500	45600
	14.67	7680	8860	13000	102	164	6050	51500	22400	26500	64500	65000	46500	45600
	16.58	7840	8860	13300	95	138	6870	53800	23900	28200	64500	65000	46500	45600
	19.20	7840	8860	13300	95	112	8600	57400	26500	31200	64500	65000	46500	45600
	21.76	7840	8860	13300	93	92	10100	60600	28800	33800	64500	65000	46500	45600
	25.14	7840	8860	13300	91	76	12000	64500	31500	36800	64500	65000	46500	45600
	27.57	7840	8860	13300	90	66	13200	65000	33300	38800	64500	65000	46500	45600
	33.79	7400	8860	12500	106	43	17700	65000	38300	44900	64500	65000	46500	45600

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	FA	FAF	F	FF	FA	FAF	F	FF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
FA107 3	31.80	7680	8860	13000	70	125	15800	65000	36500	42700	64500	65000	46500	45600
	37.61	7680	8860	13000	75	94	18300	65000	39500	46300	64500	65000	46500	45600
	43.03	7680	8860	13000	79	77	20300	65000	42000	49000	64500	65000	46500	45600
	50.73	7680	8860	13000	85	62	23000	65000	45100	51100	64500	65000	46500	45600
	58.12	7680	8860	13000	77	51	25300	65000	47800	51100	64500	65000	46500	45600
	67.62	7680	8860	13000	67	42	28000	65000	49800	51100	64500	65000	46500	45600
	74.52	7680	8860	13000	60	37	29900	65000	49800	51100	64500	65000	46500	45600
	83.99	7680	8860	13000	54	31	32200	65000	49800	51100	64500	65000	46500	45600
	88.49	7680	8860	13000	49	56	33200	65000	49800	51100	64500	65000	46500	45600
	92.47	7680	8860	13000	49	27	34100	65000	49800	51100	64500	65000	46500	45600
	101.38	7680	8860	13000	44	47	36000	65000	49800	51100	64500	65000	46500	45600
	117.94	7680	8860	13000	38	39	39300	65000	49800	51100	64500	65000	46500	45600
	129.97	7680	8860	13000	35	34	41400	65000	49800	51100	64500	65000	46500	45600
	146.49	7680	8860	13000	31	29	44200	65000	49800	51100	64500	65000	46500	45600
	161.28	7680	8860	13000	28	25	46600	65000	49800	51100	64500	65000	46500	45600
	178.64	7680	8860	13000	25	19	49100	65000	49800	51100	64500	65000	46500	45600
	199.31	7680	8860	13000	23	16	52000	65000	49800	51100	64500	65000	46500	45600
	215.37	7680	8860	13000	21	15	54000	65000	49800	51100	64500	65000	46500	45600
	254.40	7680	8860	13000	18	12	58600	65000	49800	51100	64500	65000	46500	45600

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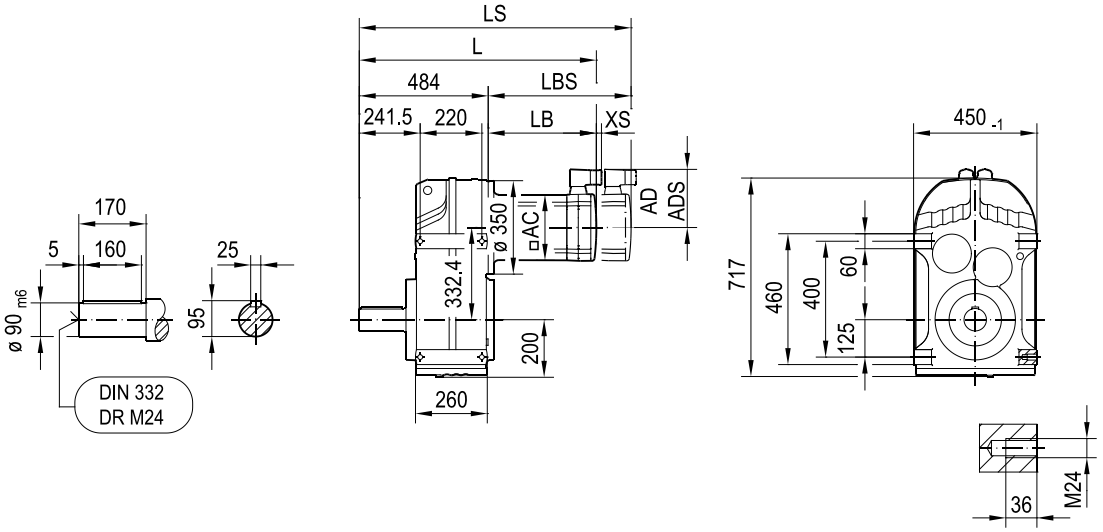
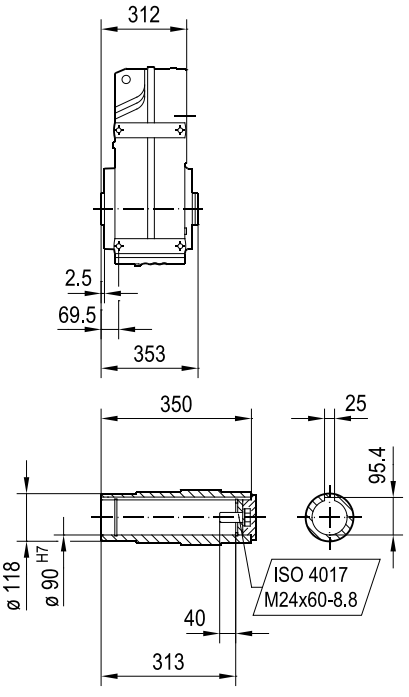
F107..

42 040 00 19



FA107B..



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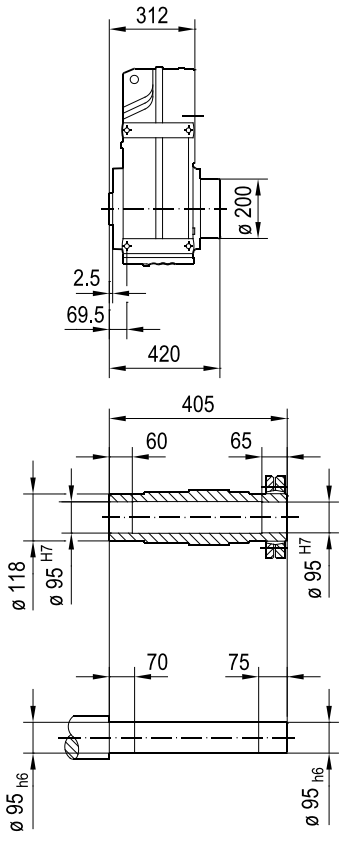

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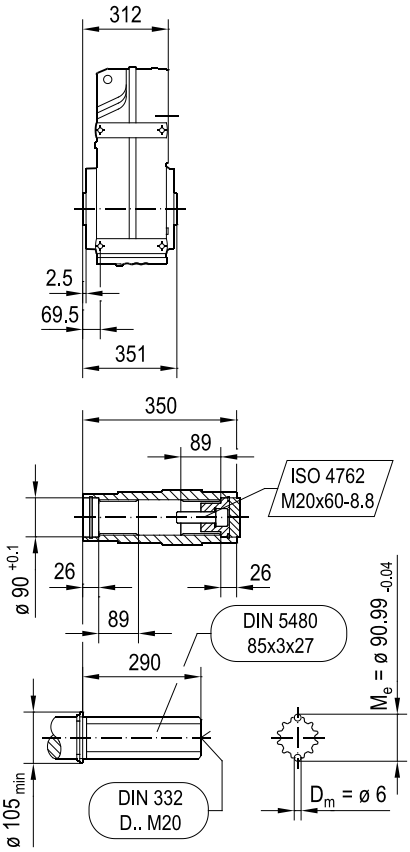

(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	699	727	784					
LS	773	801	858					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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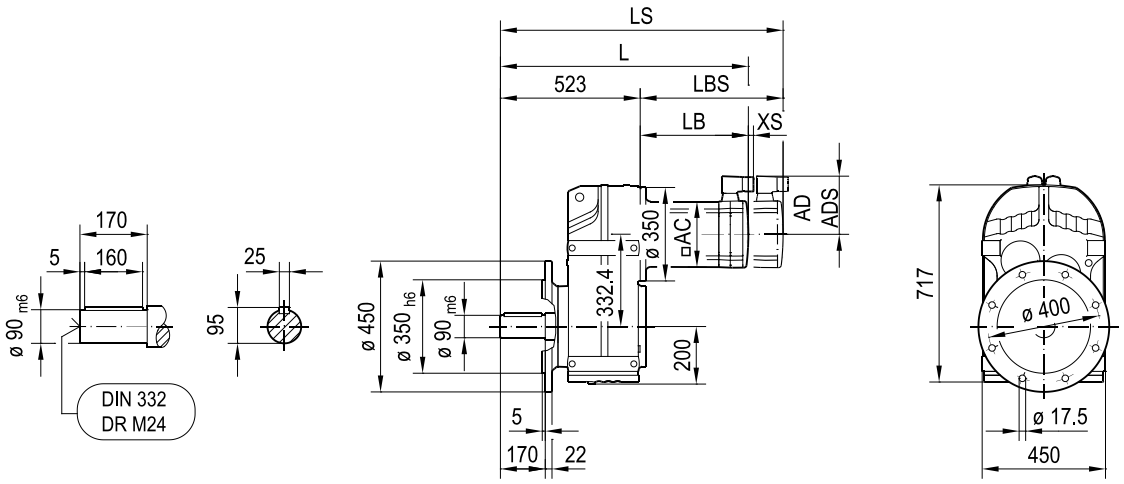
FF107..

42 041 00 19



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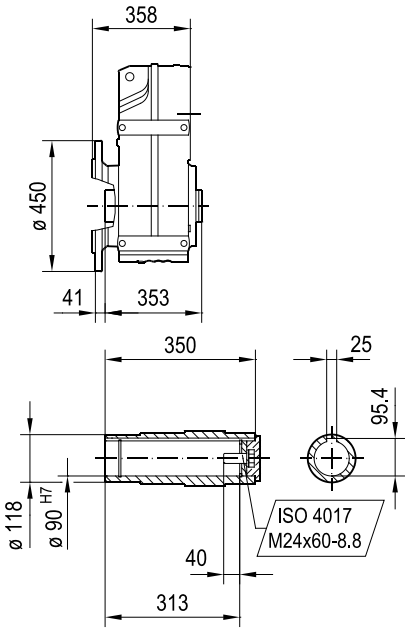
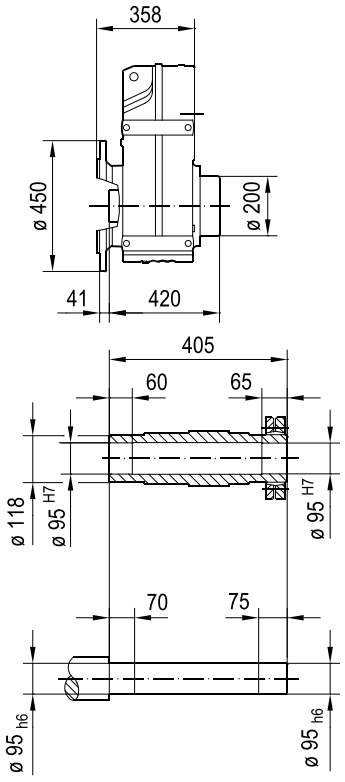


FHF107..



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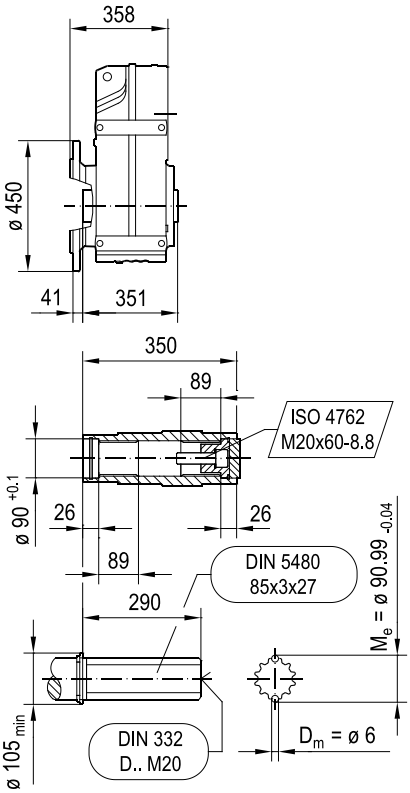

(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	738	766	823					
LS	812	840	897					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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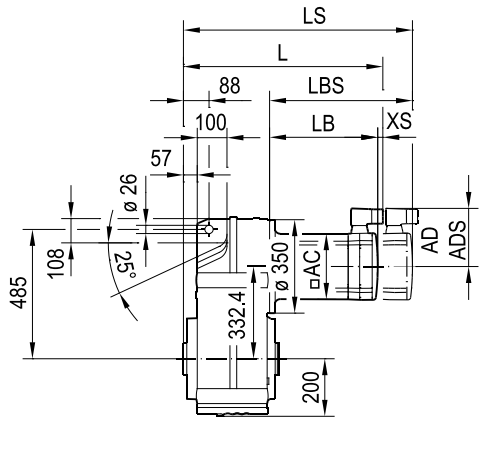
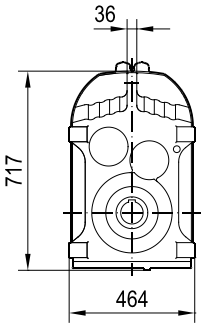
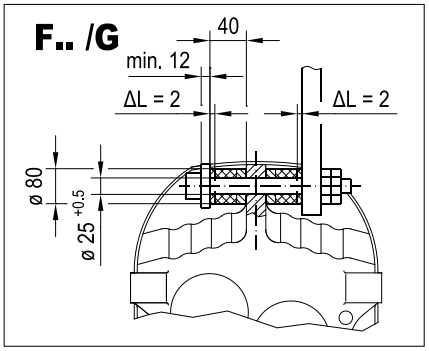
FA107..

42 042 00 19







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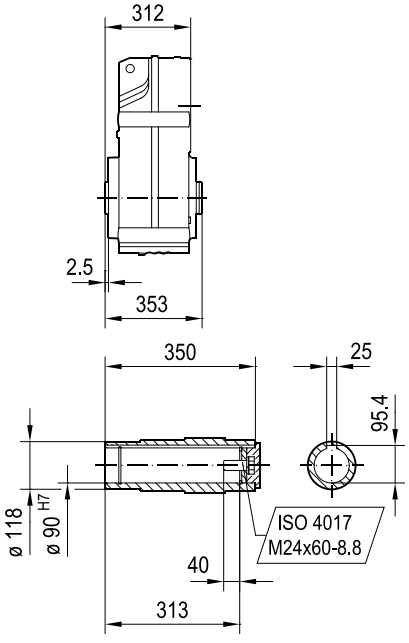

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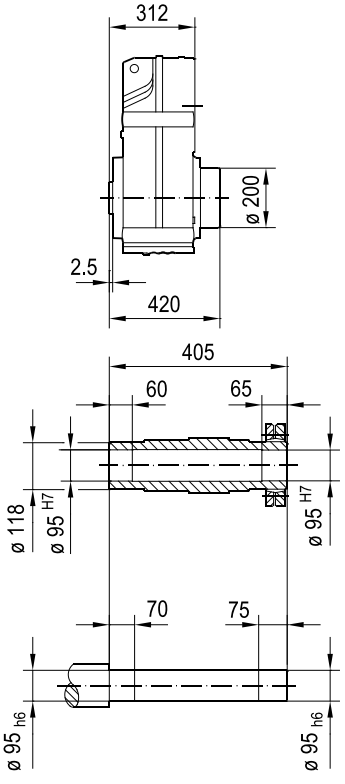

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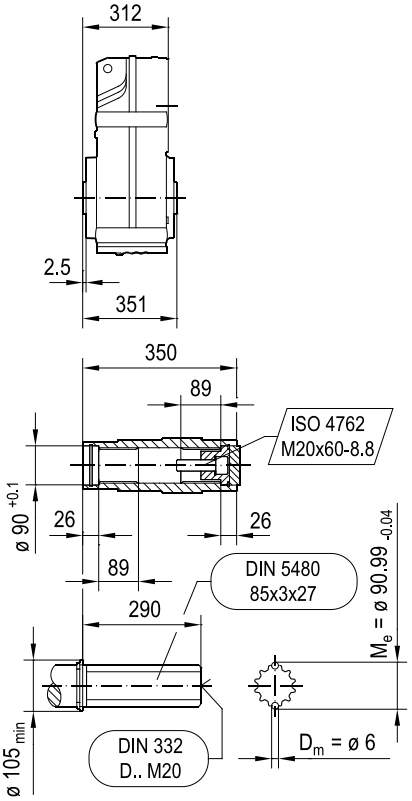

(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	527	555	612					
LS	601	629	686					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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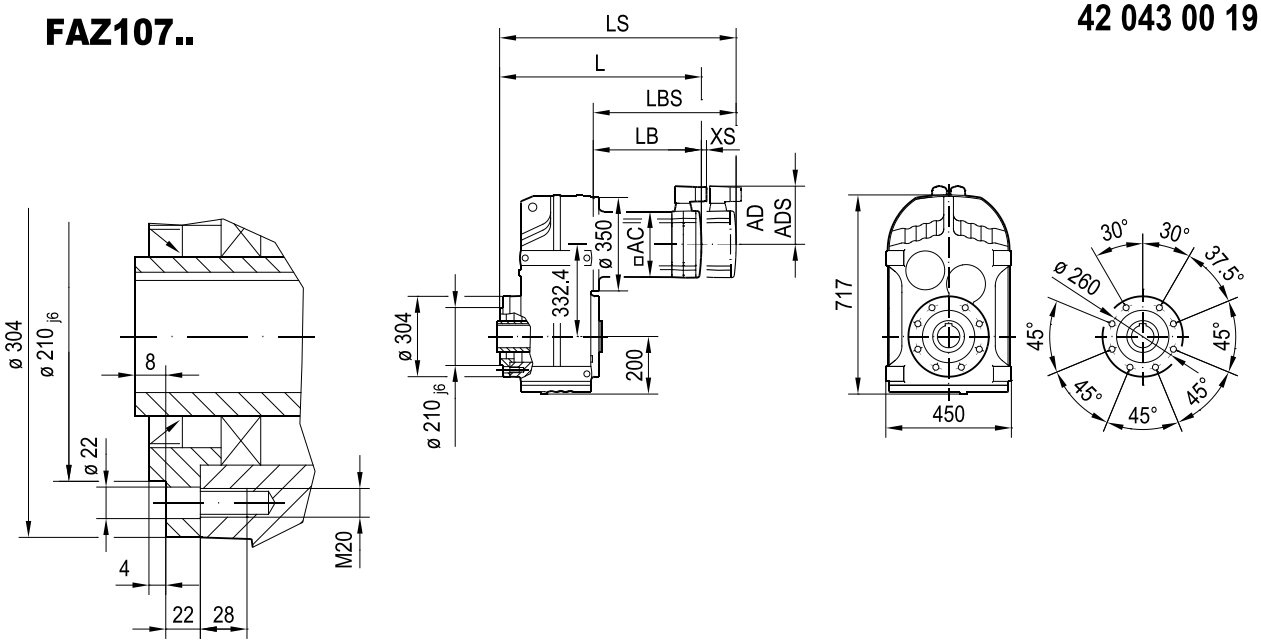
FAZ107..

42 043 00 19



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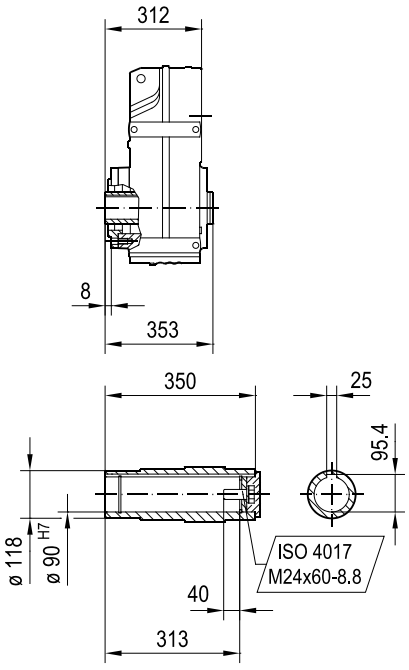
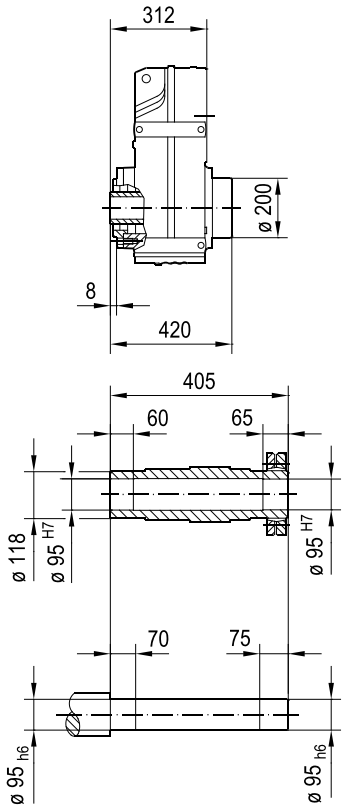
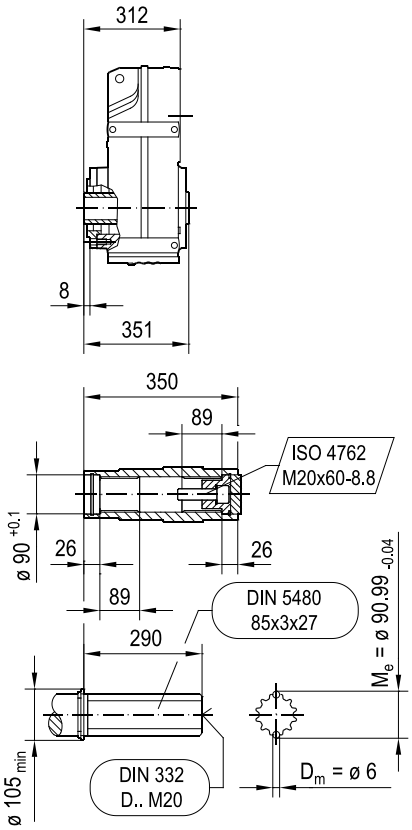


FHZ107..



FVZ107..



(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	527	555	612					
LS	601	629	686					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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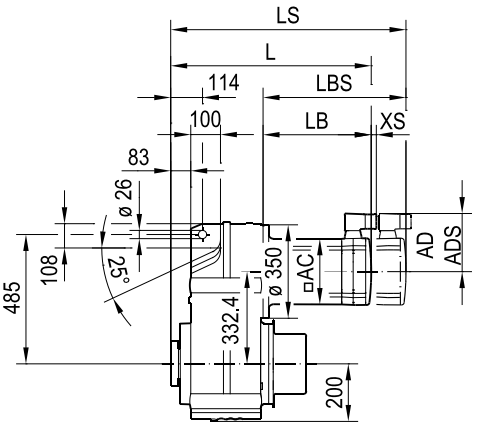
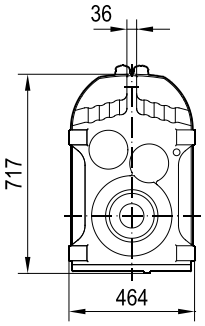
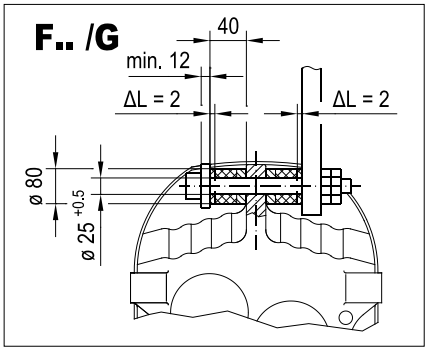
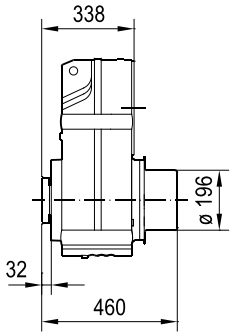
FT107..

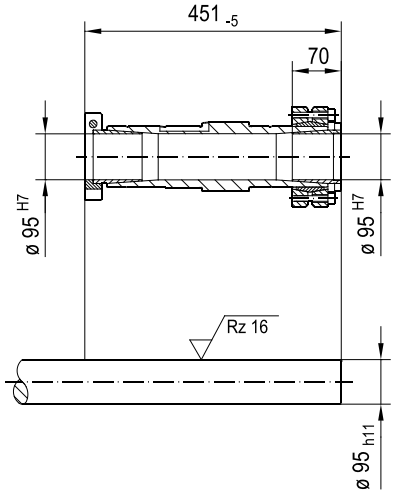
42 044 00 19

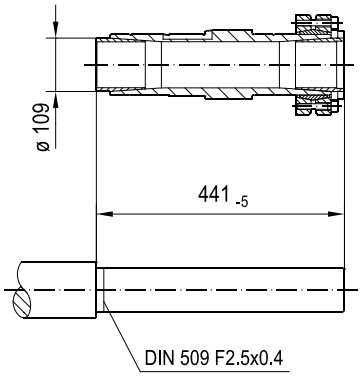












(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	553	581	638					
LS	627	655	712					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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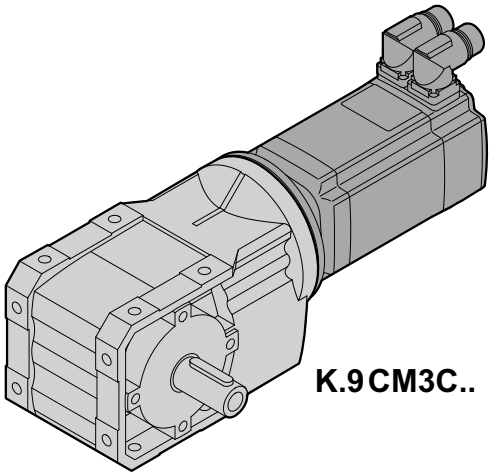
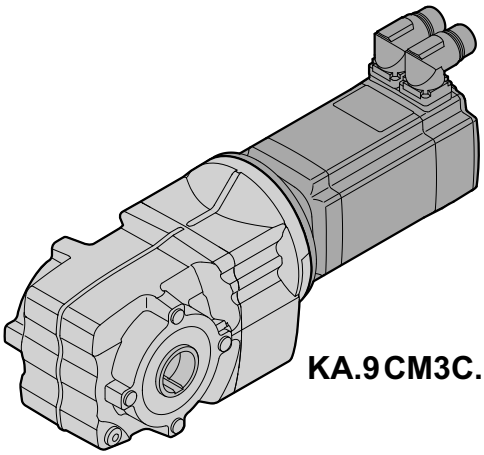
10 Helical.-bevel gearmotors – K.. gear units

10.1 K..CM3C.. designs



K.9CM3C..



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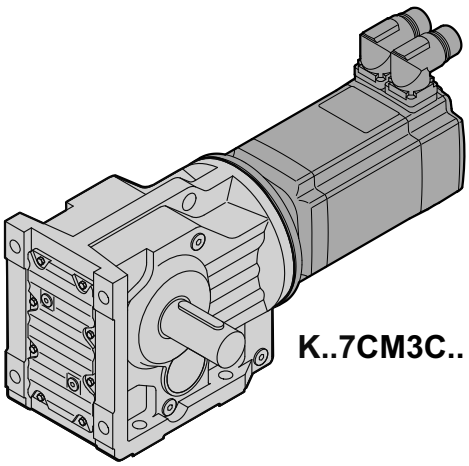
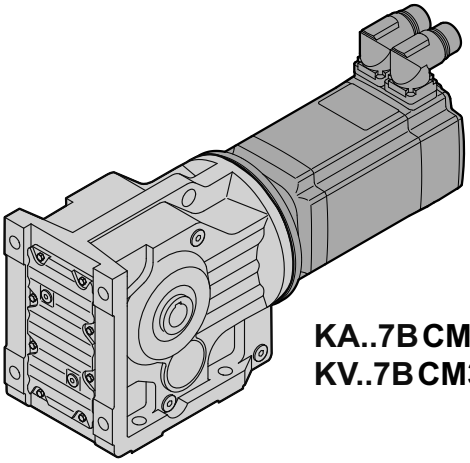
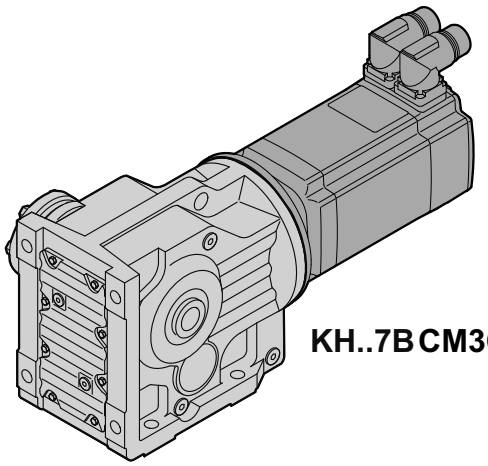


K..7CM3C..



KA..7BCM3C..
KV..7BCM3C..



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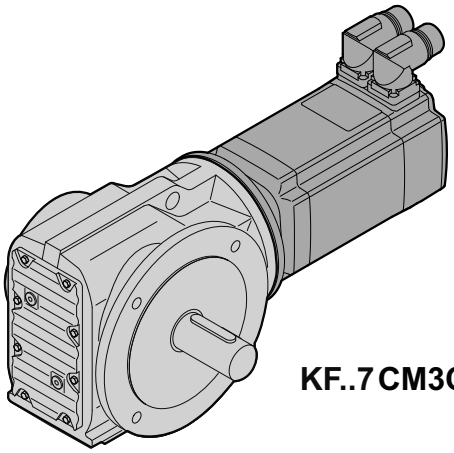
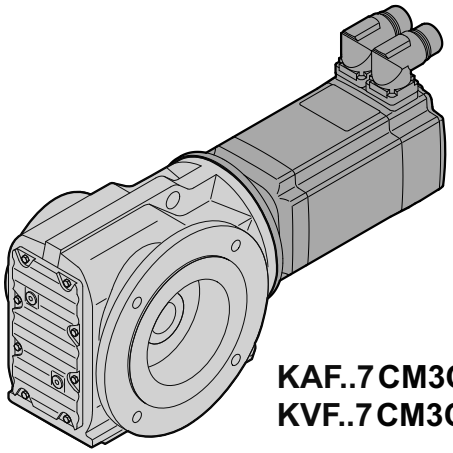
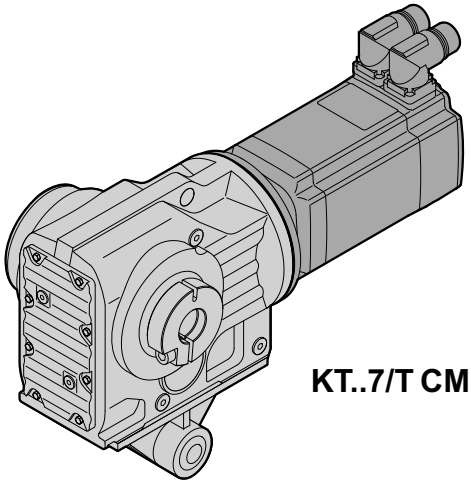


KF..7 CM3C..



KAF..7 CM3C..
KVF..7 CM3C..



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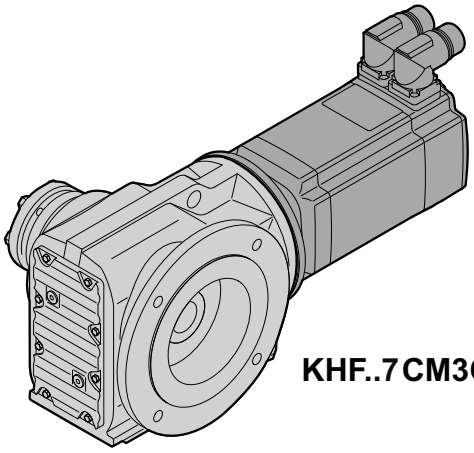

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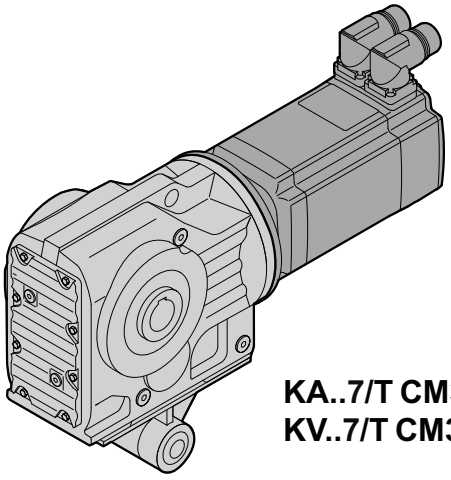

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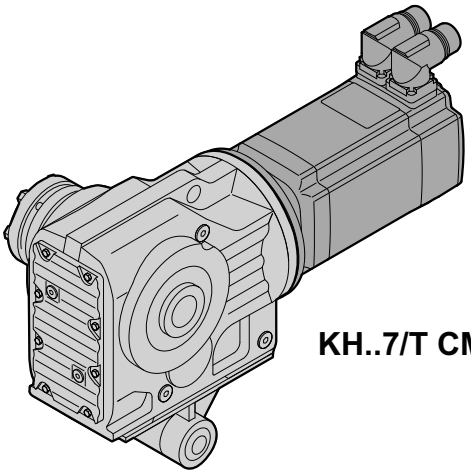

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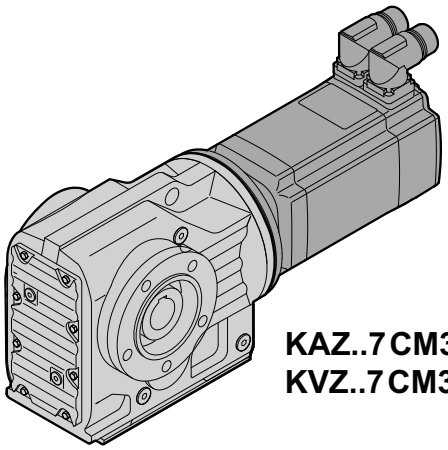

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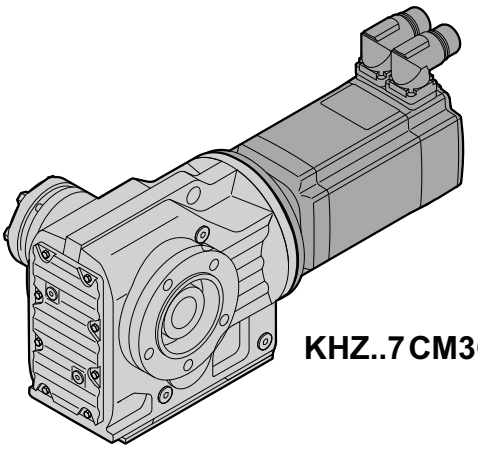

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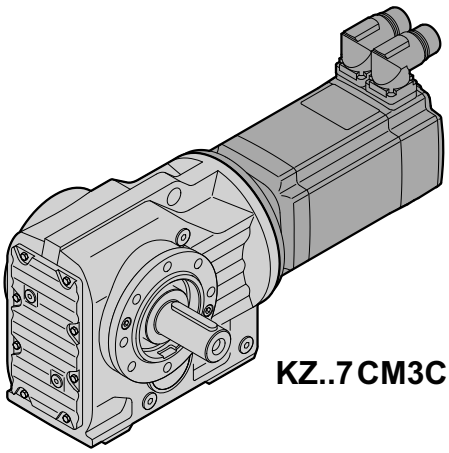

KZ..7 CM3C..

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10.2 K..CM3C.. selection tables and dimension sheets

10.2.1 K19..

K19, M_{aDyn} Nm			80 Nm
	CM3C		
i	63S	63M	71S
		2	
4.50	35	64	85
5.16	40	73	>88
5.54	43	78	>88
6.41	50	>88	>88
6.91	54	>88	>88
8.09	63		
9.58			
10.32	80	>83	>83
11.84	>86	>86	>86
12.70	>88	>88	>88
14.69	>88	>88	>88
15.84	>88	>88	>88
18.55	>88		
21.98			
24.06			
26.88			
27.16	>66	>66	>66
29.14			
29.29	>67	>67	>67
31.74			
34.29	>70		
40.63			
44.48			
49.69			
53.88			
58.68			

(→ 🗎 183)

K19, m kg			
	CM3C		
s	63S	63M	71S
2	7.3	8.7	10
KF: + 0.30 kg / KA: + -0.45 kg / KAF: + -- kg			

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CM3C..				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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K19 2	4.50	80	88	132	678	0.38	2010	1620	2500	2500	4190	3630	4500	4500
	5.16	80	88	132	663	0.30	2140	1720	2650	2650	4190	3630	4500	4500
	5.54	80	88	132	655	0.27	2200	1780	2730	2730	4190	3630	4500	4500
	6.41	80	88	132	641	0.21	2340	1890	2900	2900	4190	3630	4500	4500
	6.91	80	88	132	635	0.18	2420	1950	3000	3000	4190	3630	4500	4500
	8.09	80	88	132	556	0.14	2590	2080	3200	3200	4190	3630	4500	4500
	9.58	63	69	104	470	0.11	2910	2340	3600	3600	4340	3670	4500	4500
	10.32	76	83	124	167	0.22	2720	2190	3370	3370	4230	3610	4500	4500
	11.84	79	86	129	145	0.18	2850	2300	3530	3530	4210	3600	4500	4500
	12.70	80	88	132	139	0.16	2930	2360	3630	3630	4190	3600	4500	4500
	14.69	80	88	132	138	0.13	3110	2510	3860	3860	4190	3600	4500	4500
	15.84	80	88	132	138	0.12	3210	2590	3980	3980	4190	3600	4500	4500
	18.55	80	88	132	137	0.092	3430	2760	4250	4250	4190	3600	4500	4500
	21.98	80	88	132	136	0.072	3680	2960	4500	4500	4190	3600	4500	4500
	24.06	80	88	132	136	0.063	3820	3080	4500	4500	4190	3600	4500	4500
	26.88	80	88	132	135	0.054	3990	3220	4500	4500	4190	3600	4500	4500
	27.16	60	66	99	69	0.13	4090	3290	4500	4500	4360	3630	4500	4500
	29.14	80	88	132	135	0.048	4120	3320	4500	4500	4190	3600	4500	4500
	29.29	61	67	100	65	0.11	4200	3380	4500	4500	4350	3630	4500	4500
	31.74	80	88	132	135	0.042	4260	3440	4500	4500	4190	3600	4500	4500
	34.29	64	70	105	55	0.090	4370	3570	4500	4500	4330	3620	4500	4500
	40.63	67	73	110	47	0.071	4350	3630	4500	4500	4310	3610	4500	4500
	44.48	69	75	112	42	0.062	4340	3620	4500	4500	4290	3600	4500	4500
	49.69	70	77	116	40	0.053	4330	3620	4500	4500	4280	3600	4500	4500
	53.88	70	77	116	40	0.047	4330	3620	4500	4500	4280	3600	4500	4500
	58.68	70	77	116	40	0.042	4330	3620	4500	4500	4280	3600	4500	4500

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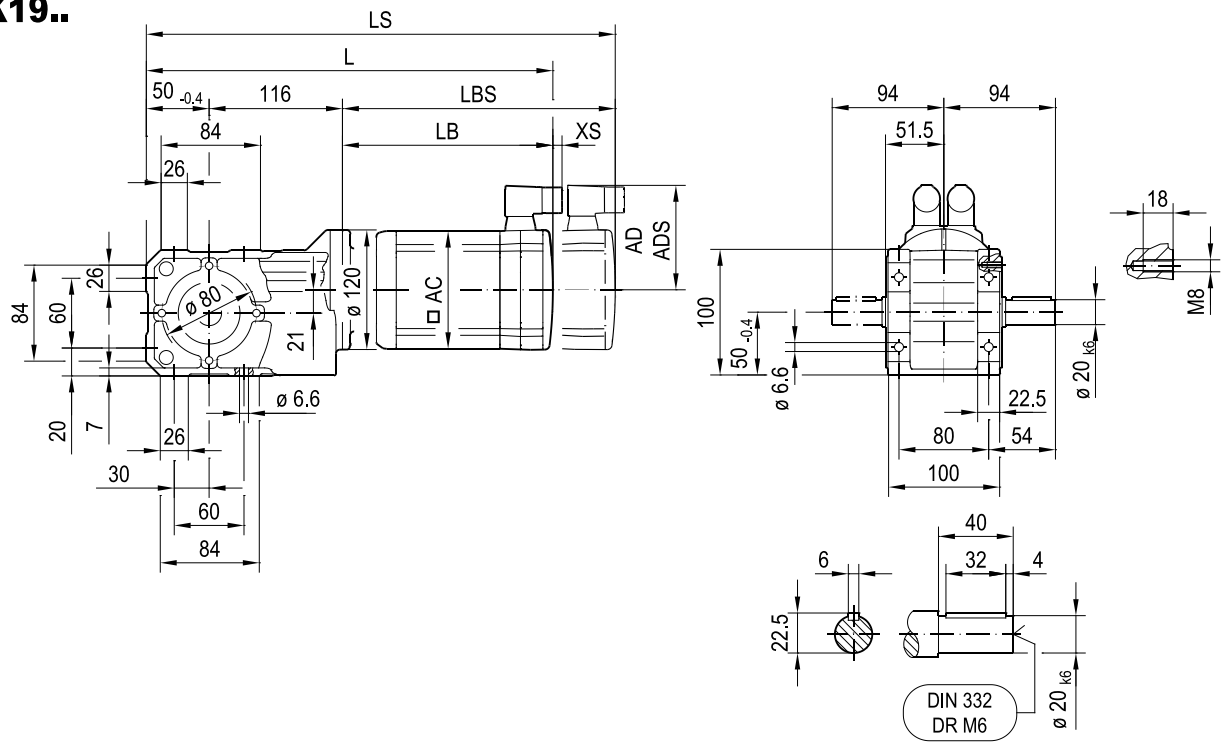
33 024 00 19

K19..



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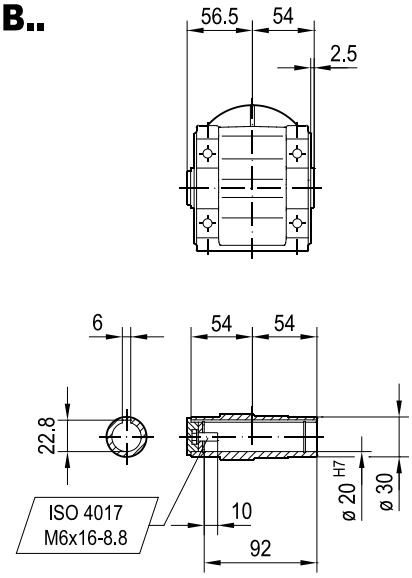

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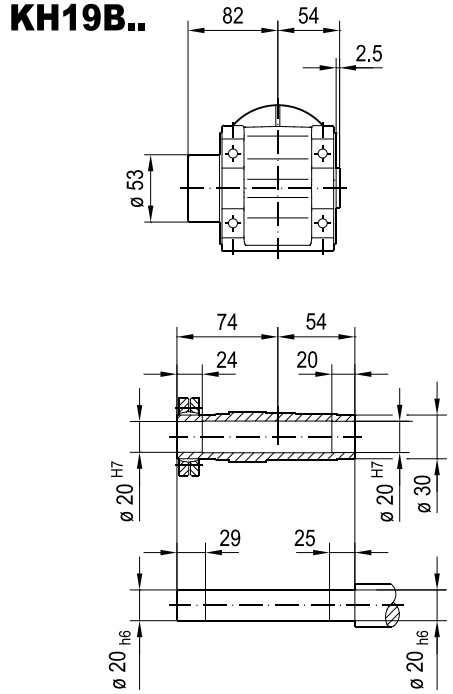

(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	317	355	353					
LS	357	395	419					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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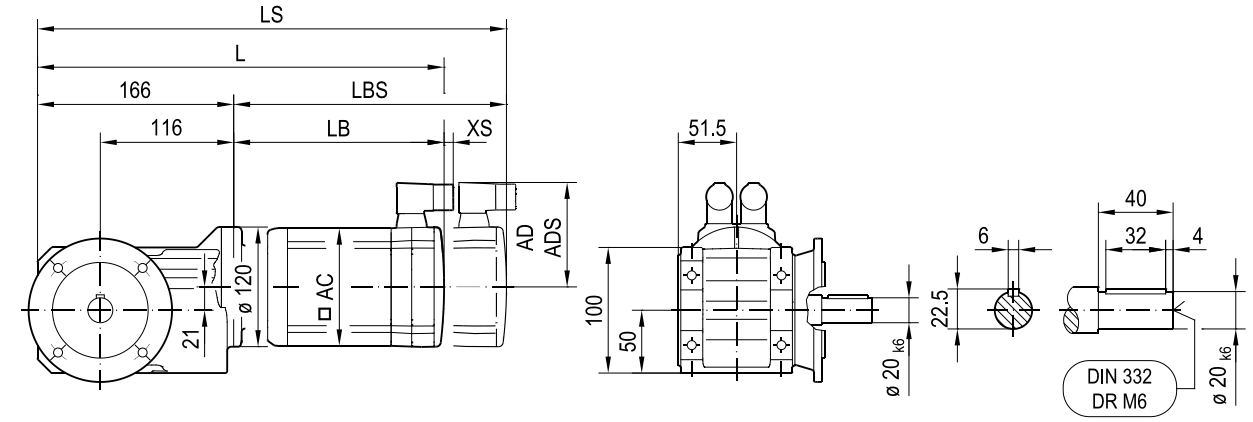
33 025 00 19

KF19B..



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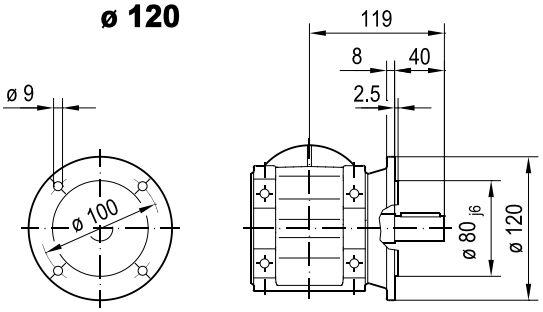

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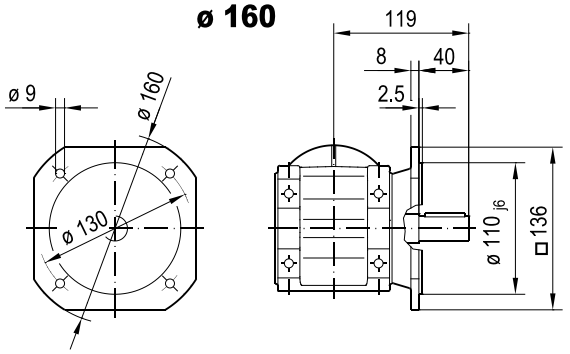

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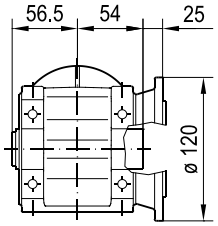

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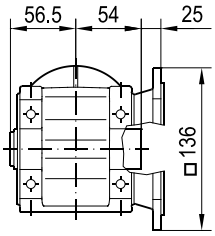

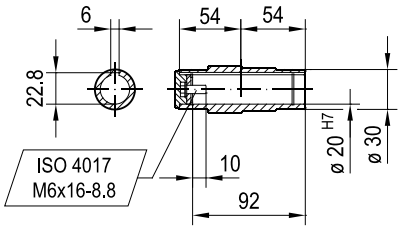

(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	317	355	353					
LS	357	395	419					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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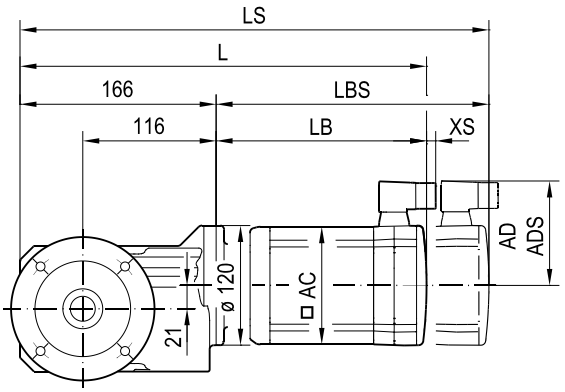
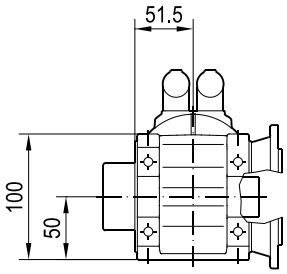
33 026 00 19

KHF19B..





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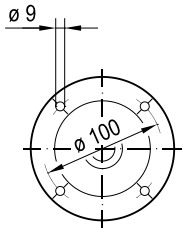

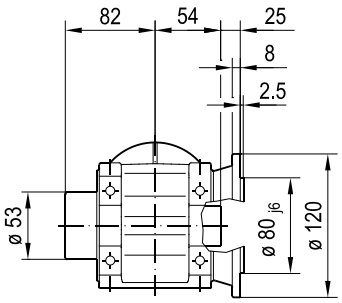

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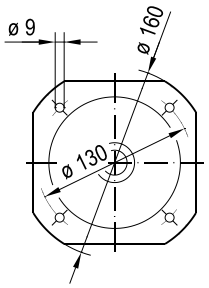

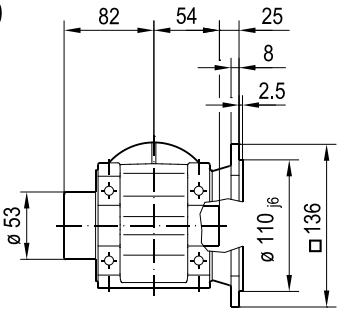

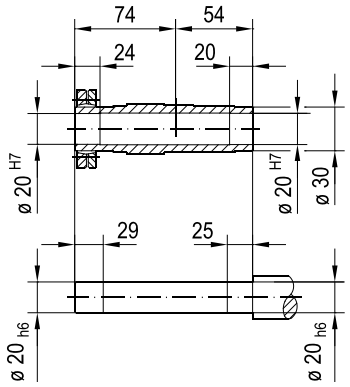

(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	317	355	353					
LS	357	395	419					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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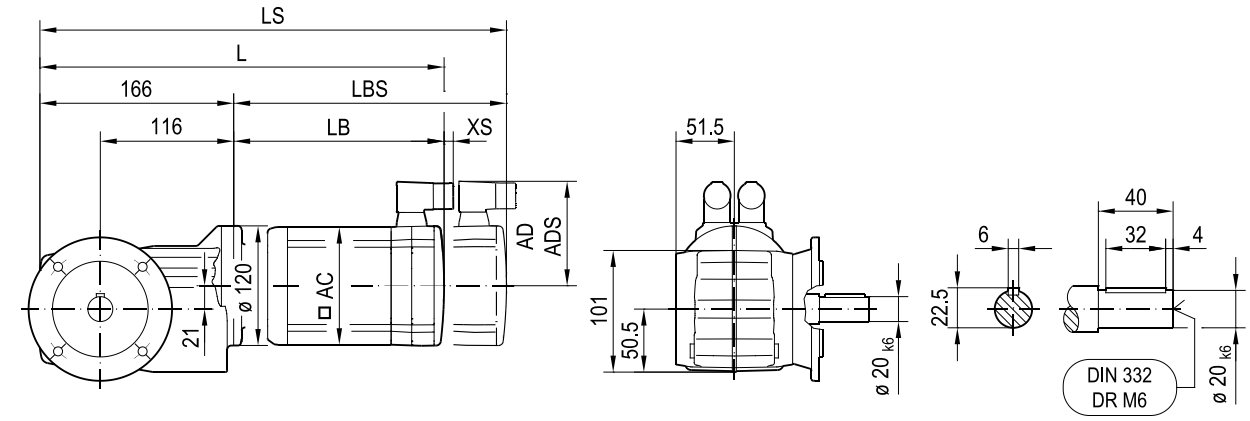
33 027 00 19

KF19..



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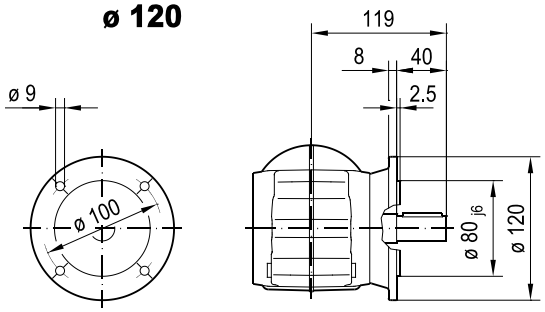

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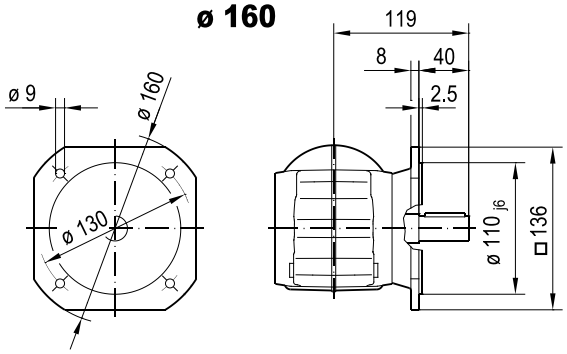

KAF19..

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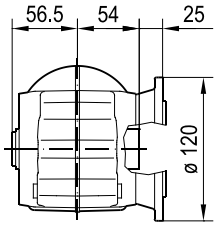

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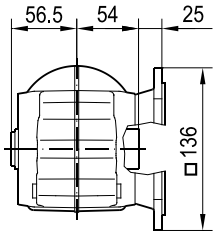

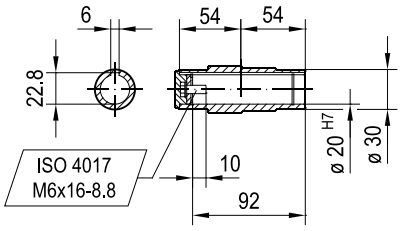

(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	317	355	353					
LS	357	395	419					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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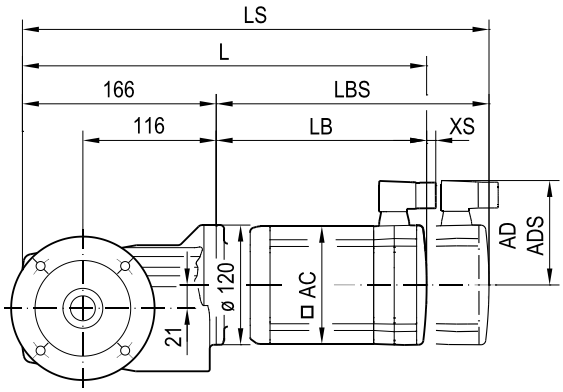
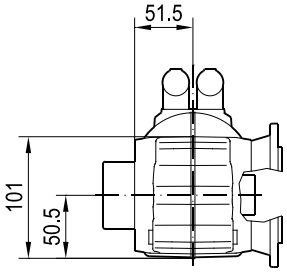
33 028 00 19

KHF19..





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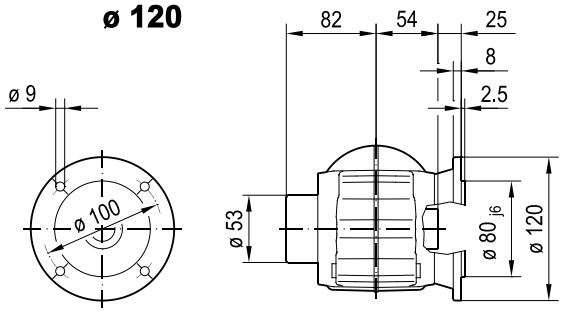

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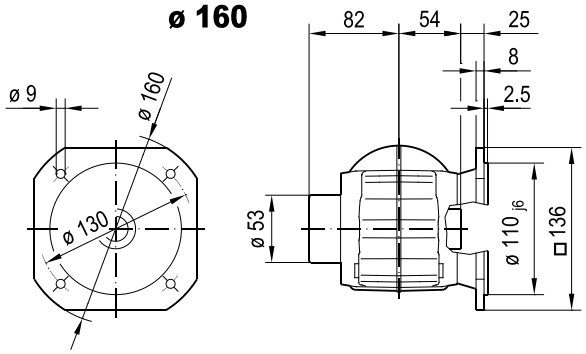

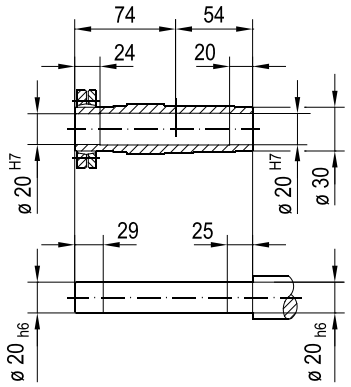

(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	317	355	353					
LS	357	395	419					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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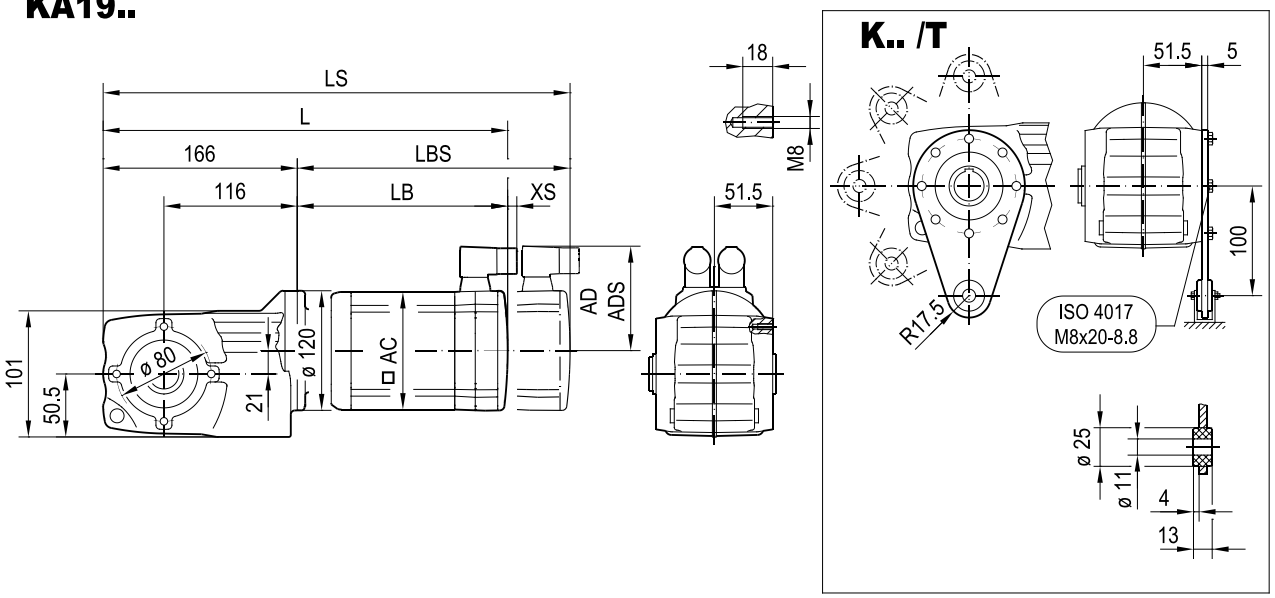
33 029 00 19

KA19..



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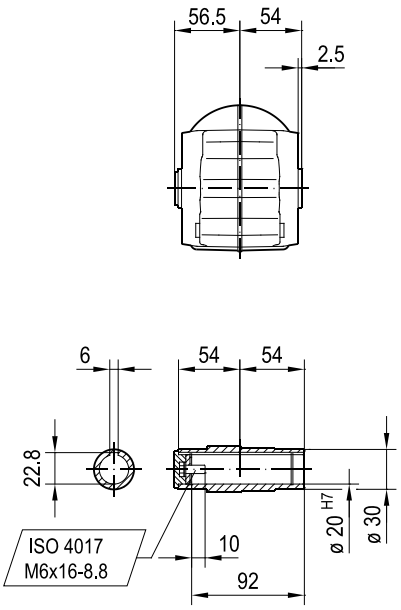

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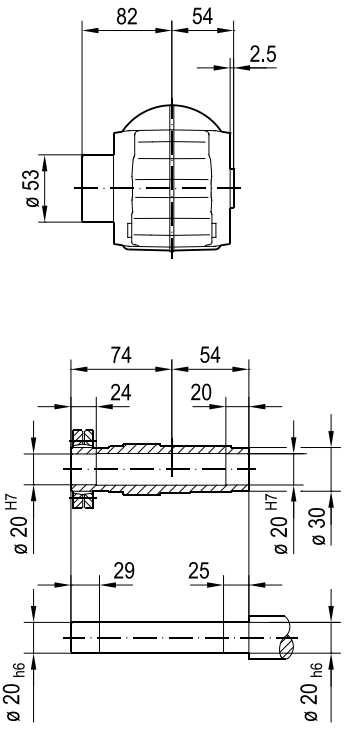

(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	317	355	353					
LS	357	395	419					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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10.2.2 K29..

K29, M_{aDyn} Nm						130 Nm
	CM3C					
i	63S	63M	63L	71S	71M	80S
			2			
3.19	25	45	59	60	88	97
3.92	30	55	73	74	108	119
5.10	40	72	94	96	>121	>121
5.75	45	81	107	108	>123	>123
6.95	54	99	>123	>123	>123	>123
7.48	58	105	>135	>135	>135	>135
8.53	67	121		>134		
9.17	71	129	>143	>143	>143	>143
9.90	77					
11.94	92	>143	>143	>143	>143	>143
13.47	104	>143	>143	>143	>143	>143
16.29	126	>143	>143	>143	>143	>143
19.99	>143	>143		>143		
22.08	>115	>115	>115	>115	>115	>115
23.19	>143					
24.91	>119	>119	>119	>119	>119	>119
27.23						
29.69						
30.11	>126	>126	>126	>126	>126	>126
33.15						
35.83						
36.96	>134	>134		>134		
38.90						
42.87	>140					
50.35						
54.89						
61.28						
66.25						
71.93						

(→ 183)

K29, m kg						
	CM3C					
s	63S	63M	63L	71S	71M	80S
2	9.1	10	12	12	14	17
KF: + 1.0 kg / KA: + -0.45 kg / KAF: + 0.35 kg						

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CM3C..				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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K29 2	3.19	110	121	182	1389	1.6	1830	1200	1860	1860	5070	6000	6000	6000
	3.92	126	138	205	969	1.1	1910	1240	1920	1920	5030	6000	6000	6000
	5.10	110	121	182	882	0.68	2260	1500	2320	2320	5070	6000	6000	6000
	5.75	112	123	184	783	0.55	2370	1580	2440	2440	5070	6000	6000	6000
	6.95	112	123	184	647	0.39	2580	1720	2660	2660	5070	6000	6000	6000
	7.48	123	135	200	238	0.74	2300	1480	2300	2300	4980	6000	6000	6000
	8.53	122	134	200	528	0.27	2740	1830	2830	2830	5040	6000	6000	6000
	9.17	130	143	210	196	0.55	2470	1600	2480	2480	4960	6000	6000	6000
	9.90	110	121	182	455	0.21	3000	2020	3120	3120	5070	6000	6000	6000
	11.94	130	143	210	194	0.37	2810	1830	2840	2840	4960	6000	6000	6000
	13.47	130	143	210	194	0.30	2970	1950	3010	3010	4960	6000	6000	6000
	16.29	130	143	210	193	0.22	3240	2140	3300	3300	4960	6000	6000	6000
	19.99	130	143	210	192	0.16	3550	2350	3640	3640	4960	6000	6000	6000
	22.08	105	115	172	86	0.33	3820	2560	3950	3950	5020	6000	6000	6000
	23.19	130	143	210	191	0.12	3790	2520	3900	3900	4960	6000	6000	6000
	24.91	109	119	178	75	0.27	3980	2660	4120	4120	5010	6000	6000	6000
	27.23	130	143	210	165	0.098	4060	2710	4190	4190	4960	6000	6000	6000
	29.69	130	143	210	152	0.086	4210	2820	4360	4360	4960	6000	6000	6000
	30.11	115	126	189	63	0.20	4250	2850	4400	4400	4990	6000	6000	6000
	33.15	130	143	210	136	0.073	4410	2960	4580	4580	4960	6000	6000	6000
	35.83	130	143	210	126	0.065	4560	3060	4740	4740	4960	6000	6000	6000
	36.96	122	134	200	51	0.14	4560	3060	4730	4730	4960	6000	6000	6000
	38.90	130	143	210	116	0.057	4720	3170	4910	4910	4960	6000	6000	6000
	42.87	128	140	210	44	0.11	4790	3210	4970	4970	4940	6000	6000	6000
	50.35	130	143	210	42	0.090	4980	3430	5300	5300	4930	6000	6000	6000
	54.89	130	143	210	42	0.079	4980	3560	5510	5510	4930	6000	6000	6000
	61.28	130	143	210	41	0.068	4980	3730	5770	5770	4930	6000	6000	6000
	66.25	130	143	210	41	0.060	4980	3860	5970	5970	4930	6000	6000	6000
	71.93	130	143	210	41	0.053	4980	4000	6000	6000	4930	6000	6000	6000

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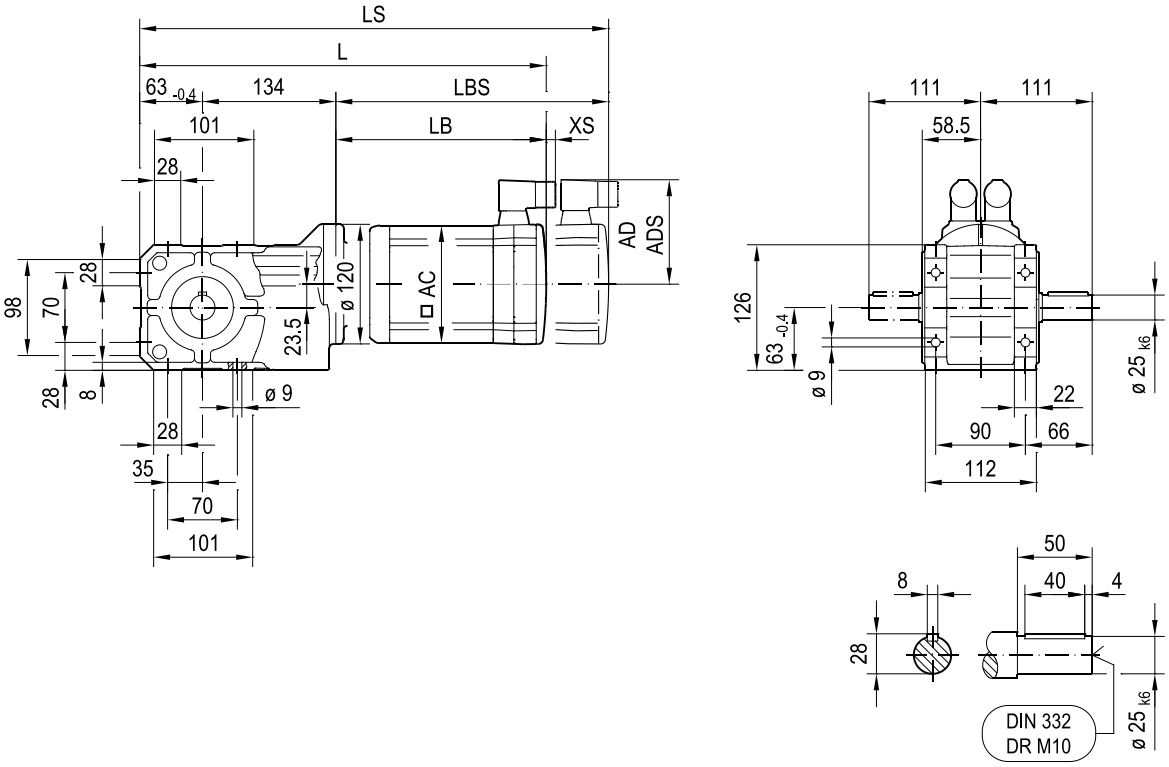
33 030 00 19

K29..



(→ 📖 7.3)	CM3C							
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AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	348	386	424	384	406	419		
LS	388	426	464	450	472	487		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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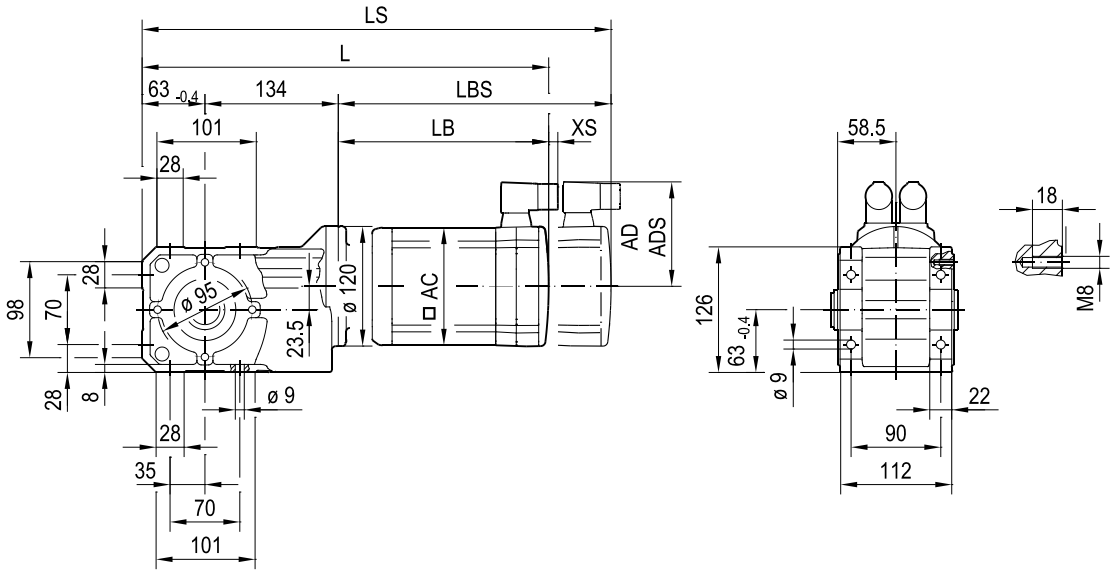
33 031 00 19

KA29B..



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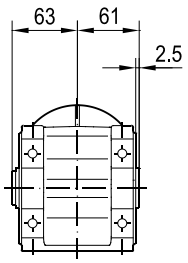
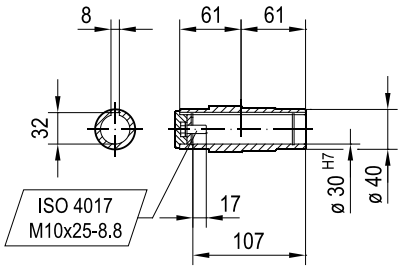
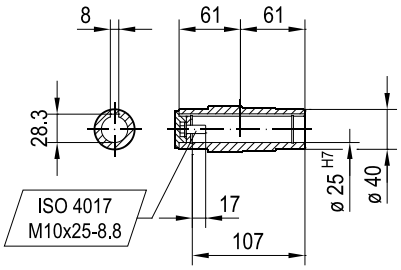


ø 30 H7
DIN 6885-3



ø 25 H7



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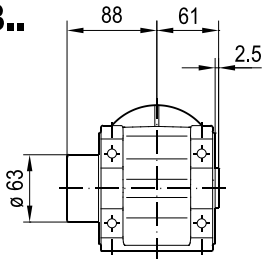

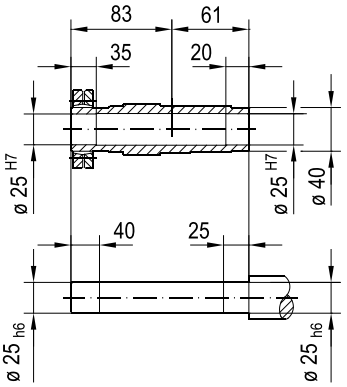

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	348	386	424	384	406	419		
LS	388	426	464	450	472	487		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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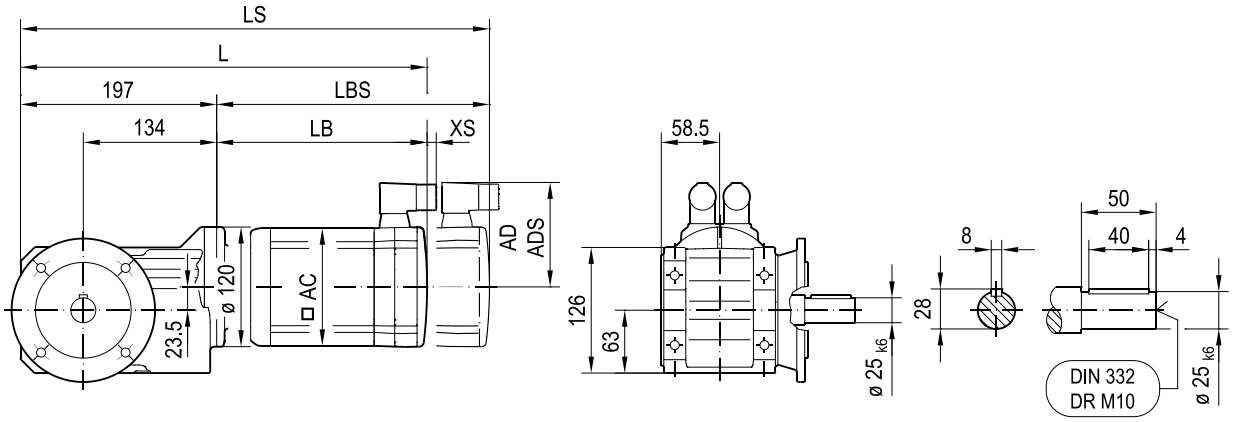
33 032 00 19

KF29B..



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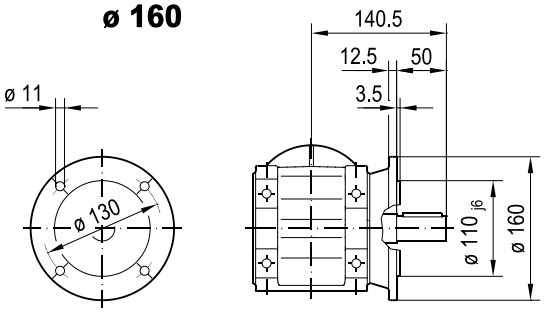

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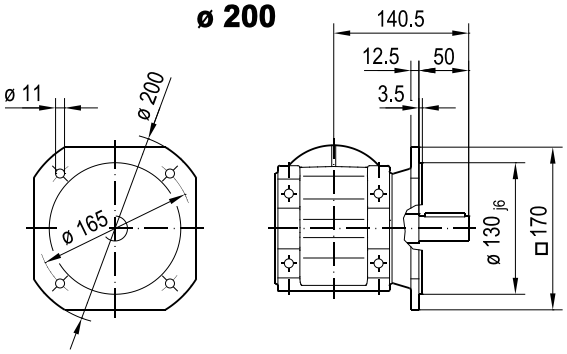

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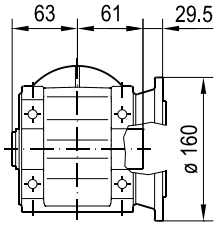

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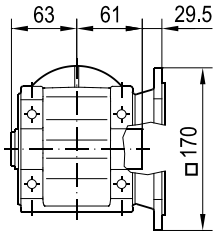
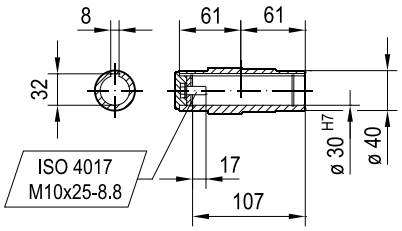
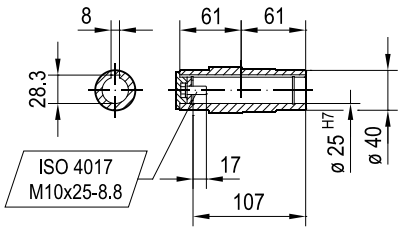


ø 30 H7
DIN 6885-3



ø 25 H7



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	348	386	424	384	406	419		
LS	388	426	464	450	472	487		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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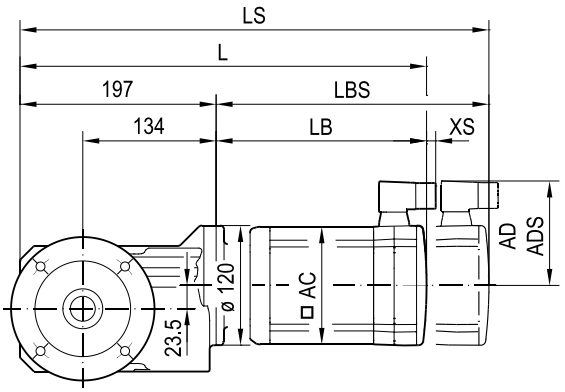
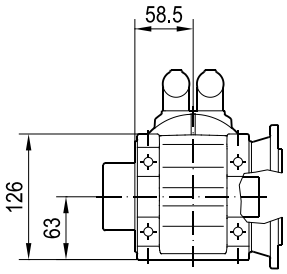
33 033 00 19

KHF29B..





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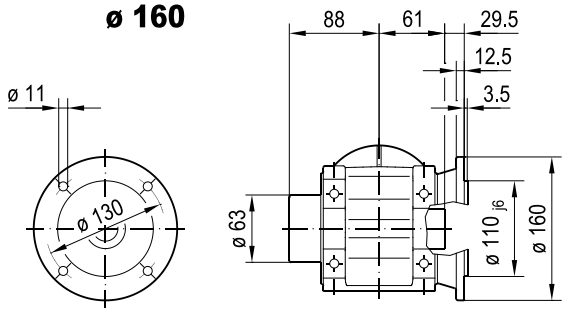

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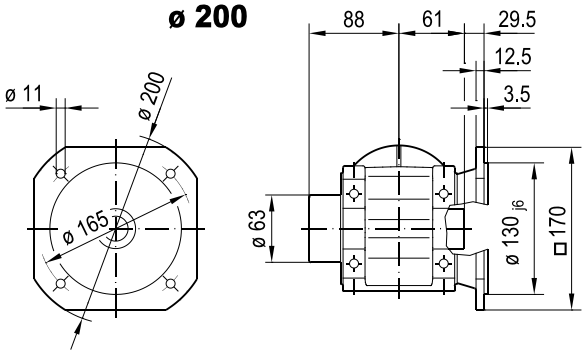

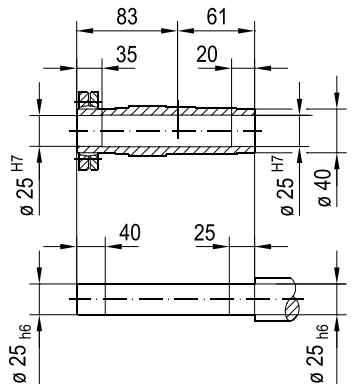

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	348	386	424	384	406	419		
LS	388	426	464	450	472	487		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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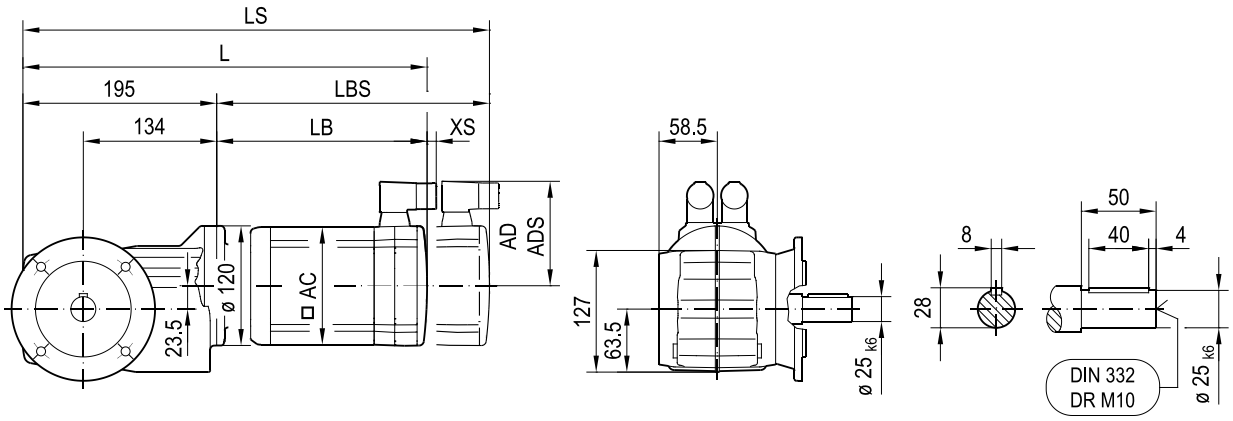
33 034 00 19

KF29..



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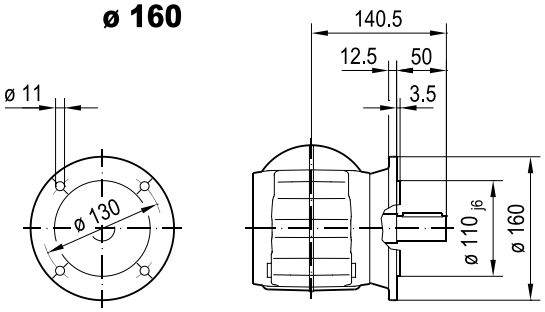

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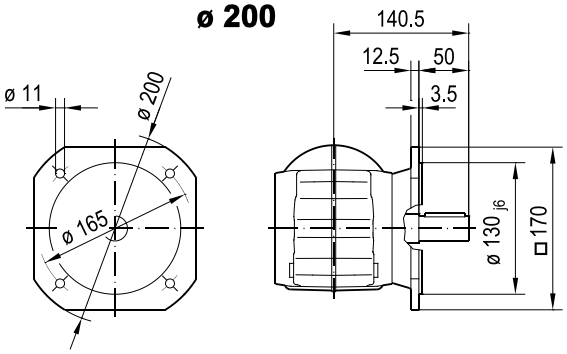
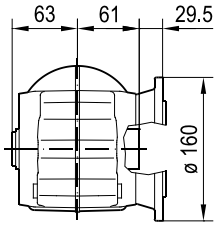


KAF29..

ø 160



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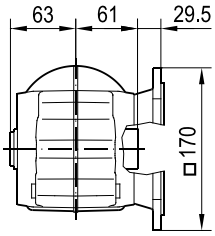
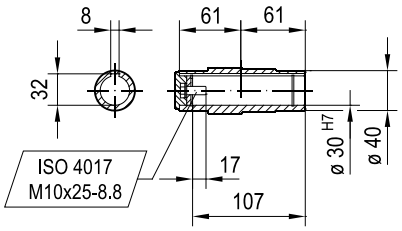
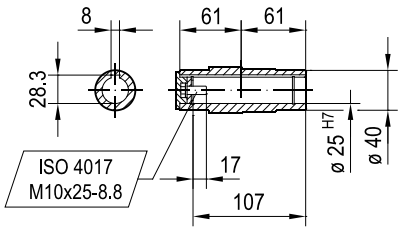


ø 30 H7



ø 25 H7



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	346	384	422	382	404	417		
LS	386	424	462	448	470	485		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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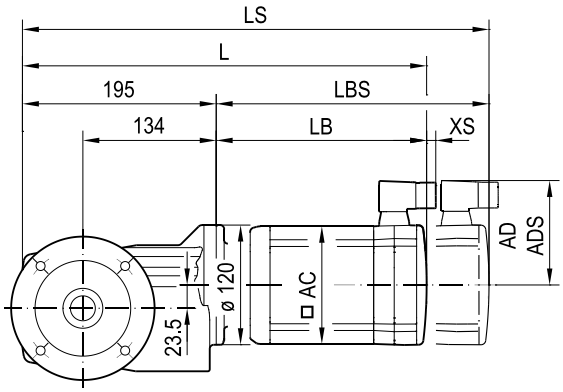
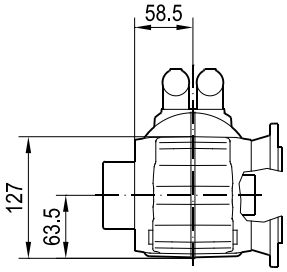
33 035 00 19

KHF29..





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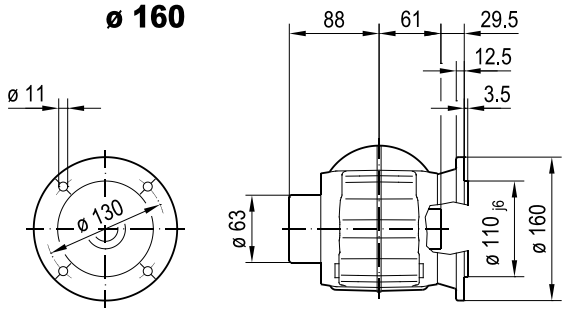

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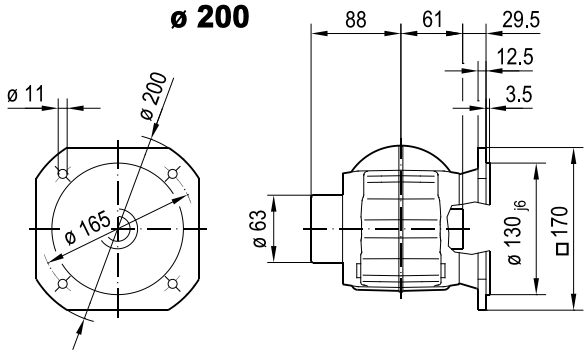

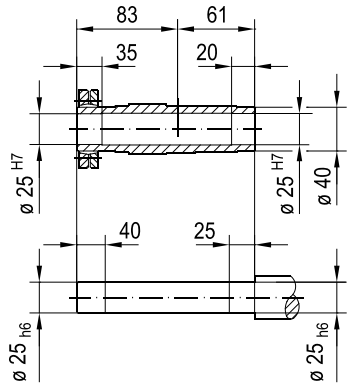

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	346	384	422	382	404	417		
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LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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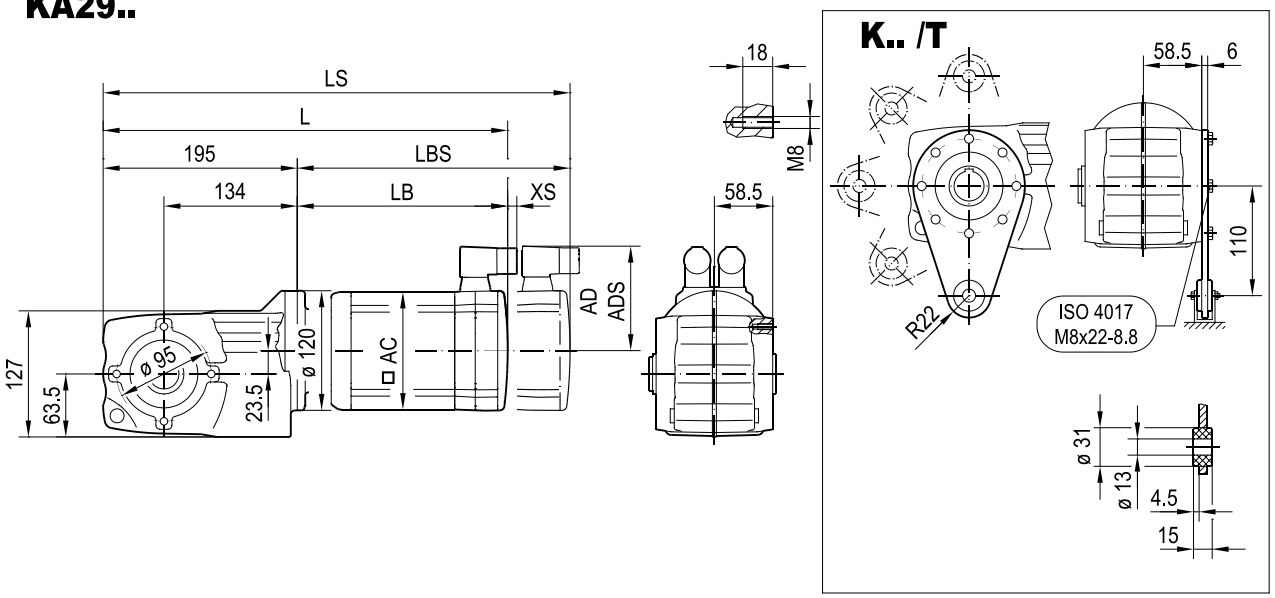
33 036 00 19

KA29..



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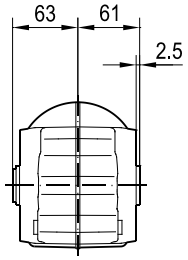
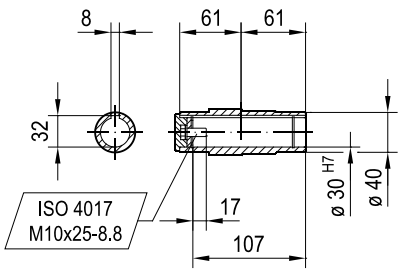


ø 30 H7
DIN 6885-3



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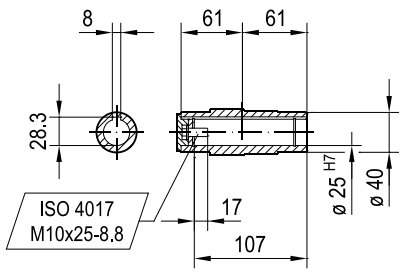
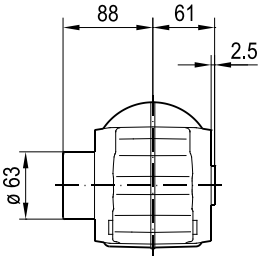
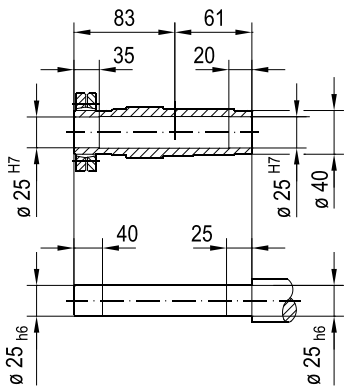


KH29..





(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
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LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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10.2.3 K37..

K37, M_{aDyn} Nm						200 Nm
	CM3C					
i	63S	63M	63L	71S	71M	80S
			3			
3.98	30	56	73	74	108	120
5.36	41	75	98	100	146	162
6.37	49	89	117	119	174	192
6.80	52	95	125	127	186	>199
7.96	61	112	146	149	>199	>199
8.91	69	125	164	166	>199	>199
10.49	81	148	193	196	>199	>199
12.14	94	171		>199		
13.08	101	184	>240	>240	>240	>240
15.31	119	215	>240	>240	>240	>240
17.15	133	>240	>240	>240	>240	>240
20.19	156	>240	>240	>240	>240	>240
23.36	181	>240		>240		
24.99	194	>240		>240		
28.83	220					
29.96	225	>230	>230	>230	>230	>230
35.57	>230	>230	>230	>230	>230	>230
37.97	>230	>230	>230	>230	>230	>230
44.46	>230	>230	>230	>230	>230	>230
49.79	>230	>230	>230	>230	>230	>230
58.60	>230	>230	>230	>230	>230	>230
67.80	>230	>230		>230		
72.54	>230	>230		>230		
83.69	>230					
97.81						
106.38						

(→ 183)

K37, m kg						
	CM3C					
s	63S	63M	63L	71S	71M	80S
3	15	16	18	18	19	23
KF: + 2.3 kg / KA: + -0.25 kg / KAF: + 1.5 kg						

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CM3C..				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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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K37 3	3.98	125	187	210	389	2.6	1660	2130	2310	2310	5780	5710	7000	7000
	5.36	140	199	235	330	1.7	1810	2340	2530	2530	5650	5640	7000	7000
	6.37	145	199	245	323	1.3	1950	2500	2720	2720	5650	5640	7000	7000
	6.80	150	199	255	299	1.1	1980	2540	2760	2760	5650	5640	7000	7000
	7.96	155	199	260	285	0.85	2110	2700	2940	2940	5650	5640	7000	7000
	8.91	160	199	270	268	0.70	2200	2810	3070	3070	5650	5640	7000	7000
	10.49	160	199	270	280	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	344	1.0	2650	3310	3660	3660	4100	4100	7000	7000
	15.31	175	240	295	294	0.76	2780	3480	3850	3850	4100	4100	7000	7000
	17.15	180	240	305	262	0.62	2900	3630	4020	4020	4100	4100	7000	7000
	20.19	185	240	315	223	0.46	3110	3870	4300	4300	4100	4100	7000	7000
	23.36	195	240	330	193	0.37	3260	4060	4510	4510	4100	4100	7000	7000
	24.99	200	240	340	180	0.33	3330	4150	4600	4600	4100	4100	7000	7000
	28.83	200	240	340	156	0.26	3580	4420	4940	4940	4100	4100	7000	7000
	29.96	200	230	340	150	0.76	3650	4500	5030	5030	5140	5140	7000	7000
	35.57	200	230	340	127	0.60	3970	4860	5460	5460	5140	5140	7000	7000
	37.97	200	230	340	119	0.54	4100	5000	5630	5630	5140	5140	7000	7000
	44.46	200	230	340	101	0.42	4420	5350	6060	6060	5140	5140	7000	7000
	49.79	200	230	340	90	0.36	4660	5610	6380	6380	5140	5140	7000	7000
	58.60	200	230	340	77	0.27	5020	5630	6860	6860	5140	5140	7000	7000
	67.80	200	230	340	66	0.23	5360	5630	7000	7000	5140	5140	7000	7000
	72.54	200	230	340	62	0.21	5520	5630	7000	7000	5140	5140	7000	7000
	83.69	200	230	340	54	0.17	5640	5630	7000	7000	5140	5140	7000	7000
	97.81	200	230	340	46	0.13	5640	5630	7000	7000	5140	5140	7000	7000
	106.38	200	230	340	42	0.12	5640	5630	7000	7000	5140	5140	7000	7000

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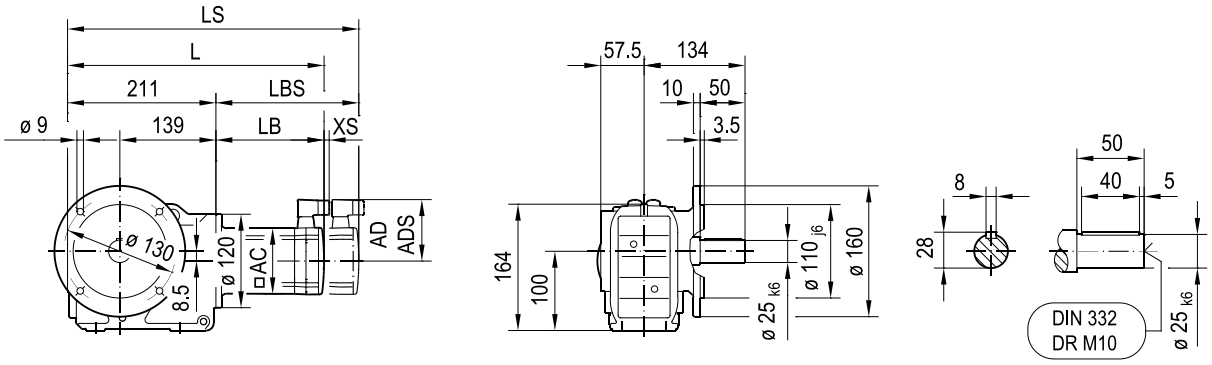
33 038 00 19

KF37..



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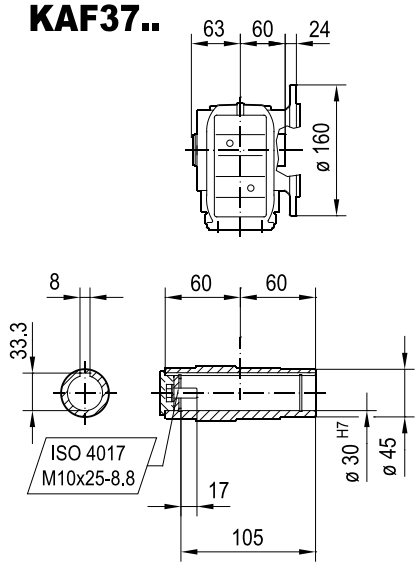

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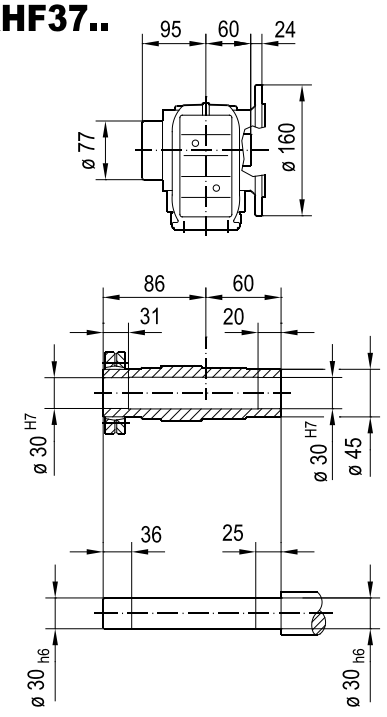

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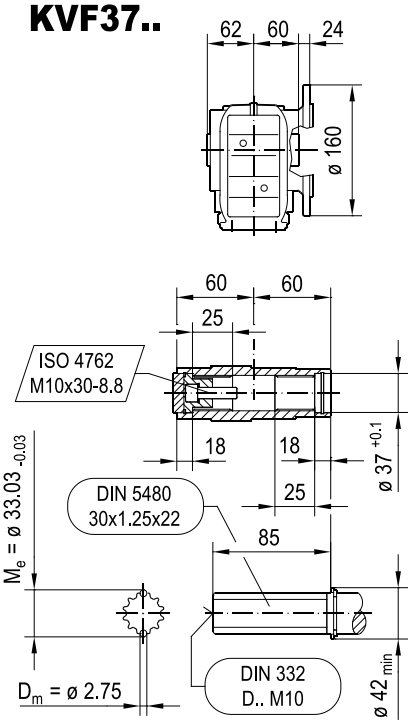

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	362	400	438	398	420	433		
LS	402	440	478	464	486	501		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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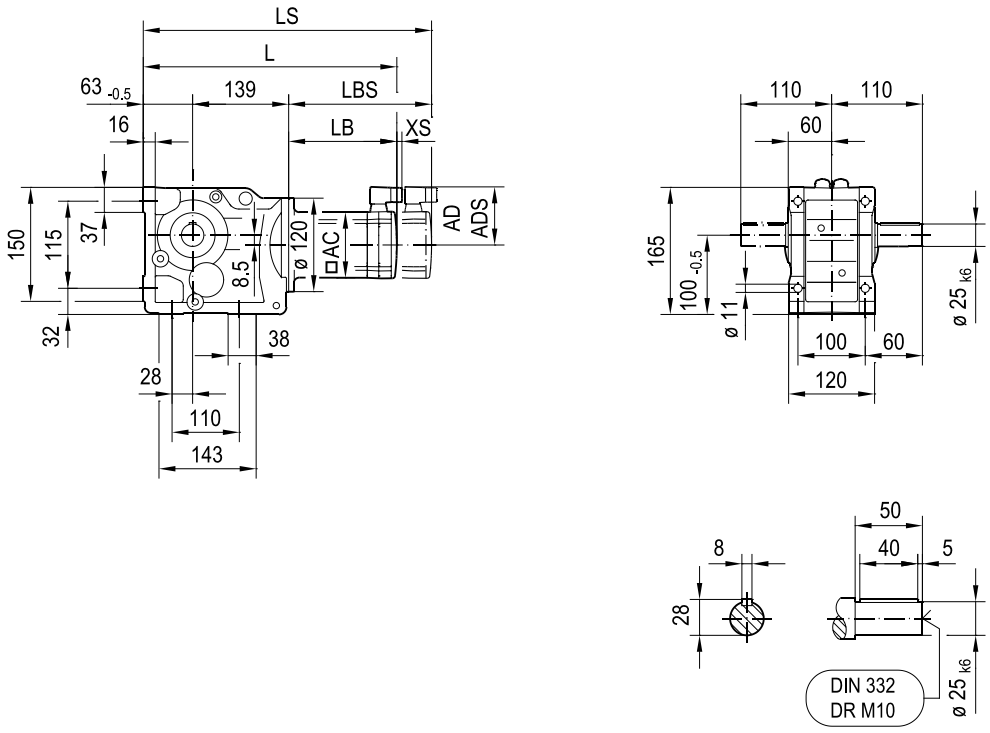
33 037 00 19

K37..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	353	391	429	389	411	424		
LS	393	431	469	455	477	492		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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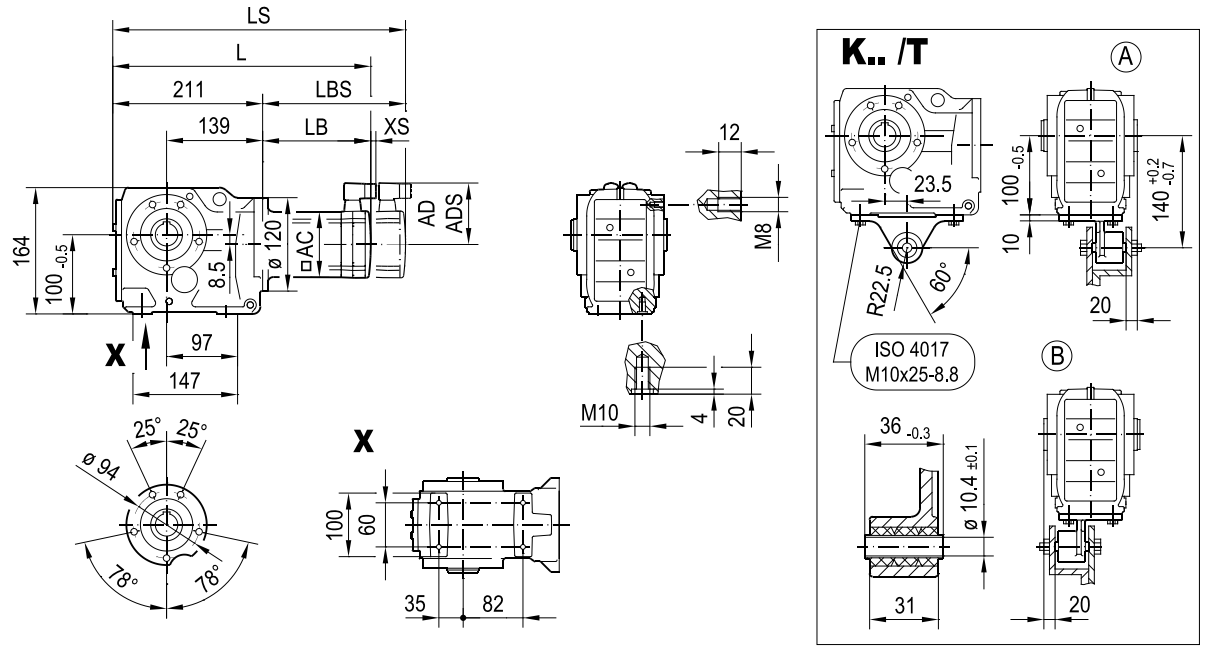
KA37..

33 039 00 19



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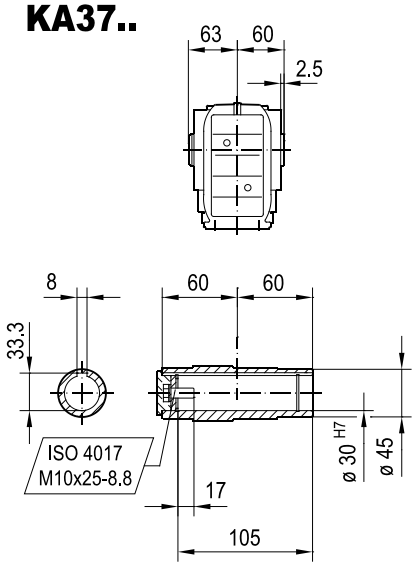

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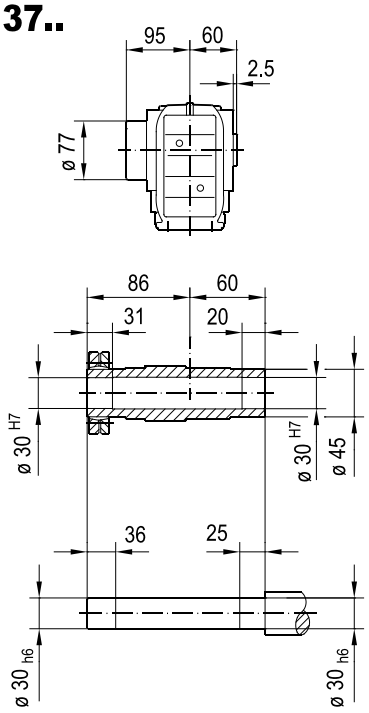

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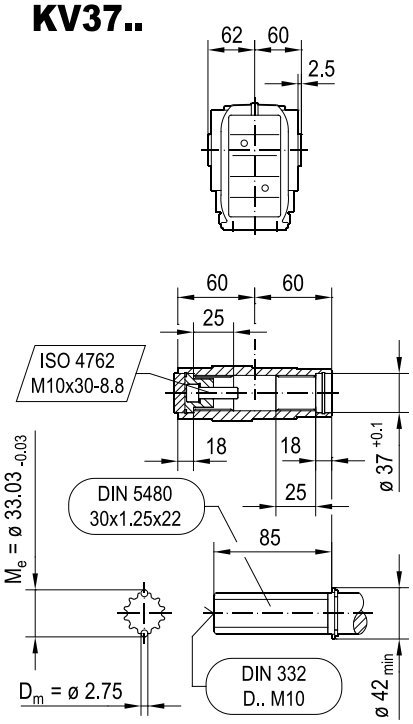

(→ 📖 7.3)	CM3C							
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AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	362	400	438	398	420	433		
LS	402	440	478	464	486	501		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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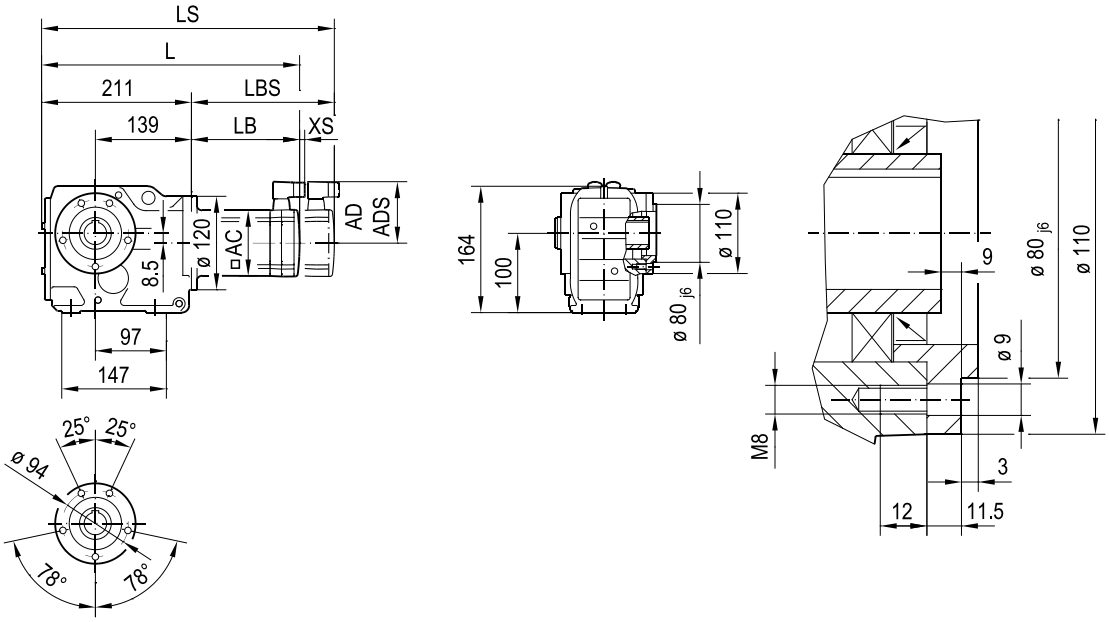
KAZ37..

33 040 00 19



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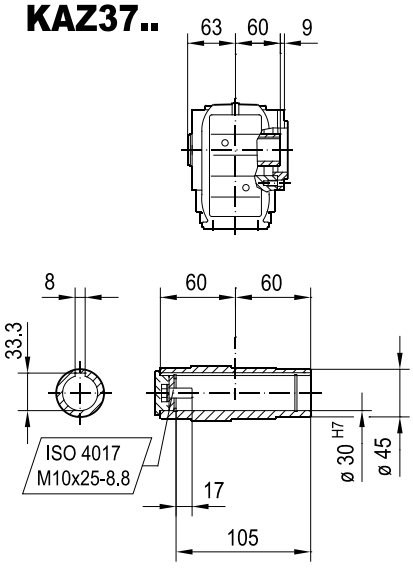

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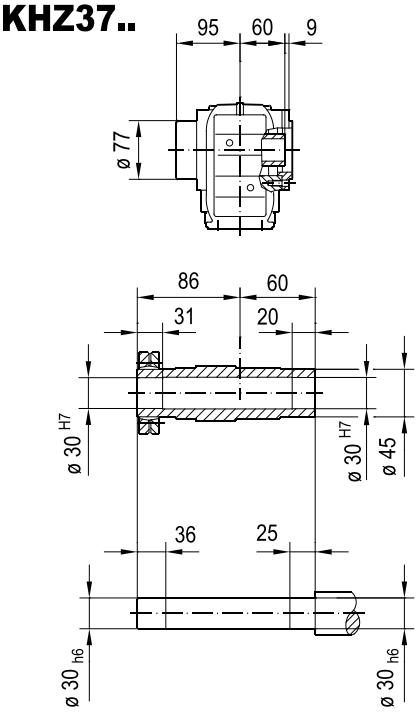

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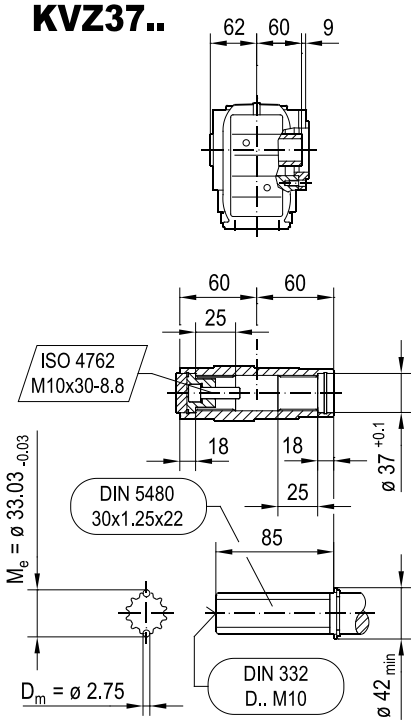

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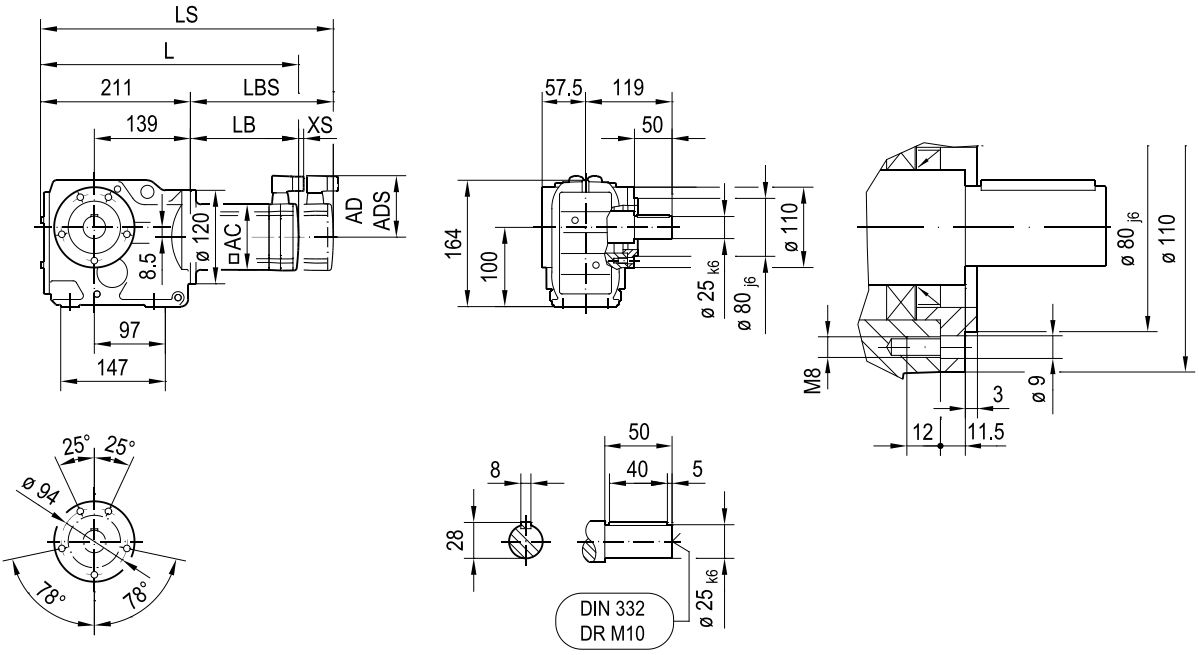
KZ37..

33 001 00 20



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ADS	93	93	93	105	105	127		
L	362	400	438	398	420	433		
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LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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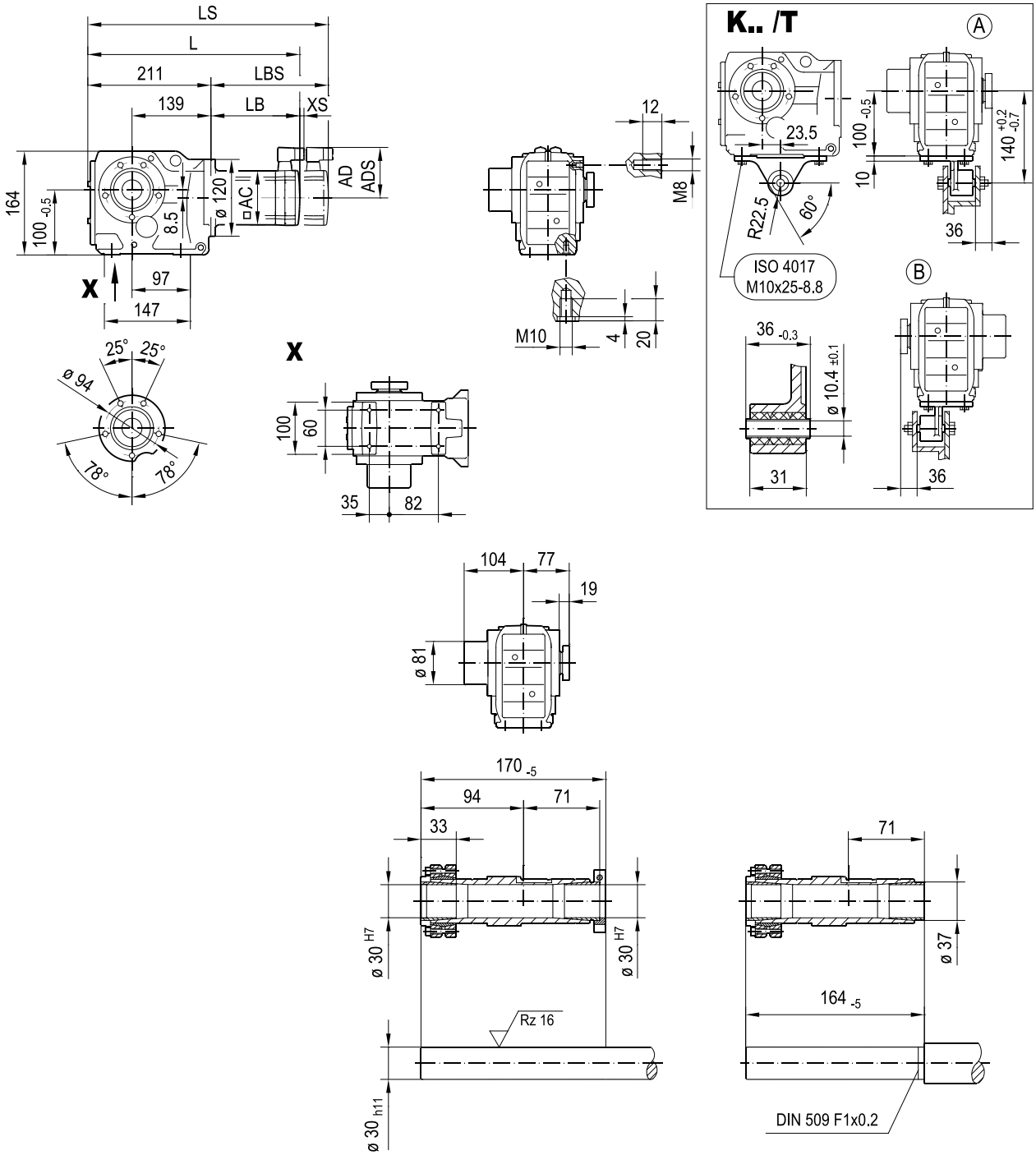
KT37..

33 041 00 19



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	362	400	438	398	420	433		
LS	402	440	478	464	486	501		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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10.2.4 K39..

K39, M_{aDyn} Nm								300 Nm
	CM3C							
i	63S	63M	63L	71S	71M	71L	80S	80M
				2				
2.81	21	39	51	52	76	112	84	124
3.94	30	55	72	73	107	158	119	177
4.52	35	63	83	84	123	182	136	200
5.22	40	73	96	97	142	210	157	230
5.75	44	81	105	107	157	230	173	255
6.75	52	95	124	126	184	270	200	300
7.15	55	100	131	133	195	285	215	320
8.12	63	114	149	152	220	325	245	360
9.00	69	127	165	168	245	360	270	>385
10.61	82	149	195	198	290		320	
12.09	94	170		225				
12.73	98	179		235				
13.44	99	179	230	235	345	>405	385	>405
15.44	113	205	265	270	400	>410	>410	>410
17.83	131	235	310	315	>410	>410	>410	>410
19.62	144	260	340	345	>410	>410	>410	>410
23.04	169	305	400	405	>410	>410	>410	>410
24.40	179	325	>410	>410	>410	>410	>410	>410
27.73	200	370	>410	>410	>410	>410	>410	>410
30.72	225	>410	>410	>410	>410	>410	>410	>410
36.22	265	>410	>410	>410	>410		>410	
41.28	300	>410		>410				
43.45	320	>410		>410				
49.69	365							
58.24								

(→ 183)

K39, m kg								
	CM3C							
s	63S	63M	63L	71S	71M	71L	80S	80M
2	20	22	23	23	24	27	27	29
KF: + 1.5 kg / KA: + -1.0 kg / KAF: + 0.50 kg								

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CM3C..				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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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K39 2	2.81	170	255	285	1601	7.9	2870	2460	2180	2180	7500	6260	7500	7500
	3.94	215	320	365	1142	4.6	3070	2630	2260	2260	7500	6180	7500	7500
	4.52	240	360	405	951	3.6	3130	2680	1730	1730	7500	6130	7500	7500
	5.22	260	390	440	770	2.9	3240	2770	960	960	7500	6090	7500	7500
	5.75	275	410	465	654	2.5	3300	2830	290	290	7470	6060	7500	7500
	6.75	300	435	510	481	2.0	3430	2940	0	0	7300	6020	7500	7500
	7.15	300	435	510	478	1.8	3530	3020	157	157	7300	6020	7500	7500
	8.12	300	385	510	477	1.4	3760	3220	2080	2080	7500	6090	7500	7500
	9.00	300	385	510	473	1.2	3950	3380	2860	2860	7500	6090	7500	7500
	10.61	285	370	485	424	0.91	4360	3730	3250	3250	7500	6110	7500	7500
	12.09	255	295	430	372	0.65	4790	4110	3700	3700	7500	6210	7500	7500
	12.73	250	295	425	353	0.58	4930	4220	3830	3830	7500	6210	7500	7500
	13.44	270	405	455	137	2.6	4160	3560	2830	2830	7500	5980	7500	7500
	15.44	280	410	475	119	2.2	4380	3750	2990	2990	7490	5960	7500	7500
	17.83	290	410	490	103	1.8	4630	3960	3180	3180	7490	5960	7500	7500
	19.62	295	410	500	97	1.5	4820	4120	3330	3330	7490	5960	7500	7500
	23.04	300	410	510	89	1.3	5180	4440	3630	3630	7490	5960	7500	7500
	24.40	300	410	510	89	1.2	5330	4560	3760	3760	7490	5960	7500	7500
	27.73	300	410	510	88	0.95	5670	4860	4070	4070	7490	5960	7500	7500
	30.72	300	410	510	88	0.82	5960	5100	4320	4320	7490	5960	7500	7500
	36.22	300	410	510	87	0.65	6440	5520	4740	4740	7490	5960	7500	7500
	41.28	300	410	510	86	0.44	6840	5860	5100	5100	7490	5960	7500	7500
	43.45	300	410	510	86	0.39	7000	6000	5240	5240	7490	5960	7500	7500
	49.69	300	410	510	86	0.32	7440	6150	5630	5630	7490	5960	7500	7500
	58.24	300	410	510	77	0.26	7500	6150	6110	6110	7490	5960	7500	7500

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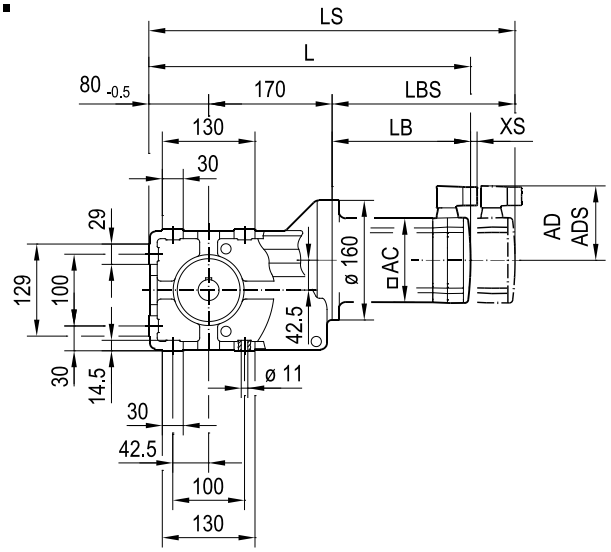
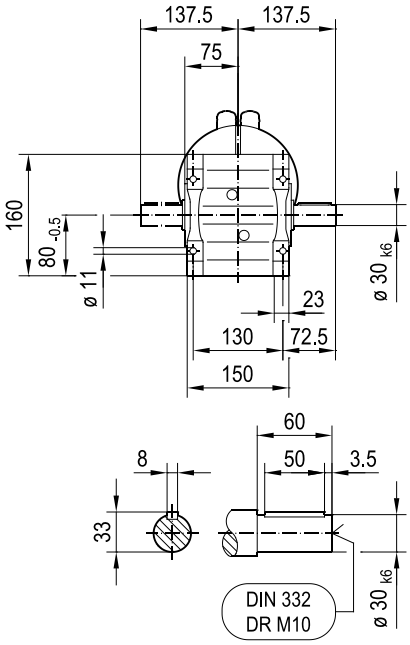
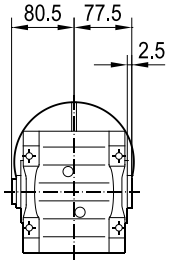
33 042 00 19

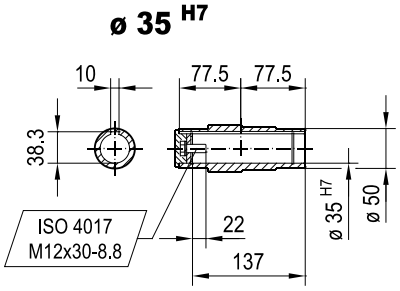
K39..

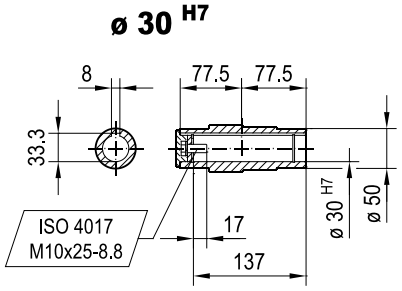




KA39B..







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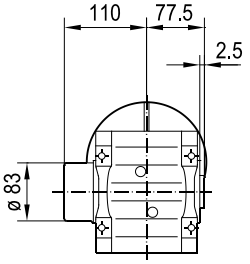

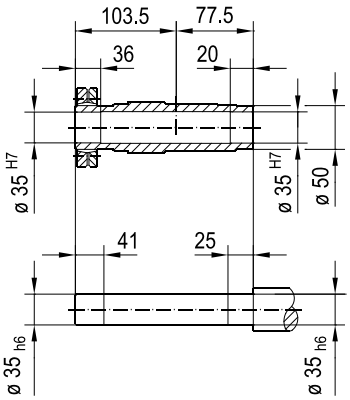

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	394	432	470	431	453	498	463	489
LS	435	473	511	497	519	564	531	557
LB	144	182	220	181	203	248	213	239
LBS	185	223	261	247	269	314	281	307
XS	13	13	13	7	7	7	47	47

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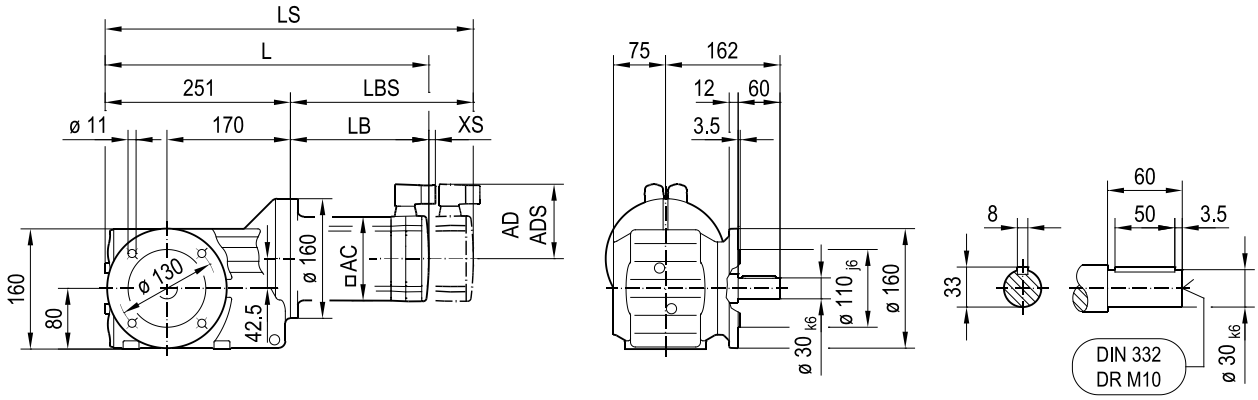
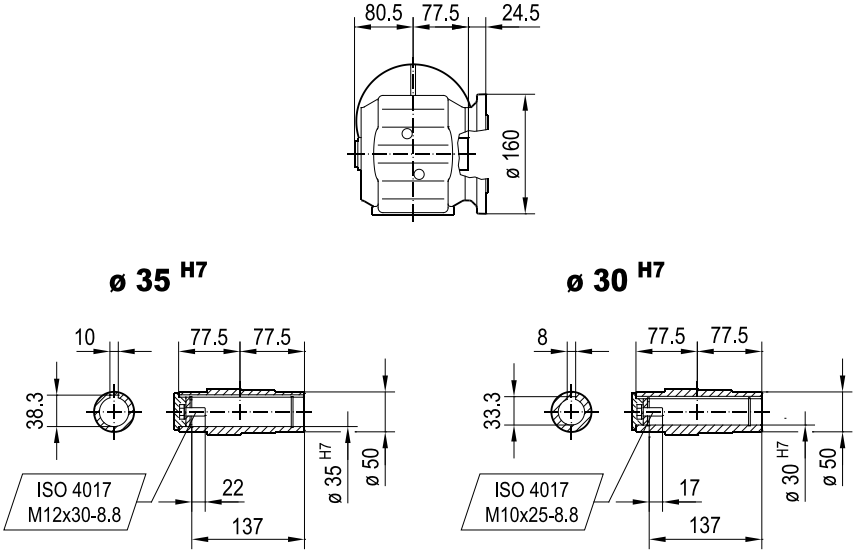
33 043 00 19

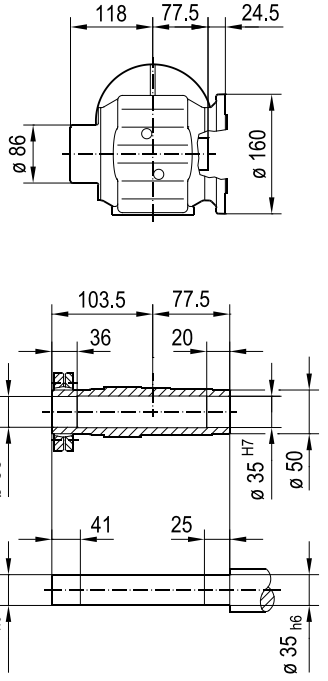
KF39..



KAF39..



KHF39..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	395	433	471	432	454	499	464	490
LS	436	474	512	498	520	565	532	558
LB	144	182	220	181	203	248	213	239
LBS	185	223	261	247	269	314	281	307
XS	13	13	13	7	7	7	47	47

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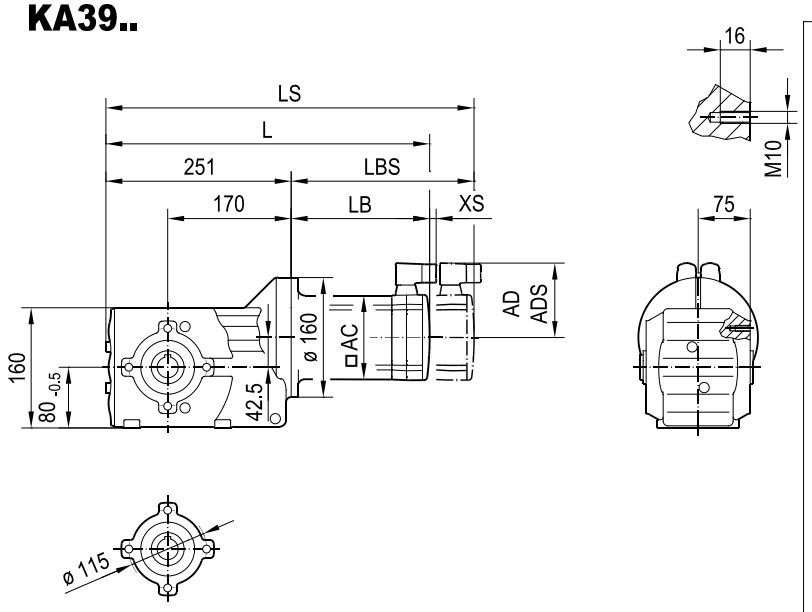
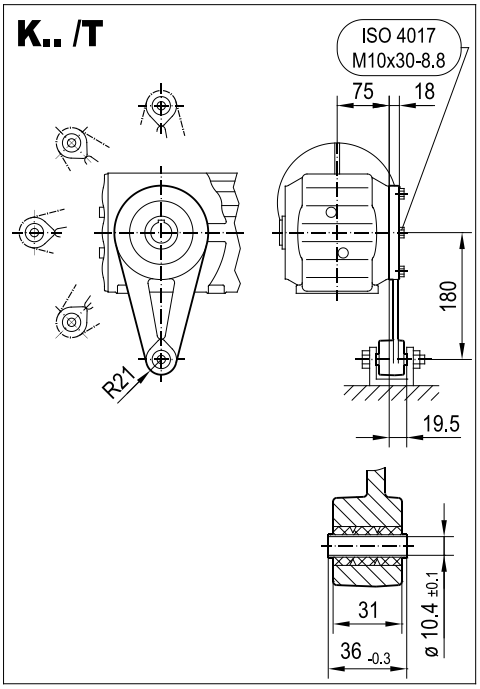
33 044 00 19

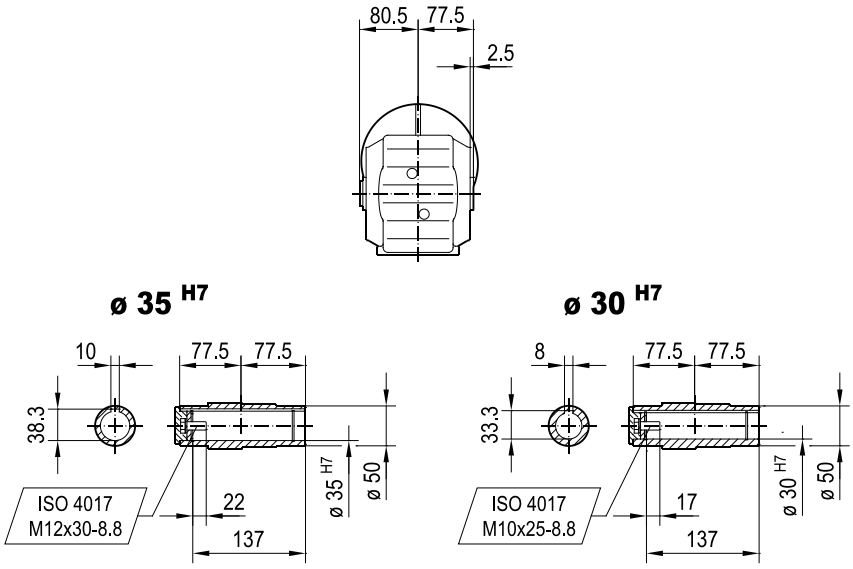
KA39..



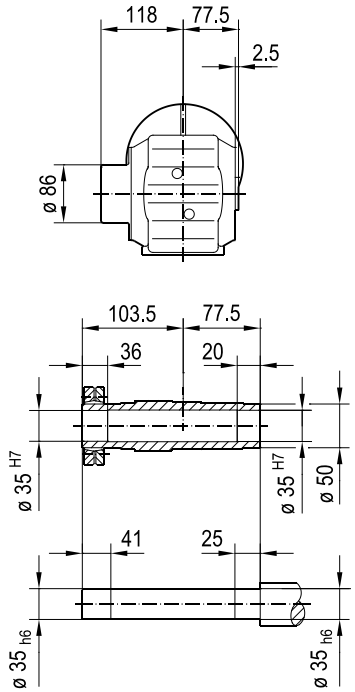
K.. /T



KA39..



KH39..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	395	433	471	432	454	499	464	490
LS	436	474	512	498	520	565	532	558
LB	144	182	220	181	203	248	213	239
LBS	185	223	261	247	269	314	281	307
XS	13	13	13	7	7	7	47	47

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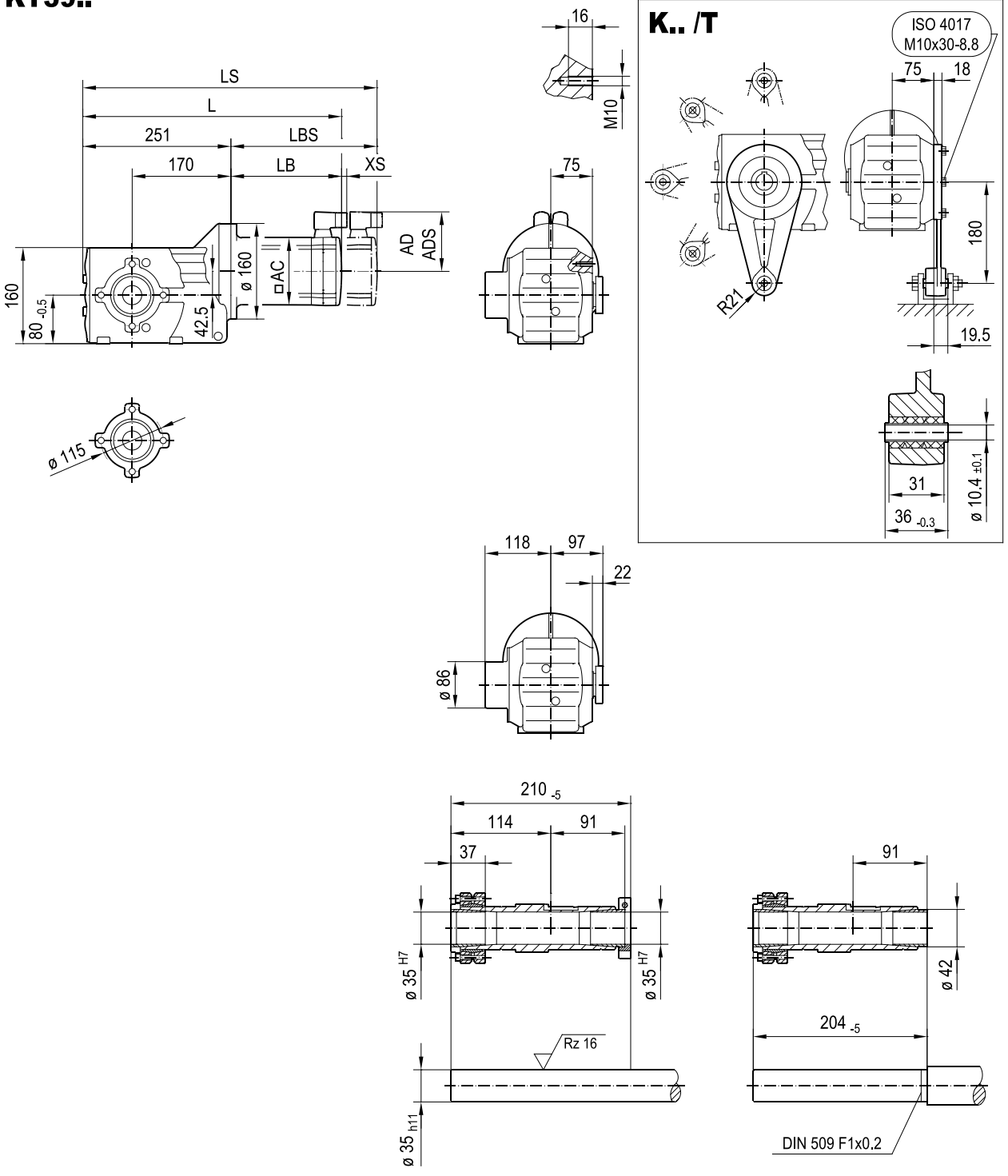
33 045 00 19

KT39..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	395	433	471	432	454	499	464	490
LS	436	474	512	498	520	565	532	558
LB	144	182	220	181	203	248	213	239
LBS	185	223	261	247	269	314	281	307
XS	13	13	13	7	7	7	47	47

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10.2.5 K47..

K47, M_{aDyn} Nm								400 Nm
	CM3C							
i	63S	63M	63L	71S	71M	71L	80S	80M
				3				
4.64	36	65	85	86	126	187	140	205
5.81	45	81	107	108	158	230	175	260
6.58	51	92	121	123	180	265	198	295
7.36	57	103	135	137	200	295	220	>310
8.56	66	120	157	160	230	>310	255	>310
9.10	70	128	167	170	245	>310	275	>310
10.56	82	149	194	197	285	>315	>315	>315
11.77	91	166	215	220	>315	>315	>315	>315
12.19	94	172	220	225	330	>435	365	>435
13.65	106	192	250	255	370	>435	410	>435
15.86	123	220	290	295	430	>435	>435	>435
16.86	131	235	310	315	>435	>435	>435	>435
19.58	152	275	360	365	>435	>435	>435	>435
21.81	169	305	400	405	>435	>435	>435	>435
24.06	187	335		>435				
25.91	200	365	>435	>435	>435		>435	
29.32	225	410		>435				
31.30	240	>435		>435				
35.39	265	>435	>435	>435	>435	>435	>435	>435
39.61	300	>435	>435	>435	>435	>435	>435	>435
46.03	350	>435	>435	>435	>435	>435	>435	>435
48.95	370	>435	>435	>435	>435	>435	>435	>435
56.83	430	>435	>435	>435	>435	>435	>435	>435
63.30	>435	>435	>435	>435	>435	>435	>435	>435
69.84	>435	>435		>435				
75.20	>435	>435	>435	>435	>435		>435	
85.12	>435	>435		>435				
90.86	>435	>435		>435				
104.37	>435							
121.48								
131.87								

(→ 183)

K47, m kg								
	CM3C							
s	63S	63M	63L	71S	71M	71L	80S	80M
3	21	23	24	24	26	28	28	31
KF: + 3.2 kg / KA: + -0.85 kg / KAF: + 2.0 kg								

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CM3C..				c_{TG}				φ
		n_{epk}	η	K	KF	KA	KAF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
K47 3	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
	24.06	4500	96	33	29	90	90	8
	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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K47 3	4.64	205	300	345	321	4.4	2980	2970	2040	2040	7060	7060	9620	10000
	5.81	230	305	390	269	3.6	3140	3140	2100	2100	7020	7020	9570	10000
	6.58	240	310	405	242	2.8	3270	3270	2190	2190	6970	6970	9520	10000
	7.36	250	310	425	226	2.3	3380	3390	2270	2270	6970	6970	9520	10000
	8.56	270	310	455	186	1.8	3500	3520	2310	2310	6970	6970	9520	10000
	9.10	280	310	475	170	1.6	3540	3560	2310	2310	6970	6970	9520	10000
	10.56	280	315	475	177	1.2	3830	3840	2580	2580	6920	6920	9470	10000
	11.77	280	315	475	184	1.0	4060	4050	2770	2770	6920	6920	9470	10000
	12.19	350	435	595	284	2.4	3720	3770	2330	2330	900	900	8510	10000
	13.65	360	435	610	259	2.0	3890	3940	2450	2450	900	900	8510	10000
	15.86	380	435	645	216	1.6	4080	4130	2570	2570	900	900	8510	10000
	16.86	380	435	645	216	1.4	4220	4270	2690	2690	900	900	8510	10000
	19.58	400	435	680	182	1.1	4440	4480	2820	2820	900	900	8510	10000
	21.81	400	435	680	182	0.91	4710	4740	3070	3070	900	900	8510	10000
	24.06	400	435	680	182	0.75	4970	4990	3300	3300	900	900	8510	10000
	25.91	400	435	680	174	0.68	5170	5180	3470	3470	900	900	8510	10000
	29.32	400	435	680	153	0.55	5520	5500	3780	3780	900	900	8510	10000
	31.30	400	435	680	144	0.50	5700	5680	3940	3940	900	900	8510	10000
	35.39	400	435	680	96	1.3	5920	5920	4270	4270	900	900	8510	10000
	39.61	400	435	680	98	1.1	5920	5920	4580	4580	900	900	8510	10000
	46.03	400	435	680	98	0.88	5920	5920	5000	5000	900	900	8510	10000
	48.95	400	435	680	92	0.80	5920	5920	5190	5190	900	900	8510	10000
	56.83	400	435	680	79	0.64	5920	5920	5640	5640	900	900	8510	10000
	63.30	400	435	680	71	0.54	5920	5920	5990	5990	900	900	8510	10000
	69.84	400	435	680	64	0.45	5920	5920	6320	6320	900	900	8510	10000
	75.20	400	435	680	60	0.42	5920	5920	6570	6570	900	900	8510	10000
	85.12	400	435	680	53	0.35	5920	5920	7000	7000	900	900	8510	10000
	90.86	400	435	680	50	0.32	5920	5920	7240	7240	900	900	8510	10000
	104.37	400	435	680	43	0.26	5920	5920	7760	7760	900	900	8510	10000
	121.48	400	435	680	37	0.21	5920	5920	8360	8360	900	900	8510	10000
	131.87	400	435	680	34	0.18	5920	5920	8700	8700	900	900	8510	10000

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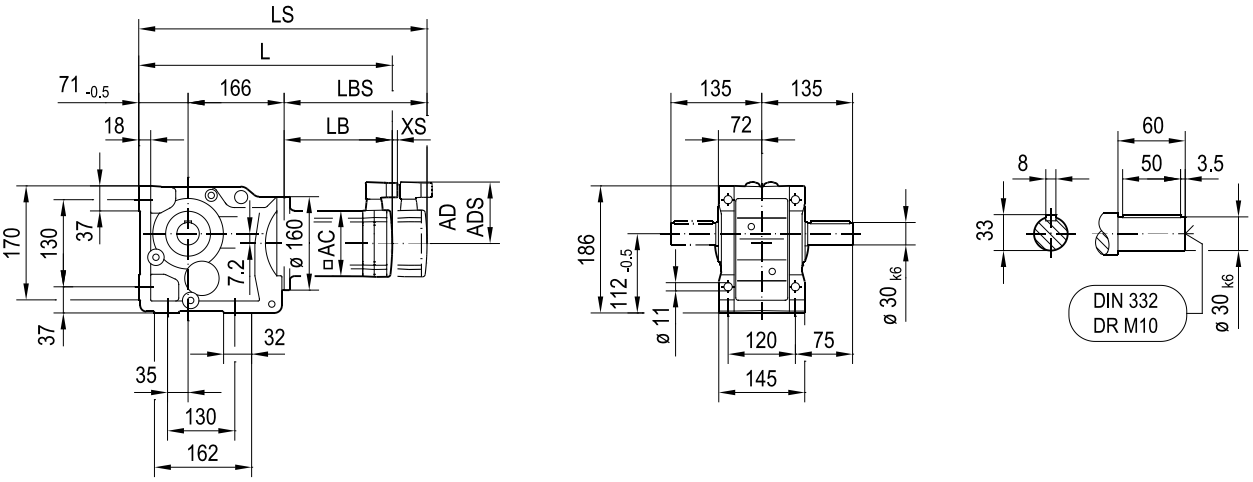
K47..

33 046 00 19



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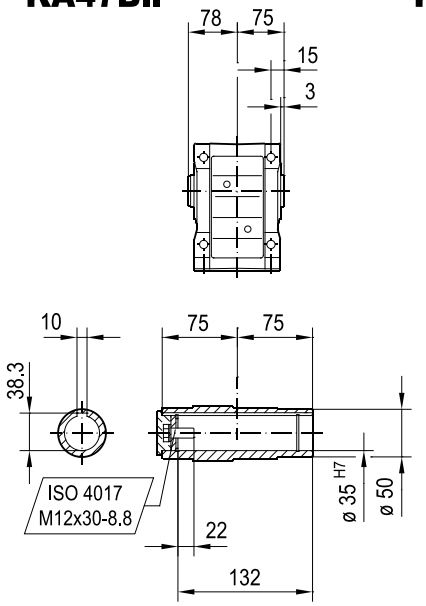

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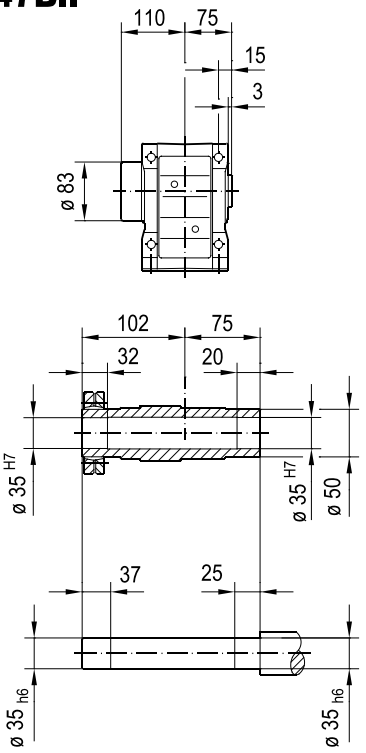

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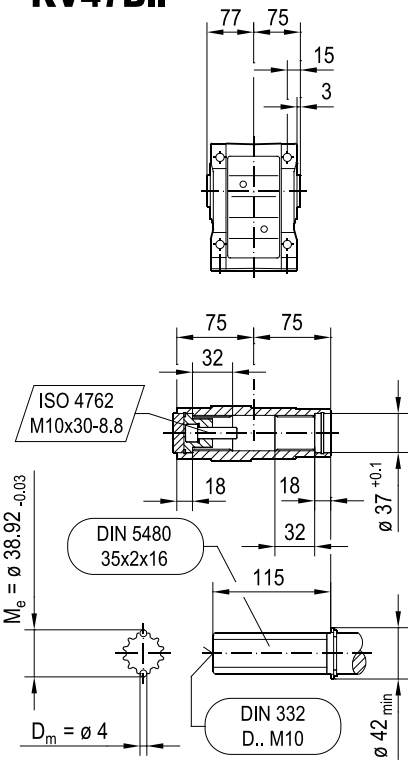

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	381	419	457	418	440	485	450	476
LS	422	460	498	484	506	551	518	544
LB	144	182	220	181	203	248	213	239
LBS	185	223	261	247	269	314	281	307
XS	13	13	13	7	7	7	47	47

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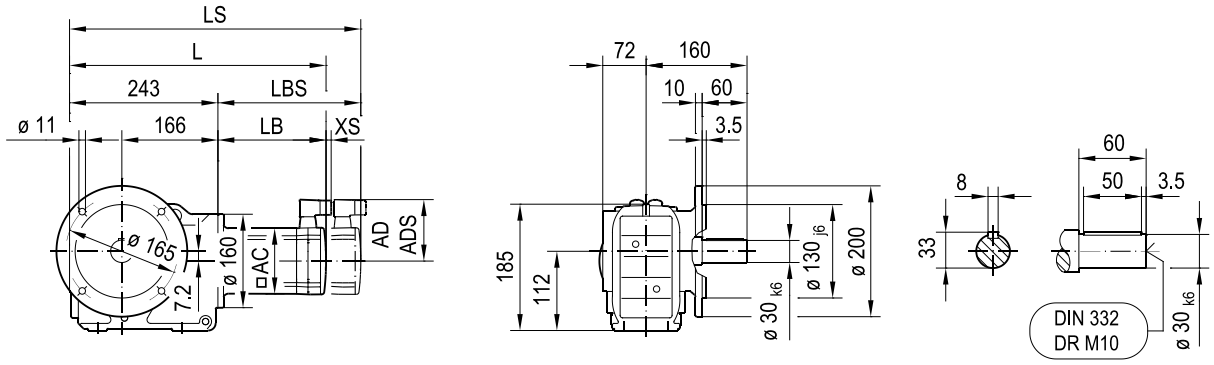
33 047 00 19

KF47..



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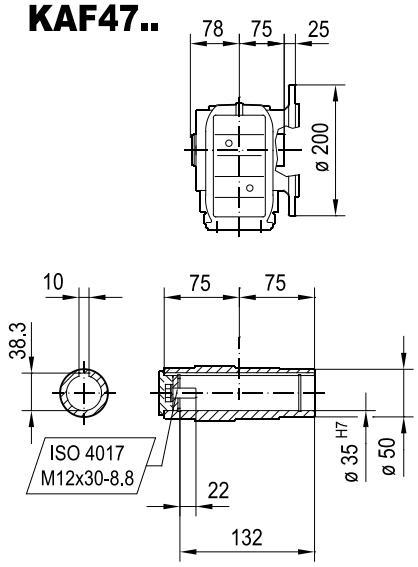

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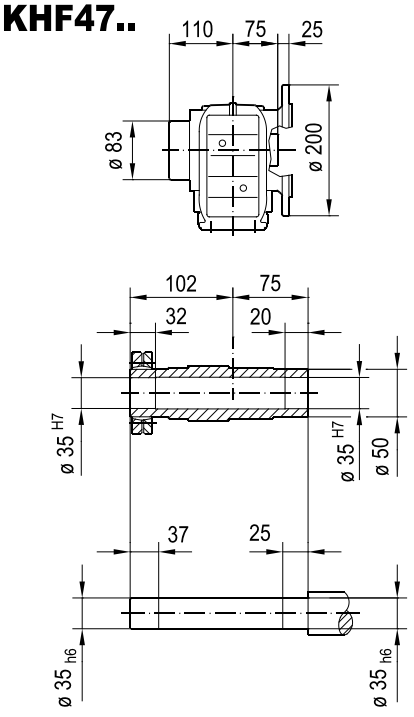

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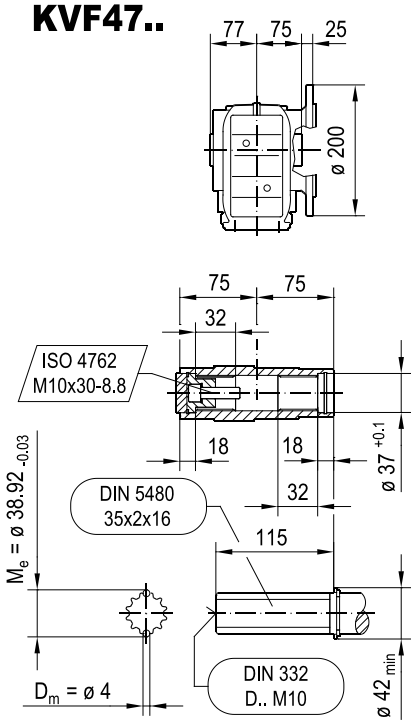

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	387	425	463	424	446	491	456	482
LS	428	466	504	490	512	557	524	550
LB	144	182	220	181	203	248	213	239
LBS	185	223	261	247	269	314	281	307
XS	13	13	13	7	7	7	47	47

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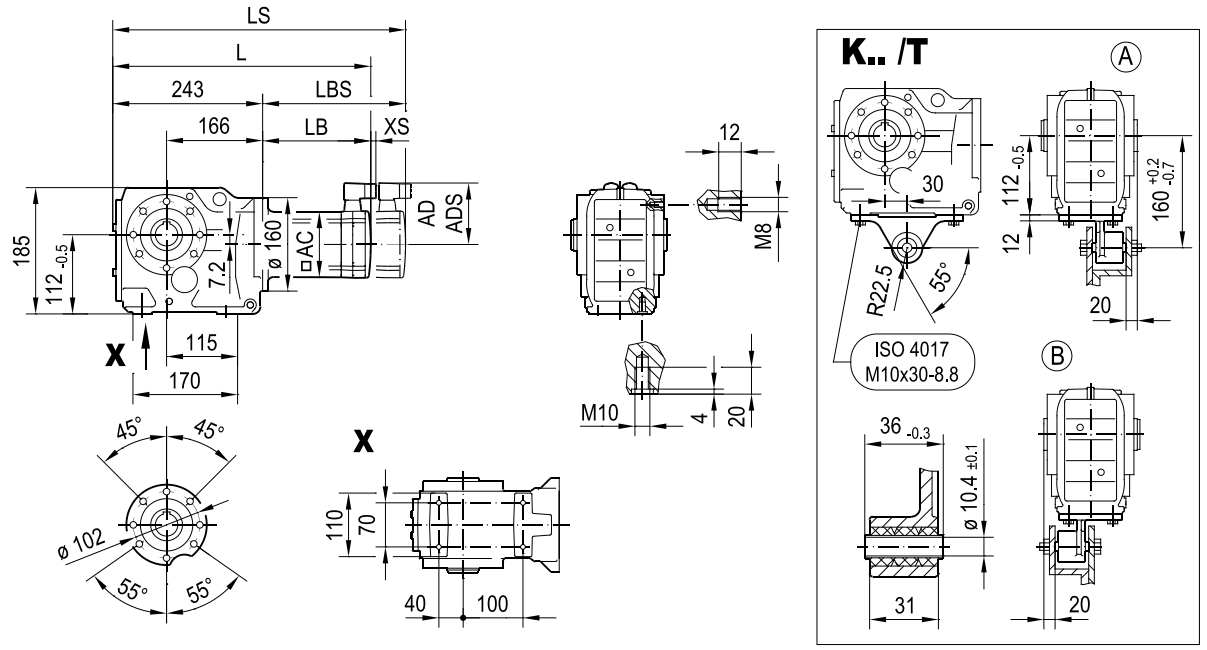
KA47..

33 048 00 19



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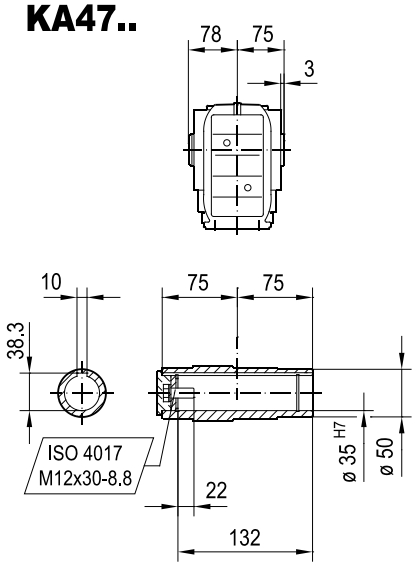

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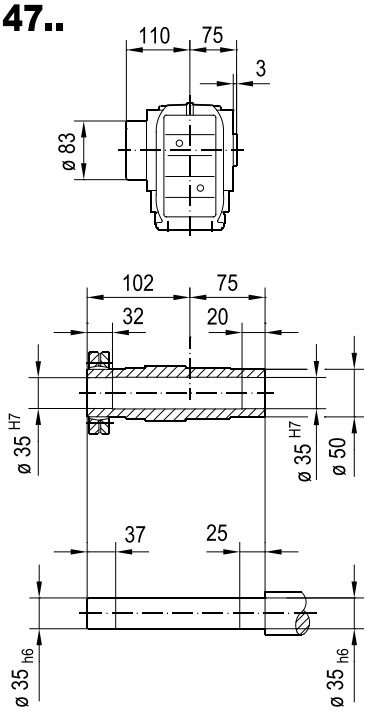

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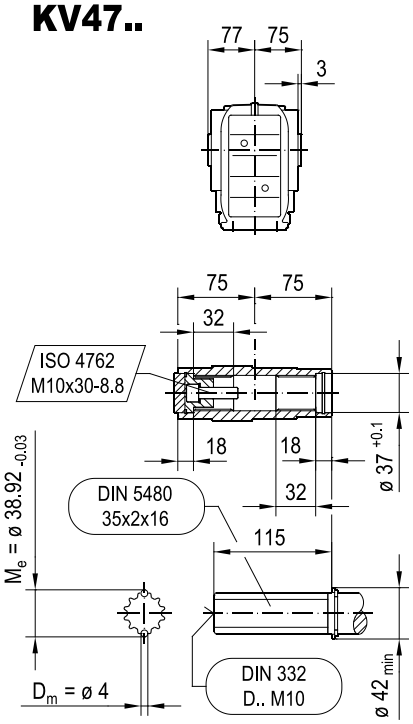

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	387	425	463	424	446	491	456	482
LS	428	466	504	490	512	557	524	550
LB	144	182	220	181	203	248	213	239
LBS	185	223	261	247	269	314	281	307
XS	13	13	13	7	7	7	47	47

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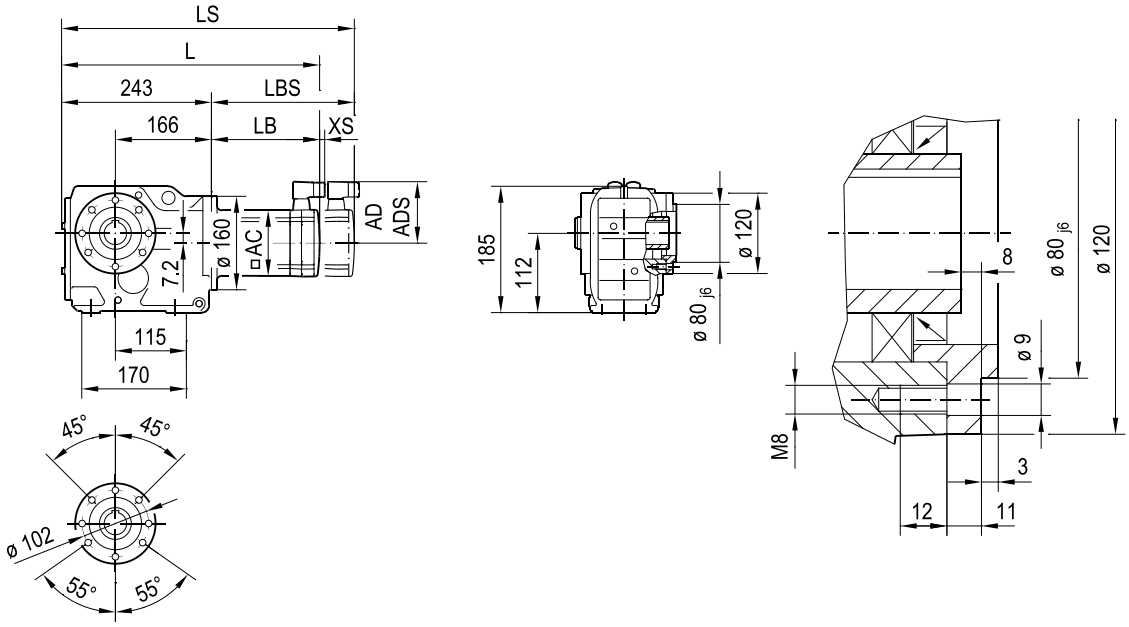
KAZ47..

33 049 00 19



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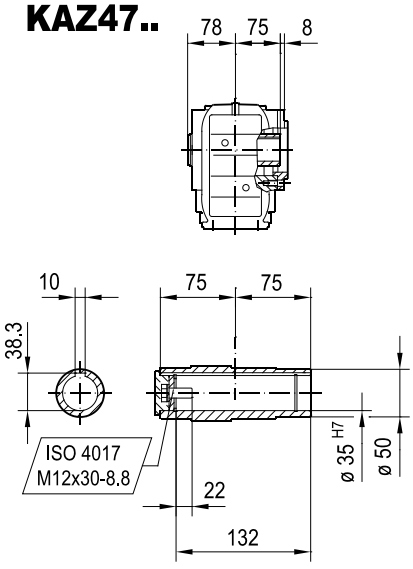

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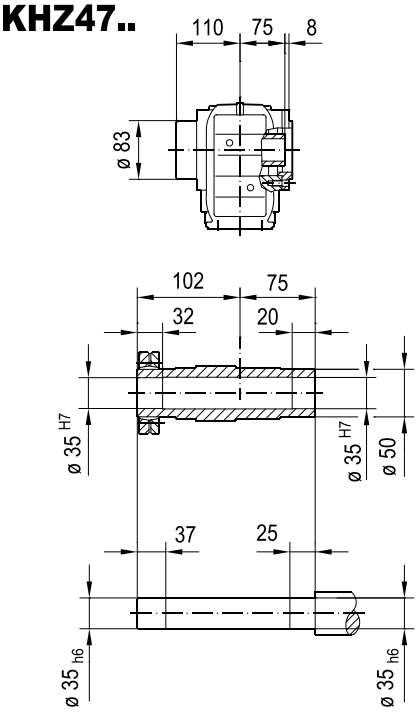

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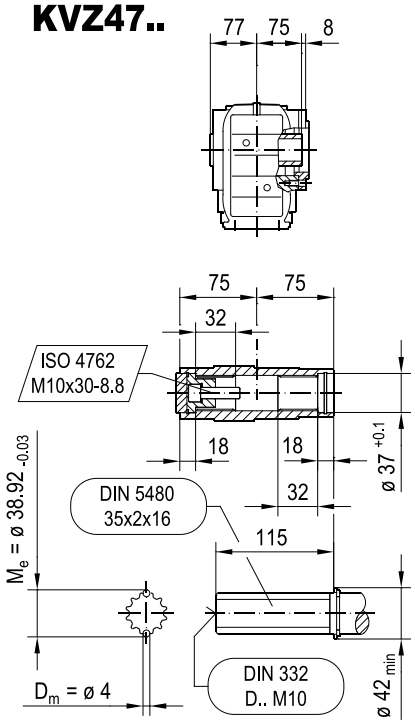

(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	387	425	463	424	446	491	456	482
LS	428	466	504	490	512	557	524	550
LB	144	182	220	181	203	248	213	239
LBS	185	223	261	247	269	314	281	307
XS	13	13	13	7	7	7	47	47

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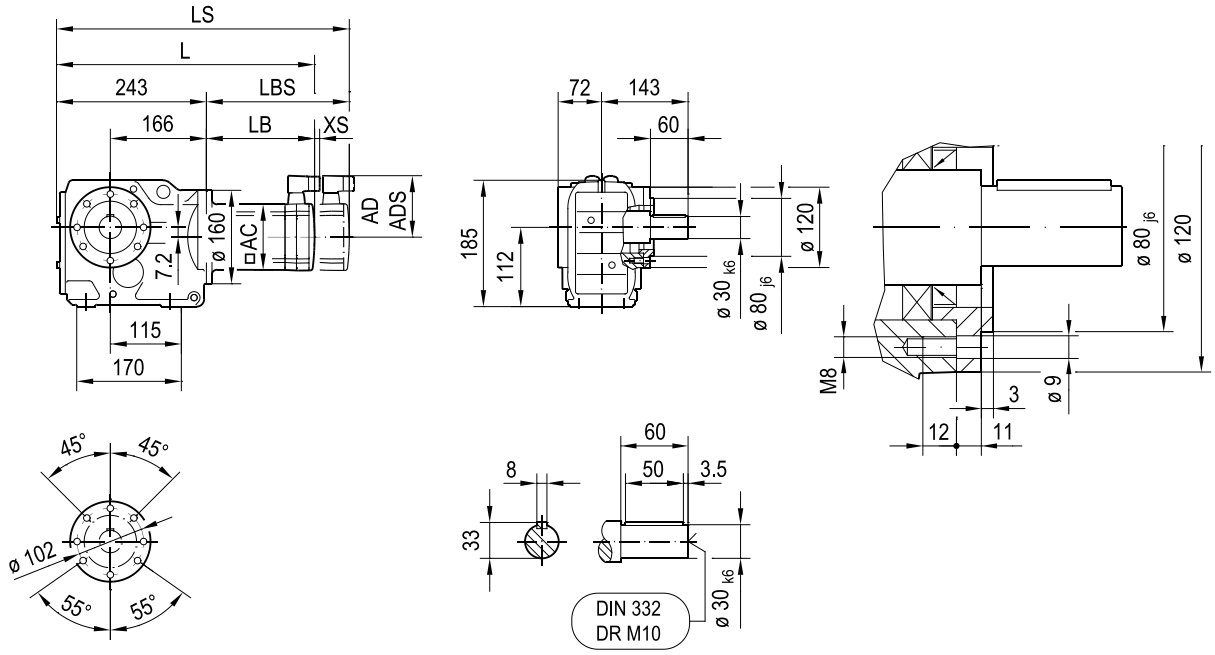
KZ47..

33 050 00 19



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	387	425	463	424	446	491	456	482
LS	428	466	504	490	512	557	524	550
LB	144	182	220	181	203	248	213	239
LBS	185	223	261	247	269	314	281	307
XS	13	13	13	7	7	7	47	47

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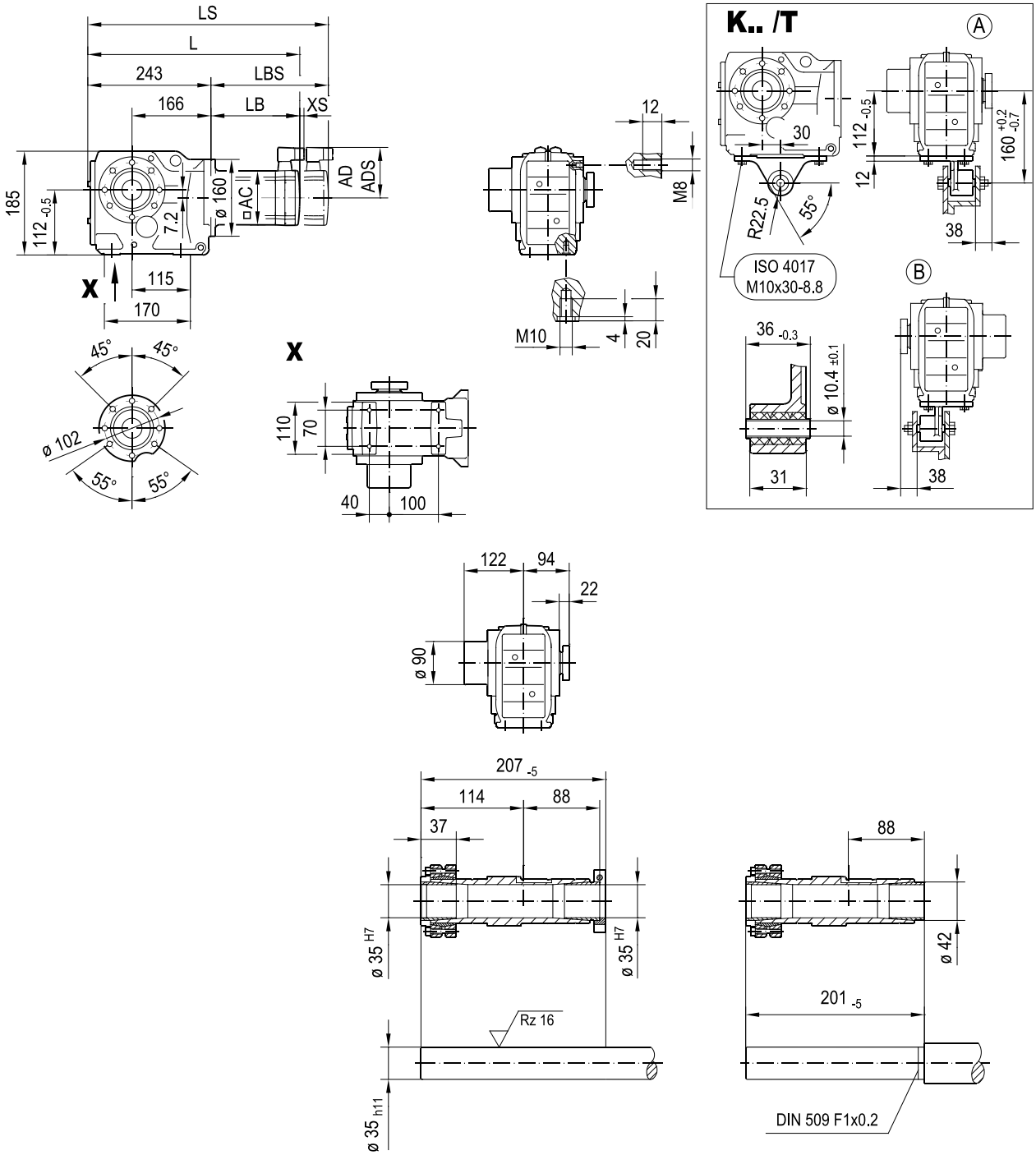
KT47..

33 051 00 19



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	387	425	463	424	446	491	456	482
LS	428	466	504	490	512	557	524	550
LB	144	182	220	181	203	248	213	239
LBS	185	223	261	247	269	314	281	307
XS	13	13	13	7	7	7	47	47

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10.2.6 K49..

K49, M_{aDyn} Nm								500 Nm
	CM3C							
i	71S	71M	71L	80S	80M	80L	100S	100M
				2				
4.00	74	109	161	120	179	260	215	305
4.69	87	128	189	141	210	305	255	360
5.29	99	144	210	159	235	345	285	405
5.99	112	163	240	181	265	390	325	460
6.83	127	186	275	205	305	445	370	525
7.58	141	205	305	225	340	495	410	585
8.66	162	235	345	260	385	565	470	>605
9.14	171	250	365	275	410	600	500	>605
10.42	195	285	420	315	465			
11.37	210	310	455	340	510			
13.38	240	350	515	385	575	>605	>605	>605
15.67	280	410	>605	450	>605	>605	>605	>605
17.67	315	460	>605	510	>605	>605	>605	>605
20.03	355	525	>605	580	>605	>605	>605	>605
22.83	405	595	>605	>605	>605	>605	>605	>605
25.34	450	>605	>605	>605	>605	>605	>605	>605
28.95	515	>605	>605	>605	>605	>605	>605	>605
30.55	545	>605	>605	>605	>605	>605	>605	>605
34.81	>605	>605	>605	>605	>605			
37.98	>605	>605	>605	>605	>605			
44.44	>605	>605		>605				
50.29	>605							
52.94	>605							
60.27								
70.19								
75.20								

(→ 183)

K49, m kg								
	CM3C							
s	71S	71M	71L	80S	80M	80L	100S	100M
2	35	36	39	39	42	47	45	48
KF: + 1.7 kg / KA: + -2.8 kg / KAF: + 2.1 kg								

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CM3C..				c_{TG}			
		n_{epk}	η	K	KF	KA	KAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K49 2	4.00	440	605	745	505	11	3110	2390	0	0	9000	9000	9000	9000
	4.69	465	605	790	437	8.8	3270	2600	0	0	9000	9000	9000	9000
	5.29	485	605	820	391	7.2	3400	2770	0	0	9000	9000	9000	9000
	5.99	500	605	850	361	5.9	3570	3030	0	0	9000	9000	9000	9000
	6.83	500	605	850	360	4.8	3840	3250	0	0	9000	9000	9000	9000
	7.58	500	605	850	361	4.1	4050	3440	1030	1030	9000	9000	9000	9000
	8.66	500	605	850	361	3.3	4340	3680	3790	3790	9000	9000	9000	9000
	9.14	500	605	850	361	3.1	4460	3780	3910	3910	9000	9000	9000	9000
	10.42	480	585	810	402	2.4	4860	4120	4330	4330	9000	9000	9000	9000
	11.37	495	605	840	370	2.1	5000	4240	4450	4450	9000	9000	9000	9000
	13.38	470	605	795	138	6.5	4320	3660	3510	3510	9000	9000	9000	9000
	15.67	490	605	830	117	5.2	4590	3890	3750	3750	9000	9000	9000	9000
	17.67	500	605	850	108	4.4	4860	4120	3990	3990	9000	9000	9000	9000
	20.03	500	605	850	107	3.7	5220	4420	4350	4350	9000	9000	9000	9000
	22.83	500	605	850	106	3.1	5610	4750	4750	4750	9000	9000	9000	9000
	25.34	500	605	850	104	2.8	5940	5030	5070	5070	9000	9000	9000	9000
	28.95	500	605	850	103	2.3	6370	5400	5510	5510	9000	9000	9000	9000
	30.55	500	605	850	102	2.1	6550	5550	5690	5690	9000	9000	9000	9000
	34.81	500	605	850	102	1.7	7000	5930	6140	6140	9000	9000	9000	9000
	37.98	500	605	850	102	1.5	7310	6200	6450	6450	9000	9000	9000	9000
	44.44	500	605	850	101	1.2	7900	6690	7040	7040	9000	9000	9000	9000
	50.29	500	605	850	89	0.83	8380	7100	7530	7530	9000	9000	9000	9000
	52.94	500	605	850	85	0.75	8590	7280	7730	7730	9000	9000	9000	9000
	60.27	500	605	850	75	0.61	9000	7740	8280	8280	9000	9000	9000	9000
	70.19	445	605	755	64	0.50	9000	8630	9000	9000	9000	9000	9000	9000
	75.20	475	605	800	60	0.43	9000	8720	9000	9000	9000	9000	9000	9000

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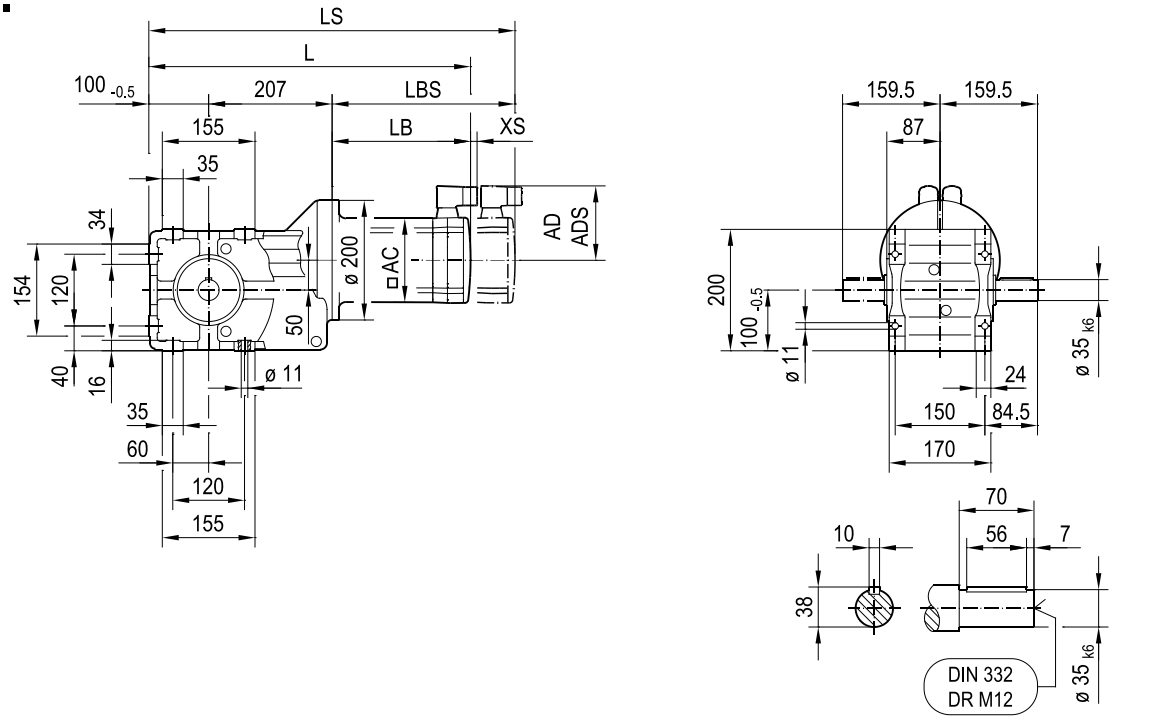
33 052 00 19

K49..



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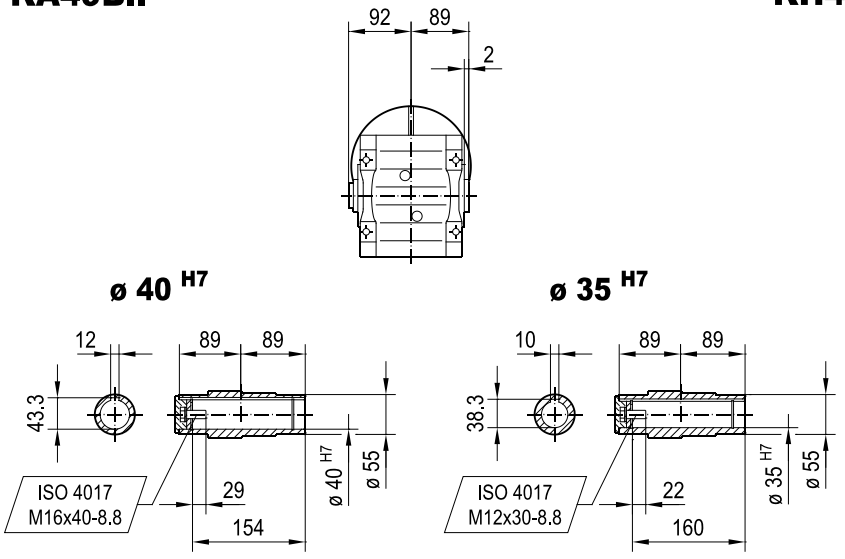

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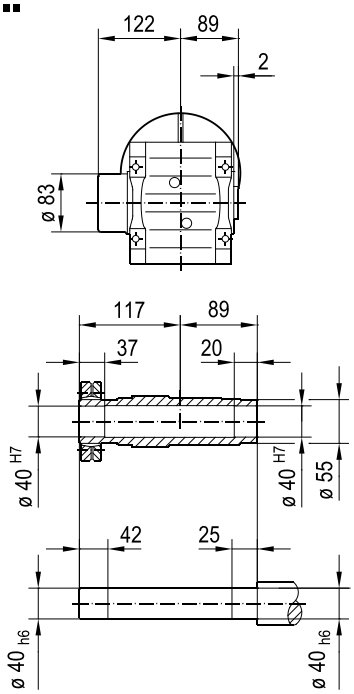

(→ 📖 7.3)	CM3C							
	71S	71M	71L	80S	80M	80L	100S	100M
AC	118	118	118	140	140	140	165	165
AD	105	105	105	127	127	127	140	140
ADS	105	105	105	127	127	127	140	140
L	480	502	547	512	538	591	538	566
LS	546	568	613	580	606	659	612	640
LB	173	195	240	205	231	284	231	259
LBS	239	261	306	273	299	352	305	333
XS	7	7	7	47	47	47	6	6

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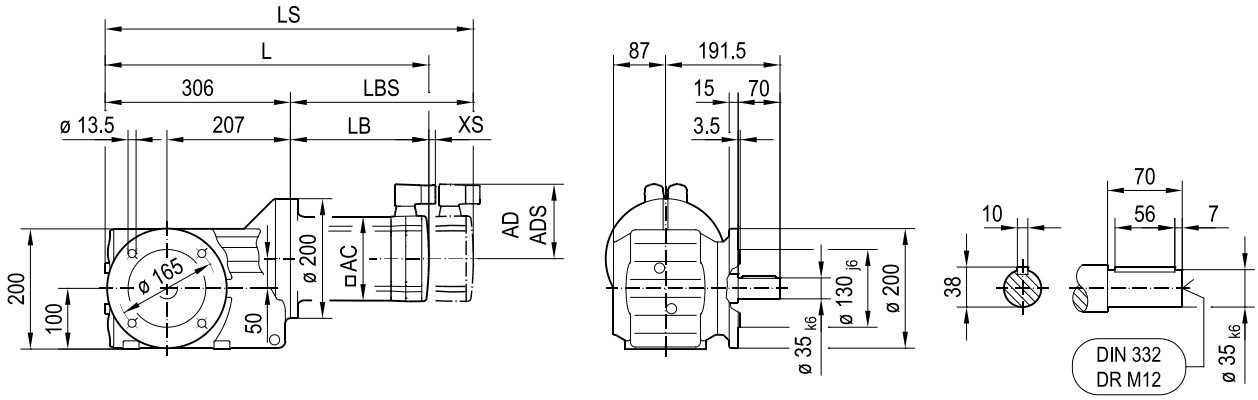
33 053 00 19

KF49..



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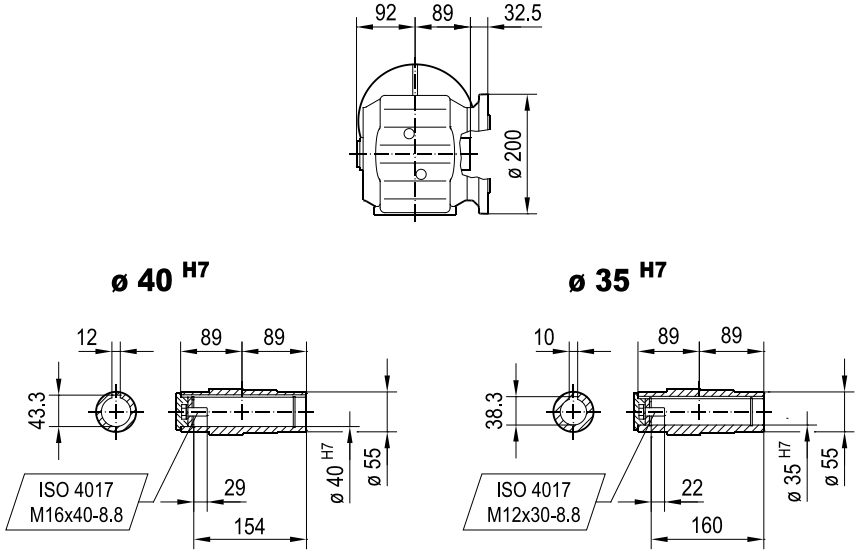

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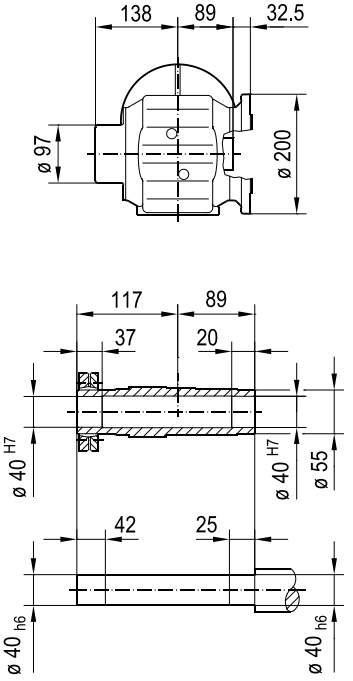

(→ 📖 7.3)	CM3C							
	71S	71M	71L	80S	80M	80L	100S	100M
AC	118	118	118	140	140	140	165	165
AD	105	105	105	127	127	127	140	140
ADS	105	105	105	127	127	127	140	140
L	479	501	546	511	537	590	537	565
LS	545	567	612	579	605	658	611	639
LB	173	195	240	205	231	284	231	259
LBS	239	261	306	273	299	352	305	333
XS	7	7	7	47	47	47	6	6

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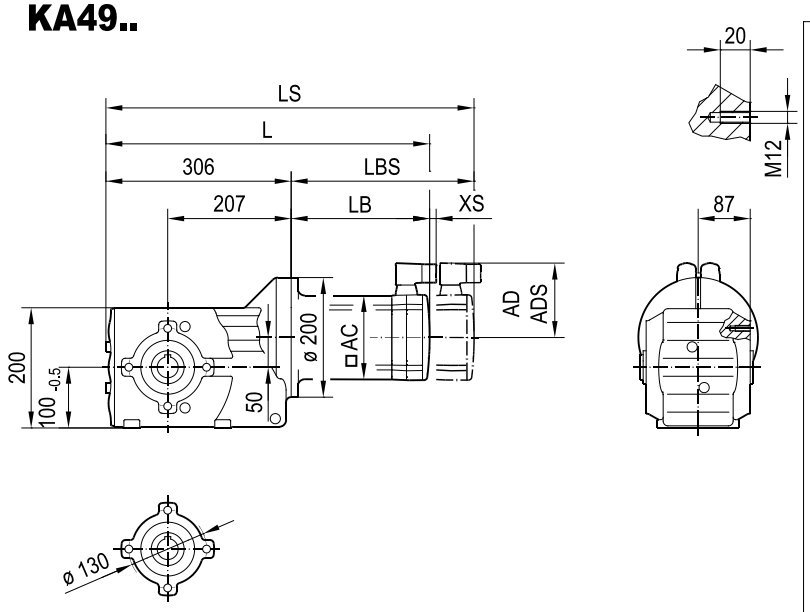
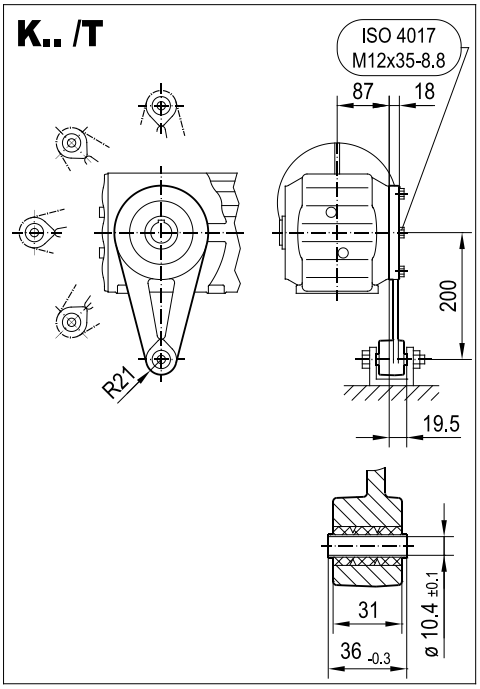
KA49..



K.. /T



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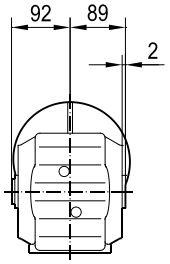
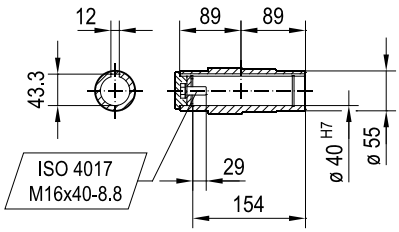
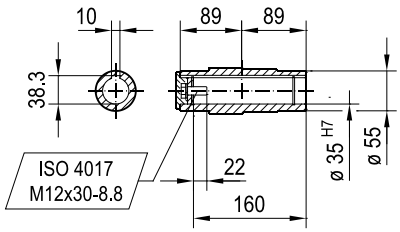


ø 40 H7



ø 35 H7



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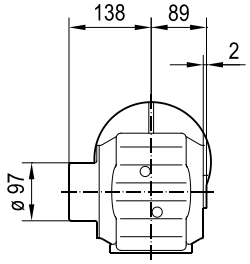

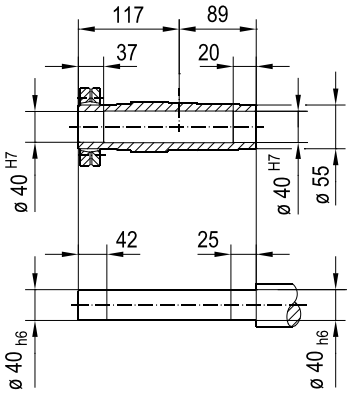

(→ 📖 7.3)	CM3C							
	71S	71M	71L	80S	80M	80L	100S	100M
AC	118	118	118	140	140	140	165	165
AD	105	105	105	127	127	127	140	140
ADS	105	105	105	127	127	127	140	140
L	479	501	546	511	537	590	537	565
LS	545	567	612	579	605	658	611	639
LB	173	195	240	205	231	284	231	259
LBS	239	261	306	273	299	352	305	333
XS	7	7	7	47	47	47	6	6

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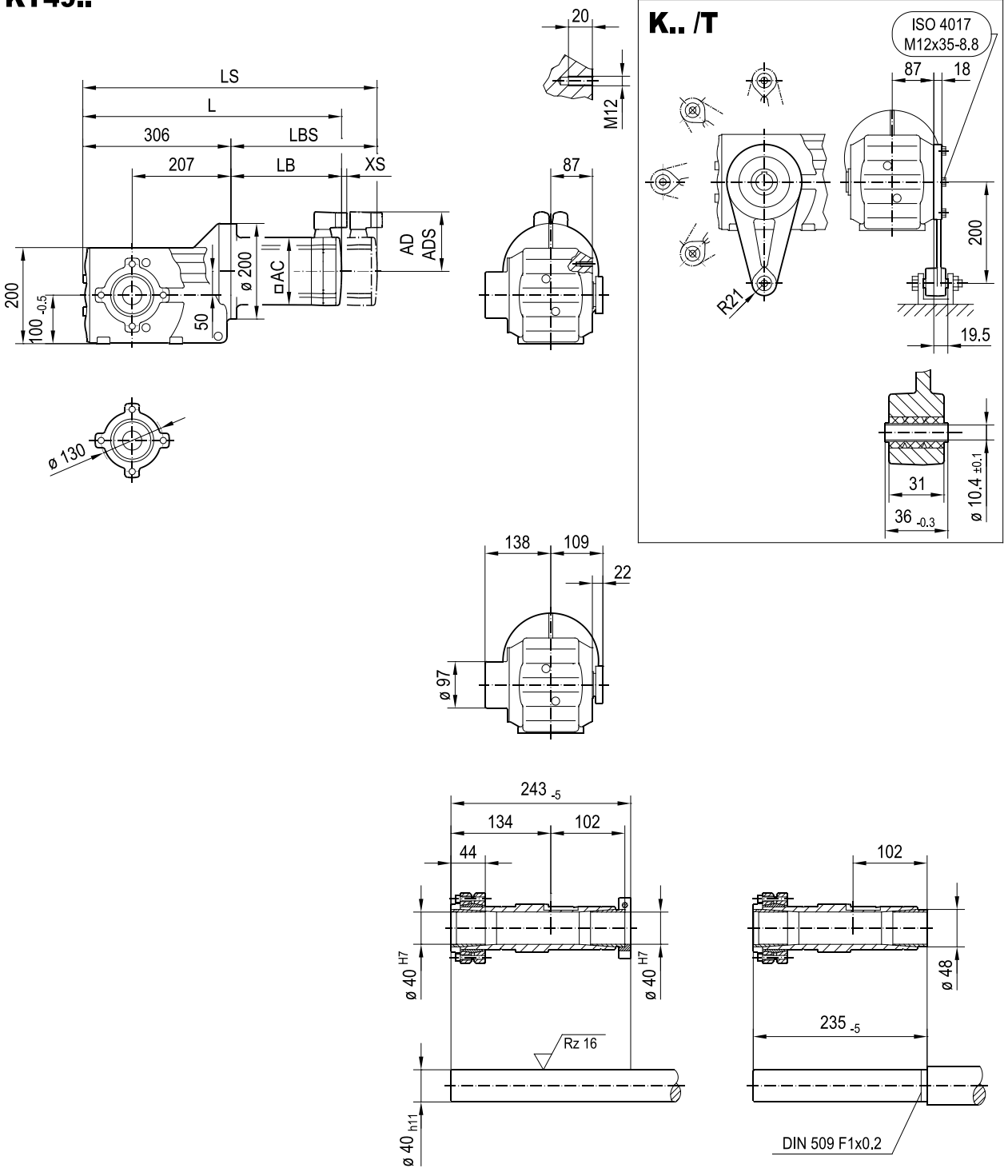
KT49..



(→ 7.3)	CM3C							
	71S	71M	71L	80S	80M	80L	100S	100M
AC	118	118	118	140	140	140	165	165
AD	105	105	105	127	127	127	140	140
ADS	105	105	105	127	127	127	140	140
L	479	501	546	511	537	590	537	565
LS	545	567	612	579	605	658	611	639
LB	173	195	240	205	231	284	231	259
LBS	239	261	306	273	299	352	305	333
XS	7	7	7	47	47	47	6	6

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10.2.7 K57..

K57, M_{aDyn} Nm											600 Nm
	CM3C										
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
						3					
4.69	36	66	86	87	128	189	141	210	305	255	360
6.57	51	92	121	122	179	260	198	295	430	355	505
7.55	58	106	139	141	205	300	225	335	495	410	>545
8.71	67	122	160	163	235	350	260	390	570	475	>585
9.59	74	135	176	179	260	385	290	430	>585	520	>585
11.26	87	158	205	210	305	450	340	505	>585	>585	>585
11.92	92	168	215	220	325	480	360	535	>585	>585	>585
13.25	103	186	240	245	360	530	400	595	>665	>665	>665
15.22	118	210	280	280	415	610	460	>665	>665	>665	>665
17.57	136	245	320	325	480	>665	530	>665	>665	>665	>665
19.34	150	270	355	360	525	>665	580	>665	>665	>665	>665
22.71	176	320	415	425	620	>665	>665	>665	>665	>665	>665
24.05	187	335	440	450	655	>665	>665	>665	>665	>665	>665
27.34	210	385	500	510	>665	>665	>665	>665			
30.28	235	425	555	565	>665	>665	>665	>665			
35.70	275	500	655	>665	>665		>665				
38.49	290	530	>665	>665	>665	>665	>665	>665	>665	>665	>665
44.43	335	610	>665	>665	>665	>665	>665	>665	>665	>665	>665
48.89	370	>665	>665	>665	>665	>665	>665	>665	>665	>665	>665
57.42	435	>665	>665	>665	>665	>665	>665	>665	>665	>665	>665
60.81	460	>665	>665	>665	>665	>665	>665	>665	>665	>665	>665
69.12	525	>665	>665	>665	>665	>665	>665	>665			
76.56	580	>665	>665	>665	>665	>665	>665	>665			
90.26	>665	>665	>665	>665	>665		>665				
102.88	>665	>665		>665							
108.29	>665	>665		>665							
123.85	>665										
145.14											

(→ 183)

K57, m kg											
	CM3C										
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
3	27	29	30	30	31	34	34	36	41	41	44
KF: + 4.7 kg / KA: + -2.1 kg / KAF: + 3.6 kg											

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CM3C..				c_{TG}				φ
		n_{epk}	η	K	KF	KA	KAF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K57 3	4.69	300	450	510	324	9.0	3800	3980	2580	2580	8520	8520	11500	11500
	6.57	345	515	585	256	5.6	4180	4400	2800	2800	7990	8110	11500	11500
	7.55	365	545	620	228	4.4	4360	4580	2900	2900	7740	7920	11500	11500
	8.71	390	585	660	195	3.5	4520	4760	2980	2980	7420	7660	11400	11500
	9.59	405	585	685	178	3.0	4650	4900	3050	3050	7420	7660	11400	11500
	11.26	415	585	705	178	2.3	4990	5250	3340	3340	7420	7660	11400	11500
	11.92	415	585	705	181	2.1	5150	5400	3470	3470	7420	7660	11400	11500
	13.25	510	665	860	226	4.8	5190	5350	3240	3240	4700	4700	11100	11500
	15.22	535	665	910	193	3.8	5430	5600	3390	3390	4700	4700	11100	11500
	17.57	555	665	940	171	3.0	5740	5910	3610	3610	4700	4700	11100	11500
	19.34	575	665	970	151	2.6	5910	6080	3710	3710	4700	4700	11100	11500
	22.71	600	665	1020	132	2.0	6280	6460	3970	3970	4700	4700	11100	11500
	24.05	600	665	1020	131	1.9	6480	6650	4140	4140	4700	4700	11100	11500
	27.34	600	665	1020	132	1.5	6930	7090	4550	4550	4700	4700	11100	11500
	30.28	600	665	1020	131	1.2	7300	7460	4880	4880	4700	4700	11100	11500
	35.70	600	665	1020	126	0.95	7630	7720	5440	5440	4700	4700	11100	11500
	38.49	600	665	1020	71	2.3	7630	7720	5710	5710	4700	4700	11100	11500
	44.43	600	665	1020	73	1.9	7630	7720	6240	6240	4700	4700	11100	11500
	48.89	600	665	1020	74	1.6	7630	7720	6610	6610	4700	4700	11100	11500
	57.42	600	665	1020	76	1.3	7630	7720	7260	7260	4700	4700	11100	11500
	60.81	600	665	1020	74	1.2	7630	7720	7490	7490	4700	4700	11100	11500
	69.12	600	665	1020	65	0.98	7630	7720	8040	8040	4700	4700	11100	11500
	76.56	600	665	1020	59	0.85	7630	7720	8500	8500	4700	4700	11100	11500
	90.26	600	665	1020	50	0.67	7630	7720	9260	9260	4700	4700	11100	11500
	102.88	600	665	1020	44	0.46	7630	7720	9900	9900	4700	4700	11100	11500
	108.29	600	665	1020	42	0.41	7630	7720	10200	10200	4700	4700	11100	11500
	123.85	600	665	1020	36	0.33	7630	7720	10900	10900	4700	4700	11100	11500
	145.14	600	665	1020	31	0.27	7630	7720	11500	11500	4700	4700	11100	11500

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K57..

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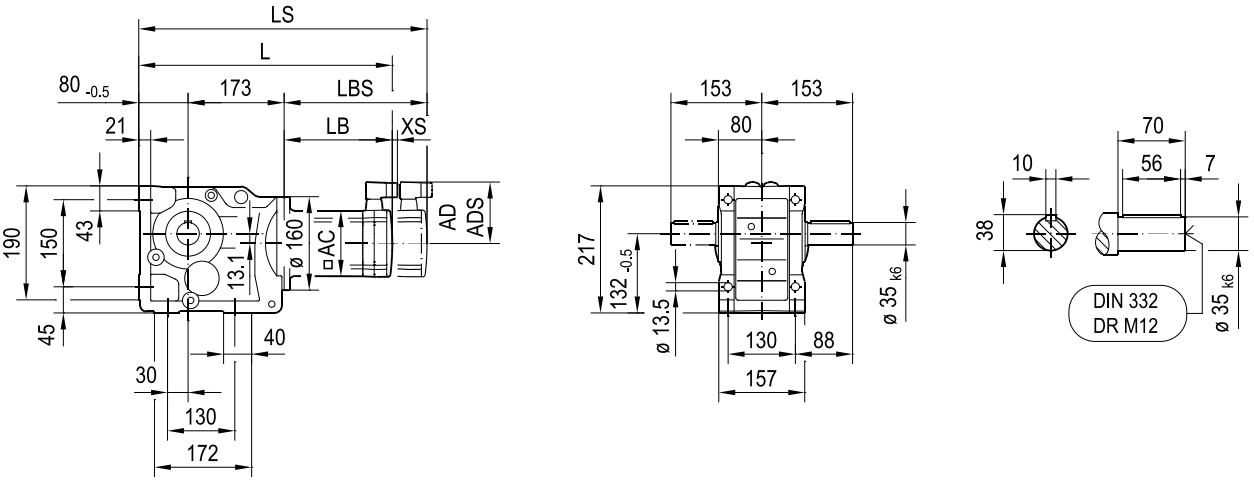

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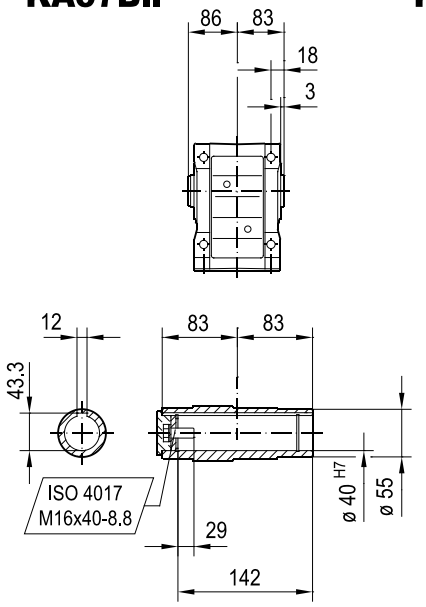

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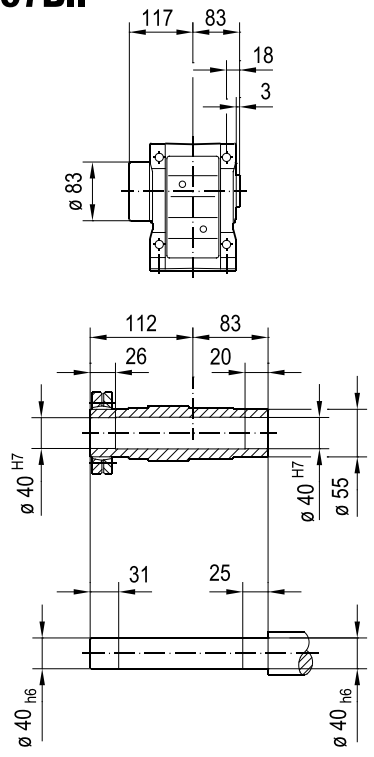

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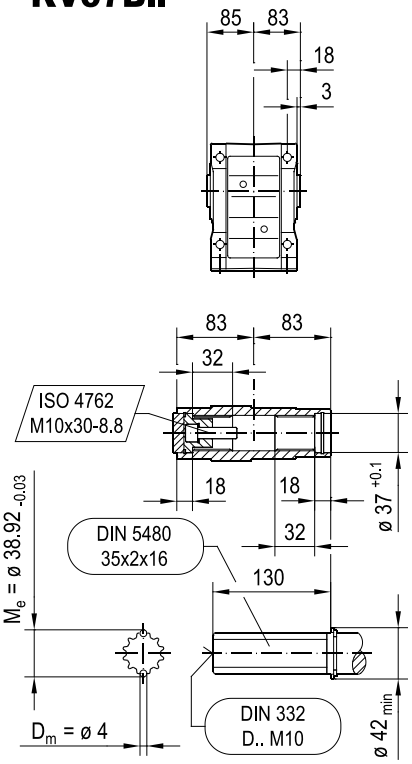

(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	397	435	473	434	456	501	466	492	545	496	524
LS	438	476	514	500	522	567	534	560	613	570	598
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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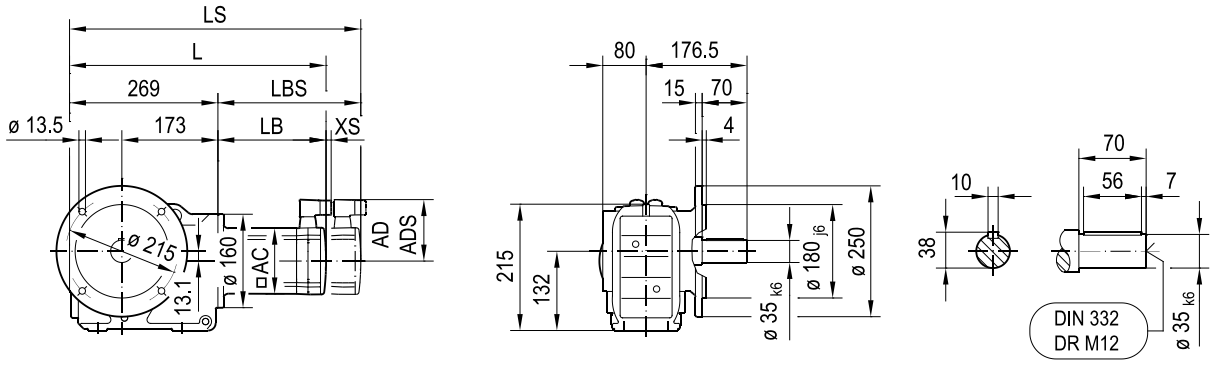
KF57..



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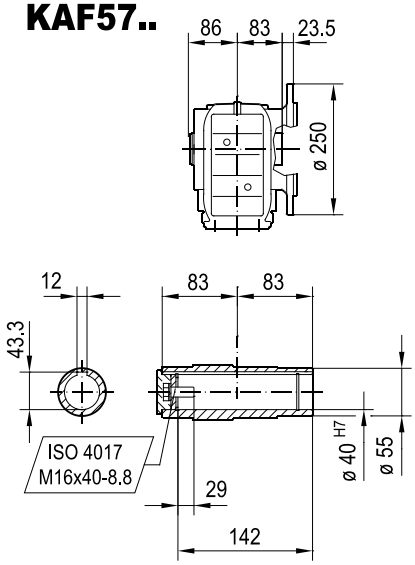

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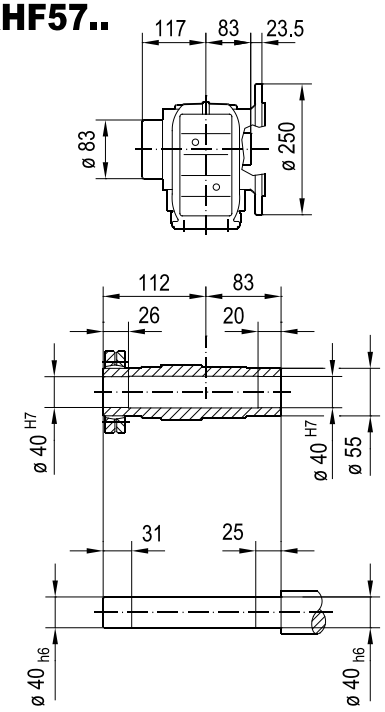

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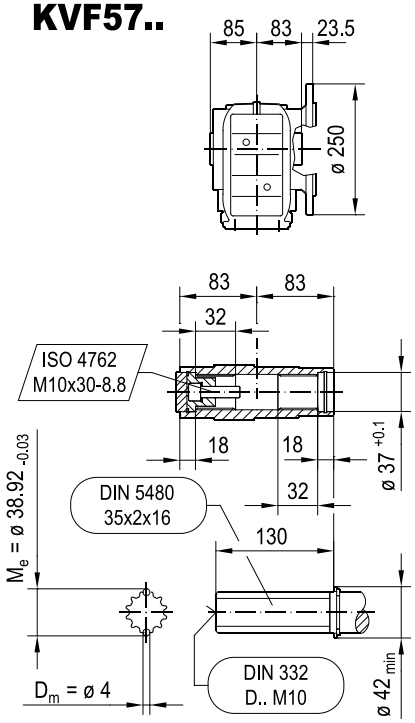

(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	413	451	489	450	472	517	482	508	561	512	540
LS	454	492	530	516	538	583	550	576	629	586	614
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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KA57..

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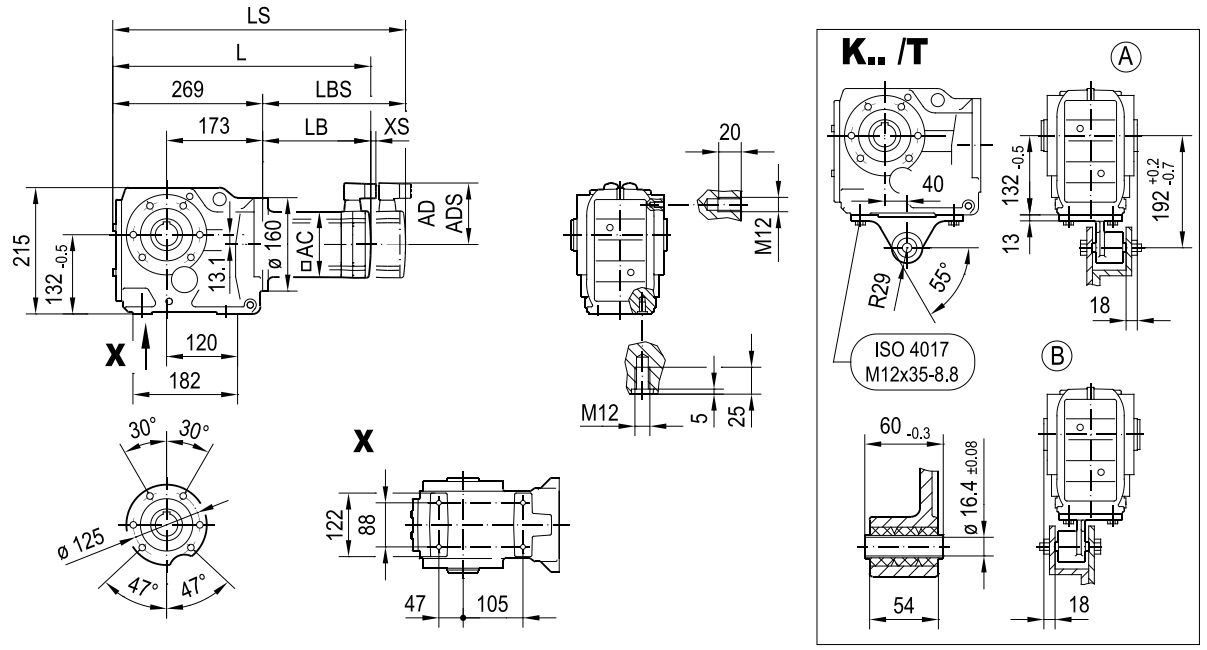

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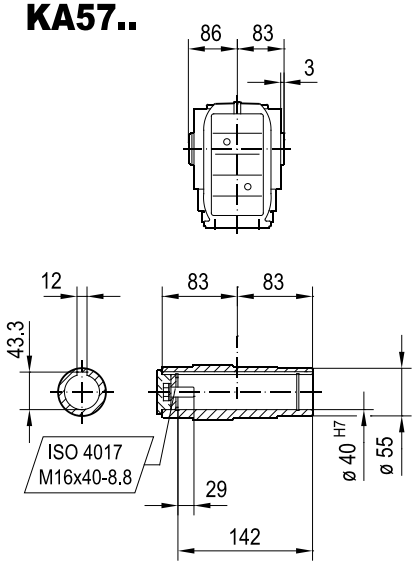

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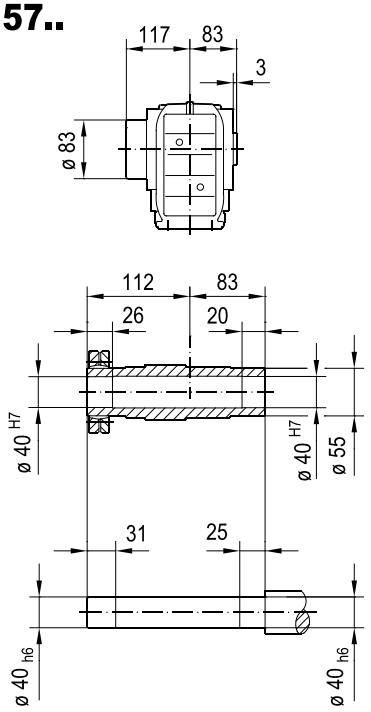

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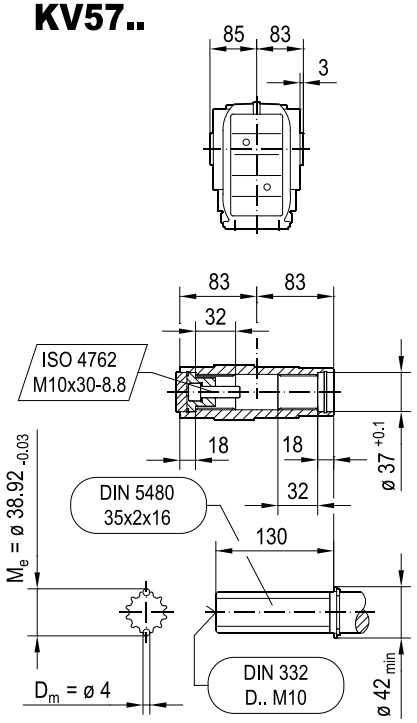

(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	413	451	489	450	472	517	482	508	561	512	540
LS	454	492	530	516	538	583	550	576	629	586	614
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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KZ57..

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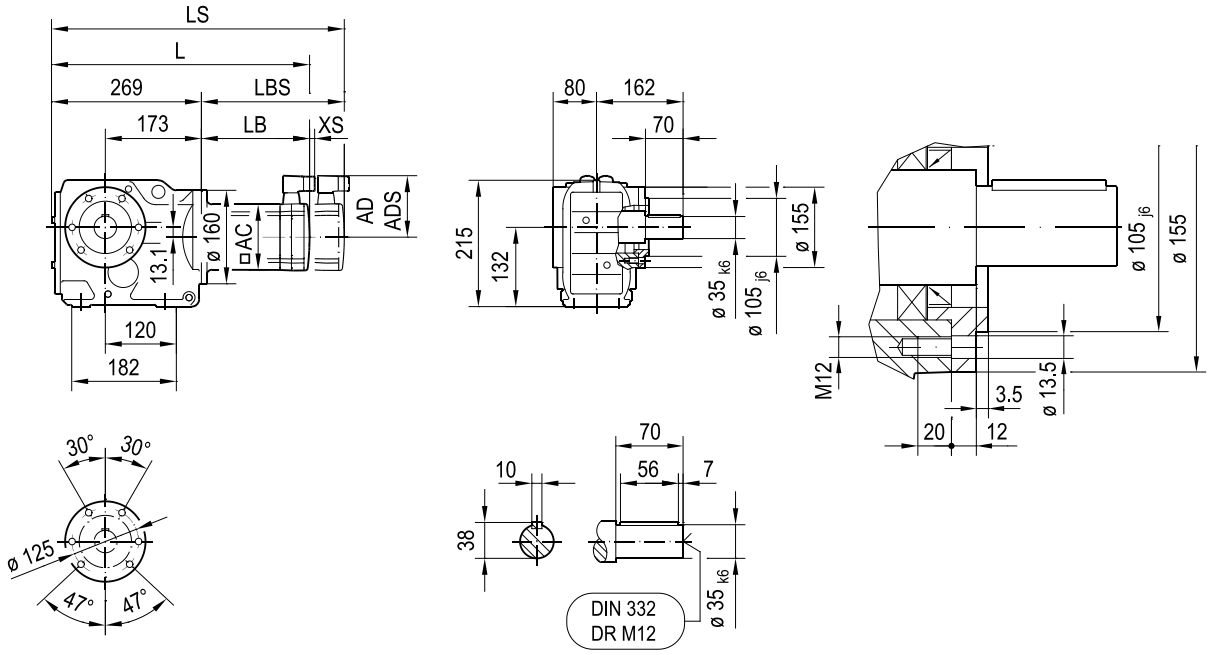

(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	413	451	489	450	472	517	482	508	561	512	540
LS	454	492	530	516	538	583	550	576	629	586	614
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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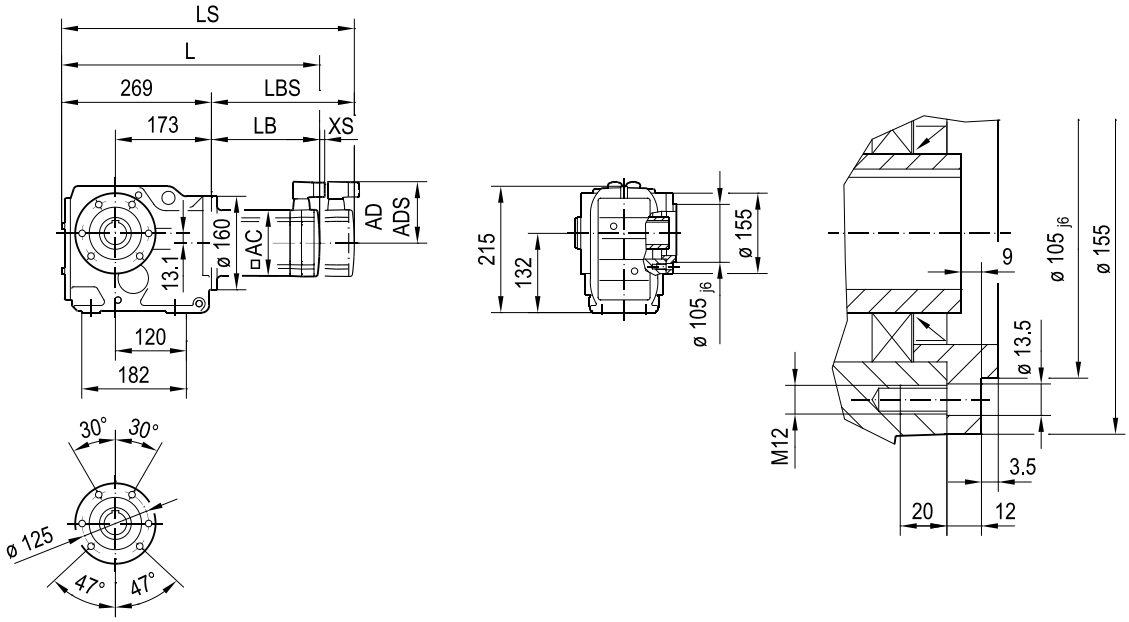
KAZ57..

33 059 00 19



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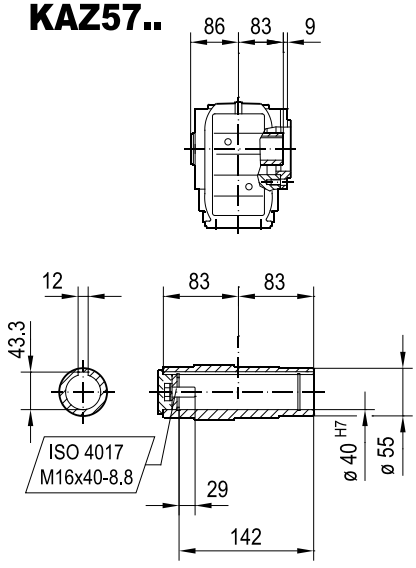
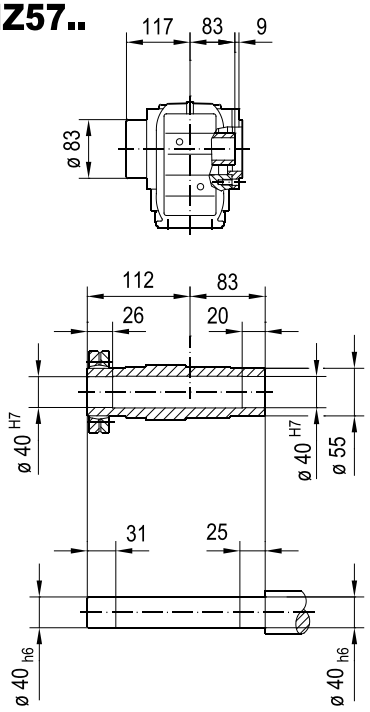


KHZ57..



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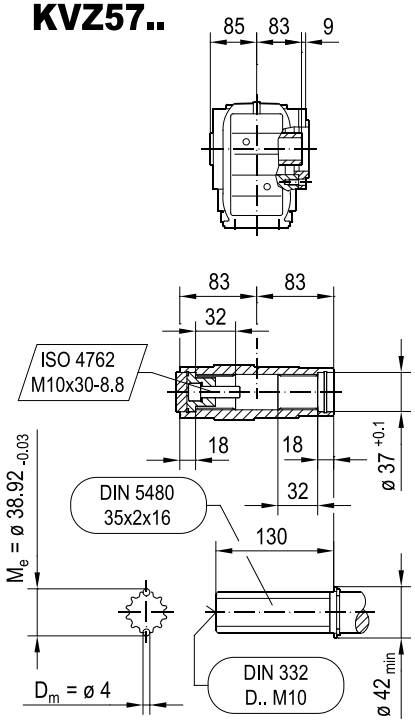

(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	413	451	489	450	472	517	482	508	561	512	540
LS	454	492	530	516	538	583	550	576	629	586	614
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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KT57..

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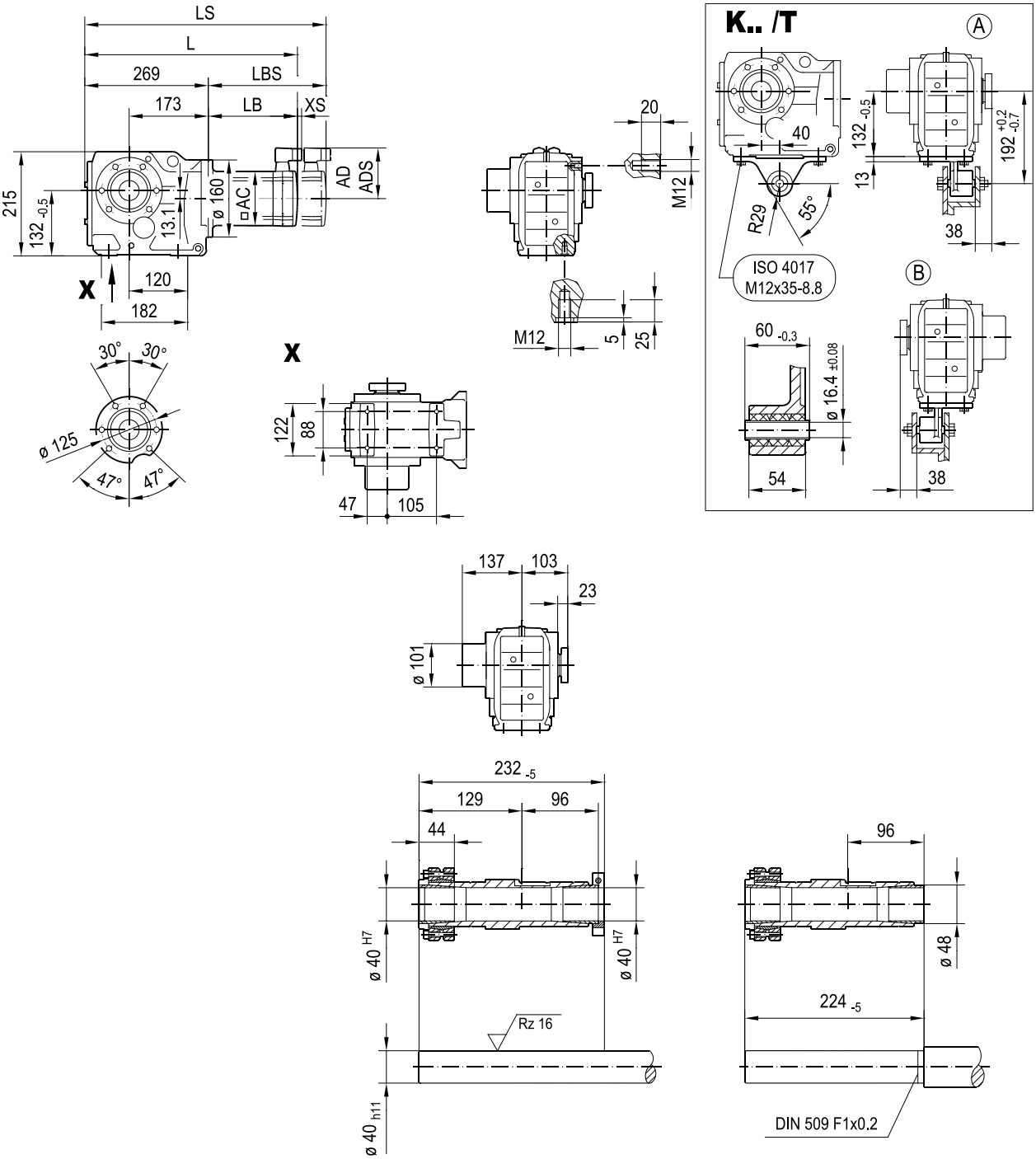

(→ 📖 7.3)	CM3C										
	63S	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	413	451	489	450	472	517	482	508	561	512	540
LS	454	492	530	516	538	583	550	576	629	586	614
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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10.2.8 K67..

K67, M_{aDyn} Nm												820 Nm
	CM3C											
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
						3						
5.20	40	73	95	97	142	205	157	230	340	280	400	
7.28	56	102	134	136	199	290	220	325	475	395	560	>630
8.37	65	118	154	156	225	335	250	375	545	455	645	>660
9.66	75	136	178	180	260	385	290	430	630	525	>685	>685
10.63	82	150	195	198	290	425	320	475	>690	580	>690	
12.48	97	176	230	230	340	500	375	560	>695	680	>695	
13.22	102	186	240	245	360	530	395	590	860	720	>920	>920
15.19	118	210	275	280	415	610	455	680	>920	830	>920	>920
17.54	136	245	320	325	475	705	530	785	>920	>920	>920	>920
19.30	150	270	355	360	525	775	580	860	>920	>920	>920	
22.66	176	315	415	420	615	910	685	>920	>920	>920	>920	
24.00	186	335	440	445	655	>920	725	>920	>920	>920	>920	
27.28	210	380	500	510	745	>920	820	>920				
30.22	230	425	555	565	820	>920	910	>920				
35.62	275	500	655	665	>920		>920					
38.39	290	530	690	700	>920	>920	>920	>920	>920	>920	>920	>920
44.32	335	610	795	810	>920	>920	>920	>920	>920	>920	>920	>920
48.77	370	670	880	890	>920	>920	>920	>920	>920	>920	>920	
57.28	435	790	>920	>920	>920	>920	>920	>920	>920	>920	>920	
60.66	460	830	>920	>920	>920	>920	>920	>920	>920	>920	>920	
68.95	530	>920	>920	>920	>920	>920	>920	>920				
76.37	585	>920	>920	>920	>920	>920	>920	>920				
90.04	685	>920	>920	>920	>920		>920					
102.62	780	>920		>920								
108.03	820	>920		>920								
123.54	>920											
144.79												

(→ 183)

K67, m kg												
	CM3C											
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
3	33	35	36	36	37	40	40	42	47	46	50	57
KF: + 5.6 kg / KA: + -2.7 kg / KAF: + 3.0 kg												

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CM3C..				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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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K67 3	5.20	350	525	595	198	11	9860	10000	2450	2450	12300	12300	12300	13000
	7.28	420	630	710	212	6.3	10700	10900	2480	2480	11700	11700	11300	13000
	8.37	440	660	745	184	4.9	11100	11400	2590	2590	11500	11500	11100	13000
	9.66	480	685	810	159	3.8	11500	11700	2550	2550	11400	11400	10800	13000
	10.63	500	690	850	145	3.2	11800	12000	2590	2590	11300	11300	10800	13000
	12.48	530	695	900	123	2.5	12300	12300	2710	2710	11300	11300	10700	13000
	13.22	670	920	1130	118	5.6	11500	11500	2420	2420	9310	9310	9840	13000
	15.19	700	920	1190	111	4.4	11300	11300	2550	2550	9310	9310	9840	13000
	17.54	740	920	1250	99	3.4	11000	11000	2630	2630	9310	9310	9840	13000
	19.30	760	920	1290	95	2.9	10800	10800	2740	2740	9310	9310	9840	13000
	22.66	780	920	1320	95	2.2	10700	10700	3070	3070	9310	9310	9840	13000
	24.00	800	920	1360	89	2.0	10500	10500	3090	3090	9310	9310	9840	13000
	27.28	820	920	1390	85	1.6	10300	10300	3340	3340	9310	9310	9840	13000
	30.22	820	920	1390	87	1.3	10300	10300	3680	3680	9310	9310	9840	13000
	35.62	820	920	1390	92	1.0	10300	10300	4260	4260	9310	9310	9840	13000
	38.39	800	920	1360	53	2.4	10500	10500	4690	4690	9310	9310	9840	13000
	44.32	820	920	1390	50	1.9	10300	10300	5070	5070	9310	9310	9840	13000
	48.77	820	920	1390	51	1.7	10300	10300	5440	5440	9310	9310	9840	13000
	57.28	820	920	1390	53	1.4	10300	10300	6100	6100	9310	9310	9840	13000
	60.66	820	920	1390	53	1.2	10300	10300	6340	6340	9310	9310	9840	13000
	68.95	820	920	1390	54	1.0	10300	10300	6900	6900	9310	9310	9840	13000
	76.37	820	920	1390	54	0.87	10300	10300	7360	7360	9310	9310	9840	13000
	90.04	820	920	1390	50	0.68	10300	10300	8140	8140	9310	9310	9840	13000
	102.62	820	920	1390	44	0.47	10300	10300	8800	8800	9310	9310	9840	13000
	108.03	820	920	1390	42	0.42	10300	10300	9060	9060	9310	9310	9840	13000
	123.54	820	920	1390	36	0.34	10300	10300	9770	9770	9310	9310	9840	13000
	144.79	820	920	1390	31	0.28	10300	10300	10700	10700	9310	9310	9840	13000

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K67..

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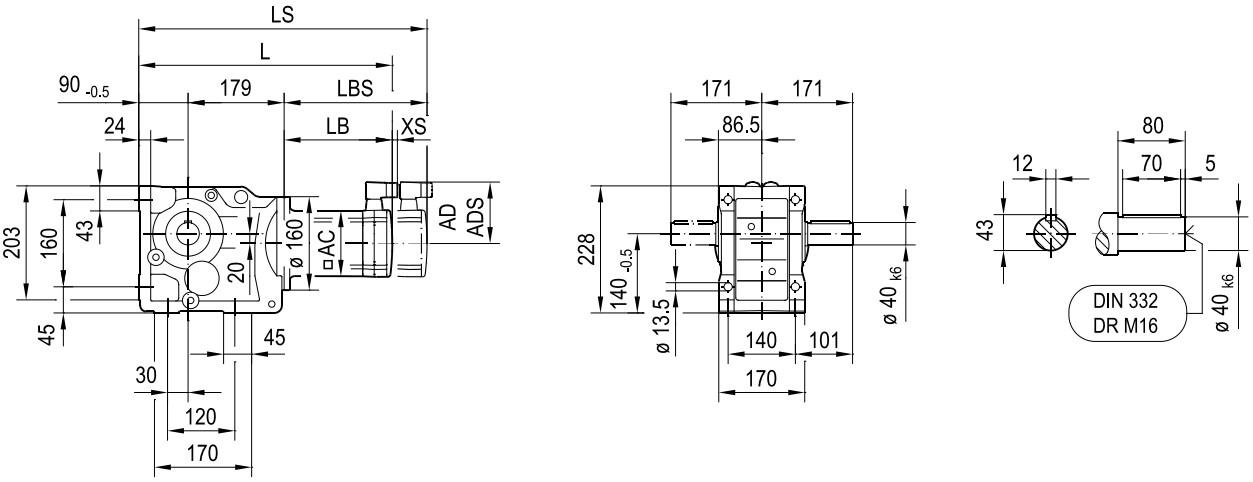

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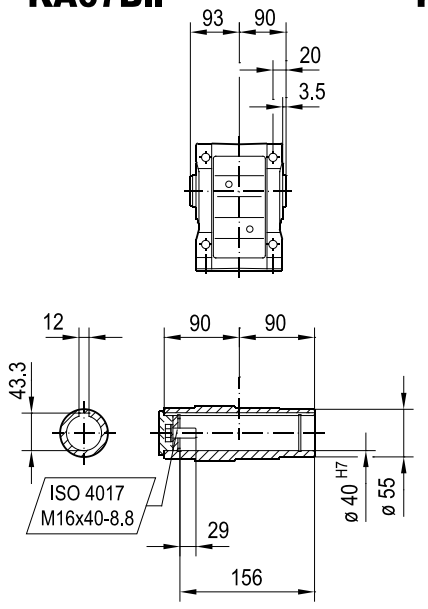

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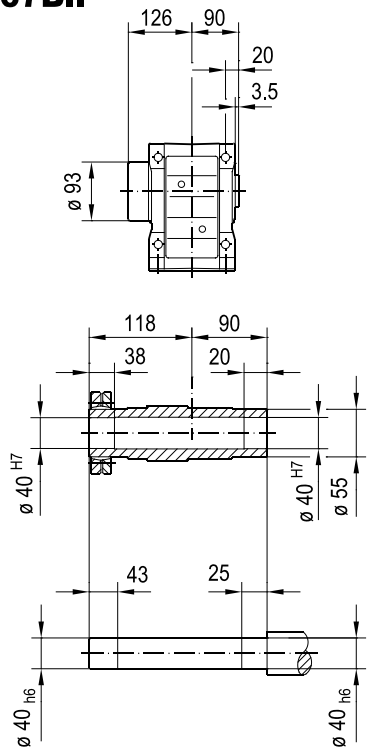

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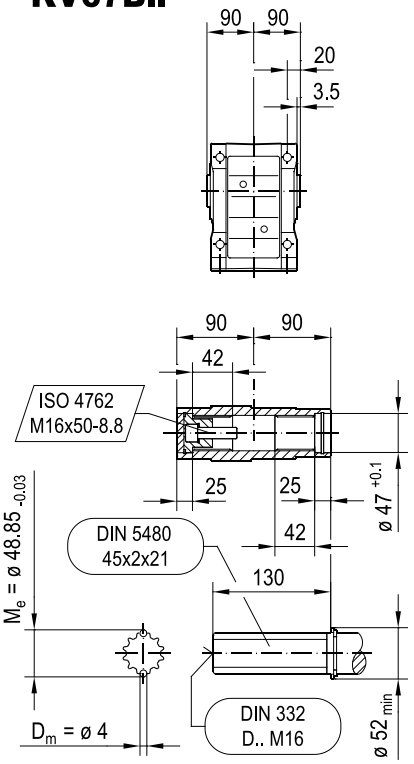

(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	413	451	489	450	472	517	482	508	561	512	540	597
LS	454	492	530	516	538	583	550	576	629	586	614	671
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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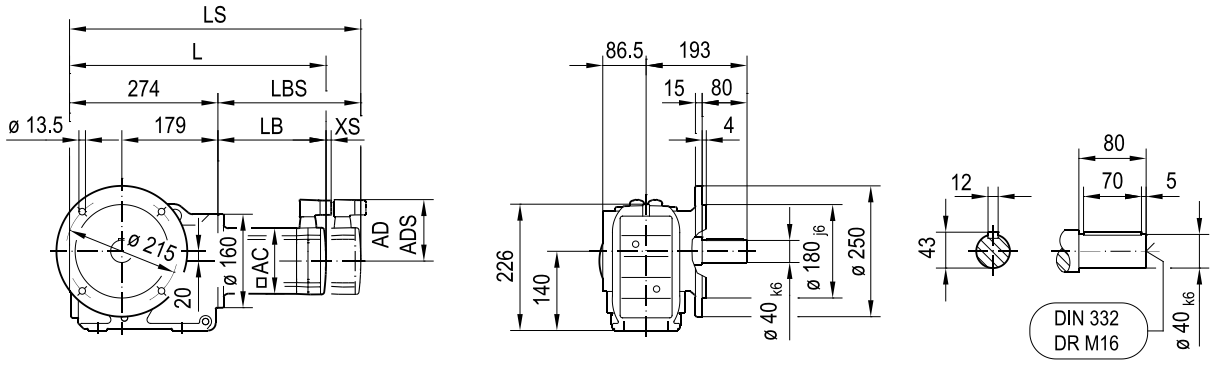
KF67..



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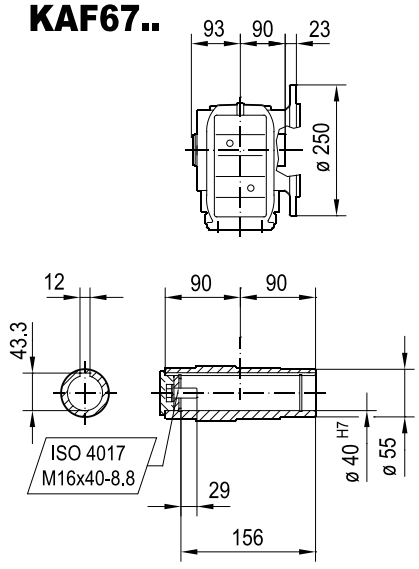

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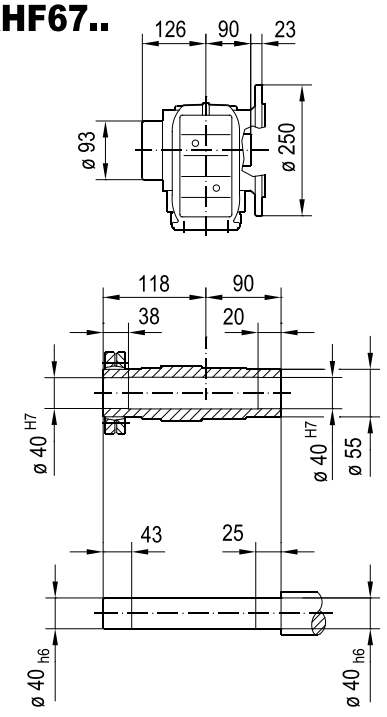

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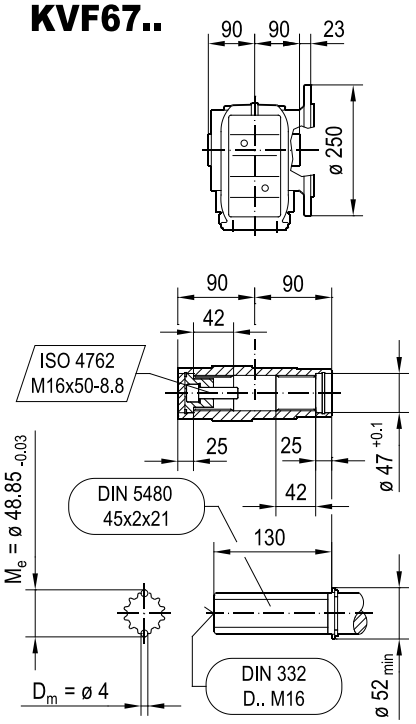

(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	418	456	494	455	477	522	487	513	566	517	545	602
LS	459	497	535	521	543	588	555	581	634	591	619	676
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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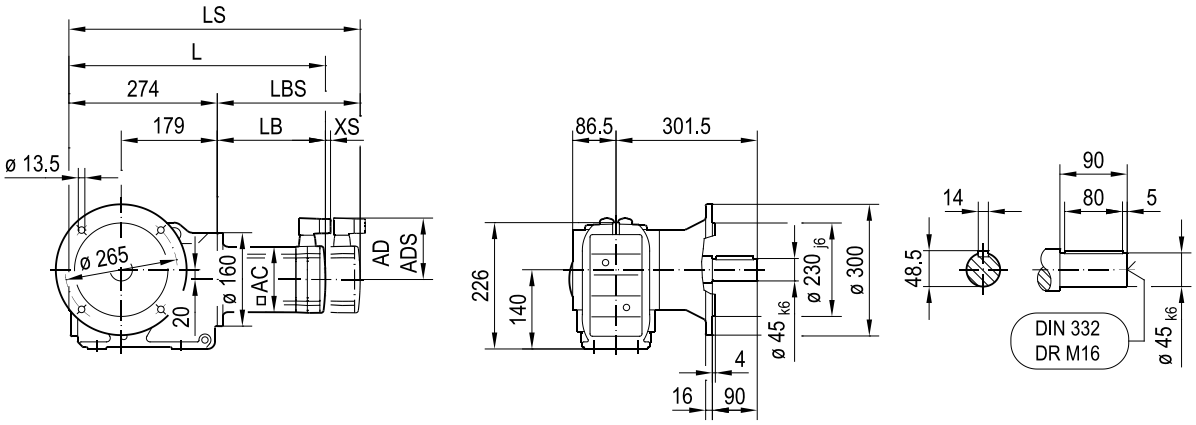
KM67..



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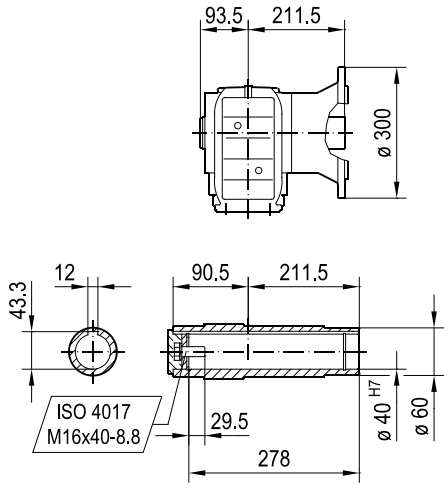

(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	418	456	494	455	477	522	487	513	566	517	545	602
LS	459	497	535	521	543	588	555	581	634	591	619	676
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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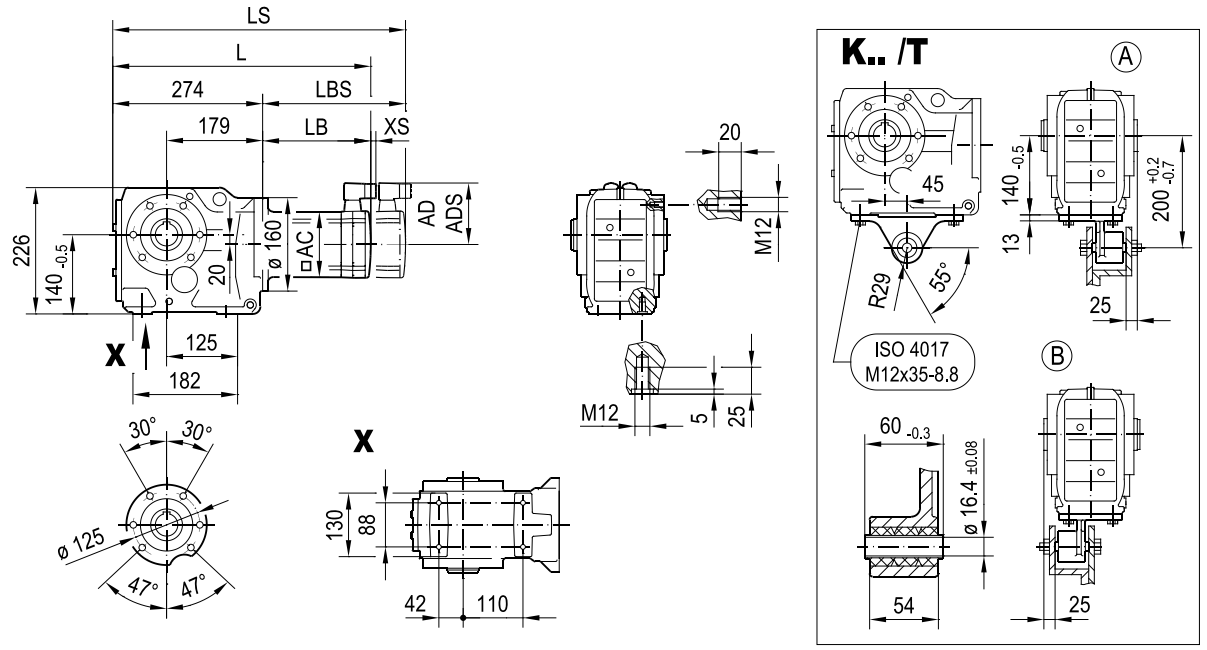
KA67..

33 063 00 19



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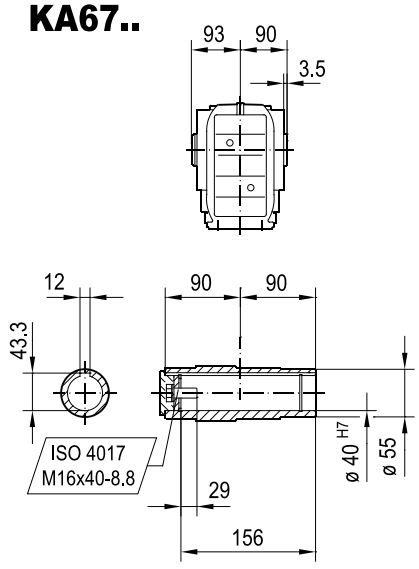

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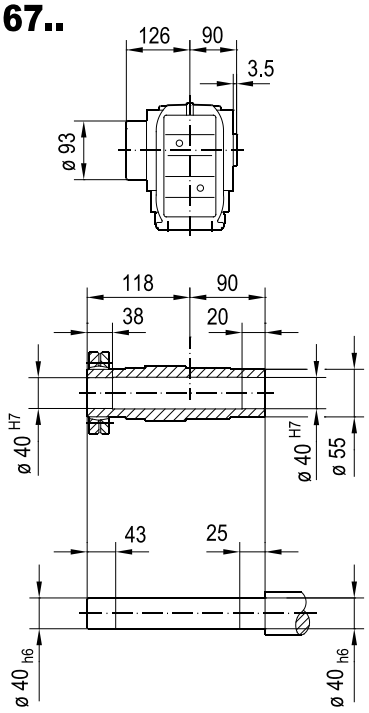

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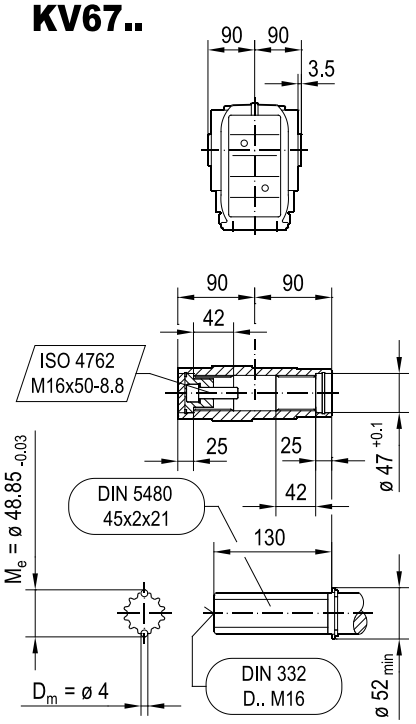

(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	418	456	494	455	477	522	487	513	566	517	545	602
LS	459	497	535	521	543	588	555	581	634	591	619	676
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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KAZ67..

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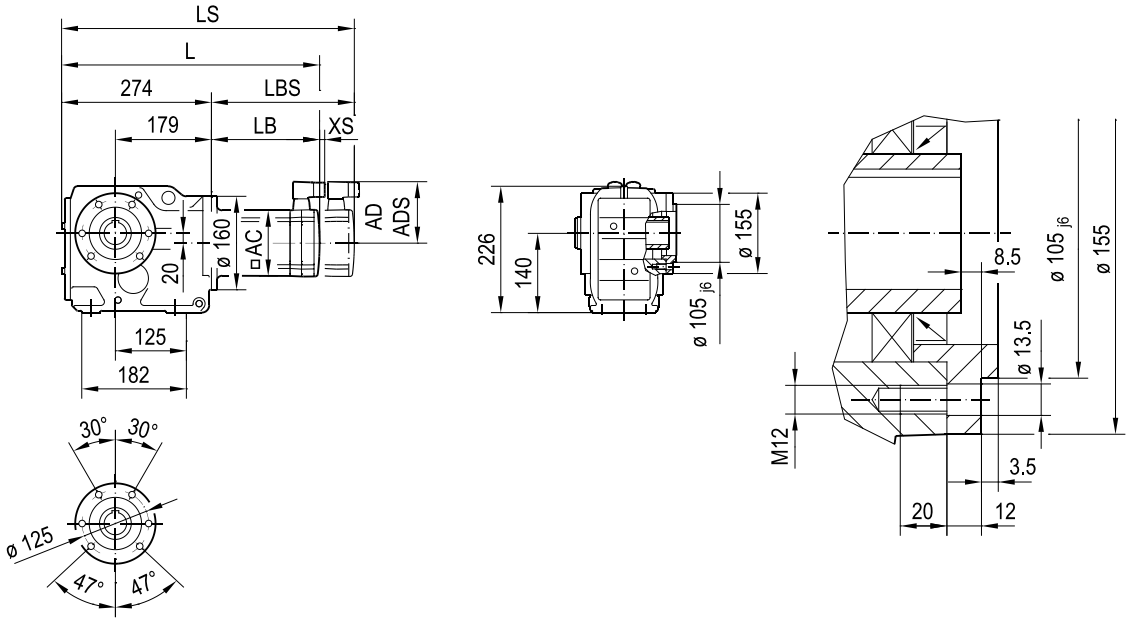

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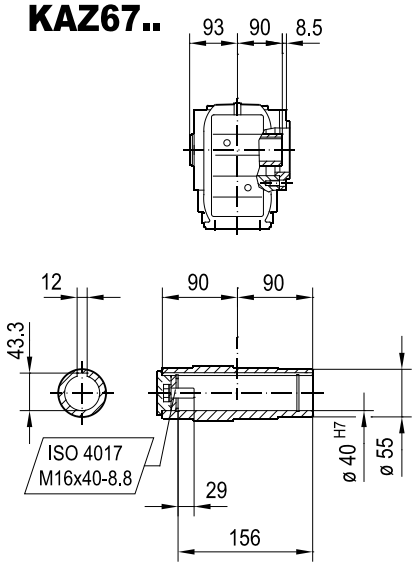

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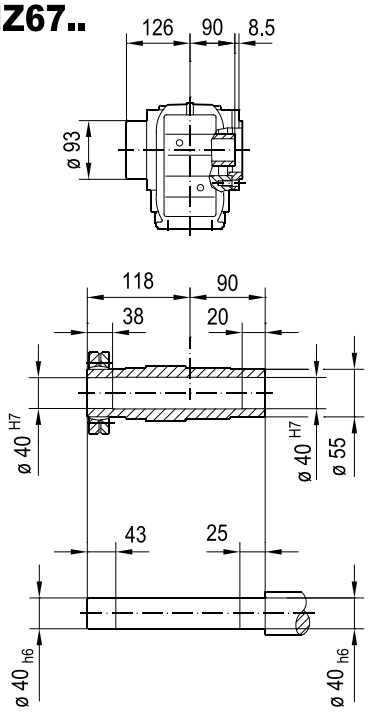

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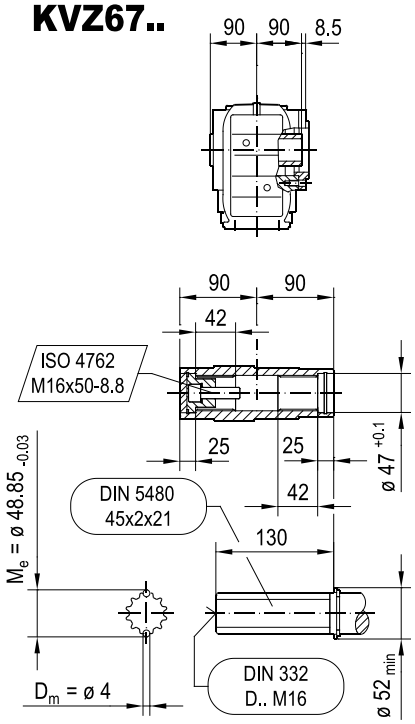

(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	418	456	494	455	477	522	487	513	566	517	545	602
LS	459	497	535	521	543	588	555	581	634	591	619	676
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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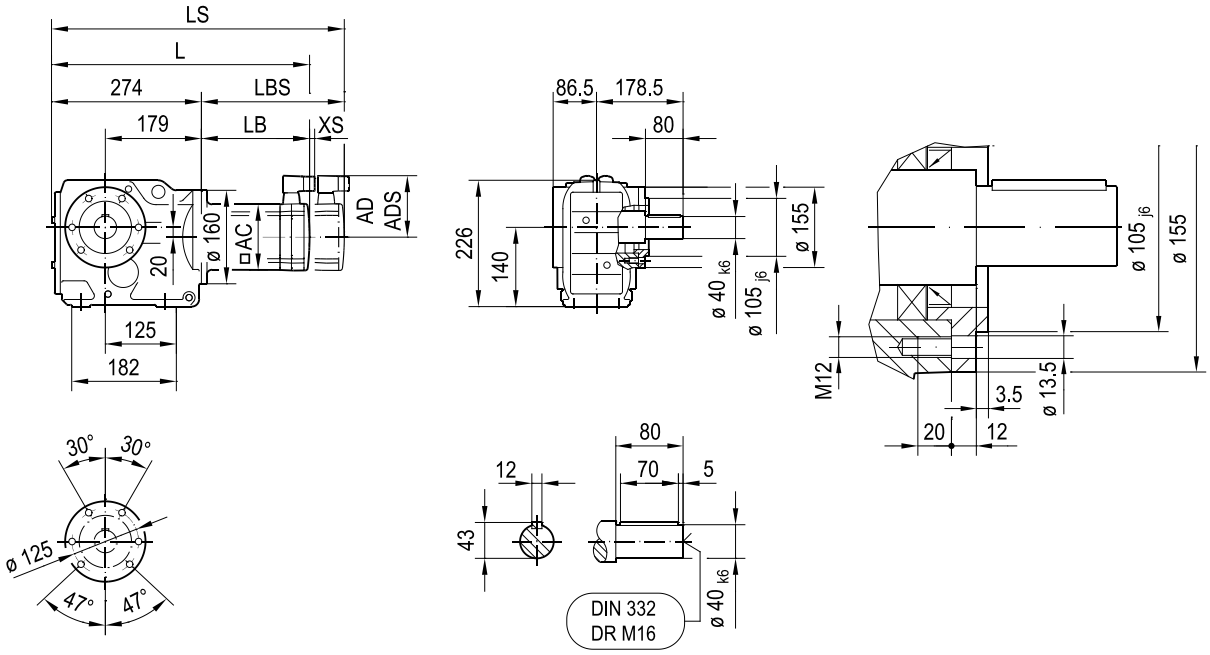
KZ67..

33 004 00 20



(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	418	456	494	455	477	522	487	513	566	517	545	602
LS	459	497	535	521	543	588	555	581	634	591	619	676
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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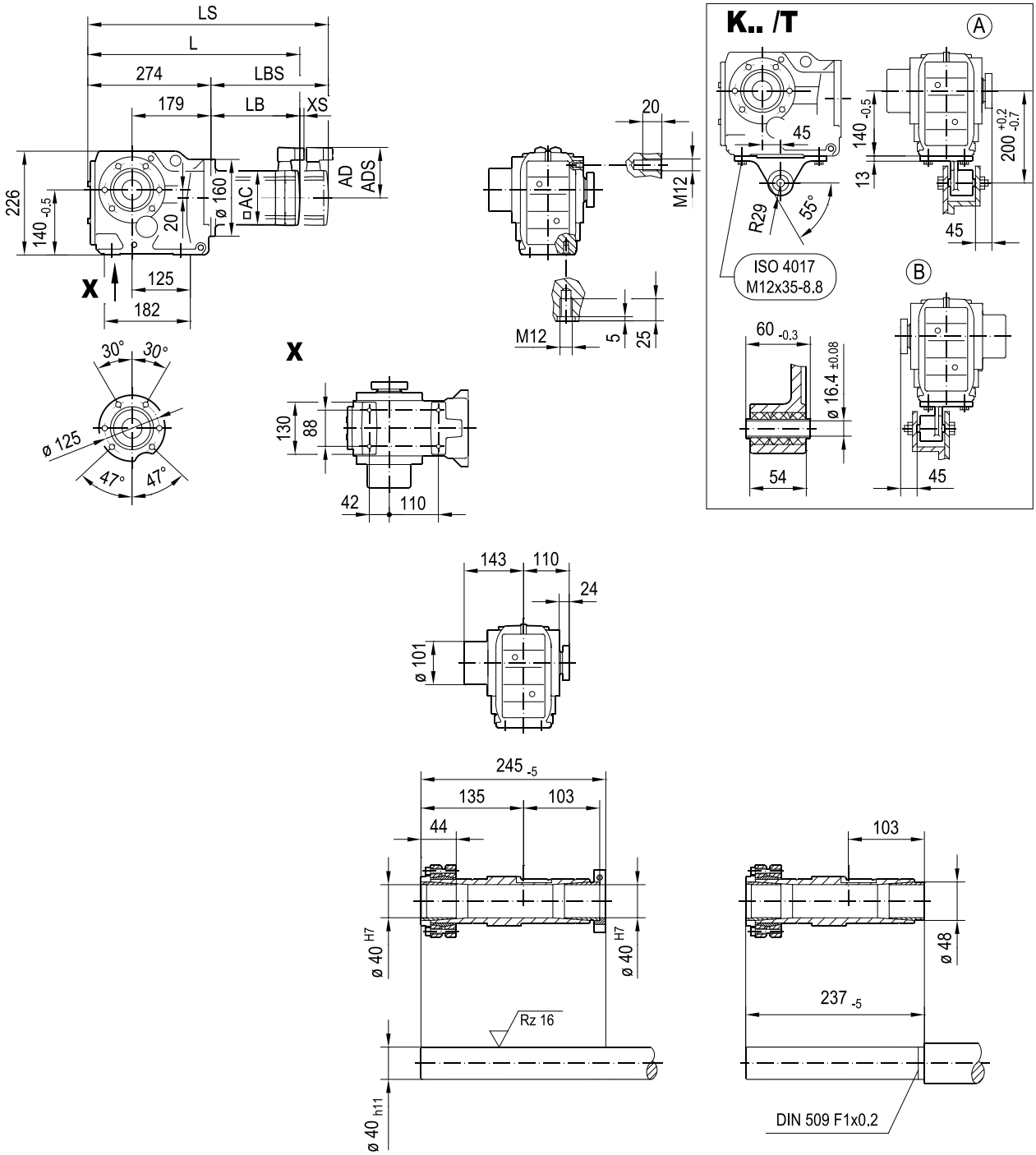
KT67..

33 065 00 19



(→ 📖 7.3)	CM3C											
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	92	92	92	118	118	118	140	140	140	165	165	165
AD	93	93	93	105	105	105	127	127	127	140	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140	140
L	418	456	494	455	477	522	487	513	566	517	545	602
LS	459	497	535	521	543	588	555	581	634	591	619	676
LB	144	182	220	181	203	248	213	239	292	243	271	328
LBS	185	223	261	247	269	314	281	307	360	317	345	402
XS	13	13	13	7	7	7	47	47	47	6	6	6

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10.2.9 K77..

K77, M_{aDyn} Nm									1550 Nm
	CM3C								
i	71S	71M	71L	80S	80M	80L	100S	100M	100L
					3				
7.24	135	198	290	215	325	475	395	555	830
8.48	158	230	340	255	380	555	460	650	970
9.56	178	260	385	285	425	625	520	735	1100
10.84	200	295	435	325	485	710	590	830	>1170
12.36	230	335	495	370	555	810	675	950	>1170
13.52	250	365	545	405	605	880	735	1040	>1550
15.84	295	430	635	475	710	1040	860	1220	>1550
17.87	330	485	720	540	800	1170	970	1370	>1550
20.25	375	550	810	610	900	1320	1100	>1550	>1550
23.08	430	630	930	695	1030	1510	1260	>1550	>1550
25.62	475	700	1030	770	1150	>1550	1400	>1550	
29.27	545	800	1180	880	1310	>1550	>1550	>1550	
30.89	575	840	1240	930	1380	>1550	>1550	>1550	
35.20	655	960	1410	1060	>1550				
38.39	715	1050	1540	1160	>1550				
40.04	740	1080	>1550	1190	>1550	>1550	>1550	>1550	>1550
45.16	830	1220	>1550	1350	>1550	>1550	>1550	>1550	>1550
51.18	940	1380	>1550	1530	>1550	>1550	>1550	>1550	>1550
58.34	1080	>1550	>1550	>1550	>1550	>1550	>1550	>1550	>1550
64.75	1190	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
73.99	1370	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
78.07	1440	>1550	>1550	>1550	>1550	>1550	>1550	>1550	
88.97	>1550	>1550	>1550	>1550	>1550				
97.05	>1550	>1550	>1550	>1550	>1550				
113.56	>1550	>1550		>1550					
128.52	>1550								
135.28	>1550								
154.02									
179.37									
192.18									

(→ 🗎 183)

K77, m kg									
	CM3C								
s	71S	71M	71L	80S	80M	80L	100S	100M	100L
3	60	62	65	65	67	72	70	74	81
KF: + 8.2 kg / KA: + -7.5 kg / KAF: + 0.40 kg									

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CM3C..				c_{TG}				φ
		n_{epk}	η	K	KF	KA	KAF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
K77 3	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
	38.39	4500	96	141	112	300	300	6
	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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K77 3	7.24	820	1150	1390	213	17	13100	13800	2490	2490	17700	17700	16800	20000
	8.48	890	1160	1510	182	13	13500	14300	2430	2430	17600	17700	16800	20000
	9.56	940	1160	1590	161	10	13900	14700	2430	2430	17600	17700	16800	20000
	10.84	990	1170	1680	142	8.2	14400	15200	2460	2460	17600	17700	16700	20000
	12.36	1000	1170	1700	126	6.5	15100	16000	2820	2820	17600	17700	16700	20000
	13.52	1340	1550	2270	155	15	14800	15800	1850	1850	15400	16600	15300	20000
	15.84	1400	1550	2380	147	11	15500	16600	2030	2030	15400	16600	15300	20000
	17.87	1450	1550	2460	140	9.0	16100	16900	2160	2160	15400	16600	15300	20000
	20.25	1500	1550	2550	133	7.2	15700	16800	2330	2330	15400	16600	15300	20000
	23.08	1550	1550	2630	126	5.8	15400	16600	2550	2550	15400	16600	15300	20000
	25.62	1550	1550	2630	133	5.0	15400	16600	2990	2990	15400	16600	15300	20000
	29.27	1550	1550	2630	140	4.0	15400	16600	3590	3590	15400	16600	15300	20000
	30.89	1550	1550	2630	142	3.6	15400	16600	3840	3840	15400	16600	15300	20000
	35.20	1550	1550	2630	128	2.9	15400	16600	4460	4460	15400	16600	15300	20000
	38.39	1500	1550	2550	117	2.5	15700	16800	5210	5210	15400	16600	15300	20000
	40.04	1550	1550	2630	38	6.0	15400	16600	5100	5100	15400	16600	15300	20000
	45.16	1550	1550	2630	34	4.9	15400	16600	5720	5720	15400	16600	15300	20000
	51.18	1550	1550	2630	30	4.1	15400	16600	6390	6390	15400	16600	15300	20000
	58.34	1550	1550	2630	31	3.3	15400	16600	7130	7130	15400	16600	15300	20000
	64.75	1550	1550	2630	32	3.0	15400	16600	7740	7740	15400	16600	15300	20000
	73.99	1550	1550	2630	32	2.4	15400	16600	8550	8550	15400	16600	15300	20000
	78.07	1550	1550	2630	32	2.3	15400	16600	8890	8890	15400	16600	15300	20000
	88.97	1550	1550	2630	33	1.9	15400	16600	9730	9730	15400	16600	15300	20000
	97.05	1550	1550	2630	33	1.6	15400	16600	10300	10300	15400	16600	15300	20000
	113.56	1550	1550	2630	33	1.3	15400	16600	11400	11400	15400	16600	15300	20000
	128.52	1550	1550	2630	33	0.90	15400	16600	12300	12300	15400	16600	15300	20000
	135.28	1550	1550	2630	33	0.81	15400	16600	12700	12700	15400	16600	15300	20000
	154.02	1550	1550	2630	29	0.66	15400	16600	13700	13700	15400	16600	15300	20000
	179.37	1450	1550	2460	25	0.53	16100	16900	15600	15600	15400	16600	15300	20000
	192.18	1450	1550	2460	23	0.46	16100	16900	16200	16200	15400	16600	15300	20000

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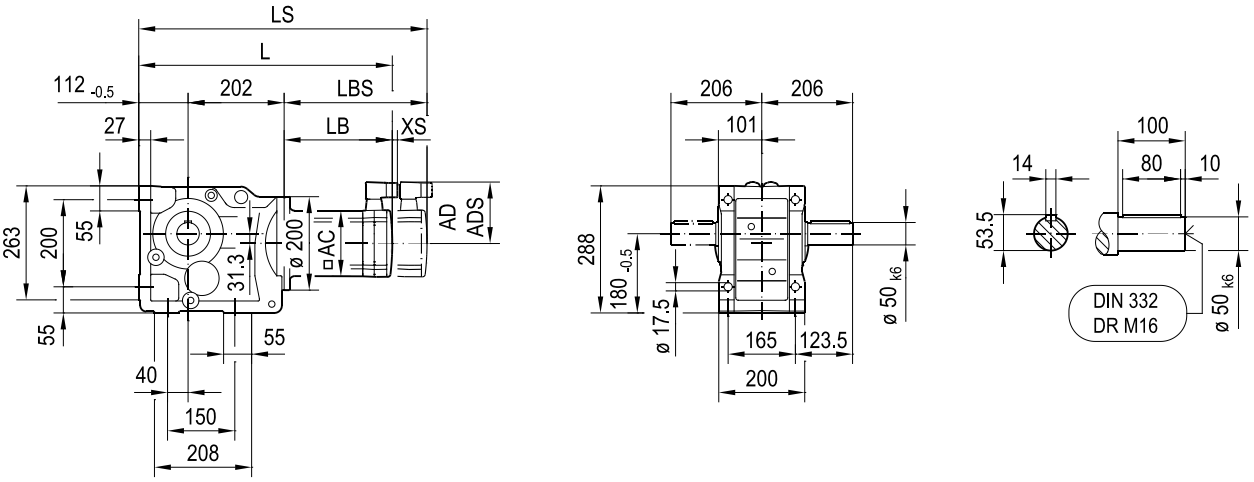
K77..

33 066 00 19



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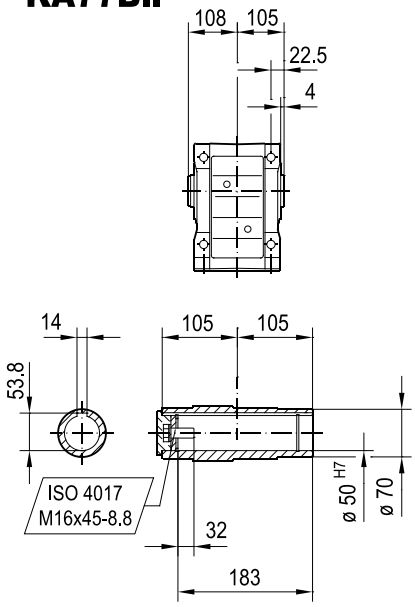

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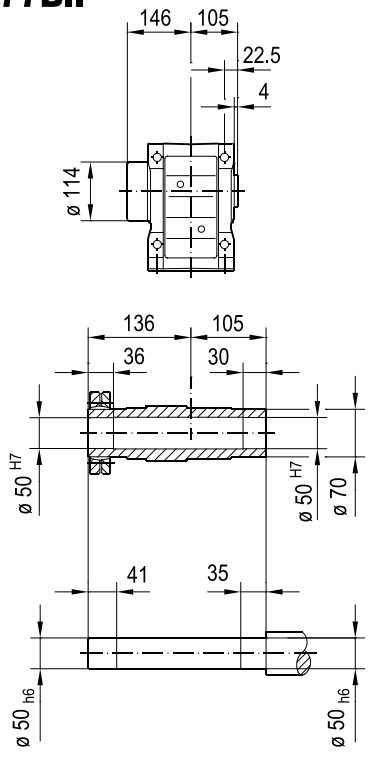

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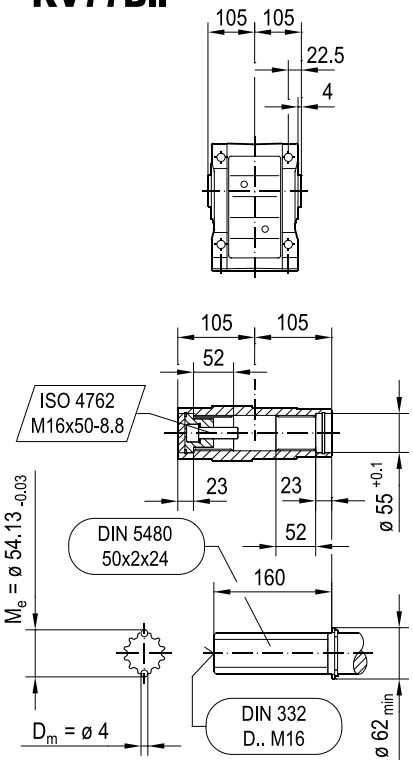

(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	487	509	554	519	545	598	545	573	630
LS	553	575	620	587	613	666	619	647	704
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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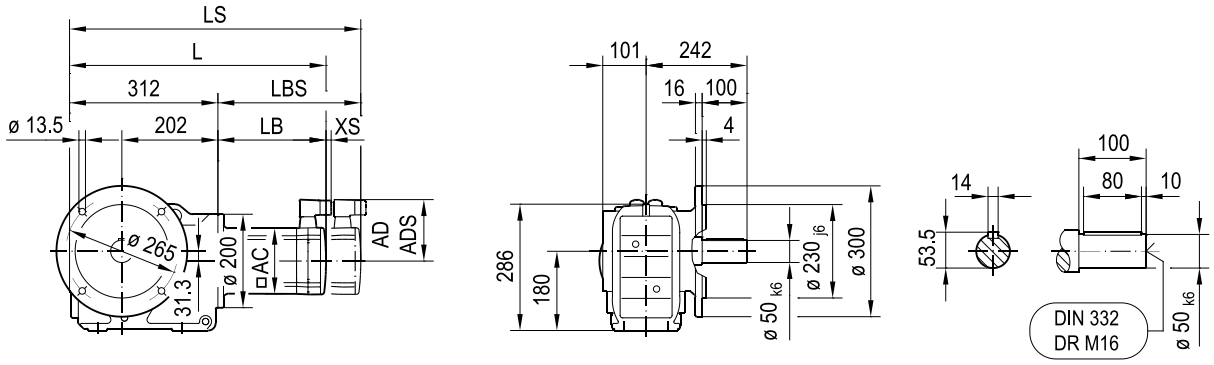
33 067 00 19

KF77..



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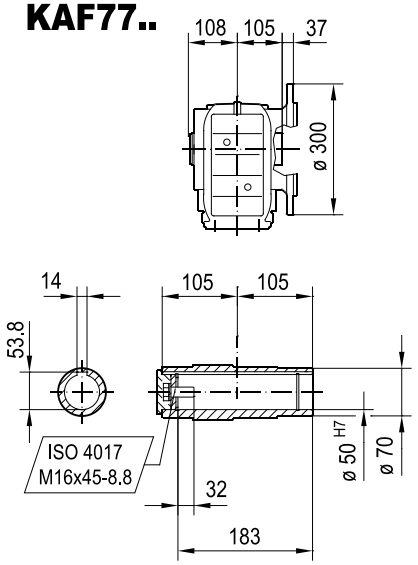

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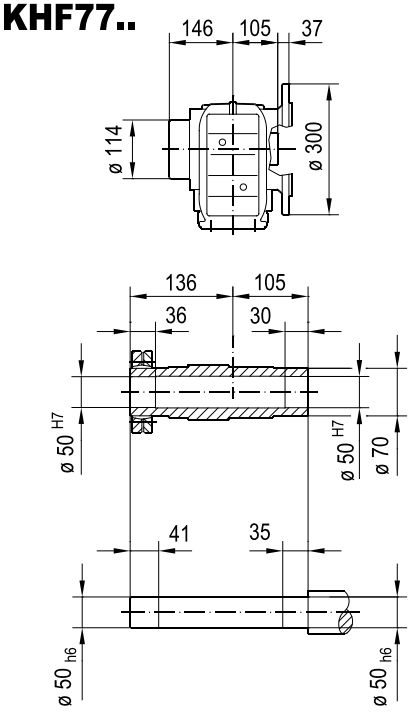

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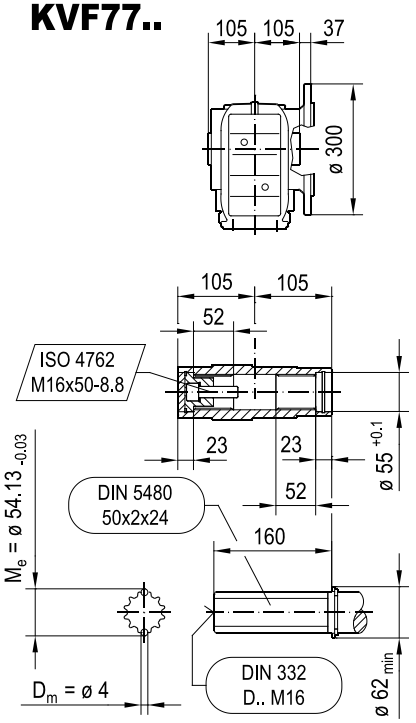

(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	485	507	552	517	543	596	543	571	628
LS	551	573	618	585	611	664	617	645	702
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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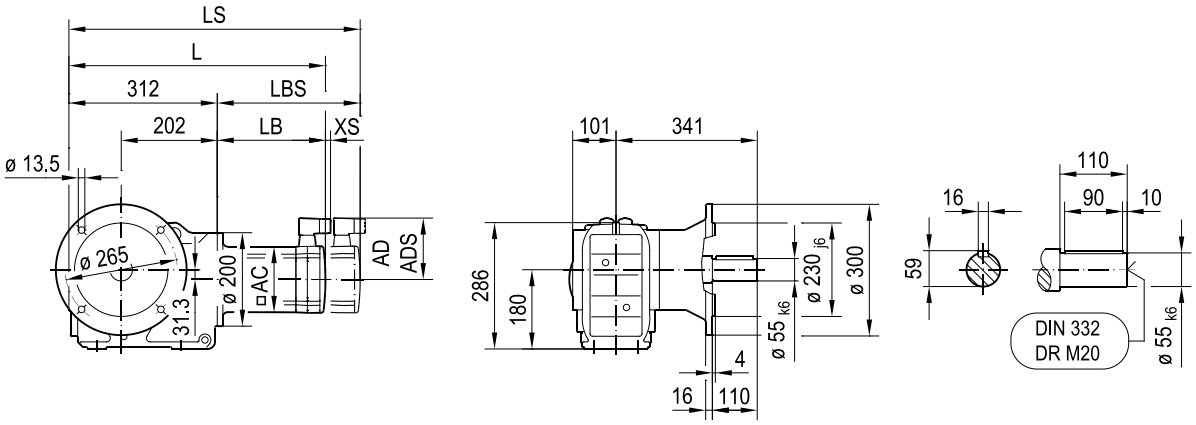
33 010 00 20

KM77..



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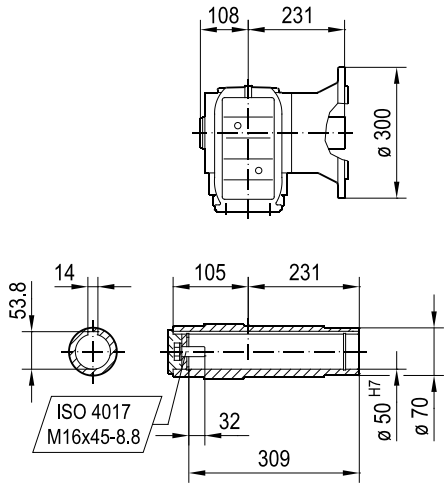

(→ 📖 7.3)	CM3C								
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	485	507	552	517	543	596	543	571	628
LS	551	573	618	585	611	664	617	645	702
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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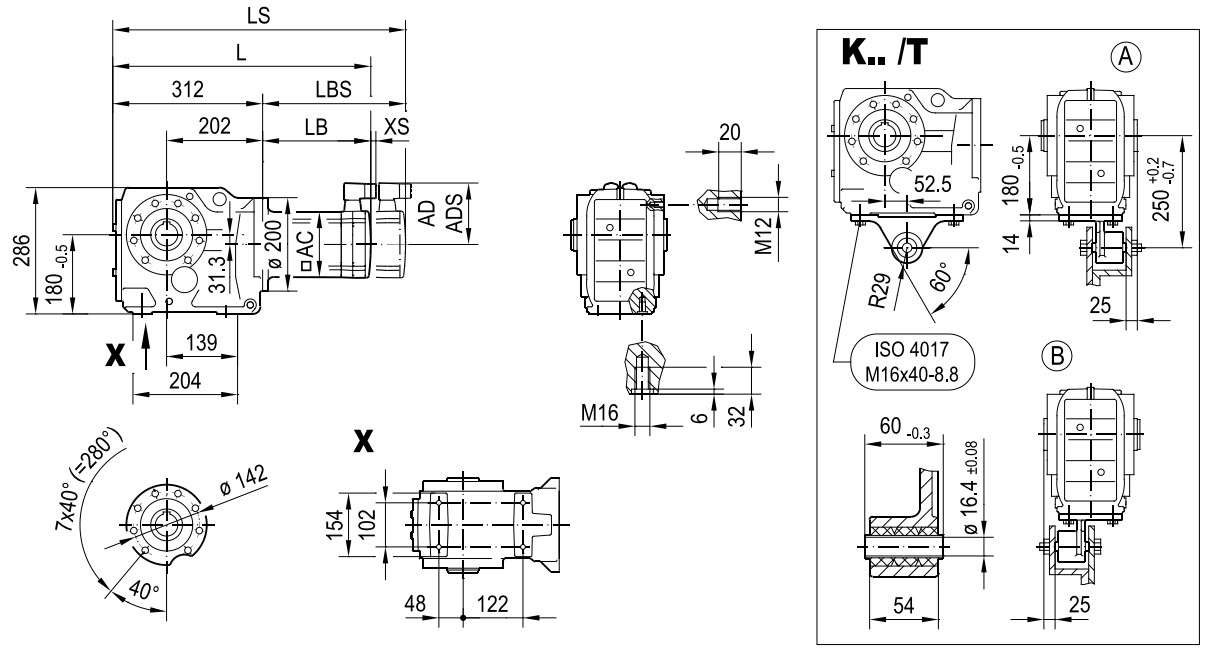
KA77..

33 068 00 19



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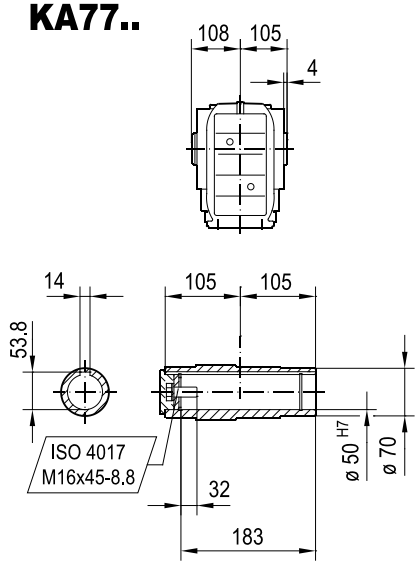

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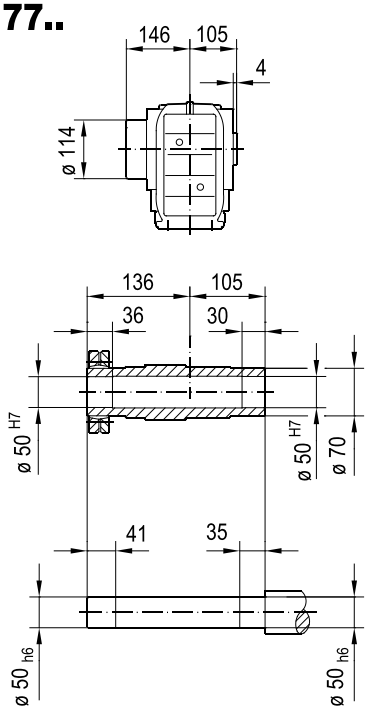

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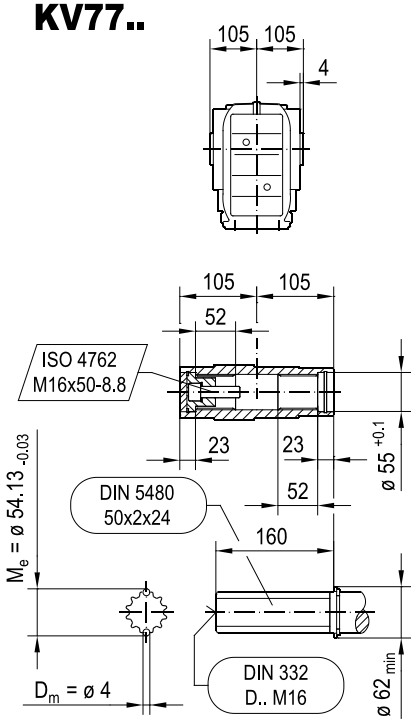

(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	485	507	552	517	543	596	543	571	628
LS	551	573	618	585	611	664	617	645	702
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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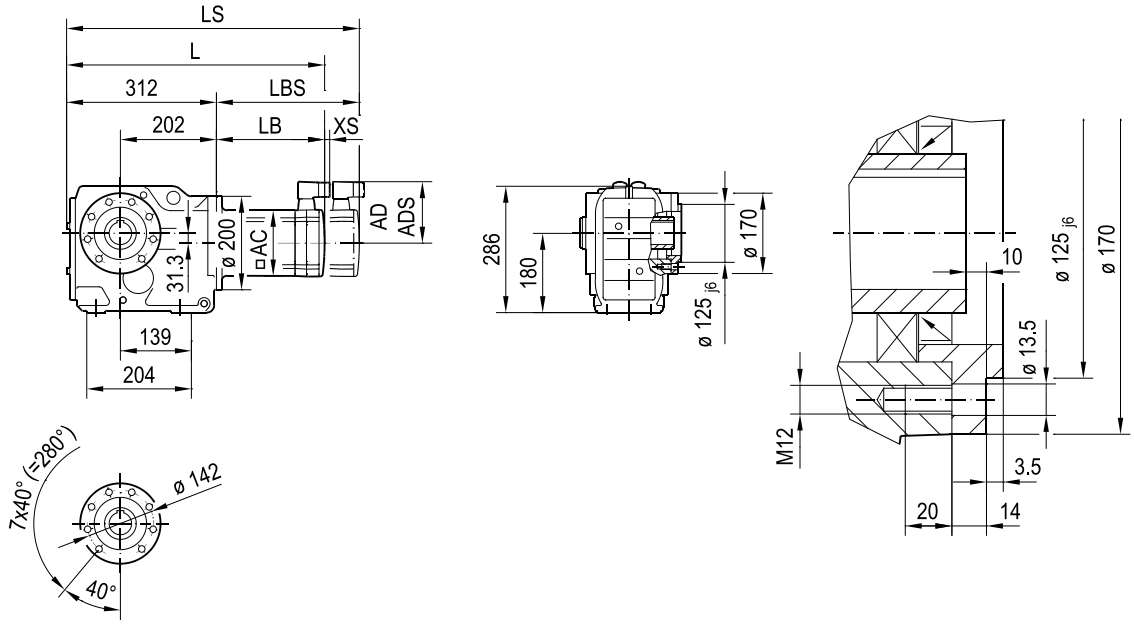
KAZ77..

33 069 00 19



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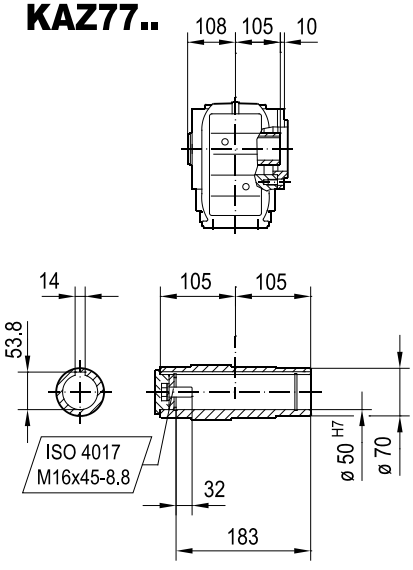

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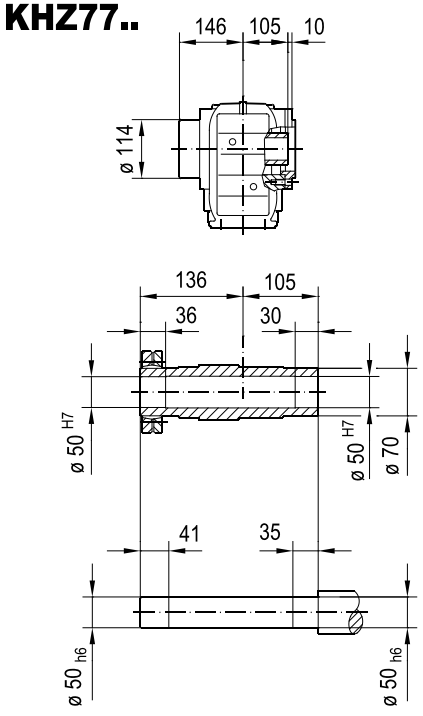

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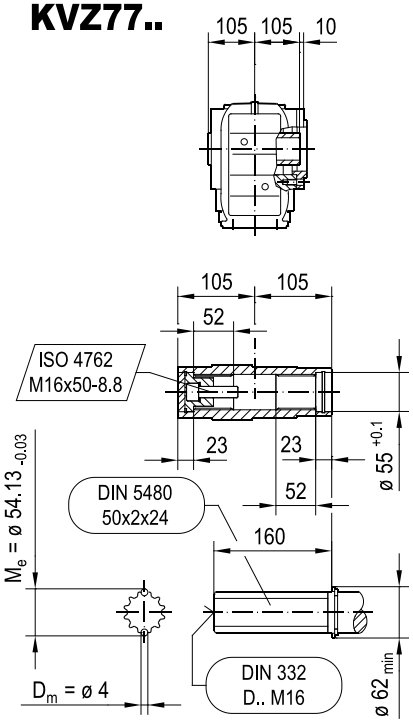

(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	485	507	552	517	543	596	543	571	628
LS	551	573	618	585	611	664	617	645	702
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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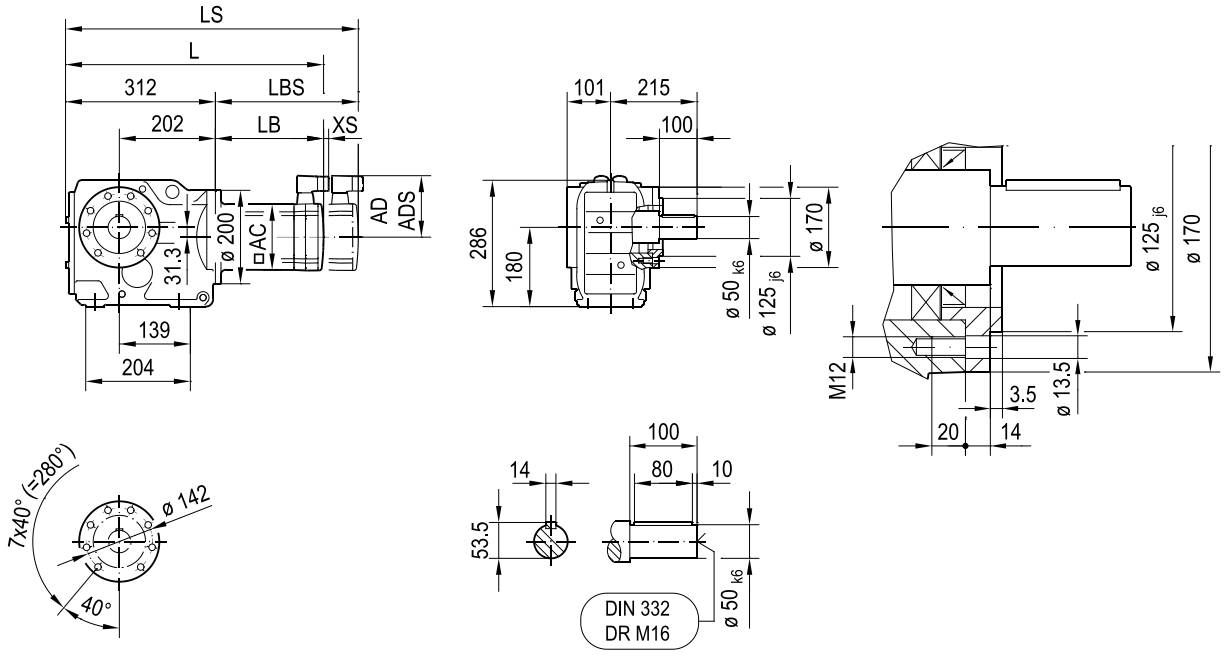
KZ77..

33 005 00 20



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	485	507	552	517	543	596	543	571	628
LS	551	573	618	585	611	664	617	645	702
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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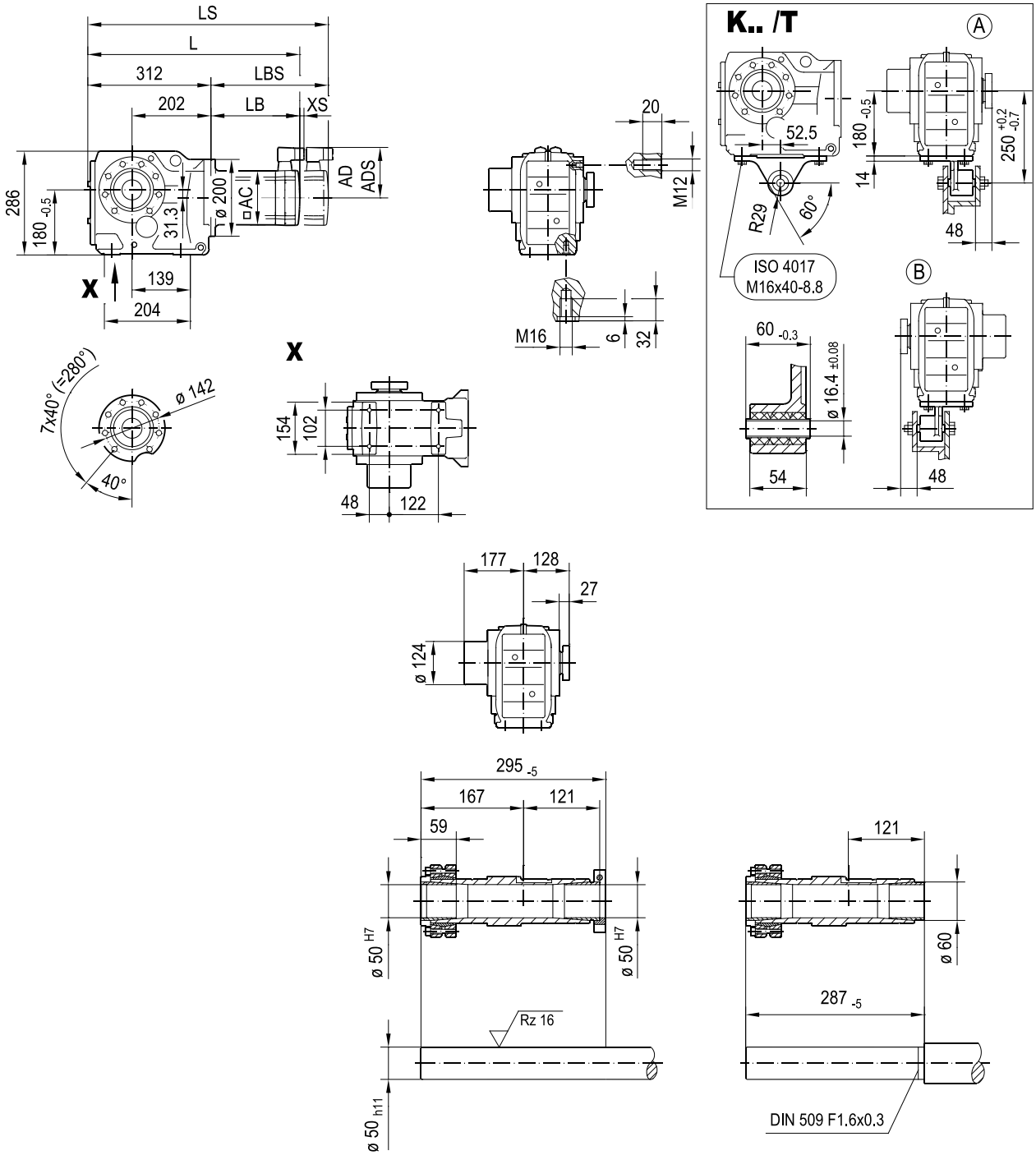
KT77..

33 070 00 19



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	485	507	552	517	543	596	543	571	628
LS	551	573	618	585	611	664	617	645	702
LB	173	195	240	205	231	284	231	259	316
LBS	239	261	306	273	299	352	305	333	390
XS	7	7	7	47	47	47	6	6	6

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10.2.10 K87..

K87, M_{aDyn} Nm									2700 Nm
	CM3C								
i	71S	71M	71L	80S	80M	80L	100S	100M	100L
					3				
7.21						470	390	555	830
8.29		225	330	250	370	540	450	635	950
10.00		270	400	300	445	655	545	770	1150
11.17	205	305	450	335	500	730	610	860	1280
12.56						820	685	960	1440
14.45		395	580	435	645	940	790	1110	1660
16.00	295	435	645	480	715	1050	870	1230	1840
17.42		475	700	525	780	1140	950	1340	2000
19.45	360	530	780	585	870	1270	1060	1500	2240
22.41	415	610	900	675	1000	1470	1220	1720	2580
24.92	465	680	1000	750	1110	1630	1360	1920	2870
27.88	520	760	1120	840	1250	1830	1520	2150	3210
31.39	585	850	1260	940	1410	2060	1710	2420	>3240
36.52		980	1450	1090	1620	2370	1970	2780	>3240
44.02		1190	1750	1310	1950	2860	2380	>3240	>3240
49.16	910	1330	1960	1470	2180	3190	2660	>3240	>3240
56.64	1040	1530	2250	1690	2510	>3240	3060	>3240	>3240
63.00	1160	1700	2510	1880	2800	>3240	>3240	>3240	>3240
70.46	1300	1900	2810	2100	3130	>3240	>3240	>3240	>3240
79.34	1460	2140	3160	2370	>3240	>3240	>3240	>3240	>3240
86.34	1590	2330	>3240	2580	>3240	>3240	>3240	>3240	
102.71	1900	2780	>3240	3070	>3240	>3240	>3240	>3240	
115.82	2140	3130	>3240	>3240	>3240				
126.91	2350	>3240	>3240	>3240	>3240				
147.32	2700	>3240		>3240					
164.34	3010								
174.19	3190								
197.37									

(→ 183)

K87, m kg									
	CM3C								
s	71S	71M	71L	80S	80M	80L	100S	100M	100L
3	96	97	100	100	100	105	105	110	115
KF: + 9.2 kg / KA: + -12 kg / KAF: + 1.1 kg									

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CM3C..				c_{TG}				φ
		n_{epk}	η	K	KF	KA	KAF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
K87 3	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
	36.52	4500	95	207	188	744	744	6
	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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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K87 3	7.21	1300	1950	2210	259	46	13200	15100	4970	4970	28100	27000	28500	30000
	8.29	1400	2100	2380	214	35	13500	15600	4960	4960	27900	26900	27600	30000
	10.00	1500	2240	2550	186	26	14200	16400	5210	5210	27800	26700	26700	30000
	11.17	1500	2250	2550	193	22	14900	17100	5770	5770	27800	26700	26600	30000
	12.56	2000	3000	3400	225	42	14800	17000	5030	5030	26900	25900	24500	30000
	14.45	2100	3150	3570	201	32	15300	17700	5240	5240	26700	25700	23700	30000
	16.00	1800	2270	3060	118	12	16000	18500	5810	5810	27700	26700	26500	30000
	17.42	2200	3240	3740	189	24	16300	18800	5770	5770	26500	25600	23200	30000
	19.45	2300	3240	3910	170	20	16800	19300	5890	5890	26500	25600	23200	30000
	22.41	2300	3240	3910	179	16	17900	20600	6790	6790	26500	25600	23200	30000
	24.92	2500	3240	4250	140	14	18000	20700	6390	6390	26500	25600	23200	30000
	27.88	2600	3240	4420	123	12	18500	21400	6600	6600	26500	25600	23200	30000
	31.39	2700	3240	4590	108	9.6	19200	22100	6900	6900	26500	25600	23200	30000
	36.52	2500	3240	4250	43	20	21400	24500	9140	9140	26500	25600	23200	30000
	44.02	2600	3240	4420	39	16	22800	26000	10100	10100	26500	25600	23200	30000
	49.16	2700	3240	4590	35	14	23500	26300	10400	10400	26500	25600	23200	30000
	56.64	2700	3240	4590	36	11	25000	26300	11600	11600	26500	25600	23200	30000
	63.00	2700	3240	4590	36	9.8	26200	26300	12600	12600	26500	25600	23200	30000
	70.46	2700	3240	4590	37	8.4	27300	26300	13700	13700	26500	25600	23200	30000
	79.34	2700	3240	4590	37	7.1	27300	26300	14800	14800	26500	25600	23200	30000
	86.34	2700	3240	4590	37	6.3	27300	26300	15700	15700	26500	25600	23200	30000
	102.71	2700	3240	4590	38	4.9	27300	26300	17500	17500	26500	25600	23200	30000
	115.82	2700	3240	4590	38	4.0	27300	26300	18800	18800	26500	25600	23200	30000
	126.91	2700	3240	4590	35	3.5	27300	26300	19900	19900	26500	25600	23200	30000
	147.32	2700	3240	4590	31	2.8	27300	26300	21600	21600	26500	25600	23200	30000
	164.34	2700	3240	4590	27	1.8	27300	26300	23000	23000	26500	25600	23200	30000
	174.19	2700	3240	4590	26	1.6	27300	26300	23700	23700	26500	25600	23200	30000
	197.37	2700	3240	4590	23	1.3	27300	26300	25400	25400	26500	25600	23200	30000

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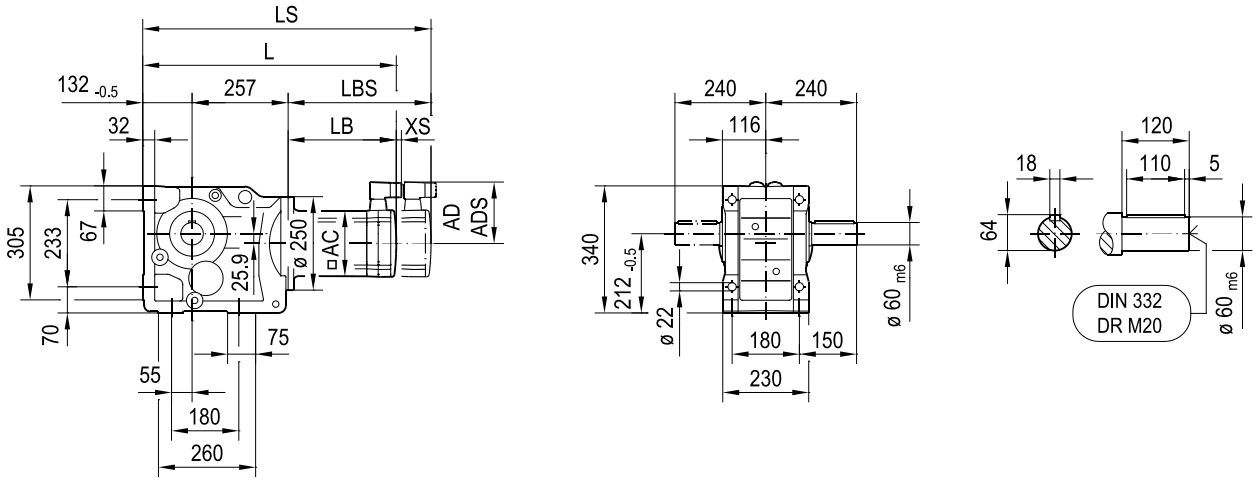
K87..

33 071 00 19



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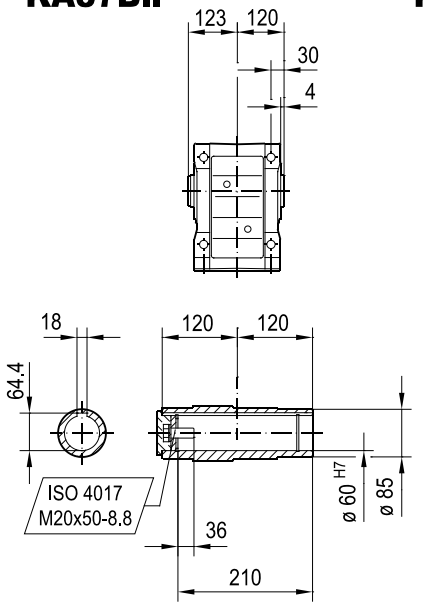

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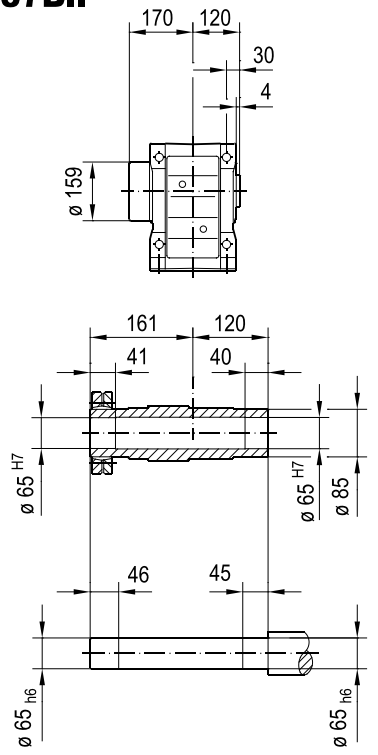

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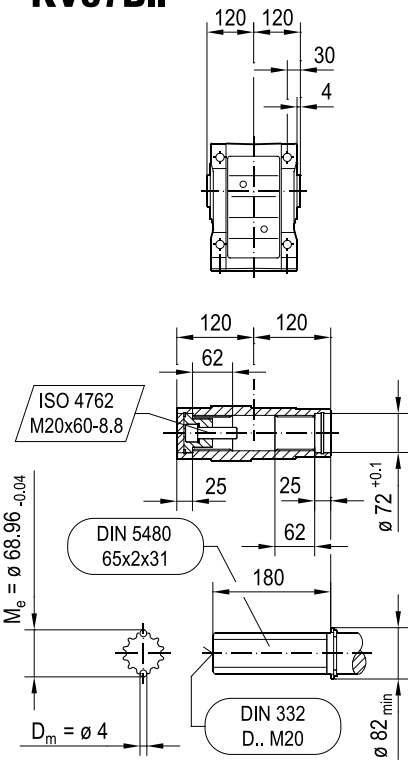

(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	558	580	625	589	615	668	615	643	700
LS	624	646	691	657	683	736	689	717	774
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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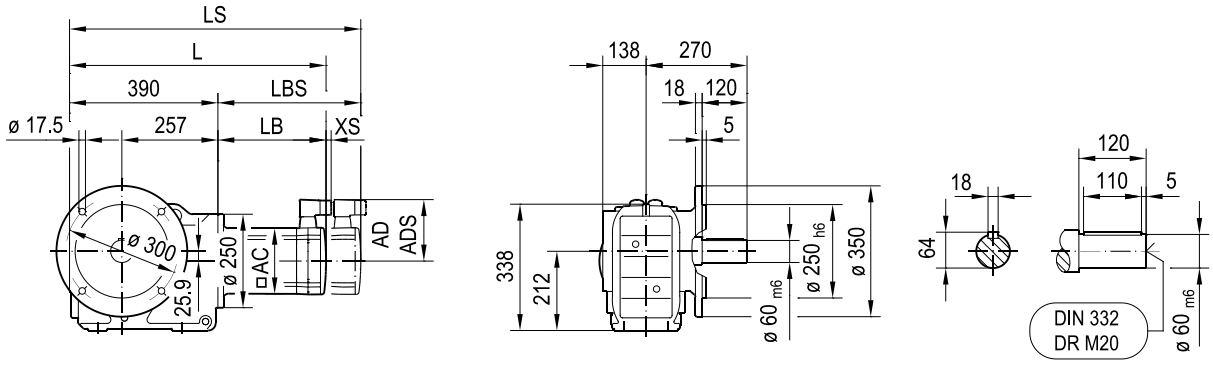
33 072 00 19

KF87..



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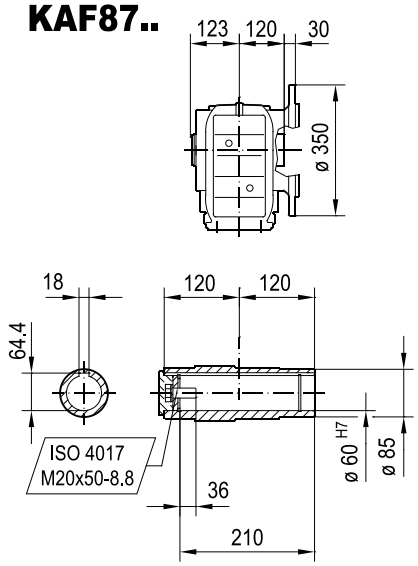

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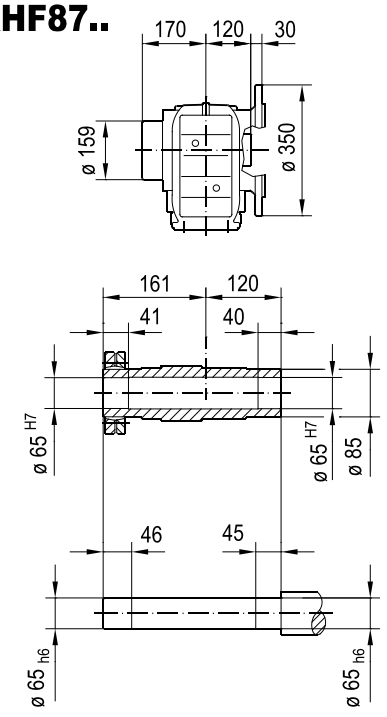

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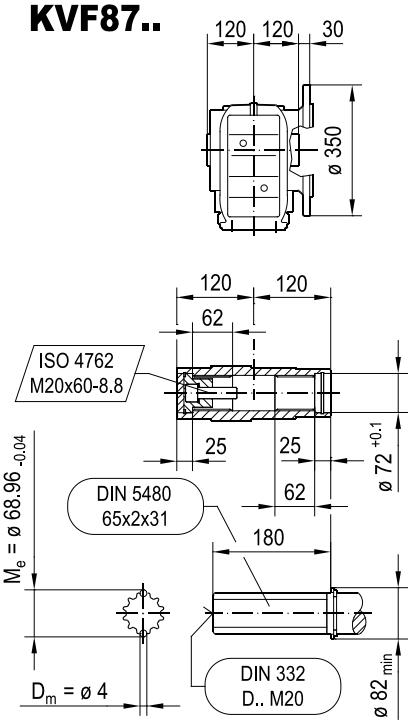

(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	559	581	626	590	616	669	616	644	701
LS	625	647	692	658	684	737	690	718	775
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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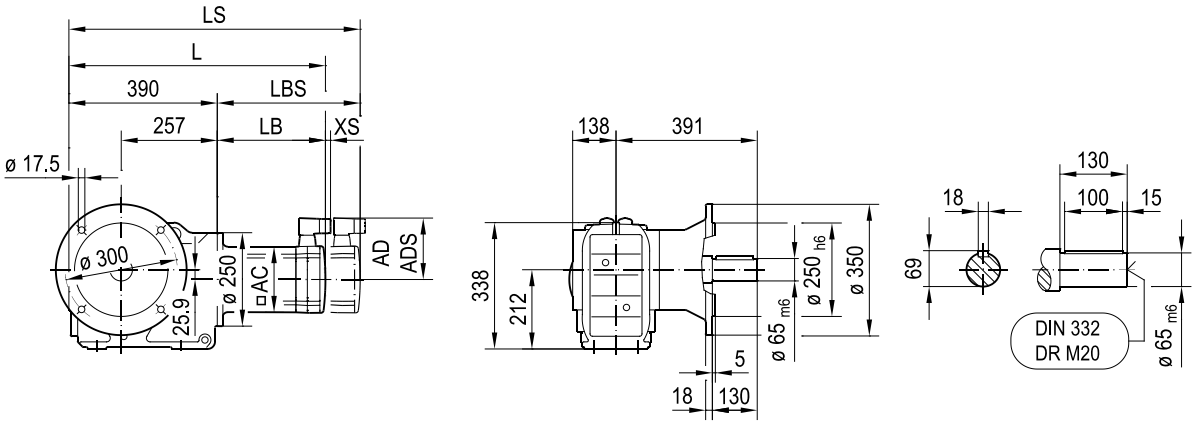
33 011 00 20

KM87..



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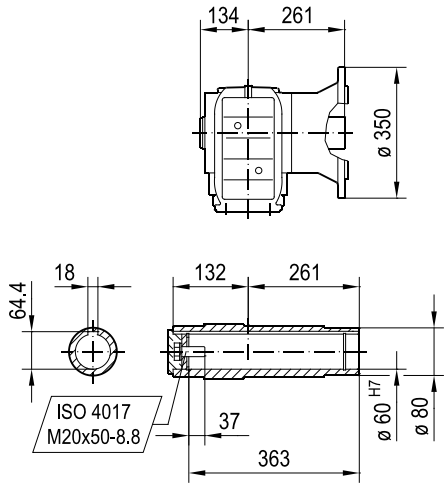

(→ 📖 7.3)	CM3C								
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	559	581	626	590	616	669	616	644	701
LS	625	647	692	658	684	737	690	718	775
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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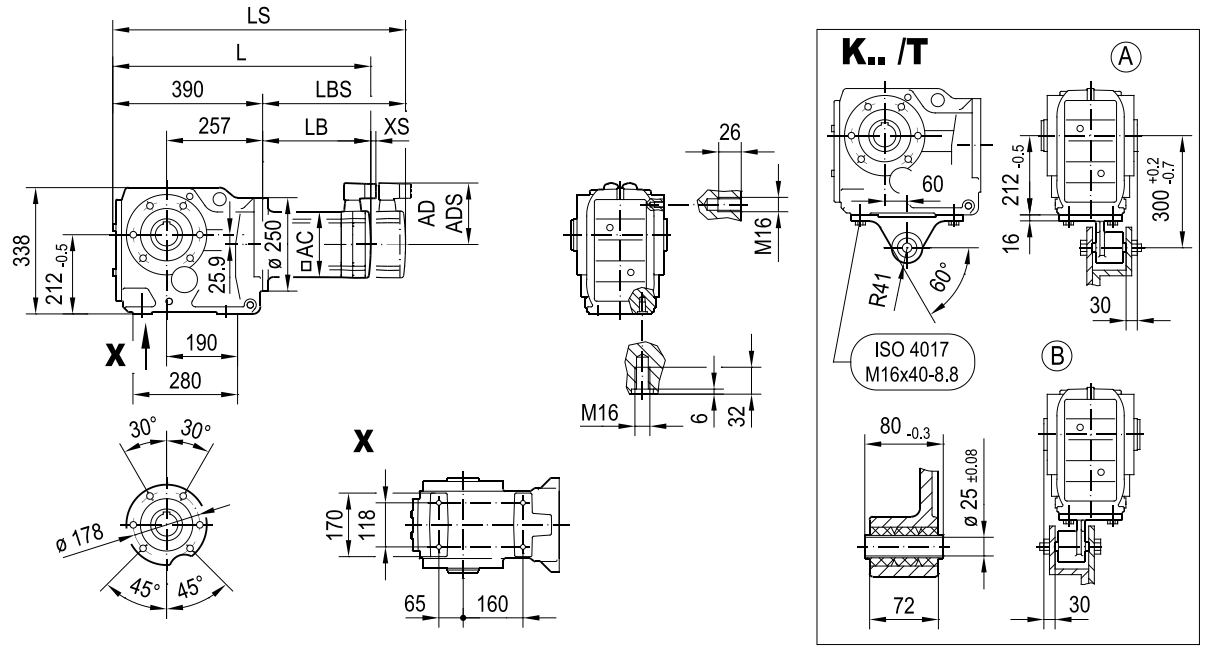
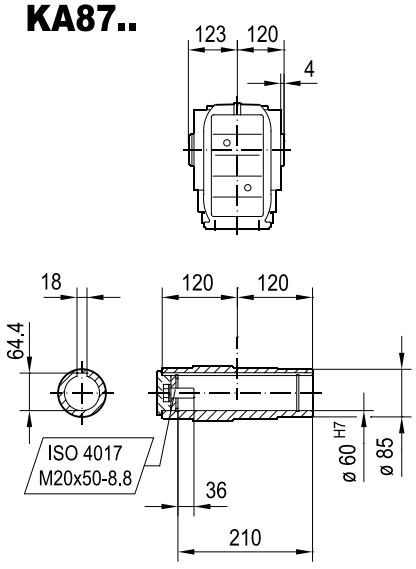
KA87..

33 073 00 19



KA87..



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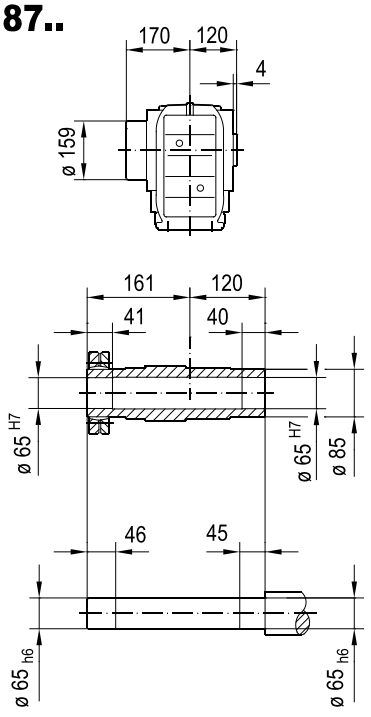

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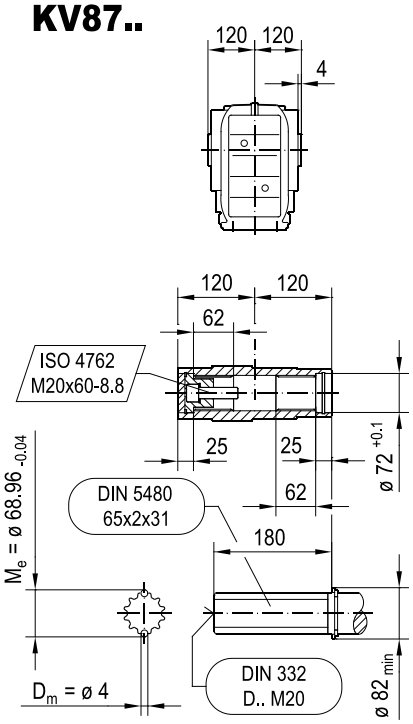

(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	559	581	626	590	616	669	616	644	701
LS	625	647	692	658	684	737	690	718	775
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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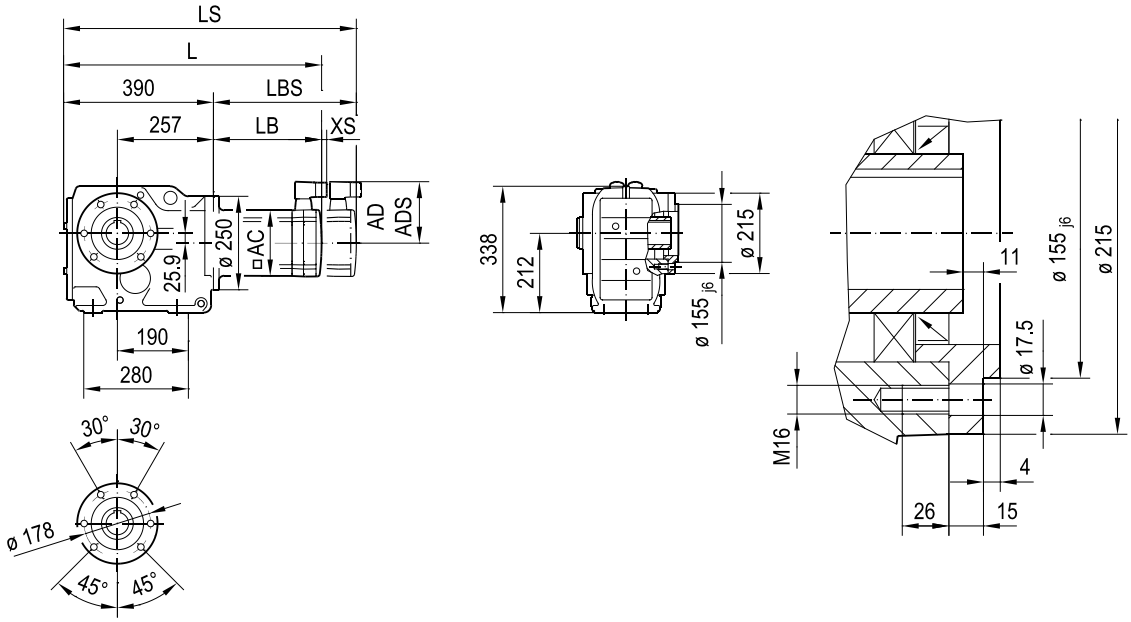
KAZ87..

33 074 00 19



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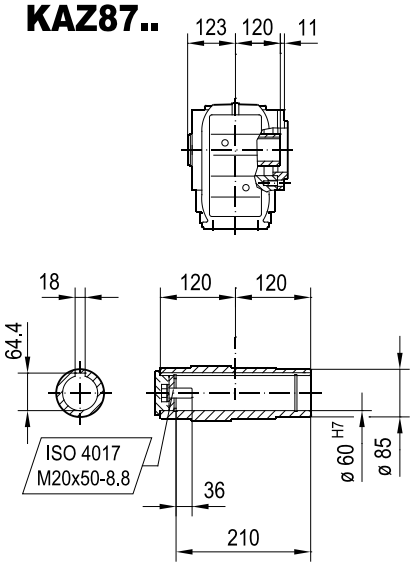

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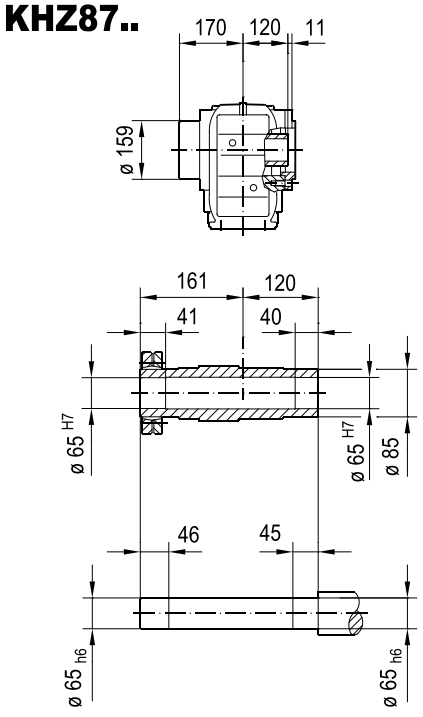

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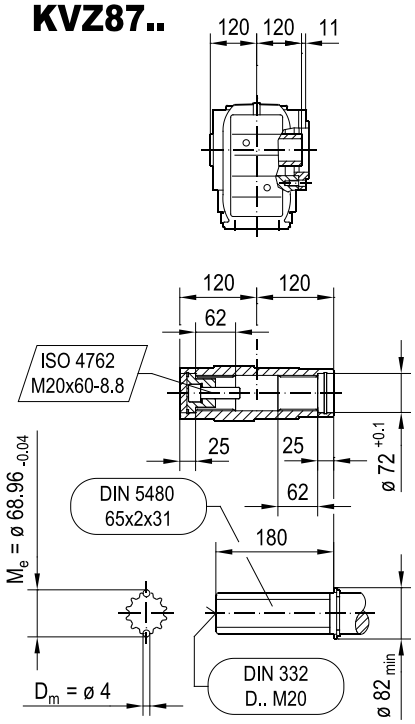

(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	559	581	626	590	616	669	616	644	701
LS	625	647	692	658	684	737	690	718	775
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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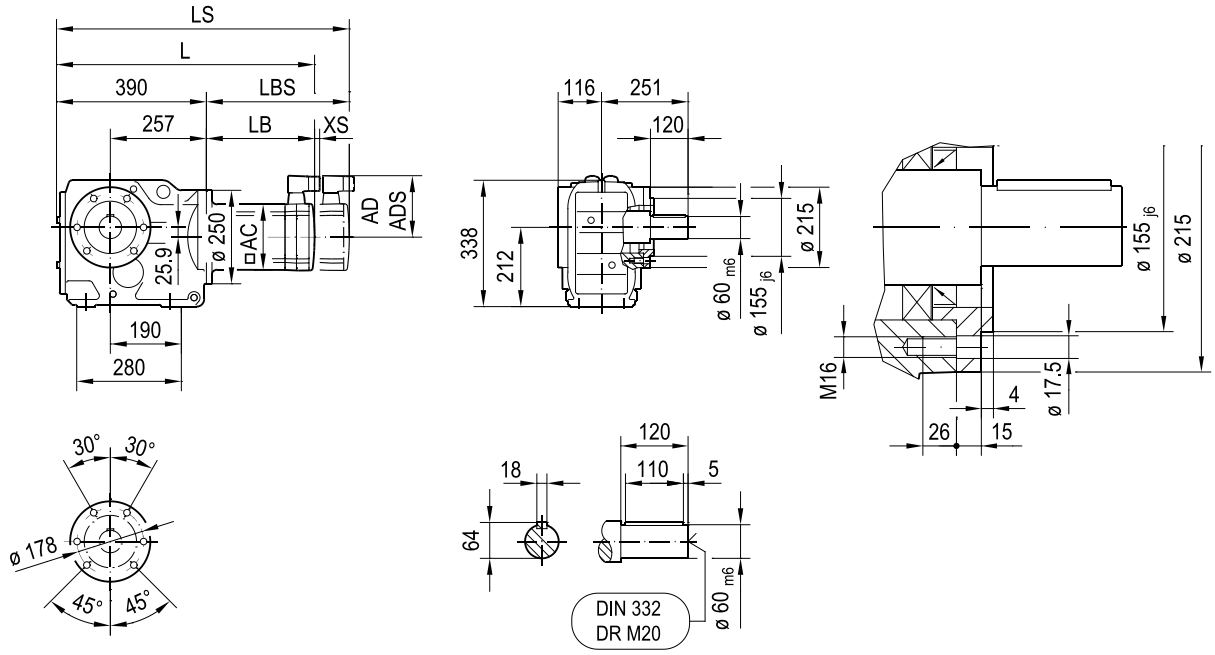
KZ87..

33 006 00 20



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	559	581	626	590	616	669	616	644	701
LS	625	647	692	658	684	737	690	718	775
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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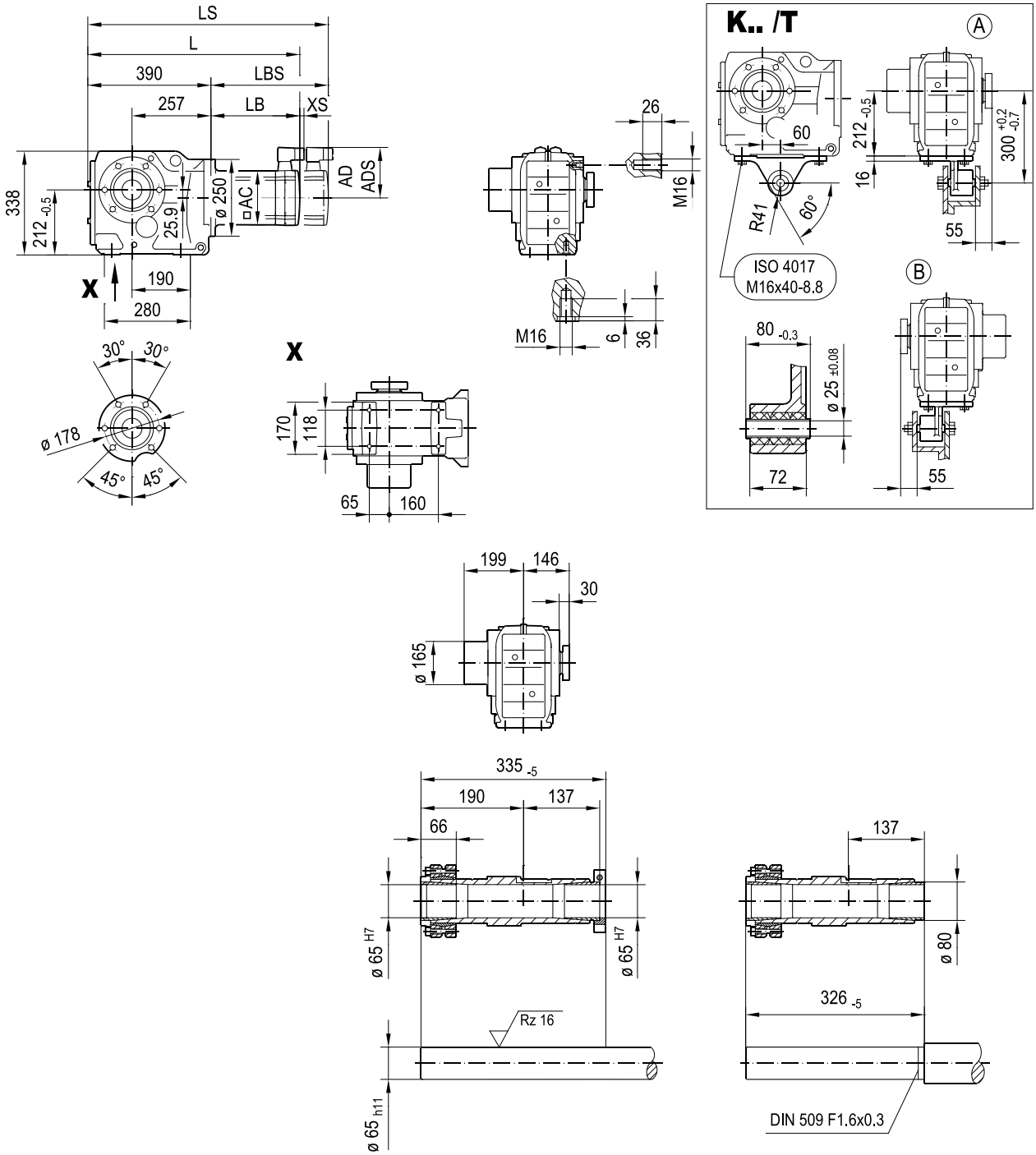
KT87..

33 075 00 19



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	559	581	626	590	616	669	616	644	701
LS	625	647	692	658	684	737	690	718	775
LB	169	191	236	200	226	279	226	254	311
LBS	235	257	302	268	294	347	300	328	385
XS	7	7	7	47	47	47	6	6	6

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10.2.11 K97..

K97, M_{aDyn} Nm						4300 Nm
	CM3C					
i	80S	80M	80L	100S	100M	100L
			3			
7.54			495	410	580	860
8.71			570	475	670	1000
10.41			680	565	800	1190
11.99			785	655	920	1380
13.85			900	755	1060	1590
16.56			1080	900	1270	1900
18.96	570	850	1240	1030	1460	2180
22.37	675	1000	1460	1220	1720	2570
24.75	745	1110	1620	1350	1910	2850
27.91	840	1250	1830	1520	2150	3210
30.82	930	1380	2020	1680	2370	3550
34.23	1030	1530	2240	1870	2640	3940
38.30	1150	1720	2510	2090	2950	4410
41.87			2660	2210	3130	4670
47.93	1410	2100	3080	2560	3620	>4710
56.55	1670	2480	3630	3020	4270	>4710
62.55	1850	2750	4020	3350	>4710	>4710
70.54	2080	3100	4530	3770	>4710	>4710
77.89	2300	3420	>4710	4170	>4710	>4710
86.52	2560	3800	>4710	4630	>4710	>4710
96.80	2860	4250	>4710	>4710	>4710	>4710
105.13	3110	4620	>4710	>4710	>4710	
123.93	3660	>4710	>4710	>4710	>4710	
140.28	4150	>4710				
153.21	4530	>4710				
176.05	>4710					

(→ 183)

K97, m kg						
	CM3C					
s	80S	80M	80L	100S	100M	100L
3	160	160	165	165	170	175
KF: + 20 kg / KA: + -18 kg / KAF: + 6.7 kg						

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CM3C..				c_{TG}				φ
		n_{epk}	η	K	KF	KA	KAF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K97 3	7.54[1)]	2400	3560	4080	290	120	15700	18100	10200	10200	40000	39300	40000	40000
	8.71[1)]	2660	3590	4520	222	94	15800	18200	9930	9930	40000	39300	40000	40000
	10.41	2870	3610	4870	187	71	16400	19000	10300	10300	40000	39300	40000	40000
	11.99[1)]	3890	4710	6610	172	115	16200	18800	9100	9100	40000	38300	40000	40000
	13.85[1)]	4300	4710	7310	132	91	16100	18900	8520	8520	40000	38300	40000	40000
	16.56	4300	4710	7310	144	69	17800	20700	10300	10300	40000	38300	40000	40000
	18.96	4300	4710	7310	151	55	19100	22100	11700	11700	40000	38300	40000	40000
	22.37	4300	4710	7310	161	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	161	30	23300	26600	16100	16100	40000	38300	40000	40000
	30.82	4300	4710	7310	146	26	24500	27800	17300	17300	40000	38300	40000	40000
	34.23	4300	4710	7310	131	22	25700	29200	18600	18600	40000	38300	40000	40000
	38.30	4300	4710	7310	117	18	27100	30700	20100	20100	40000	38300	40000	40000
	41.87	4300	4710	7310	37	42	28300	31900	21300	21300	40000	38300	40000	40000
	47.93	4300	4710	7310	32	35	30000	33800	23300	23300	40000	38300	40000	40000
	56.55	4300	4710	7310	31	28	32300	36300	25700	25700	40000	38300	40000	40000
	62.55	4300	4710	7310	32	25	33800	37800	27300	27300	40000	38300	40000	40000
	70.54	4300	4710	7310	32	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	32	5.9	40000	38700	40000	40000	40000	38300	40000	40000
	153.21	4300	4710	7310	29	5.2	40000	38700	40000	40000	40000	38300	40000	40000
	176.05	4300	4710	7310	26	4.0	40000	38700	40000	40000	40000	38300	40000	40000

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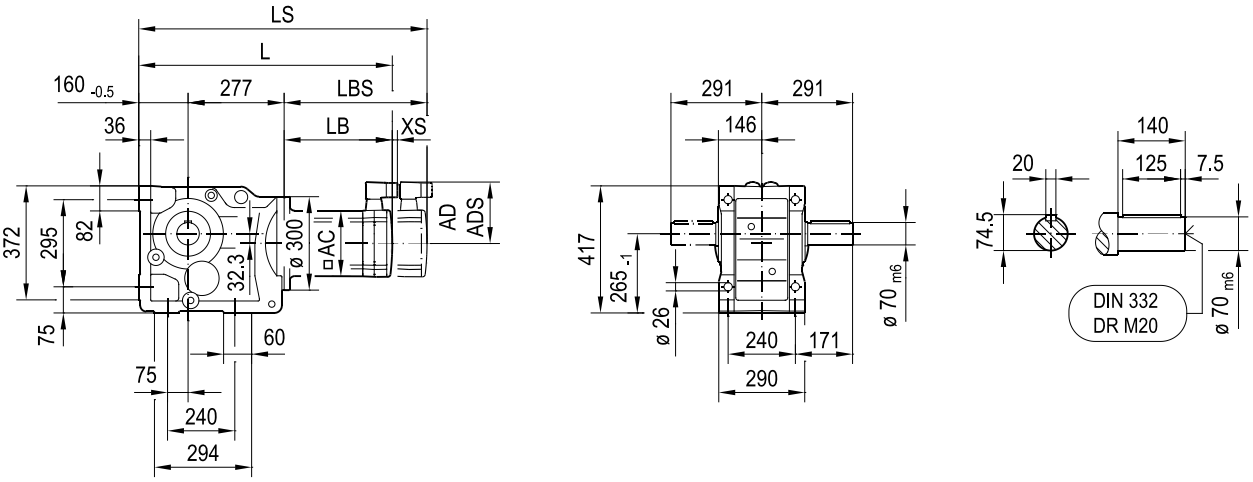
K97..

33 076 00 19



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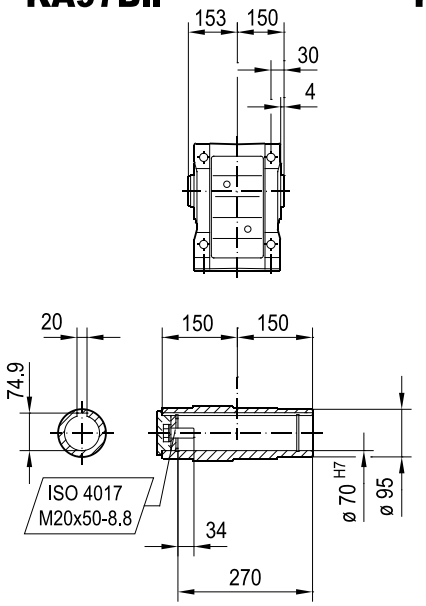

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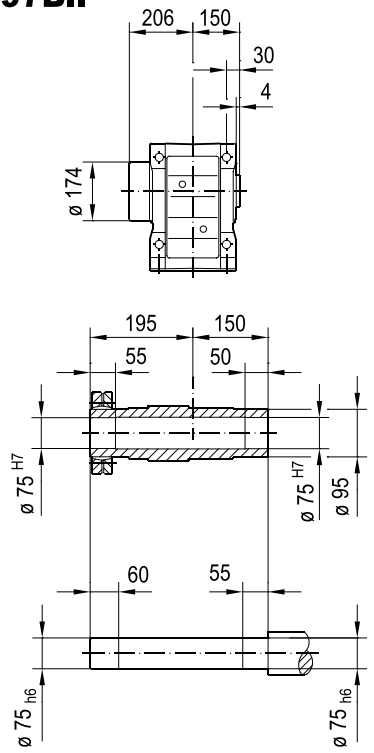

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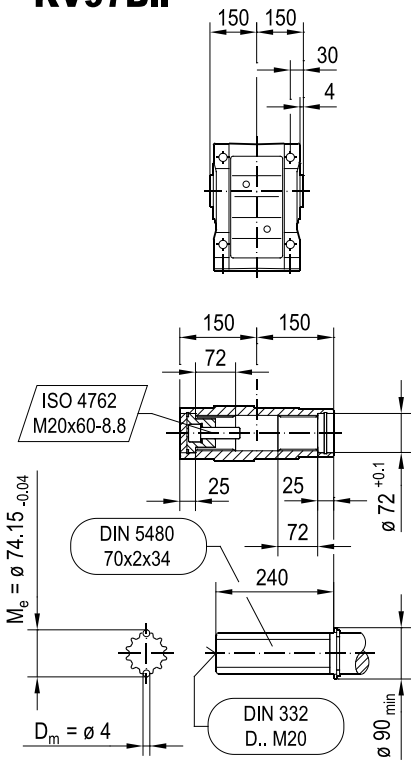

(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	632	658	711	658	686	743		
LS	700	726	779	732	760	817		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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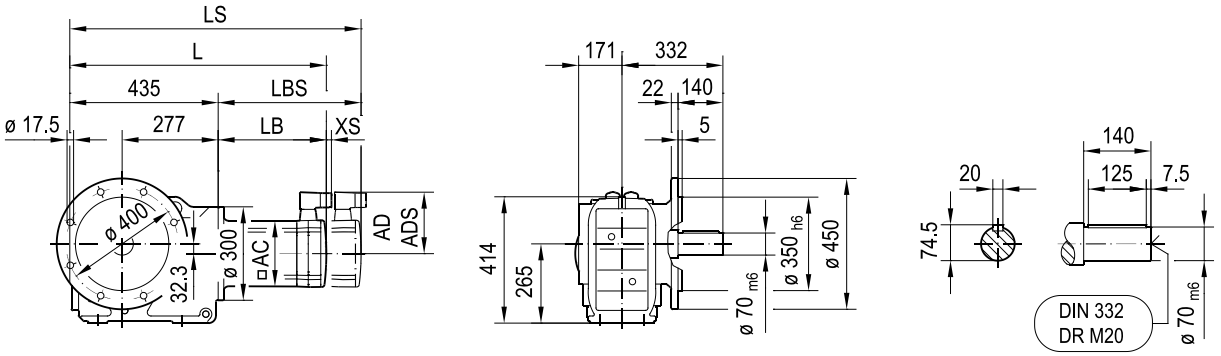
KF97..

33 077 00 19



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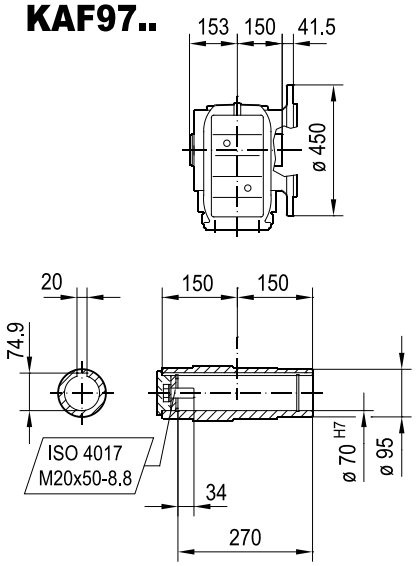

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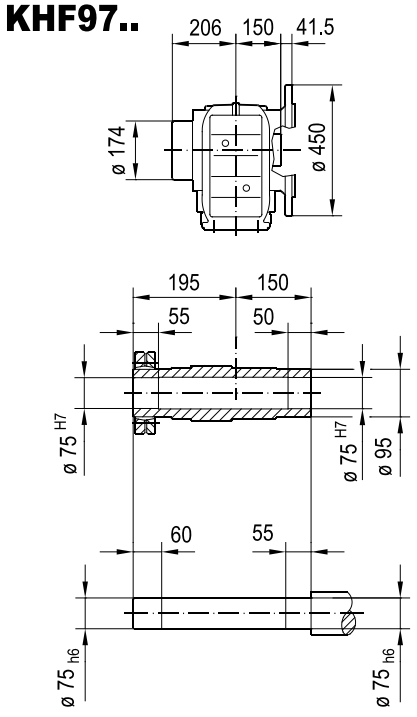

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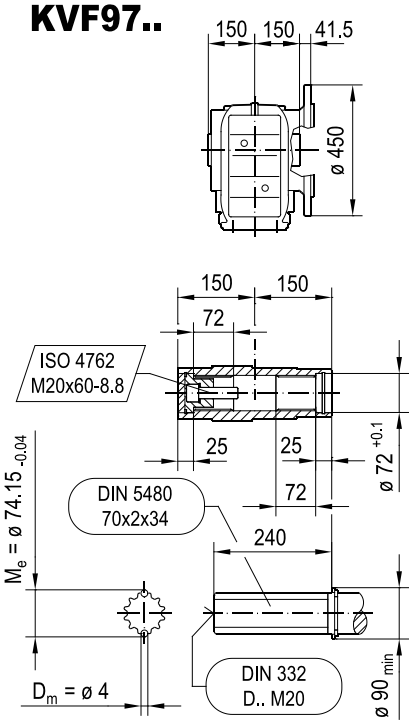

(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	630	656	709	656	684	741		
LS	698	724	777	730	758	815		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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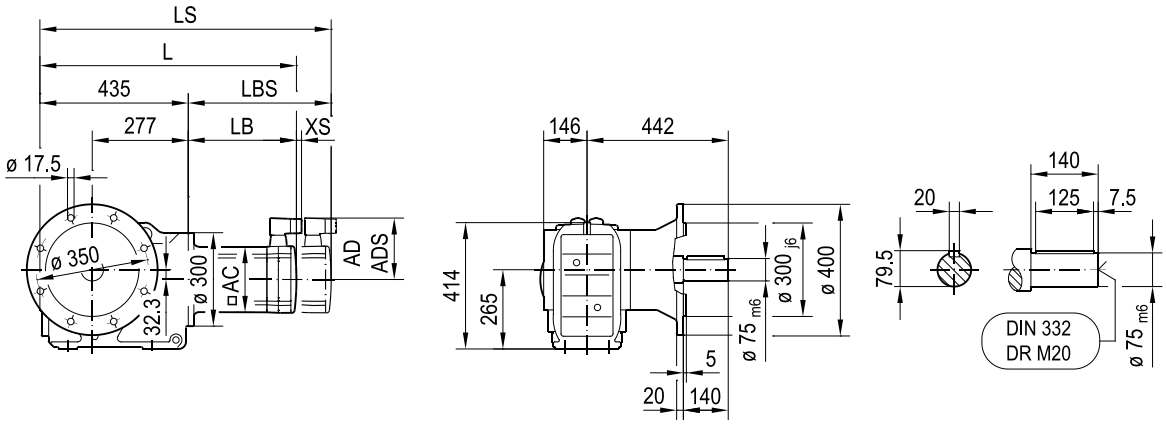
33 012 00 20

KM97..



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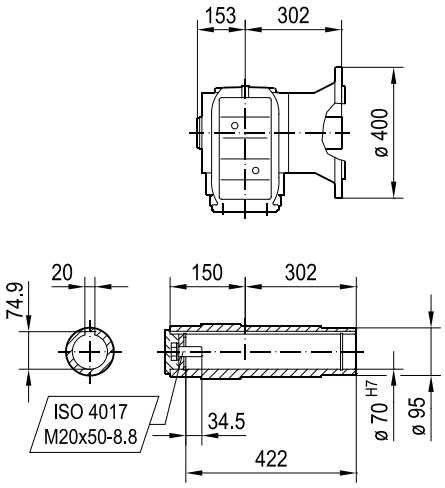

(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	630	656	709	656	684	741		
LS	698	724	777	730	758	815		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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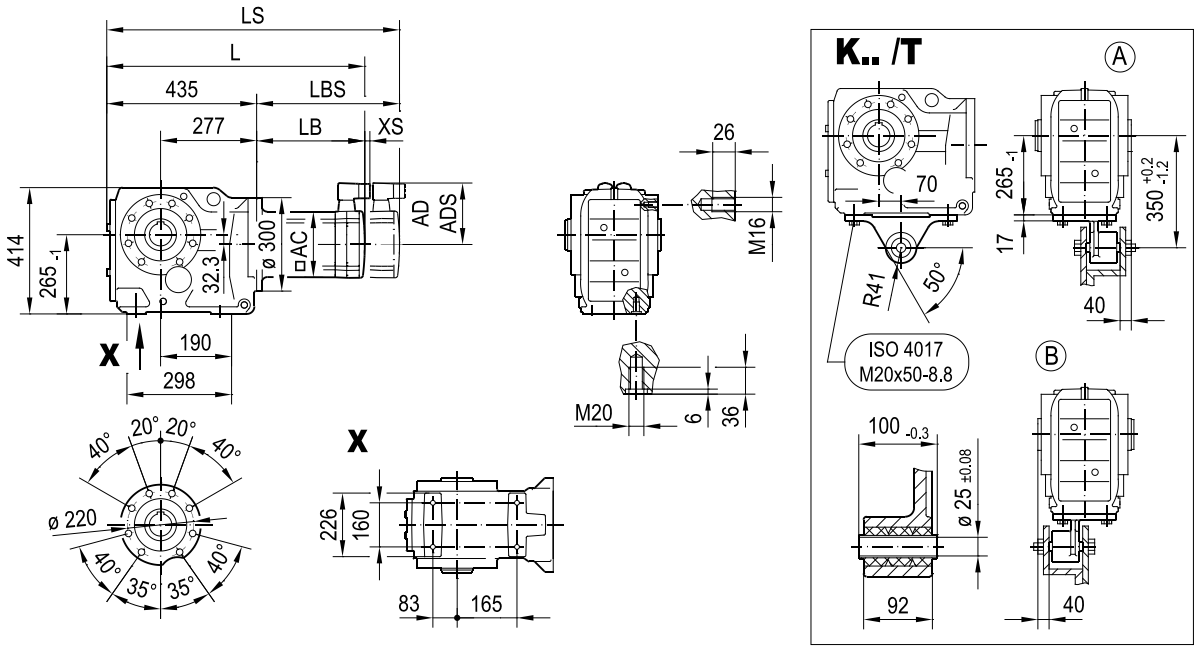
KA97..

33 078 00 19



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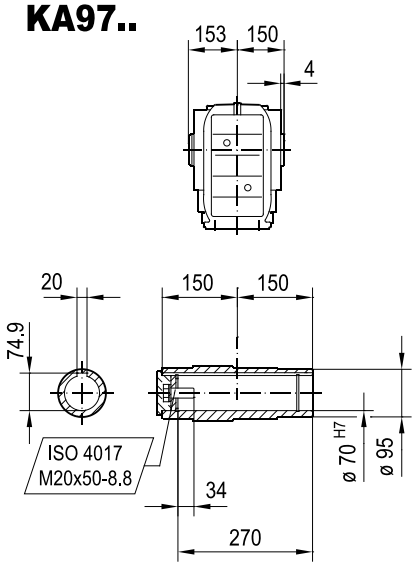

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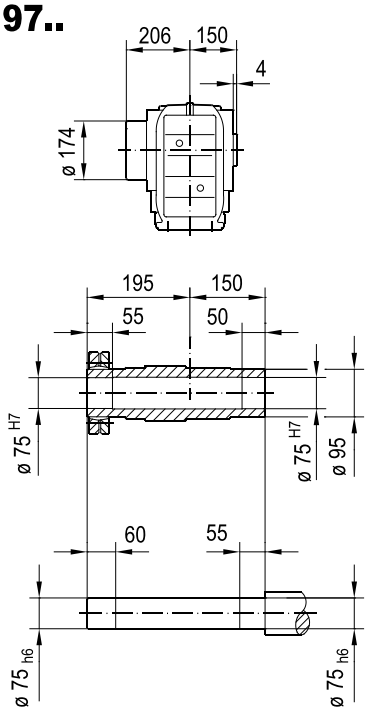

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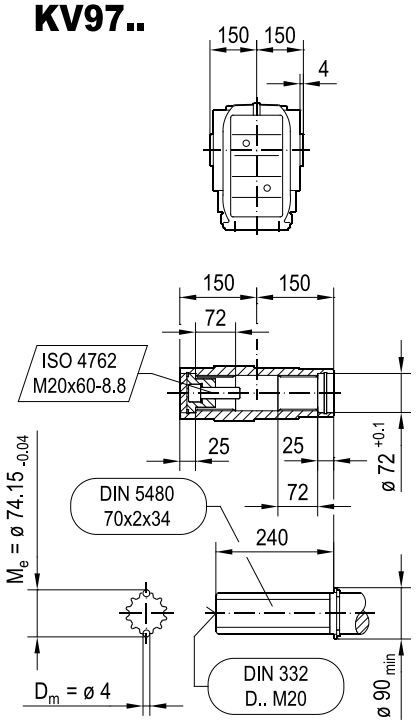

(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	630	656	709	656	684	741		
LS	698	724	777	730	758	815		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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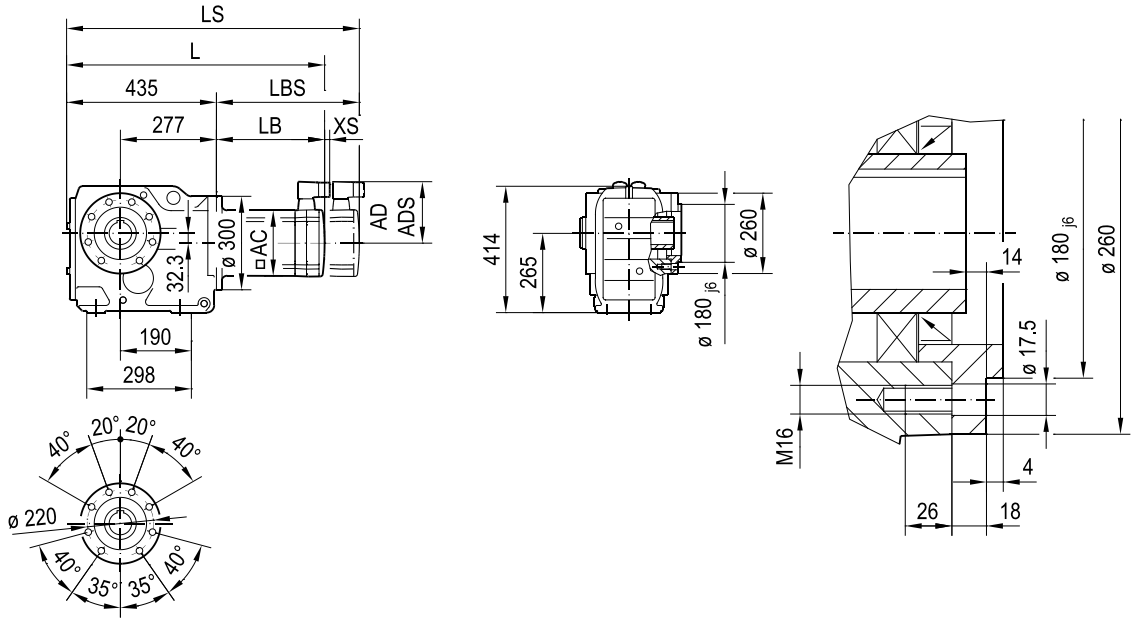
KAZ97..

33 079 00 19



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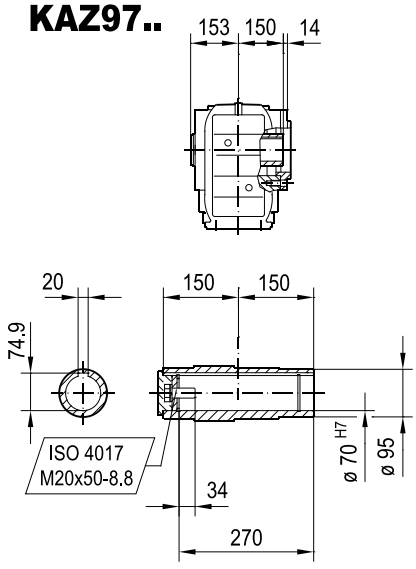

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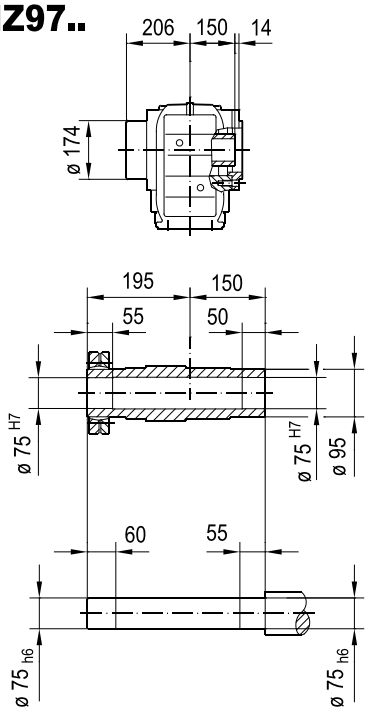

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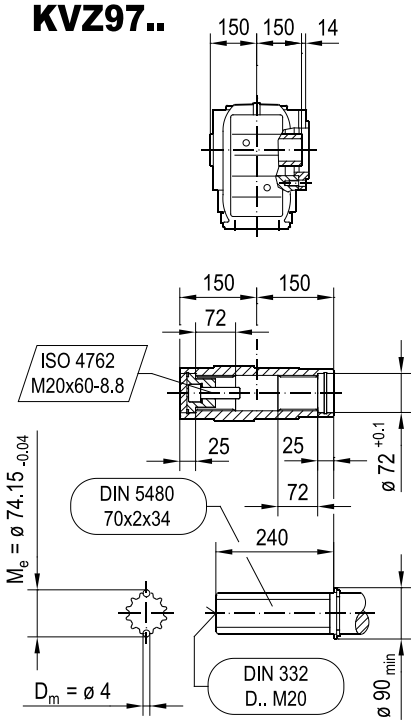

(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	630	656	709	656	684	741		
LS	698	724	777	730	758	815		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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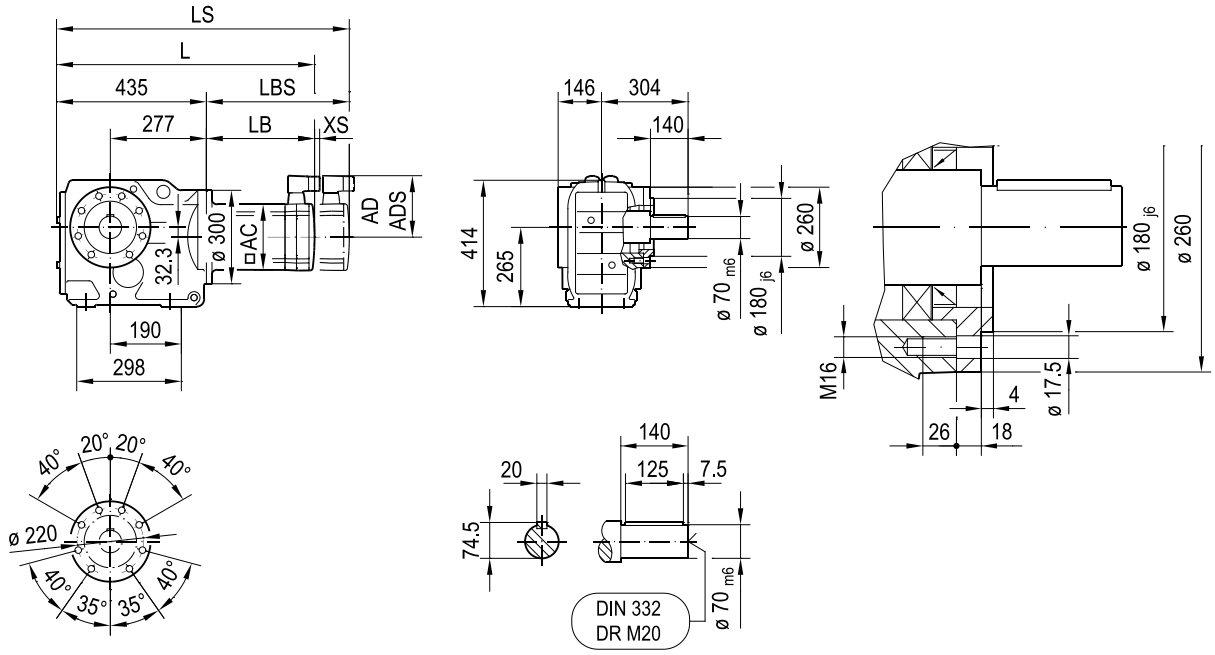
KZ97..

33 007 00 20



(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	630	656	709	656	684	741		
LS	698	724	777	730	758	815		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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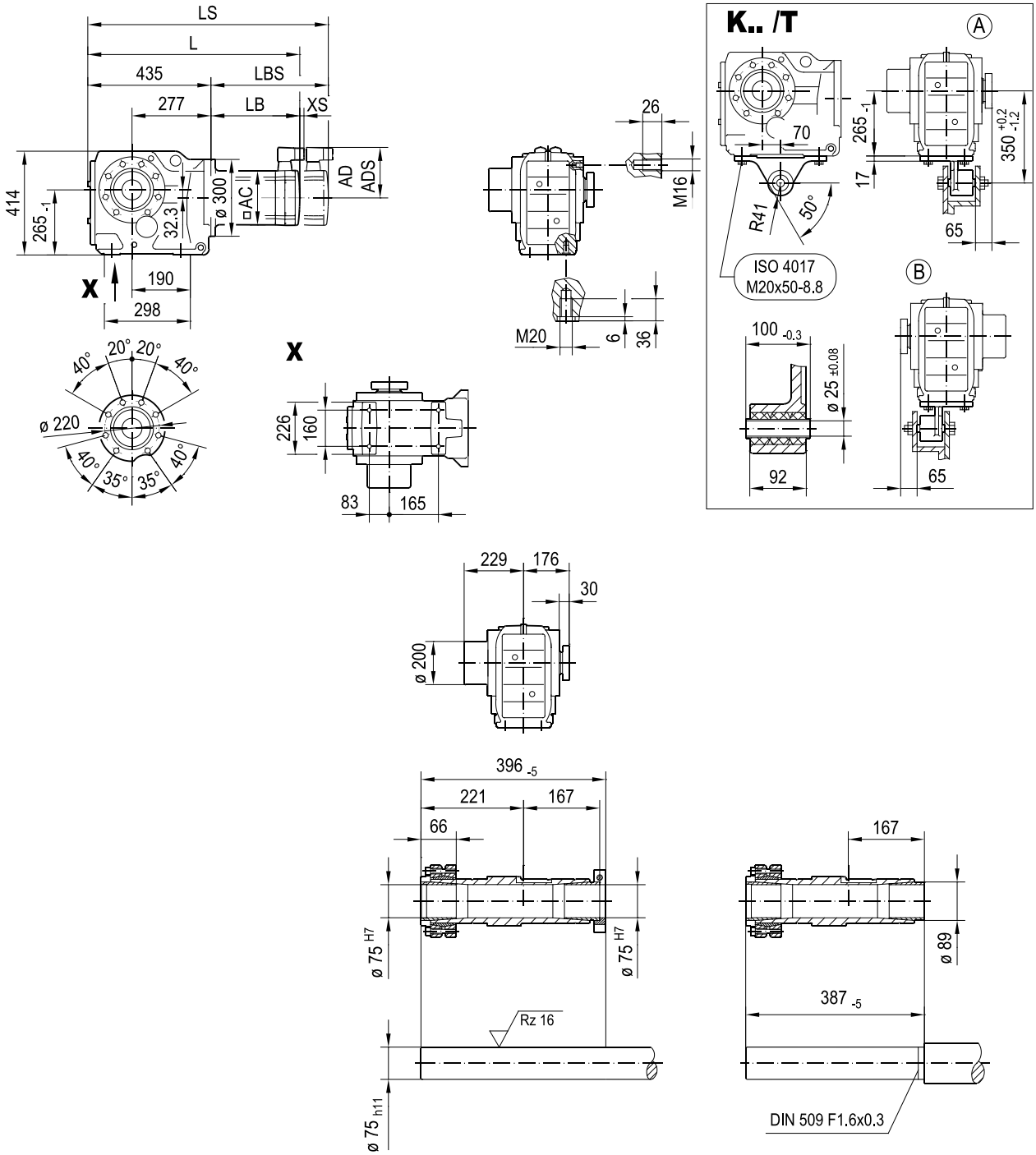
KT97..

33 080 00 19



(→ 📖 7.3)	CM3C							
	80S	80M	80L	100S	100M	100L		
AC	140	140	140	165	165	165		
AD	127	127	127	140	140	140		
ADS	127	127	127	140	140	140		
L	630	656	709	656	684	741		
LS	698	724	777	730	758	815		
LB	195	221	274	221	249	306		
LBS	263	289	342	295	323	380		
XS	47	47	47	6	6	6		

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10.2.12 K107..

K107, M_{aDyn} Nm			8000 Nm
	CM3C		
i	100S	100M	100L
		3	
7.35			840
8.69	475	670	1000
9.94	540	765	1140
11.73	640	900	1350
13.43	730	1030	1540
14.64	800	1120	1680
16.75	910	1290	1920
19.74	1080	1520	2270
22.62	1230	1740	2600
26.32	1440	2030	3030
29.00	1580	2230	3340
31.28			3520
32.69	1780	2520	3760
37.00	1980	2790	4170
42.33	2260	3190	4770
49.90	2670	3770	5620
57.17	3060	4320	6440
66.52	3560	5020	7500
73.30	3920	5530	8260
82.61	4420	6240	>9090
90.96	4870	6870	>9090
100.75	5390	7610	>9090
112.41	6020	8490	>9090
121.46	6500	>9090	
143.47	7680	>9090	

(→ 183)

K107, m kg			
	CM3C		
s	100S	100M	100L
3	280	280	290
KF: + 12 kg / KA: + -27 kg / KAF: + -3.2 kg			

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CM3C..				c_{TG}				φ
		n_{epk}	η	K	KF	KA	KAF	/R
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'	'
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
	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
	31.28	3197	94	730	670	1660	1660	6
	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

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CM3C..							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	K	KF	KA	KAF	K	KF	KA	KAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
K107 3	7.35[1)]	3600	4720	6120	298	231	24400	28500	9900	47100	65000	65000	65000	65000
	8.69	4070	4780	6910	212	170	24600	29100	9270	48300	65000	65000	65000	65000
	9.94	4190	4840	7120	204	136	25800	30500	10000	50500	65000	65000	65000	65000
	11.73	4300	4910	7310	201	104	27500	32300	11100	53500	65000	65000	65000	65000
	13.43	4300	4940	7310	210	82	29200	34200	12600	56500	65000	65000	65000	65000
	14.64	6890	8060	11700	124	163	19500	23000	6180	51700	65000	65000	64300	65000
	16.75	7050	8160	11900	122	131	21000	24800	7080	54200	65000	65000	63900	65000
	19.74	7200	8270	12200	122	100	23200	27300	8440	57700	65000	65000	63400	65000
	22.62	7200	8320	12200	127	80	25800	30300	10100	61200	65000	65000	63300	65000
	26.32	7200	8370	12200	134	63	28800	33600	12100	65000	65000	65000	63100	65000
	29.00	7200	8400	12200	137	54	30700	35800	13400	65000	65000	65000	62900	65000
	31.28[1)]	6800	9090	11500	49	112	34200	39700	16100	65000	65000	65000	60200	65000
	32.69	7200	8430	12200	138	45	33200	38600	15100	65000	65000	65000	62800	65000
	37.00	7200	9090	12200	42	86	35800	41500	17000	65000	65000	65000	60200	65000
	42.33	7360	9090	12500	38	72	37900	44000	18400	65000	65000	65000	60200	65000
	49.90	7840	9090	13300	32	58	39300	45600	19200	65000	65000	65000	60200	65000
	57.17	8000	9090	13600	30	48	41700	48400	20900	65000	65000	65000	60200	65000
	66.52	8000	9090	13600	31	40	45400	52500	23600	65000	65000	65000	60200	65000
	73.30	8000	9090	13600	31	35	47900	55300	25400	65000	65000	65000	60200	65000
	82.61	8000	9090	13600	31	29	50900	58700	27700	65000	65000	65000	60200	65000
	90.96	8000	9090	13600	32	25	53500	61600	29600	65000	65000	65000	60200	65000
	100.75	8000	9090	13600	32	20	56200	64700	31700	65000	65000	65000	60200	65000
	112.41	8000	9090	13600	32	17	59300	65000	34000	65000	65000	65000	60200	65000
	121.46	8000	9090	13600	32	15	61500	65000	35700	65000	65000	65000	60200	65000
	143.47	8000	9090	13600	31	12	65000	65000	39600	65000	65000	65000	60200	65000

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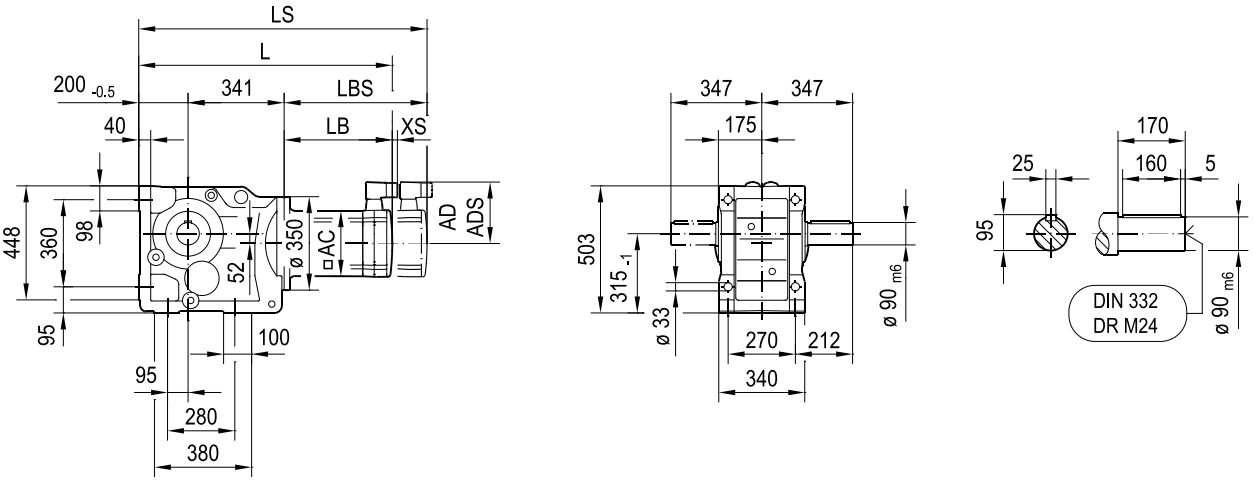
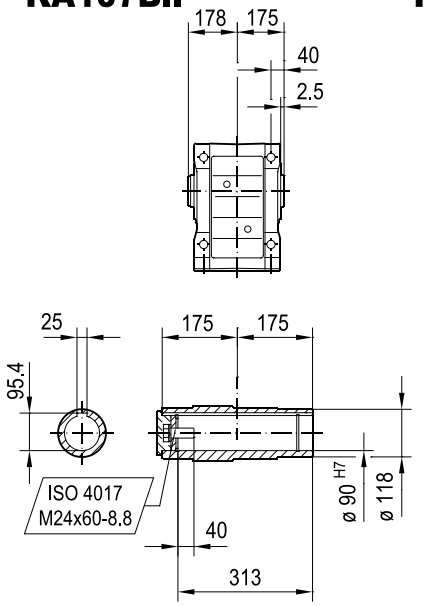
K107..

33 081 00 19



KA107B..



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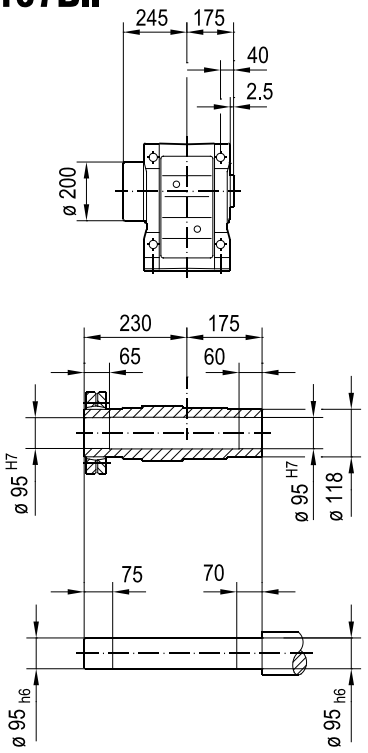
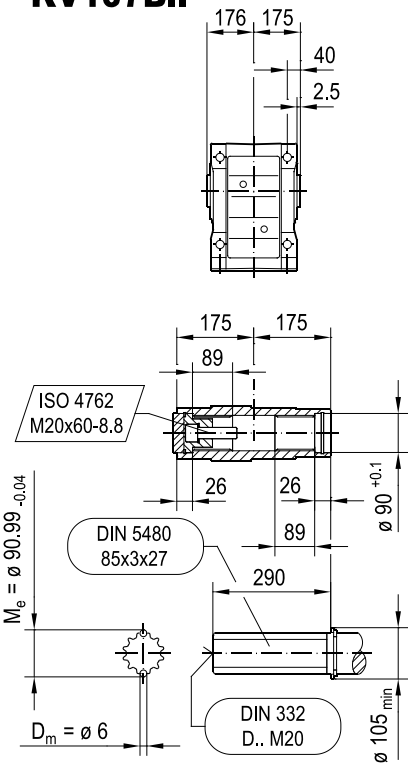


KV107B..



(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	756	784	841					
LS	830	858	915					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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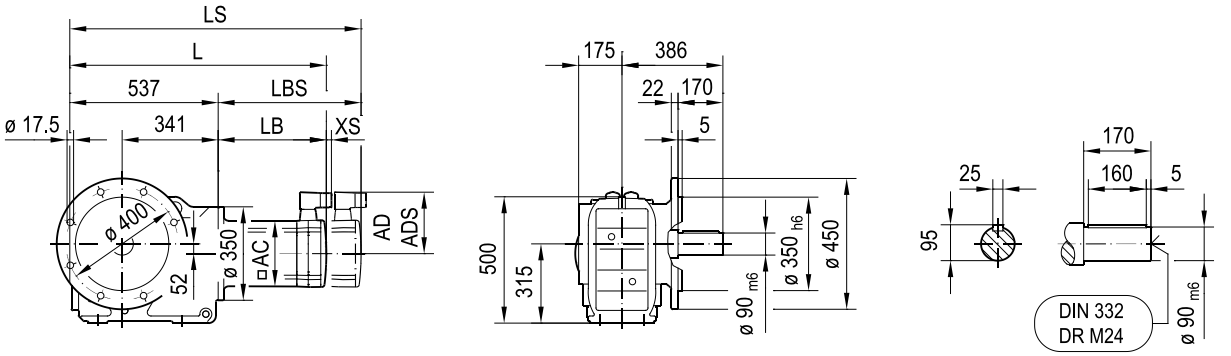
KF107..

33 082 00 19



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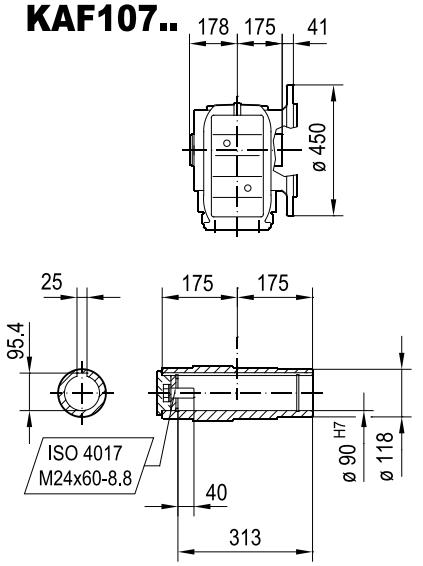

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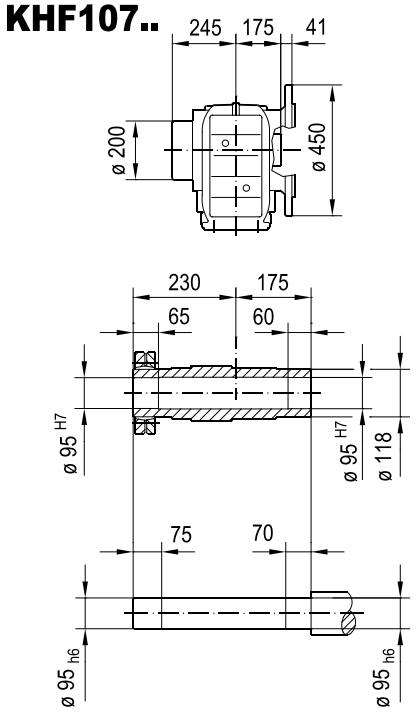

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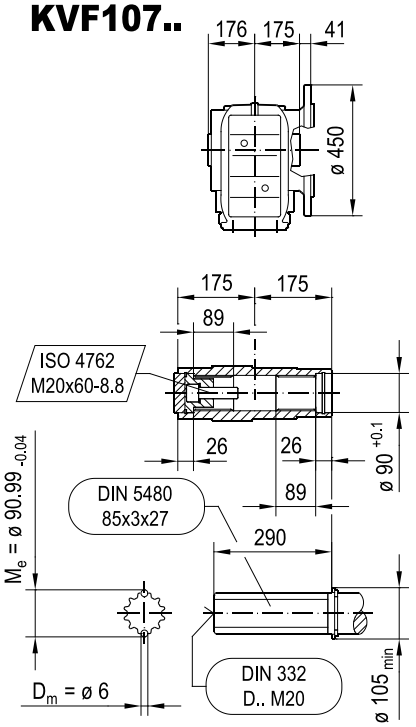

(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	752	780	837					
LS	826	854	911					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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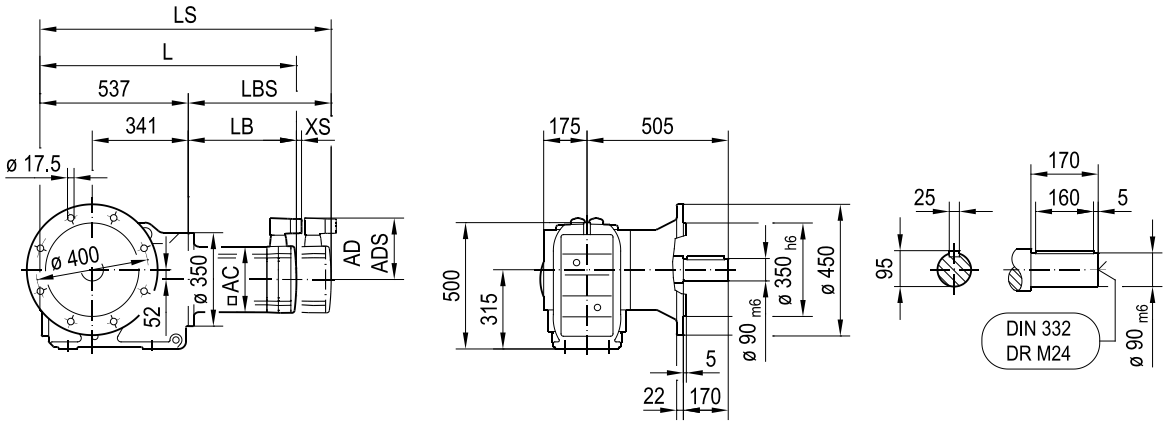
33 013 00 20

KM107..



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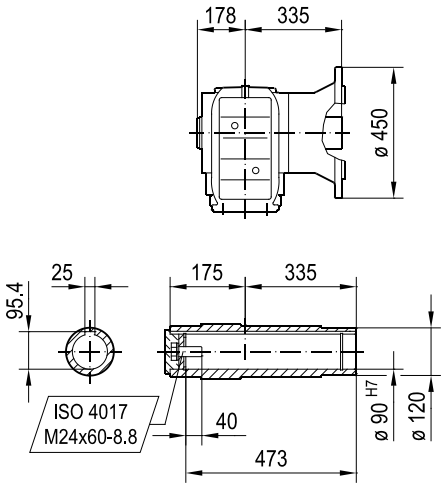

(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	752	780	837					
LS	826	854	911					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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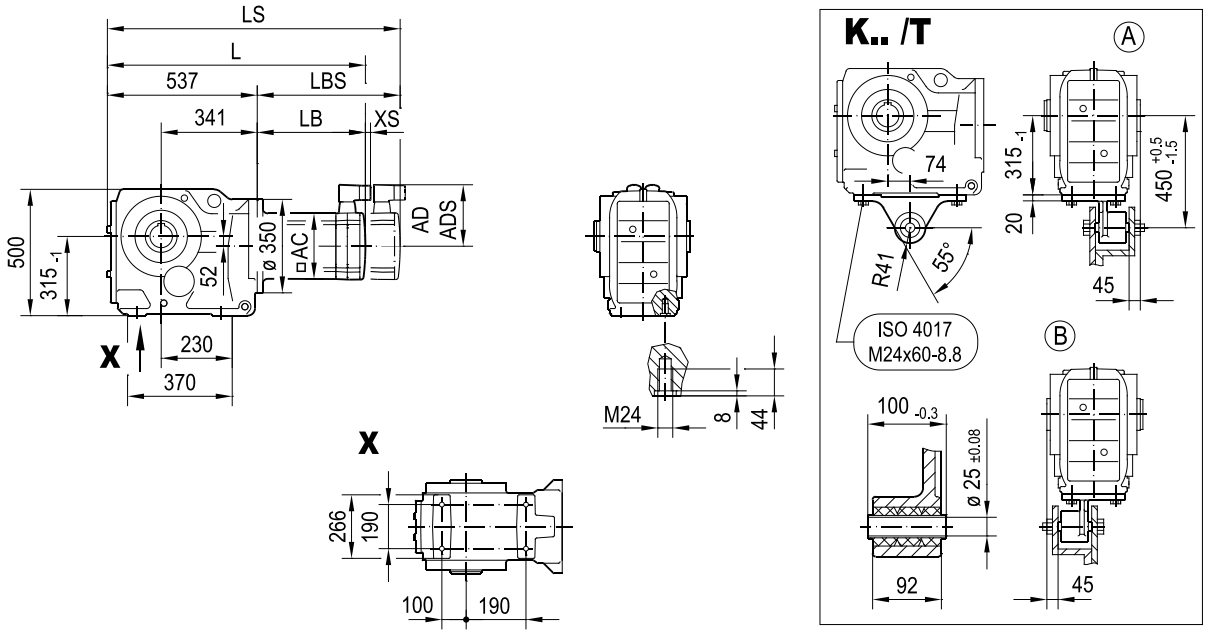
KA107..

33 083 00 19



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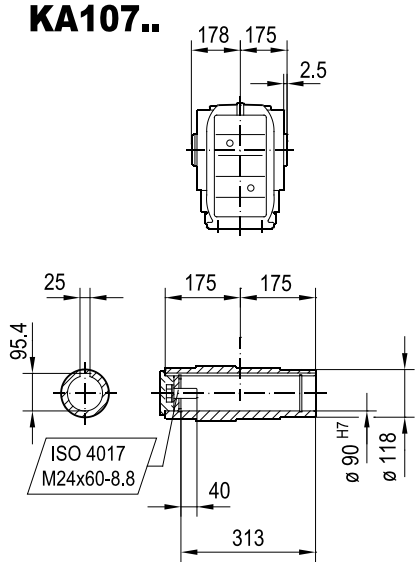
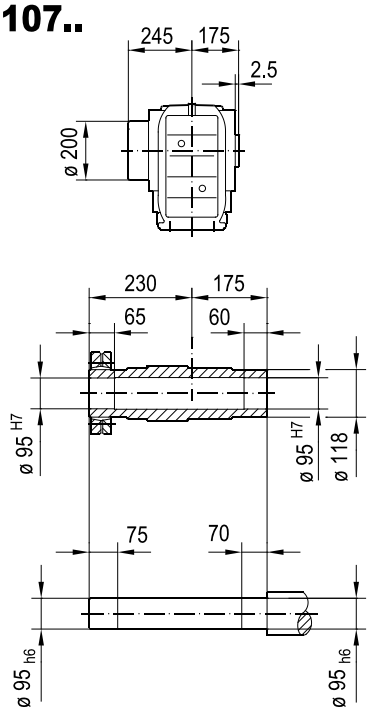


KH107..



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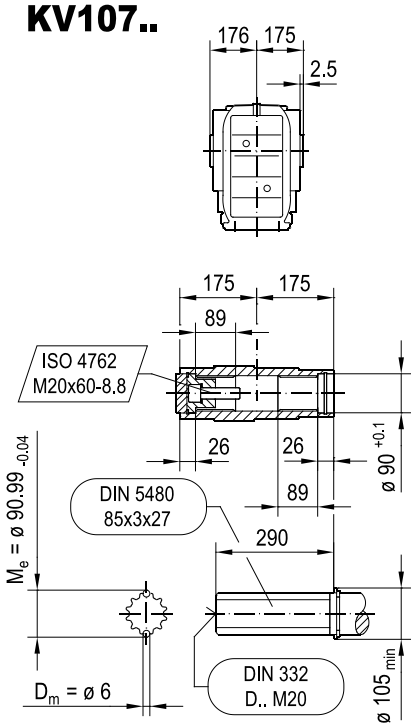

(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	752	780	837					
LS	826	854	911					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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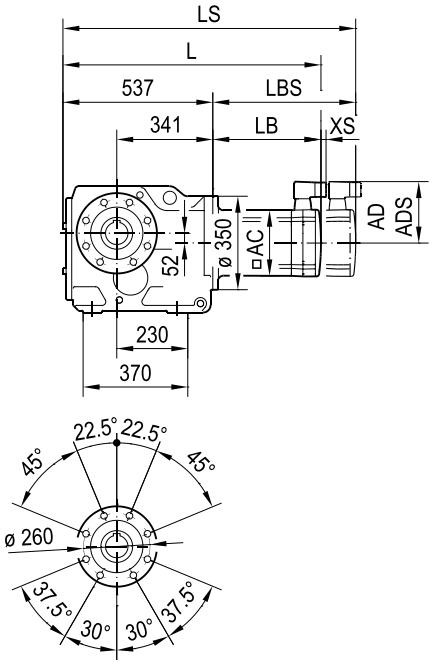
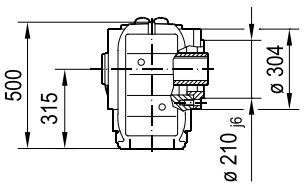
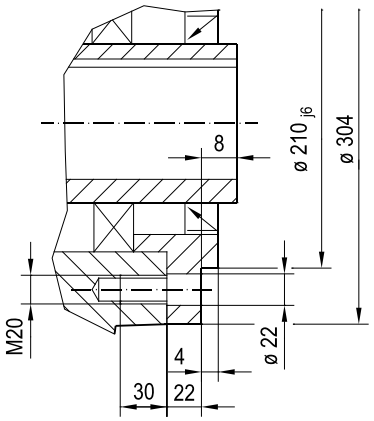
33 084 00 19

KAZ107..







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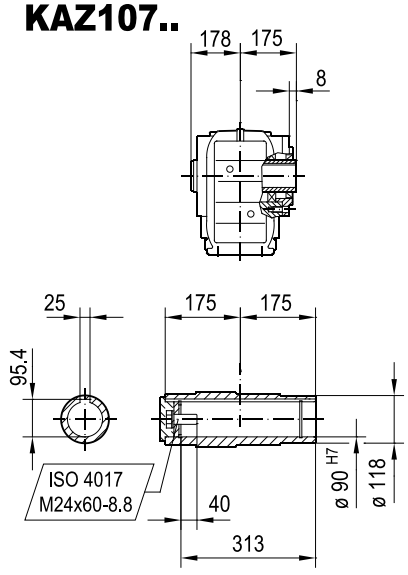

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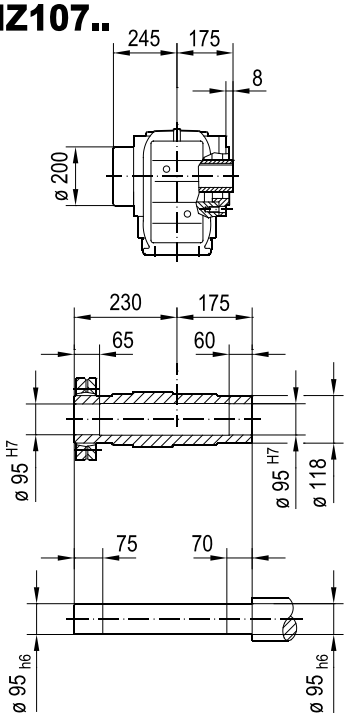

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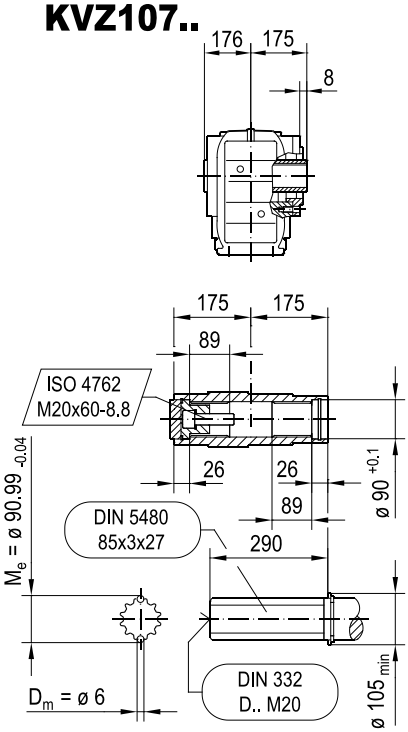

(→ 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	752	780	837					
LS	826	854	911					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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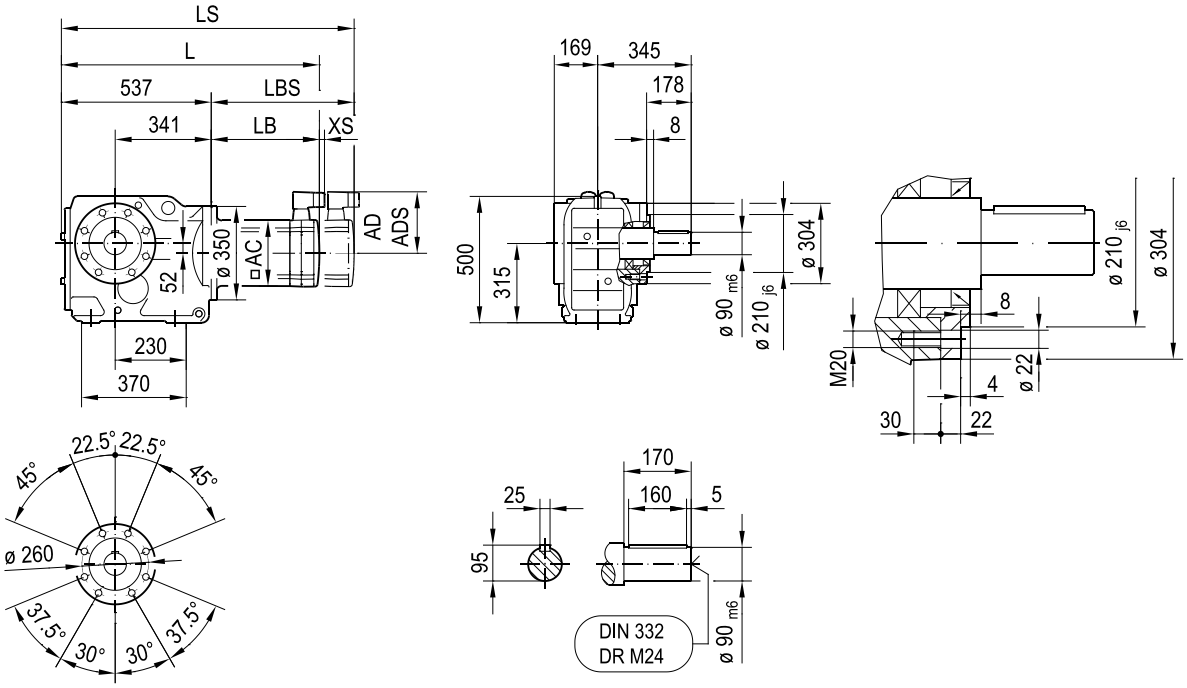
KZ107..

33 008 00 20



(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	752	780	837					
LS	826	854	911					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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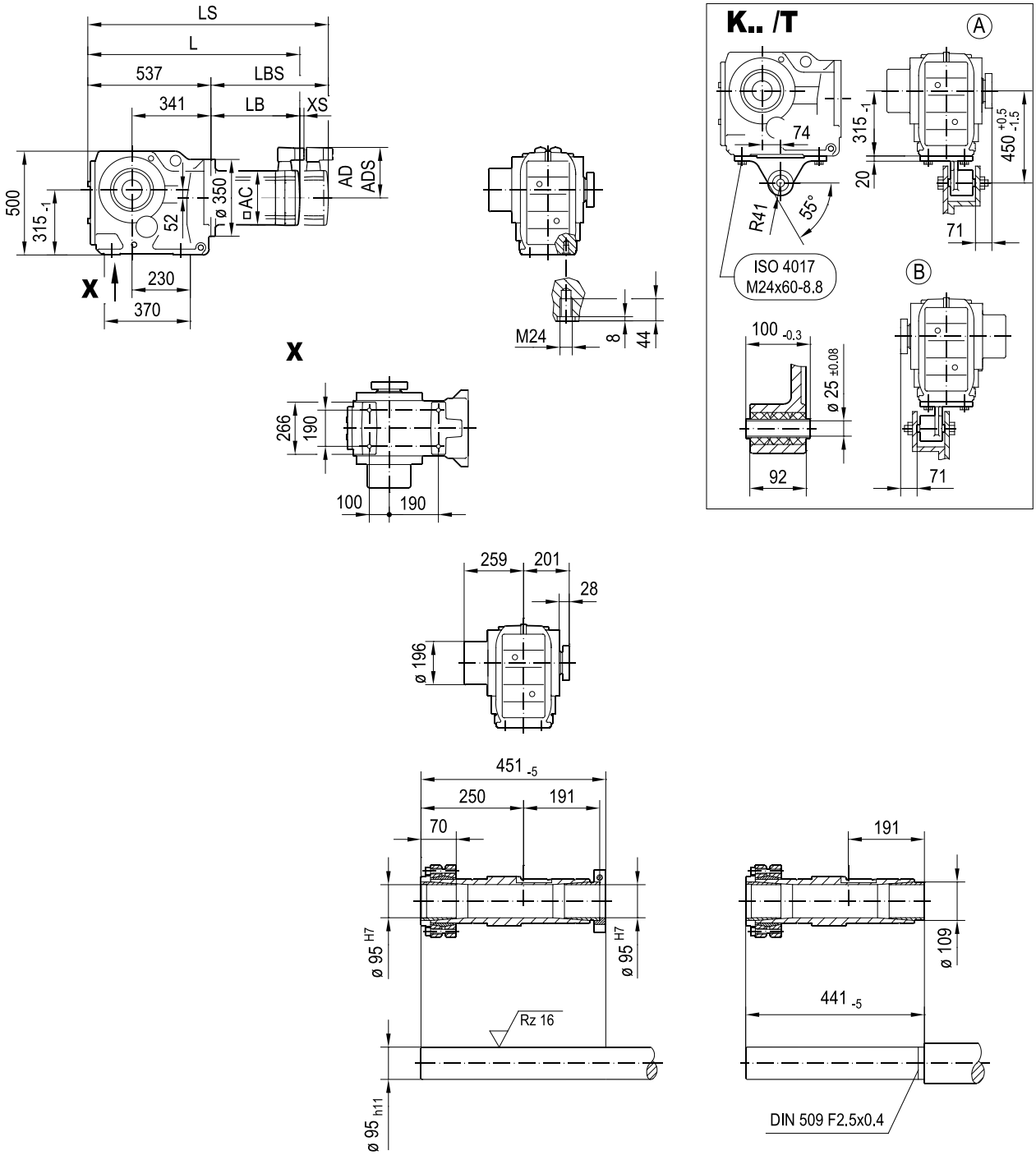
KT107..

33 085 00 19



(→ 📖 7.3)	CM3C							
	100S	100M	100L					
AC	165	165	165					
AD	140	140	140					
ADS	140	140	140					
L	752	780	837					
LS	826	854	911					
LB	215	243	300					
LBS	289	317	374					
XS	6	6	6					

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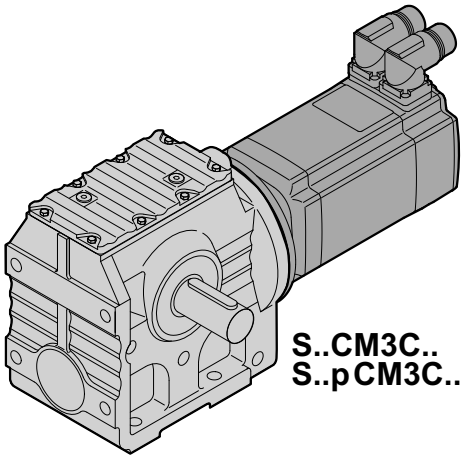
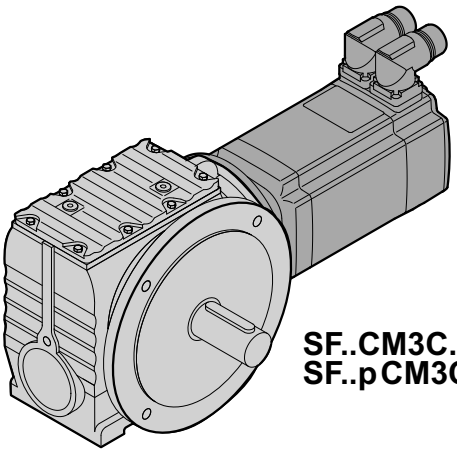
11 Helical-worm gearmotors – S..-/S..p gear units

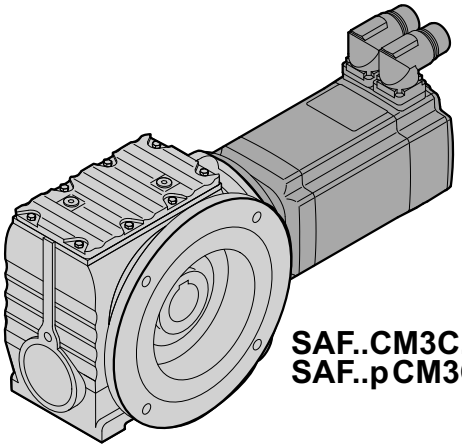
11.1 S../S..p CM3C.. designs



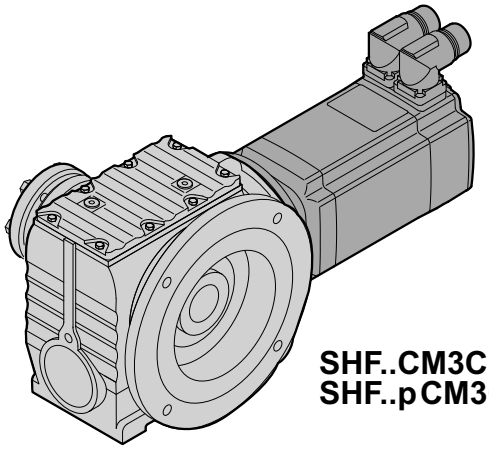
S..CM3C..
S..pCM3C..



SF..CM3C..
SF..pCM3C..



SAF..CM3C..
SAF..pCM3C..



SHF..CM3C..
SHF..pCM3C..

33298226187

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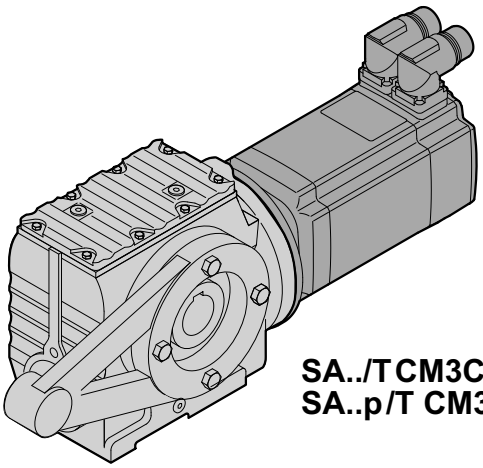
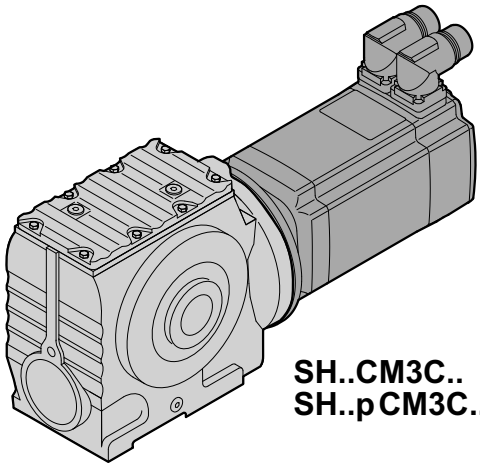
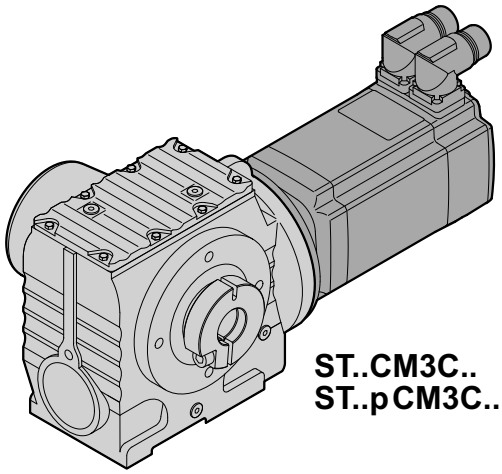


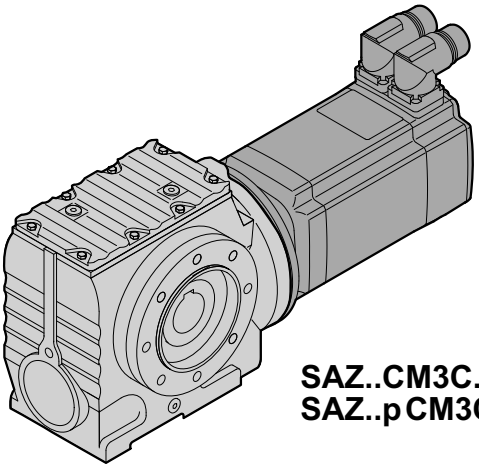
SA../T CM3C..
SA..p/T CM3C..



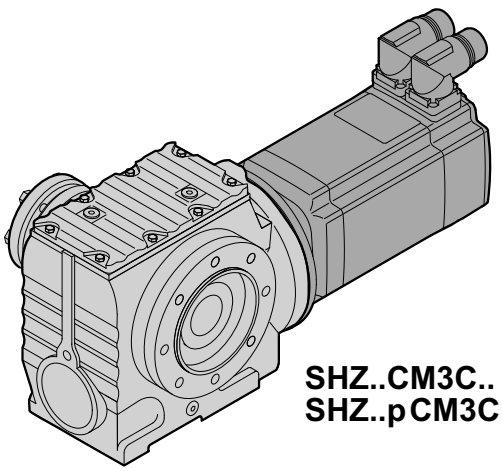
SH..CM3C..
SH..p CM3C..



ST..CM3C..
ST..p CM3C..



SAZ..CM3C..
SAZ..p CM3C..



SHZ..CM3C..
SHZ..p CM3C..

33298228619

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11.2 S../S..p CM3C.. selection tables and dimension sheets

11.2.1 S37../S37p..

S37, M_{aDyn} Nm			92 Nm
	CM3C		
i	63S	63M	71S
		2	
3.97	28	>48	>48
4.86	34	>49	>49
5.38	38	>51	>51
6.33	44	>52	>52
6.80	47	>60	>60
8.00	55	>61	>61
9.02	>62	>62	>62
10.23	>63	>63	>63
10.91	>64	>64	>64
12.48	>64	>64	>64
13.39	>65	>65	>65
15.53	>66		
18.24			
19.13	>93	>93	>93
19.89			
22.50	>95	>95	>95
25.38	>96	>96	>96
28.76	>97	>97	>97
30.68	>98	>98	>98
35.10	>99	>99	>99
37.66	>100	>100	>100
43.68	>101		
51.30			
55.93			

(→ 183)

S37, m kg			
	CM3C		
s	63S	63M	71S
2	9.4	11	12
SF: + 1.3 kg / SA: + -0.25 kg / SAF: + 1.3 kg			

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S37				c_{TG}			
		n_{epk}	η	S	SF	SA	SAF
	i	min^{-1}	%	Nm/'	Nm/'	Nm/'	Nm/'
S37 2	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	-	-	-	-
	15.53	4500	84	-	-	-	-
	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	-	-	-	-

S37							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	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
S37 2	3.97[1)]	32	48	72	1134	0.92	1400	1570	2010	2010	3000	3000	4000	4000
	4.86[1)]	33	49	74	926	0.67	1520	1700	2180	2180	3000	3000	4000	4000
	5.38[1)]	34	51	76	836	0.59	1570	1760	2260	2260	3000	3000	4000	4000
	6.33[1)]	35	52	78	711	0.44	1670	1870	2400	2400	3000	3000	4000	4000
	6.80[1)]	43	60	90	662	0.47	1630	1840	2360	2360	3000	3000	4000	4000
	8.00[1)]	45	61	77	563	0.36	1730	1950	2500	2500	3000	3000	4000	4000
	9.02[1)]	46	62	78	499	0.30	1810	2040	2610	2610	3000	3000	4000	4000
	10.23[1)]	47	63	80	440	0.24	1900	2140	2740	2740	3000	3000	4000	4000
	10.91[1)]	48	64	82	412	0.22	1940	2190	2800	2800	3000	3000	4000	4000
	12.48[1)]	48	64	82	361	0.18	2060	2320	2970	2970	3000	3000	4000	4000
	13.39[1)]	49	65	83	336	0.16	2110	2370	3040	3040	3000	3000	4000	4000
	15.53	50	66	85	290	0.13	2240	2510	3220	3220	3000	3000	4000	4000
	18.24	52	67	88	247	0.10	2380	2660	3410	3410	3000	3000	4000	4000
	19.13[1)]	71	93	121	127	0.43	2380	2670	3420	3420	3000	3000	4000	4000
	19.89	52	68	88	226	0.090	2470	2760	3540	3540	3000	3000	4000	4000
	22.50[1)]	73	95	124	118	0.32	2530	2840	3630	3630	3000	3000	4000	4000
	25.38[1)]	74	96	126	114	0.27	2660	2980	3810	3810	3000	3000	4000	4000
	28.76[1)]	75	97	128	110	0.22	2800	3000	4000	4000	3000	3000	4000	4000
	30.68[1)]	76	98	129	106	0.20	2860	3000	4000	4000	3000	3000	4000	4000
	35.10[1)]	78	99	133	99	0.16	3000	3000	4000	4000	3000	3000	4000	4000
	37.66[1)]	79	100	134	96	0.15	3000	3000	4000	4000	3000	3000	4000	4000
	43.68	81	101	138	90	0.12	3000	3000	4000	4000	3000	3000	4000	4000
	51.30	81	103	138	88	0.090	3000	3000	4000	4000	3000	3000	4000	4000
	55.93	81	104	138	80	0.080	3000	3000	4000	4000	3000	3000	4000	4000

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S37p, M_{aDyn} Nm			105 Nm
	CM3C		
i	63S	63M	71S
		2	
3.97	29	53	>55
4.86	36	>58	>58
5.38	40	>60	>60
6.33	47	>62	>62
6.80	50	>67	>67
8.00	59	>69	>69
9.02	67	>71	>71
10.23	>73	>73	>73
10.91	>73	>73	>73
12.48	>75	>75	>75
13.39	>75	>75	>75
15.53	>77		
18.24			
19.13	>114	>114	>114
19.89			
22.50	>118	>118	>118
25.38	>120	>120	>120
28.76	>123	>123	>123
30.68	>123	>123	>123
35.10	>123	>123	>123
37.66	>123	>123	>123
43.68	>123		
51.30			
55.93			

(→ 183)

S37p, m kg			
	CM3C		
s	63S	63M	71S
2	9.4	11	12
SF: + 1.3 kg / SA: + -0.25 kg / SAF: + 1.3 kg			

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S37p				c_{TG}			
	i	n_{epk} min^{-1}	η %	S Nm/'	SF Nm/'	SA Nm/'	SAF Nm/'
S37p 2	3.97	4500	92	-	-	-	-
	4.86	4500	92	-	-	-	-
	5.38	4500	92	-	-	-	-
	6.33	4500	92	-	-	-	-
	6.80	4500	92	-	-	-	-
	8.00	4500	92	-	-	-	-
	9.02	4500	92	-	-	-	-
	10.23	4500	91	-	-	-	-
	10.91	4500	91	-	-	-	-
	12.48	4500	91	-	-	-	-
	13.39	4500	91	-	-	-	-
	15.53	4500	91	-	-	-	-
	18.24	4500	90	-	-	-	-
	19.13	4500	86	-	-	-	-
	19.89	4500	90	-	-	-	-
	22.50	4500	85	-	-	-	-
	25.38	4500	85	-	-	-	-
	28.76	4500	85	-	-	-	-
	30.68	4500	85	-	-	-	-
	35.10	4500	84	-	-	-	-
	37.66	4500	84	-	-	-	-
	43.68	4500	84	-	-	-	-
	51.30	4500	83	-	-	-	-
	55.93	4500	82	-	-	-	-

S37p								F_{Ramax}				F_{Rapk}			
n_e = 1400	i	M_{amax} Nm	M_{apk} Nm	$M_{aEmergOff}$ Nm	n_{ak} min^{-1}	J_G 10^{-4} kg×m^2	S N	SF N	SA N	SAF N	S N	SF N	SA N	SAF N
S37p 2	3.97	44	55	72	997	0.92	1070	1260	1740	1740	3000	3000	4000	4000
	4.86	48	58	74	872	0.67	1140	1330	1840	1840	3000	3000	4000	4000
	5.38	51	60	76	749	0.59	1130	1340	1850	1850	3000	3000	4000	4000
	6.33	56	62	78	592	0.44	1120	1340	1870	1870	3000	3000	4000	4000
	6.80	60	67	90	550	0.47	1210	1440	1990	1990	3000	3000	4000	4000
	8.00	66	69	77	429	0.36	1200	1440	2000	2000	3000	3000	4000	4000
	9.02	70	71	78	368	0.30	1210	1470	2040	2040	3000	3000	4000	4000
	10.23	73	73	80	328	0.24	1280	1550	2150	2150	3000	3000	4000	4000
	10.91	73	73	82	326	0.22	1380	1660	2290	2290	3000	3000	4000	4000
	12.48	74	75	82	313	0.18	1560	1850	2540	2540	3000	3000	4000	4000
	13.39	75	75	83	302	0.16	1640	1930	2630	2630	3000	3000	4000	4000
	15.53	76	77	85	289	0.13	1860	2160	2810	2810	3000	3000	4000	4000
	18.24	78	78	88	247	0.10	2040	2360	3000	3000	3000	3000	4000	4000
	19.13	89	114	121	74	0.43	2170	2490	3170	3170	3000	3000	4000	4000
	19.89	78	79	88	226	0.090	2130	2460	3130	3130	3000	3000	4000	4000
	22.50	95	118	124	63	0.32	2280	2620	3330	3330	3000	3000	4000	4000
	25.38	100	120	126	55	0.27	2360	2710	3450	3450	3000	3000	4000	4000
	28.76	105	123	128	49	0.22	2450	2820	3580	3580	2970	2970	4000	4000
	30.68	105	123	129	49	0.20	2530	2910	3690	3690	2970	2970	4000	4000
	35.10	105	123	133	48	0.16	2700	3000	3930	3930	2970	2970	4000	4000
	37.66	105	123	134	48	0.15	2800	3000	4000	4000	2970	2970	4000	4000
	43.68	105	123	138	48	0.12	3000	3000	4000	4000	2970	2970	4000	4000
	51.30	104	123	138	49	0.090	3000	3000	4000	4000	2970	2970	4000	4000
	55.93	104	123	138	49	0.080	3000	3000	4000	4000	2970	2970	4000	4000

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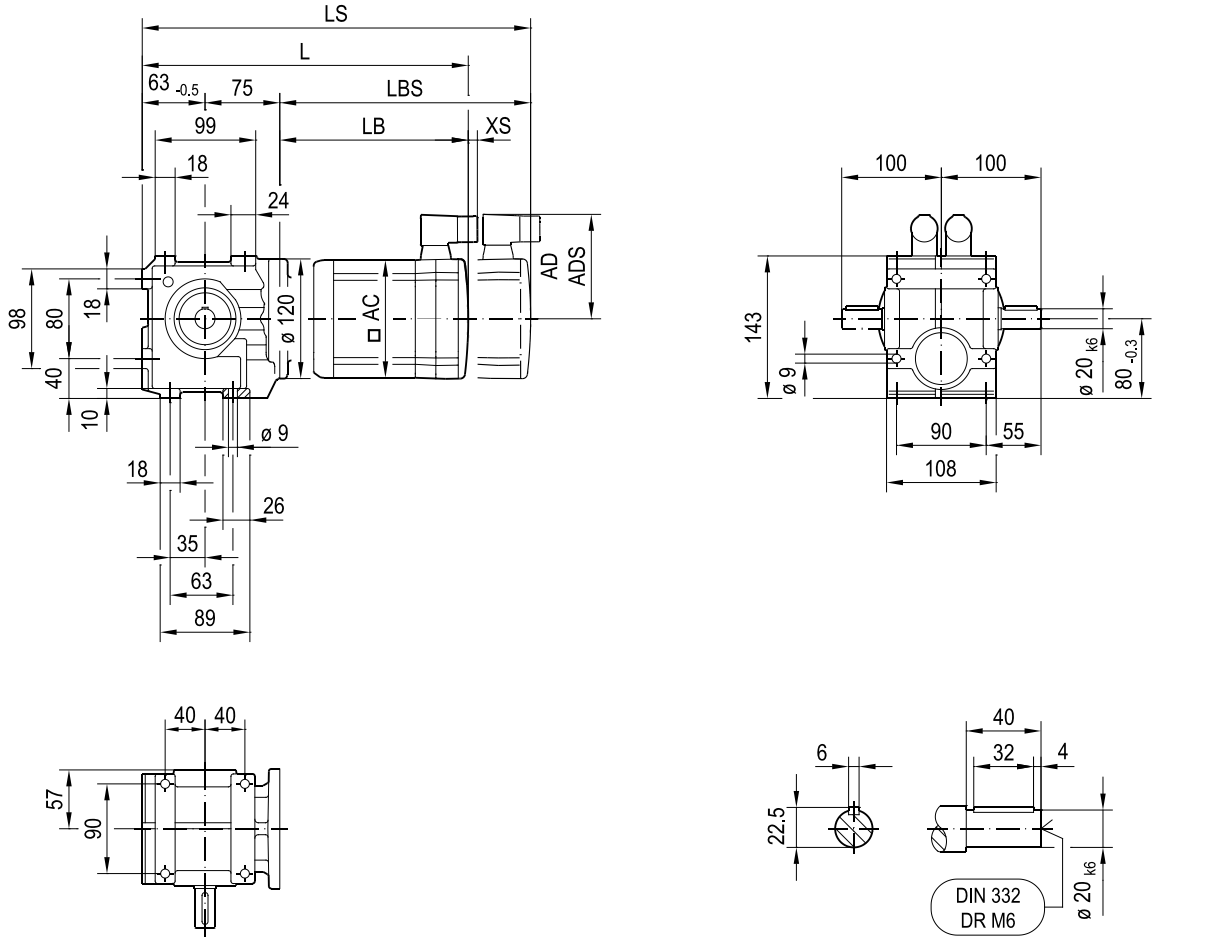
S37/S37p..

02 001 00 19



(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	289	327	325					
LS	329	367	391					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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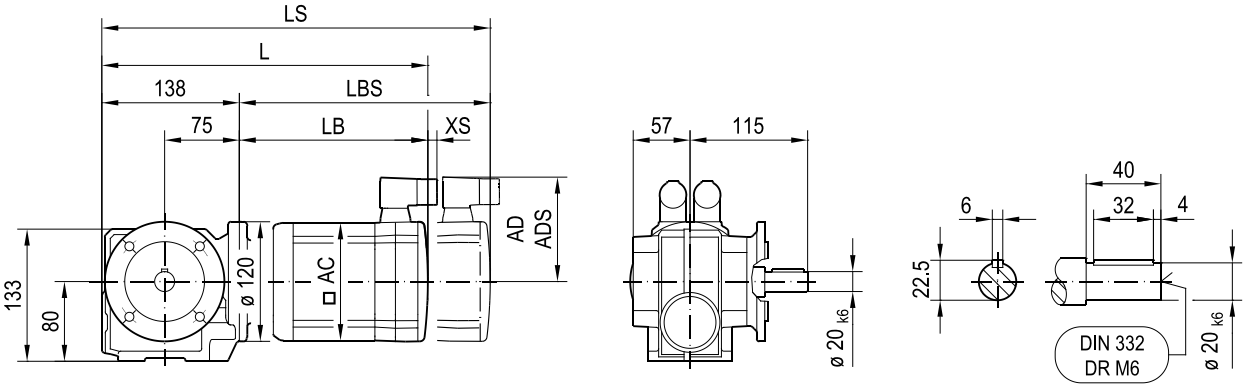
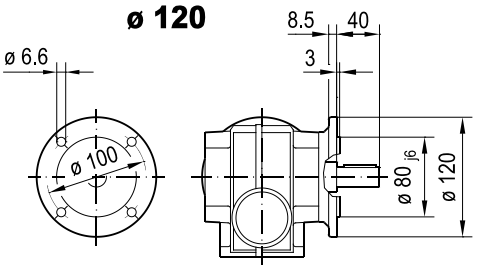
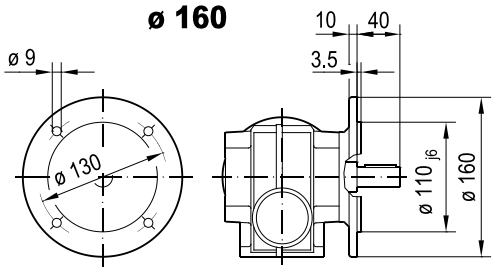
02 002 00 19

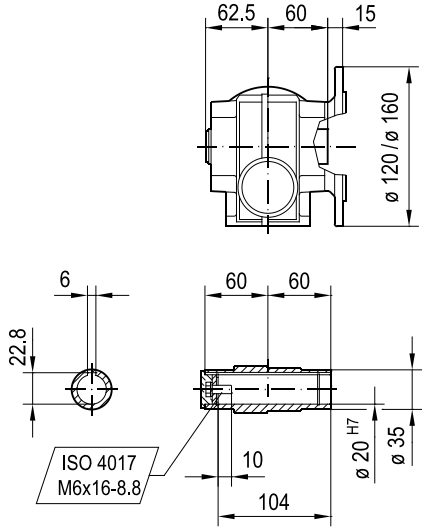
SF37/SF37p..



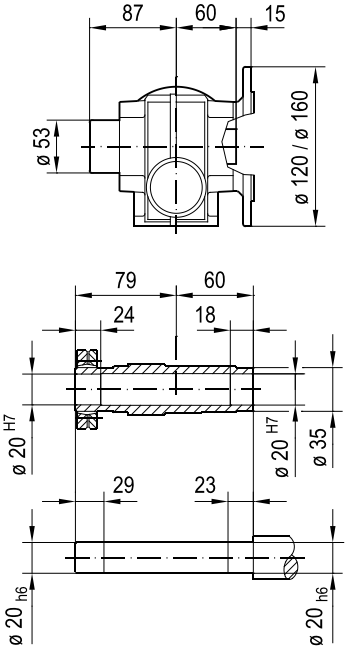




SAF37/SAF37p..



SHF37/SHF37p..



(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	289	327	325					
LS	329	367	391					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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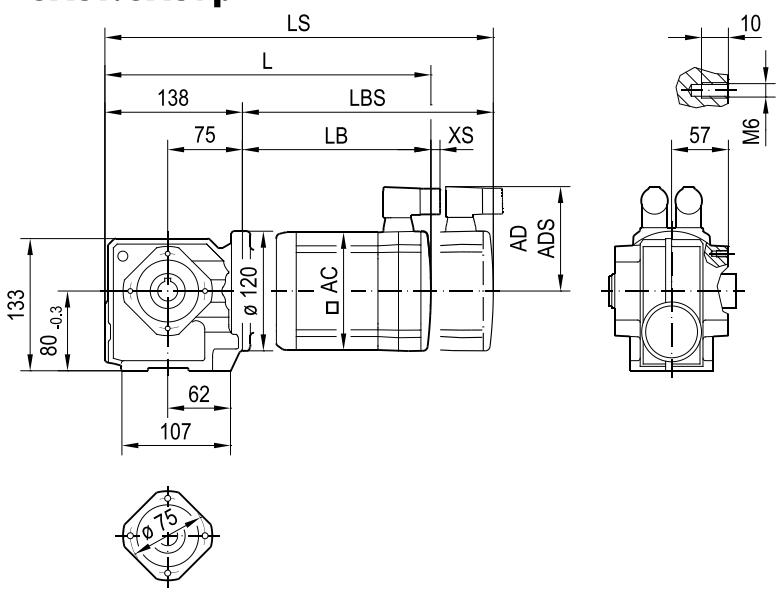
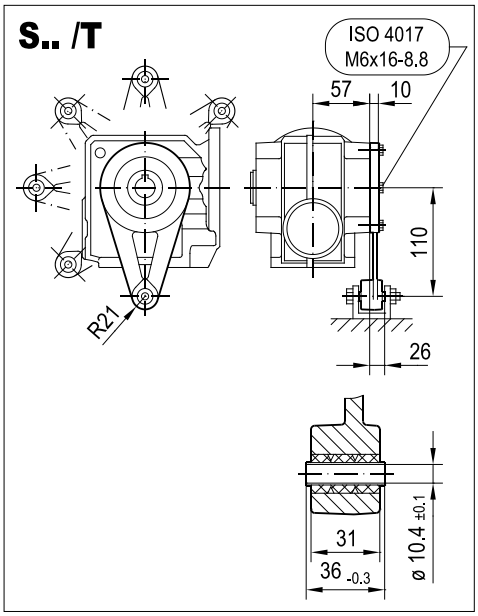
02 003 00 19

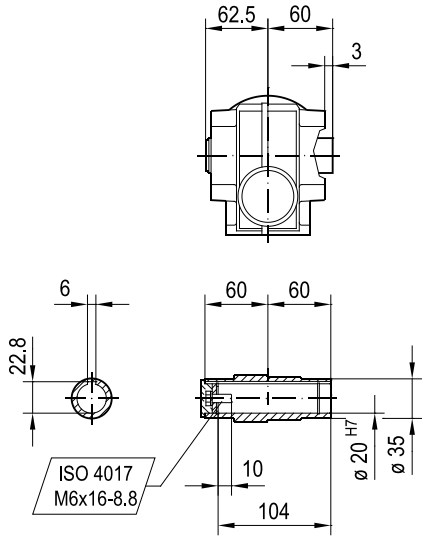
SA37/SA37p..



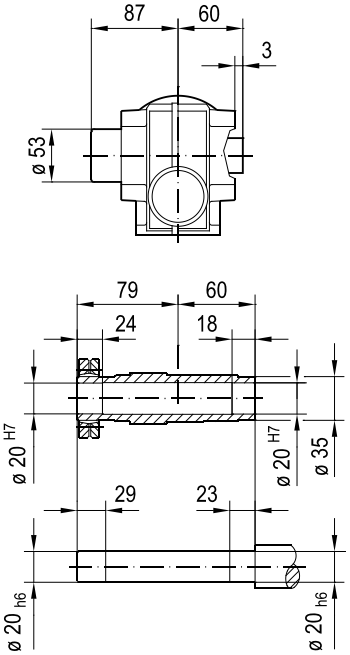
S.. /T



SA37/SA37p..



SH37/SH37p..



(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	289	327	325					
LS	329	367	391					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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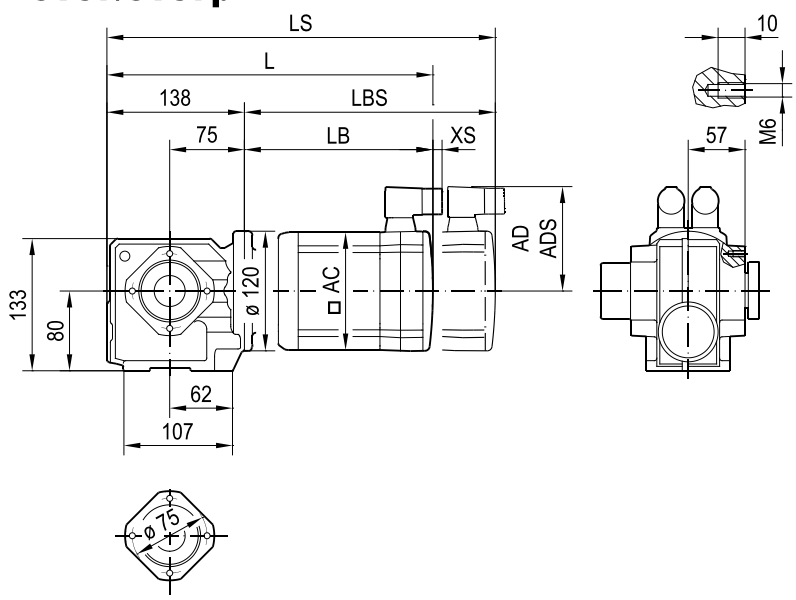
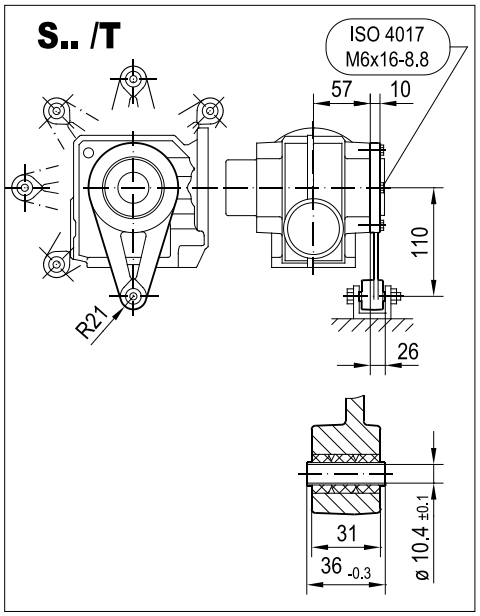
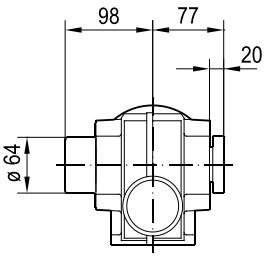
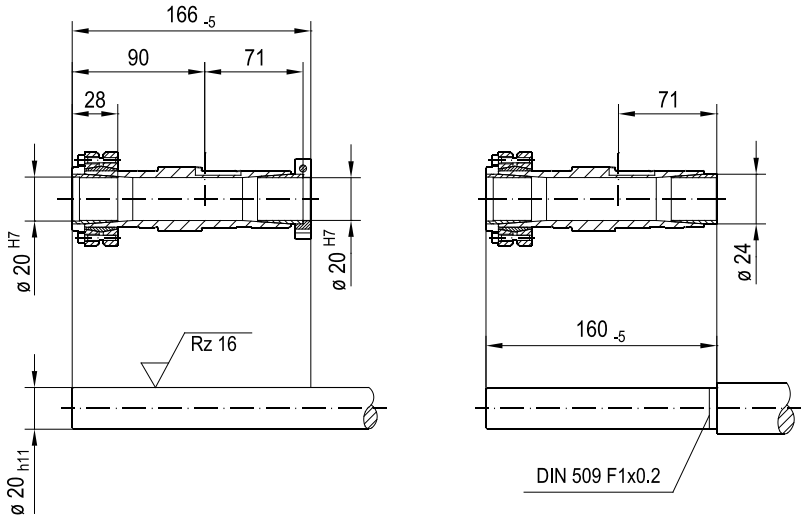
02 004 00 19

ST37/ST37p..









(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	289	327	325					
LS	329	367	391					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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11.2.2 S47../S47p..

S47, M_{aDyn} Nm						170 Nm
	CM3C					
i	63S	63M	63L	71S	71M	80S
			2			
4.00	29	52	69	70	>72	>72
4.76	34	62	82	83	>87	>87
5.39	38	70	92	93	>97	>97
6.40	46	83	109	111	>114	>114
6.83	49	89	116	>117	>117	>117
7.28	51	93	121	123	>129	>129
8.64	60	110	144	>146	>146	>146
9.23	65	118	>146	>146	>146	>146
10.80	76	138	>145	>145	>145	>145
12.10	85	>145	>145	>145	>145	>145
14.24	99	>144	>144	>144	>144	>144
16.47	114	>144		>144		
17.62	122	>144		>144		
19.54	125	>184	>184	>184	>184	>184
20.33	139					
23.20	148	>200	>200	>200	>200	>200
24.77	158	>205	>205	>205	>205	>205
29.00	183	>215	>215	>215	>215	>215
32.48	200	>215	>215	>215	>215	>215
38.23	>215	>215	>215	>215	>215	>215
44.22	>210	>210		>210		
47.32	>210	>210		>210		
54.59	>210					
63.80						
69.39						

(→ 183)

S47, m kg						
	CM3C					
s	63S	63M	63L	71S	71M	80S
2	12	14	15	15	17	20
SF: + 3.6 kg / SA: + 1.1 kg / SAF: + 2.8 kg						

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S47				c_{TG}			
	i	n_{epk} min^{-1}	η %	S Nm/'	SF Nm/'	SA Nm/'	SAF 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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S47							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	S	SF	SA	SAF	S	SF	SA	SAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
S47 2	4.00[1)]	61	72	108	1125	2.5	1980	2420	2740	2740	5680	6160	7000	7000
	4.76[1)]	72	87	130	912	1.8	2010	2490	2780	2780	5610	6100	7000	7000
	5.39[1)]	74	97	146	835	1.5	2110	2600	2920	2920	5560	6050	7000	7000
	6.40[1)]	76	114	171	703	1.1	2260	2780	3120	3120	5470	5970	7000	7000
	6.83[1)]	78	117	176	659	1.0	2300	2840	3190	3190	5460	5960	7000	7000
	7.28[1)]	103	129	175	315	1.1	2110	2690	2940	2940	5410	5910	7000	7000
	8.64[1)]	109	146	185	271	0.83	2230	2840	3110	3110	5310	5820	7000	7000
	9.23[1)]	109	146	185	273	0.74	2310	2930	3210	3210	5310	5820	7000	7000
	10.80[1)]	109	145	185	278	0.57	2500	3150	3480	3480	5310	5820	7000	7000
	12.10[1)]	109	145	185	281	0.47	2650	3310	3670	3670	5310	5820	7000	7000
	14.24[1)]	110	144	187	275	0.35	2850	3540	3950	3950	5320	5830	7000	7000
	16.47	110	144	187	273	0.28	3060	3770	4230	4230	5320	5830	7000	7000
	17.62	110	144	187	255	0.26	3160	3880	4360	4360	5320	5830	7000	7000
	19.54[1)]	144	184	245	88	0.94	3370	4120	4660	4660	5220	5720	7000	7000
	20.33	110	143	187	221	0.20	3370	4130	4650	4650	5320	5830	7000	7000
	23.20[1)]	152	200	255	75	0.72	3570	4360	4940	4940	5130	5630	7000	7000
	24.77[1)]	155	205	260	71	0.65	3650	4460	5050	5050	5100	5600	7000	7000
	29.00[1)]	155	215	260	72	0.49	3920	4760	5420	5420	5030	5530	7000	7000
	32.48[1)]	155	215	260	72	0.41	4120	4990	5690	5690	5030	5530	7000	7000
	38.23[1)]	155	215	260	72	0.31	4420	5330	6100	6100	5030	5530	7000	7000
	44.22[1)]	155	210	260	73	0.25	4710	5660	6490	6490	5060	5570	7000	7000
	47.32[1)]	155	210	260	73	0.23	4850	5810	6680	6680	5060	5570	7000	7000
	54.59	155	210	260	73	0.18	5150	5870	7000	7000	5060	5570	7000	7000
	63.80	155	210	260	71	0.15	5370	5870	7000	7000	5060	5570	7000	7000
	69.39	155	210	260	65	0.13	5370	5870	7000	7000	5060	5570	7000	7000

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S47p, M_{aDyn} Nm						200 Nm
	CM3C					
i	63S	63M	63L	71S	71M	80S
			2			
4.00	30	54	71	72	>102	>102
4.76	35	65	84	86	>108	>108
5.39	40	73	96	97	>113	>113
6.40	48	87	114	116	>119	>119
6.83	51	93	>121	>121	>121	>121
7.28	54	98	128	130	>132	>132
8.64	64	116	>146	>146	>146	>146
9.23	68	124	>146	>146	>146	>146
10.80	80	>145	>145	>145	>145	>145
12.10	90	>148	>148	>148	>148	>148
14.24	106	>152	>152	>152	>152	>152
16.47	121	>156		>156		
17.62	129	>157		>157		
19.54	136	>220	>220	>220	>220	>220
20.33	149					
23.20	161	>230	>230	>230	>230	>230
24.77	172	>230	>230	>230	>230	>230
29.00	200	>240	>240	>240	>240	>240
32.48	225	>245	>245	>245	>245	>245
38.23	>250	>250	>250	>250	>250	>250
44.22	>245	>245		>245		
47.32	>245	>245		>245		
54.59	>245					
63.80						
69.39						

(→ 183)

S47p, m kg						
	CM3C					
s	63S	63M	63L	71S	71M	80S
2	12	14	15	15	17	20
SF: + 3.6 kg / SA: + 1.1 kg / SAF: + 2.8 kg						

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S47p				c_{TG}			
	i	n_{epk} min^{-1}	η %	S Nm/'	SF Nm/'	SA Nm/'	SAF Nm/'
S47p 2	4.00	4500	93	-	-	-	-
	4.76	4500	93	-	-	-	-
	5.39	4500	93	-	-	-	-
	6.40	4500	93	-	-	-	-
	6.83	4500	93	-	-	-	-
	7.28	4500	92	-	-	-	-
	8.64	4500	92	-	-	-	-
	9.23	4500	92	-	-	-	-
	10.80	4500	92	-	-	-	-
	12.10	4500	92	-	-	-	-
	14.24	4500	92	-	-	-	-
	16.47	4500	91	-	-	-	-
	17.62	4500	91	-	-	-	-
	19.54	4500	86	-	-	-	-
	20.33	4500	91	-	-	-	-
	23.20	4500	86	-	-	-	-
	24.77	4500	86	-	-	-	-
	29.00	4500	86	-	-	-	-
	32.48	4500	86	-	-	-	-
	38.23	4500	85	-	-	-	-
	44.22	4500	85	-	-	-	-
	47.32	4500	85	-	-	-	-
	54.59	4500	84	-	-	-	-
	63.80	4500	84	-	-	-	-
	69.39	4500	83	-	-	-	-

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S47p							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	S	SF	SA	SAF	S	SF	SA	SAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
S47p 2	4.00	75	102	108	785	2.5	1860	2320	2580	2580	5540	6030	7000	7000
	4.76	91	108	130	460	1.8	1740	2220	2430	2430	5510	6010	7000	7000
	5.39	104	113	146	317	1.5	1540	2050	2180	2180	5480	5980	7000	7000
	6.40	118	119	171	225	1.1	1420	1960	2040	2040	5450	5950	7000	7000
	6.83	120	121	176	215	1.0	1490	2040	2120	2120	5440	5940	7000	7000
	7.28	109	132	175	275	1.1	2110	2690	2950	2950	5400	5900	7000	7000
	8.64	131	146	185	162	0.83	1820	2420	2570	2570	5240	5830	7000	7000
	9.23	134	146	185	152	0.74	1870	2490	2650	2650	5240	5830	7000	7000
	10.80	142	145	185	130	0.57	1990	2640	2810	2810	5250	5830	7000	7000
	12.10	146	148	185	121	0.47	2130	2820	3010	3010	5220	5820	7000	7000
	14.24	152	152	187	107	0.35	2350	3080	3310	3310	5170	5800	7000	7000
	16.47	155	156	187	103	0.28	2630	3400	3690	3690	5120	5770	7000	7000
	17.62	156	157	187	101	0.26	2720	3510	3810	3810	5110	5770	7000	7000
	19.54	156	220	245	72	0.94	3280	4050	4550	4550	4960	5460	7000	7000
	20.33	160	160	187	94	0.20	2890	3720	4040	4040	5080	5750	7000	7000
	23.20	165	230	255	61	0.72	3480	4290	4820	4820	4880	5140	7000	7000
	24.77	169	230	260	57	0.65	3550	4380	4930	4930	4880	5140	7000	7000
	29.00	179	240	260	48	0.49	3730	4610	5180	5180	4100	4100	7000	7000
	32.48	186	245	260	43	0.41	3880	4780	5380	5380	3440	3440	7000	7000
	38.23	196	250	260	37	0.31	4090	5050	5680	5680	2600	2600	7000	7000
	44.22	200	245	260	35	0.25	4350	5350	6030	6030	3440	3440	7000	7000
	47.32	200	245	260	35	0.23	4480	5500	6220	6220	3440	3440	7000	7000
	54.59	200	245	260	35	0.18	4790	5640	6630	6630	3440	3440	7000	7000
	63.80	200	240	260	35	0.15	5130	5640	7000	7000	4100	4100	7000	7000
	69.39	200	240	260	35	0.13	5130	5640	7000	7000	4100	4100	7000	7000

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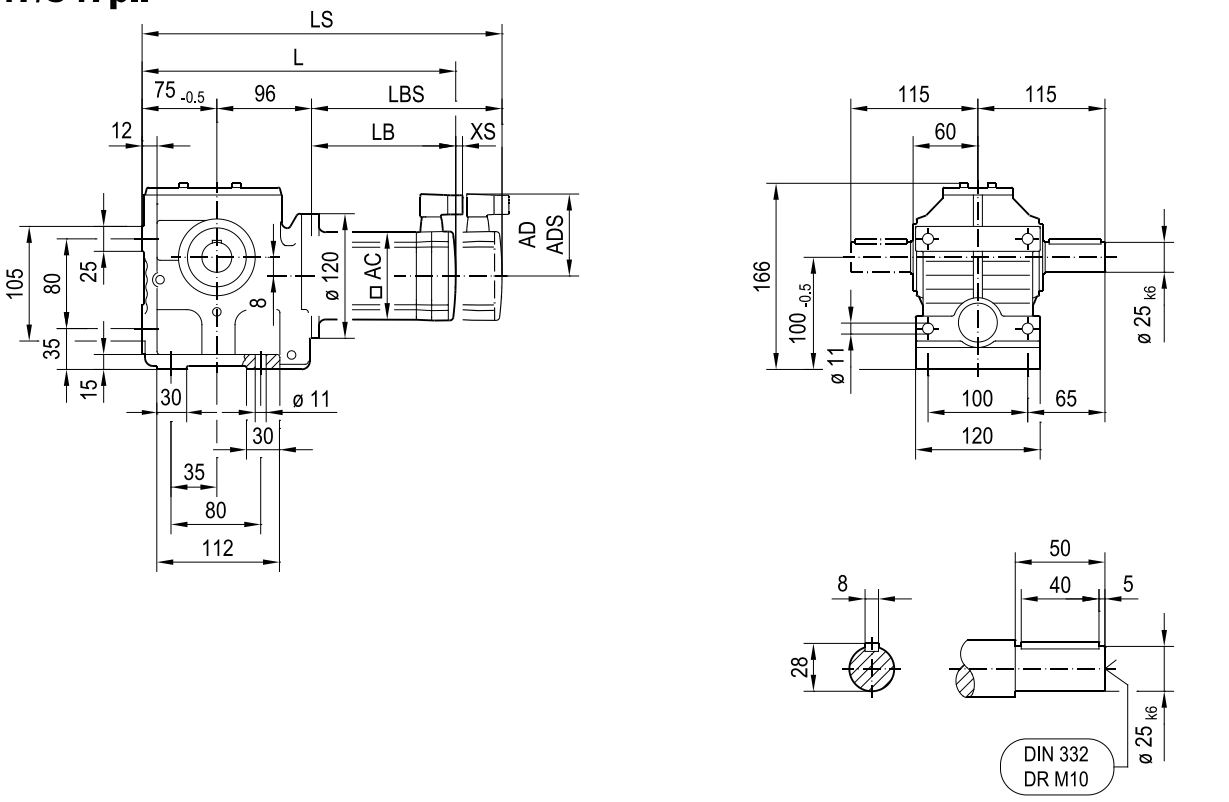
02 005 00 19

S47/S47p..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	322	360	398	358	380	393		
LS	362	400	438	424	446	461		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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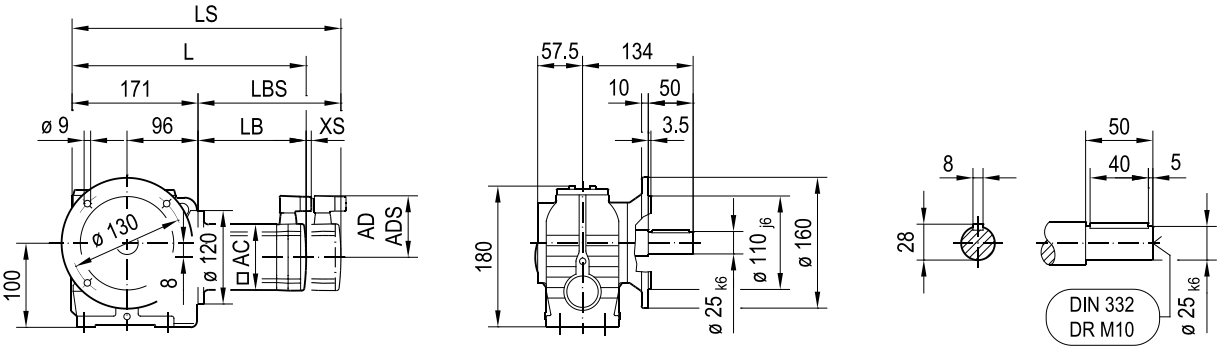
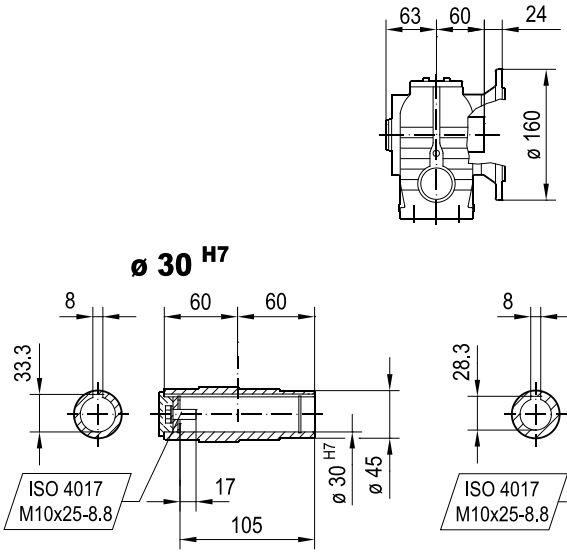
02 006 00 19

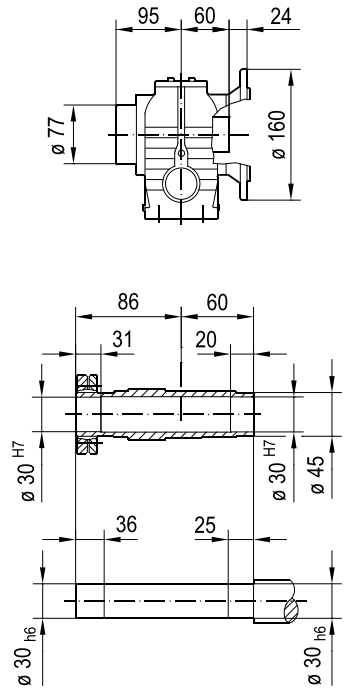
SF47/SF47p..



SAF47/SAF47p..



SHF47/SHF47p..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	322	360	398	358	380	393		
LS	362	400	438	424	446	461		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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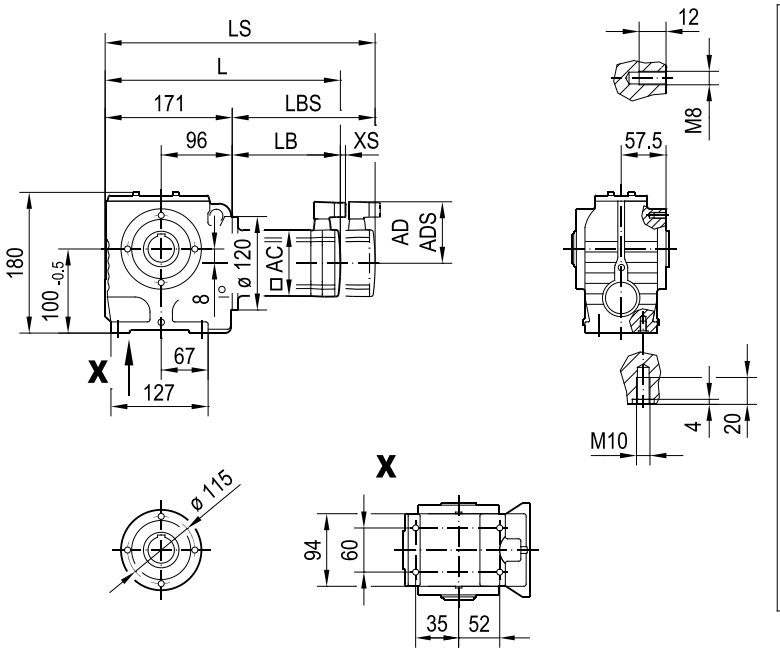
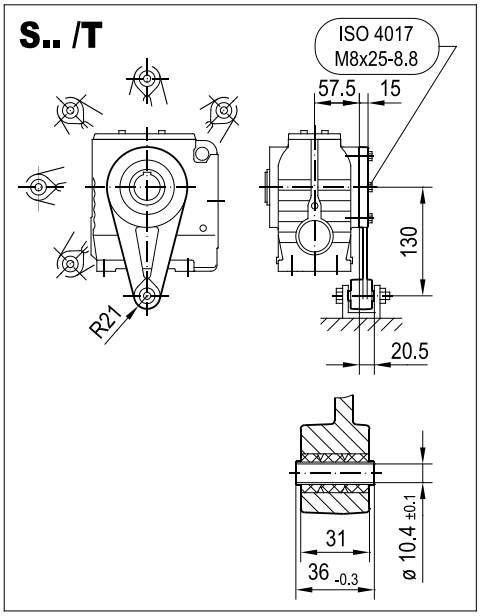
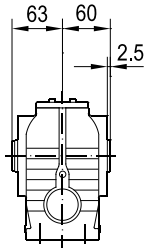
02 007 00 19

SA47/SA47p..

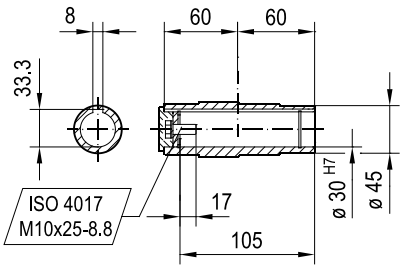




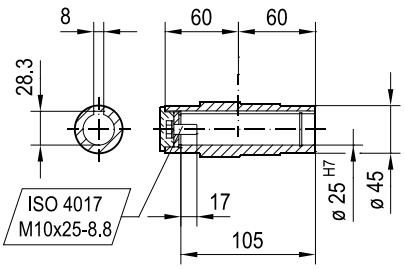
SA47/SA47p..



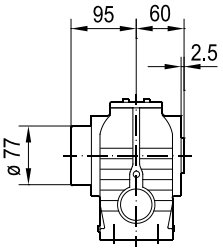
ø 30 H7

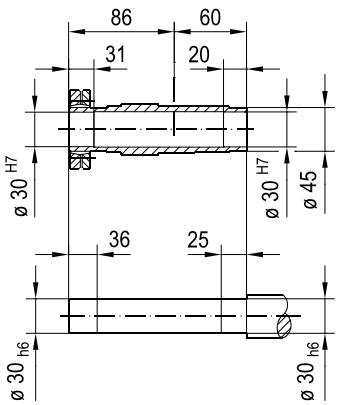


ø 25 H7



SH47/SH47p..





(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	322	360	398	358	380	393		
LS	362	400	438	424	446	461		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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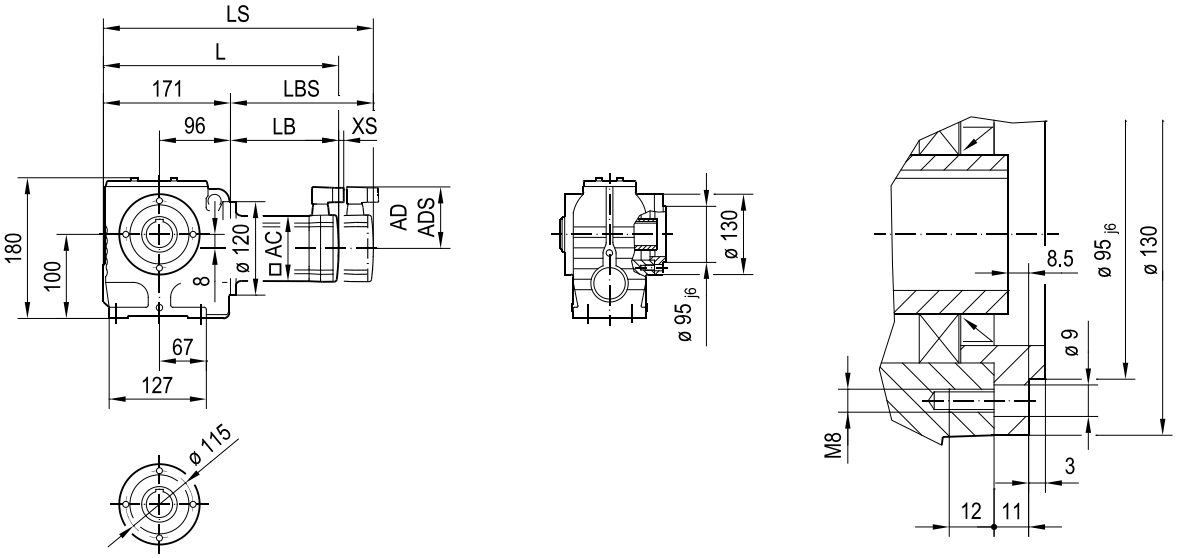
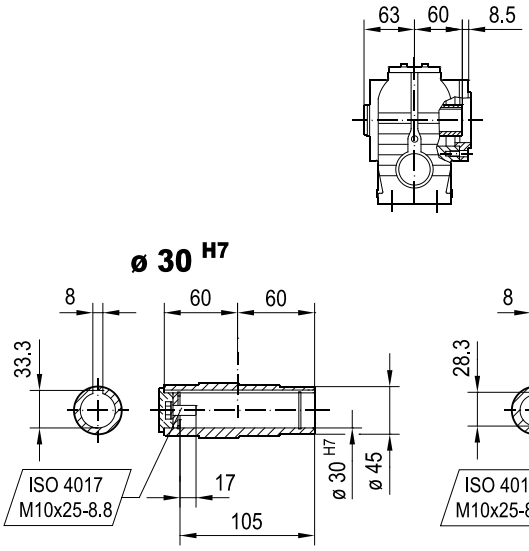
SAZ47/SAZ47p..

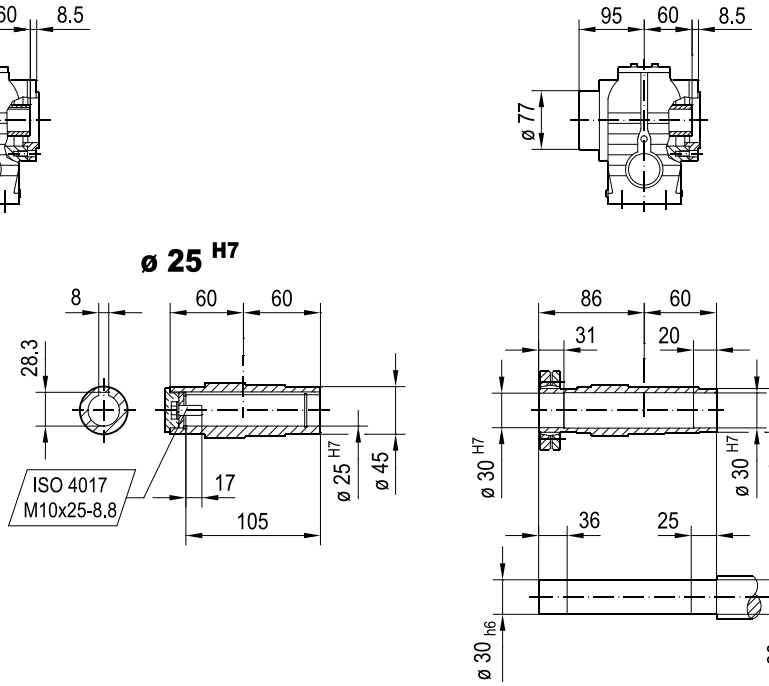
02 008 00 19



SAZ47/SAZ47p..



SHZ47/SHZ47p..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	322	360	398	358	380	393		
LS	362	400	438	424	446	461		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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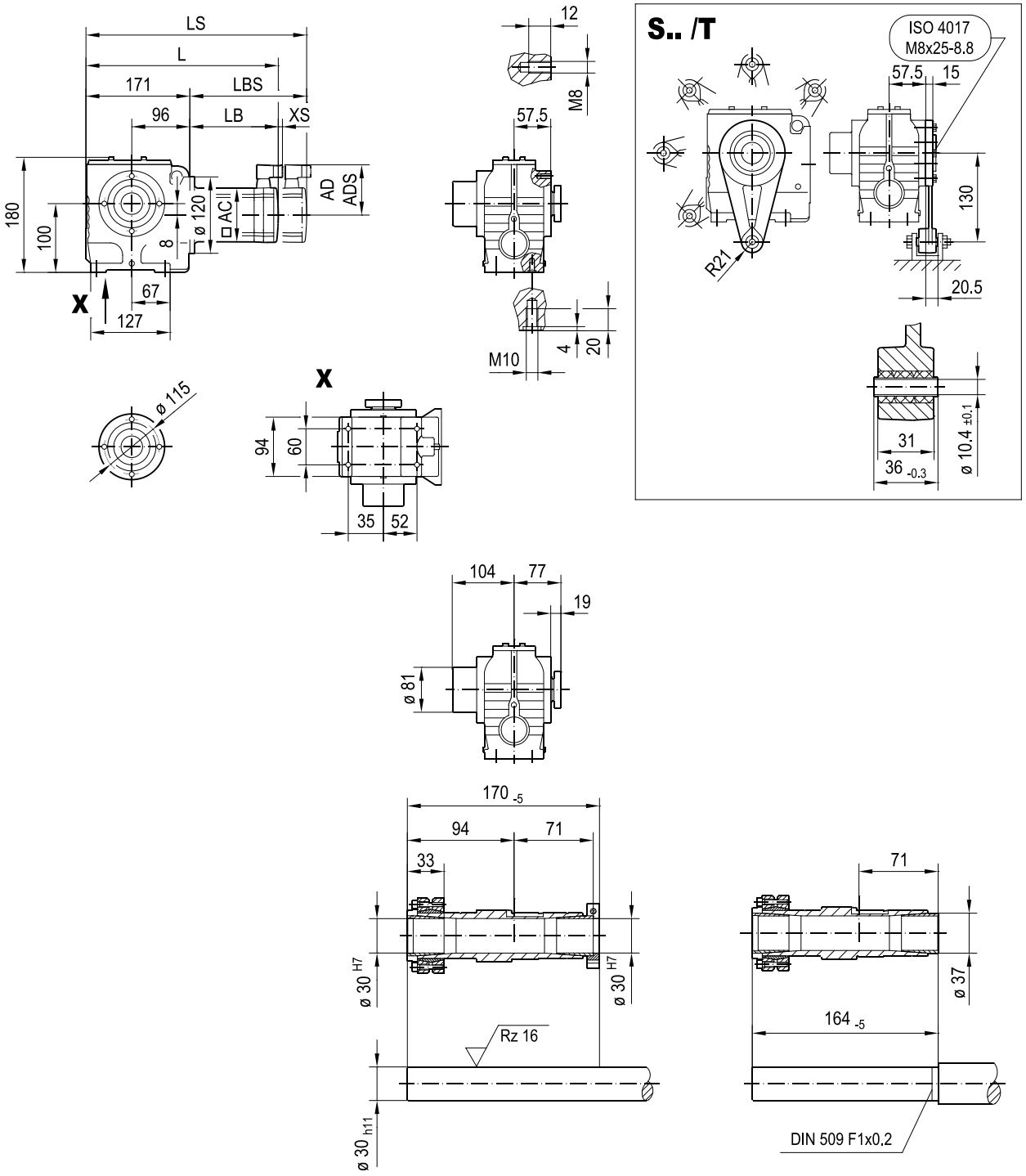
02 009 00 19

ST47/ST47p..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	80S		
AC	92	92	92	118	118	140		
AD	93	93	93	105	105	127		
ADS	93	93	93	105	105	127		
L	322	360	398	358	380	393		
LS	362	400	438	424	446	461		
LB	151	189	227	187	209	222		
LBS	191	229	267	253	275	290		
XS	13	13	13	7	7	47		

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11.2.3 S57../S57p..

S57, M_{aDyn} Nm								295 Nm
	CM3C							
i	63S	63M	63L	71S	71M	71L	80S	80M
				2				
4.00	29	52	69	70	102	>106	>106	>106
4.76	34	62	82	83	122	>126	>126	>126
5.39	39	71	93	94	138	>142	>142	>142
6.40	46	83	109	111	>147	>147	>147	>147
6.83	49	89	116	118	>150	>150	>150	>150
7.28	52	95	124	126	>183	>183	>183	>183
8.64	61	111	145	148	>210	>210	>210	>210
9.23	65	119	155	158	>220	>220	>220	>220
10.80	76	139	182	185	>220	>220	>220	>220
12.10	86	156	200	205	>220	>220	>220	>220
14.24	100	182	>220	>220	>220		>220	
16.47	116	210		>220				
17.62	122	>215		>215				
19.54	128	230	>270	>270	>270	>270	>270	>270
20.33	141							
23.20	152	275	>315	>315	>315	>315	>315	>315
24.77	160	290	>330	>330	>330	>330	>330	>330
29.00	187	340	>360	>360	>360	>360	>360	>360
32.48	205	>365	>365	>365	>365	>365	>365	>365
38.23	240	>365	>365	>365	>365		>365	
44.22	275	>365		>365				
47.32	295	>365		>365				
54.59	340							
63.80								
69.39								

(→ 183)

S57, m kg								
	CM3C							
s	63S	63M	63L	71S	71M	71L	80S	80M
2	16	18	19	19	21	23	24	26
SF: + 3.8 kg / SA: + -0.30 kg / SAF: + 2.6 kg								

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S57				c_{TG}			
	i	n_{epk} min^{-1}	η %	S Nm/'	SF Nm/'	SA Nm/'	SAF 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	-	-	-	-

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S57							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	S	SF	SA	SAF	S	SF	SA	SAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
S57 2	4.00[1)]	88	106	159	1125	4.5	3380	3320	2730	2730	8170	8170	10000	10000
	4.76[1)]	93	126	189	945	3.3	3590	3520	2900	2900	8110	8110	10000	10000
	5.39[1)]	95	142	210	835	2.6	3760	3690	3040	3040	8060	8060	10000	10000
	6.40[1)]	98	147	220	703	1.9	4010	3930	3250	3250	8040	8040	10000	10000
	6.83[1)]	100	150	225	659	1.7	4100	4010	3330	3330	8030	8030	10000	10000
	7.28[1)]	146	183	245	453	1.7	3790	3770	2620	2620	7880	7880	10000	10000
	8.64[1)]	166	210	280	318	1.3	3900	3890	2430	2430	7730	7730	10000	10000
	9.23[1)]	169	220	285	306	1.1	3990	3980	2530	2530	7660	7660	10000	10000
	10.80[1)]	169	220	285	313	0.85	4290	4270	3000	3000	7680	7680	10000	10000
	12.10[1)]	169	220	285	318	0.70	4520	4490	3360	3360	7680	7680	10000	10000
	14.24	169	220	285	316	0.51	4860	4820	3810	3810	7680	7680	10000	10000
	16.47	168	220	285	273	0.40	5200	5130	4120	4120	7680	7680	10000	10000
	17.62	168	215	285	255	0.36	5350	5280	4260	4260	7710	7710	10000	10000
	19.54[1)]	215	270	365	115	1.3	5720	5620	4610	4610	7300	7300	10000	10000
	20.33	168	215	285	221	0.28	5690	5600	4560	4560	7710	7710	10000	10000
	23.20[1)]	245	315	415	78	0.95	5930	5840	4710	4710	6950	6950	10000	10000
	24.77[1)]	245	330	415	79	0.85	6100	6000	4870	4870	6800	6800	10000	10000
	29.00[1)]	245	360	415	80	0.65	6520	6410	5250	5250	6470	6470	10000	10000
	32.48[1)]	245	365	415	80	0.54	6840	6710	5540	5540	6380	6380	10000	10000
	38.23[1)]	245	365	415	81	0.39	7320	7170	5970	5970	6380	6380	10000	10000
	44.22[1)]	245	365	415	81	0.32	7520	7520	6380	6380	6380	6380	10000	10000
	47.32[1)]	245	365	415	82	0.28	7520	7520	6580	6580	6380	6380	10000	10000
	54.59	245	365	415	82	0.23	7520	7520	7000	7000	6380	6380	10000	10000
	63.80	245	360	415	71	0.18	7520	7520	7500	7500	6470	6470	10000	10000
	69.39	245	360	415	65	0.15	7520	7520	7770	7770	6470	6470	10000	10000

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S57p, M_{aDyn} Nm								370 Nm
	CM3C							
i	63S	63M	63L	71S	71M	71L	80S	80M
				2				
4.00	30	54	71	72	106	>156	117	>156
4.76	35	65	84	86	126	>168	139	>168
5.39	40	73	96	97	142	>176	157	>176
6.40	48	87	114	116	169	>187	>187	>187
6.83	51	93	121	123	181	>191	>191	>191
7.28	54	98	128	130	190	>210	>210	>210
8.64	64	116	152	155	>220	>220	>220	>220
9.23	68	124	163	165	>225	>225	>225	>225
10.80	80	146	190	193	>235	>235	>235	>235
12.10	90	163	210	215	>240	>240	>240	>240
14.24	106	192	>250	>250	>250		>250	
16.47	122	220		>255				
17.62	131	235		>260				
19.54	137	245	325	330	>365	>365	>365	>365
20.33	151							
23.20	163	295	>385	>385	>385	>385	>385	>385
24.77	174	315	>390	>390	>390	>390	>390	>390
29.00	200	370	>405	>405	>405	>405	>405	>405
32.48	225	>415	>415	>415	>415	>415	>415	>415
38.23	265	>430	>430	>430	>430		>430	
44.22	310	>435		>435				
47.32	325	>435		>435				
54.59	380							
63.80								
69.39								

(→ 183)

S57p, m kg								
	CM3C							
s	63S	63M	63L	71S	71M	71L	80S	80M
2	16	18	19	19	21	23	24	26
SF: + 3.8 kg / SA: + -0.30 kg / SAF: + 2.6 kg								

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S57p				c_{TG}			
	i	n_{epk} min^{-1}	η %	S Nm/'	SF Nm/'	SA Nm/'	SAF Nm/'
S57p 2	4.00	4500	93	-	-	-	-
	4.76	4500	93	-	-	-	-
	5.39	4500	93	-	-	-	-
	6.40	4500	93	-	-	-	-
	6.83	4500	93	-	-	-	-
	7.28	4500	92	-	-	-	-
	8.64	4500	92	-	-	-	-
	9.23	4500	92	-	-	-	-
	10.80	4500	92	-	-	-	-
	12.10	4500	92	-	-	-	-
	14.24	4500	92	-	-	-	-
	16.47	4500	92	-	-	-	-
	17.62	4500	92	-	-	-	-
	19.54	4500	87	-	-	-	-
	20.33	4500	92	-	-	-	-
	23.20	4500	87	-	-	-	-
	24.77	4500	87	-	-	-	-
	29.00	4500	87	-	-	-	-
	32.48	4500	87	-	-	-	-
	38.23	4500	87	-	-	-	-
	44.22	4500	87	-	-	-	-
	47.32	4500	86	-	-	-	-
	54.59	4500	86	-	-	-	-
	63.80	4500	85	-	-	-	-
	69.39	4500	85	-	-	-	-

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S57p							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	S	SF	SA	SAF	S	SF	SA	SAF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N	N	N
S57p 2	4.00	108	156	159	1015	4.5	3240	3200	2280	2280	8000	8000	10000	10000
	4.76	129	168	189	634	3.3	3290	3270	1940	1940	7950	7950	10000	10000
	5.39	147	176	210	449	2.6	3300	3300	1630	1630	7910	7910	10000	10000
	6.40	156	187	220	394	1.9	3490	3490	1770	1770	7860	7860	10000	10000
	6.83	162	191	225	357	1.7	3550	3550	1740	1740	7840	7840	10000	10000
	7.28	155	210	245	390	1.7	3790	3760	2550	2550	7740	7740	10000	10000
	8.64	187	220	280	230	1.3	3800	3800	2030	2030	7680	7680	10000	10000
	9.23	199	225	285	193	1.1	3800	3820	1850	1850	7650	7650	9970	9970
	10.80	225	235	285	137	0.85	3860	3900	1540	1540	7580	7580	9850	9850
	12.10	225	240	285	139	0.70	4090	4120	1910	1910	7550	7550	9790	9790
	14.24	225	250	285	141	0.51	4440	4450	2470	2470	7480	7480	9670	9670
	16.47	225	255	285	144	0.40	4760	4760	2990	2990	7450	7450	9610	9610
	17.62	225	260	285	145	0.36	4920	4910	3240	3240	7410	7410	9550	9550
	19.54	250	365	365	75	1.3	5500	5430	4320	4320	6410	6410	9290	9290
	20.33	225	265	285	146	0.28	5260	5240	3790	3790	7370	7370	9480	9480
	23.20	270	385	415	60	0.95	5780	5710	4520	4520	6160	6160	9100	9100
	24.77	275	390	415	57	0.85	5910	5840	4630	4630	6090	6090	9060	9060
	29.00	290	405	415	49	0.65	6230	6160	4880	4880	5880	5880	8920	8920
	32.48	300	415	415	45	0.54	6480	6400	5080	5080	4920	4920	8830	8830
	38.23	320	430	480	37	0.39	6820	6740	5330	5330	2600	2600	8690	8690
	44.22	335	435	500	33	0.32	6740	6740	5600	5600	900	900	8640	8640
	47.32	345	435	515	30	0.28	6640	6640	5710	5710	900	900	8640	8640
	54.59	360	435	540	26	0.23	6470	6470	6000	6000	900	900	8640	8640
	63.80	370	435	555	24	0.18	6350	6350	6400	6400	900	900	8630	8630
	69.39	370	435	555	24	0.15	6350	6350	6680	6680	900	900	8630	8630

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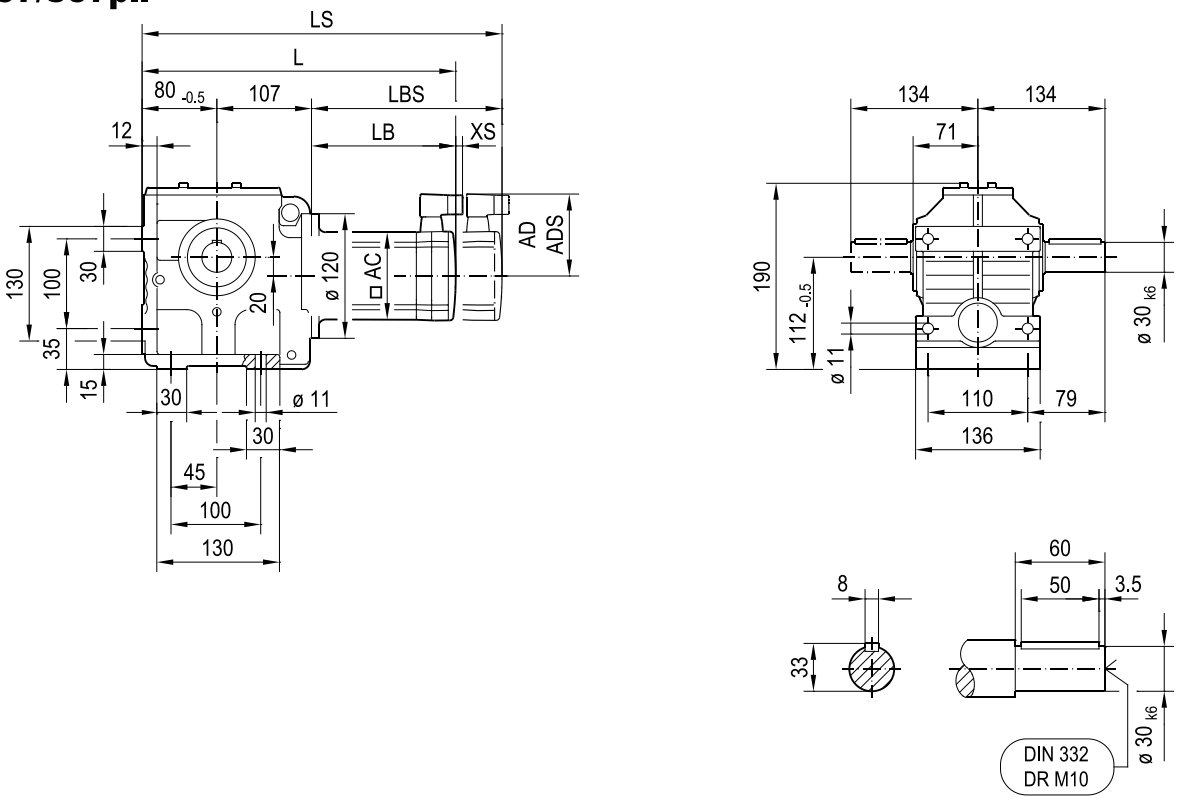
02 010 00 19

S57/S57p..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	338	376	414	374	396	441	409	435
LS	378	416	454	440	462	507	477	503
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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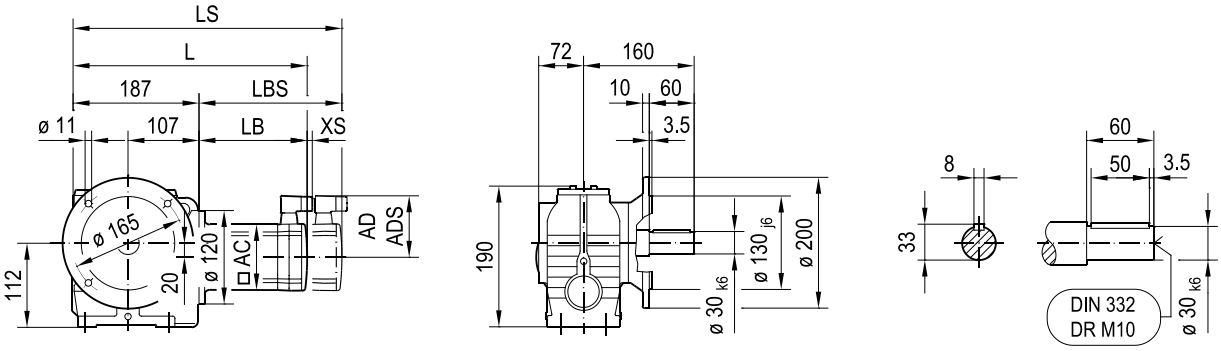
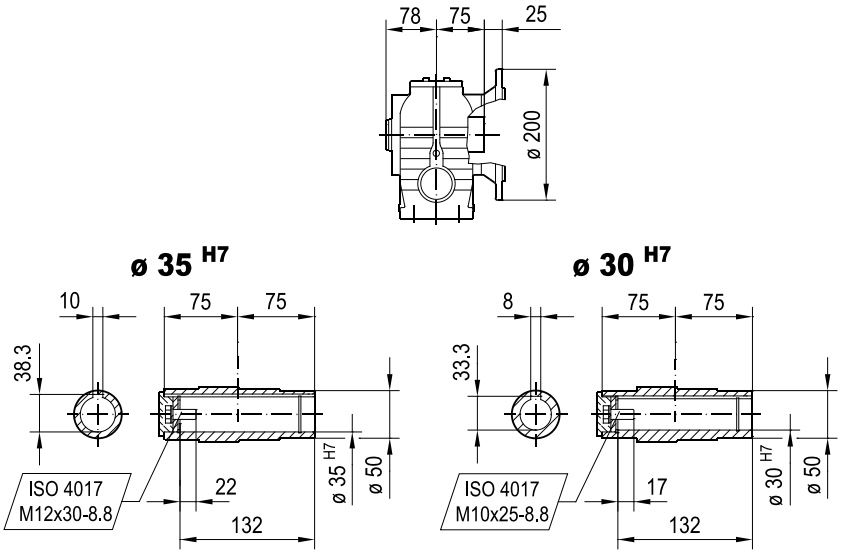
02 011 00 19

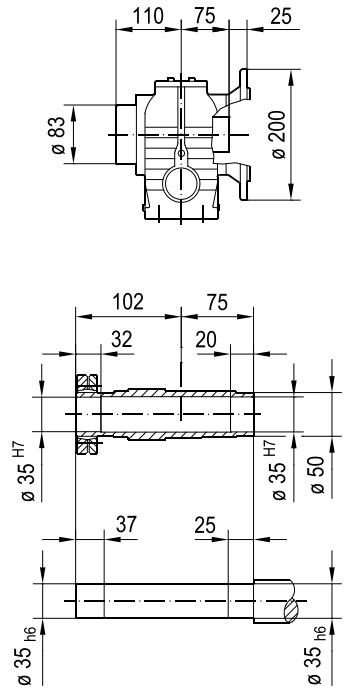
SF57/SF57p..



SAF57/SAF57p..



SHF57/SHF57p..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	338	376	414	374	396	441	409	435
LS	378	416	454	440	462	507	477	503
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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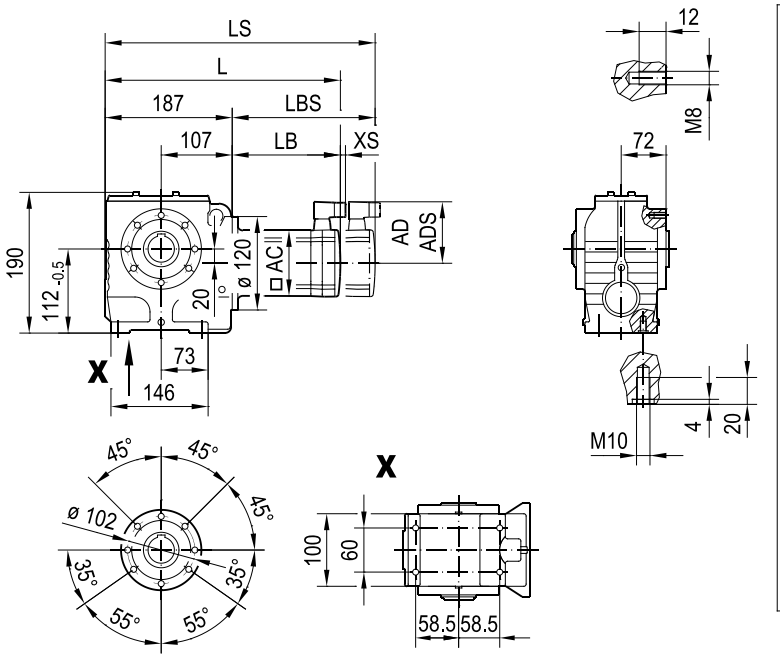
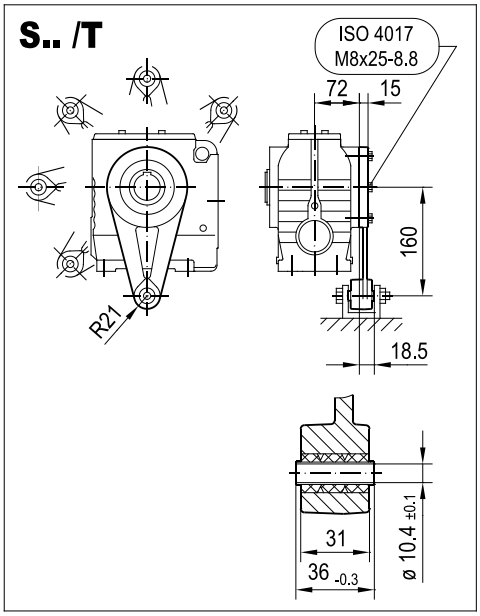
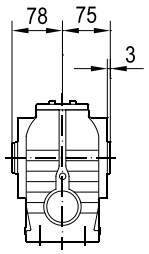
02 012 00 19

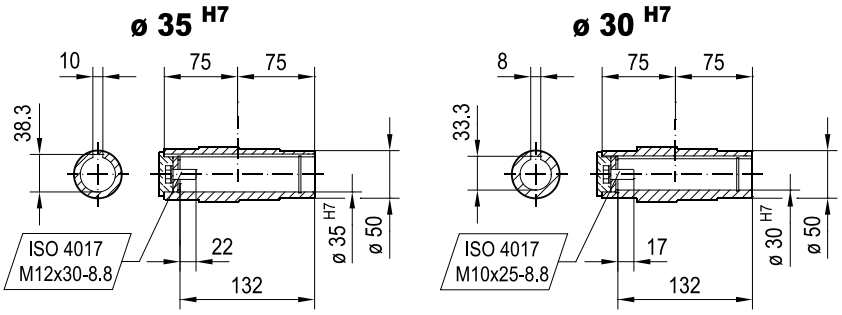
SA57/SA57p..



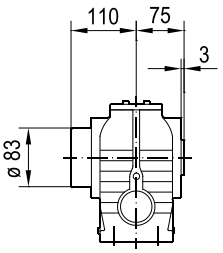


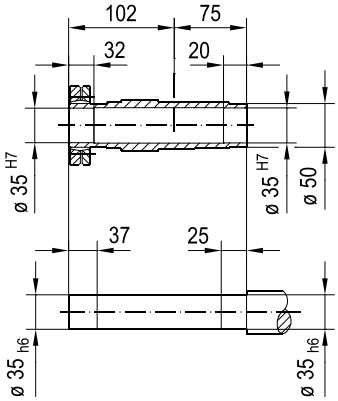
SA57/SA57p..





SH57/SH58p..





(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	338	376	414	374	396	441	409	435
LS	378	416	454	440	462	507	477	503
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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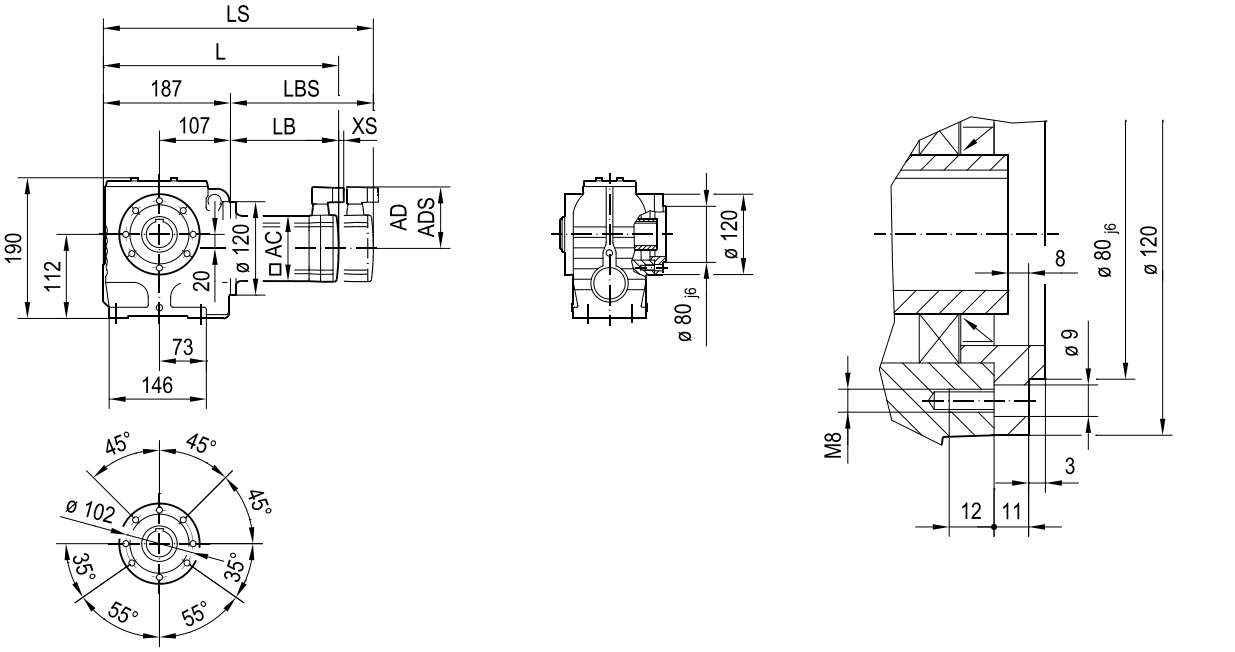
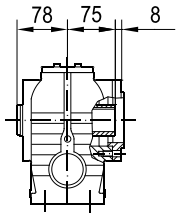
SAZ57/SAZ57p..

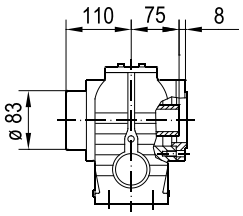
02 013 00 19

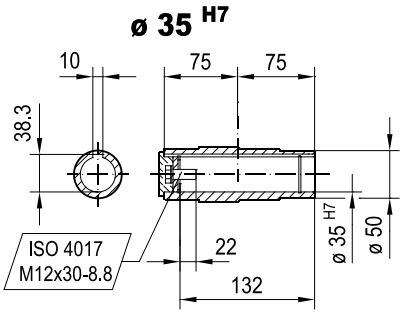


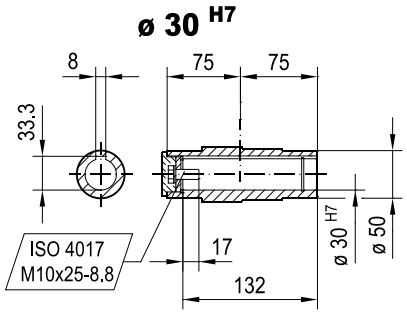
SAZ57/SAZ57p..

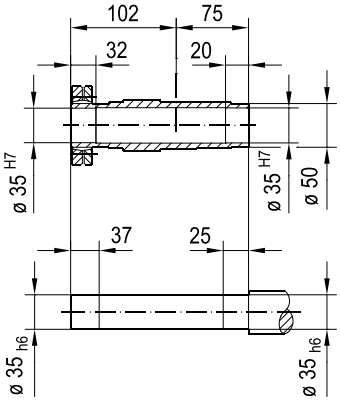


SHZ57/SHZ57p..









(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	338	376	414	374	396	441	409	435
LS	378	416	454	440	462	507	477	503
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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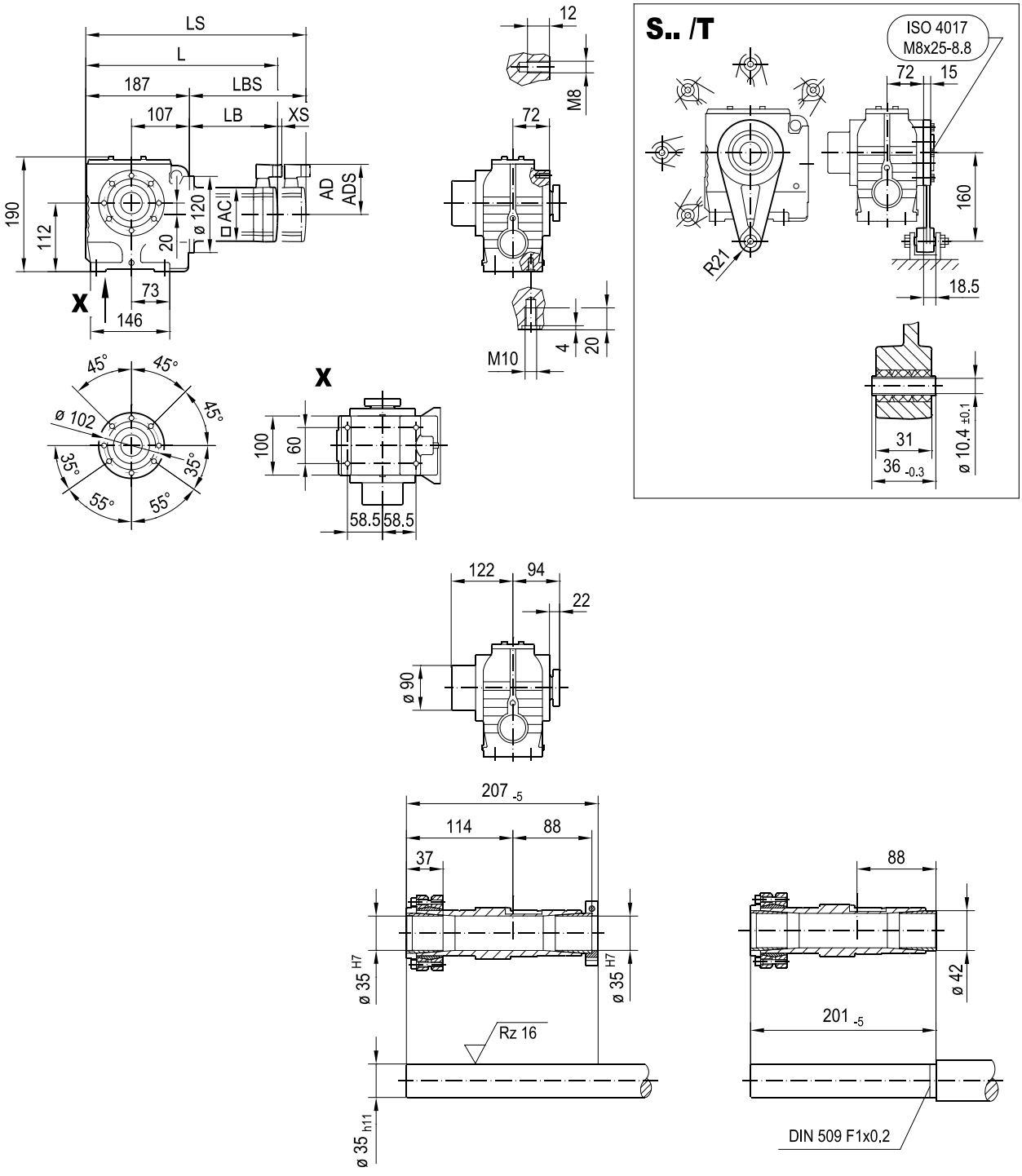
02 014 00 19

ST57/ST57p..



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M	71L	80S	80M
AC	92	92	92	118	118	118	140	140
AD	93	93	93	105	105	105	127	127
ADS	93	93	93	105	105	105	127	127
L	338	376	414	374	396	441	409	435
LS	378	416	454	440	462	507	477	503
LB	151	189	227	187	209	254	222	248
LBS	191	229	267	253	275	320	290	316
XS	13	13	13	7	7	7	47	47

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11.2.4 S67../S67p..

S67, M_{aDyn} Nm											520 Nm
	CM3C										
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
						2					
7.56	54	98	129	131	191	280	210	310	>375	>375	>375
8.69	62	113	148	150	220	320	240	360	>420	>420	>420
10.03	72	131	171	174	250	370	280	415	>450	>450	>450
11.03	79	144	188	191	275	410	305	>455	>455	>455	>455
12.96	93	169	220	220	325	>455	360	>455	>455	>455	>455
13.73	98	179	230	235	345	>455	380	>455	>455	>455	>455
15.60	111	200	260	265	390	>455	430	>455			
17.28	123	220	290	295	430	>455	>455	>455			
20.30						>490		>490	>490	>490	>490
20.37	143	260	340	345	>450		>450				
23.22	163	295		390							
23.33			365		>515	>515	>515	>515	>515	>515	>515
24.44	172	310		410							
26.93	176	320	415	425	>535	>535	>535	>535	>535	>535	>535
29.63	194	350	460	465	>550	>550	>550	>550	>550	>550	>550
34.80	225	405	530	540	>575	>575	>575	>575	>575	>575	>575
36.85	235	430	565	570	>580	>580	>580	>580	>580	>580	>580
41.89	270	490	>595	>595	>595	>595	>595	>595			
46.40	295	535	>610	>610	>610	>610	>610	>610			
54.70	345	>625	>625	>625	>625		>625				
62.35	390	>640		>640							
65.63	410	>645		>645							
75.06	465										

(→ 183)

S67, m kg											
	CM3C										
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
2	27	29	30	30	31	34	34	36	41	41	44
SF: + 6.5 kg / SA: + 1.0 kg / SAF: + 5.5 kg											

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S67				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	-	-	-	-

S67							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	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	574	5.4	3220	3890	2540	2540	9740	9740	12000	12000
	8.69[1)]	335	420	570	414	4.3	2860	3590	2020	2020	9460	9460	12000	12000
	10.03[1)]	340	450	575	399	3.3	3290	4050	2480	2480	9250	9250	12000	12000
	11.03[1)]	340	455	575	399	2.8	3660	4430	2890	2890	9210	9210	12000	12000
	12.96[1)]	340	455	575	347	2.2	4310	5110	3610	3610	9210	9210	12000	12000
	13.73[1)]	340	455	575	328	2.0	4510	5310	3870	3870	9210	9210	12000	12000
	15.60	340	455	575	288	1.5	4820	5640	4480	4480	9210	9210	12000	12000
	17.28	340	455	575	260	1.3	5080	5910	4990	4990	9210	9210	12000	12000
	20.30[1)]	425	490	720	181	4.0	5760	6650	6090	6090	8940	8940	12000	12000
	20.37	340	450	575	221	0.99	5520	6360	5700	5700	9250	9250	12000	12000
	23.22	340	450	575	194	0.71	5890	6740	6110	6110	9250	9250	12000	12000
	23.33[1)]	480	515	810	126	3.2	5810	6800	6120	6120	8720	8720	12000	12000
	24.44	340	450	575	184	0.63	6040	6900	6270	6270	9250	9250	12000	12000
	26.93[1)]	480	535	810	127	2.6	6240	7240	6590	6590	8540	8540	12000	12000
	29.63[1)]	480	550	810	128	2.2	6540	7540	6920	6920	8390	8390	12000	12000
	34.80[1)]	480	575	810	129	1.8	7060	8080	7490	7490	8140	8140	12000	12000
	36.85[1)]	480	580	810	122	1.6	7250	8280	7710	7710	8080	8080	12000	12000
	41.89[1)]	480	595	810	107	1.3	7690	8740	8200	8200	7920	7920	12000	12000
	46.40[1)]	480	610	810	97	1.1	8060	9020	8600	8600	7740	7740	12000	12000
	54.70	480	625	810	82	0.84	8670	9020	9280	9280	7560	7560	12000	12000
	62.35	480	640	810	72	0.59	9020	9020	9850	9850	7370	7370	12000	12000
	65.63	480	645	810	69	0.53	9020	9020	10100	10100	6930	7300	12000	12000
	75.06	480	655	810	60	0.43	9020	9020	10700	10700	5930	7170	12000	12000

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S67p, M_{aDyn} Nm											720 Nm
	CM3C										
i	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
						2					
7.56	56	103	134	137	200	295	220	325	>375	>375	>375
8.69	65	118	155	157	230	335	250	375	>420	>420	>420
10.03	75	137	179	181	265	390	290	435	>450	>450	>450
11.03	83	150	196	200	290	430	320	>455	>455	>455	>455
12.96	97	177	230	235	340	>455	375	>455	>455	>455	>455
13.73	103	187	245	245	360	>455	400	>455	>455	>455	>455
15.60	117	210	275	280	410	>455	>455	>455			
17.28	128	230	305	310	450	>455	>455	>455			
20.30						>560		>560	>560	>560	>560
20.37	151	275	355	365	>450		>450				
23.22	173	310		415							
23.33			390		>585	>585	>585	>585	>585	>585	>585
24.44	182	330		435							
26.93	191	345	455	460	>610	>610	>610	>610	>610	>610	>610
29.63	210	380	500	505	>625	>625	>625	>625	>625	>625	>625
34.80	245	450	585	595	>650	>650	>650	>650	>650	>650	>650
36.85	255	470	615	625	>660	>660	>660	>660	>660	>660	>660
41.89	295	535	>675	>675	>675	>675	>675	>675			
46.40	325	590	>690	>690	>690	>690	>690	>690			
54.70	385	695	>705	>705	>705		>705				
62.35	435	>720		>720							
65.63	460	>725		>725							
75.06	520										

(→ 183)

S67p, m kg											
	CM3C										
s	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
2	27	29	30	30	31	34	34	36	41	41	44
SF: + 6.5 kg / SA: + 1.0 kg / SAF: + 5.5 kg											

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S67p				c_{TG}			
	i	n_{epk} min^{-1}	η %	S Nm/'	SF Nm/'	SA Nm/'	SAF Nm/'
S67p 2	7.56	4500	93	-	-	-	-
	8.69	4500	93	-	-	-	-
	10.03	4500	93	-	-	-	-
	11.03	4500	93	-	-	-	-
	12.96	4500	93	-	-	-	-
	13.73	4500	93	-	-	-	-
	15.60	4500	93	-	-	-	-
	17.28	4500	92	-	-	-	-
	20.30	4500	87	-	-	-	-
	20.37	4500	92	-	-	-	-
	23.22	4500	92	-	-	-	-
	23.33	4500	88	-	-	-	-
	24.44	4500	92	-	-	-	-
	26.93	4500	88	-	-	-	-
	29.63	4500	88	-	-	-	-
	34.80	4500	88	-	-	-	-
	36.85	4500	87	-	-	-	-
	41.89	4500	87	-	-	-	-
	46.40	4500	87	-	-	-	-
	54.70	4500	87	-	-	-	-
	62.35	4500	87	-	-	-	-
	65.63	4500	87	-	-	-	-
	75.06	4500	86	-	-	-	-

S67p							F_{Ramax}				F_{Rapk}			
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	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
S67p 2	7.56	330	375	500	450	5.4	2680	3360	1960	1960	10600	11700	12000	12000
	8.69	350	420	570	387	4.3	2780	3500	2010	2010	10300	11400	12000	12000
	10.03	365	450	575	348	3.3	3020	3770	2240	2240	10100	11200	12000	12000
	11.03	375	455	575	325	2.8	3190	3970	2420	2420	10000	11200	12000	12000
	12.96	390	455	575	295	2.2	3550	4370	2780	2780	10000	11200	12000	12000
	13.73	395	455	575	285	2.0	3690	4520	2930	2930	10000	11200	12000	12000
	15.60	410	455	575	260	1.5	3960	4820	3190	3190	10000	11200	12000	12000
	17.28	415	455	575	252	1.3	4320	5210	3580	3580	10000	11200	12000	12000
	20.30	450	560	720	155	4.0	5490	6410	5960	5960	10200	11500	12000	12000
	20.37	435	450	575	221	0.99	4700	5640	3960	3960	10000	11200	12000	12000
	23.22	420	450	575	194	0.71	5300	6230	5060	5060	10000	11200	12000	12000
	23.33	525	585	810	99	3.2	5440	6470	5840	5840	10000	11400	12000	12000
	24.44	415	450	575	184	0.63	5480	6410	5480	5480	10000	11200	12000	12000
	26.93	600	610	810	66	2.6	5410	6560	5770	5770	9900	11200	12000	12000
	29.63	620	625	810	60	2.2	5580	6770	5950	5950	9810	11200	12000	12000
	34.80	640	650	810	55	1.8	5970	7200	6380	6380	9670	11100	12000	12000
	36.85	655	660	810	52	1.6	6070	7330	6480	6480	9610	11000	12000	12000
	41.89	670	675	810	48	1.3	6420	7710	6860	6860	9520	10900	12000	12000
	46.40	680	690	810	47	1.1	6720	8040	7200	7200	9430	10900	12000	12000
	54.70	705	705	810	42	0.84	7170	8550	7700	7700	9340	10800	12000	12000
	62.35	720	720	810	39	0.59	7580	9000	8160	8160	9250	10700	12000	12000
	65.63	720	725	810	39	0.53	7790	9220	8390	8390	9220	10700	12000	12000
	75.06	720	740	810	40	0.43	8340	9780	9010	9010	9130	10600	12000	12000

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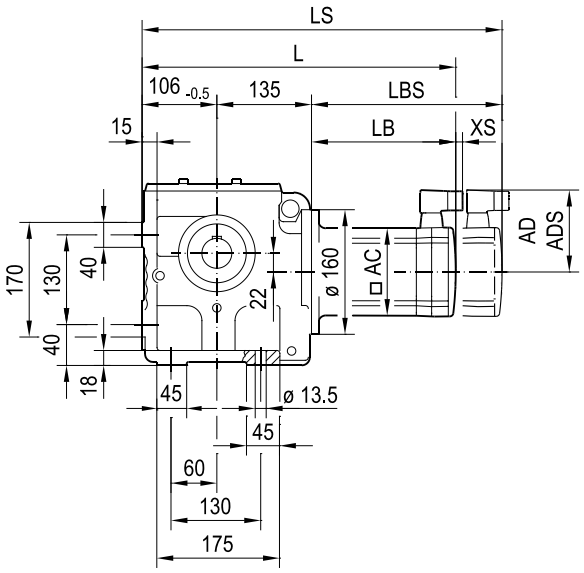
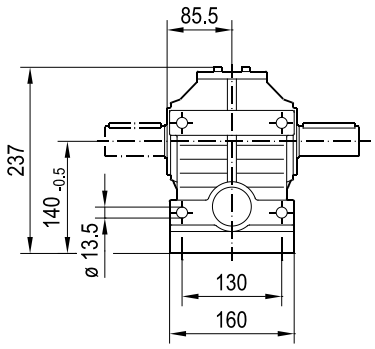
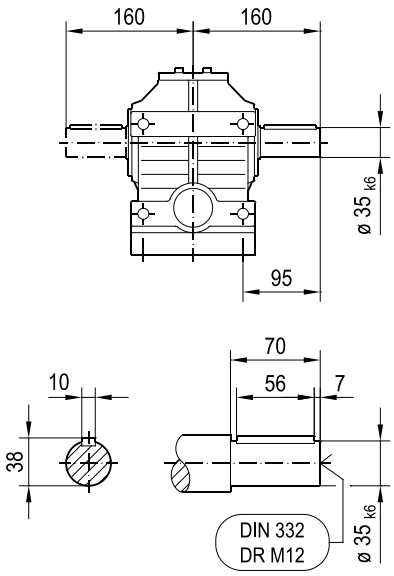
S67/S67p..

02 015 00 19

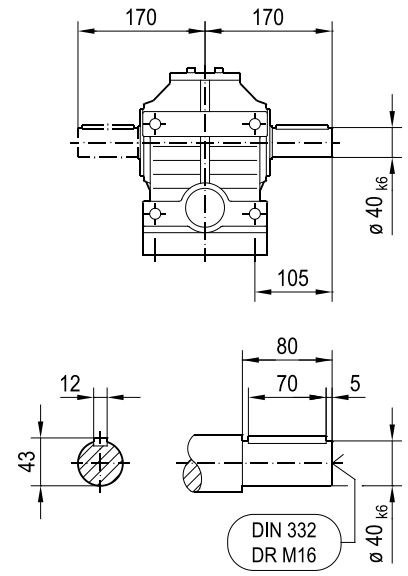




S67..



S67/S67p..



(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	385	423	461	422	444	489	454	480	533	484	512
LS	426	464	502	488	510	555	522	548	601	558	586
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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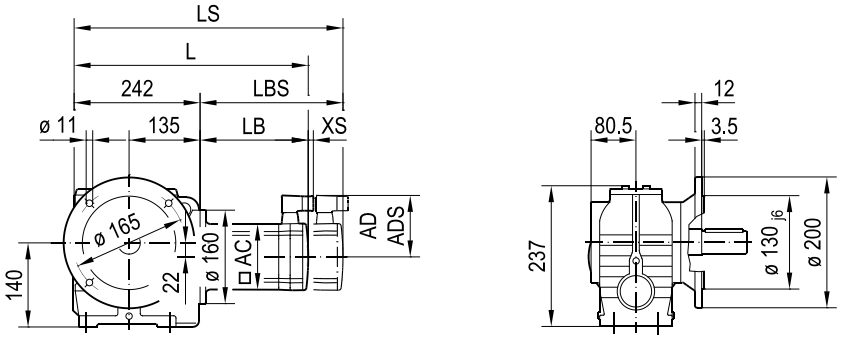
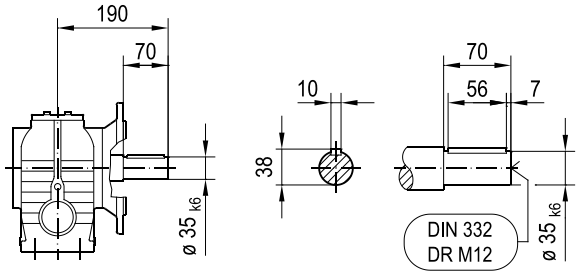
02 016 00 19

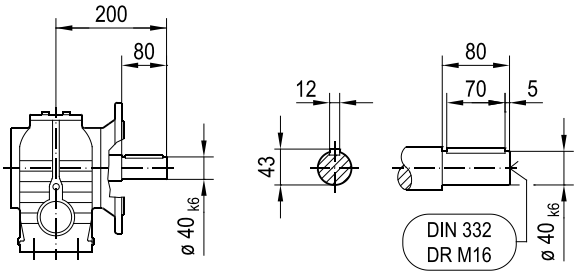
SF67/SF67p..



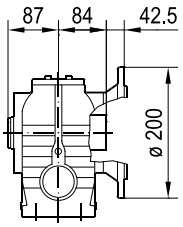
SF67..



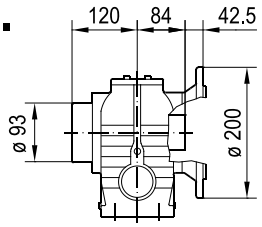
SF67/SF67p..



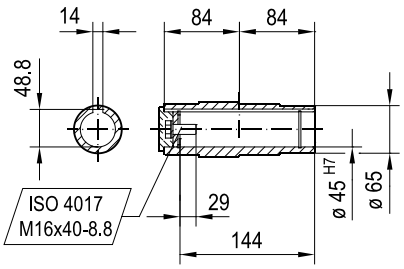
SAF67/SAF67p..



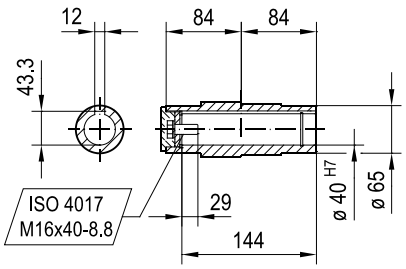
SHF67/SHF67p..

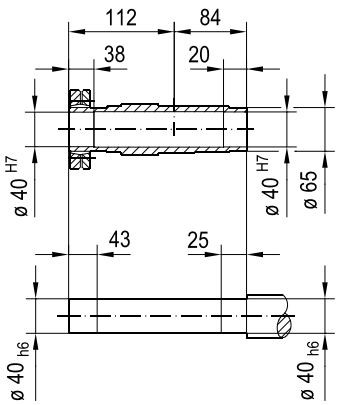


ø 45 H7



ø 40 H7





(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	386	424	462	423	445	490	455	481	534	485	513
LS	427	465	503	489	511	556	523	549	602	559	587
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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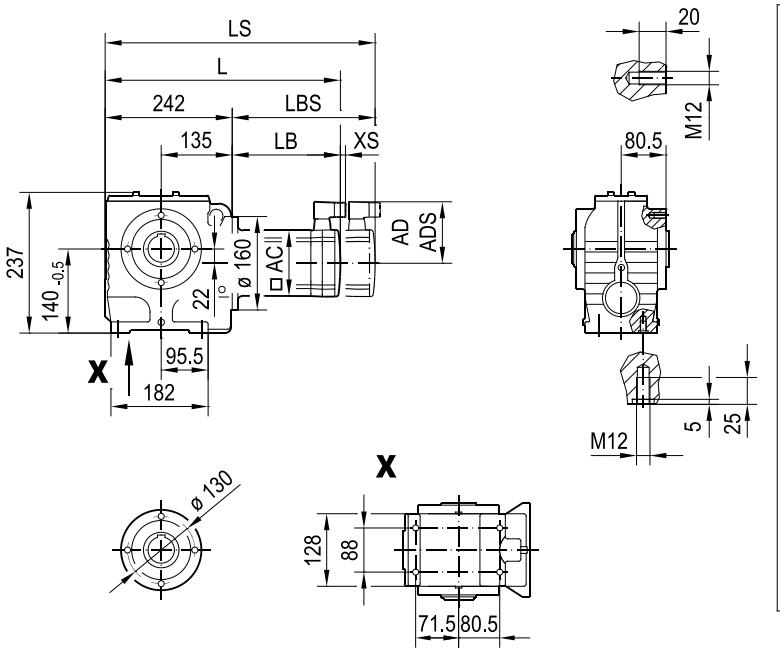
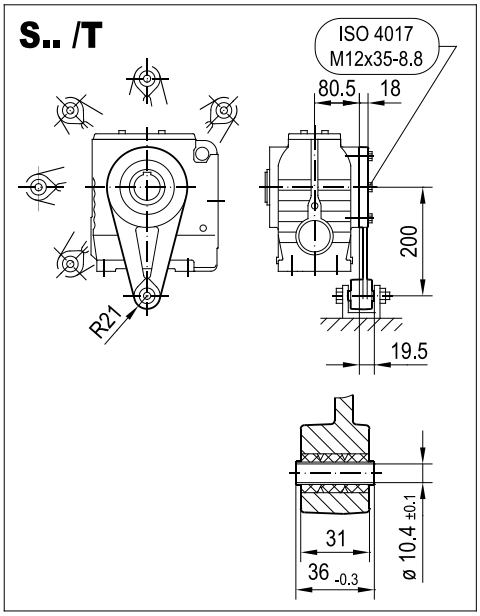
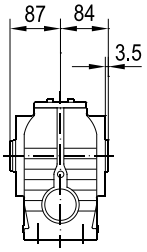
02 017 00 19

SA67/SA67p..

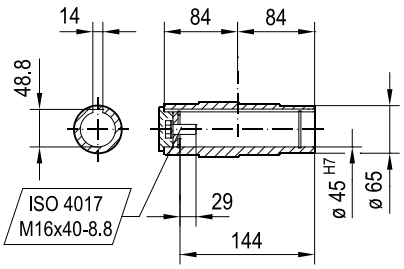




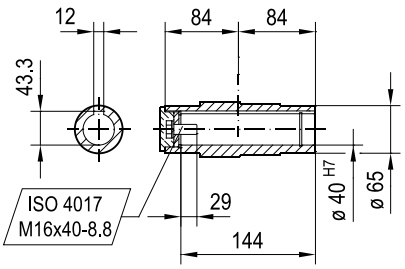
SA67/SA67p..



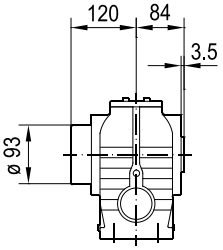
ø 45 H7

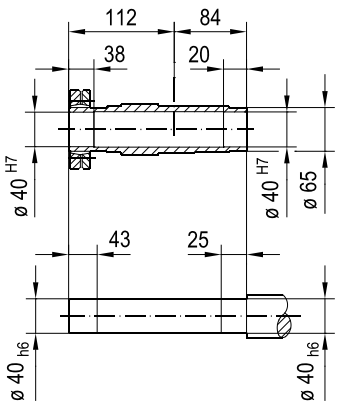


ø 40 H7



SH67/SH67p..





(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	386	424	462	423	445	490	455	481	534	485	513
LS	427	465	503	489	511	556	523	549	602	559	587
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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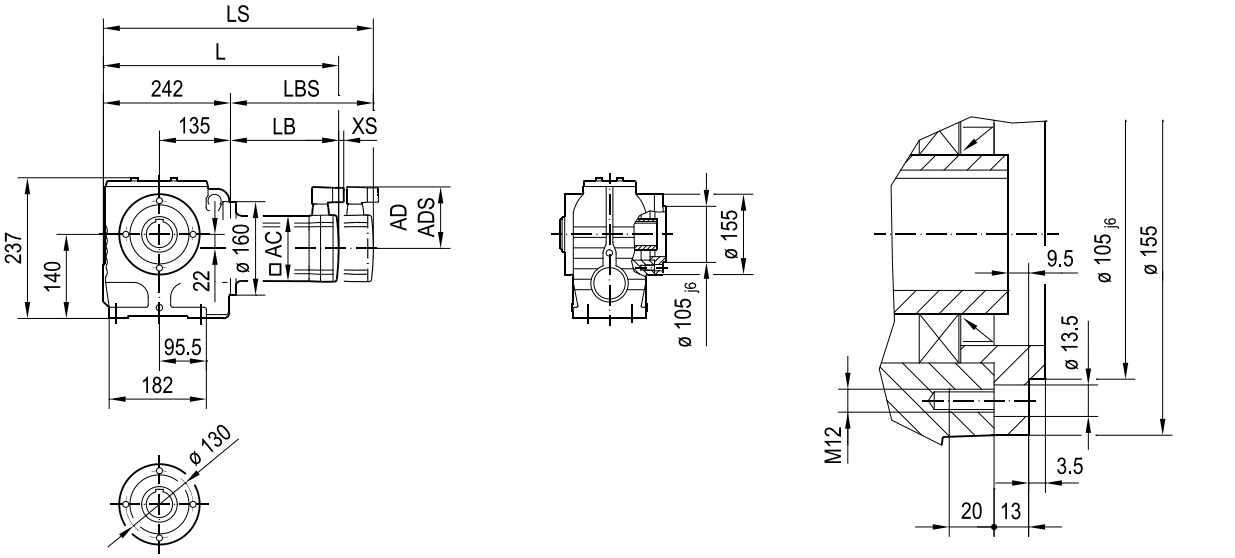
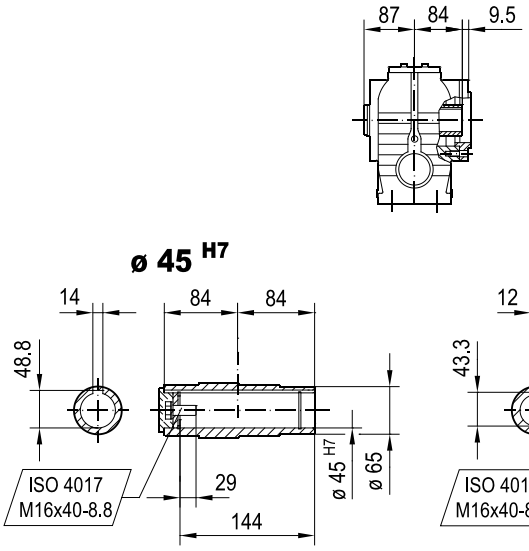
SAZ67/SAZ67p..

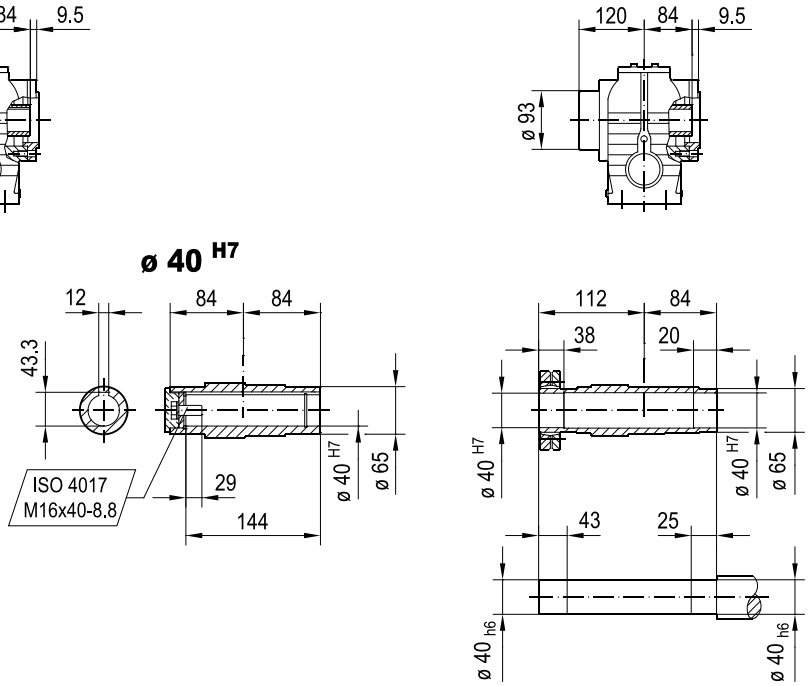
02 018 00 19



SAZ67/SAZ67p..



SHZ67/SHZ67p..



(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	386	424	462	423	445	490	455	481	534	485	513
LS	427	465	503	489	511	556	523	549	602	559	587
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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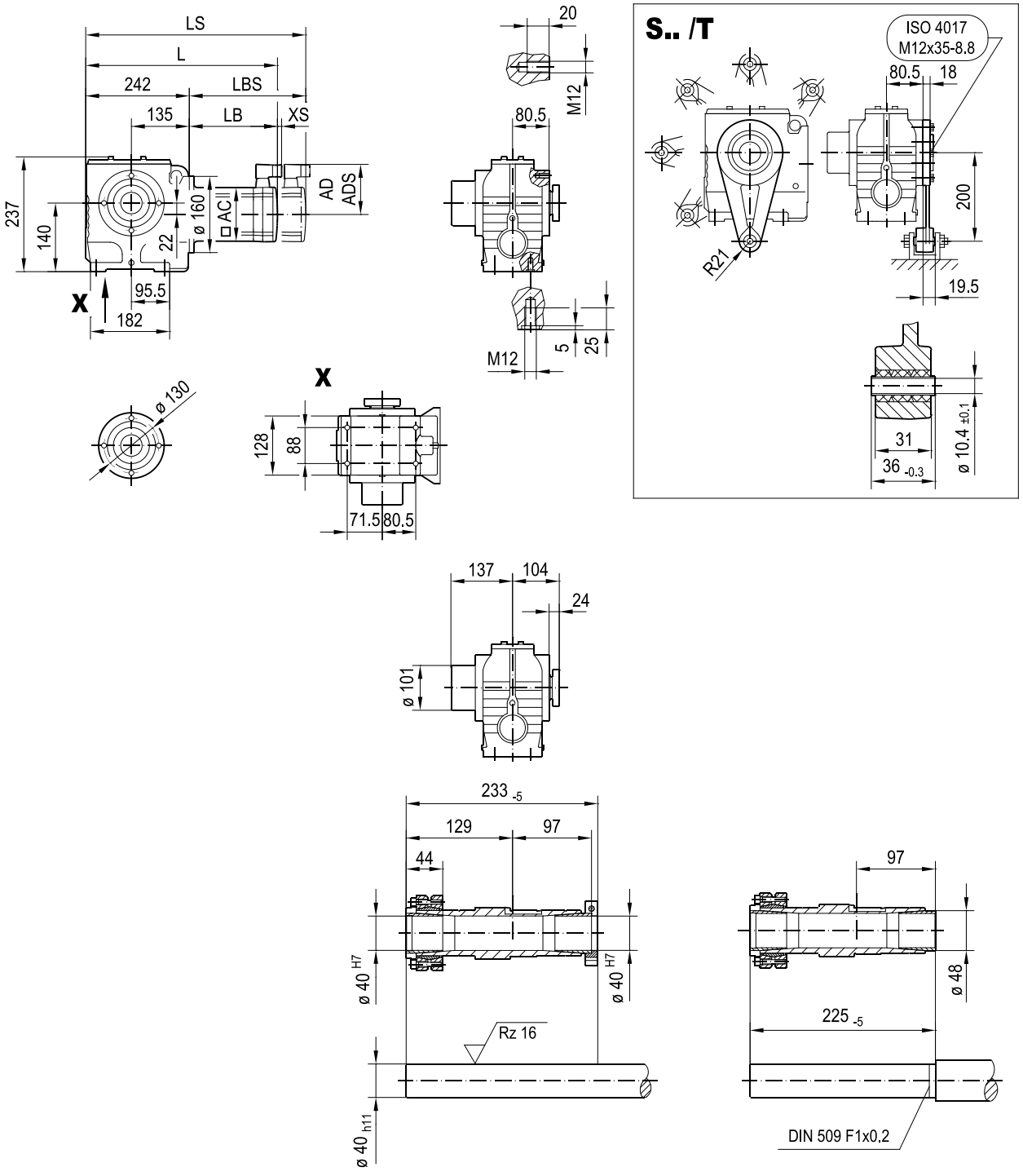
02 019 00 19

ST67/ST67p..



(→ 📖 7.3)	CM3C										
	63S	63M	63L	71S	71M	71L	80S	80M	80L	100S	100M
AC	92	92	92	118	118	118	140	140	140	165	165
AD	93	93	93	105	105	105	127	127	127	140	140
ADS	93	93	93	105	105	105	127	127	127	140	140
L	386	424	462	423	445	490	455	481	534	485	513
LS	427	465	503	489	511	556	523	549	602	559	587
LB	144	182	220	181	203	248	213	239	292	243	271
LBS	185	223	261	247	269	314	281	307	360	317	345
XS	13	13	13	7	7	7	47	47	47	6	6

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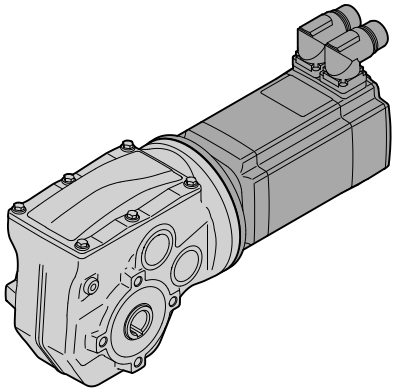
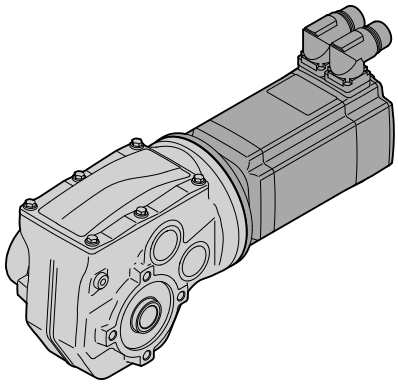
12 SPIROPLAN® gearmotors – W.. gear units

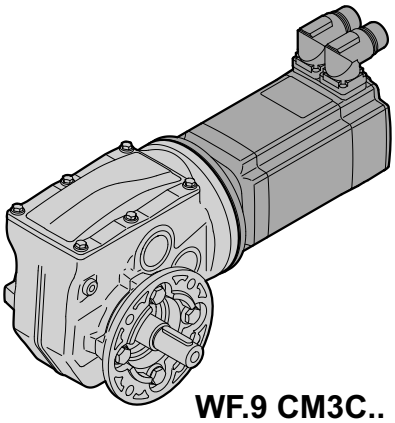
12.1 W..CM3C.. designs



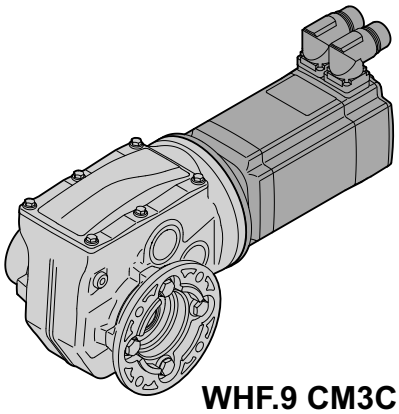
WA.9 CM3C..



WH.9 CM3C..



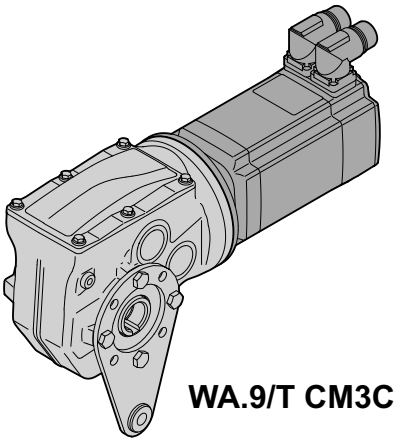
WF.9 CM3C..



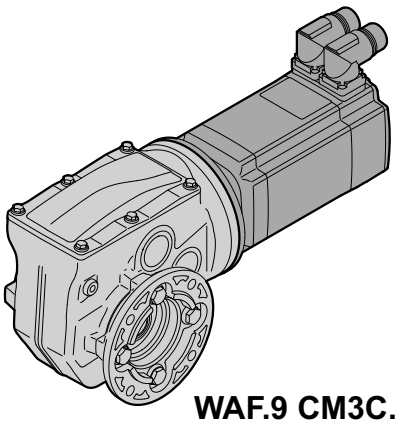
WHF.9 CM3C..

33780001931

29133866/EN – 05/2021



WA.9/T CM3C..



WAF.9 CM3C..

33780006411

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12.2 W..CM3C.. selection tables and dimension sheets

12.2.1 W29..

W29, M_{aDyn} Nm	130 Nm
i	CM3C 63S
	2
4.68	36
5.09	38
5.60	>41
6.68	51
7.27	55
8.00	>58
9.66	74
10.51	80
11.56	>85
13.57	104
14.77	112
16.25	>120
19.45	149
21.17	>156
23.29	>156
	3
25.89	>156
28.17	>156
30.99	>156
36.38	>156
38.73	>156
43.54	>156
49.58	>156
52.14	>156
56.74	>156
62.41	>156
69.68	>156
74.19	>156
78.02	>156
83.41	>156
93.58	
99.87	>156
108.68	>156
119.55	>156
131.50	
149.43	>156
188.47	

(→ 183)

WA29, m kg	
s	CM3C 63S
2	7.4
3	7.7

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WA29, m kg		
	CM3C	
s	63S	
WAF: + 0.25 kg / WF: + 0.65 kg		

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CM3C..				c_{TG}		
	i	n_{epk} min^{-1}	η %	WA Nm/'	WAF Nm/'	WF Nm/'
WA29 2	4.68	4500	95	-	-	-
	5.09	4500	94	-	-	-
	5.60	4500	93	-	-	-
	6.68	4500	95	-	-	-
	7.27	4500	94	-	-	-
	8.00	4500	93	-	-	-
	9.66	4500	95	-	-	-
	10.51	4500	94	-	-	-
	11.56	4500	93	-	-	-
	13.57	4500	95	-	-	-
	14.77	4500	94	-	-	-
	16.25	4500	93	-	-	-
	19.45	4500	95	-	-	-
	21.17	4500	94	-	-	-
	23.29	4500	93	-	-	-
WA29 3	25.89	4500	93	-	-	-
	28.17	4500	93	-	-	-
	30.99	4500	92	-	-	-
	36.38	4500	93	-	-	-
	38.73	4500	91	-	-	-
	43.54	4500	92	-	-	-
	49.58	4500	93	-	-	-
	52.14	4500	93	-	-	-
	56.74	4500	93	-	-	-
	62.41	4500	92	-	-	-
	69.68	4500	93	-	-	-
	74.19	4500	91	-	-	-
	78.02	4500	91	-	-	-
	83.41	4500	92	-	-	-
	93.58	4500	90	-	-	-
	99.87	4500	93	-	-	-
	108.68	4500	93	-	-	-
	119.55	4500	92	-	-	-
	131.50	4500	90	-	-	-
	149.43	4500	91	-	-	-
	188.47	4500	90	-	-	-

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CM3C..							F_{Ramax}			F_{Rapk}		
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	WA	WAF	WF	WA	WAF	WF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N
WA29 2	4.68	43	43	65	962	0.27	2640	2640	1720	5000	5000	3740
	5.09	43	43	65	884	0.23	2740	2740	1780	5000	5000	3740
	5.60	41	41	57	804	0.19	2890	2890	1880	5000	5000	3750
	6.68	62	62	93	674	0.20	2860	2860	1860	5000	5000	3710
	7.27	62	62	93	619	0.17	2960	2960	1930	5000	5000	3710
	8.00	58	58	81	563	0.14	3160	3160	2050	5000	5000	3720
	9.66	89	89	134	352	0.19	3190	3190	2070	5000	5000	3660
	10.51	90	90	135	340	0.16	3300	3300	2150	5000	5000	3660
	11.56	85	85	119	389	0.13	3510	3510	2280	5000	5000	3670
	13.57	124	124	186	144	0.14	3360	3360	2190	5000	5000	3580
	14.77	126	126	189	136	0.12	3480	3480	2260	5000	5000	3570
	16.25	120	120	168	154	0.099	3710	3710	2410	5000	5000	3590
	19.45	130	156	220	125	0.11	4000	4000	2600	5000	5000	3490
	21.17	130	156	220	125	0.095	4160	4160	2700	5000	5000	3490
	23.29	130	156	220	123	0.076	4340	4340	2820	5000	5000	3490
WA29 3	25.89	130	156	220	174	0.11	4350	4350	2830	5000	5000	3490
	28.17	130	156	220	160	0.097	4520	4520	2940	5000	5000	3490
	30.99	130	156	220	145	0.078	4720	4720	3070	5000	5000	3490
	36.38	130	156	220	124	0.11	5000	5000	3370	5000	5000	3490
	38.73	130	156	220	116	0.057	5000	5000	3390	5000	5000	3490
	43.54	130	156	220	103	0.073	5000	5000	3560	5000	5000	3490
	49.58	130	156	220	91	0.083	5000	5000	3560	5000	5000	3490
	52.14	130	156	220	86	0.10	5000	5000	3560	5000	5000	3490
	56.74	130	156	220	79	0.087	5000	5000	3560	5000	5000	3490
	62.41	130	156	220	72	0.070	5000	5000	3560	5000	5000	3490
	69.68	130	156	220	65	0.081	5000	5000	3560	5000	5000	3490
	74.19	130	156	220	61	0.044	5000	5000	3560	5000	5000	3490
	78.02	130	156	220	58	0.052	5000	5000	3560	5000	5000	3490
	83.41	130	156	220	54	0.056	5000	5000	3560	5000	5000	3490
	93.58	130	156	220	48	0.030	5000	5000	3560	5000	5000	3490
	99.87	130	156	220	45	0.080	5000	5000	3560	5000	5000	3490
	108.68	130	156	220	41	0.070	5000	5000	3560	5000	5000	3490
	119.55	130	156	220	38	0.055	5000	5000	3560	5000	5000	3490
	131.50	130	156	220	34	0.029	5000	5000	3560	5000	5000	3490
	149.43	130	156	220	30	0.043	5000	5000	3560	5000	5000	3490
	188.47	130	156	220	24	0.029	5000	5000	3560	5000	5000	3490

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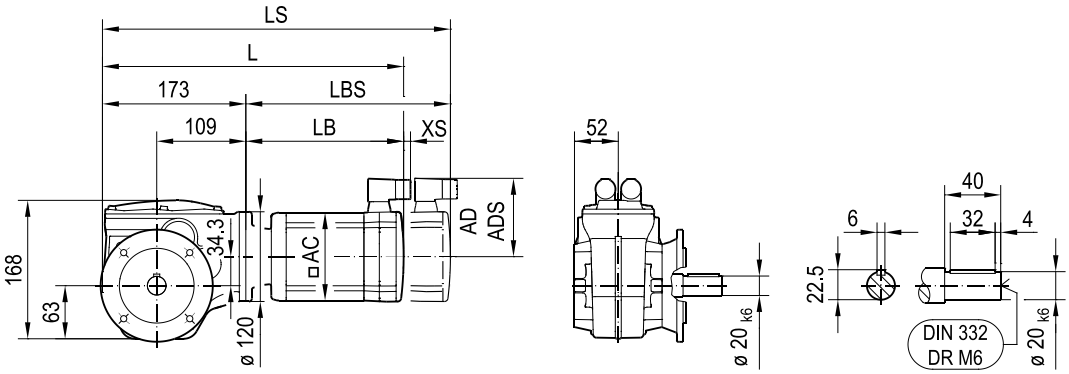
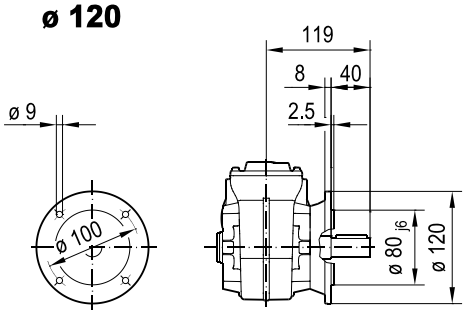
20 090 00 20

WF29..



ø 120



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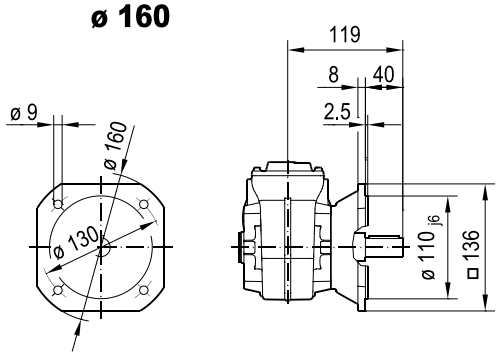
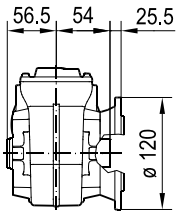


WAF29..

ø 120



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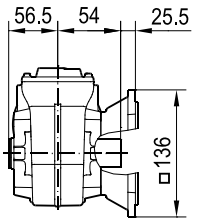
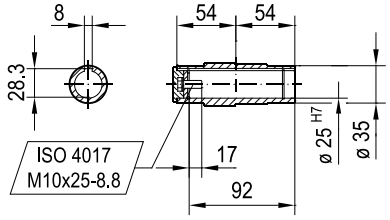


ø 25 H7



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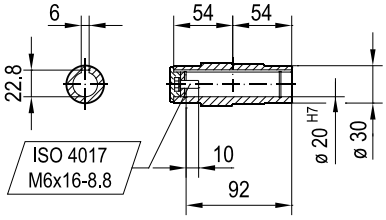

(→ 📖 7.3)	CM3C							
	63S							
AC	92							
AD	93							
ADS	93							
L	324							
LS	364							
LB	151							
LBS	191							
XS	13							

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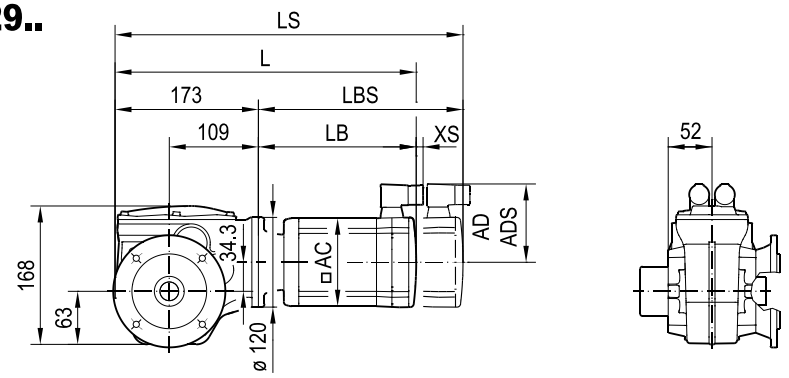
20 091 00 20

WHF29..



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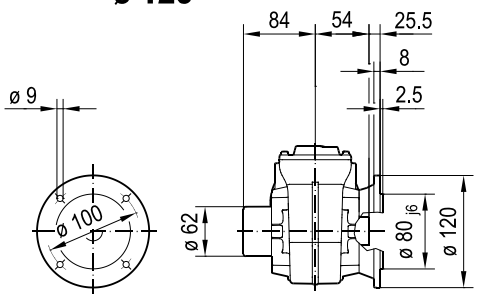

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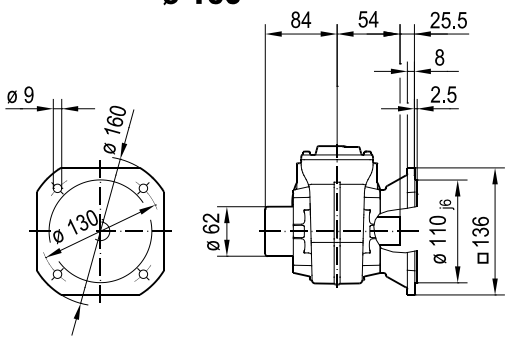

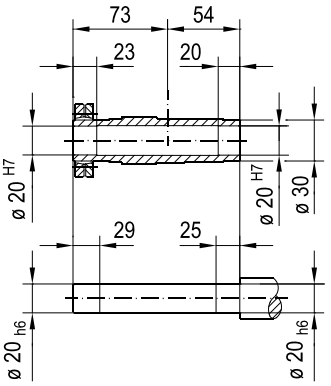

(→ 📖 7.3)	CM3C 63S							
AC	92							
AD	93							
ADS	93							
L	324							
LS	364							
LB	151							
LBS	191							
XS	13							

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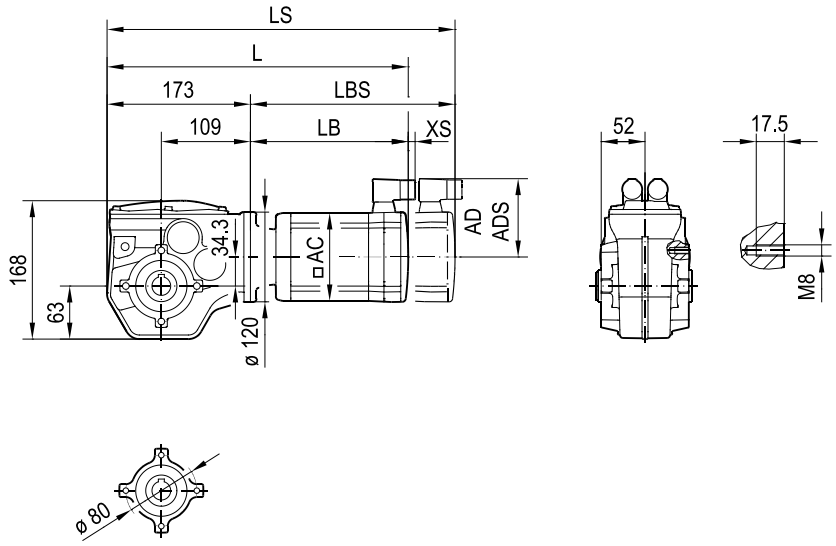
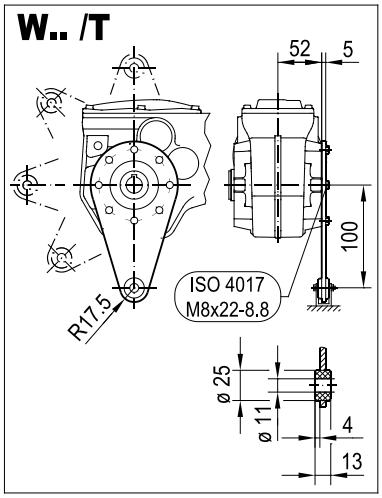
20 092 00 20

WA29..



W.. /T



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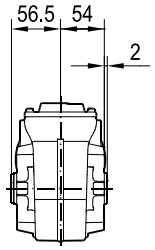
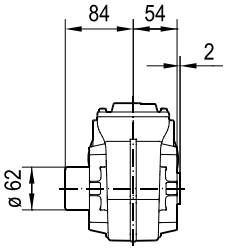
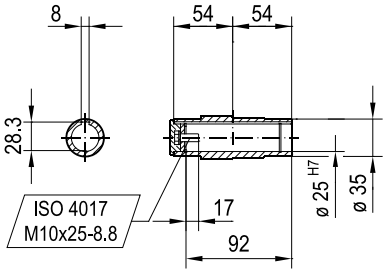


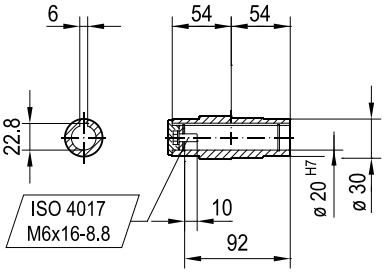
WH29..

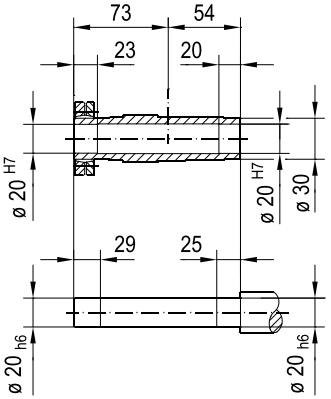


ø 25 H7



ø 20 H7





(→ 📖 7.3)	CM3C 63S							
AC	92							
AD	93							
ADS	93							
L	324							
LS	364							
LB	151							
LBS	191							
XS	13							

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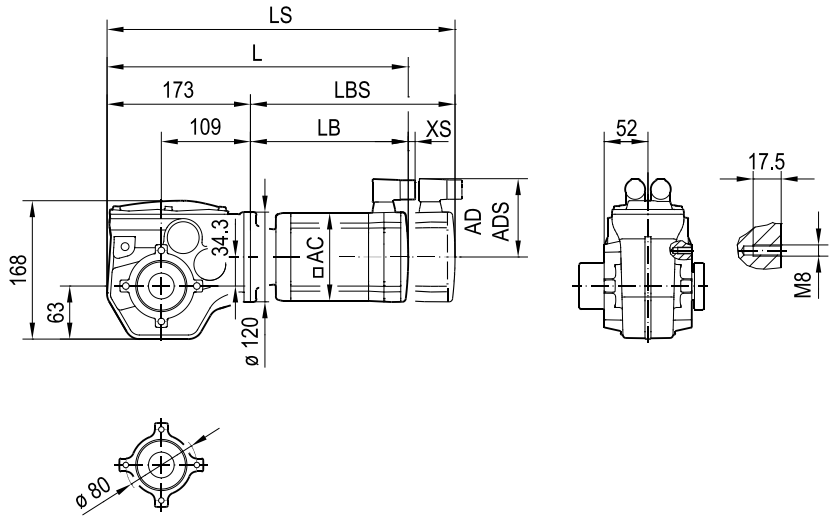
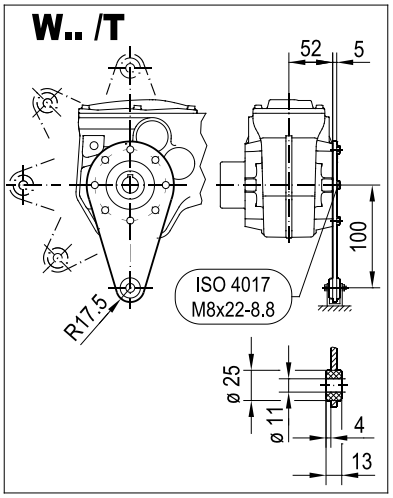
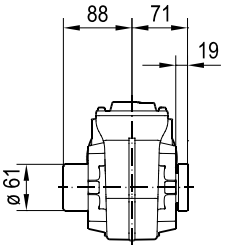
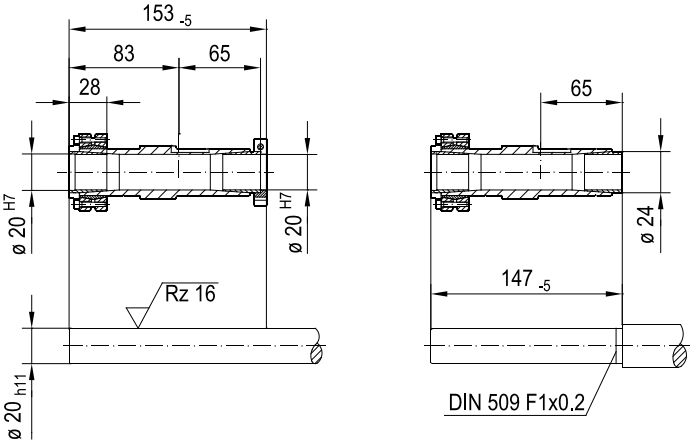
20 093 00 20

WT29..









(→ 📖 7.3)	CM3C 63S							
AC	92							
AD	93							
ADS	93							
L	324							
LS	364							
LB	151							
LBS	191							
XS	13							

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12.2.2 W39..

W39, M_{aDyn} Nm			200 Nm
		CM3C	
i	63S	63M	71S
		2	
4.72	36	>59	>59
5.14	39	>59	>59
5.65	43	>66	>66
6.35	48	>80	>80
6.91	53	>80	>80
7.61	57	>88	>88
9.14	70	>124	>124
9.94	76	>127	>127
10.94	83	>138	>138
13.27	102	>183	>183
14.44	111	>187	>187
15.89	120	>200	>200
19.78	152	>240	>240
21.53	165	>240	>240
23.68	180	>240	>240
		3	
28.38	215	>235	>235
30.88	>235	>235	>235
33.97	>235	>235	>235
41.22	>240	>240	>240
44.85	>240	>240	>240
49.34	>240	>240	>240
53.04	>220	>220	>220
58.34	>220	>220	>220
61.43	>240	>240	>240
66.85	>240	>240	>240
70.79	>240	>240	>240
73.53	>240	>240	>240
77.03	>240	>240	>240
84.74	>240	>240	>240
91.92	>240		
97.24	>220		
105.50	>240	>240	>240
114.81	>240	>240	>240
126.29	>240	>240	>240
141.23	>240		
157.87	>240		
210.49	>240		

(→ 183)

WA39, m kg			
		CM3C	
s	63S	63M	71S
2	8.9	10	12
3	9.7	11	13

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WA39, m kg			
	CM3C		
s	63S	63M	71S
WAF: + 0.80 kg / WF: + 1.7 kg			

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CM3C..				c_{TG}		
	i	n_{epk} min^{-1}	η %	WA Nm/'	WAF Nm/'	WF Nm/'
WA39 2	4.72	4500	95	-	-	-
	5.14	4500	95	-	-	-
	5.65	4500	94	-	-	-
	6.35	4500	95	-	-	-
	6.91	4500	95	-	-	-
	7.61	4500	94	-	-	-
	9.14	4500	95	-	-	-
	9.94	4500	95	-	-	-
	10.94	4500	94	-	-	-
	13.27	4500	95	-	-	-
	14.44	4500	95	-	-	-
	15.89	4500	94	-	-	-
	19.78	4500	95	-	-	-
	21.53	4500	95	-	-	-
	23.68	4500	94	-	-	-
WA39 3	28.38	4500	94	-	-	-
	30.88	4500	94	-	-	-
	33.97	4500	92	-	-	-
	41.22	4500	94	-	-	-
	44.85	4500	94	-	-	-
	49.34	4500	92	-	-	-
	53.04	4500	94	-	-	-
	58.34	4500	92	-	-	-
	61.43	4500	94	-	-	-
	66.85	4500	94	-	-	-
	70.79	4500	94	-	-	-
	73.53	4500	92	-	-	-
	77.03	4500	94	-	-	-
	84.74	4500	92	-	-	-
	91.92	4500	93	-	-	-
	97.24	4500	89	-	-	-
	105.50	4500	94	-	-	-
	114.81	4500	94	-	-	-
	126.29	4500	92	-	-	-
	141.23	4500	89	-	-	-
	157.87	4500	93	-	-	-
	210.49	4500	89	-	-	-

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CM3C..							F_{Ramax}			F_{Rapk}		
n_e = 1400		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	WA	WAF	WF	WA	WAF	WF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	N	N	N	N	N	N
WA39 2	4.72	59	59	89	953	0.55	2160	2160	1400	8000	8000	5190
	5.14	59	59	89	875	0.45	2250	2250	1460	8000	8000	5190
	5.65	66	66	99	796	0.38	2240	2240	1450	7910	7910	5110
	6.35	80	80	120	709	0.41	2280	2280	1480	7820	7820	5060
	6.91	80	80	120	651	0.34	2380	2380	1540	7820	7820	5060
	7.61	88	88	132	532	0.28	2380	2380	1540	7700	7700	4980
	9.14	124	124	186	284	0.37	2350	2350	1520	7440	7440	4810
	9.94	127	127	191	263	0.31	2430	2430	1570	7400	7400	4790
	10.94	125	138	205	268	0.26	2580	2580	1670	7260	7260	4700
	13.27	175	183	275	108	0.27	2350	2350	1520	6820	6820	4410
	14.44	175	187	280	107	0.22	2480	2480	1600	6780	6780	4380
	15.89	170	200	285	115	0.19	2690	2690	1740	6600	6600	4270
	19.78	200	240	340	81	0.22	2890	2890	1870	6380	6380	4130
	21.53	200	240	340	80	0.17	3030	3030	1960	6380	6380	4130
	23.68	200	240	340	79	0.15	3200	3200	2070	6380	6380	4130
WA39 3	28.38	196	235	330	159	0.19	3240	3240	2100	6030	6030	3900
	30.88	196	235	330	146	0.16	3400	3400	2200	6030	6030	3900
	33.97	196	235	330	132	0.13	3590	3590	2320	6030	6030	3900
	41.22	200	240	340	109	0.18	4090	4090	2650	6140	6140	3970
	44.85	200	240	340	100	0.15	4280	4280	2770	6140	6140	3970
	49.34	200	240	340	91	0.13	4490	4490	2910	6140	6140	3970
	53.04	186	220	315	85	0.12	4690	4690	3040	6180	6180	4000
	58.34	186	220	315	77	0.11	4920	4920	3180	6180	6180	4000
	61.43	200	240	340	73	0.18	5220	5220	3370	6380	6380	4130
	66.85	200	240	340	67	0.14	5430	5430	3510	6380	6380	4130
	70.79	200	240	340	64	0.15	5380	5380	3480	6140	6140	3970
	73.53	200	240	340	61	0.12	5680	5680	3670	6380	6380	4130
	77.03	200	240	340	58	0.12	5600	5600	3620	6140	6140	3970
	84.74	200	240	340	53	0.10	5860	5860	3790	6140	6140	3970
	91.92	200	240	340	49	0.075	6280	6280	4060	6380	6380	4130
	97.24	186	220	315	46	0.044	6270	6270	4060	6180	6180	4000
	105.50	200	240	340	43	0.15	6680	6680	4320	6380	6380	4130
	114.81	200	240	340	39	0.12	6820	6820	4410	6380	6380	4130
	126.29	200	240	340	36	0.10	6820	6820	4410	6380	6380	4130
	141.23	200	240	340	32	0.043	6620	6620	4280	6140	6140	3970
	157.87	200	240	340	29	0.063	6820	6820	4410	6380	6380	4130
	210.49	200	240	340	21	0.043	6820	6820	4410	6380	6380	4130

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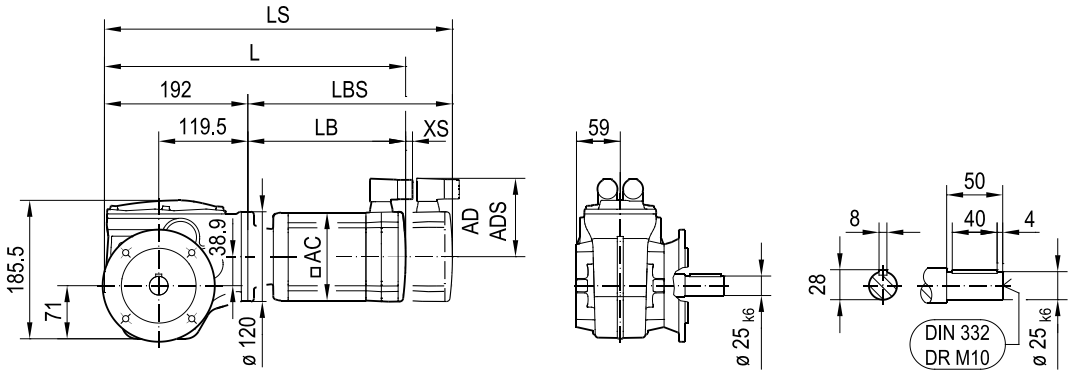
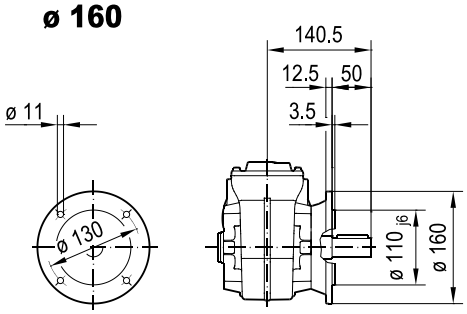
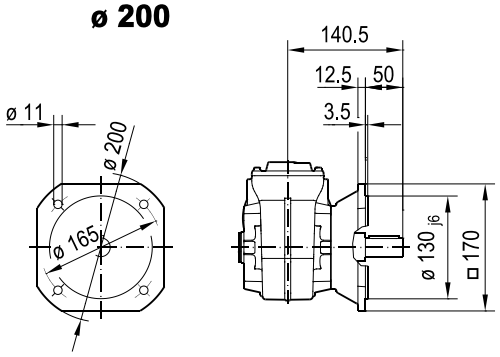
WF39..



ø 160

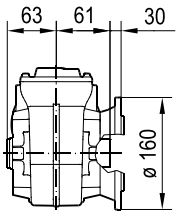


ø 200

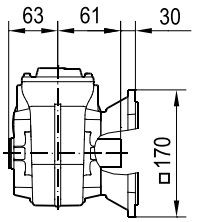


WAF39..

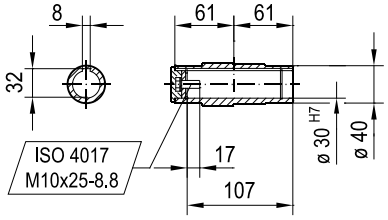
ø 160



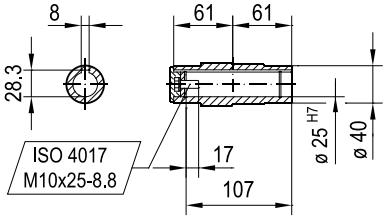
ø 200



ø 30 H7
DIN 6885-3



ø 25 H7



(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	343	381	379					
LS	383	421	445					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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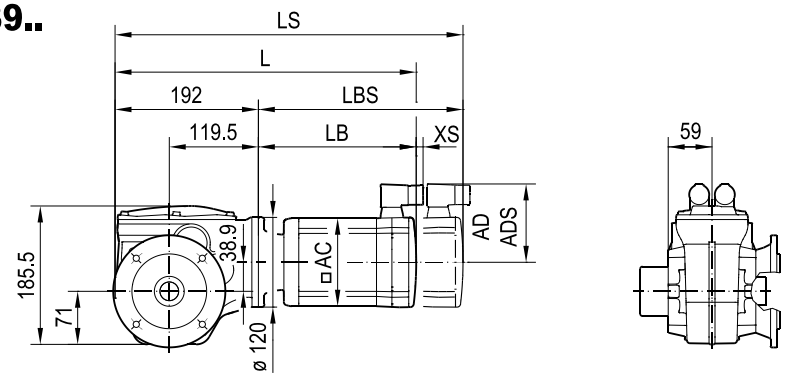
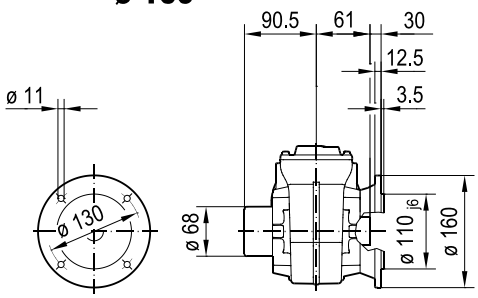
20 096 00 20

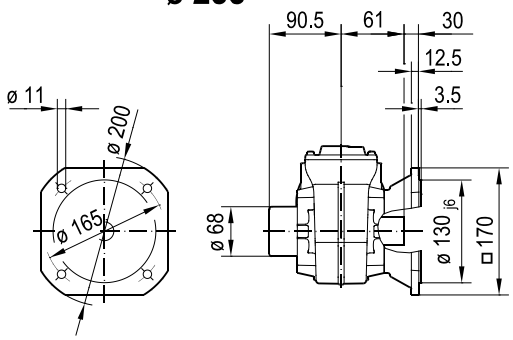
WHF39..

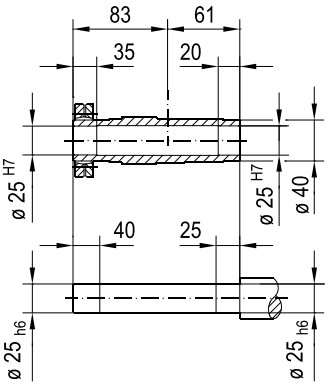


ø 160



ø 200





(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	343	381	379					
LS	383	421	445					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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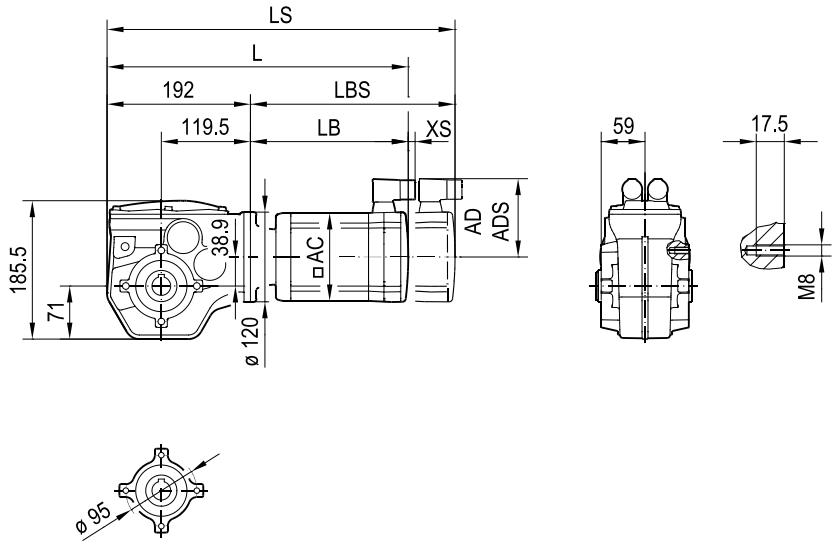
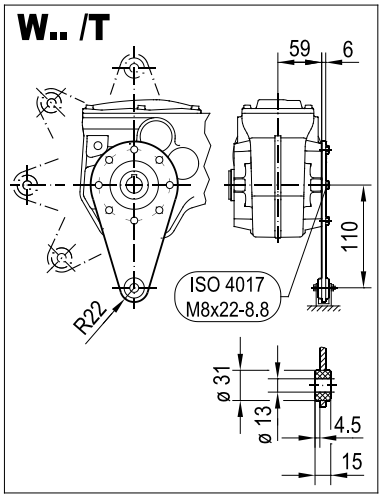
20 097 00 20

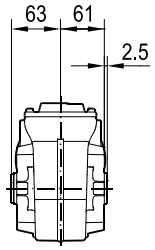
WA39..



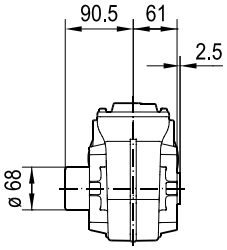
W.. /T



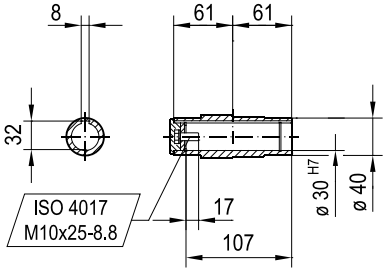
WA39..



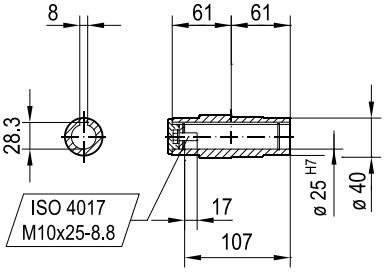
WH39..

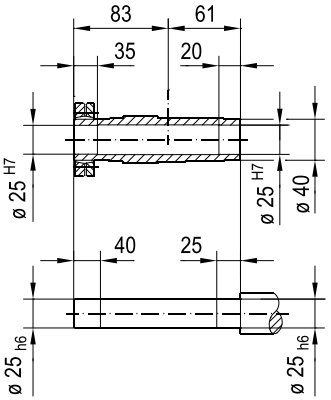


ø 30 H7
DIN 6885-3



ø 25 H7





(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	343	381	379					
LS	383	421	445					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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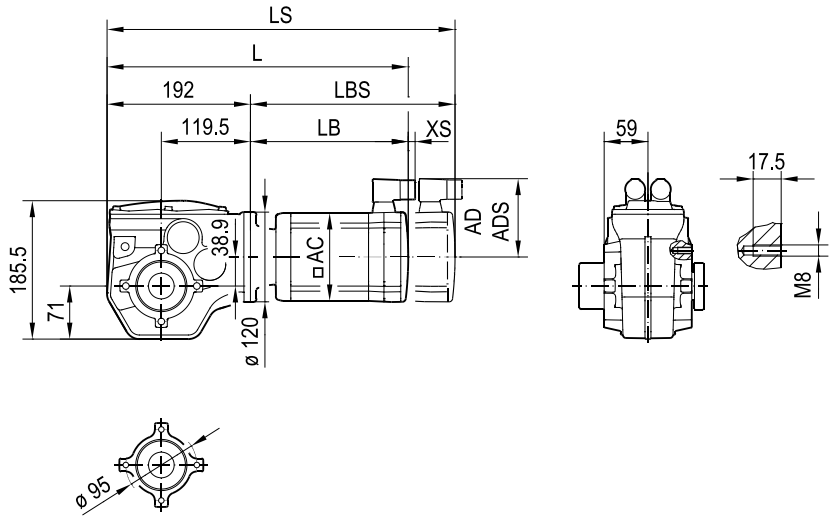
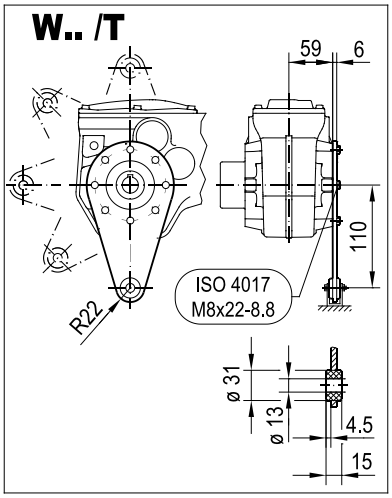
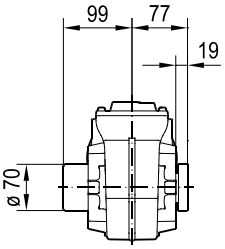
20 098 00 20

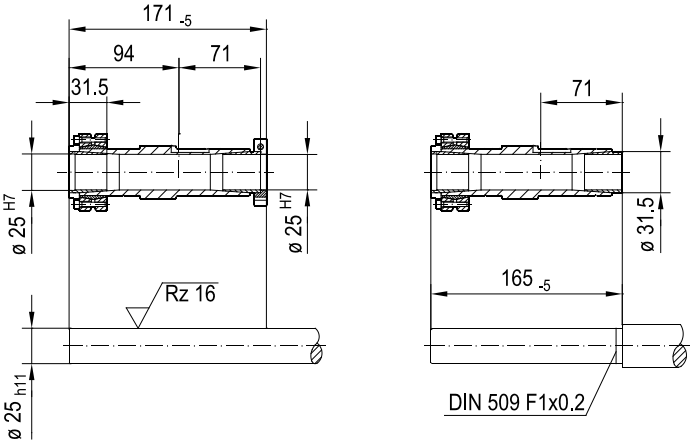
WT39..



W.. /T







(→ 📖 7.3)	CM3C							
	63S	63M	71S					
AC	92	92	118					
AD	93	93	105					
ADS	93	93	105					
L	343	381	379					
LS	383	421	445					
LB	151	189	187					
LBS	191	229	253					
XS	13	13	7					

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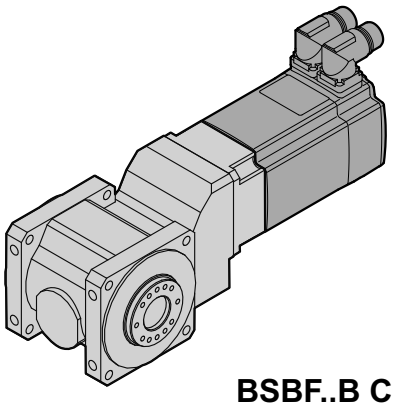
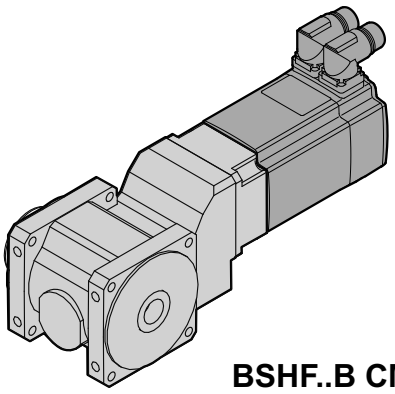
13 Helical-bevel gearmotors – BS.F.. gear units

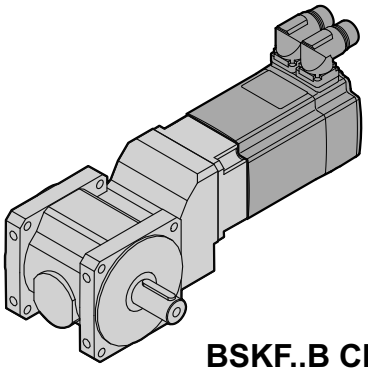
13.1 BS.F..CM3C.. designs



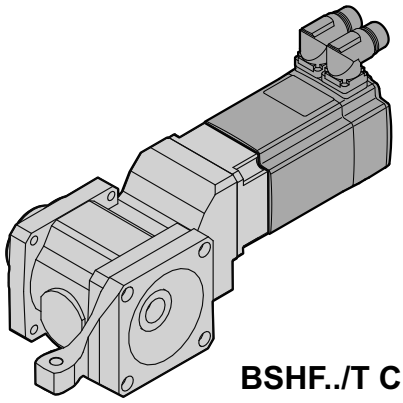
BSBF..B CM3C..



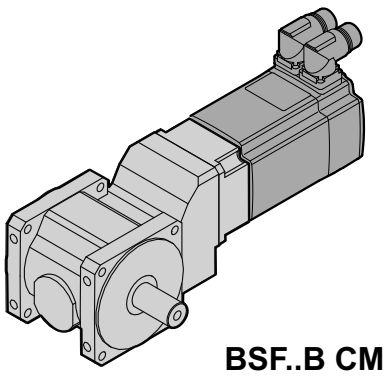
BSHF..B CM3C..



BSKF..B CM3C..



BSHF../T CM3C..



BSF..B CM3C..

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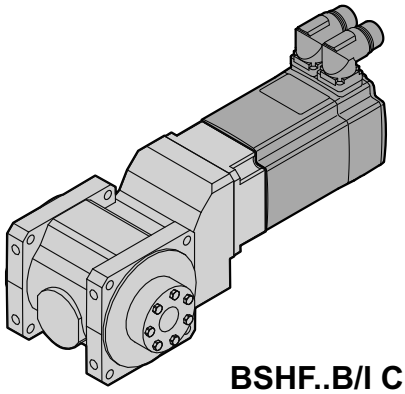
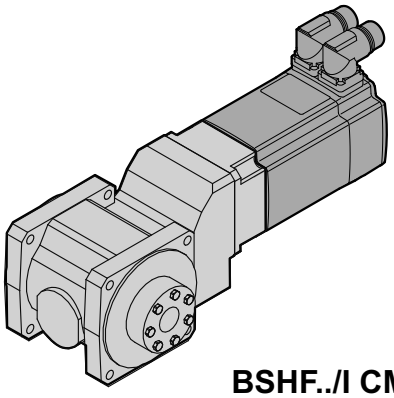
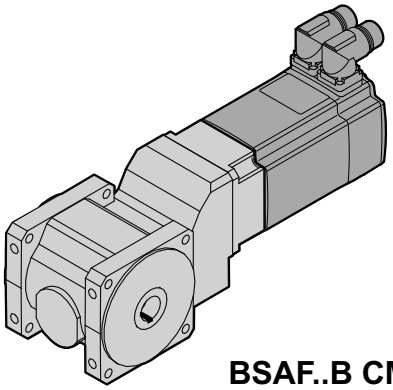


BSHF..B/I CM3C..



BSHF../I CM3C..



BSAF..B CM3C..

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13.2 BS.F..CM3C.. selection tables and dimension sheets

13.2.1 BS.F202..

BSF202, M_{aDyn} Nm	40 Nm
i	CM3C 63S
	2
3.00	22
4.00	30
6.00	45
8.00	>60
10.00	>51
15.00	>51
20.00	>51
25.00	

(→ 185)

BSF202, m kg	
s	CM3C 63S
2	6.9
BSBF: + - kg / BSHF: + - kg	

CM3C..				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	-

CM3C..							c_T			F_{Ramax}		F_{Rapk}	
n_e = 1500		M_{amax}	M_{apk}	$M_{aEmergOff}$	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
BSF202 2	3.00	40	60	90	667	0.76	2.1	2.3	2.3	2680	2970	4200	4200
	4.00	40	60	90	663	0.47	2.2	2.4	2.4	3000	3330	4200	4200
	6.00	40	60	90	662	0.23	2.2	2.5	2.5	3500	3880	4200	4200
	8.00	40	60	90	563	0.14	2.3	2.5	2.5	3900	4200	4200	4200
	10.00	40	51	77	328	0.27	4.1	4.7	4.7	4150	4200	4200	4200
	15.00	40	51	77	300	0.14	4.2	4.8	4.7	4200	4200	4200	4200
	20.00	40	51	77	225	0.091	4.2	4.8	4.7	4200	4200	4200	4200
	25.00	40	51	77	180	0.066	4.2	4.8	4.8	4200	4200	4200	4200

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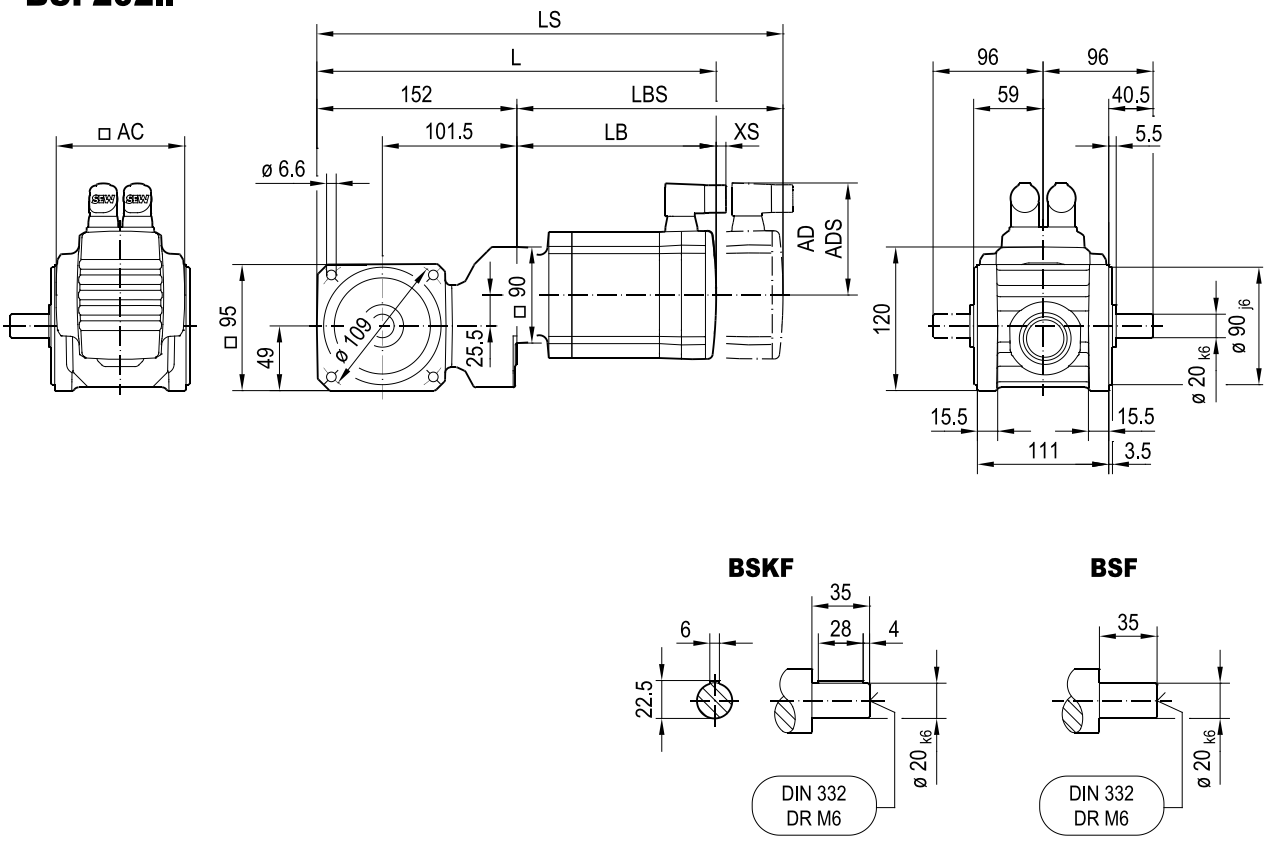
BSF202..

55 001 00 19

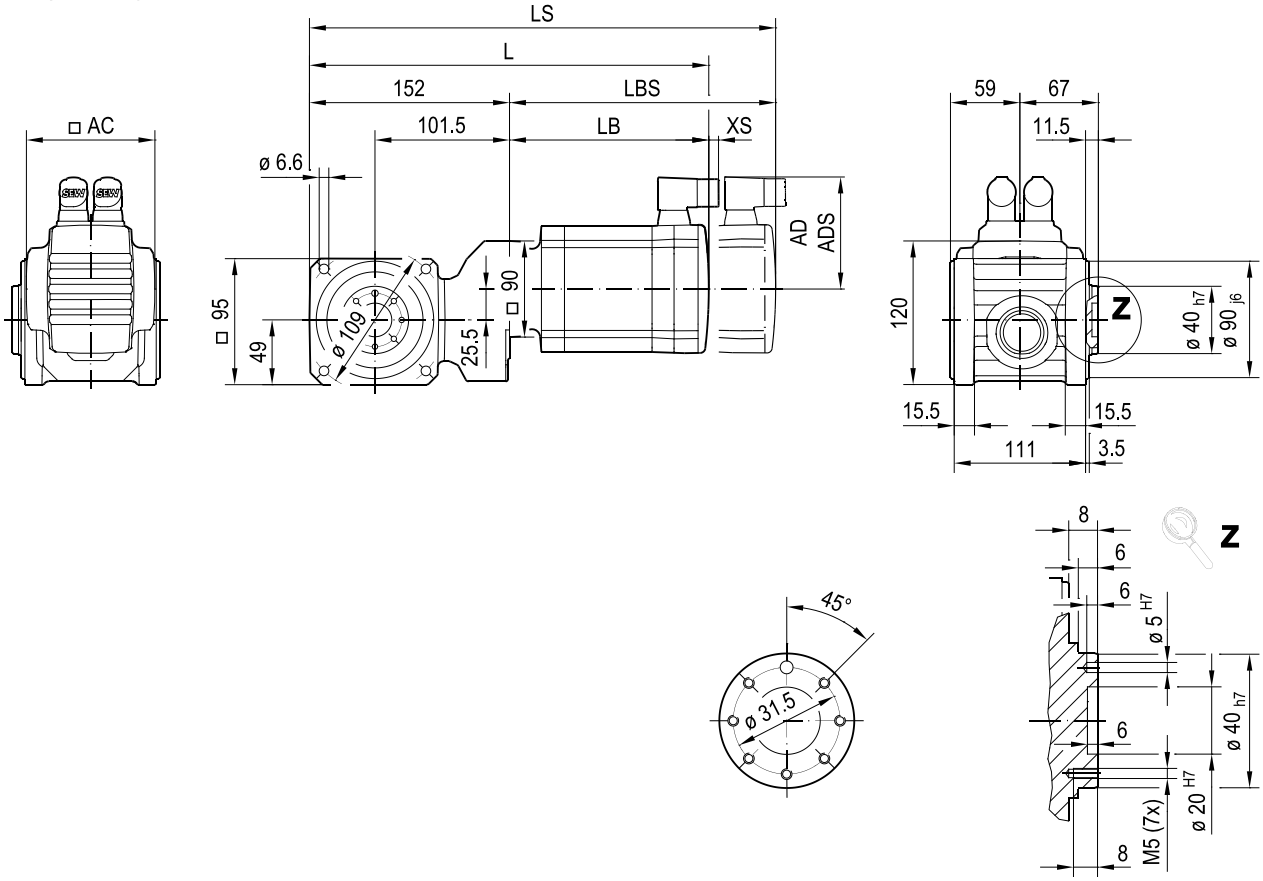


(→ 📖 7.3)	CM3C							
	63S							
AC	92							
AD	93							
ADS	93							
L	303							
LS	344							
LB	152							
LBS	192							
XS	13							

29133866/EN – 05/2021

BSBF202..

55 002 00 19

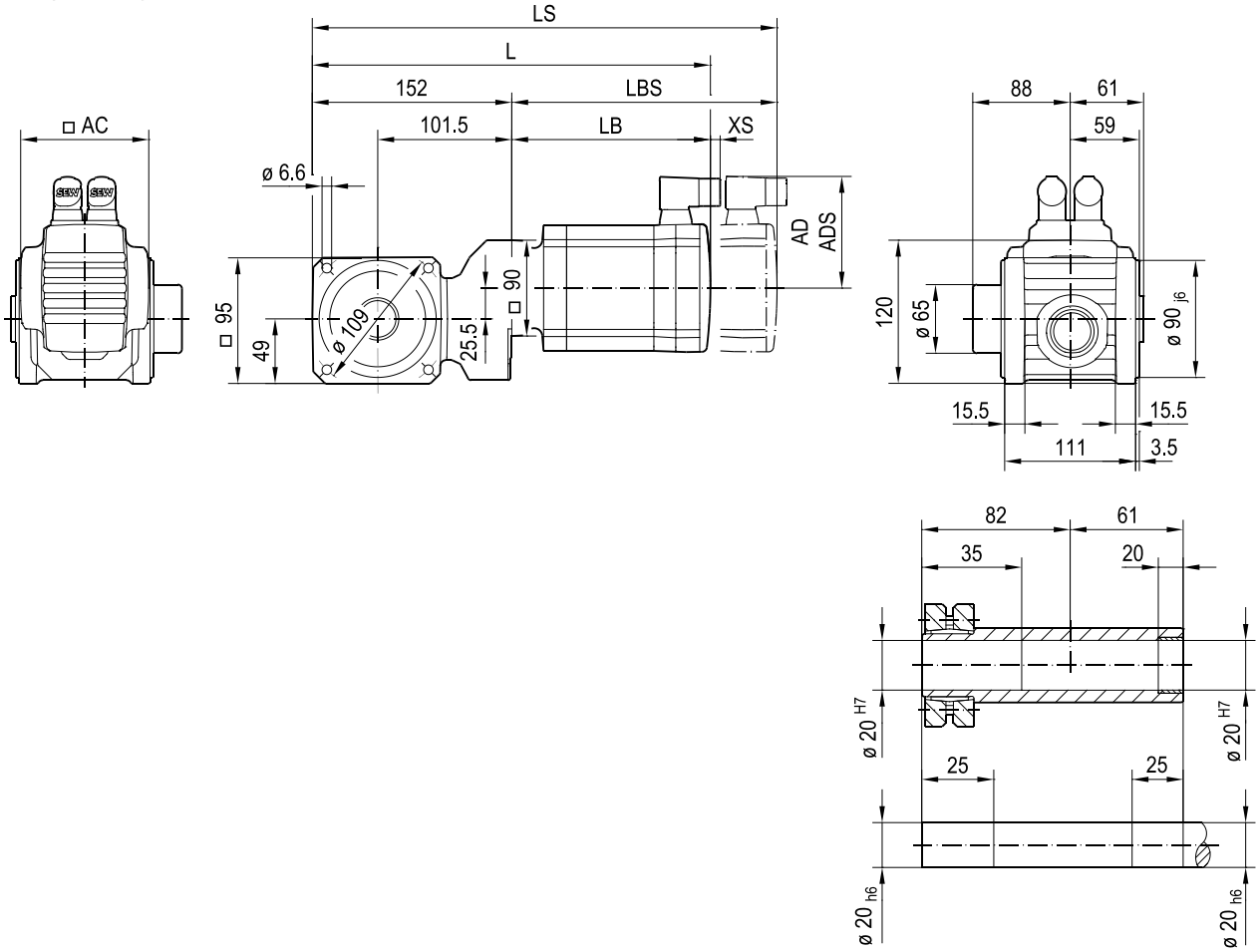


(→ 📖 7.3)	CM3C							
	63S							
AC	92							
AD	93							
ADS	93							
L	303							
LS	344							
LB	152							
LBS	192							
XS	13							

29133866/EN – 05/2021

BSHF202..

55 003 00 19

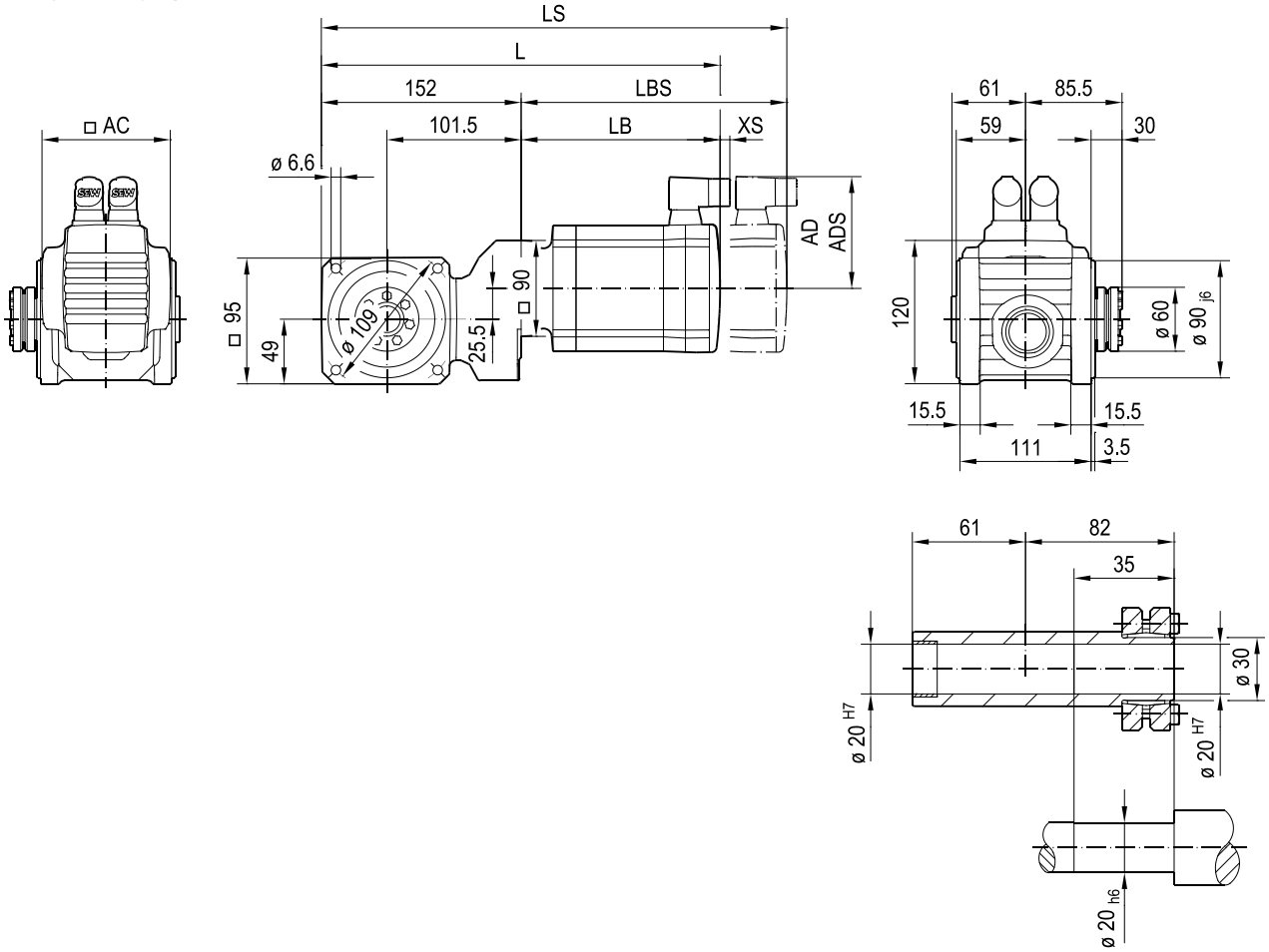


(→ 📖 7.3)	CM3C							
	63S							
AC	92							
AD	93							
ADS	93							
L	303							
LS	344							
LB	152							
LBS	192							
XS	13							

29133866/EN – 05/2021

BSHF202/I..

55 004 00 19

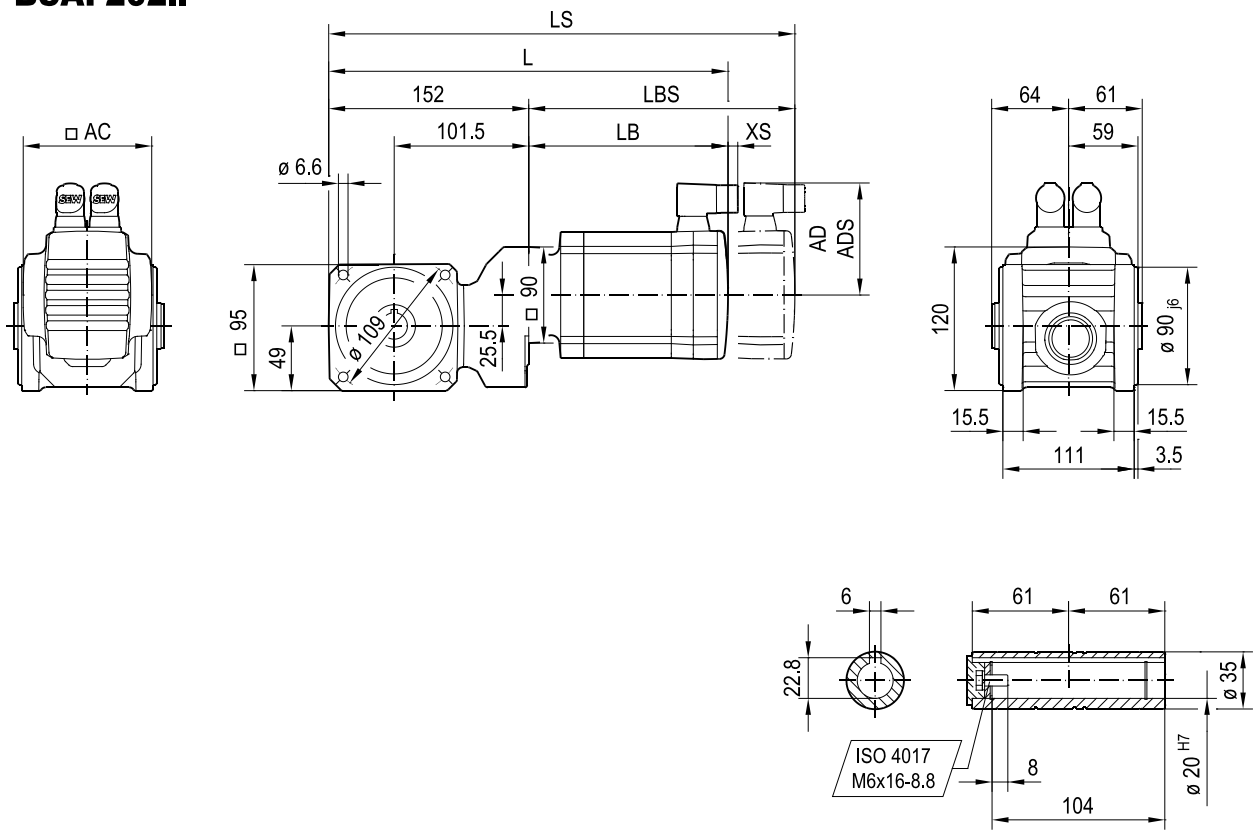


(→ 📖 7.3)	CM3C 63S							
AC	92							
AD	93							
ADS	93							
L	303							
LS	344							
LB	152							
LBS	192							
XS	13							

29133866/EN – 05/2021

BSAF202..

55 005 00 19



(→ 📖 7.3)	CM3C							
	63S							
AC	92							
AD	93							
ADS	93							
L	303							
LS	344							
LB	152							
LBS	192							
XS	13							

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13.2.2 BS.F302..

BSF302, M_{aDyn} Nm					80 Nm
	CM3C				
i	63S	63M	63L	71S	71M
			2		
3.00		41	54	54	80
4.00	30	55	72	73	107
6.00	45	82	108	109	>120
8.00	60	110		>120	
10.00	73	>108	>108	>108	>108
15.00	110	>112	>112	>112	>112
20.00	>112	>112		>112	
25.00	>112				
30.00					

(→ 185)

BSF302, m kg					
	CM3C				
s	63S	63M	63L	71S	71M
2	8.9	10	12	12	13
BSBF: + 0.35 kg / BSHF: + -0.10 kg					

CM3C..				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	-

CM3C..							c_T			F_{Ramax}		F_{Rapk}	
n_e = 1500		M_{amax}	M_{apk}	$M_{aEmergOff}$	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
BSF302 2	3.00	68	102	153	513	1.6	3.7	4.1	4.0	4520	4980	4920	6000
	4.00	76	114	171	385	0.97	4.0	4.4	4.3	4960	5460	4750	6000
	6.00	80	120	180	307	0.48	4.2	4.7	4.6	5160	6000	4660	6000
	8.00	80	120	180	328	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	108	0.29	6.9	7.8	7.7	5160	6000	4780	6000
	20.00	80	112	168	111	0.19	6.9	7.8	7.8	5160	6000	4780	6000
	25.00	80	112	168	109	0.13	7.0	7.9	7.8	5160	6000	4780	6000
	30.00	80	112	168	118	0.10	7.0	7.9	7.8	5160	6000	4780	6000

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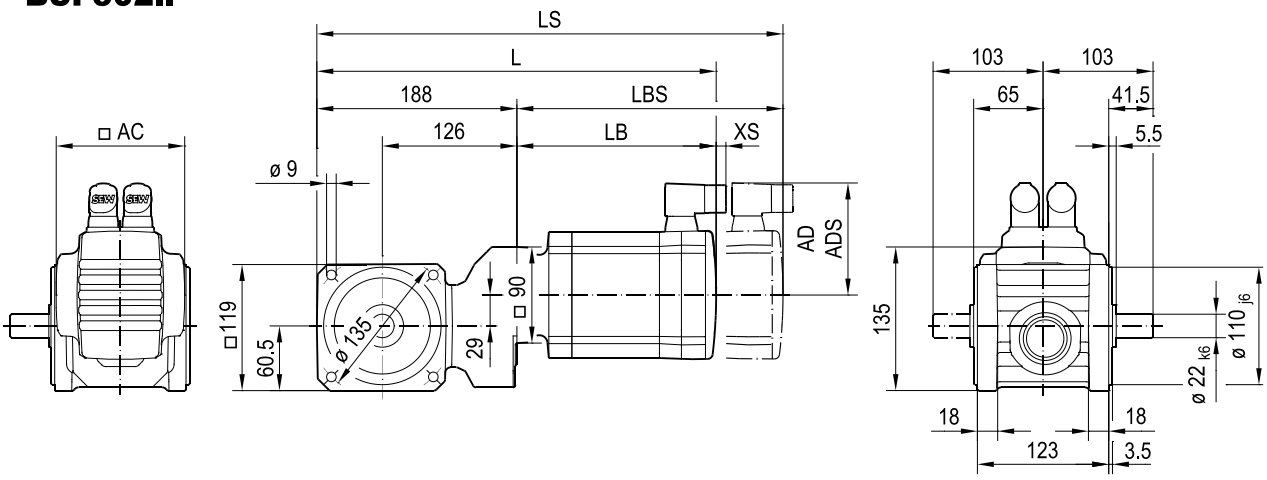
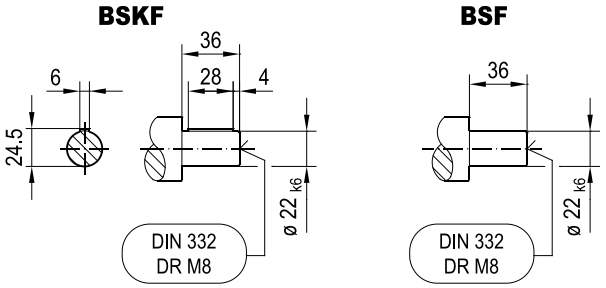
BSF302..

55 006 00 19





(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M			
AC	92	92	92	118	118			
AD	93	93	93	105	105			
ADS	93	93	93	105	105			
L	339	377	415	374	396			
LS	380	418	456	440	462			
LB	152	190	228	187	209			
LBS	192	230	268	253	275			
XS	13	13	13	7	7			

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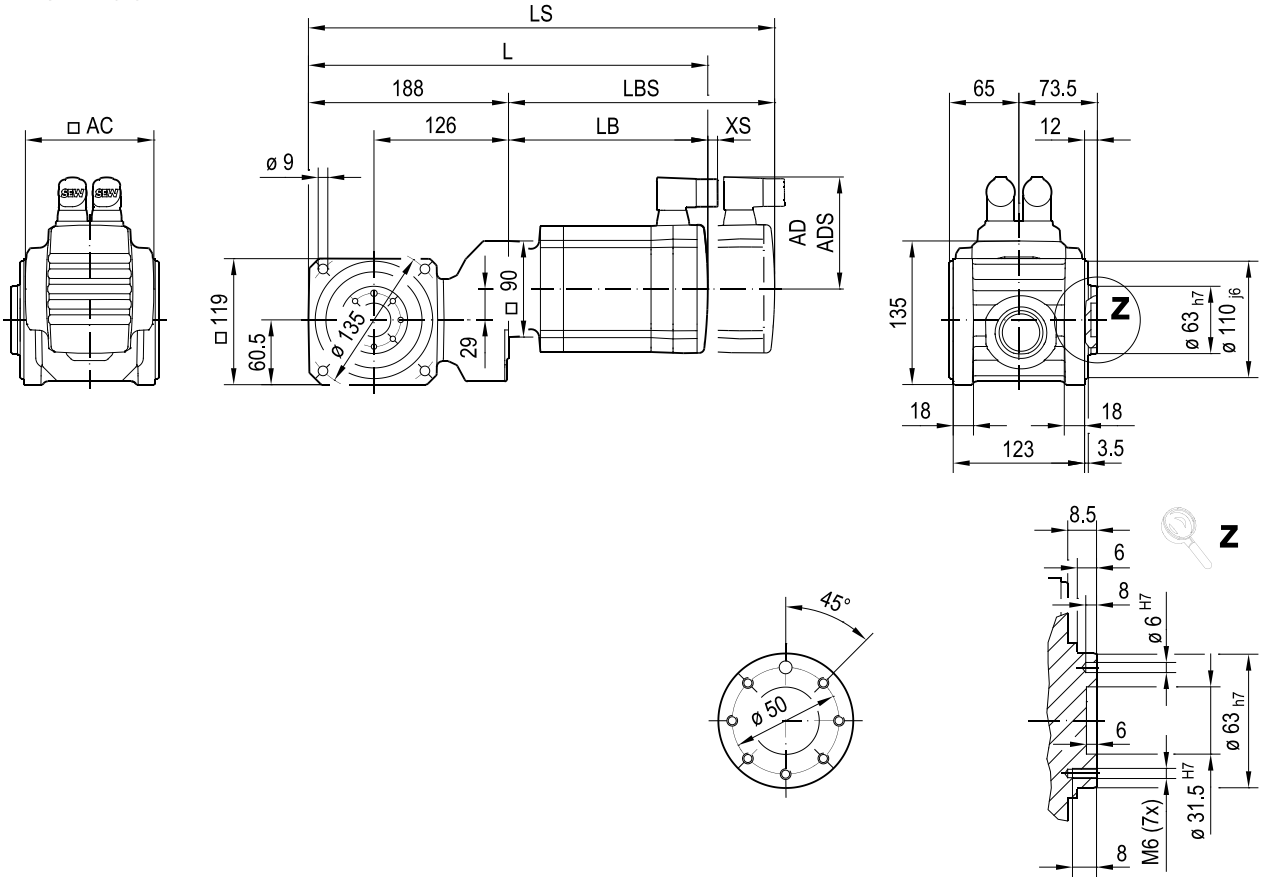
BSBF302..

55 007 00 19



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M			
AC	92	92	92	118	118			
AD	93	93	93	105	105			
ADS	93	93	93	105	105			
L	339	377	415	374	396			
LS	380	418	456	440	462			
LB	152	190	228	187	209			
LBS	192	230	268	253	275			
XS	13	13	13	7	7			

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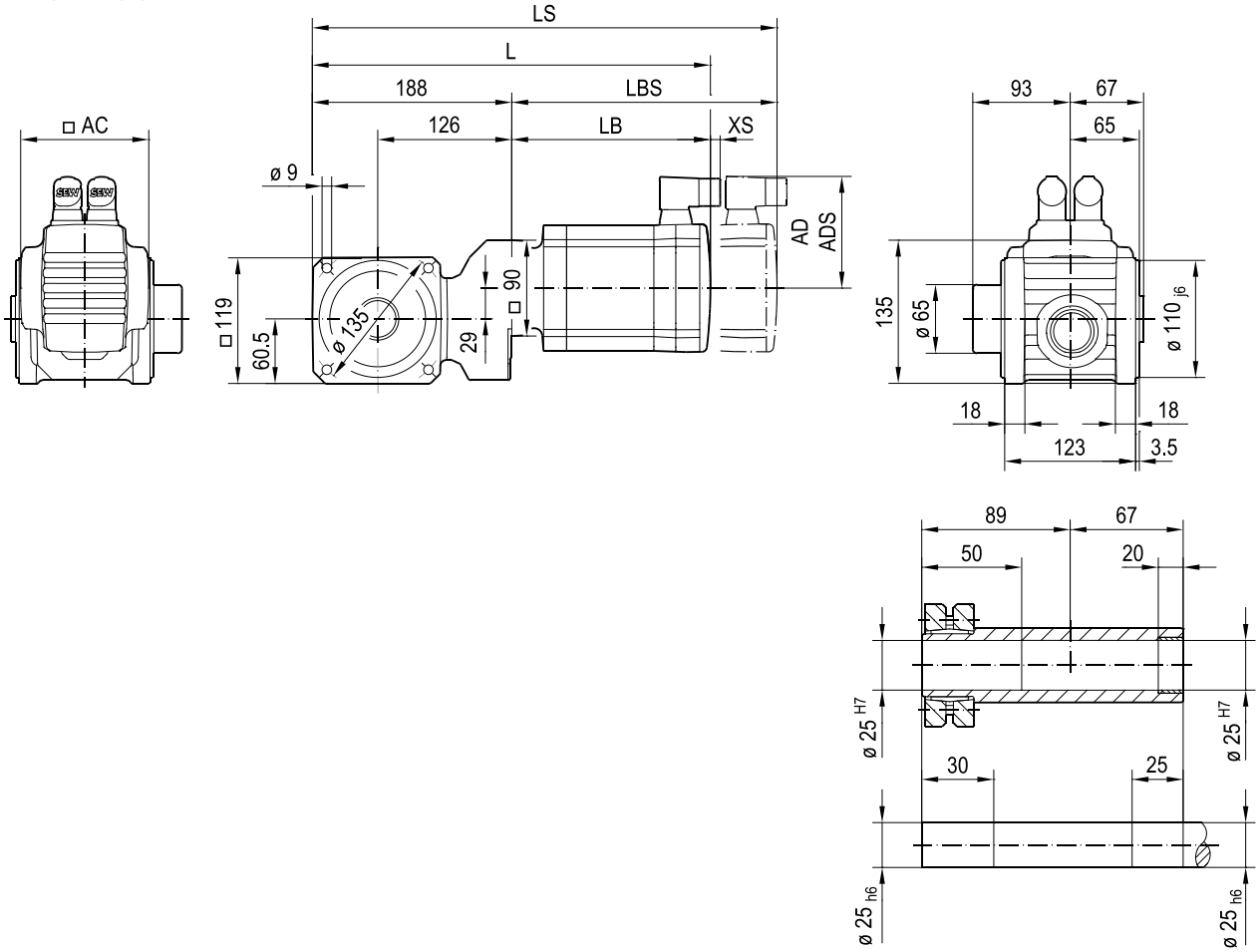
BSHF302..

55 008 00 19



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M			
AC	92	92	92	118	118			
AD	93	93	93	105	105			
ADS	93	93	93	105	105			
L	339	377	415	374	396			
LS	380	418	456	440	462			
LB	152	190	228	187	209			
LBS	192	230	268	253	275			
XS	13	13	13	7	7			

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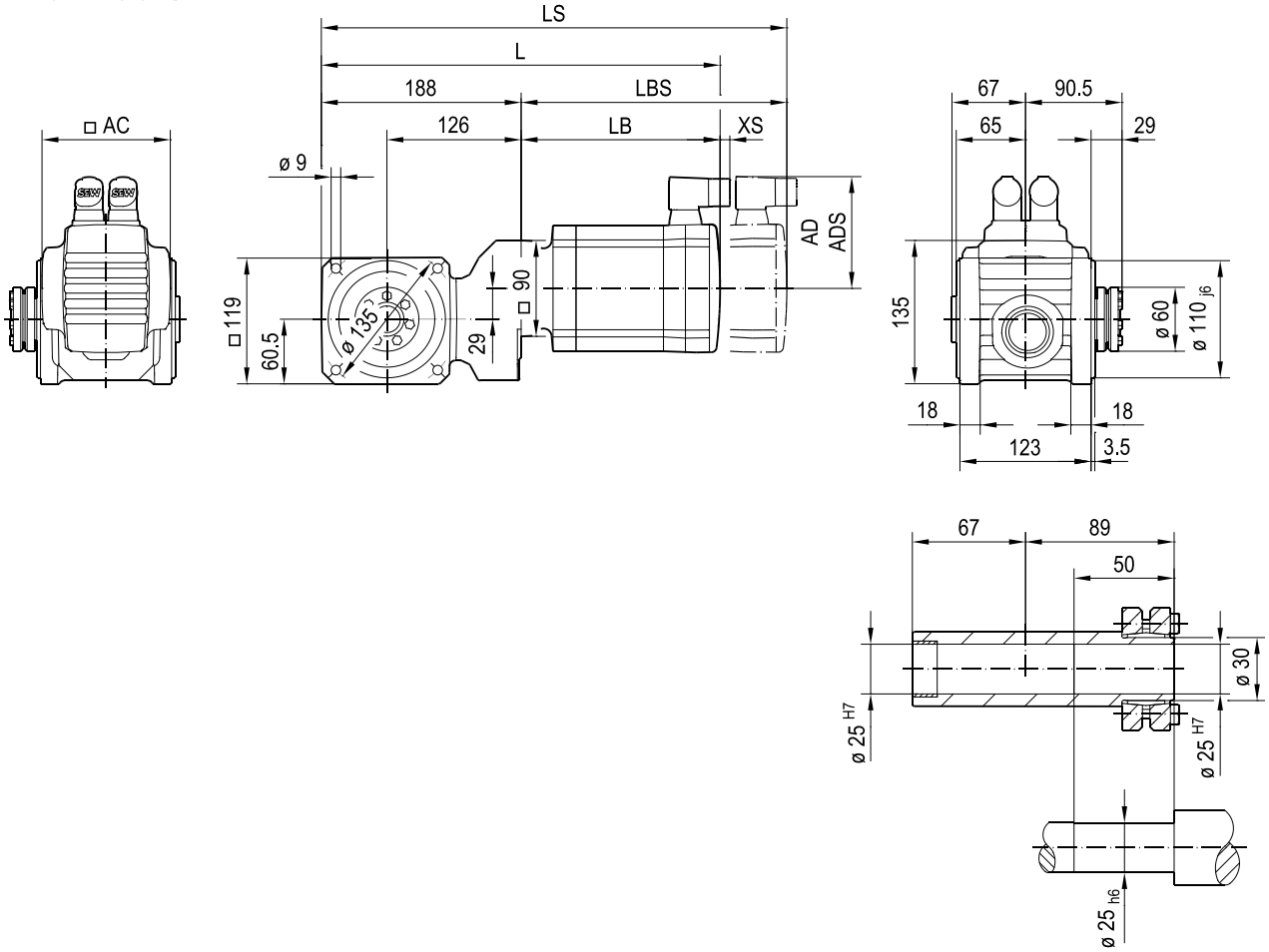
BSHF302/I..

55 009 00 19



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M			
AC	92	92	92	118	118			
AD	93	93	93	105	105			
ADS	93	93	93	105	105			
L	339	377	415	374	396			
LS	380	418	456	440	462			
LB	152	190	228	187	209			
LBS	192	230	268	253	275			
XS	13	13	13	7	7			

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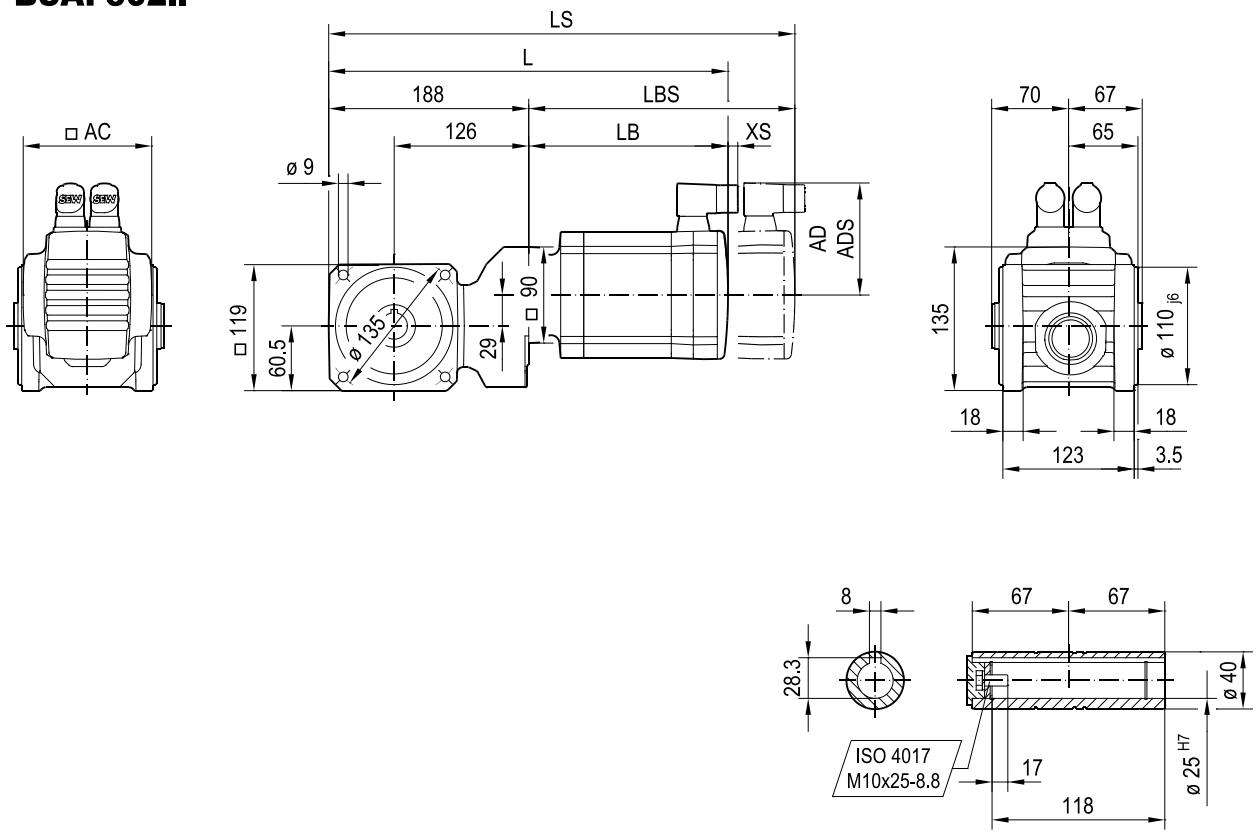
BSAF302..

55 010 00 19



(→ 📖 7.3)	CM3C							
	63S	63M	63L	71S	71M			
AC	92	92	92	118	118			
AD	93	93	93	105	105			
ADS	93	93	93	105	105			
L	339	377	415	374	396			
LS	380	418	456	440	462			
LB	152	190	228	187	209			
LBS	192	230	268	253	275			
XS	13	13	13	7	7			

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13.2.3 BS.F402..

BSF402, M_{aDyn} Nm									160 Nm
	CM3C								
i	63S	63M	63L	71S	71M	71L	80S	80M	80L
					2				
3.00			54		80	118	88	131	>183
4.00	30	55	72	73	107	157	118	175	>200
6.00	45	82	108	109	160	>205	177	>205	>205
8.00	60	110	144	146	>210		>210		
10.00	72	132	172	175	>186	>186	>186	>186	>186
15.00	110	200	>210	>210	>210	>210	>210	>210	>210
20.00	147	>220	>220	>220	>220		>220		
25.00	184	>225		>225					
30.00	220								

(→ 🗎 185)

BSF402, m kg									
	CM3C								
s	63S	63M	63L	71S	71M	71L	80S	80M	80L
2	14	15	16	17	18	21	21	23	28
BSBF: + 0.50 kg / BSHF: + -0.60 kg									

CM3C..				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	-

CM3C..							c_T			F_{Ramax}		F_{Rapk}	
n_e = 1500		M_{amax}	M_{apk}	$M_{aEmergOff}$	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
BSF402 2	3.00	122	183	275	523	5.2	7.3	8.9	8.5	6600	7580	9050	10800
	4.00	136	200	300	393	3.2	7.7	9.6	9.0	7250	8330	8970	10800
	6.00	156	205	305	262	1.5	8.1	10	9.6	8300	9530	8940	10800
	8.00	160	210	315	199	0.92	8.3	11	9.9	9140	10600	8920	10800
	10.00[1)]	124	186	275	148	1.9	11	15	14	9270	10800	9040	10800
	15.00	140	210	315	99	1.0	11	16	14	9220	10800	8920	10800
	20.00	152	220	330	74	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	61	0.34	11	16	15	9140	10800	8840	10800

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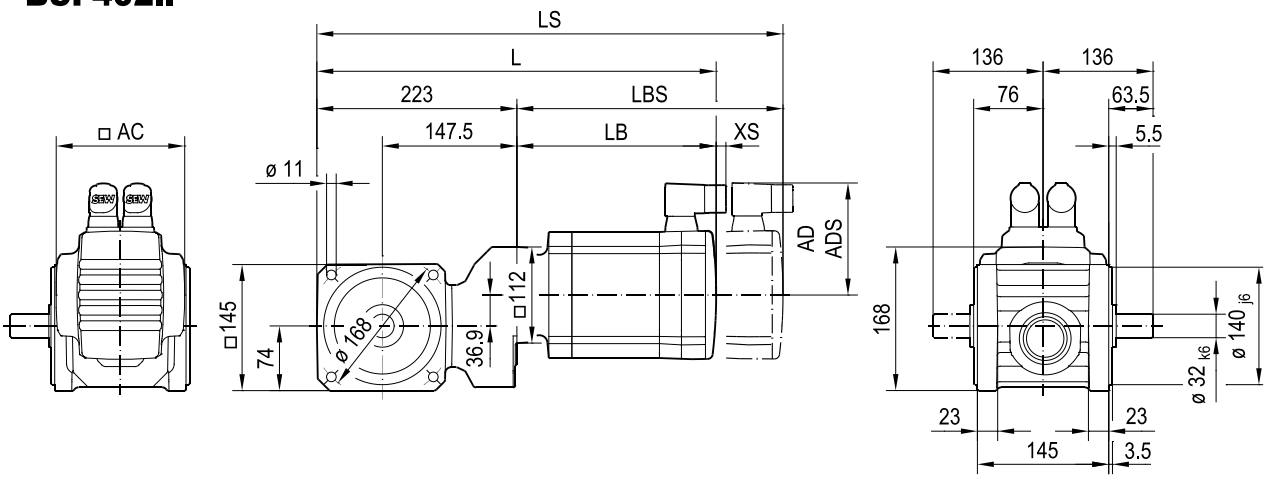
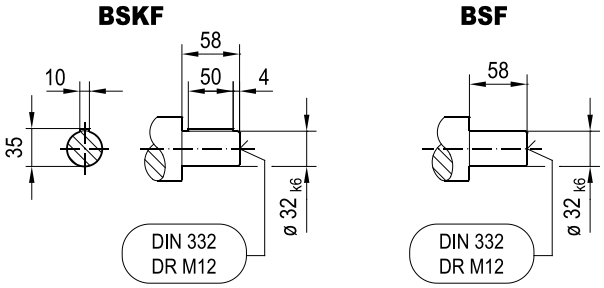
BSF402..

55 011 00 19





(→ 📖 7.3)	CM3C								
	63S	63M	63L	71S	71M	71L	80S	80M	80L
AC	92	92	92	118	118	118	140	140	140
AD	93	93	93	105	105	105	127	127	127
ADS	93	93	93	105	105	105	127	127	127
L	370	408	446	405	427	472	437	463	516
LS	410	448	486	471	493	538	505	531	584
LB	147	185	223	182	204	249	214	240	293
LBS	187	225	263	248	270	315	282	308	361
XS	13	13	13	7	7	7	47	47	47

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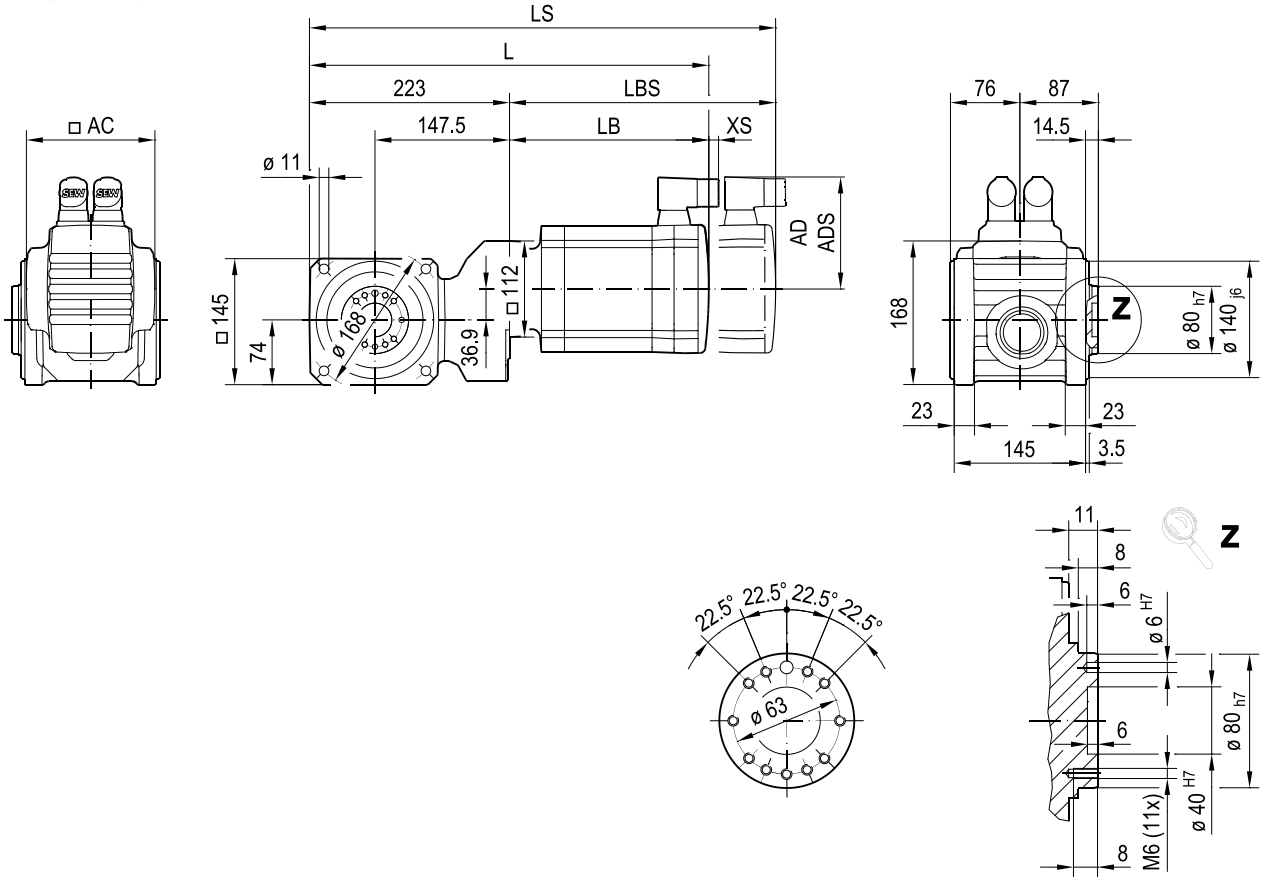
BSBF402..

55 012 00 19



(→ 📖 7.3)	CM3C								
	63S	63M	63L	71S	71M	71L	80S	80M	80L
AC	92	92	92	118	118	118	140	140	140
AD	93	93	93	105	105	105	127	127	127
ADS	93	93	93	105	105	105	127	127	127
L	370	408	446	405	427	472	437	463	516
LS	410	448	486	471	493	538	505	531	584
LB	147	185	223	182	204	249	214	240	293
LBS	187	225	263	248	270	315	282	308	361
XS	13	13	13	7	7	7	47	47	47

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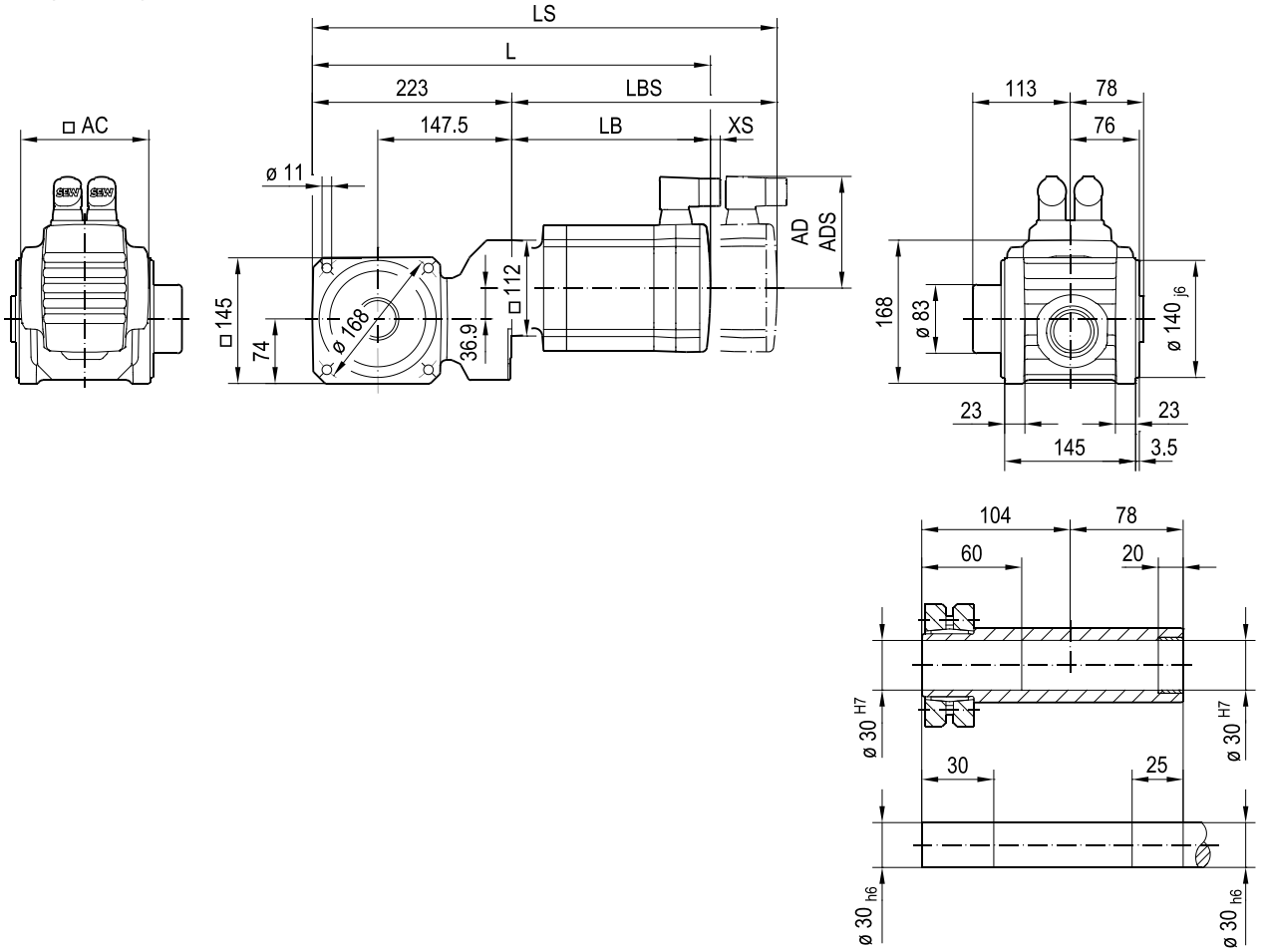
BSHF402..

55 013 00 19



(→ 📖 7.3)	CM3C								
	63S	**63M**	**63L**	**71S**	**71M**	**71L**	**80S**	**80M**	**80L**
AC	92	92	92	118	118	118	140	140	140
AD	93	93	93	105	105	105	127	127	127
ADS	93	93	93	105	105	105	127	127	127
L	370	408	446	405	427	472	437	463	516
LS	410	448	486	471	493	538	505	531	584
LB	147	185	223	182	204	249	214	240	293
LBS	187	225	263	248	270	315	282	308	361
XS	13	13	13	7	7	7	47	47	47

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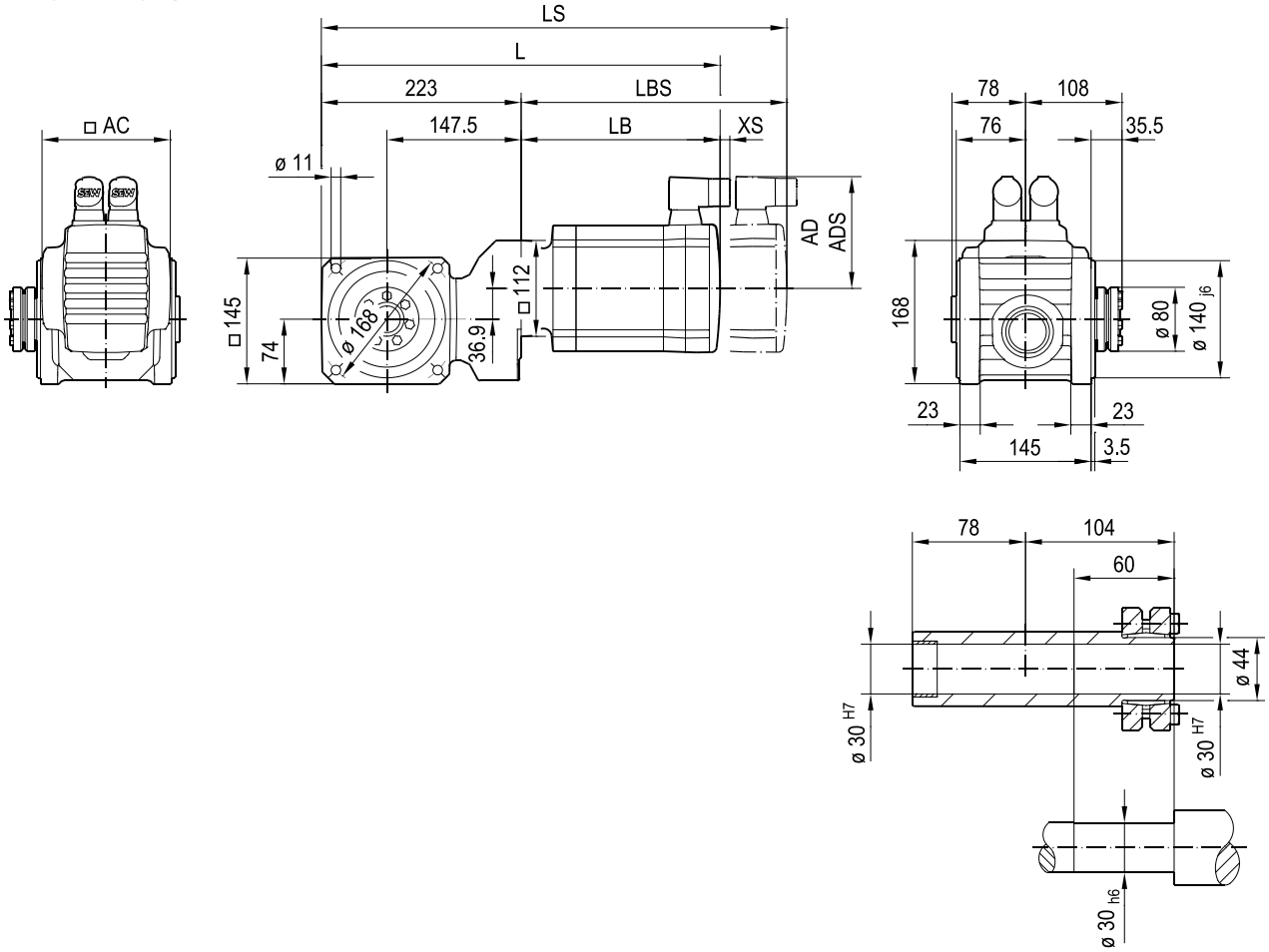
BSHF402/I..

55 014 00 19



(→ 📖 7.3)	CM3C								
	63S	63M	63L	71S	71M	71L	80S	80M	80L
AC	92	92	92	118	118	118	140	140	140
AD	93	93	93	105	105	105	127	127	127
ADS	93	93	93	105	105	105	127	127	127
L	370	408	446	405	427	472	437	463	516
LS	410	448	486	471	493	538	505	531	584
LB	147	185	223	182	204	249	214	240	293
LBS	187	225	263	248	270	315	282	308	361
XS	13	13	13	7	7	7	47	47	47

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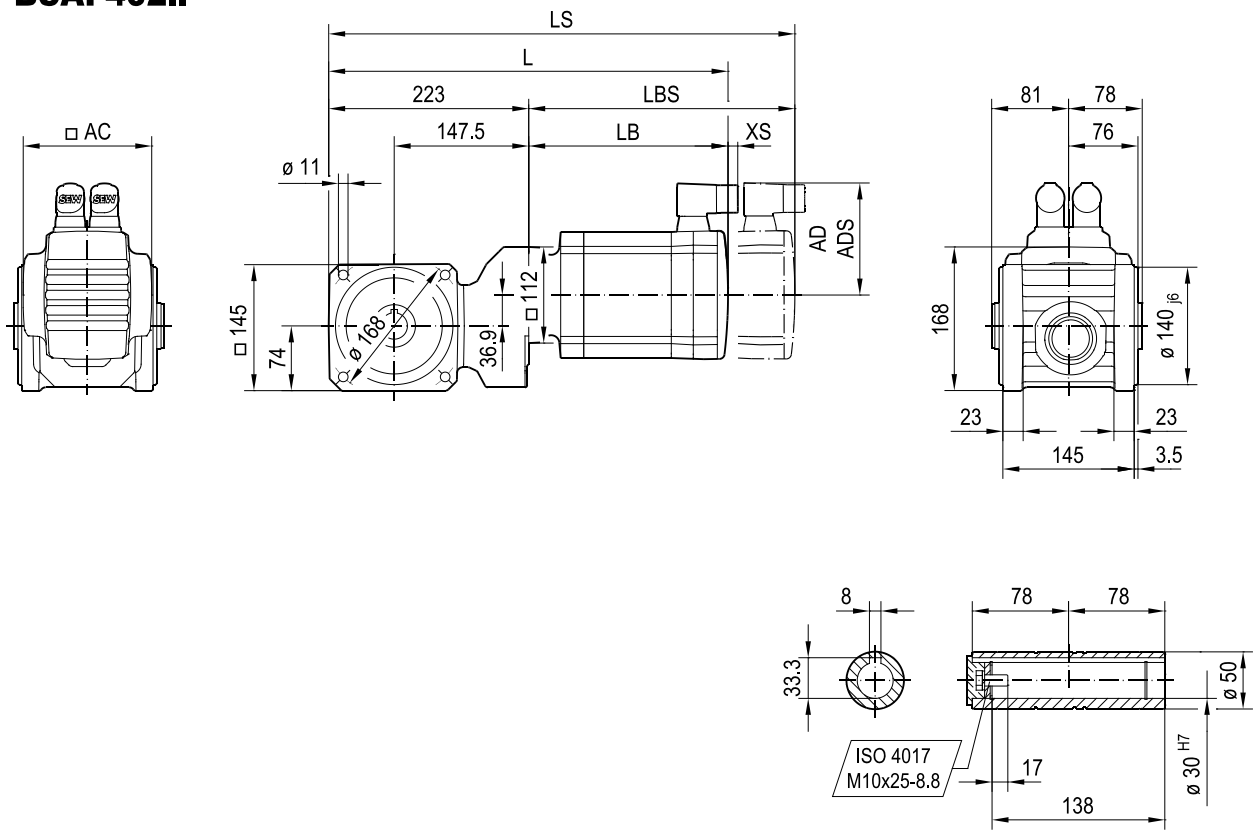
BSAF402..

55 015 00 19



(→ 📖 7.3)	CM3C								
	63S	63M	63L	71S	71M	71L	80S	80M	80L
AC	92	92	92	118	118	118	140	140	140
AD	93	93	93	105	105	105	127	127	127
ADS	93	93	93	105	105	105	127	127	127
L	370	408	446	405	427	472	437	463	516
LS	410	448	486	471	493	538	505	531	584
LB	147	185	223	182	204	249	214	240	293
LBS	187	225	263	248	270	315	282	308	361
XS	13	13	13	7	7	7	47	47	47

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13.2.4 BS.F502..

BSF502, M_{aDyn} Nm								320 Nm
	CM3C							
i	71S	71M	71L	80S	80M	80L	100S	100M
				2				
3.00						192	160	225
4.00	73	107	157	118	175	255	210	300
6.00	109	160	235	177	260	385	320	>410
8.00	146	210	315	235	350			
10.00	177	255	>375	285	>375	>375	>375	>375
12.00	215							
15.00	265	>375	>375	>375	>375	>375	>375	>375
20.00	350	>375	>375	>375	>375			
25.00	>375	>375		>375				
30.00	>375							
35.00								

(→ 185)

BSF502, m kg								
	CM3C							
s	71S	71M	71L	80S	80M	80L	100S	100M
2	34	35	38	38	40	45	44	47
BSBF: + 0.40 kg / BSHF: + -1.0 kg								

CM3C..				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	-

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CM3C..							c_T			F_{Ramax}		F_{Rapk}	
n_e = 1500		M_{amax}	M_{apk}	$M_{aEmergOff}$	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
BSF502 2	3.00	310	385	575	497	12	23	27	25	10100	12100	12000	14400
	4.00	320	400	600	425	7.3	25	31	27	11100	13400	11900	14400
	6.00	320	410	615	418	3.6	27	33	30	12200	14400	11900	14400
	8.00	320	420	630	410	6.2	28	35	31	12200	14400	11800	14400
	10.00	250	375	560	450	4.0	31	35	33	12300	14400	12000	14400
	12.00	320	410	615	375	1.1	28	36	31	12200	14400	11900	14400
	15.00	250	375	560	300	2.1	32	36	34	12300	14400	12000	14400
	20.00	250	375	560	225	1.3	32	37	35	12300	14400	12000	14400
	25.00	250	375	560	180	0.92	33	37	35	12300	14400	12000	14400
	30.00	250	375	560	150	0.70	33	37	35	12300	14400	12000	14400
	35.00	250	375	560	129	0.56	32	37	35	12300	14400	12000	14400

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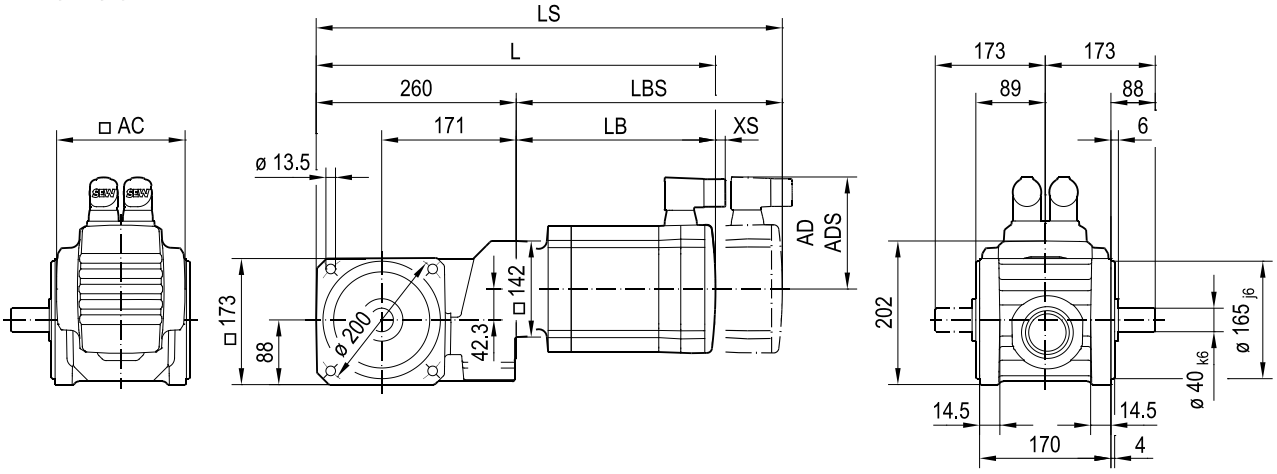
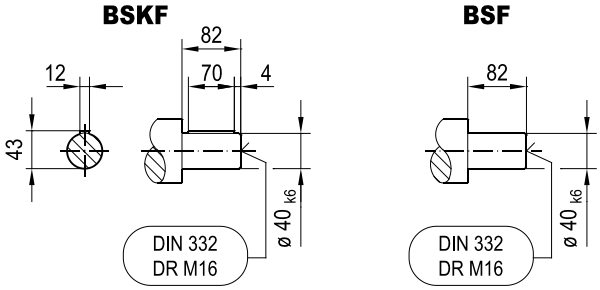
BSF502..

55 016 00 19





(→ 📖 7.3)	CM3C							
	71S	71M	71L	80S	80M	80L	100S	100M
AC	118	118	118	140	140	140	165	165
AD	105	105	105	127	127	127	140	140
ADS	105	105	105	127	127	127	140	140
L	434	456	501	466	492	545	494	522
LS	500	522	567	534	560	613	568	596
LB	174	196	241	206	232	285	234	262
LBS	240	262	307	274	300	353	308	336
XS	7	7	7	47	47	47	6	6

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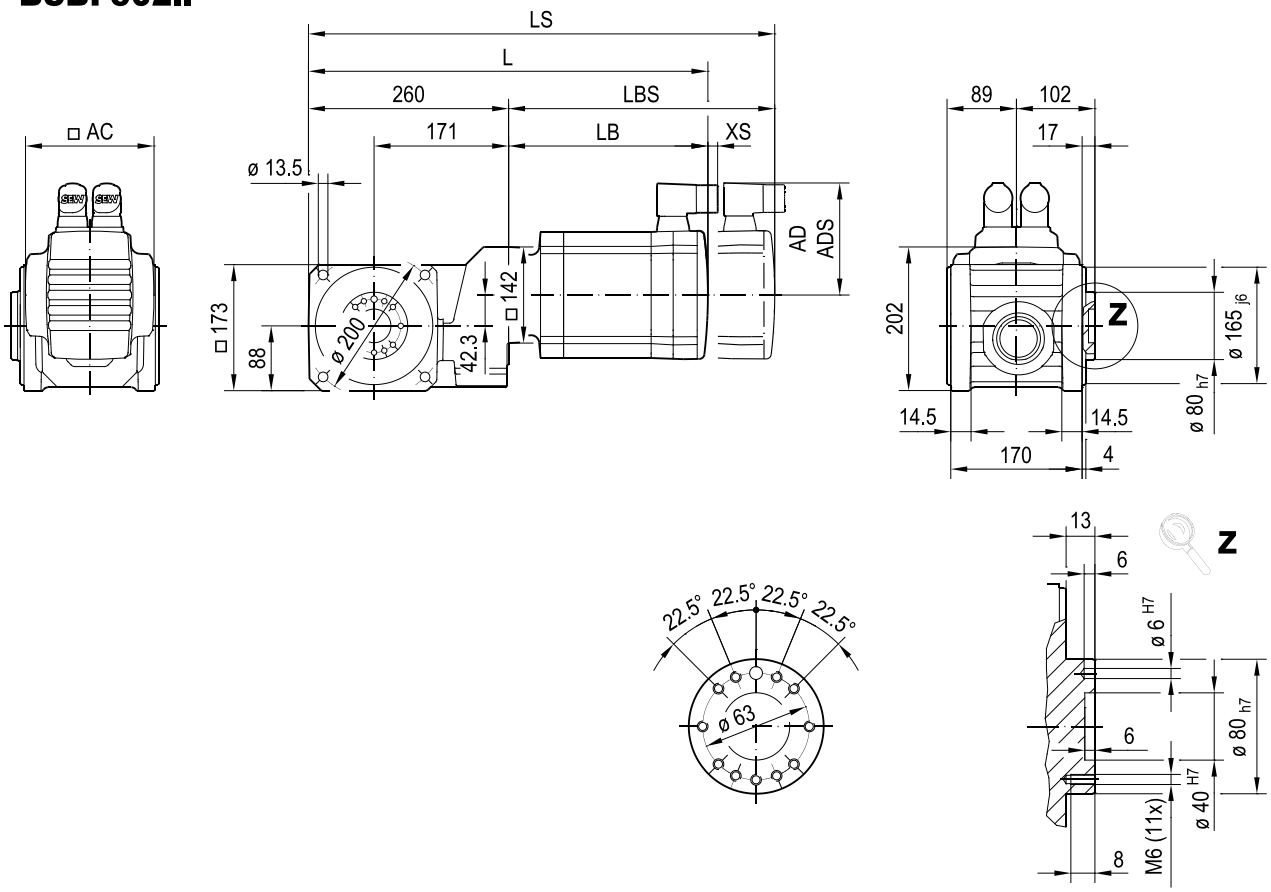
BSBF502..

55 017 00 19

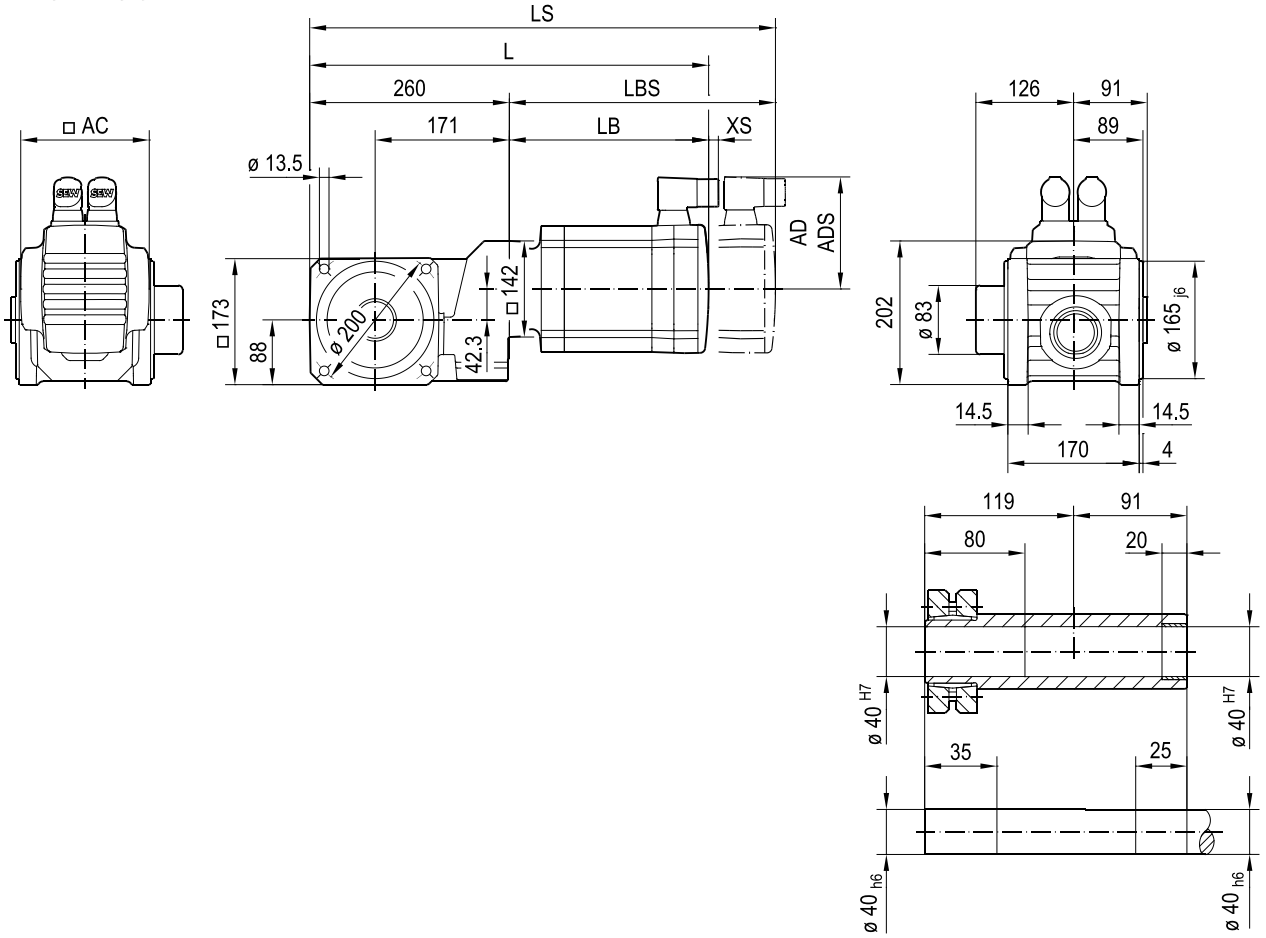


(→ 📖 7.3)	CM3C							
	71S	71M	71L	80S	80M	80L	100S	100M
AC	118	118	118	140	140	140	165	165
AD	105	105	105	127	127	127	140	140
ADS	105	105	105	127	127	127	140	140
L	434	456	501	466	492	545	494	522
LS	500	522	567	534	560	613	568	596
LB	174	196	241	206	232	285	234	262
LBS	240	262	307	274	300	353	308	336
XS	7	7	7	47	47	47	6	6

29133866/EN – 05/2021

BSHF502..

55 018 00 19

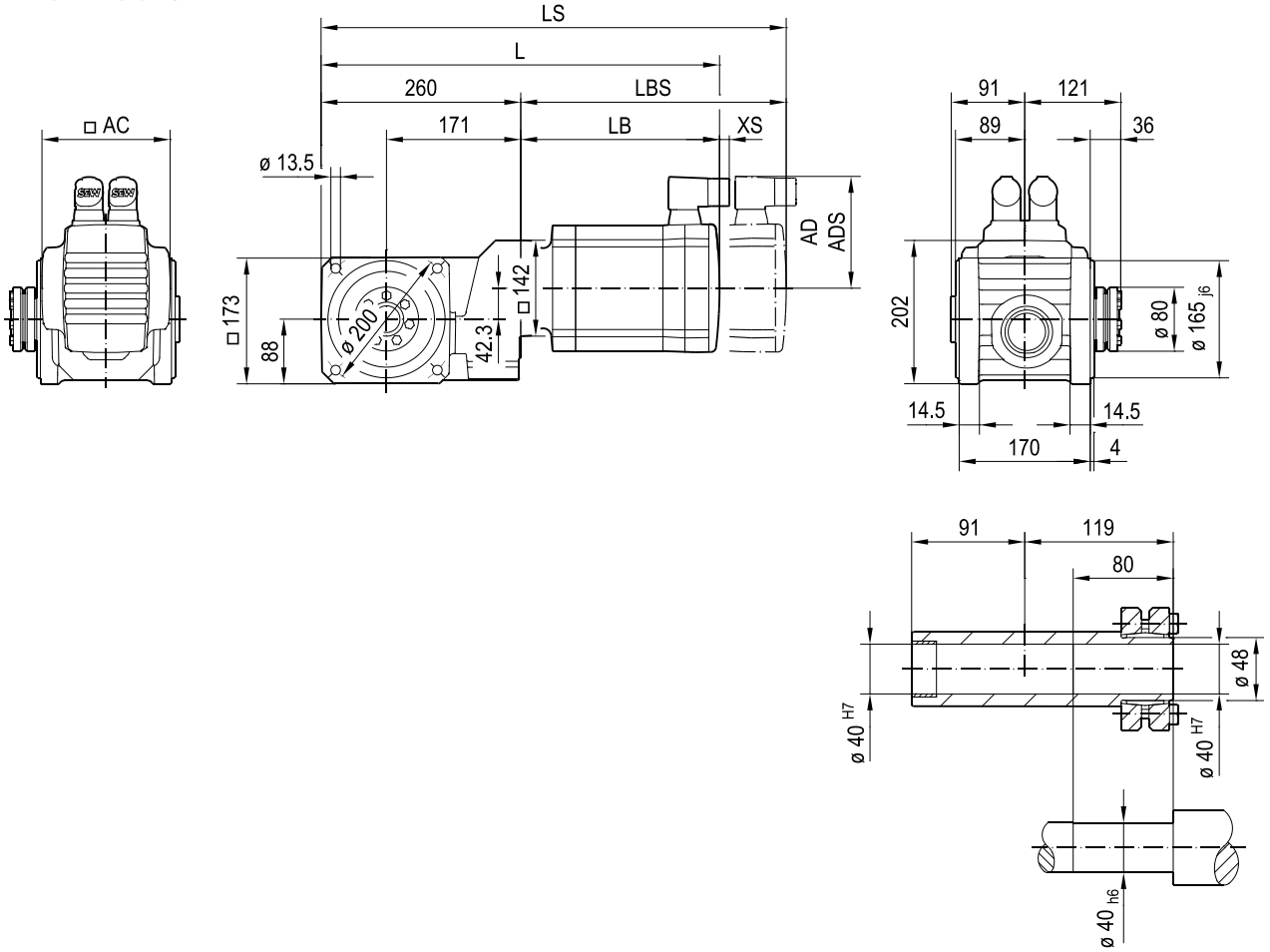


(→ 📖 7.3)	CM3C							
	71S	71M	71L	80S	80M	80L	100S	100M
AC	118	118	118	140	140	140	165	165
AD	105	105	105	127	127	127	140	140
ADS	105	105	105	127	127	127	140	140
L	434	456	501	466	492	545	494	522
LS	500	522	567	534	560	613	568	596
LB	174	196	241	206	232	285	234	262
LBS	240	262	307	274	300	353	308	336
XS	7	7	7	47	47	47	6	6

29133866/EN – 05/2021

BSHF502/I..

55 019 00 19



(→ 📖 7.3)	CM3C							
	71S	71M	71L	80S	80M	80L	100S	100M
AC	118	118	118	140	140	140	165	165
AD	105	105	105	127	127	127	140	140
ADS	105	105	105	127	127	127	140	140
L	434	456	501	466	492	545	494	522
LS	500	522	567	534	560	613	568	596
LB	174	196	241	206	232	285	234	262
LBS	240	262	307	274	300	353	308	336
XS	7	7	7	47	47	47	6	6

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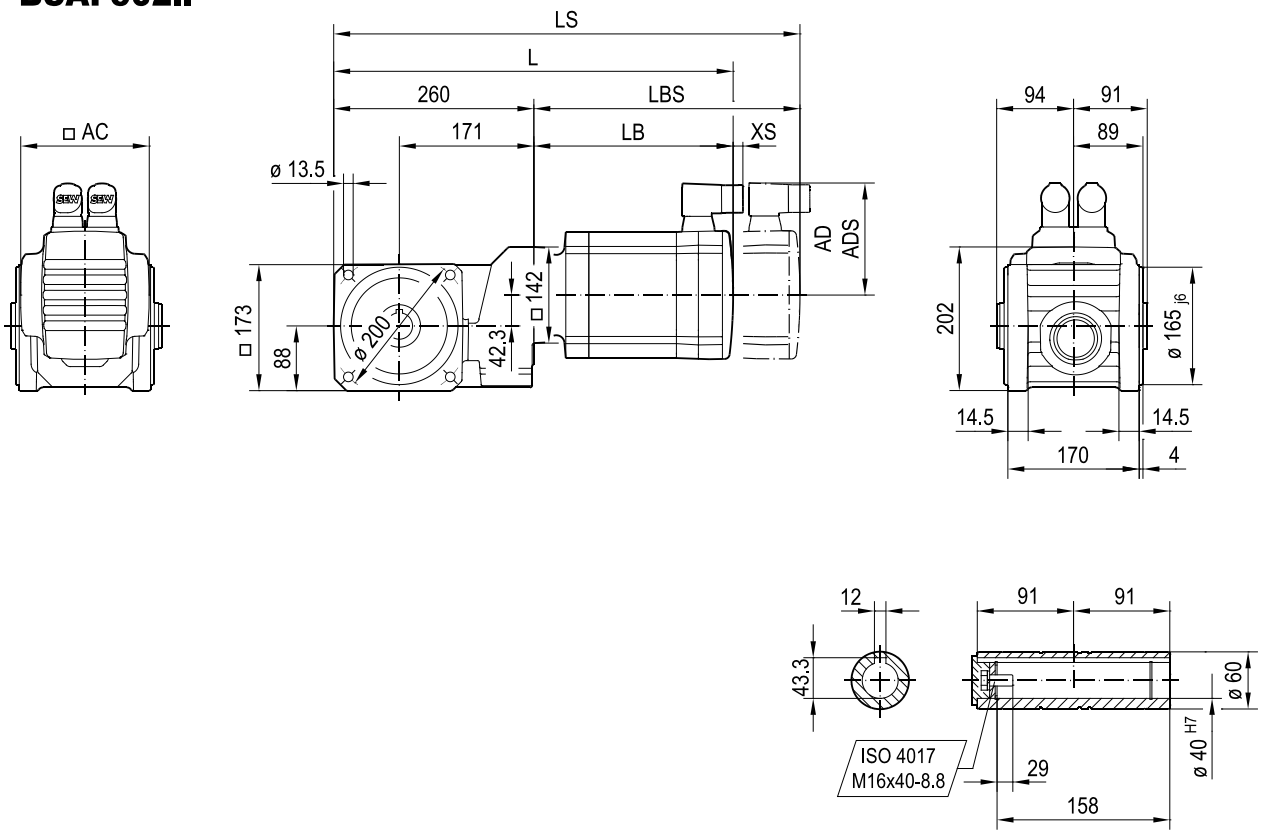
BSAF502..

55 020 00 19



(→ 7.3)	CM3C							
	71S	71M	71L	80S	80M	80L	100S	100M
AC	118	118	118	140	140	140	165	165
AD	105	105	105	127	127	127	140	140
ADS	105	105	105	127	127	127	140	140
L	434	456	501	466	492	545	494	522
LS	500	522	567	534	560	613	568	596
LB	174	196	241	206	232	285	234	262
LBS	240	262	307	274	300	353	308	336
XS	7	7	7	47	47	47	6	6

29133866/EN – 05/2021

13.2.5 BS.F602..

BSF602, M_{aDyn} Nm									640 Nm
	CM3C								
i	71S	71M	71L	80S	80M	80L	100S	100M	100L
					2				
3.00									335
4.00		107	157	118	175	255	210	300	450
6.00	109	160	235	177	260	385	320	450	675
8.00	146	210	315	235	350	510	425	600	
10.00		255	380	285	425	620	515	730	>750
12.00	215	320		355					
15.00	265	385	570	425	635	>750	>750	>750	>750
20.00	350	515	>750	570	>750	>750	>750	>750	
25.00	440	645	>750	715	>750				
30.00	530	>750		>750					
35.00	620								
40.00	705								

(→ 🗎 185)

BSF602, m kg									
	CM3C								
s	71S	71M	71L	80S	80M	80L	100S	100M	100L
2	51	52	55	55	57	62	61	64	72
BSBF: + 0.30 kg / BSHF: + -2.9 kg									

CM3C..				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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CM3C..							c_T			F_{Ramax}		F_{Rapk}	
n_e = 1500		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	BSF	BSBF	BSHF	BSF	BSBF	BSF	BSBF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	Nm/'	Nm/'	Nm/'	N	N	N	N
BSF602 2	3.00[1)]	505	700	1050	537	35	45	49	49	15200	17400	24000	24000
	4.00[1)]	575	715	1070	403	21	47	52	52	16500	18900	24000	24000
	6.00	610	800	1200	267	10	50	56	55	18800	21500	24000	24000
	8.00	640	780	1170	235	6.2	52	58	58	20600	23600	24000	24000
	10.00[1)]	520	750	1120	201	9.9	76	90	87	22400	24000	24000	24000
	12.00	640	775	1160	266	2.9	54	60	60	23700	24000	24000	24000
	15.00[1)]	520	750	1120	185	5.3	77	92	89	24000	24000	24000	24000
	20.00	520	750	1120	191	3.5	74	88	85	24000	24000	24000	24000
	25.00	520	750	1120	180	2.5	76	90	86	24000	24000	24000	24000
	30.00	520	750	1120	150	1.7	74	88	85	24000	24000	24000	24000
	35.00	520	750	1120	129	1.4	73	87	83	24000	24000	24000	24000
	40.00	520	750	1120	113	1.1	74	87	84	24000	24000	24000	24000

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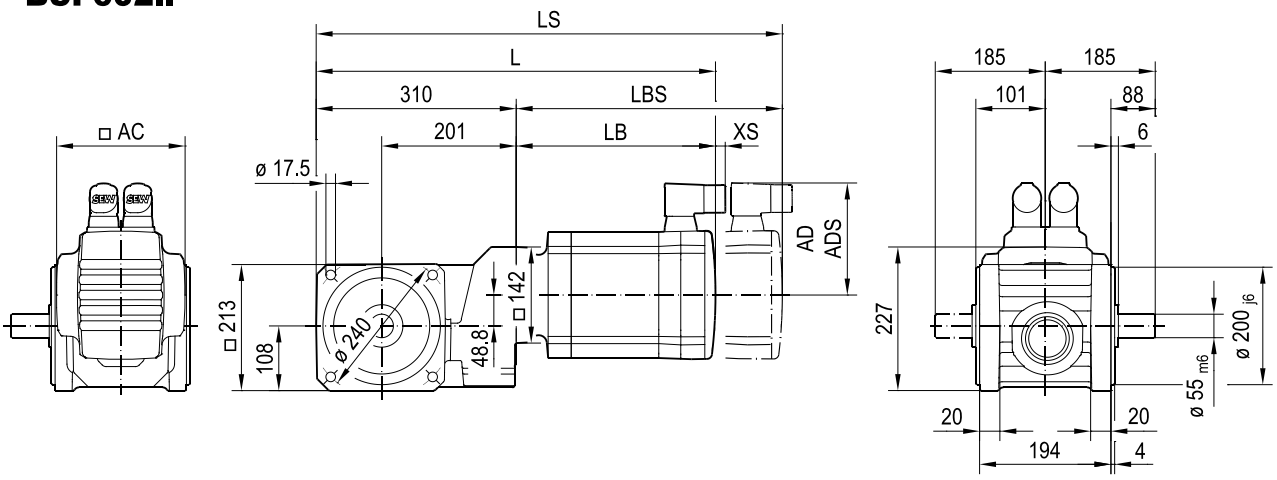
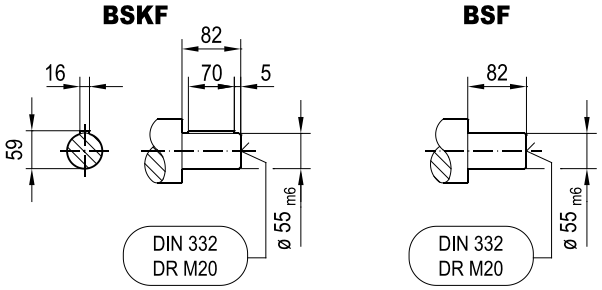
BSF602..

55 021 00 19





(→ 📖 7.3)	CM3C								
	71S	**71M**	**71L**	**80S**	**80M**	**80L**	**100S**	**100M**	**100L**
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	484	506	551	516	542	595	544	572	629
LS	550	572	617	584	610	663	618	646	703
LB	174	196	241	206	232	285	234	262	319
LBS	240	262	307	274	300	353	308	336	393
XS	7	7	7	47	47	47	6	6	6

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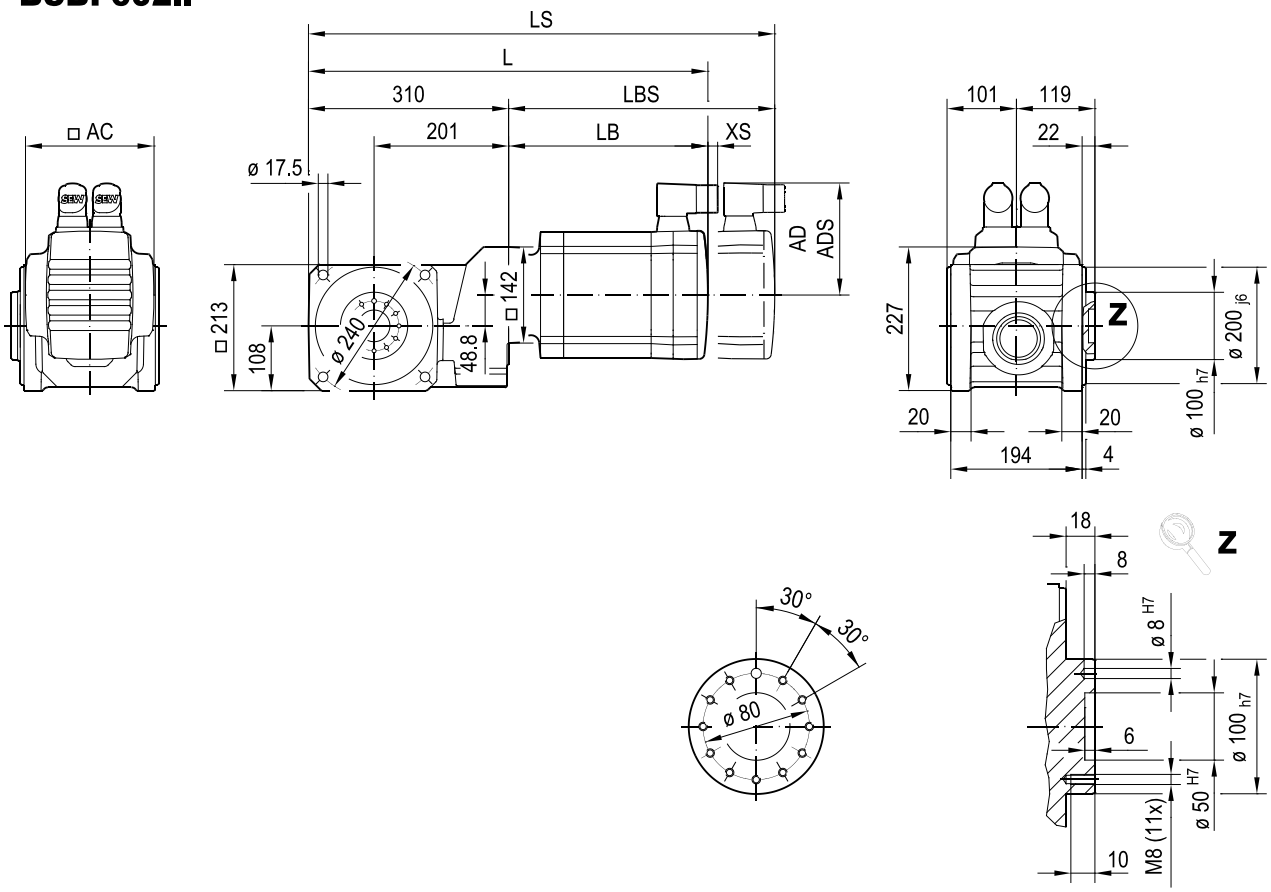
BSBF602..

55 022 00 19

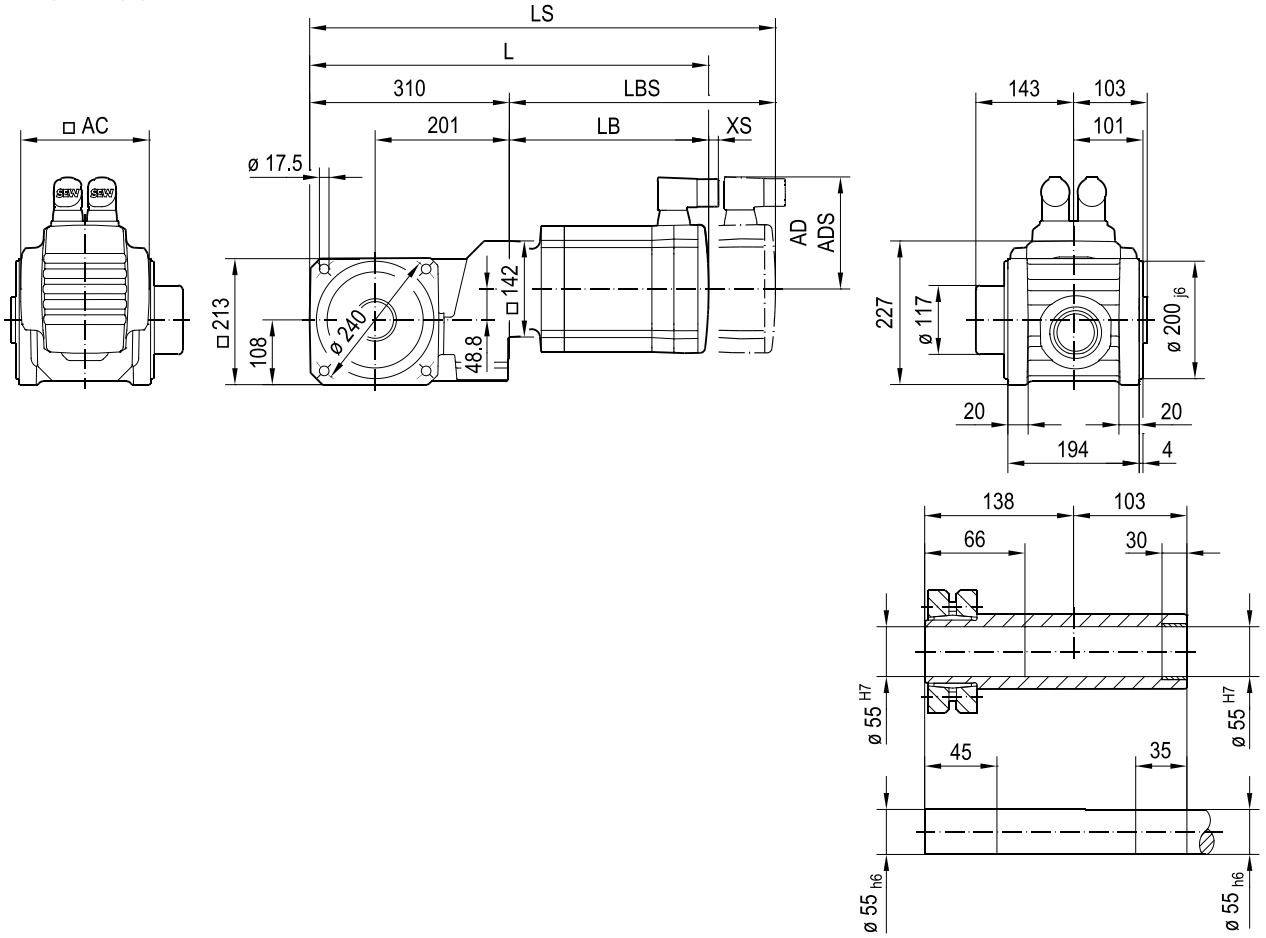


(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	484	506	551	516	542	595	544	572	629
LS	550	572	617	584	610	663	618	646	703
LB	174	196	241	206	232	285	234	262	319
LBS	240	262	307	274	300	353	308	336	393
XS	7	7	7	47	47	47	6	6	6

29133866/EN – 05/2021

BSHF602..

55 023 00 19



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	484	506	551	516	542	595	544	572	629
LS	550	572	617	584	610	663	618	646	703
LB	174	196	241	206	232	285	234	262	319
LBS	240	262	307	274	300	353	308	336	393
XS	7	7	7	47	47	47	6	6	6

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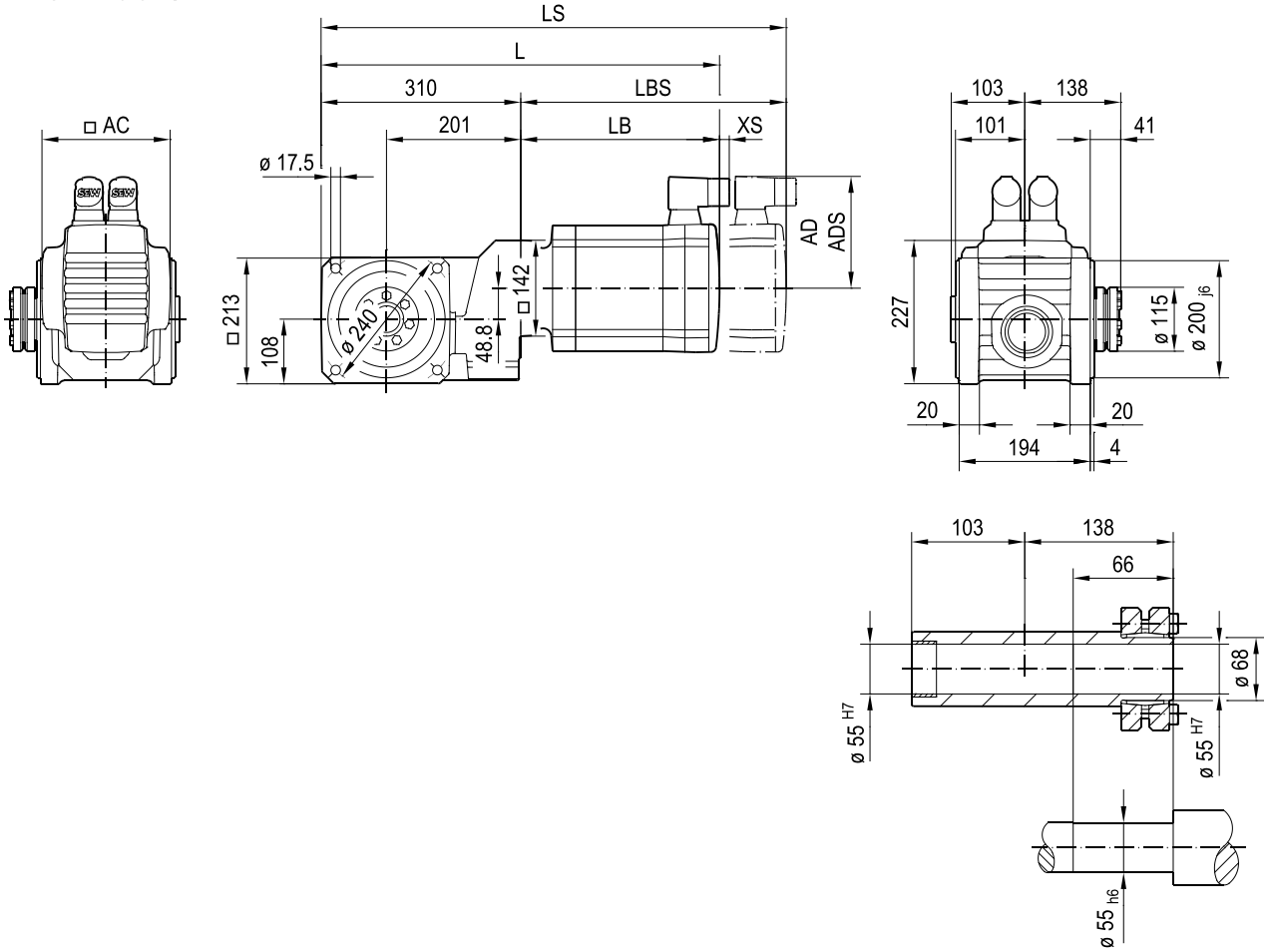
BSHF602/I..

55 024 00 19



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	484	506	551	516	542	595	544	572	629
LS	550	572	617	584	610	663	618	646	703
LB	174	196	241	206	232	285	234	262	319
LBS	240	262	307	274	300	353	308	336	393
XS	7	7	7	47	47	47	6	6	6

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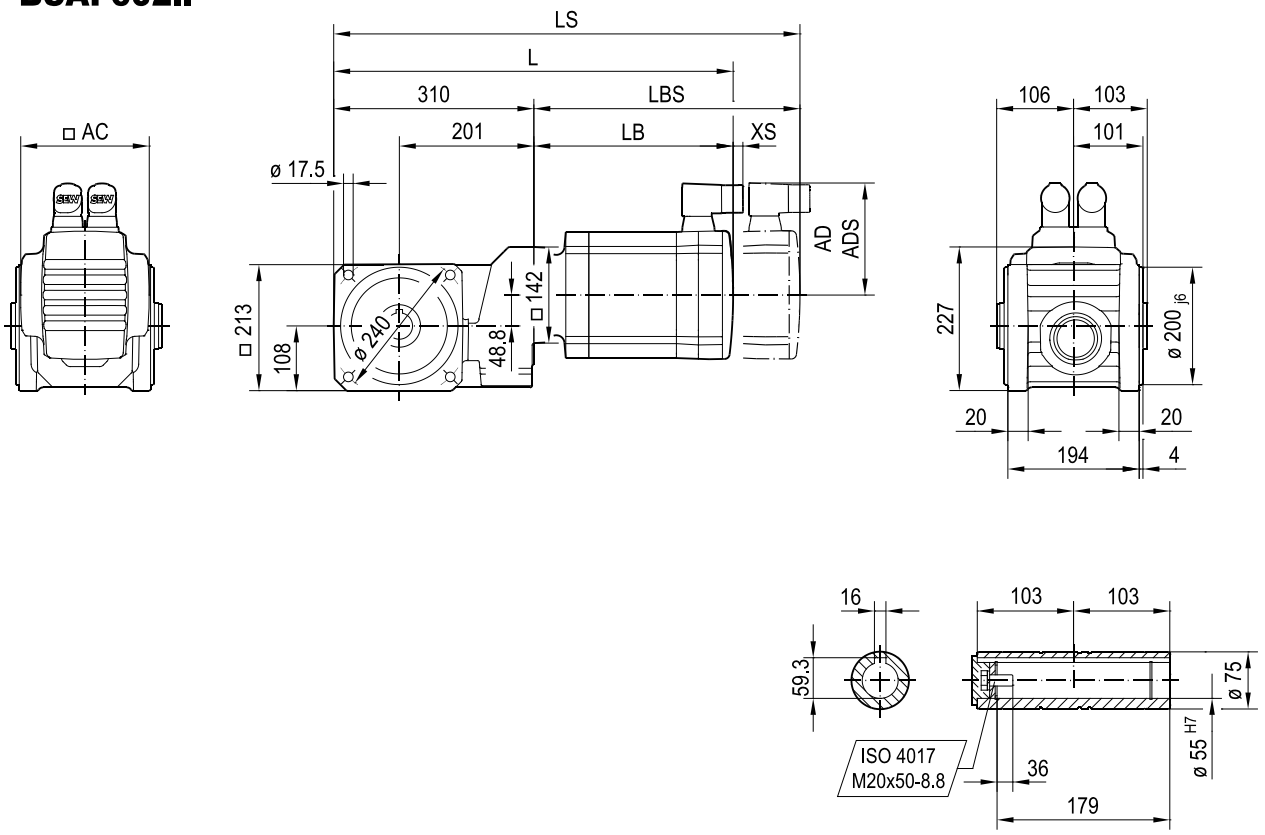
BSAF602..

55 025 00 19



(→ 📖 7.3)	CM3C								
	71S	71M	71L	80S	80M	80L	100S	100M	100L
AC	118	118	118	140	140	140	165	165	165
AD	105	105	105	127	127	127	140	140	140
ADS	105	105	105	127	127	127	140	140	140
L	484	506	551	516	542	595	544	572	629
LS	550	572	617	584	610	663	618	646	703
LB	174	196	241	206	232	285	234	262	319
LBS	240	262	307	274	300	353	308	336	393
XS	7	7	7	47	47	47	6	6	6

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13.2.6 BS.F802..

BSF802, M_{aDyn} Nm			1500 Nm
	CM3C		
i	80S	80M	80L
		2	
4.00			
6.00		260	385
8.00	235	350	510
10.00			
12.00	355	525	770
15.00		635	930
20.00	570	850	1240
25.00	715	1060	1550
30.00	850	1270	>1680
35.00	1000	1490	
40.00	1140	>1680	

(→ 185)

BSF802, m kg			
	CM3C		
s	80S	80M	80L
2	83	85	90
BSBF: + 1.1 kg / BSHF: + -3.5 kg			

CM3C..				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	-

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CM3C..							c_T			F_{Ramax}		F_{Rapk}	
n_e = 1500		M_{amax}	M_{apk}	$M_{aEmergOff}$	n_{ak}	J_G 10^{-4}	BSF	BSBF	BSHF	BSF	BSBF	BSF	BSBF
	i	Nm	Nm	Nm	min^{-1}	$kg \times m^2$	Nm/'	Nm/'	Nm/'	N	N	N	N
BSF802 2	4.00[1]	1240	1860	2790	383	70	95	112	103	29600	34800	36000	36000
	6.00	1370	1910	2860	250	34	106	126	115	33500	36000	36000	36000
	8.00	1500	1910	2860	198	21	107	128	117	36000	36000	36000	36000
	10.00[1]	1220	1680	2520	194	32	149	193	170	36000	36000	36000	36000
	12.00	1500	1910	2860	173	11	114	139	126	36000	36000	36000	36000
	15.00[1]	1220	1680	2520	186	18	154	202	176	36000	36000	36000	36000
	20.00	1220	1680	2520	193	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	150	6.5	157	208	181	36000	36000	36000	36000
	35.00	1220	1680	2520	129	5.1	156	205	178	36000	36000	36000	36000
	40.00	1220	1680	2520	113	4.2	156	206	179	36000	36000	36000	36000

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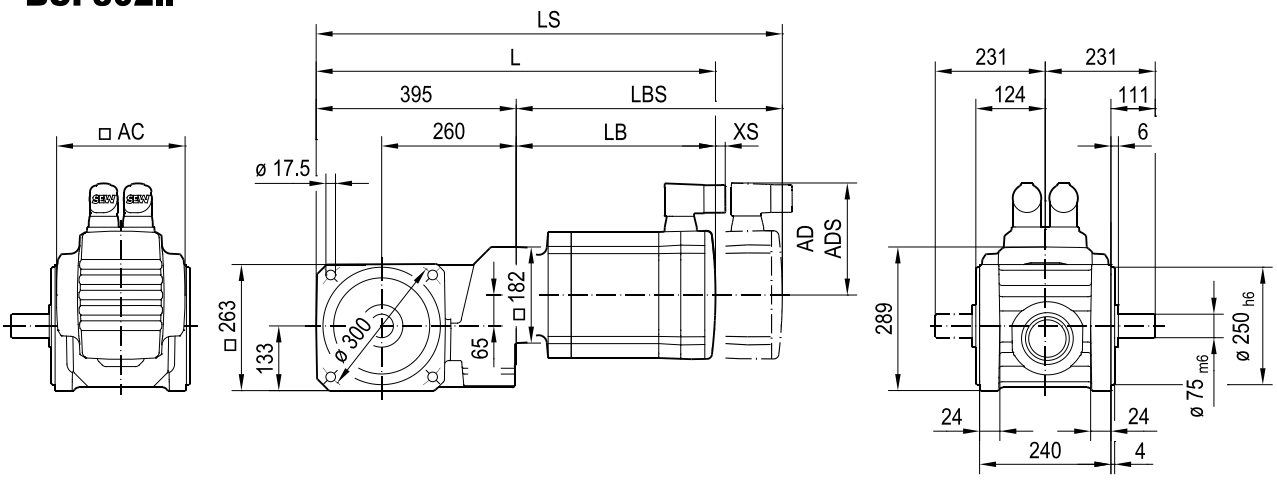
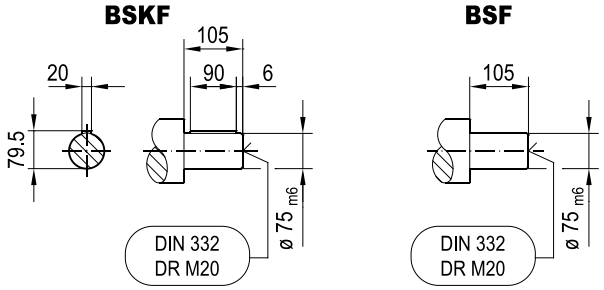
BSF802..

55 026 00 19





(→ 📖 7.3)	CM3C							
	80S	80M	80L					
AC	140	140	140					
AD	127	127	127					
ADS	127	127	127					
L	597	623	676					
LS	665	691	744					
LB	202	228	281					
LBS	270	296	349					
XS	47	47	47					

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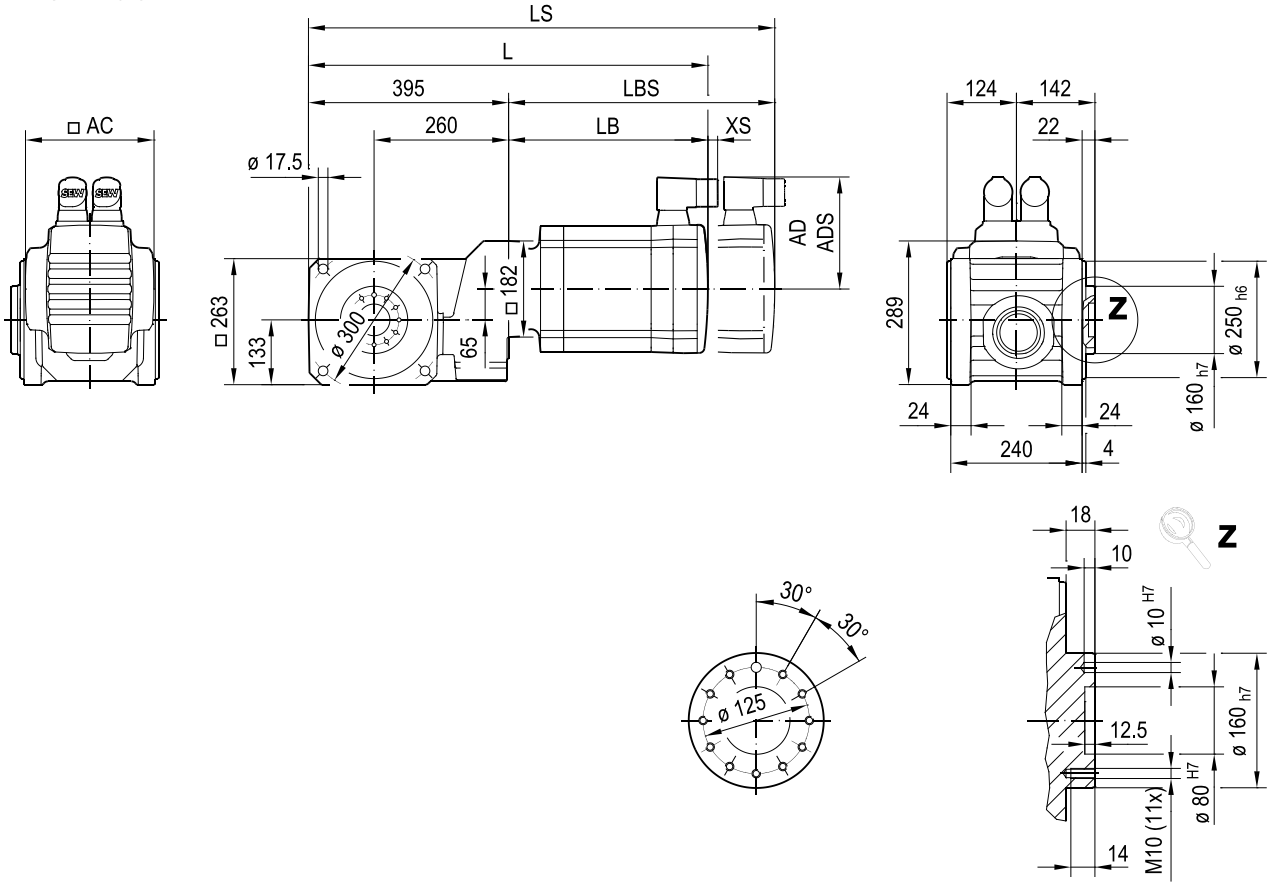
BSBF802..

55 027 00 19



(→ 📖 7.3)	CM3C							
	80S	80M	80L					
AC	140	140	140					
AD	127	127	127					
ADS	127	127	127					
L	597	623	676					
LS	665	691	744					
LB	202	228	281					
LBS	270	296	349					
XS	47	47	47					

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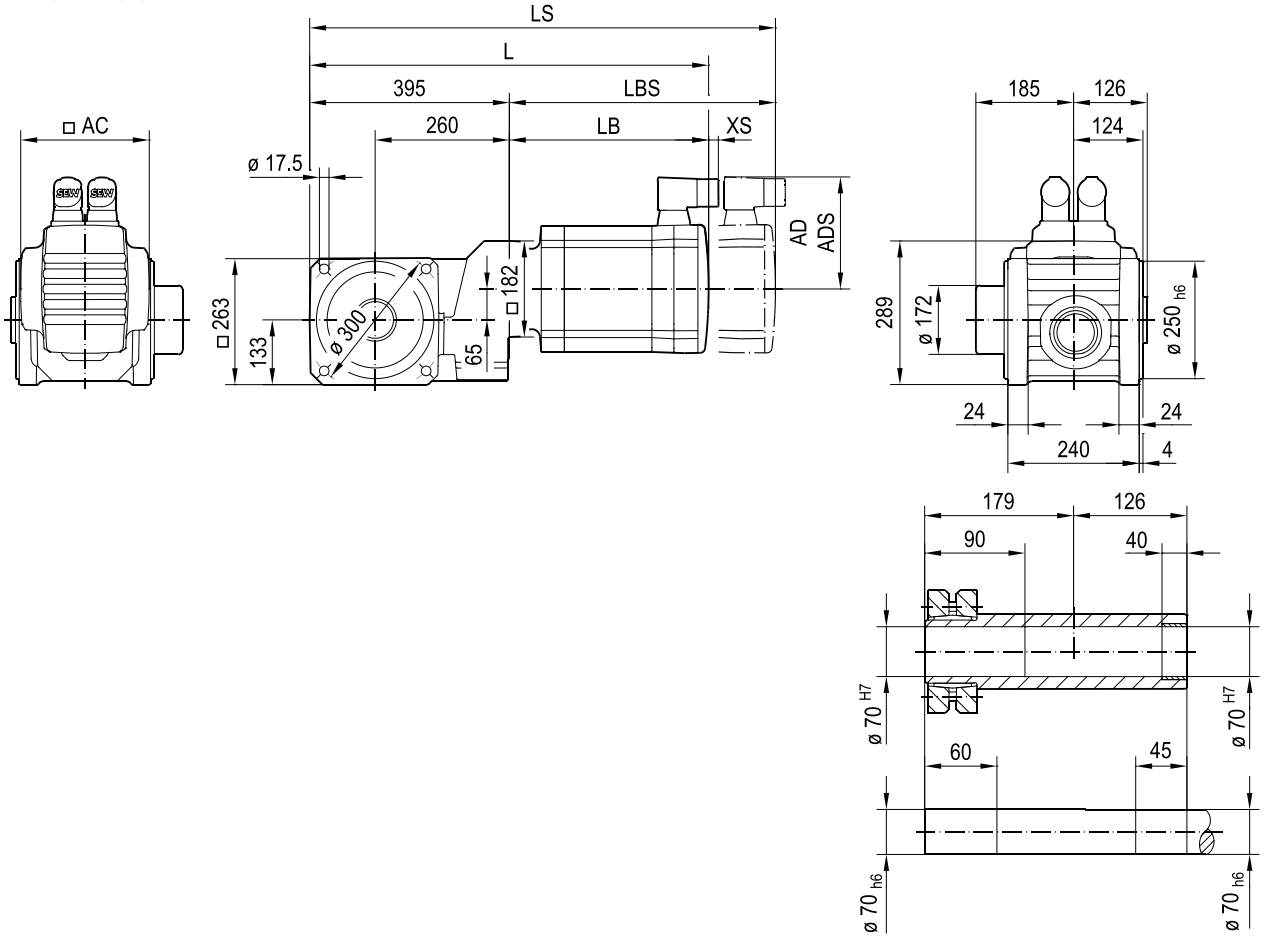
BSHF802..

55 028 00 19



(→ 📖 7.3)	CM3C							
	80S	80M	80L					
AC	140	140	140					
AD	127	127	127					
ADS	127	127	127					
L	597	623	676					
LS	665	691	744					
LB	202	228	281					
LBS	270	296	349					
XS	47	47	47					

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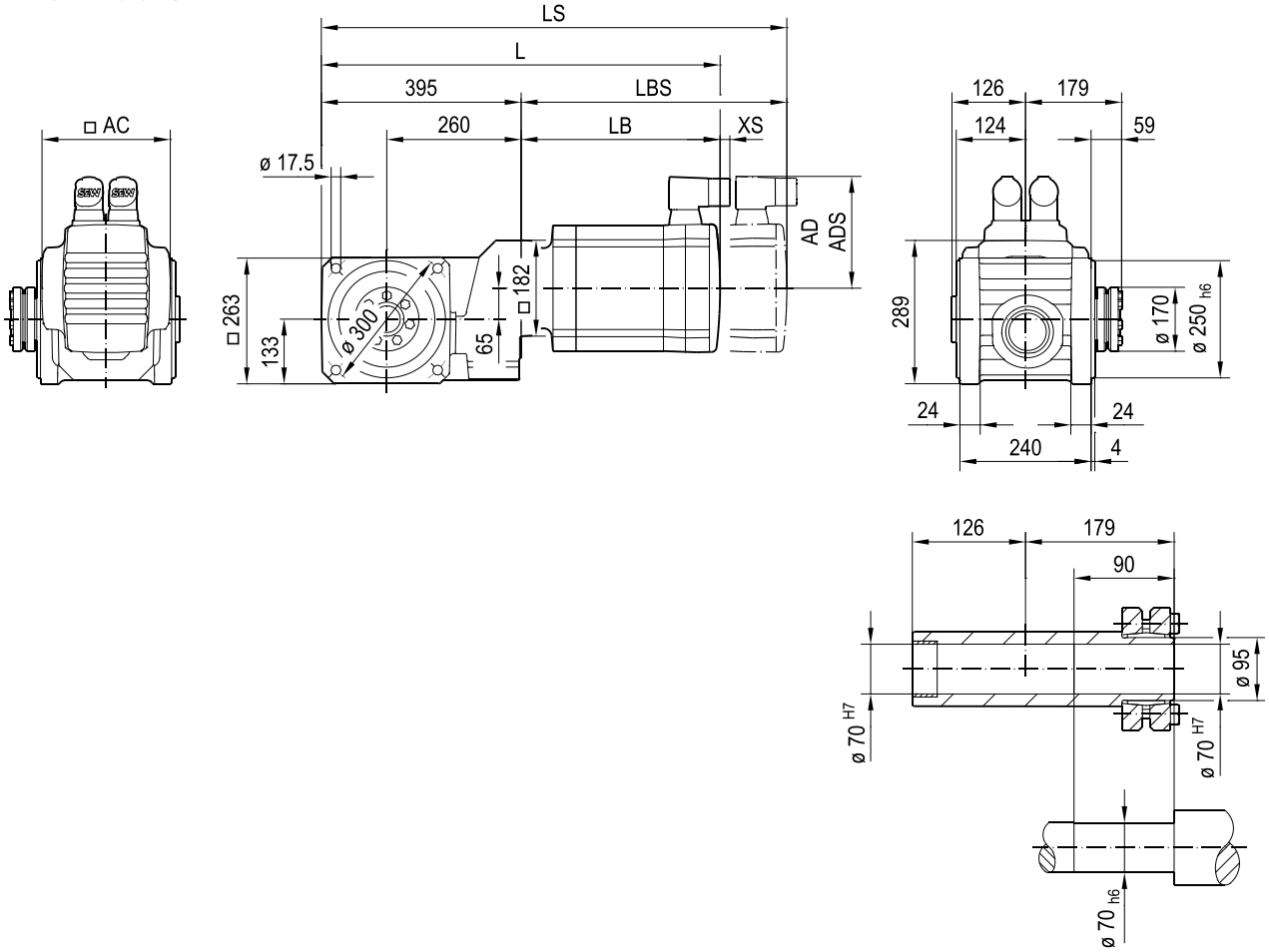
BSHF802/I..

55 029 00 19



(→ 📖 7.3)	CM3C							
	80S	80M	80L					
AC	140	140	140					
AD	127	127	127					
ADS	127	127	127					
L	597	623	676					
LS	665	691	744					
LB	202	228	281					
LBS	270	296	349					
XS	47	47	47					

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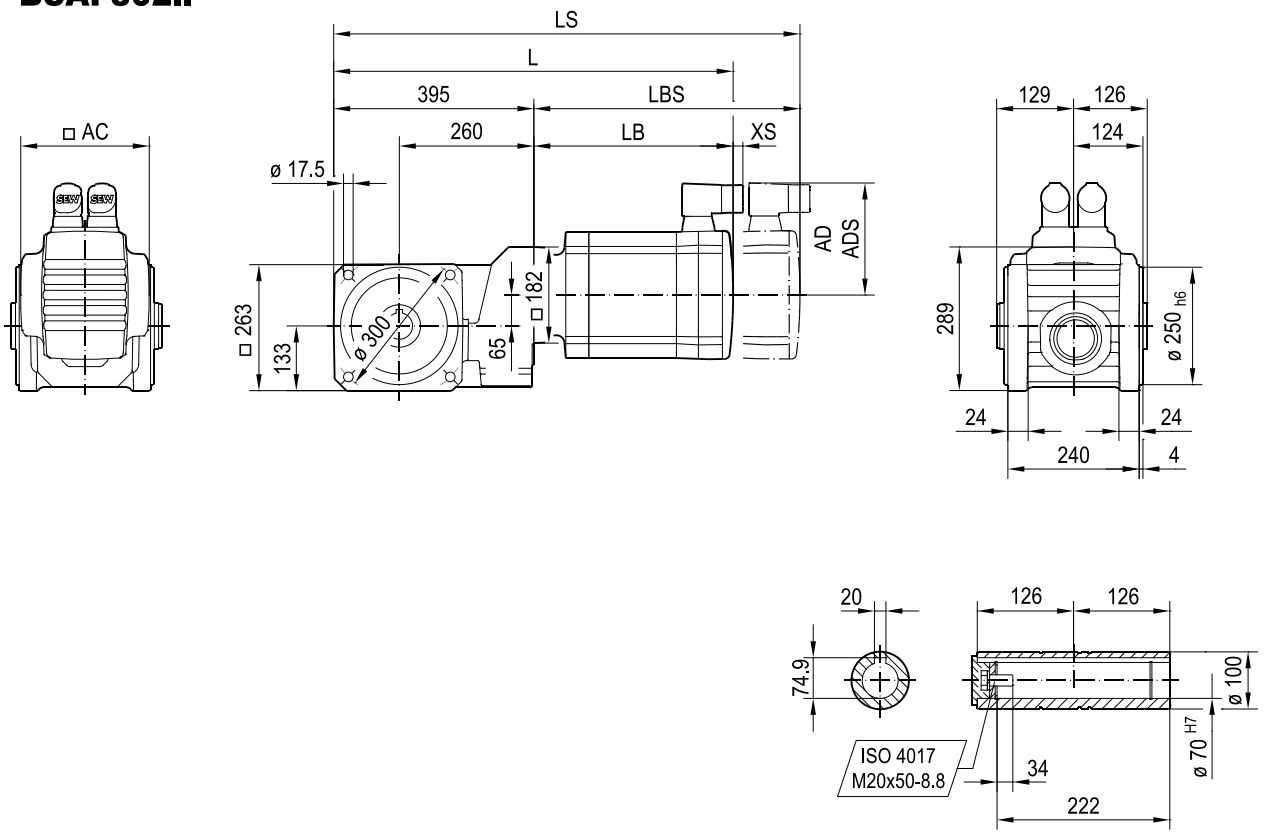
BSAF802..

55 030 00 19



(→ 7.3)	CM3C							
	80S	80M	80L					
AC	140	140	140					
AD	127	127	127					
ADS	127	127	127					
L	597	623	676					
LS	665	691	744					
LB	202	228	281					
LBS	270	296	349					
XS	47	47	47					

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14 Main technical data of the servomotors

14.1 CM3C63

			CM3C63S			CM3C63M			CM3C63L		
Speed class	n_c	min^{-1}	3000	4500	6000	3000	4500	6000	3000	4500	6000
Standstill torque	M_0	Nm	2.7			4.9			6.4		
Standstill current	I_0	A	2.17	2.94	3.71	3.27	4.63	6.14	4.04	5.72	7.35
Dynamic limit torque	M_{pk}	Nm	8.1	8.1	8.1	14.7	14.7	14.7	19.2	19.2	19.2
Maximum motor current	I_{max}	A	7.16	9.69	12.2	10.7	15.1	20	12.6	17.8	22.9
Inductance (phase)	L_1	mH	16.1	8.76	5.49	11.1	5.53	3.15	7.3	3.64	2.2
Resistance (phase) at 20 °C	R_1	Ω	6.77	3.61	2.28	3.9	1.92	1.16	2.68	1.33	0.831
Internal voltage at 1000 min^{-1}	$U_{p0\ kalt}$	V	83.1	61.4	48.6	101	71.2	53.7	107	75.3	58.6
Mechanical data of motor											
Number of poles			8								
Maximum perm. radial load	F_{Ramax}	N	477	411	372	495	423	378	489	414	366
Maximum perm. axial load	F_{Aamax}	N	159	137	124	165	141	126	163	138	122
Mass of the motor	m_{mot}	kg	3.16			4.51			5.85		
Mass moment of inertia	J_{mot}	10^{-4} kgm^2	1.3			2.5			3.6		

Mechanical data of the brakemotor

			CM3C63S				CM3C63M				CM3C63L			
Brake type			BZ05	BZ05D	BK05	BK06	BZ05	BZ05D	BK05	BK06	BZ05	BZ05D	BK05	BK06
Mass moment of inertia of the brakemotor	J_{bmot}	10^{-4} kgm^2	1.79	1.79	1.7	1.86	2.99	2.99	2.9	3.06	4.09	4.09	4	4.16
Mass of the brakemotor	m_{bmot}	kg	6.8	6.8	3.9	4.1	8.1	8.1	5.3	5.5	9.5	9.5	6.6	6.8

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14.2 CM3C71

			CM3C71S				CM3C71M				CM3C71L			
Speed class	n_c	min^{-1}	2000	3000	4500	6000	2000	3000	4500	6000	2000	3000	4500	6000
Standstill torque	M_0	Nm	6.5				9.5				14			
Standstill current	I_0	A	3.5	5	7.2	9.5	5.1	7	10.2	13.5	6.4	9.5	13.9	18.5
Dynamic limit torque	M_{pk}	Nm	19.5	19.5	19.5	19.5	28.5	28.5	28.5	28.5	42	42	42	42
Maximum motor current	I_{max}	A	12.2	17.3	25	33	18.4	25.2	36.8	48.6	21.3	31.6	46.1	61.4
Inductance (phase)	L_1	mH	17.4	8.58	4.11	2.37	11.4	6.06	2.85	1.63	8.85	4.01	1.88	1.06
Resistance (phase) at 20 °C	R_1	Ω	3.38	1.68	0.723	0.441	1.91	0.99	0.488	0.266	1.39	0.604	0.294	0.169
Internal voltage at 1000 min^{-1}	$U_{p0\ kalt}$	V	128	90.2	62.4	47.4	128	93.5	64.1	48.5	151	101	69.5	52.1
Mechanical data of motor														
Number of poles			8											
Maximum perm. radial load	F_{Ramax}	N	870	756	654	591	915	789	681	612	951	816	696	621
Maximum perm. axial load	F_{Aamax}	N	290	252	218	197	305	263	227	204	317	272	232	207
Mass of the motor	m_{mot}	kg	6.42				7.87				10.7			
Mass moment of inertia	J_{mot}	10^{-4} kgm^2	7.4				10.7				17.1			

Mechanical data of the brakemotor

			CM3C71S				CM3C71M				CM3C71L			
Brake type			BZ1	BZ1D	BK08	BK1	BZ1	BZ1D	BK08	BK1	BZ1	BZ1D	BK08	BK1
Mass moment of inertia of the brakemotor	J_{bmot}	10^{-4} kgm^2	9.05	9.05	8.25	8.82	12.4	12.4	11.6	12.1	18.8	18.8	18	18.5
Mass of the brakemotor	m_{bmot}	kg	12	12	7.9	8.3	13	13	9.4	9.8	16	16	12	13

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14.3 CM3C80

			CM3C80S				CM3C80M				CM3C80L			
Speed class	n_c	min^{-1}	2000	3000	4500	6000	2000	3000	4500	6000	2000	3000	4500	6000
Standstill torque	M_0	Nm	10.5				15.6				22.8			
Standstill current	I_0	A	5.78	8.24	11.7	15.9	7.85	10.9	16.3	21.2	11.2	16.1	23	30.8
Dynamic limit torque	M_{pk}	Nm	31.5	31.5	31.5	31.5	46.8	46.8	46.8	46.8	68.4	68.4	68.4	68.4
Maximum motor current	I_{max}	A	20	28.5	40.5	55	25.7	35.6	53.5	69.5	34.9	50.1	72	96
Inductance (phase)	L_1	mH	10.9	5.36	2.65	1.44	7.36	3.84	1.71	1.01	4.24	2.06	0.996	0.56
Resistance (phase) at 20 °C	R_1	Ω	1.55	0.786	0.354	0.208	1.05	0.546	0.225	0.135	0.559	0.265	0.131	0.0706
Internal voltage at 1000 min^{-1}	$U_{p0\ kalt}$	V	129	90.6	63.8	47	137	99.1	66	50.8	141	98.1	68.3	51.2
Mechanical data of motor														
Number of poles			8											
Maximum perm. radial load	F_{Ramax}	N	1536	1332	1155	1044	1614	1395	1203	1083	1686	1449	1239	1110
Maximum perm. axial load	F_{Aamax}	N	512	444	385	348	538	465	401	361	562	483	413	370
Mass of the motor	m_{mot}	kg	10.6				13				18			
Mass moment of inertia	J_{mot}	10^{-4} kgm^2	17.6				25.2				40.6			

Mechanical data of the brakemotor

			CM3C80S				CM3C80M				CM3C80L			
Brake type			BZ3	BZ3D	BK2	BK3	BZ3	BZ3D	BK2	BK3	BZ3	BZ3D	BK2	BK3
Mass moment of inertia of the brakemotor	J_{bmot}	10^{-4} kgm^2	22.4	22.4	20.9	23.2	30	30	28.5	30.8	45.4	45.4	43.9	46.2
Mass of the brakemotor	m_{bmot}	kg	19	19	13	14	22	22	16	16	27	27	21	21

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14.4 CM3C100

			CM3C100S			CM3C100M			CM3C100L		
Speed class	n_c	min^{-1}	2000	3000	4500	2000	3000	4500	2000	3000	4500
Standstill torque	M_0	Nm	19			26.8			40		
Standstill current	I_0	A	8.63	12.8	18.9	12.5	17.8	27.6	17.5	27.2	37.7
Dynamic limit torque	M_{pk}	Nm	57	57	57	80.4	80.4	80.4	120	120	120
Maximum motor current	I_{max}	A	31.5	46.5	69	43.7	62.1	96.2	56.8	88.4	122
Inductance (phase)	L_1	mH	8.47	3.88	1.76	5.13	2.55	1.06	3.14	1.3	0.677
Resistance (phase) at 20 °C	R_1	Ω	0.879	0.381	0.174	0.485	0.232	0.0962	0.28	0.116	0.06
Internal voltage at 1000 min^{-1}	$U_{p0\ kalt}$	V	150	102	68.6	145	102	66.1	157	101	72.9
Mechanical data of motor											
Number of poles			8								
Maximum perm. radial load	F_{Ramax}	N	2517	2187	1896	2631	2280	1974	2751	2370	2040
Maximum perm. axial load	F_{Aamax}	N	839	729	632	877	760	658	917	790	680
Mass of the motor	m_{mot}	kg	16.5			20.2			27.7		
Mass moment of inertia	J_{mot}	10^{-4} kgm^2	40			57.3			92.1		

Mechanical data of the brakemotor

			CM3C100S				CM3C100M				CM3C100L			
Brake type			BZ5	BZ5D	BK4	BK6	BZ5	BZ5D	BK4	BK6	BZ5	BZ5D	BK4	BK6
Mass moment of inertia of the brakemotor	J_{bmot}	10^{-4} kgm^2	50.8	50.8	45.9	55.7	68.1	68.1	63.2	73	103	103	98	108
Mass of the brakemotor	m_{bmot}	kg	30	30	20	21	34	34	24	25	41	41	31	32

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Colombia			
Assembly Sales Service	Bogota	SEW-EURODRIVE COLOMBIA LTDA. Calle 17 No. 132-18 Interior 2 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sew@sew-eurodrive.com.co
Croatia			
Sales Service	Zagreb	KOMPEKS d. o. o. Zeleni dol 10 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr
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Assembly Sales Service	Hostivice	SEW-EURODRIVE CZ s.r.o. Floriánova 2459 253 01 Hostivice	Tel. +420 255 709 601 Fax +420 235 350 613 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
Assembly Service	Plzeň	SEW-EURODRIVE CZ s.r.o. Areal KRPA a.s. Zahradni 173/2 326 00 Plzeň	Tel. +420 378 775 320 Fax +420 377 970 710 sew@sew-eurodrive.cz
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Service	Vejle	SEW-EURODRIVE A/S Bødkervej 2 7100 Vejle	Tel. +45 43 9585 00 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk
Egypt			
Sales Service	Cairo	Copam Egypt for Engineering & Agencies Building 10, Block 13005, First Industrial Zone, Obour City Cairo	Tel. +202 44812673 / 79 (7 lines) Fax +202 44812685 http://www.copam-egypt.com copam@copam-egypt.com
Estonia			
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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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Greece			
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Nagpur	SEW-EURODRIVE India Private Limited Plot No 49, New Kailash Nager, Samta colony, Nagpur-440027, Maharashtra	Tel. +91 95610 89525 salesnagpur@seweurodriveindia.com
Nashik	SEW-EURODRIVE India Private Limited 107, "YOG" Bunglow, Mahatama Nagar, Trimbak Road, Nashik – 422 007, Maharashtra	Tel. +91 96657 52978 salesnashik@seweurodriveindia.com
New Delhi	SEW-EURODRIVE India Private Limited # B-206 DLF Towers-B District Centre Jasola New Delhi -110044	Tel. +91 11 26944551 Fax +91 11 26944467 salesdelhi@seweurodriveindia.com
Navi Mumbai	SEW-EURODRIVE India Private Limited No.202, Shivam Yeshoram Plot No. 262/257, Sector 19 Kopar Khairane, Navi Mumbai - 400 709, Maharashtra	Tel. +91 99677 21324 salesmumbai@seweurodriveindia.com
Pune	SEW-EURODRIVE India Private Limited Plot No. 7,"Shri Shantadurga Niwas" Shivaji Co –operative Housing Society Ltd., Behind J.W. Marriot. Off Senapati Bapat Marg. Pune –411 016, Maharashtra	Tel. +91 20 27290180 salespune@seweurodriveindia.com
Pune	SEW-EURODRIVE India Private Limited Jai Tulajabhavani Complex. Office No:- 15 First Floor, Opp. Century Enka Company, MIDC Bhosari , Pune 411 026	Tel. +91 20-65118890 / 91 Fax +91 20 25380721 salespune@seweurodriveindia.com
Raipur	SEW-EURODRIVE India Private Limited Shop No. 204, 2nd Floor, Lalganga Business Park, Pachpedi Naka, NH -43 Dhamtari Road, Raipur 492 001 - Chhattisgarh	Tel. +91 771 4090765 Fax +91 771 4090765 salesraipur@seweurodriveindia.com
Rajkot	SEW-EURODRIVE India Private Limited Block No:64, Ajanta Park, Sadhu Vaswani Marg, University Road Rajkot 360005 - Gujarat	Tel. +91 8511149383 Fax +91 8511149383
Tiruchirappalli	SEW-EURODRIVE India Pvt.Ltd. V.S.Residency, 2nd floor, Flat no B-3 Elango Adigal street, Anna nagar, Near Thillai nagar, Thenur, 620017 Tamil Nadu	Tel. +91 97899 79855 salestrichy@seweurodriveindia.com
Vadodara	SEW-EURODRIVE India Private Limited Unit No. 301, Savorite Bldg, Plot No. 143, Vinayak Society, off old Padra Road, Vadodara - 390 007, Gujarat	Tel. +91 265 2325258 / 6560482 salesvadodara@seweurodriveindia.com
Vellore	SEW-EURODRIVE India Private Limited 23/2, 3rd Main road, Vani Vidyalaya School Road, Bharathi Nagar Extension, Katpadi Vellore - 632007, Tamilnadu	Tel. +91 96000 02247 salesvellore@seweurodriveindia.com
Vijayawada	SEW-EURODRIVE India Private Limited III Floor, H NO. 8-164, Masjid Street, Gollapdudi, Vijayawada - 521225 Andhra Pradesh	Tel. +91 8978861212

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Indonesia			
Sales	Medan	PT. Serumpun Indah Lestari Jl.Pulau Solor no. 8, Kawasan Industri Medan II Medan 20252	Tel. +62 61 687 1221 Fax +62 61 6871429 / +62 61 6871458 / +62 61 30008041 sil@serumpunindah.com serumpunindah@yahoo.com http://www.serumpunindah.com
	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 csajkt@cbn.net.id
	Jakarta	PT. Agrindo Putra Lestari JL.Pantai Indah Selatan, Komplek Sentra Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	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
Ireland			
Sales Service	Dublin	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alperton.ie info@alperton.ie
Israel			
Sales	Tel Aviv	Liraz Handasa Ltd. Ahofer Str 34B / 228 58858 Holon	Tel. +972 3 5599511 Fax +972 3 5599512 http://www.liraz-handasa.co.il office@liraz-handasa.co.il
Italy			
Assembly Sales Service	Milan	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Via Bernini,12 20033 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 980 999 http://www.sew-eurodrive.it milano@sew-eurodrive.it
Drive Center	Bologna	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. 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
	Caserta	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Viale Carlo III Km. 23,300 81020 S. Nicola la Strada (Caserta)	Tel. +39 0823 219011 Fax +39 02 96 980 599 caserta@sew-eurodrive.it
	Pescara	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Viale Europa,132 65010 Villa Raspa di Spoltore (PE)	Tel. +39 085 41-59-427 Fax +39 02 96 980 699 pescara@sew-eurodrive.it
	Turin	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. 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
	Verona	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Via Antonio Meucci, 5 37042 - Caldiero (VR)	Tel. +39 045 89-239-11 Fax +39 02 96 980 814 verona@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 27 21 21 81 05 Fax +225 27 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci

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Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Technical Offices	Kyoto	SEW-EURODRIVE JAPAN CO., LTD Kyoto Operation Center 9-1-11 Seikadai, Seika-cho, Souraku-gun, Kyoto 619-0238	Tel. +81 774 98-2750 Fax +81 774 93-2100 kyoto@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 5408-0521 Fax +81 3 5408-7550 tokyo@sew-eurodrive.co.jp
	Nagoya	SEW-EURODRIVE JAPAN CO., LTD Nagoya Toho building, 1-2-7, Sakae, Naka-ku Nagoya 460-0008, Aichi	Tel. +81 52-228-8608 Fax +81 52-203-2820 nagoya@sew-eurodrive.co.jp
	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
	Fukuoka	SEW-EURODRIVE JAPAN CO., LTD 8th-floor, Imon-Hakata-Bldg.-East. 2-2-1, Sumiyoshi, Hakata-ku Fukuoka, 812-0018	Tel. +81 92 291-3600 Fax +81 92 291-3602 fukuoka@sew-eurodrive.co.jp
Kazakhstan			
Sales Service	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
	Tashkent	Representative Office SEW-EURODRIVE Representative office in Uzbekistan 95A Amir Temur ave, office 401/3 100084 Tashkent	Tel. +998 97 134 01 99 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz
	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn
Technical Offices	Karagandy	SEW-EURODRIVE LLP 82, Molokov Street 100004, Karagandy	Tel. +7 (7212) 955 956 Fax +7 (7212) 955 956 karagandy@sew-eurodrive.kz
	Oskemen	SEW-EURODRIVE LLP 62 Satpaev ave. office 313 070016, Ust-Kamenogorsk	Tel. +7 (723) 291 37 48 (ext 760) Fax +7 (727) 350 5156 (ext 709) oskemen@sew-eurodrive.kz
	Aktobe	SEW-EURODRIVE LLP 52/1 Marat Ospanov str., office 11 030000, Aktobe	Tel. +7 (771) 993 0915 aktobe@sew-eurodrive.kz
	Pavlodar	SEW-EURODRIVE LLP 6/2, Lunacharsky str., office 46 140000, Pavlodar	Tel. +7 (771) 993 09 16 pavlodar@sew-eurodrive.kz
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

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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			
Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Technical Offices	Kuala Lumpur	SEW-EURODRIVE SDN BHD No. 2, Jalan Anggerik Mokara 31/46 Kota Kemuning Seksyen 31 40460 Shah Alam Selangor Darul Ehsan West Malaysia	Tel. +60 3 51229633 Fax +60 3 51229622 sewsa@sew-eurodrive.com.my
	Penang	SEW-EURODRIVE SDN BHD No. 38, Jalan Bawal Kimsar Garden 13700 Prai, Penang West Malaysia	Tel. +60 4 3999349 Fax +60 4 3999348 sewpg@sew-eurodrive.com.my
	Kuching	SEW-EURODRIVE SDN BHD No. 69, Lot 10899 1st Floor, Jalan Tun Jugah 93350 Kuching Sarawak East Malaysia	Tel. +60 82 572780 Fax +60 82 571780 sewswk@sew-eurodrive.com.my
	Kota Kinabalu	SEW-EURODRIVE SDN BHD East Malaysia	Tel. +60 19 7539395 sales@sew-eurodrive.com.my
	Ipoh	SEW-EURODRIVE SDN BHD West Malaysia	Tel. +60 19 7177366 sewsa@sew-eurodrive.com.my
Mexico			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calzada Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Mongolia			
Technical Office	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
Morocco			
Sales Service Assembly	Bouskoura	SEW-EURODRIVE Morocco SARL Parc Industriel CFCIM, Lot. 55/59 27182 Bouskoura Grand Casablanca	Tel. +212 522 88 85 00 Fax +212 522 88 84 50 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma

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Namibia			
Sales	Swakopmund	DB MINING & INDUSTRIAL SUPPLIES CC Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	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
Technical Office	Palmerston North	SEW-EURODRIVE NEW ZEALAND LTD. C/-Grant Shearman, RD 5, Aronui Road Palmerston North	Tel. +64 6 355-2165 Fax +64 6 355-2316 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd Plot 296A, Adeyemo Akapo Str. Omole GRA Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com sales@greenpegltd.com
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Pakistan			
Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L Nu Guazu No. 642 casi Campo Esperanza Santisima Trinidad Asuncion	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
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
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl

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Poland			
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Technical Offices	Tychy	SEW-EURODRIVE Polska Sp.z.o.o. ul. Strzelecka 66 43-109 Tychy	Tel. +48 32 32 32 610 Fax +48 32 32 32 648 tychy@sew-eurodrive.pl
	Bydgoszcz	SEW-EURODRIVE Polska Sp.z.o.o. ul. Fordońska 246 85-766 Bydgoszcz	Tel.+48 52 567 30 00 Fax +48 52 567 30 09 bydgoszcz@sew-eurodrive.pl
	Gdansk	SEW-EURODRIVE Polska Sp.z.o.o. ul. Galaktyczna 30A 80-299 Gdańsk	Tel. +48 58 762 70 00 Fax +48 58 762 70 09
	Posen	SEW-EURODRIVE Polska Sp.z.o.o. ul. Wschodnia 7B 62-080 Swadzim k. Poznania	Tel. +48 61 6465500 Fax +48 61 6465519
	Radom	SEW-EURODRIVE Polska Sp.z.o.o. ul. Wrocławska 10, biuro nr 7 26-600 Radom	Tel. +48 48 679 47 00 Fax +48 48 679 47 09 radom@sew-eurodrive.pl
	Rzeszów	SEW-EURODRIVE Polska Sp.z.o.o. ul. Armii Krajowej 80 35-307 Rzeszów	Tel. +48 17 784 27 00 Fax +48 17 784 27 09 rzeszow@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Service Competence Center	Lisbon	SEW-EURODRIVE, LDA. Núcleo Empresarial I de São Julião do Tojal Rua de Entremuros, 54 Fracção I 2660-533 São Julião do Tojal	Tel. +351 21 958-0198 / +351 939 598 717 Fax +351 21 958-0245 esc.lisboa@sew-eurodrive.pt
Technical Office	Porto	SEW-EURODRIVE, LDA. Rua Monte da Bela, N.º 191, Fração X 4445-294 Ermesinde	Tel. +351 229 350 383 / +351 932 559 110 Fax +351 229 350 384 esc.porto@sew-eurodrive.pt
Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 http://www.sialco.ro sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» 188660, Russia, Leningrad Region, Vse-volozhsky District, Korabselki, Aleksandra Nevskogo str. building 4, block 1 P.O. Box 36 195220 St. Petersburg	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Technical Offices	Ekaterinburg	ЗАО «СЕВ-ЕВРОДРАЙФ» Kominterna Str. 16 Office 614 620078 Ekaterinburg	Tel. +7 343 310 3977 Fax +7 343 310 3978 eso@sew-eurodrive.ru
	Irkutsk	ЗАО «СЕВ-ЕВРОДРАЙФ» 5-Armii Str., 31 664011 Irkutsk	Tel. +7 3952 25 5880 Fax +7 3952 25 5881 iso@sew-eurodrive.ru
	Moscow	ЗАО «СЕВ-ЕВРОДРАЙФ» Malaja Semjonowskaja Str. д. 9, корпус 2 107023 Moskau	Tel. +7 495 9337090 Fax +7 495 9337094 mso@sew-eurodrive.ru
	Novosibirsk	ЗАО «СЕВ-ЕВРОДРАЙФ» pr. K Marksa 30 630087 Novosibirsk	Tel. +7 383 3350200 Fax +7 383 3462544 nso@sew-eurodrive.ru

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	Perm	ЗАО «СЕВ-ЕВРОДРАЙФ» Stakhanovskaya str., 45 Office 512 614066 Perm	Tel. +7 342 2219494 Fax +7 342 2219444 pso@sew-eurodrive.ru
	Togliatti	ЗАО «СЕВ-ЕВРОДРАЙФ» Sportivnaya Str. 4B, office 2 Samarskaya obl. 445057 Togliatti	Tel. +7 8482 710529 Fax +7 8482 810590 tso@sew-eurodrive.ru
Zambia			
Representation: South Africa			
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 http://www.senemeca.com senemeca@senemeca.sn
Serbia			
Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor 11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bernolákovo	SEW-Eurodrive SK s.r.o. Priemyselná ulica 6267/7 900 27 Bernolákovo	Tel.+421 2 48 212 800 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net
South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 http://www.sew.co.za info@sew.co.za
	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
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za
Technical Office	Port Elizabeth	SEW-EURODRIVE (PROPRIETARY) LIMITED 8 Ruan Access Park Old Cape Road Greenbushes 6000 Port Elizabeth	Tel. +27 41 3722246 Fax +27 41 3722247 http://www.sew.co.za fsieberhagen@sew-co-za

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South Korea			
Assembly Sales Service	Ansan	SEW-EURODRIVE Korea Co., Ltd. 7, Dangjaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE Korea Co., Ltd. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
Assembly Service	Siheung	SEW-EURODRIVE Korea Co., Ltd. 35, Emtibeui 26-ro 58beon-gil, Siheung-si, Gyeonggi-do	http://www.sew-eurodrive.kr
Technical Offices	Daegu	SEW-EURODRIVE Korea Co., Ltd. No.303 Sungan officetel, 1834, Dalgubeol-daero, Dalseo-gu, Daegu, Zip 704-712	Tel. +82 53 650-7111 Fax +82 53 650-7112
	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
	Gwangju	SEW-EURODRIVE Korea Co., Ltd. 5fl., Hyundai B/D B, 40, Bungmun-daero, Buk-gu, Gwangju, Zip 500-855	Tel. +82 62 511-9172 Fax +82 62 511-9174
	Seoul	SEW-EURODRIVE Korea Co., Ltd. No.1804 Ace Hiend Tower 8th, 84, Gasan digital 1-ro, Geumcheon-gu, Seoul, Zip 153-797	Tel. +82 2 862-8051 Fax +82 2 862-8199
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Technical Offices	Barcelona	SEW-EURODRIVE ESPAÑA, S.L. Avda. Francesc Macià, 60 – Planta 12, porta 3 Eix Macià – “Torre Milenium” 08208 Sabadell (Barcelona)	Tel. +34 93 7162200
	Madrid	SEW-EURODRIVE ESPAÑA, S.L. Gran Via. 48-2° A-D 28220 Majadahonda (Madrid)	Tel. +34 91 6342250
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd Simunye street Matsapha, Manzini	Tel. +268 7602 0790 Fax +268 2 518 5033 charles@cgtrading.co.sz www.cgtradingswaziland.com
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Sales	Gothemburg	SEW-EURODRIVE AB Gustaf Werners gata 8 421 32 Västra Frölunda	Tel. +46 31 709 68 80 Fax +46 31 709 68 93 goteborg@sew.se
	Stockholm	SEW-EURODRIVE AB Björkholmsvägen 10 141 46 Huddinge	Tel. +46 8 449 86 80 Fax +46 8 449 86 93 stockholm@sew.se
	Malmö	SEW-EURODRIVE AB Borrgatan 5 211 24 Malmö	Tel. +46 40 680 64 80 Fax +46 40 680 64 93 malmo@sew.se

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	Skellefteå	SEW-EURODRIVE AB Trädgårdsgatan 8 931 31 Skellefteå	Tel. +46 910 71 53 80 Fax +46 910 71 53 93 skelleftea@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Technical Offices	Rhaetian Switzerland	Ivan Grumelli Z.I. Moulin du choc C 1122 Romanel-sur-Morges, VD	Tel. +41 79 725 4499 Fax +41 61 417 1700
	Bern / Solothurn	Rudolf Bühler Muntersweg 5 2540 Grenchen	Tel. +41 32 652 2339 Fax +41 32 652 2331
	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
	Lake Constance and East Switzerland	Markus Künzle Eichweg 4 9403 Goldach	Tel. +41 71 845 2808 Fax +41 71 845 2809
Taiwan			
Sales	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Huw S. Road Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
	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
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Technical Offices	Bangkok	SEW-EURODRIVE (Thailand) Ltd. 6th floor, TPS Building 1023, Phattanakarn Road Suanluang Bangkok,10250	Tel. +66 2 7178149 Fax +66 2 7178152 sewthailand@sew-eurodrive.com
	Hat Yai	SEW-EURODRIVE (Thailand) Ltd. Hadyai Country Home Condominium 59/101 Soi.17/1 Rachas-Utid Road. Hadyai, Songkhla 90110	Tel. +66 74 359441 Fax +66 74 359442 sewthailand@sew-eurodrive.com
	Khon Kaen	SEW-EURODRIVE (Thailand) Ltd. 4th Floor, Kaow-U-HA MOTOR Bldg, 359/2, Mitraphab Road. Muang District Khonkaen 40000	Tel. +66 43 225745 Fax +66 43 324871 sewthailand@sew-eurodrive.com

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Tunisia			
Sales	Tunis	T. M.S. Technic Marketing Service Zone Industrielle Mghira 2 Lot No. 39 2082 Fouchana	Tel. +216 79 40 88 77 Fax +216 79 40 88 66 http://www.tms.com.tn tms@tms.com.tn
Turkey			
Assembly Sales Service	Kocaeli-Gebze	SEW-EURODRIVE Ana Merkez Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
Technical Offices		SEW-EURODRIVE Home Ofis	Tel. +90 533 491 81 77 / +90 542 660 34 89
	Ankara	SEW-EURODRIVE Ankara Ofis 1368.Cadde Eminel İş Merkezi No: 18/68 İvedik OSB/Yenimahalle/Ankara	Tel. +90 312 385 33 90
	Bursa	SEW-EURODRIVE Bursa Ofis Beşevler Mah. Yıldırım Cd. No: 254 Karya Güçlü İş Merkezi B Blok Kat:5 No: 28 Nilüfer/Bursa	Tel. +90 224 443 45 60
	Istanbul	SEW-EURODRIVE İstanbul Ofis Yakuplu Merkez Mh. Hürriyet Bulvarı Skyport Residence No:1 D:66 Beylikdüzü/ISTANBUL	Tel. +90 212 438 41 62-63
	Izmir	SEW-EURODRIVE İzmir Ofis IAOSB Küçük Parseller Grubu Sosyal Tesis merkezi 1030 Sokak No: 16 / 110 Kara Hasan Atlı İş Merkezi Kat:6 Çiğli/İzmir	Tel. +90 232 469 62 64
United Arab Emirates			
Drive Technology Center	Dubai	SEW-EURODRIVE FZE PO Box 263835 Jebel Ali Free Zone – South, P.O. Box Dubai, United Arab Emirates	Tel. +971 (0)4 8806461 Fax +971 (0)4 8806464 info@sew-eurodrive.ae
Ukraine			
Assembly Sales Service	Dnipropetrovsk	SEW-EURODRIVE, LLC Robochya str., bld. 23-B, office 409 49008 Dnipro	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
Sales	Kiev	SEW-EURODRIVE, LLC Velyka Vasylkivska street, 77-A 03150 Kiev	Tel. +380 44 503 95 77 Fax +380 44 503 95 78 kso@sew-eurodrive.ua
	Ivano-Frankivsk	SEW-EURODRIVE, LLC Nezavisimosty str, bld. 4, office 303 76000 Ivano-Frankovsk	Tel. +380 342 725 190 Fax +380 342 725 191 ifso@sew-eurodrive.ua
Uruguay			
Assembly Sales	Montevideo	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esqina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-90 sewuy@sew-eurodrive.com.uy
USA			
Production Assembly Sales Service	Southeast Region	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Production +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	Northeast Region	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com

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USA			
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	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	Tel. +1 864 439-7537 Fax +1 864 661 1167 IGOrders@seweurodrive.com
	Additional addresses for service provided on request!		
Vietnam			
Sales	Ho Chi Minh City	SEW-EURODRIVE PTE. LTD. RO at Hochiminh City Floor 8, KV I, Loyal building, 151-151 Bis Vo Thi Sau street, ward 6, District 3, Ho Chi Minh City, Vietnam	Tel. +84 937 299 700 huytam.phan@sew-eurodrive.com
	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

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Inquiry/order

SEW EURODRIVE

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:** _____

SEW-EURODRIVE GmbH & Co KG / P.O. Box 30 23 / D-76642 Bruchsal / Tel. +49 7251 75-0 / Fax +49 7251 75-1970
www.sew-eurodrive.com / sew@sew-eurodrive.com

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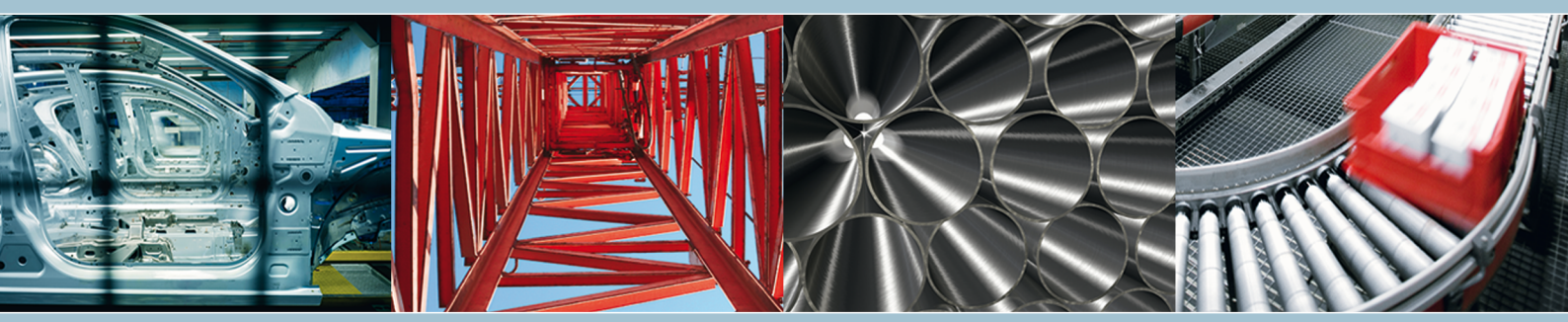

SEW-EURODRIVE
Driving the world

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