SEW EURODRIVE

Catalog



DRC Gearmotors

Edition 03/2012

19377215 / EN








KKFU 144794 3
42G1



Contents

1 Introduction 6

1.1 The SEW-EURODRIVE Group of Companies 6
1.2 Products and systems from SEW-EURODRIVE 7
1.3 Additional documentation 9
1.4 Copyright 10

2 System Description 11

2.1 DRC electronic motor – the new mechatronic drive solution 11
2.2 Overview of DRC motors 13
2.3 DRC drive units 14
2.4 Installation topology DBC – Direct Binary Communication 18
2.5 Installation topology DAC – Direct AS-Interface Communication 20
2.6 Installation topology SNI – Single Line Network Installation 22
2.7 Installation topology of DSC – Direct SBus Installation 24
2.8 Combined installation topology 26
2.9 SEW-EURODRIVE control technology – Overview 27
2.10 Controllers/fieldbus gateways 28
2.11 Configurable control technology with the Configurable Control Unit (CCU) 33

3 Product Description 38

3.1 General notes on the product description 38
3.2 Corrosion and surface protection 42
3.3 DRC drive units in ASEPTIC/ASEPTIC^{plus} design 46
3.4 Extended storage 51
3.5 Condition monitoring: Oil aging and vibration sensor 53

4 Type Designations and Variants 54

4.1 Overview of DRC drive units 54
4.2 Type designations of gear units and options 55
4.3 Type designations of electronic motor and options 58
4.4 Example type designation of DRC drive units 59
4.5 Example type designation of application options 60
4.6 Types 61

5 Mounting Positions and Important Order Information 68

5.1 General information on the mounting positions of R, F, K, S, W gear units 68
5.2 Important order information 69
5.3 Key to the mounting positions 77
5.4 Mounting positions for DRC gearmotors 78
5.5 Mounting positions for DRC stand-alone motors with IEC flange 92

6 Design and Operating Notes 93
6.1 Lubricants and fill quantities for R, F, K, W gear units 93
6.2 Reduced backlash gear unit types 99
6.3 Installation/removal of gear units with hollow shaft and key 100
6.4 Gear units with hollow shaft 104
6.5 TorqLOC® mounting system for hollow shaft gear units 105
6.6 Shouldered hollow shaft option with shrink disk 106
6.7 Adapters for mounting IEC motors 109
6.8 Gear unit mounting 110
6.9 Torque arms 110
6.10 Flange contours of RF.. and R..F gear units 111
6.11 Flange contours of FF.., KF.. and WF.. gear units 112
6.12 Flange contours of FAF.., KAF.. and WAF.. gear units 113
6.13 Fixed covers 114
6.14 Condition monitoring: Technical data of oil aging sensors 116
6.15 Condition monitoring: Technical data of vibration sensors 118
7 Technical Data of DRC Electronic Motors 120
7.1 Electronic motors DRC.-...-DBC 120
7.2 Electronic motor DRC.-...-DAC 134
7.3 Electronic motor DRC.-...-DSC 150
7.4 Electronic motor DRC.-...-SNI 172
7.5 Application options 185
7.6 Braking resistors 187
7.7 Brake 199
7.8 Accessories 200
7.9 Connection cables 203
7.10 Dimension drawings 209
8 Technical Data of MOVIFIT® FDC SNI 213
8.1 Type designation and housing concept 213
8.2 Variant for use in wet areas 217
8.3 Flexible connection technology 219
8.4 Available ABOXes 220
8.5 Selection tables 225
8.6 Dimension drawings 231
9 Project Planning 233
9.1 Gear unit 233
9.2 Electronic motor 242
9.3 Brake 246
9.4 Project planning for the drive unit 249
9.5 Applications in wet areas 260



10 Important Information on Selection Tables and Dimension Sheets 263
10.1 Information on the selection tables 263
10.2 Notes on the gearmotor dimension sheets 265
11 Helical Gearmotors 269
11.1 Variants 269
11.2 Selection tables 270
11.3 Dimension sheets 292
12 Parallel-Shaft Helical Gearmotors 322
12.1 Variants 322
12.2 Selection tables 324
12.3 Dimension sheets 338
13 Helical-Bevel Gearmotors 372
13.1 Variants 372
13.2 Selection tables 374
13.3 Dimension sheets 386
14 SPIROPLAN® Gearmotors 416
14.1 Variants 416
14.2 Selection tables 418
14.3 Dimension sheets 422
15 Abbreviation Key 431
16 Inquiry/Order 433
17 Address Directory 434
Index 456

1 Introduction

1.1 The SEW-EURODRIVE Group of Companies

1.1.1 Global presence

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

We are represented in the most important branches of industry all over the world: with 15 production plants, 75 Drive Technology Centers worldwide, and our service, which we consider an integrative service that continues our commitment to outstanding quality.

1.1.2 Always the right drive

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

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

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

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

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.

1.1.3 Your ideal partner

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

1.2 Products and systems from SEW-EURODRIVE

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

1. Gearmotors and frequency inverters
2. Servo drive systems
3. Decentralized drive systems
4. Industrial gear units

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

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

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

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

4. Industrial gear units
• Helical gear units • Bevel-helical gear units • Planetary gear units

Products and systems covering several product groups
• Operator terminals • MOVI-PLC® drive-based control system

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

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

Visit our homepage at

→ **www.sew-eurodrive.com**

The website provides comprehensive information and services.

1.3 Additional documentation

1.3.1 Contents of this publication

This DRC Gearmotor catalog provides a detailed description of the technical data of the following SEW-EURODRIVE product groups:

- DRC helical gearmotors
- DRC parallel-shaft helical gearmotors
- DRC helical-bevel gearmotors
- DRC Spiroplan® gearmotors
- DRC stand-alone motors with IEC flange
- MOVIFIT® FDC-SNI

The catalogs provide the following information:

- Product descriptions
- Type designations
- Project planning information
- Visual representation of mounting positions
- Explanation on the order information
- Design and operating notes
- Important information on tables and dimension sheets
- Description of the different types
- Selection tables
- Dimension sheets
- Technical data

1.3.2 Additional documentation

- "Drive System for Decentralized Installation" catalog

  You find more products for decentralized installation available from SEW-EURODRIVE in the catalog "Drive System for Decentralized Installation".

- Drive Engineering – Practical Implementation "Efficient Plant Automation with Mechatronic Drive Solutions"

  The publication "Drive Engineering – Practical Implementation – Efficient Plant Automation with Mechatronic Drive Solutions" presents current questions, application requirements, and trends, such as

  – Saving energy
  – Flexibility
  – Efficient plant technologies
  – Ambient conditions
  – Logistics processes
  – Process optimization

  and guides you to the ideal and efficient mechatronic drive solution.

This guide always starts with the situation and requirements of your installation site, based on our expertise from numerous, successfully implemented projects.

The focus is on:

– Situation at customer site
– Customer requirements
– Solution approach
– Customer benefits
– SEW-EURODRIVE solution
– Implementation examples/verification

leading you step by step to the ideal solution from SEW-EURODRIVE and the resulting advantages.

1.4 Copyright

Copyright © 2012 – All rights reserved.

Copyright law prohibits the unauthorized duplication, modification, distribution, and use of this document, in whole or in part.

2 System Description

2.1 DRC electronic motor – the new mechatronic drive solution

Permanent-field synchronous motor with integrated drive electronics, motor efficiency class IE4, and energy-saving potential of up to 50%: This is how the new DRC electronic motor from SEW-EURODRIVE can be characterized in brief. The DRC motor supplements the product portfolio of mechatronic drive systems by a particularly flexible drive solution for mounting to various gear unit types. Helical, parallel-shaft helical and helical-bevel gear units can be mounted directly using flange and pinion shaft.

This flexibility and the resulting universal use make the DRC motor attractive for many industries, such as logistics, automobile industry, food and beverage industry, airport logistics, and construction industry. The DRC electronic motor is the optimal and efficient mechatronic drive solution for conveyors, such as belt, chain and link-belt conveyors. Equipping the DRC with an optional brake makes it also suited for use in inclining tracks and hoists.

The following figure shows the DRC2 and DRC1 electronic motors:



4948198283

The following figure shows a DRC helical gearmotor and a DRC helical-bevel gearmotor:



5290728203

2.2 Overview of DRC motors

- Combination of a permanent-field synchronous motor (nominal speed 2000 rpm) with integrated drive electronics in a completely enclosed housing:
  - No fan
  - IP65 and IP66 degree of protection
- Power:
  - Size DRC 1: 0.55 kW (2.6 Nm nominal torque)
  - Size DRC 2: 1.5 kW (7.2 Nm nominal torque)
- Overload capacity of 250%
- High gear unit flexibility: A completely new mechatronic drive system is generated together with a highly efficient helical-bevel, helical or parallel-shaft helical gear unit
- IEC flanges for stand-alone motors and for combination with IEC adapters
- With mechanical brake as option
- Efficient mechatronic drive with IE4 motor efficiency class allows for saving up to 50% of energy.
- Mechatronic drive system from a single source: All individual components are perfectly matched, are reliable and durable, and significantly contribute to a high level of system availability.
- Possible installation topologies/communication interfaces: Single Line Network Installation (SNI), SEW system bus controller (DSC), binary (DBC) or AS-Interface (DAC).
- Can be used worldwide
  - Supply voltage of 3 x AC 380 – 500 V at 50/60 Hz
  - Significantly reduced number of variants, simplified selection and project planning
- Integrated safety function STO (Safe Torque Off)

2.3 DRC drive units

2.3.1 DRC sizes

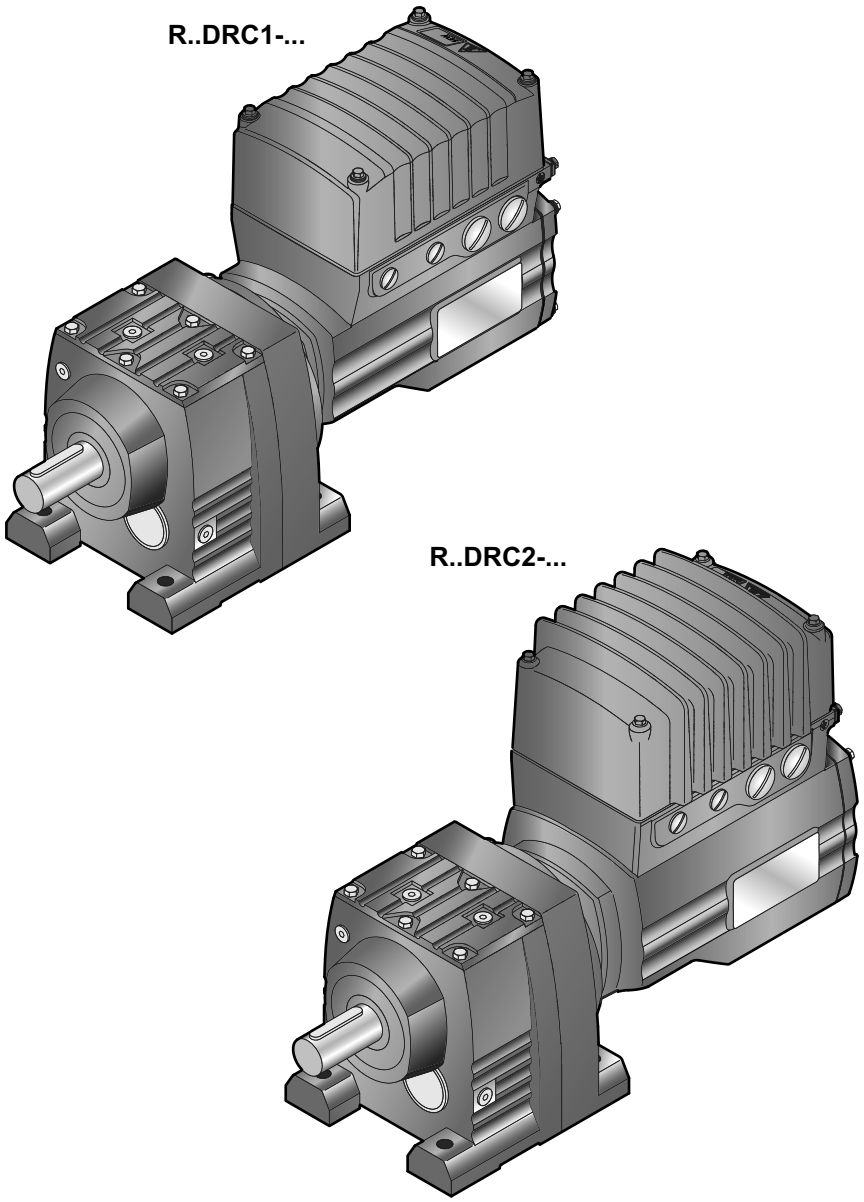
- DRC1 electronic motor (0.55 kW, 2.6 Nm nominal torque)
- DRC2 electronic motor (1.5 kW, 7.2 Nm nominal torque)

2.3.2 DRC variants

- Stand-alone motor with IEC flange
- Gearmotor with R, F, K, or SPIROPLAN® gear units

2.3.3 Example

The following figure shows drive units consisting of DRC1/DRC2 electronic motor and R gear unit:



4949702283

2.3.4 Installation technology

You can order DRC drive units with the following installation technology:

- DBC = **D**irect **B**inary **C**ommunication
- DAC = **D**irect **A**S-Interface **C**ommunication

  For DRC-DAC, you can choose between the variants binary slave GLK30 or double slave GLK31.
- DSC = **D**irect **S**Bus **C**ommunication
- SNI = **S**ingle Line **N**etwork **I**nstallation

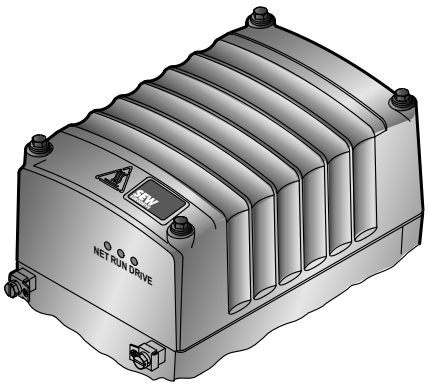
2.3.5 Design type with/without application slot

The following types of electronics covers of DRC-DSC and DRC-SNI units are available for all sizes (DRC1 and DRC2):

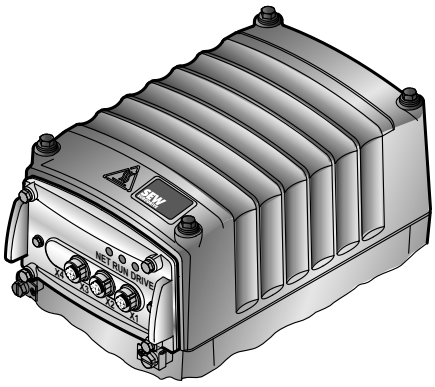
- Electronics cover without application slot
- Electronics cover with application slot

The electronics cover of DRC-DBS and DRC-DAC is designed without application slot.

The following figure shows the possible types:



Electronics cover **without** application slot



Electronics cover **with** application slot
(in the example shown with installed GIO12B option)

27021600731457675

2.3.6 Application options

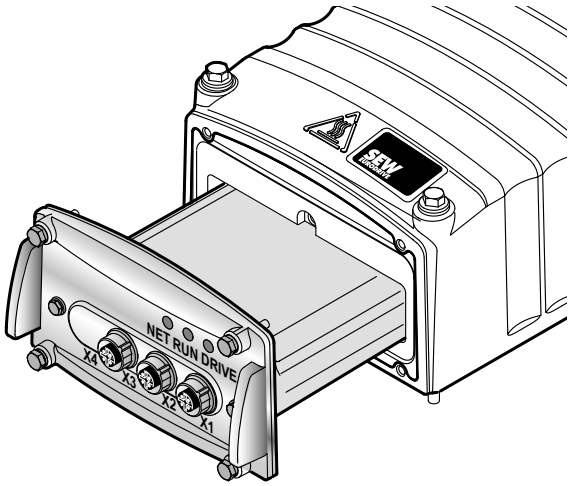
Application options are installed in the application slot of the DRC motor and implement specific interfaces, such as binary inputs or binary outputs.

The energy supply of the option as well as the communication between DRC and the option are contactless.

Application option GIO12B

The GIO12B application option allows for controlling up to 2 digital actuators and for processing up to 4 digital sensors.

The following figure shows the GIO12B application option:



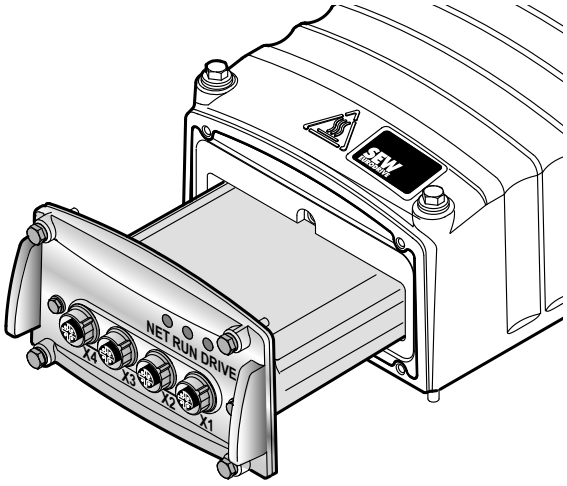
9007202538851211

GIO13B application option

The GIO13B application option comes equipped with the following interfaces:

- 1 digital output
- 4 digital inputs (two of them can be used as primary frequency input)
- 1 analog output
- 1 analog input

The following figure shows the GIO13B application option:



9007202538853131

2.3.7 General unit properties

- Wide voltage range 3 x AC 380 V to AC 500 V
- High overload capacity for all sizes
- 4Q capability due to integrated brake coil installed as standard
- Line filter integrated as standard. EMC-compliant installation ensures compliance with limit class C3 to EN 61800-3 (class A, group 2 according to EN 55011).
- LED display for operating and fault states
- Protective functions for full protection of the inverter and the motor:
  - Short circuit
  - Overload
  - Overvoltage/undervoltage
  - Excess temperature of the frequency inverter
  - Excess temperature in the drive unit
- IPOS integrated positioning and sequence control
- Integrated STO safety function
  - **STO** (safe torque off according to IEC 61800-5-2) by disconnecting the STO input.
  - Performance level e according to EN ISO 13849-1.
  - **SS1(c)** (safe stop 1, function variant c according to IEC 61800-5-2) by means of suitable external control (e.g. safety relay with delayed disconnection)
- You find the specific unit properties of DBC, DAC, DSC and SNI variants in the subsequent chapters.

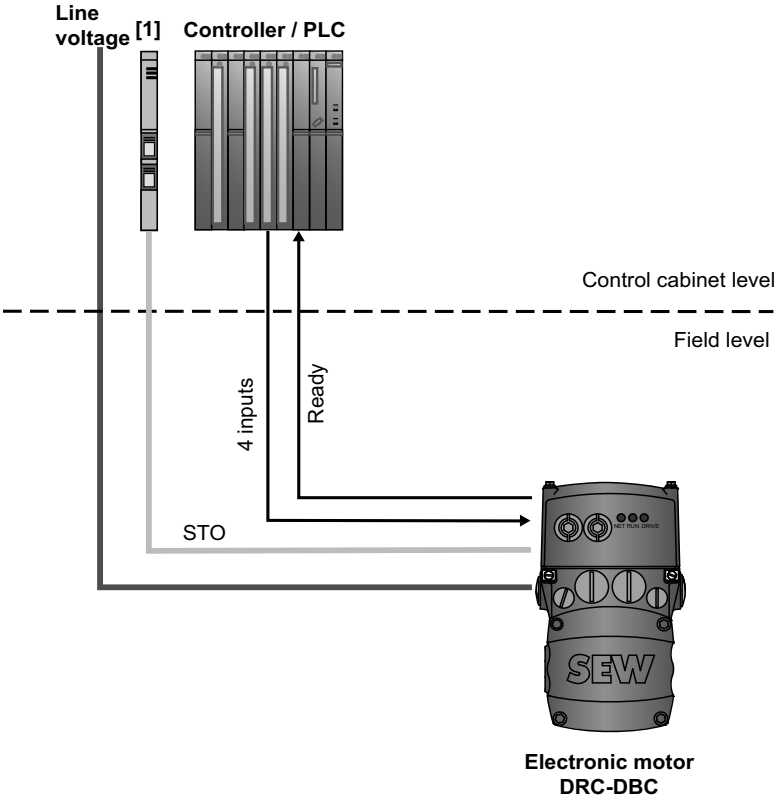
2.4 Installation topology DBC – Direct Binary Communication

2.4.1 Description

The mechatronic drive solution DRC-DBC was developed by SEW-EURODRIVE specifically for stand-alone solutions and applications with simple functions. DIP switches and potentiometers allow for simple and fast startup without the need for a PC. The unit is controlled via the binary inputs either by a central PLC or in local/manual mode.

2.4.2 Topology

The following figure shows an installation topology with Direct Binary Communication:



5010663435

[1] Safety switching device/safety controller

2.4.3 Characteristics

- Simple startup without PC via DIP switches and potentiometer
- Parameterizable fixed speeds and ramps
- Binary input control and signal relay evaluation via PLC
- Local mode via binary inputs
- Interface for diagnostics and parameterization

2.4.4 Application examples

- Simple conveyors
- Rotary tables
- Adjustment drives
- Agitators and mixers
- Crushers and shredders
- Presses

2.4.5 Application options

- Simple stand-alone applications and single applications
- For applications that require soft startup behavior
- Applications with 2 fixed speeds
- For applications with high breakaway torques
- Applications with/without STO safety function

2.5 Installation topology DAC – Direct AS-Interface Communication

2.5.1 Description

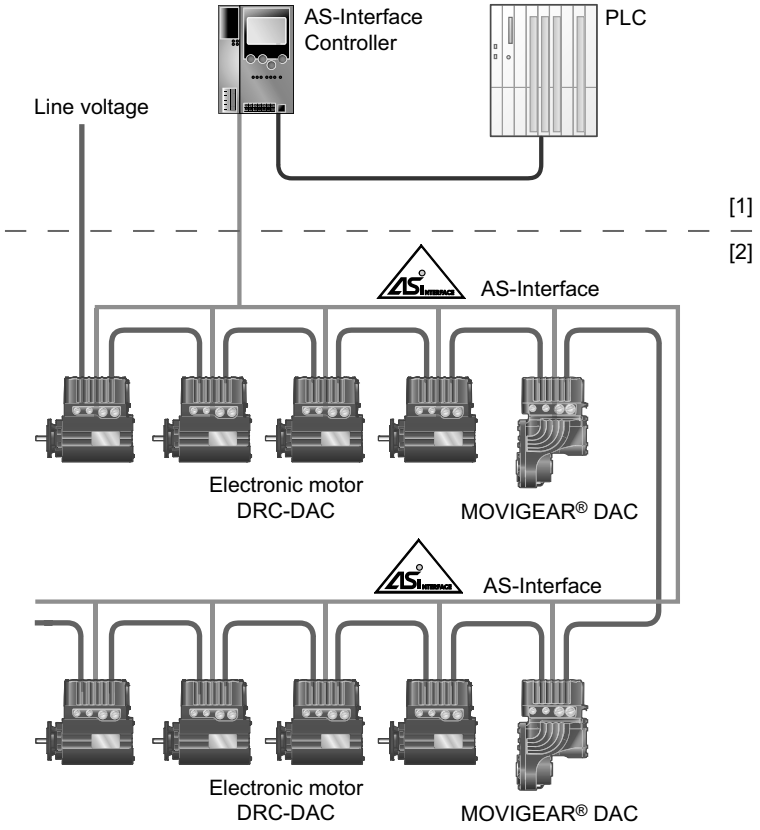
DRC-DAC electronic motors allow for easy communication connection using the standard AS-Interface protocol. Parameterizable fixed speeds and ramps, integrated STO safety function and connection options for external sensors ensure fast and extremely efficient implementation of material handling systems.

DRC-DAC electronic motors are available in the following variants:

- Binary slave GLK30
- Double slave GLK31

2.5.2 Topology

The following figure shows an installation topology with Direct AS-Interface Communication:



5010725515

[1] Control cabinet level

[2] Field level



2.5.3 Characteristics

- Simple communication connection
- Parameterizable fixed speeds and ramps
- Control via worldwide standard AS-Interface
- Connection of external sensors to the actuator
- Voltage supply for connected sensors
- Local mode via binary inputs
- Interface for diagnostics and parameterization

2.5.4 Application examples

- Accumulating roller conveyor
- Roller and wheel conveyors
- Pallet conveyors
- Rotary tables

2.5.5 Application options

- For applications that require soft startup behavior
- Signal feedback of connected sensors
- For applications that require a lot of space
- Applications with/without STO safety function

2.6 Installation topology SNI – Single Line Network Installation

2.6.1 Description

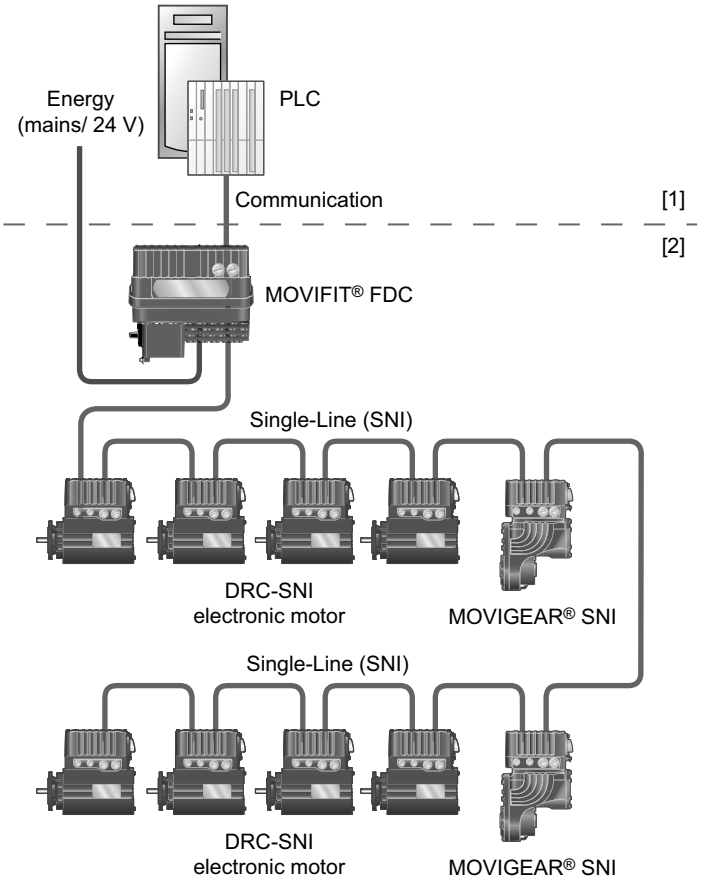
SNI stands for Single Line Network Installation and is based on the principle of using a single line for power supply and communication. The signals required for communication are modulated onto the power line the high-frequency range and are available for each connected station.

The innovative Single Line Network Installation (SNI) concept allows for a completely new plant topology for a consistent plant decentralization. Compared to conventional decentralized technology, this new technology reduces installation effort, time and cost. Only one power cable must be routed instead of three lines (400 V, 24 V, bus). This reduces the time and costs for installation, which decreases the total costs of the plant. The single-line principle also reduces the risk of hidden faults in the wiring of the communication lines.

Single Line Network Installation (SNI) makes separate bus cables almost completely redundant.

2.6.2 Topology

The following figure shows the basic installation topology with SNI (Single Line Network Installation):



5010730379

[1] Control cabinet level

[2] Field level

2.6.3 Features

- Power and communication through one power cable
  - A maximum of 10 SNI actuators in total
  - Permitted cable length between controller and last actuator max. 100 m
- Reduction in the number of components
- No fieldbus wiring necessary
- No risk of hidden faults in the bus cabling
- Reduced startup times
- Shorter project runtime/reduction of project costs
- Optional motion control inputs (via plug connectors) for local mode or sensor inputs

2.6.4 Application examples

- Belt conveyors
- Pallet conveyors
- Roller and wheel conveyors
- Screw conveyors
- Container and packaging unit transports
- Chain and drag-chain conveyors

2.6.5 Application options

- As a drive for applications with high breakaway and starting torques
- Conveyor systems with variable speeds
- As drive for applications that require soft and/or defined startup behavior.
- As group drive for easier implementation of synchronous operation
- Applications with/without STO safety function

2.7 Installation topology of DSC – Direct SBus Installation

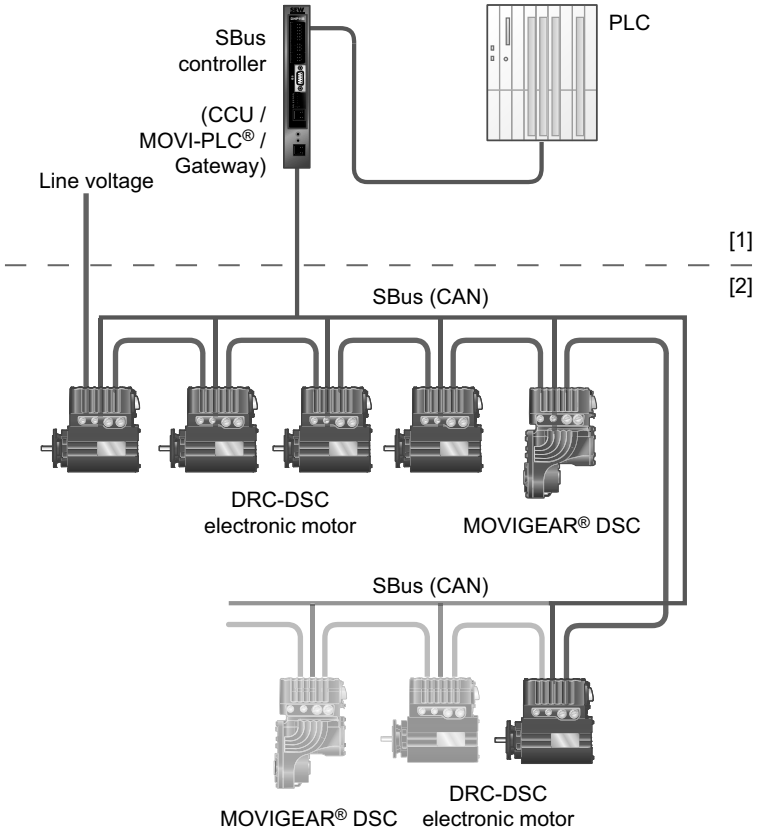
2.7.1 Description

DRC-DSC electronic motors with SEW system bus allow for the functional integration of the mechatronic drive system in applications close to the machine.

High performance and short response times distinguish this variant and enable reliable implementation of challenging drive tasks in the field of machine automation.

2.7.2 Topology

The following figure shows an installation topology with Direct SBus Installation:



5011246219

[1] Control cabinet level

[2] Field level

2.7.3 Features

- Integrated system interface. Permitted cable length between controller and last actuator when using the recommended hybrid cable:
  - 1 Mbaud: 25 m
  - 500 Kbaud: 50 m
- Fast communication for short cycle times
- Hybrid cable for minimum installation effort
- System bus controller for control cabinet or fieldbus installation with integrated PLC
- High drive dynamics and performance
- Optional motion control inputs (via plug connector) for local mode or sensor inputs

2.7.4 Application examples

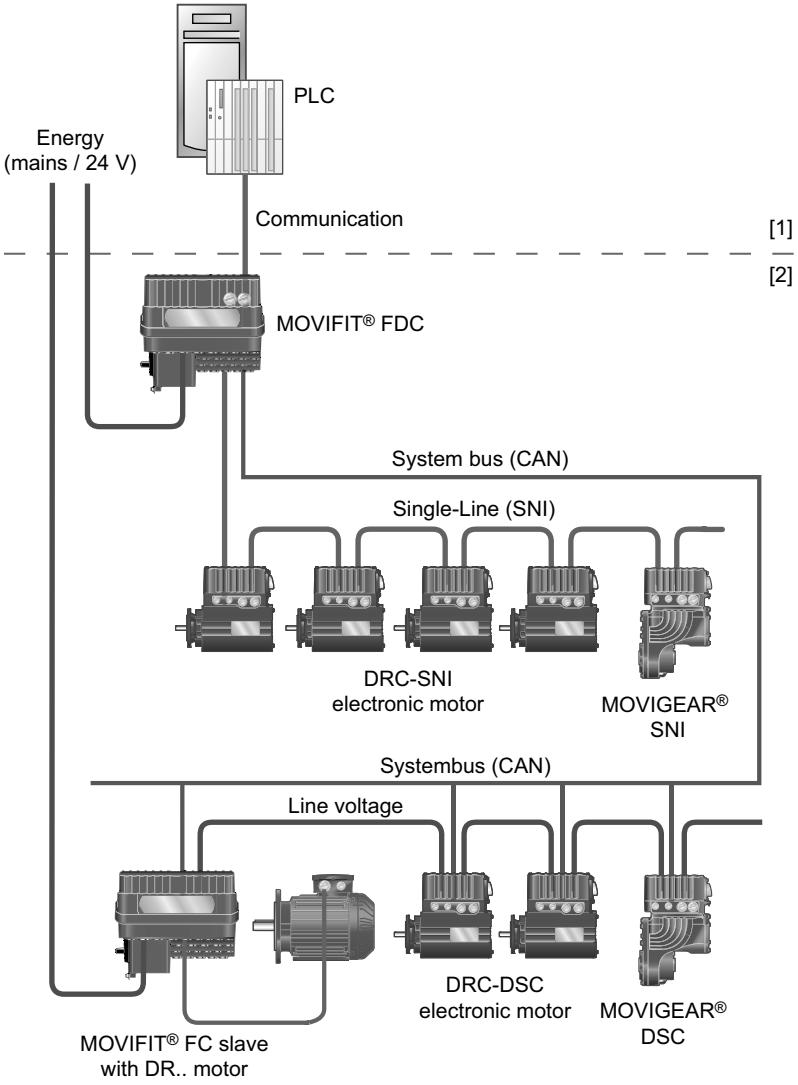
- Pallet conveyors
- Machine-integrated conveyor belts
- Feeding conveyors
- Synchronized feeder conveyors
- Reversing drives

2.7.5 Application options

- As a drive for applications with high breakaway and starting torques
- As a drive for conveyor systems that must be operated dynamically at varying speeds
- Forming intelligent function groups
- Universal application due to large control range of 1:2000
- Applications with/without STO safety function

2.8 Combined installation topology

The following figure shows a combined topology with single line network and SBus installation:



5011360907

[1] Control cabinet level

[2] Field level

2.9 SEW-EURODRIVE control technology – Overview

2.9.1 Flexible solutions for effective drive automation

Controlling motions efficiently and individually – this is at the focus of control technology from SEW-EURODRIVE for functional and economical automation of machines.

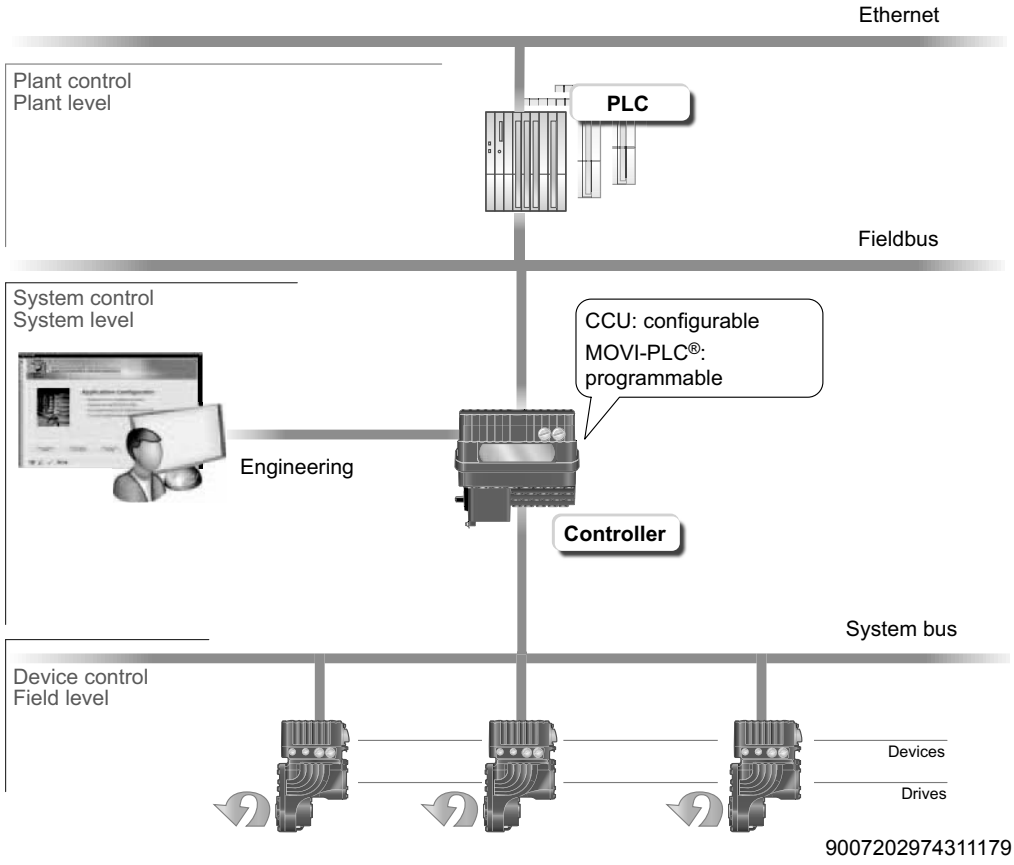
The control technology excels by offering a universal, scalable, and powerful range of controllers and software optimally matched to the drives and drive electronic components of the modular system. The practical benefits are great both in terms of functionality and cost effectiveness.

Control technology from SEW-EURODRIVE offers a wide variety of flexible components. These components can be combined to form efficient drive solutions that can be easily integrated into numerous automation concepts. In this way, new functional and economic potential can be created in many machine automation projects, including the reduction of investment and startup costs, production capacities, or any follow-up costs for maintenance and repair.

2.9.2 System overview

The following figure shows the basic system overview of control technology from SEW-EURODRIVE:

Controllers from SEW-EURODRIVE are available in "configurable" (CCU) or "programmable" (MOVI-PLC®) variants. In addition, the controllers offer different installation options (control cabinet installation or decentralized installation) and different performance classes.



2.10 Controllers/fieldbus gateways

2.10.1 MOVIFIT® FDC-SNI for controlling SNI actuators

INFORMATION

For detailed information about MOVIFIT® FDC, refer to chapter "Technical data of MOVIFIT® FDC".

The following figure shows a MOVIFIT® FDC-SNI unit and an DRC2 electronic motor:



5120831371

Features of MOVIFIT® FDC-SNI

- Up to 16 drive units can be connected, among them up to 10 SNI actuators
- **S**ingle **L**ine Network **I**nstallation – SNI
- Voltage range 3 x AC 380 – 500 V
- Easy data management with SD memory card
- Configurable application modules or free programming in accordance with IEC 61131-3
- Industrial Ethernet with the following protocols:
  - PROFINET
  - Ethernet/IP
  - Modbus TCP
- Service interfaces via
  - USB
  - Ethernet
- 12 binary inputs + 4 binary inputs/outputs
- Maintenance switch

SD memory card

The SD memory card in the EBOX serves for the central data management of MOVIFIT® FDC. It contains the firmware, the IEC program, and user data.

MOVIFIT® FDC is available with the following memory cards:

Short designation	SD card	
	Type	Feature
R95	OM**C**41B-T0	Parameterizable
R96	OM**H**41B-T0	Programmable

Configurable application controller (control card)

When using SD card OM**C**41B-T0, you can use MOVIFIT® FDC as configurable application controller (CCU).

You can then execute standardized application modules created by SEW-EURODRIVE. The application modules can be started up quickly and conveniently by graphical configuration.

Performance class CCU standard

The "CCU standard" performance class is intended for application modules with single-axis functionality and medium response times. A maximum of 16 axes (max. 10 of them SNI axes) can be connected to a configurable application controller.

The following application modules are available:

- Speed control
- Cam positioning
- Bus positioning with 6 process data
- Single-axis universal module

Performance class CCU advanced

Performance class "CCU advanced" is intended for application modules with single-axis and multi-axis functionality and fast response times. A maximum of 16 axes can be connected to a configurable application controller.

You can operate application modules with technology level T0 or higher.

Freely programmable motion and logic controller card (MOVI-PLC®)

When using SD card OM**H**41B-T0, you can use MOVIFIT® FDC as freely programmable motion and logic controller MOVI-PLC®.

MOVI-PLC® is a series of programmable motion and logic controllers. It allows drive solutions, logic processes and sequence controls to be automated simply and efficiently using IEC 61131-3 compliant programming languages.

- MOVI-PLC® is a **universal** solution because it is able to control the entire portfolio of SEW inverters and offers a simple upgrade to a more powerful MOVI-PLC® version, thanks to its universal execution of the programs.
- MOVI-PLC® is **scalable** due to several different hardware platforms (standard, advanced, etc.) and modular software concepts (libraries for numerous applications).
- MOVI-PLC® is **powerful** due to comprehensive technologies (such as electronic cam, synchronous operation) and the control of sophisticated applications.

MOVI-PLC® standard performance class

- The control card of the performance class "MOVI-PLC® Standard" enables coordinated single-axis movements and integration of external inputs/outputs as well as drive operator panels (DOP). This means the control card is suitable for use as a module controller or stand-alone controller for machines of medium complexity.

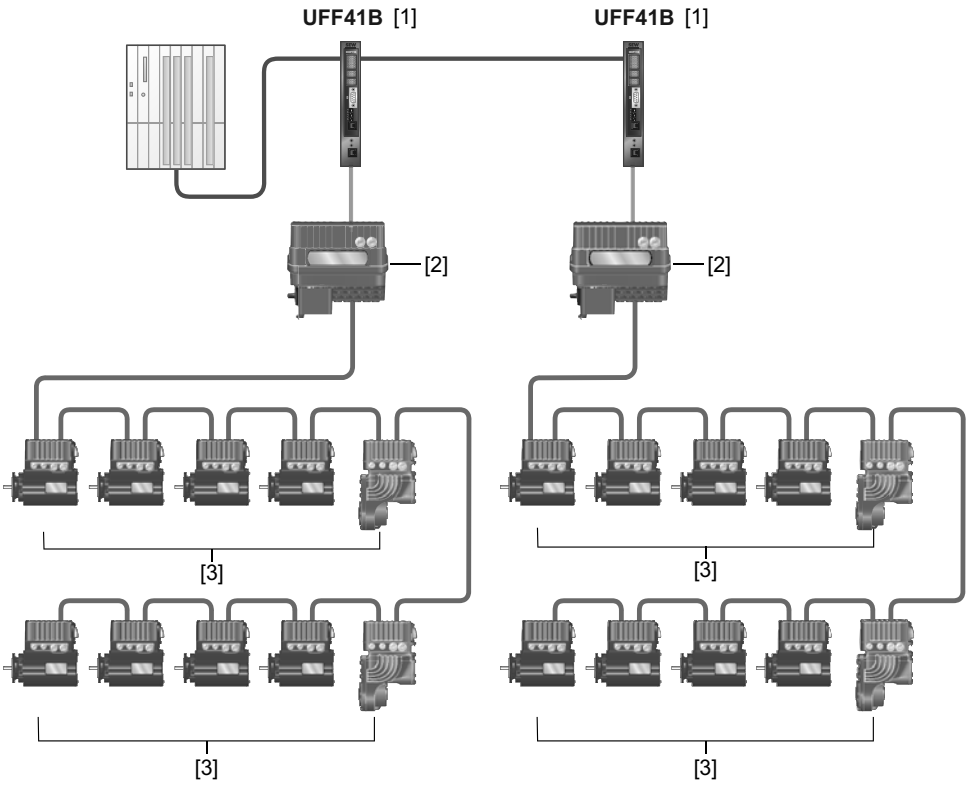
MOVI-PLC® advanced performance class

- The performance class "MOVI-PLC® advanced" is characterized by a greater variety of interfaces and a higher performance level, which allows complex calculations and interpolated movements, for example. This means the option is suitable for the automation of cells and machines. The integrated Ethernet interface enables direct connection of the DH.41B controller to the control level.

2.10.2 Fieldbus gateways for SNI actuators

For connecting a drive system with DRC-SNI or MOVIGEAR® SNI [4] to the PROFIBUS or DeviceNet fieldbus system, you can operate MOVIFIT® FDC [3] together with the UFF41B fieldbus gateway [1]. Configuration and parameter setting is carried out using a plug-in in MOVITOOLS® MotionStudio.

5011363211



[1] UFF41B fieldbus gateway with SD card OMG42B
[2] MOVIFIT® FDC
[3] SNI actuators

2.10.3 Controllers and fieldbus gateways for SBus actuators

The following products of SEW-EURODRIVE are available to connect a drive system with DRC-DSC® or MOVIGEAR® DSC to a fieldbus or Ethernet system.



2940861707

Fieldbus gateways (control cabinet installation)

The following table shows available variants:

	PROFIBUS	Interbus	DeviceNet
Bus systems	DFP21B/UOH DFS11B/UOH	UFI11A	DFD11B/UOH

	PROFINET	EtherNet/IP	Modbus TCP	EtherCAT slave
Industrial Ethernet	DFE32B/UOH DFS21B/UOH	DFE33B/UOH	DFE33B/UOH	DFE24B/UOH

Controller (control cabinet installation)

The following table shows available variants:

Variant	TYPE	Bus system / Industrial Ethernet
CCU / MOVI-PLC®	DHR21B DHR41B	PROFINET Ethernet/IP Modbus TCP
CCU / MOVI-PLC®	DHF21B DHF41B	PROFIBUS DeviceNet
MOVI-PLC®	DHE21B DHE41B	UDP

2.11 Configurable control technology with the Configurable Control Unit (CCU)

2.11.1 Easy configuration of applications

Control technology from SEW-EURODRIVE includes the configurable control unit (CCU) for easily configurable applications with standardized and immediately executable application modules, which merely have to be parameterized. The functions match the specific application and can be configured easily and quickly without any programming knowledge. An integrated diagnostic function enables quick and simple startup.

There is no faster way: Standardized and immediately executable application modules.

2.11.2 Application Configurator

The Application Configurator is a tool that lets users carry out configurations and diagnostics. This practice-oriented solution is independent of the required application module and the SEW-EURODRIVE drive and control components used. All applications are operated in the same easy manner.

2.11.3 Example of a Configurable Control Unit (CCU)

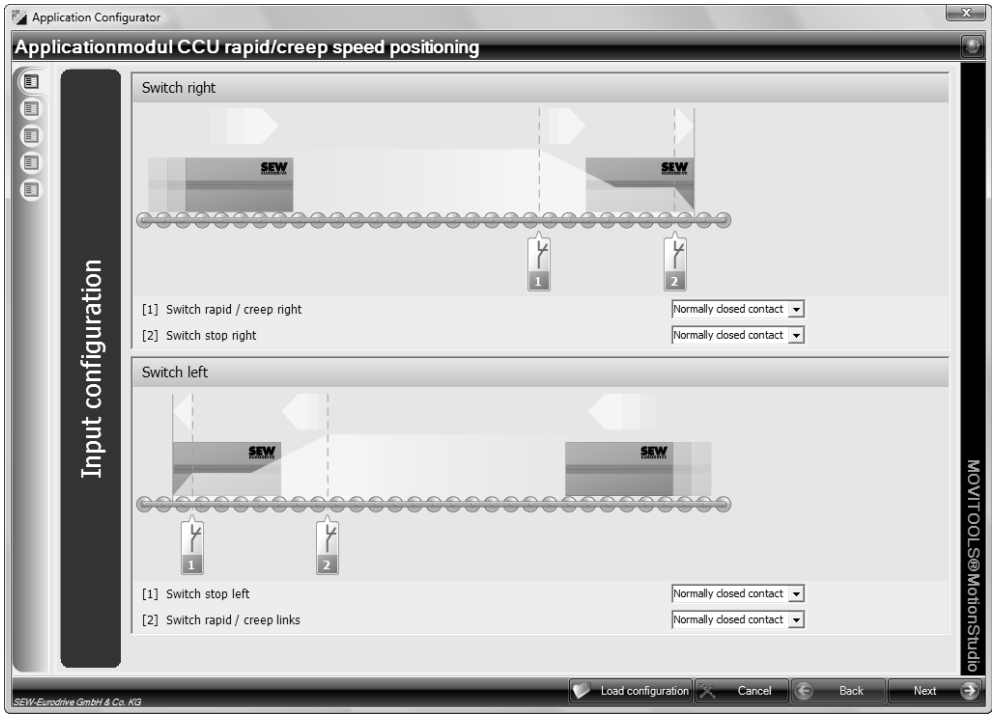
Rapid/creep speed positioning

The "rapid/creep speed positioning" application module is used for simple positioning tasks in materials handling technology (e.g. roller conveyor or rotary table).



3637572491

Positioning is carried out via 2 initiators with 2 speeds. The first initiator determines the switching point from rapid to creep speed, and the second one determines the stop position. Applications that must position in two directions require 4 initiators.



3652494731

The following operating modes are supported:

- Jog
- Feed-in (positioning)
- Feed-out
- Lifting/rotating

2.11.4 Application modules available for DRC electronic motor and MOVIGEAR®

INFORMATION

For detailed information about application modules, refer to the "Configuration Software – Application Configurator for CCU" manual.

The following table lists the permitted combinations of controller types and lower-level units:

Application module	Description	Controller (CCU)	Unit (actuator)
Speed control	The "Speed control" application module is used for speed-controlled applications without positioning.	DHF21B, DHR21B	DRC-DSC MOVIGEAR® B DSC
		DHF41B, DHR41B	DRC-DSC MOVIGEAR® B DSC
		MOVIPRO® ADC	DRC-DSC on SBus 2 MOVIGEAR® B DSC on SBus 2
		MOVIFIT® FDC-SNI	DRC-SNI MOVIGEAR® B SNI DRC-DSC on SBus 2 MOVIGEAR® B DSC on SBus 2
Rapid/creep positioning	The "Rapid/creep positioning" application module is used for simple positioning tasks in materials handling technology. This includes the following typical applications: • Roller and chain conveyors • Lifting table applications • Rotary table applications Positioning is carried out via 2 initiators with 2 speeds. The first initiator determines the switching point from rapid to creep speed, and the second one determines the stop position. Applications that must position in 2 directions require 4 initiators. The following operating modes are supported: • Jog • Inward conveyance (positioning) • Outward conveyance • Lifting/rotating	DHF21B, DHR21B	DRC-DSC MOVIGEAR® B DSC
		DHF41B, DHR41B	DRC-DSC MOVIGEAR® B DSC
		MOVIPRO® ADC	DRC-DSC on SBus 2 MOVIGEAR® B DSC on SBus 2
		MOVIFIT® FDC-SNI	DRC-SNI MOVIGEAR® B SNI DRC-DSC on SBus 2 MOVIGEAR® B DSC on SBus 2

Application module	Description	Controller (CCU)	Unit (actuator)
Bus positioning 6 PD	The "bus positioning" application module is used for variable positions in conjunction with different speeds and ramps. Positioning is carried out via the built-in motor encoder or an optional distance encoder. Only linear, absolute positioning is supported. You can work with user units. The following operating modes are supported: • Jog • Referencing • Positioning	DHF21B, DHR21B	DRC-DSC MOVIGEAR® B DSC
		DHF41B, DHR41B	DRC-DSC MOVIGEAR® B DSC
		MOVIPRO® ADC	DRC-DSC on SBus 2 MOVIGEAR® B DSC on SBus 2
		MOVIFIT® FDC-SNI	DRC-SNI MOVIGEAR® B SNI DRC-DSC on SBus 2 MOVIGEAR® B DSC on SBus 2
Universal module	The "Universal module" application module is used for all speed-controlled and positioning applications. Functional extensions such as synchronization or touch probe evaluation allow for a wide range of possible applications. The module comes equipped with a uniform process data interface that is simply extended if more functions are required. The profiles of the universal module are downward compatible. You can work with user units.	DHF21B, DHR21B	DRC-DSC MOVIGEAR® B DSC
		DHF41B, DHR41B	DRC-DSC MOVIGEAR® B DSC
		MOVIPRO® ADC	DRC-DSC on SBus 2 MOVIGEAR® B DSC on SBus 2
		MOVIFIT® FDC-SNI	DRC-SNI MOVIGEAR® B SNI DRC-DSC on SBus 2 MOVIGEAR® B DSC on SBus 2
Energy-efficient SRS	The "energy-efficient SRS" application module was developed to operate energy-efficient high-bay warehouses. The application module allows for energy savings of up to 25% due to optimized travel cycles of vertical lifting drive and horizontal travel drive. A simple interface allows for specifying the target positions and dynamic parameters for the lifting and travel axes. Integrated functions for buffer travel and slack rope detection. The IEC program controls up to 3 axes and can be used for the following devices: • MOVIAXIS® (incl. MXR regenerative power supply unit) • MOVIDRIVE®	DHF41B, DHR41B (Technology level T2)	Main axis: MOVIDRIVE® B MOVIAXIS®
			Auxiliary axis: DRC-B DSC MOVIGEAR® B DSC (with rapid/creep speed, speed control, bus positioning or universal module)

Application module	Description	Controller (CCU)	Unit (actuator)
Transparent	The "Transparent" application module is used when the process output data from the higher-level controller (PLC) is forwarded to the lower-level units via the configurable application controller (CCU). The same applies to the process data communication in the opposite direction. The process input data from the lower-level units is forwarded to the PLC via the CCU. The "Transparent" application module supports all the (IPOS^{plus}-based) application modules running directly on the inverter.	MOVIFIT®-FDC	MOVIFIT® FC slave (only Transparent 3PD)

3 Product Description

3.1 General notes on the product description

3.1.1 Ambient temperature

Gear units and gearmotors from SEW-EURODRIVE can be operated in a wide ambient temperature range. The following standard temperature ranges are permitted for filling the gear units according to the lubricant table:

Gear unit	Filled with	Permitted standard temperature range
R, F, and K	CLP(CC) VG220	-10 °C – +40 °C
W	CLP(SEW-PG) VG460	-10 °C – +40 °C

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

DRC gearmotors 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 – 25 °C in the intensive cooling range until up to +60 °C. Project planning must take special operating conditions into account and adapt the drive to the ambient conditions by selecting suitable lubricants and seals. SEW-EURODRIVE will gladly do the project planning for you.

3.1.2 Installation altitude

Due to the low air density at high installation altitudes, heat dissipation decreases on the surface of motors and gear units. The rated data listed in the catalog applies to an installation altitude of maximum 1000 m above sea level. Take account of this fact when carrying out the project planning of gear units and gearmotors above 1000 asl.

3.1.3 Power and torque

The power and torque ratings listed in the catalogs refer to mounting position M1 and similar mounting positions in which the input 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.

3.1.4 Noise

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

3.1.5 Painting

Gear units, motors and gearmotors from SEW-EURODRIVE are painted with "blue/gray"/RAL 7031 machine paint according to DIN 1843 as standard. Special paints are available on request.

3.1.6 Surface and corrosion protection

If required, all gear units, motors and gearmotors from SEW-EURODRIVE can also be supplied with special surface protection for applications in extremely humid and chemically aggressive environments.

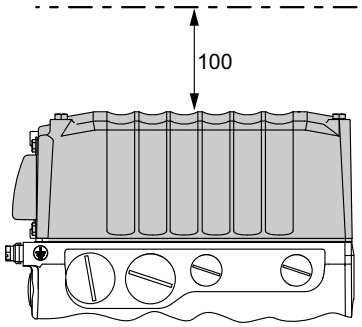
3.1.7 Weight information

Please note that all weights shown in the catalogs exclude the oil fill for gear units and gearmotors. The weights vary according to gear unit design and gear unit size. The lubricant fill depends on the mounting position selected, which means that in this case no universally applicable information can be given. Please refer to "Lubricants" in the "Design and operating notes" chapter for recommended lubricant fill quantities depending on the mounting position. For the exact weight, refer to the order confirmation.

3.1.8 Air admission and accessibility

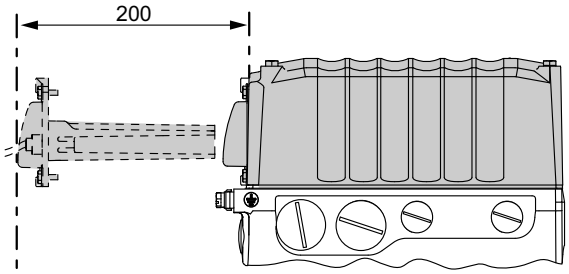
Make sure to maintain adequate distance from heat-sensitive components when installing gearmotors/brakemotors to the driven machine.

Keep a minimum installation clearance (see following figure) for removing the electronics cover.



9007201604838411

Keep a minimum installation clearance (see following figure) for installing and removing the application options.



9007201604871563

3.1.9 Multi-stage gearmotors

You can achieve particularly low output speeds by using multi-stage gear units or multi-stage gearmotors. Such a setup requires a helical gear unit or gearmotor on the input end as a second gear unit.

The motor power must be limited to match the maximum permitted output torque of the gear unit.

3.1.10 Reduced backlash version

Helical, parallel-shaft helical and helical-bevel gear units with reduced backlash are available as of gear unit size 37. The circumferential backlash of these gear units is considerably less than that of the standard versions so that positioning tasks can be solved with great precision. The circumferential backlash is specified in angular minutes ['] in the technical data. The circumferential backlash for the output shaft is specified without load (max. 1% of the rated output torque); the gear unit input end is blocked. The dimension drawings for the standard versions are applicable.

3.1.11 NOCO® fluid to prevent contact corrosion

As standard, all shaft-mounted gear units and gearmotors are supplied with NOCO® fluid, a paste that prevents contact corrosion. Use this paste in accordance with the instructions in the gear unit operating instructions. It facilitates service and stripping down jobs.

NOCO® fluid is food grade according to NSF-H1. You can tell that NOCO® fluid is a food grade oil by the NSF-H1 identification label on its packaging.

3.1.12 RM gear units, RM gearmotors

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

3.1.13 SPIROPLAN® right-angle gear units

SPIROPLAN® right-angle gear units 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 relationships and the aluminum housing. As a result, SPIROPLAN® right-angle gearmotors are wear-free, very quiet-running 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. As the oil filling is independent of the mounting position (except for SPIROPLAN® W..37 and W..47 in mounting position M4), SPIROPLAN® right-angle gear units can be installed in any mounting position without having to change the oil quantity. 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.

Two different flange diameters are available. On request, SPIROPLAN® right-angle gearmotors can be equipped with a torque arm.

3.1.14 Brakemotors

On request, DRC gearmotors can be supplied with an integrated mechanical brake. The SEW-EURODRIVE brake is an electromagnetic disk brake with a DC coil that releases electrically and brakes using spring force. Due to its operating principle, the brake is applied if the power fails. It meets the basic safety requirements. The brake is controlled by the inverter integrated in the DRC electronic motor.

3.1.15 International markets

On request, SEW-EURODRIVE supplies cUL registered motors and certified motors with combined CSA/UL approval.

3.2 Corrosion and surface protection

3.2.1 General information

SEW-EURODRIVE offers various optional protective measures for operating motors and gearmotors under special ambient conditions.

The protective measures consist of two groups:

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

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

In addition, special optional protective measures for the output shafts are available.

3.2.2 KS corrosion protection

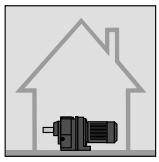
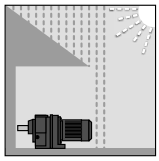
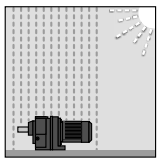
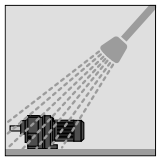
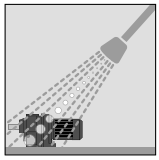
KS corrosion protection for motors comprises the following measures:

- All retaining screws that are loosened during operation are made of stainless steel.
- A top coating is applied to various motor parts.
- The flange contact surfaces and shaft ends are treated with a temporary anti-corrosion agent.
- Additional measures for brakemotors.

A sticker labeled KORROSIONSSCHUTZ (corrosion protection) indicates that special treatment has been applied.

3.2.3 OS surface protection

Instead of standard surface protection, DRC motors can be equipped with OS1 to OS4 surface protection as an option. The special procedure Z can also be performed in addition. Special measure Z means that large contour recesses are filled with rubber before painting.

Surface protection		Ambient conditions	Application examples
Standard		Suitable for machines and systems in buildings and rooms indoors with neutral atmospheres. Similar to corrosivity category[1]: • C1 (negligible)	• Machines and systems in the automobile industry • Conveyor systems in logistics areas • Conveyor systems at airports
OS1		Suited for environments prone to condensation and atmospheres with low humidity or contamination, such as applications outdoors under roof or with protection. Similar to corrosivity category[1]: • C2 (low)	• Systems in saw mills • Hall gates • Agitators and mixers
OS2		Suited for environments with high humidity or mean atmospheric contamination, such as applications outdoors subject to direct weathering. Similar to corrosivity category[1]: • C3 (moderate)	• Funiculars and chair-lifts • Applications in gravel plants
OS3		Suited for environments with high humidity and occasionally severe atmospheric and chemical contamination. Occasionally acidic or caustic wet cleaning. Also for applications in coastal areas with moderate salt load. Similar to corrosivity category:[1] • C4 (high)	• Sewage treatment works • 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. Similar to corrosivity category[1]: • C5-1 (very high)	• Drives in malting plants • Wet areas in the beverage industry • Conveyor belts in the food industry

1) According to DIN EN ISO 12 944-2

3.2.4 Special protective measures

The output shafts of the drive unit can be treated with special optional protective measures for operation subject to severe environmental pollution or in particularly demanding applications.

Measure	Protection principle	Suitable for
Fluorocarbon rubber oil seal (Viton®)	High quality material	Drives subject to chemical contamination
Coating on output shaft end	Surface coating of the contact surface of the oil seal	Severe environmental impact and in conjunction with fluorocarbon rubber oil seal (Viton®)
Output shaft made of stainless steel	Surface protection with high-quality material	Particularly demanding applications in terms of surface protection

3.2.5 NOCO® fluid

As standard, SEW-EURODRIVE supplies NOCO® fluid corrosion protection and lubricant with every hollow shaft gear unit. Use NOCO® fluid when installing hollow shaft gear units. Using this fluid 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 also order larger quantities of NOCO® fluid from SEW-EURODRIVE.

NOCO® fluid is food grade according to NSF-H1. You can tell that NOCO® fluid is a food grade oil by the NSF-H1 identification label on its packaging.

3.2.6 Resistance of OS4 surface treatment to cleaning agents

SEW-EURODRIVE had the resistance of the base coat and top coat of the OS4 surface coating independently tested and certified for cleaning agents and disinfectants from leading manufacturers.

Providing these recommended cleaning agents and disinfectants are used and that the specified cleaning intervals, temperatures and cleaning schedules are complied with, the best possible results can be achieved with ASEPTIC gearmotors in terms of service life and performance.

The following prerequisites were applied to the testing cycle:

- The testing cycle (1500 cycles) simulated daily cleaning according to product-specific instructions for a time period of five years.
- Evaluation took place approximately 7 days after regeneration.
- Evaluation of visual changes (color, degree of lustre) and changes in protective properties according to DIN EN ISO 4628-1.
- OS4 coating system on steel or aluminum base.
- Cleaning agents supplied by Henkel-ECOLAB®

Cleaning agents	Product specification	Major ingredients	Con-centra-tion	Load cycle	Test temper-ature	Decorative changes[1)]	Changes in protective properties[1)]
P3-topax 19	Alkaline foam cleaning agent	Alkalis, surfactants, complexing agents	3%	20 min	60 °C	1	0
P3-topax 56	Acid foam cleansing agent	Acids, surfac-tants, inhibitors	3%	20 min	60 °C	4	0
P3-topax 58	Acid foam cleaning agent based on organic acids	Surfactants, organic acids	5%	20 min	60 °C	0	0
P3-topax 66	Alkaline foam cleansing agent and disinfectant based on active chlorine	Alkalis, active chlorine, surfactants	5%	20 min	60 °C	2	0
P3-topax 68	Alkaline foam cleansing agent with active chlorine (suitable for aluminum)	Alkalis, active chlorine, surfactants	5%	20 min	60 °C	1	0
P3-topax 99	Alkaline foam disinfectant	Basis: Salts, organic acids	2%	20 min	60 °C	3	0
P3-topactive 200	Alkaline cleansing agent for operational cleansing as TFC application	Alkalis, surfac-tants, complexing agents	4%	20 min	60 °C	1	0
P3-topactive 500	Acid cleansing agent for operational cleansing as TFC application	Inorganic acids, surfactants	3%	20 min	60 °C	4	0
P3-oxonia	Disinfectant for closed systems	Basis: Hydrogen peroxide	1%	30 min	60 °C	1	0
P3-oxonia active	Disinfectant for closed systems	Basis: Hydrogen peroxide, peracetic acid	3%	10 min	20 °C	0	0
P3-topactive DES	Foam and TFC-capable disinfectant	Basis: Peracetic acid, surfactants	3%	30 min	20 °C	0	0
P3-oxysan ZS	Disinfectant for closed systems	Basis: Peroxide compounds	1%	30 min	20 °C	0	0

1) Assessment: 0 = No change, to 5 = Very severe changes

3.3 DRC drive units in ASEPTIC/ASEPTIC^{plus}design

3.3.1 Description

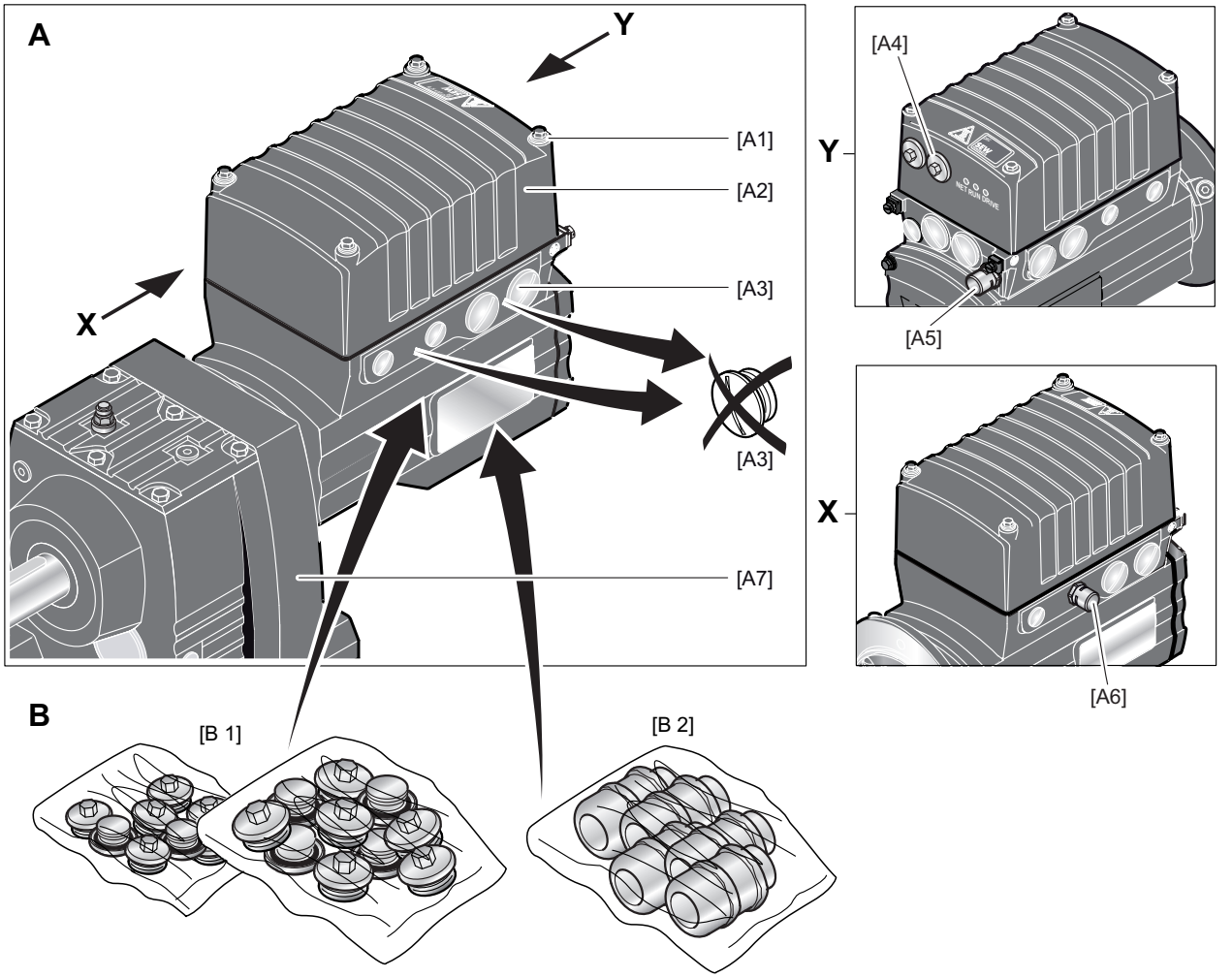
NOTICE

Loss of degree of protection IP66 and incompatibility with cleaning agents.

Possible damage to property.

- To achieve degree of protection IP66 and compatibility with cleaning agents, you have to replace the plastic screw plugs delivered as standard by suitable screw fittings made of stainless steel.

The following figure shows the additional characteristics of DRC drive units in ASEPTIC / ASEPTIC^{plus} design:



4765682443

All illustrations with ASEPTIC / ASEPTIC^{plus} design are displayed with a shading (= HP200 surface protection) in this publication

A **Scope of delivery**

[A1] Mounting screws for cover made of stainless steel

[A2] Surface protection OS2 to OS4 for ASEPTIC design / OS4 for ASEPTIC^{plus} design, see chapter "Technical data and dimension sheets"

[A3] The delivered plastic screw plugs must be replaced by suitable screw plugs made of stainless steel.

[A4] Screw plugs made of stainless steel in the electronics cover[1)]

[A5] / [A6] Factory-installed pressure compensation fitting (M16) The position depends on the mounting position and the position of the electronic cover.

Optional plug connectors (see chapter "Electrical installation") are available in connection with the ASEPTIC / ASEPTIC^{plus} design.

[A7] Features of gear units in ASEPTIC design

- Surface protection finish OS2 to OS4

Features of gear units in ASEPTIC^{plus} design

- Available for gear units with solid shaft, hollow shaft with key or TorqLOC® for the following gear unit sizes: R27-87, F27-87, K37-87 and W37-47
- Gear unit output shaft including all retaining parts on the output shaft, such as screws, keys, shrink disk, etc., are made of stainless steel
- If technically possible, the oil seals on the output are configured as double oil seals made from FKM (Viton®)
- The breather valve of the gear units is made from stainless steel
- Surface protection finish OS4 for compatibility with common cleaning agents and disinfectants
- All surface recesses sprayed with elastic rubber compound
- All gear unit options can be selected
- All mounting positions M1 to M6 are available

B **Required screw fittings**

[B1] Screw plugs made of stainless steel [2)]

[B2] Cable glands made of stainless steel [2)]

The required screw fittings can be ordered from SEW-EURODRIVE. For an overview, refer to chapter "Technical Data / Optional metal screw fittings".

1) Only in connection with DBC/DAC

2) Make sure to select plug seals that are compatible with the used cleaning agents

3.3.2 Mounting positions

DRC drive units in optional ASEPTIC / ASEPTIC^{plus} design are delivered with pressure compensation and breather valve installed according to the mounting position.

This is why DRC drive units in optional ASEPTIC / ASEPTIC^{plus} design must only be used in the mounting position specified in the order.

- Permitted cable entries

  In conjunction with ASEPTIC / ASEPTIC^{plus} design, the following cable entries are permitted depending on the mounting position and position of the electronics cover:

Permitted cable entries		Position of electronics cover			
		0° (R)	90° (B)	180° (L)	270° (T)
Mounting positions of gearmotors	M1	X / 3	X / 2 / 3	2 / 3	X / 2 / 3
	M2	X / 2 / 3			
	M3	2 / 3	X / 2 / 3	X / 3	X / 2 / 3
	M4	X / 2			
	M5	X / 2 / 3	2 / 3	X / 2 / 3	X / 3
	M6	X / 2 / 3	X / 3	X / 2 / 3	2 / 3
Mounting positions of stand-alone motors	B5	X / 3	X /2 / 3	2 / 3	X / 2 / 3
	V1	X / 2			
	V3	X / 2 / 3			

- Permitted mounting options in conjunction with DAC electronic version

  Depending on the position of the electronic cover, only the mounting positions marked in gray are permitted for the DAC electronic version in conjunction with ASEPTIC / ASEPTIC^{plus} design:

Permitted mounting options in conjunction with DAC electronic version		Position of electronics cover			
		0° (R)	90° (B)	180° (L)	270° (T)
Mounting positions of gearmotors	M1				
	M2				
	M3				
	M4				
	M5				
	M6				
Mounting positions of stand-alone motors	B5				
	V1				
	V3				

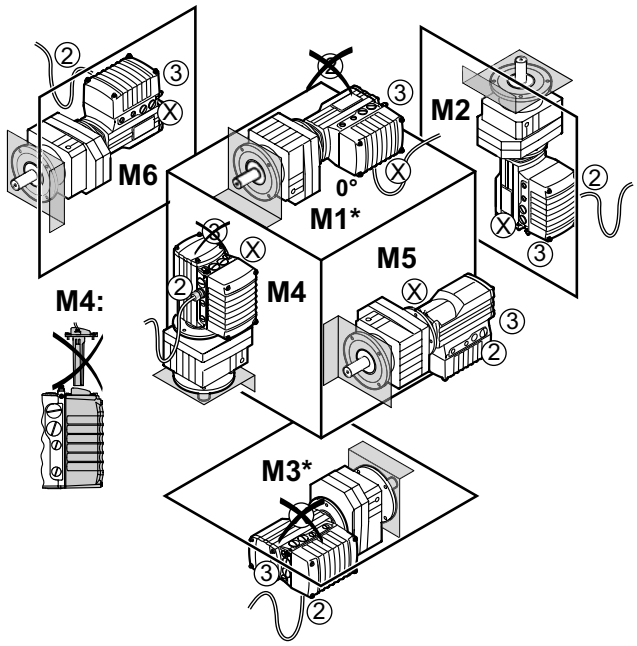
- Restrictions in conjunction with GIO... application options

  Application options are not possible in conjunction with ASEPTIC / ASEPTIC^{plus} design with mounting position M4 (V1).

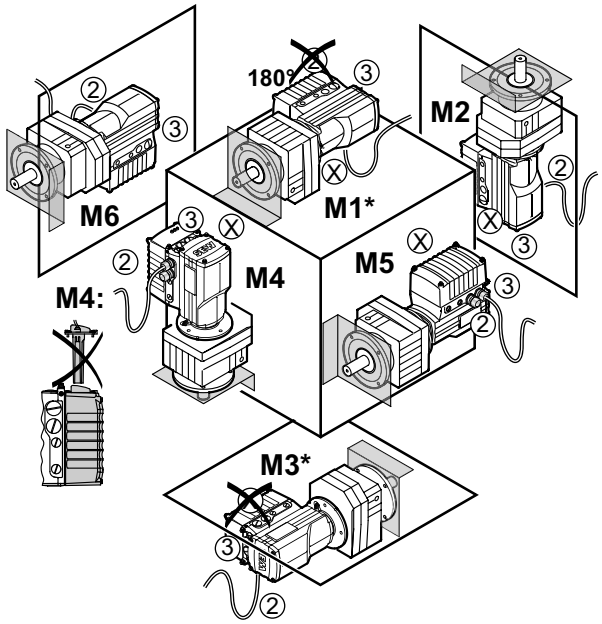
Mounting positions in conjunction with ASEPTIC / ASEPTIC^{plus} design

The following figure shows the position of the DRC drive unit when installed in mounting positions M1 to M6:

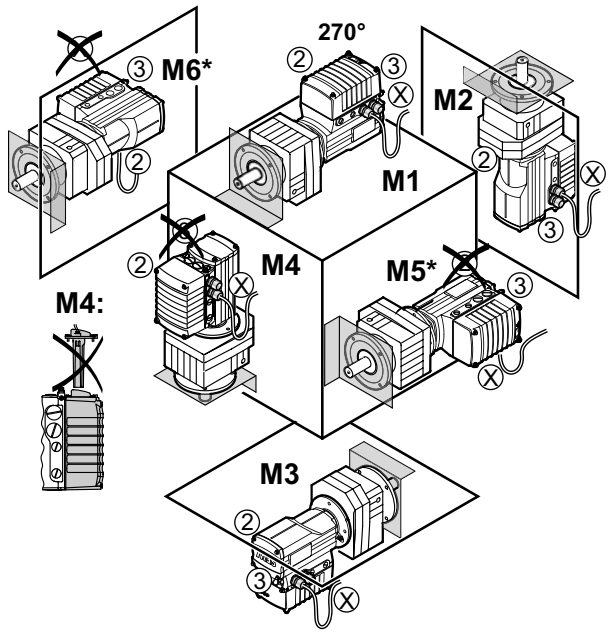
Position of electronics cover: 0°



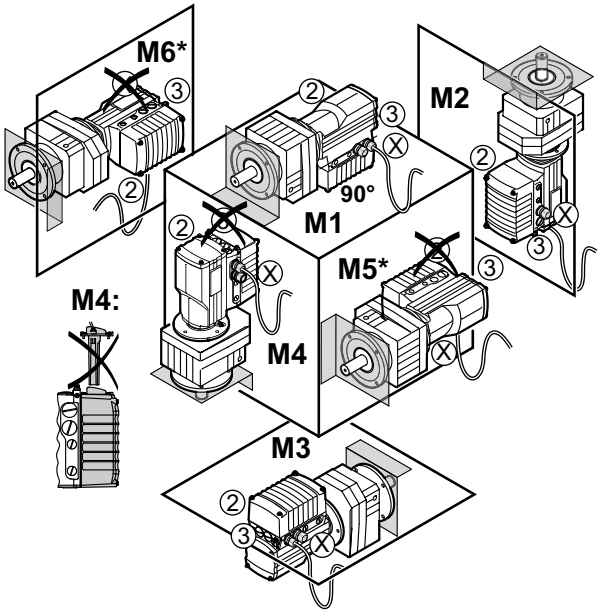
Position of electronics cover: 180°



Position of electronics cover: 270°



Position of electronics cover: 90°



9007204023324811

***** Mounting position not possible in conjunction with DAC electronic version.
Application options are not possible in conjunction with mounting position M4.

3.3.3 Surface protection

The properties of OS2 – OS4 in connection with ASEPTIC variants or OS4 in connection with ASEPTIC^{plus} variants are listed in chapter "Surface protection".

3.3.4 Cleaning

Do not mix cleaning and disinfecting agents under any circumstances!

Never mix acids and chloralkalis, as poisonous chlorine gas will result.

Strictly observe the safety instructions of the cleaning agent manufacturer.

3.3.5 Sealing material

Resistance to cleaning agents

The sealing material used in DRC motors has been tested for resistance to cleaning agents.

Resistance to the following cleaning agents was proven in the tests performed by the company ECOLAB®:

Alkaline and chlorinated alkaline foam cleaning agents		
Designation	**Application concentration**	**Application temperature**
P3-topax 12	5%	40 °C

Acid foam cleaning agents		
Designation	**Application concentration**	**Application temperature**
P3-topax 56	5%	40 °C
P3-topax 58	5%	40 °C

TFC cleaner		
Designation	**Application concentration**	**Application temperature**
P3-topactive 200	4%	40 °C
P3-topactive 500	4%	40 °C

Disinfectant		
Designation	**Application concentration**	**Application temperature**
P3-topax 990	5%	23 °C

DI water	–	40 °C

Product specifications:

P3-topax 19	Alkaline foam cleaning agent
P3-topax 56	Acid foam cleaning agent based on phosphoric acid
P3-topax 58	Acid foam cleaning agent based on organic acids
P3-topactive 200	Alkaline cleaning agent for operational cleaning as TFC application
P3-topactive 500	Acid cleaning agent for operational cleaning as TFC application
P3-topax 990	Alkaline foam disinfectant based on alkylamine acetate
DI water	Demineralized water

3.4 Extended storage

3.4.1 Variant

You can also order gear units designed for "extended storage". SEW-EURODRIVE recommends the extended storage type for storage periods longer than 9 months.

In this case, a VCI anti-corrosion agent (**v**olatile **c**orrosion **i**nhibitor) 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. If not specified otherwise in your order, the gear unit with extended storage option will be supplied with OS1 surface protection. Instead of OS1, you can order OS2, OS3 or OS4.

Surface protection	Suitable for
OS1	Low environmental impact
OS2	Medium environmental impact
OS3	High environmental impact
OS4	Very high environmental impact

INFORMATION

The gear units must remain tightly sealed until taken into operation to prevent the VCI corrosion protection agent from evaporating.

At the factory, the gear units are filled with oil to the appropriate level depending on the specified mounting position (M1 – M6). Always check the oil level before you take the gear unit into operation.

3.4.2 Storage conditions

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

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

1) The packaging must be carried out by an experienced company using the packaging materials that have been explicitly specified for the particular application.

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



3.5 Condition monitoring: Oil aging and vibration sensor

3.5.1 Diagnostic unit DUO10A (oil aging sensor)

Gear unit diagnostics via thermal analysis

The DUO10A diagnostic unit allows for diagnostic analysis as a means of preventive maintenance. The DUO10A diagnostic unit determines the individual, remaining service life of the oil based on the known service life curves and the oil temperature. The diagnostic unit consists of a temperature sensor and the actual evaluation unit. The remaining service life and the temperature of the oil can be read off via the display at the evaluation unit. The diagnostic unit is characterized by simple operation and user-friendly handling.

3.5.2 Diagnostic unit DUV10A (vibration sensor)

Rolling bearing diagnostics by means of vibration analysis

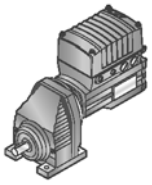
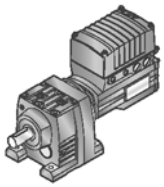
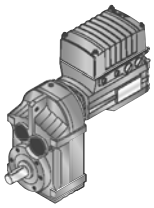
The DUV10A diagnostic unit monitors rolling bearings, gearings for imbalance, and possible damages. Vibration analysis is used to detect possible damages at an early stage. This device allows for permanent vibration monitoring. The condition and development of the damage can be directly read on the device, or can be visualized externally using switch outputs.

4 Type Designations and Variants

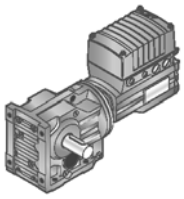
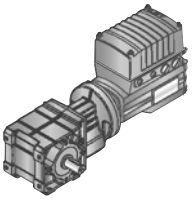
4.1 Overview of DRC drive units

The following tables give an overview of the most important technical data of DRC drive units.

4.1.1 Axially parallel gear units

	Drive unit	RX..DRC..	R..DRC..	F..DRC..
Technical data				
Max. short-term torque	M_{apk} [Nm]	8.6-137	22-1550	28-3090
Continuous output torque	M_a [Nm]	3.4-55	8.9-1550	11-1940
Max. overhung load in short-term duty	F_{Rapk} [N]	3940-13000	3690-20000	4500-30000
Max. overhung load in continuous duty	F_{Ramax} [N]	132-7500	790-20000	1180-29800
Gear ratio range	i	1.30-7.63	3.37-216.54	4.16-270.68
Option with reduced backlash	/R	-	x	x
Mechanical data				
Hollow shaft		-	-	x
Flange-mounted		x	x	x
Foot-mounted		x	x	-
B5 flange		x	x	x
B14 flange		-	x	x

4.1.2 Right-angle gear units

	Drive unit	K..DRC..	W..DRC..
Technical data			
Max. short-term torque	M_{apk} [Nm]	26-3130	20-215
Continuous output torque	M_a [Nm]	11-1250	8-180
Max. overhung load short-term duty	F_{Rapk} [N]	5710-30000	3690-8000
Max. overhung load continuous duty	F_{Ramax} [N]	1660-27300	2050-7580
Gear ratio range	i	3.98-174.19	3.20-74.98
Option with reduced backlash	/R	x	-
Mechanical data			
Hollow shaft		x	x
Flange-mounted		x	x
Foot-mounted		x	x
B5 flange		x	x
B14 flange		x	-

4.2 Type designations of gear units and options

4.2.1 Helical gear units

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

4.2.2 Parallel-shaft helical gear units

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

4.2.3 Helical-bevel gear units

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

4.2.4 SPIROPLAN® gear units

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

4.2.5 Gear unit options

R, F and K gear units:

Designation	
/R	Reduced backlash

K, S and W gear units:

Designation	
/T	With torque arm

F gear units:

Designation	
/G	With rubber buffer

4.2.6 Condition monitoring

Designation	Option
/DUO	Diagnostic Unit Oil = Oil aging sensor
/DUV	Diagnostic Unit Vibration = Vibration sensor

4.3 Type designations of electronic motor and options

4.3.1 Motor series

Designation	
DRC..	Electronic motor, Super Premium Efficiency (IE4)
...1 to 2	Sizes: 1 / 2
Number of poles	6 / 10

4.3.2 Mechanical additions

Designation	Option
/BY.C	Spring-loaded brake with specification of size

4.3.3 Thermistor/temperature detection

Designation	Option
None	One KTY84 - 130 sensor (standard)

4.3.4 Encoder

Designation	Option
/ECR	Extended control range (standard)

4.3.5 Connection options

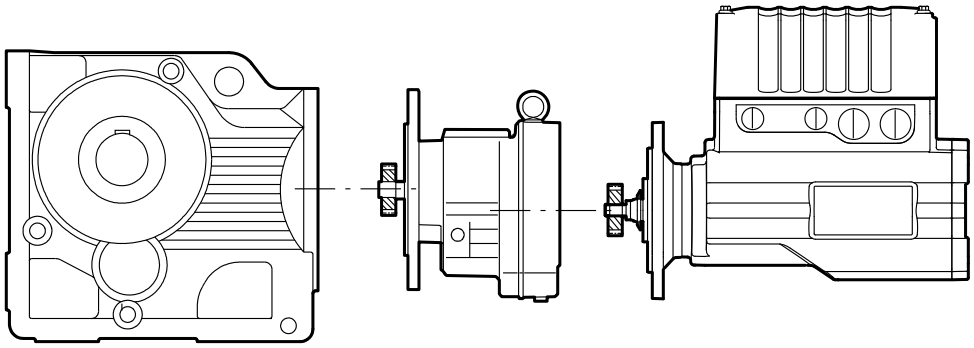
Designation	Option
/IV	Plug connector

4.3.6 Application options

Designation	Option
/GIO11B	Application option
/GIO12B	Application option

4.4 Example type designation of DRC drive units

The type designation of the gearmotor starts from the component on the output end. For example, a helical-bevel double gear unit has the following type designation:



KA107 R77 DRC

5012391051

KA 107 R 77 DRC 1 - 005 - DBC - A - ECR / IV

DRC option
IV = Plug connector
BY1C = Brake DRC1
BY2C = Brake DRC2
BW1 = Integrated braking resistor DRC1
BW2 = Integrated braking resistor DRC2

Extended control range (standard)

Version

DRC installation technology
DBC = Direct Binary Communication
DAC = Direct AS-Interface Communication
DSC = Direct SBus Communication
SNI = Single Line Network Installation

Power rating
005 = 0.55 kW
015 = 1.5 kW

Electronic motor size
1 = DRC1
2 = DRC2

Product line
DRC = Electronic motor

Gear unit size 77
Gear unit type R
2nd gear unit

Gear unit size 107
Gear unit type KA
1st gear unit

4.5 Example type designation of application options

The following table shows the type designation of application options:

G IO 1 2 B

Version

Variant
2 = 4 digital inputs + 2 digital outputs
3 = 4 digital inputs
(2 inputs can be used as primary frequency input)
+ 1 digital output
+ 1 analog input
+ 1 analog output

Version

Functionality
IO = Digital inputs/outputs

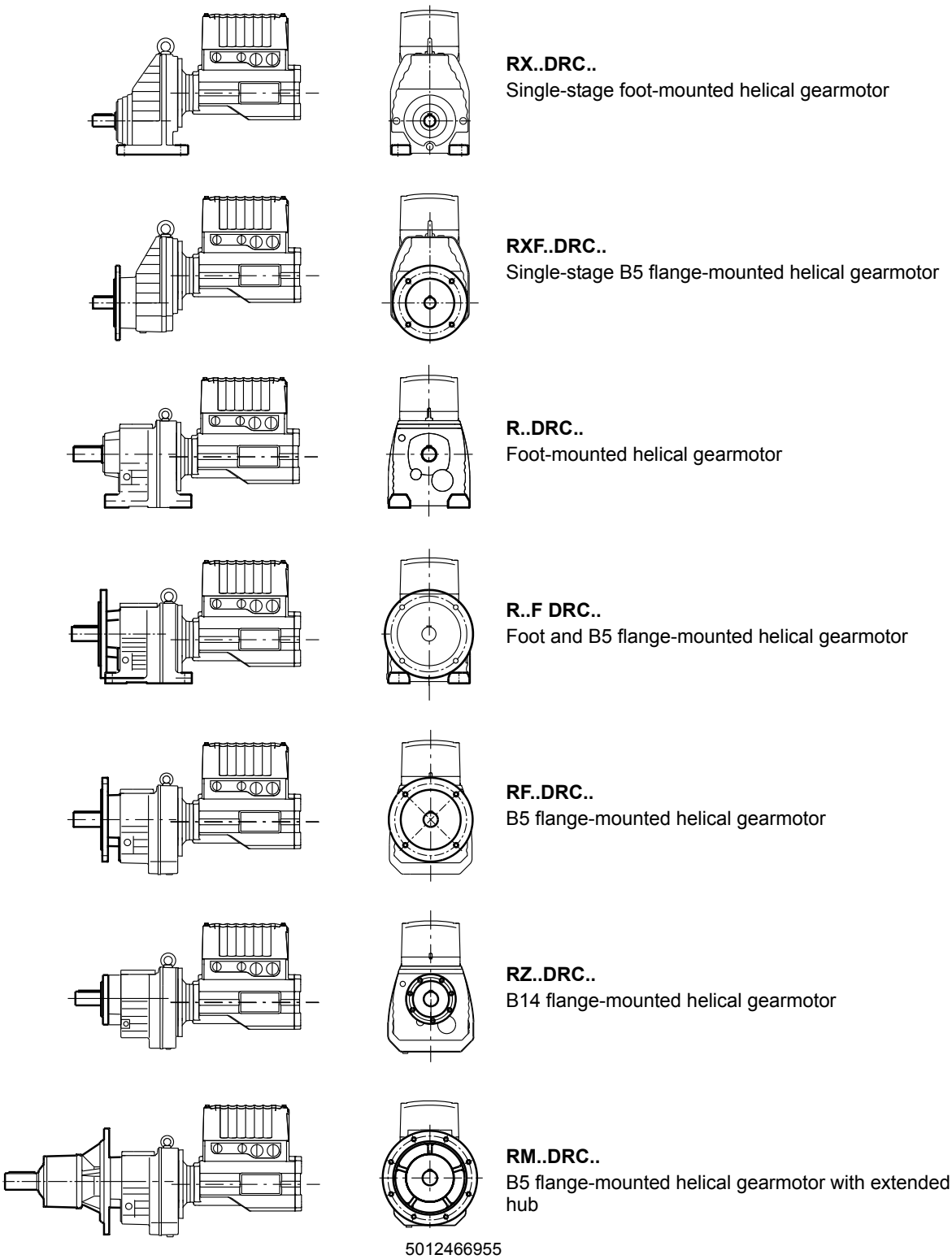
Product line
G = Option for MOVIGEAR® / DRC

4.6 Types

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

4.6.1 Helical gear units

The following types of helical gear units are available:



RX..DRC..
Single-stage foot-mounted helical gearmotor

RXF..DRC..
Single-stage B5 flange-mounted helical gearmotor

R..DRC..
Foot-mounted helical gearmotor

R..F DRC..
Foot and B5 flange-mounted helical gearmotor

RF..DRC..
B5 flange-mounted helical gearmotor

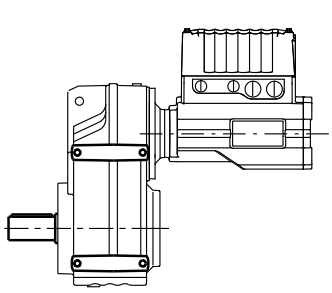
RZ..DRC..
B14 flange-mounted helical gearmotor

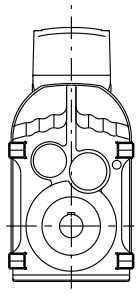
RM..DRC..
B5 flange-mounted helical gearmotor with extended bearing hub

5012466955

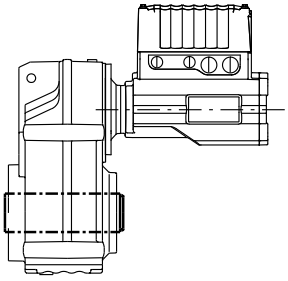
4.6.2 Parallel-shaft helical gear units

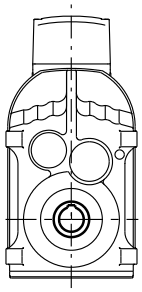
The following types of parallel-shaft helical gear units are available:





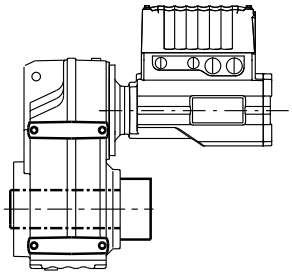
F..DRC..
Foot-mounted parallel-shaft helical gearmotor

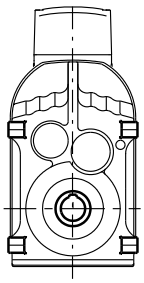




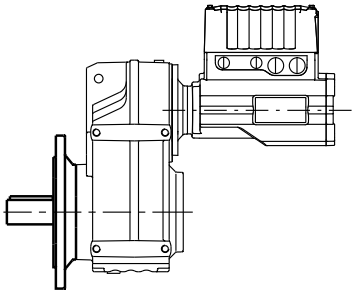
FA..B DRC..
Foot-mounted parallel shaft helical gearmotor with hollow shaft

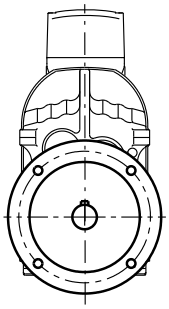
FV..B DRC..
Foot-mounted parallel shaft helical gearmotor with splined hollow shaft to DIN 5480



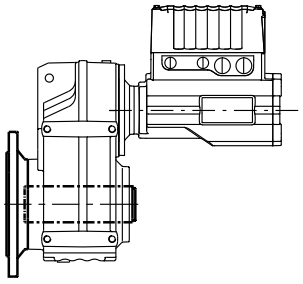


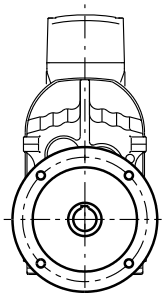
FH..B DRC..
Foot-mounted parallel shaft helical gearmotor with hollow shaft and shrink disk





FF..DRC..
B5 flange-mounted parallel shaft helical gearmotor

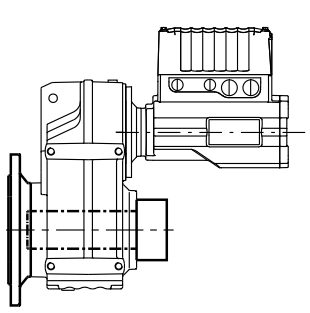


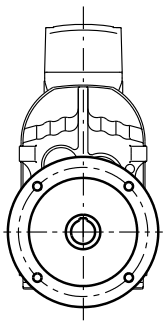


FAF..DRC..
B5 flange-mounted parallel shaft helical gearmotor with hollow shaft

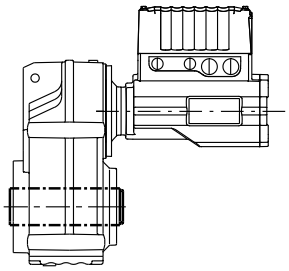
FVF..DRC..
B5 flange-mounted parallel shaft helical gearmotor with splined hollow shaft to DIN 5480

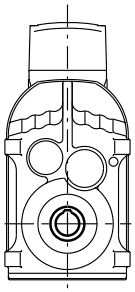
4287868683





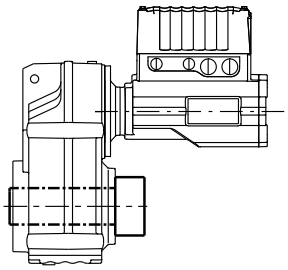
FHF..DRC..
B5 flange-mounted parallel shaft helical gearmotor with hollow shaft and shrink disk

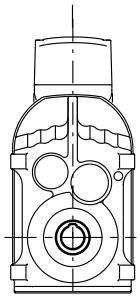




FA..DRC..
Parallel-shaft helical gearmotor with hollow shaft

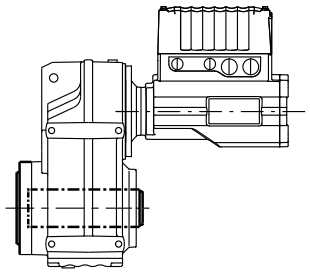
FV..DRC..
Parallel-shaft helical gearmotor with splined hollow shaft to DIN 5480

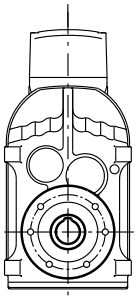




FH..DRC..
Parallel-shaft helical gearmotor with hollow shaft and shrink disk

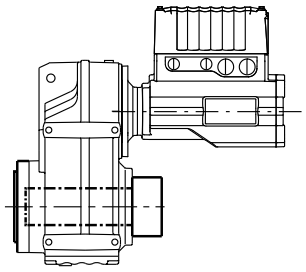
FT..DRC..
Parallel-shaft helical gearmotor with hollow shaft and TorqLOC® hollow shaft mounting system

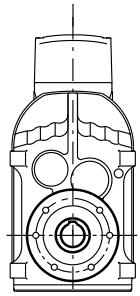




FAZ..DRC..
B14 flange-mounted parallel shaft helical gearmotor with hollow shaft

FVZ..DRC..
B14 flange-mounted parallel shaft gearmotor with splined hollow shaft to DIN 5480



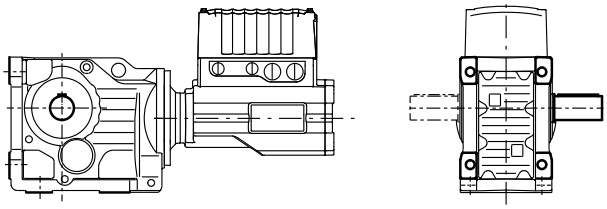


FHZ..DRC..
B14 flange-mounted parallel shaft helical gearmotor with hollow shaft and shrink disk

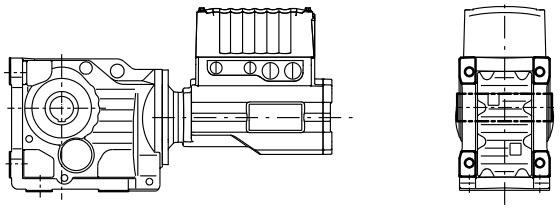
5012734731

4.6.3 Helical-bevel gear units

The following types of helical-bevel gear units are available:

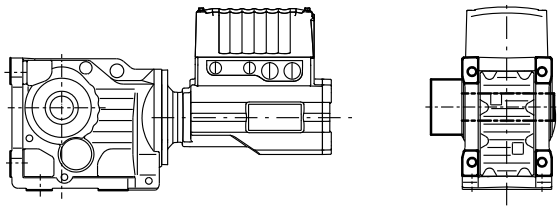


K..DRC..
Foot-mounted helical-bevel gearmotor

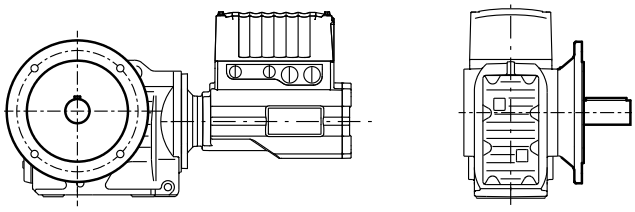


KA..B DRC..
Foot-mounted helical-bevel gearmotor with hollow shaft

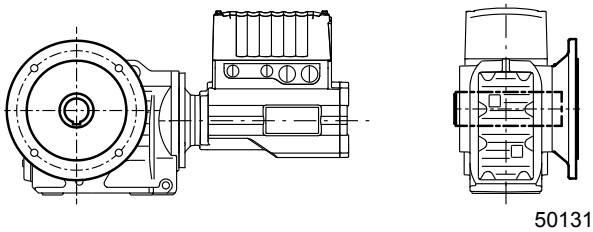
KV..B DRC..
Foot-mounted helical-bevel gearmotor with splined hollow shaft to DIN 5480



KH..B DRC..
Foot-mounted helical-bevel gearmotor with hollow shaft and shrink disk



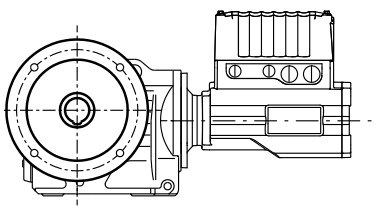
KF..DRC..
B5 flange-mounted helical-bevel gearmotor

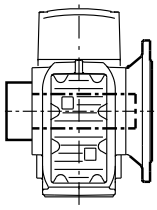


KAF..DRC..
B5 flange-mounted helical-bevel gearmotor with hollow shaft

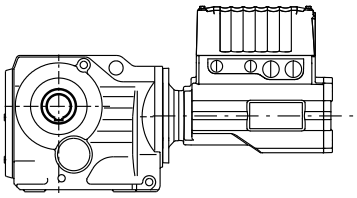
KVF..DRC..
B5 flange-mounted helical-bevel gearmotor with splined hollow shaft to DIN 5480

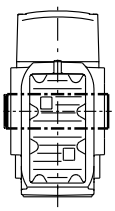
5013132683





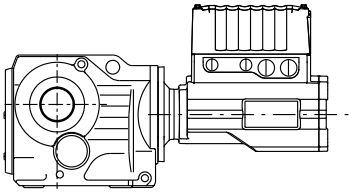
KHF..DRC..
B5 flange-mounted helical-bevel gearmotor with hollow shaft and shrink disk

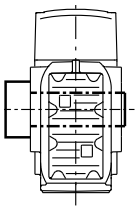




KA..DRC..
Helical-bevel gearmotor with hollow shaft

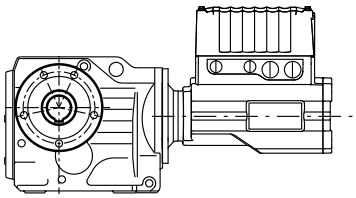
KV..DRC..
Helical-bevel gearmotor with splined hollow shaft to DIN 5480

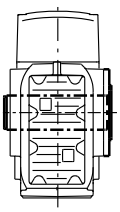




KH..DRC..
Helical-bevel gearmotor with hollow shaft and shrink disk

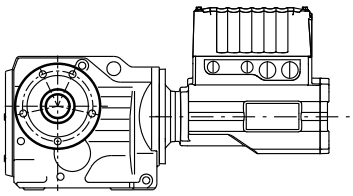
KT..DRC..
Helical-bevel gearmotor with hollow shaft and TorqLOC® hollow shaft mounting system

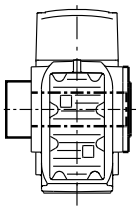




KAZ..DRC..
B14 flange-mounted helical-bevel gearmotor with hollow shaft

KVZ..DRC..
B14 flange-mounted helical-bevel gearmotor with splined hollow shaft to DIN 5480



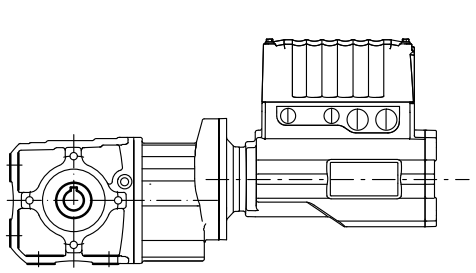


KHZ..DRC..
B14 flange-mounted helical-bevel gearmotor with hollow shaft and shrink disk

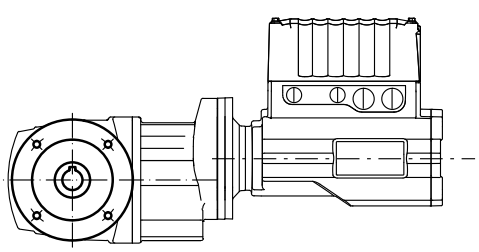
5013134731

4.6.4 SPIROPLAN® gear units

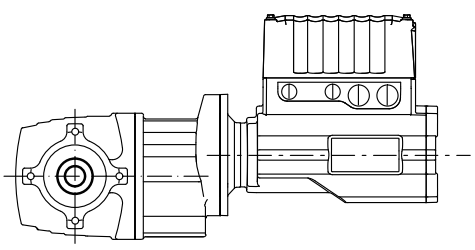
The following types of SPIROPLAN® gearmotors are available:



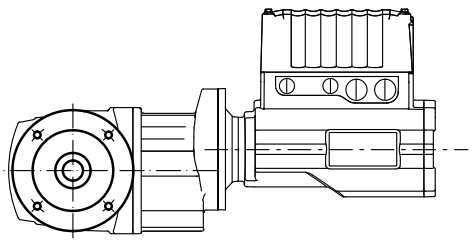
W..DRC..
Foot-mounted SPIROPLAN® gearmotor



WF..DRC..
Flange-mounted SPIROPLAN® gearmotor

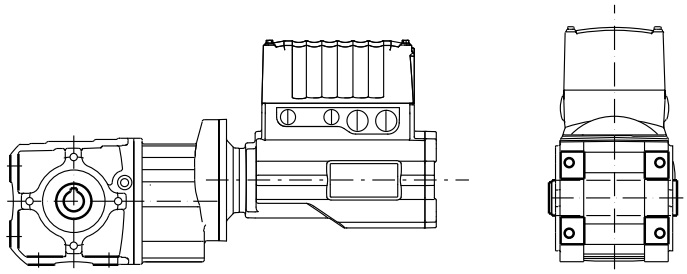


WA..DRC..
SPIROPLAN® gearmotor with hollow shaft

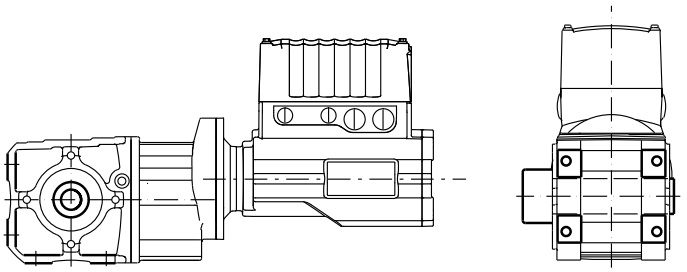


WAF..DRC..
Flange-mounted SPIROPLAN® gearmotor with hollow shaft

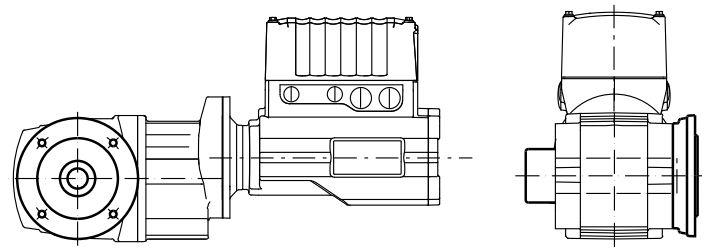
5013139083



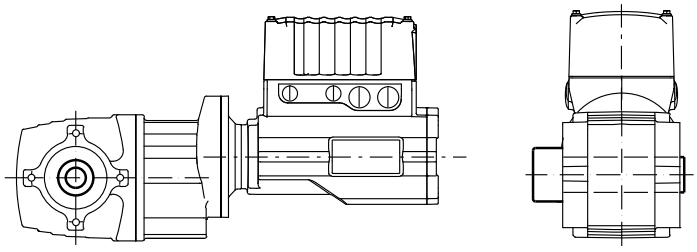
WA..B DRC..
Foot-mounted SPIROPLAN® gearmotor with hollow shaft



WH..B DRC..
Foot-mounted SPIROPLAN® gearmotor with hollow shaft and shrink disk



WHF..DRC..
Flange-mounted SPIROPLAN® gearmotor with hollow shaft and shrink disk



WH..DRC..
SPIROPLAN® gearmotor with hollow shaft and shrink disk

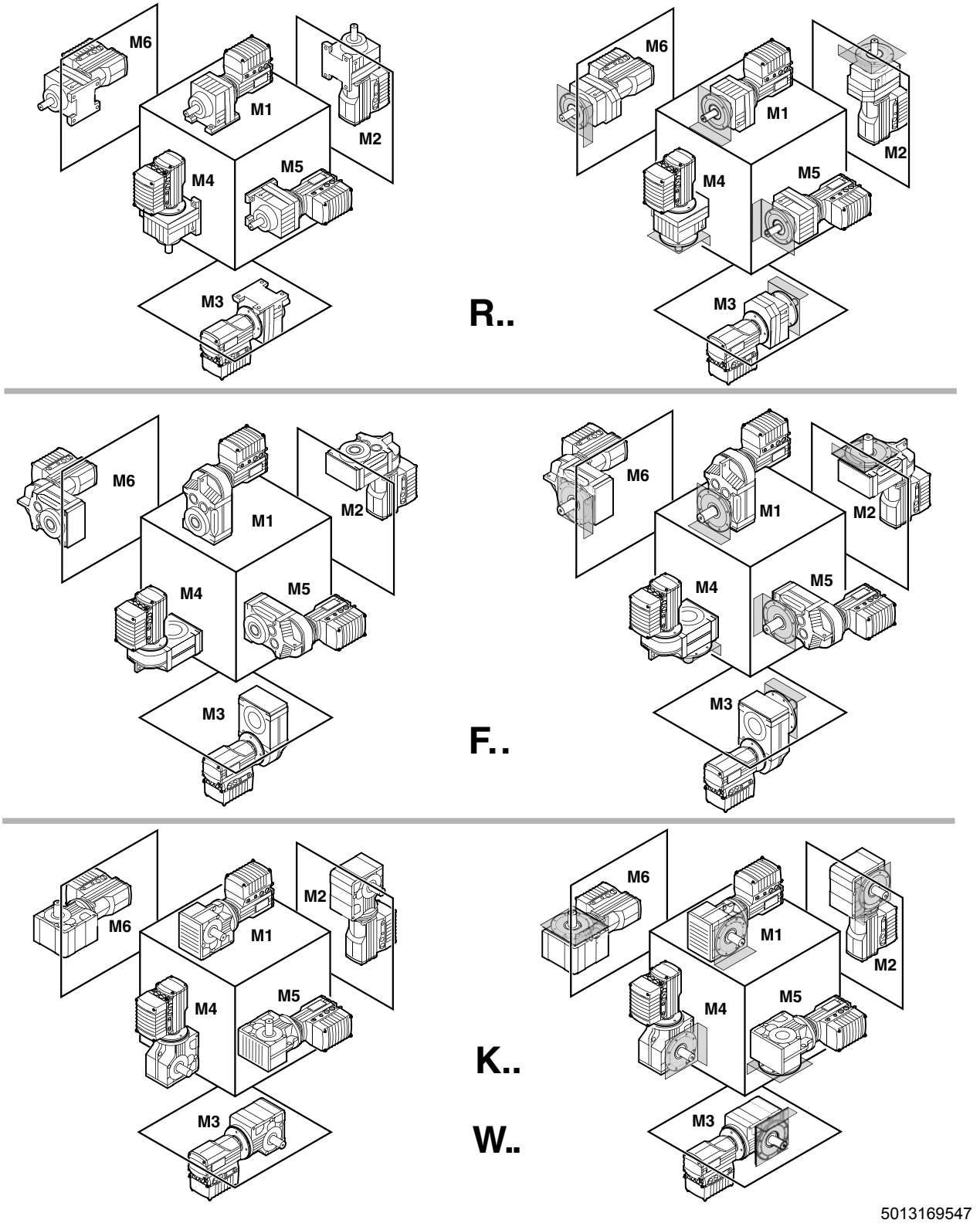
WT..DRC..
SPIROPLAN® gearmotor with hollow shaft and TorqLOC®

5013141515

5 Mounting Positions and Important Order Information

5.1 General information on the mounting positions of R, F, K, S, W gear units

SEW-EURODRIVE distinguishes between the six mounting positions M1 to M6 for DRC gearmotors. The following figure shows the spatial orientation of the gearmotor in mounting positions M1 to M6:



5013169547

5.2 Important order information

INFORMATION

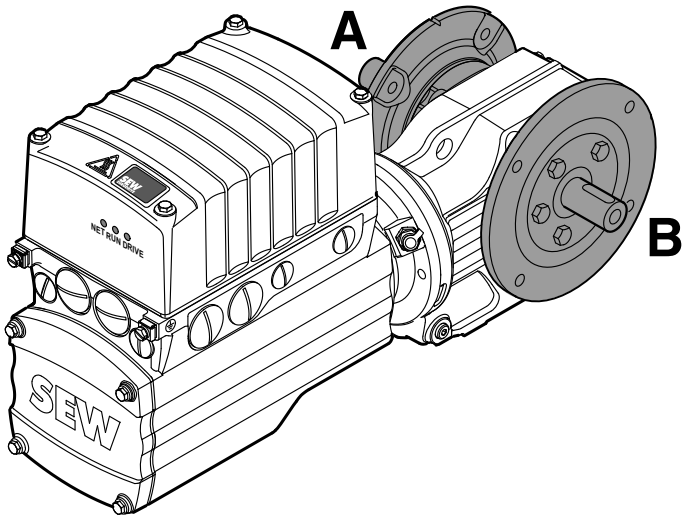
The following order information is required for R, F, and K gearmotors in addition to the mounting position to exactly determine the design of the drive.

This information is also required for Spiroplan® gearmotors (W gearmotors) that do not depend on a particular mounting position.

5.2.1 Position of output shaft and 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

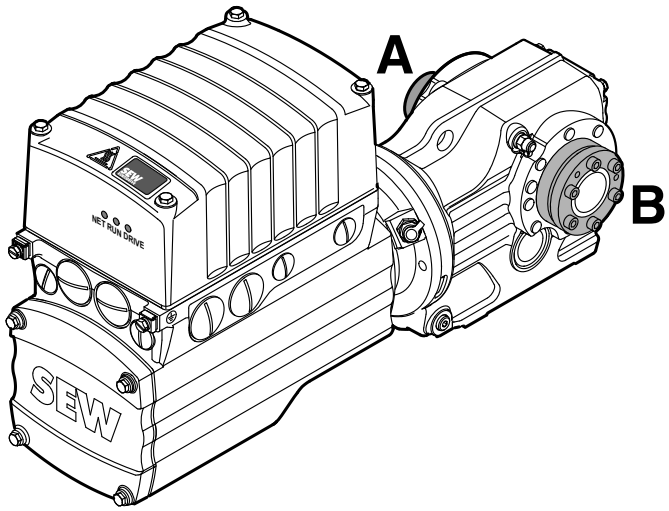


5013237643

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

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

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



5013258379

INFORMATION

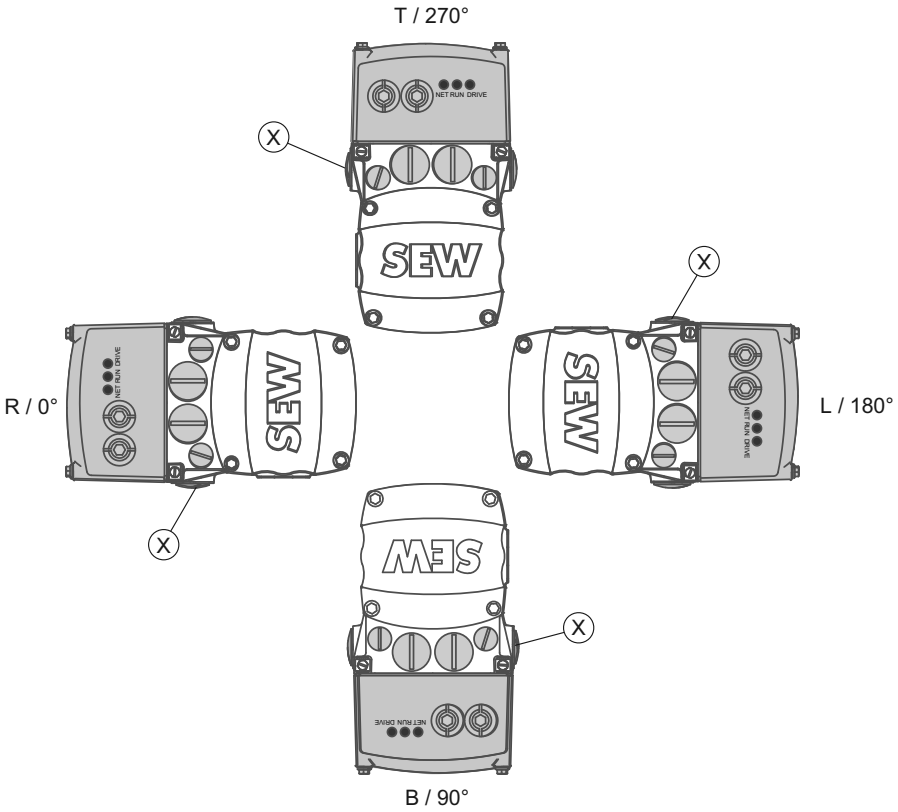
Refer to the mounting position sheets for permitted mounting surfaces (= hatched area).

5.2.3 Position of electronics cover and cable entry

The position of the electronics cover has so far been specified with 0°, 90°, 180° or 270° as viewed onto the fan guard = B end. A change in the product standard EN 60034 specifies that the following designations have to be used for terminal box positions for motors:

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

This new designation applies to motors without gear unit. The previous designation is maintained for gearmotors. The following figure shows both designations. Where the mounting position of the motor changes, R, B, L and T are rotated accordingly. For DRC gearmotors in mounting position M3, T / 270° is at the bottom.



5018727051

Unless indicated otherwise, you will receive the electronics cover type 0° with "X" cable entry.

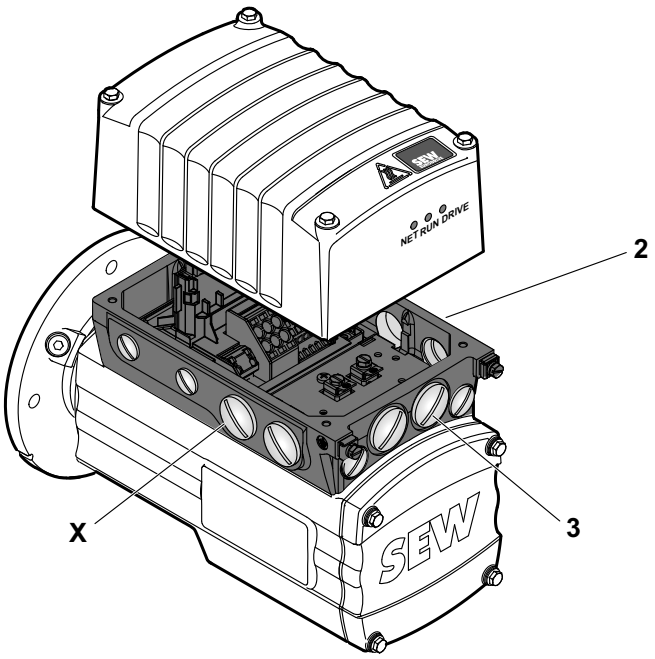
INFORMATION

When the terminal box is in the 90° (B) position, check whether the gearmotor has to be supported.

For FH/FT gear units, electronics cover position 90° is not possible.

The DRC electronic motor generally comes equipped with the following cable entries [1]:

- Position X + 2 + 3
  - X: 2 x M25 x 1.5 + 2 x M16 x 1.5
  - 2: 2 x M25 x 1.5 + 2 x M16 x 1.5
  - 3: 2 x M25 x 1.5 + 2 x M16 x 1.5



9007203301611787

5.2.4 Software support

In some cases, not all positions of the electronics cover [0°(R), 90°(B), 180°(L), 270°(T)] are possible.

For a thorough check of the possible positions of your drive, you can use the DRIVECAD software in DriveGate on the SEW-EURODRIVE website.

- If you are already a registered DriveGate user: https://portal.drivegate.biz/drivecad
- If you are not registered: www.sew-eurodrive.com → DriveGate login

5.2.5 Sample orders

Type (examples)	Mounting position	Shaft position	Flange position	Position of electronics cover	
K47DRC1-005-DSC-A-ECR	M2	Order confirmation	-	0°	(R)
KA87DRC2-015-SNI-A-ECR	M4	B	-	270°	(T)
KHF57DRC2-015-SNI-A-ECR	M1	A	A	180°	(L)
WF37DRC1-005-DBC-A-ECR	-	A	A	270°	(T)
WA47DRC2-015-DAC-A-ECR	-	Order confirmation	-	0°	(R)

1) 1 x M16 x 1.5 reserved for pressure compensation fitting (only in conjunction with ASEPTIC/ASEPTIC^{plus} variants as well as brakemotors operated at ambient temperatures of < 20 ° C)

5.2.6 Type of electronics

The following types of electronics are available for DRC drive units:

- **Installation technology**

  You can order DRC drive units with the following installation technology:

  – DBC = **D**irect **B**inary **C**ommunication

  – DAC = **D**irect **A**S-Interface **C**ommunication

    For DRC-DAC, you can choose between the variants binary slave GLK30 or double slave GLK31.

  – DSC = **D**irect **S**Bus **C**ommunication

  – SNI = **S**ingle Line **N**etwork **I**nstallation

  Refer to the "Startup" chapter for additional information on the setpoint source.

- **Electronics cover variant**

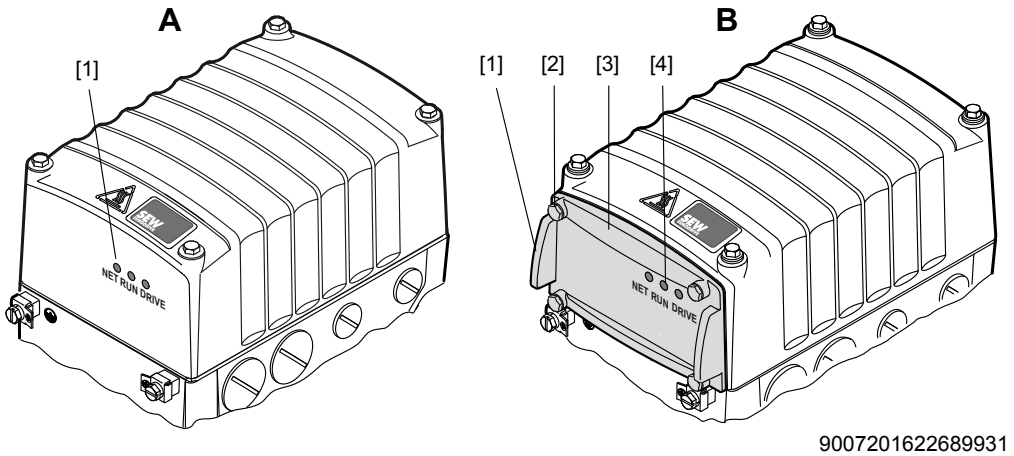
  The following types of electronics covers of DRC-DSC and DRC-SNI units are available for all sizes (DRC1 and DRC2):

  – Electronics cover without application slot

  – Electronics cover with application slot and application cover (for integrating application options)

  The electronics cover of DRC-DBC and DRC-DAC is designed without application slot.

  The following figure shows possible types of the electronics cover:



9007201622689931

A Electronics cover without application slot
[1] LED displays

B Electronics cover with application slot
[1] Assembly/disassembly handle
[2] Retaining screws (4x)
[3] Application cover
[4] LED displays

For an overview of available application options, refer to the "Example type designations of application options" chapter.

5.2.7 Plug connectors

The DRC electronic motor is supplied without plug connector unless specified otherwise in the order. Exception: DRC-DAC electronic motors are supplied with the following plug connectors as standard:

- X4271: AS-Interface communication interface
- X5011: AS-Interface sensors

For more information, see the chapter "Technical data of DRC electronic motors".

Plug connector variant



⚠ NOTICE

Possible damage of the right-angle connector in case of rotation without mating connector.

Irreparable damage to the thread, damage to the sealing surface.

- Do not use pliers to adjust the right-angle connector before connecting it.



⚠ NOTICE

Adjusting the right-angle connector too often can damage it.

Potential damage to property

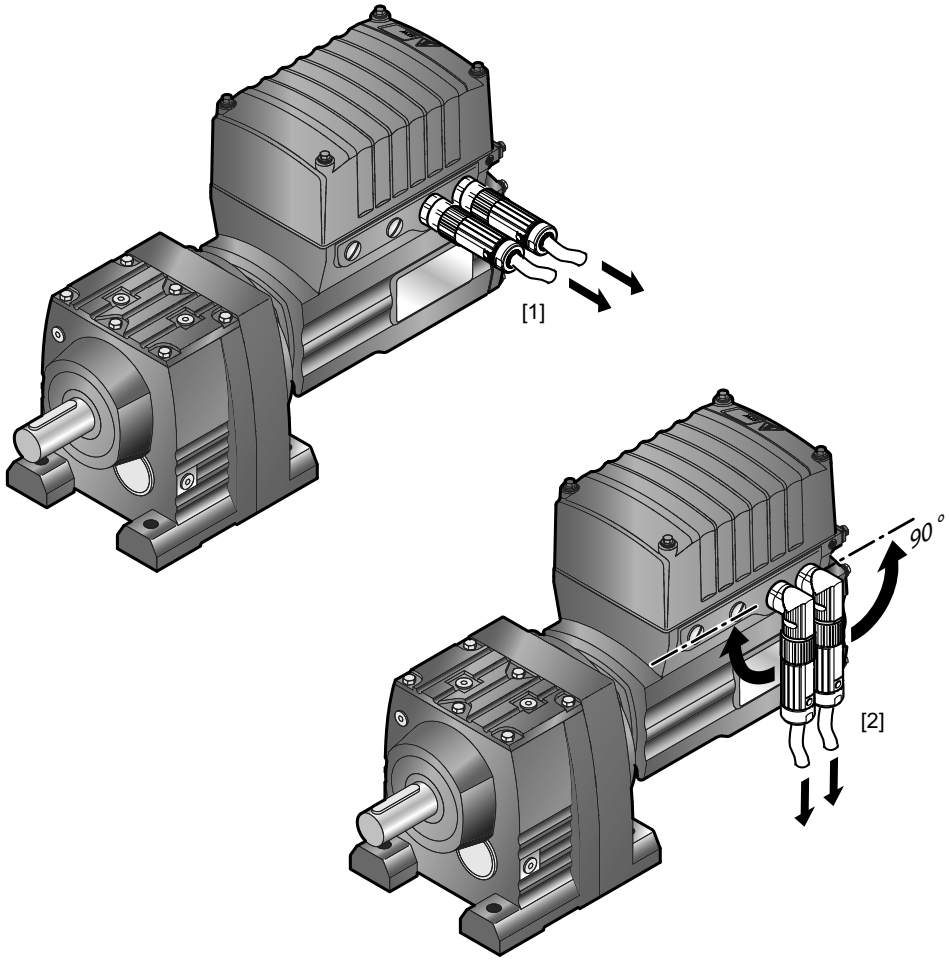
- Adjust the plug connector only when installing and connecting the drive unit.
- Make sure the plug connector is not turned regularly once it has been installed.

M23 plug connectors are available in the following variants:

- [1] "Straight" plug connector variant
- [2] "Right-angle" plug connector variant

Once the mating connector has been plugged in, the "right-angle" connector can be adjusted without using additional tools.

Example



9007203327550219

INFORMATION

The "right-angle" plug connector variant is not possible when using plug connector position 3.

5.2.8 Change in mounting position

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

- Adjust lubricant fill quantity to match the new mounting position
- Adjust the position of the breather valve and, if necessary, of the pressure compensation fitting.
- For helical-bevel gearmotors: Contact SEW-EURODRIVE customer service prior to changing to mounting position M5 or M6 and when changing from M5 to M6 or vice versa.

5.2.9 ASEPTIC design

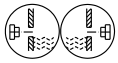
ASEPTIC or ASEPTIC^{plus} design is available for applications in wet areas.

Observe the notes in chapter "Product description/DRC drive units in ASEPTIC/ ASEPTIC^{plus} design".

5.3 Key to the mounting positions

5.3.1 Symbols used

The following table shows the symbols used in the mounting position sheets and what they mean:

Symbol	Meaning
	Breather valve
	Oil level plug[1)]
	Oil drain plug

1) Does not apply to the 1st gear unit (large gear unit) when using double gear units

5.3.2 Churning losses

Churning losses can occur in some mounting positions. Contact SEW-EURODRIVE in case of the following combinations:

Mounting position	Gear unit type	Gear unit size	Input speed [rpm]
M2, M3, M4, M5, M6	K	77 ... 87	> 1500

5.3.3 Displayed shaft

Note the following information regarding display of shafts in the mounting position sheets:

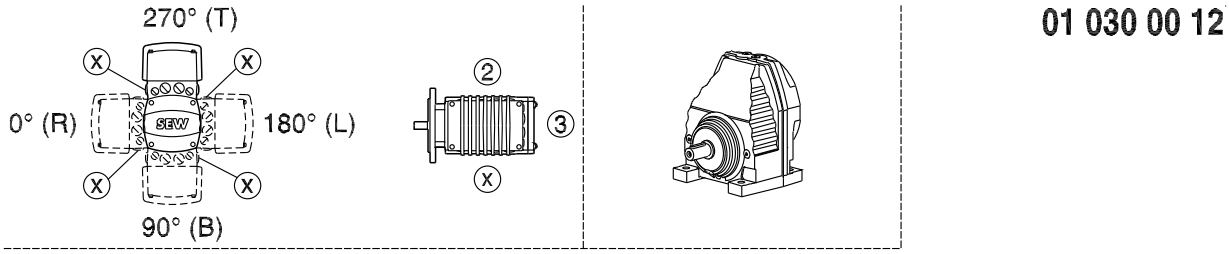
INFORMATION

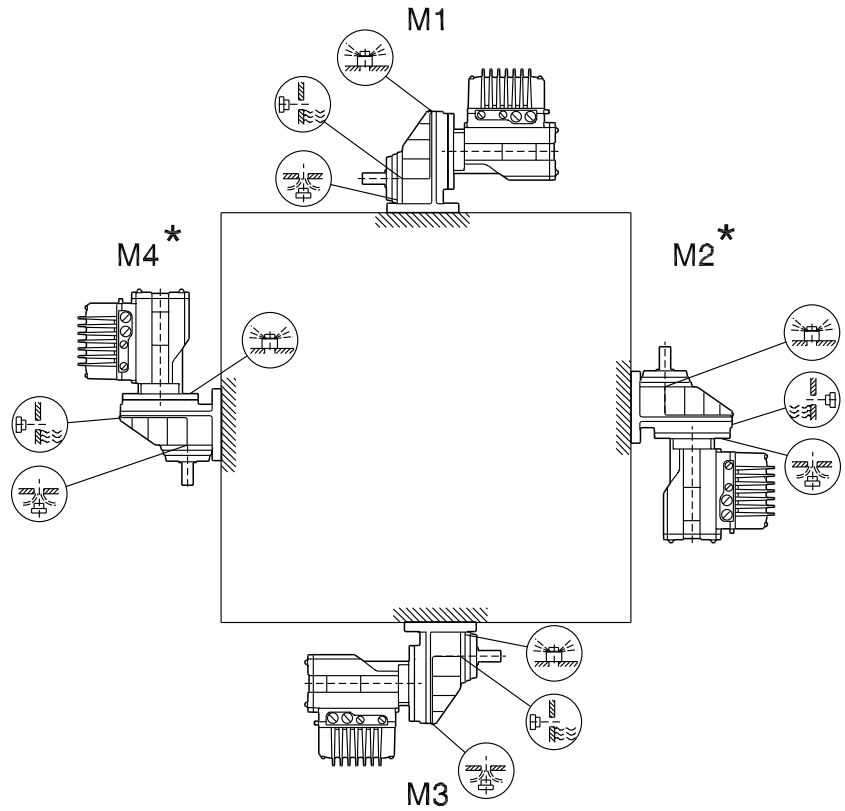
- **For gear units with solid shaft:** The displayed shaft is always on the A end.
- **For shaft-mounted gear units:** The shaft with dashed lines represents the customer shaft. The output end (≙ shaft position) is always shown on the A end.

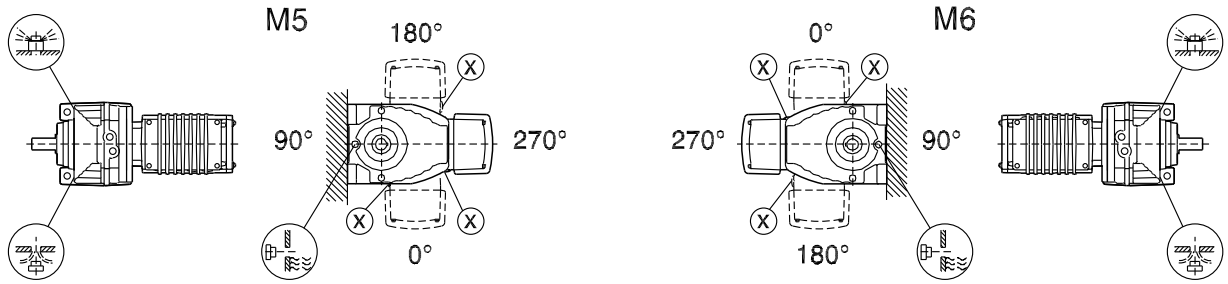
5.4 Mounting positions for DRC gearmotors

5.4.1 Mounting positions for helical gearmotors

RX57-87

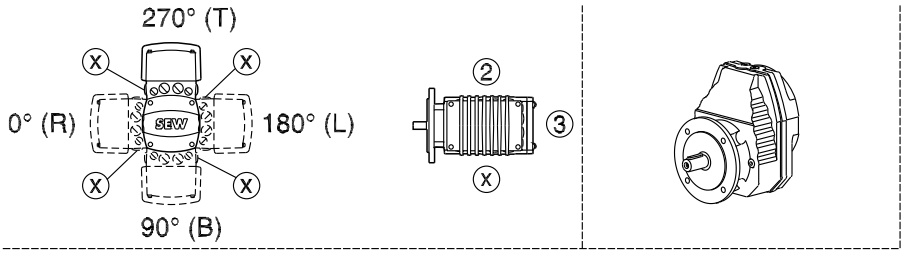




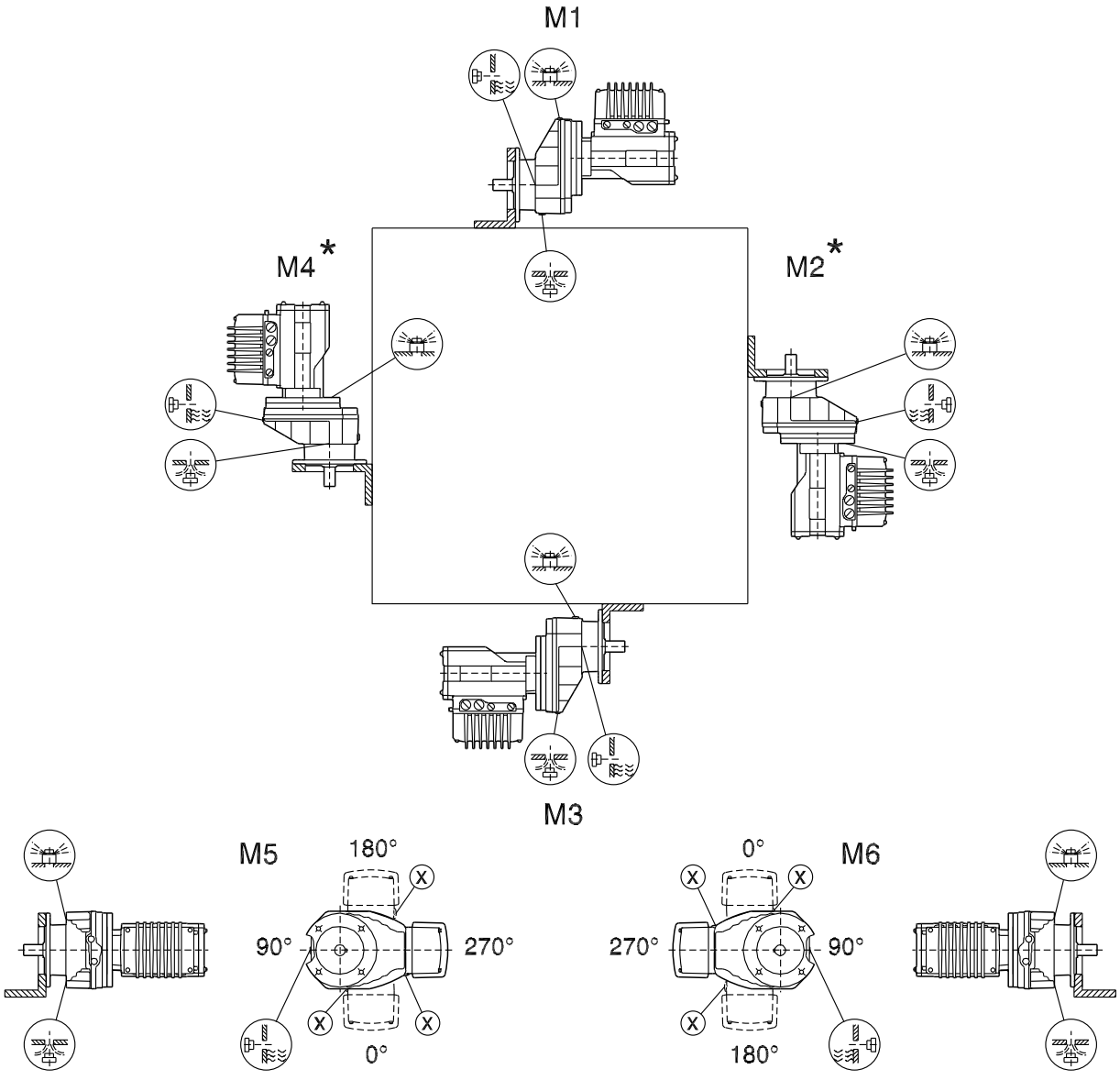


* → Page 77

RXF57-87

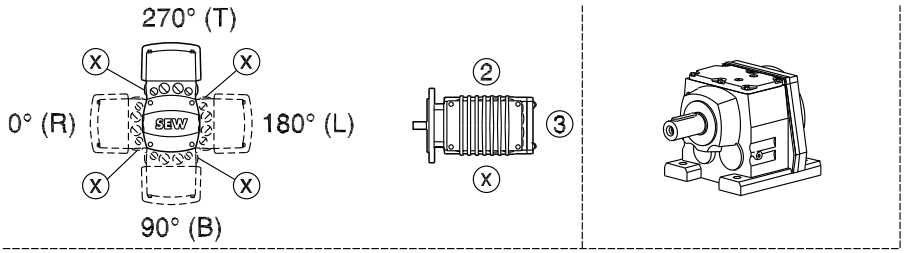


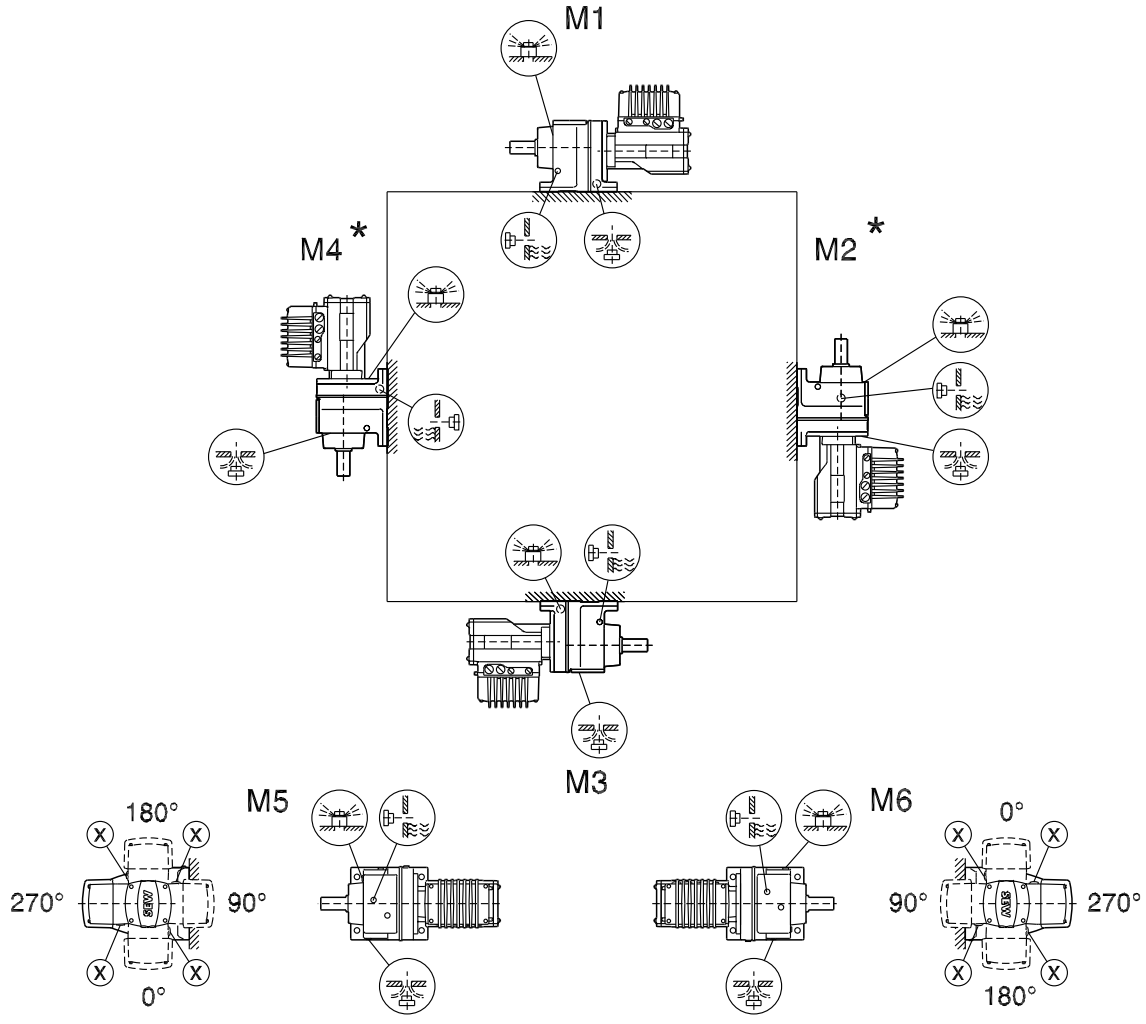
01 031 00 12



* → Page 77

R27-87

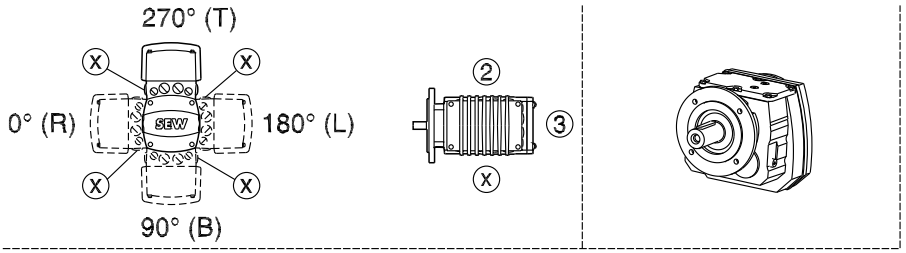


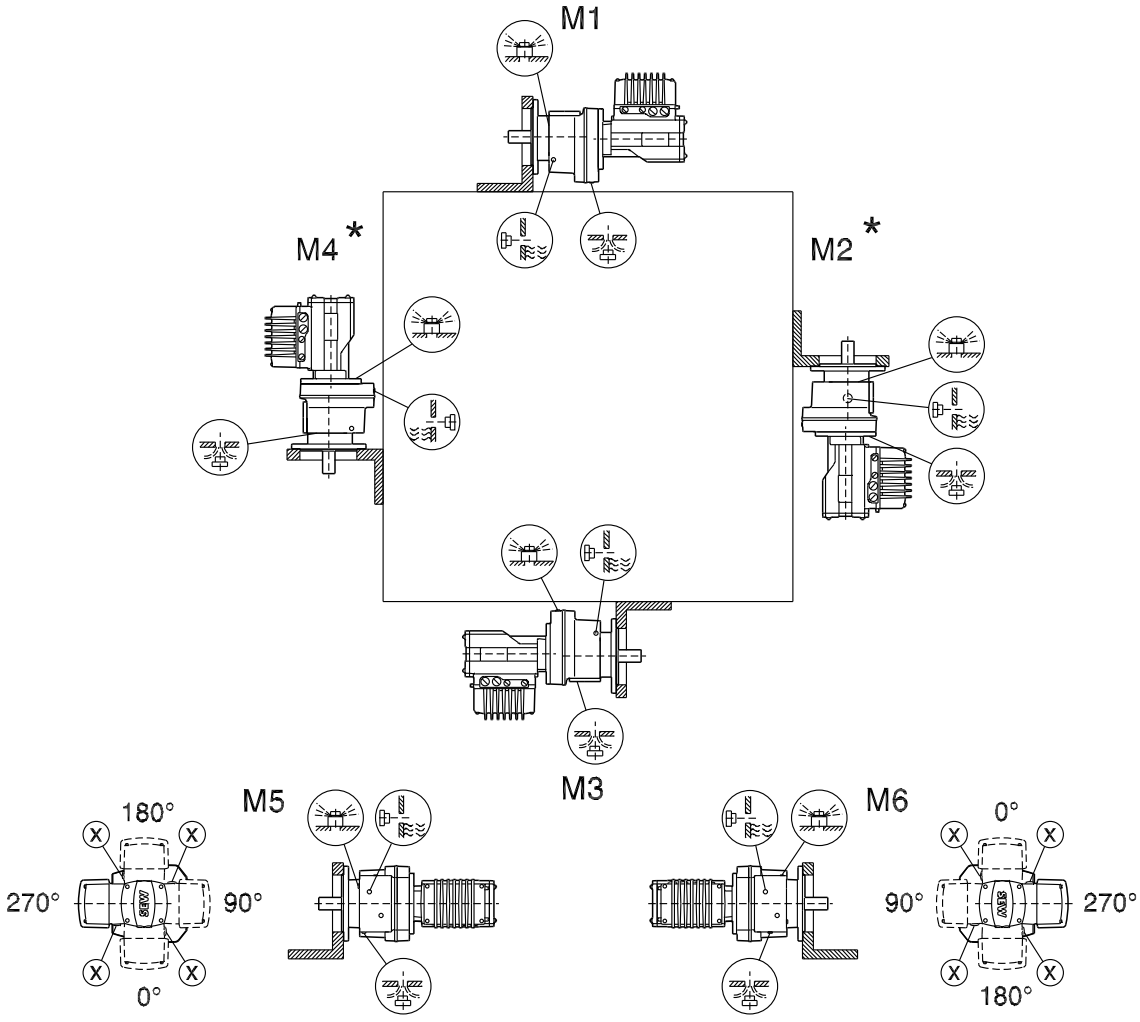


R27		M1, M3 , M5 , M6
R27		
R47, R57		M5

* → Page 77

RF/RZ27-87

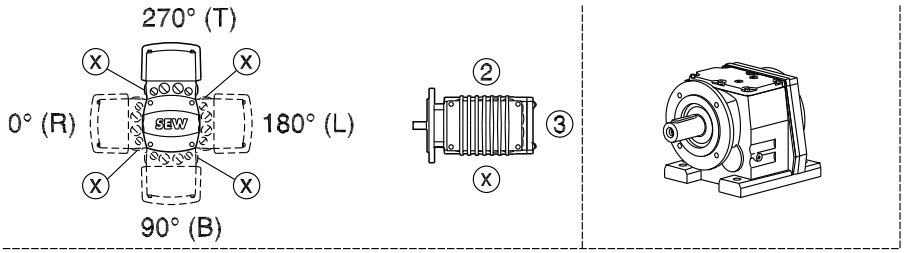


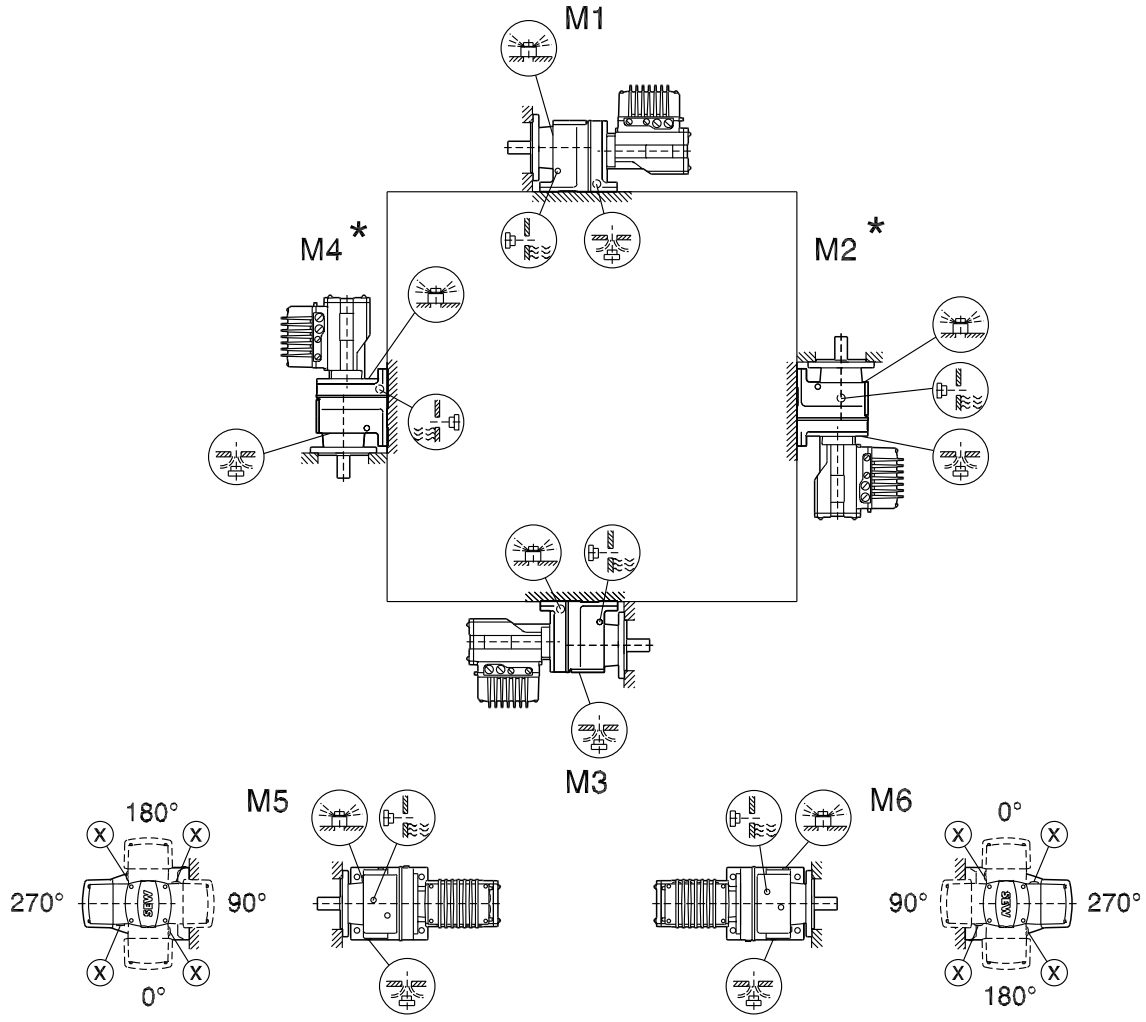


RF/RZ27		M1, M3 , M5 , M6
RF/RZ27		
RF/RZ47, 57		M5

* → Page 77

R27-87F





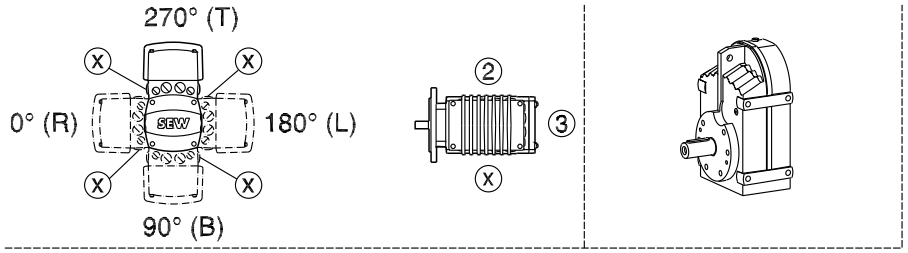
R27F		M1, M3 , M5 , M6
R27F		
R47F, R57F		M5

* → Page 77

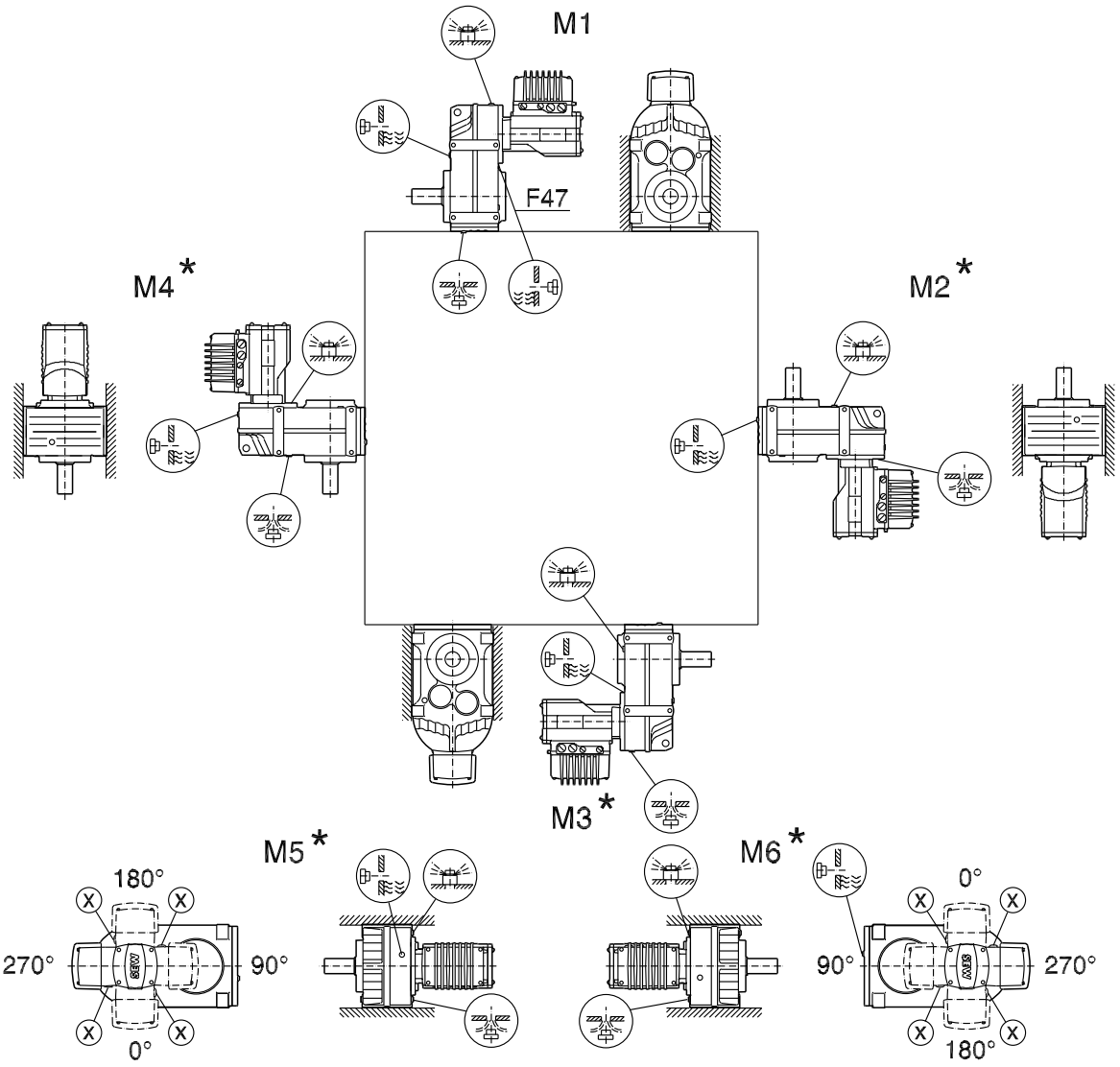
Important: Please observe the i notes in chapter "Project Planning/Gear units/Overhung and axial loads".

5.4.2 Mounting positions for parallel-shaft helical gearmotors

F/FA..B/FH..B/ FV27-87B



42 035 00 12



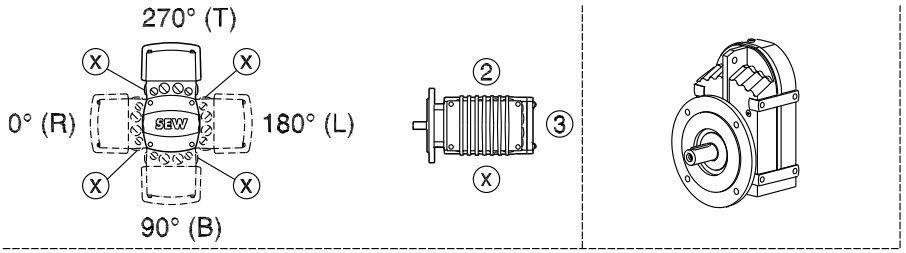
F..27 M1, M3 , M5 , M6

F..27 M1 - M6

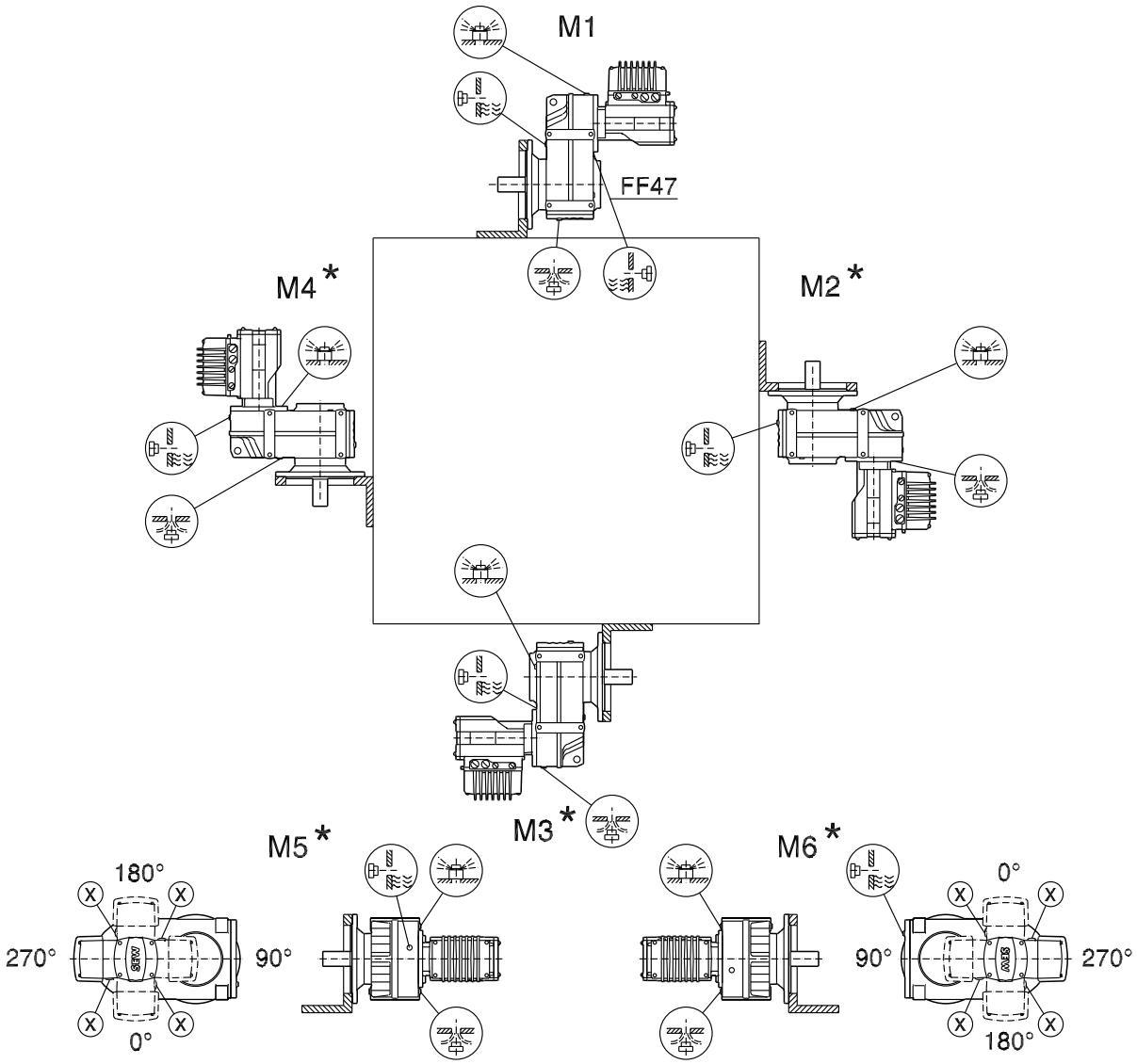
F..27 M1, M3 , M5 , M6

* → Page 77

FF/FAF/FHF/FAZ/FHZ/FVF/FVZ27-87



42 036 00 12



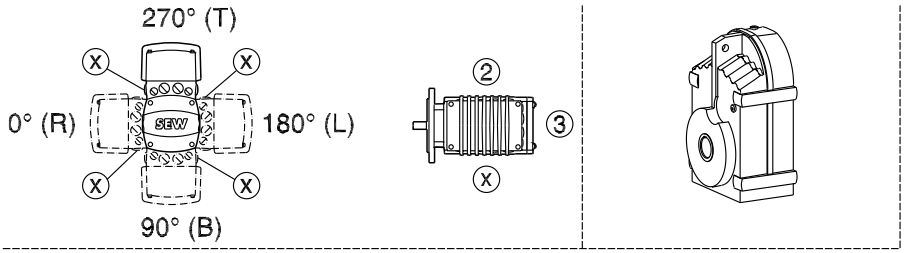
F..27 M1, M3 , M5 , M6

F..27 M1 - M6

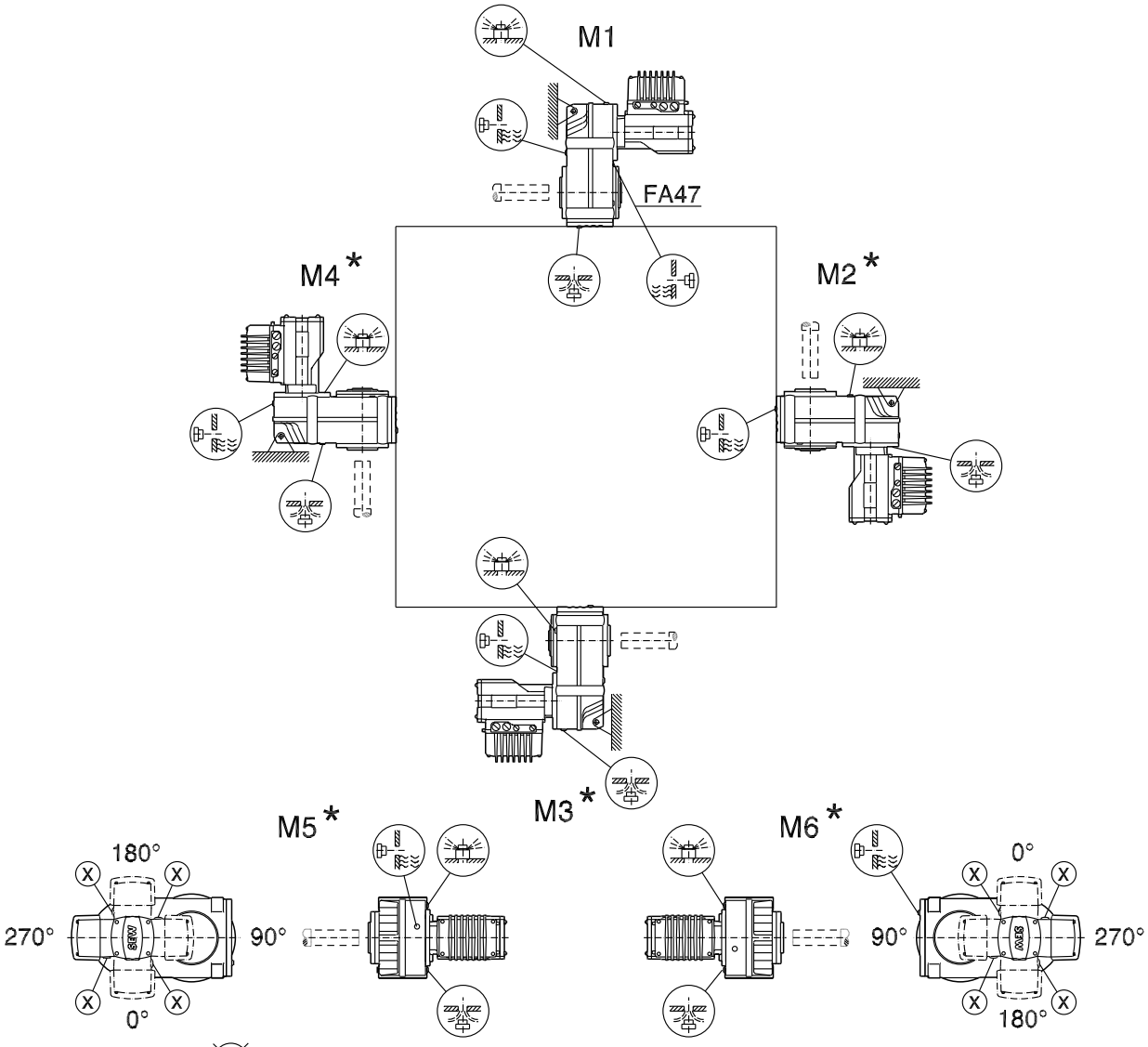
F..27 M1, M3 , M5 , M6

* → Page 77

FA/FH/FV/FT37-87



42 037 00 12

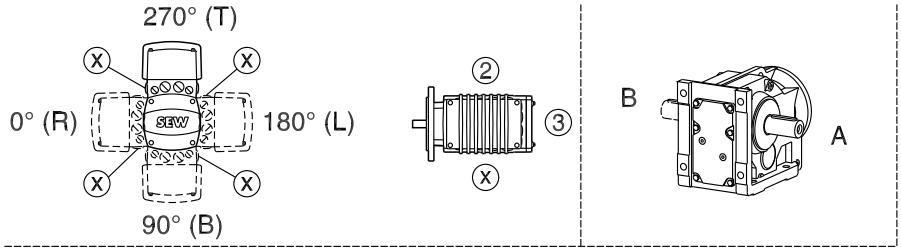


F..27		M1, M3 , M5 , M6
F..27		M1 - M6
F..27		M1, M3 , M5 , M6

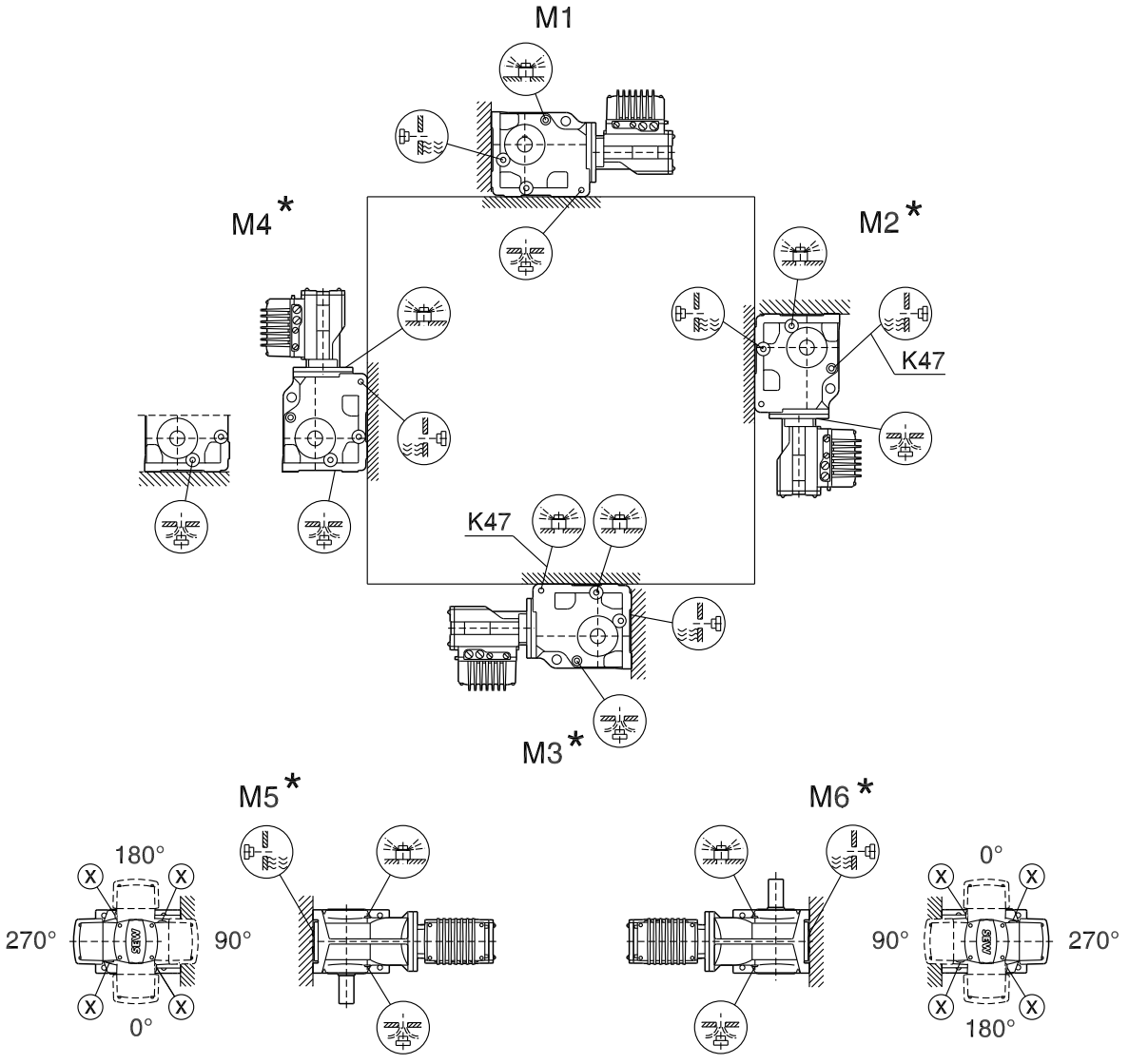
* → Page 77

5.4.3 Mounting positions for helical-bevel gearmotors

K/KA..B/KH..B/ KV37-87B



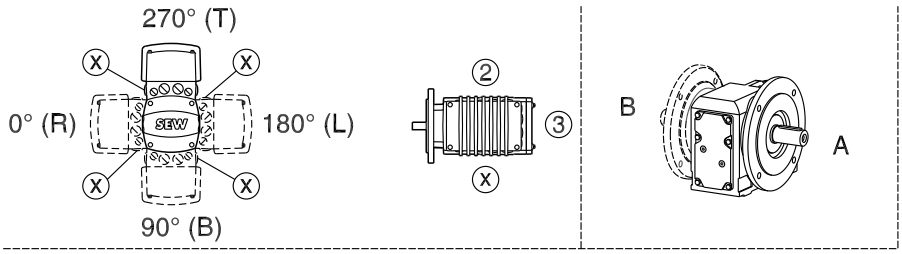
33 031 00 12



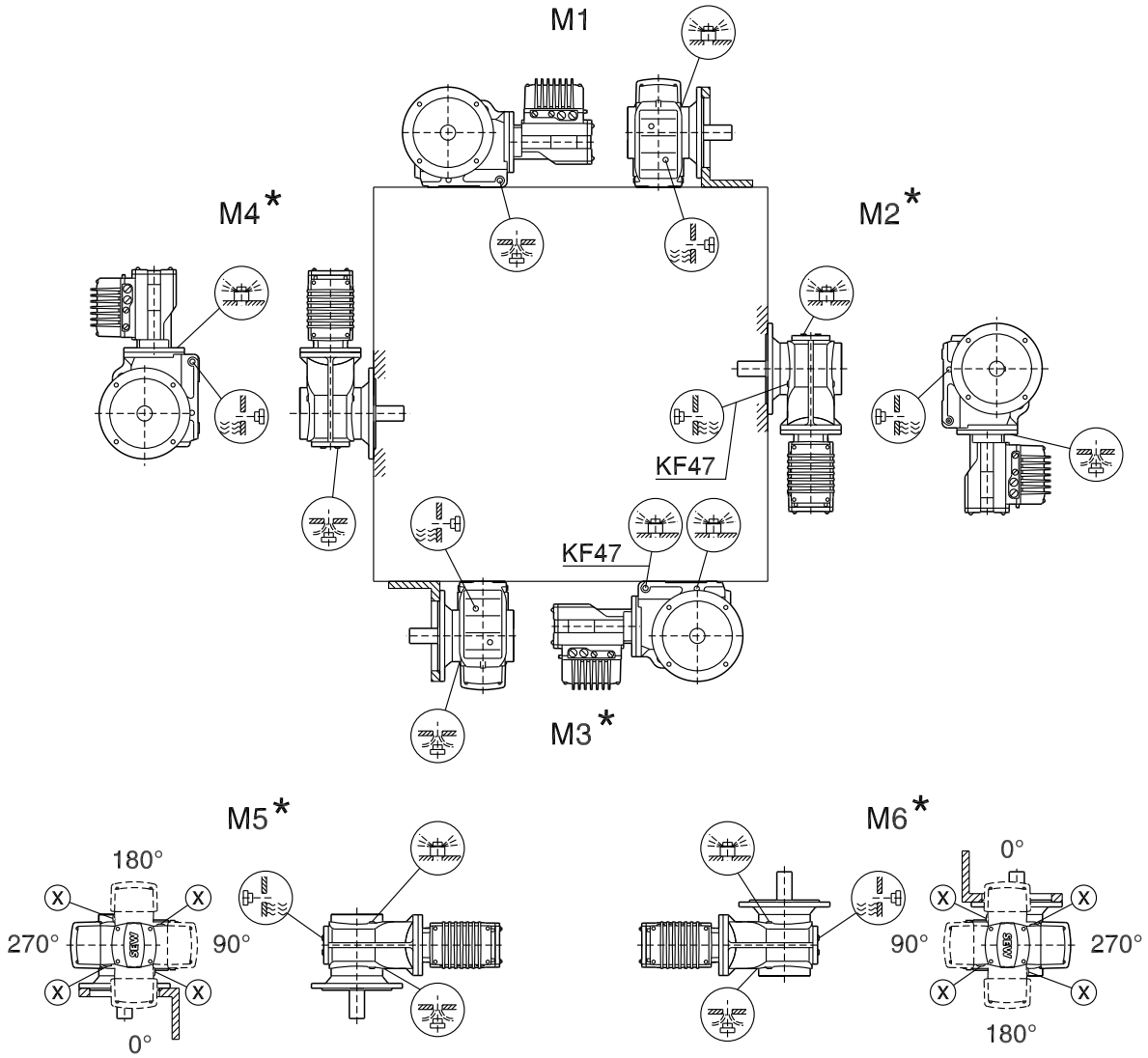
* → Page 77

Important: Please observe the i notes in chapter "Project Planning/Gear units/Overhung and axial loads".

KF/KAF/KHF/KAZ/KHZ/KVF/KVZ37-87

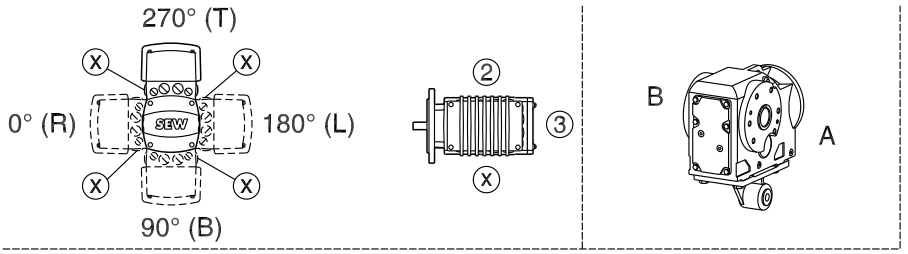


33 032 00 12

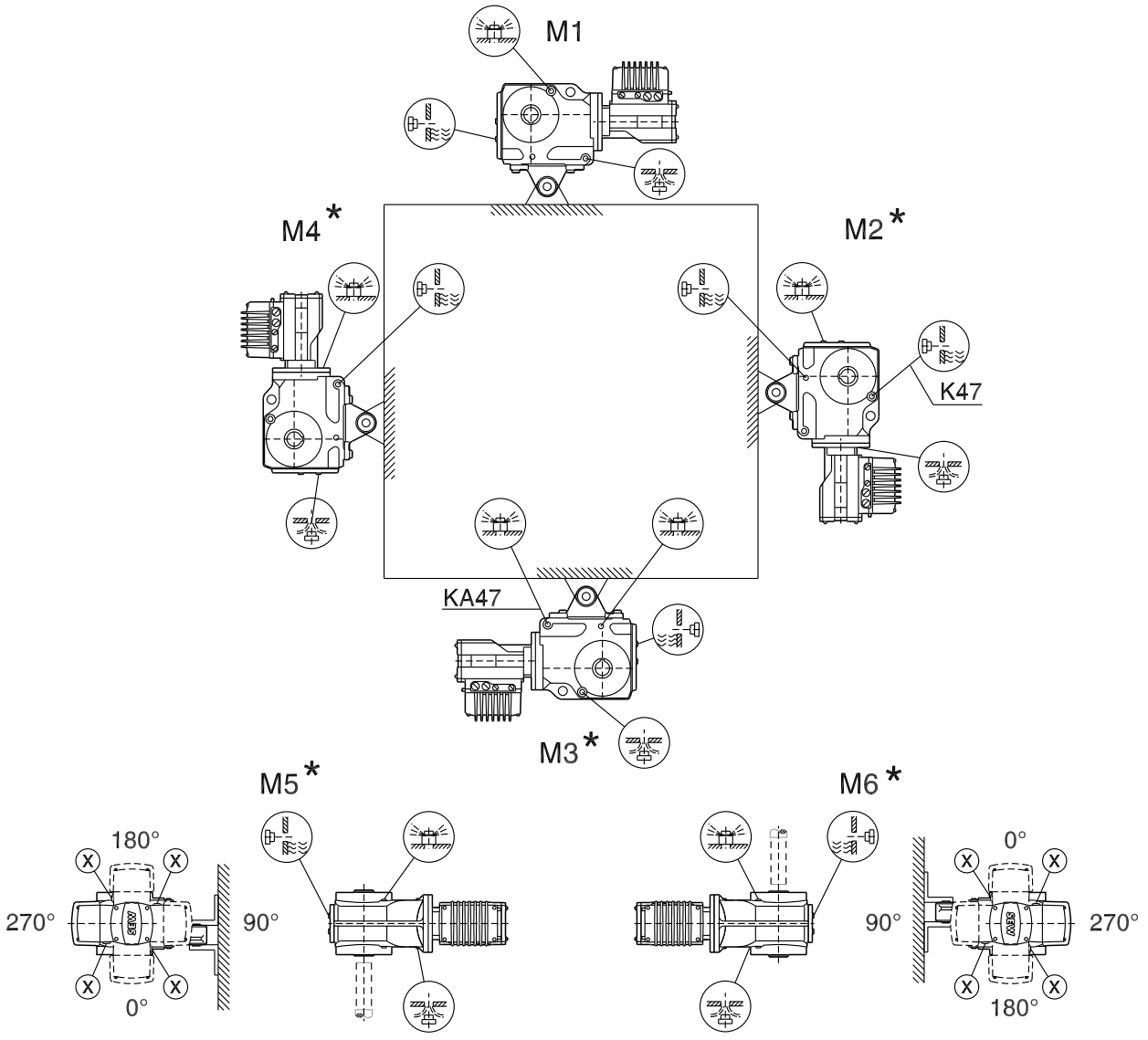


* → Page 77

KA/KH/KV/KT37-87



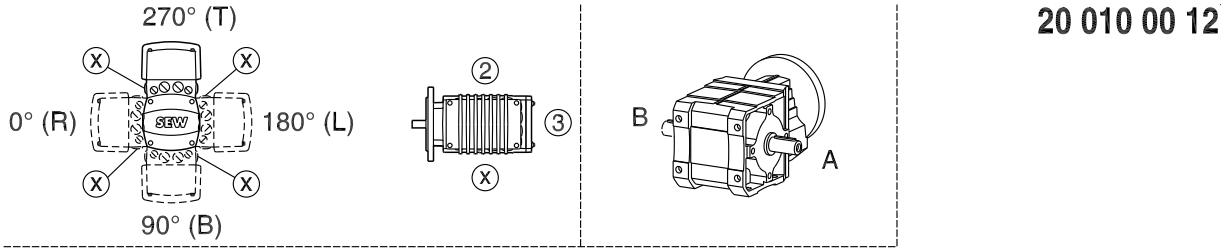
33 033 00 12

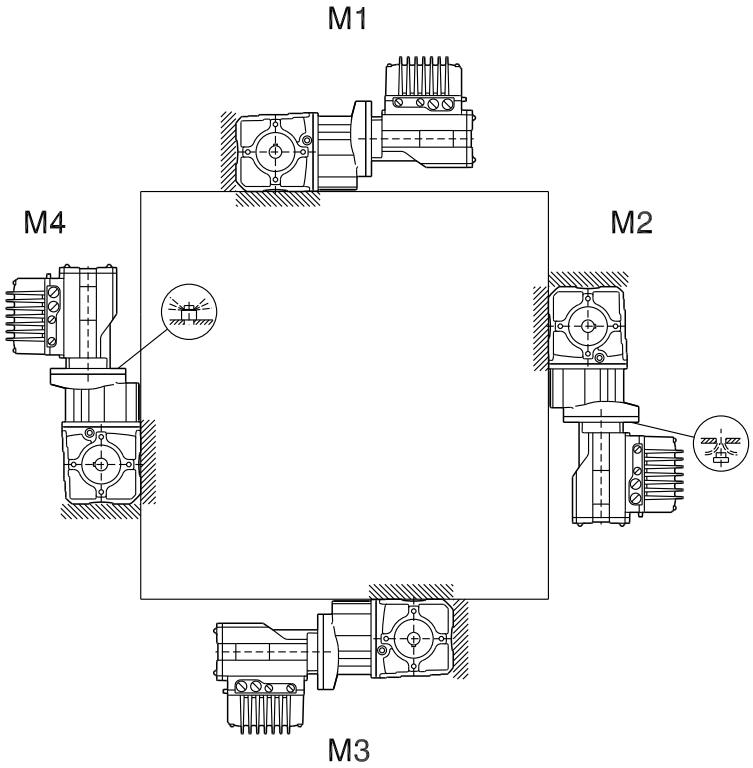


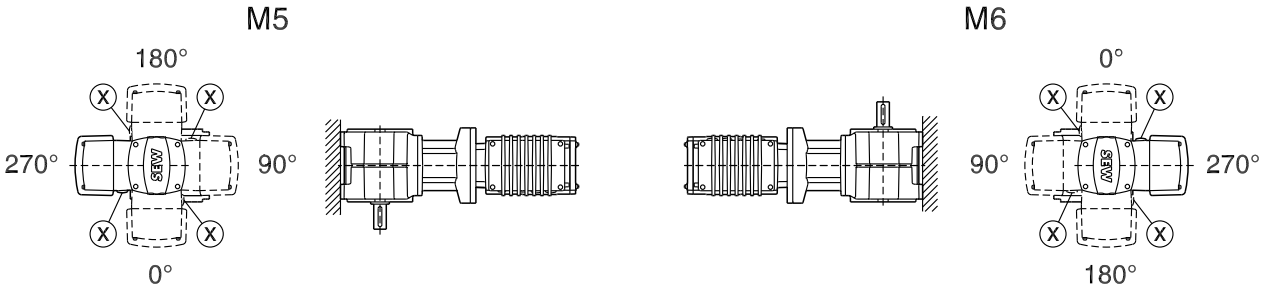
* → Page 77

5.4.4 Mounting positions for SPIROPLAN® gearmotors

W/WA..B/WH37-47B

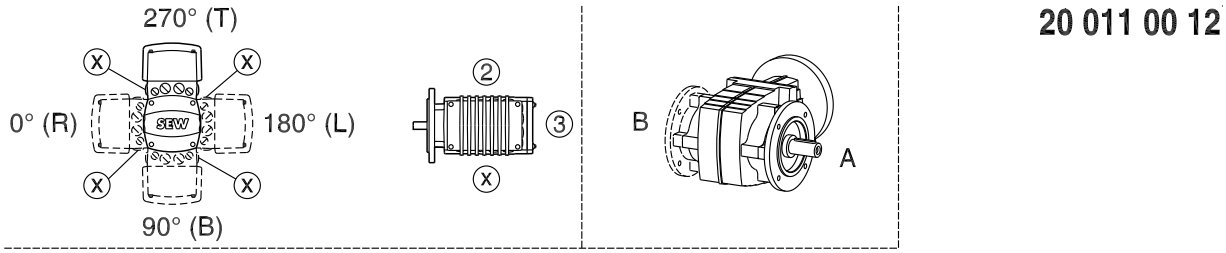


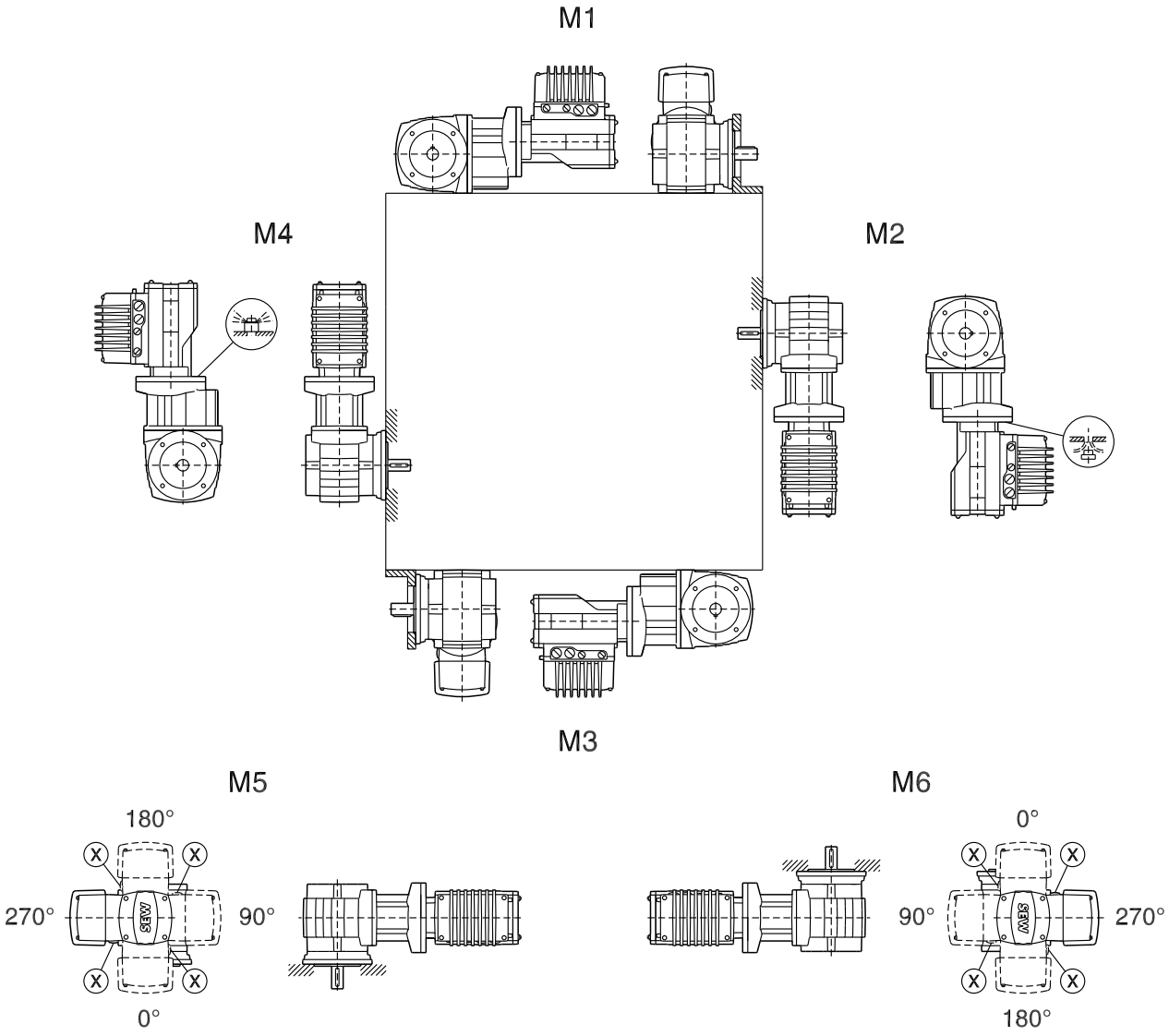




* → Page 77

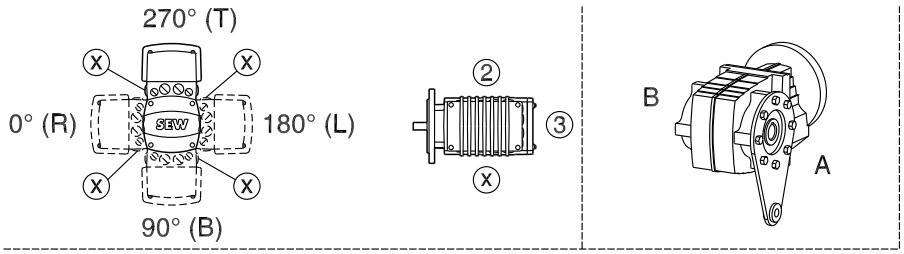
WF/WAF/WHF37-47



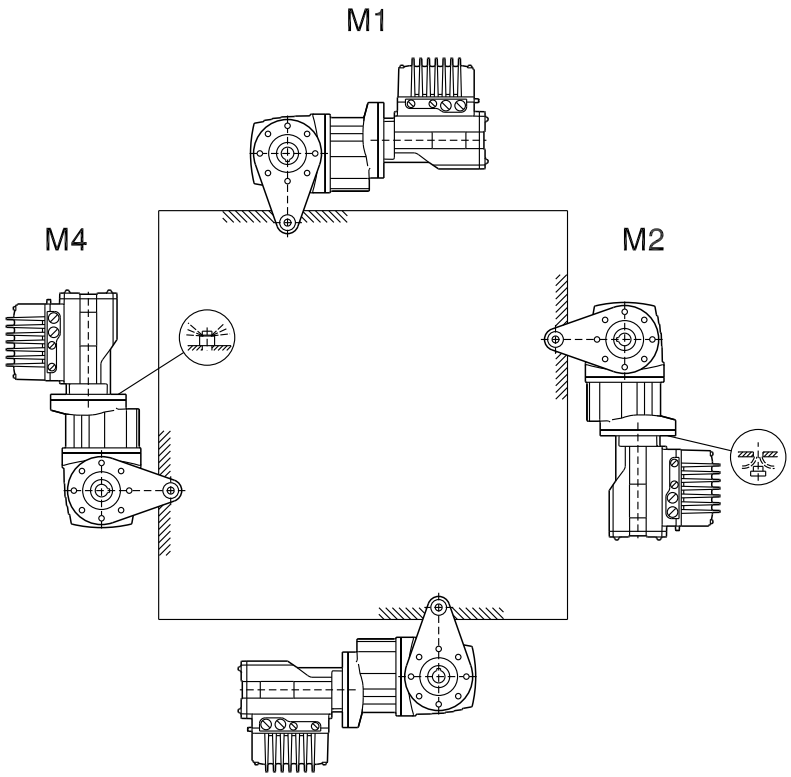


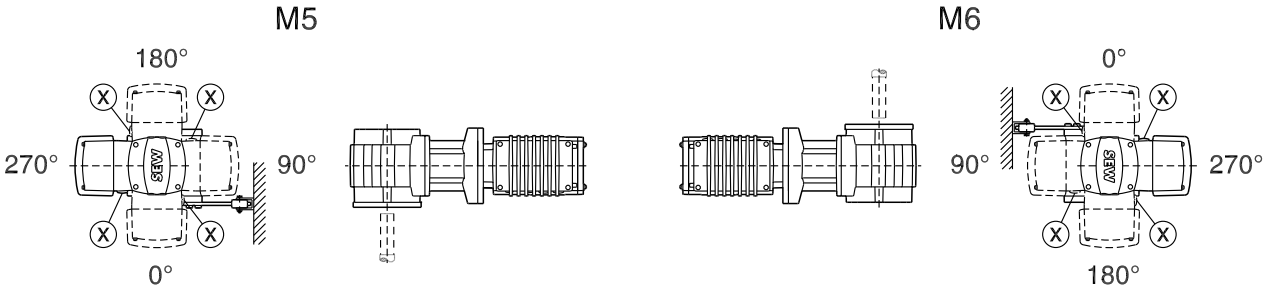
* → Page 77

WA/WH/WT37-47



20 012 00 12



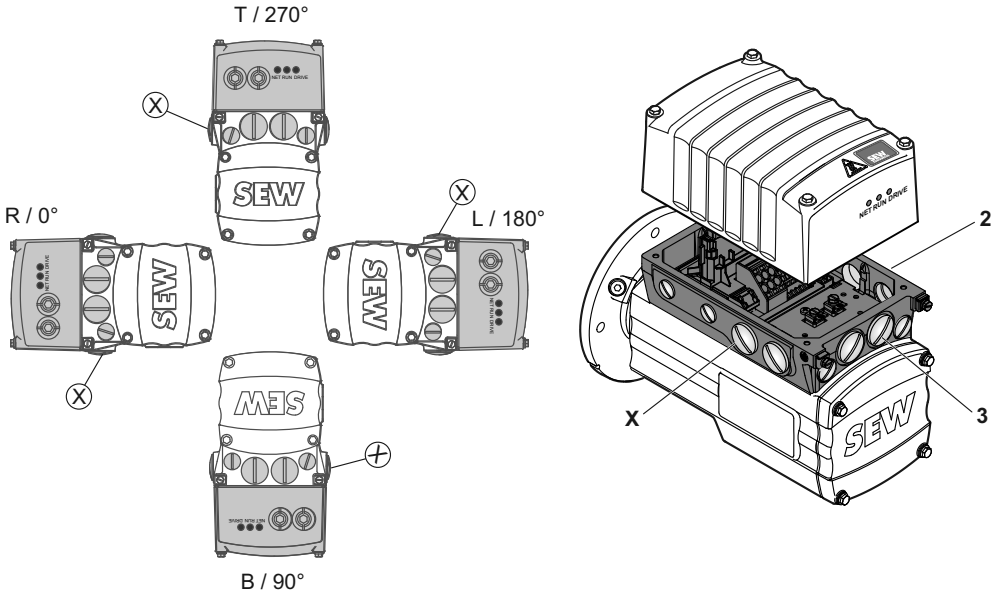


* → Page 77

5.5 Mounting positions for DRC stand-alone motors with IEC flange

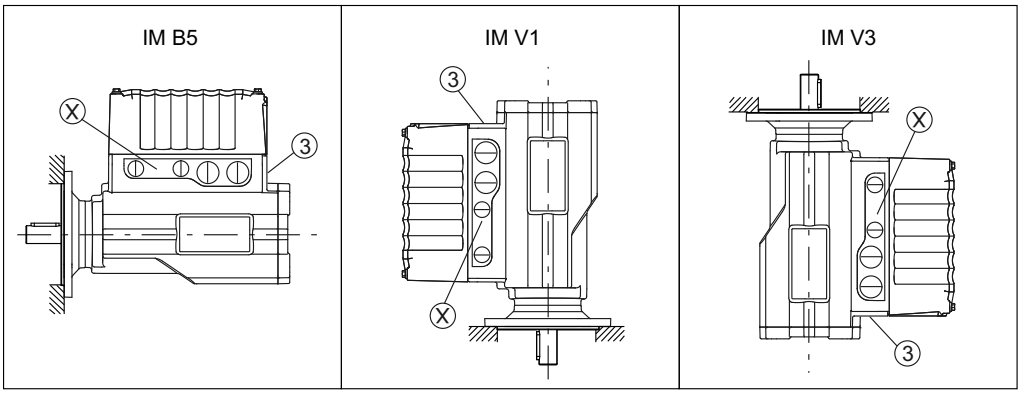
5.5.1 Position of electronics cover and cable entry

The following figure shows the mounting positions for DRC electronic motors with IEC flange:



5037224203

5.5.2 Mounting positions



5031582475

Flange mounting	Flange mounting Input side at the bottom	Flange mounting Input side on top

6 Design and Operating Notes

6.1 Lubricants and fill quantities for R, F, K, W gear units

6.1.1 General information

Unless a special arrangement is made, SEW-EURODRIVE supplies the drives with a lubricant fill adapted for the specific gear unit and mounting position. The decisive factor is the mounting position (M1 - M6, see chapter "Gearmotor Mounting Positions") specified when ordering the drive. You must adapt the lubricant fill if you change the mounting position subsequently (→ Lubricant fill quantities).

INFORMATION

SEW-EURODRIVE fills the gear units with the amount of oil specified for the specific mounting position. If the mounting position is changed, the amount of oil must be adapted accordingly. Consequently, a **mounting position** may only be **changed** after consultation with SEW-EURODRIVE, otherwise your right to claim under warranty **no longer applies**.

6.1.2 Lubricant table

The lubricant table on the following page shows the permitted lubricants for SEW-EURODRIVE gear units. Observe the following key to the lubricant table.

Key to the lubricant table

Abbreviations, meaning of shading and notes:

CLP	= Mineral oil
CLP PG	= Polyglycol (W gear units, conforms to USDA-H1)
CLP HC	= Synthetic hydrocarbons
E	= Ester oil (water hazard classification 1)
HCE	= Synthetic hydrocarbons + ester oil (USDA - H1 certification)
HLP	= Hydraulic oil
	= Synthetic lubricant (= synthetic-based roller bearing grease)
	= Mineral lubricant (= mineral-based rolling bearing grease)

1)	Helical-worm gear units with PG oil: Consult SEW-EURODRIVE.
2)	Special lubricant for SPIROPLAN® gear units only
3)	SEW-$f_B \geq 1.2$ required
4)	Observe the critical starting behavior at low temperatures.
5)	Low-viscosity grease
6)	Ambient temperature
	Lubricant for the food industry (food grade oil)
	Biodegradable oil (lubricant for agriculture, forestry, and water management)

Design and Operating Notes
Lubricants and fill quantities for R, F, K, W gear units

Lubricant table

The following table shows the assignment of lubricants to gear units:

01 751 05 04

	6) °C -50 0 +50 +100	DIN (ISO)	ISO,NLGI	Mobil®	Shell		Aral	bp	TEXACO	Castrol Tribol	Castrol Optimol	FUCHS	TOTAL
R...	Standard -15 +40	CLP(CC)	VG 220	Mobilgear 600 XP 220	Shell Omala 220	Klüberoil GEM 1-220 N	Aral Degol BG 220	BP Energol GR-XP 220	Meropa 220	Tribol 1100/220	Optigear BM 220	Renolin CLP 220	Carter EP 220
	-20 +80	CLP PG	VG 220	Mobil Glygoyle 220	Shell Tivela S 220	Klübersynth GH 6-220	Aral Degol GS 220	BP Enersyn SG-XP 220	Synlube CLP 220	Tribol 800/220	Optiflex A 220	Renolin PG 220	Carter SY 220
K...(HK...)	4) -20 +60	CLP HC	VG 220	Mobil SHC 630	Shell Omala HD 220	Klübersynth GEM 4-220 N	Aral Degol PAS 220		Pinnacle EP 220	Tribol 1510/220	Optigear Synthetic X 220	Renolin Unisyn CLP 220	
	4) -40 +40	CLP HC	VG 150	Mobil SHC 629	Shell Omala HD 150	Klübersynth GEM 4-150 N			Pinnacle EP 150		Optigear Synthetic X 150	Renolin Unisyn CLP 150	Carter SH 150
	-20 +25	CLP (CC)	VG 150 VG 100	Mobilgear 600 XP 100	Shell Omala 100	Klüberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100	Meropa 150	Tribol 1100/100	Optigear BM 100	Renolin CLP 150	Carter EP 100
F...	-30 +10	HLP (HM)	VG 68-46 VG 32	Mobil DTE 10 Excel 32	Shell Tellus T 32	Klüberoil GEM 1-68 N	Aral Degol BG 46		Rando EP Ashless 46	Tribol 1100/68	Optigear 32	Renolin B 46 HVI	Equivis ZS 46
	4) -40 +20	CLP HC	VG 68	Mobil SHC 626	Shell Omala HD 68							Renolin Unisyn CLP 68	
	4) -40 +0	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32			Cetus PAO 46		Optilieb HY 32	Renolin Unisyn OL 32	Dacnis SH 32
	4) -40 -20	HLP (HM)	VG 22 VG 15	Mobil DTE 10 Excel 15	Shell Tellus T 15	Isoflex MT 30 ROT		BP Energol HLP-HM 15	Rando HDZ 15		Hyspin AWS 22	Renolin MR 310	Equivis ZS 15
	Standard 0 +40	CLP (CC)	VG 680	Mobilgear 600 XP 680	Shell Omala 680	Klüberoil GEM 1-680 N	Aral Degol BG 680	BP Energol GR-XP 680	Meropa 680	Tribol 1100/680	Optigear BM 680	Renolin SEW 680	Carter EP 680
	-20 +80	CLP PG	VG 680 1)	Mobil Glygoyle 680	Shell Tivela S 680	Klübersynth GH 6-680		BP Enersyn SG-XP 680	Synlube CLP 680	Tribol 800/680	Optiflex A 680	Renolin PG 680	
S...(HS...)	4) -20 +60	CLP HC	VG 460	Mobil SHC 634	Shell Omala HD 460	Klübersynth GEM 4-460 N			Pinnacle EP 460		Optigear Synthetic X 460	Renolin Unisyn CLP 460	
	4) -40 +30	CLP HC	VG 150	Mobil SHC 629	Shell Omala HD 150	Klübersynth GEM 4-150 N			Pinnacle EP 150		Optigear Synthetic X 150	Renolin Unisyn CLP 150	Carter SH 150
	-20 +10	CLP (CC)	VG 150 VG 100	Mobilgear 600 XP 100	Shell Omala 100	Klüberoil GEM 1-150 N	Aral Degol BG 100	BP Energol GR-XP 100	Meropa 150	Tribol 1100/100	Optigear BM 100	Renolin CLP 150	Carter EP 100
	-20 +40	CLP PG	VG 220 1)	Mobil Glygoyle 220	Shell Tivela S 220	Klübersynth GH 6-220	Aral Degol GS 220	BP Enersyn SG-XP 220	Synlube CLP 220	Tribol 800/220	Optiflex A 220	Renolin PG 220	Carter SY 220
	4) -40 +20	CLP HC	VG 68	Mobil SHC 626	Shell Omala HD 68							Renolin Unisyn CLP 68	
	4) -40 0	CLP HC	VG 32	Mobil SHC 624		Klüber-Summit HySyn FG-32			Cetus PAO 46		Alphasyn T32	Renolin Unisyn OL 32	Dacnis SH 32
	4) -10 +40	CLPHC NSF H1	VG 460		Shell Cassida Fluid GL 460	Klüberoil 4UH1-460 N					Optileb GT 460	Geralyn SF 460	
R...,K...(HK...), F...,S...(HS...)	-20 +30		VG 220		Shell Cassida Fluid GL 220	Klüberoil 4UH1-220 N					Optileb GT 220		
	-40 0		VG 68		Shell Cassida Fluid HF 68	Klüberoil 4UH1-68 N					Optileb HY 68		
	-20 +40	E	VG 460			Klüberbio CA2-460				Tribol Bio Top 1418/460		Plantogear 460 S	
	Standard -20 +40	CLP PG 460 -SEW	VG 460 2)			Klüber SEW HT-460-5							
W...(HW...)	-40 +10	API GL5	SAE 75W90 (–VG 100)	Mobil Synthetic Gear Oil 75 W90									
	-20 +60	H1 PG	VG 460 2) 3)			Klübersynth UH1 6-460							
	Standard -20 +40	CLP PG	VG 220			Klübersynth GH 6-220							
P.S.F..	-20 +60	H1 PG	VG 460 2) 3)			Klübersynth UH1 6-460							
	-40 0	CLP HC	VG 32	Mobil SHC 624									
	Standard -10 +40	CLP (CC)	VG 220	Mobilgear 600 XP 220									
P.S.C..	-20 +40	DIN 51 818	00 5)	Mobillux EP 004									
	-20 +40		1 7)			Klübersynth UH1 14-151							
	-40 0	CLP HC	VG 32	Mobil SHC 624									
	Standard -40 +40	API GL5	SAE 75W90 (–VG 100)	Mobil Synth Gear Oil 75 W90									
BS.F..	-20 +60	H1 PG	VG 460 2) 3)			Klübersynth UH1 6-460							

5255222539

6.1.3 Lubricant fill quantities

The specified fill quantities are **guide values**. The precise values vary depending on the number of stages and gear ratio. When filling, it is essential to check the **oil level plug since it indicates the precise oil volume**.

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

Helical (R) gear units

RX..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RX57	0.60	0.80	1.30	1.30	0.90	0.90
RX67	0.80	0.80	1.70	1.90	1.10	1.10
RX77	1.10	1.50	2.60	2.70	1.60	1.60
RX87	1.70	2.50	4.80	4.80	2.90	2.90

RXF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
RXF57	0.50	0.80	1.10	1.10	0.70	0.70
RXF67	0.70	0.80	1.50	1.40	1.00	1.00
RXF77	0.90	1.30	2.40	2.00	1.60	1.60
RXF87	1.60	1.95	4.90	3.95	2.90	2.90

R.., R..F

Gear unit	Fill quantity in liters					
	M1[1)]	M2	M3	M4	M5	M6
R27	0.25/0.40	0.70	0.50	0.70	0.50	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	1.50
R57	0.80/1.70	1.90	1.70	2.10	1.70	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	7.2	6.3	6.5

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

RF..

Gear unit	Fill quantity in liters					
	M1[1)]	M2	M3	M4	M5	M6
RF27	0.25/0.40	0.70	0.50	0.70	0.50	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	1.50
RF57	0.80/1.70	1.80	1.70	2.00	1.70	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

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

Parallel-shaft helical (F) gear units

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	0.60
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.60	3.50	2.10	3.50	2.80	2.90
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.9	7.3	4.30	8.0	6.0	6.3
F..87	10.8	13.0	7.7	13.8	10.8	11.0

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	2.80	3.50	2.10	3.70	2.90	3.00
FF67	2.70	3.80	1.90	3.80	2.90	3.20
FF77	5.9	7.3	4.30	8.1	6.0	6.3
FF87	10.8	13.2	7.8	14.1	11.0	11.2

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
F..27	0.60	0.80	0.65	0.70	0.60	0.60
F..37	0.95	1.25	0.70	1.25	1.00	1.10
F..47	1.50	1.80	1.10	1.90	1.50	1.70
F..57	2.70	3.50	2.10	3.40	2.90	3.00
F..67	2.70	3.80	1.90	3.80	2.90	3.20
F..77	5.9	7.3	4.30	8.0	6.0	6.3
F..87	10.8	13.0	7.7	13.8	10.8	11.0

Helical-bevel (K) gear units

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..37	0.50	1.00	1.00	1.25	0.95	0.95
K..47	0.80	1.30	1.50	2.00	1.60	1.60
K..57	1.10	2.20	2.20	2.80	2.30	2.10
K..67	1.10	2.40	2.60	3.45	2.60	2.60
K..77	2.20	4.10	4.40	5.8	4.20	4.40
K..87	3.70	8.0	8.7	10.9	8.0	8.0

KF..

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
KF37	0.50	1.10	1.10	1.50	1.00	1.00
KF47	0.80	1.30	1.70	2.20	1.60	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	2.70
KF77	2.10	4.10	4.40	5.9	4.50	4.50
KF87	3.70	8.2	9.0	11.9	8.4	8.4

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
K..37	0.50	1.00	1.00	1.40	1.00	1.00
K..47	0.80	1.30	1.60	2.15	1.60	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	2.60
K..77	2.10	4.10	4.60	5.9	4.40	4.40
K..87	3.70	8.2	8.8	11.1	8.0	8.0

SPIROPLAN® (W) gear units

Only the fill quantity of SPIROPLAN® gear units W..37 and W..47 in mounting position M4 differs from that of other mounting positions.

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
W..37	0.50			0.70	0.50	
W..47	0.90			1.40	0.90	

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

Gear unit	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
W..37	0.50			0.70	0.50	
W..47	0.80			1.25	0.80	

6.1.4 Rolling bearing greases

The rolling bearings in gear units and motors are given a factory-fill with the greases listed below. SEW-EURODRIVE recommends regreasing rolling bearings with a grease fill at the same time as changing the oil and replacing the rolling bearings.

	Ambient temperature	Manufacturer	Type
Gear unit rolling bearings	-40 °C – +80 °C	Fuchs	Renolit CX-TOM15[1)]
Motor rolling bearings are covered on both sides and cannot be regreased.	-20 °C – +80 °C	Esso	Polyrex EM
	+20 °C – +100 °C	Klüber	Barrierta L55/2
	-40 °C – +60 °C	Kyodo Yushi	Multemp SRL[2)]
Special greases for gear unit rolling bearings:			
	-30 °C – +40 °C	Aral	Aral Eural Grease EP 2
	-20 °C – +40 °C	Aral	Aral Aralube BAB EP2

1) Rolling bearing grease based on semi-synthetic base oil.

2) Recommended for continuous operation at ambient temperatures below 0 °C, for example in a cold storage.



INFORMATION

The following grease quantities are required:

- For fast-running bearings (gear unit input end): Fill the cavities between the rolling elements one-third full with grease.
- For slow-running bearings (in gear units and at gear unit output end): Fill the cavities between the rolling elements two-thirds full with grease.

6.2 Reduced backlash gear unit types

Helical, parallel shaft helical and helical-bevel gear units with reduced backlash are available as of gear unit size 37. The circumferential backlash of these gear units is considerably less than that of the standard versions so that positioning tasks can be solved with great precision. The circumferential backlash is specified in angular minutes ['] in the selection tables. The circumferential backlash for the output shaft is specified without load (max. 1% of the rated output torque); the gear unit input end is blocked.

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

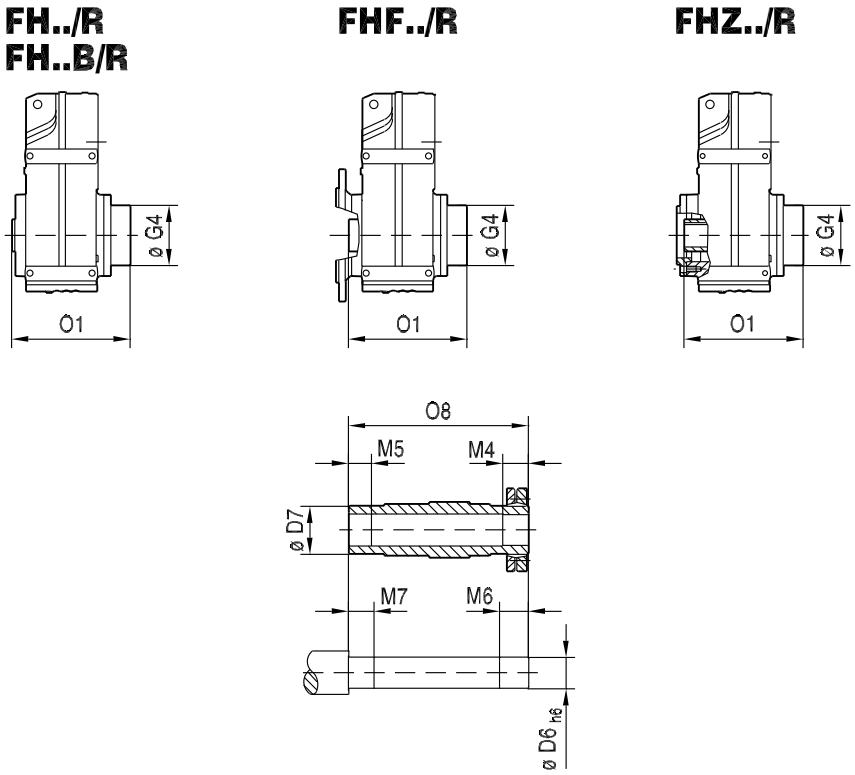
- Helical gear units (R), sizes 37 to 87
- Parallel-shaft gear units (F), sizes 37 to 87
- Helical-bevel gear units (K), sizes 37 to 87

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

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

The following figure shows the dimensions of the FH.87 gear unit with reduced backlash:

42 020 00 09



5014737675

Type	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

6.3 Installation/removal of gear units with hollow shaft and key

INFORMATION

- Always use the supplied NOCO® fluid for installation. The fluid prevents contact corrosion and facilitates subsequent disassembly.
- The key dimension X is specified by the customer, but X > DK must apply, see below figure.

6.3.1 Installation

SEW-EURODRIVE recommends two variants for installing gear units with hollow shaft and key onto the input shaft of the driven machine (= customer shaft):

1. Use the provided fastening parts for installation.
2. Use the optional installation/removal kit for installation.

1. Supplied fastening parts

The following fastening parts are provided as standard:

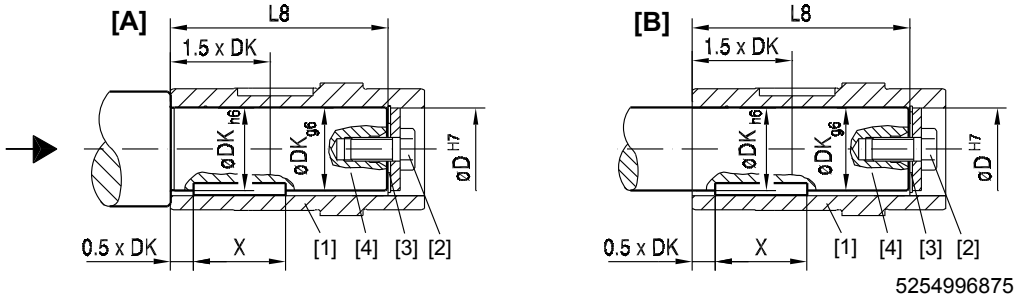
- Retaining screw with washer (2)
- Retaining ring (3)

Note the following points concerning the customer shaft:

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

The below figure shows the customer shaft with contact shoulder (A) and without contact shoulder (B).

00 001 00 02



5254996875

[1] Hollow shaft
[2] Retaining screw with washer
[3] Retaining ring
[4] Customer shaft

Dimensions and tightening torque:

The retaining screw (2) must be tightened to the tightening torque MS given in the following table:

Gear unit type	D^{H7} in mm	DK in mm	L8 in mm	MS in Nm
FA..27	25	25	88	20
WA..37	20	20	105	8
FA..37, KA..37	30	30	105	20
WA..37	25	25	105	
			118	
FA..47, KA..47	35	35	132	
WA..47	30	30	122	
FA..57, KA..57	40	40	142	40
FA..67, KA..67			156	
FA..77, KA..77, SA..77	50	50	183	40
FA..87, KA..87	60	60	210	80

2. Installation/ removal kit

You can use the optional installation/removal kit for installation. You order the kit for the specific gear unit type(s) by quoting the part numbers in the table below. The delivery includes:

- Spacer tube for installation without contact shoulder (5)
- Retaining screw for installation (2)
- Forcing washer for removal (7)
- Locked nut for removal (8)

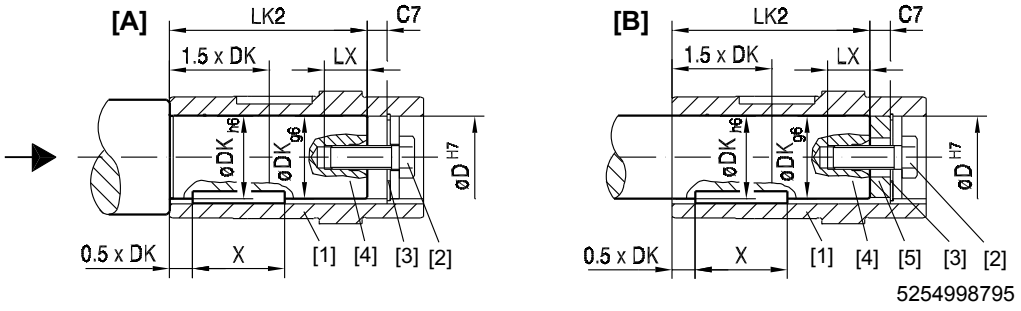
The short retaining screw delivered as standard is not required.

Note the following points concerning the customer shaft:

- The installation length of the customer shaft must be LK2. Do not use the spacer if the customer shaft **has a contact shoulder (A)**.
- The installation length of the customer shaft must be LK2. Use the spacer for customer shafts **without contact shoulderr (B)**.

The below figure shows the customer shaft with contact shoulder (A) and without contact shoulder (B).

00 002 00 02



5254998795

[1] Hollow shaft
[2] Retaining screw with washer
[3] Retaining ring
[4] Customer shaft
[5] Spacer tube

Dimensions, tightening torques and part numbers:

The retaining screw (2) must be tightened to the tightening torque MS given in the following table:

Type	D^{H7} mm	DK mm	LK2 mm	LX^{+2} mm	C7 mm	MS Nm	Part number of installation/ removal set
WA..37	20	20	72, 93	16	12	8	643 683 8
FA..27	25	25	72	22	16	20	643 684 6
WA..47	30	30	106				643 685 4
FA..37, KA..37			89				643 685 4
FA..47, KA..47, SA..57	35	35	114	28	18		643 686 2
FA..57, KA..57	40	40	124	36		40	643 687 0
FA..67			138				
KA..67			138				
FA..77, KA..77	50	50	165				643 689 7
FA..87, KA..87	60	60	188	42	22	80	643 690 0

Removal

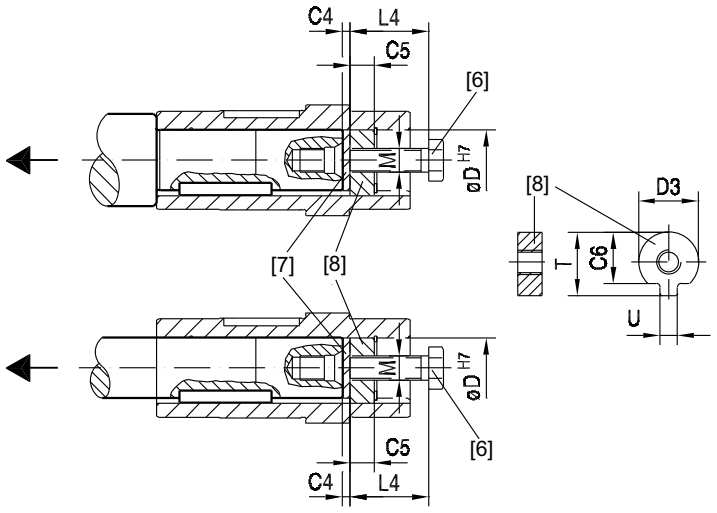
Applies only if the installation/removal kit was previously used for installation (see previous figure).

Proceed as follows for removal:

1. Loosen the retaining screw (6).
2. Remove the circlip (3) and, if used, the spacer tube (5).
3. Insert the forcing disk (7) and the fixed nut (8) between the customer's shaft (4) and circlip (3) according to the following figure.
4. Re-install the circlip (3).
5. Re-install the retaining screw (6). Now you can force the gear unit off the shaft.

The following figure shows removal of a gear unit with hollow shaft and key.

00 003 00 02



5255000715

[6] Retaining screw
[7] Forcing washer
[8] Locked nut for removal

Dimensions and part numbers:

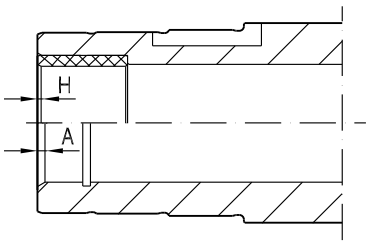
Type	D^{H7} mm	M	C4 mm	C5 mm	C6 mm	$U^{-0.5}$ mm	$T^{-0.5}$ mm	$D3^{-0.5}$ mm	L4 mm	Part number installation/ removal kit
WA..37	20	M6	5	6	15.5	5.5	22.5	19.7	25	643 683 8
FA27	25	M10		10	20	7.5	28	24.7	35	643 684 6
FA..37, KA..37, SA..47	30				25	7.5	33	29.7		643 685 4
FA..47, KA..47	35	M12		12	29	9.5	38	34.7	45	643 686 2
FA..57, KA..57, FA..67, KA..67	40	M16			34	11.5	41.9	39.7	50	643 687 0
FA..77, KA..77	50				43.5	13.5	53.5	49.7		643 689 7
FA..87, KA..87	60	M20		16	56	17.5	64	59.7	60	643 690 0

6.4 Gear units with hollow shaft

6.4.1 Chamfers on hollow shafts

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

00 004 002



5255030155

Gear unit	Variant	
	with hollow shaft (A)	with hollow shaft and shrink disk (H)
F..27	2 × 30°	0.5 × 45°
F../K../W..37	2 × 30°	0.5 × 45°
F../K../W..47	2 × 30°	0.5 × 45°
F../K..57	2 × 30°	3 × 2°
F../K..67	2 × 30°	3 × 2°
F../K..77	2 × 30°	3 × 2°
F../K..87	3 × 30°	3 × 2°

6.4.2 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):

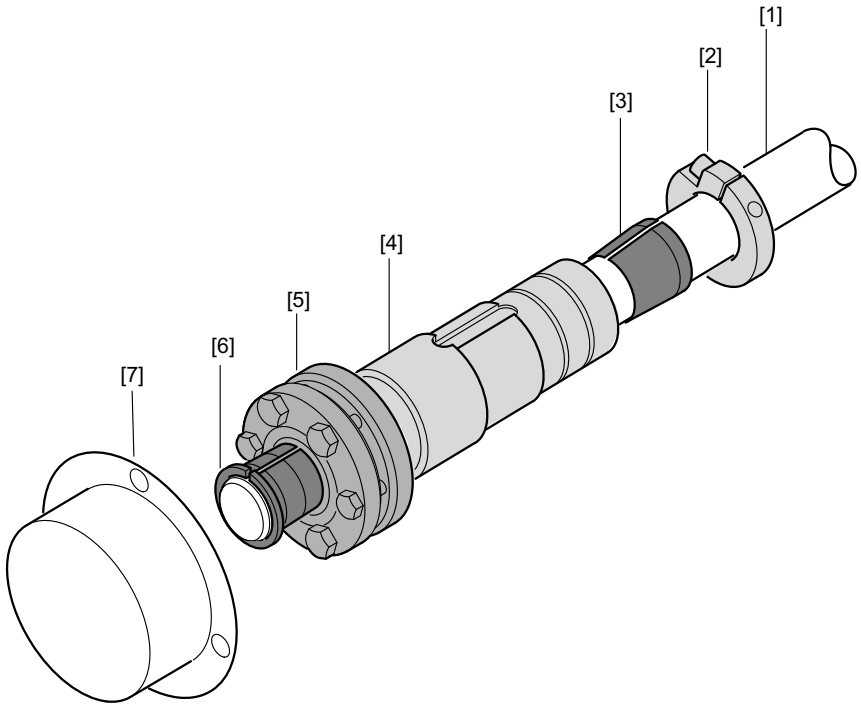
- If you use a customer shaft pushed through on the motor end, there might be a collision when a "small gear unit" is used in combination with a "large motor."
- Check the motor dimension AC to decide whether there will be a collision with a pushed-through customer shaft.

6.5 TorqLOC® mounting system for hollow shaft gear units

6.5.1 Description of TorqLOC®

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

The TorqLOC® hollow shaft mounting system comprises the following components:



5255032587

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

6.5.2 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 as 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.

6.5.3 Technical data

The TorqLOC® hollow shaft mounting system is approved for input torques of 92 Nm to 18000 Nm.

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

- Parallel-shaft helical gear unit sizes 37 to 87 (FT37 ... FT97)
- Helical-bevel gear unit sizes 37 to 87 (KT37 ... KT97)
- TorqLOC® gear unit sizes 37 and 47 (WT37 and WT47)

Available options

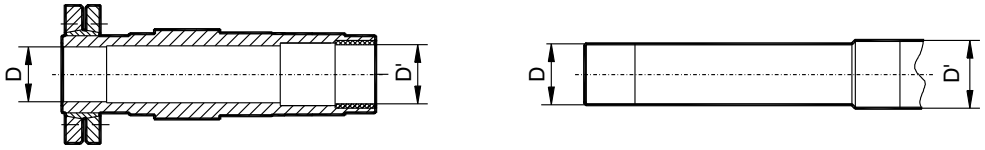
The following options are available for gear units with TorqLOC® hollow shaft mounting system:

- Helical-bevel and SPIROPLAN® gear units with TorqLOC® (KT.., WT37): The "torque arm" (../T) option is available.
- Parallel-shaft helical gear units with TorqLOC® (FT..): The "rubber buffer" (../G) option is available.

6.6 Shouldered hollow shaft option with shrink disk

Gear units with hollow shaft and shrink disk (parallel-shaft helical gear units FH/FHF/FHZ37-87, helical-bevel gear units KH/KHF/KHZ37-87) can optionally be supplied with a larger bore diameter D'.

D' = D is the standard.



5014742795

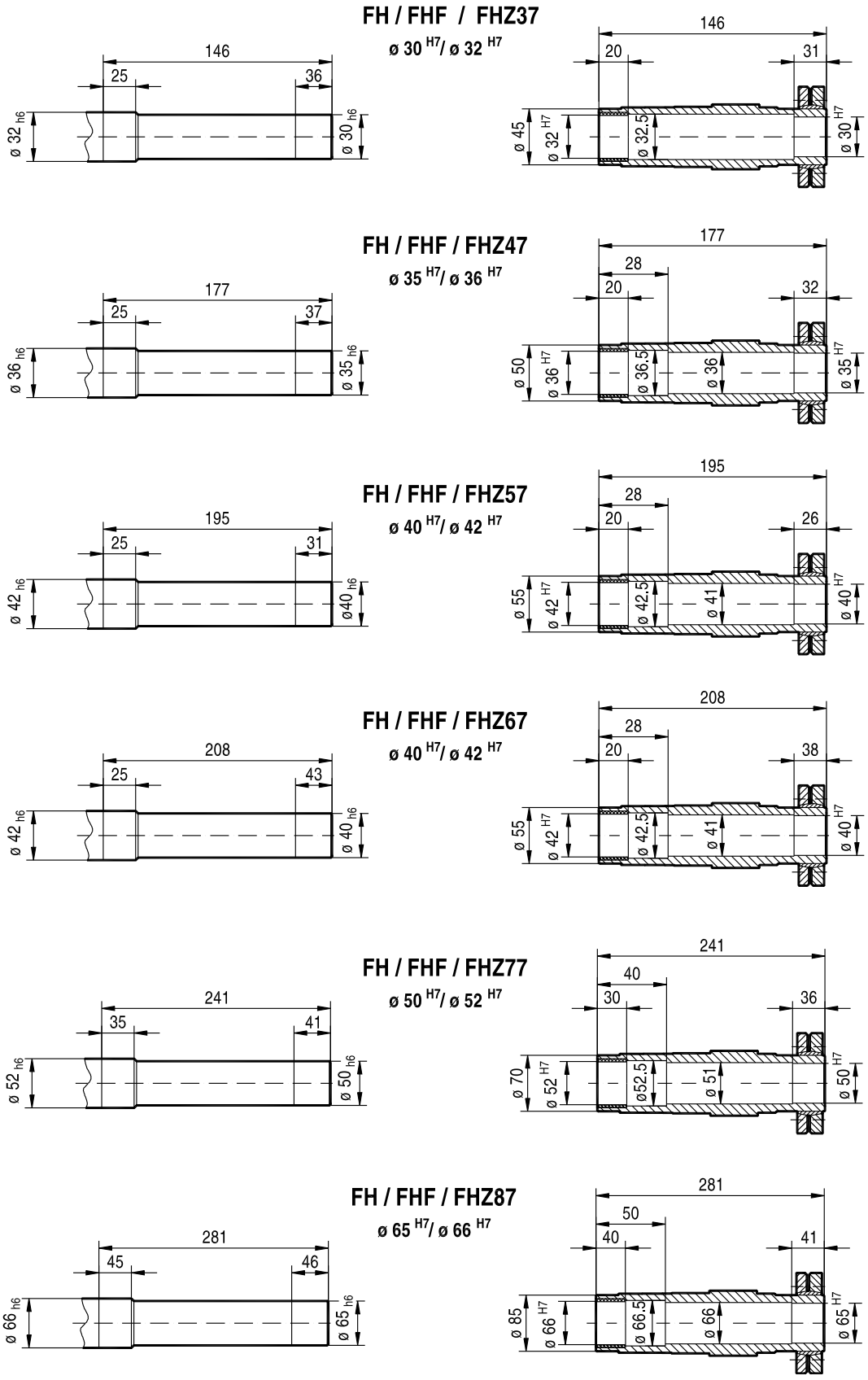
Gear unit	Bore diameter D / optionally D' [mm]
FH/FHF/FHZ37, KH/KHF/KHZ37	30 / 32
FH/FHF/FHZ47, KH/KHF/KHZ47	35 / 36
FH/FHF/FHZ57, KH/KHF/KHZ57	40 / 42
FH/FHF/FHZ67, KH/KHF/KHZ67	40 / 42
FH/FHF/FHZ77, KH/KHF/KHZ77	50 / 52
FH/FHF/FHZ87, KH/KHF/KHZ87	65 / 66

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

6.6.1 Sample order

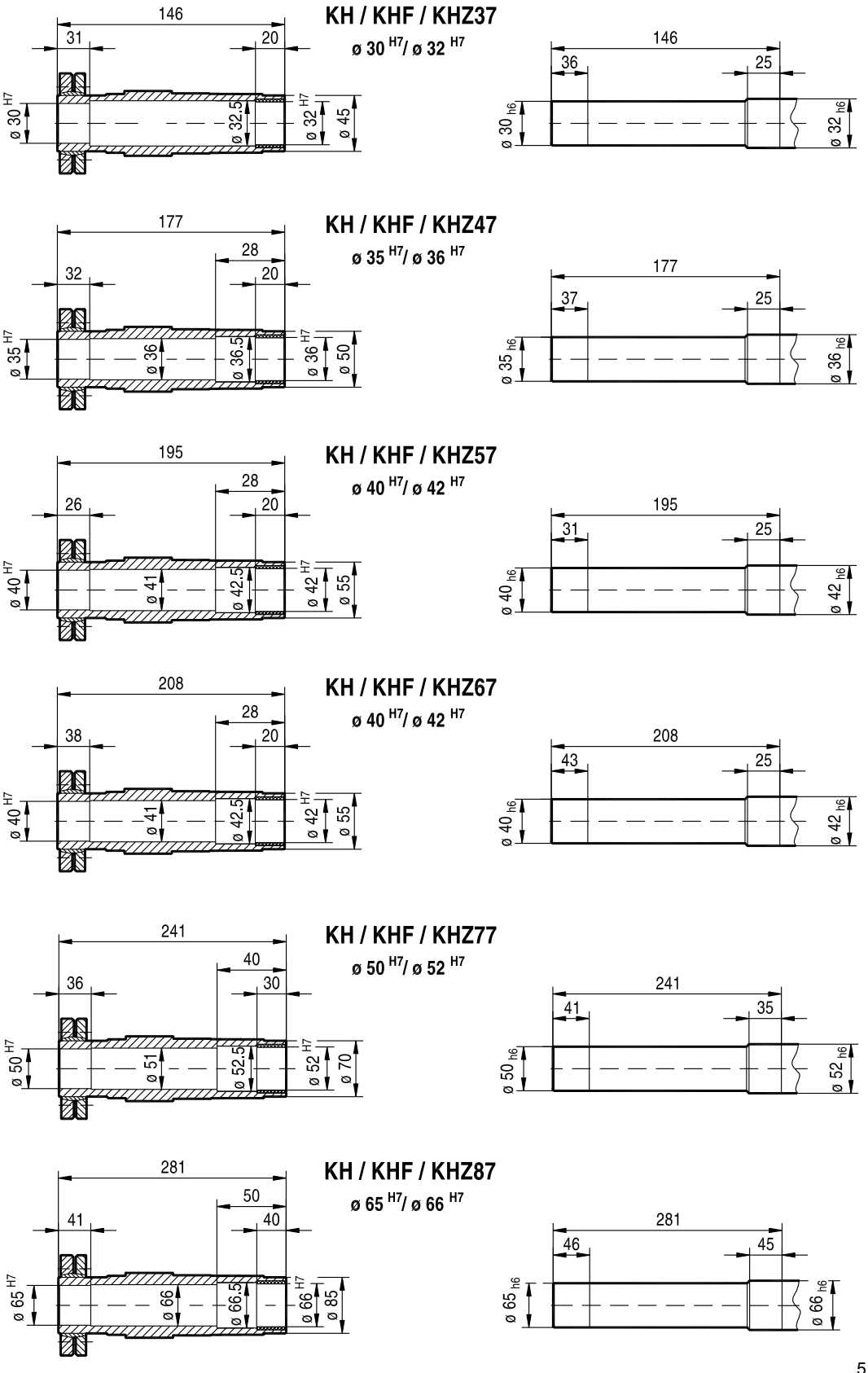
FH37 DRC1 with hollow shaft 30/32 mm

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



5112979211

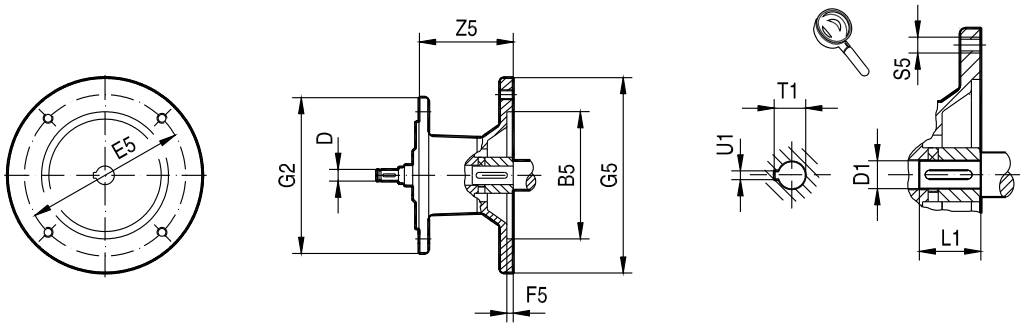
6.6.3 Helical-bevel gear units with shouldered hollow shaft (dimensions in mm):



5112977291

6.7 Adapters for mounting IEC motors

23 002 100



5015205643

Gear unit type	Adapter type	Dimensions in mm											
		B5	D	E5	F5	G2	G5	S5	Z5	D1	L1	T1	U1
R..27, R..37 F..27, F..37, F..47 K..37 W..37	AM63	95	10	115	3.5	120	140	M8	72	11	23	12.8	4
	AM71[1]	110		130	4		160			14	30	16.3	5
	AM80[1]	130	12	165	4.5		200	M10	106	19	40	21.8	6
	AM90[1]		14							24	50	27.3	8
R..47[2], R..57, R..67 F..57, F..67 K..47[2], K..57, K..67 W..47	AM63	95	10	115	3.5	160	140	M8	66	11	23	12.8	4
	AM71	110		130	4		160			14	30	16.3	5
	AM80	130	12	165	4.5		200	M10	99	19	40	21.8	6
	AM90		14							24	50	27.3	8
	AM100[1]	180	16	215	5		250	M12	134	28	60	31.3	8
	AM112[1]		18										
	AM132S/M[1]	230	22	265			300		191	38	80	41.3	10
R..77 F..77 K..77	AM63	95	10	115	3.5	200	140	M8	60	11	23	12.8	4
	AM71	110		130	4		160			14	30	16.3	5
	AM80	130	12	165	4.5		200	M10	92	19	40	21.8	6
	AM90		14							24	50	27.3	8
	AM100[1]	180	16	215	5		250	M12	126	28	60	31.3	8
	AM112[1]		18										
	AM132S/M[1]	230	22	265			300		179	38	80	41.3	10
	AM132ML[1]		28										
R..87 F..87 K..87	AM80	130	12	165	4.5	250	200	M10	87	19	40	21.8	6
	AM90		14							24	50	27.3	8
	AM100	180	16	215	5		250	M12	121	28	60	31.3	8
	AM112		18										
	AM132S/M	230	22	265			300		174	38	80	41.3	10
	AM132ML		28										
	AM160[1]	250	28	300	6		350	M16	232	42	110	45.3	12
	AM180[1]		32							48		51.8	14

1) Check dimension 1/2 G5 because component might protrude past foot-mounting surface if installed on R, K, S or W foot-mounted gear unit.

2) Not with AM112

6.8 Gear unit mounting

Use bolts of quality 8.8 to fasten gear units.

6.8.1 Exception

For the following flange-mounted (RF../RZ..) and foot/flange-mounted gear units (R..F), use bolts of **quality 10.9** to fasten the customer flange and to transmit the rated torques.

- RF37, R37F with flange Ø = 120 mm
- RF47, R47F with flange Ø = 140 mm
- RF57, R57F with flange Ø = 160 mm
- RZ37 – RZ87

6.9 Torque arms

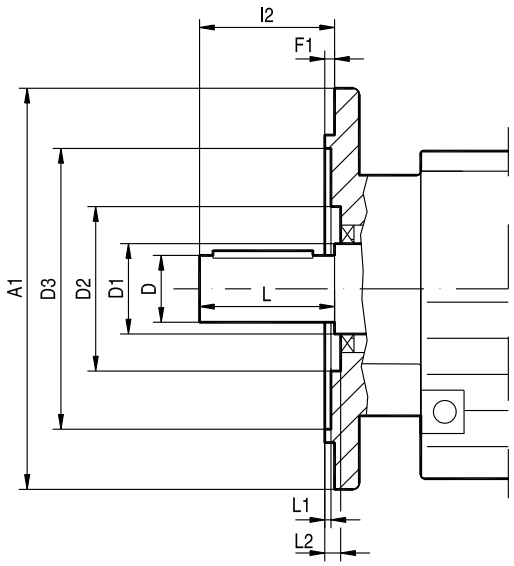
6.9.1 Available torque arms

Gear unit	Size			
	27	37	47	57
KA, KH, KV, KT	-	643 425 8	643 428 2	643 431 2
FA, FH, FV, FT **Rubber buffer (2 pieces)**	013 348 5	013 348 5	013 348 5	013 348 5

Gear unit	Size		
	67	77	87
KA, KH, KV, KT	643 431 2	643 434 7	643 437 1
FA, FH, FV, FT **Rubber buffer (2 pieces)**	013 348 5	013 349 3	013 349 3

Gear unit	Size	
	37	47
WA	1 061 129 0	1 061 187 8

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



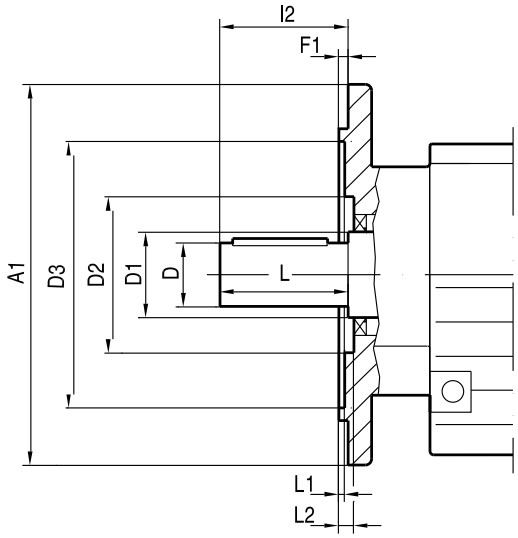
5255034507

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

Type	Dimensions in mm											
	A1	D	D1	D2		D3	F1	l2	L	L1		L2
				RF	R..F					RF	R..F	
RF27, R27F	120	25	30	54	54	66	3	50	50	1	1	6
	140				-	79	3			3	-	7
	160				-	92	3.5			3	-	7
RF37, R37F	120	25	35	60	63	70	3	50	50	5	4	7
	160				-	96	3.5			1	-	7.5
	200[1)]				-	119	3.5			1	-	7.5
RF47, R47F	140	30	35	72	64	82	3	60	60	4	1	6
	160				-	96	3.5			0.5	-	6.5
	200				-	116	3.5			0.5	-	6.5
RF57, R57F	160	35	40	76	75	96	3.5	70	70	4	2.5	5
	200				-	116	3.5			0	-	5
	250[1)]				-	160	4			0.5	-	5.5
RF67, R67F	200	35	50	90	90	118	3.5	70	70	2	4	7
	250				-	160	4			1	-	7.5
RF77, R77F	250	40	52	112	100	160	4	80	80	0.5	2.5	7
	300[1)]				-	210	4			0.5	-	7
RF87, R87F	300	50	62	123	122	210	4	100	100	0	1.5	8
	350				-	226	5			1	-	9

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

6.11 Flange contours of FF.., KF.. and WF.. gear units

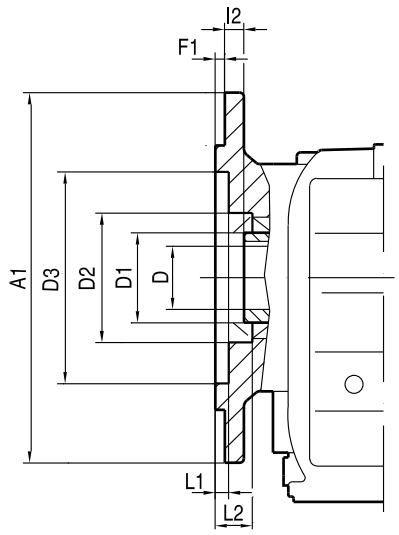


5255038603

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

Type	Dimensions in mm									
	A1	D	D1	D2	D3	F1	l2	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
KF37	160	25	30	70	94	3.5	50	50	2	6
KF47	200	30	40	72	115	3.5	60	60	3.5	7.5
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
WF37	120	20	30	-	70	2.5	40	40	-	10.5
WF37	160	20	30	-	70	2.5	40	40	-	25.5
WF47	160	30	35	-	92	3.5	10	60	6	-

6.12 Flange contours of FAF.., KAF.. and WAF.. gear units



5255054475

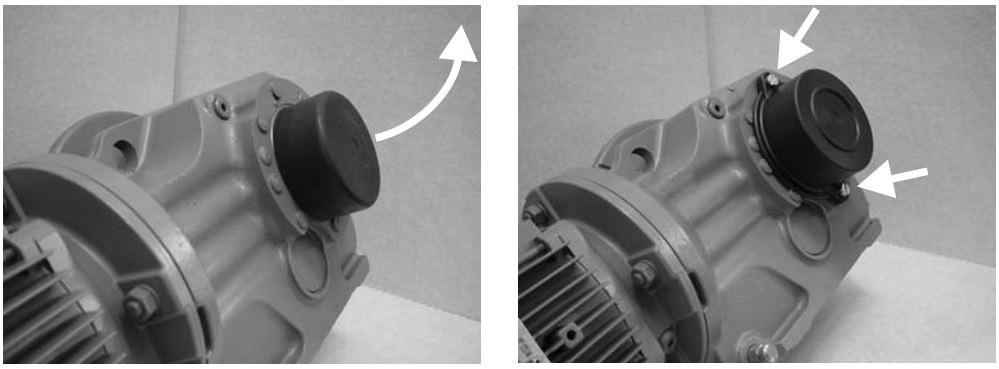
Check dimensions L1 and L2 for selection and installation of output elements.

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
KAF37	160	45	30	62	94	3.5	24	2	30
KAF47	200	50	35	70	115	3.5	25	3.5	8.5
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
WAF37	120	35	20 / 25	54	70	2.5	19.5	10.5	27
WAF37	160	35	20 / 25	54	70	2.5	34.5	25.5	42
WAF47	160	45	25 / 30	72	92	3.5	10	6	45

6.13 Fixed covers

Parallel-shaft helical, helical-bevel and SPIROPLAN® gear units with hollow shaft and shrink disk of size 37 up to size 87 come equipped with a rotating cover as standard. If, for safety reasons, fixed covers are required for these gear units, you can order them for the respective gear unit types by quoting the part numbers in the following tables. As standard, parallel-shaft helical and helical-bevel gear units with hollow shaft and shrink disk of size 107 and larger,such as parallel-shaft helical gear units of size 27, come equipped with a fixed cover.

The following figure shows how to replace the rotating cover by a fixed cover.

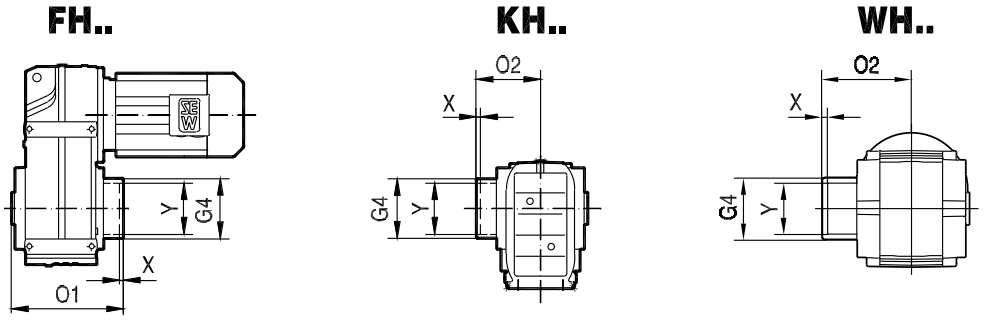


5255056395

[1] Pull off the rotating cover
[2] Install and fasten the fixed cover

6.13.1 Part numbers and dimensions

The following figure shows the main mounting elements:



5112982539

Parallel-shaft helical gearmotors	FH..37	FH..47	FH..57	FH..67	FH..77	FH..87
Part number	643 513 0	643 514 9	643 515 7	643 515 7	643 516 5	643 517 3
G4	78	88	100	100	121	164
O1	157	188.5	207.5	221.5	255	295
X	2	4.5	7.5	6	6	4
Y	75	83	83	93	114	159

Helical-bevel gearmotors[1)]	KH..37	KH..47	KH..57	KH..67	KH..77	KH..87
Part number	643 513 0	643 514 9	643 515 7	643 515 7	643 516 5	643 517 3
G4 in mm	78	88	100	100	121	164
O2 in mm	95	111.5	122.5	129	147	172
X in mm	0	1.5	5.5	3	1	2
Y in mm	75	83	83	93	114	159

1) Not possible for foot-mounted helical-bevel gear units with hollow shaft and shrink disk (KH..B).

SPIROPLAN® gearmotors	WH..37	WH..47
Part number	1 061 136 3	1 061 194 0
G4 in mm	68	80.5
O2 in mm	95.5	109.5
X in mm	11	12.5
Y in mm	50	72

6.14 Condition monitoring: Technical data of oil aging sensors

6.14.1 DUO10A diagnostic unit

DUO10A	Technical data		
Preset oil grades	OIL1	CLP mineral oil	T_{max} = 100 °C
		Bio 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 to +130 °C		
Permitted temperature sensor	PT1000		
EMC	IEC1000-4-2/3/4/6		
Ambient temperature	-25 °C to +70 °C		
Operating voltage	DC 18 – 28 V		
Current consumption at 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		

6.14.2 Designations and part numbers

Designation	Description	Part number
DUO10A 	Evaluation unit (basic unit)	1 343 875 1
DUO10A-PUR-M12-5m	5 m PUR cable with 1 connector	1 343 877 8
DUO10A-PVC-M12-5m	5 m PVC cable with 1 connector	1 343 878 6
DUO10A	Mounting bracket	1 343 880 8
DUO10A D = 34	Mounting clamp	1 343 879 4

Designation	Description	Part number
W4843 PT1000 	PT1000 temperature sensor	1 343 881 6
W4843_4x0.34-2m-PUR	2 m PUR cables for PT1000[1)]	1 343 882 4
W4843_4x0.34-2m-PVC	2 m PVC cables for PT1000[2)]	1 343 883 2
DUO10A 	Protection cap (for aseptic design, IP69K)	1 343 902 2

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

2) PVC cables are particularly suited for use in humid environments.

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

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

Complete adapter for PT1000 sensor	Part number
M10 × 1	1 343 903 0
M12 × 1.5	1 343 904 9
M22 × 1.5	1 343 905 7
M33 × 2	1 343 906 5
M42 × 2	1 343 907 3

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

Mounting base with sealing ring	Part number
M10 × 1	1 343 441 1
M12 × 1.5	1 343 827 1
M22 × 1.5	1 343 829 8
M33 × 2	1 343 830 1
M42 × 2	1 343 832 8

6.15 Condition monitoring: Technical data of vibration sensors

DUV10A and DUV30A vibration sensors are suited for early detection of gearmotor damage, which can be detected using vibration diagnostics, such as bearing damage or imbalance. The highest load of the drives at constant speed must be present to being able to use the full functionality of the diagnostic unit. Drives in which the maximum load is present during acceleration are suitable for monitoring using vibration sensors to a limited degree only.

6.15.1 DUV10A/DUV30A diagnostic unit

	Technical data	
	DUV10A	**DUV30A**
Measuring range	± 20 g	± 20 g
Frequency range	0.125 to 500 Hz	0.125 to 500 Hz / 0.125 to 5000 Hz
Spectral resolution	0.125 Hz	0.125 Hz / 1.25 Hz
Diagnostic methods	FFT, envelope-FFT, trend analysis	
Minimum measuring period	8.0 s	8.0 s / 0.8 s
Speed range	12 to 3500 rpm	12 to 3500 rpm 120 to 12000 rpm
Switch outputs	1: Early warning 2: Main alarm	
Operating voltage	DC 10-32 V	
Current consumption at DC 24 V	100 mA	
Protection class	III	
EMC	IEC1000-4-2/3/4/6	
Overload capacity	100 g	
Ambient temperature	−30 °C to +60 °C	−30 °C to +70 °C
Degree of protection	IP67	
Housing materials	Zinc die-casting, coating based on epoxy finish, polyester membrane keypad	
Electrical connection for supply and switching output	M12 plug connector	
Electrical connection RS-232 for communication	M8 plug connector	
Certificates and standards	CE, UL	

6.15.2 Designations and part numbers

Designation	Description	Part number
DUV10A / DUV30A 	Diagnostic unit (basic unit)	DUV10A: 1 406 629 7 DUV30A: 1 328 969 1
DUV.0A-S	Parameter setting software	1 406 630 0
DUV.0A-K-RS232-M8	Communication cable	1 406 631 9
DUV.0A-N24DC	DC 24 V power supply unit	1 406 632 7
DUV.0A-I	Pulse tester	1 406 633 5
DUV.0A-K-M12-2m PUR	2 m PUR cables with 1 connector[1)]	1 406 634 3
DUV.0A-K-M12-5m PUR	5 m PUR cable with 1 connector[1)]	1 406 635 1
DUV.0A-K-M12-2m PVC	2 m PVC cables with 1 connector[2)]	1 326 620 9
DUV.0A-K-M12-5m PVC	5 m PVC cable with 1 connector[2)]	1 326 621 7

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

2) PVC cables are particularly suited for use in humid environments.

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

Mounting base for installing the diagnostic unit:

Mounting base with sealing ring for gear unit	Part number
M10 × 1	1 343 441 1
M12 × 1.5	1 343 827 1
M22 × 1.5	1 343 829 8
M33 × 2	1 343 830 1
M42 × 2	1 343 832 8
G ¾	1 343 833 6
G 1	1 343 834 4
G 1 ¼	1 343 835 2
G 1 ½	1 343 836 0
Mounting base for motors	**Part number**
M 8	1 362 261 7
M 12	1 343 842 5
M 16	1 343 844 1
M 20	1 362 262 5

7 Technical Data of DRC Electronic Motors

7.1 Electronic motors DRC.-...-DBC

7.1.1 General technical data of DRC

DRC type		DRC1	DRC2
Supply voltages Permitted range	V_{line}	3 x AC 380 V - 5 % to AC 500 V +10 %	
Line frequency	f_{line}	50 Hz ... 60Hz	
Input current	I_N	1.04 A	2.8 A
	$I_{maxStart}$	2.6 A	7.0 A
Nominal output current	$I_{N\ motor}$	AC 1.3 A	AC 3.4 A
Current carrying capacity of terminals		See operating instructions, chapter "Electrical Installation / Installation instructions / Permitted cable cross section of terminals"	
Motor power S1	P_{Mot}	**0.55 kW** 0.75 HP	**1.5 kW** 2.0 HP
Nominal motor torque	M_N	2.65 Nm	7.20 Nm
Maximum motor torque	M_{max}	6.62 Nm up to 2000 rpm	18.00 Nm up to 2000 rpm
Mass moment of inertia of the motor	J_{mot} 1)	141.60 kg/mm^2	365.80 kg/mm^2
	J_{mot} 2)	203.1 kg/mm^2	536.2 kg/mm^2
PWM frequency		4 / 8 kHz	
External braking resistor	R_{min}	100 Ω	100 Ω
Interference immunity		EN 61800-3; 2. Environment (industrial environment)	
Interference emission		EN 61800-3 category C2 (class A group 2 of EN 55011)	
Climate class		EN 60721-3-3, class 3K3	
Storage temperature	ϑ_S	− 25 °C to + 70 °C (EN 60721-3-3)	
Proof of mechanical strength		According to EN 61800-5-1	
Degree of protection	IP	Standard: IP 65 according to EN 60529 (DRC housing closed and all cable glands sealed) With optional ASEPTIC / ASEPTIC^{plus} design: IP 66 according to EN 60529 (DRC housing closed and all cable glands sealed)	
Duty type		S1, continuous duty (EN 60034-1)	
Type of cooling		Self-cooling to DIN 41751 and EN 61800-5-1	
Signaling functions		Display elements on housing to indicate the unit state	
Installation altitude	h	Up to h ≤ 1000 m without restrictions. The following restrictions apply to heights ≥ 1000 m: • From 1000 m to max. 4000 m: – I_N reduced by 1% per 100 m • From 2000 m to max. 4000 m: – V_N reduced by AC 6 V per 100 m Over 2000 m only overvoltage class 2; external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.	
Mass	m 1)	12.40 kg	17.20 kg
	m 2)	13.00 kg	18.23 kg
Required preventive measures		Grounding the unit	

1) Without brake

2) With brake

7.1.2 Ambient temperature of DRC

DRC type		DRC1	DRC2
Ambient temperature	ϑ_A	-25 °C to +60 °C	
$I_{N\ motor}$ reduction Ambient temperature		3 % $I_{N\ motor}$ per K at 40 °C to 60 °C	

7.1.3 Binary inputs / signal relays

Binary inputs / signal relays			
Input type	DI01 to DI04	Isolated via optocoupler; PLC-compatible to EN 61131-2 (digital inputs type 1) $R_i \approx 3.0\ k\Omega$, $I_E \approx 10$ mA, sampling cycle ≤ 5 ms	
Number of inputs		4	
Signal level		+15 to +30 V = "1" = Contact closed –3 to +5 V = "0" = Contact open	
Signal relays Contact data	K1a K1b	Response time ≤ 15 ms DC 24 V / 50 mA / DC 12 to IEC 60947-5-1 (only SELV or PELV circuits)	
Signaling function		NO contact for ready signal	Contact closed: – with voltage present (24 V system) – if no fault was detected – after completion of self-testing phase (when unit is turned on)

7.1.4 Internal voltage supply 24V_O

Internal voltage supply for non-safety-related enable signal via STO input		
Voltage supply	+24V_O 0V24_O	DC 24 V to EN 61131-2, interference voltage proof and short-circuit proof
Permitted total current		60 mA
Required current for STO-IN supply		30 mA

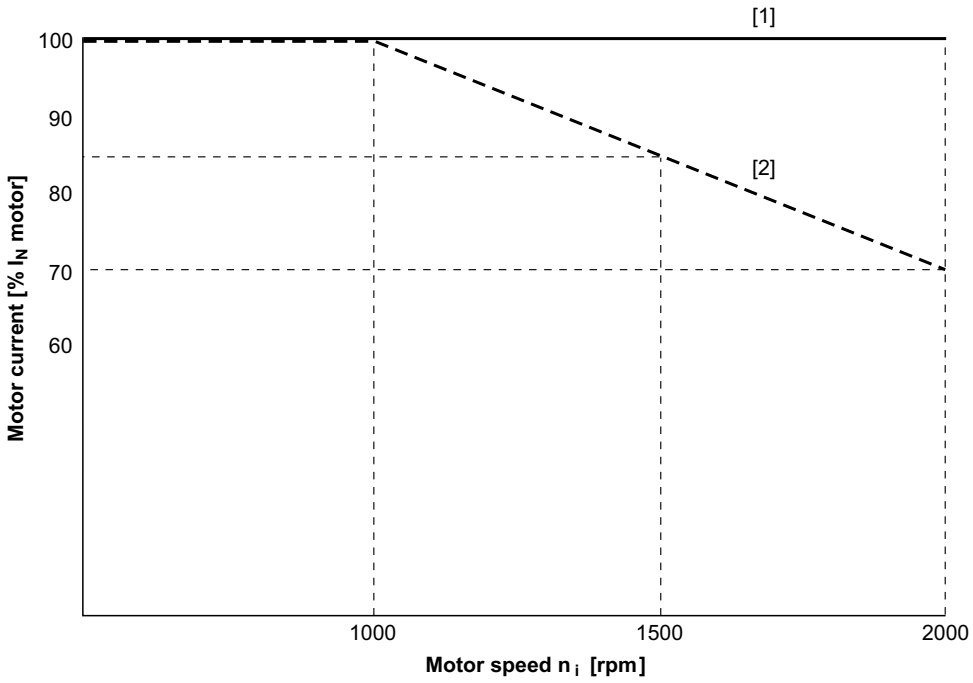
7.1.5 Derating factors

Affected unit variants

For **DRC2** motors, you must also observe the $I_{N\ motor}$ reduction shown in the following figure:

$I_{N\ motor}$ reduction

The following figure shows the $I_{N\ motor}$ reduction depending on the motor speed:



9007202114032267

[1] Ambient temperature ≤ 35 °C
[2] Ambient temperature = 40 °C

INFORMATION

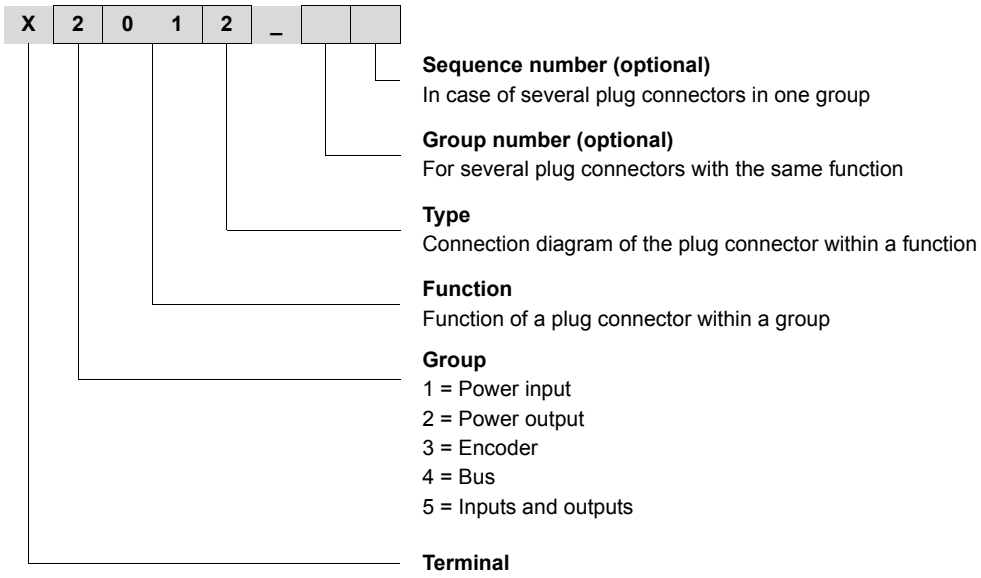
Derating is based on typical operating conditions with a supply voltage of 24 V (signal level of binary inputs, input voltage of STO input).

7.1.6 Plug connectors

The wiring diagrams of the plug connectors depict the contact end of the connection.

Designation key

The designation of plug connectors is specified according to the following key:



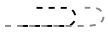
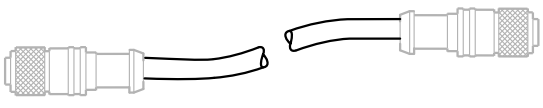
Connection cables

Connection cables are not included in the scope of delivery.

You can order prefabricated cables from SEW-EURODRIVE. They are described in the following sections. Specify the part number and length of the required cable in your order.

The number and type of required connection cables depend on the design of the units and the components to be connected. This is why not all cables in the list are actually required.

The following figures show the various cable types:

Cable	Length	Installation type
	Fixed length	Suitable for cable carrier installation  Not suitable for cable carrier installation 
	Variable length	

Using self-fabricated plug connectors

INFORMATION

You can also purchase plug connectors and the associated assembly tools from Intercontec.

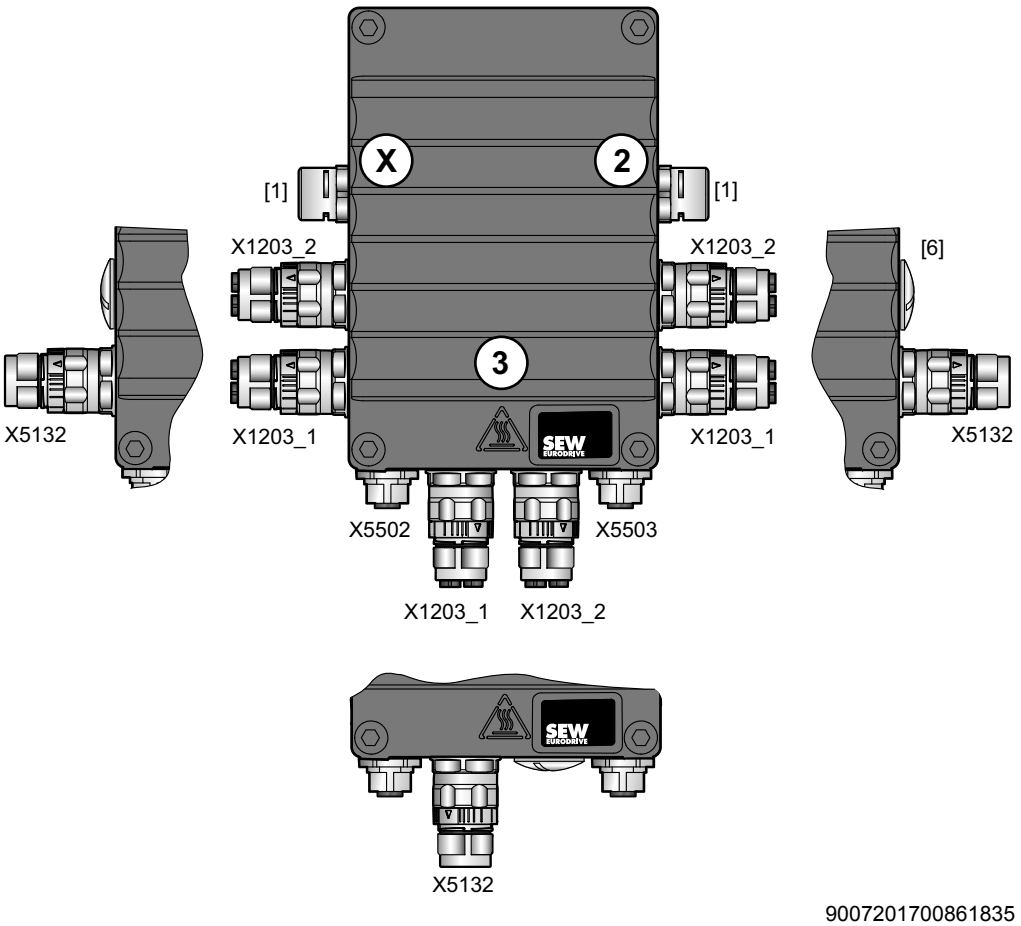
Plug connector positions

The following figure shows the possible plug connector positions. A difference is made between plug connectors with selectable position and plug connectors with fixed position:

Plug connectors	Color	Position	Location
X5132: Digital inputs/outputs	–	As required	X, 2 or 3, not together with X1203_1, X1203_2
X5502: STO – IN	Orange	Fixed	3 (left)
X5503: STO – OUT	Orange	Fixed	3 (right)
X1203_1: AC 400 V connection [1)]	Black	As required	X, 2 or 3, not together with X5132
X1203_2: AC 400 V connection	Black	As required	X, 2 or 3, not together with X5132
[1] Pressure compensation [2)]	–	Fixed	Depends on mounting position

1) Plug connector X1203_1 is also available separately (that is without plug connector X1203_2).

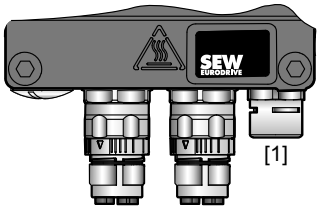
2) Only in conjunction with the optional design for use in wet areas (with MOVIGEAR®) / ASEPTIC design (with DRC).



9007201700861835

Restrictions in conjunction with pressure compensation

The position for STO plug connectors is occupied by the pressure compensation fitting [1] when using the optional design for use in wet areas (with MOVIGEAR®)/ASEPTIC^{plus} design (with DRC) and M5, M6 mounting position. In this case, plug connectors for STO are not possible:



9007201700846347

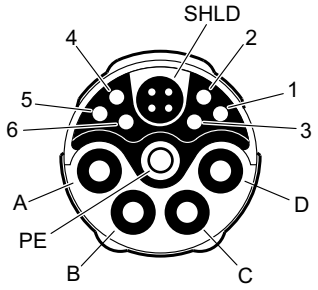
7.1.7 X1203_1 and X1203_2: AC 400 V connection

The following table informs about this connection:

Function
AC 400 V connection for supplying the unit/for looping through

Connection type
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: black, protected against contact

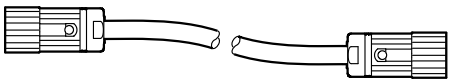
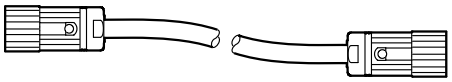
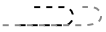
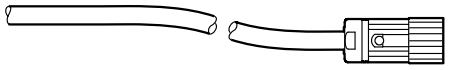
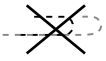
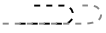
Wiring diagram

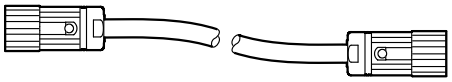
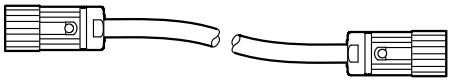
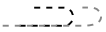
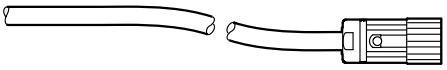
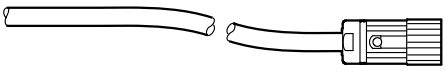
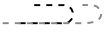


2497125387

Assignment		
No.	**Name**	**Function**
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	n.c.	Not connected
8	n.c.	Not connected
9	n.c.	Not connected
10	n.c.	Not connected
SHLD	n.c.	Not connected

Connection cables The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Cable cross section	Operating voltage
Part number 1 812 746 0  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V
Part number 1 813 395 9 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V
Part number 1 812 747 9  Open — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V
Part number 1 813 396 7 Halogen-free  Open — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V

Connection cables	Length/ Installation type	Cable cross section	Operating voltage
Part number 1 812 748 7  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm²	AC 500 V
Part number 1 813 397 5 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm²	AC 500 V
Part number 1 812 749 5  Open — M23, coding ring: black	Variable 	4 mm²	AC 500 V
Part number 1 813 398 3 Halogen-free  Open — M23, coding ring: black	Variable 	4 mm²	AC 500 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 747 9, 1 813 396 7, 1 812 749 5 and 1 813 398 3

Signal name	Core color/designation
L1	Black / 1
L2	Black / 2
L3	Black / 3
PE	Green/yellow

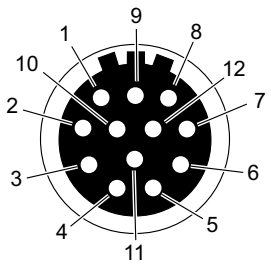
7.1.8 X5132: Digital inputs/outputs

The following table informs about this connection:

Function
Digital inputs/outputs for: DRC

Connection type
M23, P insert 12-pole, SpeedTec-capable, Intercontec, female, 0°-coded

Wiring diagram

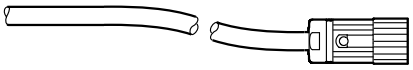
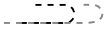


2264820107

Assignment		
No.	**Name**	**Function**
1	DI01	Binary input DI01
2	DI02	Binary input DI02
3	DI03	Binary input DI03
4	DI04	Binary input DI04
5	n.c.	Not connected
6	K1a	Signal relay K1a
7	K1b	Signal relay K1b
8	+24V_O	DC 24 V output
9	0V24_O	0V24 reference potential
10	n.c.	Not connected
11	n.c.	Not connected
12	FE	Equipotential bonding/functional ground

Connection cables

The following table provides an overview of the cables available for this connection:

Connection cable	Length/ installation type	Operating voltage
Part number 1 174 145 7  Open — M23, 12-pole, 0°-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 174 145 7

Signal name	Color coding
DI01	Pink
DI02	Gray
DI03	Red
DI04	Blue
Reserved	Yellow
K1a	Green
K1b	Violet
+24V_O	Black
0V24_O	Brown
Reserved	White
Reserved	Gray/pink
FE	Red/blue

7.1.9 X5502: STO – IN

⚠ WARNING

No safe disconnection of the DRC drive unit.

Severe or fatal injuries.

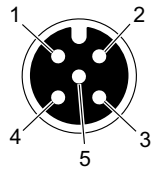
- Do not use the 24 V output (pins 1 and 3) for safety-related applications with DRC drive units.
- You may only jumper the STO input with 24 V when the DRC drive unit need not fulfill any safety function.

The following table informs about this connection:

Function
Input for safe torque off (STO)

Connection type
M12, 5-pole, female, A-coded

Wiring diagram



2264816267

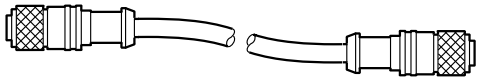
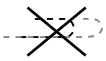
Assignment		
No.	**Name**	**Function**
1	+24V_O	DC 24 V output
2	STO −	Input STO –
3	0V24_O	0V24 reference potential
4	STO +	Input STO +
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 497 6  Open — M12, 5-pole, A-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 497 6 and 1 812 739 8

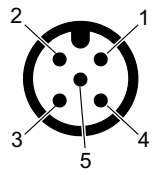
Signal name	Core color/designation
STO −	Black / 1
STO +	Black / 2

7.1.10 X5503: STO – OUT

The following table provides information about this connection:

Function
Connection for safe torque off (STO) for looping through

Connection type
M12, 5-pole, male, A-coded

Wiring diagram
 2264818187

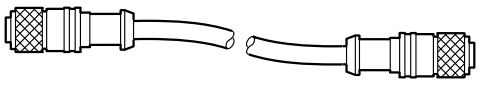
Assignment		
No.	**Name**	**Function**
1	res.	Reserved
2	STO −	Output STO – (to loop through)
3	res.	Reserved
4	STO+	Output STO + (to loop through)
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded M12, 5-pole, A-coded	Variable 	DC 60 V

7.2 Electronic motor DRC.-...-DAC

7.2.1 General technical data of DRC

DRC type		DRC1	DRC2
Supply voltages Permitted range	V_{line}	3 x AC 380 V - 5 % to AC 500 V +10 %	
Line frequency	f_{line}	50 Hz ... 60Hz	
Input current	I_N	1.04 A	2.8 A
	$I_{maxStart}$	2.6 A	7.0 A
Nominal output current	$I_{N\ motor}$	AC 1.3 A	AC 3.4 A
Current carrying capacity of terminals		See operating instructions, chapter "Electrical Installation / Installation instructions / Permitted cable cross section of terminals"	
Motor power S1	P_{Mot}	**0.55 kW** 0.75 HP	**1.5 kW** 2.0 HP
Nominal motor torque	M_N	2.65 Nm	7.20 Nm
Maximum motor torque	M_{max}	6.62 Nm up to 2000 rpm	18.00 Nm up to 2000 rpm
Mass moment of inertia of the motor	J_{mot} 1)	141.60 kg/mm^2	365.80 kg/mm^2
	J_{mot} 2)	203.1 kg/mm^2	536.2 kg/mm^2
PWM frequency		4 / 8 kHz	
External braking resistor	R_{min}	100 Ω	100 Ω
Interference immunity		EN 61800-3; 2. Environment (industrial environment)	
Interference emission		EN 61800-3 category C2 (class A group 2 of EN 55011)	
Climate class		EN 60721-3-3, class 3K3	
Storage temperature	ϑ_S	− 25 °C to + 70 °C (EN 60721-3-3)	
Proof of mechanical strength		According to EN 61800-5-1	
Degree of protection	IP	Standard: IP 65 according to EN 60529 (DRC housing closed and all cable glands sealed) With optional ASEPTIC / ASEPTIC^{plus} design: IP 66 according to EN 60529 (DRC housing closed and all cable glands sealed)	
Duty type		S1, continuous duty (EN 60034-1)	
Type of cooling		Self-cooling to DIN 41751 and EN 61800-5-1	
Signaling functions		Display elements on housing to indicate the unit state	
Installation altitude	h	Up to h ≤ 1000 m without restrictions. The following restrictions apply to heights ≥ 1000 m: • From 1000 m to max. 4000 m: – I_N reduced by 1% per 100 m • From 2000 m to max. 4000 m: – V_N reduced by AC 6 V per 100 m Over 2000 m only overvoltage class 2; external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.	
Mass	m 1)	12.40 kg	17.20 kg
	m 2)	13.00 kg	18.23 kg
Required preventive measures		Grounding the unit	

1) Without brake

2) With brake

7.2.2 Ambient temperature of DRC

DRC type		DRC1	DRC2
Ambient temperature	ϑ_A	-25 °C to +60 °C	
$I_{N\ motor}$ reduction Ambient temperature		3 % $I_{N\ motor}$ per K at 40 °C to 60 °C	

7.2.3 Binary inputs / signal relays

Binary inputs / signal relays			
Input type	DI01 to DI04	Isolated via optocoupler; PLC-compatible to EN 61131-2 (digital inputs type 1) $R_i \approx 3.0\ k\Omega$, $I_E \approx 10$ mA, sampling cycle ≤ 5 ms	
Number of inputs		4	
Signal level		+15 to +30 V = "1" = Contact closed –3 to +5 V = "0" = Contact open	
Signal relays Contact data	K1a K1b	Response time ≤ 15 ms DC 24 V / 50 mA / DC 12 to IEC 60947-5-1 (only SELV or PELV circuits)	
Signaling function		NO contact for ready signal	Contact closed: – with voltage present (24 V system) – if no fault was detected – after completion of self-testing phase (when unit is turned on)

7.2.4 Internal voltage supply 24V_O

Internal voltage supply for non-safety-related enable signal via STO input		
Voltage supply	+24V_O 0V24_O	DC 24 V to EN 61131-2, interference voltage proof and short-circuit proof
Permitted total current		60 mA
Required current for STO-IN supply		30 mA

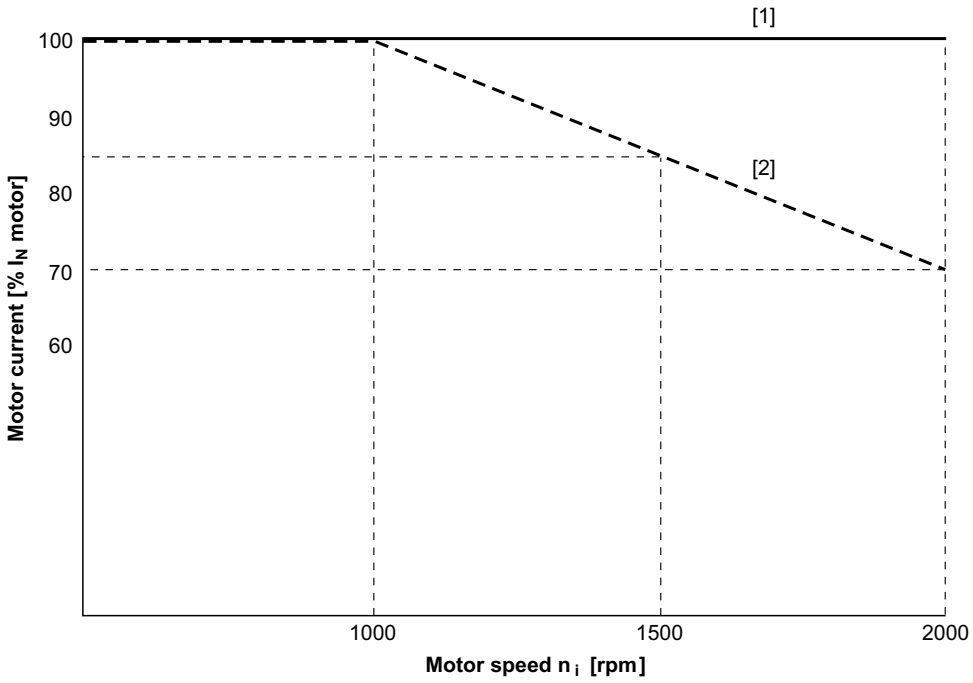
7.2.5 Derating factors

Affected unit variants

For **DRC2** motors, you must also observe the $I_{N\ motor}$ reduction shown in the following figure:

$I_{N\ motor}$ reduction

The following figure shows the $I_{N\ motor}$ reduction depending on the motor speed:



9007202114032267

[1] Ambient temperature ≤ 35 °C
[2] Ambient temperature = 40 °C

INFORMATION

Derating is based on typical operating conditions with a supply voltage of 24 V (AS-Interface electronics supply, signal level of binary inputs, input voltage of STO input).

7.2.6 Technical data of AS-Interface

AS-Interface		
AS-Interface electronics supply	Tl. AS + Tl. AS - I_E only AS-Interface:	29.5 V – 31.6 V (AS-Interface power supply to EN 50295) ≤ 50 mA[1)]
Control input	Tl. AS + Tl. AS -	Connection of the AS-interface data line Connection of the AS-interface data line
Sensor connection	Tl. DI2 Tl. DI3 Tl. V024 Tl. V0⊥	External sensor input External sensor input 24 V for sensor supply Reference potential for sensor supply
Sensor inputs	PLC-compatible in accordance with EN 61131-2 R_i about 3.0 kΩ I_E about 10 mA	
Signal level	+15 V to +30 V –3 V to +5 V	"1" "0"
Maximum sensor cable length	15 m	

1) The current increases by the demand of the connected sensors (max. sensor current 75 mA).

AS-Interface GLK30A binary slave

AS-Interface GLK30A	
Protocol variant	AS-Interface binary slave with a S-7.F profile "four bit I/O mode slave"
AS-Interface profile	S-7.F
I/O configuration	7_{hex}
ID code	F_{hex}
ext. ID code 2	E_{hex}
ext. ID code1	F_{hex}
Address	1 to 31 (factory setting: 0), can be changed as often as required

AS-Interface GLK31A double slave

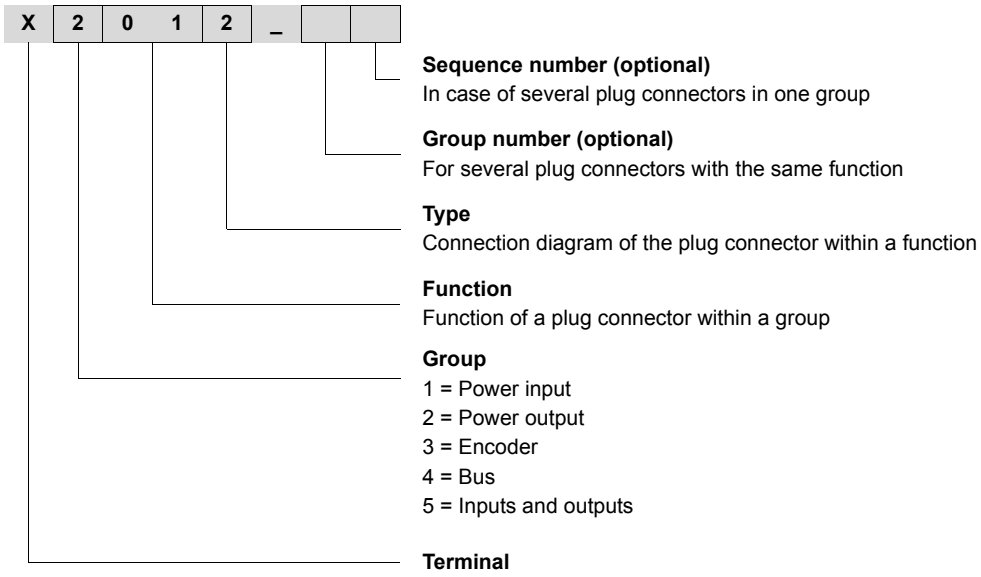
AS-Interface GLK31A	Slave A	Slave B
Protocol variant	AS-Interface double slave in extended address mode AS-Interface specification V3.0, rev.02 in conjunction with M4 master profile	
AS-Interface profile	S-7.A.7.7	S-7.A.5.F
I/O configuration	7_{hex}	7_{hex}
ID code	A_{hex}	A_{hex}
ext. ID code 2	7_{hex}	5_{hex}
ext. ID code1	7_{hex}	7_{hex}
Function	4DI/4DO cyclical 4PDI/3PDO	Serial acyclic
Address	1 to 31 (factory setting: 0), can be changed as often as required	

7.2.7 Plug connectors

The wiring diagrams of the plug connectors depict the contact end of the connection.

Designation key

The designation of plug connectors is specified according to the following key:



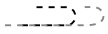
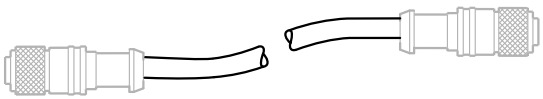
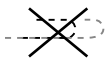
Connection cables

Connection cables are not included in the scope of delivery.

You can order prefabricated cables from SEW-EURODRIVE. They are described in the following sections. Specify the part number and length of the required cable in your order.

The number and type of required connection cables depend on the design of the units and the components to be connected. This is why not all cables in the list are actually required.

The following figures show the various cable types:

Cable	Length	Installation type
	Fixed length	Suitable for cable carrier installation 
	Variable length	Not suitable for cable carrier installation 

Using self-fabricated plug connectors

INFORMATION

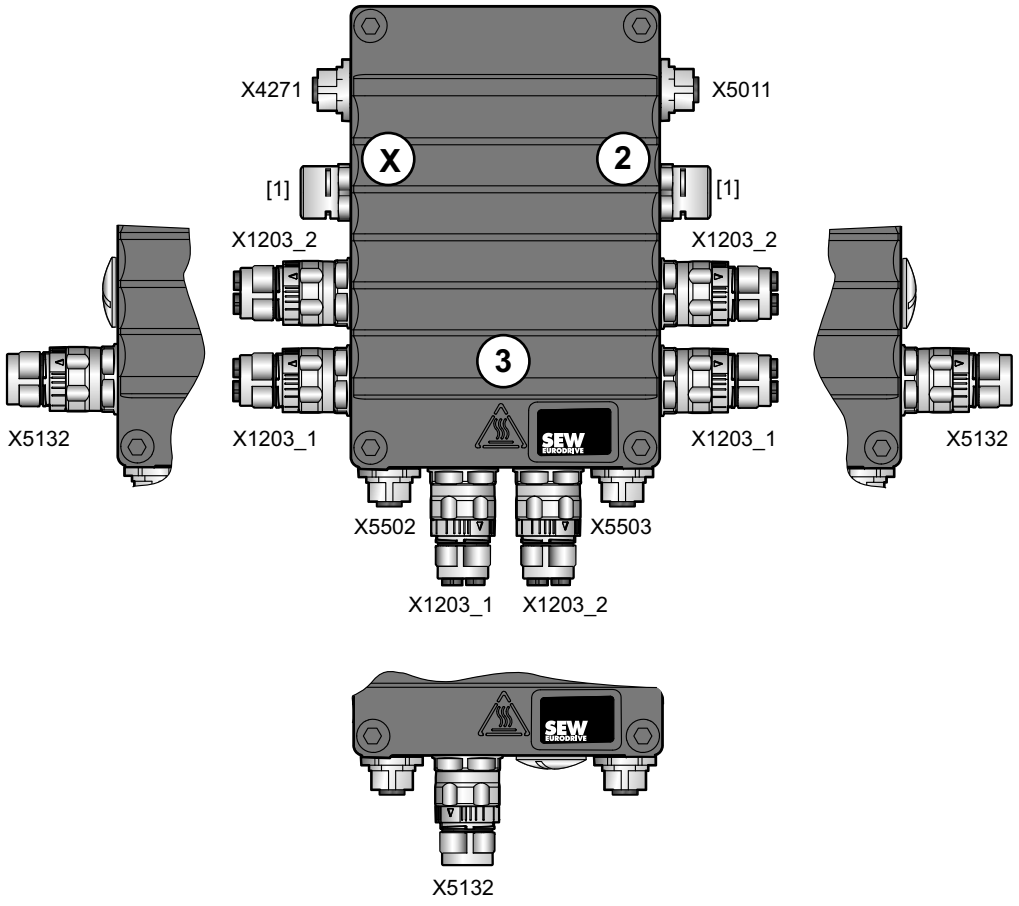
You can also purchase plug connectors and the associated assembly tools from Intercontec.

Plug connector positions

The following figure shows the possible plug connector positions. A difference is made between plug connectors with selectable position and plug connectors with fixed position:

Plug connectors	Color	Position	Location
X5132: Digital inputs/outputs	–	As required	X, 2 or 3, not together with X1203_1, X1203_2
X5502: STO – IN	Orange	Fixed	3 (left)
X5503: STO – OUT	Orange	Fixed	3 (right)
X4271: AS-Interface communication interface[1)]	Yellow	Fixed	X
X5011: AS-Interface sensors [1)]	Black	Fixed	2
X1203_1: AC 400 V connection [2)]	Black	As required	X, 2 or 3, not together with X5132
X1203_2: AC 400 V connection	Black	As required	X, 2 or 3, not together with X5132
[1] Pressure compensation [3)]	–	Fixed	Depends on mounting position

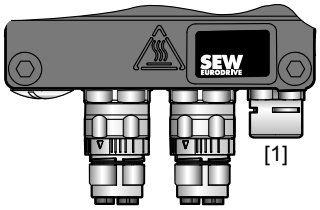
1) Standard scope of delivery
2) Plug connector X1203_1 is also available separately (that is without plug connector X1203_2).
3) Only in conjunction with the optional design for use in wet areas (with MOVIGEAR®) / ASEPTIC design (with DRC).



9007201700801803

Restrictions in conjunction with pressure compensation

The position for STO plug connectors is occupied by the pressure compensation fitting [1] when using the optional design for use in wet areas (with MOVIGEAR®)/ASEPTIC^{plus} design (with DRC) and M5, M6 mounting position. In this case, plug connectors for STO are not possible:



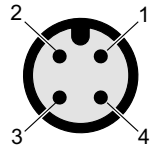
9007201700846347

7.2.8 X4271: AS-Interface communication interface

The following table informs about this connection:

Function
Connection of AS-Interface data cable

Connection type
M12, 4-pole, male, A-coded

Wiring diagram
 2384154763

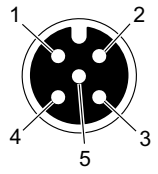
Assignment		
No.	**Name**	**Function**
1	AS+	AS-Interface data cable (+)
2	res.	Reserved
3	AS−	AS-Interface data cable (−)
4	res.	Reserved

7.2.9 X5011: AS-Interface sensor connection

The following table informs about this connection:

Function
Connection of AS-Interface sensors

Connection type
M12, 5-pole, female, A-coded

Wiring diagram
 2264816267

Assignment		
No.	**Name**	**Function**
1	+24V_SEN	DC 24 V voltage supply for sensors
2	DI3	DI3 sensor input
3	0V24_SEN	0V24 reference potential for sensors
4	DI2	DI2 sensor input
5	res.	Reserved

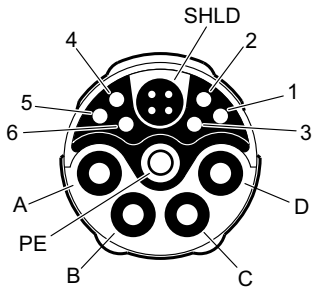
7.2.10 X1203_1 and X1203_2: AC 400 V connection

The following table informs about this connection:

Function
AC 400 V connection for supplying the unit/for looping through

Connection type
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: black, protected against contact

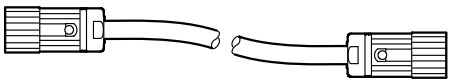
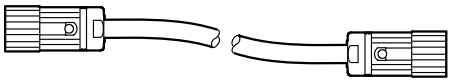
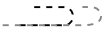
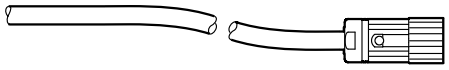
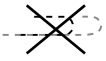
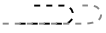
Wiring diagram

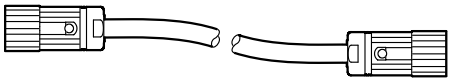
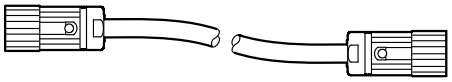
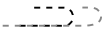
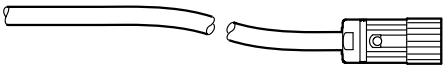
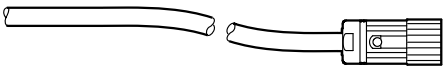
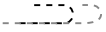


2497125387

Assignment		
No.	**Name**	**Function**
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	n.c.	Not connected
8	n.c.	Not connected
9	n.c.	Not connected
10	n.c.	Not connected
SHLD	n.c.	Not connected

Connection cables The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Cable cross section	Operating voltage
Part number 1 812 746 0  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V
Part number 1 813 395 9 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V
Part number 1 812 747 9  Open — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V
Part number 1 813 396 7 Halogen-free  Open — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V

Connection cables	Length/ Installation type	Cable cross section	Operating voltage
Part number 1 812 748 7  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm^2	AC 500 V
Part number 1 813 397 5 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm^2	AC 500 V
Part number 1 812 749 5  Open — M23, coding ring: black	Variable 	4 mm^2	AC 500 V
Part number 1 813 398 3 Halogen-free  Open — M23, coding ring: black	Variable 	4 mm^2	AC 500 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 747 9, 1 813 396 7, 1 812 749 5 and 1 813 398 3

Signal name	Core color/designation
L1	Black / 1
L2	Black / 2
L3	Black / 3
PE	Green/yellow

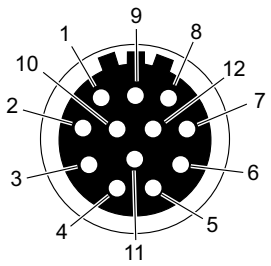
7.2.11 X5132: Digital inputs/outputs

The following table informs about this connection:

Function
Digital inputs/outputs for: DRC

Connection type
M23, P insert 12-pole, SpeedTec-capable, Intercontec, female, 0°-coded

Wiring diagram

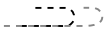


2264820107

Assignment		
No.	**Name**	**Function**
1	DI01	Binary input DI01 (CW/stop)
2	DI02	Binary input DI02 (CCW/stop)
3	DI03	Binary input DI03 (setpoint f1/f2)
4	DI04	Binary input DI04 (changeover automatic/local mode)
5	n.c.	Not connected
6	K1a	Signal relay K1a
7	K1b	Signal relay K1b
8	+24V_O	DC 24 V output
9	0V24_O	0V24 reference potential
10	n.c.	Not connected
11	n.c.	Not connected
12	FE	Equipotential bonding/functional ground

Connection cables

The following table provides an overview of the cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 174 145 7  Open — M23, 12-pole, 0°-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 174 145 7

Signal name	Color coding
DI01	Pink
DI02	Gray
DI03	Red
DI04	Blue
Reserved	Yellow
K1a	Green
K1b	Violet
+24V_O	Black
0V24_O	Brown
Reserved	White
Reserved	Gray/pink
FE	Red/blue

7.2.12 X5502: STO – IN

⚠ WARNING

No safe disconnection of the DRC drive unit.

Severe or fatal injuries.

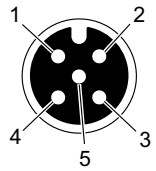
- Do not use the 24 V output (pins 1 and 3) for safety-related applications with DRC drive units.
- You may only jumper the STO input with 24 V when the DRC drive unit need not fulfill any safety function.

The following table informs about this connection:

Function
Input for safe torque off (STO)

Connection type
M12, 5-pole, female, A-coded

Wiring diagram



2264816267

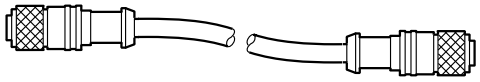
Assignment		
No.	**Name**	**Function**
1	+24V_O	DC 24 V output
2	STO −	Input STO –
3	0V24_O	0V24 reference potential
4	STO +	Input STO +
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 497 6  Open — M12, 5-pole, A-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 497 6 and 1 812 739 8

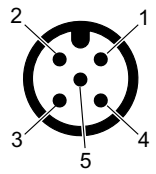
Signal name	Core color/designation
STO −	Black / 1
STO +	Black / 2

7.2.13 X5503: STO – OUT

The following table provides information about this connection:

Function
Connection for safe torque off (STO) for looping through

Connection type
M12, 5-pole, male, A-coded

Wiring diagram

2264818187

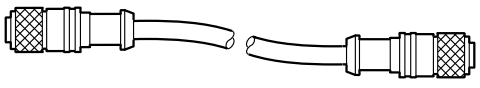
Assignment		
No.	**Name**	**Function**
1	res.	Reserved
2	STO −	Output STO – (to loop through)
3	res.	Reserved
4	STO+	Output STO + (to loop through)
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded M12, 5-pole, A-coded	Variable 	DC 60 V

7.3 Electronic motor DRC.-...-DSC

7.3.1 General technical data of DRC

DRC type		DRC1	DRC2
Supply voltages Permitted range	V_{line}	3 x AC 380 V - 5 % to AC 500 V +10 %	
Line frequency	f_{line}	50 Hz ... 60Hz	
Input current	I_N	1.04 A	2.8 A
	$I_{maxStart}$	2.6 A	7.0 A
Nominal output current	$I_{N\ motor}$	AC 1.3 A	AC 3.4 A
Current carrying capacity of terminals		See operating instructions, chapter "Electrical Installation / Installation instructions / Permitted cable cross section of terminals"	
Motor power S1	P_{Mot}	**0.55 kW** 0.75 HP	**1.5 kW** 2.0 HP
Nominal motor torque	M_N	2.65 Nm	7.20 Nm
Maximum motor torque	M_{max}	6.62 Nm up to 2000 rpm	18.00 Nm up to 2000 rpm
Mass moment of inertia of the motor	J_{mot} 1)	141.60 kg/mm^2	365.80 kg/mm^2
	J_{mot} 2)	203.1 kg/mm^2	536.2 kg/mm^2
PWM frequency		4 / 8 kHz	
External braking resistor	R_{min}	100 Ω	100 Ω
Interference immunity		EN 61800-3; 2. Environment (industrial environment)	
Interference emission		EN 61800-3 category C2 (class A group 2 of EN 55011)	
Climate class		EN 60721-3-3, class 3K3	
Storage temperature	ϑ_S	− 25 °C to + 70 °C (EN 60721-3-3)	
Proof of mechanical strength		According to EN 61800-5-1	
Degree of protection	IP	Standard: IP 65 according to EN 60529 (DRC housing closed and all cable glands sealed) With optional ASEPTIC / ASEPTIC^{plus} design: IP 66 according to EN 60529 (DRC housing closed and all cable glands sealed)	
Duty type		S1, continuous duty (EN 60034-1)	
Type of cooling		Self-cooling to DIN 41751 and EN 61800-5-1	
Signaling functions		Display elements on housing to indicate the unit state	
Installation altitude	h	Up to h ≤ 1000 m without restrictions. The following restrictions apply to heights ≥ 1000 m: • From 1000 m to max. 4000 m: – I_N reduced by 1% per 100 m • From 2000 m to max. 4000 m: – V_N reduced by AC 6 V per 100 m Over 2000 m only overvoltage class 2; external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.	
Mass	m 1)	12.40 kg	17.20 kg
	m 2)	13.00 kg	18.23 kg
Required preventive measures		Grounding the unit	

1) Without brake

2) With brake

7.3.2 Ambient temperature of DRC

DRC type		DRC1	DRC2
Ambient temperature	ϑ_A	-25 °C to +60 °C	
$I_{N\ motor}$ reduction Ambient temperature		3 % $I_{N\ motor}$ per K at 40 °C to 60 °C	

7.3.3 Motion control inputs

Motion control inputs		
Input type	DI01 to DI04[1)]	PLC-compatible according to EN 61131-2 (digital inputs type 1) $R_i \approx 3.0\ k\Omega$, $I_E \approx 10$ mA, sampling interval 2 ms
Number of inputs		4
Signal level		+15 V to +30 V "1" = Contact closed –3 V to +5 V "0" = Contact open
Permitted total current For 4 sensors		400 mA

1) Only in conjunction with optional plug connector

7.3.4 Internal voltage supply 24V_O

Internal voltage supply for non-safety-related enable signal via STO input		
Voltage supply	+24V_O	DC 24 V to EN 61131-2, interference voltage proof and short-circuit proof
	0V24_O	
Permitted total current		60 mA
Required current for STO-IN supply		30 mA

7.3.5 Derating factors

INFORMATION

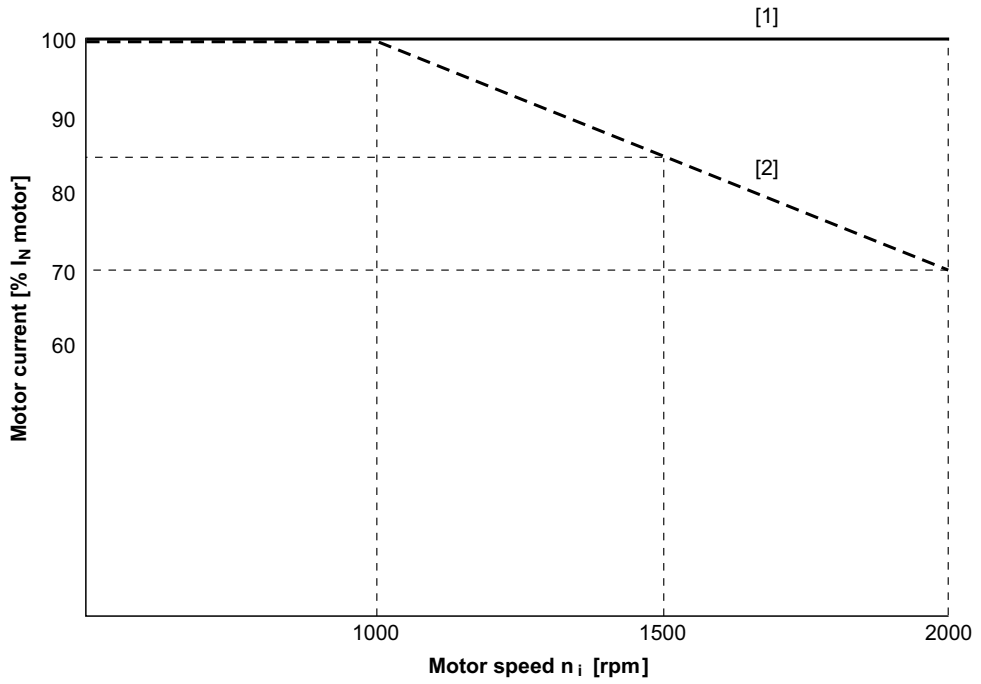
This chapter applies to unit variants with application option. You need not observe the following derating when operating units without application option.

Affected unit variants

For **DRC2** motors, you must also observe the $I_{N\ motor}$ reduction shown in the following figure:

$I_{N\ motor}$ reduction

The following figure shows the $I_{N\ motor}$ reduction depending on the motor speed:



9007202114032267

[1] Ambient temperature ≤ 35 °C
[2] Ambient temperature = 40 °C

INFORMATION

Derating is based on typical operating conditions with a supply voltage of 24 V (sensor supply, input voltage of STO input).

7.3.6 Technical data of SBus interface

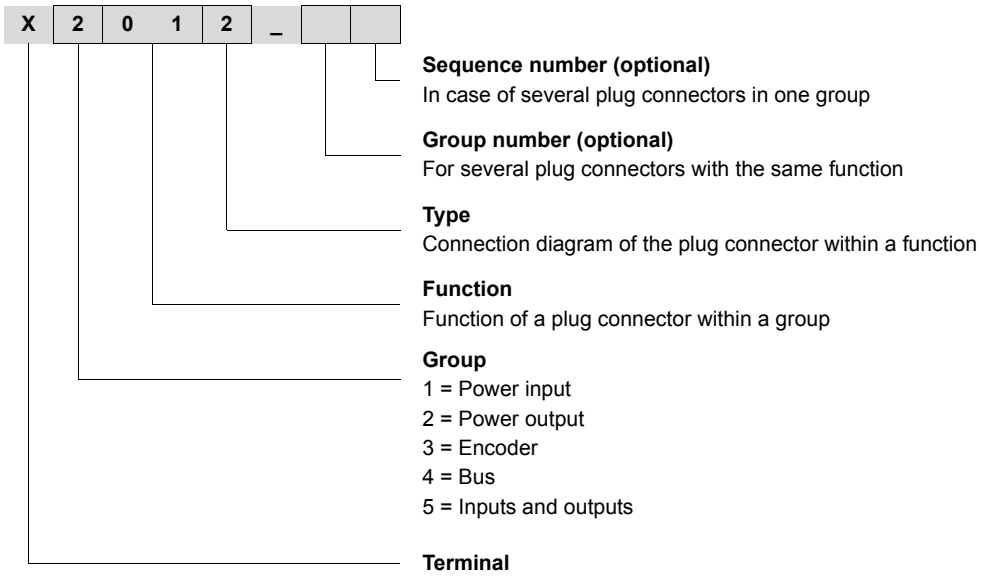
Standard	CAN specification 2.0 parts A and B
Baud rate	Can be set via DIP switch: 1000, 500 kBd
ID range	3...775
Address	Can be set via DIP switch: Number of drives that can be addressed: 32
Number of process data words	Fixed setting: 3 PD
Cable length	Depending on the baud rate, max. 50 m
Number of stations	Max. 110 CAN stations (thereof max. 32 DRC DSC stations)
Interface	According to "Electrical Installation" chapter
Type	CAN1
Profile	MOVILINK®
Connection technology	Terminal
Bus termination	According to "Startup" chapter
Control/setpoint source Index 8461.0 / 8462.0	SBus 1
Timeout monitoring	Yes, via parameter index 8602.0 to 8615.0
Process data	Configuration using parameter index 8304.0 to 8309.0
Master/slave	No
Manual mode (MOVITOOLS® MotionStudio)	Yes
IPOS bus type	5

7.3.7 Plug connectors

The wiring diagrams of the plug connectors depict the contact end of the connection.

Designation key

The designation of plug connectors is specified according to the following key:



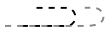
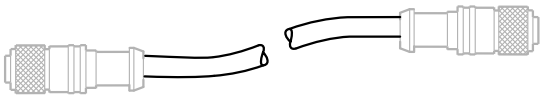
Connection cables

Connection cables are not included in the scope of delivery.

You can order prefabricated cables from SEW-EURODRIVE. They are described in the following sections. Specify the part number and length of the required cable in your order.

The number and type of required connection cables depend on the design of the units and the components to be connected. This is why not all cables in the list are actually required.

The following figures show the various cable types:

Cable	Length	Installation type
	Fixed length	Suitable for cable carrier installation  Not suitable for cable carrier installation 
	Variable length	

Using self-fabricated plug connectors

INFORMATION

You can also purchase plug connectors and the associated assembly tools from Intercontec.

Plug connector positions

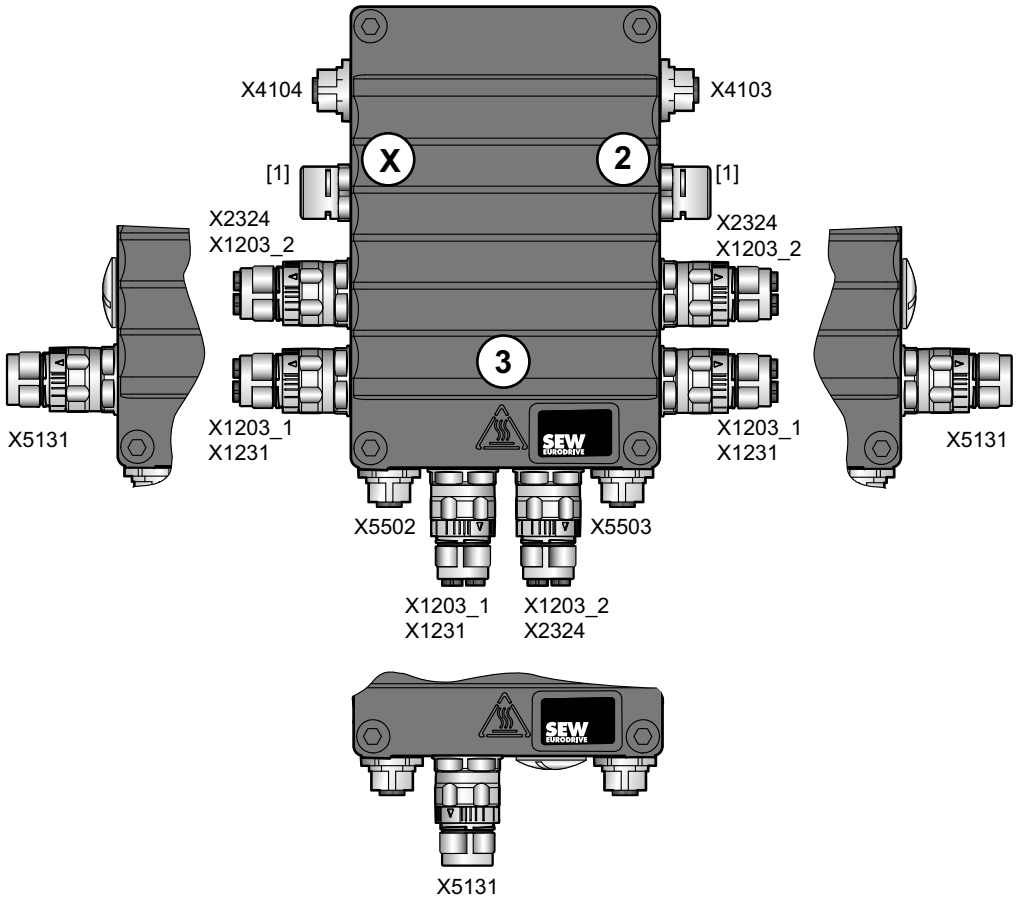
The following figure shows the possible plug connector positions. A difference is made between plug connectors with selectable position and plug connectors with fixed position:

Plug connector	Color	Position	Location
X5131: Digital inputs/outputs	–	As required	X, 2 or 3, not together with X1231, X2324, X1203_1, X1203_2
X5502: STO – IN	Orange	Fixed	3 (left)
X5503: STO – OUT	Orange	Fixed	3 (right)
X4104: CAN bus – system bus – input	Violet	Fixed	X
X4103: CAN bus – system bus – output	Violet	Fixed	2
X1231: AC 400 V connection and CAN bus [1)]	Violet	As required	X, 2 or 3, not together with X5131
X2324: AC 400 V output and CAN bus	Violet		
X1203_1: AC 400 V connection [2)]	Black	As required	X, 2 or 3, not together with X5131
X1203_2: AC 400 V connection	Black		
[1] Pressure compensation [3)]	–	Fixed	Depends on mounting position

1) Plug connector X1231 is also available separately (i.e. without plug connector X2324).

2) Plug connector X1203_1 is also available separately (that is without plug connector X1203_2).

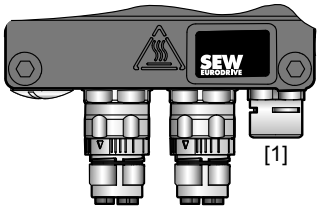
3) Only in conjunction with the optional design for use in wet areas (with MOVIGEAR®) / ASEPTIC design (with DRC).



9007201924281227

Restrictions in conjunction with pressure compensation

The position for STO plug connectors is occupied by the pressure compensation fitting [1] when using the optional design for use in wet areas (with MOVIGEAR®)/ASEPTIC^{plus} design (with DRC) and M5, M6 mounting position. In this case, plug connectors for STO are not possible:



9007201700846347

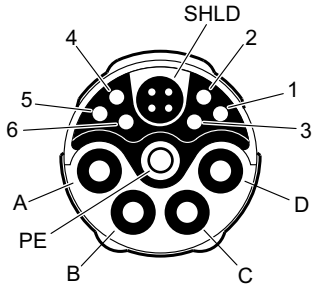
7.3.8 X1203_1 and X1203_2: AC 400 V connection

The following table informs about this connection:

Function
AC 400 V connection for supplying the unit/for looping through

Connection type
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: black, protected against contact

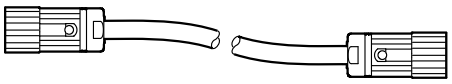
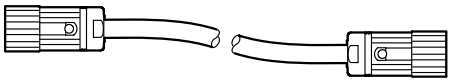
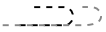
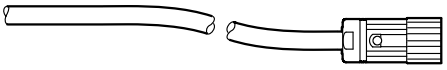
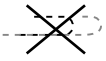
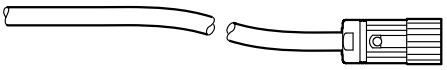
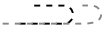
Wiring diagram

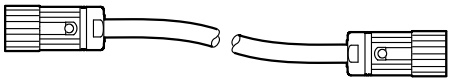
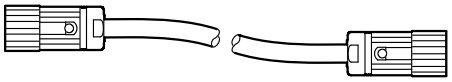
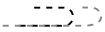
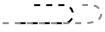


2497125387

Assignment		
No.	**Name**	**Function**
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	n.c.	Not connected
8	n.c.	Not connected
9	n.c.	Not connected
10	n.c.	Not connected
SHLD	n.c.	Not connected

Connection cables The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Cable cross section	Operating voltage
Part number 1 812 746 0  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V
Part number 1 813 395 9 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V
Part number 1 812 747 9  Open — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V
Part number 1 813 396 7 Halogen-free  Open — M23, coding ring: black	Variable 	2.5 mm^2	AC 500 V

Connection cables	Length/ Installation type	Cable cross section	Operating voltage
Part number 1 812 748 7  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm²	AC 500 V
Part number 1 813 397 5 Halogen-free  M23, coding ring: black — M23, coding ring: black	Variable 	4 mm²	AC 500 V
Part number 1 812 749 5  Open — M23, coding ring: black	Variable 	4 mm²	AC 500 V
Part number 1 813 398 3 Halogen-free  Open — M23, coding ring: black	Variable 	4 mm²	AC 500 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 747 9, 1 813 396 7, 1 812 749 5 and 1 813 398 3

Signal name	Core color/designation
L1	Black / 1
L2	Black / 2
L3	Black / 3
PE	Green/yellow

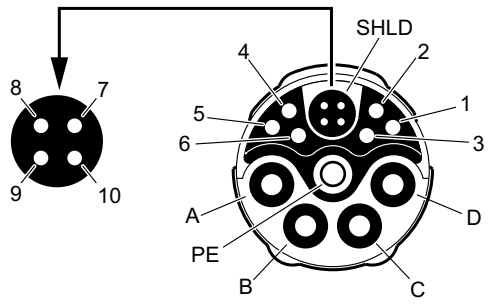
7.3.9 X1231: AC 400 V input and CAN bus

The following table informs about this connection:

Function
AC 400 V unit supply input, CAN bus (system bus)

Connection type
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: violet, protected against contact

Wiring diagram

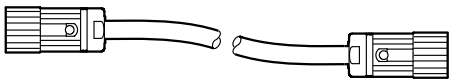
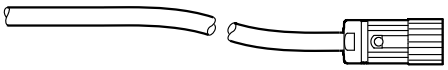
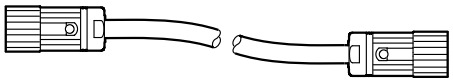
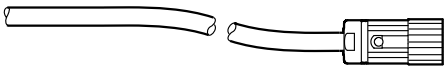
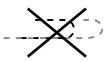


2749367179

Assignment

No.	Name	Function
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	CAN_L	CAN data line (low)
8	CAN_GND	Reference potential CAN bus
9	CAN_H	CAN data line (high)
10	n.c.	Not connected
SHLD	CAN_SHLD	Shield/equipotential bonding CAN bus

Connection cables The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Cable cross section/ cable type	Operating voltage
Part number 1 812 742 8  M23, coding ring: violet — M23, coding ring: violet	Variable 	2.5 mm² LEONI Elocab Type: EHRK 016281	AC 500 V
Part number 1 812 743 6  Open — M23, coding ring: violet	Variable 	2.5 mm² LEONI Elocab Type: EHRK 016281	AC 500 V
Part number 1 812 744 4  M23, coding ring: violet — M23, coding ring: violet	Variable 	4 mm² LEONI Elocab Type: EHRK 018473	AC 500 V
Part number 1 812 745 2  Open — M23, coding ring: violet	Variable 	4 mm² LEONI Elocab Type: EHRK 018473	AC 500 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 743 6 and 1 812 745 2

Signal name	Core color/designation
L1	Black / 1
L2	Black / 2
L3	Black / 3
PE	Green/yellow
CAN_L	Blue
CAN_GND	Black
CAN_H	White

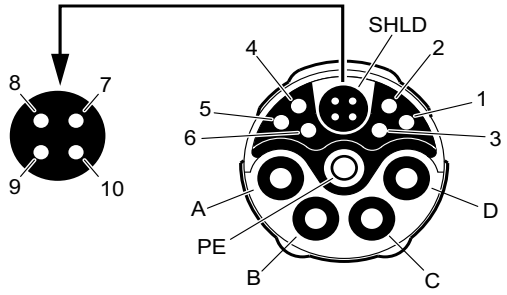
7.3.10 X2324: AC 400 V output and CAN bus

The following table informs about this connection:

Function
AC 400 V output for looping, CAN bus (system bus)

Connection type
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: violet, protected against contact

Wiring diagram



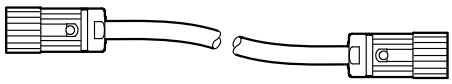
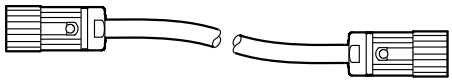
2749367179

Assignment		
No.	**Name**	**Function**
A	L1	Line connection phase L1
B	L2	Line connection phase L2
C	L3	Line connection phase L3
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	CAN_L	CAN data line (low)
8	CAN_GND	Reference potential CAN bus
9	CAN_H	CAN data line (high)
10	n.c.	Not connected
SHLD	CAN_SHLD	Shield/equipotential bonding CAN bus

INFORMATION

When the bus terminating resistor is activated (also see chapter "Startup"), the CAN bus is separated. The input and output end of the plug connectors must not be confused.

Connection cables The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Cable cross section/ cable type	Operating voltage
Part number 1 812 742 8  M23, coding ring: violet M23, coding ring: violet	Variable 	2.5 mm^2 LEONI Elocab Type: EHRK 016281	AC 500 V
Part number 1 812 744 4  M23, coding ring: violet M23, coding ring: violet	Variable 	4 mm^2 LEONI Elocab Type: EHRK 018473	AC 500 V

7.3.11 X4104: CAN bus – system bus – input

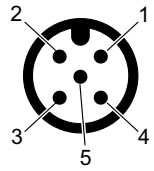
INFORMATION

To ensure a continuous connection from the housing to the unit, use CAN connection cables whose shield is connected with the connector housing in such a way that it is EMC capable.

The following table informs about this connection:

Function
CAN bus (system bus) – input

Connection type
M12, 5-pole, male, A-coded

Wiring diagram
 2264818187

Assignment		
No.	**Name**	**Function**
1	Drain	Shield/equipotential bonding CAN bus
2	res.	Reserved
3	CAN_GND	Reference potential CAN bus
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

7.3.12 X4103: CAN bus – system bus – output

INFORMATION

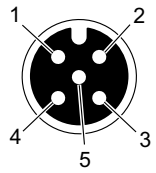
To ensure a continuous connection from the housing to the unit, use CAN connection cables whose shield is connected with the connector housing in such a way that it is EMC capable.

The following table informs about this connection:

Function
CAN bus (system bus) – output

Connection type
M12, 5-pole, female, A-coded

Wiring diagram



2264816267

Assignment		
No.	**Name**	**Function**
1	Drain	Shield/equipotential bonding CAN bus
2	res.	Reserved
3	GND	Reference potential CAN bus
4	CAN_H	CAN data line (high)
5	CAN_L	CAN data line (low)

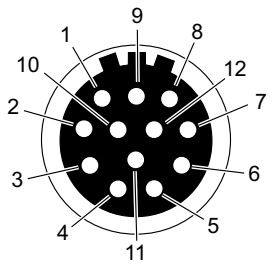
7.3.13 X5131: Digital inputs/outputs

The following table informs about this connection:

Function
Digital inputs/outputs for DRC MotionControl

Connection type
M23, P insert 12-pole, SpeedTec-capable, Intercontec, female, 0°-coded

Wiring diagram



2264820107

Assignment

No.	Name	Function Motion control inputs DIP switch S2/3 = OFF	Function Local mode DIP switch S2/3 = ON
1	DI01	DI01 sensor input	CW/stop
2	DI02	DI02 sensor input	CCW/stop
3	DI03	DI03 sensor input	Setpoint f1/f2
4	DI04	DI04 sensor input	Changeover Automatic/local mode
5	n.c.	Not connected	Not connected
6	n.c.	Not connected	Not connected
7	n.c.	Not connected	Not connected
8	+24V_O	Reserved	DC 24 V output
9	0V24V_O	Reserved	0V24 reference potential
10	0V24V_SEN	0V24 reference potential for sensors [1] must be supplied via terminals	Reserved
11	+24V_SEN	DC 24 V sensor supply [1] Must be supplied via terminals X7.3	Reserved
12	FE	Equipotential bonding/functional ground	Equipotential bonding/functional ground

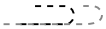
1) see operating instructions, chapter "Connecting DRC drive units"

INFORMATION

Use actuator/sensor distributors with 4 slots for the sensor inputs. Use the DC 24 V output only for local mode.

Connection cables

The following table provides an overview of the cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 174 145 7  Open — M23, 12-pole, 0°-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 174 145 7

Signal name	Color coding
DI01	Pink
DI02	Gray
DI03	Red
DI04	Blue
Reserved	Yellow
Reserved	Green
Reserved	Violet
+24V_O	Black
0V24_O	Brown
0V24_SEN	White
+24V_SEN	Gray/pink
FE	Red/blue

7.3.14 X5502: STO – IN

⚠ WARNING

No safe disconnection of the DRC drive unit.

Severe or fatal injuries.

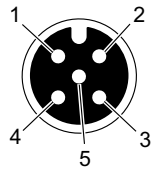
- Do not use the 24 V output (pins 1 and 3) for safety-related applications with DRC drive units.
- You may only jumper the STO input with 24 V when the DRC drive unit need not fulfill any safety function.

The following table informs about this connection:

Function
Input for safe torque off (STO)

Connection type
M12, 5-pole, female, A-coded

Wiring diagram



2264816267

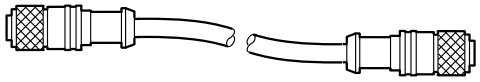
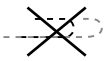
Assignment		
No.	**Name**	**Function**
1	+24V_O	DC 24 V output
2	STO −	Input STO –
3	0V24_O	0V24 reference potential
4	STO +	Input STO +
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 497 6  Open — M12, 5-pole, A-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 497 6 and 1 812 739 8

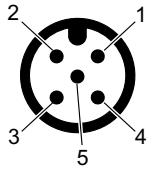
Signal name	Core color/designation
STO −	Black / 1
STO +	Black / 2

7.3.15 X5503: STO – OUT

The following table provides information about this connection:

Function
Connection for safe torque off (STO) for looping through

Connection type
M12, 5-pole, male, A-coded

Wiring diagram

2264818187

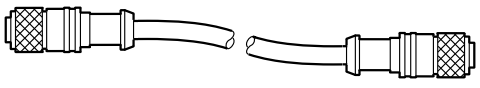
Assignment		
No.	**Name**	**Function**
1	res.	Reserved
2	STO −	Output STO – (to loop through)
3	res.	Reserved
4	STO+	Output STO + (to loop through)
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded M12, 5-pole, A-coded	Variable 	DC 60 V

7.4 Electronic motor DRC.-...-SNI

7.4.1 General technical data of DRC

DRC type		DRC1	DRC2
Supply voltages Permitted range	V_{line}	3 x AC 380 V - 5 % to AC 500 V +10 %	
Line frequency	f_{line}	50 Hz ... 60Hz	
Input current	I_N	1.04 A	2.8 A
	$I_{maxStart}$	2.6 A	7.0 A
Nominal output current	$I_{N\ motor}$	AC 1.3 A	AC 3.4 A
Current carrying capacity of terminals		See operating instructions, chapter "Electrical Installation / Installation instructions / Permitted cable cross section of terminals"	
Motor power S1	P_{Mot}	**0.55 kW** 0.75 HP	**1.5 kW** 2.0 HP
Nominal motor torque	M_N	2.65 Nm	7.20 Nm
Maximum motor torque	M_{max}	6.62 Nm up to 2000 rpm	18.00 Nm up to 2000 rpm
Mass moment of inertia of the motor	J_{mot} 1)	141.60 kg/mm^2	365.80 kg/mm^2
	J_{mot} 2)	203.1 kg/mm^2	536.2 kg/mm^2
PWM frequency		4 / 8 kHz	
External braking resistor	R_{min}	100 Ω	100 Ω
Interference immunity		EN 61800-3; 2. Environment (industrial environment)	
Interference emission		EN 61800-3 category C2 (class A group 2 of EN 55011)	
Climate class		EN 60721-3-3, class 3K3	
Storage temperature	ϑ_S	− 25 °C to + 70 °C (EN 60721-3-3)	
Proof of mechanical strength		According to EN 61800-5-1	
Degree of protection	IP	Standard: IP 65 according to EN 60529 (DRC housing closed and all cable glands sealed) With optional ASEPTIC / ASEPTIC^{plus} design: IP 66 according to EN 60529 (DRC housing closed and all cable glands sealed)	
Duty type		S1, continuous duty (EN 60034-1)	
Type of cooling		Self-cooling to DIN 41751 and EN 61800-5-1	
Signaling functions		Display elements on housing to indicate the unit state	
Installation altitude	h	Up to h ≤ 1000 m without restrictions. The following restrictions apply to heights ≥ 1000 m: • From 1000 m to max. 4000 m: – I_N reduced by 1% per 100 m • From 2000 m to max. 4000 m: – V_N reduced by AC 6 V per 100 m Over 2000 m only overvoltage class 2; external measures are required for overvoltage class 3. Overvoltage classes according to DIN VDE 0110-1.	
Mass	m 1)	12.40 kg	17.20 kg
	m 2)	13.00 kg	18.23 kg
Required preventive measures		Grounding the unit	

1) Without brake

2) With brake

7.4.2 Ambient temperature of DRC

DRC type		DRC1	DRC2
Ambient temperature	ϑ_A	0 °C to +60 °C	
$I_{N\ motor}$ reduction Ambient temperature		3 % $I_{N\ motor}$ per K at 40 °C to 60 °C	

7.4.3 Motion control inputs

Motion control inputs		
Input type	DI01 to DI04[1)]	PLC-compatible according to EN 61131-2 (digital inputs type 1) $R_i \approx 3.0\ k\Omega$, $I_E \approx 10$ mA, sampling interval 2 ms
Number of inputs		4
Signal level		+15 V to +30 V "1" = Contact closed –3 V to +5 V "0" = Contact open
Permitted total current For 4 sensors		400 mA

1) Only in conjunction with optional plug connector

7.4.4 Internal voltage supply 24V_O

Internal voltage supply for non-safety-related enable signal via STO input		
Voltage supply	+24V_O	DC 24 V to EN 61131-2, interference voltage proof and short-circuit proof
	0V24_O	
Permitted total current		60 mA
Required current for STO-IN supply		30 mA

7.4.5 Derating factors

INFORMATION

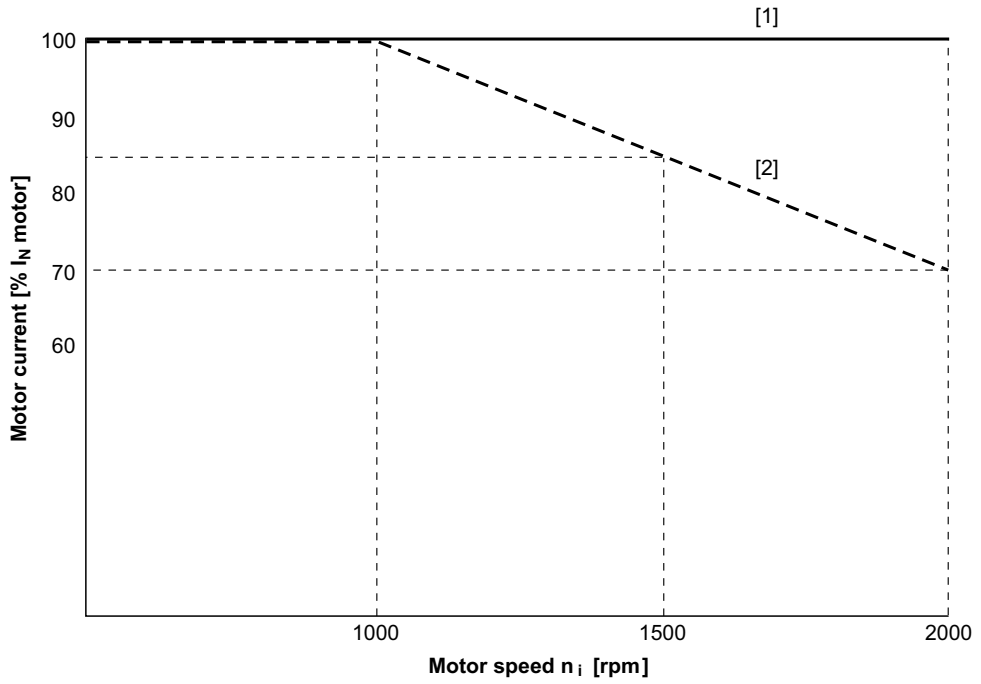
This chapter applies to unit variants with application option. You need not observe the following derating when operating units without application option.

Affected unit variants

For **DRC2** motors, you must also observe the $I_{N\ motor}$ reduction shown in the following figure:

$I_{N\ motor}$ reduction

The following figure shows the $I_{N\ motor}$ reduction depending on the motor speed:



9007202114032267

[1] Ambient temperature ≤ 35 °C
[2] Ambient temperature = 40 °C

INFORMATION

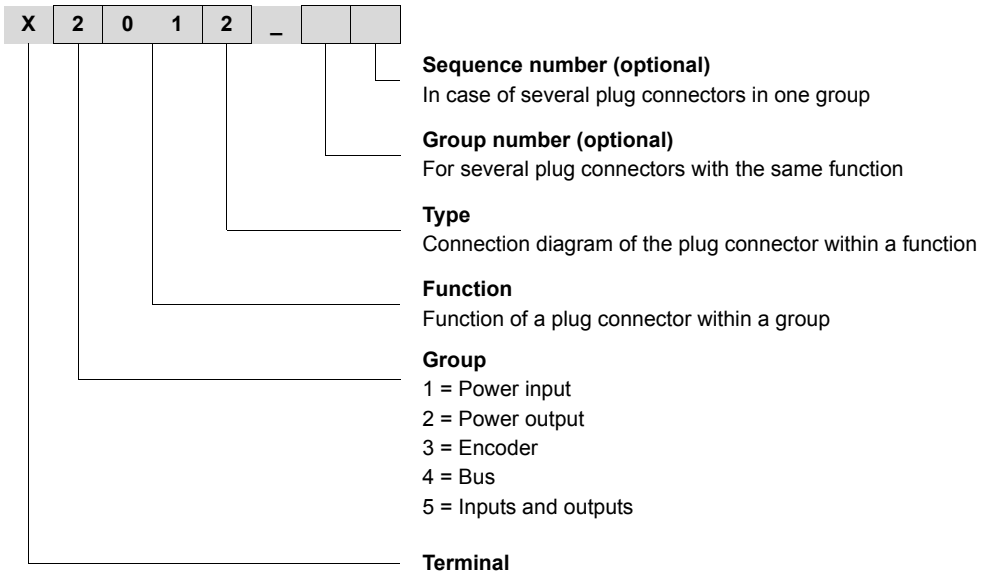
Derating is based on typical operating conditions with a supply voltage of 24 V (sensor supply, input voltage of STO input).

7.4.6 Plug connectors

The wiring diagrams of the plug connectors depict the contact end of the connection.

Designation key

The designation of plug connectors is specified according to the following key:



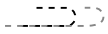
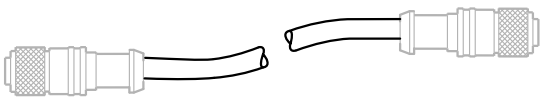
Connection cables

Connection cables are not included in the scope of delivery.

You can order prefabricated cables from SEW-EURODRIVE. They are described in the following sections. Specify the part number and length of the required cable in your order.

The number and type of required connection cables depend on the design of the units and the components to be connected. This is why not all cables in the list are actually required.

The following figures show the various cable types:

Cable	Length	Installation type
	Fixed length	Suitable for cable carrier installation  Not suitable for cable carrier installation 
	Variable length	

Using self-fabricated plug connectors

INFORMATION

You can also purchase plug connectors and the associated assembly tools from Intercontec.

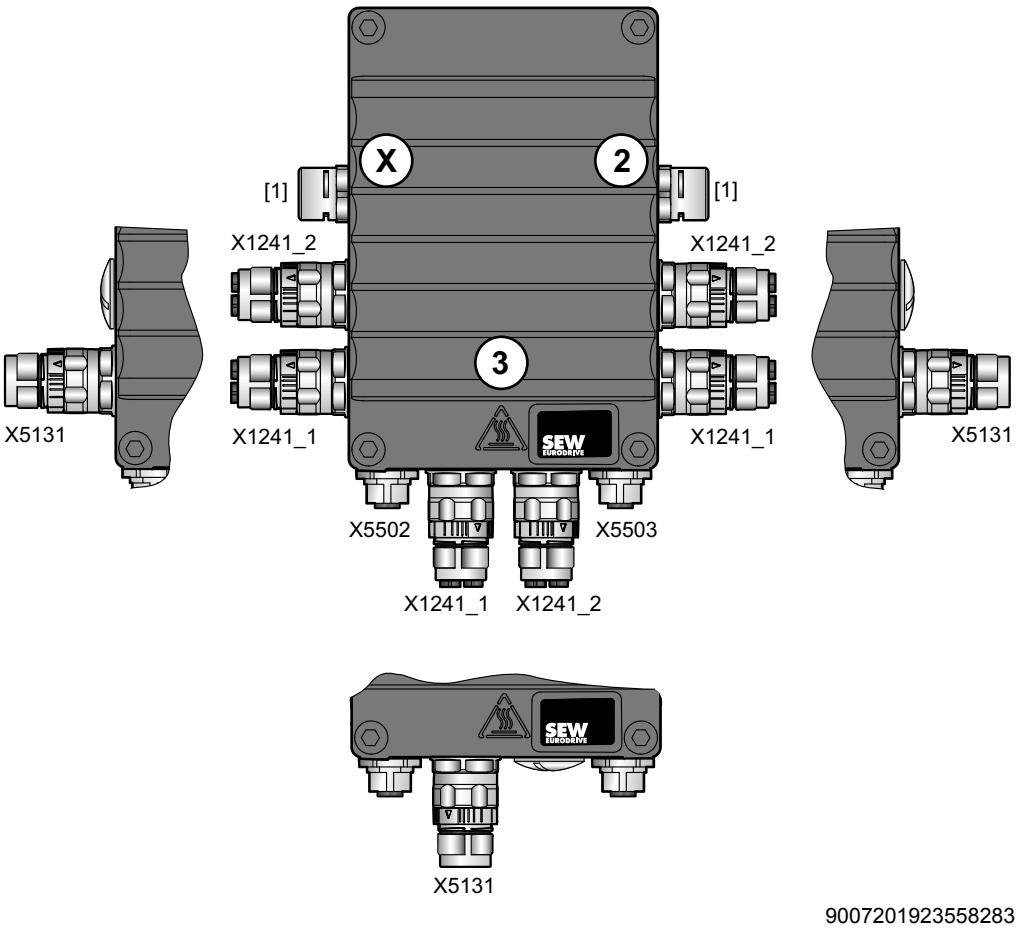
Plug connector positions

The following figure shows the possible plug connector positions. A difference is made between plug connectors with selectable position and plug connectors with fixed position:

Plug connectors	Color	Position	Location
X5131: Digital inputs/outputs	–	As required	X, 2 or 3, not together with X1241_1, X1241_2
X5502: STO – IN	Orange	Fixed	3 (left)
X5503: STO – OUT	Orange	Fixed	3 (right)
X1241_1: AC 400 V connection with SNI [1)]	Red	As required	X, 2 or 3, not together with X5131
X1241_2: AC 400 V connection with SNI	Red	As required	X, 2 or 3, not together with X5131
[1] Pressure compensation [2)]	–	Fixed	Depends on mounting position

1) Plug connector X1241_1 is also available separately (i.e. without plug connector X1241_2).

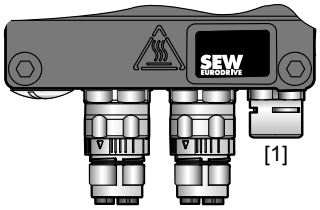
2) Only in conjunction with the optional design for use in wet areas (with MOVIGEAR®) / ASEPTIC design (with DRC).



9007201923558283

Restrictions in conjunction with pressure compensation

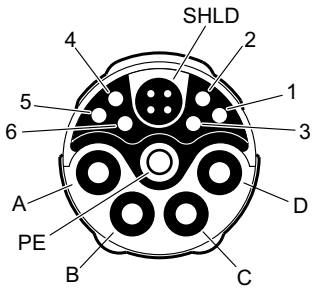
The position for STO plug connectors is occupied by the pressure compensation fitting [1] when using the optional design for use in wet areas (with MOVIGEAR®)/ASEPTIC^{plus} design (with DRC) and M5, M6 mounting position. In this case, plug connectors for STO are not possible:



9007201700846347

7.4.7 X1241_1 and X1241_2: AC 400 V connection with SNI

The following table informs about this connection:

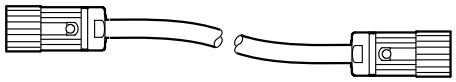
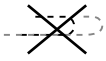
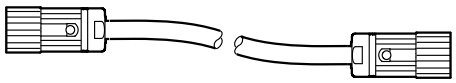
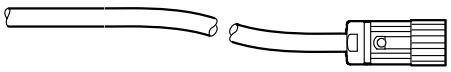
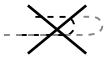
Function		
AC 400 V connection for supplying the unit/for looping through with single-line network installation (SNI)		
Connection type		
M23, SEW insert, SpeedTec-capable, company: Intercontec, female, coding ring: red, protected against contact		
Wiring diagram		
 2497125387		
Assignment		
No.	**Name**	**Function**
A	L1_SNI	Actuator supply phase L1 with SNI communication
B	L2_SNI	Actuator supply phase L2 with SNI communication
C	L3_SNI	Actuator supply phase L3 with SNI communication
D	n.c.	Not connected
PE	PE	PE connection
1	n.c.	Not connected
2	n.c.	Not connected
3	n.c.	Not connected
4	n.c.	Not connected
5	n.c.	Not connected
6	n.c.	Not connected
7	n.c.	Not connected
8	n.c.	Not connected
9	n.c.	Not connected
10	n.c.	Not connected
SHLD	n.c.	Not connected

INFORMATION

The communication method requires that you must observe the order of the line phases L1, L2, L3 between SNI controller and DRC SNI drive units 1 to 10.

Connection cables

The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Cable cross section/cable type	Operating voltage
Part number 1 812 750 9  M23, coding ring: red — M23, coding ring: red	Variable 	2.5 mm² HELUKA-BEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V
Part number 1 812 751 7  Open — M23, coding ring: red	Variable 	2.5 mm² HELUKA-BEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V
Part number 1 812 752 5  M23, coding ring: red — M23, coding ring: red	Variable 	4 mm² HELUKA-BEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V
Part number 1 812 753 3  Open — M23, coding ring: red	Variable 	4 mm² HELUKA-BEL TOPFLEX® – EMV-UV-2YSLCYK-J	AC 500 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 751 7 and 1 812 753 3

Signal name	Color coding
L1_SNI	Brown
L2_SNI	Black
L3_SNI	Gray
PE	Green/yellow

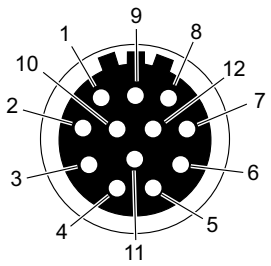
7.4.8 X5131: Digital inputs/outputs

The following table informs about this connection:

Function
Digital inputs/outputs for DRC MotionControl

Connection type
M23, P insert 12-pole, SpeedTec-capable, Intercontec, female, 0°-coded

Wiring diagram



2264820107

Assignment

No.	Name	Function Motion control inputs DIP switch S2/3 = OFF	Function Local mode DIP switch S2/3 = ON
1	DI01	DI01 sensor input	CW/stop
2	DI02	DI02 sensor input	CCW/stop
3	DI03	DI03 sensor input	Setpoint f1/f2
4	DI04	DI04 sensor input	Changeover Automatic/local mode
5	n.c.	Not connected	Not connected
6	n.c.	Not connected	Not connected
7	n.c.	Not connected	Not connected
8	+24V_O	Reserved	DC 24 V output
9	0V24V_O	Reserved	0V24 reference potential
10	0V24V_SEN	0V24 reference potential for sensors [1] must be supplied via terminals	Reserved
11	+24V_SEN	DC 24 V sensor supply [1] Must be supplied via terminals X7.3	Reserved
12	FE	Equipotential bonding/functional ground	Equipotential bonding/functional ground

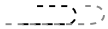
1) see operating instructions, chapter "Connecting DRC drive units"

INFORMATION

Use actuator/sensor distributors with 4 slots for the sensor inputs. Use the DC 24 V output only for local mode.

Connection cables

The following table provides an overview of the cables available for this connection:

Connection cable	Length/ Installation type	Operating voltage
Part number 1 174 145 7  Open — M23, 12-pole, 0°-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 174 145 7

Signal name	Color coding
DI01	Pink
DI02	Gray
DI03	Red
DI04	Blue
Reserved	Yellow
Reserved	Green
Reserved	Violet
+24V_O	Black
0V24_O	Brown
0V24_SEN	White
+24V_SEN	Gray/pink
FE	Red/blue

7.4.9 X5502: STO – IN

⚠ WARNING

No safe disconnection of the DRC drive unit.

Severe or fatal injuries.

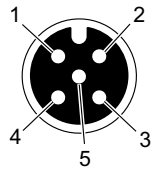
- Do not use the 24 V output (pins 1 and 3) for safety-related applications with DRC drive units.
- You may only jumper the STO input with 24 V when the DRC drive unit need not fulfill any safety function.

The following table informs about this connection:

Function
Input for safe torque off (STO)

Connection type
M12, 5-pole, female, A-coded

Wiring diagram



2264816267

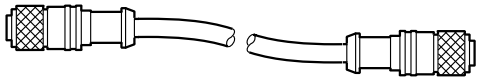
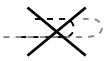
Assignment		
No.	**Name**	**Function**
1	+24V_O	DC 24 V output
2	STO −	Input STO –
3	0V24_O	0V24 reference potential
4	STO +	Input STO +
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded — M12, 5-pole, A-coded	Variable 	DC 60 V
Part number 1 812 497 6  Open — M12, 5-pole, A-coded	Variable 	DC 60 V

Connection of cables with open end

The following table shows the conductor assignment of the cable with the following part number:

1 812 497 6 and 1 812 739 8

Signal name	Core color/designation
STO −	Black / 1
STO +	Black / 2

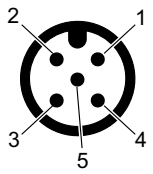
7.4.10 X5503: STO – OUT

The following table provides information about this connection:

Function
Connection for safe torque off (STO) for looping through

Connection type
M12, 5-pole, male, A-coded

Wiring diagram



2264818187

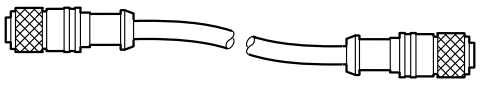
Assignment		
No.	**Name**	**Function**
1	res.	Reserved
2	STO −	Output STO – (to loop through)
3	res.	Reserved
4	STO+	Output STO + (to loop through)
5	res.	Reserved

Connection cables

INFORMATION

Use only shielded cables for this connection and only suitable plug connectors that connect the shield with the unit in an HF-capable manner.

The following table provides an overview of the cables available for this connection:

Connection cables	Length/ Installation type	Operating voltage
Part number 1 812 496 8  M12, 5-pole, A-coded M12, 5-pole, A-coded	Variable 	DC 60 V

7.5 Application options

7.5.1 GIO12B application option

GIO12B application option	
Degree of protection	IP66
Number of inputs	4
Number of outputs	2
Connection technology	M12 plug connector (A-coded, female)
Input type	PLC-compatible according to EN 61131-2 (digital inputs type 3) R_i about 8 kΩ, sampling cycle 4 ms Signal level +11 V to +30 V "1" = Contact closed –3 V to +5 V "0" = Contact open
Output type	PLC-compatible to EN 61131-2, interference-voltage-proof and short-circuit-proof
Sensor/actuator supply **Permitted total current**	DC 24 V to EN 61131-2, Interference voltage-proof and short-circuit-proof 250 mA (total of all connected sensors/actuators, maximum individual load: 250 mA)
Part number	1 823 801 7

7.5.2 GIO13B application option

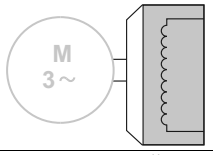
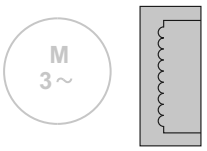
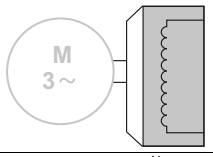
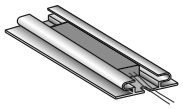
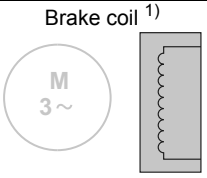
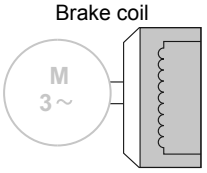
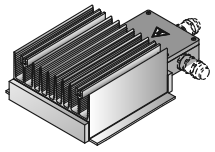
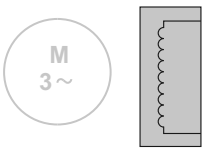
GIO13B application option		
Binary inputs / binary outputs		
Number of binary inputs	4 (2 inputs can be used as primary frequency input)	
Primary frequency input	The primary frequency input function occupies a maximum of 2 digital inputs. The function is used to evaluate frequency input signals that are provided, for example, by a distance encoder (A/B tracks or only A track) or an external controller. The frequency value is then converted into a digital value for further processing. Input frequency range: 0 to 120 kHz Signal voltage: HTL signal level	
Input type	PLC-compatible according to EN 61131-2 (digital inputs type 3) R_i about 8 kΩ, sampling cycle 4 ms Signal level +11 V to +30 V "1" = Contact closed –3 V to +5 V "0" = Contact open	
Number of binary outputs	1	
Output type	Relay with change-over contact V_{max} = DC 30 V I_{min} = DC 100 mA I_{max} = DC 800 mA	
Analog inputs / analog outputs		
Number of analog inputs	1	
Analog input type	Differential input	
	Voltage input V_{in} = DC 0 to +10V Resolution 10 bit Internal resistance R_i >10 kΩ	Current input I_{in} = DC 4 to 20 mA Resolution 10 bit Internal resistance R_i = 250 Ω
Number of analog outputs	1	
Analog output type	Output characteristics: 4 to 20 mA Max. output voltage: 25 V Short-circuit-proof Resolution 10 bit	

GIO13B application option	
General technical data	
Degree of protection	IP65 (only when installed)
Connection technology	M12 plug connector (A-coded, female)
Sensor/actuator supply	DC 24 V to EN 61131-2, Interference voltage-proof and short-circuit-proof
Permitted total current	140 mA (total of all connected sensors/actuators, maximum individual load: 140 mA)
Part number	1 822 652 3

7.6 Braking resistors

7.6.1 Overview

The DRC electronic motor is equipped with 2 brake choppers. The following table shows their possible use in regenerative mode:

Application	Drive	Dissipation of regenerative energy		
		Brake chopper 1		Brake chopper 2
Very small amount of regenerative energy	DRC1/2 electronic motor with brake	Brake coil 	+	–
	DRC1/2 electronic motor without brake	Brake coil [1] 		
Small amount of regenerative energy	DRC1/2 electronic motor with brake	Brake coil 	+	Integrated braking resistor 
	DRC1/2 electronic motor without brake	Brake coil [1] 		
Medium/large amount of regenerative energy	DRC1/2 electronic motor with brake	Brake coil 	+	External braking resistor 
	DRC1/2 electronic motor without brake	Brake coil [1] 		

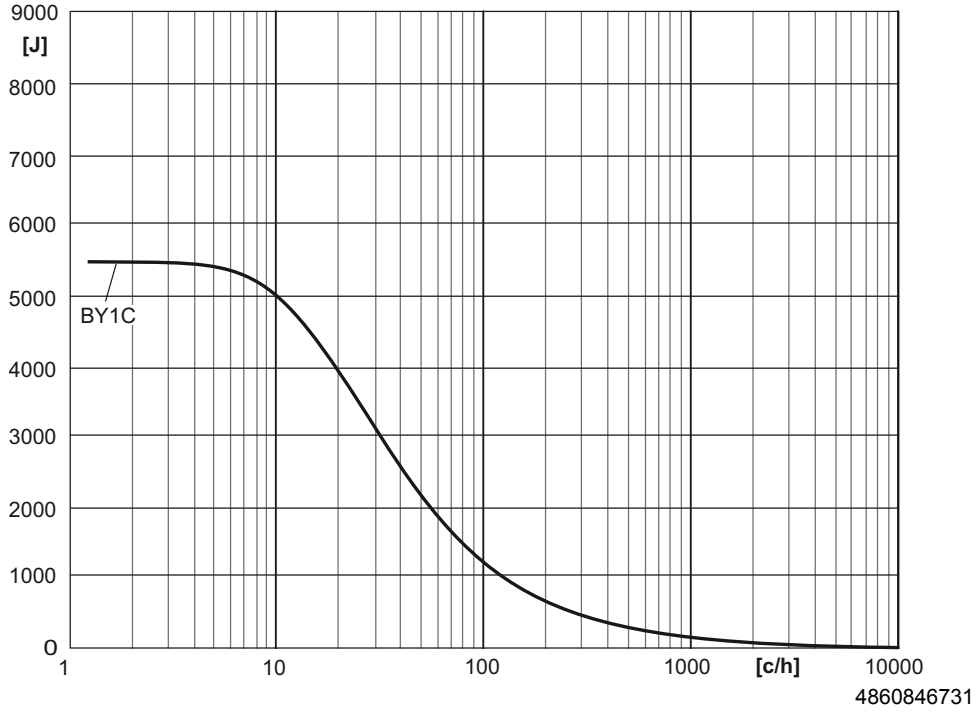
1) Motors without brake are also equipped with a brake coil (without brake disk) to dissipate the regenerative energy.

7.6.2 4Q operation with integrated brake coil

- In 4Q operation, the brake coil can be used as a braking resistor.
- The brake coil (without brake disk) is also integrated in motors without a brake.
- Brake voltage is generated internally within the unit, which means it is mains-independent.
- 4Q operation with only the integrated brake coil is recommended for applications with very small amounts of regenerative energy.
- If the amount of regenerated energy is too high for the application, you can use an additional internal or external braking resistor.

BY1C (DRC1)

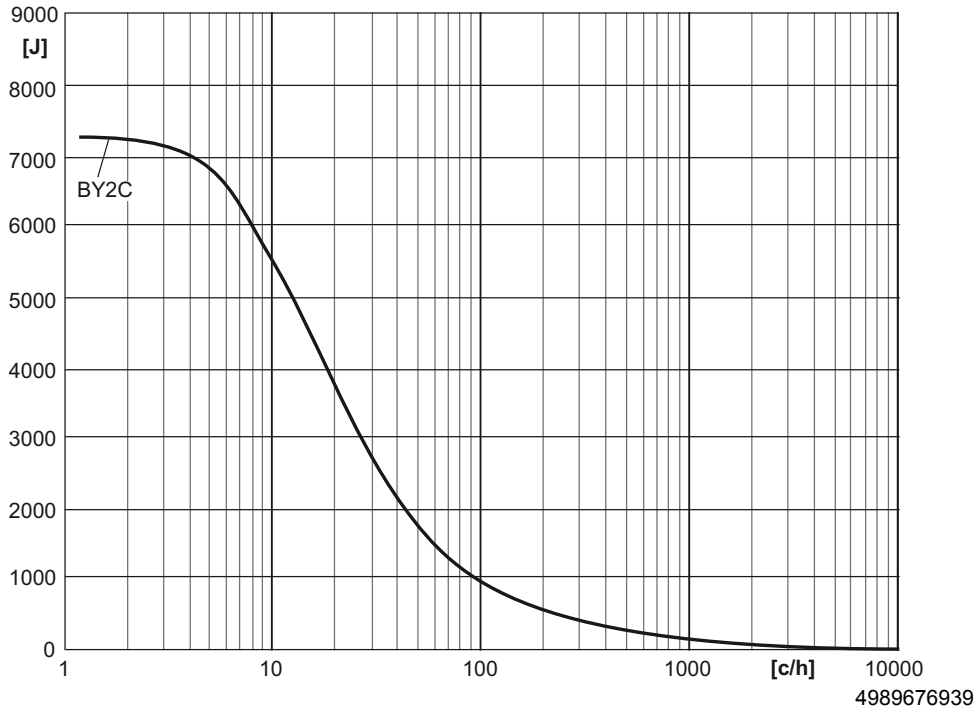
The following figure shows the permitted regenerative load on the BY1C brake coil (DRC1):



c/h = cycles per hour

BY2C (DRC2)

The following figure shows the permitted regenerative load on the BY2C brake coil (DRC2):



c/h = cycles per hour

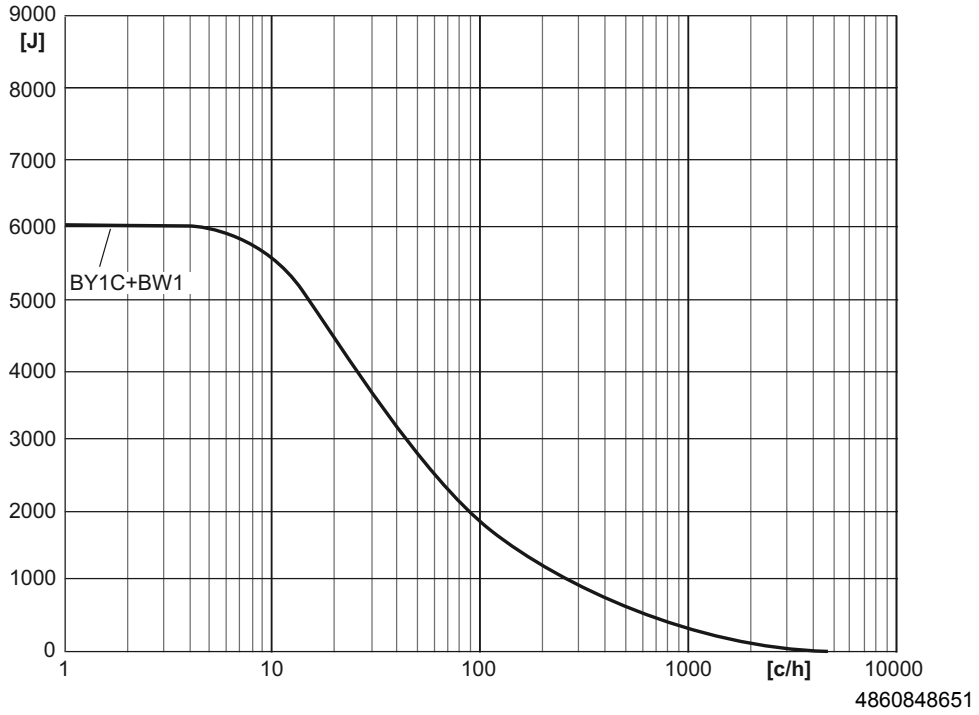
7.6.3 4Q operation with integrated brake coil and integrated braking resistor

- 4Q operation with integrated braking resistor is recommended for applications in which the level of regenerative energy is low.
- The resistor protects itself (reversible) against regenerative overload by changing abruptly to high resistance and no longer consuming any more energy. The inverter then trips with overvoltage error.
- If the amount of regenerated energy is too high for the application, you can use an external braking resistor as an alternative.

BY1C brake coil and integrated BW1 braking resistor (DRC1)

Regenerative load capacity for a brake ramp of 10 s

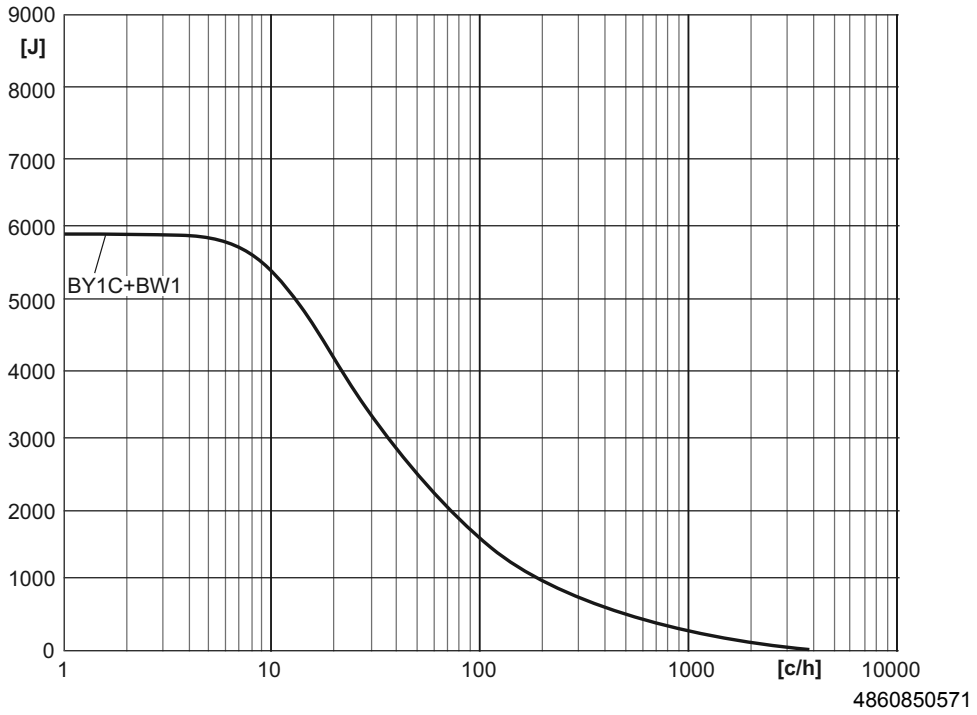
The following figure shows the permitted regenerative energy load of the BY1C brake coil in combination with the integrated BW1 braking resistor for a brake ramp of 10 s:



c/h = cycles per hour

Regenerative load capacity for a brake ramp of 4 s

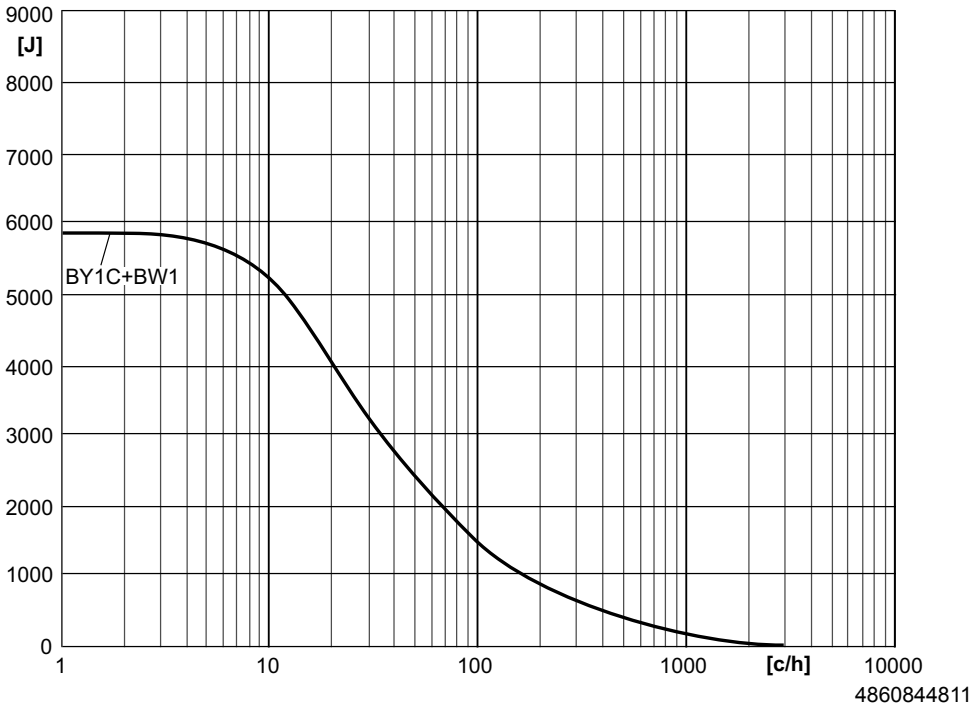
The following figure shows the permitted regenerative energy load of the BY1C brake coil in combination with the integrated BW1 braking resistor for a brake ramp of 4 s:



c/h = cycles per hour

Regenerative load capacity for a brake ramp of 0.2 s

The following figure shows the permitted regenerative energy load of the BY1C brake coil in combination with the integrated BW1 braking resistor for a brake ramp of 0.2 s:

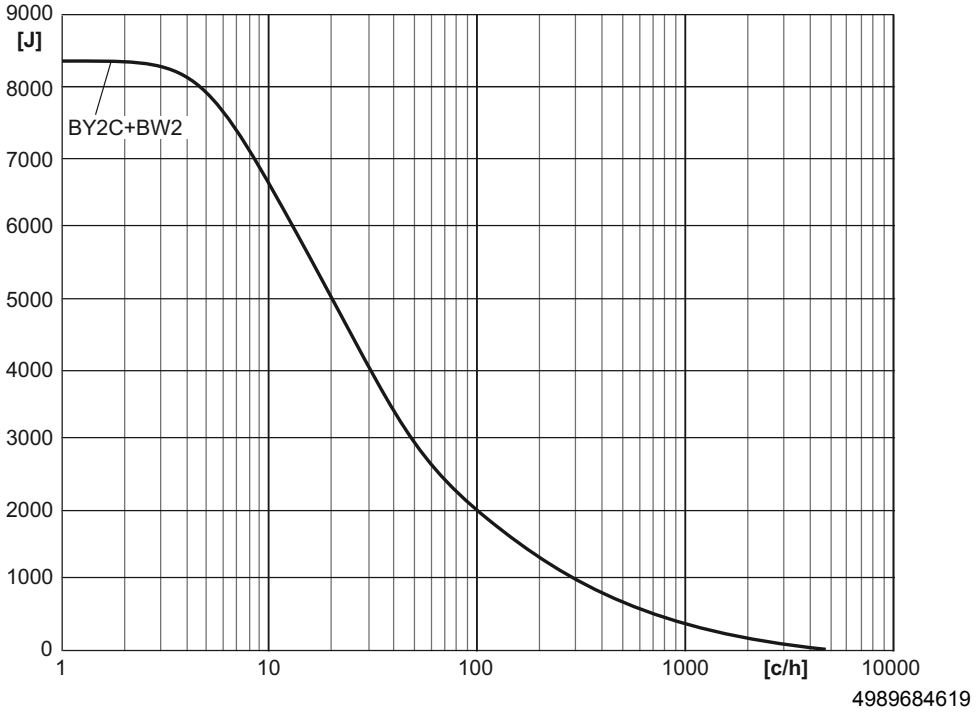


c/h = cycles per hour

BY2C brake coil and integrated BW2 braking resistor (DRC2)

Regenerative load capacity for a brake ramp of 10 s

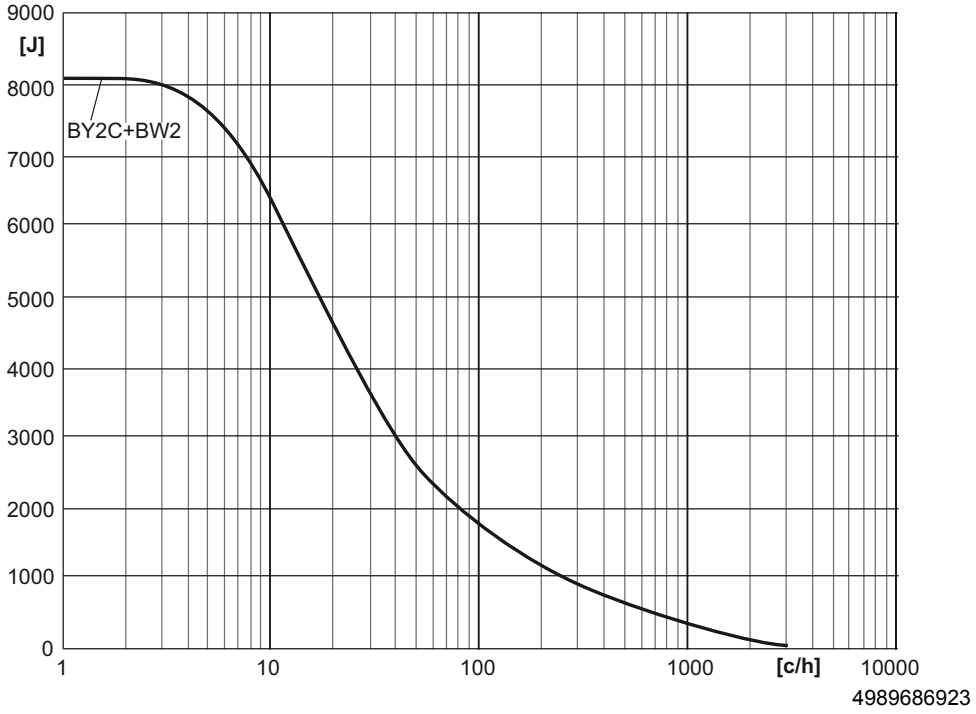
The following figure shows the permitted regenerative energy load of the BY2C brake coil in combination with the integrated BW2 braking resistor for a brake ramp of 10 s:



c/h = cycles per hour

Regenerative load capacity for a brake ramp of 4 s

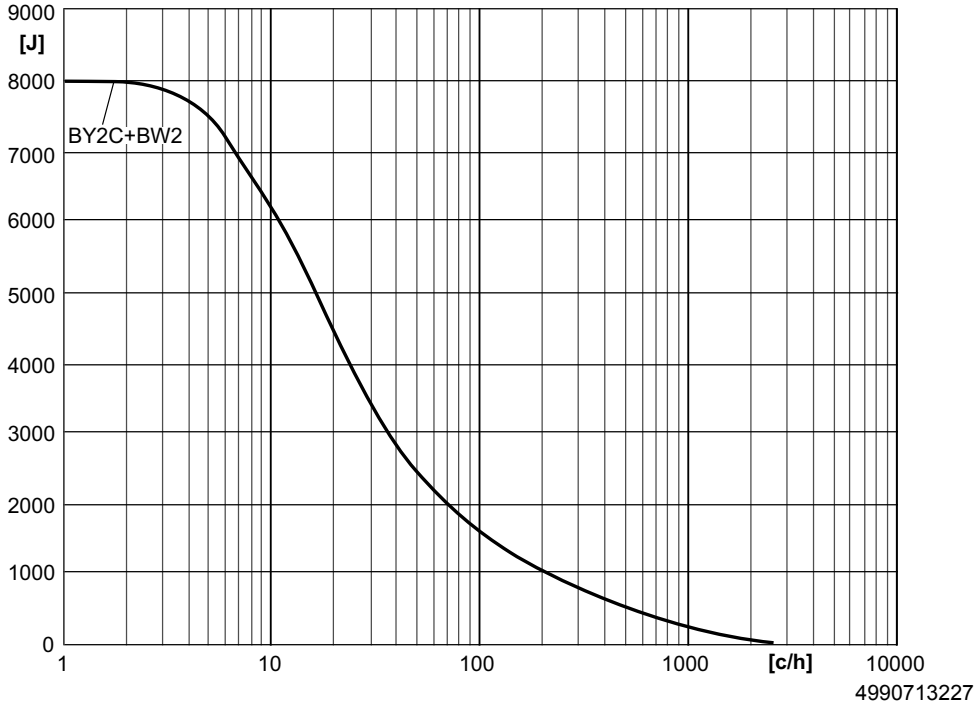
The following figure shows the permitted regenerative energy load of the BY2C brake coil in combination with the integrated BW2 braking resistor for a brake ramp of 4 s:



c/h = cycles per hour

Regenerative load capacity for a brake ramp of 0.2 s

The following figure shows the permitted regenerative energy load of the BY2C brake coil in combination with the integrated BW2 braking resistor for a brake ramp of 0.2 s:



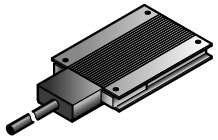
c/h = cycles per hour

7.6.4 4Q operation with integrated brake coil and external braking resistor

4Q operation with external braking resistor is necessary for applications with a large amount of regenerative energy.

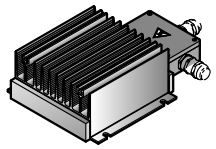
The following tables show the external braking resistors that are available for DRC1/DRC2.

BW...-.../K-1.5



	BW100-005/K-1.5	BW150-003/K-1.5
Part number	0 828 286 2	0 828 2927
Function	Dissipating the regenerative energy	
Degree of protection	IP65	IP65
Resistance	100 Ω	150 Ω
Power in S1, 100% cdf	200 W	100 W
Dimensions W x H x D	252 x 15 x 80 mm	146 x 15 x 80 mm
Cable length	1.5 m	1.5 m

BW...-...-T

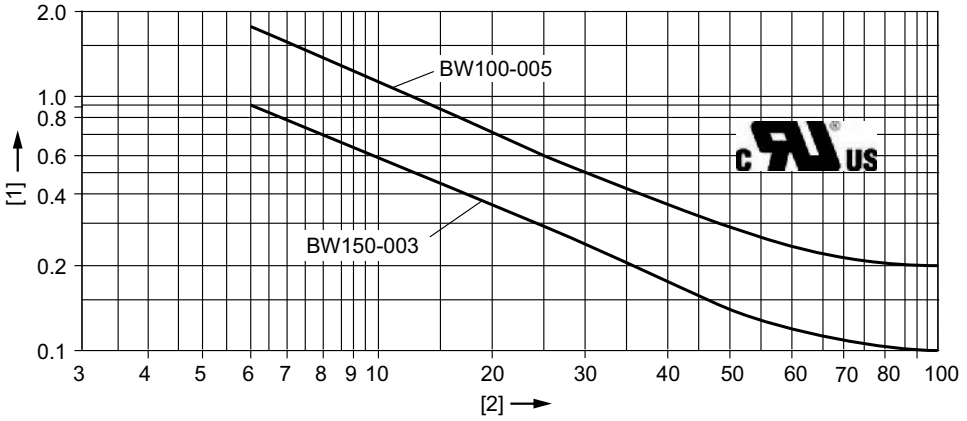


	BW150-006-T	BW100-009-T
Part number	1 796 956 5	1 796 957 3
Function	Dissipating the regenerative energy	
Degree of protection	IP66	IP66
Resistance	150 Ω	100 Ω
Power in S1, 100% cdf	600 W	900 W
Dimensions W x H x D	285 x 75 x 174 mm	435 x 75 x 174 mm
Maximum permitted cable length	15 m	15 m

7.6.5 Technical data of BW100-005/K-1.5 and BW150-003/K-1.5

Rating diagrams of BW100-005/K-1.5, BW150-003/K-1.5

The following figure shows the rating diagrams of the braking resistors BW100-005/K-1.5, BW150-003/K-1.5:

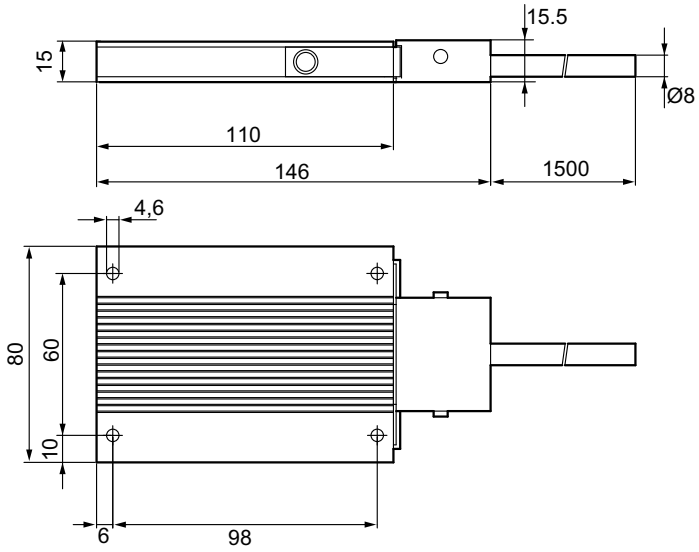


4850138507

[1] Power in kW
[2] Cyclic duration factor cdf in %

Dimension drawing BW150-003/K-1.5

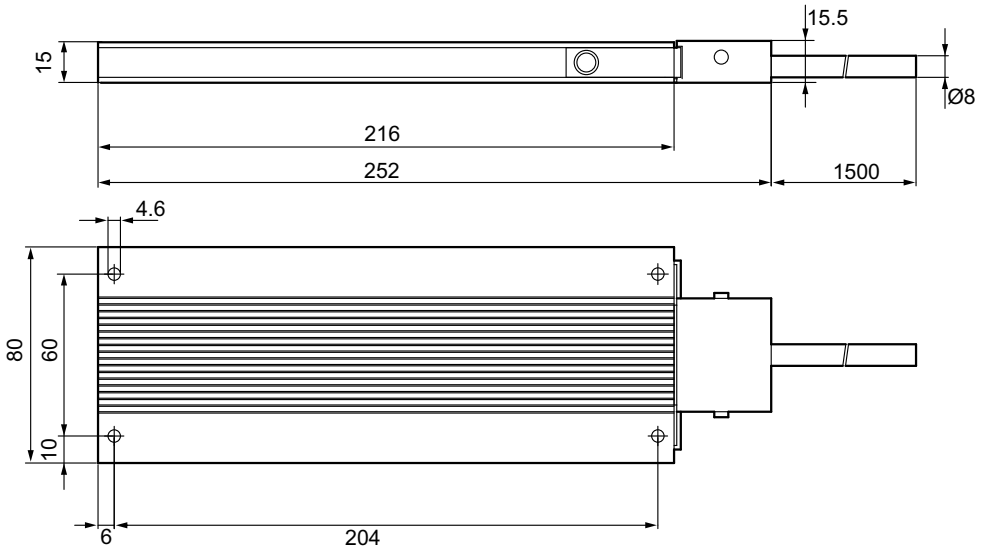
The following figure shows the dimensions of the external braking resistor BW150-003/K-1.5:



4850134027

Dimension drawing BW100-005/K-1.5

The following figure shows the dimensions of the external braking resistor BW100-005/K-1.5:

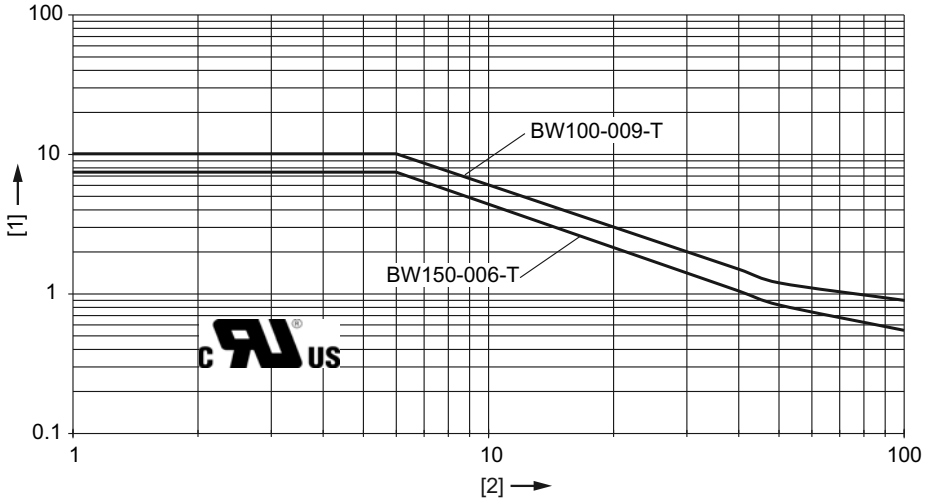


4850166795

7.6.6 Technical data of BW100-009-T and BW150-006-T

Rating diagrams of BW150-006-T and BW100-009-T

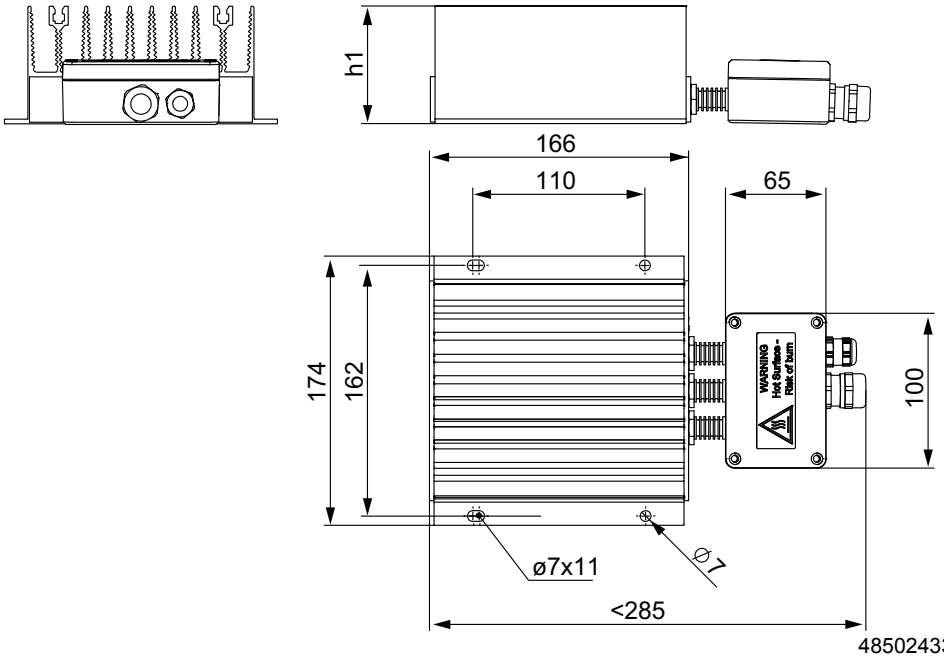
The following figure shows the rating diagrams of the braking resistors BW150-006-T and BW100-009-T:



[1] Power in kW
[2] Cyclic duration factor cdf in %
cdf = cyclic duration factor of the braking resistor, based on a cycle time of 120 s.

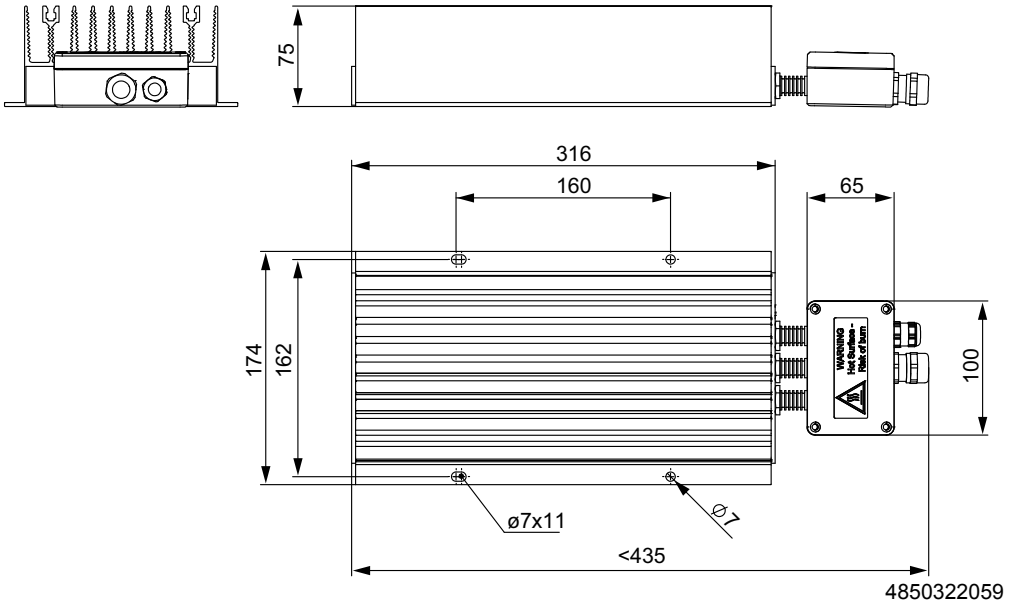
Dimension drawing BW150-006-T

The following figure shows the dimensions of the external braking resistor BW150-006-T:



Dimension drawing BW100-009-T

The following figure shows the dimensions of the external braking resistor BW100-009-T:



7.7 Brake

7.7.1 Braking work, braking torque

Type	Braking torque [Nm]	Braking work per emergency braking operation [kJ]	Max. number of emergency stop braking	Braking work until maintenance [MJ]
BY1C (DRC1)	7	5	10 / h	40
	2.5	5	10 / h	40
BY2C (DRC2)	14	15	10 / h	65
	7	15	10 / h	65



NOTICE

Damage to the DRC drive unit

Potential damage to property

- Note that only the SEW-EURODRIVE Service or qualified personnel trained by SEW-EURODRIVE is permitted to carry out maintenance/inspection work on the brake or to change the braking torque.

7.7.2 Response and application times

Type	Braking torque [Nm]	t_1 [ms]	t_2 [ms]
BY1C (DRC1)	7	100	200
	2.5		400
BY2C (DRC2)	14	100	200
	7		250

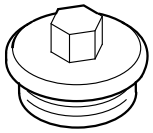
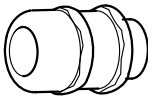
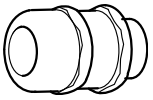
t_1 Response time
t_2 Application time

7.8 Accessories

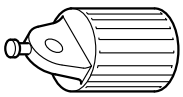
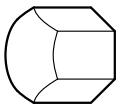
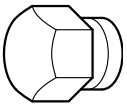
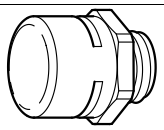
7.8.1 Screw fittings

The following tables show the screw connections available from SEW-EURODRIVE:

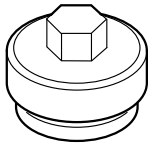
Cable glands / screw plugs

Type of screw fitting	Figure	Content	Size	Part number
Screw plugs Hexagon (made of stainless steel)		10 pcs	M16 x 1.5	1 824 734 2
		10 pcs	M25 x 1.5	1 824 735 0
EMC cable gland (nickel-plated brass)		10 pcs	M16 x 1.5	1 820 478 3
		10 pcs	M25 x 1.5	1 820 480 5
EMC cable gland (made of stainless steel)		10 pcs	M16 x 1.5	1 821 636 6
		10 pcs	M25 x 1.5	1 821 638 2

Screw fittings: plug connectors/ pressure compensation

Type of screw fitting	Figure	Content	Size	Part number
M23 plug (made of plastic)		10 pcs	M23 x 1.5	1 823 733 9
M12 plug (made of stainless steel)		10 pcs	M12 x 1.0	1 820 279 9
M12 plug (made of stainless steel)		10 pcs	M12 x 1.0	1 820 227 6
Pressure compensation fitting		1 pc	M16 x 1.5	1 820 409 0

Screw fittings: diagnostic interface/ potentiometer

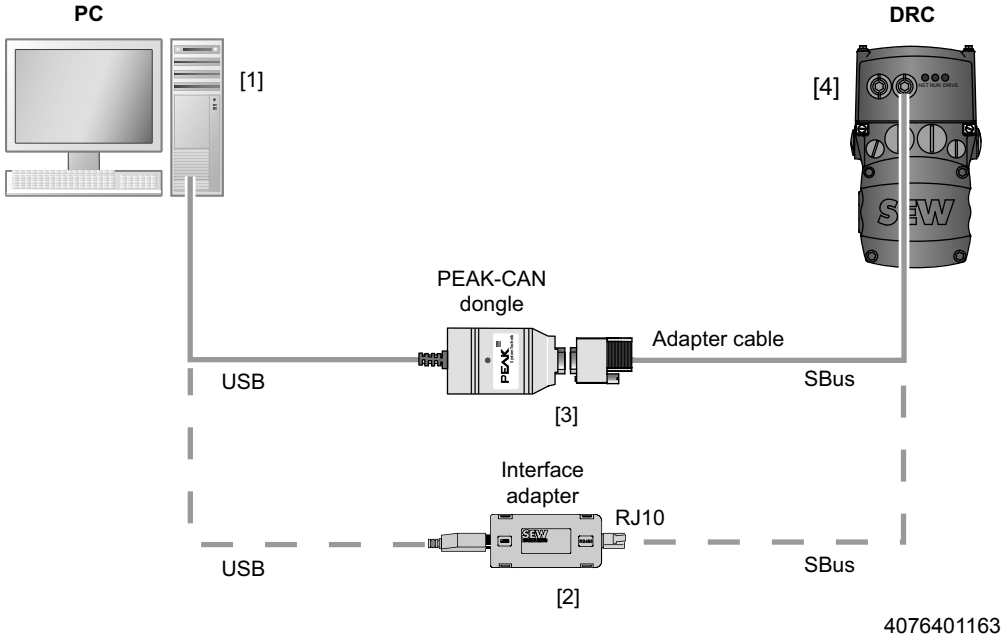
Type of screw fitting	Figure	Content	Size	Part number
Screw plug Hexagon For f1 potentiometer And diagnostic interface (made of stainless steel)		10 pcs	M24 x 1.5	1 824 107 7

7.8.2 PC connection

The diagnostic interface [4] can be connected to a commercially available PC/laptop [1] using one of the following options:

- [3] PEAK-CAN dongle with adapter cable
  - Part number of PEAK-CAN dongle: 1821 0597
  - Part number of adapter cable: 1812 3864
- [2] Interface adapter (in preparation)

Connection example



7.8.3 STO jumper plug

⚠ WARNING

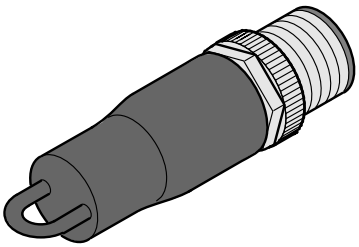
Safe disconnection of the DRC drive unit is not possible when the STO jumper plug is used.

Severe or fatal injuries.

- You may only jumper the STO input with 24 V when the DRC drive unit need not fulfill any safety function.

The STO jumper plug can be connected to the STO plug connector of the DRC drive unit. The STO jumper plug deactivates the safety functions of the DRC drive unit.

The following figure shows the STO jumper plug, part number 1 174 709 9:



18014399658394891

7.9 Connection cables

7.9.1 Prescribed connection cables for single-line installation

SEW-EURODRIVE prescribes the following cables types for the connection between DRC SNI drive units and SNI controllers:

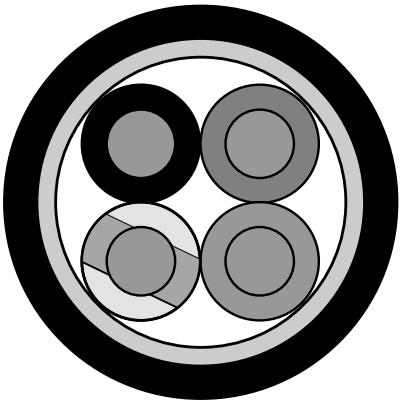
HELUKABEL TOPFLEX®

- **HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J**
- **HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J/UL/CSA**

  (UL-compliant installation)
- **HELUKABEL TOPFLEX® – EMV-2YSLCY-J**

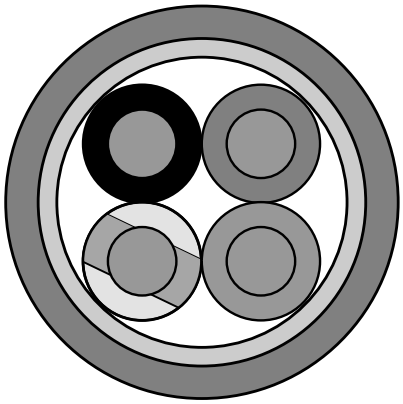
  The following figure shows the cable structure:

HELUKABEL TOPFLEX®
– EMV-UV-2YSLCYK-J
– EMV-UV-2YSLCYK-J/UL/CSA
Black outer cable sheath (UV-resistant)



2393726347

HELUKABEL TOPFLEX® – EMV-2YSLCY-J
Transparent outer cable sheath

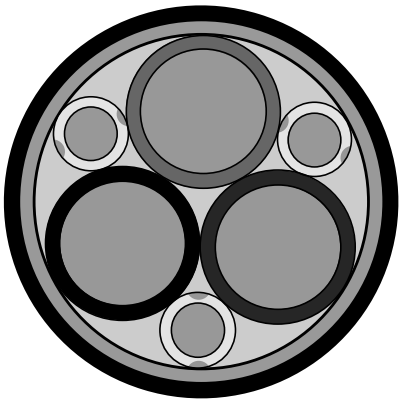


2688418699

- **HELUKABEL TOPFLEX® – EMV-UV-3 PLUS 2YSLCYK-J**

  The following figure shows the cable structure:

HELUKABEL TOPFLEX® – EMV-UV-3 PLUS 2YSLCYK-J
Black outer cable sheath (UV-resistant)



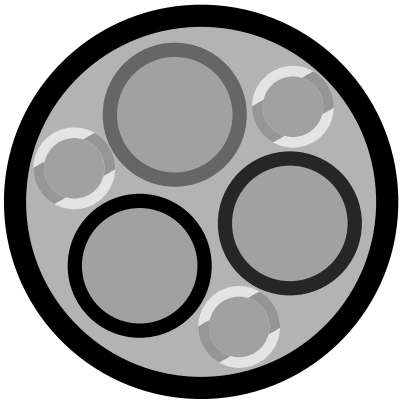
4848585355

LAPP ÖLFLEX®

- **LAPP ÖLFLEX® SERVO 2YSLCYK-JB**
  LAPP ÖLFLEX® SERVO 2YSLCY-JB

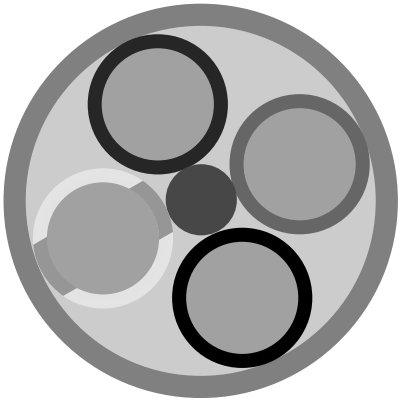
  The following figures show the cable structure:

LAPP ÖLFLEX® SERVO 2YSLCYK-JB
Black outer cable sheath (UV-resistant)



3336402059

LAPP ÖLFLEX® SERVO 2YSLCY-JB
Transparent outer cable sheath



2640950539

INFORMATION

A high signal quality is achieved due to the low operating capacitance of the specified cables.

The shielding prevents interference emission resulting from the data transmission modulated onto the line.

7.9.2 Specification of recommended CAN connection cable

When individual CAN connection cables are used, SEW-EURODRIVE recommends the cable type *"Belden 9841/LOW-capacitance computer cable for EIA".*

Description

24 AWG stranded TC wire, insulated with polyethylene, drilled, shielded with Beldfoil® (100%) + TC braid (90 % shielding), 24 AWG stranded TC drain wire, PVC sheath.

Physical properties (total)

Conductor: AWG			
Twisted-pairs	**AWG**	**Stranding**	**Conductor material**
1	24	7x32	TC – tinned copper

Mechanical properties (total)

Mechanical properties (total)	
Operating temperature	−30 °C to +80 °C
Nominal UL temperature	80 °C
Weight of raw cable	36 lbs/1000 ft.
Max. recommended tensile stress	72.3 lbs.
Min. bending radius of secondary axis	2.5 inch

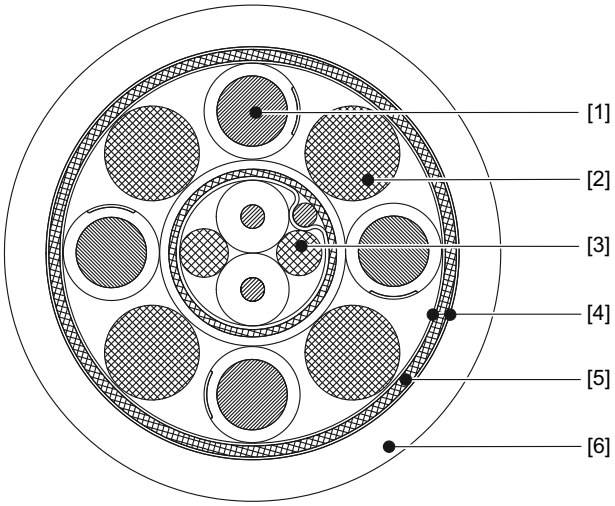
Applicable specifications and compliance with regulatory specifications (total) Applicable standards	
NEC/(UL) specification	CM
CEC/C(UL) specification	CM
AWM specification	UL style 2919 (30 V 80°)
EU CE mark (Y/N)	Yes
EU RoHS compliant (Y/N)	Yes
EU RoHS compliance date (MM/DD/YYYY)	01/01/2004
Plenum / Non-Plenum: Plenum (Y/N)	No
Plenum number	82841, 89841

Electrical properties (total)

Electrical properties (total)	
Characteristic rated impedance **Impedance (ohms)**	120
Nominal capacitance conductor/conductor **Capacitance (pF/ft)**	12.8
Nominal capacitance conductor/other conductor & shield **Capacitance (pF/ft)**	23.0
Nominal propagation speed **VP (%)**	66
Nominal delay time **Delay (ns/ft)**	1.6
Nominal value of the direct current resistance of the conductor **Nominal DC resistance at 20 °C (Ohm/1000 ft)**	24.0
Nominal value of the direct current resistance of the outer shield **Nominal DC resistance at 20 °C (Ohm/1000 ft)**	3.4
Nominal attenuation **Attenuation (dB/100ft)**	0.6 (at 1 MHz)
Max. operating voltage – UL **Voltage**	300 V RMS 20 V RMS (UL AWM Style 2919)
Max. recommended amperage **Amperage**	2.1 A per conductor at 25 °C

7.9.3 Specification of recommended hybrid cable

SEW-EURODRIVE recommends the following hybrid cables for the connection between DRC DSC drive units and controllers: The following figure shows the structure of the hybrid cable:



2389090443

	Type: LEONI Elocab EHRK 016281	Type: LEONI Elocab EHRK 018473
[1]	4 cores 2.5 mm^2 Conductor (141 x 0.15 mm) blank copper Insulation TPE Colors black, with printed numbers 1-3 1 x yellow-green	4 cores 4.0 mm ^{2} Conductor (228 x 0.15 mm) blank copper Insulation TPE Colors black, with printed numbers 1-3 1 x yellow-green
[2]	Filler	
[3]	1 conductor pair 0.25 mm^2 Conductor (19 x 0.13 mm) blank copper Insulation PE Colors white/blue	
	Foil shield Aluminum-clad side toward the braided shield Opt. cover 100%	
	Drain wire 0.25 mm^2 Conductor (19 x 0.13 mm) blank copper	
	Shield braided Conductor (0.10 mm) tin-plated copper	
	Sheathing TPE Color purple	
[4]	Windings	
[5]	Shield braided Conductor (0.161 mm) tinned copper Opt. cover at least 85%	
[6]	Outer sheath Polyurethane, flame retardant, halogen-free Color black	

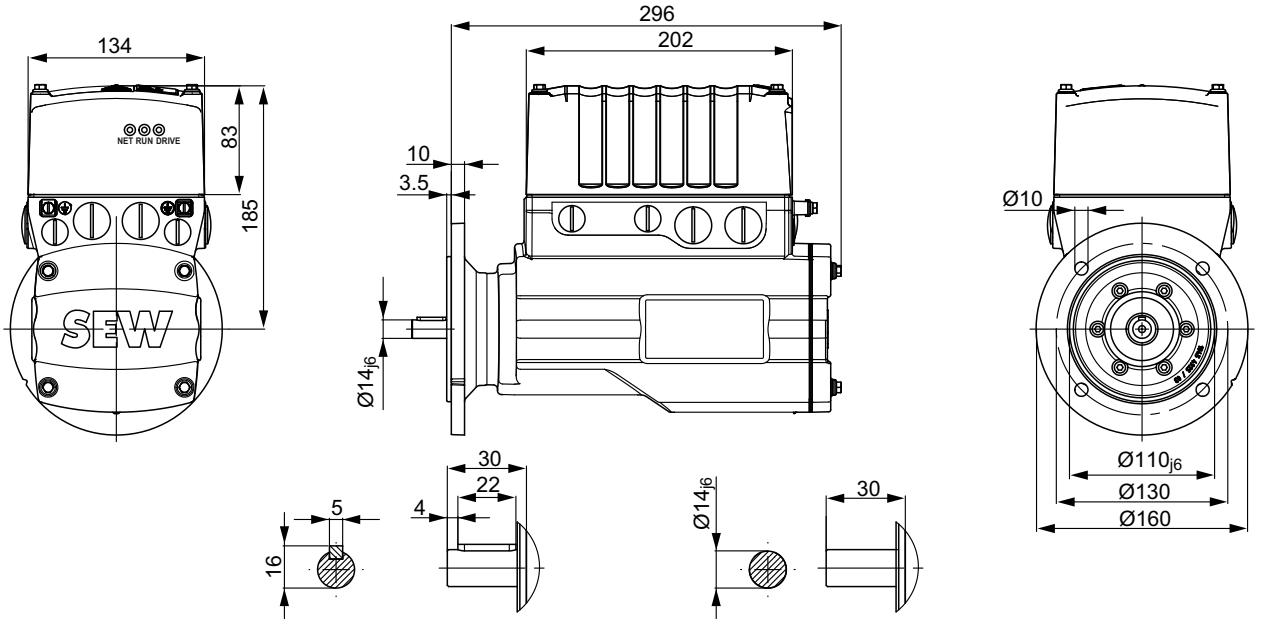
Technical data of hybrid cables

The following table shows the technical data of the hybrid cable:

Properties	Type: LEONI Elocab EHRK 016281	Type: LEONI Elocab EHRK 018473
UL features	UL style 20234 80 °C 1000 V c UL us certified 80 °C 600 V	
Operating voltage	1000 V	
Test voltage core/core	DC 4700 V	
Test voltage core/shield	DC 3110 V	
Test voltage shield Position [3]	DC 3000 V (spark test)	
Operating temperature	-30 °C to +80 °C (fixed installation)	
Weight of cable	Nom. 291 g/m	Nom. 333 g/m
Wave impedance Position [3]	120 Ω .. ± 10%	
Attenuation Position [3]	Nom. 1.8 dB / 100 m at 1 MHz Nom. 5.6 dB / 100 m at 10 MHz	
Delay Position [3]	Nom. 5 ns / m	
Bending radii	Single bending when routing the cable: 2x cable diameter	

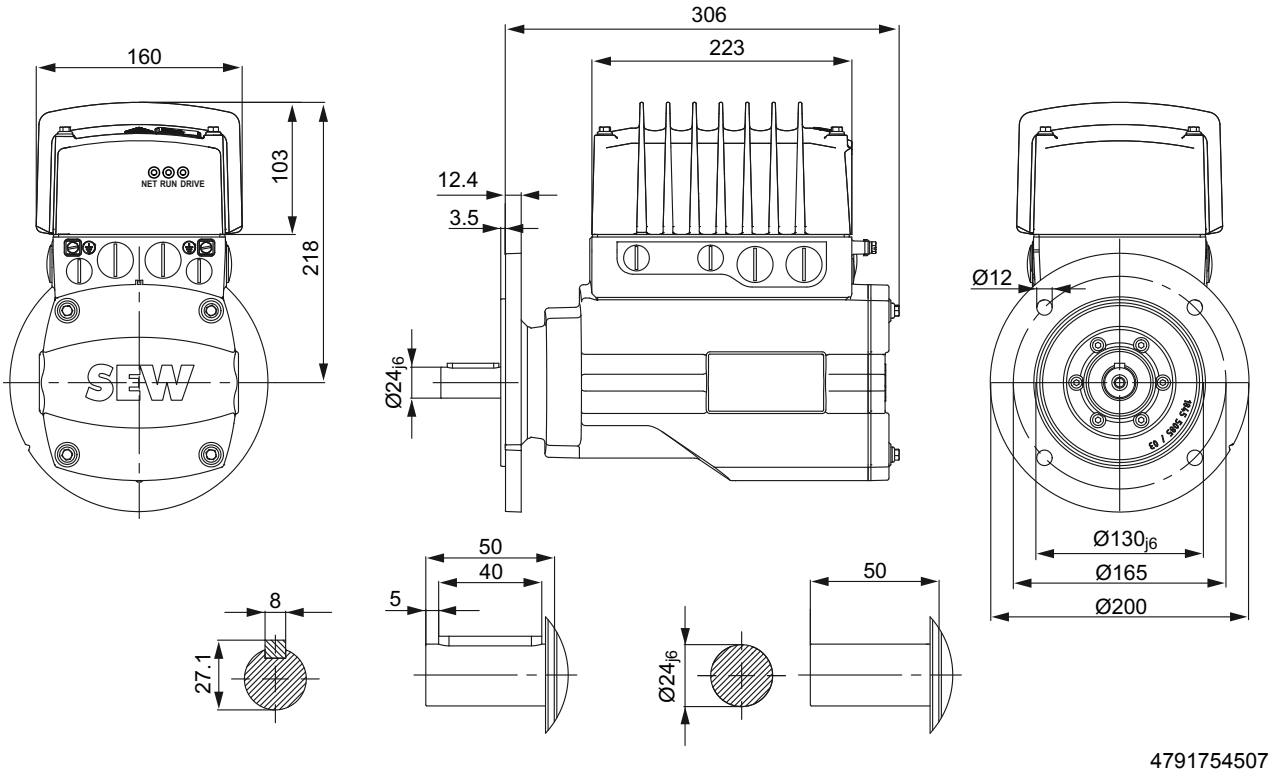
7.10 Dimension drawings

7.10.1 DRC1 with IEC flange[1)]



4791750667

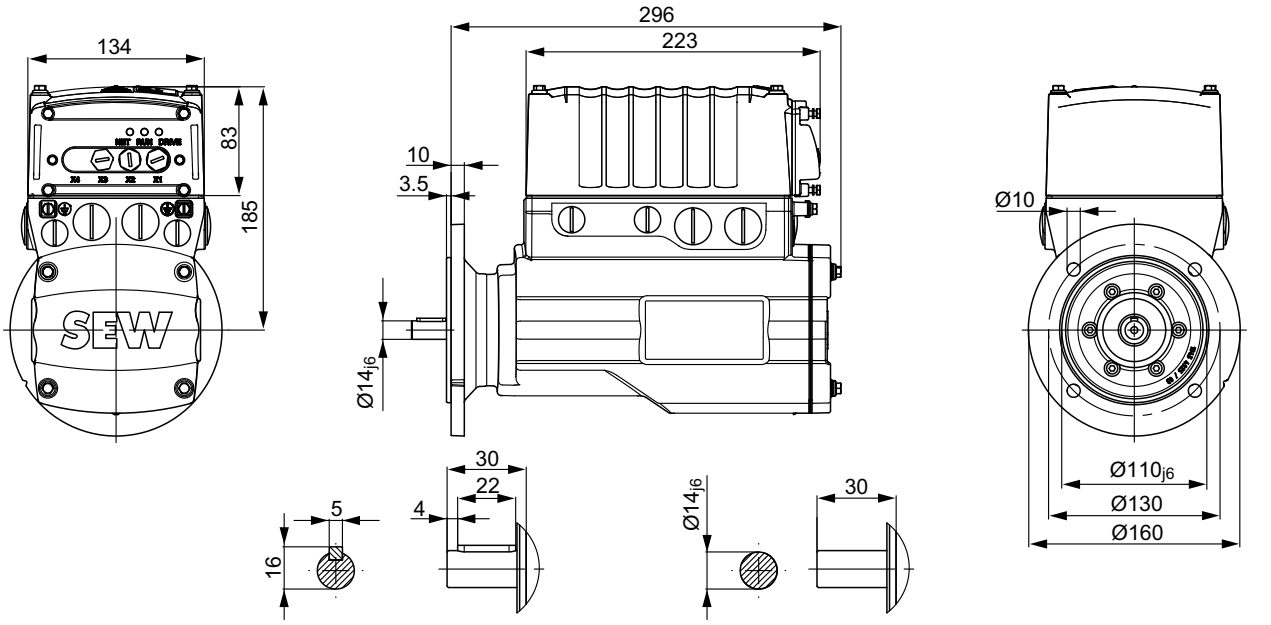
7.10.2 DRC2 with IEC flange[1)]



4791754507

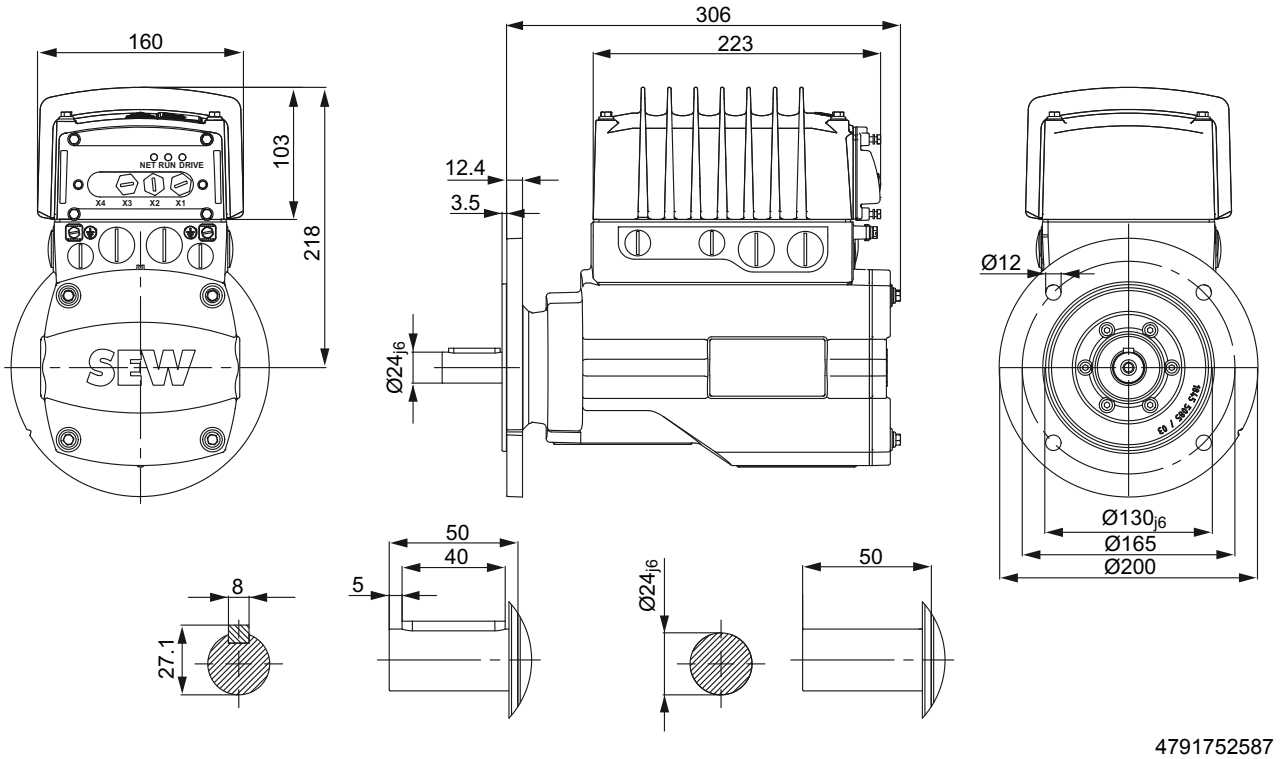
1) For gearmotor dimension sheets, refer to the "DRC Gearmotors" catalog

7.10.3 DRC1 with IEC flange and application option[1)]



4791756427

7.10.4 DRC2 with IEC flange and application option[1)]

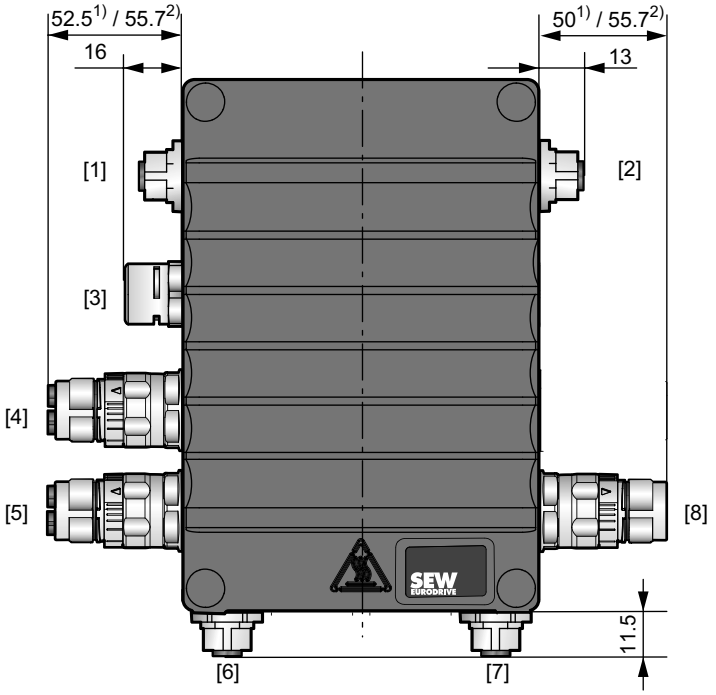


4791752587

1) For gearmotor dimension sheets, refer to the "DRC Gearmotors" catalog

7.10.5 Plug connectors

The following figure shows an example of the additional dimensions of optional plug connectors:



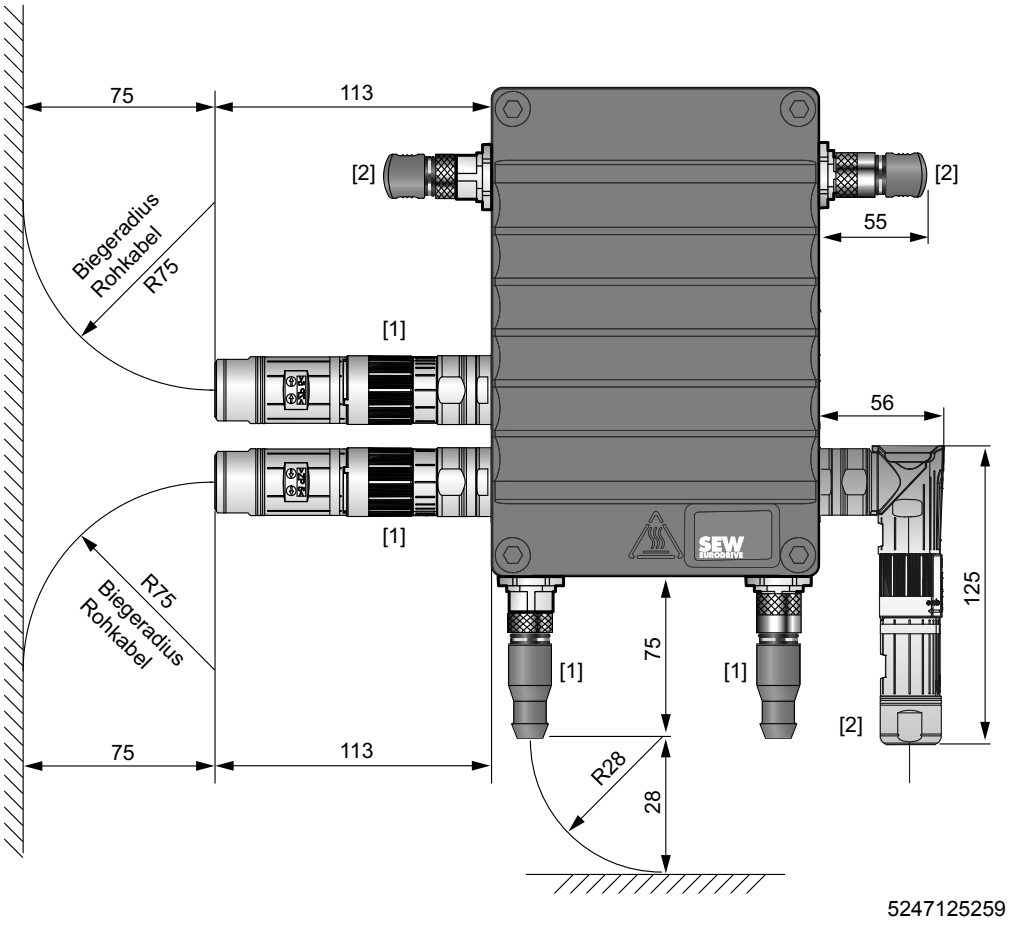
18014401150429835

1) "Straight" plug connector variant
2) "Right-angle" plug connector variant

	DRC-DBC	DRC-SNI	DRC-DAC	DRC-DSC
[1]	Not possible	Not possible	X4271: AS-Interface communication interface	X4104: CAN bus – system bus – input
[2]	Not possible	Not possible	X5011: AS-Interface sensors	X4103: CAN bus – system bus – output
[3]	Pressure compensation fitting in connection with the optional ASEPTIC design			
[4]	X1203_2: AC 400 V connection	X1203_2: AC 400 V connection with SNI	X1203_2: AC 400 V connection	X1203_2: AC 400 V connection / X1231: AC 400 V output and CAN bus
[5]	X1203_1: AC 400 V connection	X1203_1: AC 400 V connection with SNI	X1203_1: AC 400 V connection	X1203_1: AC 400 V connection / X2324: AC 400 V input and CAN bus
[6]	X5502: STO – IN	X5502: STO – IN	X5502: STO – IN	X5502: STO – IN
[7]	X5503: STO – OUT	X5503: STO – OUT	X5503: STO – OUT	X5503: STO – OUT
[8]	X5132: Digital inputs/outputs	X5131: Digital inputs/outputs	X5132: Digital inputs/outputs	X5131: Digital inputs/outputs

7.10.6 Plug connectors and mating connectors

The following figure shows the additional dimensions / bending radii of the optional plug connectors including mating connector in connection with prefabricated cables from SEW-EURODRIVE.



[1] "Straight" plug connector variant
[2] "Right-angle" plug connector variant

8 Technical Data of MOVIFIT® FDC-SNI

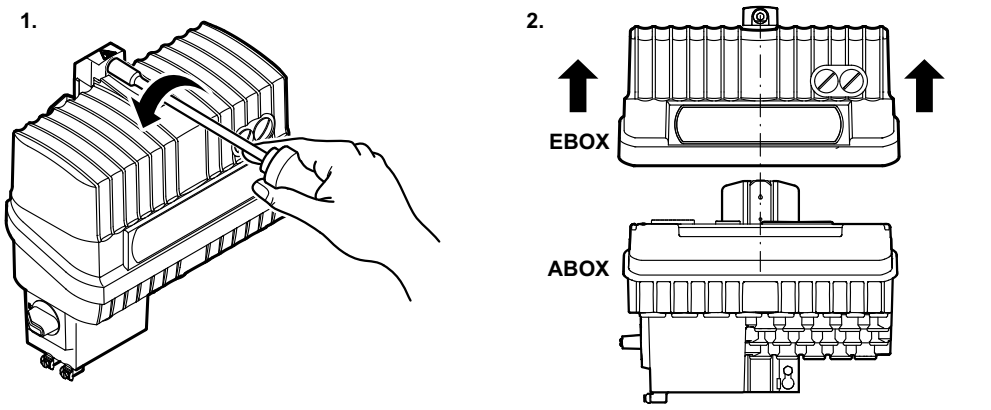
8.1 Type designation and housing concept

8.1.1 Characteristics

The MOVIFIT® FDC housing has the following characteristics:

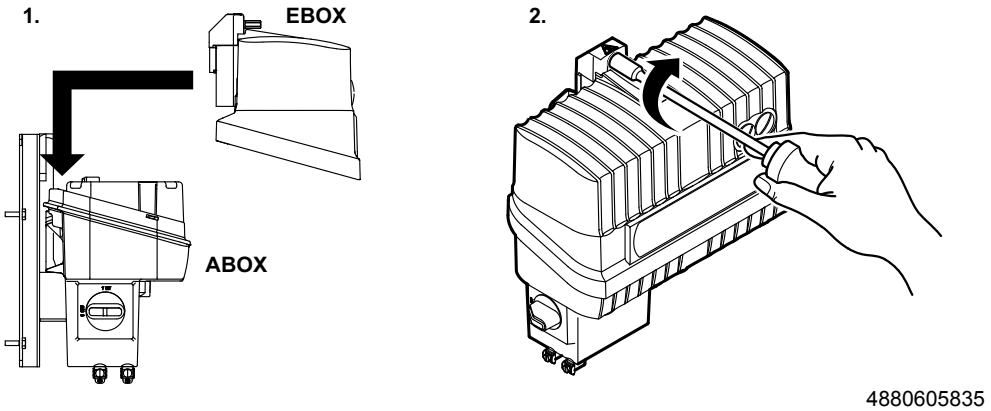
- Aluminum die-cast housing
  - High rigidity
  - IP65 version for industrial requirements
  - Optional design for wet areas with specially treated surface for the food industry
- Separation of connection unit (ABOX) and electronics (EBOX):
  - No damage to the electronics during installation and maintenance
  - Data backup of user parameters on the SD memory card of the EBOX
  - Fast replacement of electronics without wiring: Only one screw is required to connect the EBOX to the ABOX, see following figures.

Remove EBOX



4880603531

Place EBOX on top of ABOX and screw it on



4880605835

8.1.2 Example type designation

Example EBOX

MT C 11 A 000 - 503 - R95xx - 00

EBOX variant
00 = Series

Memory card type
R95x = SD card type OMC41B-T0 (parameterizable)
R96x = SD card type OMH41B-T0 (programmable)

Connection type
3 = 3-phase (AC)

Supply voltage
50 = 380 V – 500 V

Unit power
000 = MTC variant (MOVIFIT® FDC)

Version A

Series
11 = Standard (IP65)
13 = Variant for wet areas (IP65)

Unit type
C = MOVIFIT® FDC

MT = MOVIFIT® unit series

Example: ABOX

MT A 11 A - 50 3 - S04 3 - M16 - 00 / M11

ABOX option
M11 = Stainless steel mounting rail

ABOX variant
00 = Series

Maintenance switch
M16 = Motor protection switch 15 A
M20 = Motor protection switch 20 A

Fieldbus
3 = PROFINET IO, EtherNet/IP, Modbus/TCP

Connection configuration
S04 = Standard ABOX
with terminals and cable bushings
S54 = Hybrid ABOX with M12 for I/Os + bus
and plug connector for MOVIGEAR®
S64 = Hybrid ABOX with M12 for I/Os,
push-pull RJ45 for bus
and plug connector for MOVIGEAR®

Supply phases
3 = 3-phase (AC)

Supply voltage
50 = 380 V – 500 V

A = Version

Series
11 = Standard (IP65)
13 = Variant for wet areas (IP65)

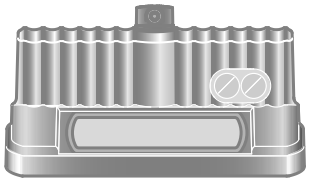
Unit type
A = ABOX (connection box)

MT = MOVIFIT® unit series

8.1.3 Combination options of MOVIFIT® FDC-SNI

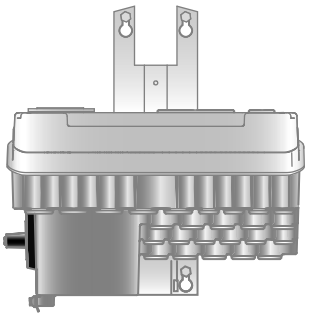
EBOX

MTC...-...-00



MOVIFIT® FDC
for controlling
MOVIGEAR® drive units

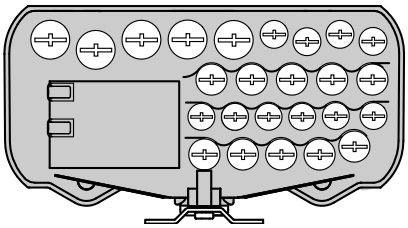
ABOX



ABOX

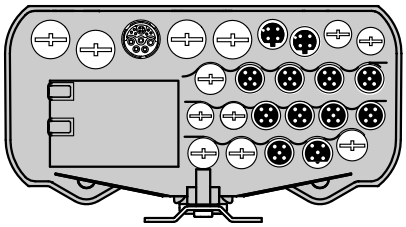
Variant

MTA...-S04.-...-0



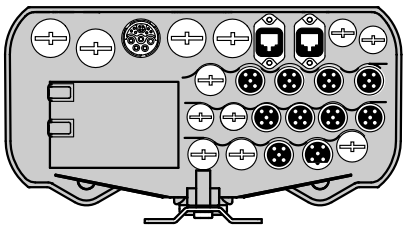
Standard ABOX
with terminals and cable bushings

MTA...-S54.-...-00



Hybrid ABOX
with M12 for I/Os and bus

MTA...-S64.-...-00



Hybrid ABOX
with M12 for I/Os and push-pull RJ45

8.2 Variant for use in wet areas

The following figure shows the MOVIFIT® variant for use in wet areas:



842731659

8.2.1 Characteristics

The variant for wet areas has the following characteristics:

- IP65 in accordance with EN 60529 (MOVIFIT® housing closed and all cable entries sealed according to the relevant degree of protection)
- Easy-to-clean housing (self-draining design)
- Surface with non-stick properties
- High impact resistance of the surface against mechanical damage
- Specifically treated mounting rail with anti-adhesive properties
- The variant for wet areas optimally supplements DRC drive units in ASEPTIC / ASEPTIC^{plus} design and MOVIGEAR® drive units with optional package for wet areas

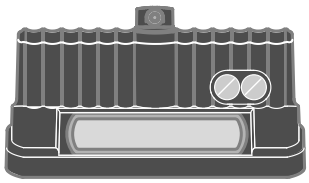
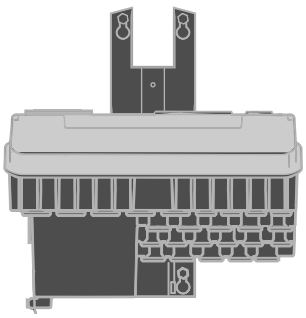
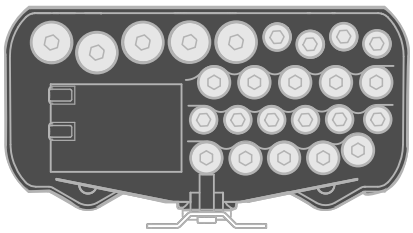
INFORMATION

For detailed information, refer to the "MOVIFIT® FDC-SNI operating instructions.

8.2.2 Possible combinations in connection with the variant for wet areas

INFORMATION

The variant for wet areas is only available in connection with the standard ABOX with terminals and cable bushings.

EBOX	ABOX	Variant
MTC13...-...-00  MOVIFIT® FDC for controlling MOVIGEAR® drive units		**MTA13....-S04.-...-00**  Standard ABOX with terminals and cable bushings

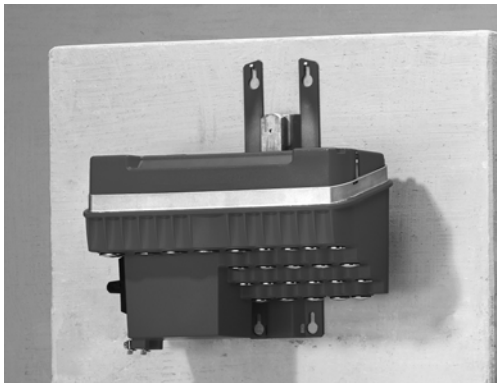
In SEW-EURODRIVE publications, all illustrations of MOVIFIT® variants for wet areas are displayed as hatched (= specially treated surface).

8.3 Flexible connection technology

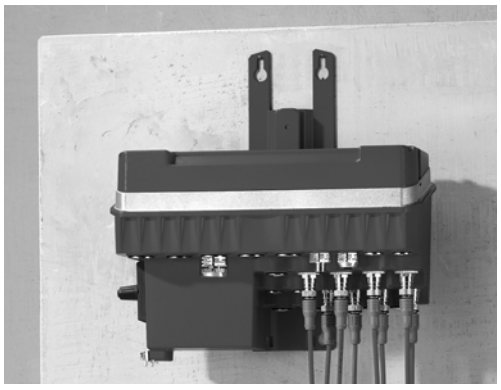
8.3.1 Overview

The flexible connection technology of MOVIFIT® FDC-SNI allows the unit to be adjusted to suit various installation philosophies. This flexibility is made possible thanks to the fact that in addition to the standard version that has to be wired up, there are also prewired solutions with industry-standard connectors.

- **Standard ABOX**
  - with terminals and cable bushings



- **Hybrid ABOX**
  - with M12 for I/Os and bus
  - with M12 for I/Os and push-pull RJ45 for bus

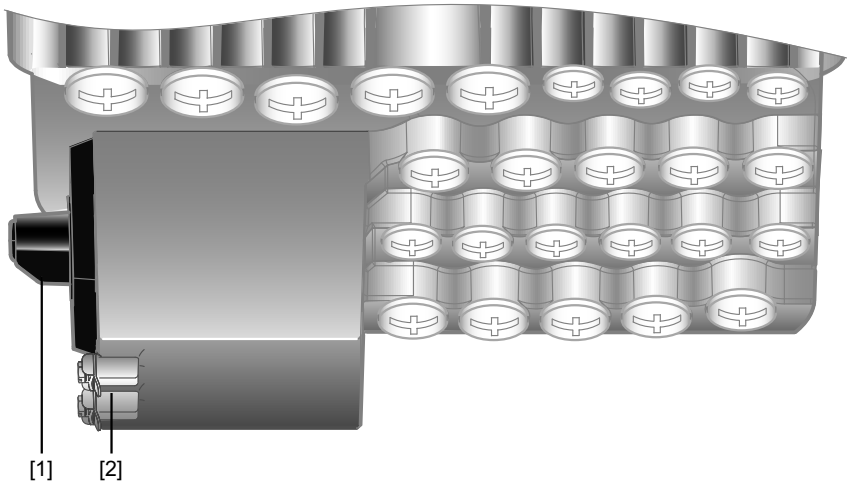


8.4 Available ABOXes

8.4.1 Standard ABOX "MTA...-S04.-...-00"

Description

The following figure depicts the standard ABOX "MTA...-S04.-...-00" with terminals and cable bushings:



3045820427

[1] Maintenance switch
[2] PE connection

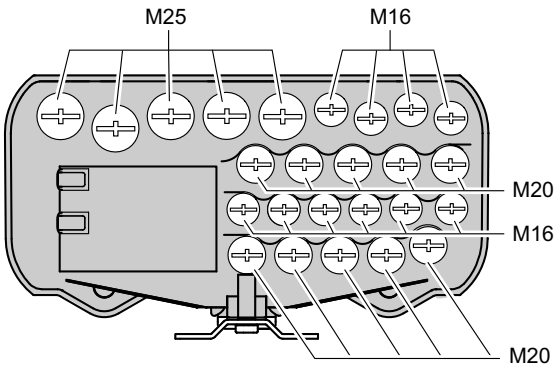
Variants

The standard ABOX is available in the following variants:

- MTA11A-503-**S04**.-...-00: Standard ABOX for MOVIFIT® FDC (MTC)
  - Motor protection switch integrated as standard for line protection

The following figure depicts the screw fittings of the standard ABOX:

PROFINET MTA11A-503-S043-...-00
EtherNet/IP MTA11A-503-S043-...-00
Modbus/TCP MTA11A-503-S043-...-00



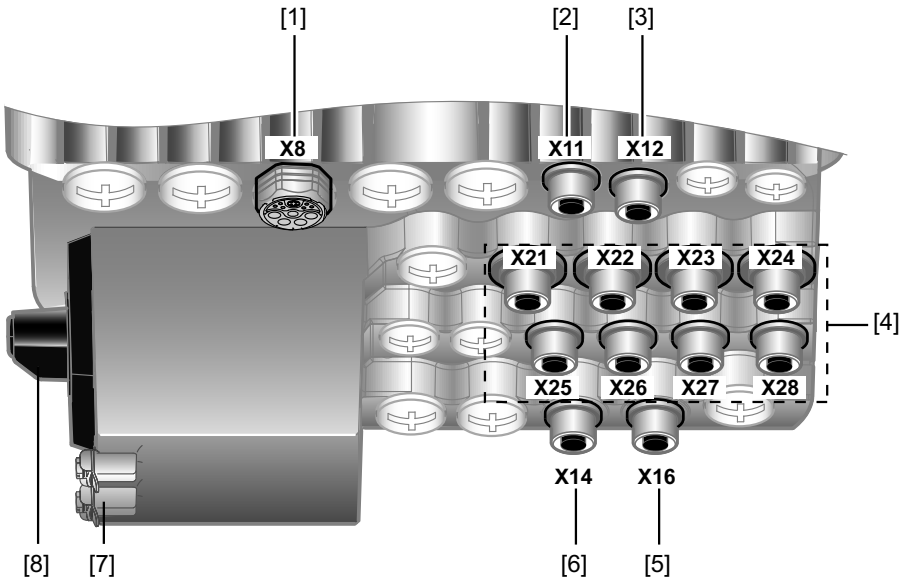
8.4.2 Hybrid ABOX "MTA...-S54.-...-00"

INFORMATION

- The hybrid ABOX is based on the standard ABOX "MTA...-S02.-...-00". The following therefore only describes the additional plug connectors in comparison with the Standard ABOX.

Description

The following figure depicts the hybrid ABOX with M12 plug connectors for connecting I/Os and bus:



3051482891

[1] AC 400 V output (SNI cable for connecting the MOVIGEAR® drive units)
[2] Ethernet interface, port 1
[3] Ethernet interface, port 2
[4] Binary inputs/outputs
[5] RS485 interface – external
[6] SBus (CAN) – external
[7] PE connection
[8] Maintenance switch

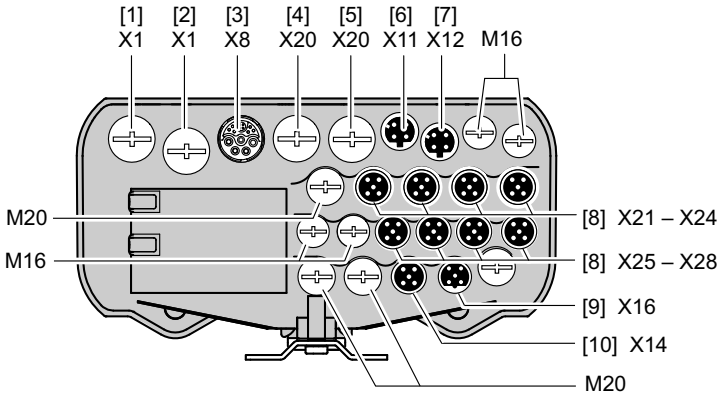
Variants

The hybrid ABOX is available in the following variants:

- MTA11A-503-**S54**.-...-00: Hybrid ABOX for MOVIFIT® FDC (MTC)
  - Motor protection switch integrated as standard for line protection

The following figure shows the cable glands and plug connectors of the Hybrid ABOX:

PROFINET MTA11A-503-S543-...-00
EtherNet/IP MTA11A-503-S543-...-00
Modbus/TCP MTA11A-503-S543-...-00



3051956747

[1]	X1	AC 400 V input	(terminals underneath the M25 gland)
[2]	X1	Reserved	(M25 gland)
[3]	X8	AC 400 V output (SNI)	(M23 H-Tec, SEW P-insert 15-pole, female, coding 1)
[4]	X20	DC 24 V input	(terminals underneath the M25 gland)
[5]	X20	Reserved	(M25 gland)
[6]	X11	Ethernet interface, port 1	(M12, 4-pole, female, D-coded)
[7]	X12	Ethernet interface, port 2	(M12, 4-pole, female, D-coded)
[8]	X21 – X28	Binary inputs/outputs	(M12, 5-pole, female, A-coded)
[9]	X16	RS485 interface – external	(M12, 5-pole, female, B-coded)
[10]	X14	SBus (CAN) – external	(M12, 5-pole, female, A-coded)

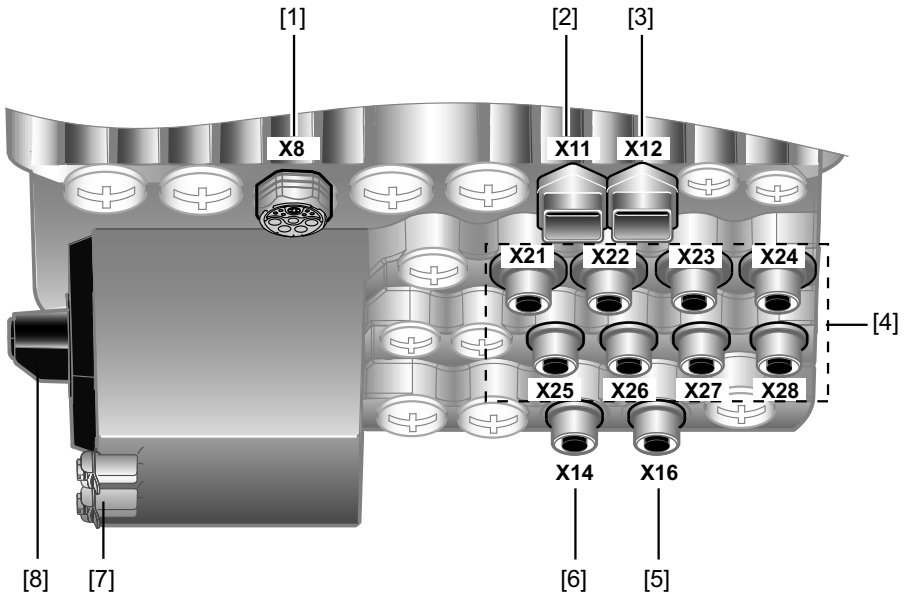
8.4.3 Hybrid ABOX "MTA...-S64.-...-00"

INFORMATION

- The hybrid ABOX is based on the standard ABOX "MTA...-S02.-...-00". The following therefore only describes the additional plug connectors in comparison with the Standard ABOX.

Description

The following figure shows the hybrid ABOX with M12 plug connectors for connecting I/Os and push-pull RJ45 plug connector for Ethernet connection:



3053262091

[1] AC 400 V output (SNI cable for connecting the MOVIGEAR® drive units)
[2] Ethernet interface, port 1
[3] Ethernet interface, port 2
[4] Binary inputs/outputs
[5] RS485 interface – external
[6] SBus (CAN) – external
[7] PE connection
[8] Maintenance switch

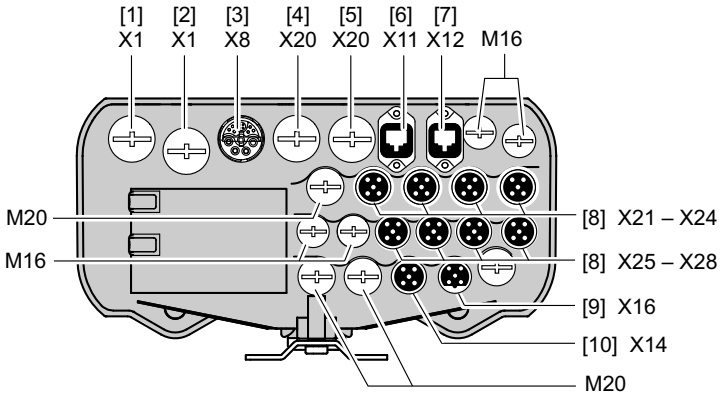
Variants

The hybrid ABOX is available in the following variants:

- MTA11A-503-**S64**.-...-00: Hybrid ABOX for MOVIFIT® FDC (MTC)
  - Motor protection switch integrated as standard for line protection

The following figure shows the cable glands and plug connectors of the Hybrid ABOX:

PROFINET MTA11A-503-S643-...-00
EtherNet/IP MTA11A-503-S643-...-00
Modbus/TCP MTA11A-503-S643-...-00



3053275659

[1]	X1	AC 400 V input	(terminals underneath the M25 gland)
[2]	X1	Reserved	(M25 gland)
[3]	X8	AC 400 V output (SNI)	(M23 H-Tec, SEW P-insert 15-pole, female, coding 1)
[4]	X20	DC 24 V input	(terminals underneath the M25 gland)
[5]	X20	Reserved	(M25 gland)
[6]	X11	Ethernet interface, port 1	(Han® 3 A RJ45)
[7]	X12	Ethernet interface, port 2	(Han® 3 A RJ45)
[8]	X21 – X28	Binary inputs/outputs	(M12, 5-pole, female, A-coded)
[9]	X16	RS485 interface – external	(M12, 5-pole, female, B-coded)
[10]	X14	SBus (CAN) – external	(M12, 5-pole, female, A-coded)

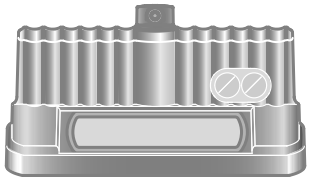
8.5 Selection tables

8.5.1 Available combinations for MOVIFIT® FDC-SNI

MOVIFIT® FDC-SNI in connection with standard-ABOX MTA...-S04.-...-00

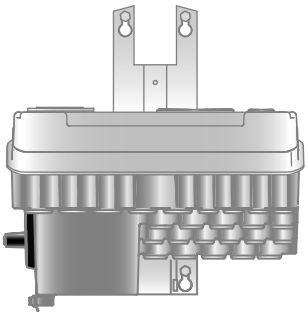
EBOX

MTC...-...-00

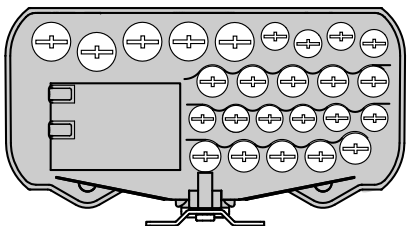


MOVIFIT® FDC
for controlling
MOVIGEAR® drive units

ABOX



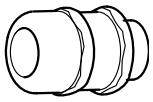
MTA...-S04.-...-00



Standard ABOX
with terminals and cable bushings

Performance class	Fieldbus	EBOX Type	ABOX Type
CCU standard (R95x)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R95x-00	MTA11A-503-S043-M16-00 MTA11A-503-S043-M20-00
MOVI-PLC® standard (R96x)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R96x-00	MTA11A-503-S043-M16-00 MTA11A-503-S043-M20-00

Accessories

Type	Figure	Content	Size	Part number
EMC cable gland (brass, nickel plated)		10 pcs	M16 x 1.5	1820 478 3
		10 pcs	M20 x 1.5	1820 479 1
		10 pcs	M25 x 1.5	1820 480 5
Screw plug for interfaces on the EBOX		1 piece		1 813 062 3

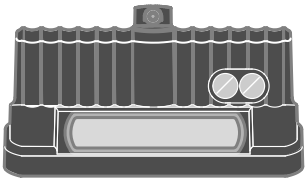
Option

Option	Integrated in	Type
Stainless steel mounting rail	**ABOX**	**/M11**

MOVIFIT® FDC-SNI in connection with standard ABOX and design for wet areas

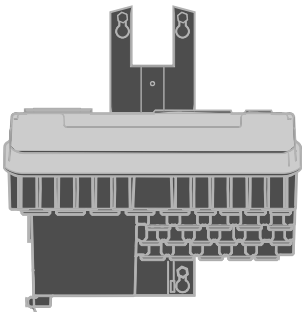
EBOX

MTC13...-...-00
(variant for use in wet areas)

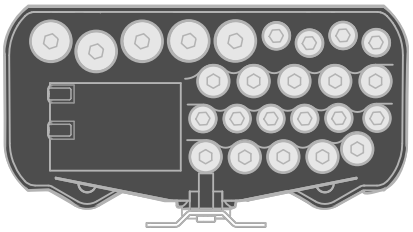


MOVIFIT® FDC
for controlling up to
10 MOVIGEAR® drive units

ABOX



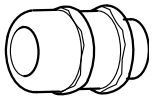
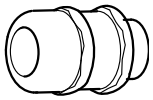
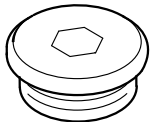
MTA13...-S04.-...-00
(variant for use in wet areas)



Standard ABOX
with terminals and cable bushings

Performance class	Fieldbus	EBOX Type	ABOX Type
CCU standard (R95x)	**PROFINET EtherNet/IP Modbus/TCP**	MTC13A000-503-R95x-00	MTA13A-503-S043-M16-00 MTA13A-503-S043-M20-00
MOVI-PLC® standard (R96x)	**PROFINET EtherNet/IP Modbus/TCP**	MTC13A000-503-R96x-00	MTA13A-503-S043-M16-00 MTA13A-503-S043-M20-00

Accessories

Type	Figure	Content	Size	Part number
EMC cable gland (brass, nickel plated)		10 pcs	M16 x 1.5	1820 478 3
		10 pcs	M20 x 1.5	1820 479 1
		10 pcs	M25 x 1.5	1820 480 5
EMC cable gland (stainless steel)		10 pcs	M16 x 1.5	1821 636 6
		10 pcs	M20 x 1.5	1821 637 4
		10 pcs	M25 x 1.5	1821 638 2
Stainless steel screws plugs		10 pcs	M16 x 1.5	1820 223 3
		10 pcs	M20 x 1.5	1820 224 1
		10 pcs	M25 x 1.5	1820 226 8
Screw plug for interfaces on the EBOX		1 piece		1 813 062 3

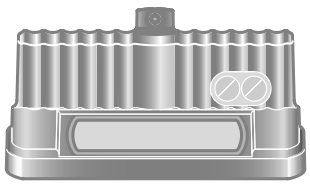
Option

Option	Integrated in	Type
Stainless steel mounting rail	**ABOX**	**/M11**

MOVIFIT® FDC-SNI in connection with hybrid ABOX MTA...-S54.-...-00

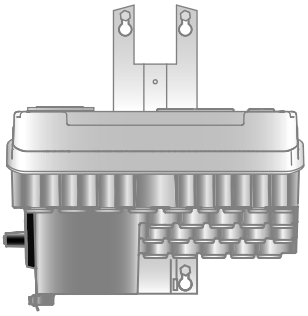
EBOX

MTC...-...-00

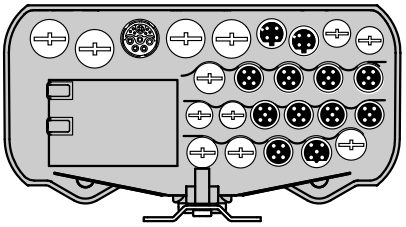


MOVIFIT® FDC
for controlling
MOVIGEAR® drive units

ABOX



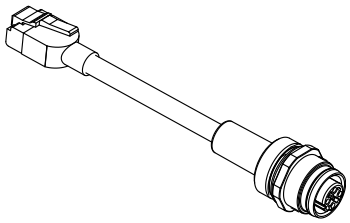
MTA...-S54.-...-00



Hybrid ABOX
with M12 for I/Os and bus

Performance class	Fieldbus	EBOX Type	ABOX Type
CCU standard (R95x)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R95x-00	MTA11A-503-S543-M16-00 MTA11A-503-S543-M20-00
MOVI-PLC® standard (R96x)	**PROFINET (Cu) EtherNet/IP (Cu) Modbus/TCP (Cu)**	MTC11A000-503-R96x-00	MTA11A-503-S543-M16-00 MTA11A-503-S543-M20-00

Accessories

Type	Figure	Content	Part number
RJ45-M12 Ethernet adapter RJ45 (internal) M12 (external) 2 required for each unit.		1 piece	1 328 168 2
Screw plug for interfaces on the EBOX		1 piece	1 813 062 3

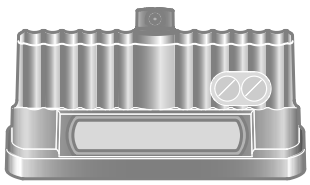
Option

Option	Integrated in	Type
Stainless steel mounting rail	**ABOX**	**/M11**

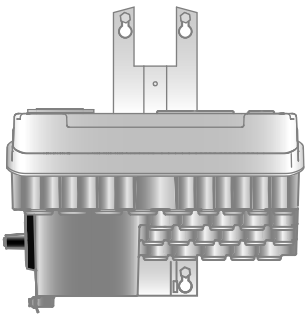
MOVIFIT® FDC-SNI in connection with hybrid ABOX MTA...-S64.-...-00

EBOX | **ABOX**

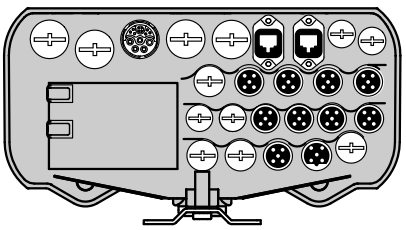
MTC...-...-00



MOVIFIT® FDC
for controlling
MOVIGEAR® drive units



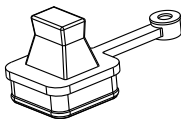
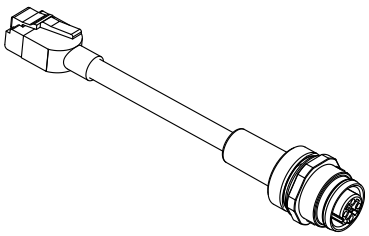
MTA...-S64.-...-00



Hybrid ABOX
with M12 for I/Os and push-pull RJ45

Performance class	Fieldbus	EBOX Type	ABOX Type
CCU standard (R95x)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R95x-00	MTA11A-503-S643-M16-00 MTA11A-503-S643-M20-00
MOVI-PLC® standard (R96x)	**PROFINET EtherNet/IP Modbus/TCP**	MTC11A000-503-R96x-00	MTA11A-503-S643-M16-00 MTA11A-503-S643-M20-00

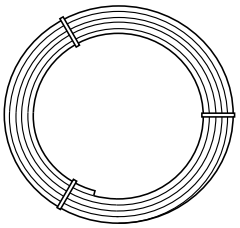
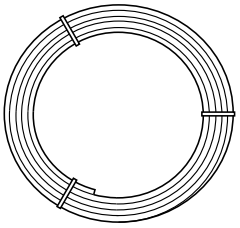
Accessories

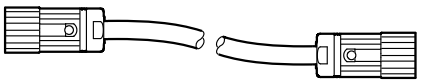
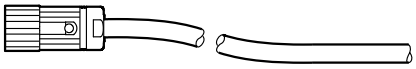
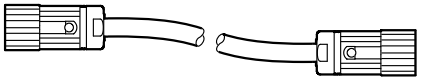
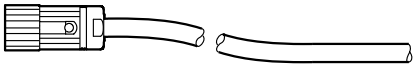
Type	Figure	Content	Part number
Ethernet closing plug for push-pull RJ45 socket		10 pcs	1 822 370 2
		30 pcs	1 822 371 0
RJ45-M12 Ethernet adapter RJ45 (internal) M12 (external) 2 required for each unit.		1 piece	1 328 168 2
Screw plug for interfaces on the EBOX		1 piece	1 813 062 3

Option

Option	Integrated in	Type
Stainless steel mounting rail	**ABOX**	**/M11**

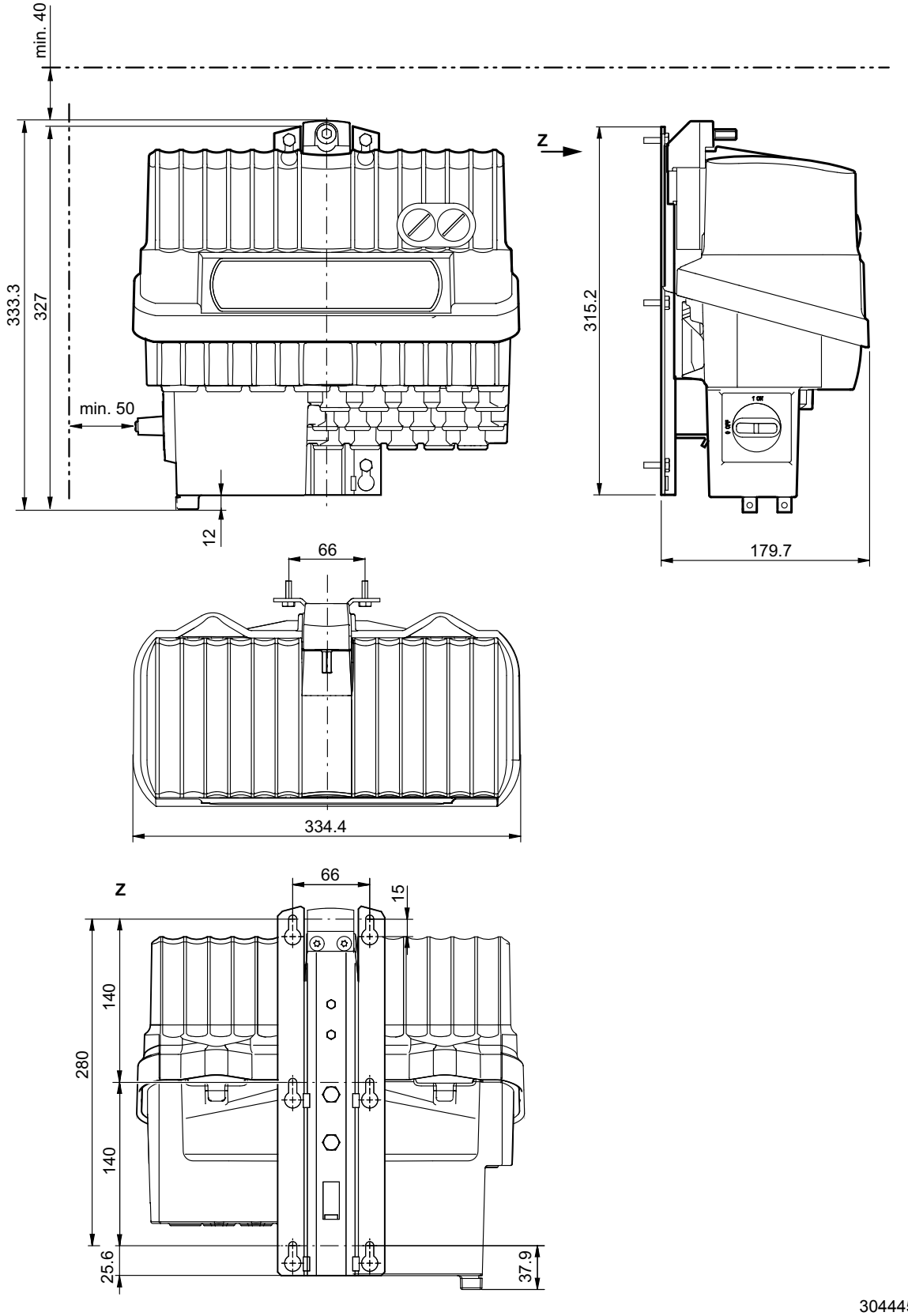
8.5.2 Hybrid cables for connecting MOVIFIT® FDC and drive unit

MOVIFIT® FDC	SNI connection cable	Length/routing	Cable cross section/cable type
Standard ABOX: **MTA...-S04.-...-00**	**Part no. 1 330 330 9** **Cable reel 30 m** **Cable reel 100 m** **Cable reel 200 m**  Open cable end (not prefabricated)	Variable 	2.5 mm^2 HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J
	Part no. 1 330 550 6 **Cable reel 30 m** **Cable reel 100 m** **Cable reel 200 m**  Open cable end (not prefabricated)	Variable 	4 mm^2 HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J

MOVIFIT® FDC	SNI connection cable	Length/routing	Cable cross section/cable type
Hybrid ABOX: MTA...-S54.-...-00 MTA...-S64.-...-00	**Part number 1 812 750 9**  M23, coding ring: Red — M23, coding ring: Red	Variable 	2.5 mm² HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J
	Part number 1 812 751 7  M23, coding ring: Red — Open	Variable 	2.5 mm² HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J
	Part number 1 812 752 5  M23, coding ring: Red — M23, coding ring: Red	Variable 	4 mm² HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J
	Part number 1 812 753 3  M23, coding ring: Red — Open	Variable 	4 mm² HELUKABEL TOPFLEX® – EMV-UV-2YSLCYK-J

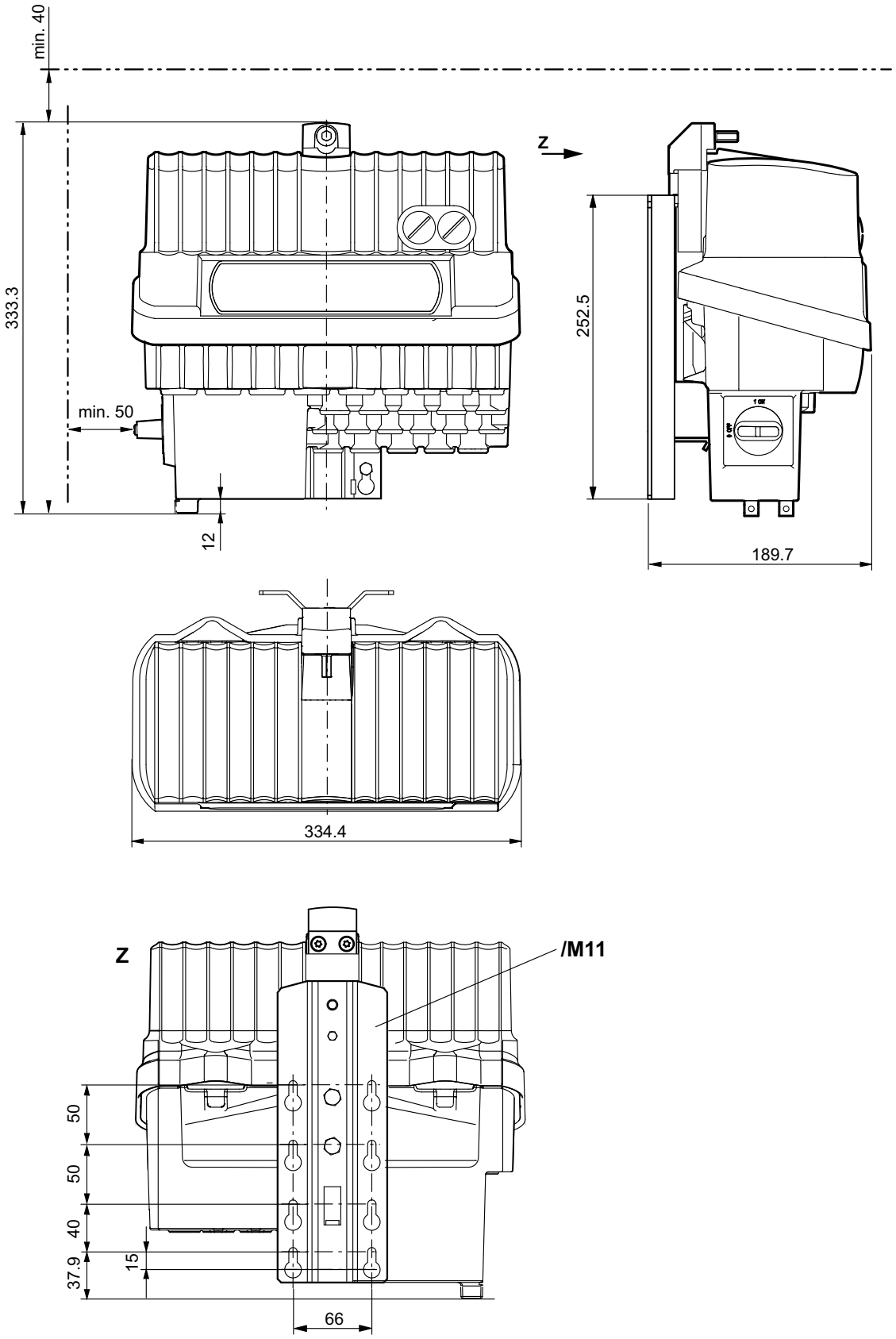
8.6 Dimension drawings

8.6.1 MOVIFIT® FDC with standard mounting rail



3044455819

8.6.2 MOVIFIT® FDC with optional stainless steel mounting rail M11



3044457739

9 Project Planning

9.1 Gear unit

9.1.1 Efficiency of gear units

General information

The efficiency of gear units is mainly determined by the gearing and bearing friction. Keep in mind that the starting efficiency of a gear unit is always less than its efficiency at operating speed. This factor is especially pronounced in the case of helical-worm and SPIROPLAN® right-angle gearmotors.

R, F, K gear units

The efficiency of helical, parallel-shaft and helical-bevel gear units varies with the number of gear stages, between 96% (3-stage), 97% (2-stage) and 98% (1-stage).

W gear units

The gearing in helical-worm and SPIROPLAN® gear units produces a high proportion of sliding friction. As a result, these gear units have higher gearing losses than R, F or K gear units and therefore lower efficiency.

The efficiency depends on the following factors:

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

SPIROPLAN® gear units W37/W47 from SEW-EURODRIVE have an efficiency of more than 90%, which drops only slightly even for large gear unit ratios.

Self-locking

Retrodriving torques on SPIROPLAN® gear units produce an efficiency of $\eta' = 2 - 1/\eta$, which is significantly less favorable than the forward efficiency η. The SPIROPLAN® gear unit is self-locking if the forward efficiency is $\eta \leq 0.5$. Some SPIROPLAN® gear units are dynamically self-locking. Contact SEW-EURODRIVE if you want to make technical use of the braking effect of self-locking characteristics.

INFORMATION

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

Run-in phase

The tooth flanks of new SPIROPLAN® 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 unit ratio. Subtract the following values from the listed efficiency during the running-in phase:

i range	SPIROPLAN® W.. η reduction
About 30 – 75	About 8%
About 10 – 30	bout 5 %
About 3 – 10	About 3%

The run-in phase usually lasts 48 hours. SPIROPLAN® gear units achieve their listed rated efficiency values when:

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

Churning losses

With certain gear unit mounting positions, the first stage is completely immersed in the lubricant. When the circumferential velocity of the input stage is high, considerable churning losses occur in larger gear units that must be taken into account. Contact SEW-EURODRIVE if you want to use gear units of this type.

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

9.1.2 Multi-stage gearmotors

General information

You can achieve extremely low output speeds by using multi-stage gear units or multi-stage gearmotors. This means an additional second gear unit, usually a helical gear unit, is installed in front of the gear unit or between gear unit and motor.

The resulting total reduction ratio may make gear unit protection necessary.

Limiting the motor power

You have to reduce the maximum output motor power according to the maximum permitted output torque on the gear unit ($M_{a\ max}$). For this purpose you first have to determine the maximum permitted motor torque ($M_{N\ zul}$).

You can calculate the maximum permitted motor torque as follows:

$$M_{N\ zul} = \frac{M_{a\,max}}{i_{ges} \times \eta_{ges}}$$

4954402827

Use this maximum permitted motor torque $M_{N\ zul}$ and the load diagram of the motor to determine the associated value for the motor current.

Take suitable measures to prevent the continuous current consumption of the motor from exceeding the previously determined value for the motor torque $M_{N\ zul}$. A suitable measure is, for example, to set the trip current of the protective circuit breaker to this maximum current value. A motor protection switch offers the option to compensate for a brief overload, for example during the startup phase of the motor. A suitable measure for inverter drives is to limit the output current of the inverter according to the determined motor current.

Checking braking torques

If you use a multi-stage brakemotor, you have to limit the braking torque (M_B) according to the maximum permitted motor torque $M_{N\ zul}$. The maximum permitted braking torque is 200% $M_{N\ zul}$.

$M_{B\ max} \leq 200\%\ M_{N\ zul}$

If you have questions on the permitted starting frequency of double-gear unit brakemotors, please consult SEW-EURODRIVE.

Avoiding blockage

Blockage on the output side of the double gear unit or double gearmotor is not permitted. The reason is that indeterminable torques and uncontrolled overhung and axial loads may occur. The gear units may suffer irreparable damage as a result.

INFORMATION

Consult SEW-EURODRIVE if blockages of the double gear unit or double gearmotor cannot be avoided due to the application.

9.1.3 Overhung and axial loads

Determining the overhung load

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

Transmission element	Transmission element factor f_Z	Comments
Gears	1.15	< 17 teeth
Chain sprockets	1.40	< 13 teeth
Chain sprockets	1.25	< 20 teeth
Narrow V-belt pulleys	1.75	Influence of the pre-tensioning
Flat belt pulleys	2.50	Influence of the pre-tensioning
Toothed belt pulleys	2.00 – 2.50	Influence of the pre-tensioning
Gear rack pinion, pre-tensioned	2.00	Influence of the pre-tensioning

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

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

4954405899

F_R = Overhung load in N
M_d = Torque in Nm
d_0 = Mean diameter of the installed transmission element in mm
f_Z = Transmission element factor

Higher permitted overhung loads

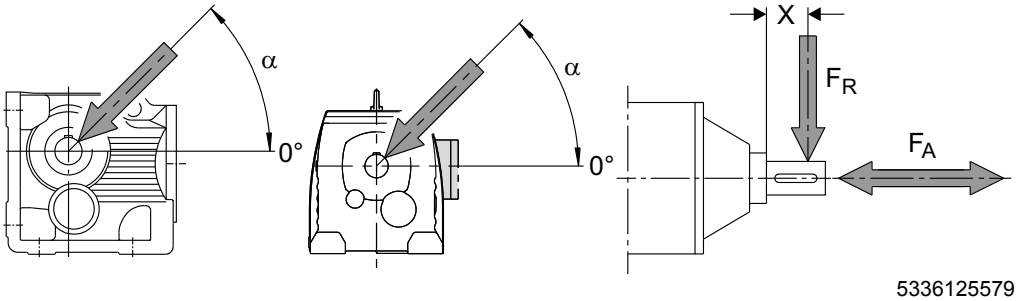
Exactly considering the force application angle α and the direction of rotation makes it possible to achieve a higher overhung load than listed in the selection tables.

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

Contact SEW-EURODRIVE in such cases.

Definition of the force application

Force application is defined according to the following figure:



5336125579

F_X = Permitted overhung load at point x [N]
F_A = Permitted axial load [N]

Permitted axial loads

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..137... to R..167...
- Parallel-shaft and helical-bevel gearmotors with solid shaft except for F97...

INFORMATION

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

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

The permitted overhung loads F_{Ramax} and F_{Rapk} given in the data tables apply to force application on l / 2 (solid shaft) or force application on the shaft end face (hollow shaft). If the distance of the point of force application to the the gear unit differs, you will have to determine the permitted overhung loads again according to the project planning procedure. The following conditions must be met:

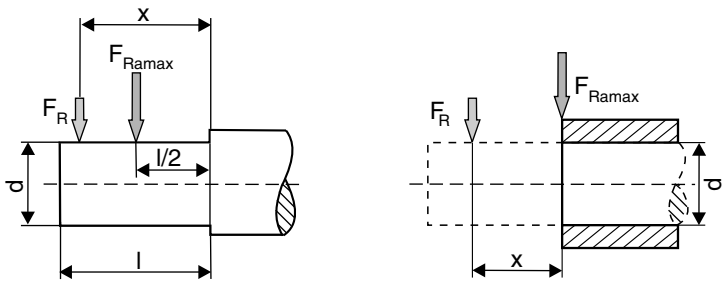
$$F_R \le F_{Ra\max} \times \frac{a}{b + x}[N]$$

$$F_R \le \frac{c}{f + x}[N]$$

4954424459

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

The following figure shows the overhung load F_R with increased distance x to the gear unit.



5336128011

Gear unit constants for overhung load conversion

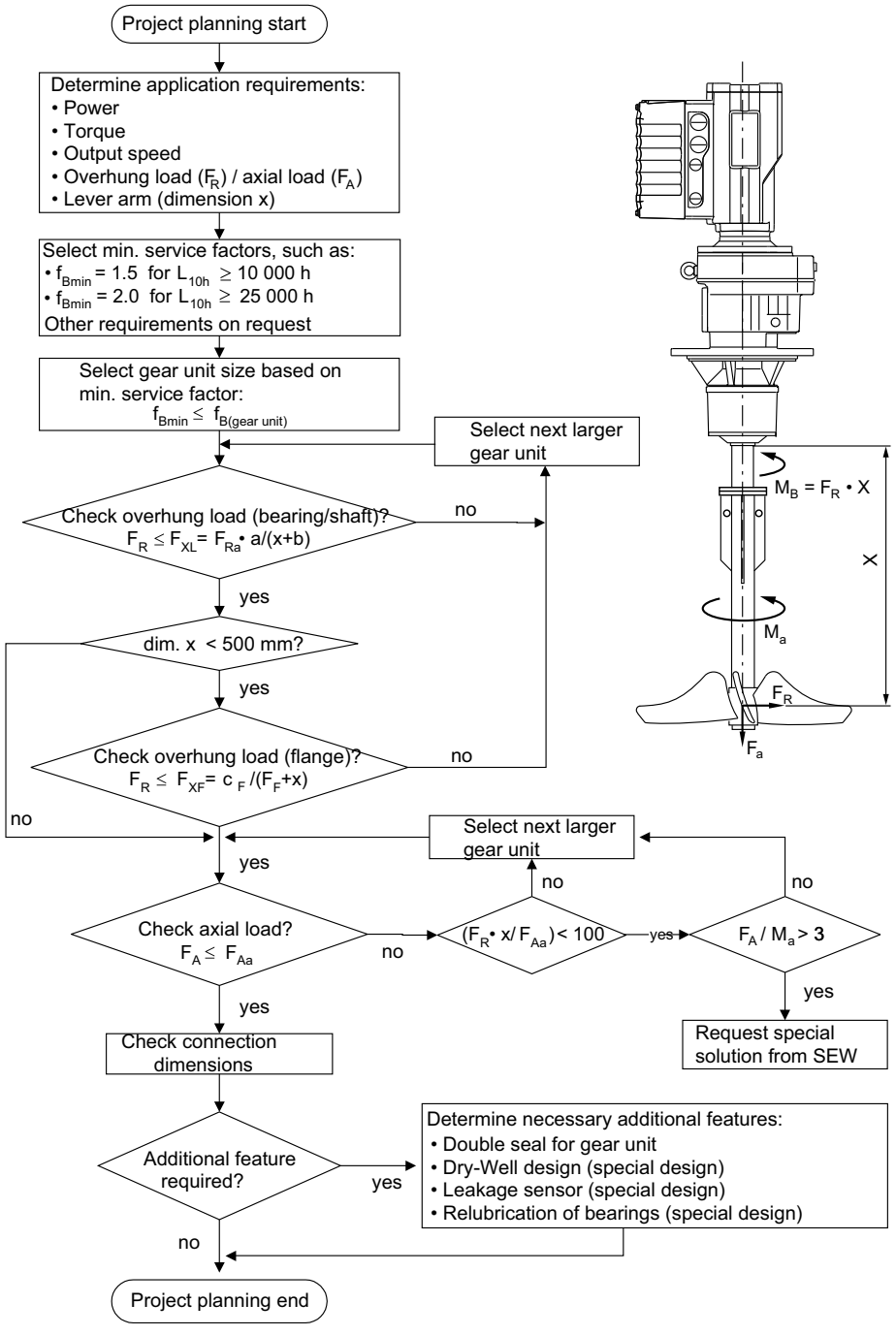
Gear unit type	a [mm]	b [mm]	c [Nmm]	f [mm]	d [mm]	l [mm]
RX57	43.5	23.5	1.51×10^5	34.2	20	40
RX67	52.5	27.5	2.42×10^5	39.7	25	50
RX77	60.5	30.5	1.95×10^5	0	30	60
RX87	73.5	33.5	7.69×10^5	48.9	40	80
R27	106.5	81.5	1.56×10^5	11.8	25	50
R37	118	93	1.24×10^5	0	25	50
R47	137	107	2.44×10^5	15	30	60
R57	147.5	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
F27	109.5	84.5	1.13×10^5	0	25	50
F37	123.5	98.5	1.07×10^5	0	25	50
F47	153.5	123.5	1.40×10^5	0	30	60
F57	170.7	135.7	2.70×10^5	0	35	70
F67	181.3	141.3	4.12×10^5	0	40	80
F77	215.8	165.8	7.87×10^5	0	50	100
F87	263	203	1.06×10^6	0	60	120
K37	123.5	98.5	1.30×10^5	0	25	50
K47	153.5	123.5	1.40×10^5	0	30	60
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
W37	121.1	101.1	6.95 ξ 10^4	0	20	40
W47	145.5	115.5	4.26 x 10^5	35.6	30	60

Values for types not listed are available on request.

9.1.4 RM gear units

Project planning

Take account of the higher overhung and axial loads when planning projects with RM helical gear units with extended bearing hub. Observe the following project planning procedure:



4954429963

a = Conversion factor of data table
b = Conversion factor of data table
c_F = Gear unit constant of data table
F_A = Axial load occurring during operation
F_F = Gear unit constant of data table
F_R = Overhung load occurring during operation
F_{Ra} = Permitted overhung load (when x = 1000 mm) of data table
F_{XF} = Permitted overhung load on housing (flange strength)
F_{XL} = Permitted overhung load based on bearing service life
x = Distance from the shaft shoulder to the force application point
M = Output torque
F = Permitted axial load

Permitted overhung and axial loads

The permitted overhung loads F_{Ra} and axial forces F_{Aa} are specified for various service factors f_B and nominal bearing service life L_{10h}.

f_{Bmin} = 1.5; L_{10h} = 10 000 h

		Output speed n_a rpm							
		> 16	16-25	26-40	41-60	61-100	101-160	161-250	251-400
RM57	F_{Ra} [N]	400	400	400	400	400	405	410	415
	F_{Aa} [N]	18800	15000	11500	9700	7100	5650	4450	3800
RM67	F_{Ra} [N]	575	575	575	580	575	585	590	600
	F_{Aa} [N]	19000	18900	15300	11900	9210	7470	5870	5050
RM77	F_{Ra} [N]	1200	1200	1200	1200	1200	1210	1210	1220
	F_{Aa} [N]	22000	22000	19400	15100	11400	9220	7200	6710
RM87	F_{Ra} [N]	1970	1970	1970	1970	1980	1990	2000	2010
	F_{Aa} [N]	30000	30000	23600	18000	14300	11000	8940	8030

f_{Bmin} = 2.0; L_{10h} = 25 000 h

		Output speed n_a rpm							
		> 16	16-25	26-40	41-60	61-100	101-160	161-250	251-400
RM57	F_{Ra} [N]	410	410	410	410	410	415	415	420
	F_{Aa} [N]	12100	9600	7350	6050	4300	3350	2600	2200
RM67	F_{Ra} [N]	590	590	590	595	590	595	600	605
	F_{Aa} [N]	15800	12000	9580	7330	5580	4460	3460	2930
RM77	F_{Ra} [N]	1210	1210	1210	1210	1210	1220	1220	1220
	F_{Aa} [N]	20000	15400	11900	9070	6670	5280	4010	3700
RM87	F_{Ra} [N]	2000	2000	2000	2000	2000	1720	1690	1710
	F_{Aa} [N]	24600	19200	14300	10600	8190	6100	5490	4860

Conversion factors and gear unit constants

The following conversion factors and gear unit constants apply to calculating the permitted overhung load F_{xL} at point x ≠ 1000 mm for RM gearmotors:

Gear unit type	a	b	c_F (f_B = 1.5)	c_F (f_B = 2.0)	F_F
RM57	1047	47	1220600	1260400	277
RM67	1047	47	2047600	2100000	297.5
RM77	1050	50	2512800	2574700	340.5
RM87	1056.5	56.5	4917800	5029000	414

Additional weight of RM gear units

The following table shows the additional weight of RM gear units:

Type	Additional weight compared to RF with reference to the smallest RF flange Δm [kg]
RM57	12.0
RM67	15.8
RM77	25.0
RM87	29.7

9.1.5 Condition monitoring

Diagnostic unit DUO10A (oil aging sensor)

The diagnostic unit consists of a temperature sensor and the actual evaluation unit. The temperature sensor is screwed into a screw plug bore of the gear unit via an adapter system and connected to the evaluation unit.

The service life curves of the oil grades common in SEW gear units are stored in the electronics of the evaluation unit. SEW-EURODRIVE can also customize any oil grade in the diagnostic unit. Standard parameterization is performed directly on the evaluation unit. During operation, the evaluation unit continuously calculates the remaining service life in days based on the oil temperature, i.e. the time until the next oil change. The remaining service life is displayed directly on the evaluation unit. The expiration of the service life can also be transferred to a higher-level system via a binary signal and be evaluated or visualized there. Other switch outputs signal when a prewarning stage has been reached, a preset temperature limit is exceeded or readiness for operation. The voltage supply is DC 24 V.

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

Diagnostic unit DUV10A (vibration sensor)

The DUV10A diagnostics unit measures the structure-borne noise and uses this value to calculate the frequency spectrum. The structure-born noise sensor and evaluation electronics are fully integrated in the diagnostic unit. Data, such as vibration acceleration, damage frequencies, etc., can be recorded, processed and evaluated decentralized without any expert knowledge. The damage progress of the diagnosis objects is indicated by the LEDs directly on the diagnostic unit. External visualization of the binary signals to the controller is also possible. A depth diagnosis can be displayed via the software.

The diagnostics unit is attached to the gearmotor or motor using a fastening element. The position where the diagnostic unit is installed depends on the objects to be diagnosed (gear unit/motor type, mounting position). The tightening torque for the screw connection is 7 Nm.

The diagnostic unit can be used to monitor up to 5 different objects or 20 individual frequencies. The diagnostic unit can be used with both constant and variable speeds. To ensure correct diagnosis when using variable speeds, a 0...20 mA current loop or a pulse signal must be supplied. The voltage supply is DC 24 V.

The parameters of the unit are set using the supplied software. When all data have been parameterized, a pulse test is carried out to check the signal level from the diagnostics object to the diagnostic unit. Next, all data is transferred to the sensor and a teach-in run can be performed. The teach-in is a self-learning process performed by the sensor under operating conditions. After successful teach-in, the unit is ready and enters monitoring mode. As the unit requires a certain measuring time at constant speed depending on the setting and number of objects to be monitored, you should consult SEW-EURODRIVE for applications where this time is < 16 seconds.

9.2 Electronic motor

9.2.1 Overhung and axial loads of DRC stand-alone motors with IEC flange

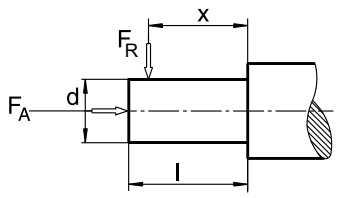
The following overhung loads are determined by subjecting the shaft to a load with the rated torque.

The permitted overhung loads F_R at point x are determined via the following diagrams. "x" is the distance between the shaft shoulder and the force application.

The diagrams are based on the following nominal bearing service life: L10h = 20000 h

$F_A = 0.33 \times F_{Rmax}$

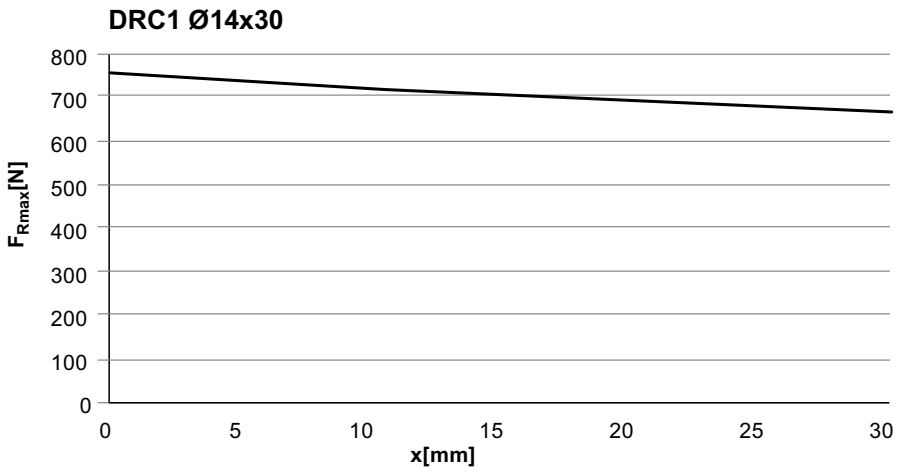
Permitted overhung and axial loads for x = l / 2 (shaft center)



5107526411

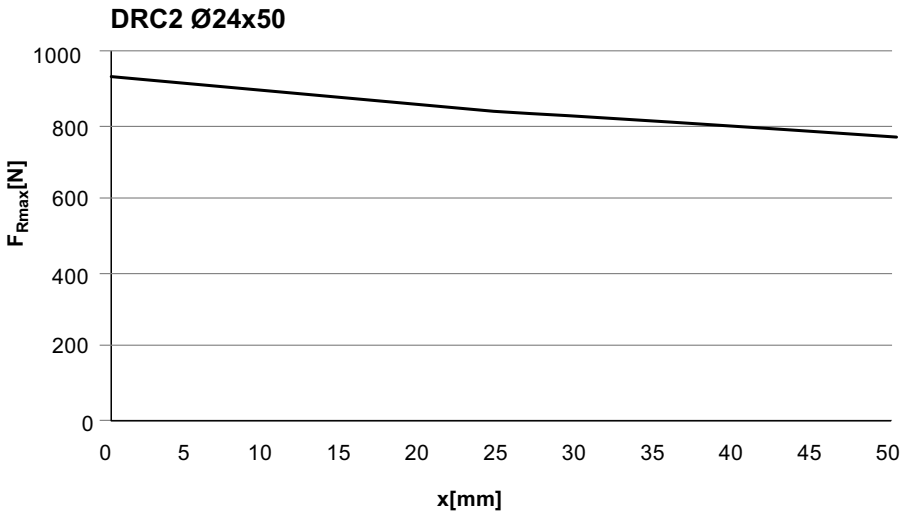
Motor type	$F_{R\ max}$ (applies to x = l / 2) [N]	F_A (applies to x = l / 2) [N]
DRC1	707	233
DRC2	840	277

Permitted overhung load for DRC1



5107530379

Permitted overhung load for DRC2



5107528459

9.2.2 Dynamic and thermal characteristic curve for DRC electronic motors

Definition/key

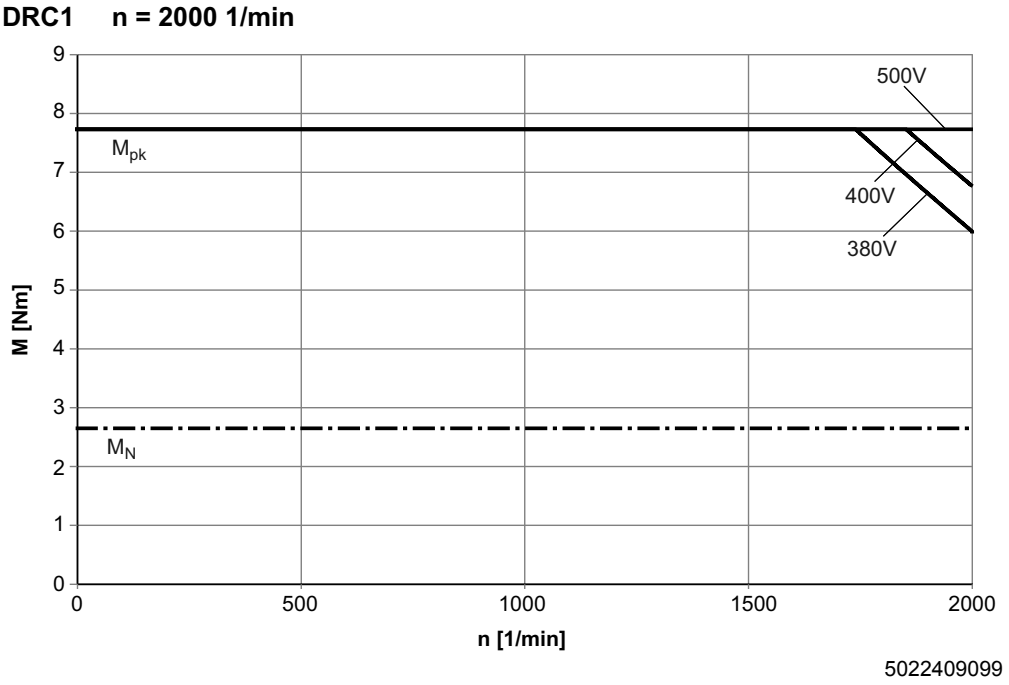
Definition:

- M_{pk} = Maximum dynamic torque for a maximum line voltage on the inverter of 380 V, 400 V, 500 V
- M_N = Thermal limit characteristic curve in S1 - 100% operation

INFORMATION

For the max. availalbe torque, refer to chapter "Technical Data".

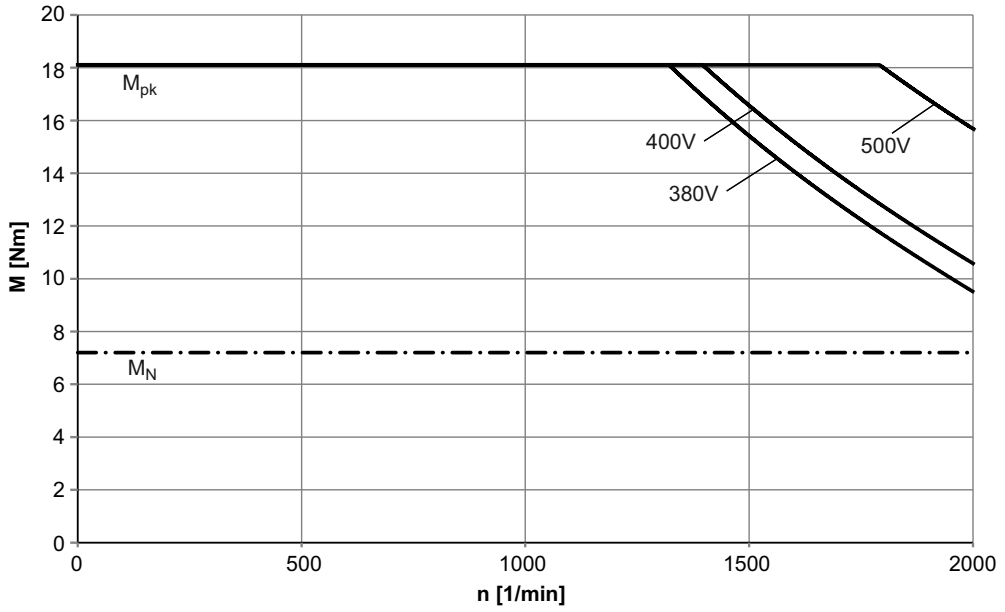
DRC1



M_N	Nominal torque
500 V	500 V line voltage
400 V	400 V line voltage
380 V	380 V line voltage

DRC2

DRC2 n = 2000 1/min



5022407179

M_N	Nominal torque
500 V	500 V line voltage
400 V	400 V line voltage
380 V	380 V line voltage

9.3 Brake

9.3.1 Description of the brake

On request, SEW-EURODRIVE motors can be supplied with an integrated mechanical brake. The brake is a DC-operated electromagnetic disk brake with a high working capacity that is released electrically and applied using spring force. The brake is applied in case of a power failure. It meets the basic safety requirements.

9.3.2 General information

The brakemotor must be dimensioned carefully to ensure the longest possible service life.

The following aspects described in detail must be taken into account:

1. Selecting the braking torque in accordance with the project planning data.
2. Important design information.

9.3.3 Selecting the brake according to the project planning data

The mechanical components, brake type and braking torque, are determined when the drive motor is selected. The drive type or application areas and the standards that have to be taken into account are used for the brake selection.

Selection criteria:

- Motor size
- Number of braking operations during service and number of emergency braking operations
- Working brake or holding brake
- Level of braking torque (“soft braking”/“hard braking”)
- Hoist application
- Minimum/maximum deceleration

Values determined/ calculated for brake selection

Basic specification	Link / addition / comment
Motor type	Brake type Brake control system
Braking torque[1)]	Brake springs
Braking time **Braking distance** **Deceleration** **Braking accuracy**	The required data can only be observed if the aforementioned parameters meet the requirements

1) The braking torque is determined from the requirements of the application with regard to the maximum deceleration and the maximum permitted distance or time.

For detailed information on selecting the size of the brakemotor and calculating the braking data, refer to the documentation "Drive Engineering - Practical Implementation – Project Planning for Drives".

Selecting the brake

The brake suitable for the relevant application is selected by means of the following main criteria:

- Required braking torque
- Required working capacity

Braking torque

The braking torque is usually selected according to the required deceleration.

For more information, refer to chapter "Technical data of the BY.C brake".

Braking torque in hoist applications

The selected braking torque must be greater by at least factor 2 than the maximum load torque.

Working capacity

The working capacity of the brake is determined by the permitted braking work W_1 per braking operation and the total permitted braking work W_{insp} until the next inspection of the brake.

For the total permitted braking work W_{insp}, refer to chapter "Technical data of the brake".

Permitted number of braking operations until maintenance of the brake:

$$NB = \frac{W_{insp}}{W_1}$$

Braking work per braking operation:

$$W_1 = \frac{J_{ges} \times n^2 \times M_B}{182.4 \times (M_B \pm M_L)}$$

NB	= Number of braking operations until service
W_{insp}	= Total braking work until service in J
W_1	= Braking work per braking operation in J
J_{ges}	= Total mass moment of inertia (related to the motor shaft) in kgm^2
n	= Motor speed [rpm]
M_B	= Braking torque in Nm
M_L	= Load torque in Nm (observe the +/- character) +: for vertical upward and horizontal movement −: for vertical downward movement

EMERGENCY STOP features

The limits of the permitted maximum braking work must not be exceeded, not even for emergency switch-off.

The emergency stop features must therefore be based on the direction of movement.

Brakes for vertical direction of movement

In hoist applications, the limits of the permitted maximum braking work (including emergency stops) may not be exceeded.

Please consult SEW-EURODRIVE if you need values for increased EMERGENCY STOP braking work in hoist applications.

9.3.4 No-load starting frequency

The following no-load starting frequency Z_0 must not be exceeded in order to prevent the BY brake from heating up.

Brake	No-load starting frequency
BY1C	7200 per hour
BY2C	7200 per hour

9.3.5 Important design information

Maintenance intervals:

The time to maintenance is determined on the basis of the expected brake wear. This value is important for setting up the maintenance schedule for the machine to be used by the customer's service personnel (machine documentation).

9.4 Project planning for the drive unit

9.4.1 Data for drive selection

Certain data is required to be able to precisely define the components for your drive. These are:

Drive selection data			Your entry
n_{amin}	Minimum output speed	rpm	
n_{amax}	Maximum output speed	rpm	
M_a at n_{amin}	Output torque at minimum output speed	Nm	
M_a at n_{amax}	Output torque at maximum output speed	Nm	
S.., ..% cdf	Duty type and cyclic duration factor (cdf) or exact load cycle can be entered.		
Z	Starting frequency; alternatively, exact load cycle can be specified	1/h	
M..	Mounting position		
IP..	Required degree of protection		
ϑ_{Amb}	Ambient temperature	°C	
H	Installation altitude	m	

Determining the motor data

First, you require the data (mass, speed, setting range, etc.) of the machine to be driven to select the correct drive.

These data help determine the required power, torque and speed. Refer to the "Drive Engineering – Practical Implementation, Project Planning" publication or the SEW Workbench project planning software for assistance.

Selecting the appropriate drive

The appropriate drive can be determined with the calculated power and speed and with other mechanical requirements taken into account.

9.4.2 Notes on the project planning procedure

Stand-alone motors with IEC flange

The project planning also applies to stand-alone motors with IEC flange. Note the modified designations of the characteristic values:

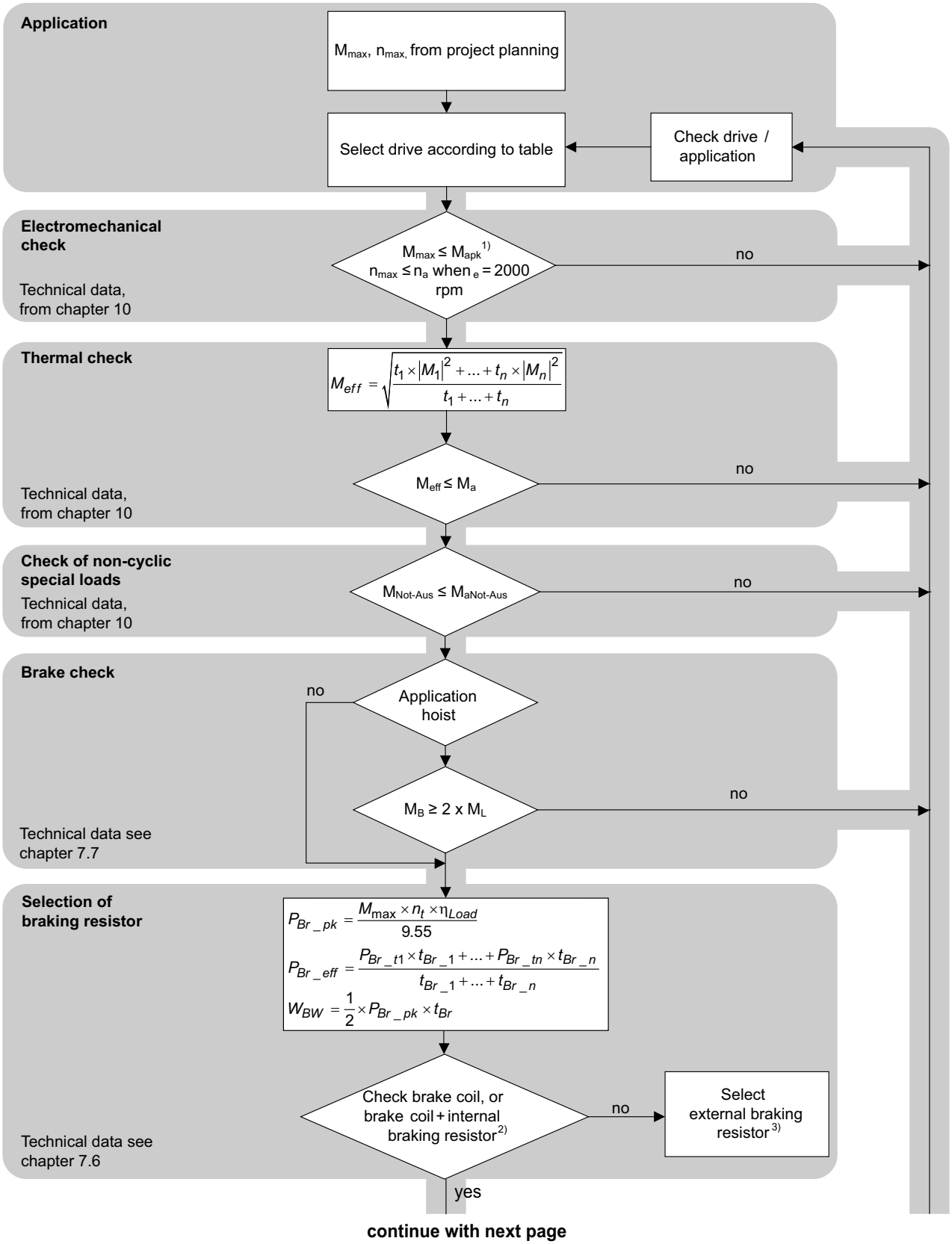
- $M_{apk} \rightarrow M_{pk}$
- $M_a \rightarrow M_n$

Abbreviation key

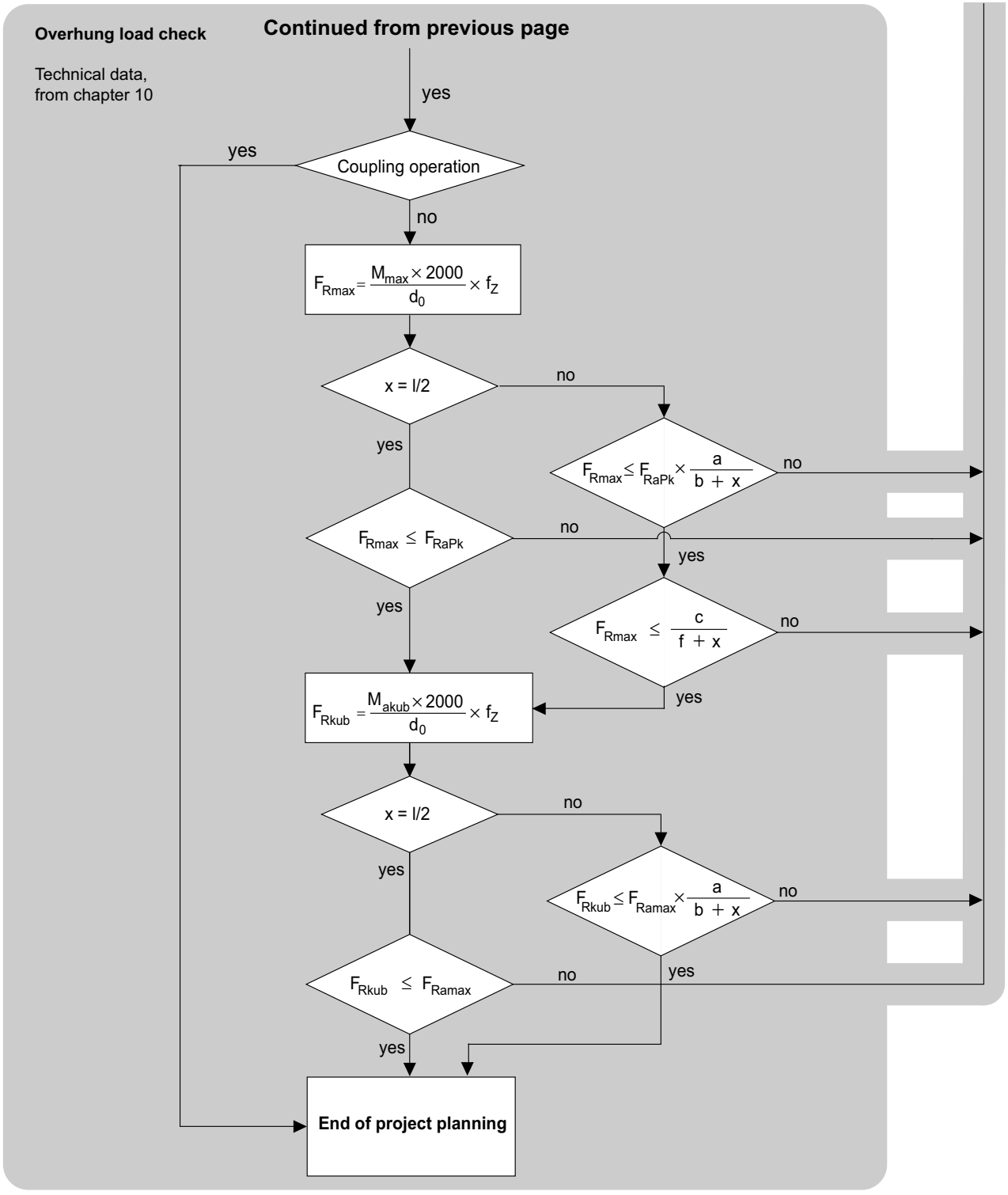
1)	If M_{apk} occurs more often than 10 times per hour, a detailed project planning must be carried out using the SEW Workbench.	
2)	Check by WBW braking work and starting frequency	
3)	Select by means of the effective and peak braking power P_{Br_eff}/P_{Br_pk} and cyclic duration factor.	
M_{max}	Maximum application torque	[Nm]
M_{eff}	Effective torque	[Nm]
M_n	Torque of travel section n	[Nm]
n_{max}	Maximum application speed	[rpm]
t_n	Time of travel section n	[s]
t_{Br_n}	Deceleration time of travel section n	[s]
n_t	Output speed in travel section t	[rpm]
P_{Br_pk}	Peak braking power	[W]
P_{Br_eff}	Mean braking power	[W]
W_{BW}	Mean braking work with regenerative load	[J]
W_B	Mean braking work when the brake is applied	[J]
M_L	Torque resulting from the static load	[Nm]
η_{Last}	Efficiency of the application	
F_R	Overhung load on the output shaft	[N]
n_a	Output speed	[rpm]
M_a	Continuous output torque	[Nm]
M_{apk}	Maximum permitted torque for short-time duty	
$M_{aNotaus}$	Maximum permitted torque for non-cyclical special loads, maximum 1000 cycles	[Nm]
W_1	Permitted braking work per emergency braking	[J]
W_{insp}	Permitted braking work until service	[J]
M_B	Braking torque	[Nm]
M_L	Load torque	[Nm]
F_{Ramax}	Maximum permitted overhung load at the output shaft for continuous duty (load application point at middle of shaft end)	[N]
F_{Rapk}	Maximum permitted overhung load at the output shaft for short-time duty (load application point at middle of shaft end)	[N]
F_{Remax}	Maximum permitted overhung load at the input shaft for continuous duty (load application point at middle of 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]

9.4.3 Project planning procedure

The following flow diagram illustrates the project planning procedure for a DRC gearmotor:



5107533451


Overhung load check
Technical data, from chapter 10
Continued from previous page
yes
Coupling operation
yes
no
$F_{Rmax} = \frac{M_{max} \times 2000}{d_0} \times f_Z$
x = l/2
no
yes
$F_{Rmax} \leq F_{RaPk} \times \frac{a}{b + x}$
no
$F_{Rmax} \leq F_{RaPk}$
no
yes
yes
$F_{Rmax} \leq \frac{c}{f + x}$
no
yes
$F_{Rkub} = \frac{M_{akub} \times 2000}{d_0} \times f_Z$
x = l/2
no
yes
$F_{Rkub} \leq F_{Ramax} \times \frac{a}{b + x}$
no
$F_{Rkub} \leq F_{Ramax}$
no
yes
yes
End of project planning

5109045771

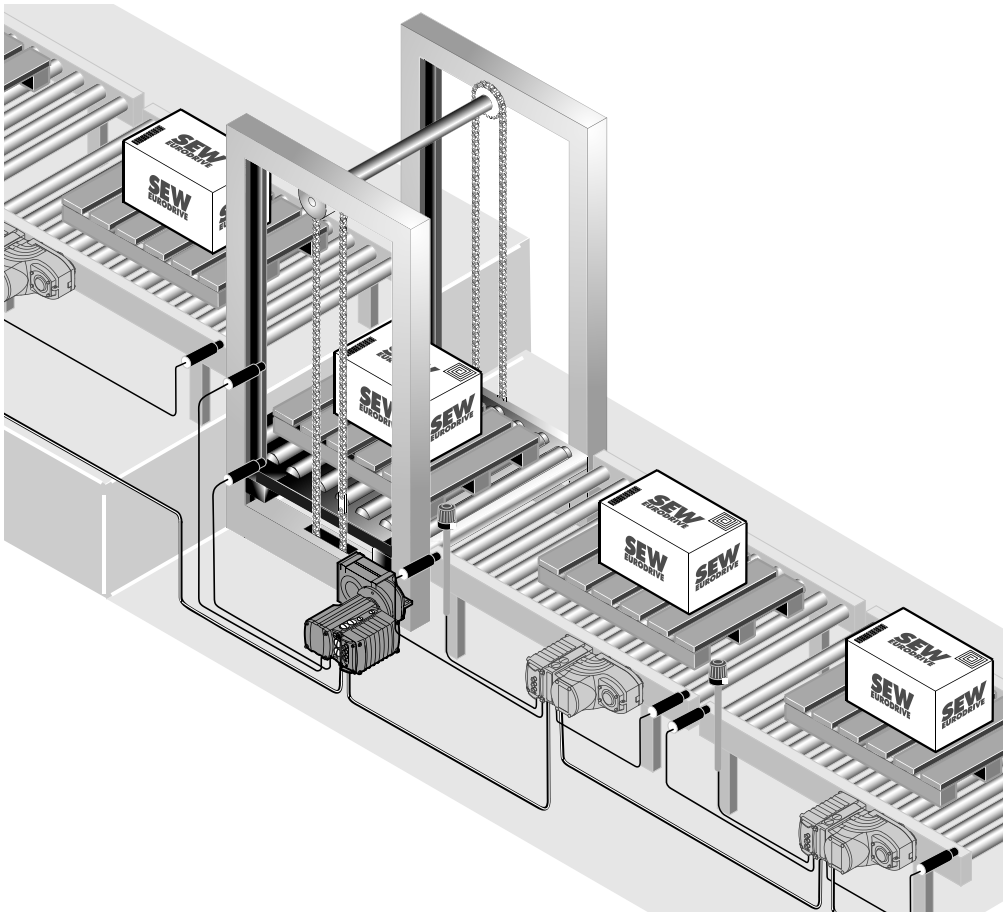
9.4.4 Drive selection taking as example "Hoist for conveying pallets"

Description of the application

This chapter describes the selection of a DRC gearmotor taking as example a hoist for conveying pallets. The following specifications are made:

Load mass of the conveyor with pallet	m	2500 kg
Lifting speed	v	1.8 m/min
Acceleration	a	0.1 m/s^2
Efficiency of the application	η_{App}	0.9
Chain diameter	D	200 mm
Toothed-wheel gearing		2.5
Diameter of the output pinion on the gear unit	d_0	80 mm
Switching frequency		6 times/hour
Rest period per cycle	t_4	560 s

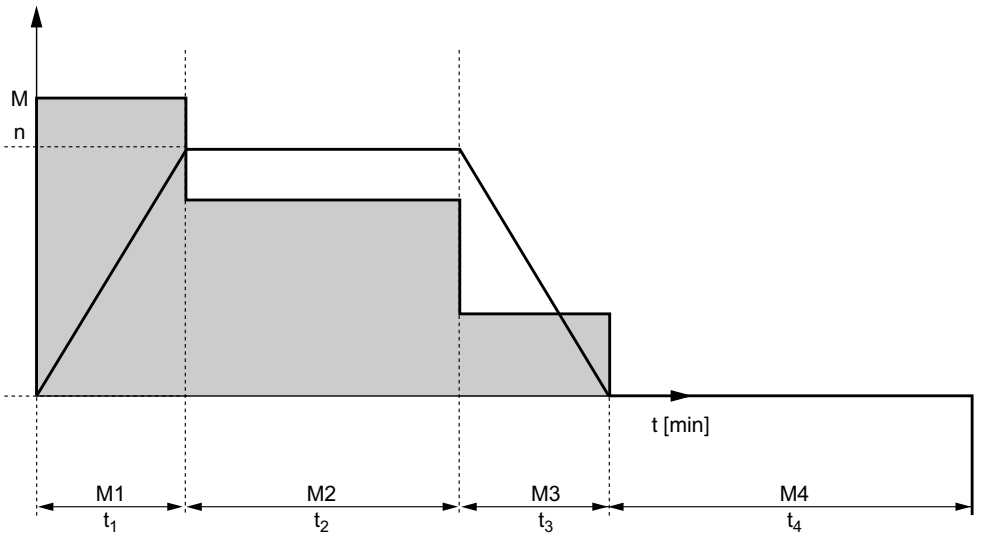
The following figure shows a schematic illustration:



5106208011

Calculating the application

The travel profile consists of the 4 travel sections acceleration, constant movement, deceleration, and pause.



5103172107

The following table shows the calculations for the application required to determine the DRC gearmotor:

Calculations	
Static lifting force:	$F_S = m \times g$ $F_S = 2500\,kg \times 9{,}81 \frac{m}{s^2}$ $F_S = 24525\,N$
Dynamic lifting force	$F_D = m \times a$ $F_D = 2500\,kg \times 0{,}1 \frac{m}{s^2}$ $F_D = 250\,N$
Torque in range M1	$M_1 = \frac{(F_S + F_D) \times \frac{D}{2}}{\eta}$ $M_1 = \frac{(24525\,N + 250\,N) \times \frac{0{,}2\,m}{2}}{0{,}9}$ $M_1 = 2752{,}78\,Nm$
Torque in range M2	$M_2 = \frac{F_S \times \frac{D}{2}}{\eta}$ $M_2 = \frac{24525\,N \times \frac{0{,}2\,m}{2}}{0{,}9}$ $M_2 = 2725\,Nm$

Calculations	
Torque in range M3	$M_3 = (\frac{F_S}{\eta} - F_D \times \eta) \times \frac{D}{2}$ $M_3 = (\frac{24525\,N}{0,9} - 250\,N \times 0,9) \times \frac{0,2\,m}{2}$ $M_3 = 2702,5\,Nm$
Output speed of the application	$n_a = \frac{V}{\pi \times D} = \frac{1,8 \frac{m}{\min}}{\pi \times 0,2\,m} = 2,86 \frac{1}{\min}$
Consideration of the additional gear of 2.5	$M_1_Vorgelege = \frac{M_1}{2,5} = 1101Nm$ $M_2_Vorgelege = \frac{M_2}{2,5} = 1090\,Nm$ $M_3_Vorgelege = \frac{M_3}{2,5} = 1081Nm$ $n_a_Vorgelege = n_a \times 2,5 = 7,15 \frac{1}{\min}$
Maximum overhung load	$F_{Q\max} = \frac{M_{1_Vorgelege}}{d/2} = \frac{1101Nm}{0,04\,m} = 27525\,N$

Selecting the DRC gearmotor

The DRC gearmotor is selected according to the following procedure:

1. Which gear unit type do you want to use?

   Requirement: A shaft-mounted gear unit is required.

   Result: In the example, a parallel-shaft helical gear unit with hollow shaft type FA is selected.

2. Which torque class (size) is required?

   Requirement: The maximum possible starting torque of the DRC gearmotor must be higher than the maximum application torque: Due to the application calculations, the maximum application torque for starting is M_{max} = 1101 Nm.

   FA87 with DRC2 and a gear ratio of i > 159.61 meet this requirement.

   Result: An FA 87 with DRC2 is selected.

3. Selecting the ratio with the output speed:

   Requirement: Due to the application calculations, the output speed is n^a = 7.15 rpm. In order to achieve a high setting range and an optimum efficiency, the required output speed should be achieved as precisely as possible at an input speed of n^e = 2000 rpm.

   Result: The drive with a gear ratio of i_{ges} = 255.37 and output speed na = 7.8 when ne = 2000 rpm is selected from the selection tables:

			DRC2			
	na_1 [rpm]	na_{2000} [rpm]	M_a [Nm]	M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
...	...	...	...	...	...	...
	0.03	68			4267	29.20
	0.03	57			4437	35.19
	0.03	51	280	705	4624	39.30
	0.02	44	325	810	4794	45.28
	0.02	40	360	900	4998	50.36
	0.02	35			5100	56.75
	0.01	29			5100	68.40
	0.01	26	550	1370	5100	76.39
FA87	0.01	23	630	1580	5100	88.01
 3	0.01	20	700	1760	5100	97.89
	0.009	18	785	1970	5100	109.49
	0.008	16	880	2210	5100	123.29
	0.007	15	960	2410	5100	134.16
	0.006	13	1140	2870	5100	159.61
	0.006	11	1290	>3090	5100	179.97
	0.005	10	1410	>3090	5100	197.20
	0.004	8.7	1640	>3090	5100	228.93
	0.004	7.8	1830	>3090	5100	255.37
	0.004	7.4	1940	>3090	5100	270.68

m [kg]			DRC2		
FA87	2		115		
FA87	3		115		
FAF: + 12.7 kg / F: + 5.7 kg / FF: + 21.3 kg					

4. Thermal check of the DRC gearmotor

Requirement: In order to avoid thermal problems, the effective torque of the application must be smaller than the continuous output torque of the DRC gearmotor:

$M_{eff} < M_a$

$$t_1 = t_3 = \frac{v}{a} = \frac{1{,}8\,\frac{m}{\min}}{0{,}1\,\frac{m}{s^2} \times 60} = 0{,}3\,s$$

$$t_2 = 10\,\min \times 60\,\frac{s}{\min} - t_1 - t_3 - t_4 = 39{,}4\,s$$

$$t_4 = 560\,s$$

$$M_{eff} = \sqrt[2]{\frac{t_1 \times |M1|^2 + t_2 \times |M2|^2 + t_3 \times |M3|^2 + t_4 \times |M4|^2}{t_1 + t_2 + t_3 + t_4}}$$

$$M_{eff} = \sqrt[2]{\frac{0{,}3\,s \times |1101\,Nm|^2 + 39{,}4\,s \times |1090|^2 + 0{,}3\,s \times |1081\,Nm|^2 + 560\,s \times |0\,Nm|^2}{0{,}3\ s + 39{,}4\,s + 0{,}3\,s + 560\,s}}$$

$$M_{eff} = 281{,}44\,Nm$$

Due to the application calculation, the effective torque is M_{eff} = 281.44 Nm. The continuous output torque of the selected DRC gearmotor is M_a = 1830 Nm.

If applicable, observe derating factors (derating for installation altitude and ambient temperature).

Result: The requirements are met.

5. Hoist as application

Requirement: The following requirement must be fulfilled for hoists:

$$M_B \geq 2 \times M_L$$

Result: M_L is the static application torque in relation to the motor shaft. In this case, the efficiency is taken account of as supportive factor.

$$M_L = \frac{F_S \times \frac{D}{2} \times \eta}{i_{Vorgelege} \times i_{Getriebe}} = \frac{24525\,N \times \frac{0{,}2\,m}{2} \times 0{,}9}{2{,}5 \times 255{,}37} = 3{,}46\,Nm$$

The BY2C brake is available with a braking torque of 14 Nm or with a reduced braking torque of 7 Nm.

$$7\,Nm \geq 2 \times 3{,}46\,Nm$$

$$7\,Nm \geq 6{,}92\,Nm$$

This means the requirement of the double static torque for hoists is fulfilled.

6. Calculating the braking resistor

   Calculating the regenerative power and work during deceleration:

   Peak braking power:

$$P_{Br_pk} = \frac{M_{max} \times n_1}{9,55}$$

$$P_{Br_pk} = \frac{2702,5\,Nm \times 2,86}{9,55} = 809,3\,W$$

   Braking work:

$$W_{BW} = \frac{1}{2} \times P_{Br_pk} \times t$$

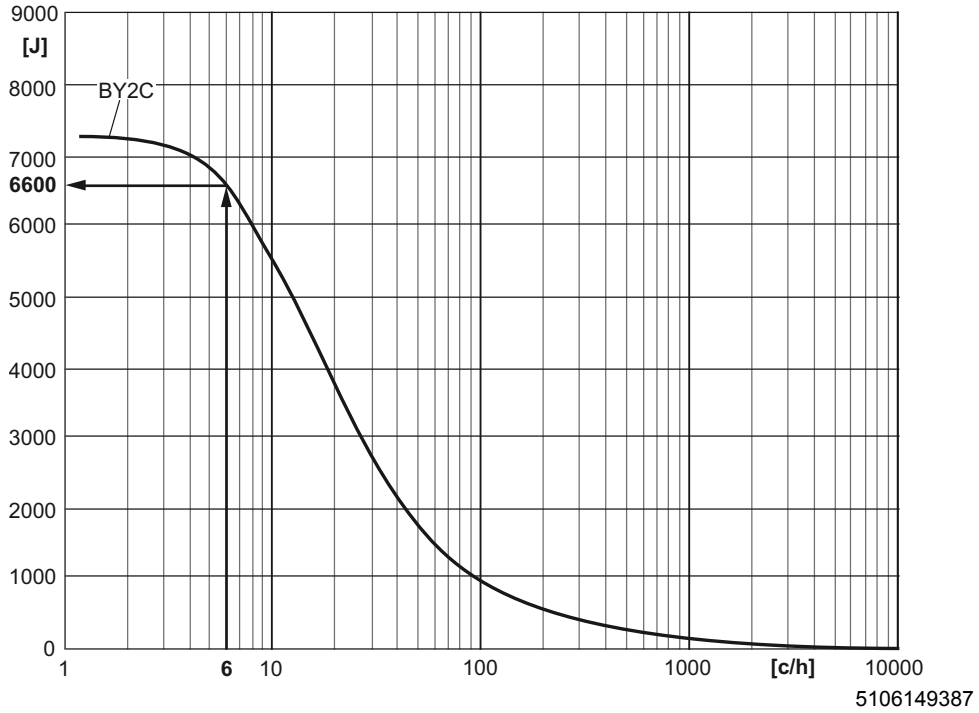
$$W_{BW} = \frac{1}{2} \times 809,3 \times 0,3\,s = 121,4\,J$$

7. Regenerative load capacity of the integrated braking resistor

   The known values are:

   - Braking work: 121.4 J
   - 6 brake applications per hour

   The diagram in chapter "Technical data of the DRC electronic motor" permits 6600 J of braking energy at 6 cycles per hour. In this case, the required 121.4 J can be dissipated via BY2C brake coil.



8. Checking the overhung load

   Requirement: As there is no coupling operation, an overhung load occurs on the gear unit ouptut shaft. This overhung load must now be checked.

$$F_{R\max} = \frac{M_{\max} \times 2000}{d_o} \times f_z$$

$$F_{R\max} = \frac{1101 Nm \times 2000}{80\,mm} \times 1{,}0 = 27525\,N$$

$$F_{R\max} \leq F_{RaPk}$$

$$27525\,N \leq 30000\,N$$

   Result: The overhung load at starting is ok.

   As the overhung load at starting is also lower than the value F_{Ramax} (28900 N), further checking is not required in this case as this is the worst case.

9. End of project planning.Project planning finished.

9.5 Applications in wet areas

SEW-EURODRIVE recommends to use DRC drive units with optional ASEPTIC / ASEPTIC^{plus} design under the following conditions:

- Large temperature differences (e.g. when the drive is cleaned with cold water immediately after operation).
- In case of changing temperatures (e. g. "Cold storage lock" application)
- When sealing surfaces come into contact with water during operation
- When the drive is cleaned with low surface tension water and/or chemicals
- In case of cycle operation (S3) in cold and/or humid environment

9.5.1 Support through special consultants

INFORMATION

- These requirements cannot always be imparted in written form. Consulting talks between system operators, system suppliers and component suppliers have proved to be productive means to clarify the existing conditions and necessary measures.
- SEW-EURODRIVE has a team of competent consultants that offer their active support when it comes to selecting optimum configurations and economical solutions.

9.5.2 Questionnaire

INFORMATION

Please complete the following questionnaire and submit it to SEW to provide for an optimal preparation for a consultation with SEW-EURODRIVE.

Company: .....

Contact person: .....

Phone/fax: .....

Email: .....

Street: .....

ZIP code: .....

Place, date: .....

1. Information regarding the location

- Detailed description of the system (e.g. bottle filling, transportation of empty bottles, cans, etc.)

.....

.....

.....

- What is the ambient temperature in the plant?

  In the summer approx.: .....

  In the winter approx.: .....

- What is the relative humidity in the vicinity of the motor?

  min: ..... max.: .....

- Which duty cycles apply to the drive? (e.g. S1, S3, etc.)

.....

.....

- Is the drive subject to extreme temperature fluctuations? (e.g. does the drive run for an extended period of time and then cool down, or does the operating environment heat up and then cool down again?)

.....

.....

.....

- Are you operating other products (non-SEW products) in the same area?

.....

.....

2. Cleaning

- How often does cleaning take place?

  ..... times a day ..... times a week

- Are pressure washers used to clean the location? (e.g. Kärcher)

  ☐ Yes: ..... ☐ No

- Does the water contain solvents or cleaning agents?

  ☐ Yes: ..... ☐ No

- Is the drive regularly exposed to liquids, emulsions or other substances used in the current production?

  ☐ Yes: ..... ☐ No

- Are the components compatible with sealing compounds?

  ☐ Yes ☐ No

10 Important Information on Selection Tables and Dimension Sheets

10.1 Information on the selection tables

INFORMATION

The fields marked with ">..." mean that the maximally possible output torques have to be limited to the specified torque because the motor can overload the gear unit. The motor current I_{max} must be limited at startup.

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
R67 2	0.23	466			31	77	459	4.29
	0.20	406	13	33	35	89	493	4.93
	0.18	351	15	38	41	103	527	5.70
	0.16	319	17	42	45	113	561	6.27
	0.14	272	20	49	53	132	629	7.36*
	...	...	...	...	...	...	...	...
R67 3	...	...	...	...	...	...	...	...
	0.008	16	340	>660	>600	>660	1020	128.97
	0.007	15	360	>660	>600	>660	1020	137.67
	0.006	13	415	>660			1020	158.14
	0.005	11	485	>660			1020	184.07
	0.005	10	525	>660			1020	199.81

Maximum permitted torque for short-time duty

Continuous output torque

Output speed at 2000 rpm motor speed

Output speed at 1 rpm motor speed

Gear unit type and size
Number of gear unit stages

Maximum torque for non-cyclical special loads, maximum 1000 cycles

Gear unit ratio (* = finite i)

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

m [kg]			DRC1	DRC2		
R67	2		45	51		
R67	3		46	52		
RF: + 3.2 kg / RM: + 19.0 kg						

m = Mass of the drive

DRC.. n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	F_{Ramax} R [N]	F_{Ramax} RF [N]	F_{Ramax} RM [N]	F_{Rapk} R [N]	F_{Rapk} RF [N]	F_{Rapk} RM [N]
R67 2	4.29	10	5.9	5000	5000	8720	9300	9300	9800
	4.93	9	4.6	5210	5210	9120	9100	9100	9760
	5.70	9	3.6	5450	5450	9560	8870	8870	9710
	6.27	9	3.0	5590	5590	9850	8710	8710	9680
	7.36*	8	2.4	5790	5790	9850	8710	8710	9680
	7.79	8	2.1	5830	5830	9840	8710	8710	9680
	8.70*	7	4.0	5960	5960	9750	5350	5350	9330

i = Gear unit ratio (* = finite i)

φ = Rotational clearance of the reduced backlash variant.
A "-" means that this gear unit cannot be ordered as "reduced backlash" version.

J_G = Mass moment of inertia of the gear unit

F_{Ramax} = Maximum permitted overhung load at the output shaft for continuous duty, load applied to the middle of the shaft end

F_{Rapk} = Maximum permitted overhung load at the output shaft for short-term operation, load applied to the middle of the shaft end

10.2 Notes on the gearmotor dimension sheets

10.2.1 Scope of delivery



= Standard parts supplied by SEW-EURODRIVE.

= Standard parts not supplied by SEW-EURODRIVE.

10.2.2 Tolerances

Shaft heights

The following tolerances apply to the indicated dimensions:

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

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

Shaft ends

Diameter tolerance:

Ø	≤ 50 mm	→ ISO k6
Ø	> 50 mm	→ ISO m6

Center bores according to DIN 332, shape DR:

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

Keys: according to DIN 6885 (domed type)

Hollow shafts

Diameter tolerance:

Ø → ISO H7 measured with plug gauge

Keys: according to DIN 6885 (domed type)

Exception: Key for WA37 with shaft diameter of 25 mm according to DIN 6885-3 (low form)

Multiple-spline shafts

Dm	= Measuring roller diameter
Me	= Check size

Flanges

Centering shoulder tolerance:

Ø	≤ 230 mm (flange sizes A120 to A300)	→ ISO j6
Ø	> 230 mm (flange sizes A350 to A660)	→ ISO h6

Up to 3 different flange dimensions are available for each size of helical gear unit, SPIROPLAN® gear unit, AC (brake) motor and explosion-proof AC (brake) motor. The respective dimension drawings will show the flanges approved for each size.

10.2.3 Eyebolts, lifting eyes

R27 helical gear units are delivered without special transportation fixtures. All other gear units and motors are equipped with cast-on suspension eye lugs, screw-on suspension eye lugs or screw-on lifting eyebolts.

Gear unit/motor type	Screw-on		Cast-on eyebolts
	Eyebolts	Lifting eyes	
R..37-R..57	-	•	-
R..67-R..87	•	-	-
RX57-RX67	-	•	-
RX77-RX87	•	-	-
F..27-F..87	-	-	•
K..37-K..87	-	-	•

10.2.4 Breather valves

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

10.2.5 Shrink disk connection

Hollow shaft gear unit with shrink disk connection: If required, please request a detailed data sheet on shrink disks, data sheet no. 33 753 ..95.

10.2.6 Splining

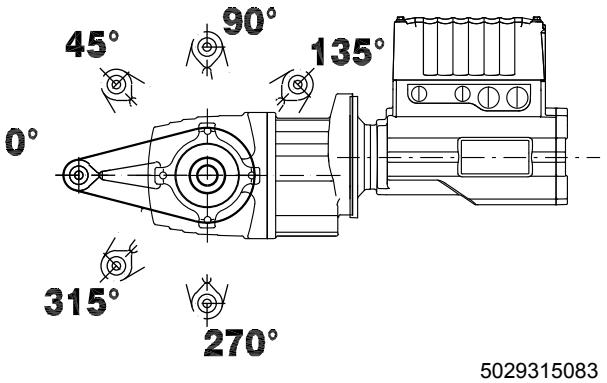
FV.. hollow shaft gear unit sizes 27 to 87 and KV.. sizes 37 to 87 are supplied with splining according to DIN 5480 (tooth space tolerance 9H).

10.2.7 Rubber buffer for FA/FH/FV/FT

Preload rubber buffer by the indicated value mL. The characteristic curve of spring for the rubber buffers is available at SEW-EURODRIVE on request.

10.2.8 Torque arm position

The following illustration shows the possible torque arm positions for SPIROPLAN® as well as the respective angles:



5029315083

10.2.9 Motor dimensions

Motor options

The motor dimensions may change when installing motor options. Refer to the dimension drawings of the motor options.

Special designs

The dimensions of the terminal box on special designs such as KS, CSA, VIK, low voltage or voltage changeover may deviate from the standard dimensions.

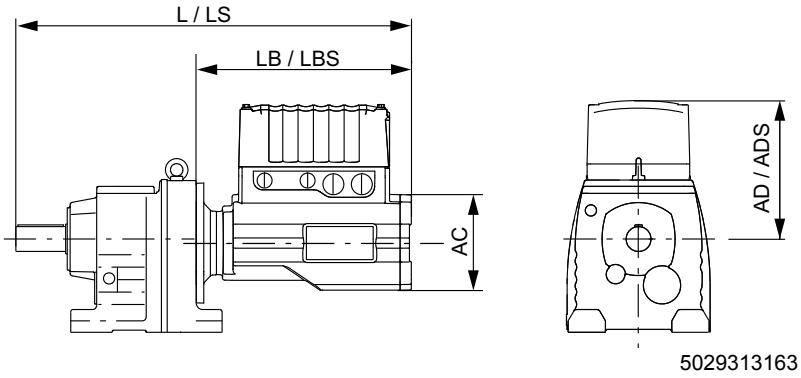
EN 50347

European standard EN 50347 became effective in August 2001. This standard adopts the dimension designations for three-phase AC motors for sizes 56 to 315M and flange sizes 65 to 740 from the IEC 72-1 standard.

The new dimension designations given in EN 50347 / IEC 72-1 are used for the dimensions in question in the dimension tables of the dimensions sheets.

Dimension designations of motors

The dimension designations for the motors are described below:



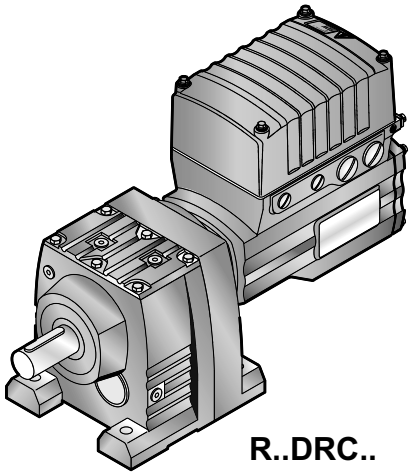
5029313163

L = Total length of the gearmotor
LS = Total length of gearmotor including brake
LB = Length of the motor
LBS = Length of the brakemotor
AC = Diameter of the motor
AD = Distance between the center of the motor shaft and the top part of the terminal box
ADS = Distance between the center of the brakemotor shaft and the top part of the terminal box

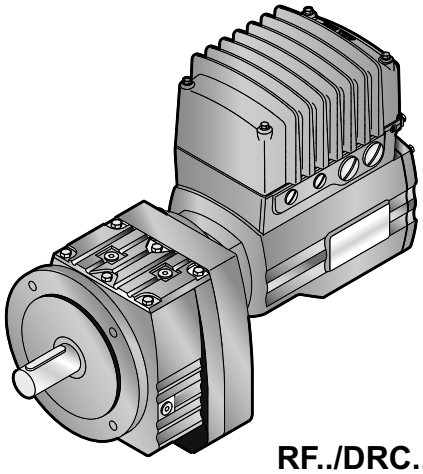
Page remains empty for printing reasons.

11 Helical Gearmotors

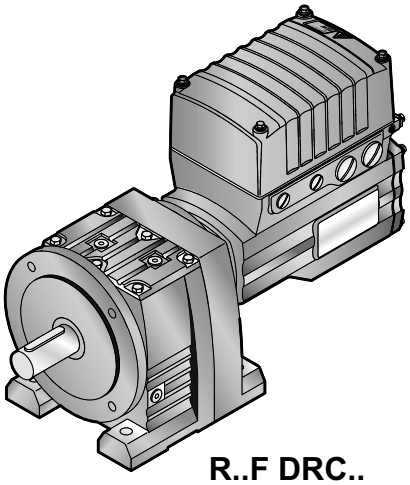
11.1 Variants



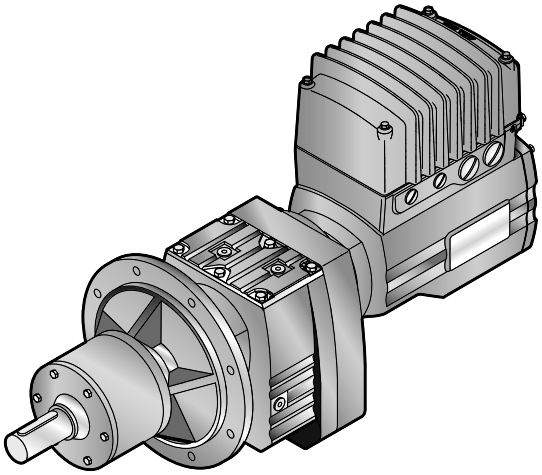
R..DRC..



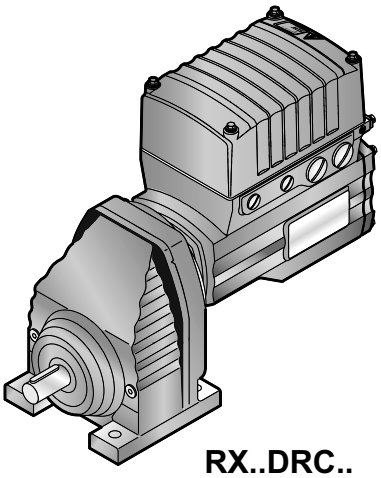
RF../DRC..



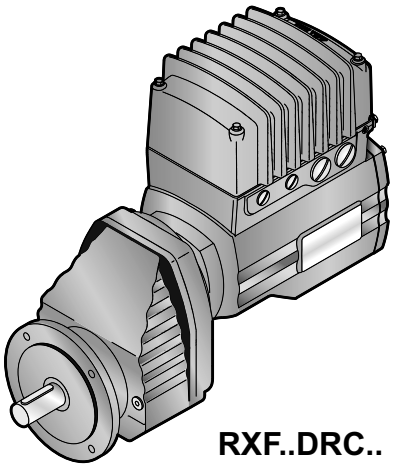
R..F DRC..



RM..DRC..



RX..DRC..



RXF..DRC..

4952829835

11.2 Selection tables

11.2.1 RX 57

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
RX57  1	0.77	1540	3.4	8.6	9.4	23	107	1.30
	0.68	1350	3.9	9.8	11	27	116	1.48
	0.61	1210	4.4	11	12	30	117	1.65
	0.52	1040	5.1	13	14	35	117	1.92*
	0.49	980	5.4	14	15	37	117	2.04
	0.42	844	6.3	16	17	43	117	2.37
	0.38	758	7.0	17	19	48	117	2.64*
	0.34	687	7.7	19	21	52	114	2.91
	0.32	637	8.3	21	23	57	111	3.14
	0.28	563	9.4	24	26	64	117	3.55*
	0.26	528	10	25	27	68	117	3.79
	0.23	460	12	29			116	4.35
	0.20	394	13	34			61	5.07
	0.18	364	15	36			66	5.50*

m [kg]			DRC1	DRC2		
RX57	 1		29	35		
RXF: + 1.9 kg						

DRC.. n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	F_{Ramax} RX [N]	F_{Ramax} RXF [N]	F_{Rapk} RX [N]	F_{Rapk} RXF [N]
RX57  1	1.30	-	1.9	132	132	3940	3940
	1.48	-	1.4	112	112	3950	3950
	1.65	-	1.2	430	430	3960	3960
	1.92*	-	0.94	880	880	3970	3970
	2.04	-	0.85	1070	1070	3970	3970
	2.37	-	0.64	1500	1500	3980	3980
	2.64*	-	0.55	1810	1810	3980	3980
	2.91	-	0.44	2170	2170	3980	3980
	3.14	-	0.42	2320	2320	3990	3990
	3.55*	-	0.35	2420	2420	3990	3990
	3.79	-	0.32	2480	2480	3990	3990
	4.35	-	0.26	2640	2640	4000	4000
	5.07	-	0.21	3030	3030	4210	4210
	5.50*	-	0.18	3100	3100	4190	4190

11.2.2 RX 67

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aE\text{-}merg.Off}$ [Nm]	i
RX67 1	0.71	1430			10	25	177	1.40
	0.62	1240	4.3	11	12	29	194	1.61
	0.54	1075	4.9	12	13	33	214	1.86
	0.49	980	5.4	14	15	37	228	2.04
	0.42	833	6.4	16	17	43	209	2.40*
	0.39	787	6.7	17	18	46	201	2.54
	0.35	692	7.7	19	21	52	180	2.89
	0.31	625	8.5	21	23	58	170	3.20*
	0.27	531	10.0	25	27	68	148	3.77
	0.23	465	11	28	31	77	136	4.30*
	0.22	442	12	30	33	82	139	4.53
	0.19	386	14	34			128	5.18
	0.16	329	16	40			73	6.07

m [kg]			DRC1	DRC2		
RX67	1		32	38		
RXF: + 4.0 kg						

DRC..				F_{Ramax}		F_{Rapk}	
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	RX [N]	RXF [N]	RX [N]	RXF [N]
RX67 1	1.40*	-	3.2	205	205	5450	5450
	1.61	-	2.6	245	245	5380	5380
	1.86	-	2.1	225	225	5300	5300
	2.04	-	1.8	230	230	5310	5310
	2.40*	-	1.4	1530	1530	5460	5460
	2.54	-	1.3	2000	2000	5470	5470
	2.89	-	1.0	2640	2640	5590	5590
	3.20*	-	0.88	2800	2800	5590	5590
	3.77	-	0.69	3090	3090	5660	5660
	4.30*	-	0.47	3300	3300	5770	5770
	4.53	-	0.42	3350	3350	5760	5760
	5.18	-	0.34	3580	3580	5760	5760
	6.07	-	0.28	4000	4000	5970	5970

11.2.3 RX 77

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
RX77  1	0.70	1410			10	26	264	1.42
	0.60	1200			12	30	294	1.67
	0.53	1065			14	34	318	1.88*
	0.47	939	5.6	14	15	38	340	2.13
	0.41	823	6.4	16	17	44	366	2.43
	0.37	741	7.2	18	19	49	366	2.70
	0.32	649	8.2	20	22	55	328	3.08*
	0.31	615	8.6	22	23	58	309	3.25*
	0.27	541	9.8	24	27	67	260	3.70
	0.25	495	11	27	29	73	243	4.04*
	0.21	423	13	31	34	85	209	4.73
	0.19	374	14	35	39	96	175	5.35*
	0.18	355	15	37	41	101	187	5.63
	0.16	312	17	42			175	6.41
	0.13	268	20	49			90	7.47
	0.12	250	21	53			97	8.00*

m [kg]			DRC1	DRC2		
RX77	 1		43	49		
RXF: + 2.3 kg						

DRC.. n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	F_{Ramax} RX [N]	F_{Ramax} RXF [N]	F_{Rapk} RX [N]	F_{Rapk} RXF [N]
RX77 1	1.42	-	7.6	240	240	10000	10000
	1.67	-	6.0	240	240	10000	10000
	1.88*	-	5.0	255	255	10000	10000
	2.13	-	4.1	360	360	10000	10000
	2.43	-	3.4	425	425	10000	10000
	2.70	-	3.0	1030	1030	10000	10000
	3.08*	-	2.5	2490	2490	10000	10000
	3.25*	-	2.3	3140	3140	10000	10000
	3.70	-	1.9	4280	4280	10000	10000
	4.04*	-	1.6	4490	4490	10000	10000
	4.73	-	1.3	4890	4890	10000	10000
	5.35*	-	0.90	5240	5240	10000	10000
	5.63	-	0.81	5300	5300	10000	10000
	6.41	-	0.66	5600	5600	10000	10000
	7.47	-	0.53	6200	6200	10000	10000
	8.00*	-	0.46	6330	6330	10000	10000

11.2.4 RX 87

	na_1 [rpm]	na_{2000} [rpm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
RX87 1	0.72	1440			493	1.39
	0.62	1250			536	1.60*
	0.52	1035			604	1.93
	0.47	930	15	39	655	2.15
	0.40	806	18	45	689	2.48
	0.36	725	20	50	689	2.76*
	0.32	647	22	56	689	3.09
	0.29	575	25	63	689	3.48
	0.26	529	27	68	519	3.78
	0.22	444	32	81	493	4.50*
	0.20	394	37	91	425	5.07
	0.18	360	40	100	383	5.56*
	0.16	310	46	116	326	6.45
	0.14	278	52	130	238	7.20*
	0.13	262	55	137	253	7.63
	0.12	231			236	8.65

m [kg]			DRC2		
RX87	1		65		
RXF: + 5.0 kg					

DRC.. n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	F_{Ramax} RX [N]	F_{Ramax} RXF [N]	F_{Rapk} RX [N]	F_{Rapk} RXF [N]
RX87 1	1.39	-	25	74	74	12700	12700
	1.60*	-	19	74	74	12500	12500
	1.93	-	15	185	185	12300	12300
	2.15	-	13	42	42	12300	12300
	2.48	-	11	470	470	12300	12300
	2.76*	-	9.4	1200	1200	12400	12400
	3.09	-	8.1	2030	2030	12400	12400
	3.48	-	6.9	2810	2810	12400	12400
	3.78	-	6.2	5050	5050	12700	12700
	4.50*	-	4.8	5520	5520	12800	12800
	5.07	-	3.9	5990	5990	13000	13000
	5.56*	-	3.4	6330	6330	13000	13000
	6.45	-	2.7	6860	6860	13000	13000
	7.20*	-	1.8	7380	7380	13000	13000
	7.63	-	1.6	7500	7500	13000	13000
	8.65	-	1.3	7890	7890	13000	13000

11.2.5 R 27

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
R27 2	0.30	593	8.9	22	24	61	134	3.37
	0.25	500	11	26	29	72	145	4.00*
	0.23	468	11	28	31	77	148	4.27
	0.20	400	13	33	36	90	162	5.00*
	0.18	357	15	37	40	101	168	5.60*
	0.15	303	17	44	47	119	180	6.59
	0.13	262	20	51	55	137	190	7.63*
	0.12	245	22	54	59	147	197	8.16
	0.11	213	25	62			207	9.41
	0.10	197	27	67	73	>136	207	10.13
	0.08	169	31	79	85	>136	219	11.86
	0.08	151	35	88	96	>136	221	13.28*
	0.06	128	41	103	113	>136	221	15.63
	0.06	111	48	120	>130	>136	221	18.08
	0.05	103	51	128	>130	>136	221	19.35
	0.04	90	59	>136			221	22.32
	0.04	77	69	>136			221	26.09
	0.04	70	75	>136			221	28.37
R27 3	0.04	82	65	>136	>130	>136	221	24.47
	0.03	69	76	>136	>130	>136	221	28.78
	0.03	62	86	>136	>130	>136	221	32.47
	0.03	54	97	>136	>130	>136	221	36.79
	0.03	51	104	>136	>130	>136	221	39.25
	0.02	45	119	>136	>130	>136	221	44.90
	0.02	42	128	>136	>130	>136	221	48.17
	0.02	36	>130	>136			221	55.87
	0.02	33	>130	>136	>130	>136	221	61.30
	0.01	29	>130	>136	>130	>136	221	69.47
	0.01	27	>130	>136	>130	>136	221	74.11
	0.01	24	>130	>136	>130	>136	221	84.78
	0.01	22	>130	>136	>130	>136	221	90.96
	0.009	19	>130	>136			221	105.49
	0.008	16	>130	>136			221	123.91
	0.007	15	>130	>136			221	135.09

m [kg]			DRC1	DRC2		
R27	2		24	30		
R27	3		24	30		
RF: + -0.1 kg						

DRC..				F_{Ramax}		F_{Rapk}	
n_e = 1400		φ /R	J_G 10^{-4}	R	RF	R	RF
	i	[']	[kgm^2]	[N]	[N]	[N]	[N]
R27 2	3.37	-	1.1	900	790	4290	3690
	4.00*	-	0.85	900	800	4250	3660
	4.27	-	0.76	920	810	4230	3640
	5.00*	-	0.58	860	760	4180	3590
	5.60*	-	0.48	880	775	4170	3580
	6.59	-	0.36	880	775	4160	3580
	7.63*	-	0.29	900	795	4150	3570
	8.16	-	0.26	870	770	4150	3570
	9.41	-	0.21	900	795	4140	3560
	10.13	-	0.61	1890	1670	4210	3620
	11.86	-	0.47	1980	1750	4210	3620
	13.28*	-	0.39	2140	1910	4210	3620
	15.63	-	0.29	2290	2170	4210	3620
	18.08	-	0.24	2440	2310	4210	3620
	19.35	-	0.22	2510	2380	4210	3620
	22.32	-	0.18	2660	2520	4210	3620
	26.09	-	0.14	2840	2690	4210	3620
	28.37	-	0.12	2940	2780	4210	3620
R27 3	24.47	-	0.49	2760	2620	4210	3620
	28.78	-	0.37	2950	2800	4210	3620
	32.47	-	0.31	3100	2940	4210	3620
	36.79	-	0.25	3260	3090	4210	3620
	39.25	-	0.22	3350	3170	4210	3620
	44.90	-	0.18	3530	3340	4210	3620
	48.17	-	0.16	3630	3430	4210	3620
	55.87	-	0.13	3840	3640	4210	3620
	61.30	-	0.26	3980	3640	4210	3620
	69.47	-	0.22	4180	3640	4210	3620
	74.11	-	0.20	4230	3640	4210	3620
	84.78	-	0.16	4230	3640	4210	3620
	90.96	-	0.15	4230	3640	4210	3620
	105.49	-	0.12	4230	3640	4210	3620
	123.91	-	0.090	4230	3640	4210	3620
	135.09	-	0.080	4230	3640	4210	3620

11.2.6 R 37

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
R37 2	0.29	587	9.0	23	25	61	190	3.41
	0.25	494	11	27	29	73	207	4.05
	0.23	463	11	29	31	78	214	4.32
	0.20	395	13	33	36	91	230	5.06
	0.18	353	15	38	41	102	241	5.67
	0.15	300	18	44	48	120	245	6.67
	0.13	251	21	53	57	143	265	7.97
	0.11	211	25	63	68	170	284	9.47
	0.10	198	27	67	73	182	289	10.11
	0.08	169	31	78	85	>205	311	11.83
	0.08	151	35	88	95	>205	323	13.25
	0.06	128	41	103	112	>205	340	15.60
	0.06	111	48	119	130	>205	340	18.05
	0.05	104	51	128	139	>205	340	19.31
	0.04	90	59	147			340	22.27
	0.04	77	69	172			315	26.03
	0.04	71	75	187			340	28.32
R37 3	0.04	82	65	162	176	>205	340	24.42
	0.03	70	76	190	>200	>205	340	28.73
	0.03	62	86	>205	>200	>205	340	32.40
	0.03	54	97	>205	>200	>205	340	36.72
	0.03	51	104	>205	>200	>205	340	39.17
	0.02	45	119	>205	>200	>205	340	44.81
	0.02	42	127	>205	>200	>205	340	48.08
	0.02	36	148	>205			340	55.76
	0.02	33	162	>205	>200	>205	340	61.18
	0.01	29	184	>205	>200	>205	340	69.33
	0.01	27	196	>205	>200	>205	340	73.96
	0.01	24	>200	>205	>200	>205	340	84.61
	0.01	22	>200	>205	>200	>205	340	90.77
	0.009	19	>200	>205			340	105.28
	0.008	16	>200	>205			340	123.66
	0.007	15	>200	>205			340	134.82

m [kg]			DRC1	DRC2		
R37	2		30	36		
R37	3		30	36		
RF: + 1.5 kg						

DRC..				F_{Ramax}		F_{Rapk}	
n_e = 1400		φ /R	J_G 10^{-4}	R	RF	R	RF
	i	[']	[kgm^2]	[N]	[N]	[N]	[N]
R37 2	3.41	14	1.4	900	800	5500	5500
	4.05	13	1.1	840	750	5440	5440
	4.32	13	0.95	820	725	5430	5430
	5.06	13	0.72	790	700	5420	5420
	5.67	12	0.59	760	675	5420	5420
	6.67	12	0.43	1000	890	5320	5320
	7.97	8	0.96	1720	1520	4880	4880
	9.47	8	0.74	1760	1560	4880	4880
	10.11	8	0.66	1820	1620	4880	4880
	11.83	8	0.51	1810	1610	4880	4880
	13.25	8	0.43	1880	1670	4880	4880
	15.60	8	0.31	2010	1780	4880	4880
	18.05	8	0.26	2390	2120	4880	4880
	19.31	7	0.23	2570	2280	4880	4880
	22.27	7	0.19	2970	2640	4880	4880
	26.03	7	0.15	3860	3420	4880	4880
	28.32	7	0.13	3690	3270	4880	4880
R37 3	24.42	9	0.53	3240	2870	4880	4880
	28.73	9	0.39	3740	3310	4880	4880
	32.40	9	0.31	4120	3650	4880	4880
	36.72	9	0.25	4540	4020	4880	4880
	39.17	9	0.23	4760	4220	4880	4880
	44.81	9	0.19	4940	4640	4880	4880
	48.08	9	0.17	4940	4870	4880	4880
	55.76	9	0.13	4940	4940	4880	4880
	61.18	8	0.26	4940	4940	4880	4880
	69.33	8	0.22	4940	4940	4880	4880
	73.96	8	0.20	4940	4940	4880	4880
	84.61	8	0.16	4940	4940	4880	4880
	90.77	8	0.15	4940	4940	4880	4880
	105.28	8	0.12	4940	4940	4880	4880
	123.66	8	0.090	4940	4940	4880	4880
	134.82	8	0.080	4940	4940	4880	4880

11.2.7 R 47

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
R47 2	0.26	522	10	25	28	69	245	3.83
	0.23	461	12	29	31	78	248	4.34
	0.21	412	13	32	35	87	255	4.85
	0.18	355	15	37	41	102	264	5.64*
	0.17	333	16	40	43	108	265	6.00
	0.14	287	18	46	50	125	270	6.96
	0.13	258	21	51	56	140	277	7.76*
	0.12	250	21	53	58	144	349	8.01
	0.11	221	24	60	65	163	374	9.07
	0.10	197	27	67	73	183	391	10.15
	0.08	170	31	78	85	210	417	11.79
	0.08	159	33	83	90	225	425	12.54
	0.07	137	39	96	105	260	451	14.56
	0.06	123	43	107	117	290	468	16.22
	0.06	112	47	118	129	>305	493	17.89
	0.05	104	51	128	139	>305	502	19.27
	0.05	92	58	144	157	>305	510	21.81
	0.04	86	62	154	168	>305	510	23.28
	0.04	75	71	177			510	26.74
	0.03	64	82	205			374	31.12
	0.03	59	90	220			408	33.79
R47 3	0.04	85	63	156	170	>305	510	23.59
	0.04	75	71	177	192	>305	510	26.70
	0.03	67	79	198	215	>305	510	29.88
	0.03	58	92	225	250	>305	510	34.73
	0.03	54	98	240	265	>305	510	36.93
	0.02	47	114	280	>300	>305	510	42.87
	0.02	42	127	>305	>300	>305	510	47.75
	0.02	38	140	>305	>300	>305	510	52.69
	0.02	35	150	>305	>300	>305	510	56.73
	0.02	31	170	>305	>300	>305	510	64.21
	0.01	29	182	>305	>300	>305	510	68.54
	0.01	26	200	>305	>300	>305	510	76.23
	0.01	24	220	>305	>300	>305	510	84.90
	0.01	21	245	>305	>300	>305	510	93.68
	0.010	20	265	>305	>300	>305	510	100.86
	0.009	18	>300	>305	>300	>305	510	114.17
	0.008	16	>300	>305	>300	>305	510	121.87
	0.007	14	>300	>305			510	139.99
	0.006	12	>300	>305			510	162.94
	0.006	11	>300	>305			510	176.88

m [kg]			DRC1	DRC2		
R47	2		33	39		
R47	3		34	40		
RF: + 0.1 kg						

DRC..				F_{Ramax}		F_{Rapk}	
n_e = 1400		φ /R	J_G 10^{-4}	R	RF	R	RF
	i	[']	[kgm^2]	[N]	[N]	[N]	[N]
R47 2	3.83	11	2.6	2080	2080	5960	5960
	4.34	11	2.0	2190	2190	5940	5940
	4.85	10	1.7	2280	2280	5930	5930
	5.64*	10	1.3	2410	2410	5920	5920
	6.00	10	1.2	2470	2470	5910	5910
	6.96	10	0.93	2620	2620	5890	5890
	7.76*	10	0.77	2720	2720	5880	5880
	8.01	8	2.0	2690	2690	5420	5420
	9.07	8	1.6	2780	2780	5390	5390
	10.15	7	1.3	2880	2880	5390	5390
	11.79	7	1.0	3020	3020	5390	5390
	12.54	7	0.95	3080	3080	5390	5390
	14.56	7	0.74	3230	3230	5390	5390
	16.22	7	0.63	3350	3350	5390	5390
	17.89	7	0.51	3390	3390	5390	5390
	19.27	7	0.48	3530	3530	5390	5390
	21.81	7	0.39	3710	3710	5390	5390
	23.28	7	0.36	3820	3820	5390	5390
	26.74	7	0.29	4050	4050	5390	5390
	31.12	7	0.23	4610	4610	5390	5390
	33.79	7	0.20	4680	4680	5390	5390
R47 3	23.59	8	1.7	3840	3840	5390	5390
	26.70	8	1.4	4050	4050	5390	5390
	29.88	8	1.2	4240	4240	5390	5390
	34.73	8	0.93	4520	4520	5390	5390
	36.93	8	0.85	4630	4630	5390	5390
	42.87	8	0.67	4930	4930	5390	5390
	47.75	8	0.56	5140	5140	5390	5390
	52.69	8	0.47	5350	5350	5390	5390
	56.73	8	0.44	5420	5420	5390	5390
	64.21	8	0.37	5420	5420	5390	5390
	68.54	8	0.33	5420	5420	5390	5390
	76.23	7	0.60	5420	5420	5390	5390
	84.90	7	0.52	5420	5420	5390	5390
	93.68	7	0.43	5420	5420	5390	5390
	100.86	7	0.41	5420	5420	5390	5390
	114.17	7	0.34	5420	5420	5390	5390
	121.87	7	0.31	5420	5420	5390	5390
	139.99	7	0.25	5420	5420	5390	5390
	162.94	7	0.20	5420	5420	5390	5390
	176.88	7	0.18	5420	5420	5390	5390

11.2.8 R 57

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
R57 2	0.23	456			32	79	476	4.39
	0.20	396	13	33	36	91	519	5.05
	0.17	344	15	39	42	105	544	5.82
	0.16	312	17	42	46	115	570	6.41
	0.13	266	20	50	54	136	595	7.53
	0.13	251	21	53	57	143	604	7.97
	0.11	221	24	60	65	163	638	9.06
	0.11	214	25	62	67	168	629	9.35
	0.09	185	29	71	78	194	663	10.79
	0.08	168	31	79	86	210	689	11.88
	0.07	143	37	92	100	250	731	13.95*
	0.07	135	39	98	106	265	740	14.77*
	0.06	119	44	111	121	300	765	16.79
	0.05	108	49	123	134	330	765	18.60*
	0.05	91	58	145	158	390	765	21.93
	0.04	80	66	165	180	445	765	24.99*
	0.04	76	70	174	189	>455	765	26.31
R57 3	0.04	74	71	179	194	>455	765	26.97
	0.03	66	80	200	215	>455	765	30.18
	0.03	57	93	230	250	>455	765	35.07
	0.03	54	99	245	265	>455	765	37.30*
	0.02	46	115	285	310	>455	765	43.30
	0.02	41	128	315	345	>455	765	48.23
	0.02	38	141	350	380	>455	765	53.22
	0.02	35	152	375	410	>455	765	57.29
	0.02	31	172	425	>450	>455	765	64.85
	0.01	29	183	>455	>450	>455	765	69.23
	0.01	25	210	>455	>450	>455	765	80.55
	0.01	22	235	>455	>450	>455	765	89.71
	0.01	20	260	>455	>450	>455	765	98.99
	0.009	19	280	>455	>450	>455	765	106.58
	0.008	17	315	>455	>450	>455	765	120.63
	0.008	16	340	>455	>450	>455	765	128.77
	0.007	14	390	>455			765	147.92
	0.006	12	>450	>455			765	172.17
	0.005	11	>450	>455			765	186.89

m [kg]			DRC1	DRC2		
R57	2		38	44		
R57	3		39	45		
RF: + 3.4 kg / RM: + 15.4 kg						

DRC.. n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	F_{Ramax} R [N]	F_{Ramax} RF [N]	F_{Ramax} RM [N]	F_{Rapk} R [N]	F_{Rapk} RF [N]	F_{Rapk} RM [N]
R57 2	4.39	10	4.3	1900	1900	4000	7230	7230	4000
	5.05	10	3.4	1730	1730	4000	7210	7210	4000
	5.82	10	2.7	1820	1820	4000	7210	7210	4000
	6.41	9	2.3	1770	1770	4000	7210	7210	4000
	7.53	9	1.8	1950	1950	4000	7210	7210	4000
	7.97	9	1.6	2020	2020	4000	7210	7210	4000
	9.06	9	1.3	2010	2010	4000	7210	7210	4000
	9.35	7	2.8	3180	3180	4000	7080	7080	4000
	10.79	7	2.2	3330	3330	4000	7080	7080	4000
	11.88	7	1.9	3430	3430	4000	7080	7080	4000
	13.95*	7	1.6	3610	3610	4000	7080	7080	4000
	14.77*	7	1.4	3690	3690	4000	7080	7080	4000
	16.79	7	1.1	3860	3860	4000	7080	7080	4000
	18.60*	7	0.94	4050	4050	4000	7080	7080	4000
	21.93	7	0.73	4370	4370	4000	7080	7080	4000
	24.99*	6	0.51	4640	4640	4000	7080	7080	4000
	26.31	6	0.45	4750	4750	4000	7080	7080	4000
R57 3	26.97	8	1.5	4800	4800	4000	7080	7080	4000
	30.18	8	1.3	5040	5040	4000	7080	7080	4000
	35.07	8	0.97	5390	5390	4000	7080	7080	4000
	37.30*	8	0.89	5530	5530	4000	7080	7080	4000
	43.30	8	0.70	5900	5900	4000	7080	7080	4000
	48.23	8	0.60	6170	6170	4000	7080	7080	4000
	53.22	8	0.49	6430	6430	4000	7080	7080	4000
	57.29	8	0.46	6630	6630	4000	7080	7080	4000
	64.85	8	0.38	6980	6980	4000	7080	7080	4000
	69.23	7	0.35	7100	7100	4000	7080	7080	4000
	80.55	7	0.62	7100	7100	4000	7080	7080	4000
	89.71	7	0.54	7100	7100	4000	7080	7080	4000
	98.99	7	0.45	7100	7100	4000	7080	7080	4000
	106.58	7	0.42	7100	7100	4000	7080	7080	4000
	120.63	7	0.35	7100	7100	4000	7080	7080	4000
	128.77	7	0.32	7100	7100	4000	7080	7080	4000
	147.92	7	0.26	7100	7100	4000	7080	7080	4000
	172.17	7	0.21	7100	7100	4000	7080	7080	4000
	186.89	7	0.18	7100	7100	4000	7080	7080	4000

11.2.9 R 67

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
R67 2	0.23	466			31	77	459	4.29
	0.20	406	13	33	35	89	493	4.93
	0.18	351	15	38	41	103	527	5.70
	0.16	319	17	42	45	113	561	6.27
	0.14	272	20	49	53	132	629	7.36*
	0.13	257	21	52	56	140	646	7.79
	0.11	230			63	157	748	8.70*
	0.10	200	26	66	72	180	799	10.00
	0.09	173	31	76	83	205	850	11.54
	0.08	157	34	84	91	225	884	12.70
	0.07	134	40	99	107	265	935	14.91
	0.06	127	42	105	114	280	952	15.79
	0.06	111	48	119	129	320	1003	17.95
	0.05	101	53	132	143	355	1020	19.89
	0.04	85	62	155	169	420	952	23.44
	0.04	75	71	177	192	480	918	26.72
	0.04	71	75	186	200	505	918	28.13
R67 3	0.03	69	76	191	205	515	884	28.83
	0.03	62	86	210	230	580	918	32.27
	0.03	53	99	245	270	>595	969	37.50
	0.03	50	106	260	285	>595	986	39.88*
	0.02	43	123	305	330	>600	1020	46.29
	0.02	39	137	340	370	>600	1020	51.56
	0.02	35	151	375	405	>600	1020	56.89
	0.02	33	162	405	440	>600	1020	61.26
	0.01	29	185	460	500	>660	1020	69.75
	0.01	27	197	490	530	>660	1020	74.17
	0.01	23	225	570	>600	>660	1020	86.11
	0.01	21	250	630	>600	>660	1020	95.91
	0.009	19	280	>660	>600	>660	1020	105.83
	0.009	18	300	>660	>600	>660	1020	113.94
	0.008	16	340	>660	>600	>660	1020	128.97
	0.007	15	360	>660	>600	>660	1020	137.67
	0.006	13	415	>660			1020	158.14
	0.005	11	485	>660			1020	184.07
	0.005	10	525	>660			1020	199.81

m [kg]			DRC1	DRC2		
R67	2		45	51		
R67	3		46	52		
RF: + 3.2 kg / RM: + 19.0 kg						

DRC..				F_{Ramax}			F_{Rapk}		
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	R [N]	RF [N]	RM [N]	R [N]	RF [N]	RM [N]
R67 2	4.29	10	5.9	5000	5000	8720	9300	9300	9800
	4.93	9	4.6	5210	5210	9120	9100	9100	9760
	5.70	9	3.6	5450	5450	9560	8870	8870	9710
	6.27	9	3.0	5590	5590	9850	8710	8710	9680
	7.36*	8	2.4	5790	5790	9850	8710	8710	9680
	7.79	8	2.1	5830	5830	9840	8710	8710	9680
	8.70*	7	4.0	5960	5960	9750	5350	5350	9330
	10.00	7	3.2	6220	6220	9700	4700	4700	9320
	11.54	7	2.5	6500	6500	9660	4700	4700	9320
	12.70	6	2.2	6640	6640	9620	4700	4700	9320
	14.91	6	1.7	6980	6980	9560	4700	4700	9320
	15.79	6	1.6	7130	7130	9540	4700	4700	9320
	17.95	6	1.2	7330	7330	9480	4700	4700	9320
	19.89	6	1.0	7560	7560	9460	4700	4700	9320
	23.44	6	0.80	8010	8010	9540	4700	4700	9320
	26.72	6	0.56	8210	8210	9580	4700	4700	9320
	28.13	6	0.50	8210	8210	9580	4700	4700	9320
R67 3	28.83	7	1.5	8400	8400	9620	7620	7620	9470
	32.27	7	1.3	8210	8210	9580	7620	7620	9470
	37.50	7	1.0	7900	7900	9520	7620	7620	9470
	39.88*	7	0.93	7790	7790	9500	7620	7620	9470
	46.29	7	0.72	7560	7560	9460	7620	7620	9470
	51.56	7	0.61	7560	7560	9460	7620	7620	9470
	56.89	7	0.50	7560	7560	9460	7620	7620	9470
	61.26	7	0.47	7560	7560	9460	7620	7620	9470
	69.75	7	0.88	7560	7560	9460	5350	5350	9330
	74.17	7	0.81	7560	7560	9460	5350	5350	9330
	86.11	6	0.63	7560	7560	9460	5350	5350	9330
	95.91	6	0.54	7560	7560	9460	5350	5350	9330
	105.83	6	0.45	7560	7560	9460	5350	5350	9330
	113.94	6	0.42	7560	7560	9460	5350	5350	9330
	128.97	6	0.36	7560	7560	9460	5350	5350	9330
	137.67	6	0.32	7560	7560	9460	5350	5350	9330
	158.14	6	0.26	7560	7560	9460	5350	5350	9330
	184.07	6	0.21	7560	7560	9460	5350	5350	9330
	199.81	6	0.19	7560	7560	9460	5350	5350	9330

11.2.10 R 77

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
R77 2	0.19	377			38	96	867	5.31*
	0.17	334			43	108	918	5.99*
	0.15	295	18	45	49	122	986	6.79
	0.13	258	21	51	56	139	1037	7.74
	0.12	233	23	57	62	155	1071	8.59
	0.10	207			69	174	1071	9.64
	0.09	184			78	196	1122	10.88
	0.08	162	33	82	89	220	1173	12.33
	0.07	142	37	93	101	250	1224	14.05
	0.06	128	41	103	112	280	1258	15.60
	0.06	112	47	118	128	320	1326	17.82*
	0.05	106	50	124	135	335	1326	18.80
	0.05	93	57	142	154	385	1394	21.43
	0.04	86	62	155	168	420	1394	23.37
R77 3	0.04	79			182	450	1326	25.23
	0.03	69	77	192	205	520	1394	29.00
	0.03	60	89	220	240	600	1394	33.47
	0.03	54	98	240	265	660	1394	36.83
	0.02	46	115	285	310	775	1394	43.26
	0.02	44	121	300	325	820	1394	45.81
	0.02	38	138	340	370	>900	1394	52.07
	0.02	35	153	380	415	>900	1394	57.68
	0.02	30	174	435	470	>900	1394	65.77
	0.01	26	200	510	555	>900	1394	77.24
	0.01	24	215	540	585	>900	1394	81.80
	0.01	22	245	615	665	>900	1394	92.97
	0.010	19	270	680	740	>900	1394	102.99
	0.008	16	320	800	>820	>900	1394	121.42
	0,007	14	365	>900	>820	>900	1394	138.39
	0.007	14	385	>900	>820	>900	1394	145.67
	0,006	12	440	>900			1394	166.59
	0.005	10	515	>900			1394	195.24*

m [kg]			DRC1	DRC2		
R77	2		52	58		
R77	3		53	59		
RF: + 5.7 kg / RM: + 30.7 kg						

DRC.. n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	F_{Ramax} R [N]	F_{Ramax} RF [N]	F_{Ramax} RM [N]	F_{Rapk} R [N]	F_{Rapk} RF [N]	F_{Rapk} RM [N]
R77 2	5.31*	8	7.7	3990	3990	12700	10400	10400	13000
	5.99*	8	6.4	3990	3990	13000	10000	10000	13000
	6.79	8	5.2	3850	3850	13000	9730	9730	13000
	7.74	8	4.2	3940	3940	13000	9730	9730	13000
	8.59	7	3.7	4110	4110	13000	9730	9730	13000
	9.64	7	6.6	6300	6300	13000	9110	9110	13000
	10.88	7	5.5	6490	6490	13000	9110	9110	13000
	12.33	6	4.5	6740	6740	13000	9110	9110	13000
	14.05	6	3.7	7050	7050	13000	9110	9110	13000
	15.60	6	3.3	7390	7390	13000	9110	9110	13000
	17.82*	6	2.7	7620	7620	13000	9110	9110	13000
	18.80	6	2.5	7980	7980	13000	9110	9110	13000
	21.43	6	2.0	8250	8250	13000	9110	9110	13000
	23.37	6	1.7	8870	8870	13000	9110	9110	13000
R77 3	25.23	7	3.7	10100	10100	13000	9110	9110	13000
	29.00	7	3.0	9920	9920	13000	9110	9110	13000
	33.47	7	2.2	9920	9920	13000	9110	9110	13000
	36.83	7	1.9	9920	9920	13000	9110	9110	13000
	43.26	7	1.6	9920	9920	13000	9110	9110	13000
	45.81	7	1.4	9920	9920	13000	9110	9110	13000
	52.07	7	1.1	9920	9920	13000	9110	9110	13000
	57.68	7	0.97	9920	9920	13000	9110	9110	13000
	65.77	7	1.6	9920	9920	13000	9110	9110	13000
	77.24	7	1.3	9920	9920	13000	9110	9110	13000
	81.80	6	1.2	9920	9920	13000	9110	9110	13000
	92.97	6	0.99	9920	9920	13000	9110	9110	13000
	102.99	6	0.86	9920	9920	13000	9110	9110	13000
	121.42	6	0.68	9920	9920	13000	9110	9110	13000
	138.39	6	0.46	9920	9920	13000	9110	9110	13000
	145.67	6	0.42	9920	9920	13000	9110	9110	13000
	166.59	6	0.34	9920	9920	13000	9110	9110	13000
	195.24*	6	0.27	9920	9920	13000	9110	9110	13000

11.2.11 R 87

	na_1 [rpm]	na_{2000} [rpm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
	0.19	377			1547	5.30*
	0.16	313			1734	6.39
	0.14	281	51	128	1819	7.13
	0.12	243	59	148	1972	8.22
	0.11	219	66	165	2057	9.14*
	0.10	202			2006	9.90*
	0.08	168			2091	11.93
R87	0.08	150	96	235	2176	13.33
 2	0.07	130	111	275	2278	15.35
	0.06	117	123	305	2363	17.08*
	0.05	105	138	340	2448	19.10
	0.05	93	155	385	2550	21.51
	0.04	85	168	420	2635	23.40
	0.04	72	200	500	2635	27.84*
	0.03	64	225	565	2635	31.40
	0.03	58	245	615	2550	34.40*
	0.04	72	200	500	2550	27.88
	0.03	61	235	585	2635	32.66*
	0.03	54	265	660	2635	36.84*
	0.02	48	300	750	2635	41.74
	0.02	42	340	850	2635	47.58
	0.02	38	380	950	2635	52.82
	0.02	33	430	1080	2635	60.35*
	0.02	31	455	1140	2635	63.68*
	0.01	28	520	1300	2635	72.57
R87	0.01	24	585	1470	2635	81.92
 3	0.01	21	670	>1550	2635	93.38
	0,010	19	745	>1550	2635	103.65
	0,008	17	850	>1550	2635	118.43*
	0.008	16	890	>1550	2635	124.97
	0.007	14	1020	>1550	2635	142.41
	0.006	13	1110	>1550	2635	155.34
	0.006	11	1300	>1550	2635	181.77
	0.005	9.7	1480	>1550	2635	205.71
	0.005	9.2	>1550	>1550	2635	216.54
	0.004	8.1			2635	246.54

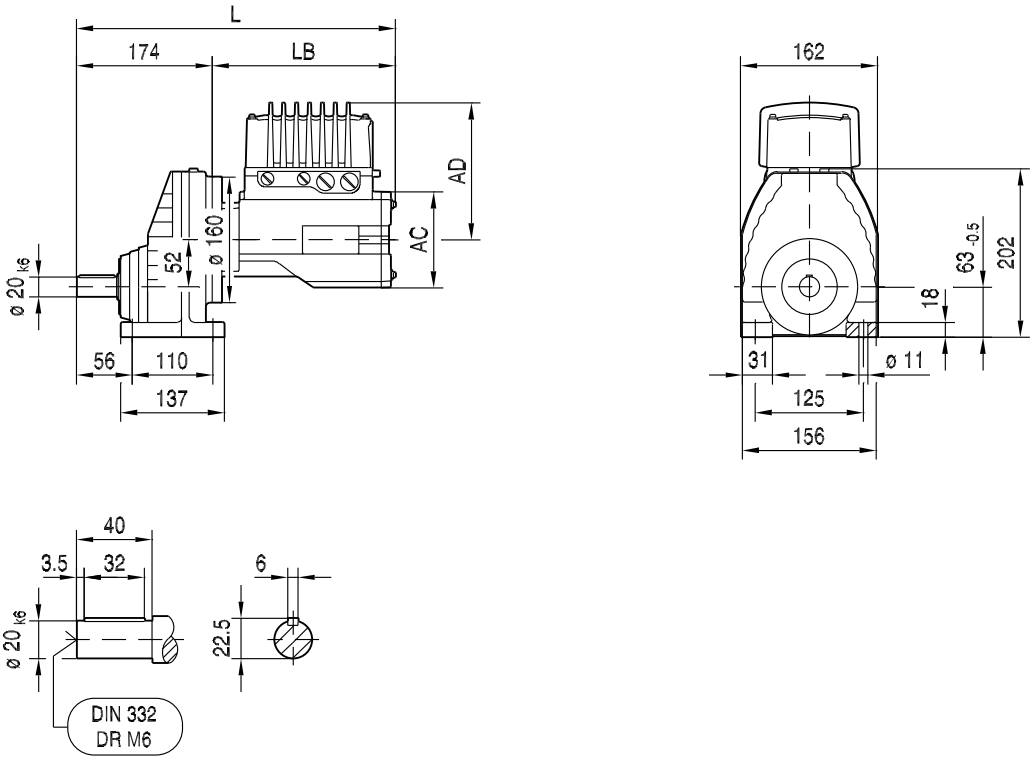
m [kg]			DRC2		
R87	 2		84		
R87	 3		85		
RF: + 7.1 kg / RM: + 36.8 kg					

DRC..				F_{Ramax}			F_{Rapk}		
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	R [N]	RF [N]	RM [N]	R [N]	RF [N]	RM [N]
R87 2	5.30*	7	25	1710	1710	16700	18600	18600	20000
	6.39	7	19	970	970	17800	18600	18600	20000
	7.13	7	16	820	820	18400	18600	18600	20000
	8.22	7	13	225	225	19300	18600	18600	20000
	9.14*	6	11	99	99	20000	18600	18600	20000
	9.90*	6	21	3520	3520	20000	16900	16900	20000
	11.93	6	17	4120	4120	20000	16900	16900	20000
	13.33	6	14	4220	4220	20000	16900	16900	20000
	15.35	6	12	4450	4450	20000	16900	16900	20000
	17.08*	6	10	4580	4580	20000	16900	16900	20000
	19.10	6	8.7	4800	4800	20000	16900	16900	20000
	21.51	6	7.3	4970	4970	20000	16900	16900	20000
	23.40	6	6.6	5000	5000	20000	16900	16900	20000
	27.84*	6	5.1	6640	6640	20000	16900	16900	20000
	31.40	5	4.1	7820	7820	20000	16900	16900	20000
	34.40*	5	3.6	9480	9480	20000	16900	16900	20000
R87 3	27.88	7	9.8	7370	7370	20000	16900	16900	20000
	32.66*	7	7.6	8220	8220	20000	16900	16900	20000
	36.84*	7	6.2	9470	9470	20000	16900	16900	20000
	41.74	7	5.1	10800	10800	20000	16900	16900	20000
	47.58	7	4.1	12300	12300	20000	16900	16900	20000
	52.82	6	3.6	13500	13500	20000	16900	16900	20000
	60.35*	6	2.9	15200	15200	20000	16900	16900	20000
	63.68*	6	2.7	15800	15800	20000	16900	16900	20000
	72.57	6	2.2	16900	16900	20000	16900	16900	20000
	81.92	6	4.0	16900	16900	20000	16900	16900	20000
	93.38	6	3.3	16900	16900	20000	16900	16900	20000
	103.65	6	3.0	16900	16900	20000	16900	16900	20000
	118.43*	6	2.4	16900	16900	20000	16900	16900	20000
	124.97	6	2.3	16900	16900	20000	16900	16900	20000
	142.41	6	1.9	16900	16900	20000	16900	16900	20000
	155.34	6	1.6	16900	16900	20000	16900	16900	20000
	181.77	6	1.3	16900	16900	20000	16900	16900	20000
	205.71	6	0.90	16900	16900	20000	16900	16900	20000
	216.54	6	0.81	16900	16900	20000	16900	16900	20000
	246.54	6	0.66	16900	16900	20000	16900	16900	20000

11.3 Dimension sheets

01 001 00 12

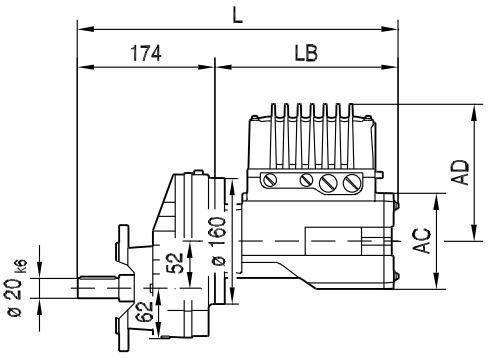
RX57..

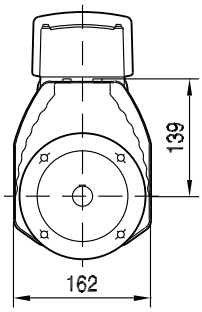


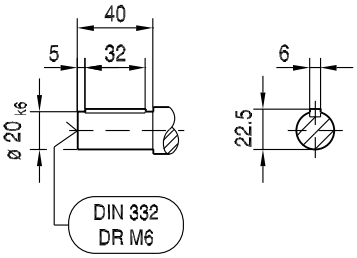
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	461	478						
LB	287	304						

01 002 00 12

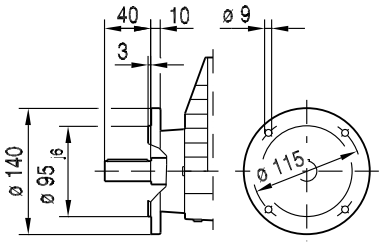
RXF57..



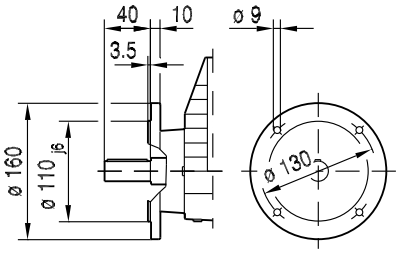




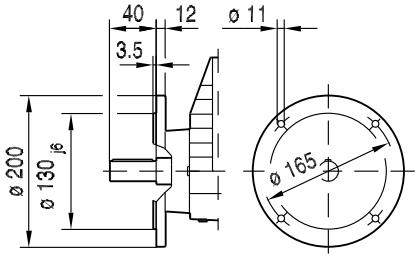
ø 140



ø 160



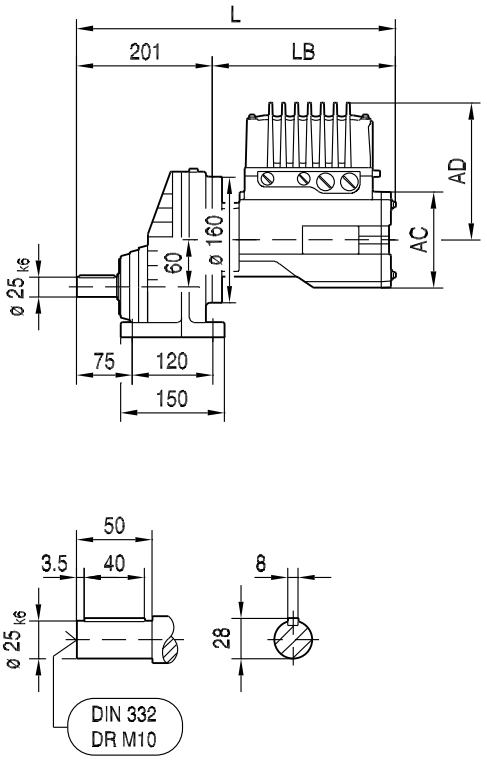
ø 200



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	461	478						
LB	287	304						

01 003 00 12

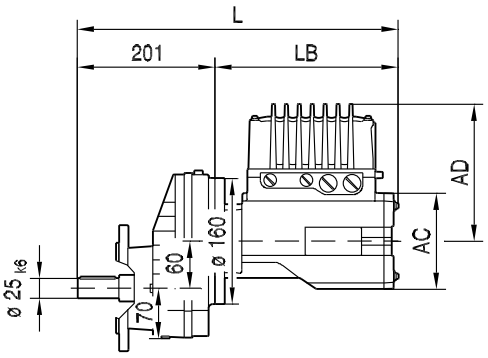
RX67..

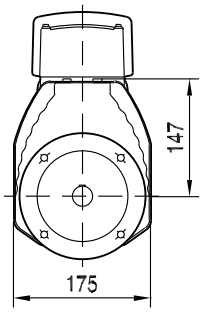


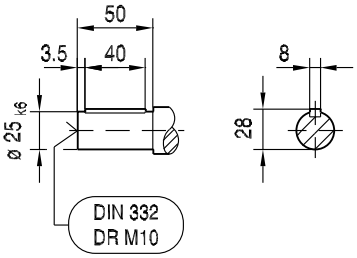
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	488	505						
LB	287	304						

RXF67..

01 004 00 12

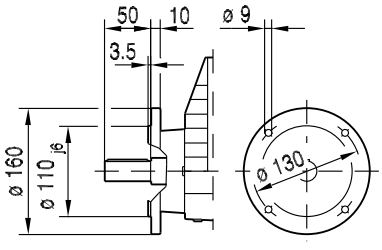




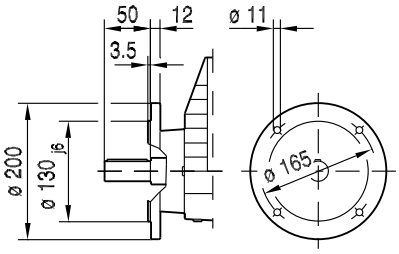


11

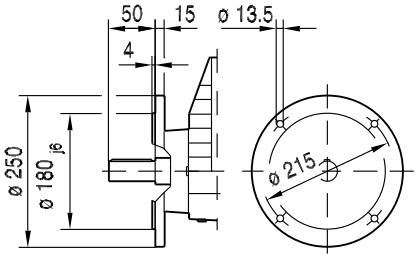
ø 160



ø 200



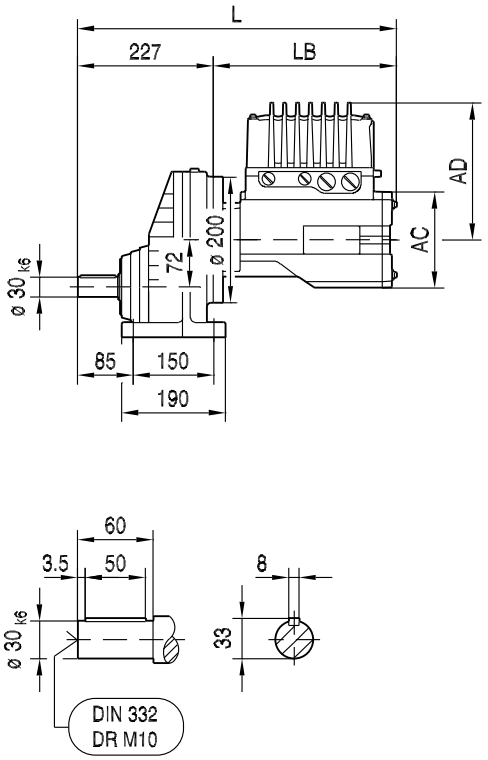
ø 250



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	488	505						
LB	287	304						

01 005 00 12

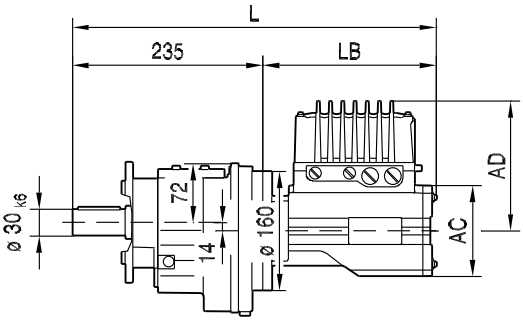
RX77..

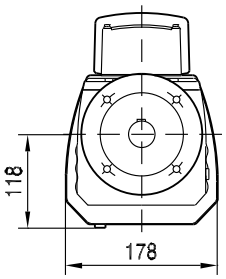


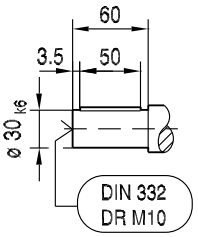
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	508	523						
LB	281	296						

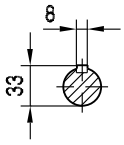
RF47..

01 016 00 12

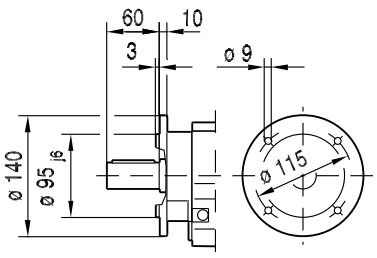




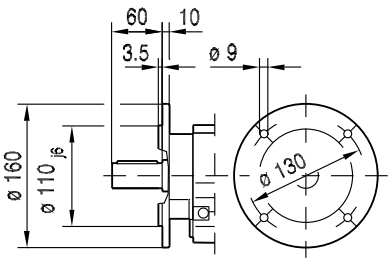




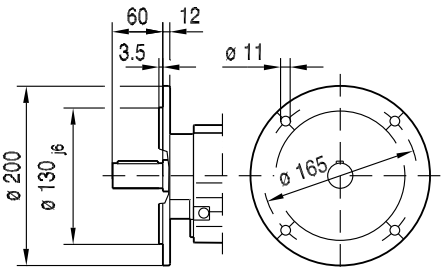
ø 140



ø 160



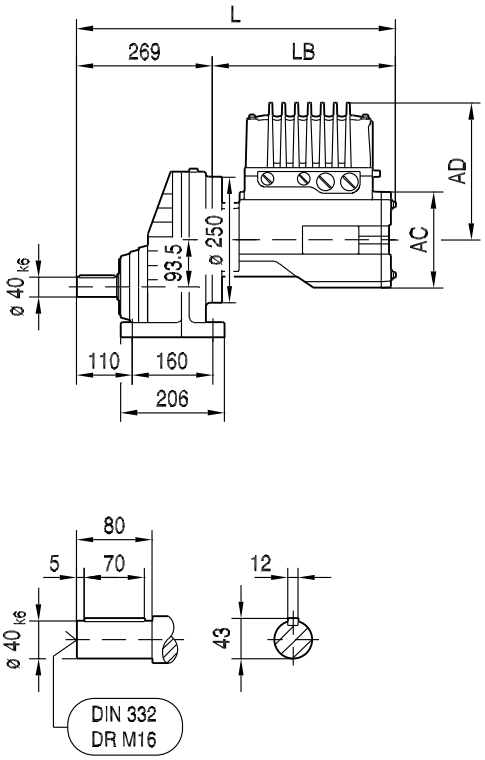
ø 200



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	508	523						
LB	281	296						

01 007 00 12

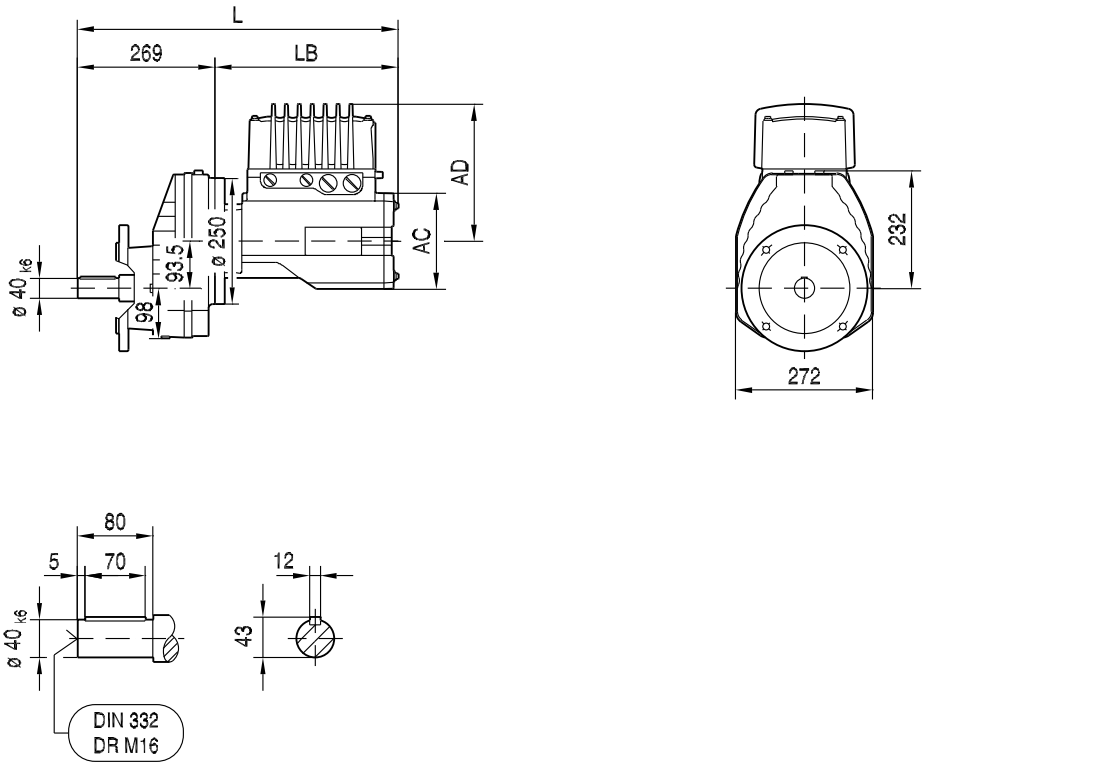
RX87..



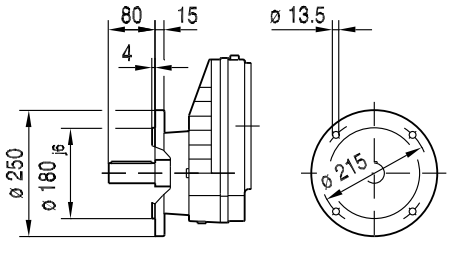
(→ 📖 265)	DRC2							
AC	154							
AD	218							
L	561							
LB	292							

RXF87..

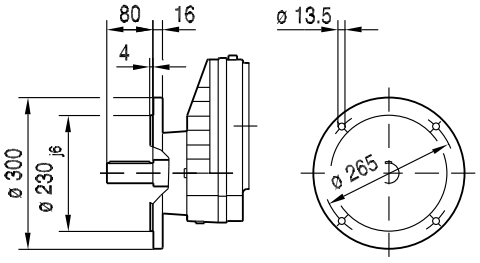
01 008 00 12



ø 250



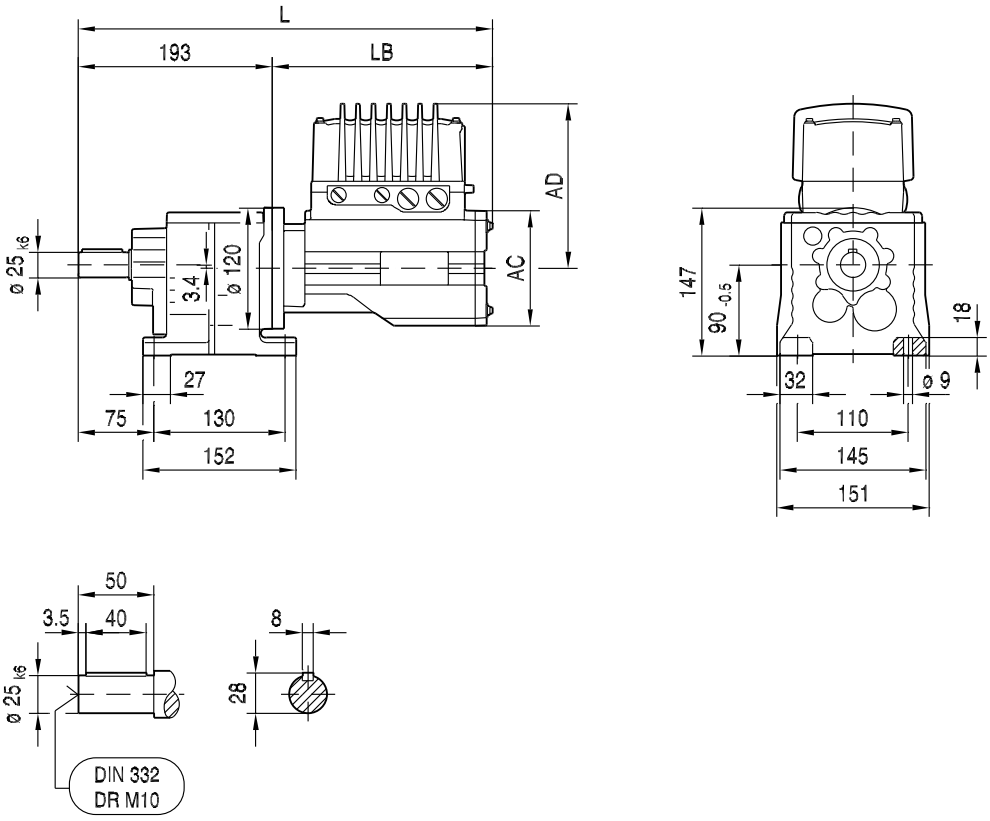
ø 300



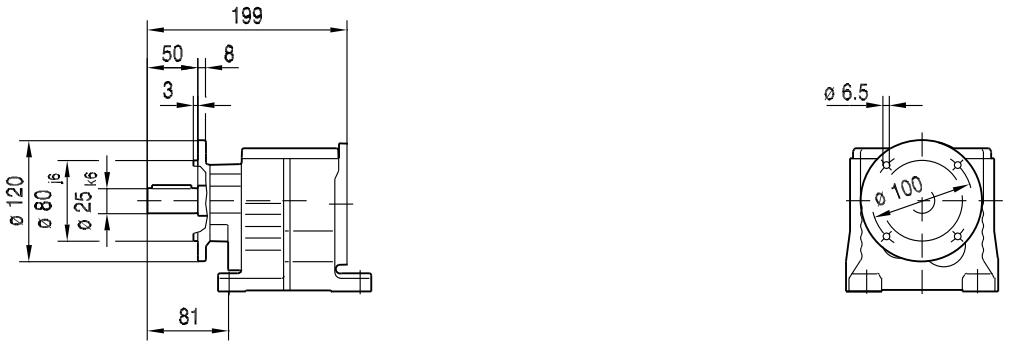
(→ 📖 265)	DRC2							
AC	154							
AD	218							
L	561							
LB	292							

01 009 00 12

R27..



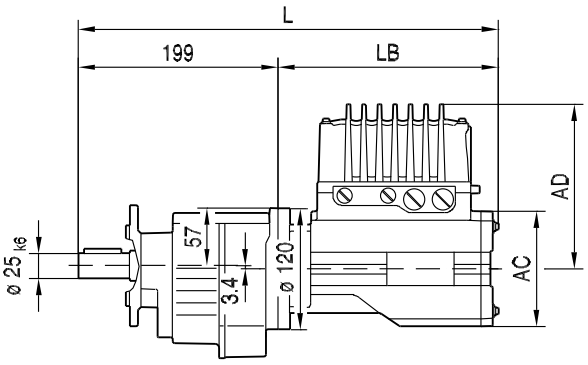
R27F..

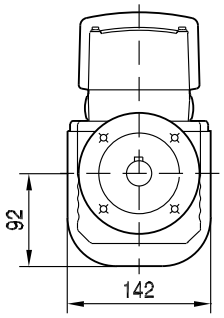


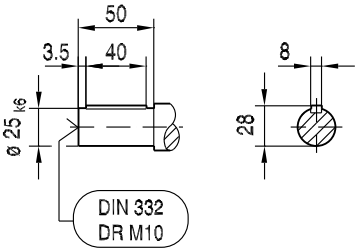
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	487	503						
LB	294	310						

RF27..

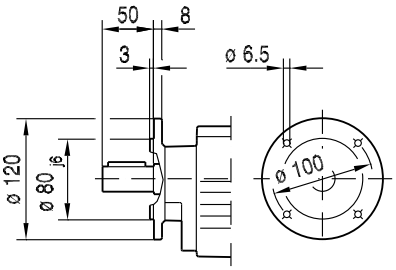
01 010 00 12



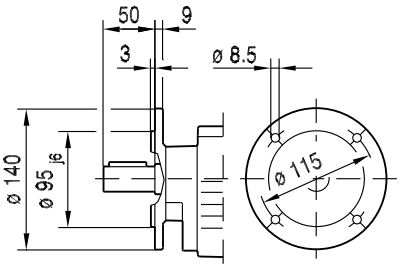




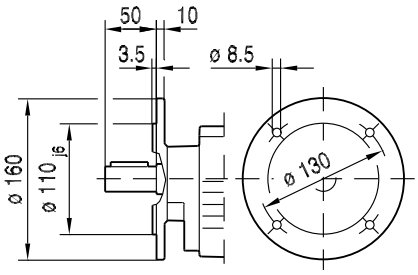
ø 120



ø 140



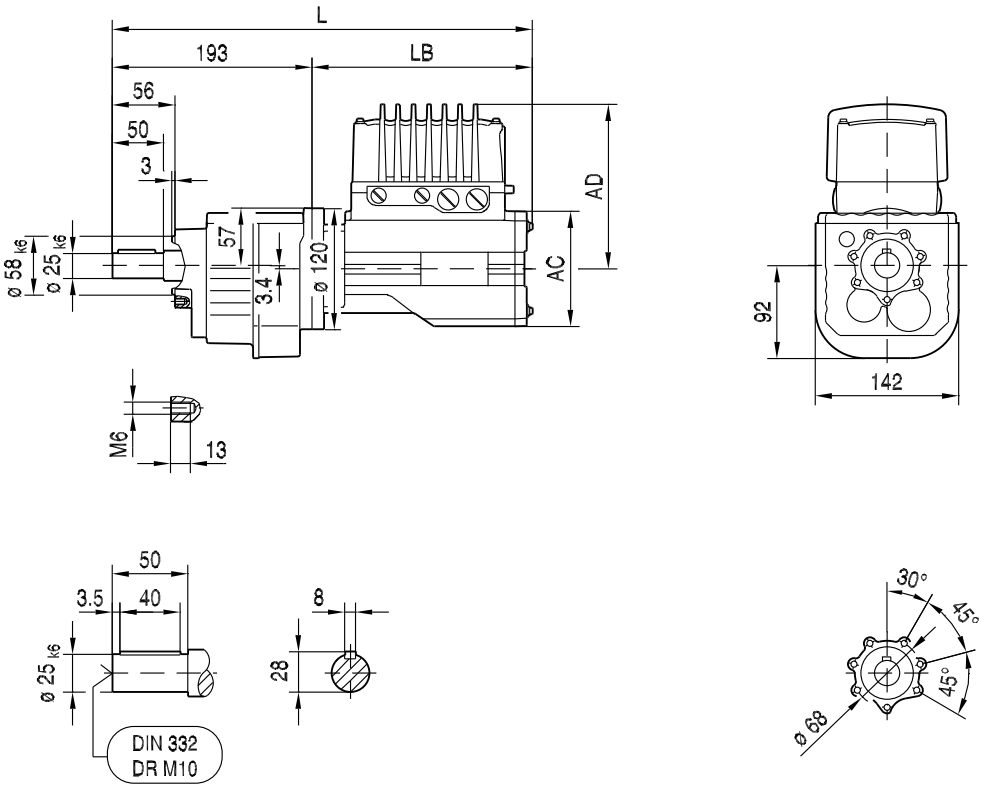
ø 160



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	493	509						
LB	294	310						

01 011 00 12

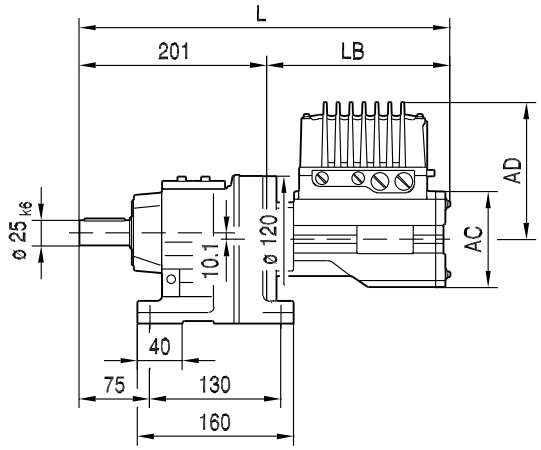
RZ27..

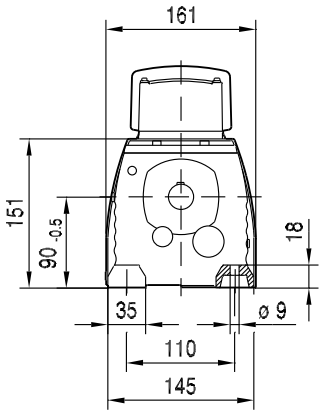


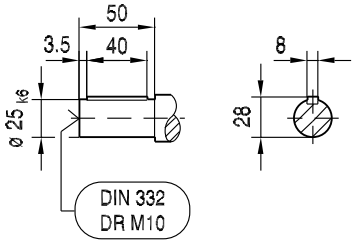
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	487	503						
LB	294	310						

01 012 00 12

R37..

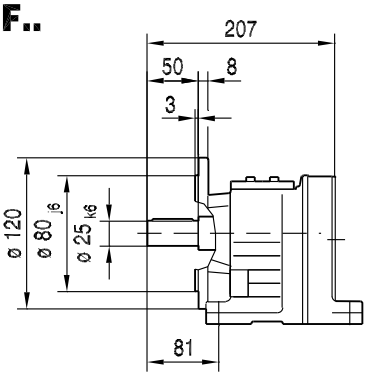


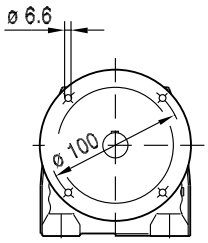




11

R37F..

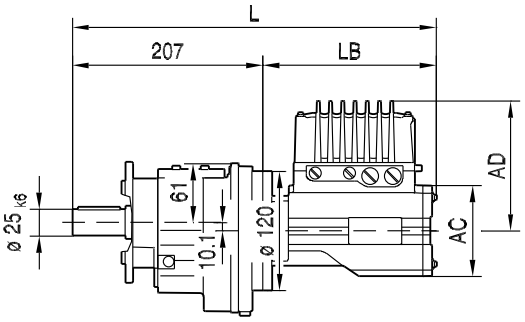


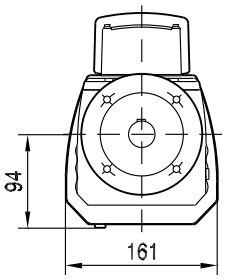


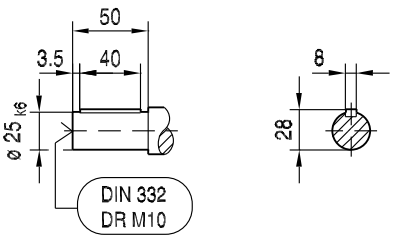
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	495	511						
LB	294	310						

RF37..

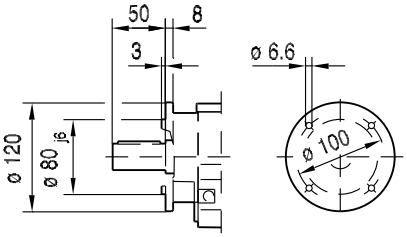
01 013 00 12



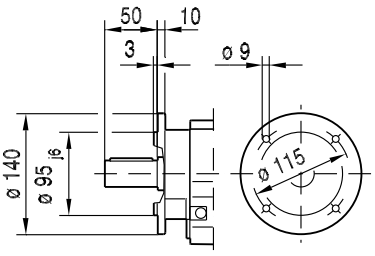




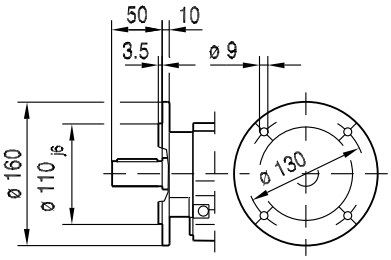
ø 120



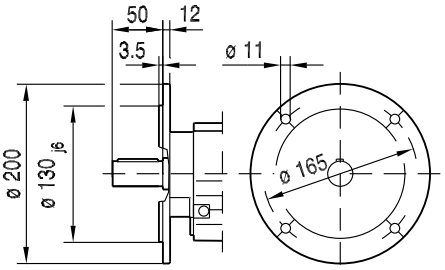
ø 140



ø 160



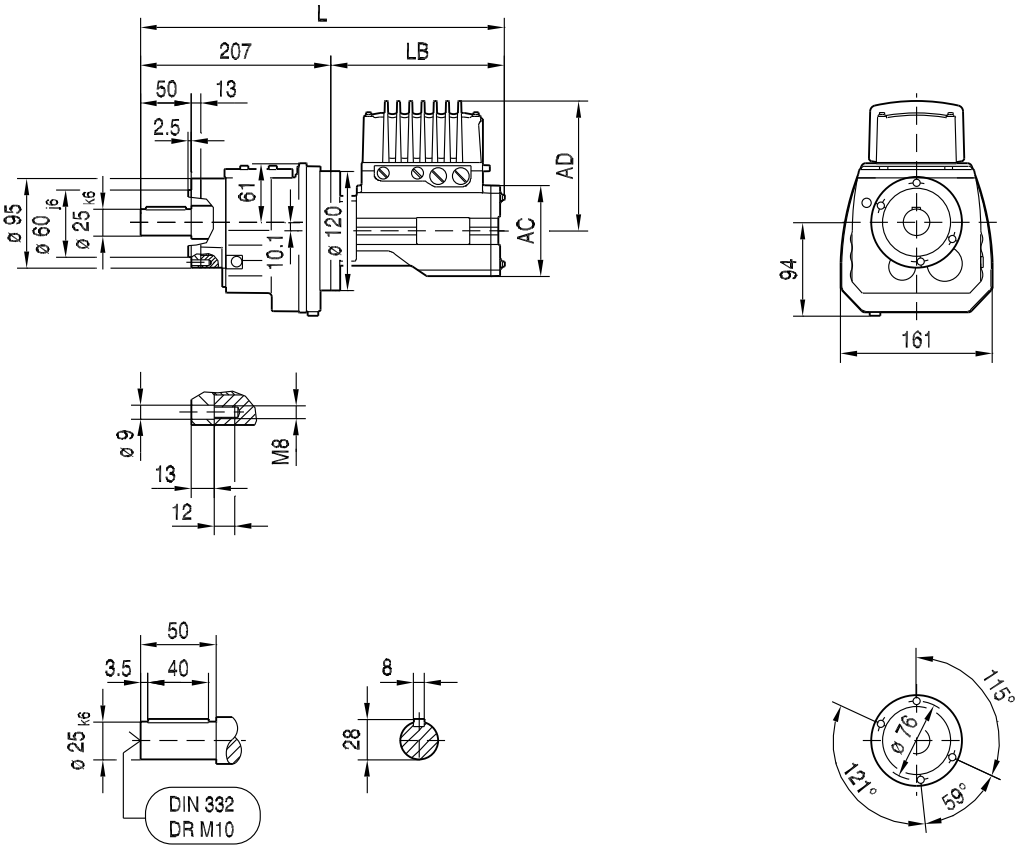
ø 200



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	501	517						
LB	294	310						

RZ37..

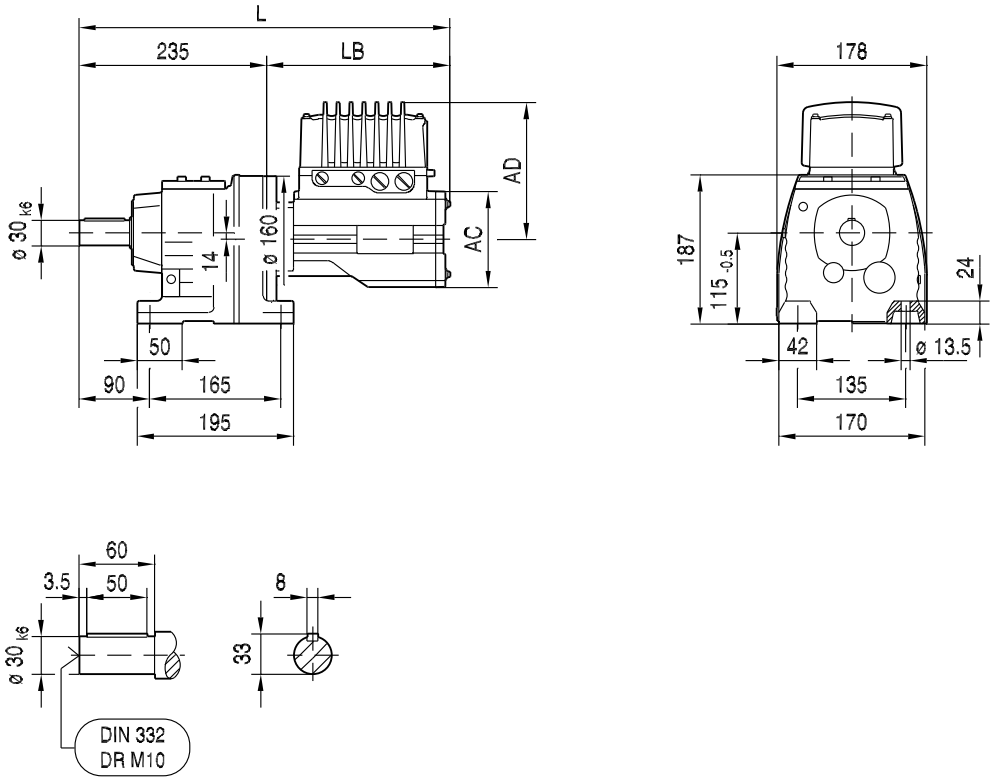
01 014 00 12



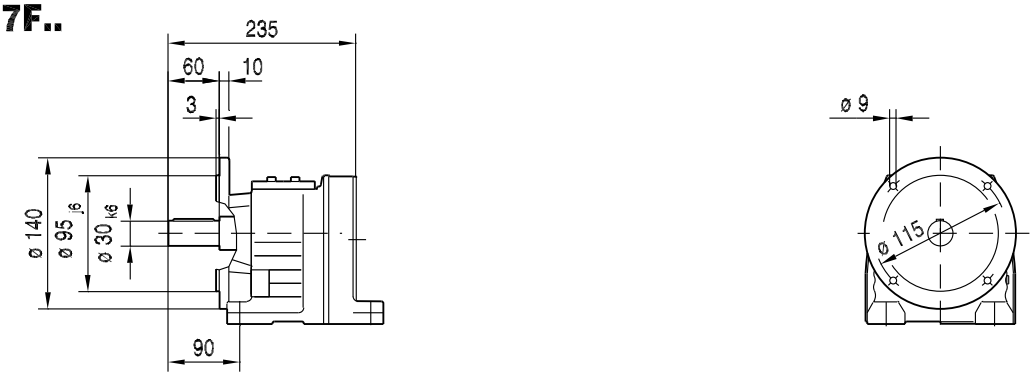
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	501	517						
LB	294	310						

01 015 00 12

R47..



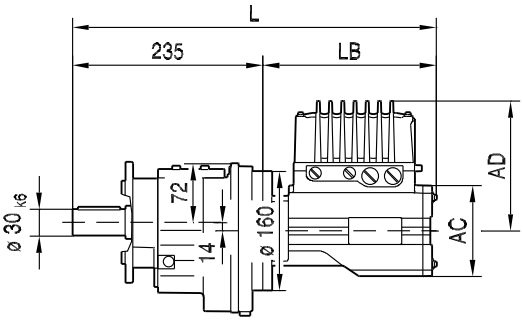
R47F..

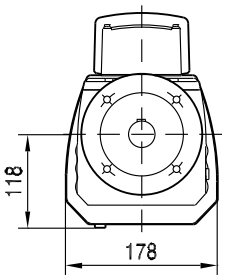


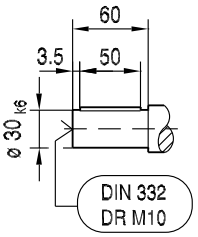
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	522	539						
LB	287	304						

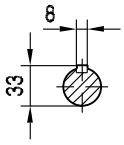
RF47..

01 016 00 12

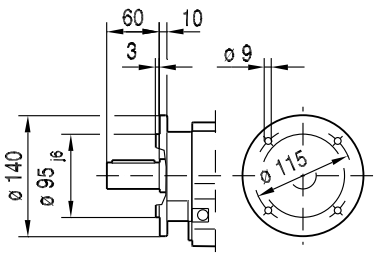




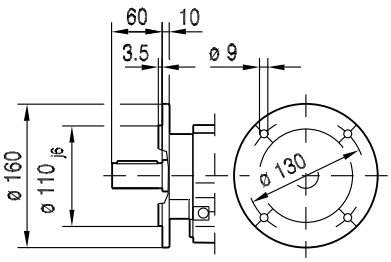




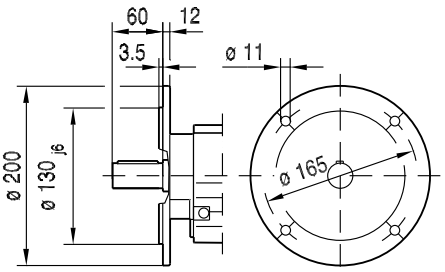
ø 140



ø 160



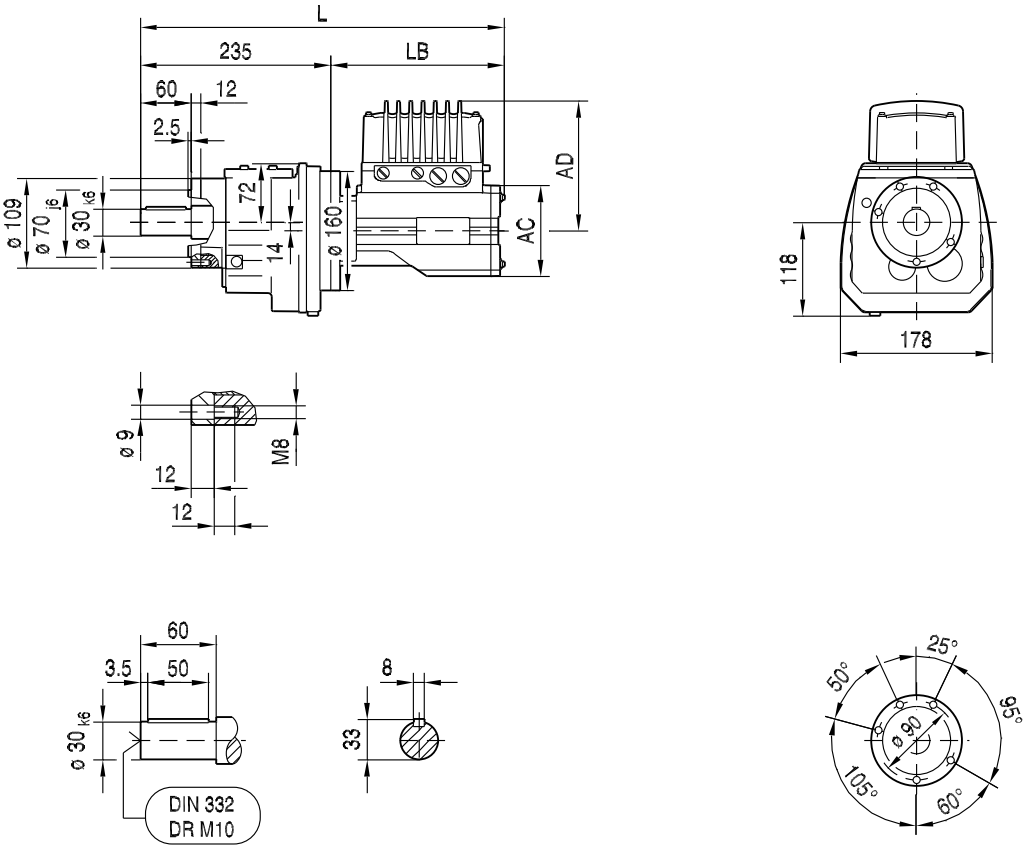
ø 200



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	522	539						
LB	287	304						

RZ47..

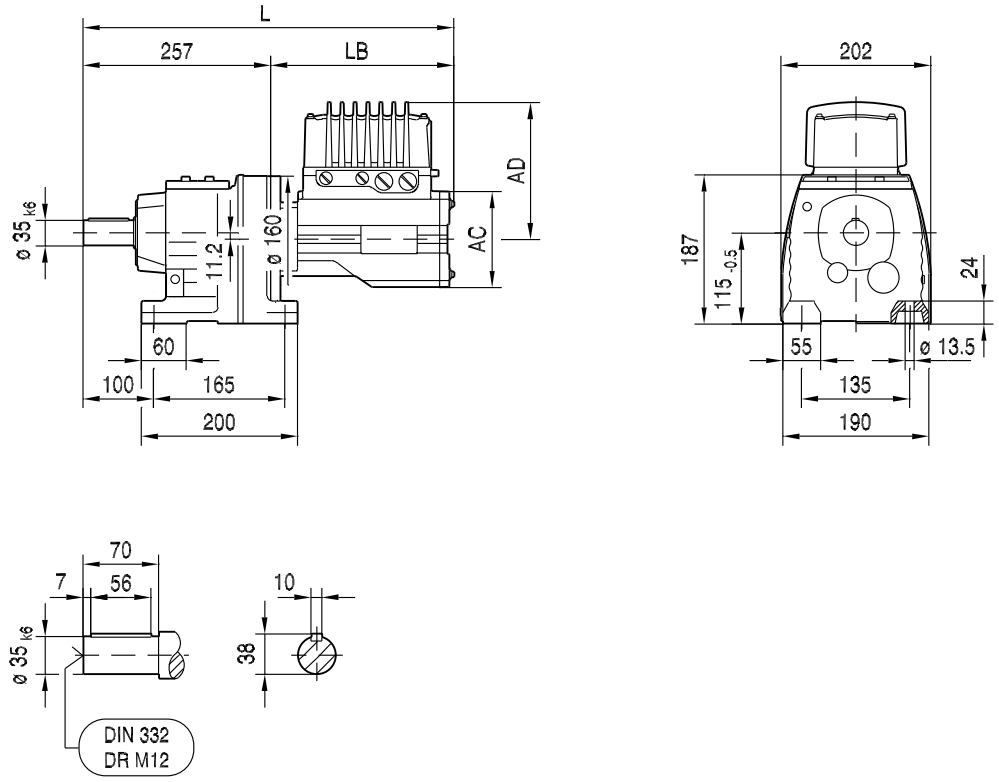
01 017 00 12



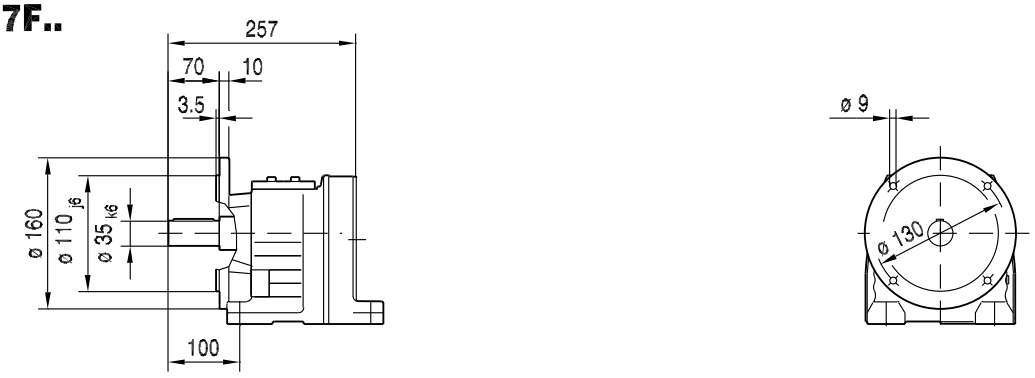
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	522	539						
LB	287	304						

01 018 00 12

R57..



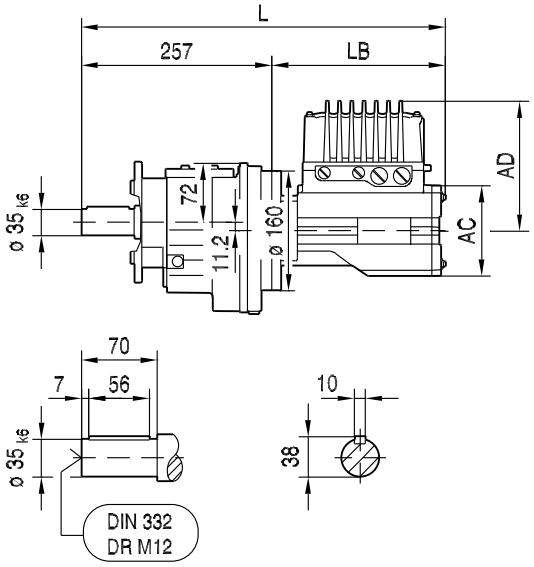
R57F..

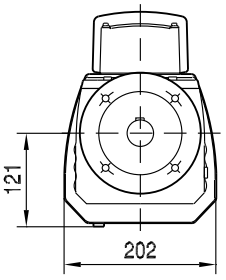


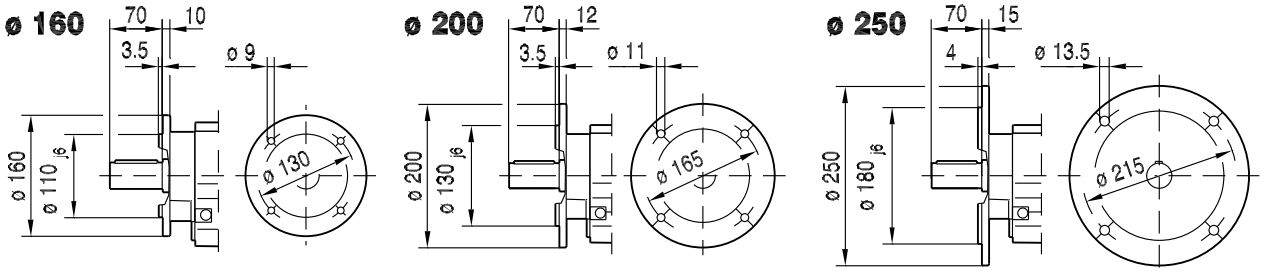
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	544	561						
LB	287	304						

01 019 00 12

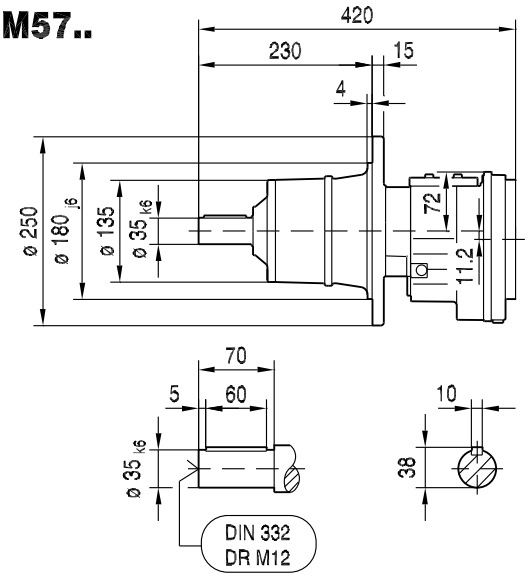
RF57..

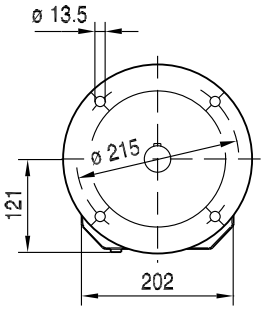






RM57..

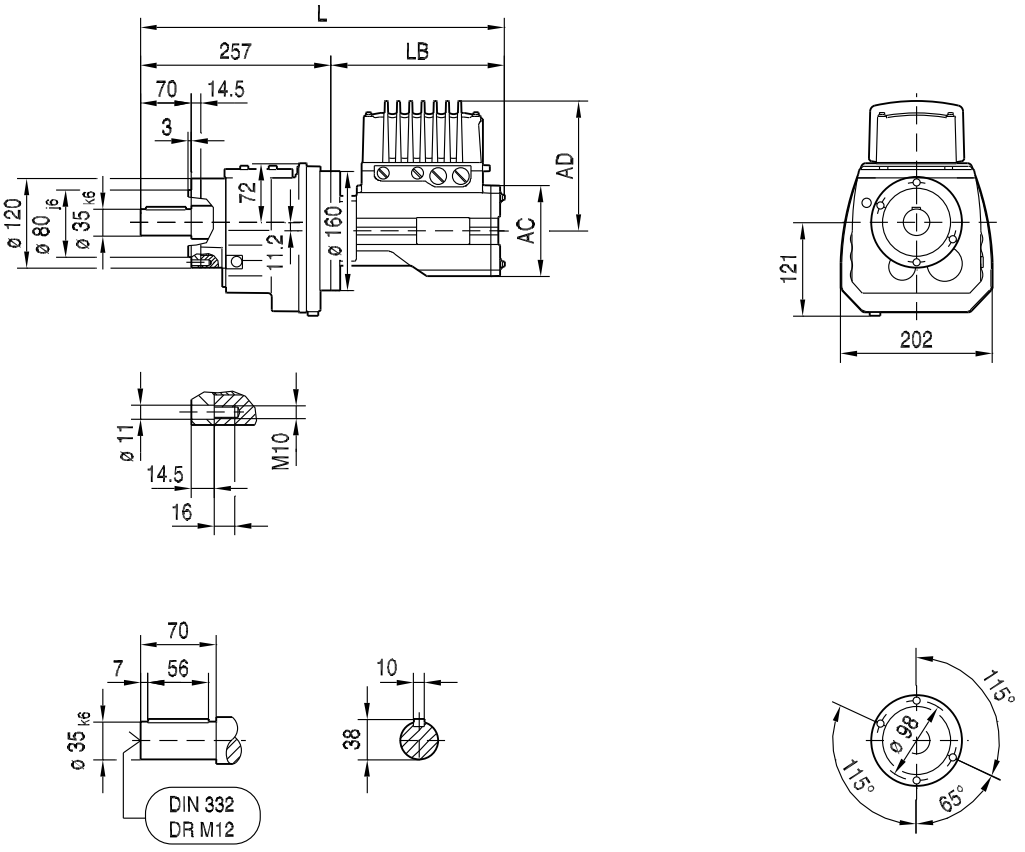




(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	544	561						
LB	287	304						

RZ57..

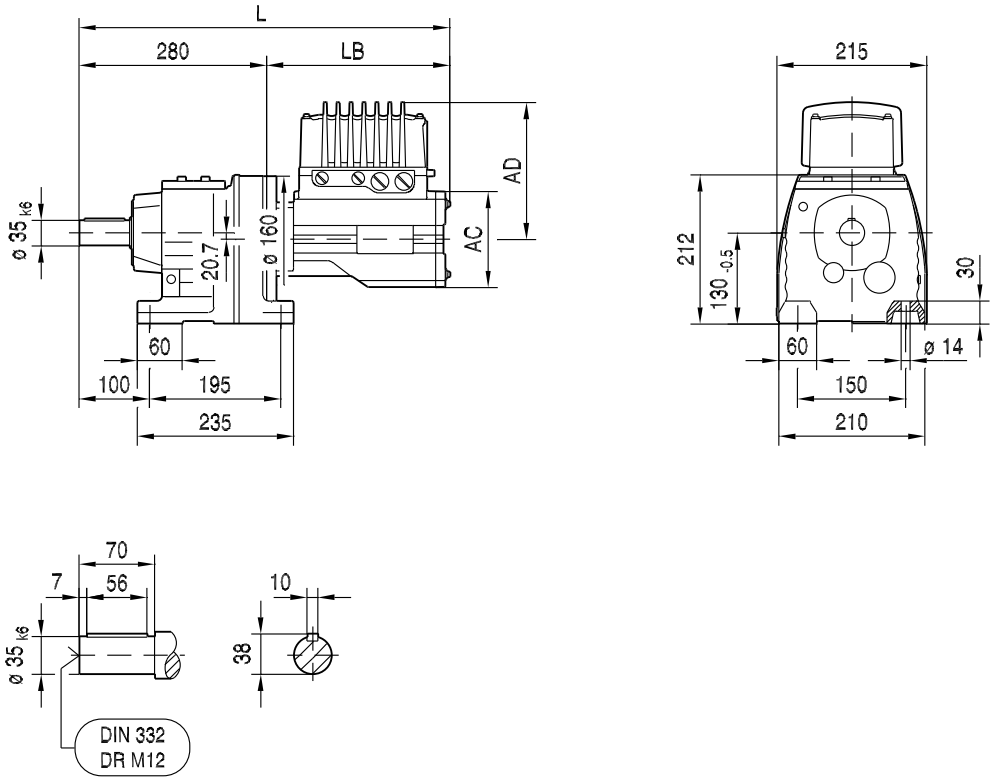
01 020 00 12



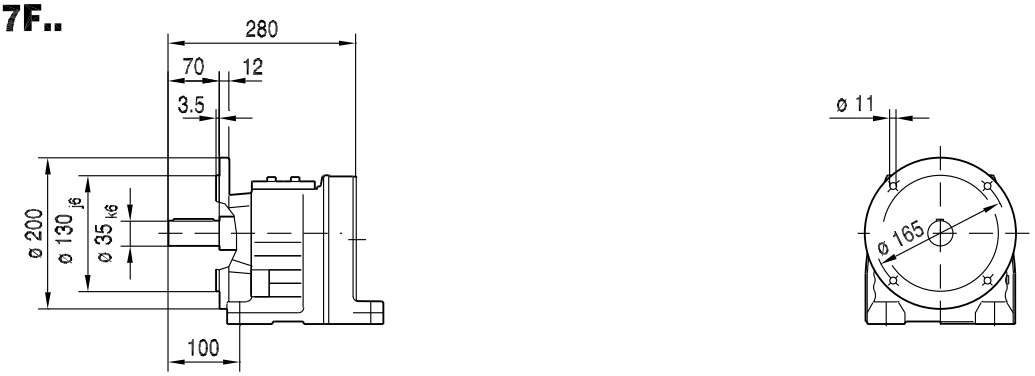
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	544	561						
LB	287	304						

01 021 00 12

R67..



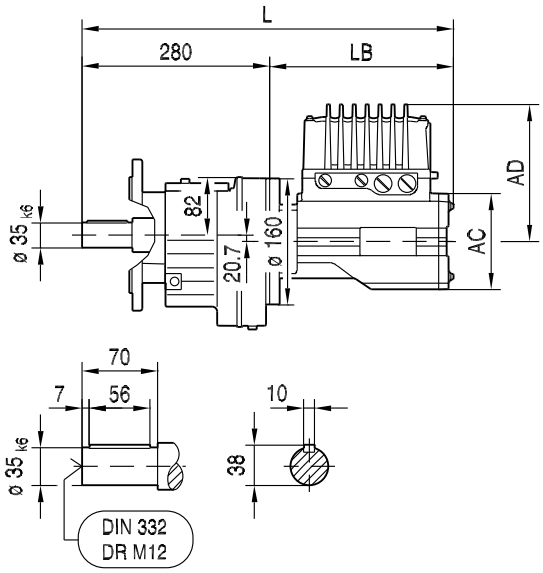
R67F..

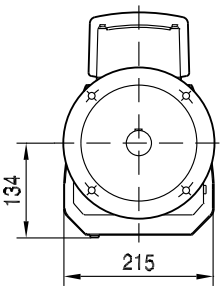


(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	567	584						
LB	287	304						

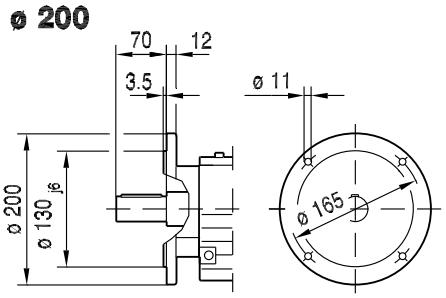
01 022 00 12

RF67..

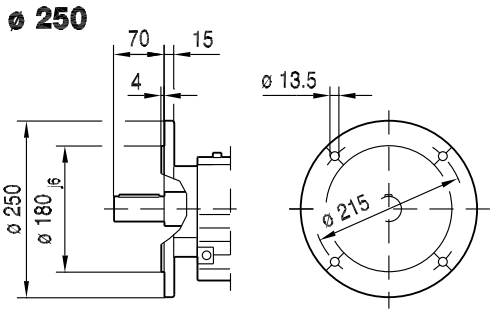




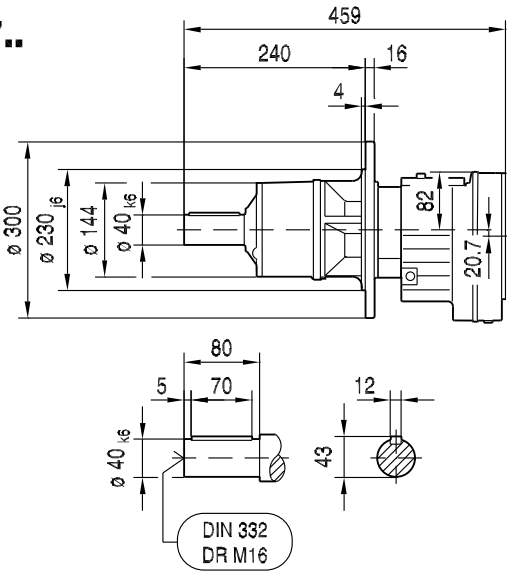
ø 200

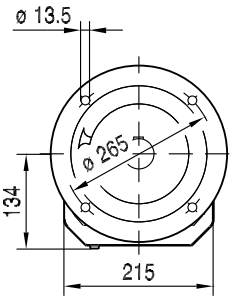


ø 250



RM67..

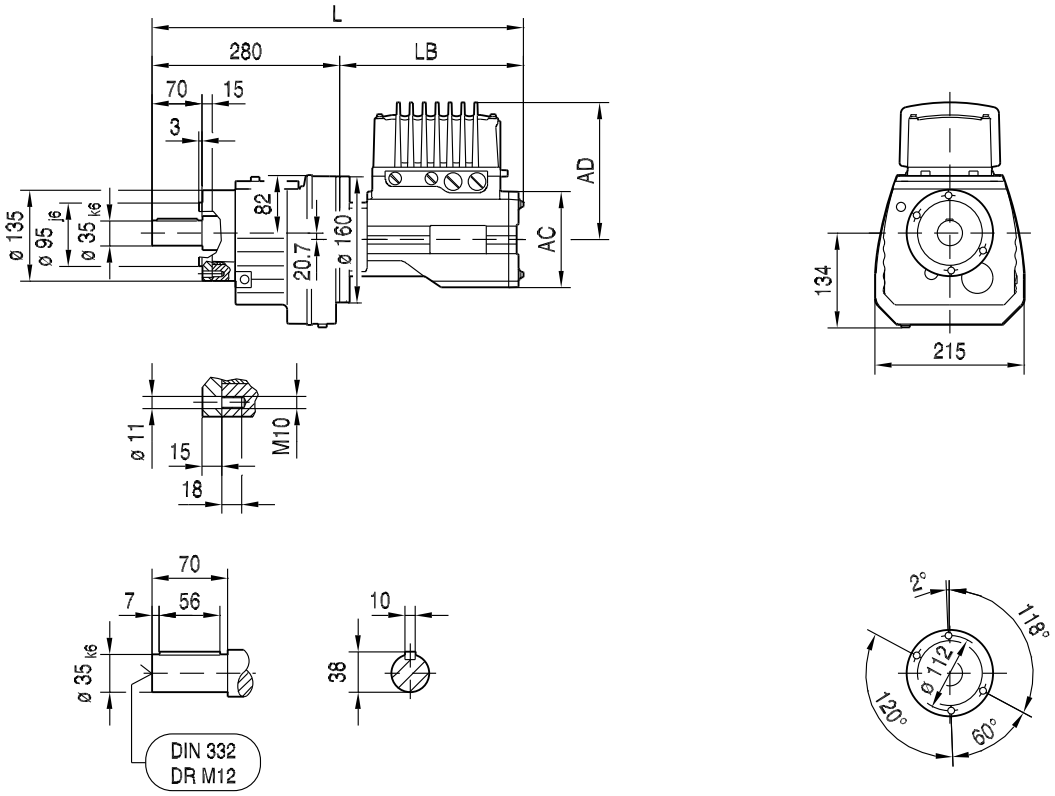




(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	567	584						
LB	287	304						

RZ67..

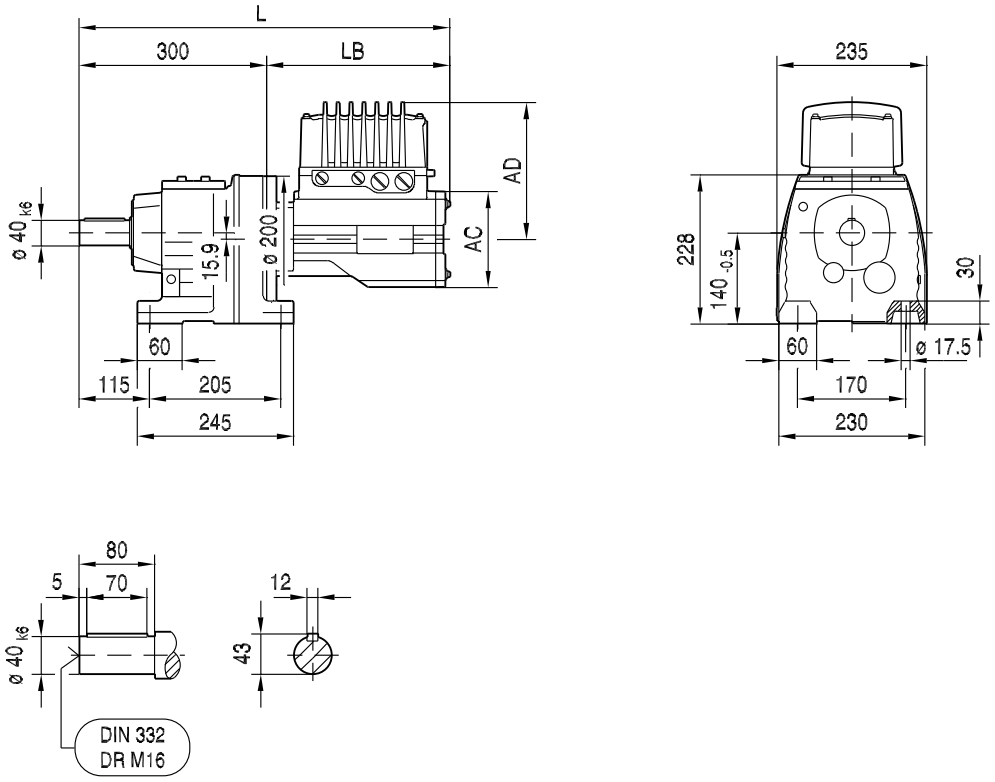
01 023 00 12



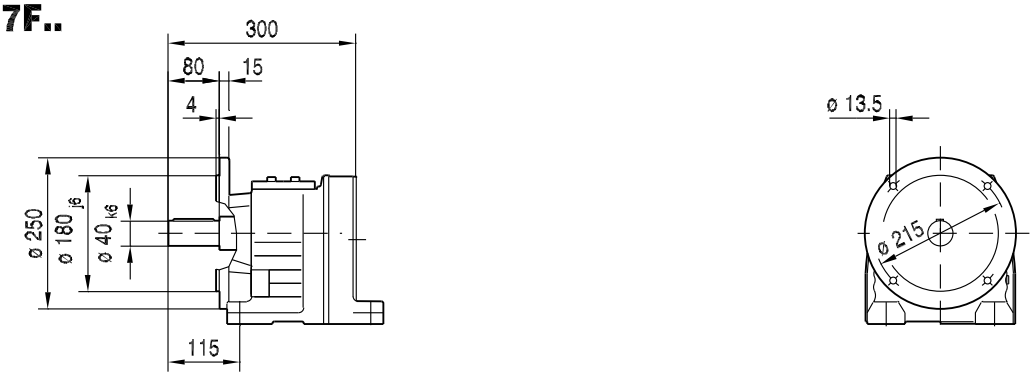
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	567	584						
LB	287	304						

01 024 00 12

R77..



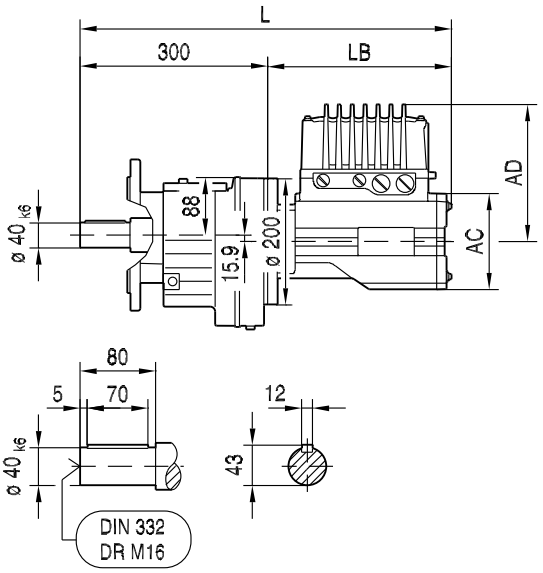
R77F..

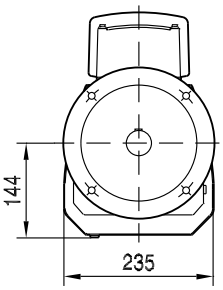


(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	581	596						
LB	281	296						

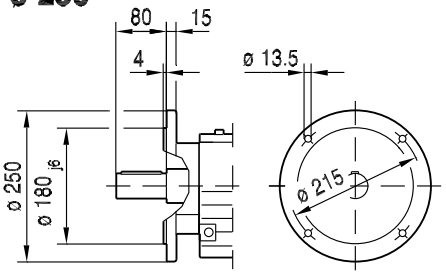
01 025 00 12

RF77..

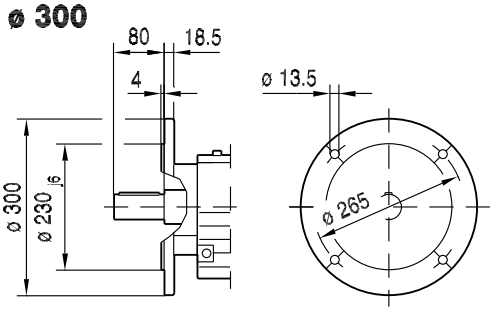




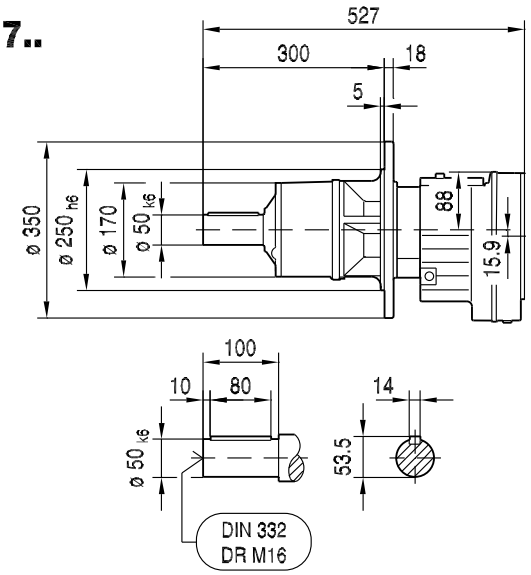
ø 250

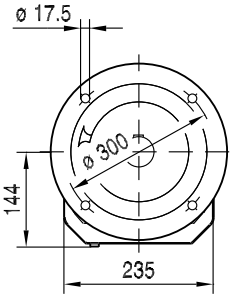


ø 300



RM77..

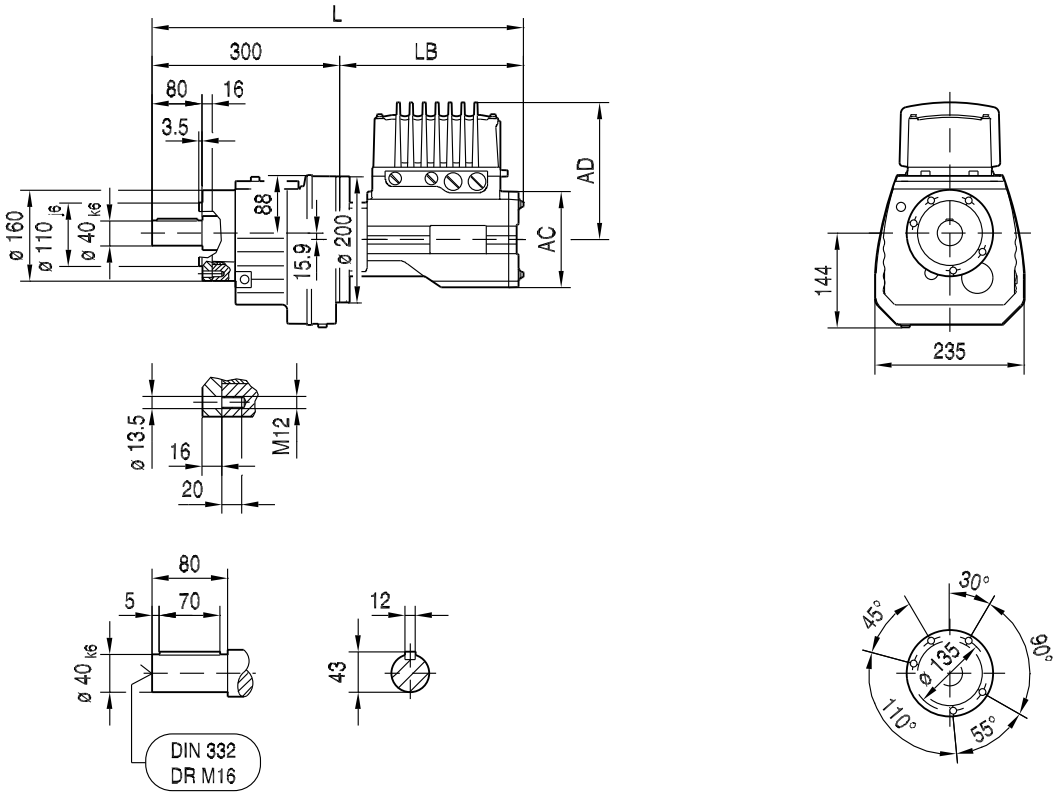




(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	581	596						
LB	281	296						

RZ77..

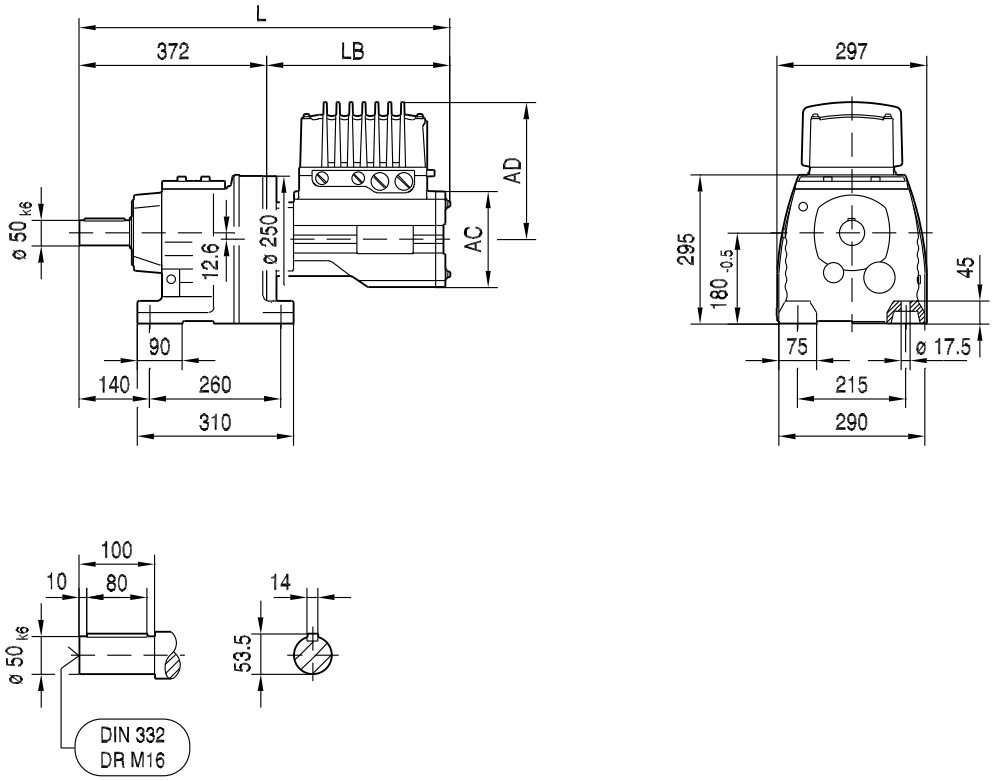
01 026 00 12



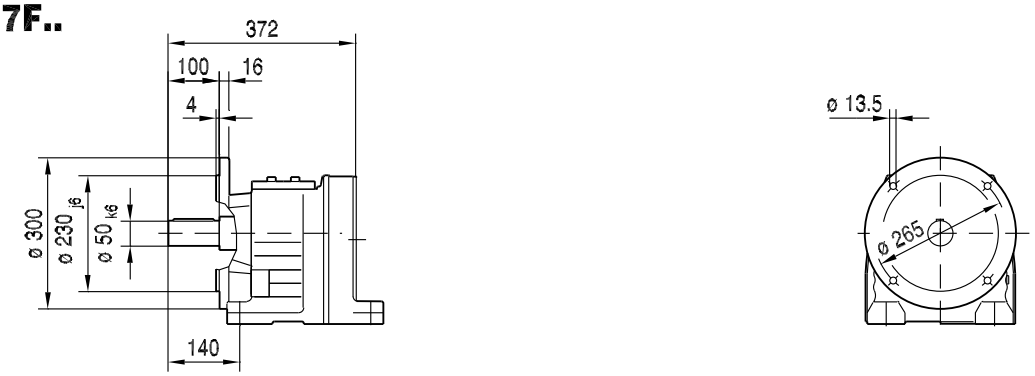
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	581	596						
LB	281	296						

01 027 00 12

R87..



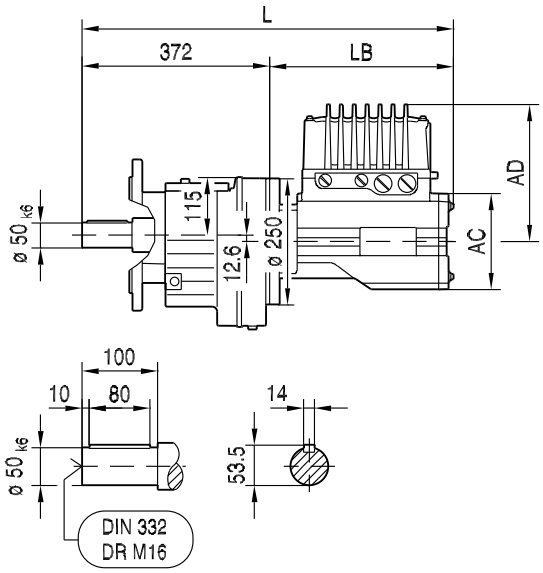
R87F..

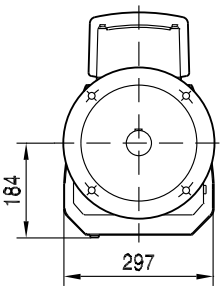


(→ 📖 265)	DRC2							
AC	154							
AD	218							
L	664							
LB	292							

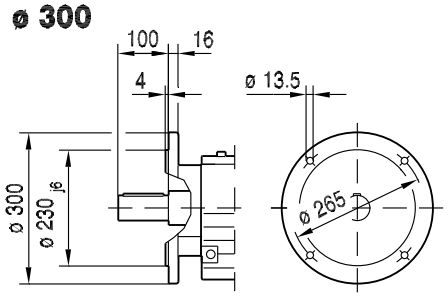
01 028 00 12

RF87..

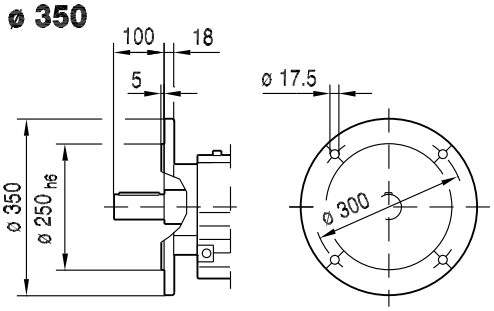




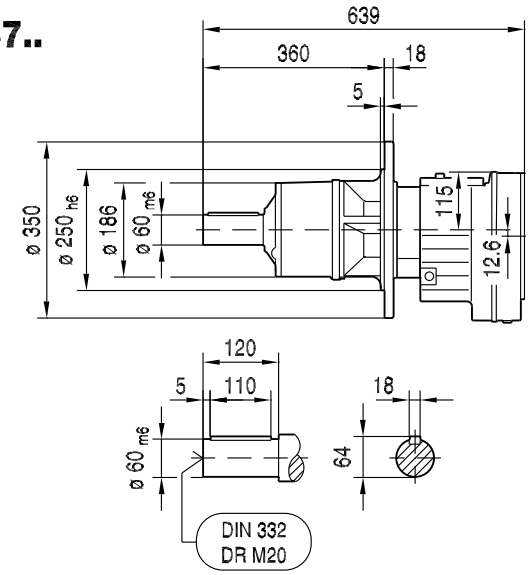
ø 300

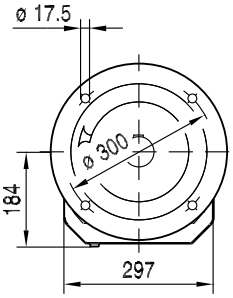


ø 350



RM87..

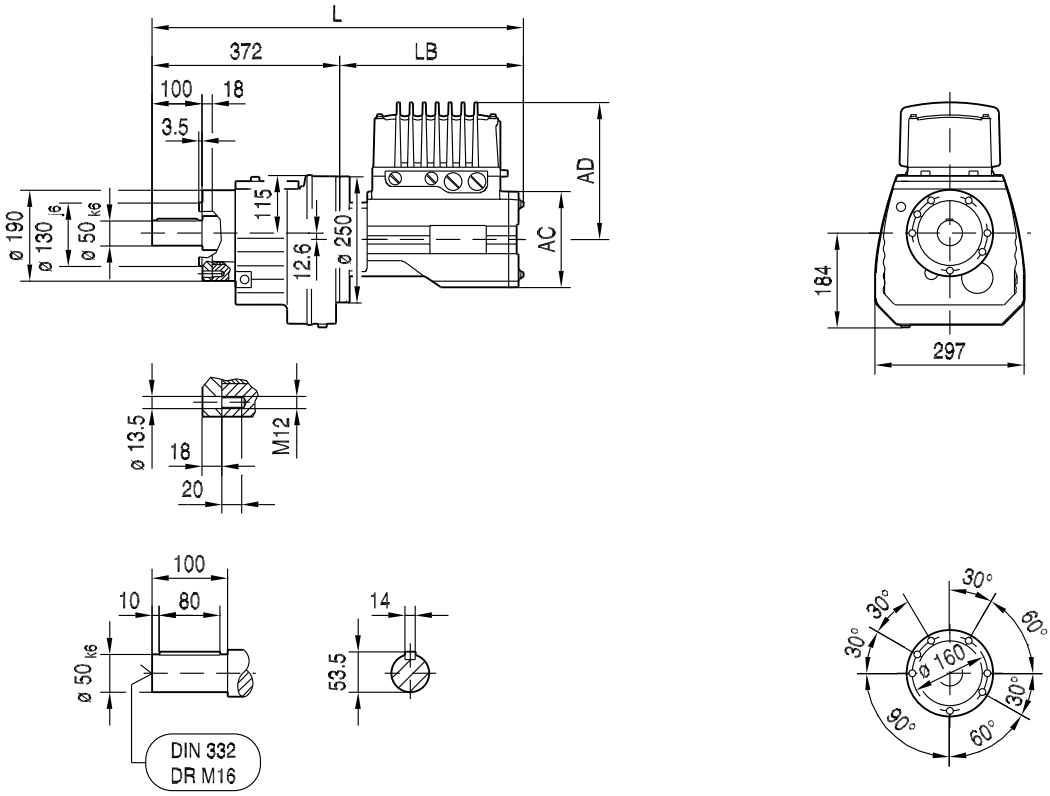




(→ 📖 265)	DRC2							
AC	154							
AD	218							
L	664							
LB	292							

RZ87..

01 029 00 12

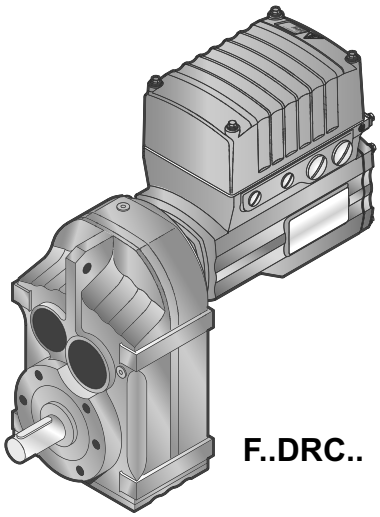


(→ 📖 265)	DRC2							
AC	154							
AD	218							
L	664							
LB	292							

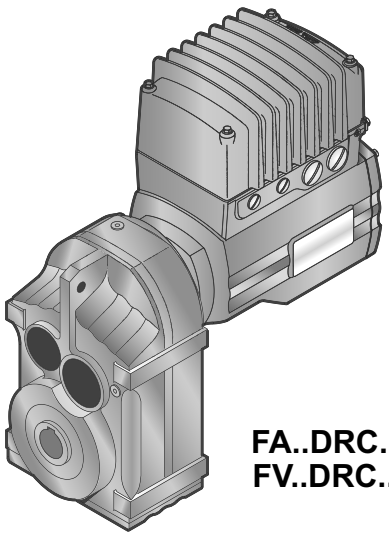
Page remains empty for printing reasons.

12 Parallel-Shaft Helical Gearmotors

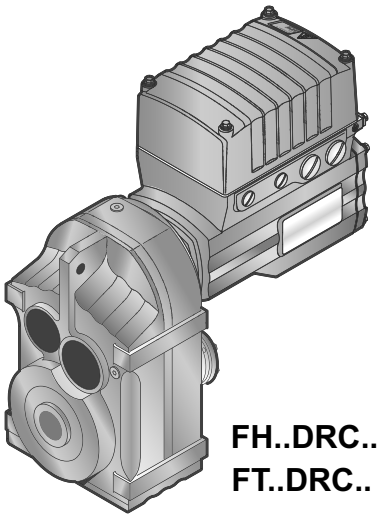
12.1 Variants



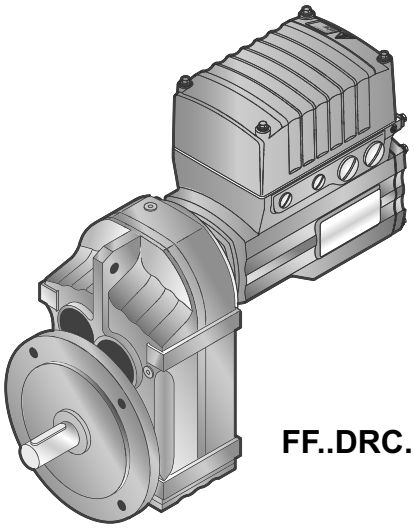
F..DRC..



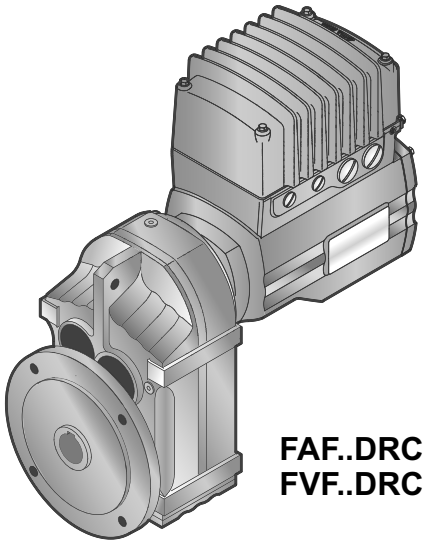
FA..DRC..
FV..DRC..



FH..DRC..
FT..DRC..

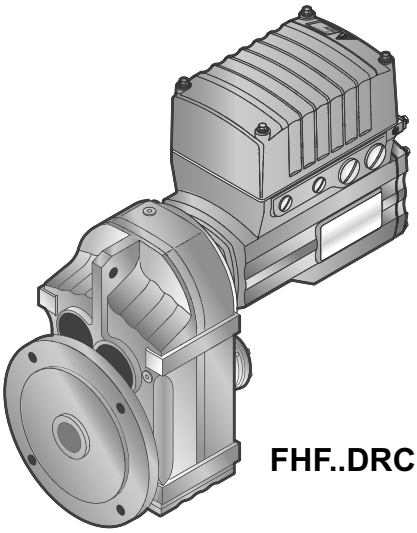


FF..DRC..

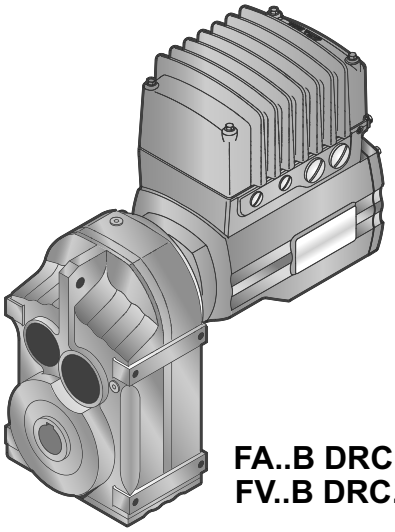


FAF..DRC..
FVF..DRC..

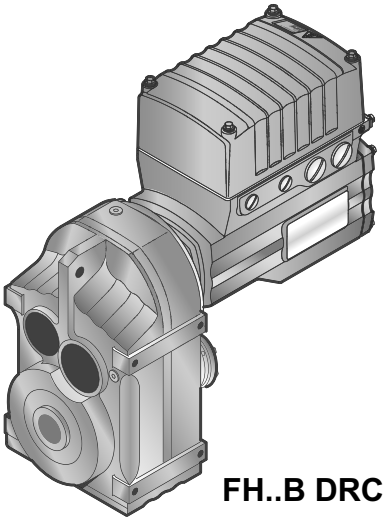
9007204207788427



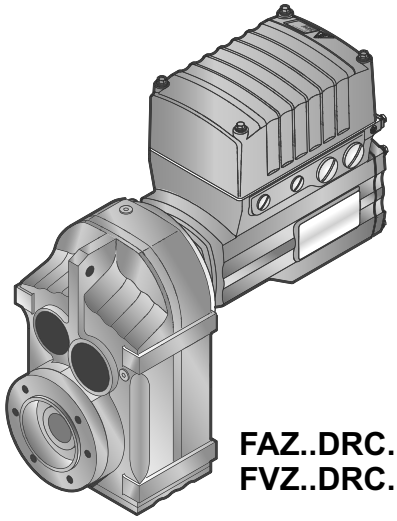
FHF..DRC..



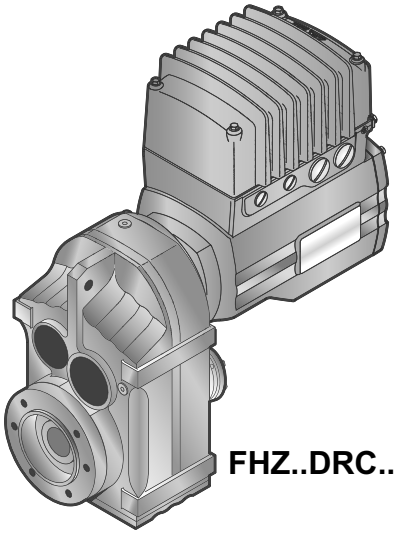
FA..B DRC..
FV..B DRC..



FH..B DRC..



FAZ..DRC..
FVZ..DRC..



FHZ..DRC..

9007204207786507

12.2 Selection tables

12.2.1 F 27

			DRC1		DRC2			
	na_1 [rpm]	na_{2000} [rpm]	M_a [Nm]	M_{apk} [Nm]	M_a [Nm]	M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
FA27 2	0.24	481	11	28	30	75	148	4.16
	0.20	406	13	33	35	89	163	4.93
	0.19	380	14	35	38	95	170	5.27
	0.16	324	16	41	44	111	185	6.17
	0.14	289	18	46	50	124	194	6.91
	0.12	246	22	54	59	146	209	8.13
	0.11	213	25	62	68	>163	221	9.40
	0.10	202	26	65	71	>157	221	9.88
	0.09	190	28	70	76	>157	221	10.55
	0.08	162	33	82	89	>157	221	12.35
	0.07	145	37	92	100	>157	221	13.84
	0.06	123	43	108	117	>157	221	16.28
	0.05	106	50	125	>130	>157	221	18.84
	0.05	99	53	133	>130	>157	221	20.15
	0.04	86	62	154			221	23.25
	0.04	74	72	>157			221	27.18
	0.03	68	78	>157			221	29.56
FA27 3	0.03	59	90	>157	>130	>157	221	33.83
	0.03	52	102	>157	>130	>157	221	38.33
	0.02	49	108	>157	>130	>157	221	40.89
	0.02	43	124	>157	>130	>157	221	46.78
	0.02	40	>130	>157	>130	>157	221	50.19
	0.02	35	>130	>157	>130	>157	221	56.62
	0.02	31	>130	>157	>130	>157	221	63.86
	0.01	28	>130	>157	>130	>157	221	72.37
	0.01	26	>130	>157	>130	>157	221	77.21
	0.01	23	>130	>157	>130	>157	221	88.32
	0.01	21	>130	>157	>130	>157	221	94.76
	0.009	18	>130	>157			221	109.90
	0.008	15	>130	>157			221	129.09
	0.007	14	>130	>157			221	140.74

m [kg]			DRC1	DRC2		
FA27	2		25	31		
FA27	3		26	32		
FAF: + 0.7 kg / F: + 0.5 kg / FF: + 1.3 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	FA [N]	FAF [N]	F [N]	FF [N]	FA [N]	FAF [N]	F [N]	FF [N]
FA27 2	4.16	-	1.4	1810	1810	1380	1180	4500	4500	4500	4500
	4.93	-	1.0	1860	1860	1420	1210	4500	4500	4500	4500
	5.27	-	0.90	1880	1880	1440	1220	4500	4500	4500	4500
	6.17	-	0.68	1940	1940	1480	1260	4500	4500	4500	4500
	6.91	-	0.56	2000	2000	1530	1300	4500	4500	4500	4500
	8.13	-	0.42	2080	2080	1580	1350	4500	4500	4500	4500
	9.40	-	0.33	2170	2170	1660	1410	4500	4500	4500	4500
	9.88	-	0.74	2400	2400	1830	1560	4500	4500	4500	4500
	10.55	-	0.67	2490	2490	1900	1620	4500	4500	4500	4500
	12.35	-	0.51	2700	2700	2060	1760	4500	4500	4500	4500
	13.84	-	0.43	2860	2860	2180	1860	4500	4500	4500	4500
	16.28	-	0.32	3110	3110	2370	2020	4500	4500	4500	4500
	18.84	-	0.26	3340	3340	2550	2170	4500	4500	4500	4500
	20.15	-	0.23	3450	3450	2630	2240	4500	4500	4500	4500
	23.25	-	0.19	3690	3690	2820	2400	4500	4500	4500	4500
	27.18	-	0.15	3970	3970	3030	2580	4500	4500	4500	4500
	29.56	-	0.13	4120	4120	3140	2680	4500	4500	4500	4500
FA27 3	33.83	-	0.31	4380	4380	3340	2850	4500	4500	4500	4500
	38.33	-	0.26	4500	4500	3530	3010	4500	4500	4500	4500
	40.89	-	0.23	4500	4500	3640	3100	4500	4500	4500	4500
	46.78	-	0.18	4500	4500	3860	3290	4500	4500	4500	4500
	50.19	-	0.17	4500	4500	3980	3390	4500	4500	4500	4500
	56.62	-	0.31	4500	4500	4180	3570	4500	4500	4500	4500
	63.86	-	0.26	4500	4500	4400	3750	4500	4500	4500	4500
	72.37	-	0.22	4500	4500	4500	3960	4500	4500	4500	4500
	77.21	-	0.20	4500	4500	4500	4060	4500	4500	4500	4500
	88.32	-	0.16	4500	4500	4500	4290	4500	4500	4500	4500
	94.76	-	0.15	4500	4500	4500	4420	4500	4500	4500	4500
	109.90	-	0.12	4500	4500	4500	4500	4500	4500	4500	4500
	129.09	-	0,090	4500	4500	4500	4500	4500	4500	4500	4500
	140.74	-	0,080	4500	4500	4500	4500	4500	4500	4500	4500

12.2.2 F 37

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
FA37 2	0.27	531	10.0	25	27	68	179	3.77
	0.24	474	11	28	30	76	187	4.22
	0.20	408	13	32	35	88	204	4.90
	0.19	384	14	34	38	94	213	5.21
	0.17	331	16	40	44	109	230	6.05
	0.15	297	18	45	49	121	238	6.74
	0.13	269	20	49	54	134	247	7.44
	0.12	250	21	53	58	144	289	8.01
	0.11	223	24	59	65	161	298	8.97
	0.10	192	28	69	75	188	315	10.42
	0.09	181	29	73	80	199	323	11.08
	0.08	155	34	85	93	230	340	12.87
	0.07	140	38	95	103	>240	340	14.33
	0.06	127	42	105	114	>240	340	15.81
	0.06	117	45	113	123	>240	340	17.03
	0.05	104	51	128	139	>240	340	19.27
	0.05	97	55	136	148	>240	340	20.57
	0.04	85	63	156			340	23.63
FA37 3	0.04	84	63	158	172	>240	340	23.88
	0.04	71	74	186	>200	>240	340	28.09
	0.03	63	84	205	>200	>240	340	31.69
	0.03	56	95	235	>200	>240	340	35.91
	0.03	52	102	>240	>200	>240	340	38.31
	0.02	46	116	>240	>200	>240	340	43.83
	0.02	43	125	>240	>200	>240	340	47.02
	0.02	39	137	>240	>200	>240	340	51.70
	0.02	37	145	>240			340	54.54
	0.02	34	155	>240	>200	>240	340	58.32
	0.02	30	175	>240	>200	>240	340	66.09
	0.01	28	187	>240	>200	>240	340	70.50
	0.01	25	>200	>240	>200	>240	340	80.65
	0.01	23	>200	>240	>200	>240	340	86.53
	0.010	20	>200	>240			340	100.36
	0.008	17	>200	>240			340	117.88
	0.008	16	>200	>240			340	128.51

m [kg]			DRC1	DRC2		
FA37	2		32	38		
FA37	3		32	38		
FAF: + 1.5 kg / F: + 0.5 kg / FF: + 2.3 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	FA [N]	FAF [N]	F [N]	FF [N]	FA [N]	FAF [N]	F [N]	FF [N]
FA37 2	3.77	12	2.8	2470	2470	1970	2220	7000	7000	4810	5860
	4.22	11	2.3	2550	2550	2030	2300	7000	7000	4730	5820
	4.90	11	1.8	2630	2630	2100	2380	7000	7000	4560	5740
	5.21	10	1.6	2660	2660	2120	2410	7000	7000	4470	5700
	6.05	10	1.2	2750	2750	2190	2510	7000	7000	4460	5700
	6.74	10	1.0	2850	2850	2270	2600	7000	7000	4460	5700
	7.44	10	0.83	2940	2940	2350	2680	7000	7000	4460	5700
	8.01	7	1.5	2960	2960	2360	2710	7000	7000	3610	4100
	8.97	7	1.3	3080	3080	2460	2820	7000	7000	3610	4100
	10.42	7	1.0	3230	3230	2580	2960	7000	7000	3610	4100
	11.08	7	0.94	3290	3290	2620	3020	7000	7000	3610	4100
	12.87	7	0.74	3450	3450	2750	3170	7000	7000	3610	4100
	14.33	7	0.63	3650	3650	2910	3330	7000	7000	3610	4100
	15.81	6	0.52	3840	3840	3070	3490	7000	7000	3610	4100
	17.03	6	0.48	3990	3990	3180	3610	7000	7000	3610	4100
	19.27	6	0.40	4250	4250	3390	3820	7000	7000	3610	4100
	20.57	6	0.36	4390	4390	3500	3940	7000	7000	3610	4100
	23.63	6	0.29	4690	4690	3740	4190	7000	7000	3610	4100
FA37 3	23.88	8	0.60	4720	4720	3760	4210	7000	7000	3610	4100
	28.09	8	0.45	5090	5090	4060	4520	7000	7000	3610	4100
	31.69	8	0.35	5380	5380	4290	4760	7000	7000	3610	4100
	35.91	8	0.29	5700	5700	4290	5020	7000	7000	3610	4100
	38.31	8	0.26	5870	5870	4290	5160	7000	7000	3610	4100
	43.83	8	0.21	6240	6240	4290	5460	7000	7000	3610	4100
	47.02	8	0.19	6430	6430	4290	5620	7000	7000	3610	4100
	51.70	7	0.34	6710	6710	4290	5670	7000	7000	3610	4100
	54.54	8	0.15	6860	6860	4290	5670	7000	7000	3610	4100
	58.32	7	0.27	7000	7000	4290	5670	7000	7000	3610	4100
	66.09	7	0.23	7000	7000	4290	5670	7000	7000	3610	4100
	70.50	7	0.21	7000	7000	4290	5670	7000	7000	3610	4100
	80.65	7	0.17	7000	7000	4290	5670	7000	7000	3610	4100
	86.53	7	0.15	7000	7000	4290	5670	7000	7000	3610	4100
	100.36	7	0.12	7000	7000	4290	5670	7000	7000	3610	4100
	117.88	7	0.10	7000	7000	4290	5670	7000	7000	3610	4100
	128.51	7	0.080	7000	7000	4290	5670	7000	7000	3610	4100

12.2.3 F 47

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
FA47 2	0.20	401	13	33	36	90	544	4.99
	0.17	347	15	38	41	104	578	5.76
	0.16	315	17	42	46	114	595	6.34
	0.13	269	20	49	54	134	646	7.44*
	0.13	254	21	52	57	142	646	7.88
	0.11	223	24	59	65	161	561	8.96
	0.09	182	29	73	79	197	680	10.97
	0.08	158	34	84	91	225	680	12.66
	0.07	144	37	92	100	250	680	13.93
	0.06	122	43	108	118	290	680	16.36
	0.06	115	46	115	125	310	680	17.33
	0.05	102	52	130	142	350	680	19.70
	0.05	92	58	144	157	390	680	21.82
	0.04	78	68	170	185	>435	680	25.72
	0.03	68	78	194	210	>435	680	29.32
	0.03	65	82	200	220	>435	680	30.86
FA47 3	0.03	69	77	191	205	>435	680	28.88
	0.03	58	91	225	245	>435	680	34.29
	0.03	55	97	240	260	>435	680	36.61
	0.02	47	114	280	305	>435	680	42.86
	0.02	42	127	315	345	>435	680	48.00*
	0.02	35	150	370	>400	>435	680	56.49
	0.02	31	173	430	>400	>435	680	65.36
	0.01	29	180	>435	>400	>435	680	68.09
	0.01	25	210	>435	>400	>435	680	79.72
	0.01	22	235	>435	>400	>435	680	89.29
	0.010	19	275	>435	>400	>435	680	105.09
	0.008	16	320	>435	>400	>435	680	121.57
	0.008	15	340	>435	>400	>435	680	130.07
	0.007	13	395	>435			680	150.06
	0.006	11	>400	>435			680	175.38
	0.005	10	>400	>435			680	190.76

m [kg]			DRC1	DRC2		
FA47	2		36	42		
FA47	3		37	43		
FAF: + 2.7 kg / F: + 0.8 kg / FF: + 3.9 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	FA [N]	FAF [N]	F [N]	FF [N]	FA [N]	FAF [N]	F [N]	FF [N]
FA47 2	4.99	9	4.4	1160	1160	2310	2410	10000	10000	900	900
	5.76	9	3.4	1180	1180	2390	2500	10000	10000	900	900
	6.34	8	2.9	1230	1230	2470	2580	10000	10000	900	900
	7.44*	8	2.3	1190	1190	2530	2660	10000	10000	900	900
	7.88	8	2.1	1280	1280	2630	2750	10000	10000	900	900
	8.96	8	1.6	1970	1970	3250	3310	10000	10000	900	900
	10.97	6	2.6	2060	2060	3440	3510	10000	10000	900	900
	12.66	6	2.1	2320	2320	3740	3790	10000	10000	900	900
	13.93	6	1.8	2510	2510	3950	3990	10000	10000	900	900
	16.36	6	1.5	2840	2840	4320	4340	10000	10000	900	900
	17.33	6	1.4	2960	2960	4450	4470	10000	10000	900	900
	19.70	6	1.1	3230	3230	4770	4770	10000	10000	900	900
	21.82	6	0.96	3460	3460	5030	5020	10000	10000	900	900
	25.72	6	0.75	3850	3850	5460	5430	10000	10000	900	900
	29.32	6	0.52	4170	4170	5830	5780	10000	10000	900	900
	30.86	6	0.46	4300	4300	5920	5920	10000	10000	900	900
FA47 3	28.88	7	1.1	4130	4130	5790	5740	10000	10000	900	900
	34.29	7	0.85	4580	4580	5920	5920	10000	10000	900	900
	36.61	7	0.76	4750	4750	5920	5920	10000	10000	900	900
	42.86	7	0.58	5190	5190	5920	5920	10000	10000	900	900
	48.00*	7	0.48	5520	5520	5920	5920	10000	10000	900	900
	56.49	7	0.36	6020	6020	5920	5920	10000	10000	900	900
	65.36	7	0.29	6490	6490	5920	5920	10000	10000	900	900
	68.09	6	0.61	6620	6620	5920	5920	10000	10000	900	900
	79.72	6	0.48	7160	7160	5920	5920	10000	10000	900	900
	89.29	6	0.40	7570	7570	5920	5920	10000	10000	900	900
	105.09	6	0.30	8180	8180	5920	5920	10000	10000	900	900
	121.57	6	0.25	8760	8760	5920	5920	10000	10000	900	900
	130.07	6	0.23	9040	9040	5920	5920	10000	10000	900	900
	150.06	6	0.18	9640	9640	5920	5920	10000	10000	900	900
	175.38	6	0.14	10000	10000	5920	5920	10000	10000	900	900
	190.76	6	0.13	10000	10000	5920	5920	10000	10000	900	900

12.2.4 F 57

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
FA57 2	0.19	386	14	34	37	93	706	5.18
	0.17	334	16	40	43	108	714	5.98
	0.15	304	17	44	47	118	714	6.58
	0.13	259	20	51	56	139	714	7.73
	0.12	244	22	54	59	147	714	8.19
	0.11	215	25	62	67	168	714	9.31
	0.09	188	28	70	77	192	1020	10.64
	0.08	163	33	81	88	220	1020	12.29
	0.07	148	36	90	97	240	1020	13.52
	0.06	126	42	105	114	285	1020	15.88
	0.06	119	45	111	121	300	1020	16.81
	0.05	105	51	127	138	340	1020	19.11
	0.05	94	56	140	152	380	1020	21.17
	0.04	80	66	165	180	445	978	24.96
	0.04	70	75	188	200	510	910	28.45
	0.03	67	79	198	215	535	927	29.94
	0.03	58	91	225			850	34.24
	0.02	50	106	265			493	40.13
FA57 3	0.03	66	80	200	215	540	1003	30.15
	0.03	56	95	235	255	640	1020	35.79
	0.03	52	101	250	275	>645	1020	38.21
	0.02	45	119	295	320	>645	1020	44.73
	0.02	40	133	330	360	>645	1020	50.10
	0.02	34	156	390	420	>645	1020	58.97
	0.01	29	181	450	490	>645	1020	68.22
	0.01	27	193	480	525	>645	1020	72.98
	0.01	24	220	550	>600	>645	1020	83.46
	0.01	21	245	615	>600	>645	1020	93.47
	0.009	18	290	>645	>600	>645	1020	110.01
	0.008	16	335	>645	>600	>645	1020	127.27
	0.007	15	360	>645	>600	>645	1020	136.16
	0.006	13	415	>645			1020	157.09
	0.005	11	485	>645			1020	183.60
	0.005	10	525	>645			1020	199.70

m [kg]			DRC1	DRC2		
FA57	2		43	49		
FA57	3		44	50		
FAF: + 5.5 kg / F: + 0.2 kg / FF: + 6.6 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	FA [N]	FAF [N]	F [N]	FF [N]	FA [N]	FAF [N]	F [N]	FF [N]
FA57 2	5.18	9	5.8	2020	2020	3460	3670	11500	11500	9910	8490
	5.98	9	4.5	2240	2240	3730	3940	11500	11500	9910	8490
	6.58	8	3.8	2430	2430	3940	4140	11500	11500	9880	8460
	7.73	8	2.9	2760	2760	4310	4500	11500	11500	9880	8460
	8.19	8	2.6	2880	2880	4450	4640	11500	11500	9840	8440
	9.31	8	2.0	3170	3170	4760	4950	11500	11500	10000	8580
	10.64	6	3.2	2470	2470	4320	4590	11500	11500	6930	6930
	12.29	6	2.6	2810	2810	4710	4970	11500	11500	6930	6930
	13.52	6	2.2	3050	3050	4980	5230	11500	11500	6930	6930
	15.88	6	1.8	3470	3470	5450	5690	11500	11500	6930	6930
	16.81	6	1.6	3630	3630	5620	5860	11500	11500	6930	6930
	19.11	6	1.3	3980	3980	6020	6260	11500	11500	6930	6930
	21.17	6	1.1	4280	4280	6350	6580	11500	11500	6930	6930
	24.96	6	0.84	4970	4970	7060	7260	11500	11500	6930	6930
	28.45	6	0.59	5690	5690	7760	7930	11500	11500	6930	6930
	29.94	6	0.53	5790	5790	7890	8060	11500	11500	6930	6930
	34.24	6	0.43	6580	6580	8670	8500	11500	11500	6930	6930
	40.13	6	0.34	8750	8750	10500	9550	11500	11500	10400	8850
FA57 3	30.15	7	1.3	5460	5460	7650	7850	11500	11500	6930	6930
	35.79	7	0.94	5980	5980	8250	7900	11500	11500	6930	6930
	38.21	7	0.84	6210	6210	8510	7900	11500	11500	6930	6930
	44.73	7	0.64	6790	6790	9160	7900	11500	11500	6930	6930
	50.10	7	0.52	7230	7230	9200	7900	11500	11500	6930	6930
	58.97	7	0.38	7890	7890	9200	7900	11500	11500	6930	6930
	68.22	6	0.31	8510	8510	9200	7900	11500	11500	6930	6930
	72.98	6	0.28	8810	8810	9200	7900	11500	11500	6930	6930
	83.46	6	0.51	9420	9420	9200	7900	11500	11500	6930	6930
	93.47	6	0.42	9960	9960	9200	7900	11500	11500	6930	6930
	110.01	6	0.31	10800	10800	9200	7900	11500	11500	6930	6930
	127.27	6	0.26	11500	11500	9200	7900	11500	11500	6930	6930
	136.16	6	0.23	11500	11500	9200	7900	11500	11500	6930	6930
	157.09	6	0.19	11500	11500	9200	7900	11500	11500	6930	6930
	183.60	6	0.15	11500	11500	9200	7900	11500	11500	6930	6930
	199.70	6	0.13	11500	11500	9200	7900	11500	11500	6930	6930

12.2.5 F 67

			DRC1		DRC2			
	na_1 [rpm]	na_{2000} [rpm]	M_a [Nm]	M_{apk} [Nm]	M_a [Nm]	M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
FA67 2	0.25	504			29	71	850	3.97
	0.21	429			34	84	952	4.66
	0.19	381			38	94	1003	5.25
	0.17	336	16	39	43	107	1037	5.95
	0.15	295	18	45	49	122	1054	6.78
	0.13	266	20	50	54	136	1037	7.53
	0.12	233	23	57	62	155	969	8.60
	0.11	220	24	60	65	163	901	9.08
	0.10	207			70	174	1394	9.66
	0.09	177			81	200	1394	11.31
	0.08	157			92	225	1394	12.76
	0.07	138	38	96	104	260	1394	14.46
	0.06	121	44	109	119	295	1394	16.48
	0.05	109	48	121	132	325	1394	18.29
	0.05	96	55	138	150	375	1394	20.90*
	0.05	91	58	146	159	395	1394	22.05
	0.04	80	67	166	181	450	1394	25.13
	0.04	73	73	181	197	490	1394	27.41
	0.03	62	85	210	230	575	1394	32.08
	0.03	55	96	240	260	650	1394	36.30
FA67 3	0.03	59	90	225	240	610	1258	34.01
	0.03	51	104	255	280	705	1326	39.26
	0.02	46	114	285	310	775	1394	43.20
	0.02	39	134	335	365	910	1394	50.74
	0.02	37	142	355	385	>920	1394	53.73
	0.02	33	162	400	435	>920	1394	61.07
	0.01	30	179	445	485	>920	1394	67.65
	0.01	25	210	525	570	>920	1394	79.76
	0.01	22	240	595	650	>920	1394	90.59
	0.01	21	250	635	690	>920	1394	95.94
	0.009	18	285	720	785	>920	1394	109.04
	0.008	17	320	795	>820	>920	1394	120.79
	0.007	14	375	>920	>820	>920	1394	142.40
	0.006	12	430	>920	>820	>920	1394	162.31
	0.006	12	450	>920	>820	>920	1394	170.85
	0.005	10	515	>920			1394	195.39
	0.004	8.7	605	>920			1394	228.99

m [kg]			DRC1	DRC2		
FA67	2		47	53		
FA67	3		48	54		
FAF: + 6.3 kg / F: + 2.8 kg / FF: + 8.9 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	FA [N]	FAF [N]	F [N]	FF [N]	FA [N]	FAF [N]	F [N]	FF [N]
FA67 2	3.97	10	16	1220	1220	8390	8620	13000	13000	11300	11300
	4.66	9	12	1020	1020	8590	8860	13000	13000	11300	11300
	5.25	9	10.0	1010	1010	8850	9140	13000	13000	11200	11200
	5.95	9	8.0	1090	1090	9200	9500	13000	13000	11200	11200
	6.78	9	6.3	1280	1280	9660	9950	13000	13000	11200	11200
	7.53	8	5.5	1570	1570	10100	10400	13000	13000	11200	11200
	8.60	8	4.4	2180	2180	10900	11200	13000	13000	11200	11200
	9.08	8	4.0	2620	2620	11400	11600	13000	13000	11200	11200
	9.66	6	8.5	1580	1580	10300	10300	13000	13000	9310	9310
	11.31	6	6.7	1960	1960	10300	10300	13000	13000	9310	9310
	12.76	6	5.6	2260	2260	10300	10300	13000	13000	9310	9310
	14.46	6	4.6	2580	2580	10300	10300	13000	13000	9310	9310
	16.48	6	3.8	2940	2940	10300	10300	13000	13000	9310	9310
	18.29	6	3.4	3230	3230	10300	10300	13000	13000	9310	9310
	20.90*	5	2.7	3620	3620	10300	10300	13000	13000	9310	9310
	22.05	5	2.5	3780	3780	10300	10300	13000	13000	9310	9310
	25.13	5	2.0	4190	4190	10300	10300	13000	13000	9310	9310
	27.41	5	1.7	4470	4470	10300	10300	13000	13000	9310	9310
	32.08	5	1.4	5000	5000	10300	10300	13000	13000	9310	9310
	36.30	5	0.98	5440	5440	10300	10300	13000	13000	9310	9310
FA67 3	34.01	6	2.8	5730	5730	11000	11000	13000	13000	9310	9310
	39.26	6	2.2	5980	5980	10700	10700	13000	13000	9310	9310
	43.20	6	1.9	6080	6080	10300	10300	13000	13000	9310	9310
	50.74	6	1.6	6710	6710	10300	10300	13000	13000	9310	9310
	53.73	6	1.4	6940	6940	10300	10300	13000	13000	9310	9310
	61.07	6	1.1	7480	7480	10300	10300	13000	13000	9310	9310
	67.65	6	0.97	7930	7930	10300	10300	13000	13000	9310	9310
	79.76	6	0.76	8680	8680	10300	10300	13000	13000	9310	9310
	90.59	6	1.4	9290	9290	10300	10300	13000	13000	9310	9310
	95.94	6	1.2	9570	9570	10300	10300	13000	13000	9310	9310
	109.04	6	0.98	10200	10200	10300	10300	13000	13000	9310	9310
	120.79	6	0.85	10800	10800	10300	10300	13000	13000	9310	9310
	142.40	6	0.68	11700	11700	10300	10300	13000	13000	9310	9310
	162.31	6	0.47	12400	12400	10300	10300	13000	13000	9310	9310
	170.85	6	0.42	12700	12700	10300	10300	13000	13000	9310	9310
	195.39	6	0.34	13000	13000	10300	10300	13000	13000	9310	9310
	228.99	6	0.27	13000	13000	10300	10300	13000	13000	9310	9310

12.2.6 F 77

			DRC1		DRC2			
	na_1 [rpm]	na_{2000} [rpm]	M_a [Nm]	M_{apk} [Nm]	M_a [Nm]	M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
FA77 2	0.23	467					1717	4.28
	0.19	388					1836	5.16
	0.17	347			41	104	1836	5.76
	0.15	301			48	120	1836	6.64
	0.14	271			53	133	1836	7.39
	0.12	242	22	55	59	149	1836	8.26
	0.11	215	25	62	67	167	1836	9.30
	0.09	183					2550	10.93
	0.08	164			88	215	2550	12.20
	0.07	142			101	250	2550	14.06
	0.06	128			113	280	2550	15.64*
	0.06	114	46	116	126	310	2550	17.49
	0.05	102	52	130	142	350	2550	19.70
	0.05	93	57	142	154	385	2550	21.43
	0.04	78	68	169	184	455	2550	25.50*
	0.03	70	76	190	205	515	2431	28.75
	0.03	63	84	205	225	565	2346	31.51
	0.03	55	97	240	260	655	1887	36.58
FA77 3	0.04	78			184	455	2465	25.54
	0.03	67			215	535	2550	29.91
	0.03	59			240	605	2550	33.74
	0.03	52	101	250	275	685	2550	38.23
	0.02	46	115	285	310	780	2550	43.58
	0.02	41	128	320	345	870	2550	48.37
	0.02	36	146	365	395	990	2550	55.27
	0.02	34	155	385	415	1040	2550	58.32
	0.02	30	176	435	475	1190	2550	66.46
	0.01	28	192	475	520	1300	2550	72.50
	0.01	27	199	495	540	1350	2550	75.02
	0.01	23	225	565	615	>1530	2550	85.52
	0.01	21	250	625	680	>1530	2550	94.93
	0.009	18	285	715	780	>1530	2550	108.46*
	0.009	17	300	755	820	>1530	2550	114.45
	0.008	15	345	860	930	>1530	2550	130.42
	0.007	14	375	940	1020	>1530	2550	142.27
	0.006	12	440	1100	1190	>1530	2550	166.47
	0.005	11	495	1240	1350	>1530	2550	188.40
	0.005	10	525	1310	1420	>1530	2550	198.31
	0.004	8.9	595	1490			2550	225.79
	0,004	7.6	695	>1530			2550	262.93
	0.004	7.1	745	>1530			2550	281.71

m [kg]			DRC1	DRC2		
FA77	2		70	76		
FA77	3		72	78		
FAF: + 6.6 kg / F: + 3.8 kg / FF: + 14.4 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	FA [N]	FAF [N]	F [N]	FF [N]	FA [N]	FAF [N]	F [N]	FF [N]
FA77 2	4.28	8	42	630	630	10200	10900	20000	20000	16900	17400
	5.16	8	31	640	640	10700	11500	20000	20000	16800	17400
	5.76	8	26	930	930	11300	12000	20000	20000	16800	17400
	6.64	8	20	1310	1310	12000	12700	20000	20000	16800	17400
	7.39	7	17	1610	1610	12500	13300	20000	20000	16800	17400
	8.26	7	14	1940	1940	13100	13900	20000	20000	16800	17400
	9.30	7	12	2300	2300	13800	14600	20000	20000	16800	17400
	10.93	6	19	2080	2080	14200	15100	20000	20000	15500	17000
	12.20	5	16	2450	2450	14900	15800	20000	20000	15500	17000
	14.06	5	13	2940	2940	15700	16700	20000	20000	15500	17000
	15.64*	5	11	3330	3330	15700	17100	20000	20000	15500	17000
	17.49	5	9.5	3750	3750	15700	17100	20000	20000	15500	17000
	19.70	5	7.9	4220	4220	15700	17100	20000	20000	15500	17000
	21.43	5	7.1	4560	4560	15700	17100	20000	20000	15500	17000
	25.50*	5	5.5	5300	5300	15700	17100	20000	20000	15500	17000
	28.75	5	4.4	6190	6190	16200	17300	20000	20000	15500	17000
	31.51	5	3.8	6870	6870	16500	17500	20000	20000	15500	17000
	36.58	5	3.0	8990	8990	17900	18300	20000	20000	15500	17000
FA77 3	25.54	6	10	5560	5560	16100	17300	20000	20000	15500	17000
	29.91	6	7.8	6010	6010	15700	17100	20000	20000	15500	17000
	33.74	6	6.4	6580	6580	15700	17100	20000	20000	15500	17000
	38.23	6	5.2	7190	7190	15700	17100	20000	20000	15500	17000
	43.58	6	4.3	7850	7850	15700	17100	20000	20000	15500	17000
	48.37	6	3.8	8410	8410	15700	17100	20000	20000	15500	17000
	55.27	6	3.0	9140	9140	15700	17100	20000	20000	15500	17000
	58.32	6	2.8	9450	9450	15700	17100	20000	20000	15500	17000
	66.46	6	2.2	10200	10200	15700	17100	20000	20000	15500	17000
	72.50	6	1.9	10700	10700	15700	17100	20000	20000	15500	17000
	75.02	6	4.0	11000	11000	15700	17100	20000	20000	15500	17000
	85.52	6	3.3	11800	11800	15700	17100	20000	20000	15500	17000
	94.93	5	3.0	12500	12500	15700	17100	20000	20000	15500	17000
	108.46*	5	2.5	13400	13400	15700	17100	20000	20000	15500	17000
	114.45	5	2.3	13800	13800	15700	17100	20000	20000	15500	17000
	130.42	5	1.9	14800	14800	15700	17100	20000	20000	15500	17000
	142.27	5	1.6	15400	15400	15700	17100	20000	20000	15500	17000
	166.47	5	1.3	16700	16700	15700	17100	20000	20000	15500	17000
	188.40	5	0.91	17700	17700	15700	17100	20000	20000	15500	17000
	198.31	5	0.82	18100	18100	15700	17100	20000	20000	15500	17000
	225.79	5	0.67	19300	19300	15700	17100	20000	20000	15500	17000
	262.93	5	0.54	20000	20000	15700	17100	20000	20000	15500	17000
	281.71	5	0.47	20000	20000	15700	17100	20000	20000	15500	17000

12.2.7 F 87

	na_1 [rpm]	na_{2000} [rpm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
FA87 2	0.24	485			2482	4.12
	0.20	407			2601	4.92
	0.18	355			2601	5.63
	0.15	301			2601	6.65
	0.14	272	53	132	2601	7.35
	0.12	241	60	149	2601	8.29
	0.10	209			4896	9.58
	0.09	175			5100	11.46
	0.08	152			5100	13.12*
	0.06	129			5100	15.48
	0.06	117	123	305	5100	17.12
	0.05	104	139	345	5100	19.31
	0.05	94	154	380	5100	21.32*
	0.04	84	170	425	5100	23.68
	0.04	75	191	475	5100	26.50
	0.03	69	205	515	4165	28.78
	0.03	59	240	610	4437	33.92
FA87 3	0.03	68			4267	29.20
	0.03	57			4437	35.19
	0.03	51	280	705	4624	39.30
	0.02	44	325	810	4794	45.28
	0.02	40	360	900	4998	50.36
	0.02	35			5100	56.75
	0.01	29			5100	68.40
	0.01	26	550	1370	5100	76.39
	0.01	23	630	1580	5100	88.01
	0.01	20	700	1760	5100	97.89
	0.009	18	785	1970	5100	109.49
	0.008	16	880	2210	5100	123.29
	0.007	15	960	2410	5100	134.16
	0.006	13	1140	2870	5100	159.61
	0.006	11	1290	>3090	5100	179.97
	0.005	10	1410	>3090	5100	197.20
	0.004	8.7	1640	>3090	5100	228.93
	0.004	7.8	1830	>3090	5100	255.37
	0.004	7.4	1940	>3090	5100	270.68

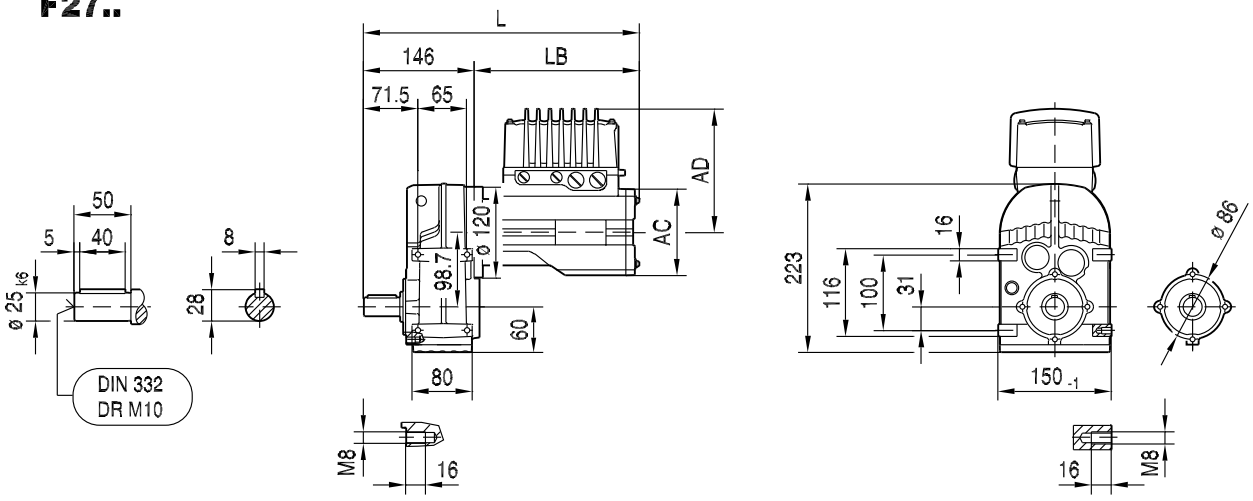
m [kg]			DRC2		
FA87	2		115		
FA87	3		115		
FAF: + 12.7 kg / F: + 5.7 kg / FF: + 21.3 kg					

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	FA [N]	FAF [N]	F [N]	FF [N]	FA [N]	FAF [N]	F [N]	FF [N]
FA87 2	4.12	7	114	3020	3020	5980	11800	30000	30000	26400	23400
	4.92	7	85	3310	3310	6430	12600	30000	30000	26300	23400
	5.63	7	67	3850	3850	7020	13400	30000	30000	26300	23400
	6.65	7	52	4550	4550	7790	14400	30000	30000	26300	23400
	7.35	7	44	5000	5000	8280	15000	30000	30000	26300	23400
	8.29	7	36	5550	5550	8890	15800	30000	30000	26200	23300
	9.58	7	63	275	275	5050	11000	30000	30000	16000	16000
	11.46	7	49	575	575	5580	11800	30000	30000	16000	16000
	13.12*	7	40	1300	1300	6370	13100	30000	30000	16000	16000
	15.48	7	32	2220	2220	7390	14700	30000	30000	16000	16000
	17.12	7	28	2810	2810	8040	15800	30000	30000	16000	16000
	19.31	7	23	3540	3540	8840	17000	30000	30000	16000	16000
	21.32*	7	20	4160	4160	9520	18000	30000	30000	16000	16000
	23.68	7	17	4850	4850	10300	19100	30000	30000	16000	16000
	26.50	7	15	5610	5610	11100	19800	30000	30000	16000	16000
	28.78	7	13	8940	8940	13900	22500	30000	30000	16000	16000
	33.92	7	10	9340	9340	14600	22200	30000	30000	16000	16000
FA87 3	29.20	8	25	8740	8740	13800	22400	30000	30000	16000	16000
	35.19	8	19	9610	9610	14900	22200	30000	30000	16000	16000
	39.30	8	16	9910	9910	15400	22000	30000	30000	16000	16000
	45.28	8	13	10500	10500	16200	21700	30000	30000	16000	16000
	50.36	7	11	10800	10800	16800	21500	30000	30000	16000	16000
	56.75	7	20	11600	11600	17700	19800	30000	30000	16000	16000
	68.40	7	16	13300	13300	19600	19800	30000	30000	16000	16000
	76.39	7	14	14300	14300	19800	19800	30000	30000	16000	16000
	88.01	7	11	15800	15800	19800	19800	30000	30000	16000	16000
	97.89	7	9.9	16900	16900	19800	19800	30000	30000	16000	16000
	109.49	7	8.3	18100	18100	19800	19800	30000	30000	16000	16000
	123.29	7	7.0	19400	19400	19800	19800	30000	30000	16000	16000
	134.16	7	6.3	20400	20400	19800	19800	30000	30000	16000	16000
	159.61	7	4.9	22500	22500	19800	19800	30000	30000	16000	16000
	179.97	7	4.0	24100	24100	19800	19800	30000	30000	16000	16000
	197.20	7	3.5	25300	25300	19800	19800	30000	30000	16000	16000
	228.93	7	2.8	27300	27300	19800	19800	30000	30000	16000	16000
	255.37	7	1.8	28900	28900	19800	19800	30000	30000	16000	16000
	270.68	7	1.6	29800	29800	19800	19800	30000	30000	16000	16000

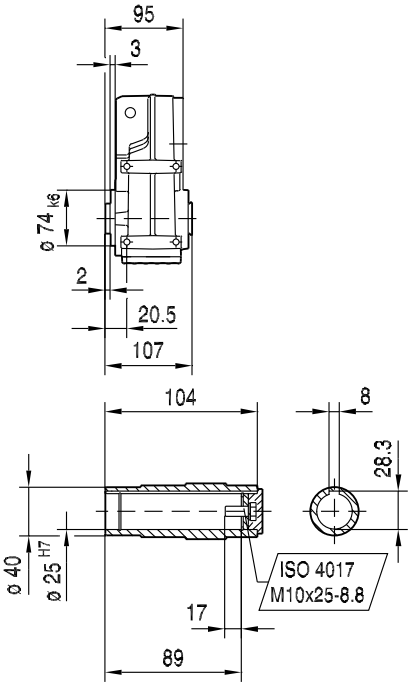
12.3 Dimension sheets

42 001 00 12

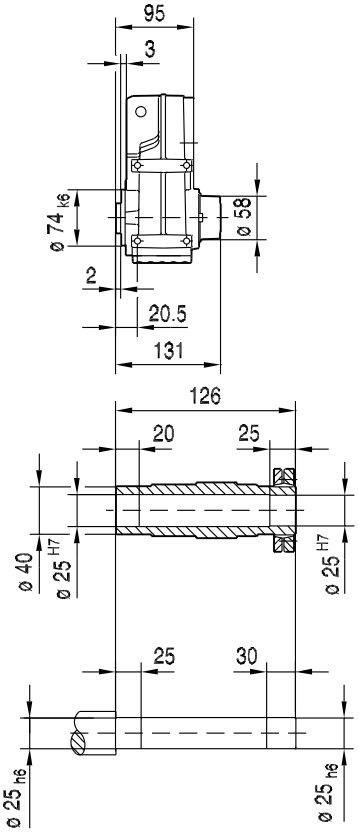
F27..



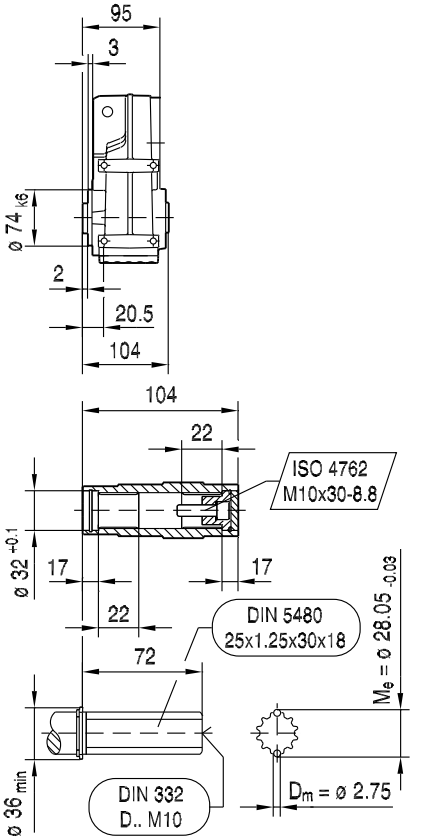
FA27B..



FH27B..



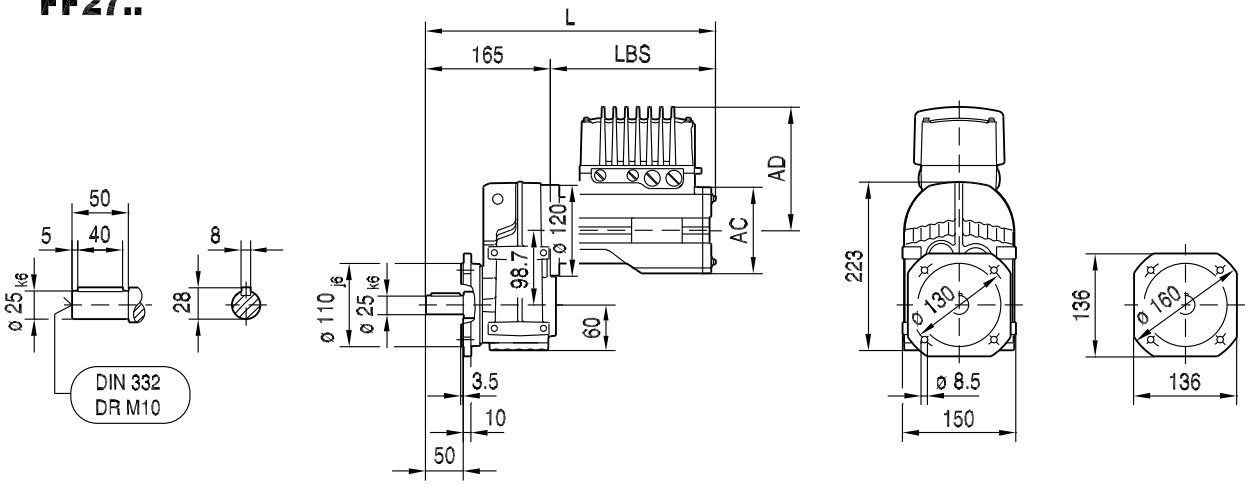
FV27B..



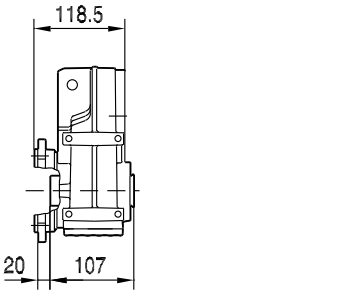
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	440	456						
LB	294	310						

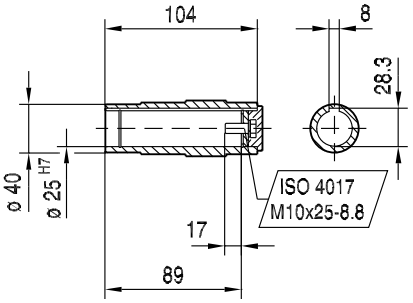
42 002 00 12

FF27..

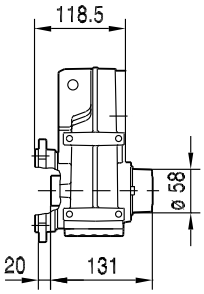


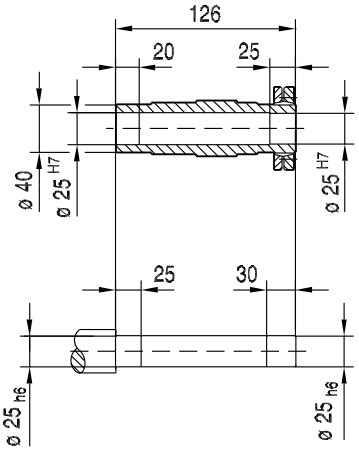
FAF27..



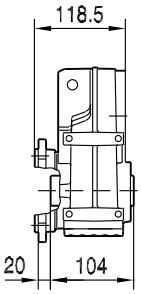


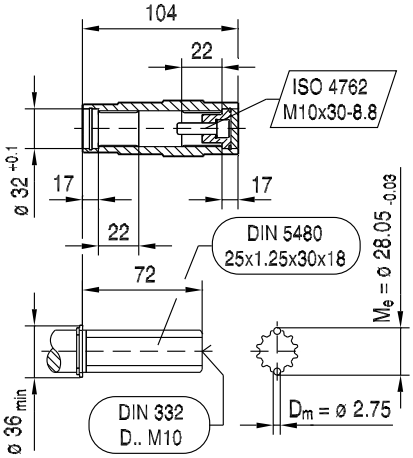
FHF27..





FVF27..

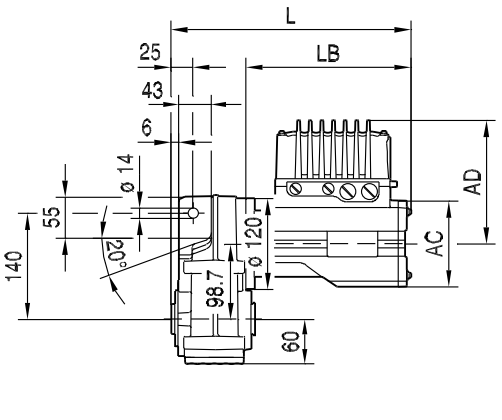


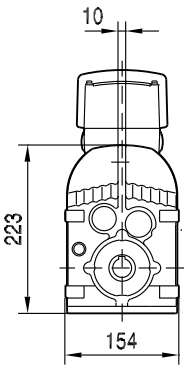


(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	459	475						
LB	294	310						

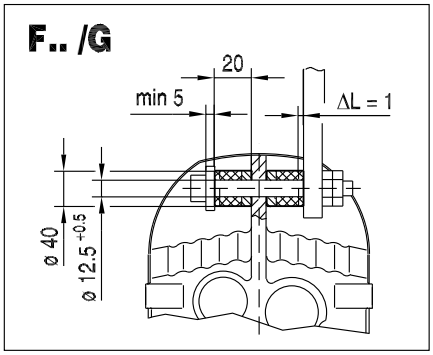
42 003 00 12

FA27..

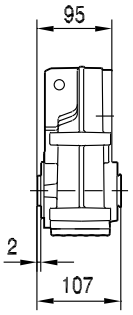


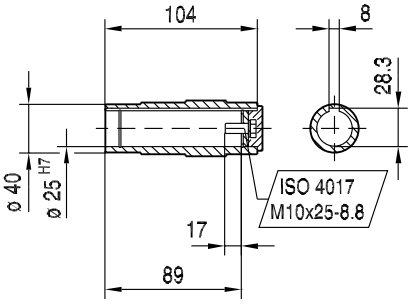


F.. /G

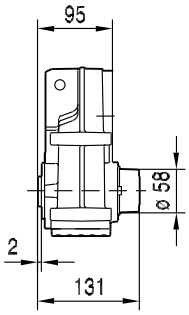


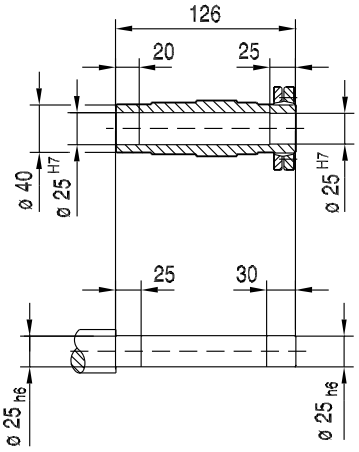
FA27..



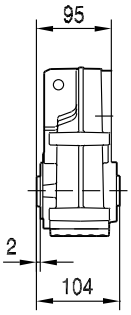


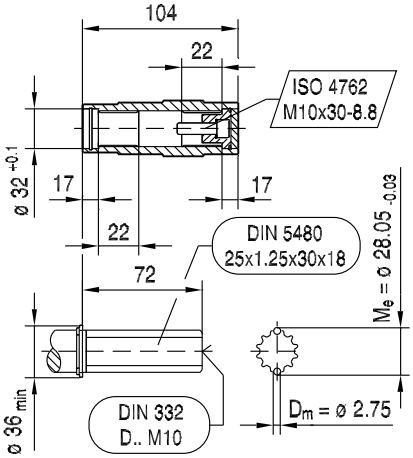
FH27..





FV27..

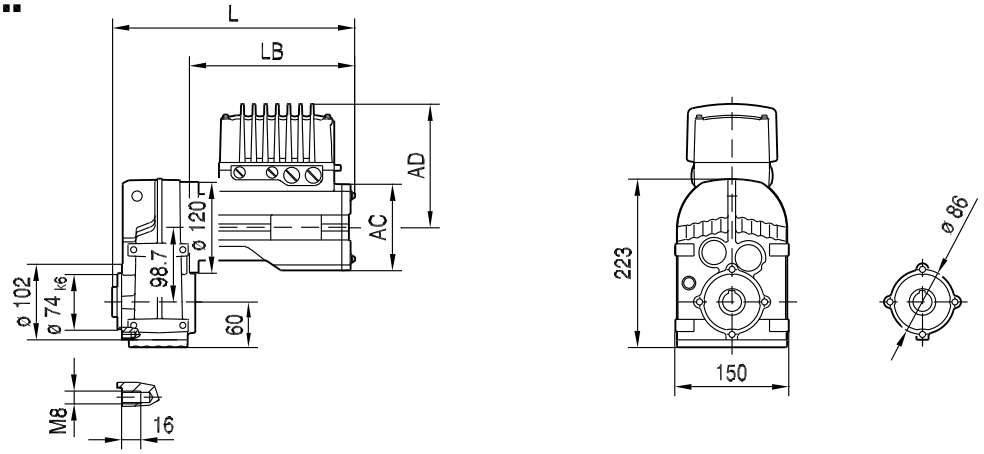




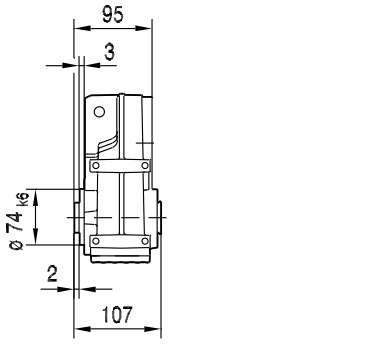
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	389	405						
LB	294	310						

42 004 00 12

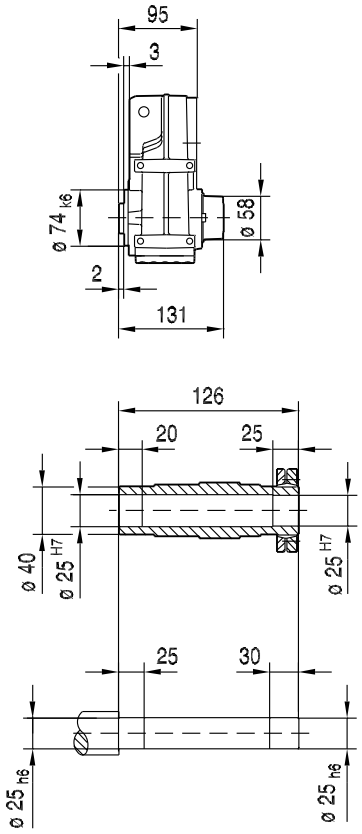
FAZ27..



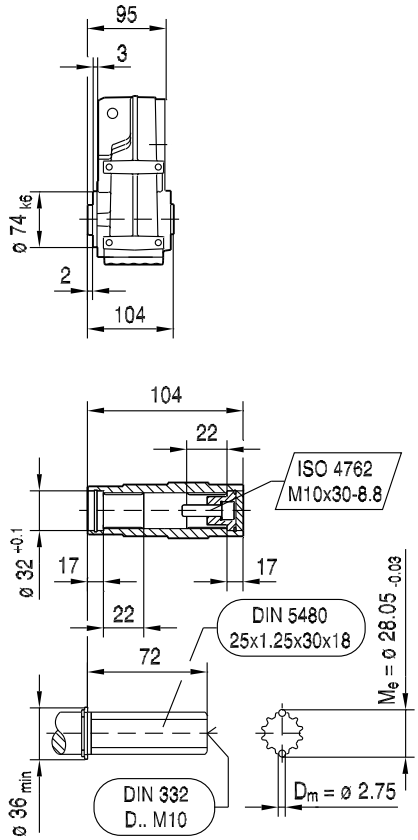
FAZ27..



FHZ27..



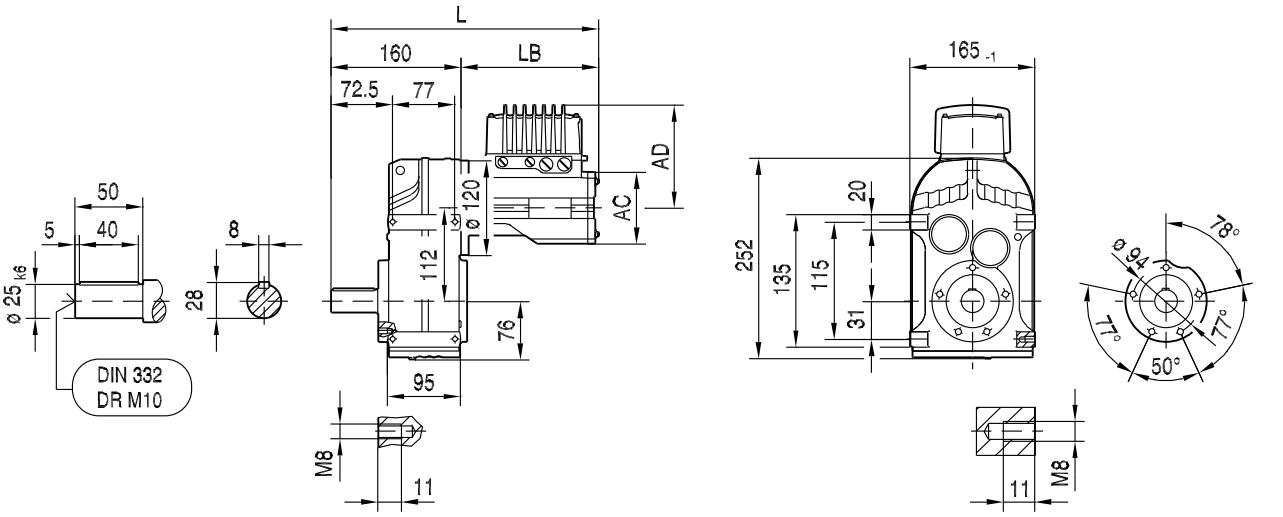
FVZ27..



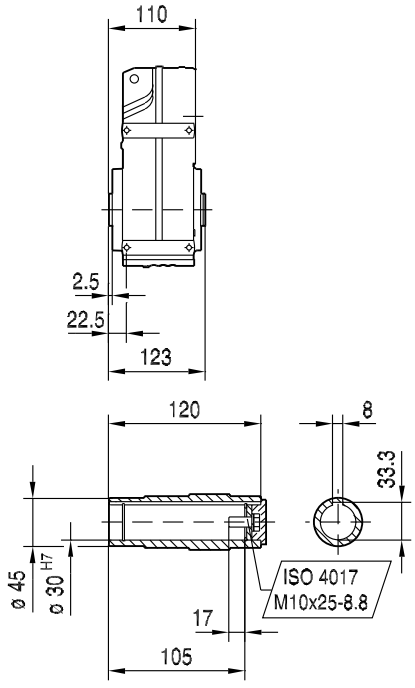
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	389	405						
LB	294	310						

42 005 00 12

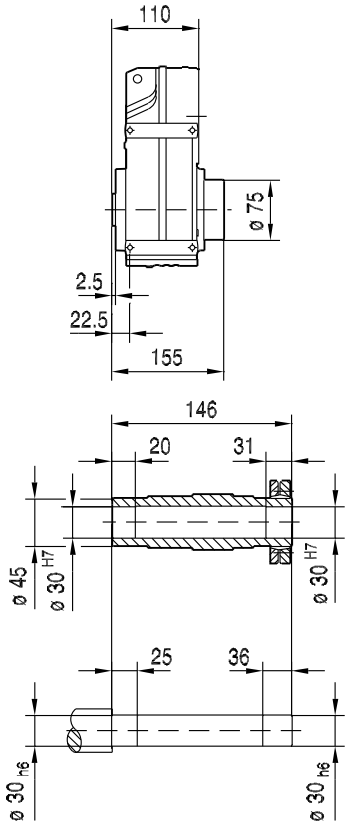
F37..



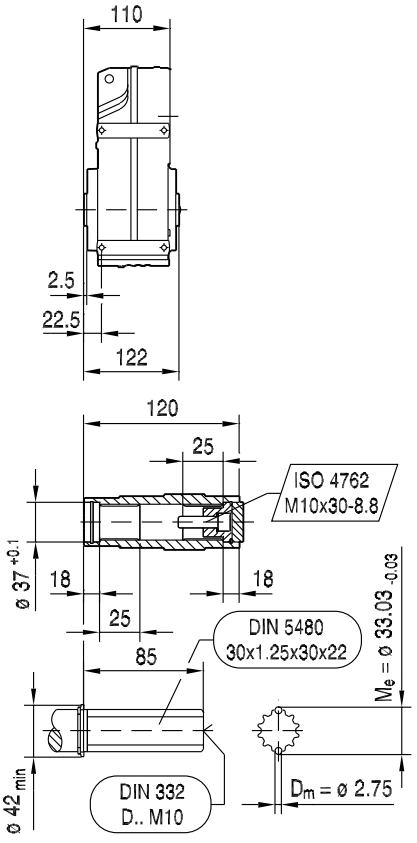
FA37B..



FH37B..



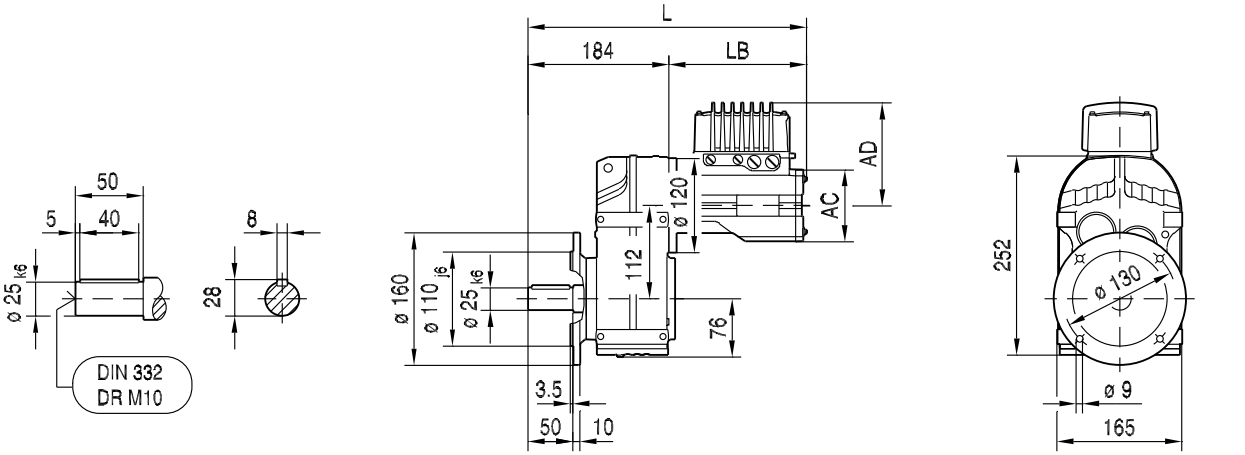
FV37B..



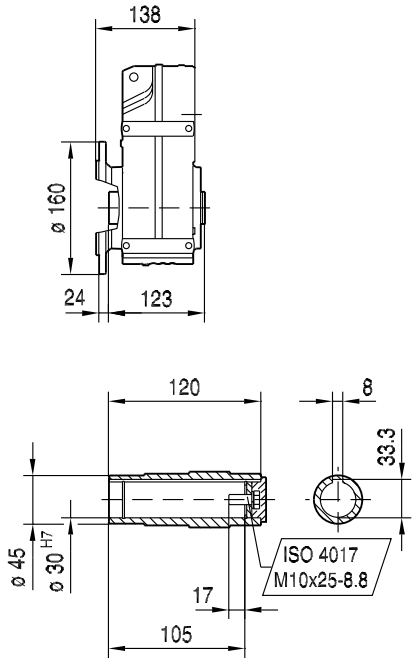
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	454	470						
LB	294	310						

FF37..

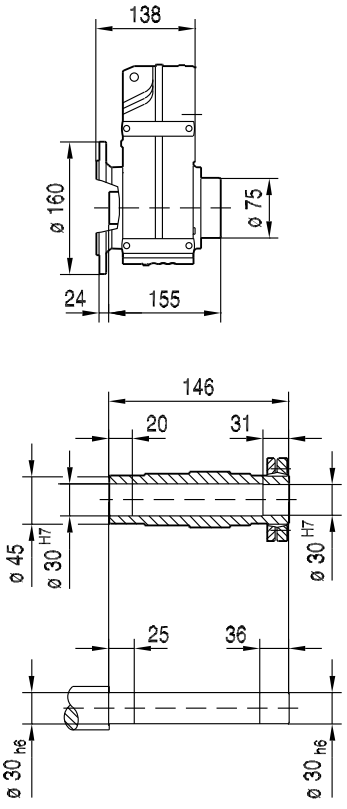
42 006 00 12



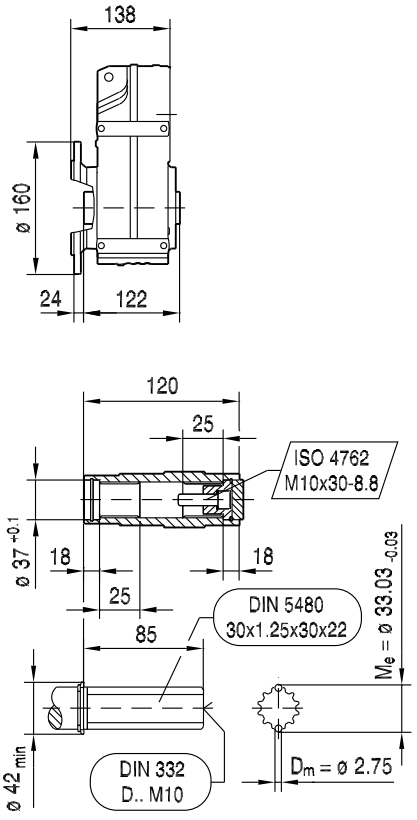
FAF37..



FHF37..



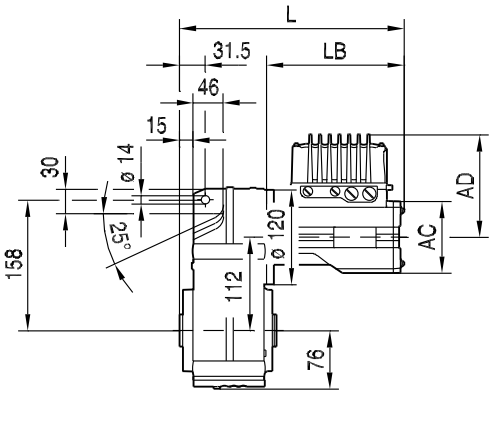
FVF37..

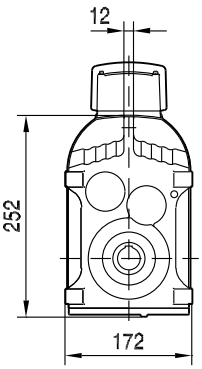


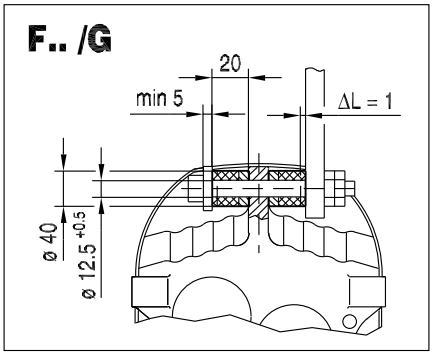
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	478	494						
LB	294	310						

FA37..

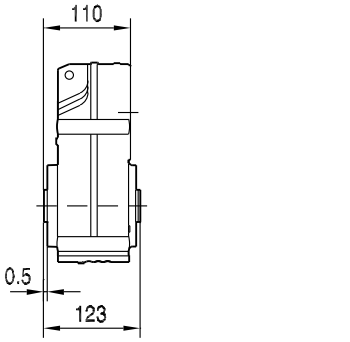
42 007 00 12



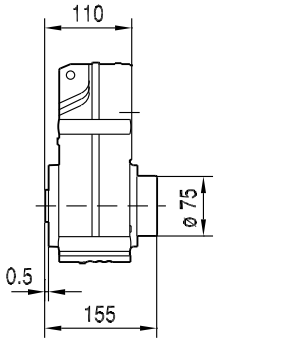




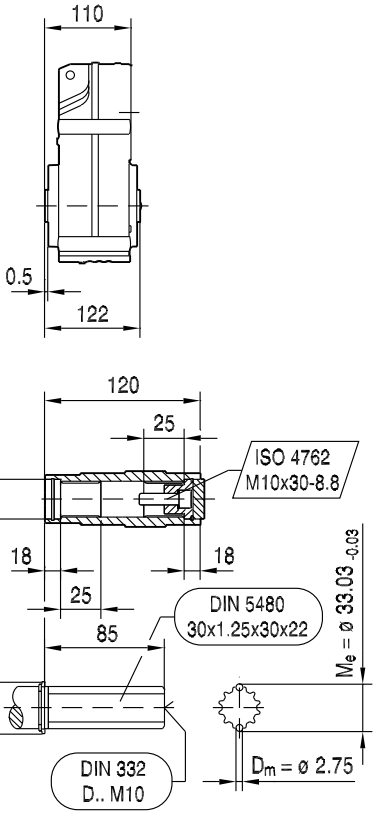
FA37..



FH37..



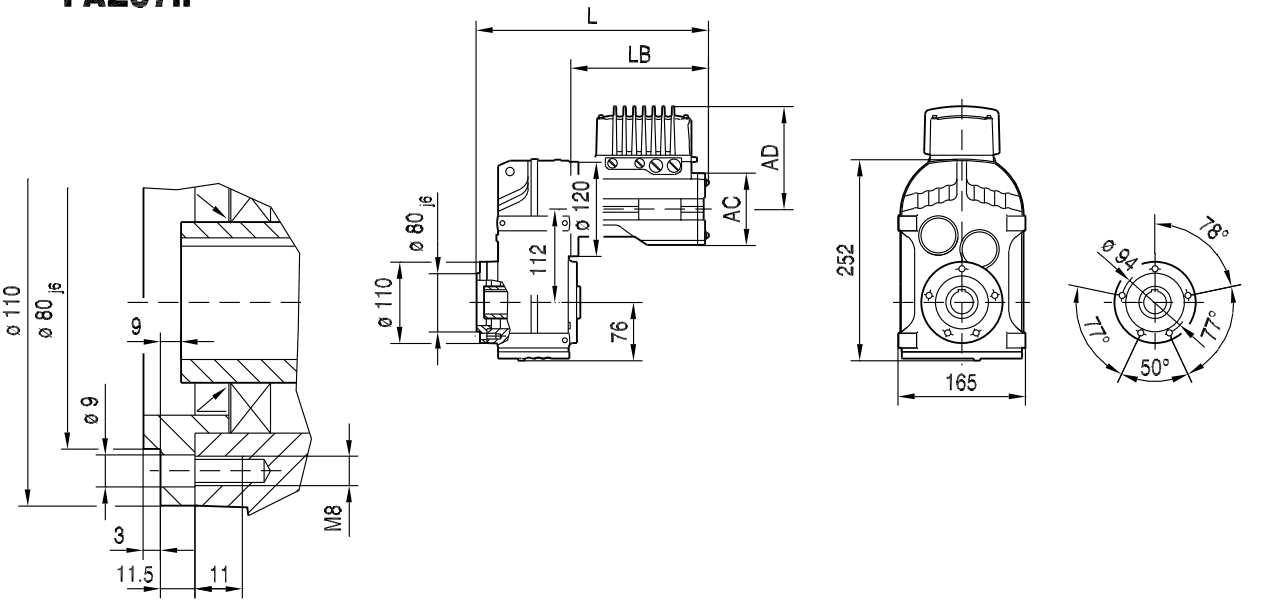
FV37..



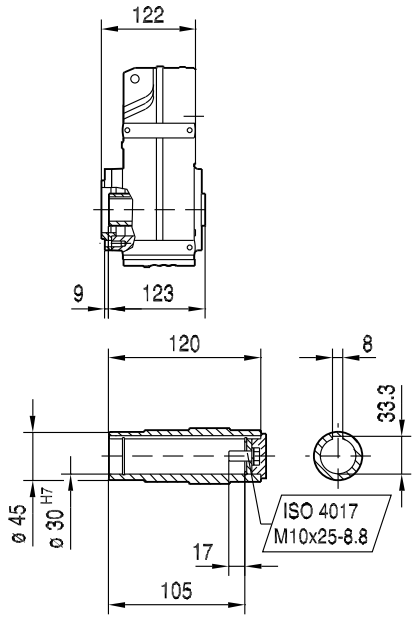
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	404	420						
LB	294	310						

FAZ37..

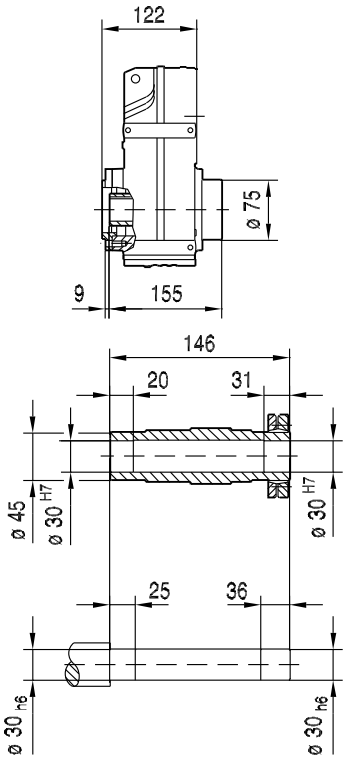
42 008 00 12



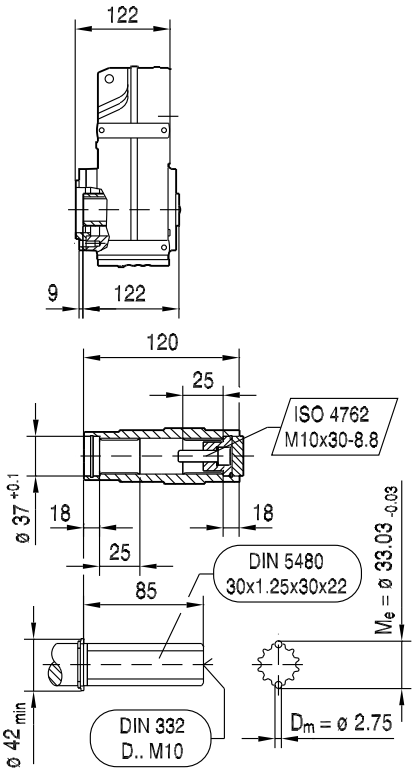
FAZ37..



FHZ37..



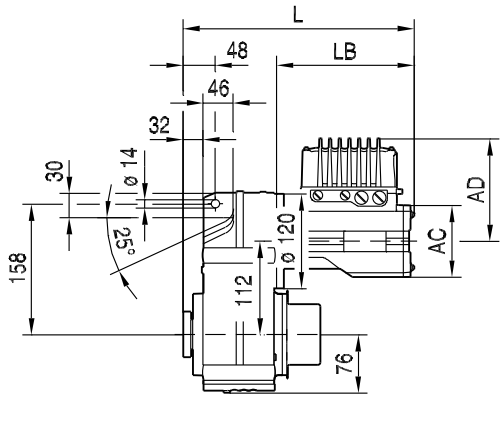
FVZ37..

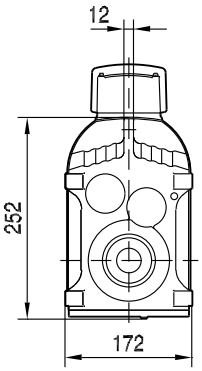


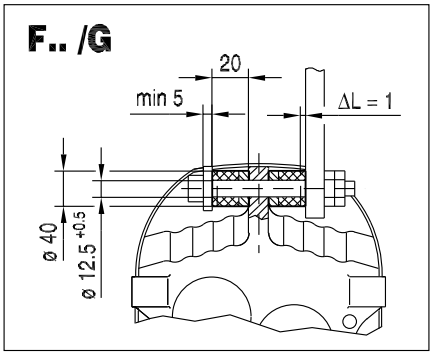
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	416	432						
LB	294	310						

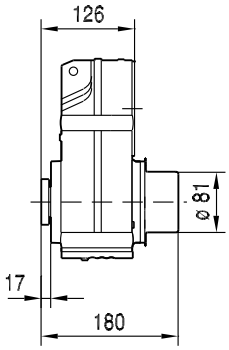
FT37..

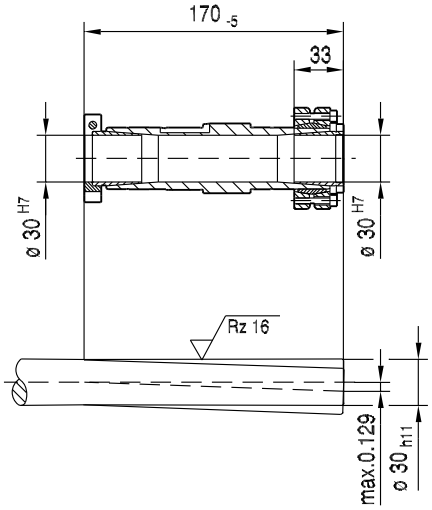
42 009 00 12

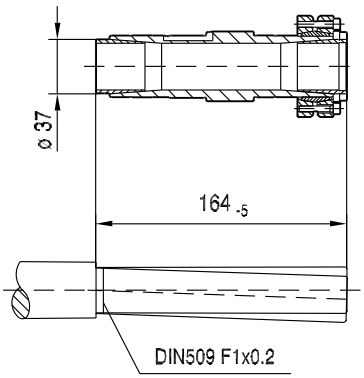








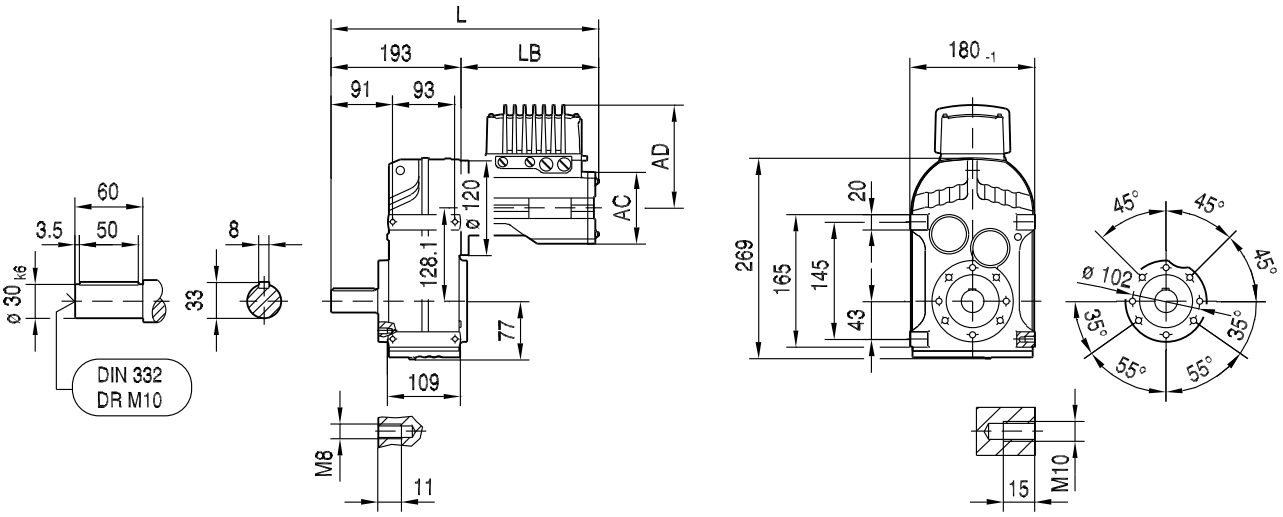




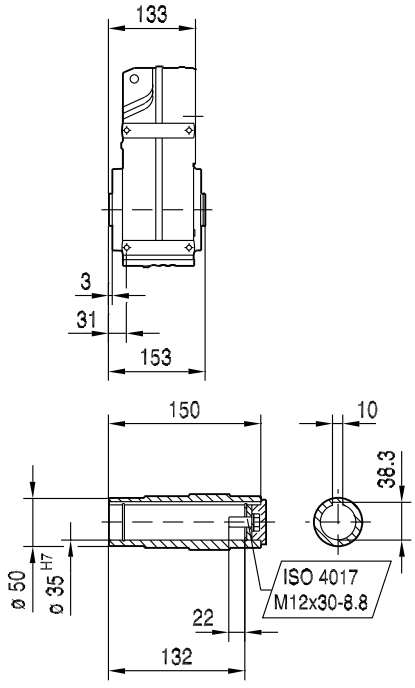
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	420	436						
LB	294	310						

F47..

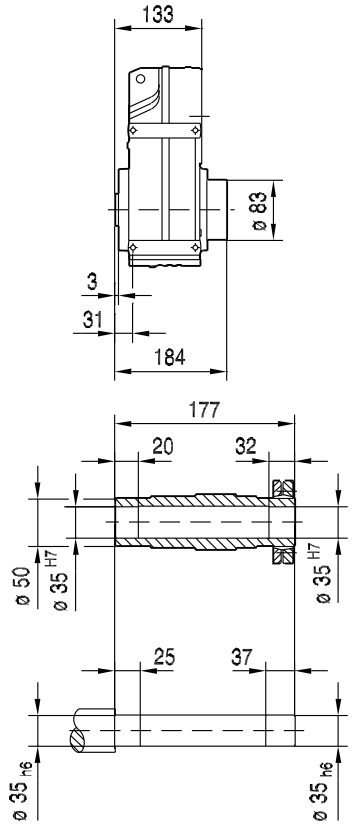
42 010 00 12



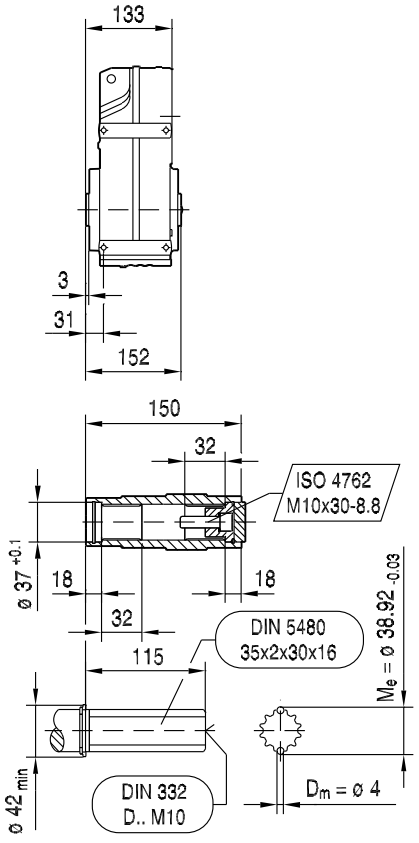
FA47B..



FH47B..



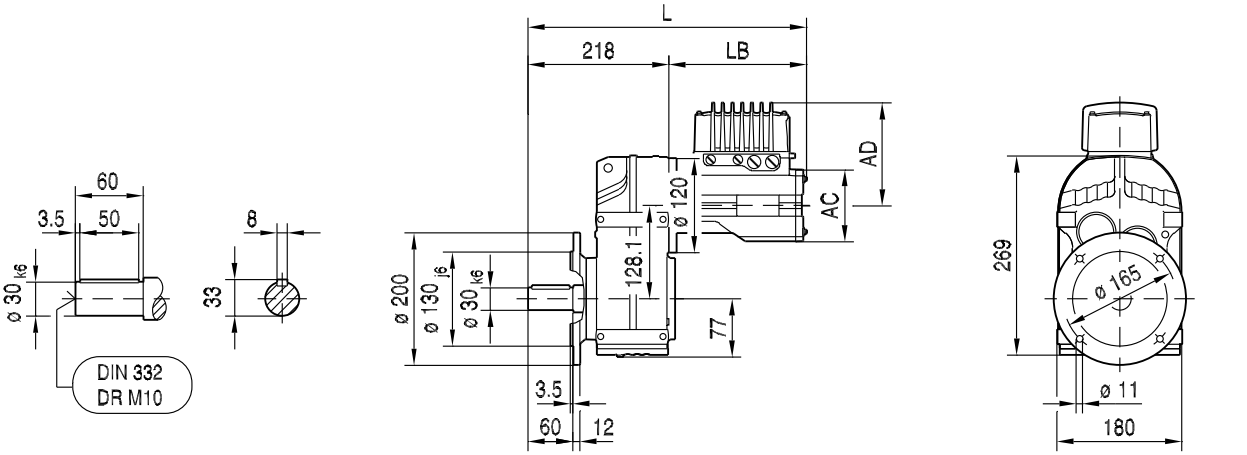
FV47B..



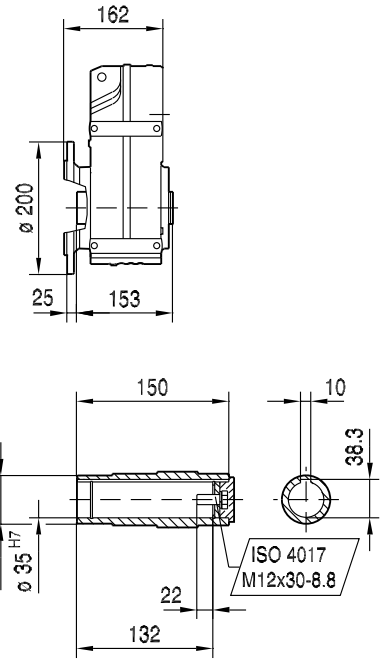
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	487	503						
LB	294	310						

FF47..

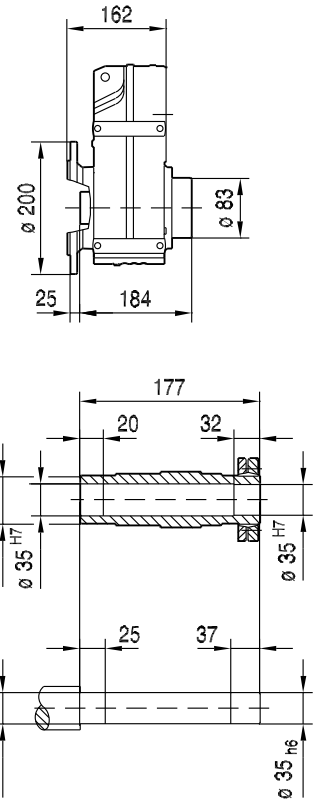
42 011 00 12



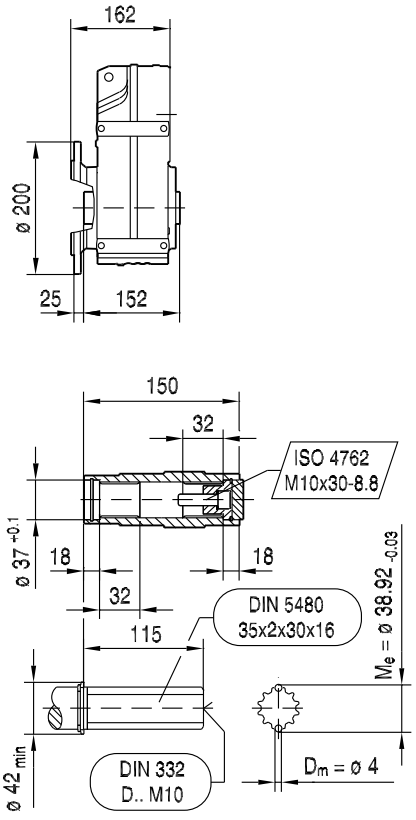
FAF47..



FHF47..



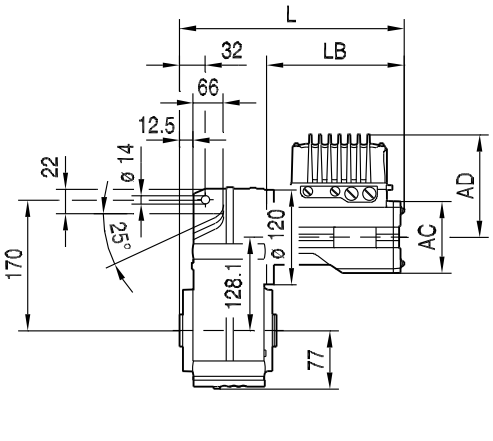
FVF47..

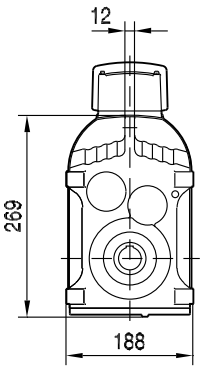


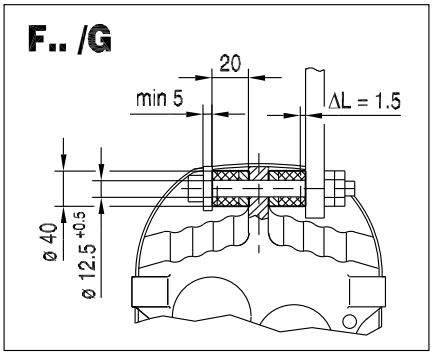
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	512	528						
LB	294	310						

FA47..

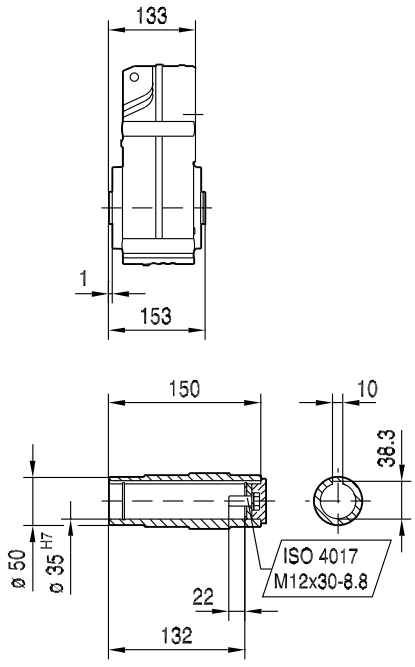
42 012 00 12



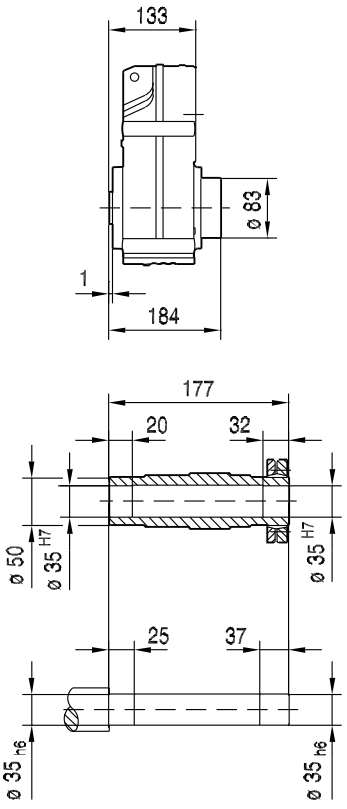




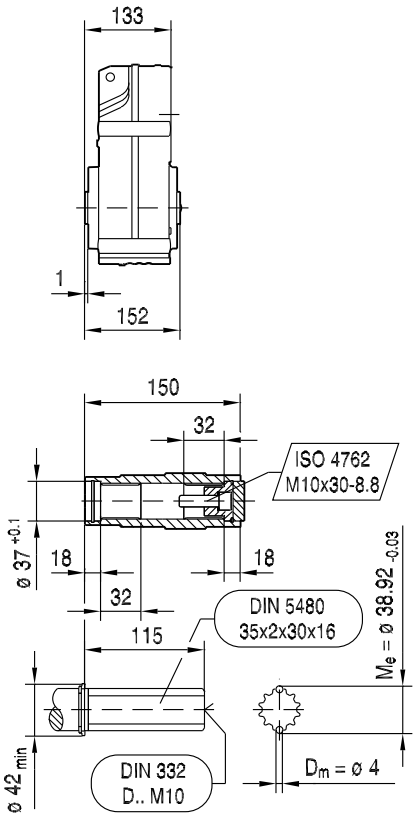
FA47..



FH47..



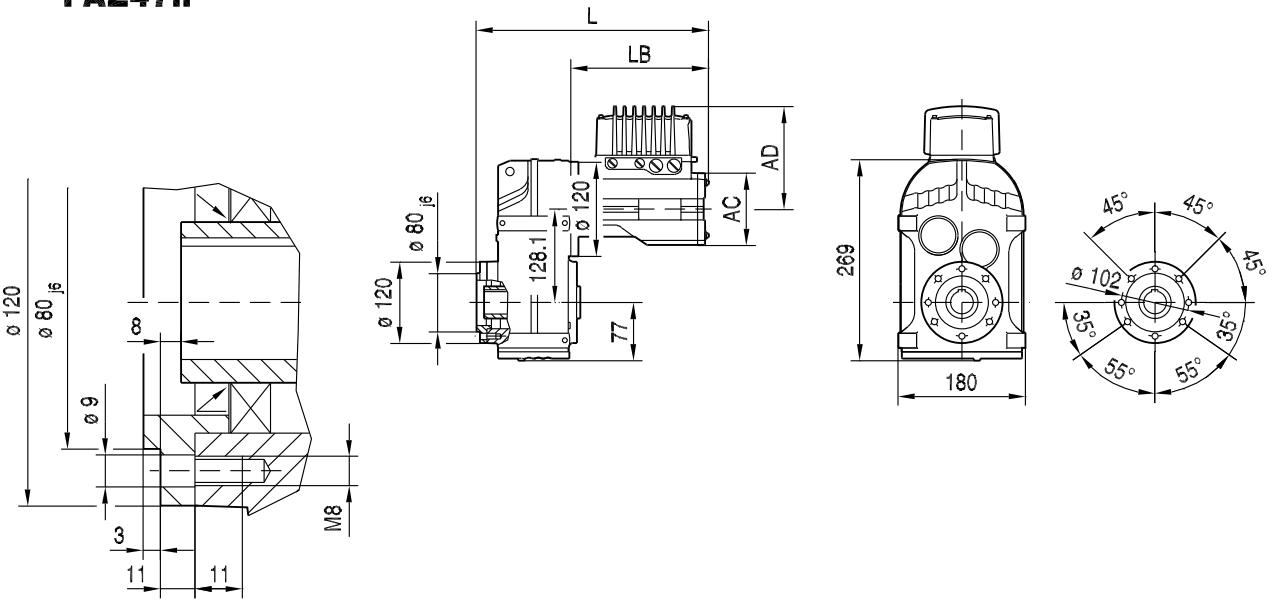
FV47..



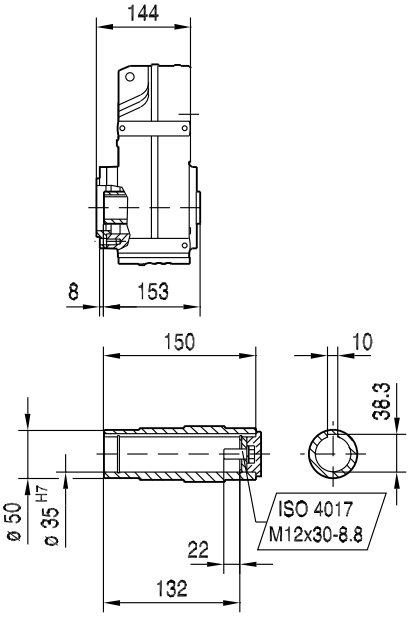
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	427	443						
LB	294	310						

42 013 00 12

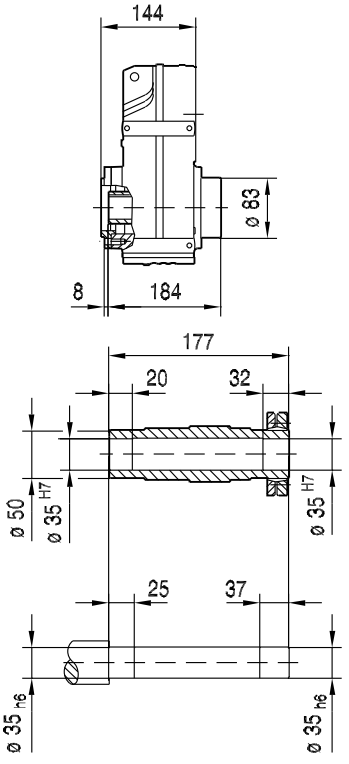
FAZ47..



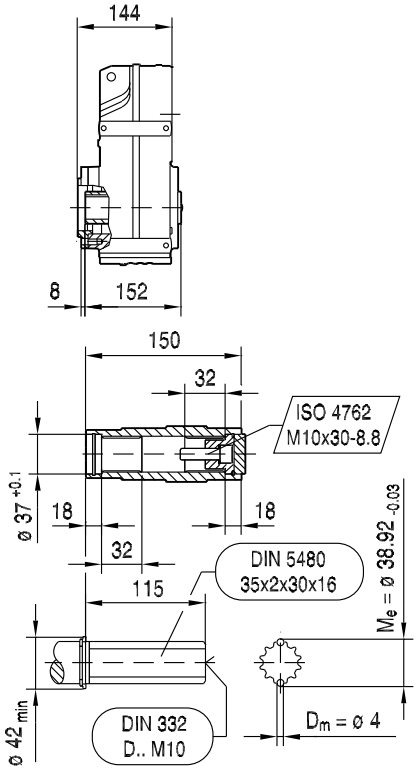
FAZ47..



FHZ47..

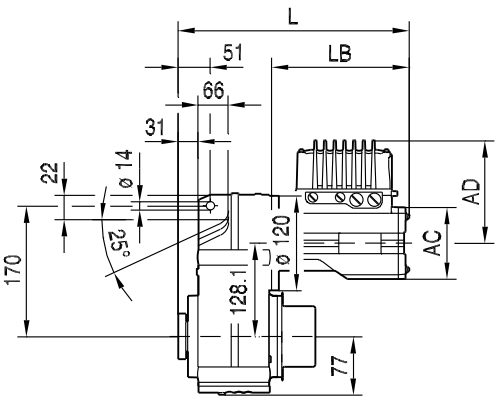


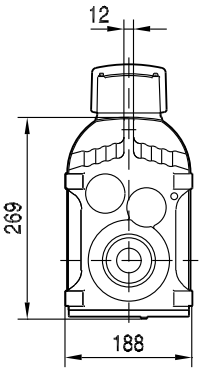
FVZ47..



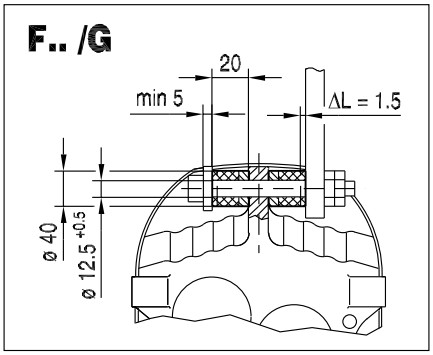
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	438	454						
LB	294	310						

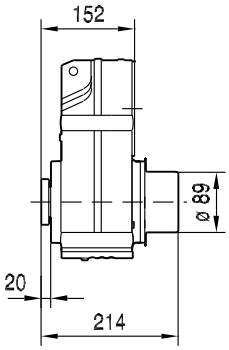
FT47..

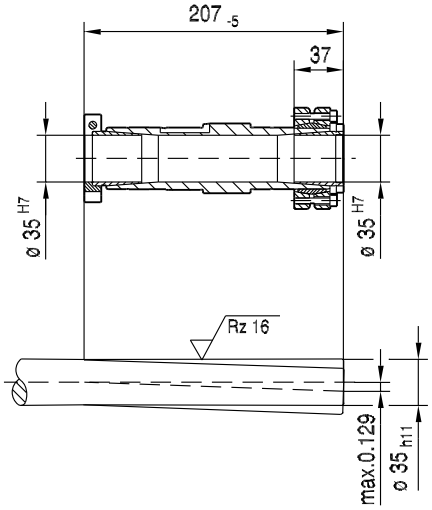


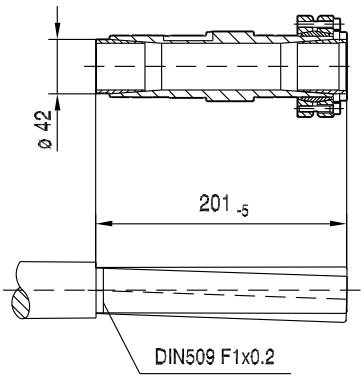


42 014 00 12





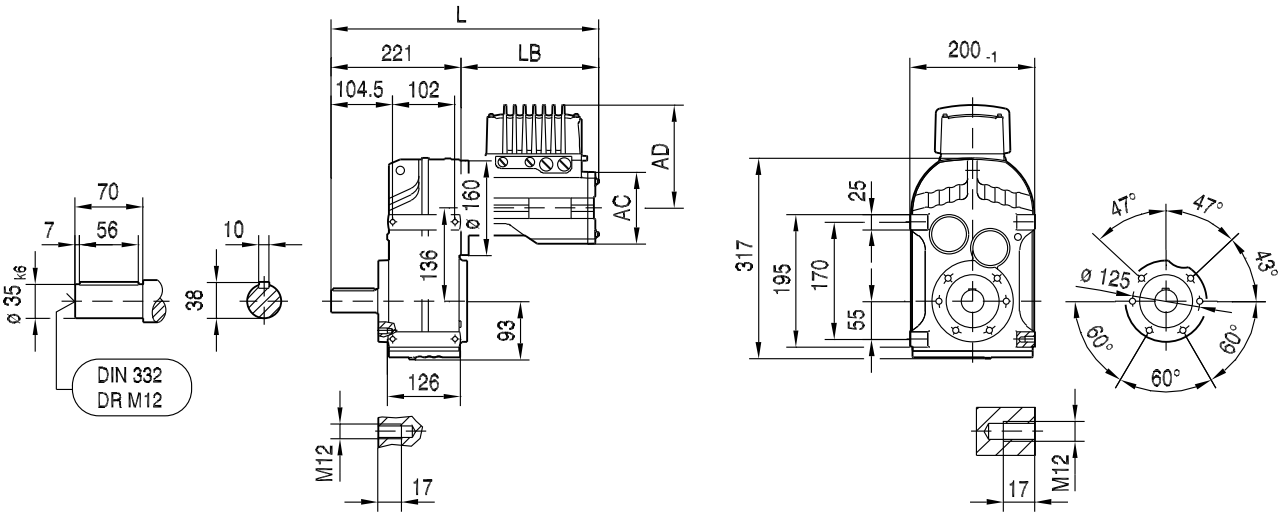




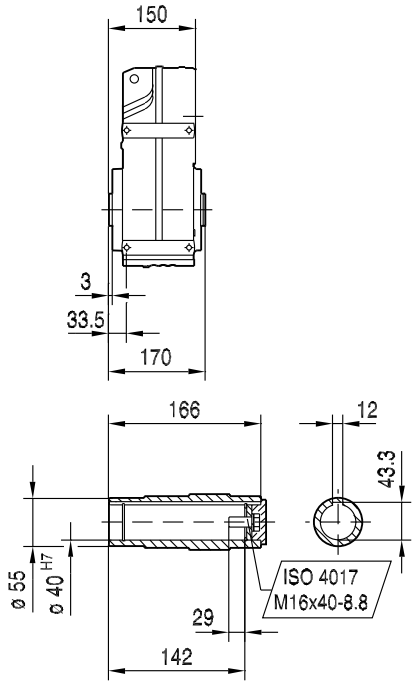
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	446	462						
LB	294	310						

42 015 00 12

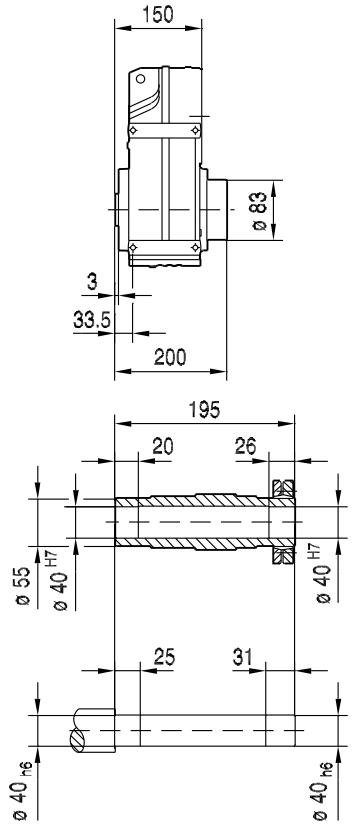
F57..



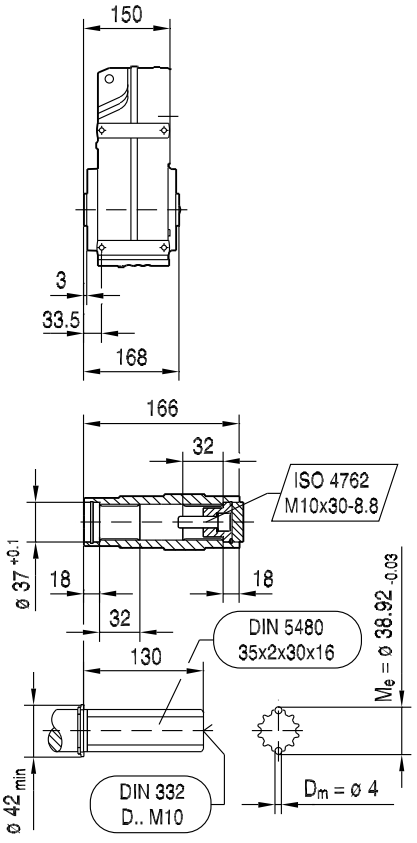
FA57B..



FH57B..



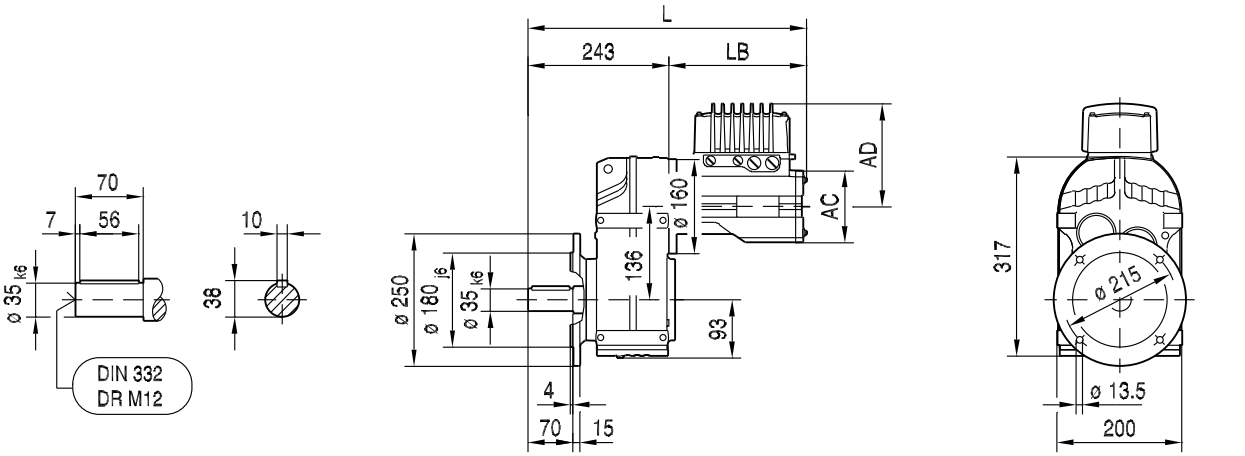
FV57B..



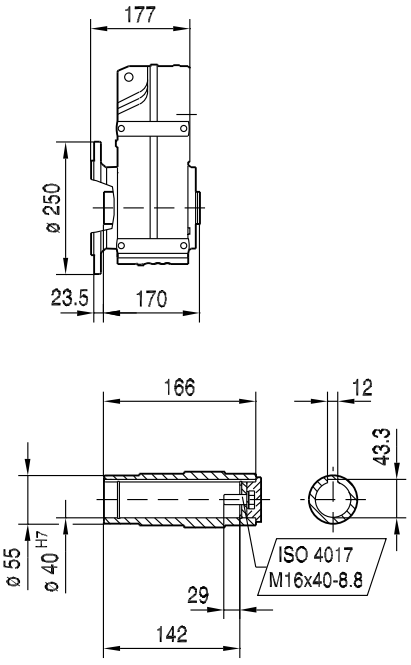
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	508	525						
LB	287	304						

FF57..

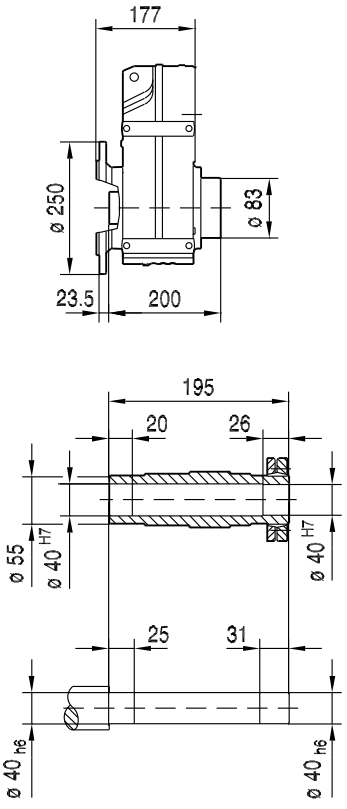
42 016 00 12



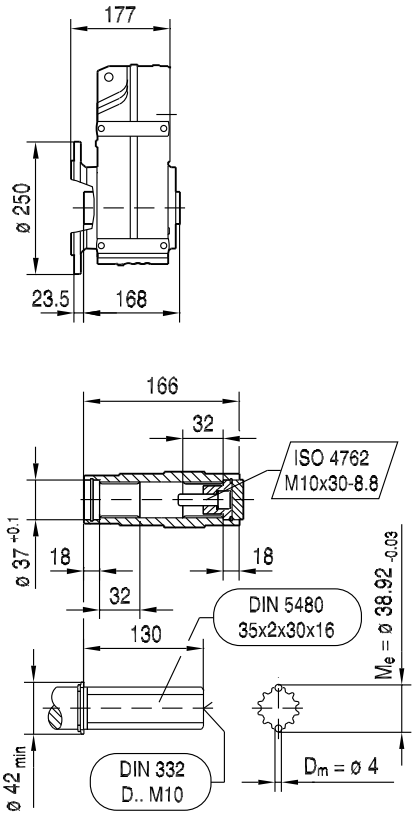
FAF57..



FHF57..



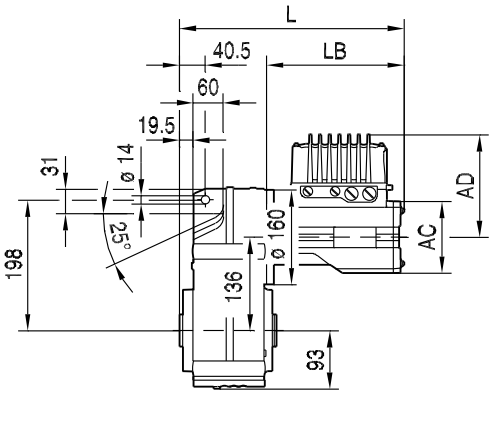
FVF57..

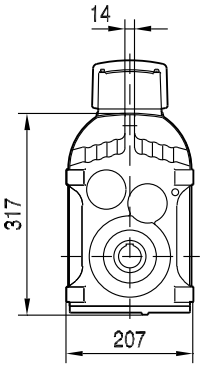


(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	530	547						
LB	287	304						

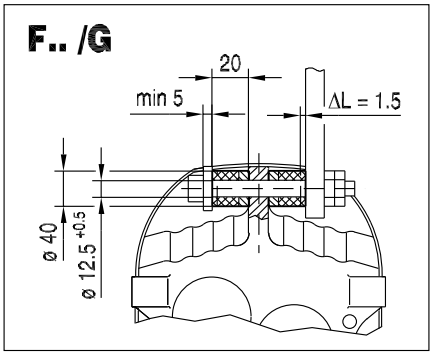
42 017 00 12

FA57..

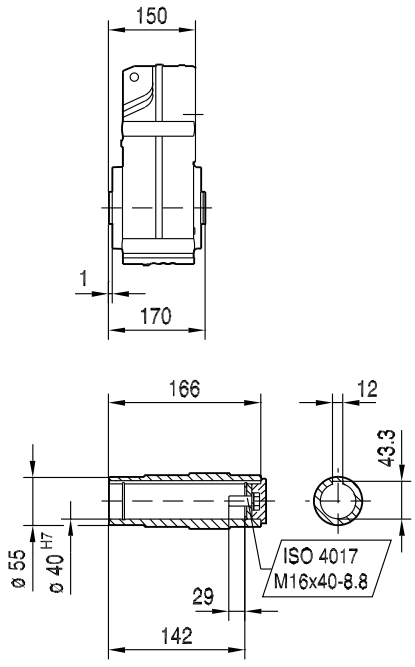




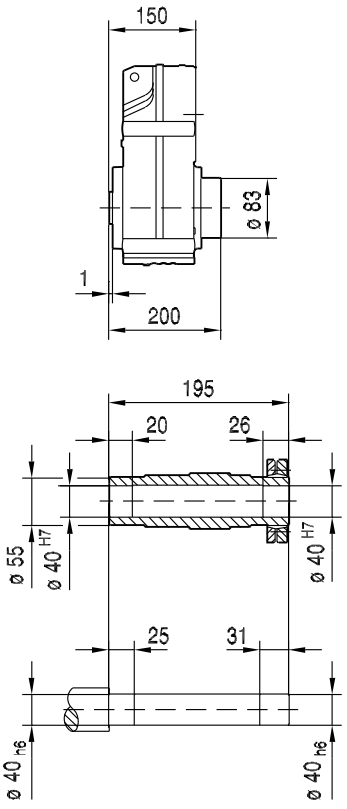
F.. /G



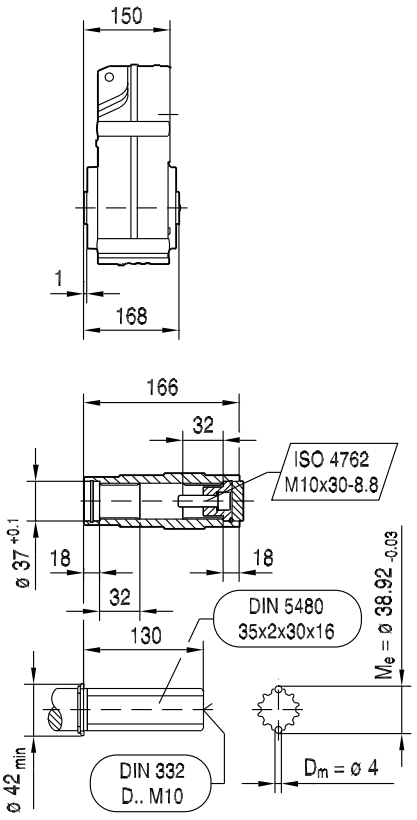
FA57..



FH57..



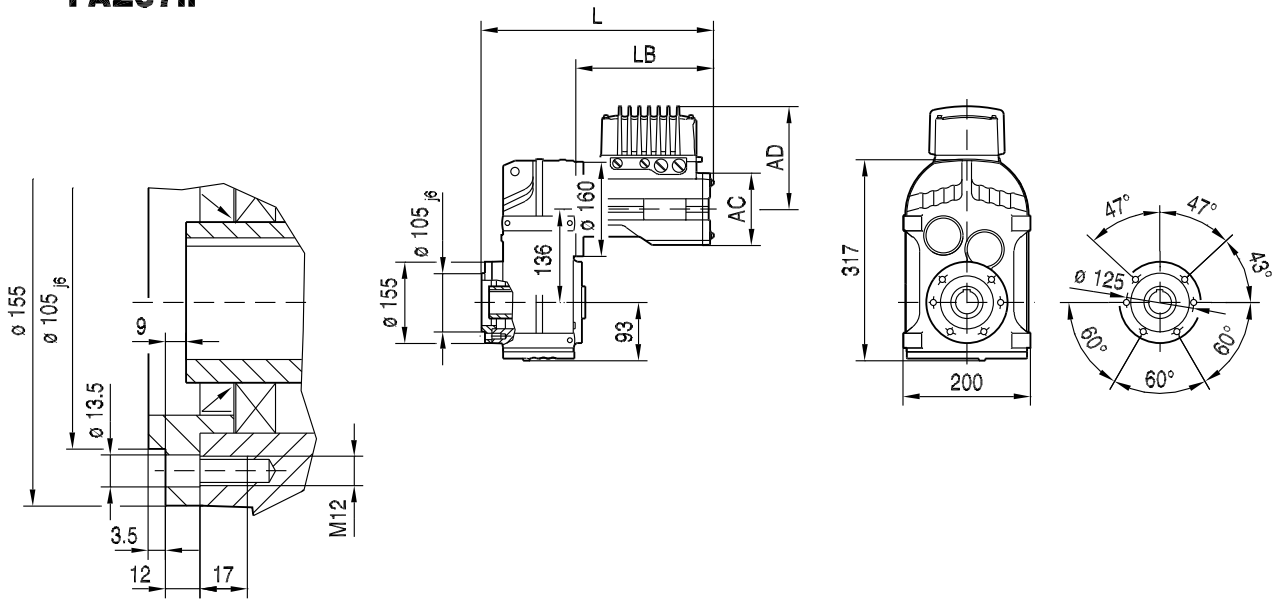
FV57..



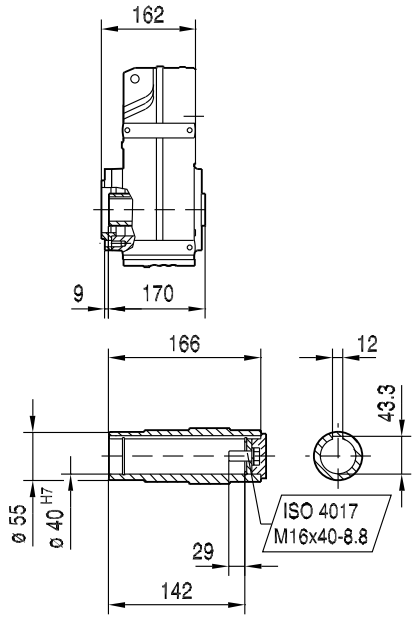
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	437	454						
LB	287	304						

42 018 00 12

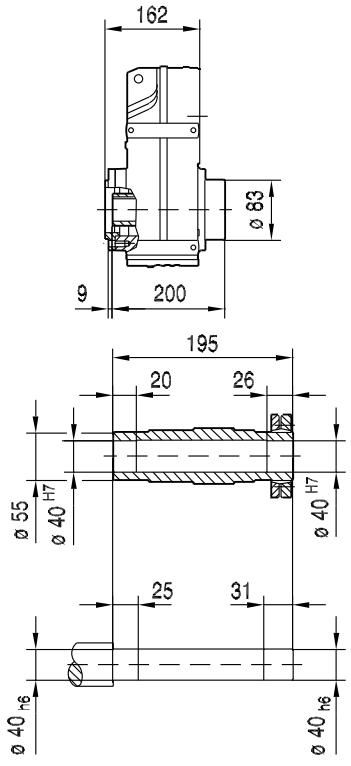
FAZ57..



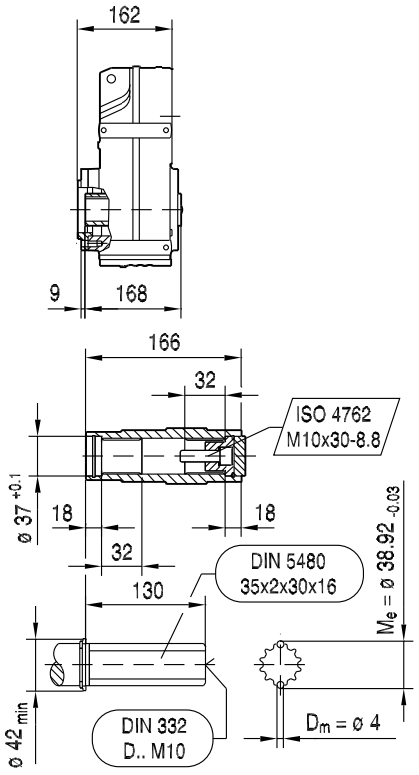
FAZ57..



FHZ57..



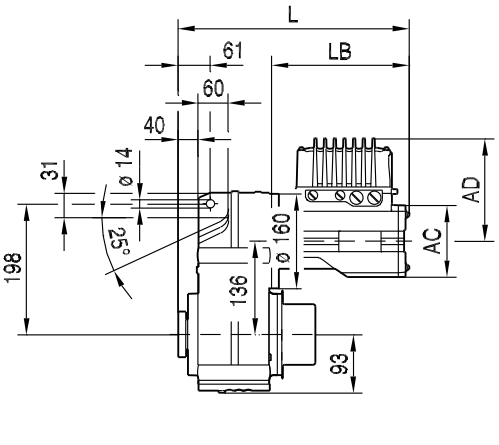
FVZ57..

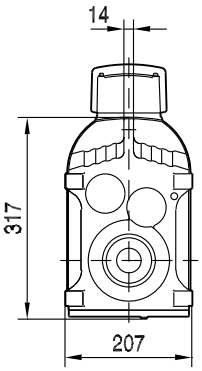


(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	449	466						
LB	287	304						

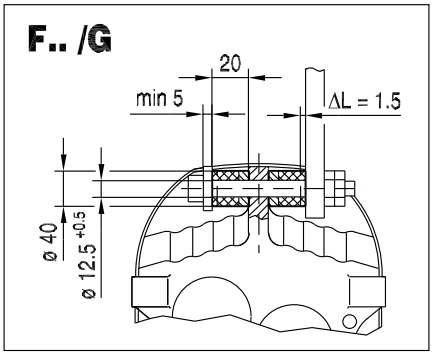
FT57..

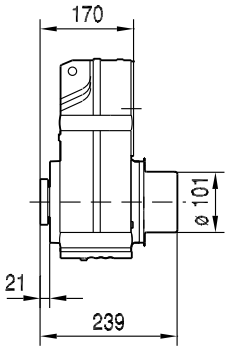
42 019 00 12

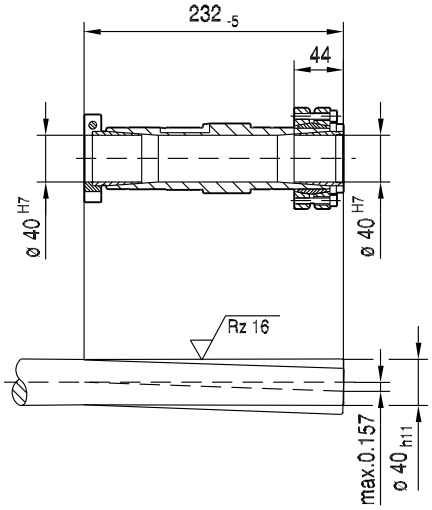


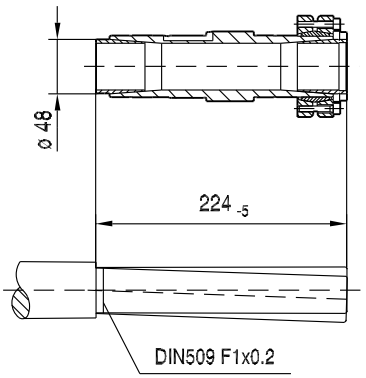


F.. /G





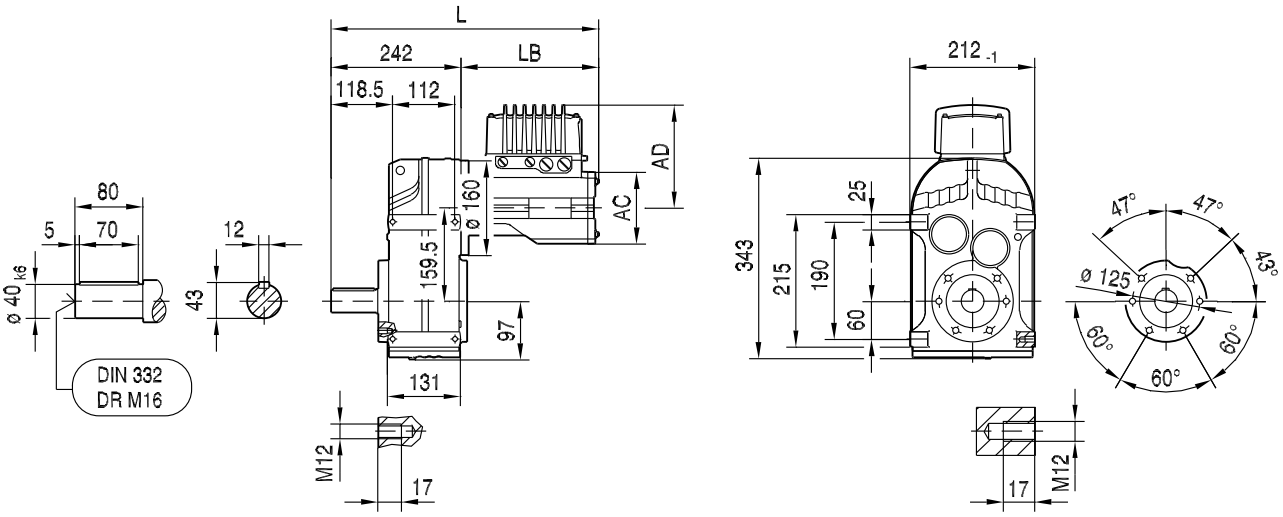




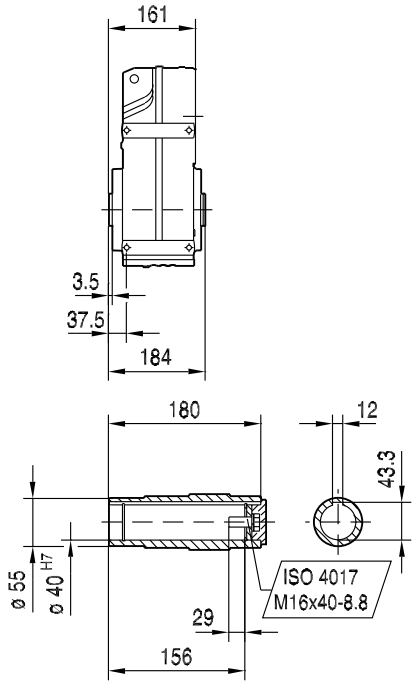
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	457	474						
LB	287	304						

F67..

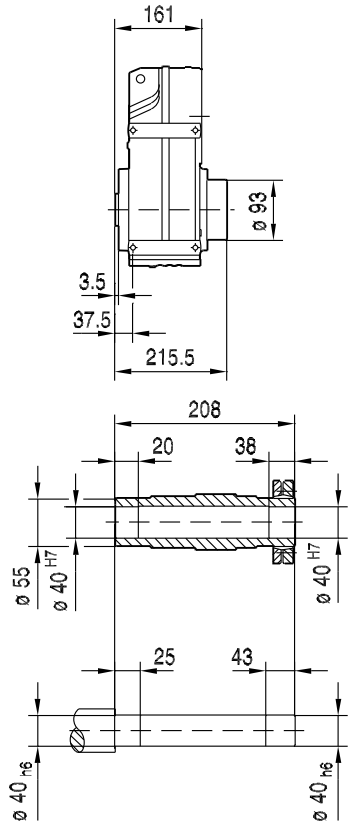
42 020 00 12



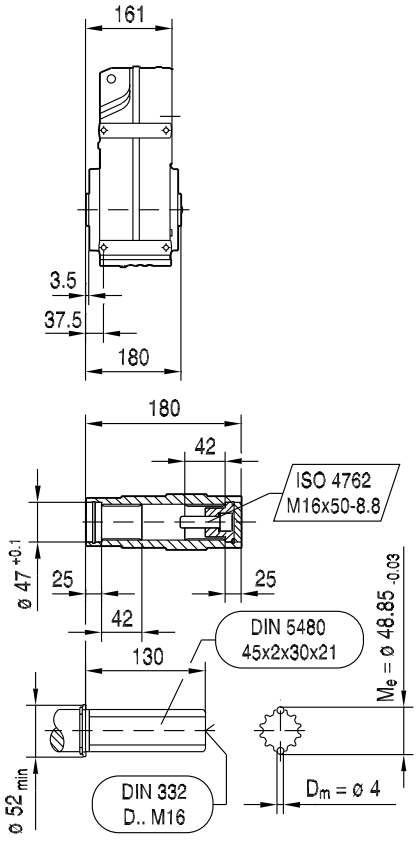
FA67B..



FH67B..



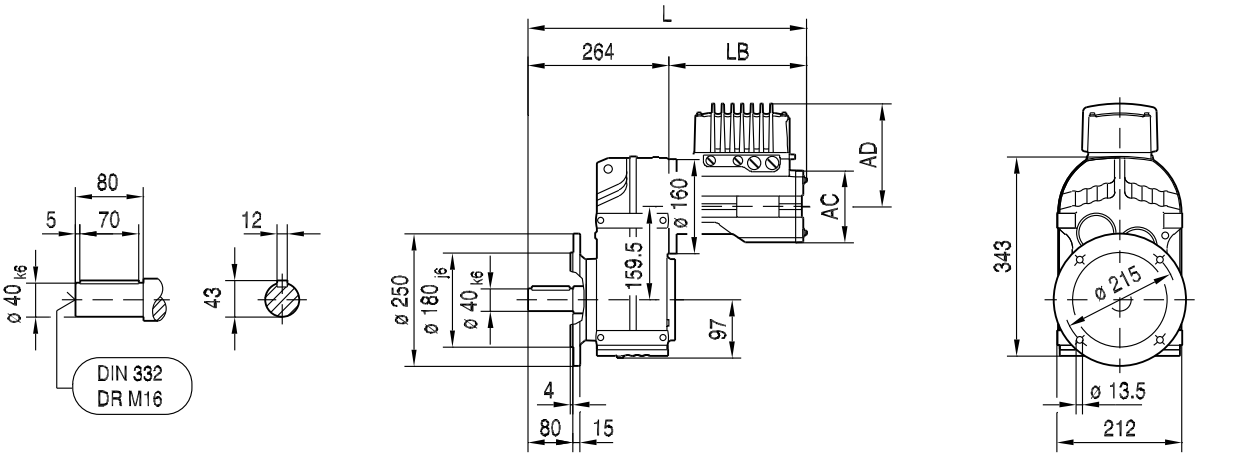
FV67B..



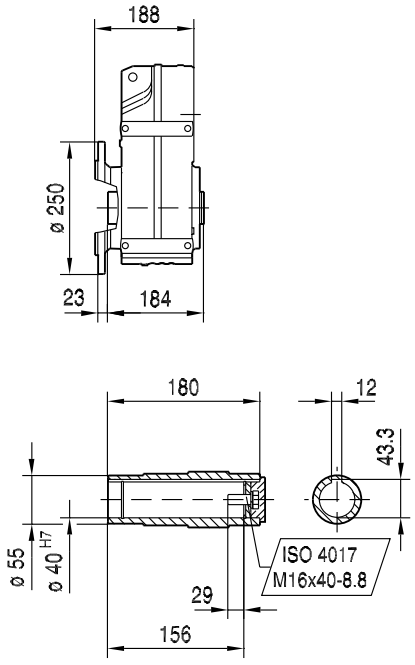
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	529	546						
LB	287	304						

FF67..

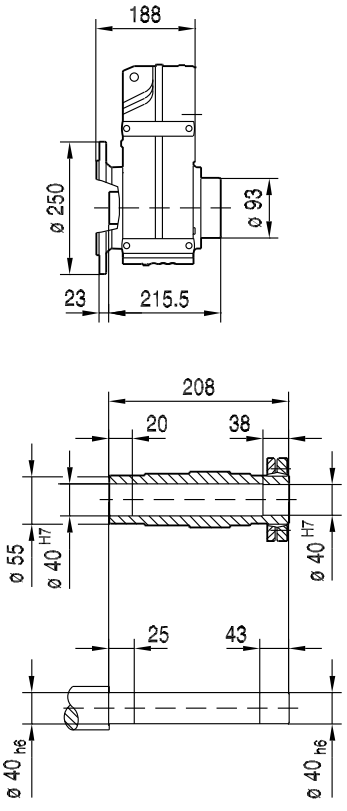
42 021 00 12



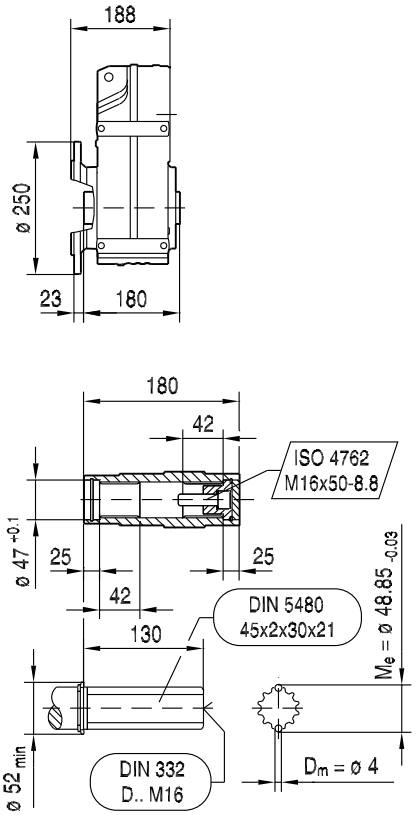
FAF67..



FHF67..

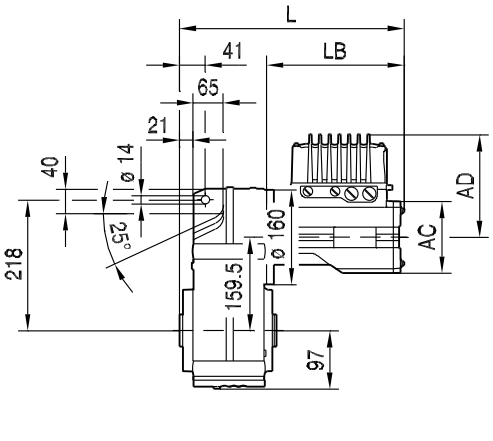


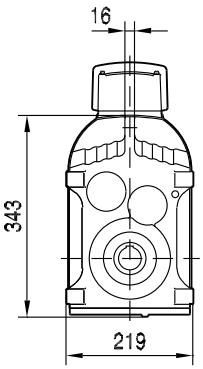
FVF67..



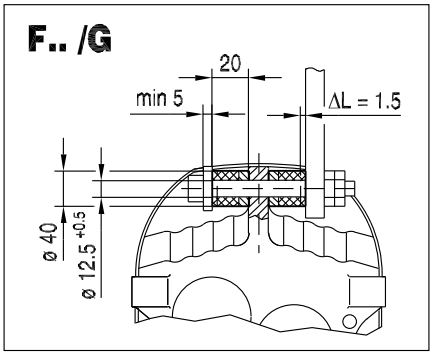
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	551	568						
LB	287	304						

FA67..

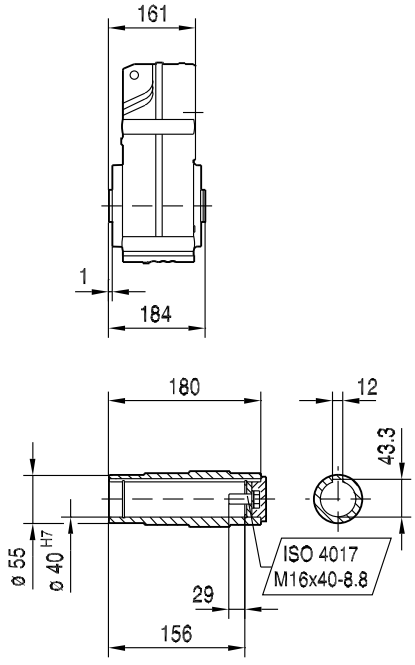




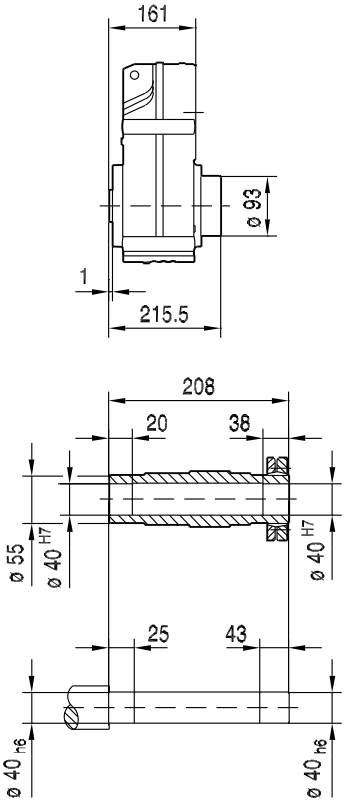
42 022 00 12



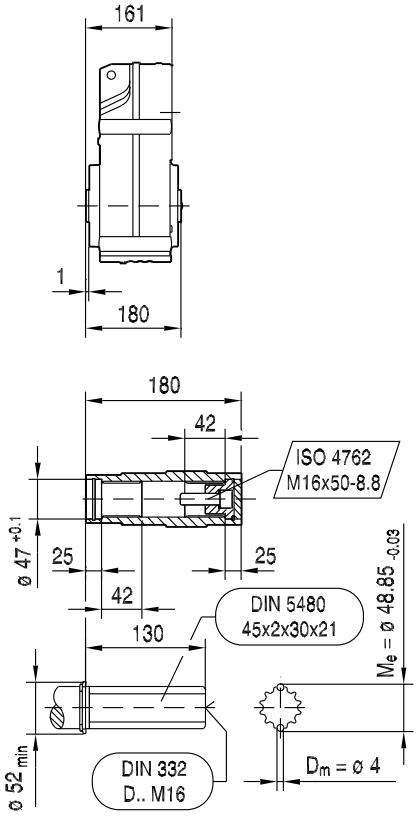
FA67..



FH67..



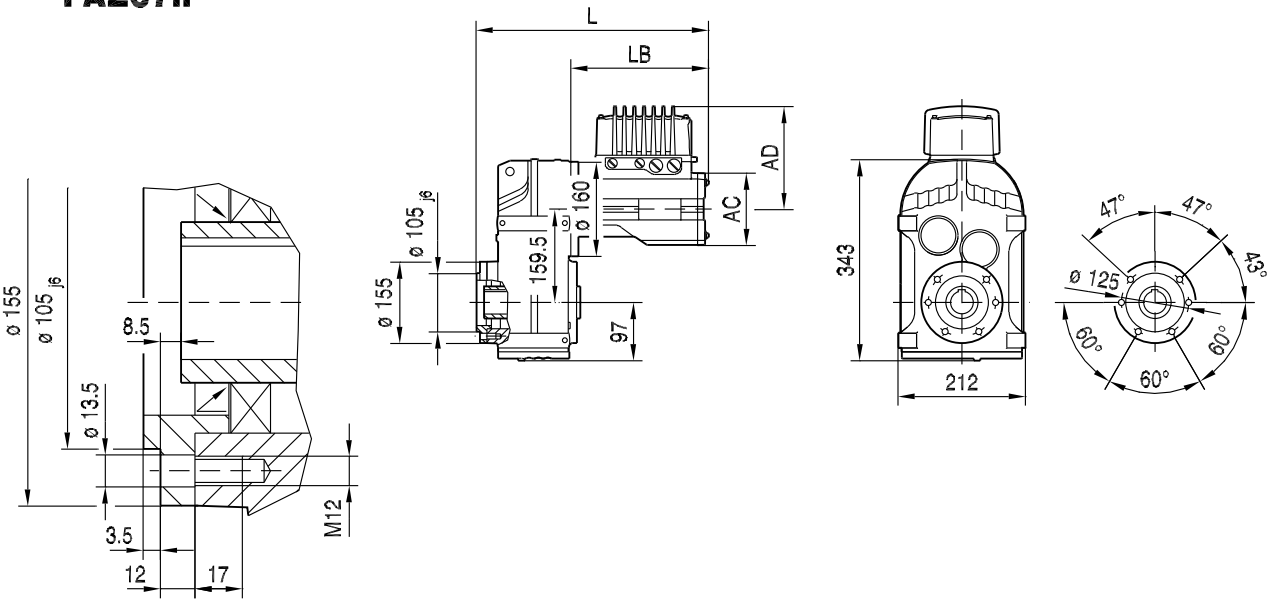
FV67..



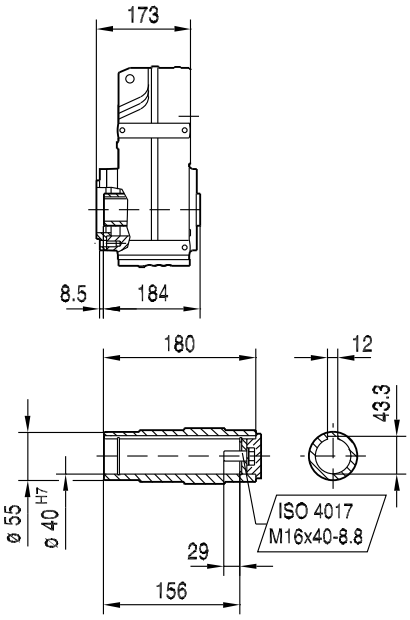
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	448	465						
LB	287	304						

42 023 00 12

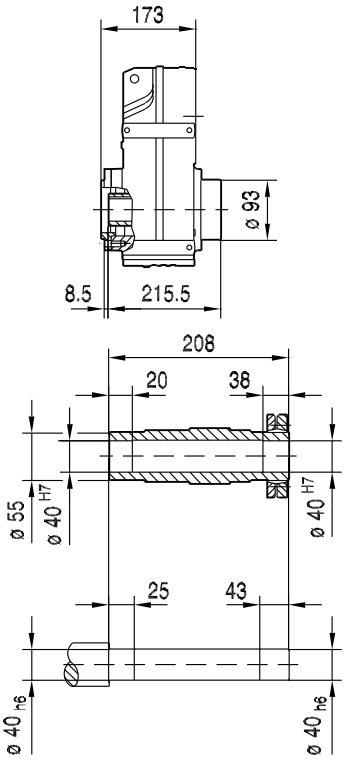
FAZ67..



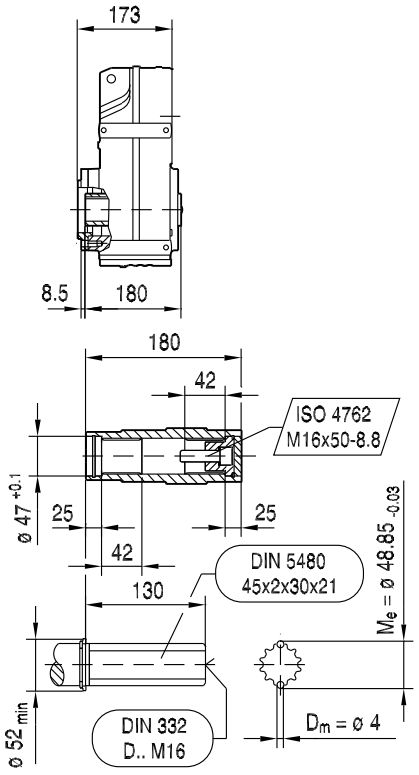
FAZ67..



FHZ67..



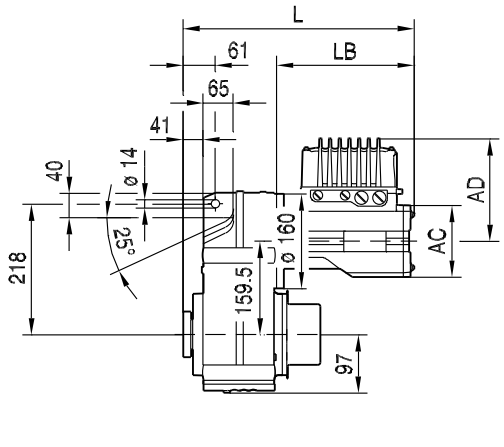
FVZ67..

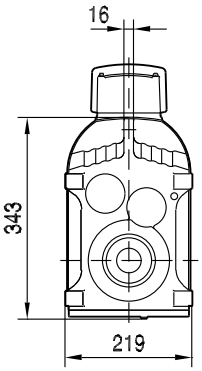


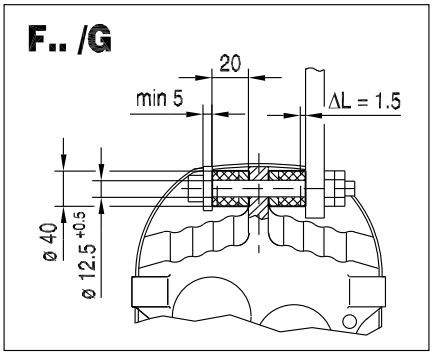
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	460	477						
LB	287	304						

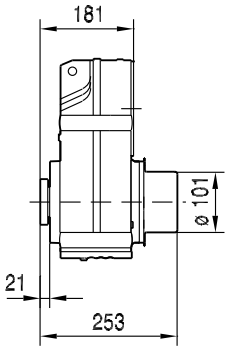
FT67..

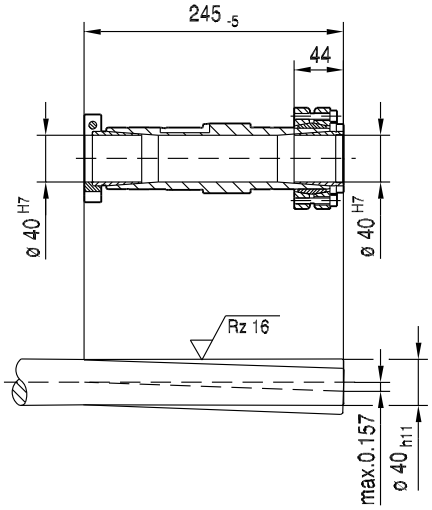
42 024 00 12

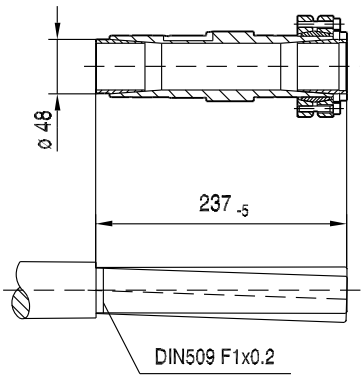








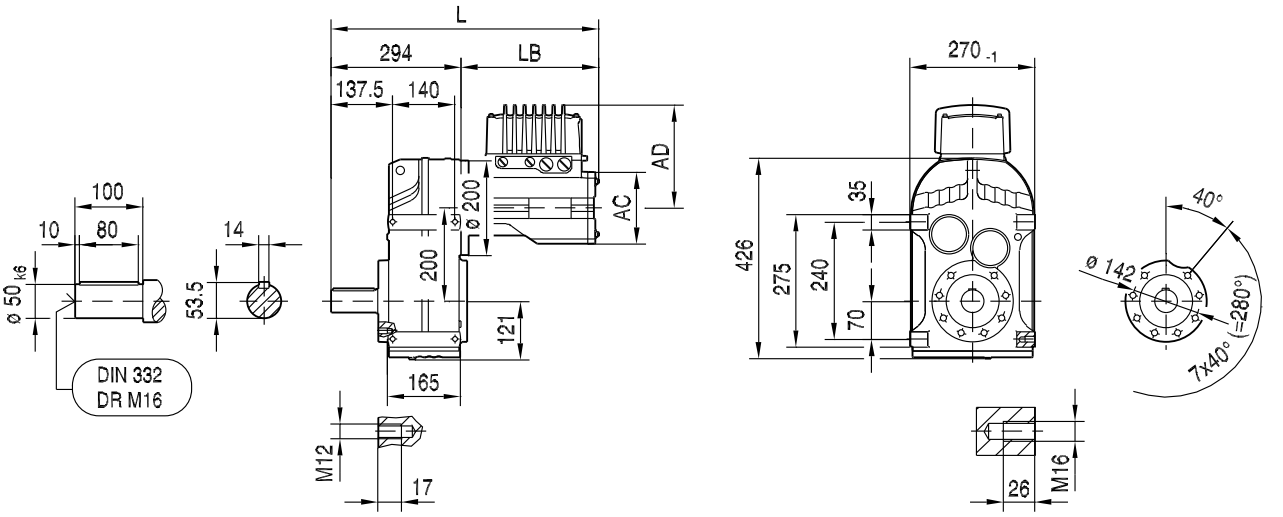




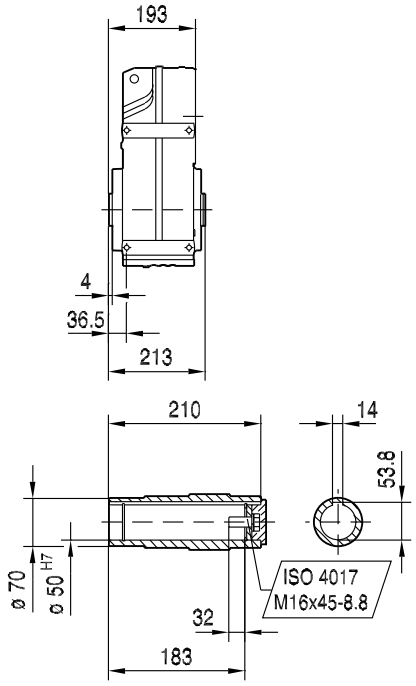
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	468	485						
LB	287	304						

42 025 00 12

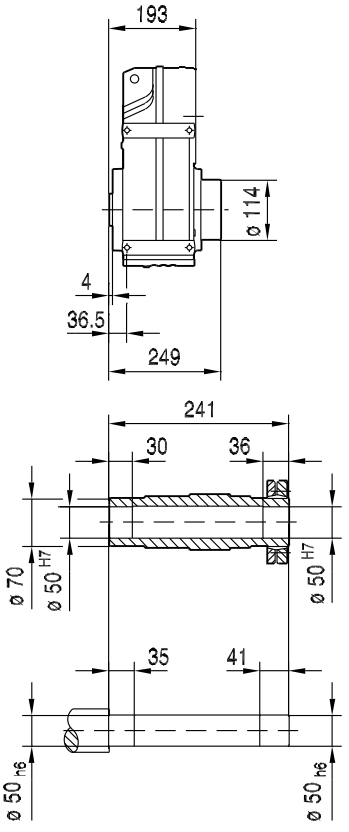
F77..



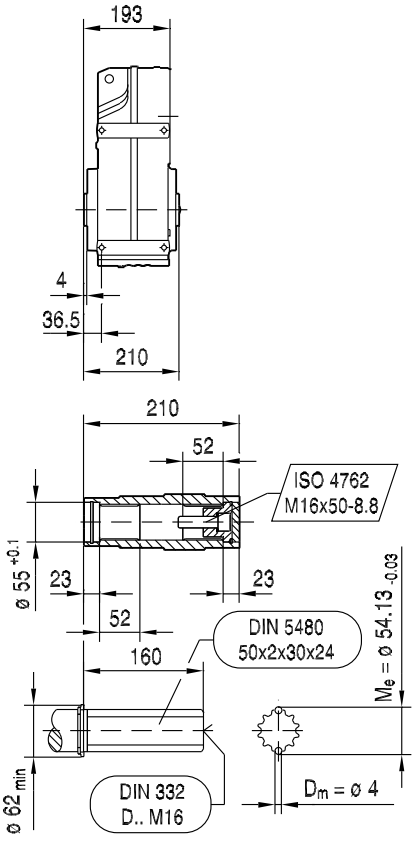
FA77B..



FH77B..



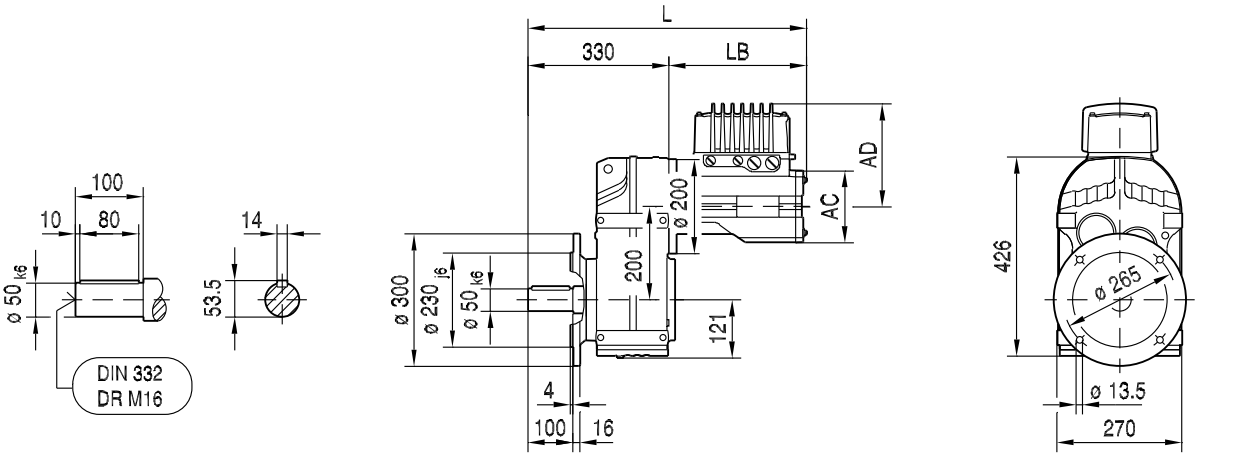
FV77B..



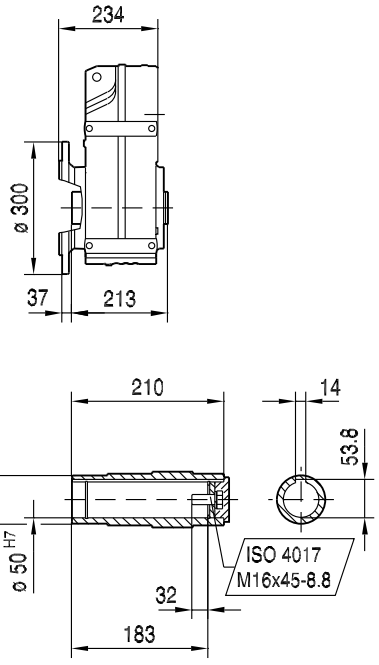
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	575	590						
LB	281	296						

FF77..

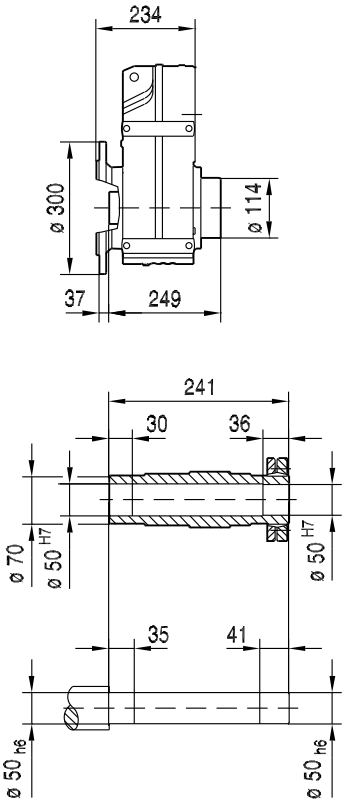
42 026 00 12



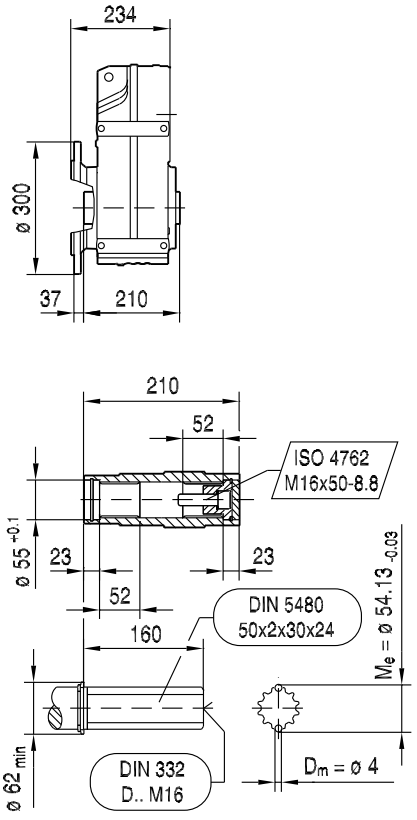
FAF77..



FHF77..



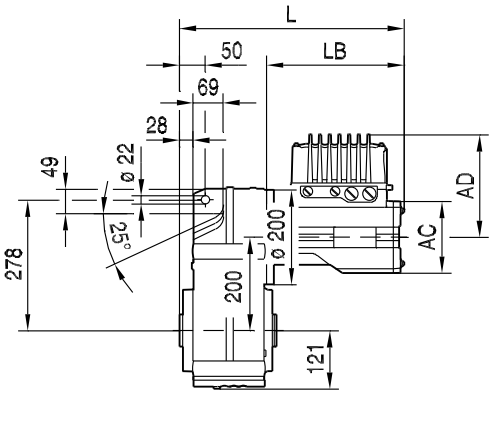
FVF77..

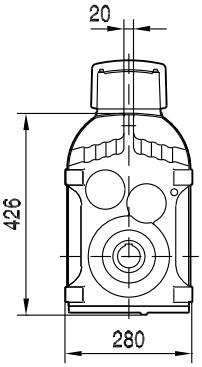


(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	611	626						
LB	281	296						

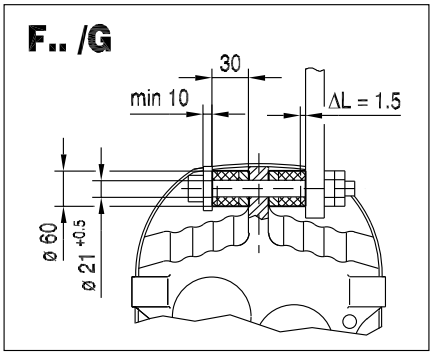
42 027 00 12

FA77..

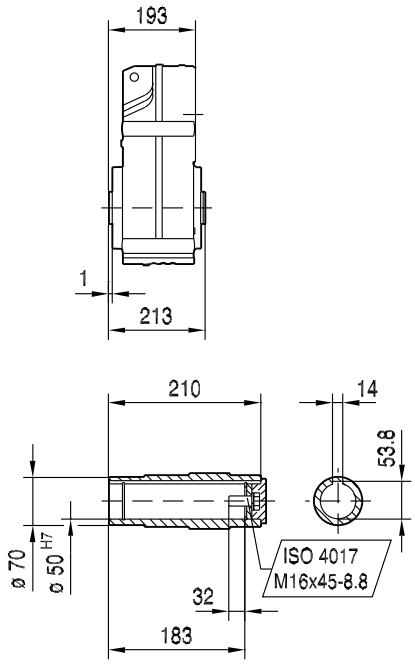




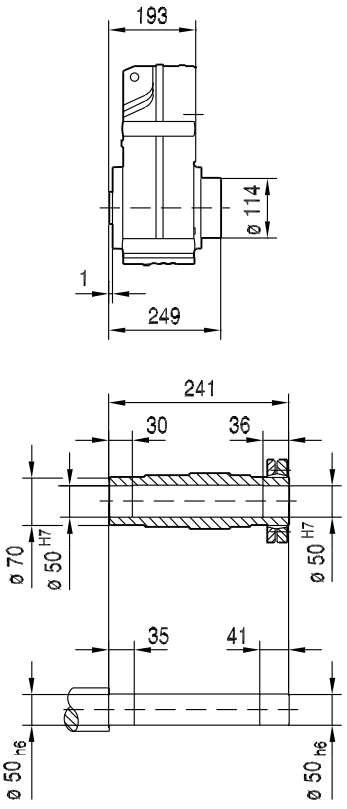
F.. /G



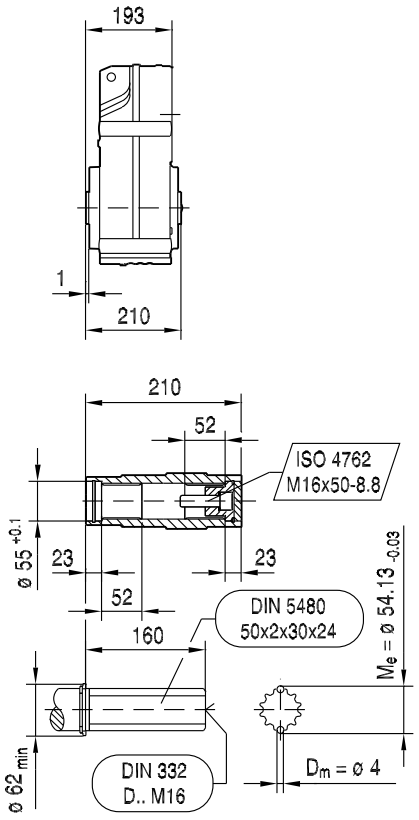
FA77..



FH77..



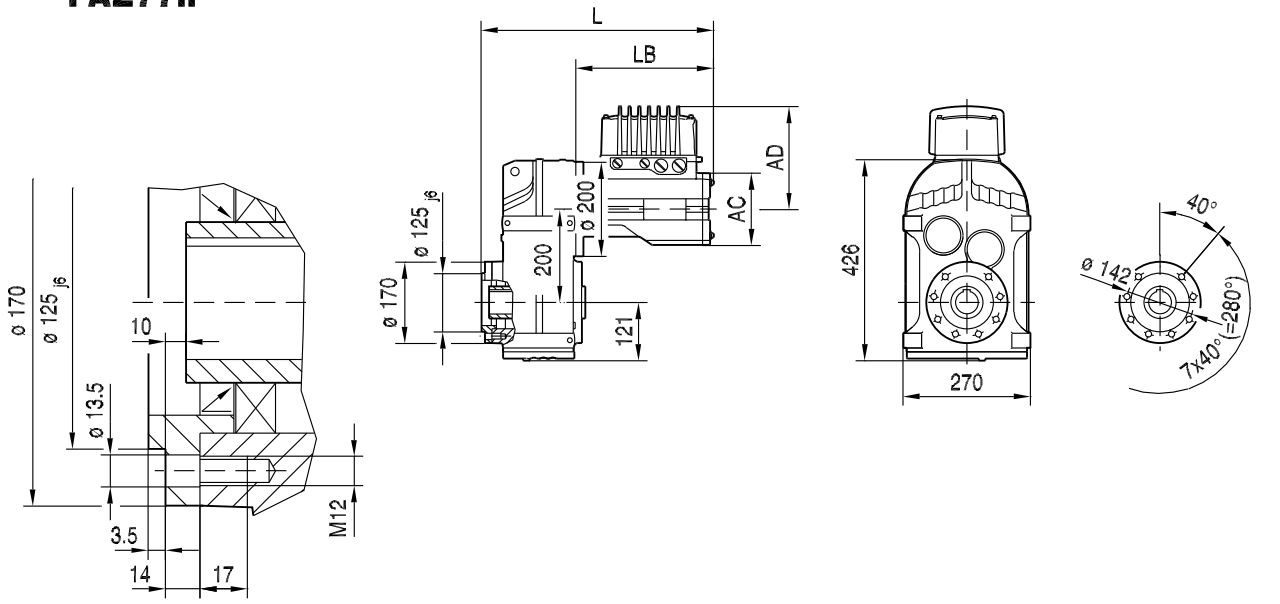
FV77..



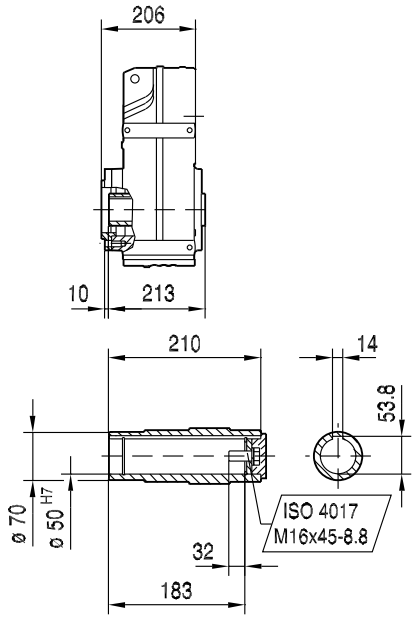
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	474	489						
LB	281	296						

FAZ77..

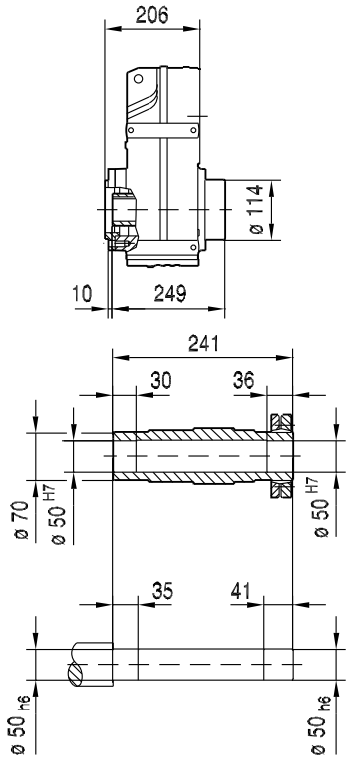
42 028 00 12



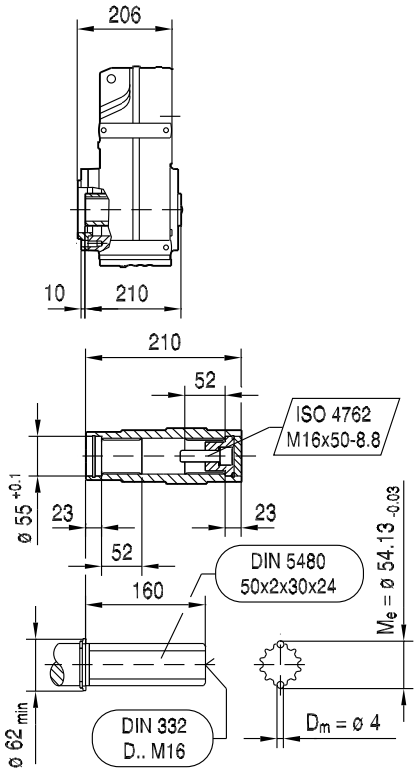
FAZ77..



FHZ77..



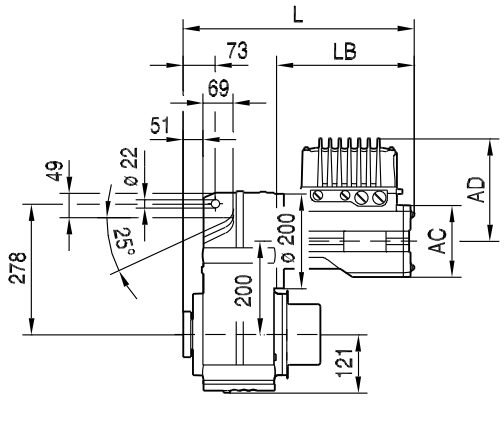
FVZ77..

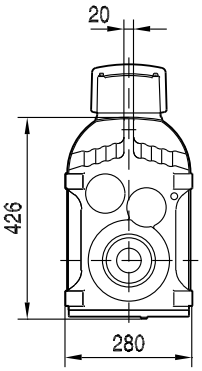


(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	487	502						
LB	281	296						

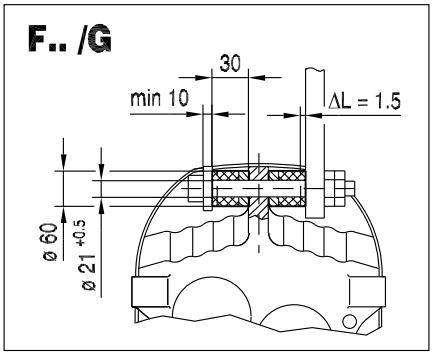
FT77..

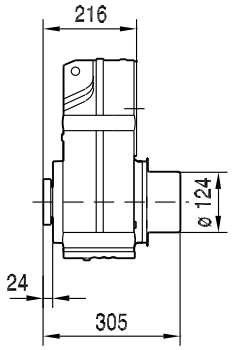
42 029 00 12

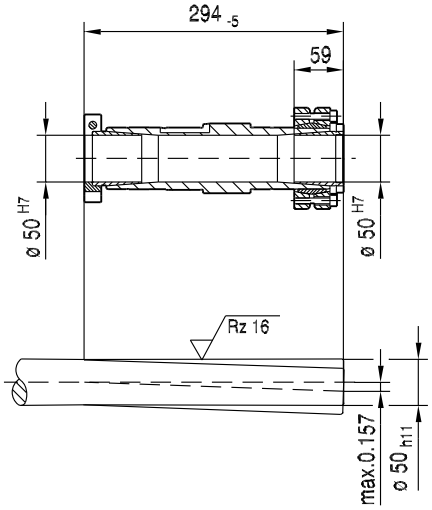


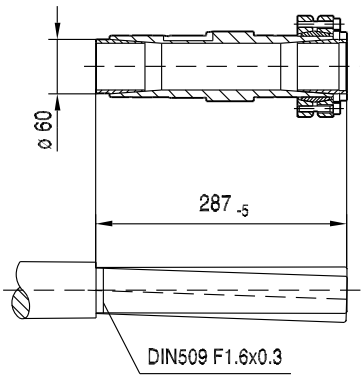


F.. /G





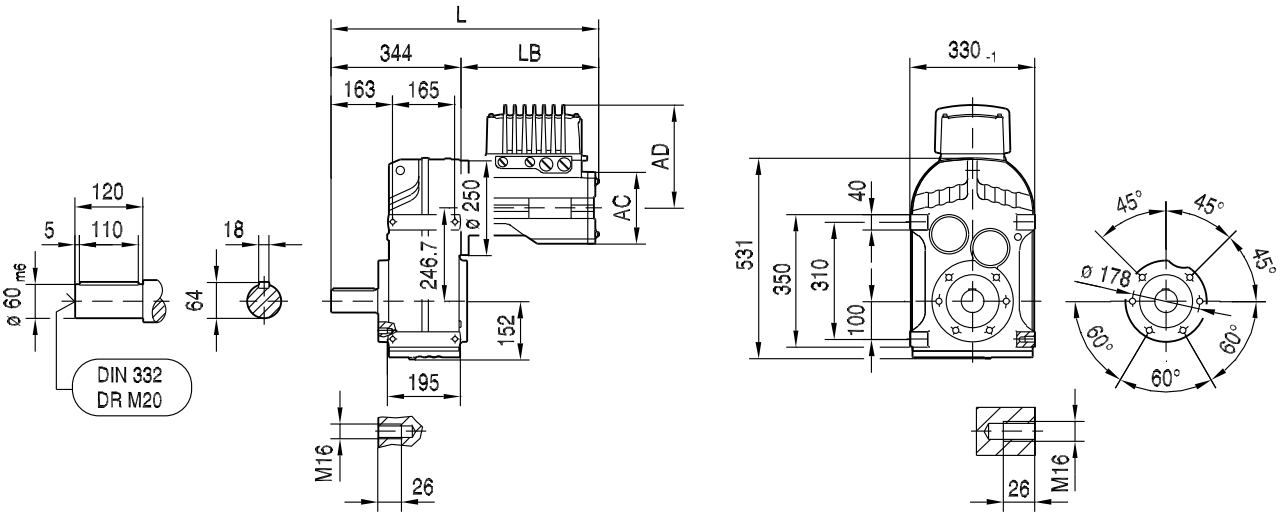




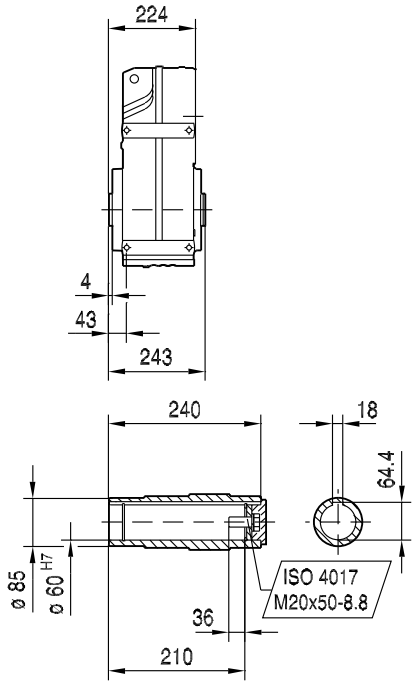
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	497	512						
LB	281	296						

F87..

42 030 00 12

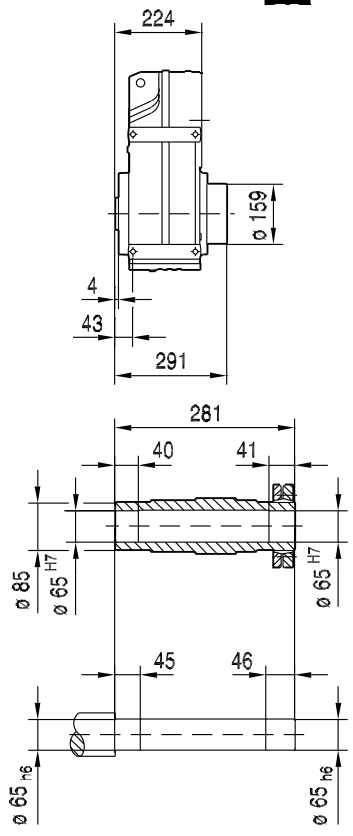


FA87B..

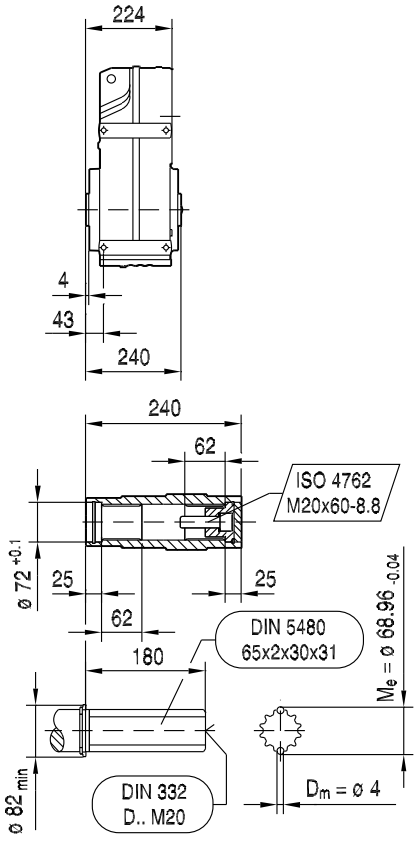


FH87B..

FH87B/R.. → 99



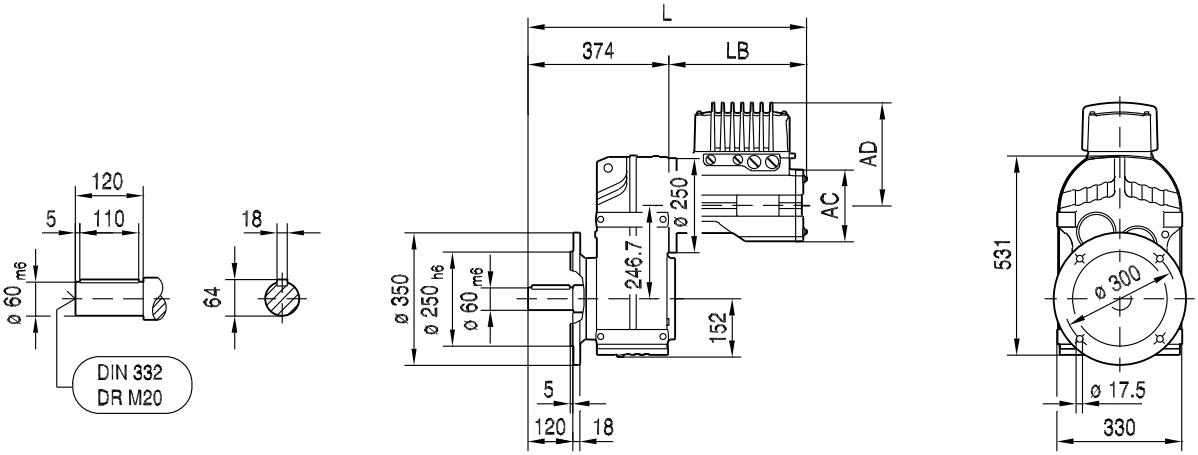
FV87B..



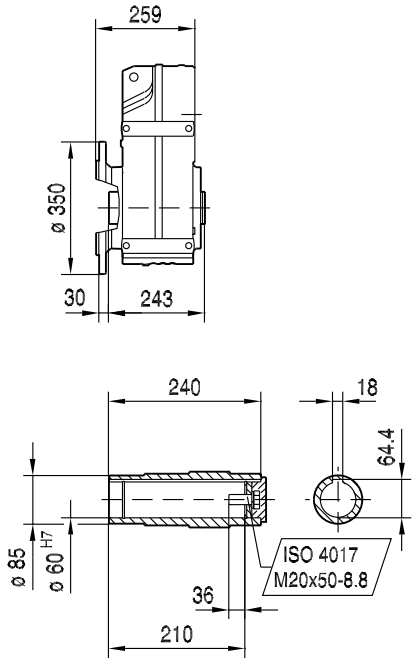
(→ 265)	DRC2							
AC	154							
AD	218							
L	636							
LB	292							

42 031 00 12

FF87..

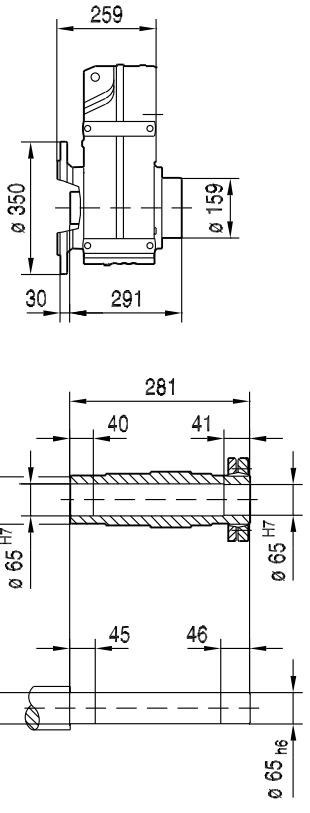


FAF87..

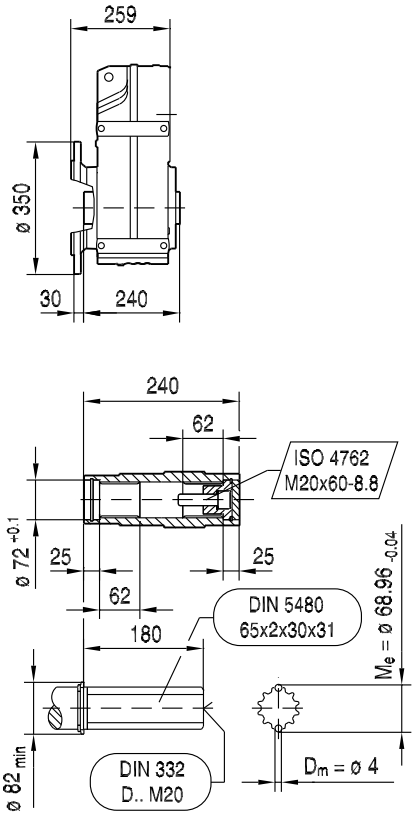


FHF87..

FHF87/R.. → 99

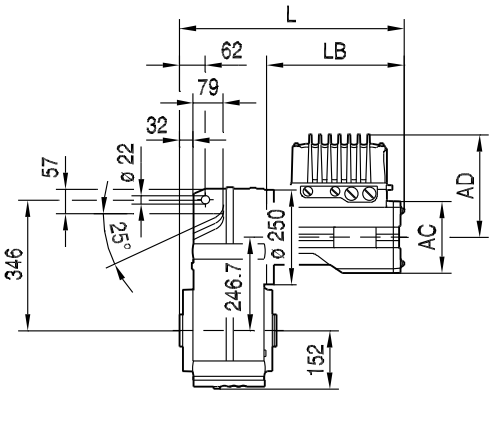


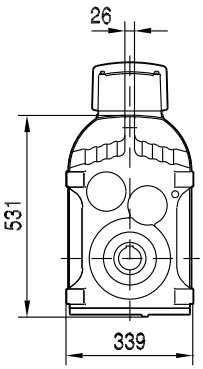
FVF87..



(→ 265)	DRC2							
AC	154							
AD	218							
L	666							
LB	292							

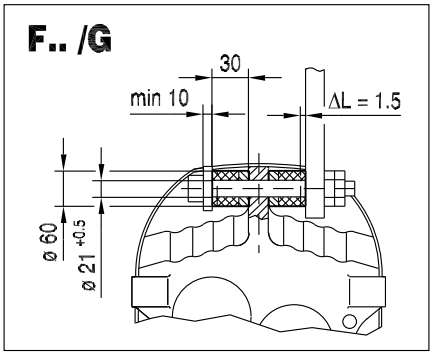
FA87..



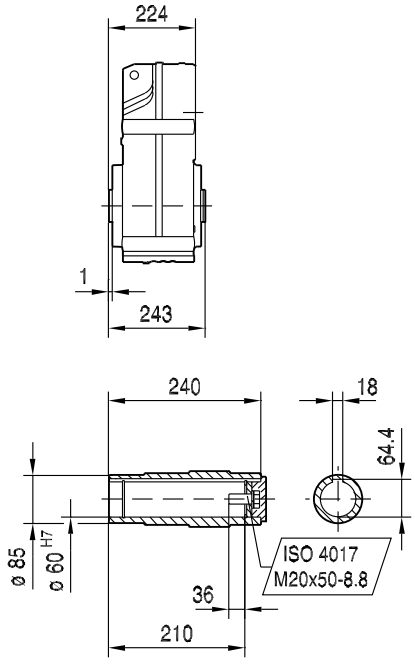


42 032 00 12

F.. /G

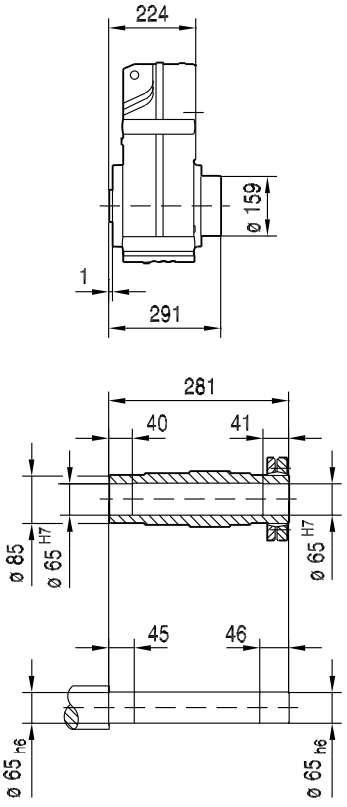


FA87..

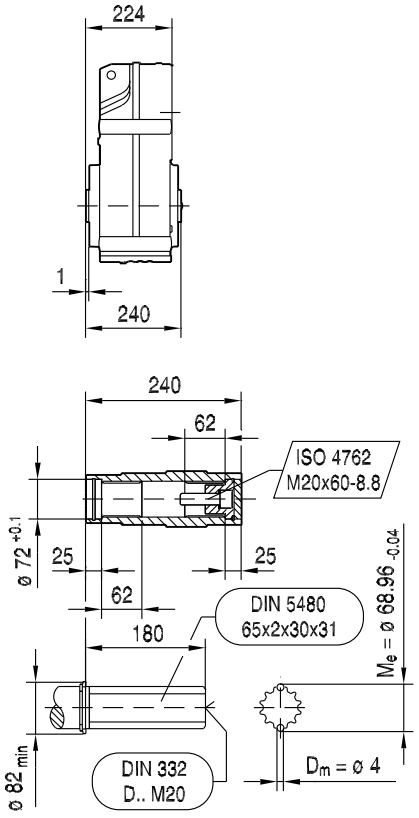


FH87..

FH87/R.. → 99



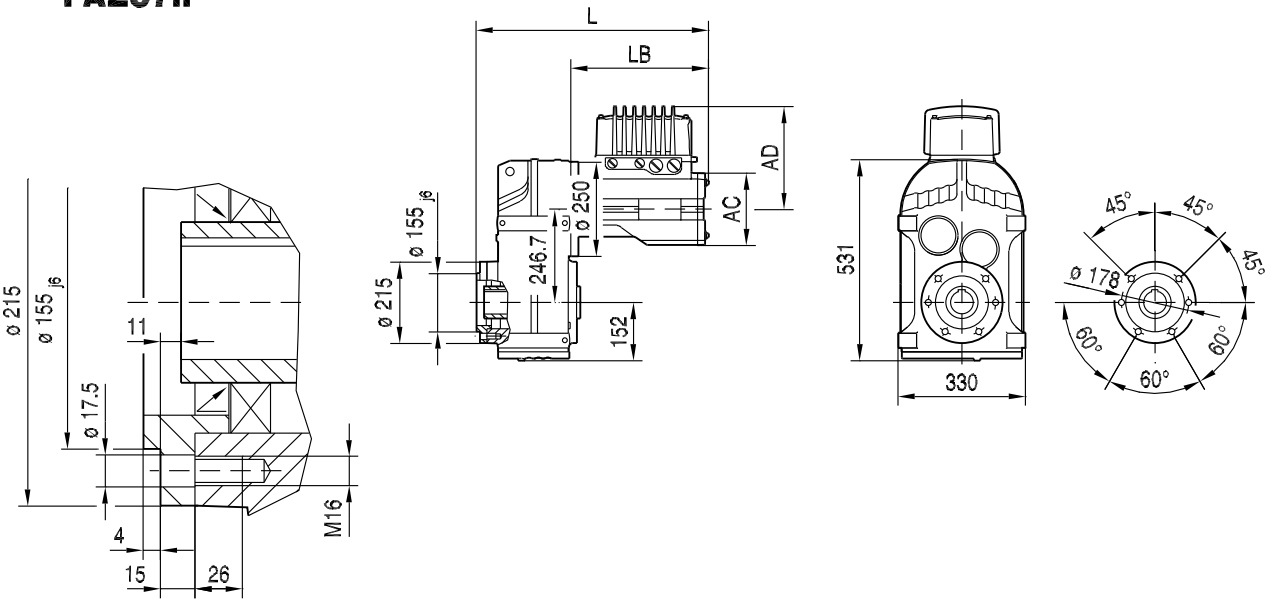
FV87..



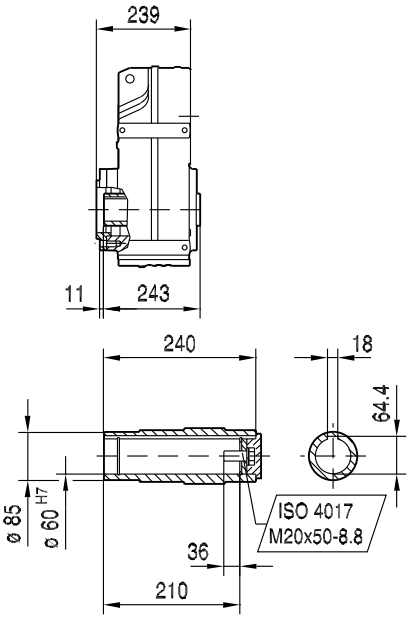
(→ 265)	DRC2							
AC	154							
AD	218							
L	516							
LB	292							

FAZ87..

42 033 00 12

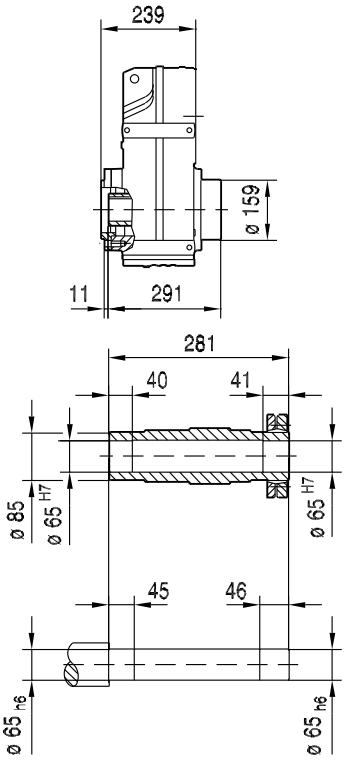


FAZ87..

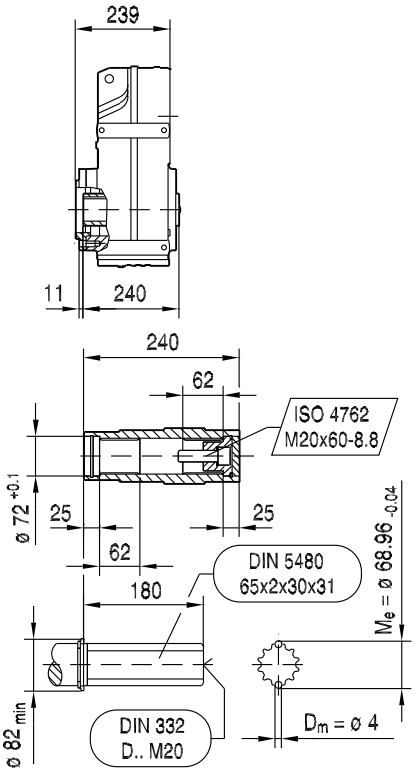


FHZ87..

FHZ87/R.. → 99



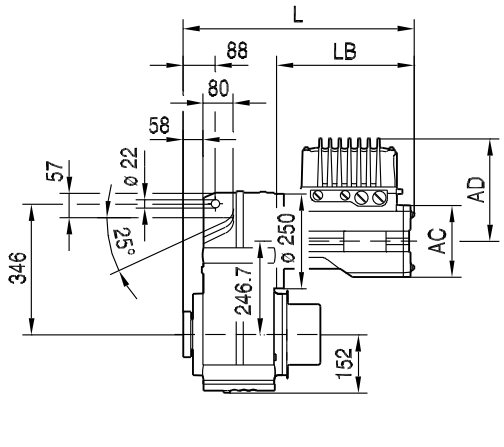
FVZ87..

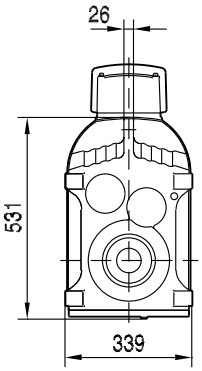


(→ 265)	DRC2							
AC	154							
AD	218							
L	531							
LB	292							

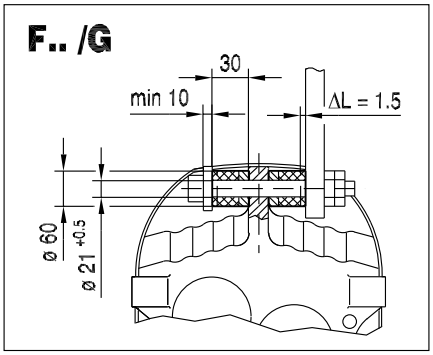
FT87..

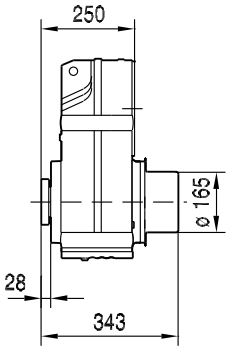
42 034 00 12

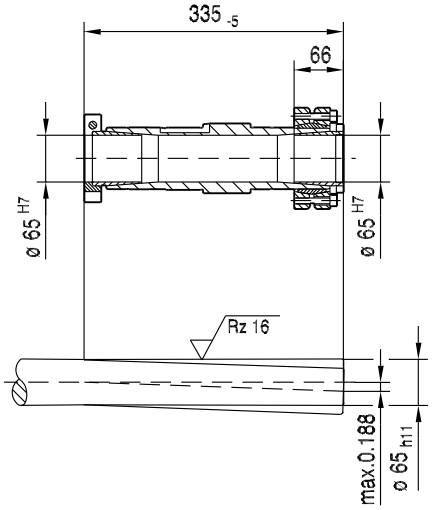


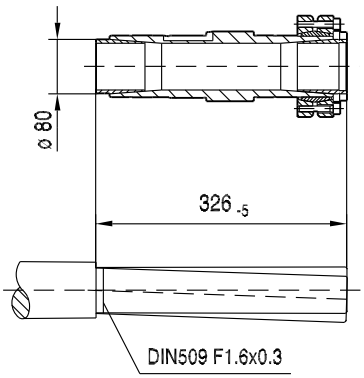


F.. /G





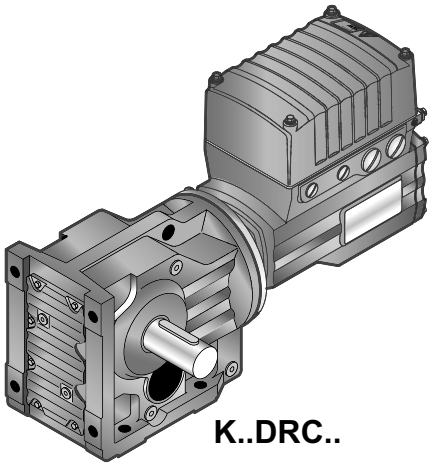




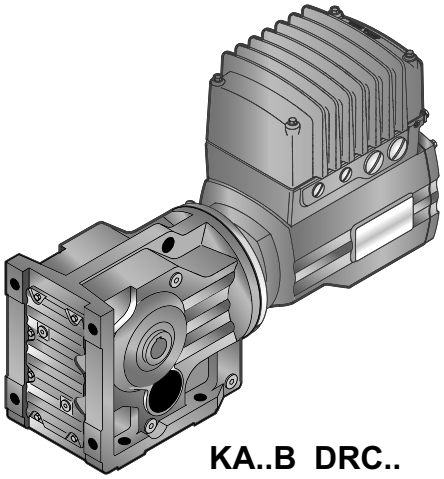
(→ 📖 265)	DRC2							
AC	154							
AD	218							
L	542							
LB	292							

13 Helical-Bevel Gearmotors

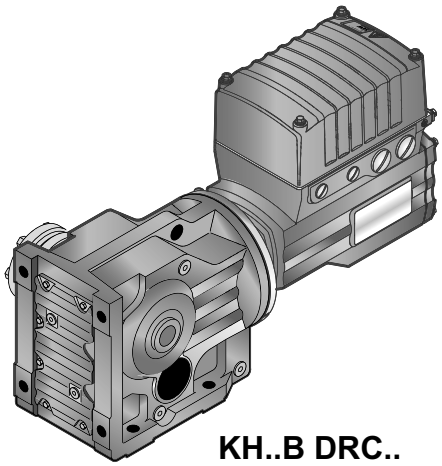
13.1 Variants



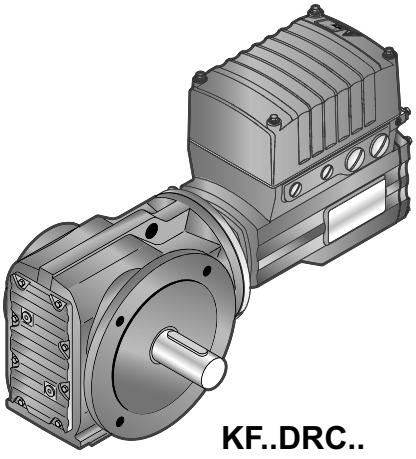
K..DRC..



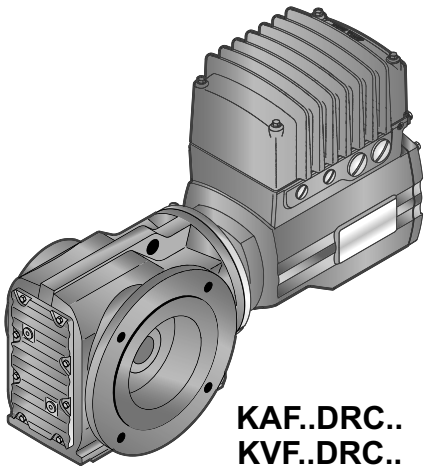
KA..B DRC..
KV..B DRC..



KH..B DRC..

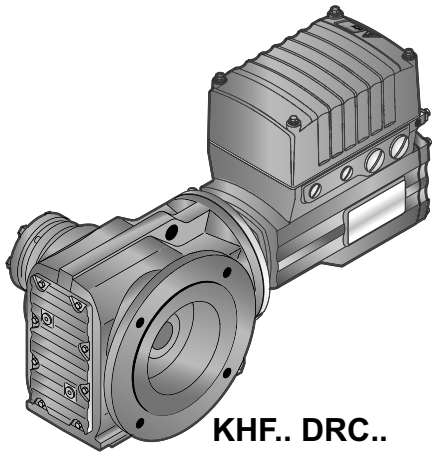


KF..DRC..

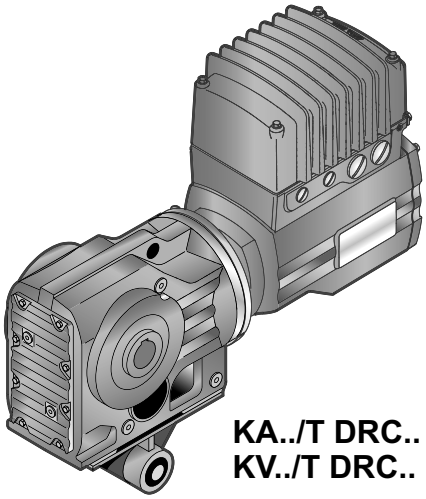


KAF..DRC..
KVF..DRC..

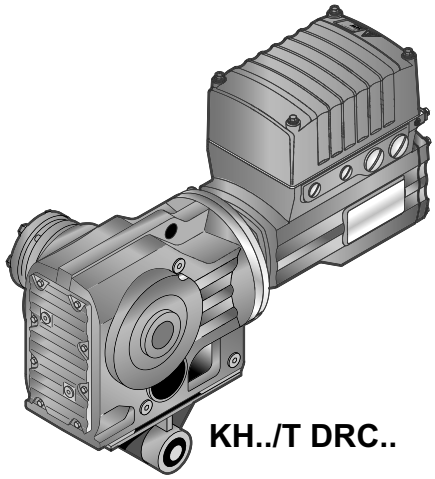
9007204207741963



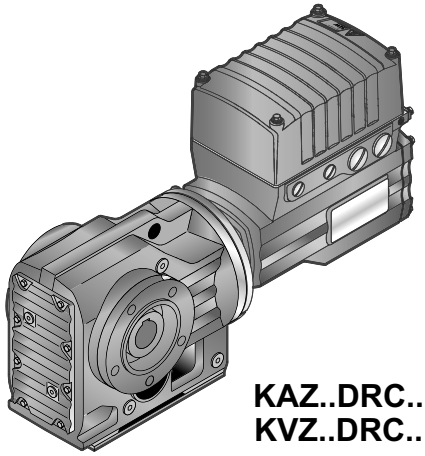
KHF.. DRC..



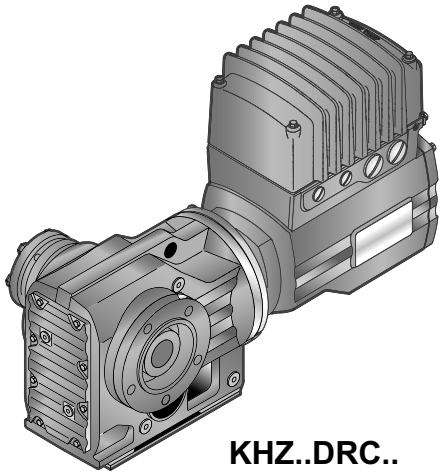
KA../T DRC..
KV../T DRC..



KH../T DRC..



KAZ..DRC..
KVZ..DRC..



KHZ..DRC..

4952999051

13.2 Selection tables

13.2.1 K 37

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
K37 3	0.25	503	11	26	29	72	213	3.98
	0.19	373	14	35	39	96	238	5.36
	0.16	314	17	42	46	115	247	6.37
	0.15	294	18	45	49	122	255	6.80
	0.13	251	21	53	57	143	264	7.96
	0.11	224	24	59	64	160	272	8.91
	0.10	191	28	69	76	189	272	10.49
	0.08	165	32	80	87	>199	272	12.14
	0.08	153	35	87	94	235	281	13.08
	0.07	131	41	101	110	>240	298	15.31
	0.06	117	45	114	123	>240	306	17.15
	0.05	99	54	134	145	>240	315	20.19
	0.04	86	62	155	168	>240	332	23.36
	0.04	80	66	165	180	>240	340	24.99
	0.03	69	76	191			340	28.83
	0.03	67	79	198	>200	>230	340	29.96
	0.03	56	94	>230	>200	>230	340	35.57
	0.03	53	101	>230	>200	>230	340	37.97
	0.02	45	118	>230	>200	>230	340	44.46
	0.02	40	132	>230	>200	>230	340	49.79
	0.02	34	155	>230	>200	>230	340	58.60
	0.01	29	180	>230	>200	>230	340	67.80
	0.01	28	192	>230	>200	>230	340	72.54
	0.01	24	>200	>230			340	83.69
	0.01	20	>200	>230			340	97.81
	0.009	19	>200	>230			340	106.38

m [kg]			DRC1	DRC2		
K37	3		32	38		
KF: + 2.3 kg / KA: + -0.2 kg / KAF: + 1.5 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	K [N]	KF [N]	KA [N]	KAF [N]	K [N]	KF [N]	KA [N]	KAF [N]
K37 3	3.98	13	2.6	1660	2130	2310	2310	5780	5710	7000	7000
	5.36	13	1.7	1810	2340	2530	2530	5650	5640	7000	7000
	6.37	13	1.3	1950	2500	2720	2720	5650	5640	7000	7000
	6.80	13	1.1	1980	2540	2760	2760	5650	5640	7000	7000
	7.96	13	0.85	2110	2700	2940	2940	5650	5640	7000	7000
	8.91	12	0.70	2200	2810	3070	3070	5650	5640	7000	7000
	10.49	12	0.51	2410	3030	3340	3340	5650	5640	7000	7000
	12.14	12	0.40	2600	3240	3600	3600	5650	5640	7000	7000
	13.08	9	1.0	2650	3310	3660	3660	4100	4100	7000	7000
	15.31	9	0.76	2780	3480	3850	3850	4100	4100	7000	7000
	17.15	8	0.62	2900	3630	4020	4020	4100	4100	7000	7000
	20.19	8	0.46	3110	3870	4300	4300	4100	4100	7000	7000
	23.36	8	0.37	3260	4060	4510	4510	4100	4100	7000	7000
	24.99	8	0.33	3330	4150	4600	4600	4100	4100	7000	7000
	28.83	8	0.26	3580	4420	4940	4940	4100	4100	7000	7000
	29.96	7	0.76	3650	4500	5030	5030	5140	5140	7000	7000
	35.57	7	0.60	3970	4860	5460	5460	5140	5140	7000	7000
	37.97	7	0.54	4100	5000	5630	5630	5140	5140	7000	7000
	44.46	7	0.42	4420	5350	6060	6060	5140	5140	7000	7000
	49.79	7	0.36	4660	5610	6380	6380	5140	5140	7000	7000
	58.60	7	0.27	5020	5630	6860	6860	5140	5140	7000	7000
	67.80	7	0.23	5360	5630	7000	7000	5140	5140	7000	7000
	72.54	7	0.21	5520	5630	7000	7000	5140	5140	7000	7000
	83.69	7	0.17	5640	5630	7000	7000	5140	5140	7000	7000
	97.81	7	0.13	5640	5630	7000	7000	5140	5140	7000	7000
	106.38	7	0.12	5640	5630	7000	7000	5140	5140	7000	7000

13.2.2 K 47

			DRC1		DRC2			
	na_1 [rpm]	na_{2000} [rpm]	M_a [Nm]	M_{apk} [Nm]	M_a [Nm]	M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
K47 3	0.22	431			33	84	349	4.64
	0.17	344	15	38	42	105	391	5.81
	0.15	304	17	44	47	118	408	6.58
	0.14	272	20	49	53	132	425	7.36
	0.12	234	23	57	62	154	459	8.56
	0.11	220	24	60	66	164	476	9.10
	0.09	189	28	70	76	190	476	10.56
	0.08	170	31	78	85	210	476	11.77
	0.08	164	32	81	88	215	595	12.19
	0.07	147	36	90	98	245	612	13.65
	0.06	126	42	105	114	285	646	15.86
	0.06	119	45	112	121	300	646	16.86
	0.05	102	52	130	141	350	680	19.58
	0.05	92	58	144	157	390	680	21.81
	0.04	83	64	159	173	430	680	24.06
	0.04	77	69	172	187	>435	680	25.91
	0.03	68	78	194	210	>435	680	29.32
	0.03	64	83	205	225	>435	680	31.30
	0.03	57	94	230	250	>435	680	35.39
	0.03	50	105	260	285	>435	680	39.61
	0.02	43	122	300	330	>435	680	46.03*
	0.02	41	130	320	350	>435	680	48.95*
	0.02	35	151	375	>400	>435	680	56.83
	0.02	32	168	415	>400	>435	680	63.30*
	0.01	29	185	>435	>400	>435	680	69.84
	0.01	27	199	>435	>400	>435	680	75.20*
	0.01	23	225	>435	>400	>435	680	85.12*
	0.01	22	240	>435	>400	>435	680	90.86
	0.010	19	275	>435			680	104.37
	0.008	16	320	>435			680	121.48*
	0,008	15	345	>435			680	131.87*

m [kg]			DRC1	DRC2		
K47	3		38	44		
KF: + 3.2 kg / KA: + -0.9 kg / KAF: + 2.0 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	K [N]	KF [N]	KA [N]	KAF [N]	K [N]	KF [N]	KA [N]	KAF [N]
K47 3	4.64	12	4.4	2980	2970	2040	2040	7060	7060	10000	10000
	5.81	12	3.6	3140	3140	2100	2100	7020	7020	10000	10000
	6.58	12	2.8	3270	3270	2190	2190	6970	6970	10000	10000
	7.36	11	2.3	3380	3390	2270	2270	6970	6970	10000	10000
	8.56	11	1.8	3500	3520	2310	2310	6970	6970	10000	10000
	9.10	11	1.6	3540	3560	2310	2310	6970	6970	10000	10000
	10.56	11	1.2	3830	3840	2580	2580	6920	6920	10000	10000
	11.77	10	1.0	4060	4050	2770	2770	6920	6920	10000	10000
	12.19	8	2.4	3720	3770	2330	2330	900	900	10000	10000
	13.65	8	2.0	3890	3940	2450	2450	900	900	10000	10000
	15.86	8	1.6	4080	4130	2570	2570	900	900	10000	10000
	16.86	8	1.4	4220	4270	2690	2690	900	900	10000	10000
	19.58	8	1.1	4440	4480	2820	2820	900	900	10000	10000
	21.81	8	0.91	4710	4740	3070	3070	900	900	10000	10000
	24.06	8	0.75	4970	4990	3300	3300	900	900	10000	10000
	25.91	8	0.68	5170	5180	3470	3470	900	900	10000	10000
	29.32	8	0.55	5520	5500	3780	3780	900	900	10000	10000
	31.30	7	0.50	5700	5680	3940	3940	900	900	10000	10000
	35.39	7	1.3	5920	5920	4270	4270	900	900	10000	10000
	39.61	7	1.1	5920	5920	4580	4580	900	900	10000	10000
	46.03*	7	0.88	5920	5920	5000	5000	900	900	10000	10000
	48.95*	7	0.80	5920	5920	5190	5190	900	900	10000	10000
	56.83	7	0.64	5920	5920	5640	5640	900	900	10000	10000
	63.30*	7	0.54	5920	5920	5990	5990	900	900	10000	10000
	69.84	6	0.45	5920	5920	6320	6320	900	900	10000	10000
	75.20*	6	0.42	5920	5920	6570	6570	900	900	10000	10000
	85.12*	6	0.35	5920	5920	7000	7000	900	900	10000	10000
	90.86	6	0.32	5920	5920	7240	7240	900	900	10000	10000
	104.37	6	0.26	5920	5920	7760	7760	900	900	10000	10000
	121.48*	6	0.21	5920	5920	8360	8360	900	900	10000	10000
	131.87*	6	0.18	5920	5920	8700	8700	900	900	10000	10000

13.2.3 K 57

			DRC1		DRC2			
	na_1 [rpm]	na_{2000} [rpm]	M_a [Nm]	M_{apk} [Nm]	M_a [Nm]	M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
K57 3	0.21	426			34	84	510	4.69
	0.15	304			47	118	587	6.57
	0.13	265	20	50	54	136	621	7.55
	0.11	230	23	58	63	157	663	8.71
	0.10	209	25	63	69	173	689	9.59
	0.09	178	30	75	81	200	706	11.26
	0.08	168	32	79	86	210	706	11.92
	0.08	151			95	235	867	13.25
	0.07	131	40	101	110	270	910	15.22
	0.06	114	47	116	127	315	944	17.57
	0.05	103	51	128	139	345	978	19.34
	0.04	88	60	150	164	405	1020	22.71
	0.04	83	64	159	173	430	1020	24.05
	0.04	73	72	181	197	490	1020	27.34
	0.03	66	80	200	215	545	1020	30.28
	0.03	56	95	235	255	640	1020	35.70
	0.03	52	102	250	275	>665	1020	38.49
	0.02	45	118	290	315	>665	1020	44.43
	0.02	41	130	320	350	>665	1020	48.89
	0.02	35	152	380	410	>665	1020	57.42*
	0.02	33	161	400	435	>665	1020	60.81*
	0.01	29	183	455	495	>665	1020	69.12
	0.01	26	200	505	550	>665	1020	76.56*
	0.01	22	235	595	>600	>665	1020	90.26*
	0.010	19	270	>665	>600	>665	1020	102.88*
	0.009	18	285	>665	>600	>665	1020	108.29
	0,008	16	325	>665			1020	123.85
	0.007	14	380	>665			1020	145.14*

m [kg]			DRC1	DRC2		
K57	3		44	50		
KF: + 4.7 kg / KA: + -2.1 kg / KAF: + 3.6 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	K [N]	KF [N]	KA [N]	KAF [N]	K [N]	KF [N]	KA [N]	KAF [N]
K57 3	4.69	11	9.0	3800	3980	2580	2580	8520	8520	11500	11500
	6.57	10	5.6	4180	4400	2800	2800	7990	8110	11500	11500
	7.55	10	4.4	4360	4580	2900	2900	7740	7920	11500	11500
	8.71	10	3.5	4520	4760	2980	2980	7420	7660	11500	11500
	9.59	10	3.0	4650	4900	3050	3050	7420	7660	11500	11500
	11.26	9	2.3	4990	5250	3340	3340	7420	7660	11500	11500
	11.92	9	2.1	5150	5400	3470	3470	7420	7660	11500	11500
	13.25	7	4.8	5190	5350	3240	3240	4700	4700	11500	11500
	15.22	7	3.8	5430	5600	3390	3390	4700	4700	11500	11500
	17.57	7	3.0	5740	5910	3610	3610	4700	4700	11500	11500
	19.34	7	2.6	5910	6080	3710	3710	4700	4700	11500	11500
	22.71	7	2.0	6280	6460	3970	3970	4700	4700	11500	11500
	24.05	7	1.9	6480	6650	4140	4140	4700	4700	11500	11500
	27.34	7	1.5	6930	7090	4550	4550	4700	4700	11500	11500
	30.28	7	1.2	7300	7460	4880	4880	4700	4700	11500	11500
	35.70	7	0.95	7630	7720	5440	5440	4700	4700	11500	11500
	38.49	6	2.3	7630	7720	5710	5710	4700	4700	11500	11500
	44.43	6	1.9	7630	7720	6240	6240	4700	4700	11500	11500
	48.89	6	1.6	7630	7720	6610	6610	4700	4700	11500	11500
	57.42*	6	1.3	7630	7720	7260	7260	4700	4700	11500	11500
	60.81*	6	1.2	7630	7720	7490	7490	4700	4700	11500	11500
	69.12	6	0.98	7630	7720	8040	8040	4700	4700	11500	11500
	76.56*	6	0.85	7630	7720	8500	8500	4700	4700	11500	11500
	90.26*	6	0.67	7630	7720	9260	9260	4700	4700	11500	11500
	102.88*	6	0.46	7630	7720	9900	9900	4700	4700	11500	11500
	108.29	6	0.41	7630	7720	10200	10200	4700	4700	11500	11500
	123.85	6	0.33	7630	7720	10900	10900	4700	4700	11500	11500
	145.14*	6	0.27	7630	7720	11500	11500	4700	4700	11500	11500

13.2.4 K 67

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
	0.19	385			37	94	595	5.20
	0.14	275			52	131	714	7.28
	0.12	239	22	55	60	151	748	8.37
	0.10	207	26	64	70	174	816	9.66
	0.09	188	28	70	77	191	850	10.63
	0.08	160	33	83	90	220	901	12.48
	0.08	151			95	235	1139	13.22
	0.07	132	40	101	109	270	1190	15.19
	0.06	114	46	116	126	315	1258	17.54
	0.05	104	51	128	139	345	1292	19.30
	0.04	88	60	150	163	405	1326	22.66
	0.04	83	64	159	173	430	1360	24.00
K67	0.04	73	72	181	196	490	1394	27.28
 **3**	0.03	66	80	200	215	540	1394	30.22
	0.03	56	94	235	255	640	1394	35.62
	0.03	52	102	250	275	690	1360	38.39
	0.02	45	117	290	315	795	1394	44.32
	0.02	41	129	320	350	870	1394	48.77
	0.02	35	152	375	410	>920	1394	57.28
	0.02	33	161	400	435	>920	1394	60.66
	0.01	29	183	455	495	>920	1394	68.95
	0.01	26	200	505	545	>920	1394	76.37
	0.01	22	235	595	645	>920	1394	90.04
	0.010	19	270	675	735	>920	1394	102.62
	0.009	19	285	715	775	>920	1394	108.03
	0.008	16	325	810			1394	123.54
	0.007	14	380	>920			1394	144.79*

m [kg]			DRC1	DRC2		
K67	 **3**		50	56		
KF: + 5.6 kg / KA: + -2.7 kg / KAF: + 3.0 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	K [N]	KF [N]	KA [N]	KAF [N]	K [N]	KF [N]	KA [N]	KAF [N]
	5.20	10	11	9860	10000	2450	2450	12300	12300	13000	13000
	7.28	9	6.3	10700	10900	2480	2480	11700	11700	13000	13000
	8.37	9	4.9	11100	11400	2590	2590	11500	11500	13000	13000
	9.66	9	3.8	11500	11700	2550	2550	11400	11400	13000	13000
	10.63	9	3.2	11800	12000	2590	2590	11300	11300	13000	13000
	12.48	9	2.5	12300	12300	2710	2710	11300	11300	13000	13000
	13.22	8	5.6	11500	11500	2420	2420	9310	9310	13000	13000
	15.19	8	4.4	11300	11300	2550	2550	9310	9310	13000	13000
	17.54	7	3.4	11000	11000	2630	2630	9310	9310	13000	13000
	19.30	7	2.9	10800	10800	2740	2740	9310	9310	13000	13000
	22.66	7	2.2	10700	10700	3070	3070	9310	9310	13000	13000
	24.00	7	2.0	10500	10500	3090	3090	9310	9310	13000	13000
K67	27.28	7	1.6	10300	10300	3340	3340	9310	9310	13000	13000
 3	30.22	7	1.3	10300	10300	3680	3680	9310	9310	13000	13000
	35.62	7	1.0	10300	10300	4260	4260	9310	9310	13000	13000
	38.39	6	2.4	10500	10500	4690	4690	9310	9310	13000	13000
	44.32	6	1.9	10300	10300	5070	5070	9310	9310	13000	13000
	48.77	6	1.7	10300	10300	5440	5440	9310	9310	13000	13000
	57.28	6	1.4	10300	10300	6100	6100	9310	9310	13000	13000
	60.66	6	1.2	10300	10300	6340	6340	9310	9310	13000	13000
	68.95	6	1.0	10300	10300	6900	6900	9310	9310	13000	13000
	76.37	6	0.87	10300	10300	7360	7360	9310	9310	13000	13000
	90.04	6	0.68	10300	10300	8140	8140	9310	9310	13000	13000
	102.62	6	0.47	10300	10300	8800	8800	9310	9310	13000	13000
	108.03	6	0.42	10300	10300	9060	9060	9310	9310	13000	13000
	123.54	6	0.34	10300	10300	9770	9770	9310	9310	13000	13000
	144.79*	6	0.28	10300	10300	10700	10700	9310	9310	13000	13000

13.2.5 K 77

			DRC1		DRC2			
	na_1 [rpm]	na_{2000} [rpm]	M_a [Nm]	M_{apk} [Nm]	M_a [Nm]	M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
K77 3	0.14	276			52	130	1394	7.24
	0.12	236			61	153	1513	8.48
	0.10	209			69	172	1598	9.56
	0.09	185	29	72	78	195	1683	10.84
	0.08	162	33	82	89	220	1700	12.36
	0.07	148			97	240	2278	13.52
	0.06	126			114	285	2380	15.84
	0.06	112			129	320	2465	17.87
	0.05	99	54	134	146	360	2550	20.25
	0.04	87	61	153	166	415	2635	23.08
	0.04	78	68	170	184	460	2635	25.62
	0.03	68	78	194	210	525	2635	29.27
	0.03	65	82	200	220	555	2635	30.89
	0.03	57	93	230	250	630	2635	35.20
	0.03	52	102	250	275	690	2550	38.39
	0.02	50			285	720	2635	40.04
	0.02	44			325	810	2635	45.16
	0.02	39	136	335	365	920	2635	51.18
	0.02	34	155	385	420	1050	2635	58.34
	0.02	31	172	425	465	1160	2635	64.75
	0.01	27	196	485	530	1330	2635	73.99
	0.01	26	205	515	560	1400	2635	78.07
	0.01	22	235	585	640	>1550	2635	88.97
	0.01	21	255	640	695	>1550	2635	97.05
	0.009	18	300	750	810	>1550	2635	113.56
	0.008	16	340	850	920	>1550	2635	128.52
	0.007	15	355	890	970	>1550	2635	135.28
	0.006	13	405	1010			2635	154.02
	0.006	11	475	1180			2465	179.37
	0.005	10	505	1270			2465	192.18

m [kg]			DRC1	DRC2		
K77	3		76	82		
KF: + 8.3 kg / KA: + -7.5 kg / KAF: + 0.4 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	K [N]	KF [N]	KA [N]	KAF [N]	K [N]	KF [N]	KA [N]	KAF [N]
K77 3	7.24	8	17	13100	13800	2490	2490	17700	17700	20000	20000
	8.48	8	13	13500	14300	2430	2430	17600	17700	20000	20000
	9.56	8	10	13900	14700	2430	2430	17600	17700	20000	20000
	10.84	8	8.2	14400	15200	2460	2460	17600	17700	20000	20000
	12.36	8	6.5	15100	16000	2820	2820	17600	17700	20000	20000
	13.52	7	15	14800	15800	1850	1850	15400	16600	20000	20000
	15.84	6	11	15500	16600	2030	2030	15400	16600	20000	20000
	17.87	6	9.0	16100	16900	2160	2160	15400	16600	20000	20000
	20.25	6	7.2	15700	16800	2330	2330	15400	16600	20000	20000
	23.08	6	5.8	15400	16600	2550	2550	15400	16600	20000	20000
	25.62	6	5.0	15400	16600	2990	2990	15400	16600	20000	20000
	29.27	6	4.0	15400	16600	3590	3590	15400	16600	20000	20000
	30.89	6	3.6	15400	16600	3840	3840	15400	16600	20000	20000
	35.20	6	2.9	15400	16600	4460	4460	15400	16600	20000	20000
	38.39	6	2.5	15700	16800	5210	5210	15400	16600	20000	20000
	40.04	6	6.0	15400	16600	5100	5100	15400	16600	20000	20000
	45.16	6	4.9	15400	16600	5720	5720	15400	16600	20000	20000
	51.18	6	4.1	15400	16600	6390	6390	15400	16600	20000	20000
	58.34	6	3.3	15400	16600	7130	7130	15400	16600	20000	20000
	64.75	5	3.0	15400	16600	7740	7740	15400	16600	20000	20000
	73.99	5	2.4	15400	16600	8550	8550	15400	16600	20000	20000
	78.07	5	2.3	15400	16600	8890	8890	15400	16600	20000	20000
	88.97	5	1.9	15400	16600	9730	9730	15400	16600	20000	20000
	97.05	5	1.6	15400	16600	10300	10300	15400	16600	20000	20000
	113.56	5	1.3	15400	16600	11400	11400	15400	16600	20000	20000
	128.52	5	0.90	15400	16600	12300	12300	15400	16600	20000	20000
	135.28	5	0.81	15400	16600	12700	12700	15400	16600	20000	20000
	154.02	5	0.66	15400	16600	13700	13700	15400	16600	20000	20000
	179.37	5	0.53	16100	16900	15600	15600	15400	16600	20000	20000
	192.18	5	0.46	16100	16900	16200	16200	15400	16600	20000	20000

13.2.6 K 87

			DRC2			
	na_1 [rpm]	na_{2000} [rpm]	M_a [Nm]	M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
K87 3	0.14	277			2210	7.21
	0.12	241			2380	8.29
	0.10	200			2550	10.00
	0.09	179	80	200	2550	11.17
	0.08	159			3400	12.56
	0.07	138			3570	14.45
	0.06	125	115	285	3060	16.00
	0.06	115			3740	17.42
	0.05	103	140	350	3910	19.45
	0.04	89	161	400	3910	22.41
	0.04	80	179	445	4250	24.92
	0.04	72	200	500	4420	27.88
	0.03	64	225	565	4590	31.39
	0.03	55			4250	36.52*
	0.02	45			4420	44.02
	0.02	41	350	880	4590	49.16
	0.02	35	405	1010	4590	56.64
	0.02	32	450	1130	4590	63.00*
	0.01	28	505	1260	4590	70.46
	0.01	25	570	1420	4590	79.34
	0.01	23	620	1550	4590	86.34
	0.010	19	735	1840	4590	102.71*
	0.009	17	830	2080	4590	115.82
	0.008	16	910	2280	4590	126.91*
	0.007	14	1060	2650	4590	147.32*
	0.006	12	1180	2950	4590	164.34*
	0,006	11	1250	3130	4590	174.19
	0.005	10			4590	197.37

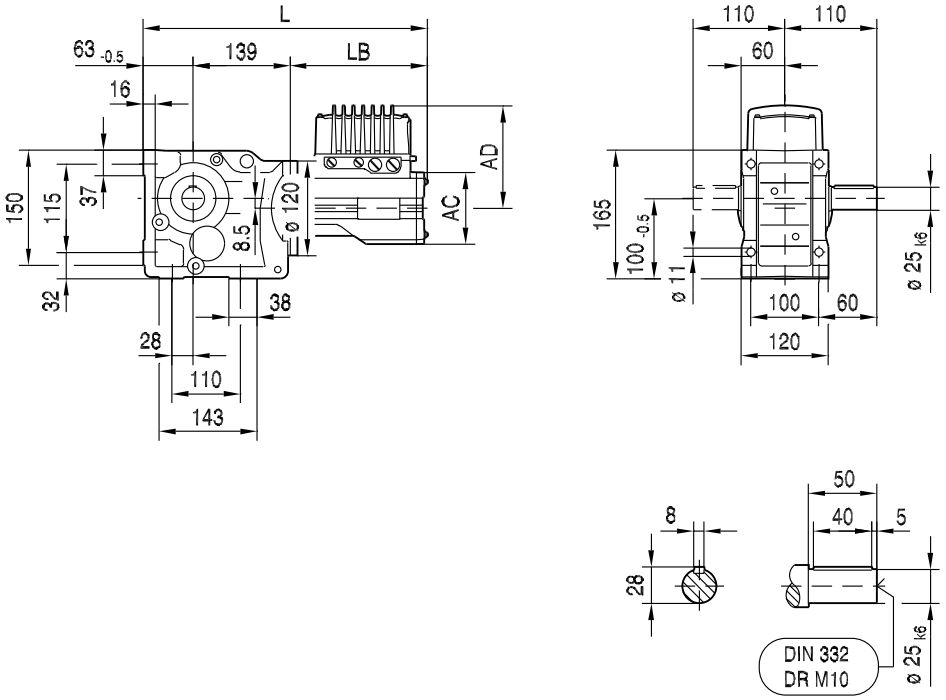
m [kg]			DRC2		
K87	3		115		
KF: + 9.2 kg / KA: + -12.1 kg / KAF: + 1.1 kg					

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	K [N]	KF [N]	KA [N]	KAF [N]	K [N]	KF [N]	KA [N]	KAF [N]
K87 3	7.21	7	46	13200	15100	4970	4970	28100	27000	30000	30000
	8.29	7	35	13500	15600	4960	4960	27900	26900	30000	30000
	10.00	7	26	14200	16400	5210	5210	27800	26700	30000	30000
	11.17	7	22	14900	17100	5770	5770	27800	26700	30000	30000
	12.56	6	42	14800	17000	5030	5030	26900	25900	30000	30000
	14.45	6	32	15300	17700	5240	5240	26700	25700	30000	30000
	16.00	6	12	16000	18500	5810	5810	27700	26700	30000	30000
	17.42	6	24	16300	18800	5770	5770	26500	25600	30000	30000
	19.45	6	20	16800	19300	5890	5890	26500	25600	30000	30000
	22.41	6	16	17900	20600	6790	6790	26500	25600	30000	30000
	24.92	6	14	18000	20700	6390	6390	26500	25600	30000	30000
	27.88	6	12	18500	21400	6600	6600	26500	25600	30000	30000
	31.39	6	9.6	19200	22100	6900	6900	26500	25600	30000	30000
	36.52*	6	20	21400	24500	9140	9140	26500	25600	30000	30000
	44.02	6	16	22800	26000	10100	10100	26500	25600	30000	30000
	49.16	5	14	23500	26300	10400	10400	26500	25600	30000	30000
	56.64	5	11	25000	26300	11600	11600	26500	25600	30000	30000
	63.00*	5	9.8	26200	26300	12600	12600	26500	25600	30000	30000
	70.46	5	8.4	27300	26300	13700	13700	26500	25600	30000	30000
	79.34	5	7.1	27300	26300	14800	14800	26500	25600	30000	30000
	86.34	5	6.3	27300	26300	15700	15700	26500	25600	30000	30000
	102.71*	5	4.9	27300	26300	17500	17500	26500	25600	30000	30000
	115.82	5	4.0	27300	26300	18800	18800	26500	25600	30000	30000
	126.91*	5	3.5	27300	26300	19900	19900	26500	25600	30000	30000
	147.32*	5	2.8	27300	26300	21600	21600	26500	25600	30000	30000
	164.34*	5	1.8	27300	26300	23000	23000	26500	25600	30000	30000
	174.19	5	1.6	27300	26300	23700	23700	26500	25600	30000	30000
	197.37	5	1.3	27300	26300	25400	25400	26500	25600	30000	30000

13.3 Dimension sheets

K37..

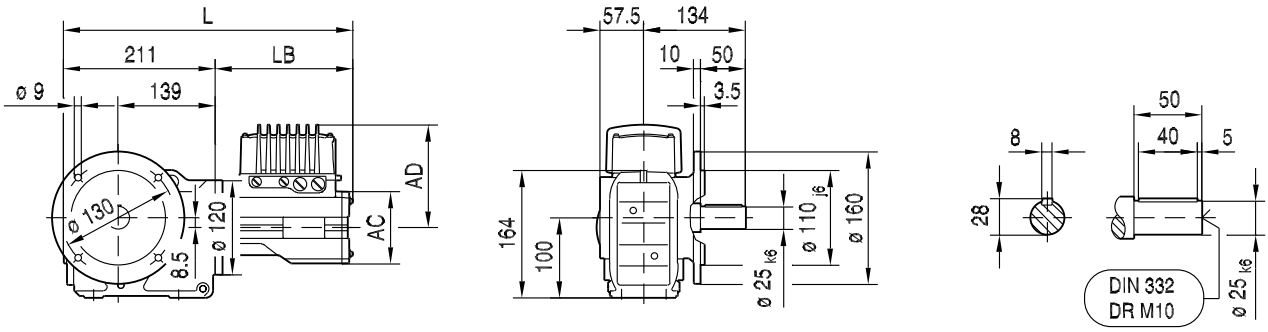
33 001 00 12



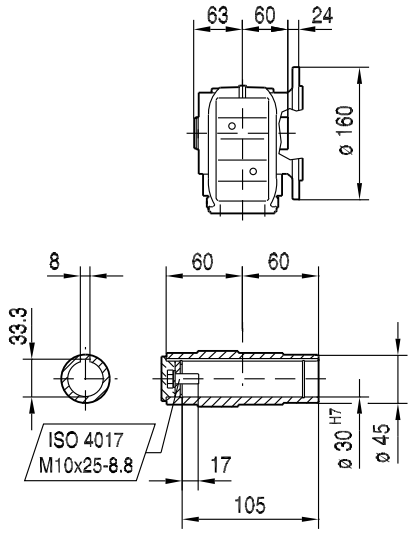
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	496	512						
LB	294	310						

KF37..

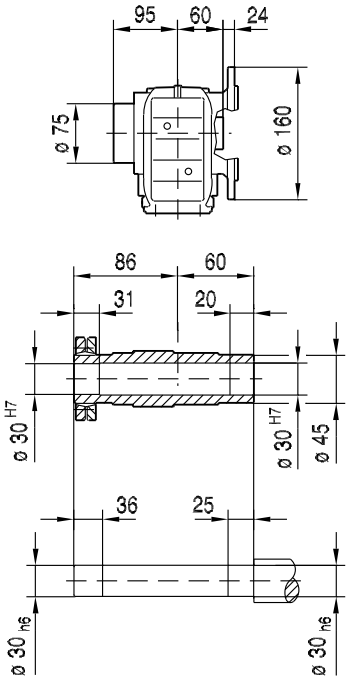
33 002 00 12



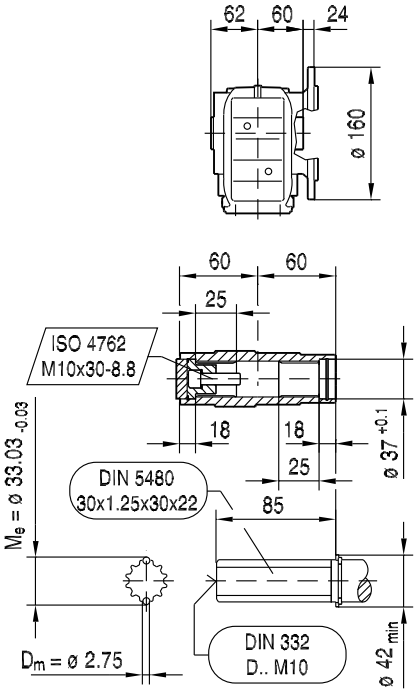
KAF37..



KHF37..



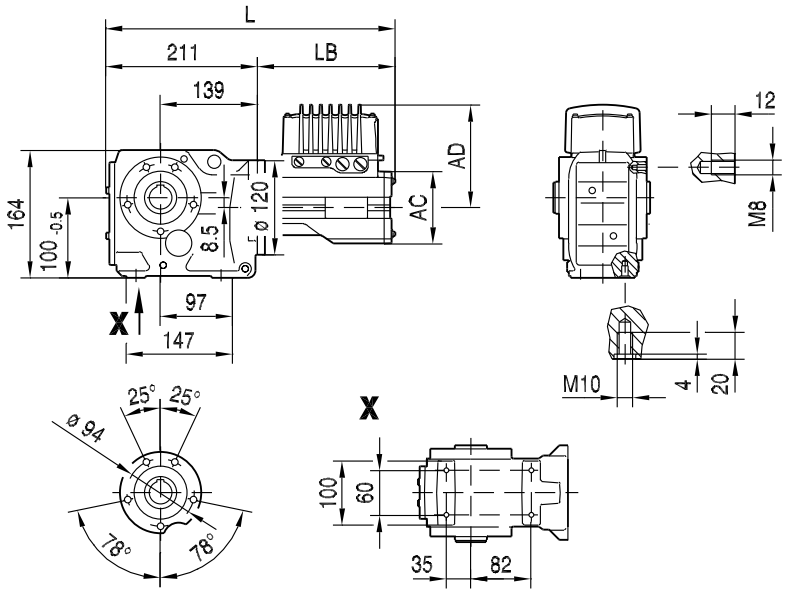
KVF37..

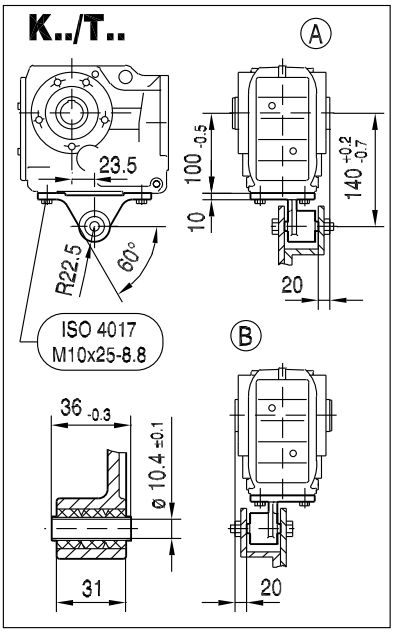


(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	505	521						
LB	294	310						

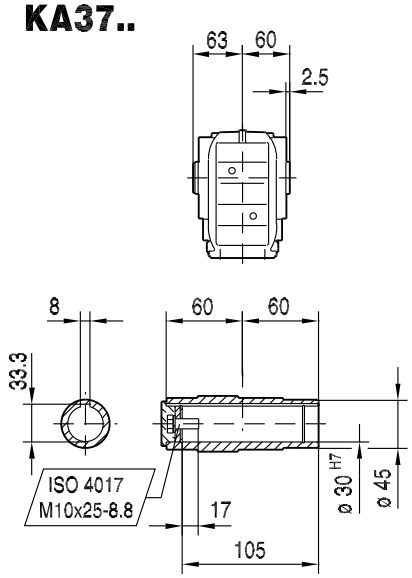
KA37..

33 003 00 12

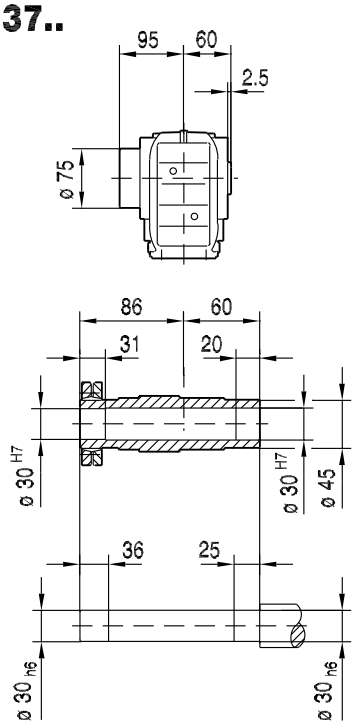




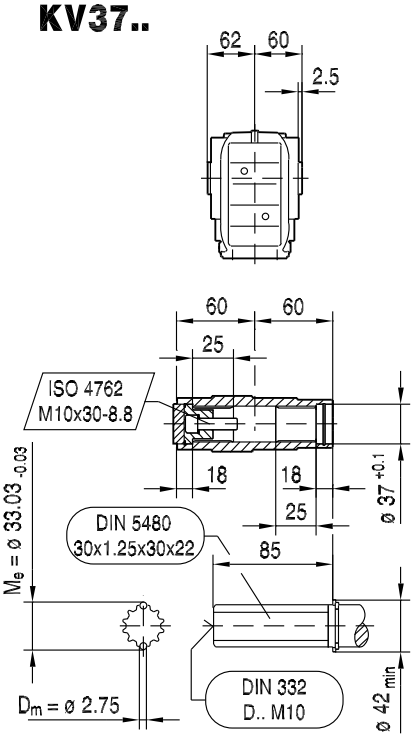
KA37..



KH37..



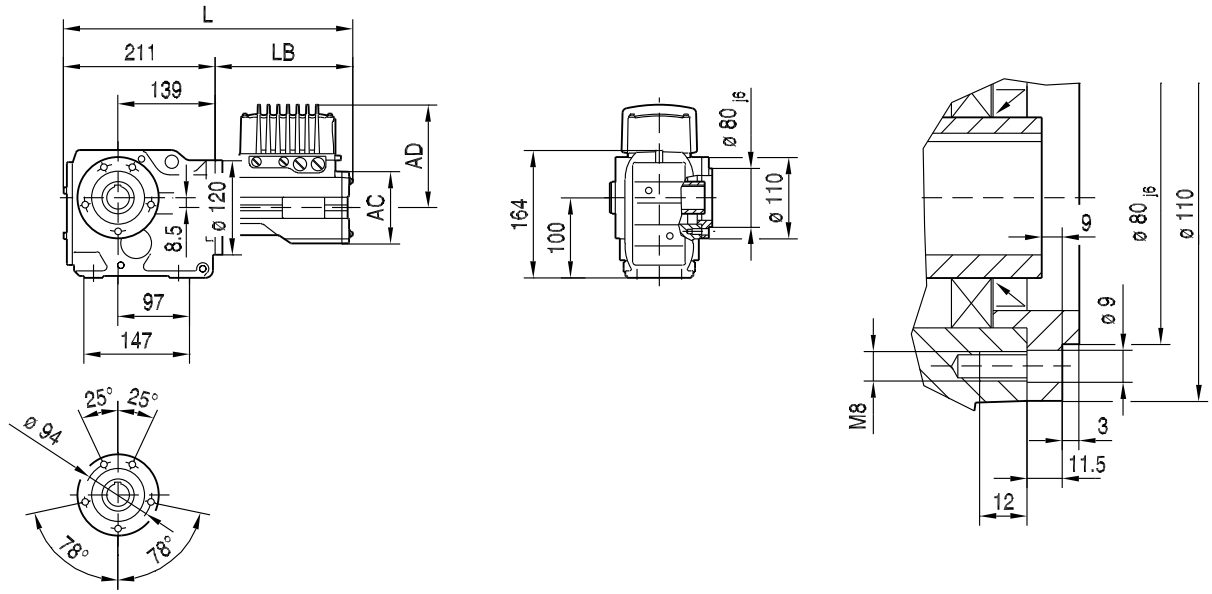
KV37..



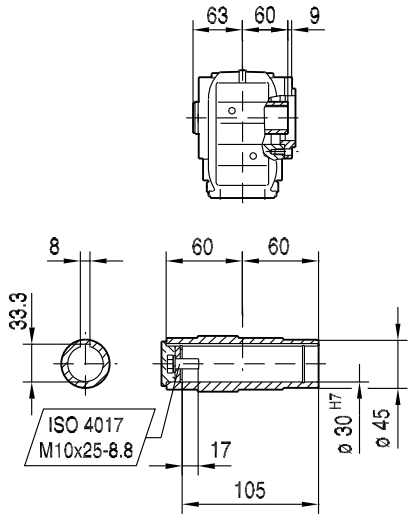
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	505	521						
LB	294	310						

KAZ37..

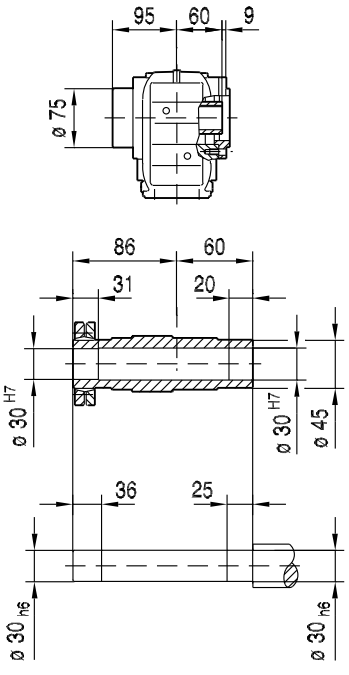
33 004 00 12



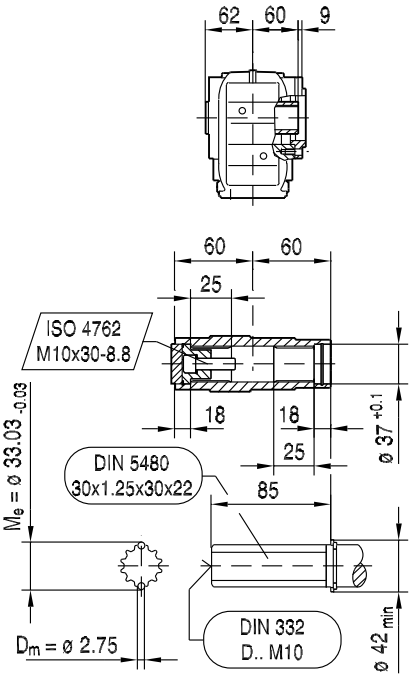
KAZ37..



KHZ37..



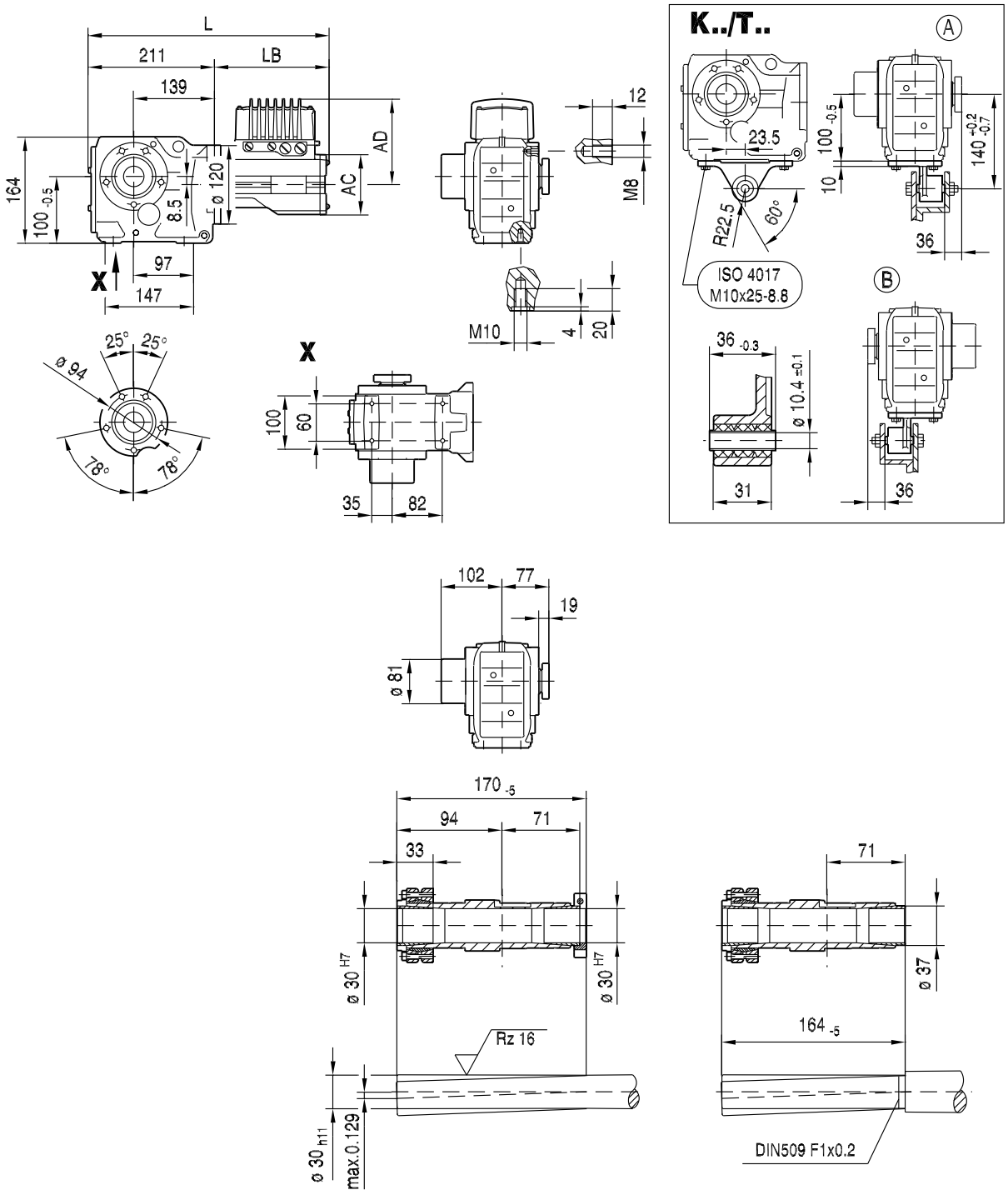
KVZ37..



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	505	521						
LB	294	310						

KT37..

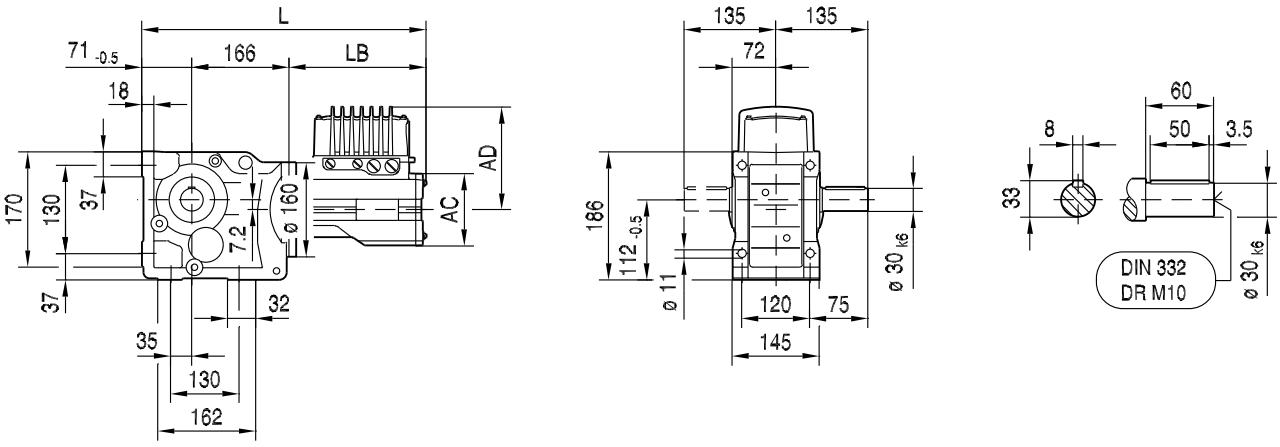
33 005 00 12



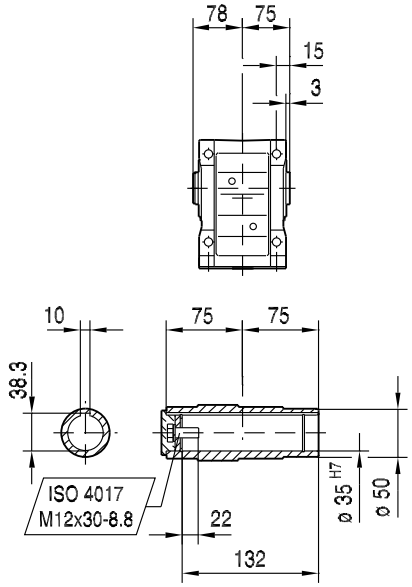
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	505	521						
LB	294	310						

K47..

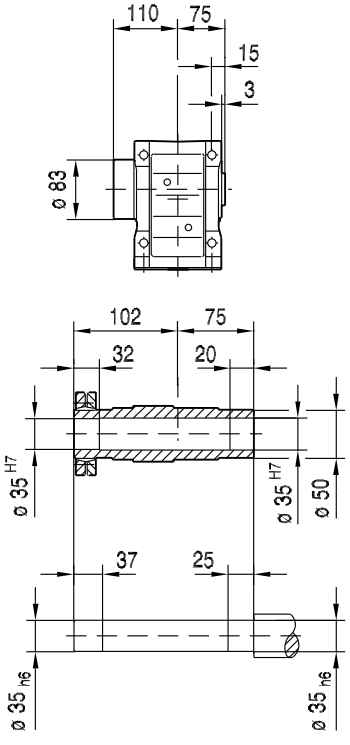
33 006 00 12



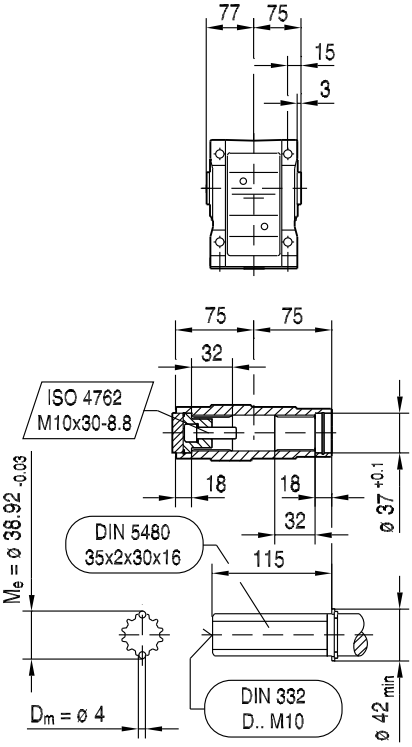
KA47B..



KH47B..



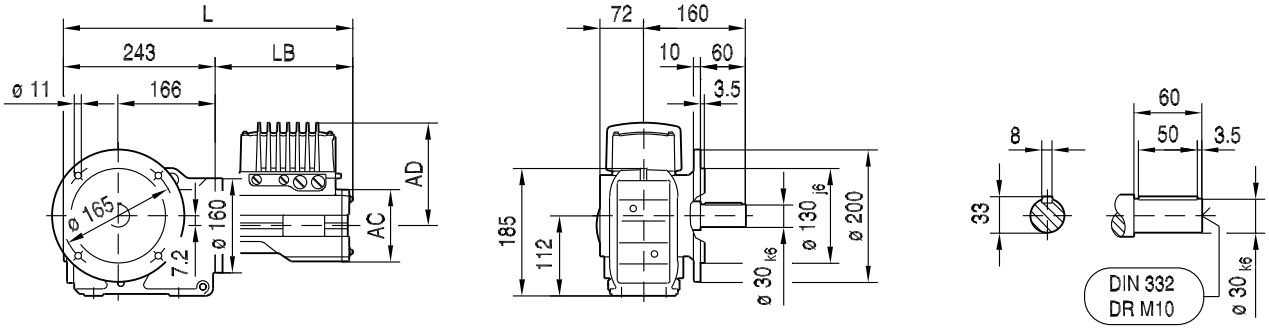
KV47B..



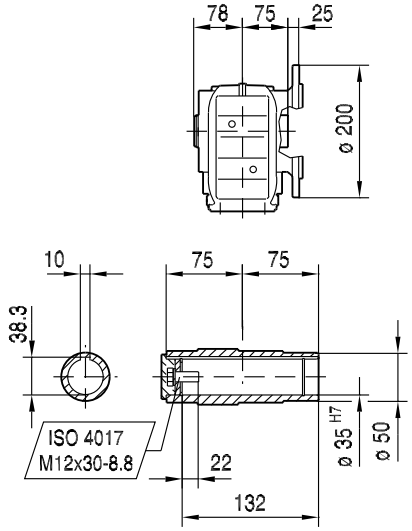
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	524	541						
LB	287	304						

KF47..

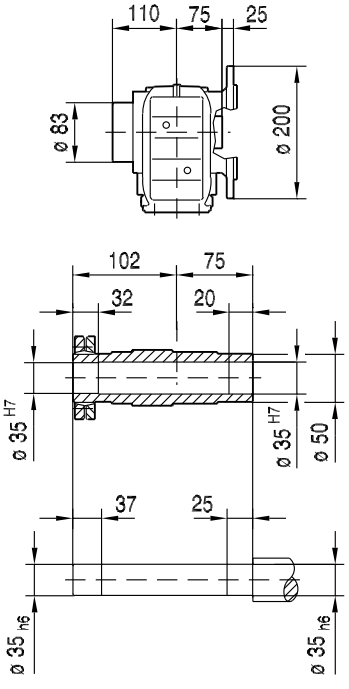
33 007 00 12



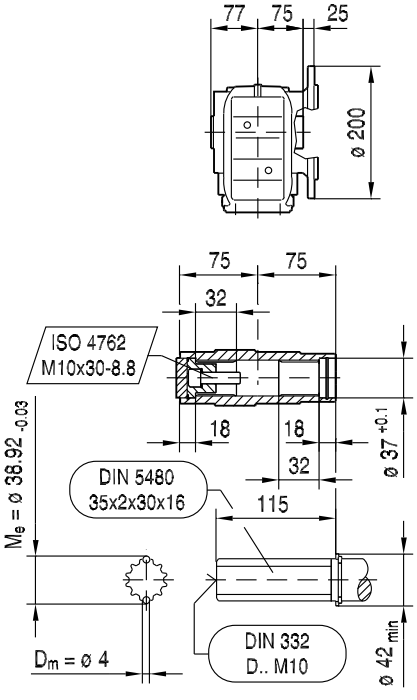
KAF47..



KHF47..



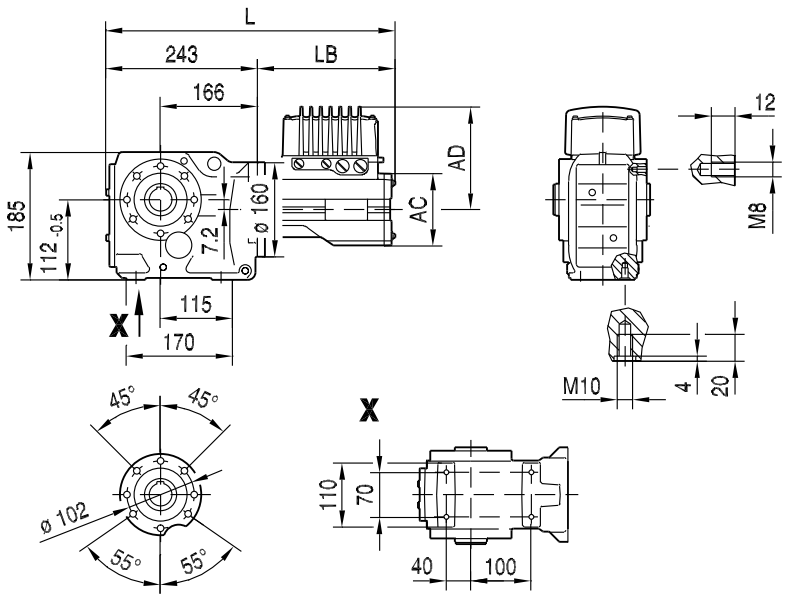
KVF47..

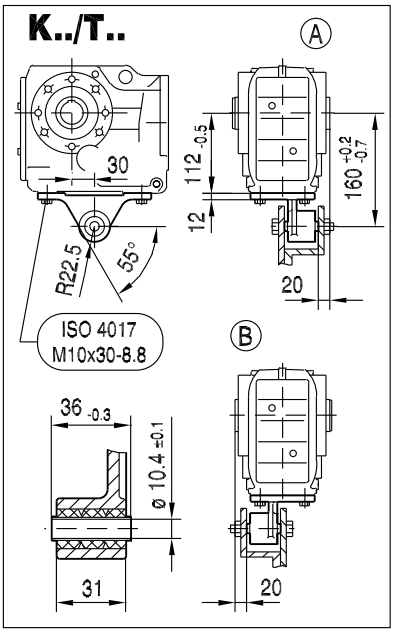


(→ 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	530	547						
LB	287	304						

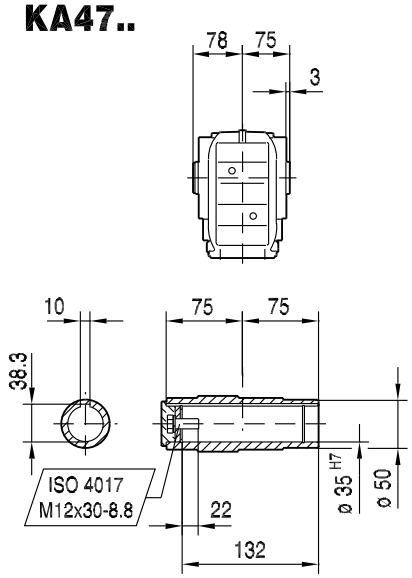
KA47..

33 008 00 12

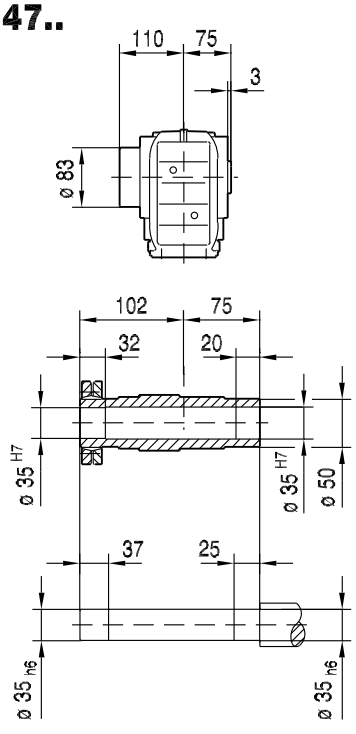




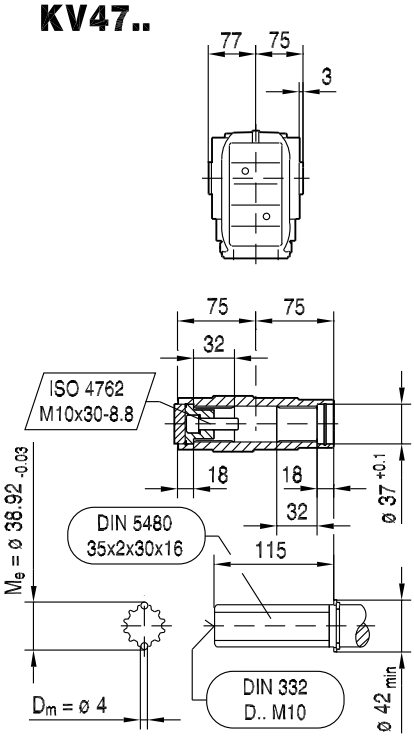
KA47..



KH47..



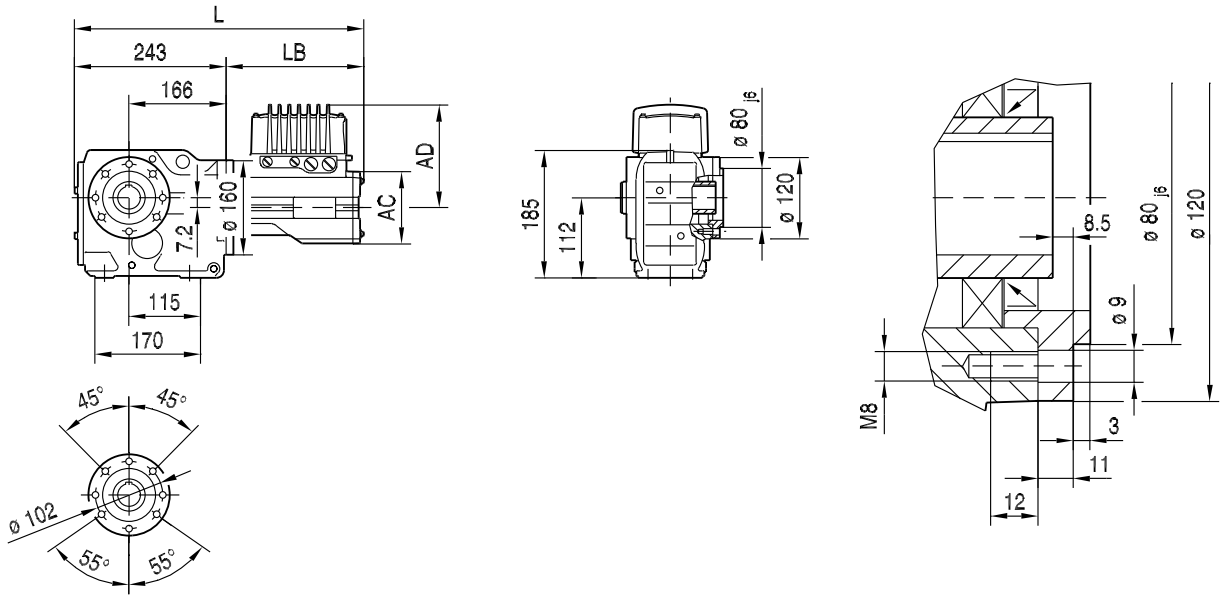
KV47..



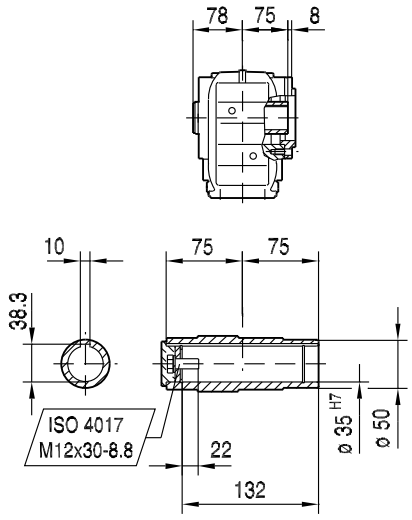
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	530	547						
LB	287	304						

KAZ47..

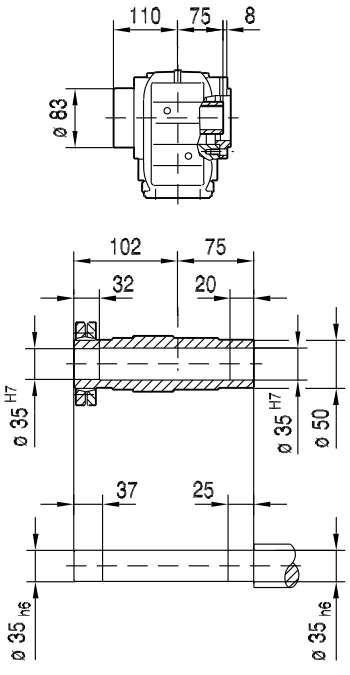
33 009 00 12



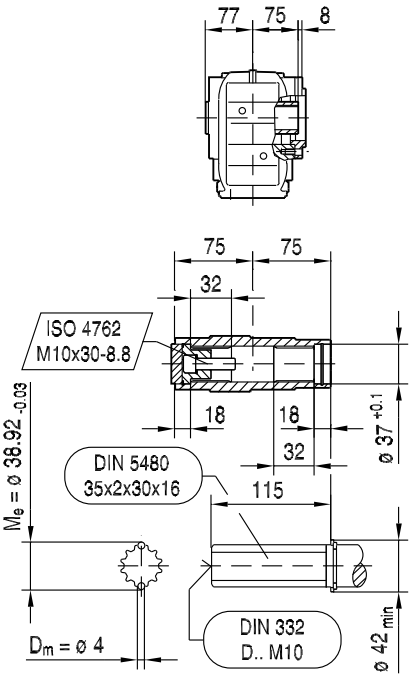
KAZ47..



KHZ47..



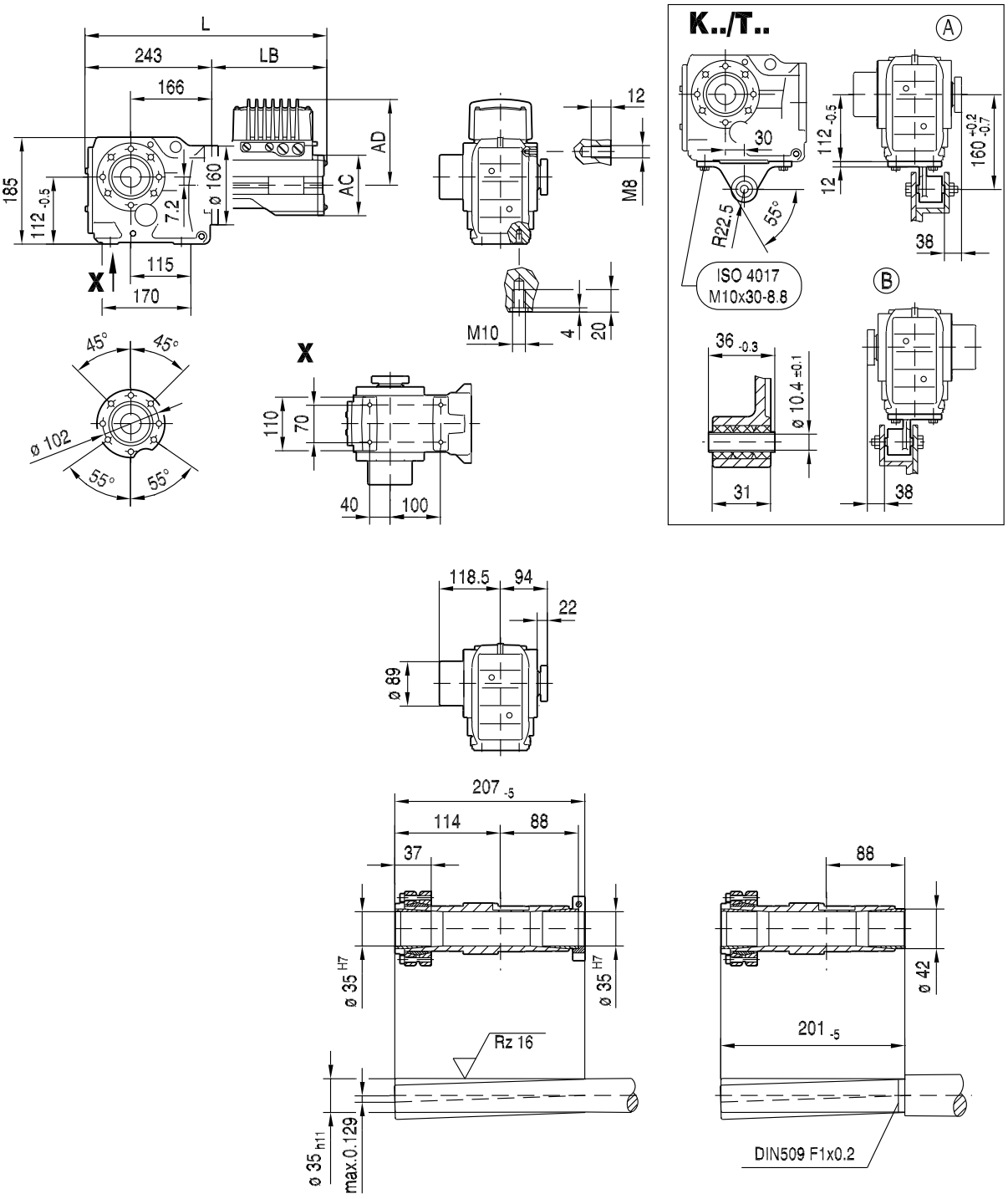
KVZ47..



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	530	547						
LB	287	304						

KT47..

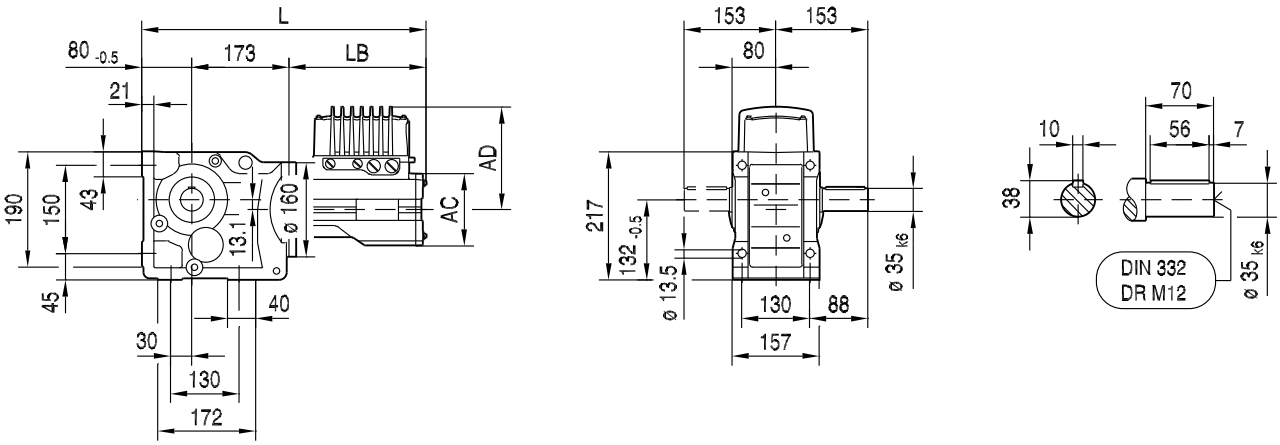
33 010 00 12



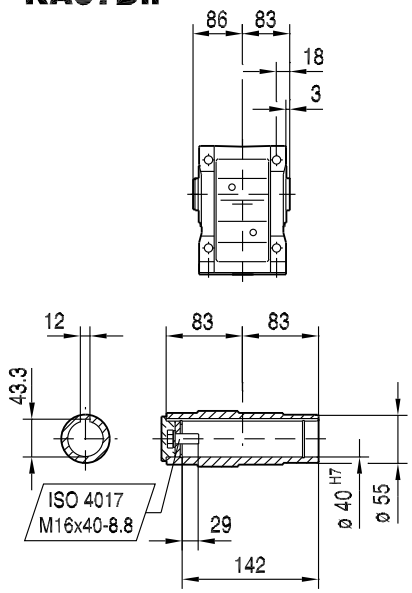
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	530	547						
LB	287	304						

K57..

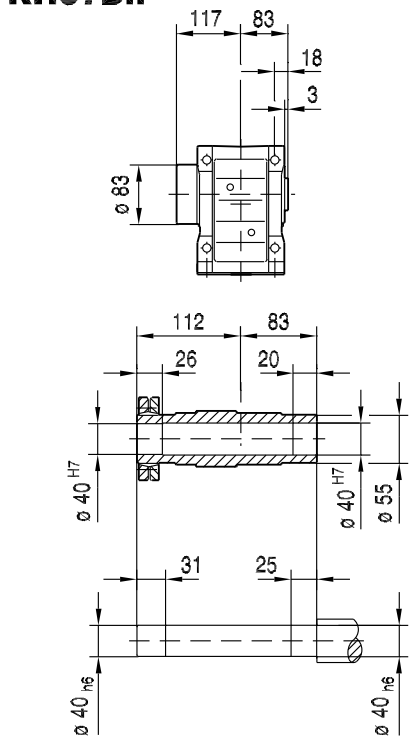
33 011 00 12



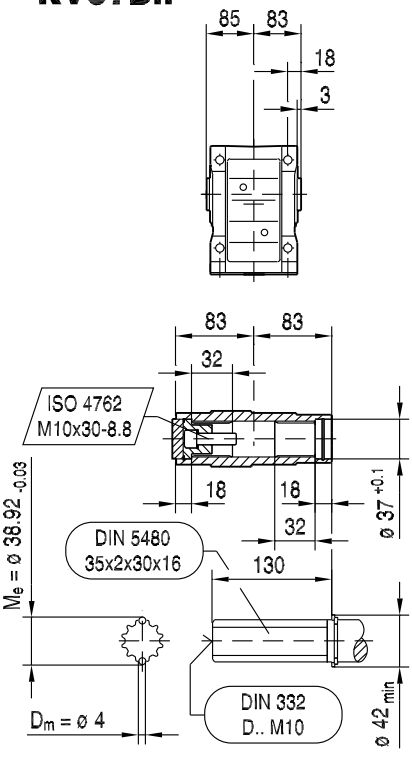
KA57B..



KH57B..



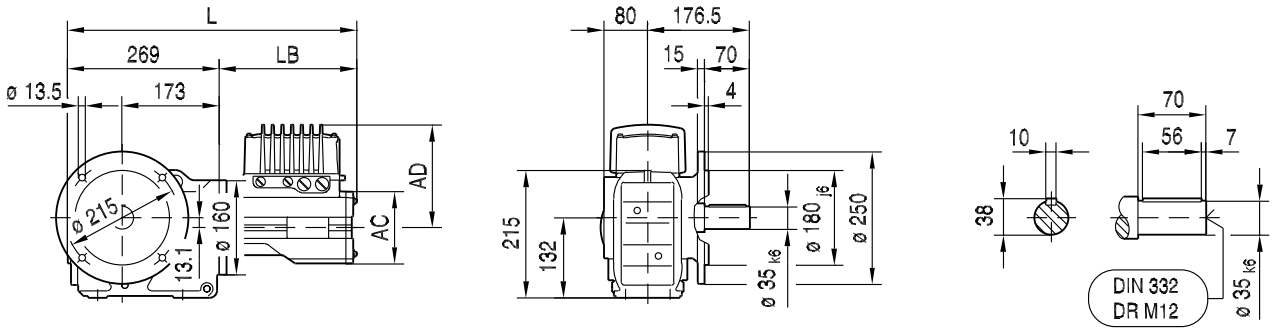
KV57B..



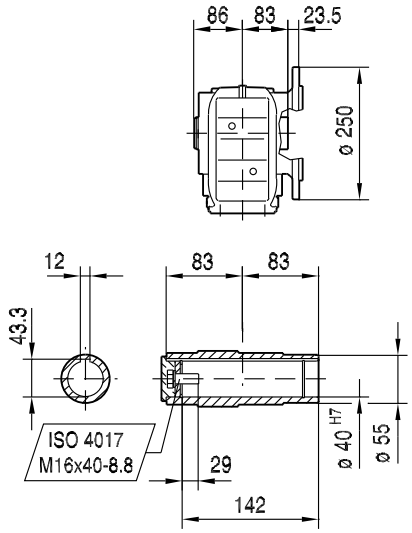
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	540	557						
LB	287	304						

KF57..

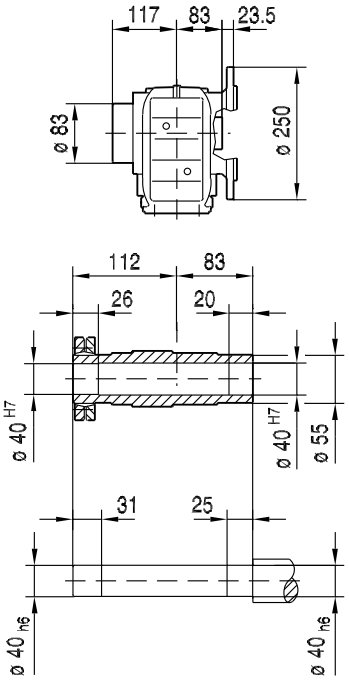
33 012 00 12



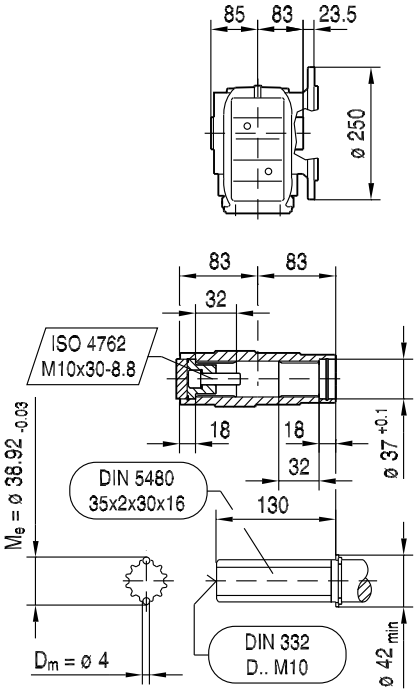
KAF57..



KHF57..



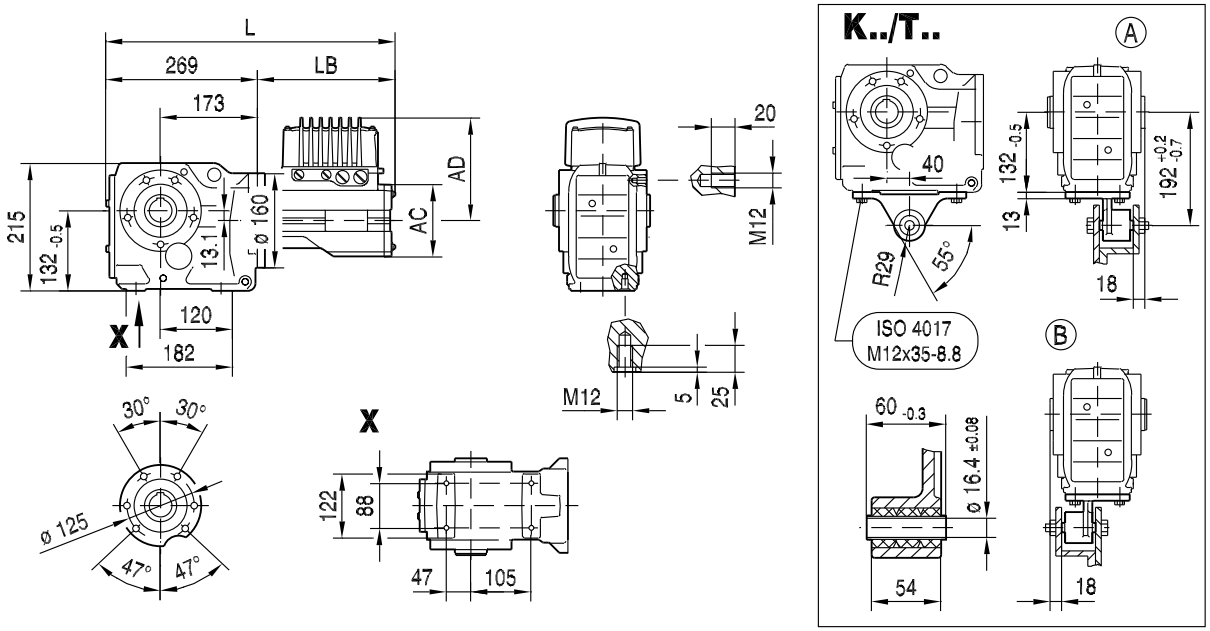
KVF57..



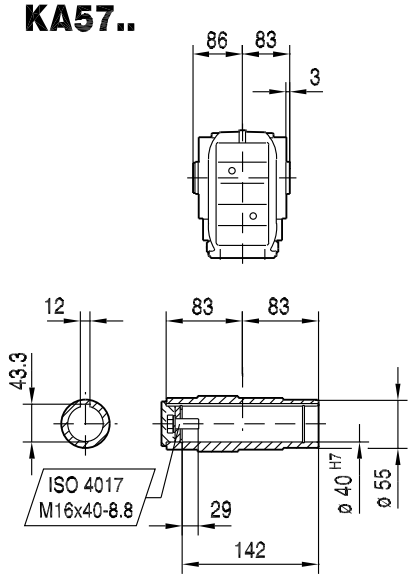
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	556	573						
LB	287	304						

KA57..

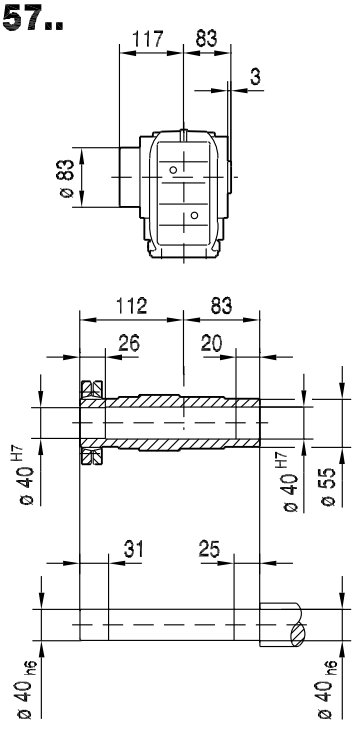
33 013 00 12



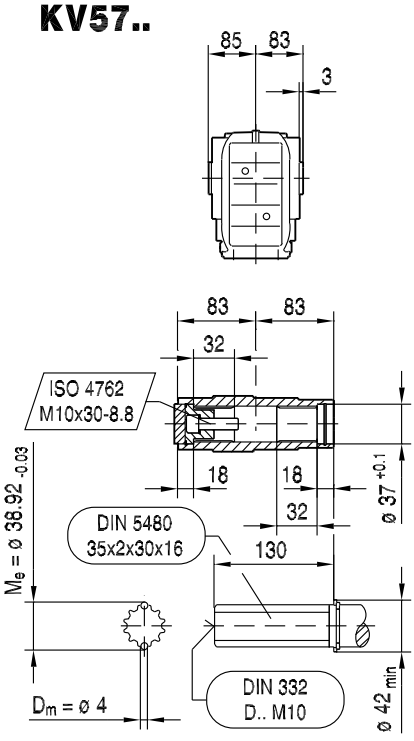
KA57..



KH57..



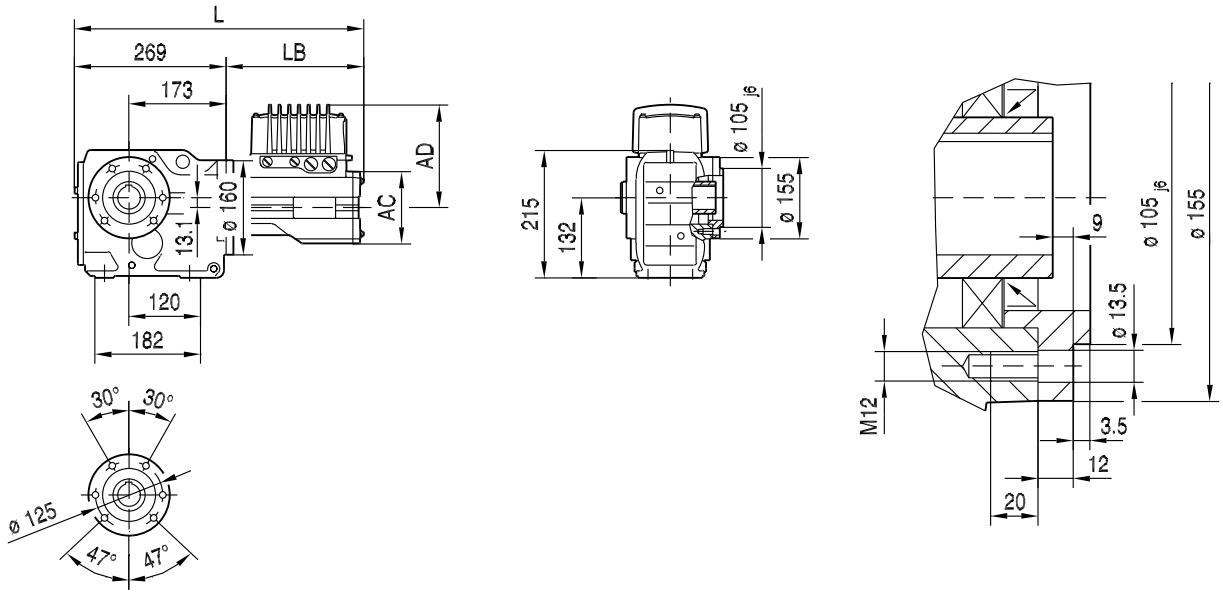
KV57..



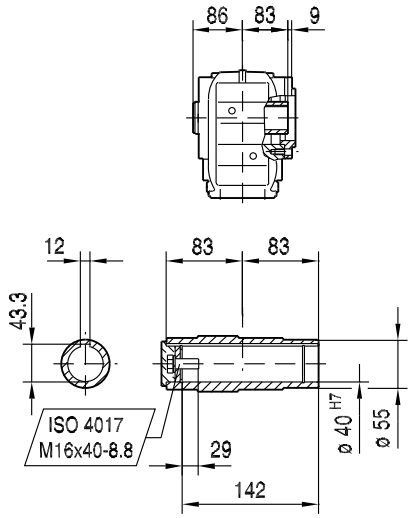
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	556	573						
LB	287	304						

KAZ57..

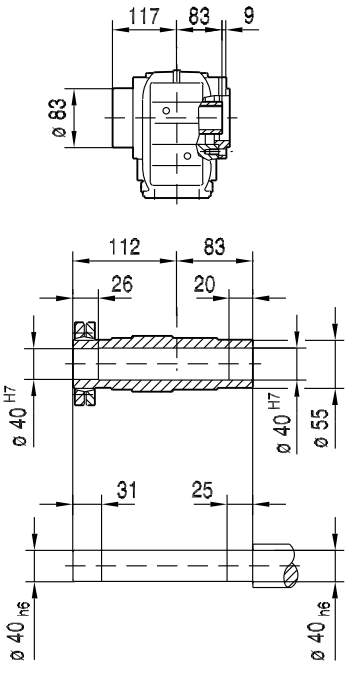
33 014 00 12



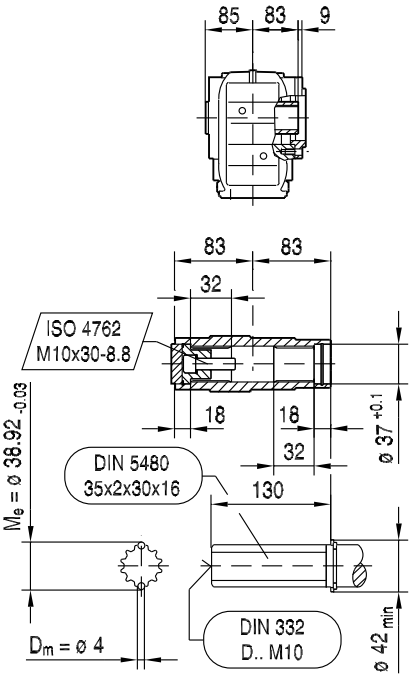
KAZ57..



KHZ57..



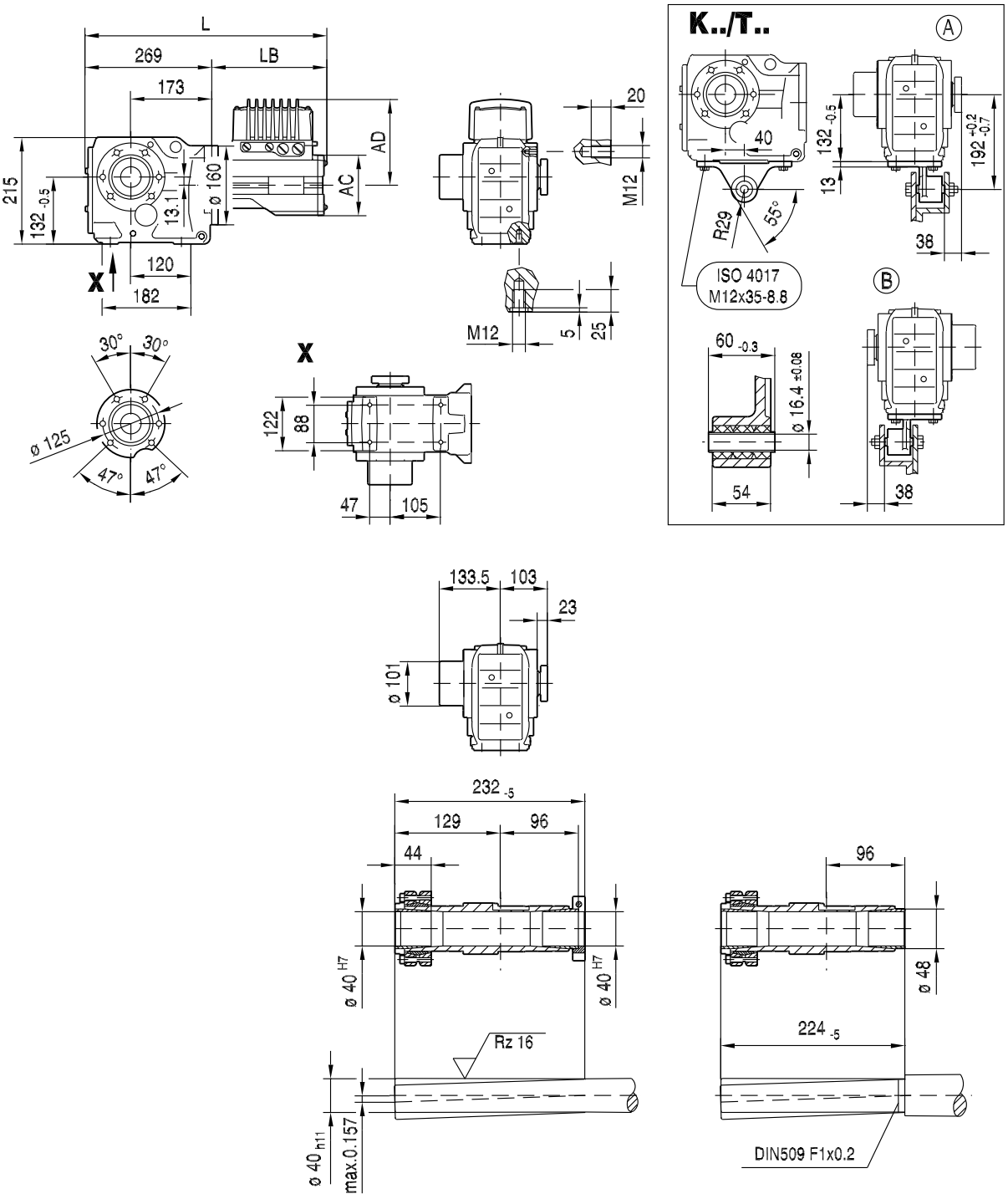
KVZ57..



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	556	573						
LB	287	304						

KT57..

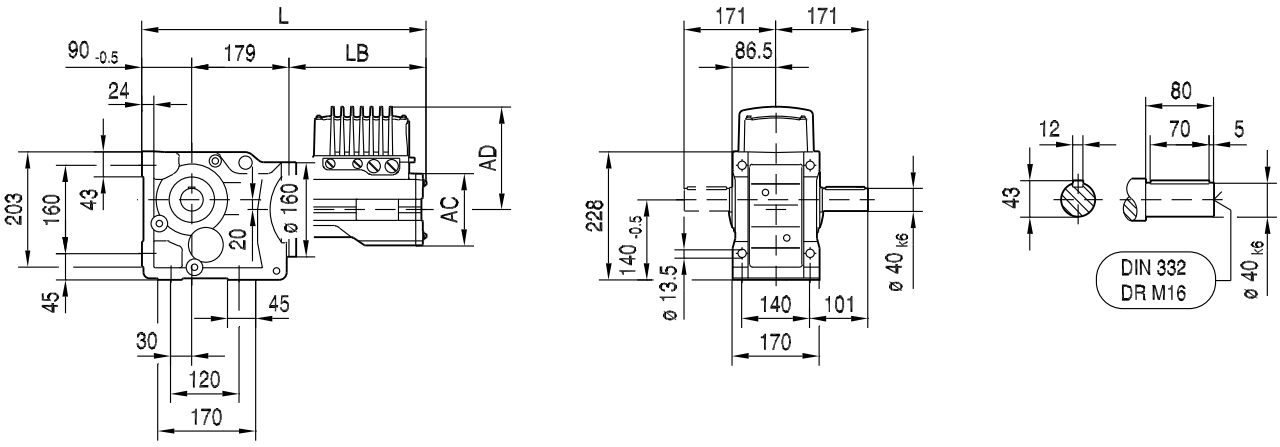
33 015 00 12



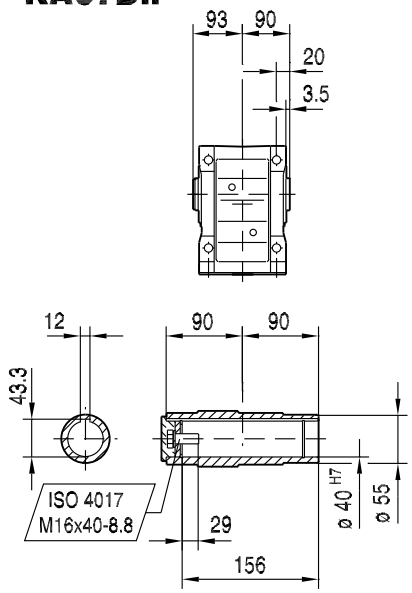
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	556	573						
LB	287	304						

K67..

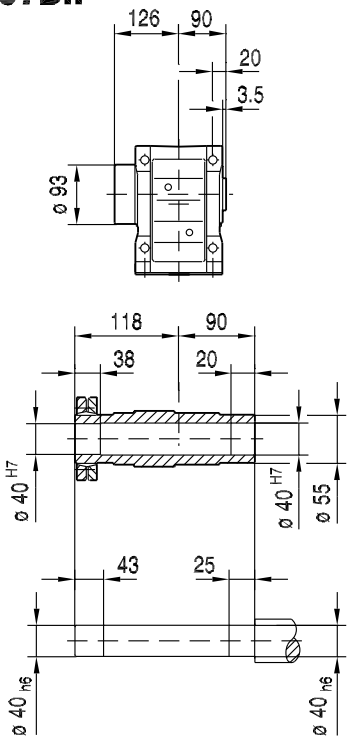
33 016 00 12



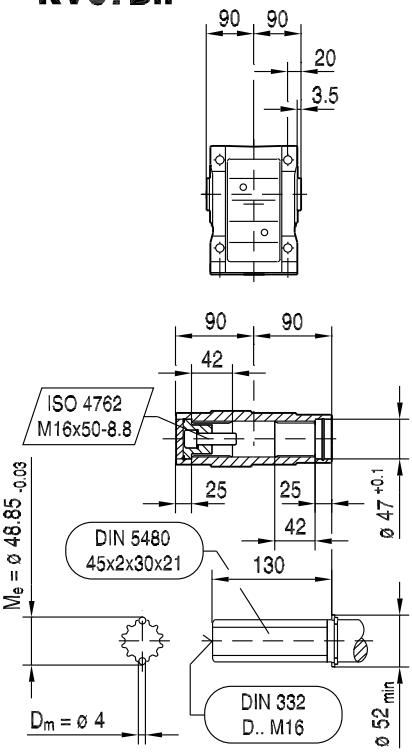
KA67B..



KH67B..



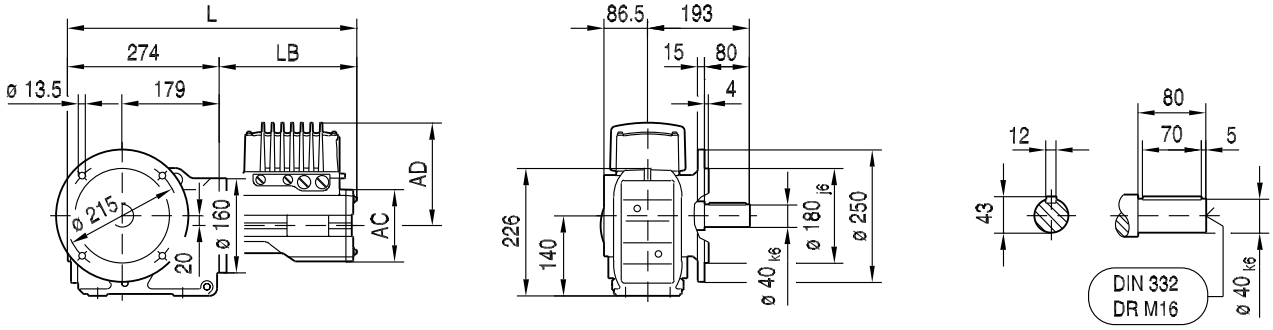
KV67B..



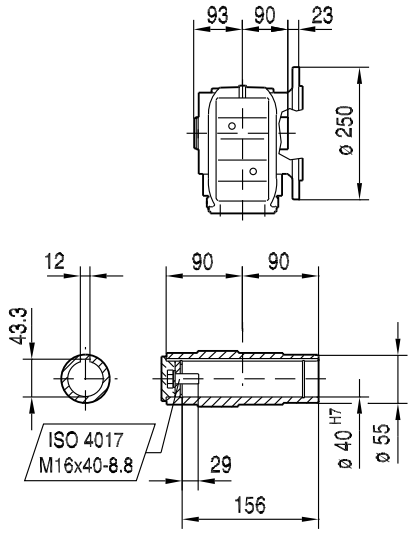
(→ 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	556	573						
LB	287	304						

KF67..

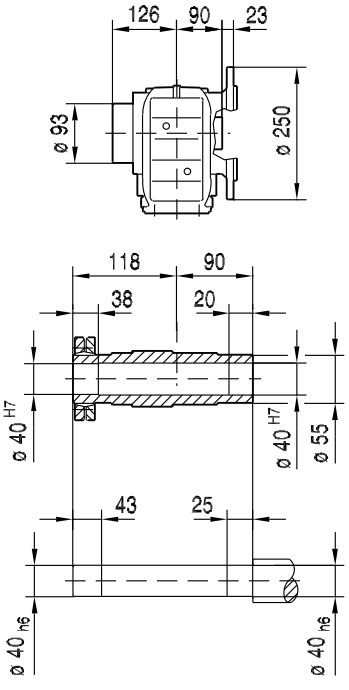
33 017 00 12



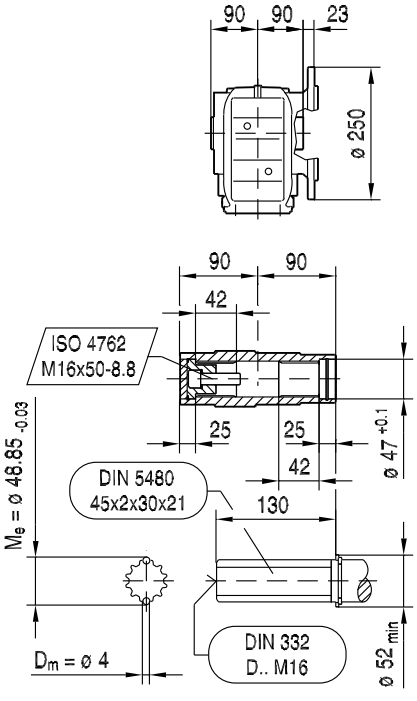
KAF67..



KHF67..



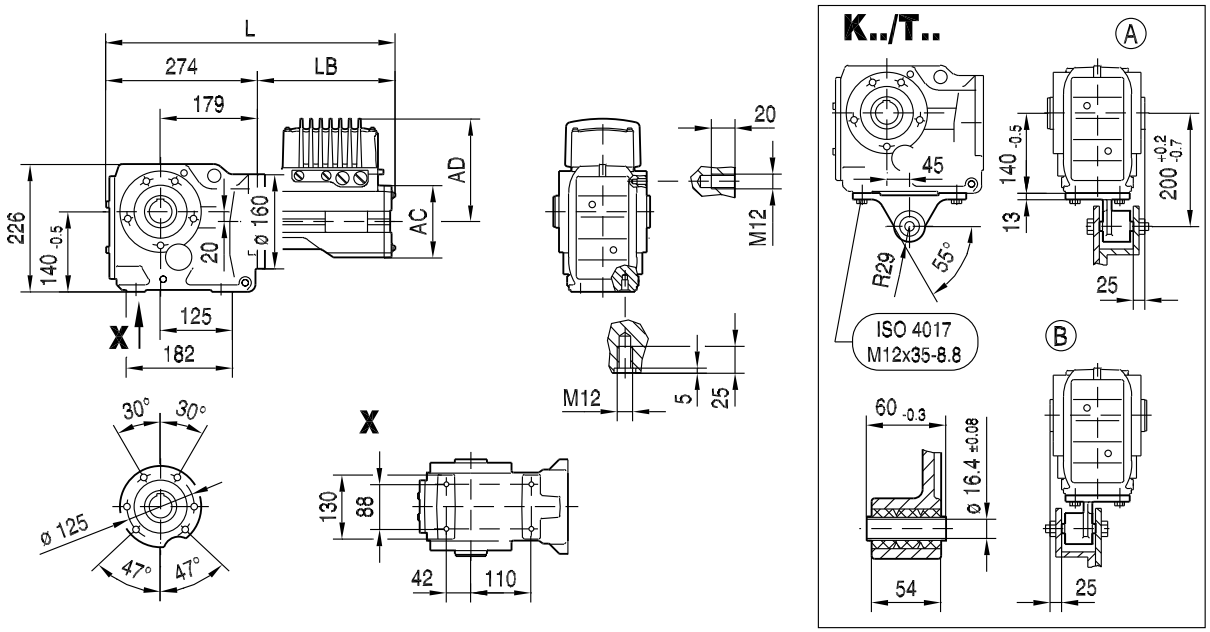
KVF67..



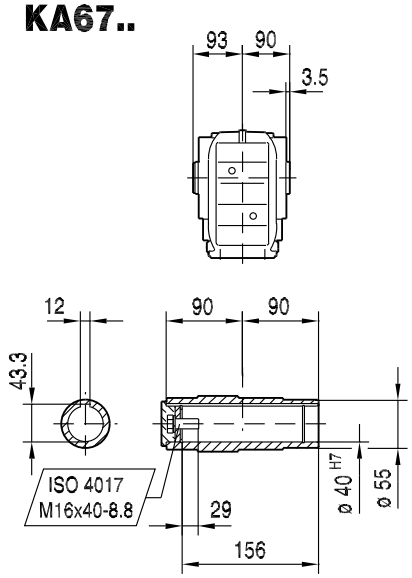
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	561	578						
LB	287	304						

KA67..

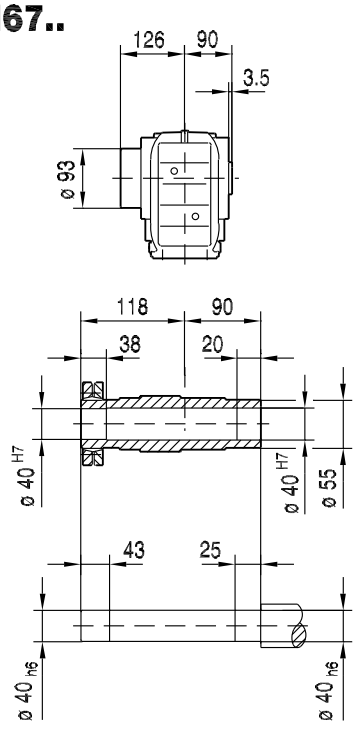
33 018 00 12



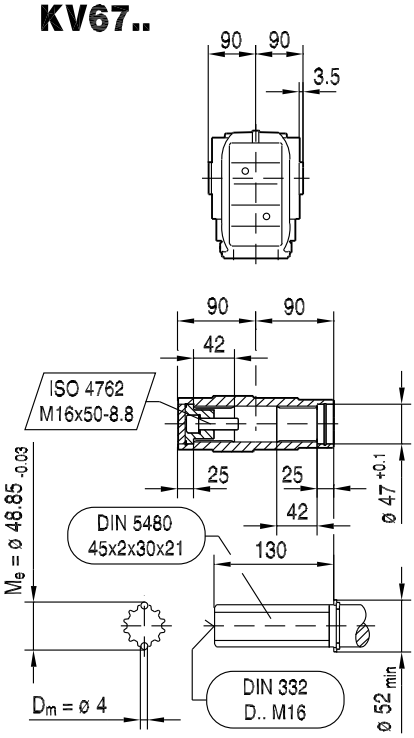
KA67..



KH67..



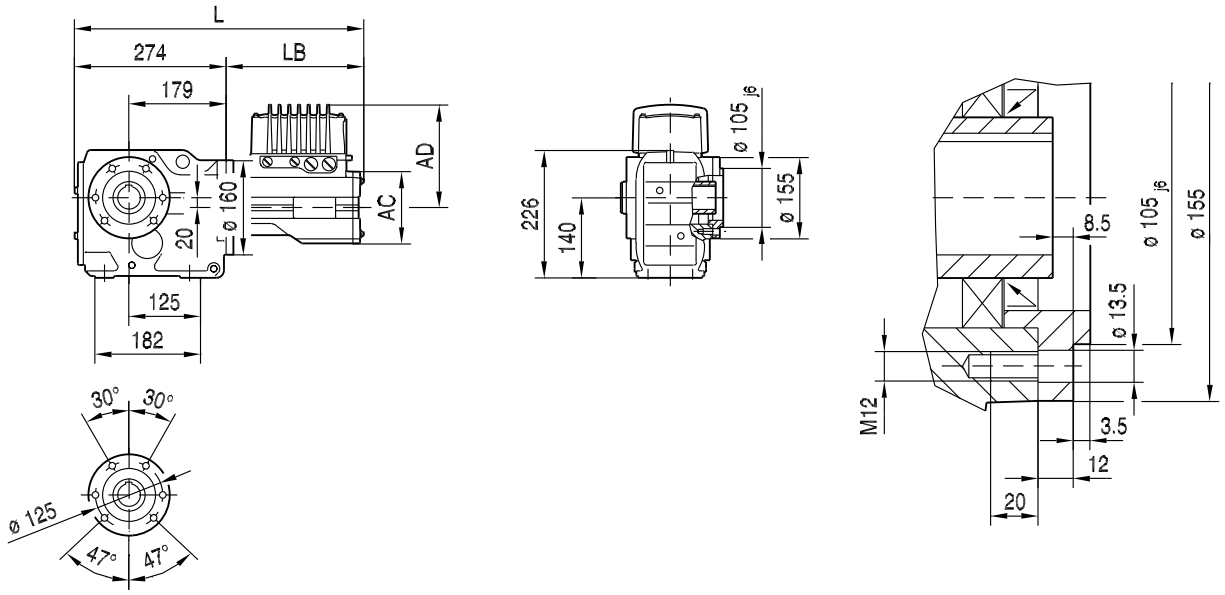
KV67..



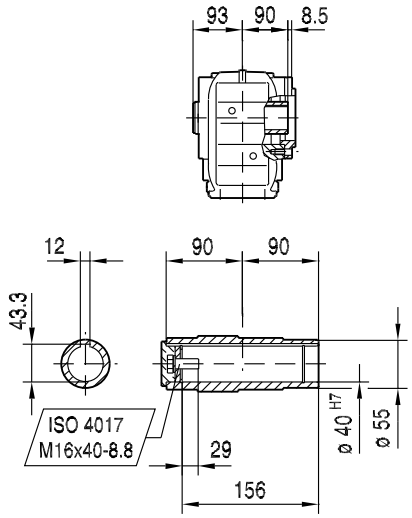
(→ 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	561	578						
LB	287	304						

KAZ67..

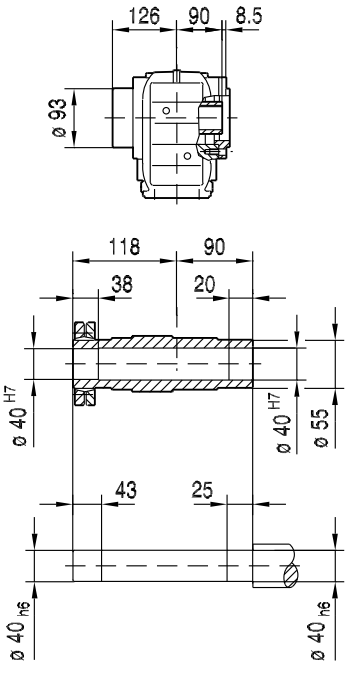
33 019 00 12



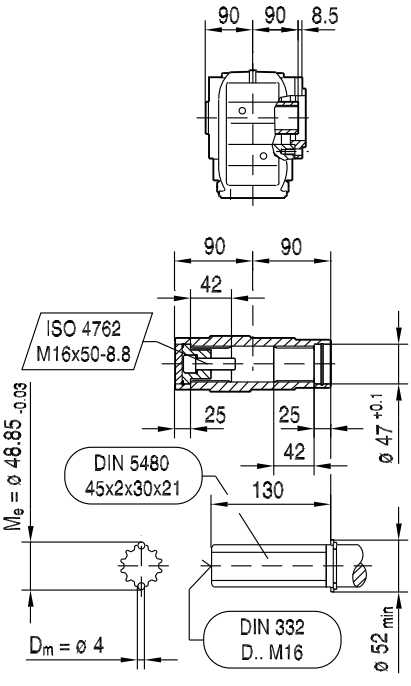
KAZ67..



KHZ67..



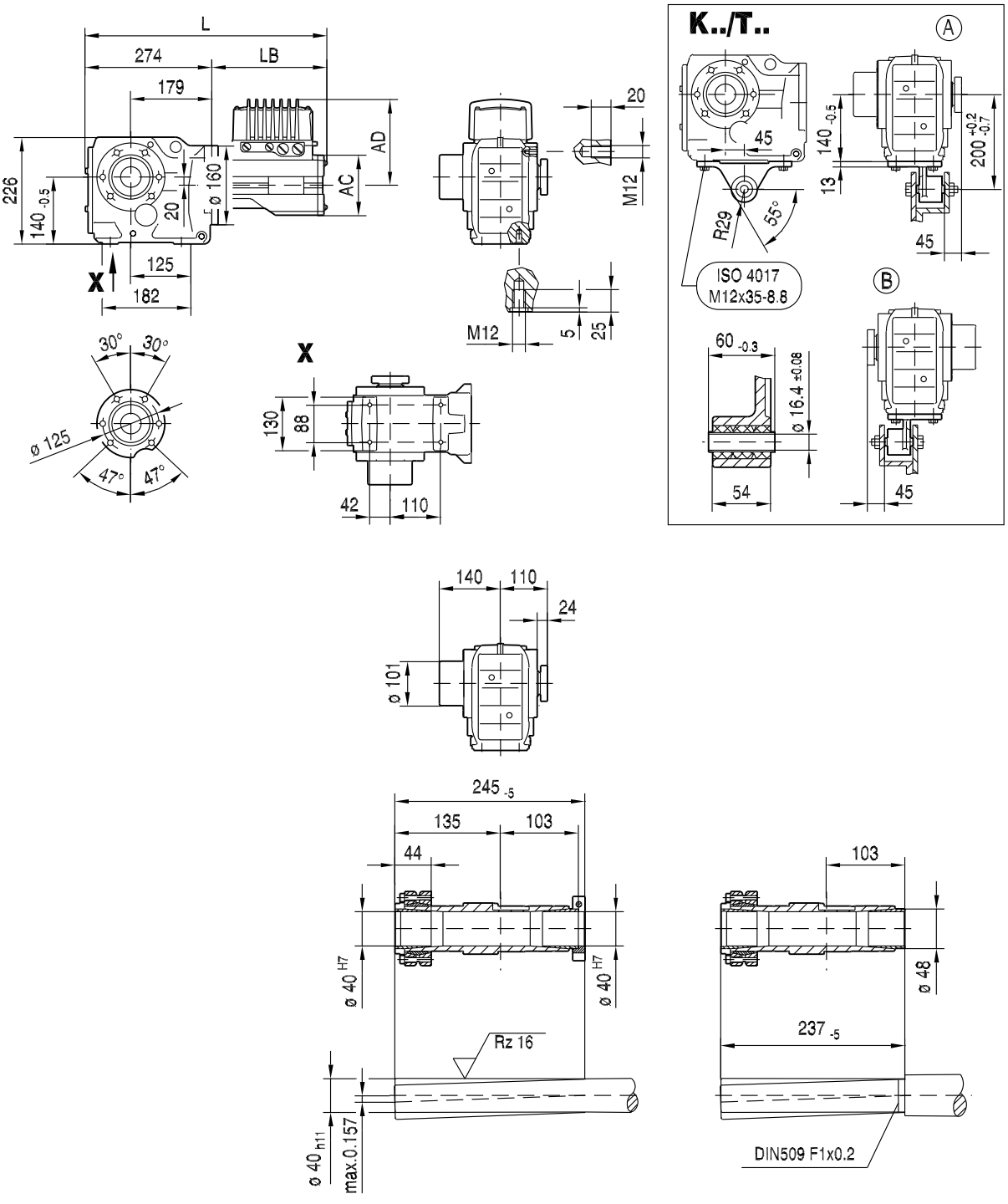
KVZ67..



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	561	578						
LB	287	304						

KT67..

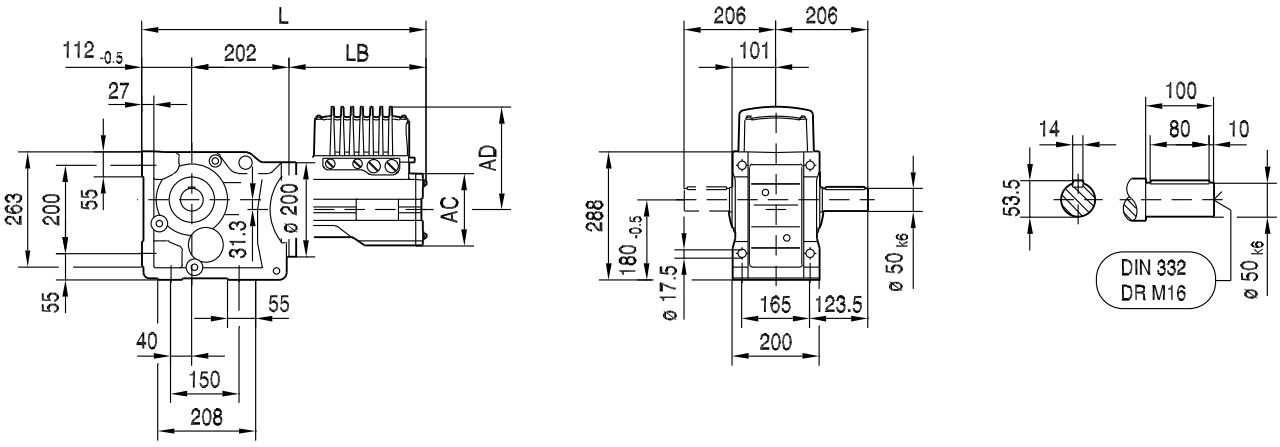
33 020 00 12



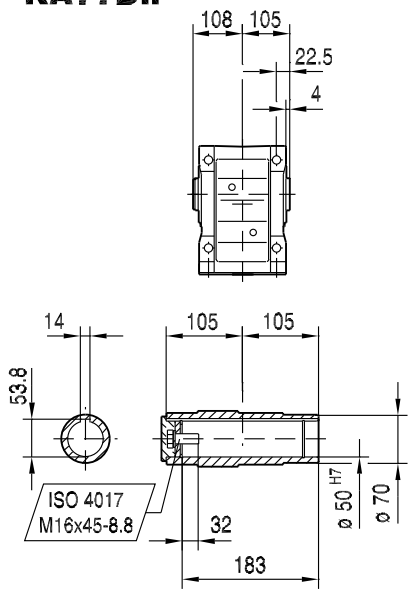
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	561	578						
LB	287	304						

K77..

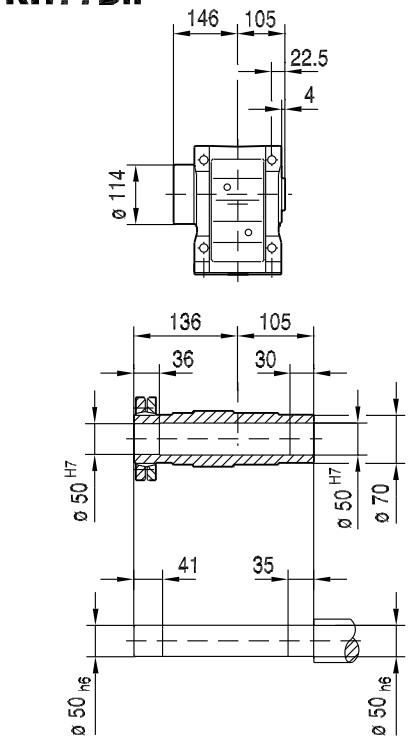
33 021 00 12



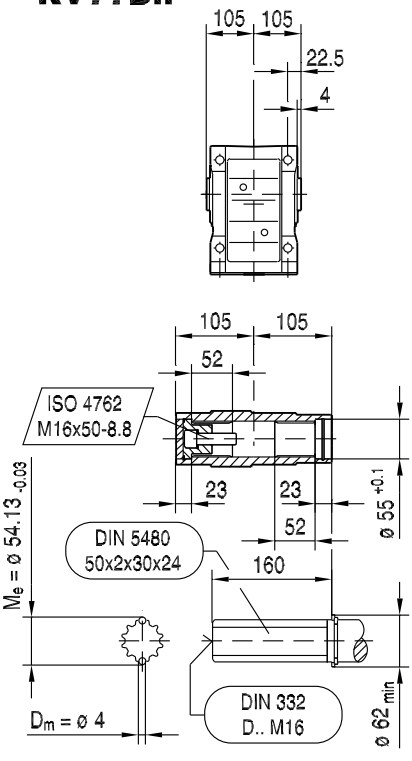
KA77B..



KH77B..



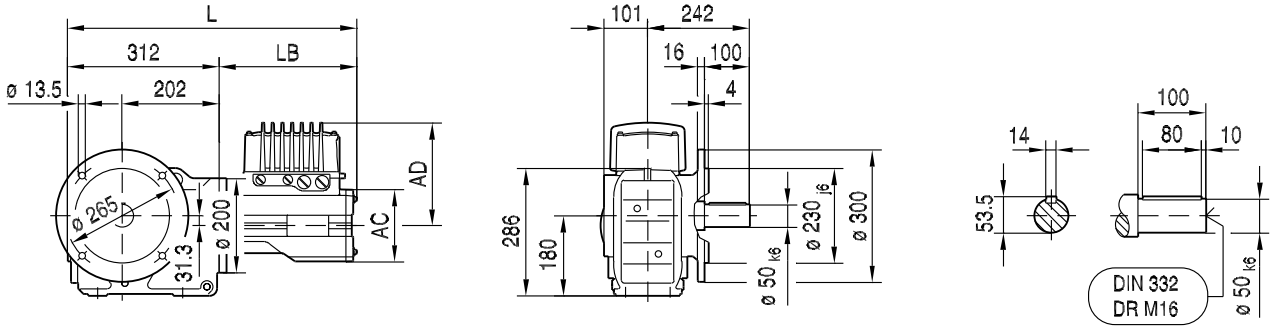
KV77B..



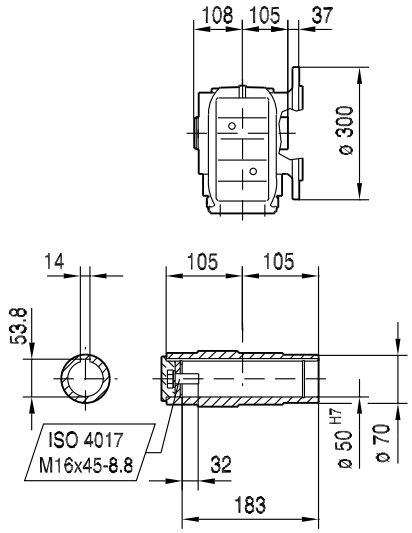
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	595	610						
LB	281	296						

KF77..

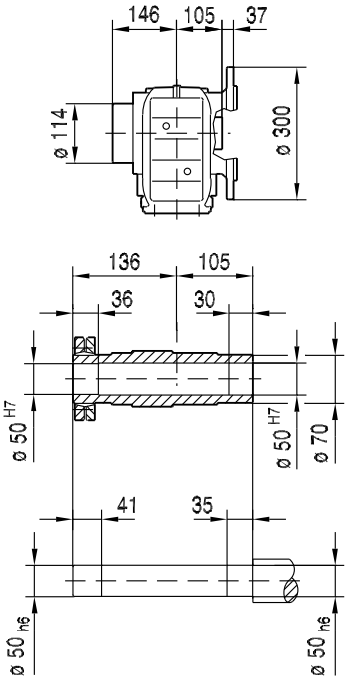
33 022 00 12



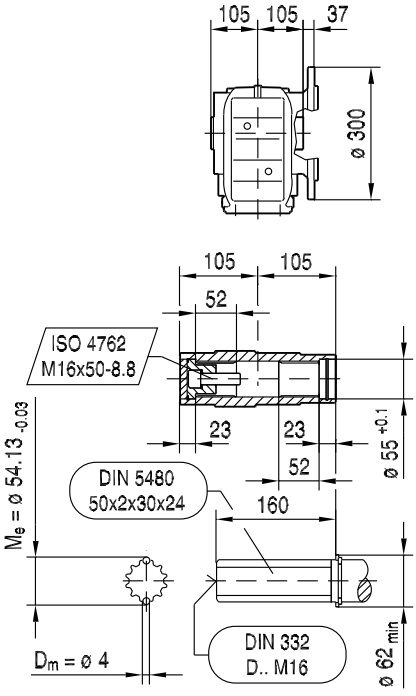
KAF77..



KHF77..



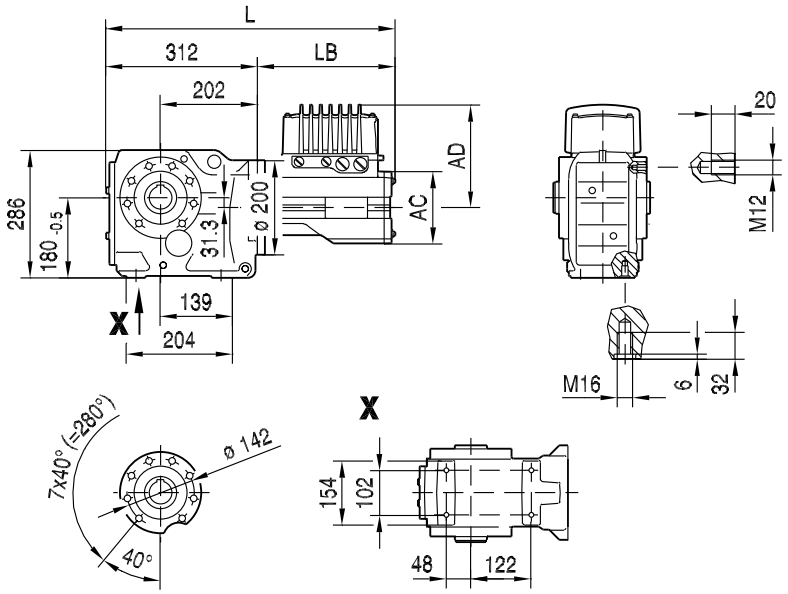
KVF77..

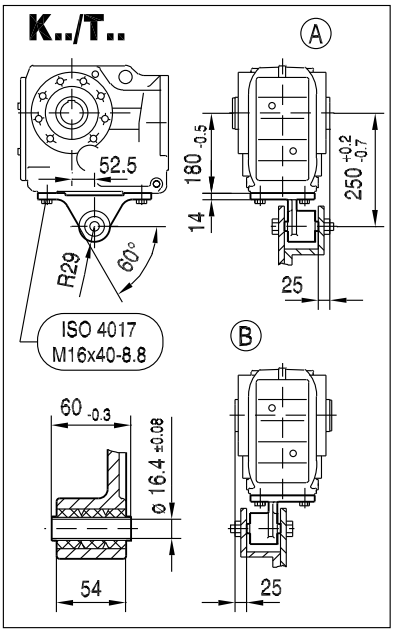


(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	593	608						
LB	281	296						

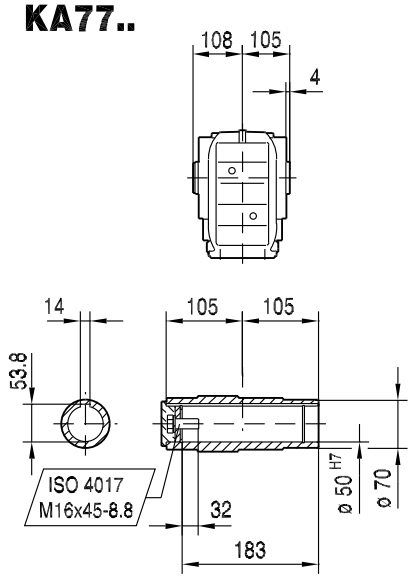
KA77..

33 023 00 12

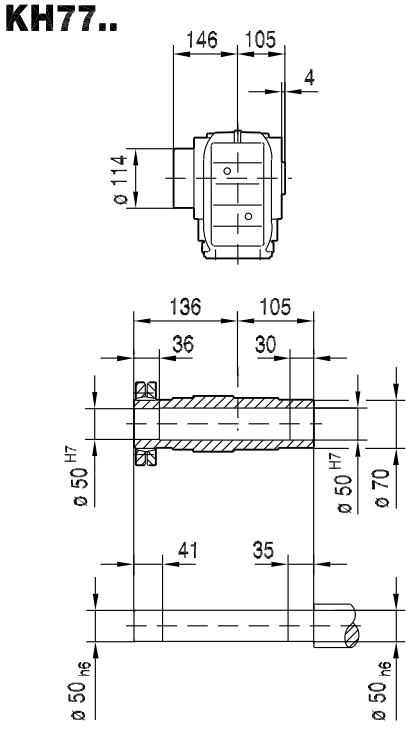




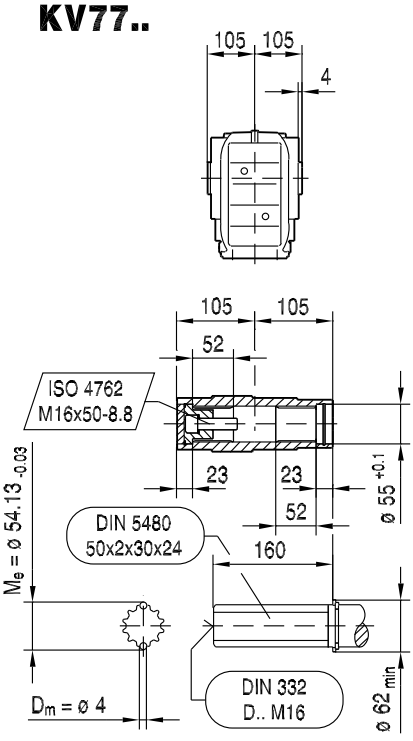
KA77..



KH77..



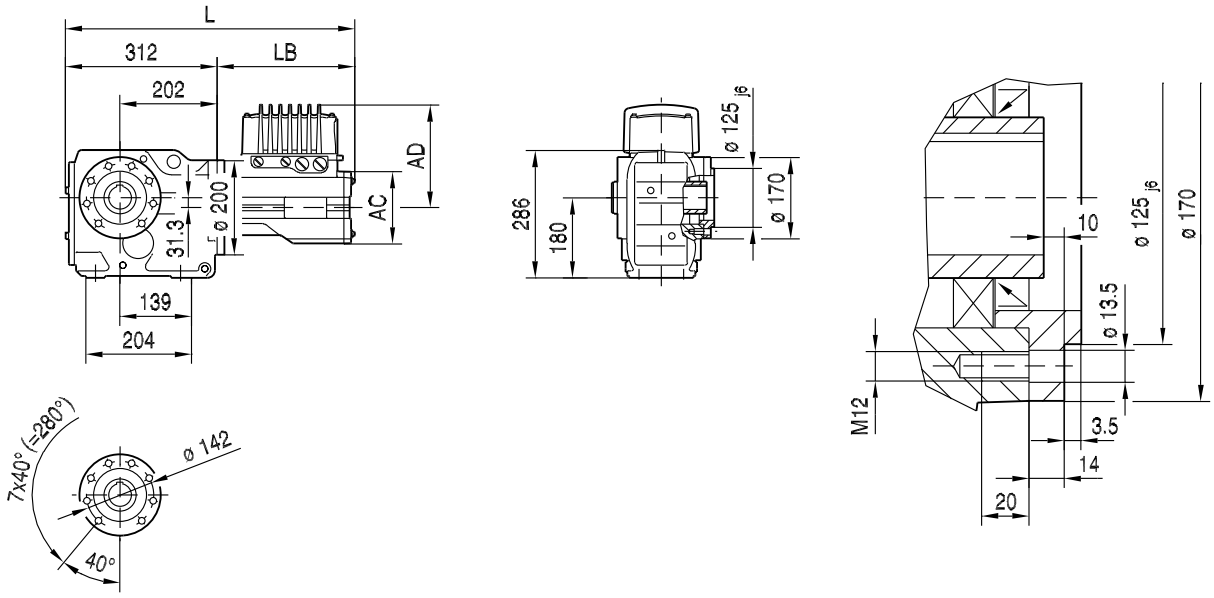
KV77..



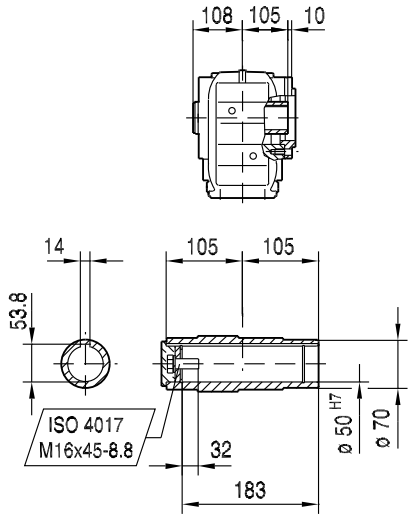
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	593	608						
LB	281	296						

KAZ77..

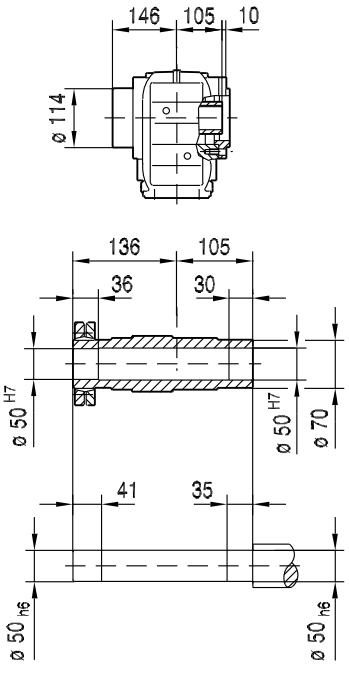
33 024 00 12



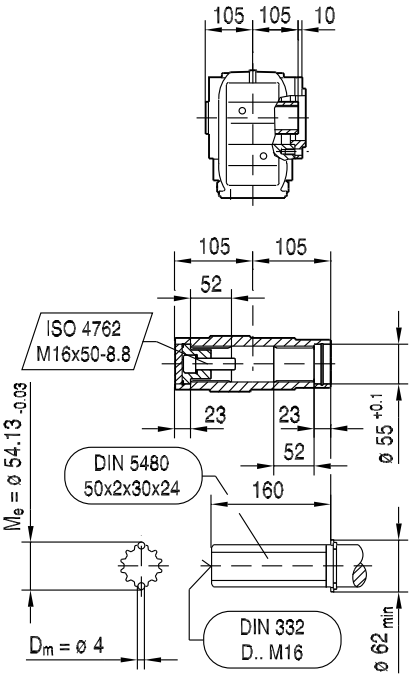
KAZ77..



KHZ77..



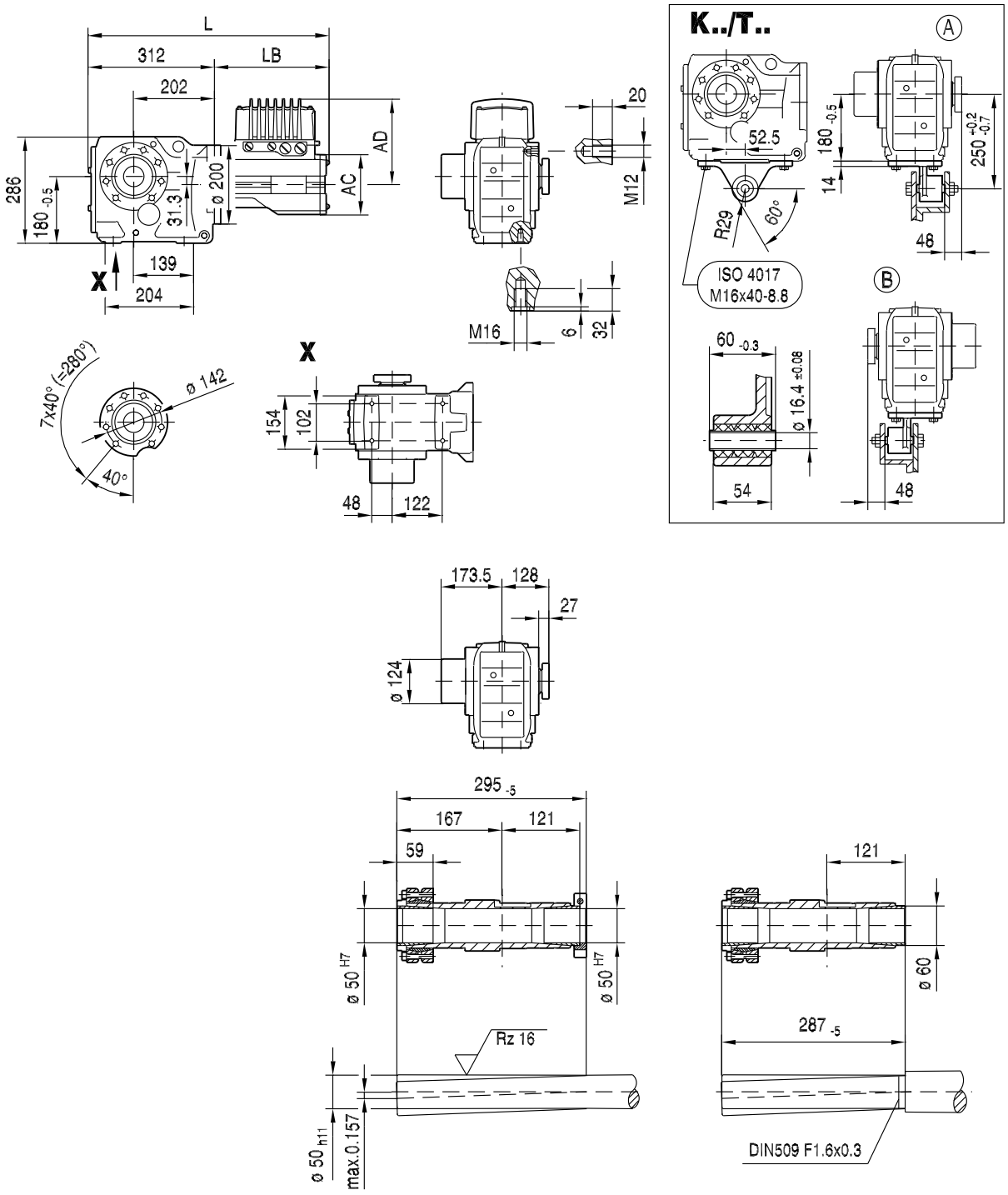
KVZ77..



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	593	608						
LB	281	296						

KT77..

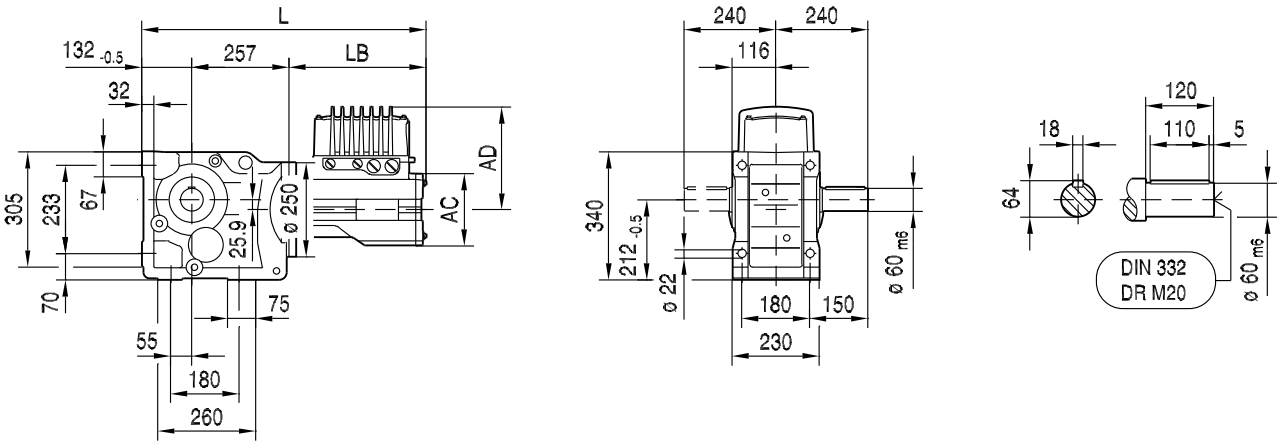
33 025 00 12



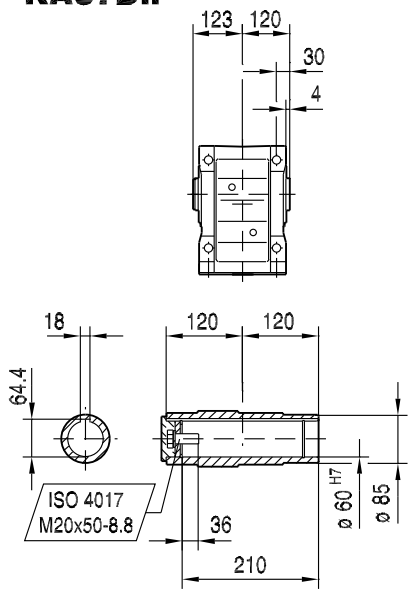
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	593	608						
LB	281	296						

K87..

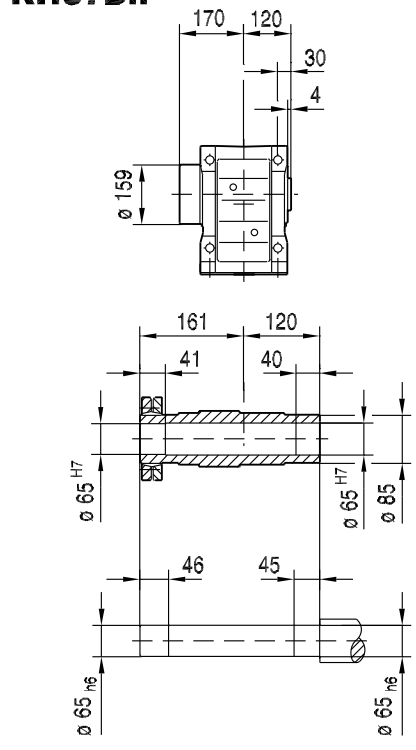
33 026 00 12



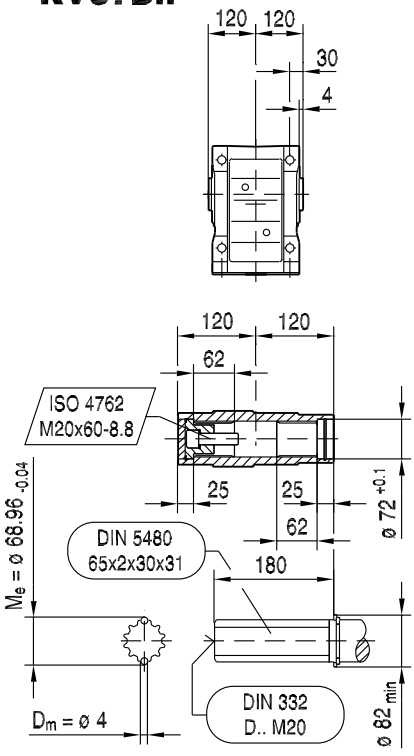
KA87B..



KH87B..



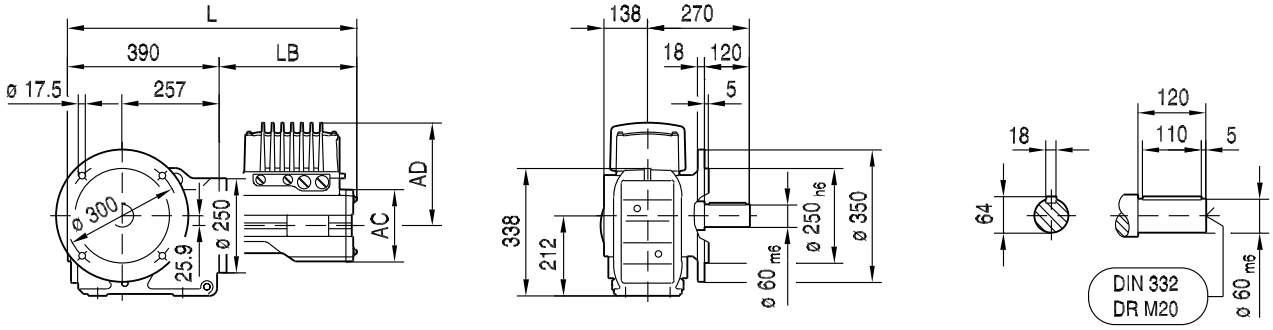
KV87B..



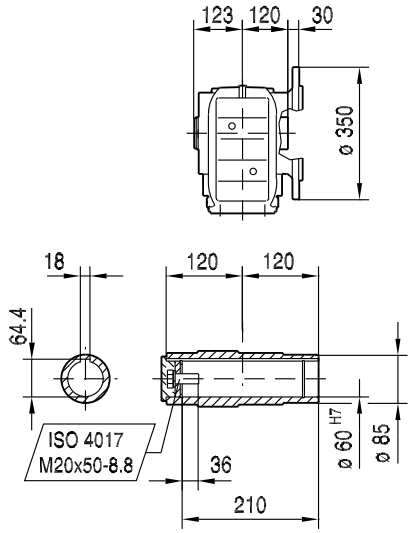
(→ 📖 265)	DRC2							
AC	154							
AD	218							
L	681							
LB	292							

KF87..

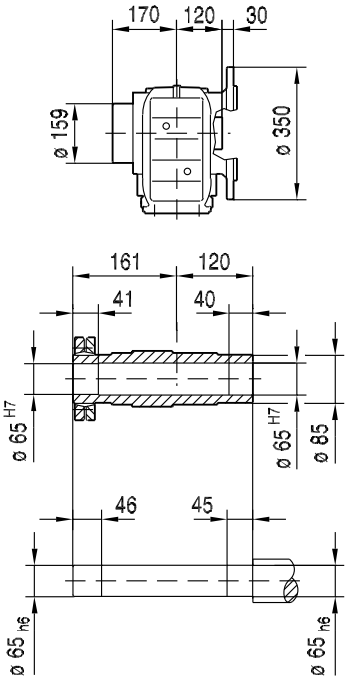
33 027 00 12



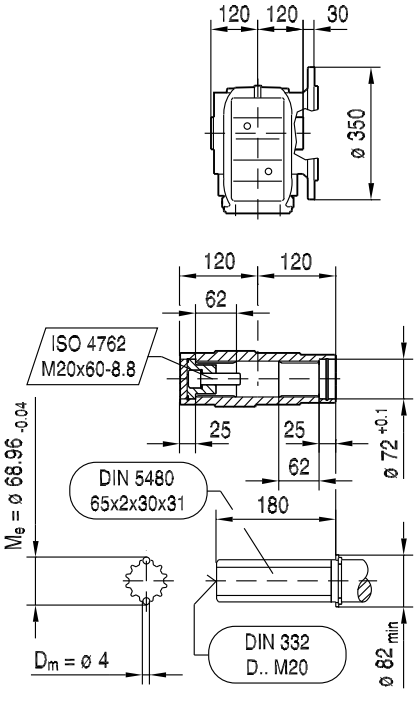
KAF87..



KHF87..



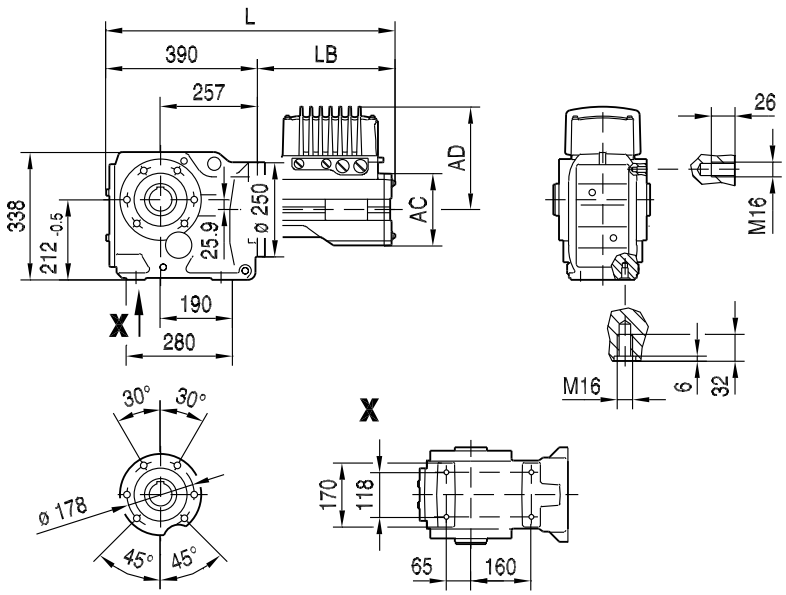
KVF87..

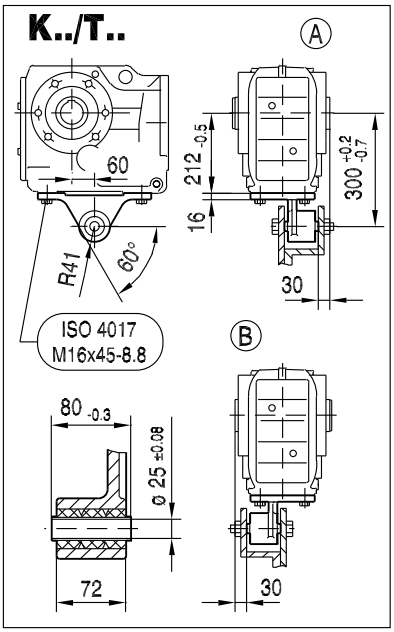


(→ 📖 265)	DRC2							
AC	154							
AD	218							
L	682							
LB	292							

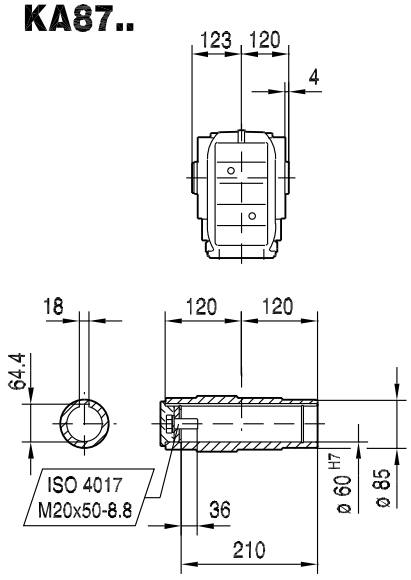
KA87..

33 028 00 12

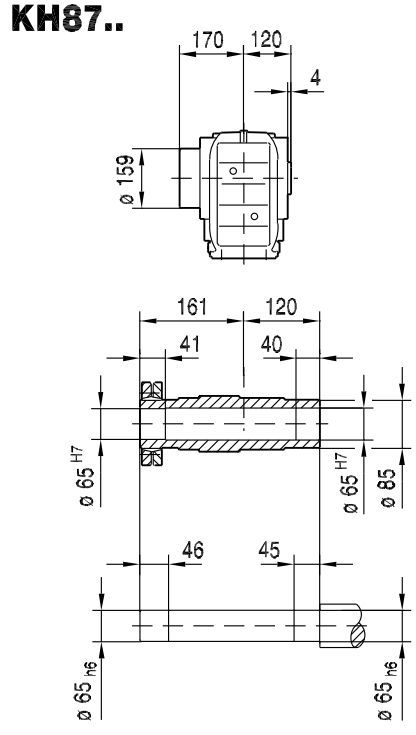




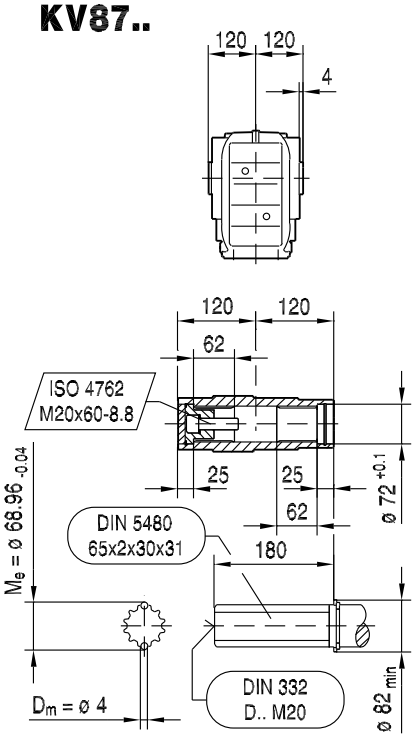
KA87..



KH87..



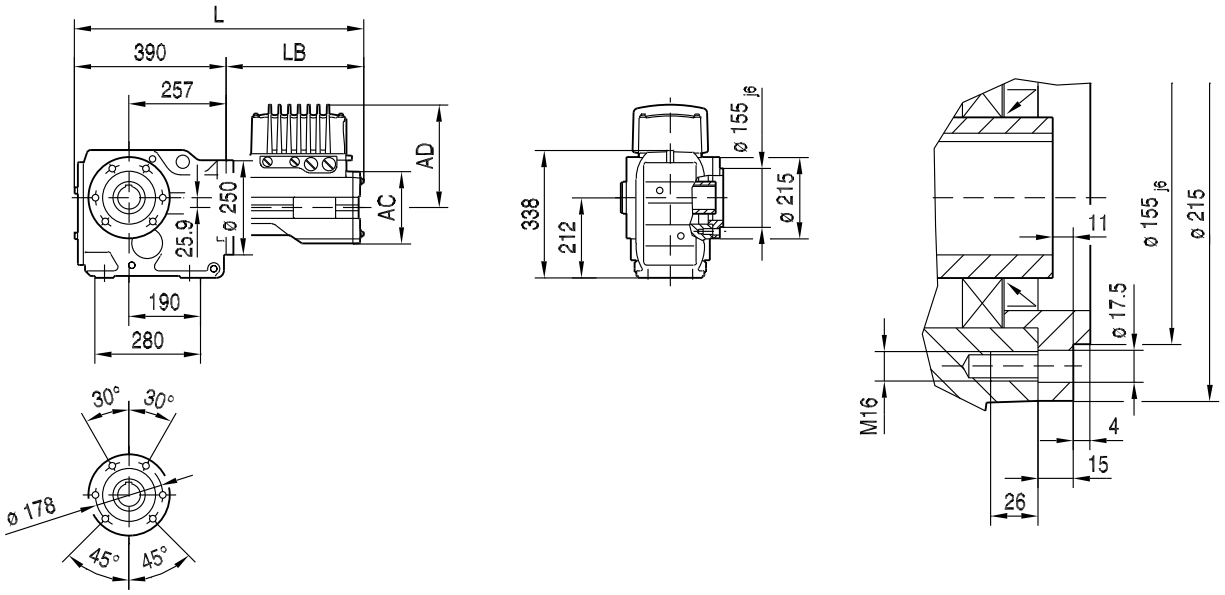
KV87..



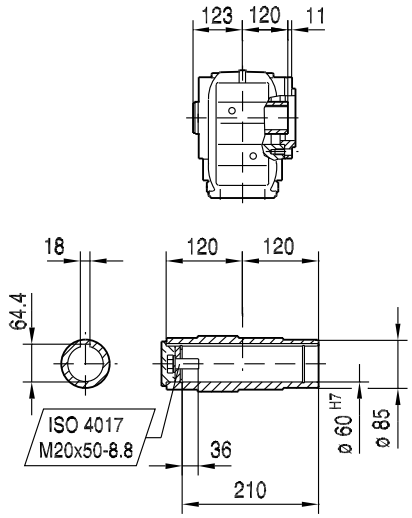
(→ 265)	DRC2							
AC	154							
AD	218							
L	682							
LB	292							

KAZ87..

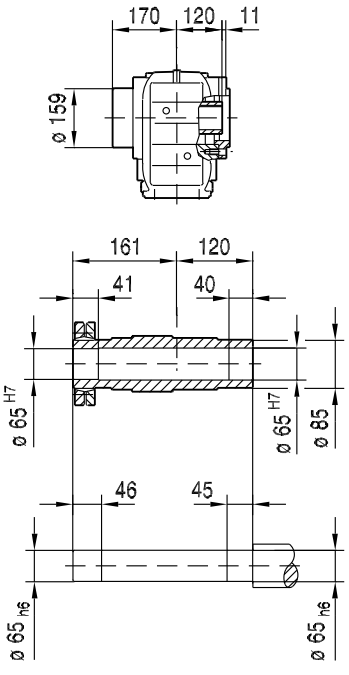
33 029 00 12



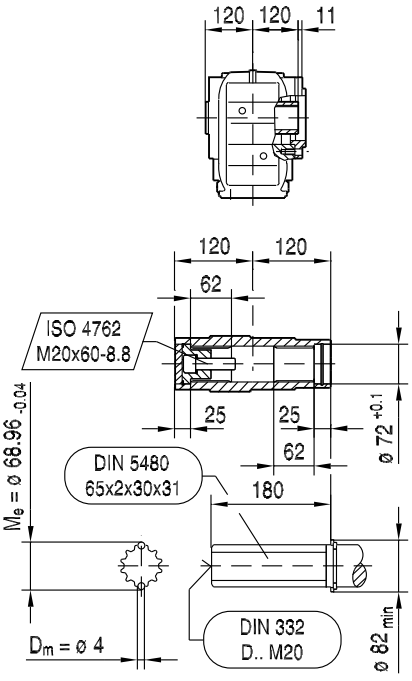
KAZ87..



KHZ87..



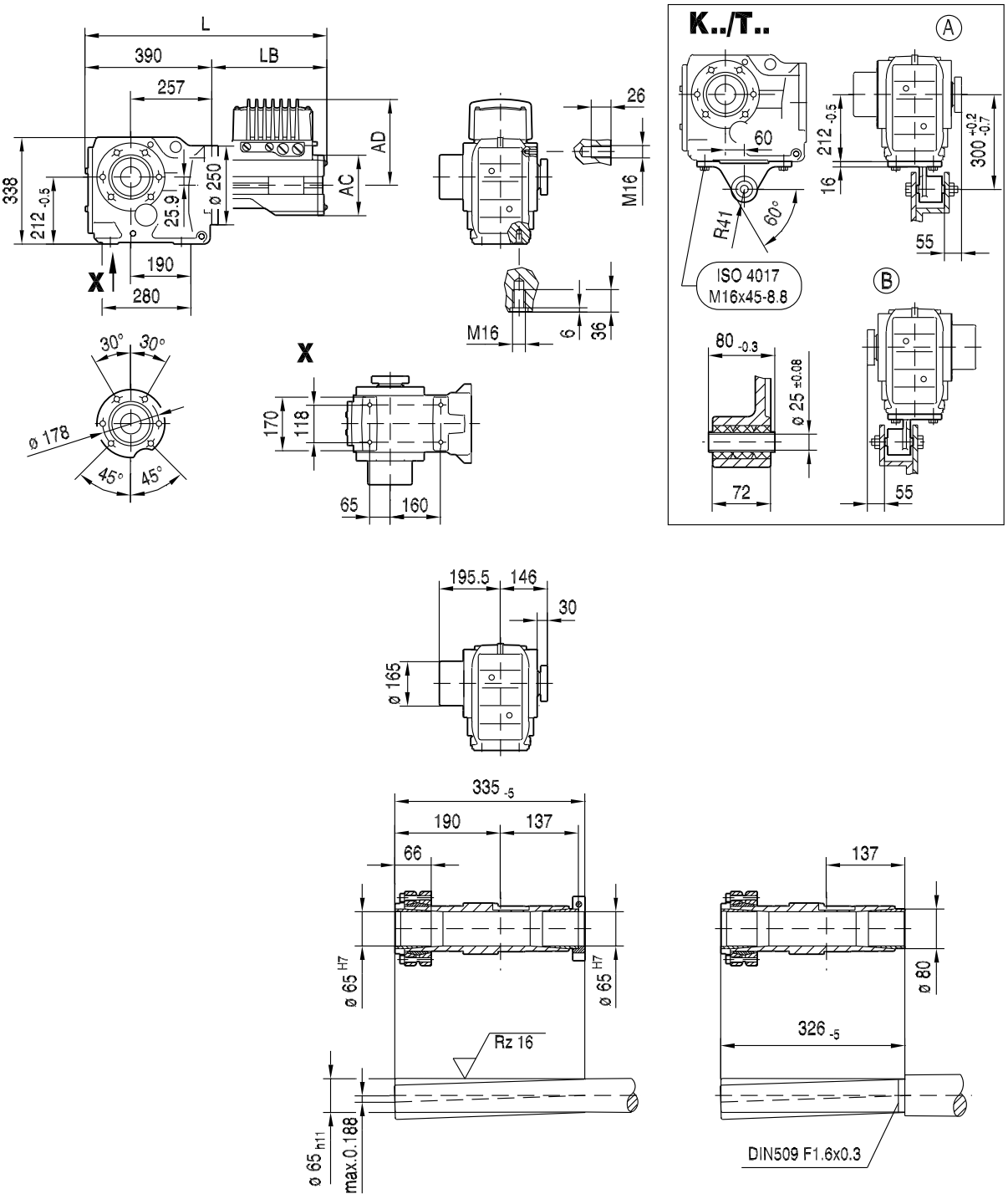
KVZ87..



(→ 📖 265)	DRC2							
AC	154							
AD	218							
L	682							
LB	292							

KT87..

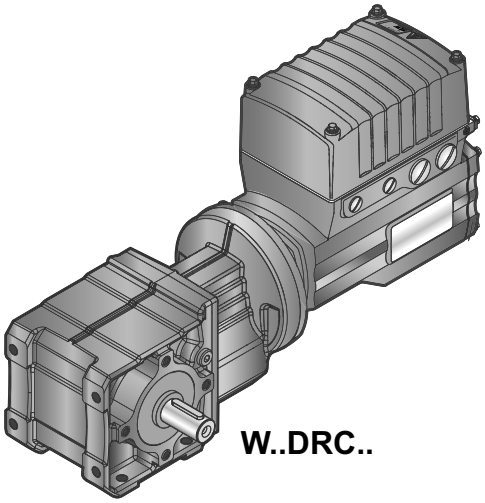
33 030 00 12



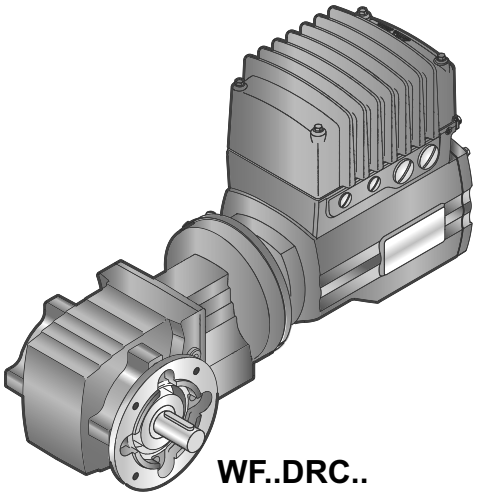
(→ 📖 265)	DRC2							
AC	154							
AD	218							
L	682							
LB	292							

14 SPIROPLAN® Gearmotors

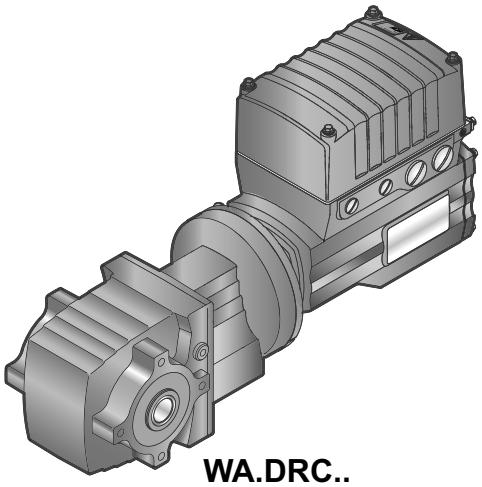
14.1 Variants



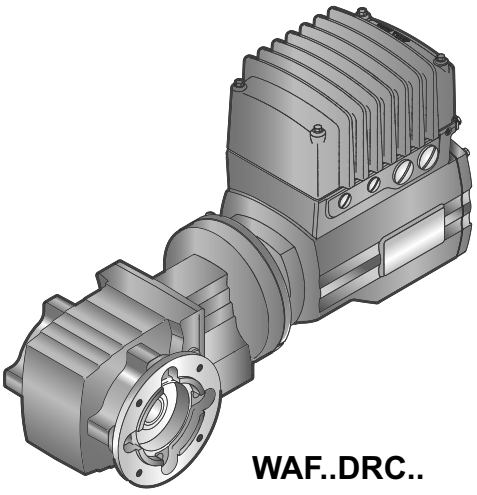
W..DRC..



WF..DRC..

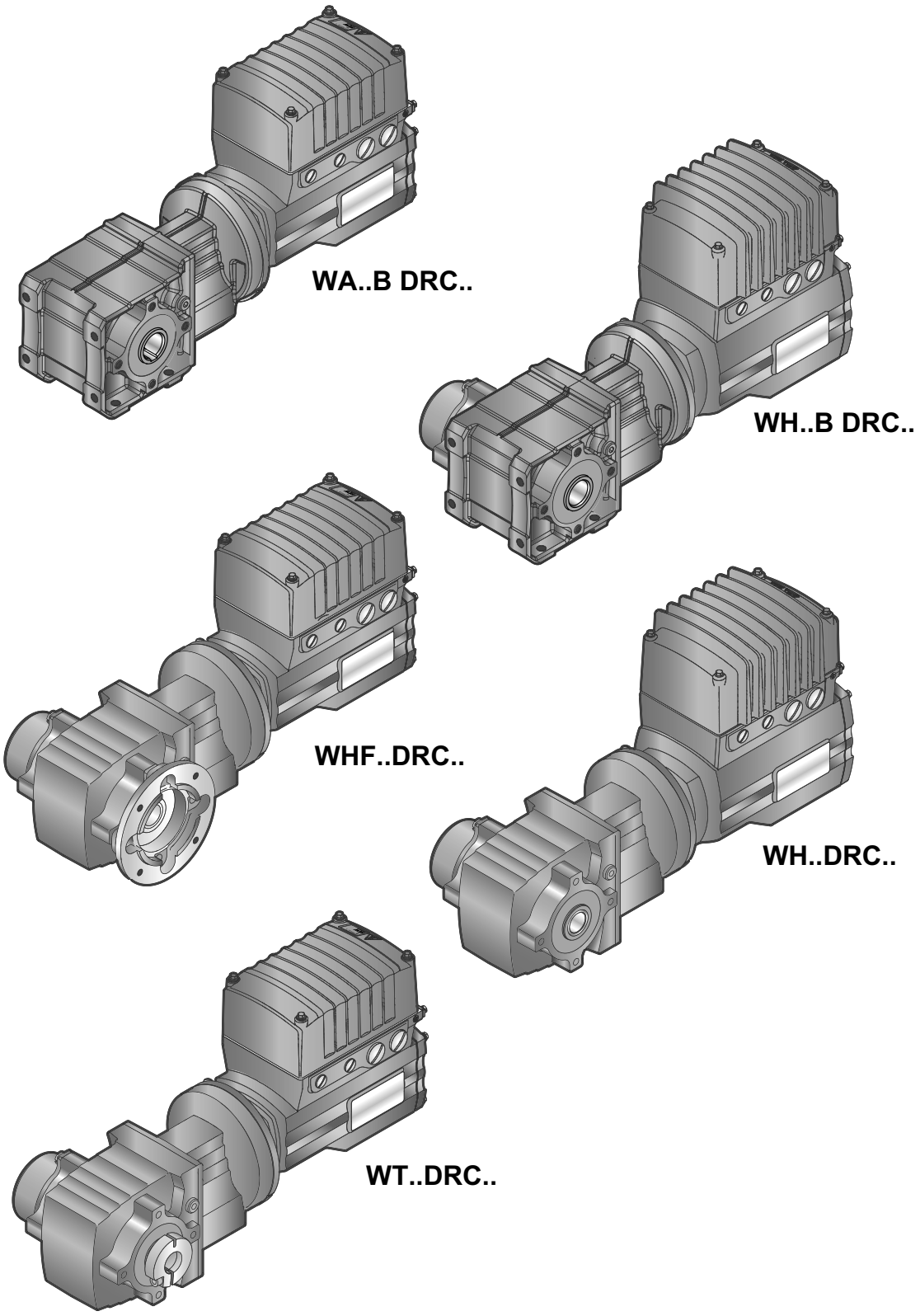


WA.DRC..



WAF..DRC..

9007204207790347



9007204283104395

14.2 Selection tables

14.2.1 W 37

			DRC1		DRC2			
	na_1 [rpm]	na_{2000} [rpm]	M_a [Nm]	M_{apk} [Nm]	M_a [Nm]	M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
W37 2	0.31	625	8.0	20	22	54	119	3.20*
	0.25	509	9.8	24	27	66	119	3.93
	0.20	391	13	31	34	>84	119	5.11
	0.17	347	14	36	39	>84	119	5.77
	0.14	287	17	43	47	>84	119	6.97
	0.12	234	21	52			119	8.55
	0.10	202	24	60			119	9.92
	0.09	187	25	62	68	>108	153	10.67
	0.09	172	28	71			119	11.65
	0.08	157	31	77			119	12.70
	0.07	144	32	80	87	>108	153	13.89
	0.06	128	36	90	>90	>108	153	15.67
	0.05	106	43	108	>90	>108	153	18.94
	0.05	94	44	109	>110	>110	144	21.33
	0.04	86	52	>108			153	23.25
	0.04	74	60	>108			153	26.96
	0.04	72	55	>111	>110	>111	158	27.78
	0.03	64	61	>117	>110	>117	166	31.33
	0.03	63	70	>108			153	31.67
	0.03	58	75	>108			153	34.52
	0.03	53	73	>126	>110	>126	178	37.88
	0.02	43	87	>130			187	46.49
	0.02	37	100	>130			187	53.92
	0.02	32	>110	>126			178	63.33
	0.01	29	>110	>130			187	69.05

m [kg]			DRC1	DRC2		
W37	2		26	32		
WF: + 0.0 kg / WA: + 0.0 kg / WAF: + 0.0 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	W [N]	WF [N]	WA [N]	WAF [N]	W [N]	WF [N]	WA [N]	WAF [N]
W37 2	3.20*	-	2.3	2220	2350	2050	2050	3690	3690	5000	5000
	3.93	-	1.6	2410	2550	2240	2240	3690	3690	5000	5000
	5.11	-	0.96	2680	2820	2490	2490	3690	3690	5000	5000
	5.77	-	0.77	2810	2950	2620	2620	3690	3690	5000	5000
	6.97	-	0.54	3020	3170	2830	2830	3690	3690	5000	5000
	8.55	-	0.37	3270	3420	3070	3070	3690	3690	5000	5000
	9.92	-	0.28	3460	3620	3250	3250	3690	3690	5000	5000
	10.67	-	0.80	2880	3140	2530	2530	3360	3360	5000	5000
	11.65	-	0.21	3680	3830	3460	3460	3690	3690	5000	5000
	12.70	-	0.18	3800	3830	3580	3580	3690	3690	5000	5000
	13.89	-	0.52	3250	3510	2890	2890	3360	3360	5000	5000
	15.67	-	0.42	3430	3610	3070	3070	3360	3360	5000	5000
	18.94	-	0.30	3610	3610	3360	3360	3360	3360	5000	5000
	21.33	-	0.71	3320	3320	2940	2940	3320	3320	5000	5000
	23.25	-	0.21	3610	3610	3690	3690	3360	3360	5000	5000
	26.96	-	0.16	3610	3610	3950	3950	3360	3360	5000	5000
	27.78	-	0.46	3320	3320	3400	3400	3300	3300	5000	5000
	31.33	-	0.38	3320	3320	3620	3620	2960	2960	5000	5000
	31.67	-	0.13	3610	3610	4240	4240	3360	3360	5000	5000
	34.52	-	0.11	3610	3610	4410	4410	3360	3360	5000	5000
	37.88	-	0.27	3320	3320	3990	3990	2080	2080	5000	5000
	46.49	-	0.19	3320	3320	4410	4410	1490	1490	5000	5000
	53.92	-	0.15	3320	3320	4730	4730	1490	1490	5000	5000
	63.33	-	0.12	3320	3320	5000	5000	2080	2080	5000	5000
	69.05	-	0.10	3320	3320	5000	5000	1490	1490	5000	5000

14.2.2 W 47

	na_1 [rpm]	na_{2000} [rpm]	DRC1 M_a [Nm]	DRC1 M_{apk} [Nm]	DRC2 M_a [Nm]	DRC2 M_{apk} [Nm]	$M_{aNotAus}$ [Nm]	i
	0.31	612	8.4	21	23	57	198	3.27
	0.26	514	9.9	25	27	67	198	3.89
	0.23	455	11	28	30	76	198	4.40
	0.19	382	13	33	36	90	198	5.23
	0.18	358	14	35	39	96	198	5.58
	0.15	306	17	41	45	113	198	6.53
	0.14	273	18	46	50	125	198	7.32
	0.12	232	22	54	59	>132	198	8.61
	0.10	201	25	63	68	>132	198	9.96
	0.09	188	27	67	73	>132	198	10.66
	0.09	177	27	67	73	181	285	11.32
	0.08	163	31	77			198	12.30
	0.07	149	32	79	86	>192	285	13.44
	0.07	139	33	84	91	>192	285	14.35
W47	0.06	119	39	98	106	>192	285	16.80
 2	0.05	106	43	108	118	>192	285	18.82
	0.05	90	51	128	139	>192	285	22.15
	0.04	80	53	133	144	>215	320	25.07
	0.04	78	58	146	159	>192	285	25.62
	0.04	75	57	142	154	>215	320	26.76
	0.04	73	62	156	>160	>192	285	27.41
	0.03	64	66	164	178	>215	320	31.33
	0.03	63	71	178			285	31.62
	0.03	57	73	181	>180	>215	320	35.09
	0.02	48	84	210	>180	>215	320	41.30
	0.02	42	95	>215	>180	>215	320	47.78
	0.02	39	102	>215	>180	>215	320	51.12
	0.02	34	116	>215			320	58.98
	0.01	29	133	>215			320	68.93
	0.01	27	143	>215			320	74.98

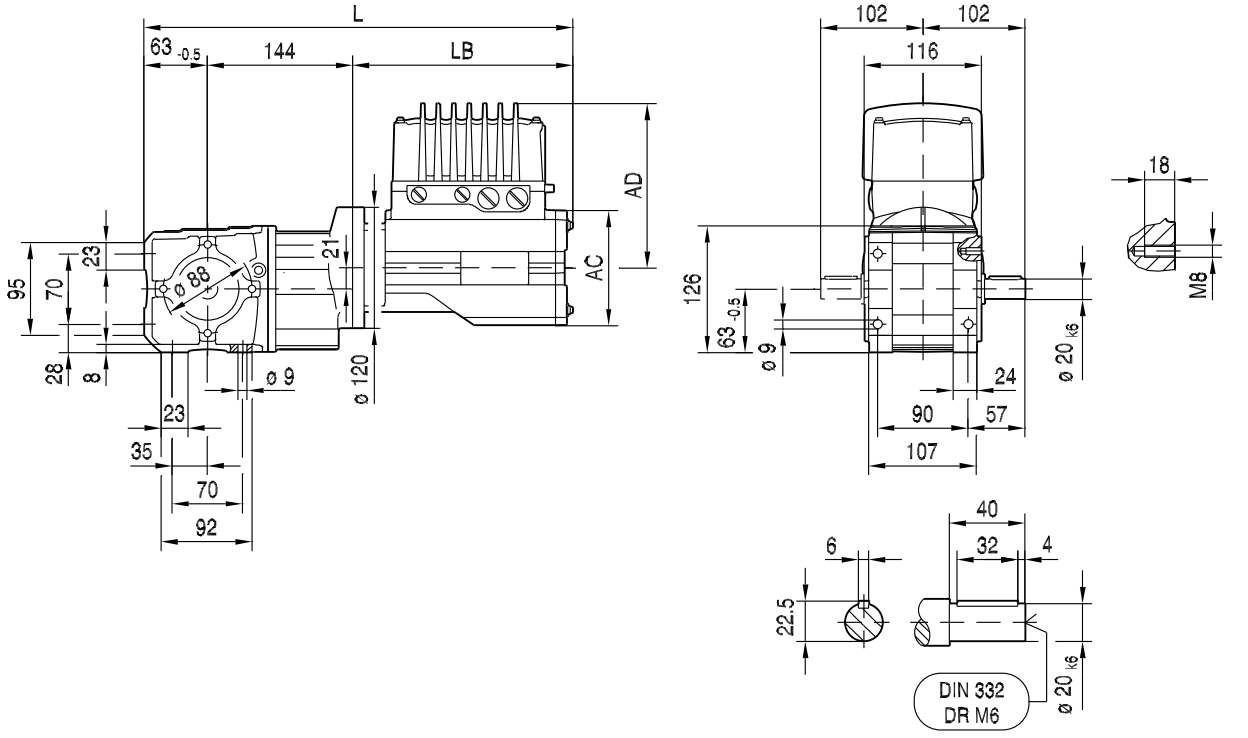
m [kg]			DRC1	DRC2		
W47	 2		31	37		
WF: + 0.5 kg / WA: + -1.5 kg / WAF: + -0.7 kg						

DRC..				F_{Ramax}				F_{Rapk}			
n_e = 1400	i	φ /R [']	J_G 10^{-4} [kgm^2]	W [N]	WF [N]	WA [N]	WAF [N]	W [N]	WF [N]	WA [N]	WAF [N]
W47 2	3.27	-	8.3	2660	3170	2440	2440	6990	7910	8000	8000
	3.89	-	5.9	2860	3390	2640	2640	6990	7910	8000	8000
	4.40	-	4.7	3020	3560	2790	2790	6990	7910	8000	8000
	5.23	-	3.3	3240	3810	3010	3010	6990	7910	8000	8000
	5.58	-	2.9	3320	3900	3090	3090	6990	7910	8000	8000
	6.53	-	2.1	3540	4140	3310	3310	6990	7910	8000	8000
	7.32	-	1.7	3710	4330	3470	3470	6990	7910	8000	8000
	8.61	-	1.2	3960	4600	3720	3720	6990	7910	8000	8000
	9.96	-	0.96	4190	4860	3950	3950	6990	7910	8000	8000
	10.66	-	0.84	4300	4980	4060	4060	6990	7910	8000	8000
	11.32	-	1.6	3460	4350	2980	2980	6470	7600	8000	8000
	12.30	-	0.65	4550	5250	4300	4300	6990	7910	8000	8000
	13.44	-	1.2	3760	4680	3280	3280	6470	7600	8000	8000
	14.35	-	1.1	3880	4810	3400	3400	6470	7600	8000	8000
	16.80	-	0.77	4180	5140	3690	3690	6470	7600	8000	8000
	18.82	-	0.63	4410	5390	3920	3920	6470	7600	8000	8000
	22.15	-	0.46	4750	5770	4250	4250	6470	7600	8000	8000
	25.07	-	0.93	4430	5610	3800	3800	6160	7430	8000	8000
	25.62	-	0.37	5070	6120	4570	4570	6470	7600	8000	8000
	26.76	-	0.82	4580	5770	3940	3940	6160	7430	8000	8000
	27.41	-	0.33	5220	6290	4720	4720	6470	7600	8000	8000
	31.33	-	0.60	4950	6180	4310	4310	6160	7430	8000	8000
	31.62	-	0.26	5560	6660	5050	5050	6470	7600	8000	8000
	35.09	-	0.49	5230	6490	4580	4580	6160	7430	8000	8000
	41.30	-	0.36	5650	6950	4990	4990	6160	7430	8000	8000
	47.78	-	0.29	6040	7380	5380	5380	6160	7430	8000	8000
	51.12	-	0.26	6230	7580	5570	5570	6160	7430	8000	8000
	58.98	-	0.21	6400	7580	5980	5980	6160	7430	8000	8000
	68.93	-	0.16	6400	7580	6450	6450	6160	7430	8000	8000
	74.98	-	0.14	6400	7580	6710	6710	6160	7430	8000	8000

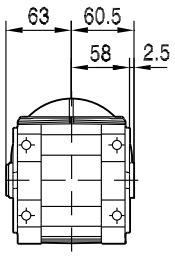
14.3 Dimension sheets

W37..

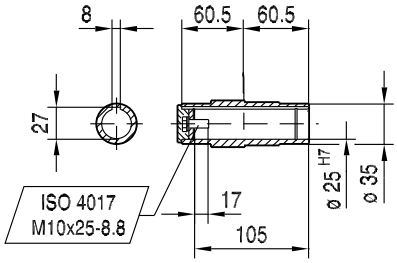
20 001 00 12



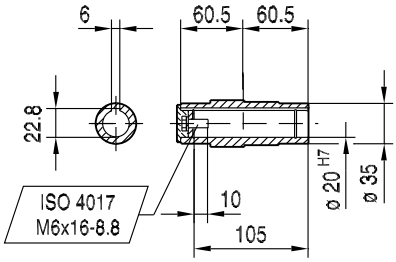
WA37B..



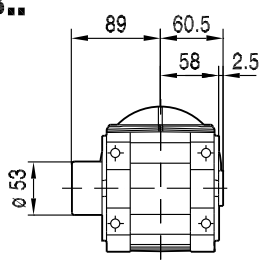
ø 25 H7
DIN 6885-3

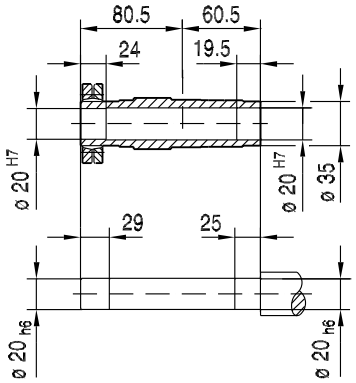


ø 20 H7



WH37B..

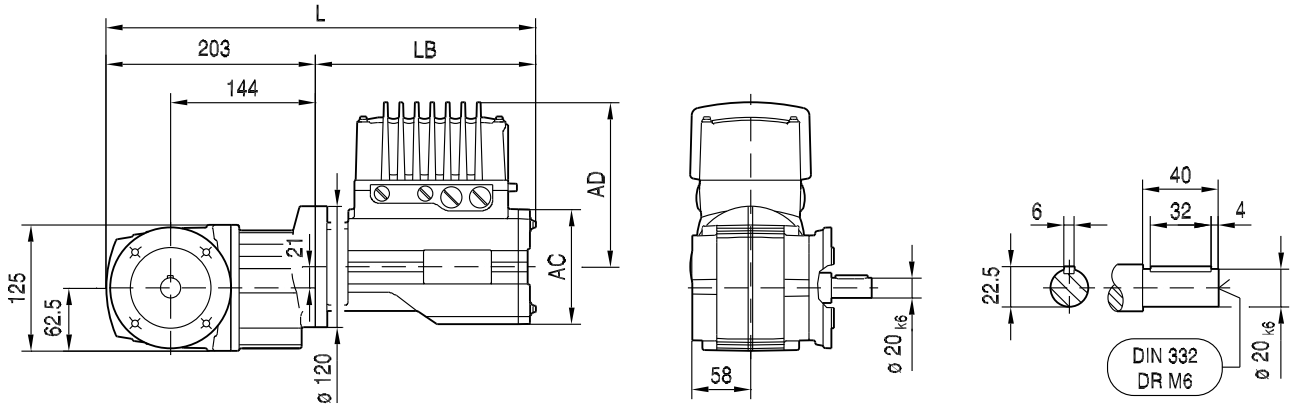


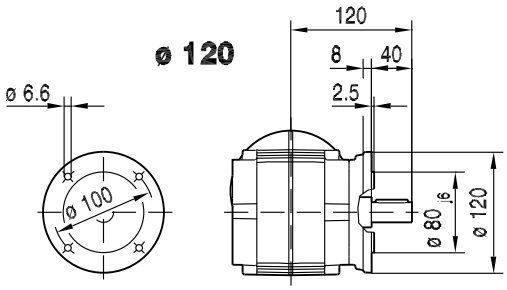


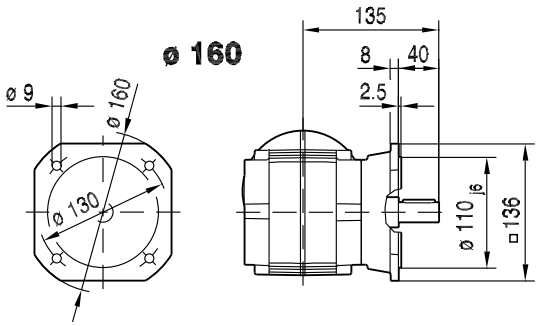
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	501	517						
LB	294	310						

WF37..

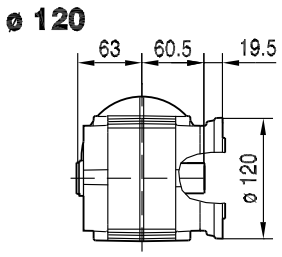
20 002 00 12

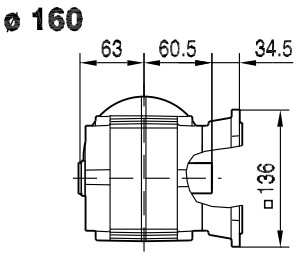


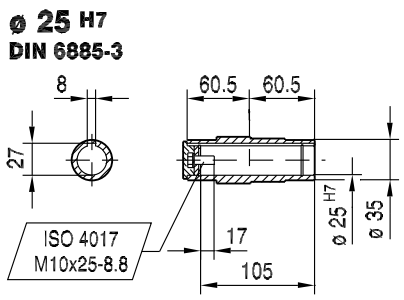


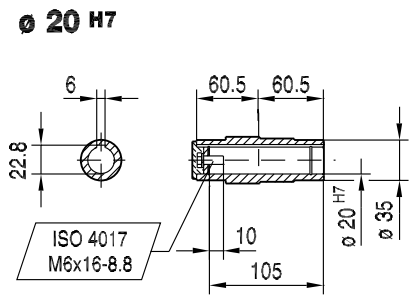


WAF37..





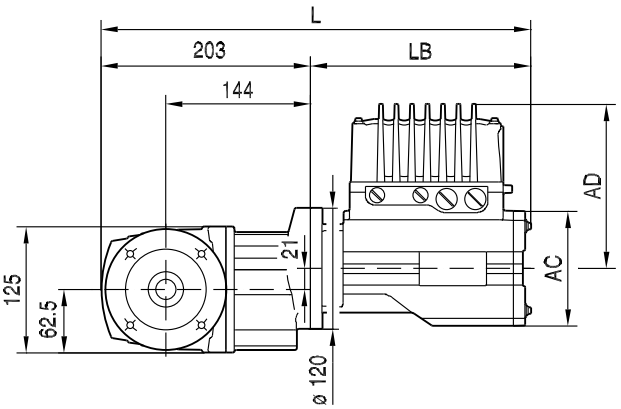




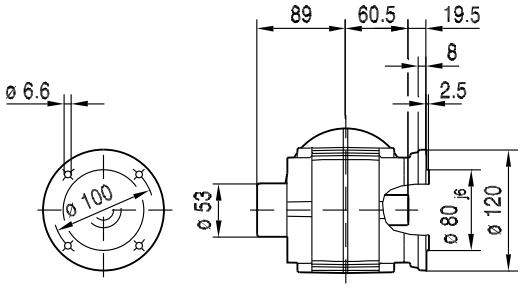
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	497	513						
LB	294	310						

WHF37..

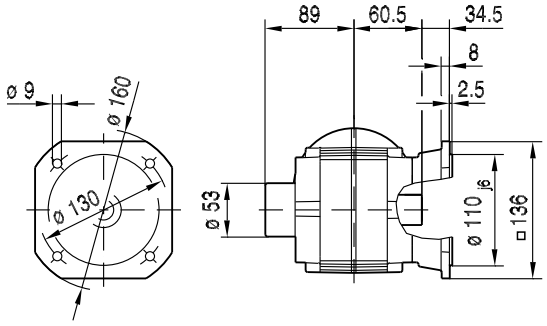
20 003 00 12

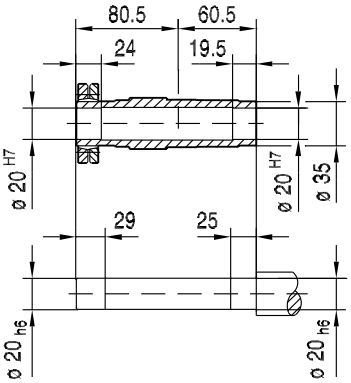


ø 120



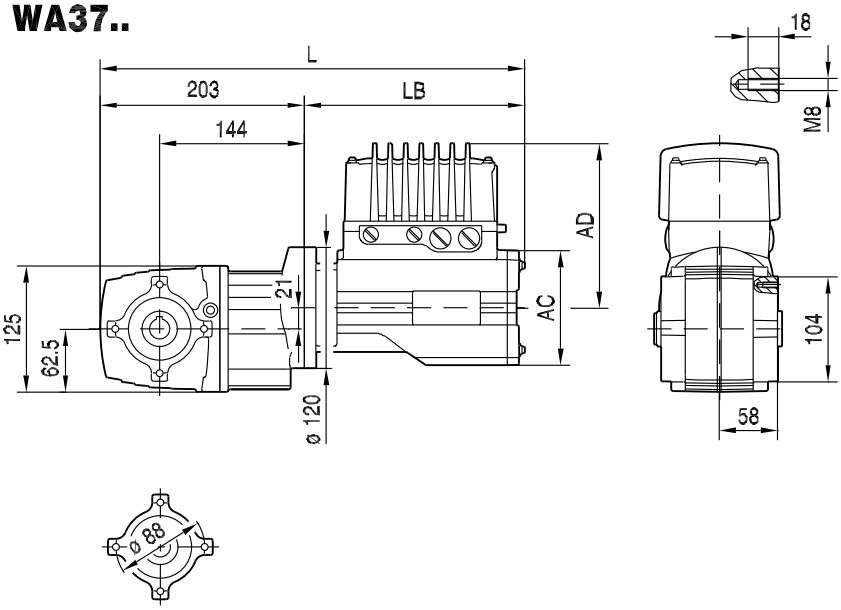
ø 160





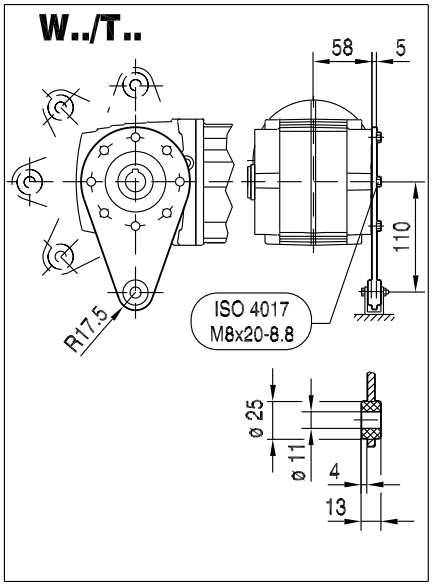
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	497	513						
LB	294	310						

WA37..

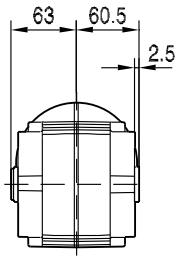


20 004 00 12

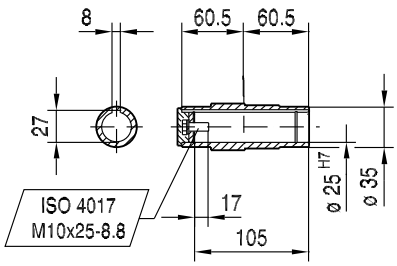
W../T..



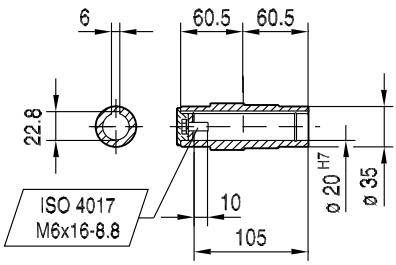
WA37..



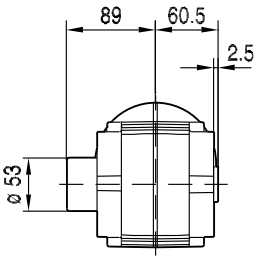
ø 25 H7
DIN 6885-3

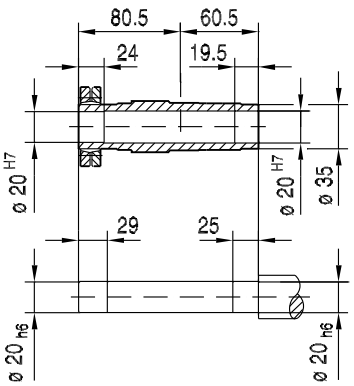


ø 20 H7



WH37..

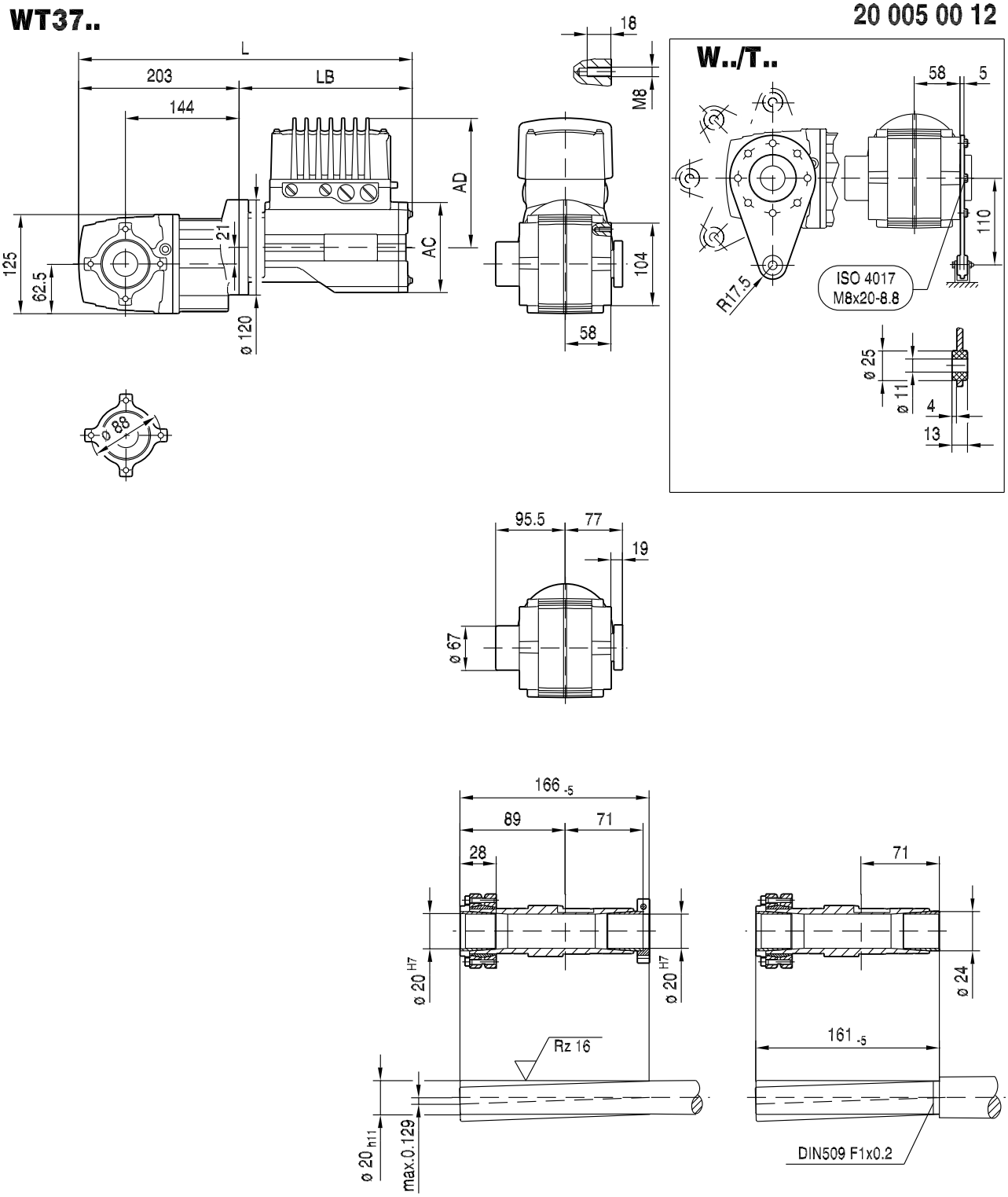




(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	497	513						
LB	294	310						

WT37..

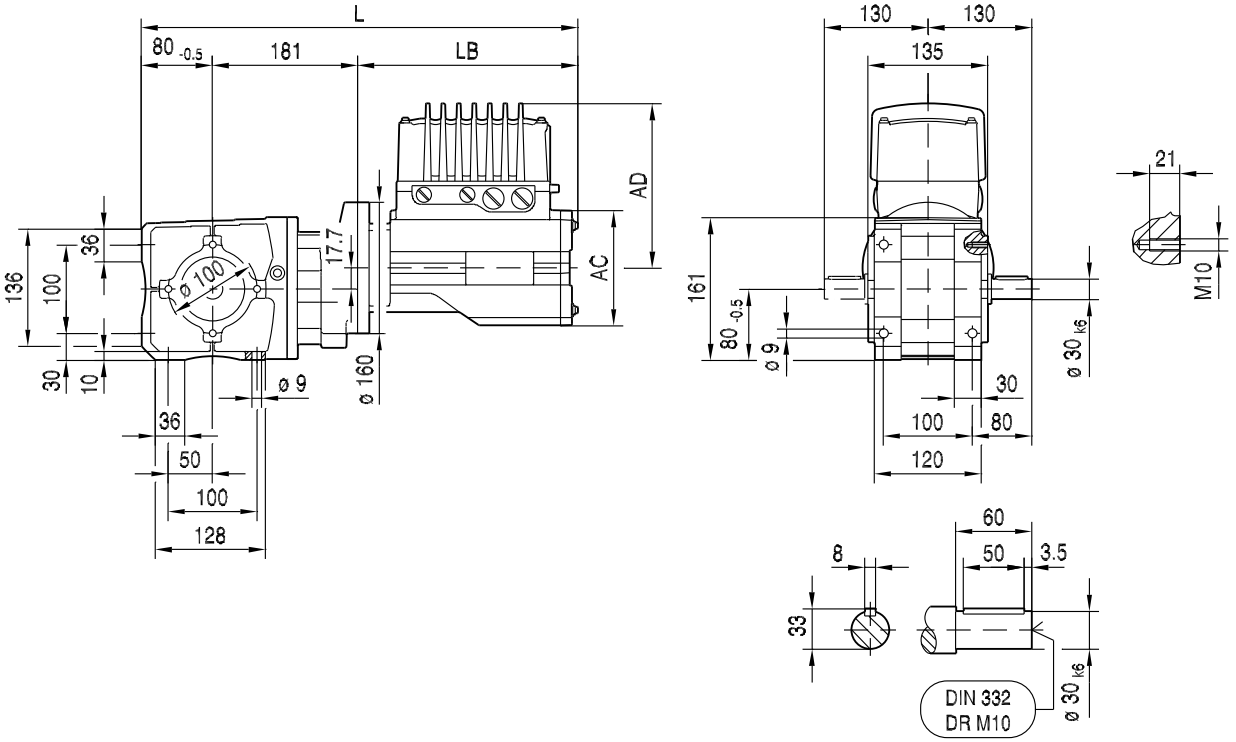
20 005 00 12



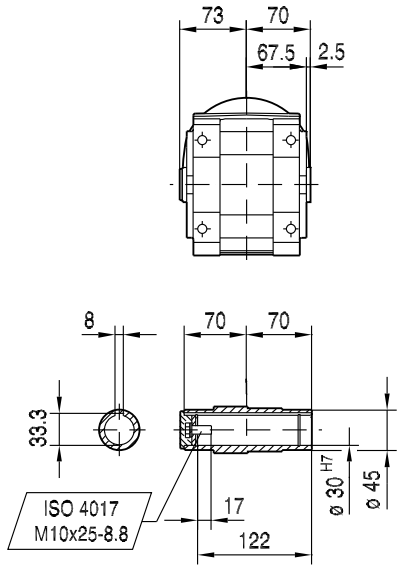
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	497	513						
LB	294	310						

W47..

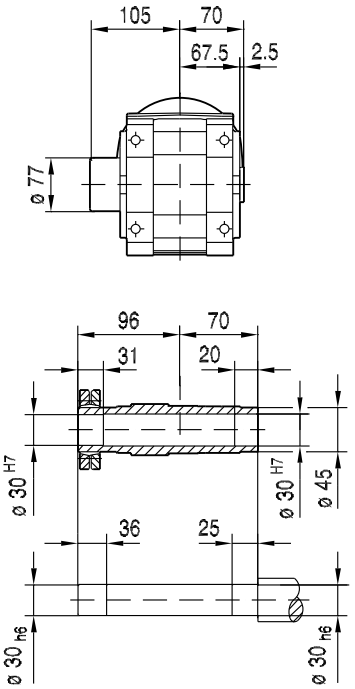
20 006 00 12



WA47B..



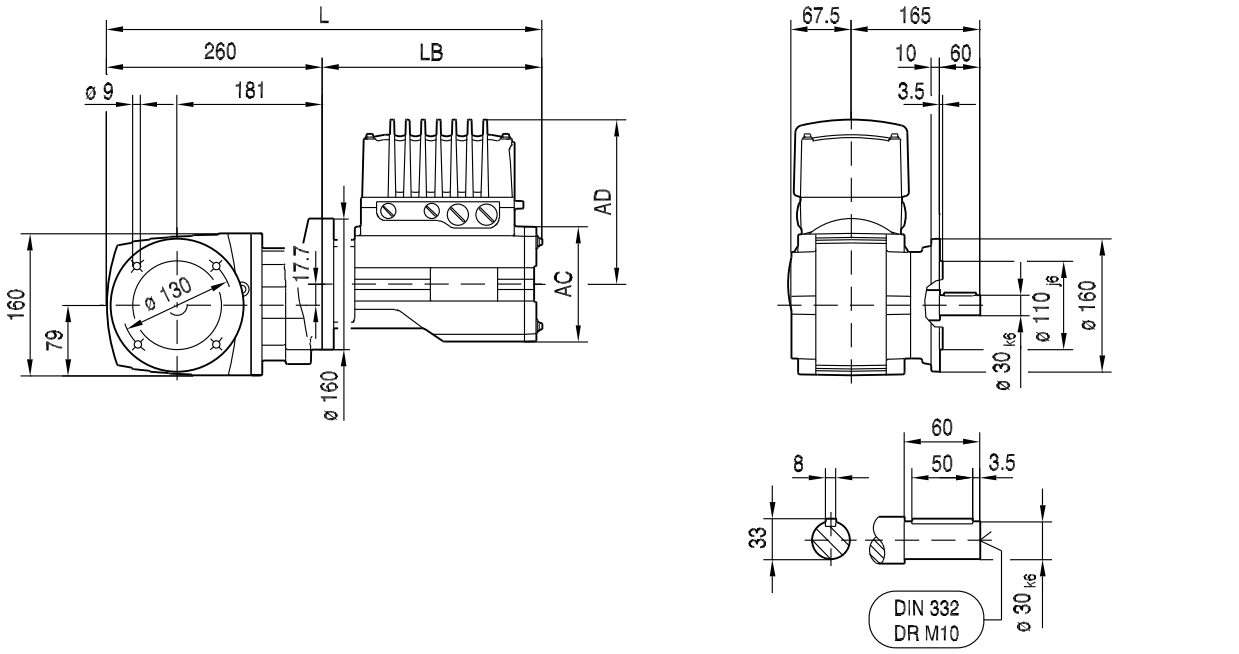
WH47B..



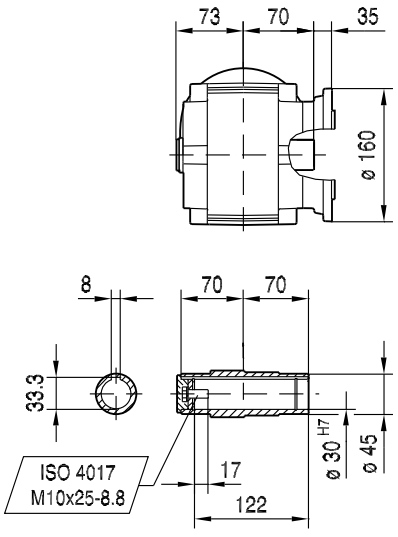
(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	548	565						
LB	287	304						

WF47..

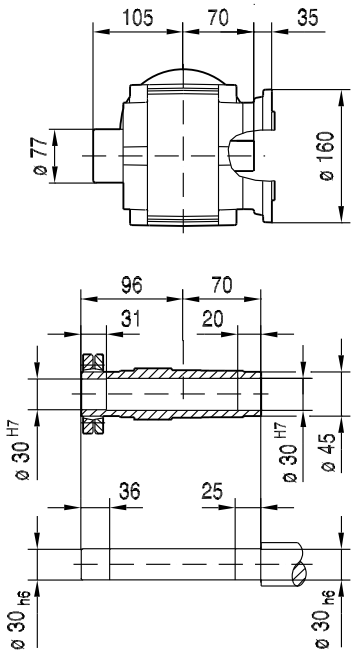
20 007 00 12



WAF47..

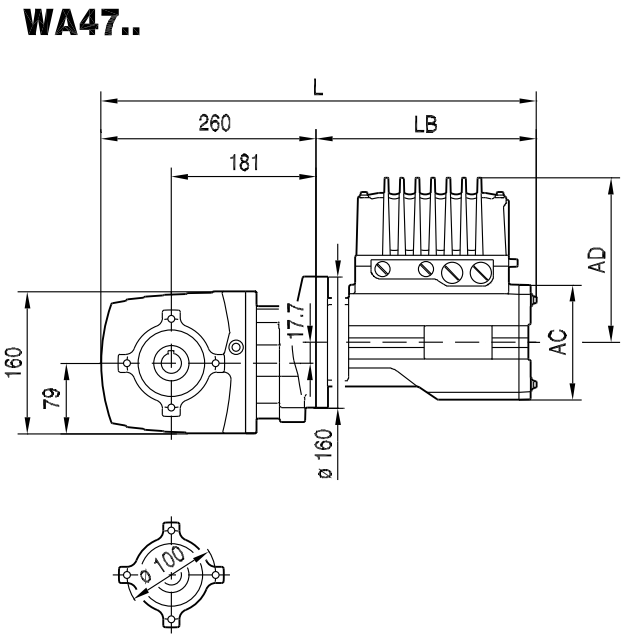


WHF47..

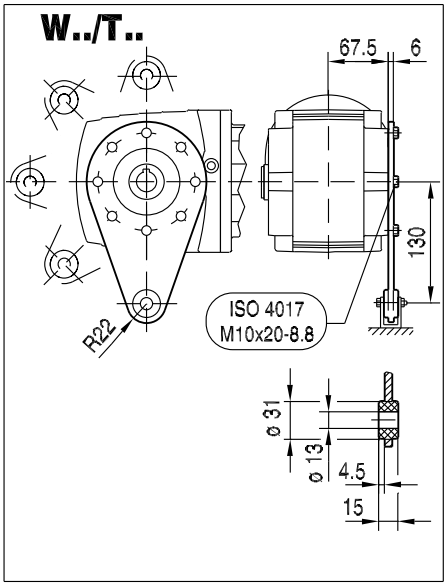


(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	547	564						
LB	287	304						

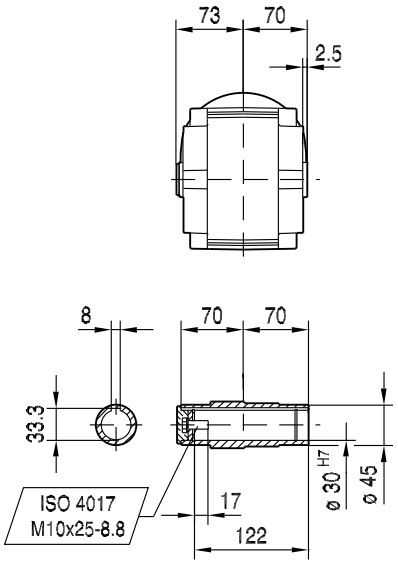
WA47..



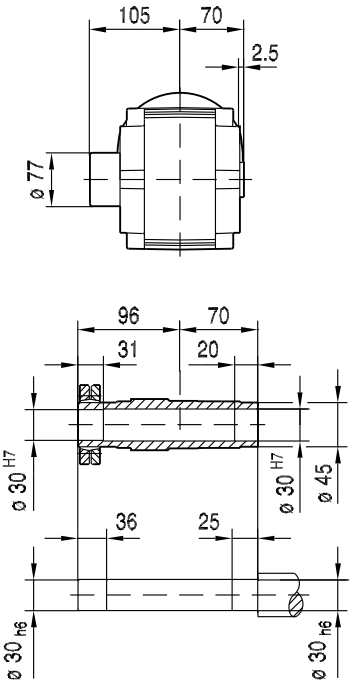
20 008 00 12



WA47..



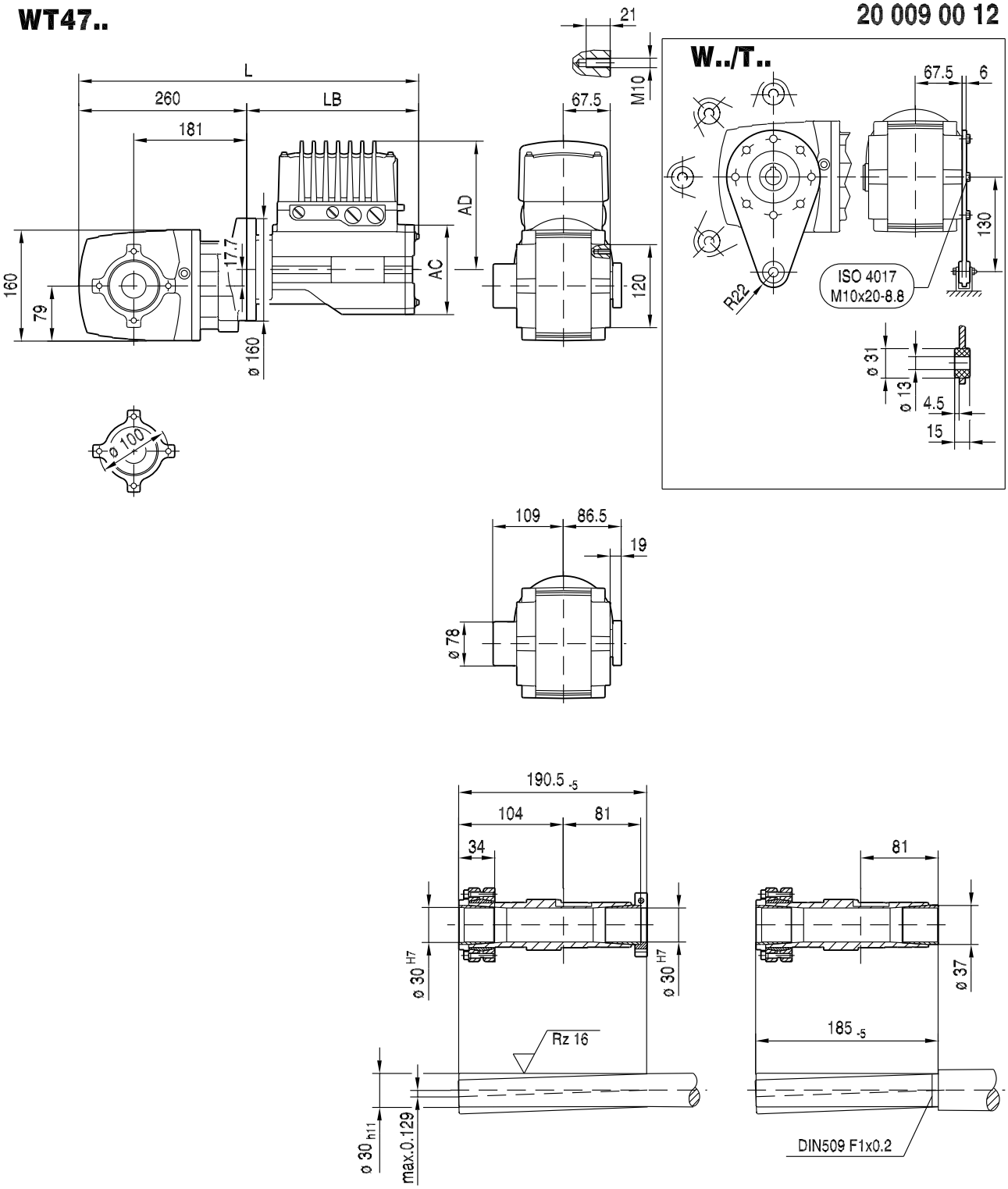
WH47..



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	547	564						
LB	287	304						

WT47..

20 009 00 12



(→ 📖 265)	DRC1	DRC2						
AC	128	154						
AD	185	218						
L	547	564						
LB	287	304						

15 Abbreviation Key

a, b, f	Constants for converting overhung loads	[mm]
c	Constant for converting overhung load	[Nmm]
cos φ	Power factor of the motor	
F	Force	[N]
F_A	Axial load on the output shaft	[N]
f_B	Service factor	
f_{line}	Line frequency	[Hz]
F_R	Overhung loads on the output shaft	[N]
f_T, f_H	Performance-reducing factors of the motor	
f_Z	Transmission elment factor for determining the overhung load	
H	Installation altitude	[m above sea level]
i	Gear ratio	
I_A/I_N	Ratio between starting current and rated current of the motor	
i_{ges}	Total gear ratio	
I_N	Nominal current	[A]
IP..	Degree of protection	
i_{sch}	Gear ratio of the helical-worm gear stage	
J_{Last}	Mass moment of inertia to be driven	[10^{-4} kgm^2]
J_{mot}	Mass moment of inertia of the motor	[10^{-4} kgm^2]
J_X	Mass moment of inertia scaled down to the motor shaft	[10^{-4} kgm^2]
J_Z	Mass moment of inertia of the flywheel fan	[10^{-4} kgm^2]
M	Torque	[Nm]
M1 – M6	Mounting position	
M_a	Output torque	[Nm]
M_A/M_N	Ratio between starting torque and rated torque of the motor	
M_B	Braking torque	[Nm]
M_H/M_N	Ratio between starting torque and rated torque of the motor	
M_L	Load torque (note the sign)	[Nm]
n	Speed	[rpm]
n_a	Output speed	[rpm]
NB	Number of braking operations until maintenance of the brake	
n_e	Input speed	[rpm]
n_M	Motor speed	[rpm]
n_N	Rated speed	[rpm]
P_a	Output power	[kW]
P_{BR}	Braking power	[W]
P_e	Calculated drive power of the gear unit	[kW]
P_N	Rated power	[kW]
S.., ..% cdf	Duty type and cyclic duration factor (cdf)	
T	Cycle duration	[min]
t1	Response time of the motor brake	[10^{-3} s]
t2	Application time of the motor brake	[10^{-3} s]
V_{brake}	Operating voltage of the brake	[V]

V_{mot}	Operating voltage of the motor	[V]
W_{BW}	Braking work	[J]
W_{insp}	Total braking work until service	[J]
x	Reduction of overhung loads	[mm]
Z	Switching frequency	[1/h], [c/h]
Z_0	No-load starting frequency	[1/h], [c/h]
η	Forward efficiency	
η'	Retrodriving efficiency	
$\eta_{75\%}/\eta_{100\%}$	Motor efficiency at nominal load of 75% / 100%	
ϑ_{Amb}	Ambient temperature	[°C]

16 Inquiry/Order

Inquiry/Order

SEW EURODRIVE

Customer data:
Company: _____ Customer no.: _____
Department: _____
Name: _____ Phone: _____
Street/P.O. Box: _____ Fax: _____
_____ Email: _____
ZIP code/city: _____

Your contact partner at SEW:
Name: _____ Phone: _____
Technical Office: _____ Fax: _____

Technical data:
Quantity: _____ Requested delivery date: _____
Catalog designation: _____

Gear unit type:
☐ Helical ☐ Parallel shaft helical ☐ Helical-bevel ☐ Helical-worm ☐ Spiroplan®
☐ Multi-stage ☐ Servo ☐ Variable speed ☐ EMS ☐ Other: _____

Power: _____ kW Output speed: _____ rpm Output torque: _____ Nm

Cycles/h: _____ c/h Cyclic duration factor: S _____ / _____ % cdf
☐ 1-shift operation ☐ 2-shift operation ☐ 3-shift operation
☐ Uniform ☐ Non-uniform ☐ Extremely non-uniform

Mounting position:
M1 ☐ M2 ☐ M3 ☐ M4 ☐ M5 ☐ M6 ☐ Pivoting ☐

Housing type:
☐ Foot-mounted ☐ Flange (bore) ☐ Flange (thread)
☐ Torque arm ☐ Other: _____

Shaft type:
☐ Solid shaft with key ☐ Shrink disk Shaft/hollow shaft : _____ mm
☐ Hollow shaft with key ☐ TorqLOC® Flange : _____ mm

Shaft position (right-angle units): ☐ A ☐ B ☐ AB

Terminal box position: ☐ 0°(R) ☐ 90°(B) ☐ 180°(L) ☐ 270°(T)

Cable entry: ☐ X ☐ 1 ☐ 2 ☐ 3

Degree of protection:
IP54 ☐ IP55 ☐ IP56 ☐ IP65 ☐ IP66 ☐ IP69K ☐

Thermal class:
130(B) ☐ 155(F) ☐ 180(H) ☐ KS ☐

Surface/corrosion protection:
OS1 ☐ OS2 ☐ OS3 ☐ OS4 ☐

Mains voltage: _____ V
Mains frequency: ☐ 50Hz ☐ 60Hz

Connection type: ☐ Δ ☐ Y ☐ YY ☐ Y/Y

☐ For inverter operation: Max. frequency: _____ Hz Control range: _____

Required options:
☐ Brake: voltage _____ V Braking torque: _____ Nm
☐ Manual brake release: ☐ HR or ☐ HF
☐ Forced cooling fan: Forced cooling fan voltage: _____ V
☐ Motor protection: ☐ TF or ☐ TH
☐ Encoder: _____
☐ Plug connection: _____
☐ Inverter: _____
☐ RAL 7031 or ☐ RAL _____

Other options:

Special ambient conditions:
Temperature from _____ °C to _____ °C ☐ Outdoor use ☐ Installation >1000m above msl
Other ambient conditions: _____
Other: _____

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

5038033163

17 Address Directory

Germany			
Headquarters **Production** **Sales**	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal P.O. Box Postfach 3023 • D-76642 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-1970 http://www.sew-eurodrive.de sew@sew-eurodrive.de
Production / Industrial Gears	**Bruchsal**	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str.10 D-76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production	**Graben**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf P.O. Box Postfach 1220 • D-76671 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251 75-2970
	Östringen	SEW-EURODRIVE GmbH & Co KG, Werk Östringen Franz-Gurk-Straße 2 D-76684 Östringen	Tel. +49 7253 9254-0 Fax +49 7253 9254-90 oestringen@sew-eurodrive.de
Service Competence Center	**Central**	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 D-76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 sc-mitte@sew-eurodrive.de
	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 D-30823 Garbsen (near Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 sc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 D-08393 Meerane (near Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 sc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim (near München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 sc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld (near Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 sc-west@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 D-76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 sc-elektronik@sew-eurodrive.de
	Drive Service Hotline / 24 Hour Service		+49 180 5 SEWHELP +49 180 5 7394357 14 euro cents/min on the German landline network. Max 42 euro cents/min from a German mobile network. Prices for mobile and international calls may differ.
Technical Offices	**Augsburg**	SEW-EURODRIVE GmbH & Co KG August-Wessels-Straße 27 D-86156 Augsburg	Tel. +49 821 22779-10 Fax +49 821 22779-50 tb-augsburg@sew-eurodrive.de
	Berlin	SEW-EURODRIVE GmbH & Co KG Lilienthalstraße 3a D-12529 Schönefeld	Tel. +49 306331131-30 Fax +49 306331131-36 tb-berlin@sew-eurodrive.de
	Bodensee	SEW-EURODRIVE GmbH & Co KG Burgbergring 91 D-88662 Überlingen	Tel. +49 7551 9226-30 Fax +49 7551 9226-56 tb-bodensee@sew-eurodrive.de
	Bremen	SEW-EURODRIVE GmbH & Co KG Bornstr.19 ... 22 D-28195 Bremen	Tel. +49 421 33918-10 Fax +49 421 33918-22 tb-bremen@sew-eurodrive.de

Germany			
	Dortmund	SEW-EURODRIVE GmbH & Co KG Hildastraße 8 D-44145 Dortmund	Tel. +49 231 229028-10 Fax +49 231 229028-20 tb-dortmund@sew-eurodrive.de
	Dresden	SEW-EURODRIVE GmbH & Co KG Hauptstraße 32 D-01445 Radebeul	Tel. +49 351 26338-0 Fax +49 351 26338-38 tb-dresden@sew-eurodrive.de
	Erfurt	SEW-EURODRIVE GmbH & Co KG Dubliner Straße 12 D-99091 Erfurt	Tel. +49 361 21709-70 Fax +49 361 21709-79 tb-erfurt@sew-eurodrive.de
	Güstrow	SEW-EURODRIVE GmbH & Co KG Am Gewerbegrund 3 D-18273 Güstrow P.O. Box Postfach 1216 • D-18262 Güstrow	Tel. +49 3843 8557-80 Fax +49 3843 8557-88 tb-guestrow@sew-eurodrive.de
	Hamburg	SEW-EURODRIVE GmbH & Co KG Bramfelder Straße 119 D-22305 Hamburg	Tel. +49 40 298109-60 Fax +49 40 298109-70 tb-hamburg@sew-eurodrive.de
	Hannover/Garbsen	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Str.40-42 D-30823 Garbsen P.O. Box Postfach 1104 53 • D-30804 Garbsen	Tel. +49 5137 8798-10 Fax +49 5137 8798-50 tb-hannover@sew-eurodrive.de
	Heilbronn	SEW-EURODRIVE GmbH & Co KG Zeppelinstraße 7 D-74357 Bönnigheim	Tel. +49 7143 8738-0 Fax +49 7143 8738-25 tb-heilbronn@sew-eurodrive.de
	Herford	SEW-EURODRIVE GmbH & Co KG Radewiger Straße 21 D-32052 Herford P.O. Box Postfach 4108 • D-32025 Herford	Tel. +49 5221 9141-0 Fax +49 5221 9141-20 tb-herford@sew-eurodrive.de
	Karlsruhe	SEW-EURODRIVE GmbH & Co KG Ettlinger Weg 2 D-76467 Bietigheim P.O. Box Postfach 43 • D-76463 Bietigheim	Tel. +49 7245 9190-10 Fax +49 7245 9190-20 tb-karlsruhe@sew-eurodrive.de
	Kassel	SEW-EURODRIVE GmbH & Co KG Lange Straße 14 D-34253 Lohfelden	Tel. +49 561 95144-80 Fax +49 561 95144-90 tb-kassel@sew-eurodrive.de
	Koblenz	SEW-EURODRIVE GmbH & Co KG Bahnstraße 17a D-56743 Mendig	Tel. +49 2652 9713-30 Fax +49 2652 9713-40 tb-koblenz@sew-eurodrive.de
	Lahr	SEW-EURODRIVE GmbH & Co KG Europastraße 3/1 D-77933 Lahr / Schwarzwald	Tel. +49 7821 90999-60 Fax +49 7821 90999-79 tb-lahr@sew-eurodrive.de
	Langenfeld	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 D-40764 Langenfeld	Tel. +49 2173 8507-10 Fax +49 2173 8507-50 tb-langenfeld@sew-eurodrive.de
	Magdeburg	SEW-EURODRIVE GmbH & Co KG Breiteweg 53 D-39179 Barleben	Tel. +49 39203 7577-1 Fax +49 39203 7577-9 tb-magdeburg@sew-eurodrive.de
	Mannheim	SEW-EURODRIVE GmbH & Co KG Besselstraße 26 D-68219 Mannheim	Tel. +49 621 71683-10 Fax +49 621 71683-22 tb-mannheim@sew-eurodrive.de
	München	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 D-85551 Kirchheim	Tel. +49 89 90955-110 Fax +49 89 90955-150 tb-muenchen@sew-eurodrive.de

Germany			
	Münster	SEW-EURODRIVE GmbH & Co KG Hafenplatz 4 D-48155 Münster	Tel. +49 251 41475-11 Fax +49 251 41475-50 tb-muenster@sew-eurodrive.de
	Nürnberg	SEW-EURODRIVE GmbH & Co KG Plattenäckerweg 6 D-90455 Nürnberg	Tel. +49 911 98884-50 Fax +49 911 98884-60 tb-nuernberg@sew-eurodrive.de
	Regensburg	SEW-EURODRIVE GmbH & Co KG Im Gewerbepark A15 D-93059 Regensburg	Tel. +49 941 46668-68 Fax +49 941 46668-66 tb-regensburg@sew-eurodrive.de
	Rhein-Main	SEW-EURODRIVE GmbH & Co KG Niederstedter Weg 5 D-61348 Bad Homburg	Tel. +49 6172 9617-0 Fax +49 6172 9617-50 tb-rheinmain@sew-eurodrive.de
	Stuttgart	SEW-EURODRIVE GmbH & Co KG Friedrich-List-Straße 46 D-70771 Leinfelden-Echterdingen	Tel. +49 711 16072-0 Fax +49 711 16072-72 tb-stuttgart@sew-eurodrive.de
	Ulm	SEW-EURODRIVE GmbH & Co KG Dieselstraße 14 D-89160 Dornstadt	Tel. +49 7348 9885-0 Fax +49 7348 9885-90 tb-ulm@sew-eurodrive.de
	Würzburg	SEW-EURODRIVE GmbH & Co KG Nürnbergerstraße 118 D-97076 Würzburg-Lengfeld	Tel. +49 931 27886-60 Fax +49 931 27886-66 tb-wuerzburg@sew-eurodrive.de
	Zwickau / Meerane	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg1 D-08393 Meerane	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 tb-zwickau@sew-eurodrive.de

France			
Production **Sales** **Service**	**Haguenau**	SEW-USOCOME 48-54 route de Soufflenheim B. P. 20185 F-67506 Haguenau Cedex	Tel. +33 3 88 73 67 00 Fax +33 3 88 73 66 00 http://www.usocome.com sew@usocome.com
Production	**Forbach**	SEW-USOCOME Zone industrielle Technopôle Forbach Sud B. P. 30269 F-57604 Forbach Cedex	Tel. +33 3 87 29 38 00
Assembly **Sales** **Service**	**Bordeaux**	SEW-USOCOME Parc d'activités de Magellan 62 avenue de Magellan - B. P. 182 F-33607 Pessac Cedex	Tel. +33 5 57 26 39 00 Fax +33 5 57 26 39 09
	Lyon	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 00 Fax +33 4 72 15 37 15
	Nantes	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 00 Fax +33 2 40 78 42 20
	Paris	SEW-USOCOME Zone industrielle 2 rue Denis Papin F-77390 Verneuil l'Etang	Tel. +33 1 64 42 40 80 Fax +33 1 64 42 40 88
Technical Offices	**Alsace**	SEW-USOCOME 1 rue Auguste Gasser F-68360 Soultz	Tel. +33 3 89 74 51 62 Fax +33 3 89 76 58 71

France			
	Aquitaine / Charentes	SEW-USOCOME Aux Cardinals F-47270 Saint-Pierre-de-Clairac	Tel. +33 5 53 48 78 19 Fax +33 5 53 48 78 20
	Auvergne / Limousin	SEW-USOCOME Farges F-19600 Chasteaux	Tel. +33 5 55 20 12 10 Fax +33 5 55 20 12 11
	Lower Normandy	SEW-USOCOME 5 rue de la Limare F-14250 Brouay	Tel. +33 2 31 37 92 86 Fax +33 2 31 74 68 15
	Burgundy	SEW-USOCOME 10 rue de la poste F-71350 Saint Loup Géanges	Tel. +33 3 85 49 92 18 Fax +33 3 85 49 92 19
	Brittany	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 04 Fax +33 2 40 78 42 20
	Centre / Poitou	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 11 Fax +33 2 40 78 42 20
	Champagne-Ardenne	SEW-USOCOME 6 place des Harkis F-10000 Troyes	Tel. +33 3 25 79 63 24 Fax +33 3 25 79 63 25
	Franche-Comté	SEW-USOCOME Chemin des saules F-25870 Venise	Tel. +33 3 81 60 20 47 Fax +33 3 81 87 75 93
	Île-de-France East / Aisne	SEW-USOCOME	Tel. +33 1 64 17 02 47 Fax +33 1 64 17 66 49
	Île-de-France North / Picardy	SEW-USOCOME 25bis rue Kléber F-92300 Levallois Perret	Tel. +33 1 41 05 92 74 Fax +33 1 41 05 92 75
	Île-de-France South	SEW-USOCOME 6 chemin des bergers Lieu-dit Marchais F-91410 Roinville sous Dourdan	Tel. +33 1 60 81 10 56 Fax +33 1 60 81 10 57
	Lorraine / Alsace North	SEW-USOCOME 1 rue de la forêt F-54250 Champigneulles	Tel. +33 3 83 96 28 04 Fax +33 3 83 96 28 07
	Midi-Pyrénées / Roussillon	SEW-USOCOME 179 route de Grazac F-31190 Caujac	Tel. +33 5 61 08 15 85 Fax +33 5 61 08 16 44
	Nord-Pas-de-Calais	SEW-USOCOME 209 route d'Hesdigneul F-62360 Hesdin l'Abbé	Tel. +33 3 21 10 86 86 Fax +33 3 21 10 86 87
	Paris / Île-de-France West	SEW-USOCOME 42 avenue Jean Jaurès F-78580 Maule	Tel. +33 1 30 90 89 86 Fax +33 1 30 90 93 15
	Pays de la Loire	SEW-USOCOME Parc d'activités de la forêt 4 rue des Fontenelles F-44140 Le Bignon	Tel. +33 2 40 78 42 03 Fax +33 2 40 78 42 20
	Provence-Alpes-Côte d'Azur	SEW-USOCOME Résidence Les Hespérides Bât. B2 67 boulevard des Alpes F-13012 Marseille	Tel. +33 4 91 18 00 11 Fax +33 4 91 18 00 12

France			
	Rhône-Alpes East	SEW-USOCOME Montée de la Garenne F-26750 Génissieux	Tel. +33 4 75 05 65 95 Fax +33 4 75 05 65 96
	Rhône-Alpes North	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 03 Fax +33 4 72 15 37 15
	Rhône-Alpes West	SEW-USOCOME Parc d'affaires Roosevelt Rue Jacques Tati F-69120 Vaulx en Velin	Tel. +33 4 72 15 37 04 Fax +33 4 72 15 37 15

Algeria			
Sales	**Algiers**	REDUCOM Sarl 16, rue des Frères Zaghnoune Bellevue 16200 El Harrach Alger	Tel. +213 21 8214-91 Fax +213 21 8222-84 info@reducom-dz.com http://www.reducom-dz.com

Argentina			
Assembly **Sales**	**Buenos Aires**	SEW EURODRIVE ARGENTINA S.A. Centro Industrial Garin, Lote 35 Ruta Panamericana Km 37,5 1619 Garin	Tel. +54 3327 4572-84 Fax +54 3327 4572-21 sewar@sew-eurodrive.com.ar http://www.sew-eurodrive.com.ar

Australia			
Assembly **Sales** **Service**	**Melbourne**	SEW-EURODRIVE PTY. LTD. 27 Beverage Drive Tullamarine, Victoria 3043	Tel. +61 3 9933-1000 Fax +61 3 9933-1003 http://www.sew-eurodrive.com.au enquires@sew-eurodrive.com.au
	Sydney	SEW-EURODRIVE PTY. LTD. 9, Sleigh Place, Wetherill Park New South Wales, 2164	Tel. +61 2 9725-9900 Fax +61 2 9725-9905 enquires@sew-eurodrive.com.au
Sales **Service**	**Adelaide**	SEW-EURODRIVE PTY. LTD. 9C Park Way Mawson Lakes, SA 5095	Tel. +61 8 8161 4000 Fax +61 8 8161 4002 enquires@sew-eurodrive.com.au
	Brisbane	SEW-EURODRIVE PTY.LTD. 1 /34 Collinsvale St Rocklea, Queensland, 4106	Tel. +61 7 3276 5100 Fax +61 7 3276 5102 enquires@sew-eurodrive.com.au
	Perth	SEW-EURODRIVE PTY. LTD. 10 Colin Jamieson Drive Welshpool, WA 6106	Tel. +61 8 9251-4900 Fax +61 8 9251-4903 enquires@sew-eurodrive.com.au
Sales	**Townsville**	SEW-EURODRIVE PTY. LTD. 12 Leyland Street Garbutt, QLD 4814	Tel. +61 7 4779 4333 Fax +61 7 4779 5333 enquires@sew-eurodrive.com.au

Austria			
Assembly **Sales** **Service**	**Wien**	SEW-EURODRIVE Ges.m.b.H. Richard-Strauss-Strasse 24 A-1230 Wien	Tel. +43 1 617 55 00-0 Fax +43 1 617 55 00-30 http://www.sew-eurodrive.at sew@sew-eurodrive.at
Technical Offices	**Linz**	SEW-EURODRIVE Ges.m.b.H. Reuchlinstr. 6/3 A-4020 Linz	Tel. +43 732 655 109-0 Fax +43 732 655 109-20 tb-linz@sew-eurodrive.at
	Graz	SEW-EURODRIVE Ges.m.b.H. Grabenstraße 231 A-8045 Graz	Tel. +43 316 685 756-0 Fax +43 316 685 755 tb-graz@sew-eurodrive.at

Austria			
	Dornbirn	SEW-EURODRIVE Ges.m.b.H. Lustenauerstraße 27/1 A-6850 Dornbirn	Tel. +43 5572 3725 99-0 Fax +43 5572 3725 99-20 tb-dornbirn@sew-eurodrive.at

Bangladesh			
Sales	**Bangladesh**	SEW-EURODRIVE INDIA PRIVATE LIMITED Genetic Udayanchal, House-96 (6th Floor), Road-23/A, Block-B, Banani, Dhaka-1213, Bangladesh	Mobile +88 01729 097309 salesdhaka@seweurodrivebangla-desh.com

Belarus			
Sales	**Minsk**	SEW-EURODRIVE BY RybalkoStr. 26 BY-220033 Minsk	Tel.+375 17 298 47 56 / 298 47 58 Fax +375 17 298 47 54 http://www.sew.by sales@sew.by

Belgium			
Assembly **Sales** **Service**	**Brussels**	**SEW-EURODRIVE n.v./s.a.** Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.be info@sew-eurodrive.be
Service Compe-tence Center	**Industrial Gears**	**SEW-EURODRIVE n.v./s.a.** Rue de Parc Industriel, 31 BE-6900 Marche-en-Famenne	Tel. +32 84 219-878 Fax +32 84 219-879 http://www.sew-eurodrive.be service-wallonie@sew-eurodrive.be

Brazil			
Production **Sales** **Service**	**São Paulo**	SEW-EURODRIVE Brasil Ltda. Avenida Amâncio Gaiolli, 152 - Rodovia Presi-dente Dutra Km 208 Guarulhos - 07251-250 - SP SAT - SEW ATENDE - 0800 7700496	Tel. +55 11 2489-9133 Fax +55 11 2480-3328 http://www.sew-eurodrive.com.br sew@sew.com.br

Bulgaria			
Sales	**Sofia**	BEVER-DRIVE GmbH Bogdanovetz Str.1 BG-1606 Sofia	Tel. +359 2 9151160 Fax +359 2 9151166 bever@bever.bg

Cameroon			
Sales	**Douala**	Electro-Services Rue Drouot Akwa B.P. 2024 Douala	Tel. +237 33 431137 Fax +237 33 431137 electrojemba@yahoo.fr

Canada			
Assembly **Sales** **Service**	**Toronto**	SEW-EURODRIVE CO. OF CANADA LTD. 210 Walker Drive Bramalea, ON L6T 3W1	Tel. +1 905 791-1553 Fax +1 905 791-2999 http://www.sew-eurodrive.ca l.watson@sew-eurodrive.ca
	Vancouver	SEW-EURODRIVE CO. OF CANADA LTD. Tilbury Industrial Park 7188 Honeyman Street Delta, BC V4G 1G1	Tel. +1 604 946-5535 Fax +1 604 946-2513 b.wake@sew-eurodrive.ca
	Montreal	SEW-EURODRIVE CO. OF CANADA LTD. 2555 Rue Leger Lasalle, PQ H8N 2V9	Tel. +1 514 367-1124 Fax +1 514 367-3677 a.peluso@sew-eurodrive.ca
	Additional addresses for service in Canada provided on request!		

Chile			
Assembly **Sales** **Service**	**Santiago**	SEW-EURODRIVE CHILE LTDA. Las Encinas 1295 Parque Industrial Valle Grande LAMPA RCH-Santiago de Chile P.O. Box Casilla 23 Correo Quilicura - Santiago - Chile	Tel. +56 2 75770-00 Fax +56 2 75770-01 http://www.sew-eurodrive.cl ventas@sew-eurodrive.cl

China			
Production **Assembly** **Sales** **Service**	**Tianjin**	SEW-EURODRIVE (Tianjin) Co., Ltd. No. 46, 7th Avenue, TEDA Tianjin 300457	Tel. +86 22 25322612 Fax +86 22 25323273 info@sew-eurodrive.cn http://www.sew-eurodrive.com.cn
Assembly **Sales** **Service**	**Suzhou**	SEW-EURODRIVE (Suzhou) Co., Ltd. 333, Suhong Middle Road Suzhou Industrial Park Jiangsu Province, 215021	Tel. +86 512 62581781 Fax +86 512 62581783 suzhou@sew-eurodrive.cn
	Guangzhou	SEW-EURODRIVE (Guangzhou) Co., Ltd. No. 9, JunDa Road East Section of GETDD Guangzhou 510530	Tel. +86 20 82267890 Fax +86 20 82267922 guangzhou@sew-eurodrive.cn
	Shenyang	SEW-EURODRIVE (Shenyang) Co., Ltd. 10A-2, 6th Road Shenyang Economic Technological Development Area Shenyang, 110141	Tel. +86 24 25382538 Fax +86 24 25382580 shenyang@sew-eurodrive.cn
	Wuhan	SEW-EURODRIVE (Wuhan) Co., Ltd. 10A-2, 6th Road No. 59, the 4th Quanli Road, WEDA 430056 Wuhan	Tel. +86 27 84478388 Fax +86 27 84478389 wuhan@sew-eurodrive.cn
	Xi'An	SEW-EURODRIVE (Xi'An) Co., Ltd. No. 12 Jinye 2nd Road Xi'An High-Technology Industrial Development Zone Xi'An 710065	Tel. +86 29 68686262 Fax +86 29 68686311 xian@sew-eurodrive.cn

Colombia			
Assembly **Sales** **Service**	**Bogotá**	SEW-EURODRIVE COLOMBIA LTDA. Calle 22 No. 132-60 Bodega 6, Manzana B Santafé de Bogotá	Tel. +57 1 54750-50 Fax +57 1 54750-44 http://www.sew-eurodrive.com.co sewcol@sew-eurodrive.com.co

Croatia			
Sales **Service**	**Zagreb**	KOMPEKS d. o. o. Zeleni dol 10 HR 10 000 Zagreb	Tel. +385 1 4613-158 Fax +385 1 4613-158 kompeks@inet.hr

Czech Republic			
Sales **Assembly** **Service**	**Prague**	SEW-EURODRIVE CZ s.r.o. Lužná 591 16000 Praha 6 - Vokovice	Tel. +420 255 709 601 Fax +420 220 121 237 http://www.sew-eurodrive.cz sew@sew-eurodrive.cz
	Drive Service Hotline / 24 Hour Service	HOT-LINE +420 800 739 739 (800 SEW SEW)	**Servis:** Tel. +420 255 709 632 Fax +420 235 358 218 servis@sew-eurodrive.cz

Czech Republic			
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
Technical Offices	**Brno**	SEW-EURODRIVE CZ s.r.o. Křenová 52 60200 Brno	Tel. +420 543 254 174 Fax +420 543 256 845 radek.chmela@sew-eurodrive.cz
	Hradec Králové	SEW-EURODRIVE CZ s.r.o. Čechova 498 50202 Hradec Králové	Tel. +420 495 510 141 Fax +420 495 521 313 miroslav.moravec@sew-eurodrive.cz
	Ostrava	SEW-EURODRIVE CZ s.r.o. Studentská 6202/17 708 00 Ostrava-Poruba	Tel. +420 597 329 044 jan.kurs@sew-eurodrive.cz
	Klatovy	SEW-EURODRIVE CZ s.r.o. Vídeňská 841 33901 Klatovy	Tel. +420 376 331 634 Fax +420 376 331 634 viktor.kubernat@sew-eurodrive.cz
Service	**Horní Moštěnice**	SEW-EURODRIVE CZ s.r.o. Nám.Dr.M.Tyrše 14/64 751 17 Horní Moštěnice	Tel. +420 581 224 374 Fax +420 581 224 374 servis@sew-eurodrive.cz

Denmark			
Assembly **Sales** **Service**	**Copenhagen**	SEW-EURODRIVEA/S Geminivej 28-30 DK-2670 Greve	Tel. +45 43 9585-00 Fax +45 43 9585-09 http://www.sew-eurodrive.dk sew@sew-eurodrive.dk

Egypt			
Sales **Service**	**Cairo**	Copam Egypt for Engineering & Agencies 33 El Hegaz ST, Heliopolis, Cairo	Tel. +20 2 22566-299 +1 23143088 Fax +20 2 22594-757 http://www.copam-egypt.com/ copam@datum.com.eg

Estonia			
Sales	**Tallin**	ALAS-KUUL AS Reti tee 4 EE-75301 Peetri küla, Rae vald, Harjumaa	Tel. +372 6593230 Fax +372 6593231 veiko.soots@alas-kuul.ee

Finland			
Assembly **Sales** **Service**	**Lahti**	SEW-EURODRIVE OY Vesimäentie 4 FIN-15860 Hollola 2	Tel. +358 201 589-300 Fax +358 3 780-6211 http://www.sew-eurodrive.fi sew@sew.fi
Technical Offices	**Helsinki**	SEW-EURODRIVE OY Luutnantintie 5 FIN-00410 Helsinki	Tel. +358 201 589-300 Fax + 358 9 5666-311 sew@sew.fi
	Vaasa	SEW-EURODRIVE OY Hietasaarenkatu 18 FIN-65100 Vaasa	Tel. +358 201 589-300 Fax +358 6 3127-470 sew@sew.fi
	Kuopio	SEW-EURODRIVE OY Viestikatu 3 FIN-70600 Kuopio	Tel. +358 201 589-300 sew@sew.fi
	Rovaniemi	SEW-EURODRIVE OY Valtakatu 4 A FIN-96100 Rovaniemi	Tel. +358 201 589-300 Fax +358 201 589-239 sew@sew.fi

Finland			
Production **Assembly**	**Karkkila**	SEW Industrial Gears Oy Valurinkatu 6, PL 8 FI-03600 Karkkila, 03601 Karkkila	Tel. +358 201 589-300 Fax +358 201 589-310 sew@sew.fi http://www.sew-eurodrive.fi

Gabon			
Sales	**Libreville**	ESG Electro Services Gabun Feu Rouge Lalala 1889 Libreville Gabun	Tel. +241 741059 Fax +241 741059 esg_services@yahoo.fr

Great Britain			
Assembly **Sales** **Service**	**Normanton**	SEW-EURODRIVE Ltd. Beckbridge Industrial Estate Normanton West Yorkshire WF6 1QR	Tel. +44 1924 893-855 Fax +44 1924 893-702 http://www.sew-eurodrive.co.uk info@sew-eurodrive.co.uk
	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911
Service Competence Center	**Southern England**	SEW-EURODRIVE Ltd. Unit 41 Easter Park Benyon Road Silchester Reading Berkshire RG7 2PQ	Tel. +44 1189 701-699 Fax +44 1189 701-021
Technical Offices	**Midlands**	SEW-EURODRIVE Ltd. 5 Sugar Brook court Aston Road Bromsgrove Worcs. B60 3EX	Tel. +44 1527 877-319 Fax +44 1527 575-245
	Scotland	SEW-EURODRIVE Ltd. No 37 Enterprise House Springkerse Business Park Stirling FK7 7UF	Tel. +44 17 8647-8730 Fax +44 17 8645-0223

Greece			
Sales	**Athens**	Christ. Boznos & Son S.A. 12, K. Mavromichali Street P.O. Box 80136 GR-18545 Piraeus	Tel. +30 2 1042 251-34 Fax +30 2 1042 251-59 http://www.boznos.gr info@boznos.gr
Technical Office	**Thessaloniki**	Christ. Boznos & Son S.A. Asklipiou 26 562 24 Evosmos, Thessaloniki	Tel. +30 2 310 7054-00 Fax +30 2 310 7055-15 info@boznos.gr

Hong Kong			
Assembly **Sales** **Service**	**Hong Kong**	SEW-EURODRIVE LTD. Unit No. 801-806, 8th Floor Hong Leong Industrial Complex No. 4, Wang Kwong Road Kowloon, Hong Kong	Tel. +852 36902200 Fax +852 36902211 contact@sew-eurodrive.hk

Hungary			
Sales **Service**	**Budapest**	SEW-EURODRIVE Kft. H-1037 Budapest Kunigunda u. 18	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu

Iceland			
Sales	**Reykjavik**	VARMA & VELAVERK EHF Dalshrauni 5 IS-220 Hafnarjördur	Tel. +354 585 1070 Fax +354 585)1071 varmaverk@varmaverk.is http://www.varmaverk.is

India			
Registered Office **Assembly** **Sales** **Service**	**Vadodara**	SEW-EURODRIVE India Private Limited Plot No. 4, GIDC POR Ramangamdi • Vadodara - 391 243 Gujarat	Tel. +91 265 3045200, +91 265 2831086 Fax +91 265 3045300, +91 265 2831087 http://www.seweurodriveindia.com salesvadodara@seweurodrivein-dia.com
Assembly **Sales** **Service**	**Chennai**	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
Technical Offices	**Ahmedabad**	SEW-EURODRIVE India Private Limited 306, Shaan office complex, Behind Sakar-IV, Ellisebridge, Ashram Road Ahmedabad – Gujarat	Tel. +91 79 40072067/68 Fax +91 79 40072069 salesahmedabad@seweurodrivein-dia.com
	Bangladesh	SEW-EURODRIVE INDIA PRIVATE LIMITED Genetic Udayanchal, House-96 (6th Floor), Road-23/A, Block-B, Banani, Dhaka-1213, Bangladesh	Mobile +88 01729 097309 salesdhaka@seweurodrivebangla-desh.com
	Bangalore	SEW-EURODRIVE India Private Limited 308, Prestige Centre Point 7, Edward Road Bengaluru - 560052 - Karnataka	Tel. +91 80 22266565 Fax +91 80 22266569 salesbangalore@seweurodrivein-dia.com
	Chennai	SEW-EURODRIVE India Private Limited 2nd Floor, Josmans Complex, No. 5, McNichols Road, Chetpet Chennai - 600031 - Tamil Nadu	Tel. +91 44 42849813 Fax +91 44 42849816 saleschennai@seweurodriveindia.com
	Coimbatore	SEW-EURODRIVE INDIA PRIVATE LIMITED 687/2, SRI SAKTHIVEL TOWERS (NEAR DEEPAM HOSPITAL) TRICHY ROAD, RAMANATHAPURAM COIMBATORE - 641 045.Tamilnadu	Tel. +91 422 2322420 Fax +91 422 2323988 salescoimbatore@seweurodrivein-dia.com
	Cuttack	SEW-EURODRIVE India Private Limited Plot No.- 1764, Nuasahi, Nayapalli Bhubaneswar-12 Orissa	Tel. +91 9937446333 salescuttack@seweurodriveindia.com
	Hyderabad	SEW-EURODRIVE India Private Limited 408, 4th Floor, Meridian Place Green Park Road Amerpeet Hyderabad - 500016 - Andhra Pradesh	Tel. +91 40 23414698 Fax +91 40 23413884 saleshyderabad@seweurodrivein-dia.com

India			
	Jamshedpur	SEW-EURODRIVE India Private Limited Flat No.: B/2, B.S. Apartment Road No.: 4, Contractor's area, Bistupur Jamshedpur 831 001 - Chhattisgarh	Tel. +91 9934123671 salesjamshedpur@seweurodrivein-dia.com
	Kolkata	SEW EURODRIVE India Private Limited 2nd floor, Room No. 35 Chowringhee Court 55, Chowringhee Road Kolkata - 700 071 - West Bengal	Tel. +91 33 22827457 Fax +91 33 22894204 saleskolkata@seweurodriveindia.com
	Lucknow	SEW-EURODRIVE India Private Limited 69, Shiv Vihar Colony Vikas Nagar-5 Lucknow 226022 - Uttar Pradesh	Tel. +91 9793627333 saleslucknow@seweurodriveindia.com
	Mumbai	SEW-EURODRIVE India Private Limited 312 A, 3rd Floor, Acme Plaza, J.B. Nagar, Andheri Kurla Road, Andheri (E) Mumbai - 400059 - Maharashtra	Tel. +91 22 28348440 Fax +91 22 28217858 salesmumbai@seweurodriveindia.com
	Nashik	SEW-EURODRIVE India Private Limited 107, "YOG" Bunglow, Mahatama Nagar, Trimbak Road, Nashik, Maharashtra – 422 007	Tel. +91 9665752978 salesnashik@seweurodriveindia.com
	New Delhi	SEW-EURODRIVE India Private Limited 1008, 10th Floor, 12th Level 'Westend Mall' Tower Plot, District Centre Adjacent Hotel Hilton Janak Puri, New Delhi – 110058	Tel. +91 11 25544111 Fax +91 11 25544113 salesdelhi@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited Lunawat Prism 4th floor, S. No. 148, Neena Co-Operative Housing Society, Paud Road, Pune 411038 - Maharashtra	Tel. +91 20 25380730 / 735 Fax +91 20 25380721 salespune@seweurodriveindia.com
	Raipur	SEW-EURODRIVE India Private Limited A-42, Ashoka Millenium Complex, Ring Road-1, Raipur 492 001 - Chhattisgarh	Tel. +91 771 4090765 Fax +91 771 4090765 salesraipur@seweurodriveindia.com
	Ranchi	SEW-EURODRIVE India Private Limited Flat No : A - 101, Krishna Shree Apartment, Anantpur, P.O. Doranda – Ranchi 834002	Tel. +91 8294630772 salesranchi@seweurodriveindia.com
	Tiruchirappalli	SEW-EURODRIVE India Private Limited A-106,Trichy Towers, Chandrasekarapuram, Salai Road, Trichy – 620018.	Mobile +91 95009 88081 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 Fax +91 265 2325259 salesvadodara@seweurodrivein-dia.com
	Vijayawada	SEW-EURODRIVE India Private Limited Door No: 40-5/3-10A, Shyam Nagar, Tikkle Road, NGO's Colony, Vijayawada, A.P. – 520010	Tel. +91 9989501748 Fax +91 866-2475157 salesvijayawada@seweurodrivein-dia.com

Indonesia			
Sales	**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
		PT. Agrindo Putra Lestari Jl.Prof.DR.Latumenten no27/A Jakarta 11330	Tel: +62 21 63855588 Fax: +62 21 63853789 aplindo@indosat.net.id
		PT. Sentratek Adiprestasi Jl. Industri Raya I, Komp. Gunung Sahari 8 Block B-3 Gunung Sahari Utara, Sawah B Jakarta 10720	Tel: +62 21 6398122 Fax: +62 21 6499264 adm_samit@yahoo.co.id roberto_samit@yahoo.co.id
	Medan	PT. Serumpun Indah Lestari 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
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60122	Tel: +62 31 5990128 Fax: +62 31 5962666 triagri@indosat.net.id
		CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel: +62 31 5458589 / +62 31 5317224 Fax: +62 31 5317220 / +62 31 5994629 sianhwa@sby.centrin.net.id

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 info@alperton.ie http://www.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**	**Solaro**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 9801 Fax +39 02 96 799781 http://www.sew-eurodrive.it sewit@sew-eurodrive.it
Technical Offices	**Bologna**	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via della Grafica, 47 I-40064 Ozzano dell'Emilia (Bo)	Tel. +39 051 65-23-801 Fax +39 051 796-595
	Caserta	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Viale Carlo III Km. 23,300 I-81020 S. Nicola la Strada (Caserta)	Tel. +39 0823 219011 Fax +39 0823 421414
	Milan	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Bernini,14 I-20020 Solaro (Milano)	Tel. +39 02 96 980229 Fax +39 02 96 799781
	Pescara	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Viale Europa,132 I-65010 Villa Raspa di Spoltore (PE)	Tel. +39 085 41-59-427 Fax +39 085 41-59-643
	Torino	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Filiale Torino c.so Unione Sovietica 612/15 - int. C I-10135 Torino	Tel. +39 011 3473780 Fax +39 011 3473783

Italy			
	Verona	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via P. Sgulmero, 27/A I-37132 Verona	Tel. +39 045 89-239-11 Fax +39 045 97-6079

Ivory Coast			
Sales	**Abidjan**	SICA Société Industrielle & Commerciale pour l'Afrique 165, Boulevard de Marseille 26 BP 1173 Abidjan 26	Tel. +225 21 25 79 44 Fax +225 21 25 88 28 sicamot@aviso.ci

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 373855 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp
Technical Offices	**Fukuoka**	SEW-EURODRIVE JAPAN CO., LTD. C-go, 5th-floor, Yakuin-Hiruzu-Bldg. 1-5-11, Yakuin, Chuo-ku Fukuoka, 810-0022	Tel. +81 92 713-6955 Fax +81 92 713-6860 sewkyushu@jasmine.ocn.ne.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 sewosaka@crocus.ocn.ne.jp
	Tokyo	SEW-EURODRIVE JAPAN CO., LTD. Omarimon Yusen Bldg. 13th floor 3-23-5 Nishinbashi, Minato-ku Tokyo 105-0003	Tel. +81 3 3239-0469 Fax +81 3 3239-0943 sewtokyo@basil.ocn.ne.jp

Kazakhstan			
Sales	**Almaty**	ТОО "СЕВ-ЕВРОДРАЙВ" пр.Райымбека, 348 050061 г. Алматы Республика Казахстан	Тел. +7 (727) 334 1880 Факс +7 (727) 334 1881 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz

Latvia			
Sales	**Riga**	SIA Alas-Kuul Katlakalna 11C LV-1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.com 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 info@medrives.com http://www.medrives.com

Lithuania			
Sales	**Alytus**	UAB Irseva Statybininku 106C LT-63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 irmantas@irseva.lt http://www.sew-eurodrive.lt

Luxembourg			
Assembly **Sales** **Service**	**Brussels**	**SEW-EURODRIVE n.v./s.a.** Researchpark Haasrode 1060 Evenementenlaan 7 BE-3001 Leuven	Tel. +32 16 386-311 Fax +32 16 386-336 http://www.sew-eurodrive.lu info@sew-eurodrive.be

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	**Kota Kinabalu**	SEW-EURODRIVE Sdn Bhd (Kota Kinabalu Branch) Lot No. 2,1st Floor, Inanam Baru Phase III, Miles 5.1 /2, Jalan Tuaran, Inanam 89350 Kota Kinabalu Sabah, Malaysia	Tel. +60 88 424792 Fax +60 88 424807
	Kuala Lumpur	SEW-EURODRIVE Sdn. Bhd. No. 2, Jalan Anggerik Mokara 31/46 Kota Kemuning Seksyen 31 40460 Shah Alam Selangor Darul Ehsan	Tel. +60 3 5229633 Fax +60 3 5229622 sewsa@sew-eurodrive.com.my
	Kuching	SEW-EURODRIVE Sdn. Bhd. Lot 268, Section 9 KTLD Lorong 9, Jalan Satok 93400 Kuching, Sarawak East Malaysia	Tel. +60 82 232380 Fax +60 82 242380
	Penang	SEW-EURODRIVE Sdn. Bhd. No. 38, Jalan Bawal Kimsar Garden 13700 Prai, Penang	Tel. +60 4 3999349 Fax +60 4 3999348 sewpg@sew-eurodrive.com.my

Mauritania			
Sales	**Zouérat**	AFRICOM - SARL En Face Marché Dumez P.B. 88 Zouérate	Tel. +222 45 44 50 19 Fax +222 45 44 03 14 contact@africom-sarl.com

Mexico			
Assembly **Sales** **Service**	**Quéretaro**	SEW-EURODRIVE MEXICO SA DE CV SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Quéretaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

Morocco			
Sales **Service**	**Mohammedia**	SEW EURODRIVE SARL Z.I. Sud Ouest - Lot 28 2ème étage Mohammedia 28810	Tel. +212 523 32 27 80/81 Fax +212 523 32 27 89 sew@sew-eurodrive.ma http://www.sew-eurodrive.ma

Netherlands			
Assembly **Sales** **Service**	**Rotterdam**	SEW-EURODRIVE B.V. Industrieweg 175 NL-3044 AS Rotterdam Postbus 10085 NL-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. 10 Settlers Crescent, Ferrymead Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Technical Offices	**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

Norway			
Assembly **Sales** **Service**	**Moss**	SEW-EURODRIVE A/S Solgaard skog 71 N-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

Peru			
Assembly **Sales** **Service**	**Lima**	SEW DEL PERU MOTORES REDUCTORES 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	**Luzon**	Totaltech Corporation 5081-B C&L Mansion Filmore Ave. Cor. Fahrenheit St. 1235 Makati City	Tel: +63 2 551-9265 / +63 2 551-9271 / +63 2 551-9378 Fax: +63 2 551-9273 totaltek@info.com.ph
	All Areas	P.T. Cerna Corporation 2166 Primo Rivera St., Brgy. La Paz, Makati City	Tel: +63 2 890 2862 / +63 2 890 2813 Fax: +63 2 890 2802 electrical_controls@ptcerna.com

Poland			
Assembly **Sales** **Service**	**Lodz**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 PL-92-518 Łódź	Tel. +48 42 676 53 00 Fax +48 42 676 53 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 6765332 / 42 6765343 Fax +48 42 6765346	Linia serwisowa Hotline 24H Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Technical Office	**Tychy**	SEW-EURODRIVE Polska Sp.z.o.o. ul. Fabryczna 5 PL-43-100 Tychy	Tel. +48 32 32 32 610 Fax +48 32 32 32 648
	Bydgoszcz	SEW-EURODRIVE Polska Sp.z.o.o. ul. Fordońska 246 PL-85-959 Bydgoszcz	Tel. +48 52 3606590 Fax +48 52 3606591
	Poznan	SEW-EURODRIVE Polska Sp.z.o.o. ul. Romana Maya 1 PL-61-371 Poznań	Tel. +48 61 6465500 Fax +48 61 6465519

Poland			
	Radom	SEW-EURODRIVE Polska Sp.z.o.o. ul. Słowackiego 84 PL-26-600 Radom	Tel. +48 48 365 40 50 Fax +48 48 365 40 52

Portugal			
Assembly **Sales** **Service**	**Coimbra**	SEW-EURODRIVE, LDA. Apartado 15 P-3050-901 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Service Competence Center	**Lisboa**	SEW-EURODRIVE, LDA. Núcleo Empresarial I de São Julião do Tojal Rua de Entremuros, 54 Fracção I P-2660-533 São Julião do Tojal	Tel. +351 21 958-0198 Fax +351 21 958-0245 esc.lisboa@sew-eurodrive.pt
Technical Office	**Porto**	SEW-EURODRIVE, LDA. Av. 25 de Abril, 68 4440-502 Valongo	Tel. +351 229 350 383 Fax +351 229 350 384 Tel. +351 9 32559110 esc.porto@sew-eurodrive.pt

Romania			
Sales **Service**	**Bucharest**	Sialco Trading SRL str. Madrid nr.4 011785 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro

Russia			
Assembly **Sales** **Service**	**St. Petersburg**	ZAO SEW-EURODRIVE P.O. Box 36 195220 St. Petersburg Russia	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Technical Office	**Yekaterinburg**	ZAO SEW-EURODRIVE Kominterna Str. 16 Office 614 RUS-620078 Ekaterinburg	Tel. +7 343 310 3977 Fax +7 343 310 3978 eso@sew-eurodrive.ru
	Irkutsk	ZAO SEW-EURODRIVE 5-Armii Str., 31 RUS-664011 Irkutsk	Tel. +7 3952 25 5880 Fax +7 3952 25 5881 iso@sew-eurodrive.ru
	Moscow	ZAO SEW-EURODRIVE Malaja Semjonowskaja Str. д. 9, корпус 2 RUS-107023 Moskau	Tel. +7 495 9337090 Fax +7 495 9337094 mso@sew-eurodrive.ru
	Novosibirsk	ZAO SEW-EURODRIVE pr. K Marksa 30 RUS-630087 Novosibirsk	Tel. +7 383 3350200 Fax +7 383 3462544 nso@sew-eurodrive.ru
	Perm	ZAO SEW-EURODRIVE Stakhanovskaya str., 45 Office 512 614066 Russia, Perm	Tel. +7 342 2219494 Fax +7 342 2219444 pso@sew-eurodrive.ru
	Togliatti	ZAO SEW-EURODRIVE Sportivnaya Str. 4B, office 2 Samarskaya obl. RUS-445057 Togliatti	Tel. +7 8482 710529 Fax +7 8482 810590

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 senemeca@sentoo.sn http://www.senemeca.com

Serbia			
Sales	**Beograd**	DIPAR d.o.o. Ustanicka 128a PC Košum, IV sprat SRB-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	**Bratislava**	SEW-Eurodrive SK s.r.o. Rybničná 40 SK-831 06 Bratislava	Tel. +421 2 33595 202 Fax +421 2 33595 200 sew@sew-eurodrive.sk http://www.sew-eurodrive.sk
	Žilina	SEW-Eurodrive SK s.r.o. Industry Park - PChZ ulica M.R.Štefánika 71 SK-010 01 Žilina	Tel. +421 41 700 2513 Fax +421 41 700 2514 sew@sew-eurodrive.sk
	Banská Bystrica	SEW-Eurodrive SK s.r.o. Rudlovská cesta 85 SK-974 11 Banská Bystrica	Tel. +421 48 414 6564 Fax +421 48 414 6566 sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 SK-040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 sew@sew-eurodrive.sk

Slovenia			
Sales **Service**	**Celje**	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 SLO - 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 11 494-3104 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 Cape Town	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 cfoster@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 2 Monaco Place Pinetown Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 700-3451 Fax +27 31 700-3847 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PTY) LTD. 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za

South Africa			
Technical Offices	**Port Elizabeth**	SEW-EURODRIVE PTY LTD. 8 Ruan Access Park Old Cape Road Greenbushes 6000 Port Elizabeth	Tel. +27 41 3722246 Fax +27 41 3722247 dtait@sew.co.za
	Richards Bay	SEW-EURODRIVE PTY LTD. 103 Bulion Blvd Richards Bay P.O. Box 458 Richards Bay, 3900	Tel. +27 35 797-3805 Fax +27 35 797-3819 jswart@sew.co.za

South Korea			
Assembly **Sales** **Service**	**Ansan**	SEW-EURODRIVE KOREA CO., LTD. B 601-4, Banweol Industrial Estate #1048-4, Shingil-Dong, Danwon-Gu, Ansan-City, Kyunggi-Do Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-korea.co.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE KOREA Co., Ltd. No. 1720 - 11, Songjeong - dong Gangseo-ku Busan 618-270	Tel. +82 51 832-0204 Fax +82 51 832-0230 master@sew-korea.co.kr
Technical Offices	**Daegu**	SEW-EURODRIVE KOREA Co., Ltd. No.1108 Sungan officetel 87-36, Duryu 2-dong, Dalseo-ku Daegu 704-712	Tel. +82 53 650-7111 Fax +82 53 650-7112
	Daejeon	SEW-EURODRIVE KOREA Co., Ltd. No. 1502, Hongin officetel 536-9, Bongmyung-dong, Yusung-ku Daejeon 305-301	Tel. +82 42 828-6461 Fax +82 42 828-6463
	Gwangju	SEW-EURODRIVE KOREA Co., Ltd. 4fl., Dae-Myeong B/D 96-16 Unam-dong, Buk-ku Kwangju 500-170	Tel. +82 62 511-9172 Fax +82 62 511-9174
	Seoul	SEW-EURODRIVE KOREA Co., Ltd. No.504 Sunkyung officetel 106-4 Kuro 6-dong, Kuro-ku Seoul 152-054	Tel. +82 2 862-8051 Fax +82 2 862-8199

Spain			
Assembly **Sales** **Service**	**Bilbao**	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 E-48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 Fax +34 94 43184-71 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Technical Offices	**Barcelona**	Delegación Barcelona Avda. Francesc Macià, 60 – Planta 16, porta 1 Eix Macià – "Torre Milenium" E-08208 Sabadell (Barcelona)	Tel. +34 93 7162200 Fax +34 93 7233007
	Madrid	Delegación Madrid Gran Via. 48-2° A-D E-28220 Majadahonda (Madrid)	Tel. +34 91 6342250 Fax +34 91 6340899
	Seville	MEB Pólogono Calonge, C/A Nave 2 - C E-41.077 Sevilla	Tel. +34 954 356 361 Fax +34 954 356 274 mebsa.sevilla@mebsa.com
	Valencia	MEB Músico Andreu i Piqueres, 4 E-46.900 Torrente (Valencia)	Tel. +34 961 565 493 Fax +34 961 566 688 mebsa.valencia@mebsa.com

Sri Lanka			
Sales	**Colombo**	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981

Sweden			
Assembly **Sales** **Service**	**Jönköping**	SEW-EURODRIVE AB Gnejsvägen 6-8 S-55303 Jönköping Box 3100 S-55003 Jönköping	Tel. +46 36 3442 00 Fax +46 36 3442 80 http://www.sew-eurodrive.se jonkoping@sew.se
Sales	**Göteborg**	SEW-EURODRIVE AB Gustaf Werners gata 8 S-42132 Västra Frölunda	Tel. +46 31 70968 80 Fax +46 31 70968 93 goteborg@sew.se
	Stockholm	SEW-EURODRIVE AB Björkholmsvägen 10 S-14146 Huddinge	Tel. +46 8 44986 80 Fax +46 8 44986 93 stockholm@sew.se
	Malmö	SEW-EURODRIVE AB Borrgatan 5 S-21124 Malmö	Tel. +46 40 68064 80 Fax +46 40 68064 93 malmo@sew.se
	Skellefteå	SEW-EURODRIVE AB Trädgårdsgatan 8 S-93131 Skellefteå	Tel. +46 910 7153 80 Fax +46 910 7153 93 skelleftea@sew.se

Switzerland			
Assembly **Sales** **Service**	**Basel**	Alfred Imhof A.G. Jurastrasse 10 CH-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**	André Gerber Es Perreyres CH-1436 Chamblon	Tel. +41 24 445 3850 Fax +41 24 445 4887
	Bern / Solothurn	Rudolf Bühler Muntersweg 5 CH-2540 Grenchen	Tel. +41 32 652 2339 Fax +41 32 652 2331
	Central Switzerland, Aargau	Armin Pfister Stierenweid CH-4950 Huttwill, BE	Tel. +41 62 962 54 55 Fax +41 62 962 54 56
	Zürich, Ticino	Gian-Michele Muletta Fischerstrasse 61 CH-8132 Egg bei Zürich	Tel. +41 44 994 81 15 Fax +41 44 994 81 16
	Bodensee and East Switzerland	Markus Künzle Eichweg 4 CH-9403 Goldach	Tel. +41 71 845 2808 Fax +41 71 845 2809

Taiwan (R.O.C.)			
Sales	**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
	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Hwa South Road, Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net

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 sew-thailand@sew-eurodrive.com

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**	**Istanbul**	SEW-EURODRIVE Hareket Sistemleri Sanayi Ticaret Limited Şirketi Gebze Organize Sanayi Bölgesi 400.Sokak No:401 TR-41480 Gebze KOCAELİ	Tel. +90-262-9991000-04 Fax +90-262-9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
Technical Offices	**Adana**	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Kizilay Caddesi 8 Sokak No 6 Daðtekin Is Merkezi Kat 4 Daire 2 TR-01170 SEYHAN / ADANA	Tel. +90 322 359 94 15 Fax +90 322 359 94 16
	Ankara	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Özcelik Is Merkezi, 14. Sok, No. 4/42 TR-06370 Ostim/Ankara	Tel. +90 312 385 33 90 Fax +90 312 385 32 58
	Bursa	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. Üçevler Mah. Bayraktepe Sok. Akay İş Merkezi Kat:3 No: 7/6 TR Nilüfer/Bursa	Tel. +90 224 443 45 60 Fax +90 224 443 45 58
	Izmir	SEW-EURODRIVE Hareket Sistemleri San. ve Tic. Ltd. Sti. 1203/11 Sok. No. 4/613 Hasan Atli Is Merkezi TR-35110 Yenisehir-İzmir	Tel. +90 232 469 62 64 Fax +90 232 433 61 05

Ukraine			
Assembly **Sales** **Service**	**Dnipropetrovsk**	SEW-EURODRIVE Str. Rabochaja 23-B, Office 409 49008 Dnepropetrovsk	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua

Ukraine			
Sales	**Kiev**	SEW-EURODRIVE GmbH S. Oleynika str. 21 02068 Kiev	Tel. +380 44 503 95 77 Fax +380 44 503 95 78 kso@sew-eurodrive.ua
	Donetsk	SEW-EURODRIVE GmbH 25th anniversary of RKKA av. 1-B, of. 805 Donetsk 83000	Tel. +380 62 38 80 545 Fax +380 62 38 80 533 dso@sew-eurodrive.ua

United Arab Emirates			
Sales **Service**	**Sharjah**	Copam Middle East (FZC) Sharjah Airport International Free Zone P.O. Box 120709 Sharjah	Tel. +971 6 5578-488 Fax +971 6 5578-499 copam_me@eim.ae

Uruguay			
Sales	**Montevideo**	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esqina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-89 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 Manufacturing +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
	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
	Additional addresses for service in the USA provided on request!		

Venezuela			
Assembly **Sales** **Service**	**Valencia**	SEW-EURODRIVE Venezuela S.A. Av. Norte Sur No. 3, Galpon 84-319 Zona Industrial Municipal Norte Valencia, Estado Carabobo	Tel. +58 241 832-9804 Fax +58 241 838-6275 http://www.sew-eurodrive.com.ve ventas@sew-eurodrive.com.ve sewfinanzas@cantv.net

Vietnam			
Sales	**Ho Chi Minh City**	**All sectors except for ports, mining and off-shore:** Nam Trung Co., Ltd 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 namtrungco@hcm.vnn.vn truongtantam@namtrung.com.vn khanh-nguyen@namtrung.com.vn

Vietnam			
		Ports, mining and offshore: DUC VIET INT LTD Industrial Trading and Engineering Services A75/6B/12 Bach Dang Street, Ward 02, Tan Binh District, 70000 Ho Chi Minh City	Tel. +84 8 62969 609 Fax +84 8 62938 842 totien@ducvietint.com
	Hanoi	Nam Trung Co., Ltd R.205B Tung Duc Building 22 Lang ha Street Dong Da District, Hanoi City	Tel. +84 4 37730342 Fax +84 4 37762445 namtrunghn@hn.vnn.vn

Index

A

Abbreviation key 431
ABOX 213, 220
  Hybrid ABOX "MTA...-S54.-...-00" 221
  Hybrid ABOX "MTA...-S64.-...-00" 223
  Standard ABOX "MTA...-S04.-...-00" 220
Accessibility 39
Adapter cable 201
Adapters for mounting IEC motors 109
Air admission 39
Ambient temperature 38, 121, 135, 151, 173
Application options 16
  GIO12A 185
  GIO13A 185
Application times 199
ASEPTIC design
  Mounting positions 48
ASEPTIC/ASEPTIC^{plus} design 46
  Cleaning 50
  Description 46
  Sealing material 50
  Surface protection 50
AS-Interface
  GLK30A binary slave 137
  GLK31A double slave 137
  Technical data 137
Avoiding blockage 235
Axial loads
  DRC stand-alone motors 242
  Gear units 236
  RM gear units 240

B

Binary inputs 121, 135
Binary slave 137
Brake 246
  Application times 199
  Braking torque 199, 247
  Braking work 199
  Description 246
  Emergency stop features 247
  General information 246
  Hoist applications 247
  Important design information 248
  No-load starting frequency 248
  Project planning 246
  Response times 199
  Selection 246
  Working capacity 247
Brake coil
  BY1C (DRC1) 188
  BY1C + BW1 (DRC1) 190
  BY2C (DRC2) 189
  BY2C + BW2 (DRC2) 192
Brakemotors 41
Braking resistors, overview 187
Braking resistor, external 194
  BW100-005/K-1.5 194
  BW100-009-T 194
  BW150-003/K-1.5 194
  BW150-006-T 194
Braking resistor, integrated 188, 190
  BW1 190
  BW2 192
  BY1C + BW1 (DRC1) 190
  BY2C + BW2 (DRC2) 192
Braking torque 199
Braking work 199
BW1 ....190, 191
BW100-005/K-1.5 ....194, 195, 196
BW100-009-T 194, 197, 198
BW150-003/K-1.5 ....194, 195
BW150-006-T 194, 197
BW2 ....192, 193
BY1C (DRC1) 188
BY1C + BW1 (DRC1) 190
BY2C (DRC2) 189
BY2C + BW2 (DRC2) 192



C

Cable glands 200
Cables, available.127, 130, 132, 133, 143, 146, 148, 149, 158, 161, 164, 168, 170, 171, 179, 181, 183, 184
Cables, prescribed 203
Cables, recommended 205, 207
CAN adapter 201
CAN connection cables....205
Checking braking torques 235
Churning losses 234
Cleaning 50
Condition Monitoring
  DUO10A diagnostic unit....116
  DUV10A / DUV30A diagnostic units 118
  Technical data....116
Condition monitoring 53, 116
  DUO10A (oil aging sensor) 53
  DUV10A (vibration sensor) 53
  Project planning 241
Connection
  PC 201
  Plug connectors 123, 138, 154, 175
Connection cables, available127, 130, 132, 133, 143, 146, 148, 149, 158, 161, 164, 168, 170, 171, 179, 181, ...183, 184
Connection cables, notes....123, 138, 154, 175
Connection cables, prescribed....203
Connection cables, recommended....205, 207
Contents of this publication 9
Control technology
  Available application modules....35
  Configurable Control Unit (CCU) 33
  Controllers/fieldbus gateways 28
  Overview 27
Controller
  MOVIFIT® FDC-SNI....28
Controllers....28
  Controller for SBus actuators....32
Corrosion protection....38, 42
  ASEPTIC/ASEPTIC^{plus} design 46
  General 42
  KS corrosion protection....42
  NOCO® fluid 44
  Special protective measures....44
Covers....114
CSA/UL approval 41
cUL registered motors....41

D

DAC – Direct AS-Interface Communication....20
DBC – Direct Binary Communication....18
Derating factors 122, 136, 152, 174
Design notes....93
Dimension drawings
  BW100-005/K-1.5 196
  BW100-009-T 198
  BW150-003/K-1.5 195
  BW150-006-T 197
  DRC1 with IEC flange....209
  DRC1 with IEC flange and application option..210
  DRC2 with IEC flange....209
  DRC2 with IEC flange and application option..210
  MOVIFIT® FDC....231
  MOVIFIT® FDC, option M11....232
  Notes 265
  Parallel-shaft helical gearmotors 338
  Plug connectors....211
Dimension sheets
  Helical gearmotors....292
  Helical-bevel gearmotors....386
  SPIROPLAN® gearmotors....422
Direction of rotation of the output shaft....69
Documentation, additional 9
Double gearmotors
  Limiting the motor power 235
Double slave 137
DRC electronic motor
  Application options....16
  Description....11
  Drive units....14
  Installation technology 15
  Overview....13
  Sizes....14
  Unit properties 17
  Variants....14
  With/without application slot 15
DSC – Direct SBus Installation 24
DUO10A 53
DUV10A....53
Dynamic characteristic curve for DRC electronic motors....244

E

EBOX....213
Efficiency of gear units....233
Electronics cover of MOVIGEAR®....73
Electronics type 73

EMC cable glands
Overview 200
Extended storage 51
Storage conditions 52
Type 51

F
Fieldbus gateways 28
Fieldbus gateways for SNI actuators 31
Fieldbus gateways SBus actuators 32
Flange contours
FAF.., KAF.., and WAF.. gear units 113
RF.. and R..F gear units 111
Flange contours of FF.., KF.. and WF.. gear units 112
Fretting corrosion 40

G
Gear unit mounting 110
Gear unit with hollow shaft and key 100
Gear units with hollow shaft 104
GIO12A 185
GIO12B 16
GIO13A 185
GIO13B 16
GLK30A 137
GLK31A 137

H
Helical gearmotors 269
Dimension sheets 292
Lubricant fill quantities 95
Mounting positions 78
Selection tables 270
Type designation 55
Types 61
Variants 269
Helical-bevel gearmotors 372
Dimension sheets 386
Lubricant fill quantities 97
Mounting positions 86
Selection tables 374
Type designation 56
Types 64, 372
Hybrid cable 207

I
Inquiry 433
Installation altitude 38
Installation topology DBC – Direct Binary Communication 18
Installation (electrical)
PC connection 201
Plug connectors 123, 138, 154, 175
Installation/removal kit 102
Internal voltage supply 24V_O 121, 135, 151, 173
International markets 41

K
Kraftangriff Definition 236

L
Lubricant fill quantities 95
Helical gear units 95
Helical-bevel gear units 97
SPIROPLAN® gear units 97
Lubricant fill quantities for parallel-shaft helical gear units 96
Lubricant table 94

M
Motion control inputs 151, 173
Mounting gear units with hollow shaft and key 100
Mounting positions 68
Change in mounting position 76
DRC stand-alone motors with IEC flange 92
Helical gearmotors 78
Helical-bevel gearmotors 86
Key 77
Notes 68
Parallel-shaft helical gearmotors 83
SPIROPLAN® gearmotors 89
MOVIFIT®- DC
Dimension drawings, option M11 232
MOVIFIT® FDC 28, 213
Available ABOXes 220
Combination options 216
Connection technology 219
Dimension drawings 231
Features 28
Housing concept 213
Hybrid cables 229



Possible combinations with the variant for wet areas 218
SD memory card 29
Selection tables....225
Type designation....213
Variant for use in wet areas 217
MOVIFIT® FDC
Leistungsklasse 29
Multi-stage gearmotors 39, 235
M11 232

N

NOCO® fluid....40
Noise....38

O

Oil aging sensor 53
Operating notes 93
Order....433
Order information 68
ASEPTIC/ASEPTIC^{plus} design 76
Cable entry position 71
Change in mounting position 76
Mounting positions....68
Plug connectors 74
Position of the electronics cover 71
Position of the output end 70
Position of the output flange 69
Position of the output shaft 69
Sample orders....72
Software support....72
Type of electronics....73
Overhung loads
Gear units 236
RM gear units....240
Overhungs loads
DRC stand-alone motors 242

P

Painting 38
Parallel-shaft helical gearmotors....322
Dimension drawings....338
Lubricant fill quantities 96
Mounting positions....83
Selection tables....324
Type designation....55
Types 62
Variants....322
PC connection 201
PEAK-CAN adapter 201
Plug connector
Designation key 123, 138, 154, 175
Plug connectors 74, 123, 138, 154, 175
Connection cables 123, 138, 154, 175
Dimension drawing 211
Order information....74
Plug connector positions....124, 139, 155, 176
Plug connector variant....74
Restrictions....125, 140, 156, 177
Power rating....38
Product description 38
Product groups 7
Project planning 233
Applications in wet areas 260
Brake 246
Drive unit....249
Electronic motor....242
Gear units 233
Project planning example 253
Project planning procedure....250

R

Reduced backlash gear unit types....99
Reduced backlash version....40
Regenerative load capacity
Brake coil 188, 189
Brake coil and integrated braking resistor 190, 192
BY1C (DRC1) 188
BY1C + BW1 (DRC1) 190
BY2C (DRC2) 189
BY2C + BW2 (DRC2) 192
Removing gear units with hollow shaft and key 100
Response times 199
RM gearmotors 40, 239
Permitted overhung and axial loads 240
Project planning 239
Rolling bearing greases 98
Run-in phase 234

S

SBus
Technical data 153

Screw fittings....200
Diagnostic interface....200
Plug connectors....200
Potentiometer....200
Pressure compensation....200
Screw plugs....200
Sealing material....50
Selection tables
Helical gearmotors....270
Helical-bevel gearmotors....374
Information....263
MOVIFIT® FDC....225
Parallel-shaft helical gearmotors....324
SPIROPLAN® gearmotors....418
Self-locking....233
Sensor inputs....151, 173
SEW-EURODRIVE
Group of companies....6
Products....7
Systems....7
Shouldered hollow shaft with shrink disk....106
Signal relays....121, 135
SNI
Prescribed connection cables....203
SNI – Single Line Network Installation....22
SPIROPLAN® gearmotors....416
Dimension sheets....422
Lubricant fill quantities....97
Mounting positions....89
Selection tables....418
Type designation....56
Types....66
Variants....416
SPIROPLAN® right-angle gear units....40
Stainless steel mounting rail M11....232
STO jumper plug....202
Storage conditions....52
Surface protection....38, 42
ASEPTIC/ASEPTIC^{plus} design....46
General information....42
NOCO® fluid....44
OS surface protection....43
Resistance....45
Special protective measures....44

T

Technical data
Ambient temperature....121, 135, 151, 173
AS-Interface....137
Binary inputs / signal relays....121, 135
Braking resistors....187
Braking work, braking torque....199
Condition monitoring....116
Connection cables....203
Derating factors....122, 136, 152, 174
General technical data....120, 134, 150, 172
Internal voltage supply 24V_O....121, 135, 151, 173
Motion control inputs....151, 173
Response and application times of the brake....199
SBus interface....153
Screw fittings....200
Thermal characteristic curve for DRC electronic motors....244
Topology
Combined installation topology....26
DAC – Direct AS-Interface Communication....20
DSC – Direct SBus Installation....24
SNI – Single Line Network Installation....22
TorqLOC® hollow shaft mounting system....105
Torque arms....110
Torques....38
Type designation....54
Application options....58, 60
Condition monitoring....57
Connection alternatives....58
DRC drive units....59
Electronic motor and options....58
Encoder....58
Gear unit options....57
Gear units and options....55
Helical gearmotors....55
Helical-bevel gearmotors....56
Mechanical motor additions....58
Motor....58
Overview of DRC drive units....54
Parallel-shaft helical gearmotors....55
Plug connectors....123, 138, 154, 175
SPIROPLAN® gearmotors....56
Temperature sensor/detection....58
Type of electronics....73



Types
Helical gearmotors 61
Helical-bevel gearmotors 64
Parallel-shaft helical gearmotors 62
SPIROPLAN® gearmotors 66

V

Variants 54
Helical gearmotors 269
Helical-bevel gearmotors 372
Overview of DRC drive units 54
Parallel-shaft helical gearmotors 322
SPIROPLAN® gearmotors 416
Vibration sensor 53

W

Weight information 39

X

X1203_1 ..... 126, 142, 157
X1203_2 ..... 126, 142, 157
X1231 160
X1241_1 178
X1241_2 178
X2324 163
X4103 166
X4104 165
X4271 141
X5011 141
X5131 ..... 167, 180
X5132 ..... 129, 145
X5502 ..... 131, 147, 169, 182
X5503 ..... 133, 149, 171, 184

0 ... 9

4Q operation
With integrated brake coil 188
With integrated brake coil and external braking resistor 194
With integrated brake coil and integrated braking resistor 190










SEW-EURODRIVE
Driving the world

SEW-EURODRIVE GmbH & Co KG
P.O. Box 3023
D-76642 Bruchsal/Germany
Phone +49 7251 75-0
Fax +49 7251 75-1970
sew@sew-eurodrive.com
→ www.sew-eurodrive.com