SEW EURODRIVE

Catalog

Gear Units for Electrified Monorail System

HW.., HS.., HK.. Series

Edition 12/2011

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Content

1 Introduction

1.1 The SEW-EURODRIVE group of companies

1.1.1 Global presence

Driving the world – with innovative drive solutions for all branches and for every application. Products and systems from SEW-EURODRIVE are used in all around 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.

Not only is SEW-EURODRIVE represented in all important industries of our time, SEW-EURODRIVE is also present all over the world: with 12 production plants and 67 assembly plants in 47 countries and our customer service, which we see as an integrative part of our portfolio that extends our high quality standards.

1.1.2 Always the right drive

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

The gearmotors are electronically empowered by MOVITRAC® frequency inverters, MOVIDRIVE® inverters and MOVIAXIS® multi-axis servo inverters, a combination that blends perfectly with the existing SEW-EURODRIVE 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 flexible and customized implementation of your applications.

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 and produced specifically to ensure cost-effective solutions, independent of the philosophy behind or the size of the system.

New developments from SEW-EURODRIVE include: MOVITRANS®, the system for contactless energy transfer, MOVIPRO®, the decentralized drive control and MOVIFIT®, the new decentralized intelligence.

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 applications in all branches of industries and applications.

1.2 Products and systems from SEW-EURODRIVE

The products and systems from SEW-EURODRIVE are divided into product groups. These product groups are:

1. Gearmotors and frequency inverters
2. Servo technology
3. Drive systems for decentralized installation
4. Industrial gear units
5. VARIOLUTION® and MAXOLUTION®
6. Interdisciplinary products

The following tables indicate the products included in the respective product group:

Gearmotors and frequency inverters
• R..7, F..7, K..7, S..7 and SPIROPLAN® W series gear units in standard and explosion-proof design • HW.., HS.., HK.. gear units for overhead trolley systems • Stainless steel gear units and gearmotors • Variable-speed gear units and variable-speed gearmotors in standard and explosion-proof design • DR.. AC motors and AC brakemotors in standard and explosion-proof design • DR.. energy-efficient motors • Pole-changing gearmotors • Aseptic gearmotors • Geared torque motors • Single-phase motors and single-phase brakemotors • Asynchronous linear motors • MOVITRAC® frequency inverters • MOVIDRIVE® inverters • Control, technology and communication options for inverters

Servo technology
• BS.F.., PS.F.. and PS.C.. series servo gear units in standard and explosion-proof design • Low backlash R..7, F..7, K..7, S..7 and SPIROPLAN® W series gear units in standard and explosion-proof design • CMP synchronous servomotors and servo brakemotors in standard and explosion-proof design • CMDV compact servomotor and servo brakemotors • SL2 and SL2 synchronous linear motors • DRL asynchronous servomotors and servomotors • CMS electric cylinders • MOVIDRIVE® servo inverters • MOVIAXIS® multi-axis servo inverters • MOVITRAC® LTX servo inverter • Control, technology and communication options for servo drive inverters and servo inverters

Drive systems for decentralized installation
• MOVIMOT® geared brakemotor with integrated frequency inverter in standard and explosion-proof design • MOVI-SWITCH® geared brakemotor with integrated switching and protection function in standard and explosion-proof design • MOVIGEAR® mechatronic drive system • MOVIFIT® drive controller • MOVIPRO® drive and positioning controller • MOVITRANS® contactless energy transfer • Fieldbus interfaces in standard and explosion-proof design • Field distributors

Industrial gear units
• X.. and MC.. series helical and bevel-helical gear units in standard and explosion-proof design as well as ML.. • P..1 and P..2 helical and bevel-helical planetary gear units and gearmotors in standard and explosion-proof design • P.MC helical and bevel-helical planetary gear units in standard and explosion-proof design

VARIOLUTION® and MAXOLUTION®
• VARIOLUTION® packages for high technical solution expertise in plants and machines • MAXOLUTION® systems for customer-specific system solutions and plants

Interdisciplinary products
• Components in design with functional safety technology • Installation software • Control software • Operator panels • Fieldbus interfaces and gateways • Diagnostic unit

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 Documentation

1.3.1 Contents of this publication

This "Gear Units for Electrified Monorail Systems HW.., HS.., HK.. Series" catalog provides a detailed description of the following product groups from SEW-EURODRIVE:

- HW10, HW30 SPIROPLAN® gear units
- Helical-worm gear unit HS41
- Helical-bevel gear units HK37, HK40, HK50, HK60

The descriptions include:

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

1.3.2 Additional documentation

The following price catalogs and catalogs are available from SEW-EURODRIVE in addition to this "Gear Units for Electrified Monorail Systems HW.., HS.., HK.. Series":

- Gearmotors

  (R, F, K, S and SPIROPLAN® gearmotors)
- DR gearmotors

  (R, F, K, S and SPIROPLAN® gear units in combination with DR motor)
- MOVIMOT® gearmotors

  (R, F, K, S and SPIROPLAN® gearmotors in combination with MOVIMOT®)
- MOVIMOT® gearmotors with AC motor DRS/DRE/DRP

  (R, F, K, S and SPIROPLAN® gear units in combination with DR motors and MOVIMOT®)

These catalogs offer the following information:

- Product descriptions
- Technical data and inverter assignments
- Important information on tables and dimension sheets
- Description of the different types
- Selection tables
- Dimension sheets
- Technical data
- Notes on adapter mounting

1.4 Product names and trademarks

The brands and product names in this catalog are trademarks or registered trademarks of the titleholders.

1.5 Copyright

2 Product Description of the Gear Units

2.1 Description

Specific requirements are placed on gear units for operating electrified monorail systems (EMS). With the gear unit series HW.. helical-worm and HK..helical-bevel gear unit, SEW-EURODRIVE supplies drives that are specifically tailored to meet the requirements for light and heavy load applications. The performance features of both groups of gear units meet the specific requirements, such as conveying capacity, conveying speed or payload.

All gear units for electrified monorail systems are additionally equipped with an integrated coupling.

Both groups of gear units have the following characteristics:

- High permitted overhung loads for maximum working loads
- Energy-efficient operating principle of gear units and motors
- Reproducible stopping accuracy by using disk brakes

2.2 Notes

2.2.1 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
HW	CLP (SEW-PG) VG460	-20 °C to +40 °C
HS	CLP (CC) VG680	0 °C to +40 °C
HK	CLP (CC) VG220	-15 °C to +40 °C

The rated data of the gear units and gearmotors specified in the catalog refer to an ambient temperature of +20 °C.

Gear units and 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 -40 °C in the intensive cooling range until up to +60 °C. Project planning must take special operating conditions into account and adapt the drive to the ambient conditions by selecting suitable lubricants and seals. Project planning is generally recommended for higher ambient temperatures and in particular for helical-worm gear units. SEW-EURODRIVE is happy to carry out this project planning for you.

If the drive is to be operated on a frequency inverter, you must also consider the project planning notes of the inverter and take into account the thermal effects of inverter operation.

2.2.2 Installation altitude

Due to the low air density at high installation altitudes, heat dissipation on the surface of motors and gear units decreases. The rated data listed in the catalog applies to an installation altitude of maximum 1000 m above sea level. Installation altitudes of more than 100 m asl must be taken into account for project planning of gear units and gearmotors.

2.2.3 Power and torque

The power and torque values listed in the catalogs apply to the M1 mounting position. In addition, the gearmotors are assumed to be standard versions with standard lubrication and under normal ambient conditions.

Please note that the motor power shown in the selection tables for gearmotors is subject to selection. However, the output torque and the desired output speed are essential for the application and need to be checked.

2.2.4 Speeds

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

2.2.5 Noise

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

2.2.6 Coating

Gear units from SEW-EURODRIVE are painted as follows:

Gear units	Coating according to DIN1843
HW.., HS.. and HK.. gear units	blue/gray /RAL 7031

Special paints are available on request.

2.2.7 Weight

Please note that all weights shown in the catalogs exclude the oil fill for the 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 "Design and operating notes / lubricants and fill quantities" for recommended lubricant fill quantities depending on the mounting position. The exact weight is given in the order confirmation.

2.2.8 Air admission and accessibility

The gearmotors/brakemotors must be mounted on the driven machine in such a way that both axially and radially there is enough space left for unimpeded air admission, for maintenance work on the brake and, if required, for the MOVIMOT® inverter. Please also refer to the notes in the motor dimension sheets.

2.2.9 SPIROPLAN® right-angle gear units

SPIROPLAN® right-angle gearmotors are robust right-angle gear units with SPIROPLAN® gearing.

2.2.10 Direct motor mounting

Electrified monorail systems from SEW-EURODRIVE are usually produced for direct motor mounting. These gearmotors make it possible to mount gear units directly to motors from SEW-EURODRIVE without an adapter.

2.2.11 Reliable, long service life, and low maintenance

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

2.2.12 Coupling

The electrified monorail drives operate with a reliable disengageable clutch. This clutch decouples the output stage of the gear unit from the output shaft.

2.3 Surface protection

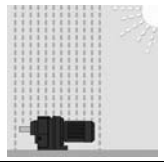
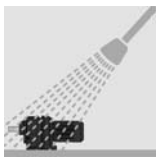
2.3.1 General information

SEW-EURODRIVE offers the following optional protective measure for operating gear units under special environmental conditions.

- Surface protection OS for motors and gear units

2.3.2 OS surface protection

As an option for standard surface protection, motors and gear units are also available with surface protection OS1 to OS3.

Surface protection[1]		Ambient conditions	Application examples
Standard		Suitable for machines and systems in buildings and rooms indoors with neutral atmospheres. Similar to corrosivity category[2]: • C1 (negligible)	• Machines and systems in the automobile industry • Transport systems in logistics • Conveyor belts at airports
OS1		Suited for environments prone to condensation and atmospheres with low humidity or contamination, such as applications outdoors under roof or with protection. According to corrosivity category[2]: • C2 (low)	• Systems in saw mills • Hall gates • Agitators and mixers
OS2		Suitable for environments with high humidity or mean atmospheric contamination, such as applications outdoors subject to direct weathering. According to corrosivity category[2]: • C3 (moderate)	• Applications in amusement parks • Funiculars and chair-lifts • Applications in gravel plants • Systems in nuclear power 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. According to corrosivity category[2]: • C4 (high)	• Sewage treatment plants • Port cranes • Mining applications

1) Motors/brakemotors in degree of protection IP56 or IP66 are only available with OS2, OS3 surface protection.

2) According to DIN EN ISO 12944-2, classification of ambient conditions

2.4 Extended storage

2.4.1 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.

The lubricant of those gear units is then mixed with a VCI anti-corrosion agent (**v**olatile **c**orrosion **i**nhibitors). Please note that this VCI corrosion inhibitor is only effective in a temperature range between -25 °C and +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 will be supplied with OS1 surface protection. You can order OS2 or OS3 instead of OS1.

Surface protection	Suitable for
OS1	Low environmental impact
OS2	Medium environmental impact
OS3	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.

2.4.2 Storage conditions

Observe the following conditions 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 < 60 °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 cleanness and mechanical damage during the 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 cleanness and mechanical damage during the inspection. Check corrosion protection.

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

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

3 Overview of Types and Type Designation

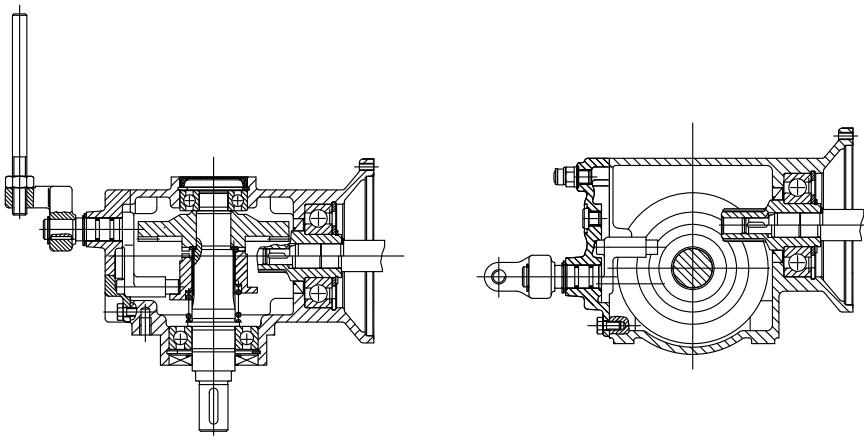
3.1 Variants

The following sections show the different designs of gear units.

3.1.1 SPIROPLAN® gear units

The following figure illustrates a SPIROPLAN® gear unit:

Designation	
HW..	Flange-mounted design



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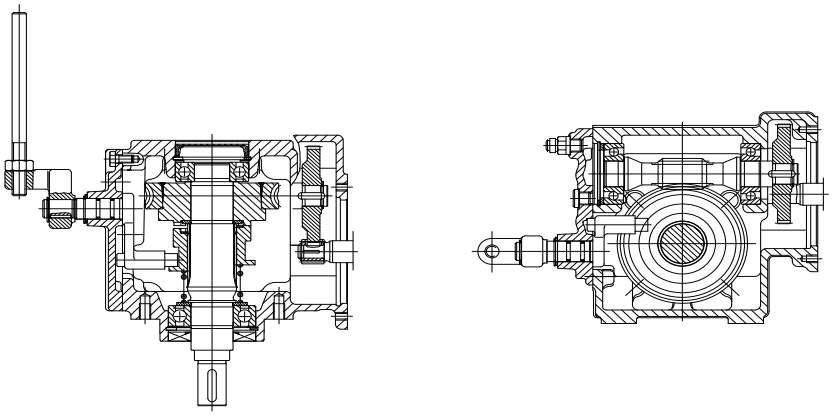
3.1.2 Helical-worm gear unit

The following figure illustrates a helical-worm gear unit:

Designation	
HS..	Flange-mounted design



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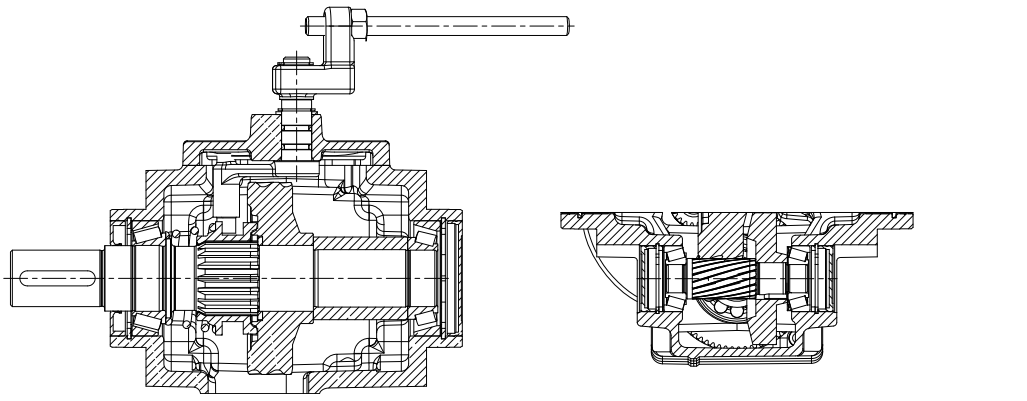
3.1.3 Helical-bevel gear unit

The following figure illustrates a helical-bevel gear unit:

Designation	
HK37	Flange-mounted



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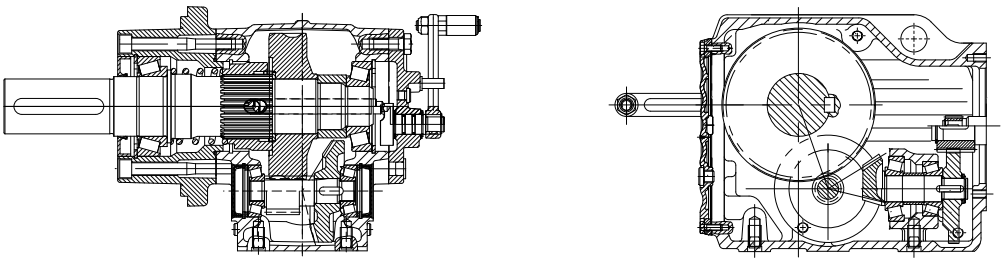
The following figure illustrates a helical-bevel gear unit:

Designation	
HK40 – 60	Flange-mounted



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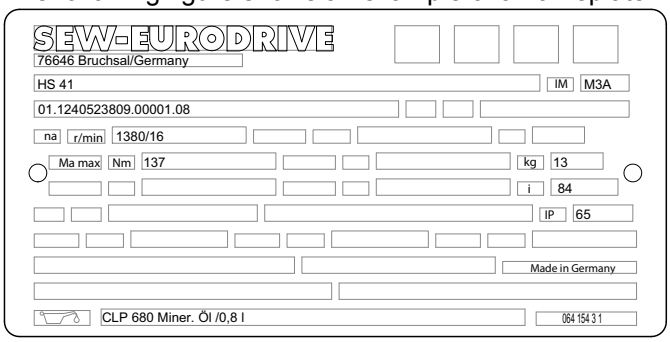
3.2 Nameplate

The following figure shows an example of a nameplate:



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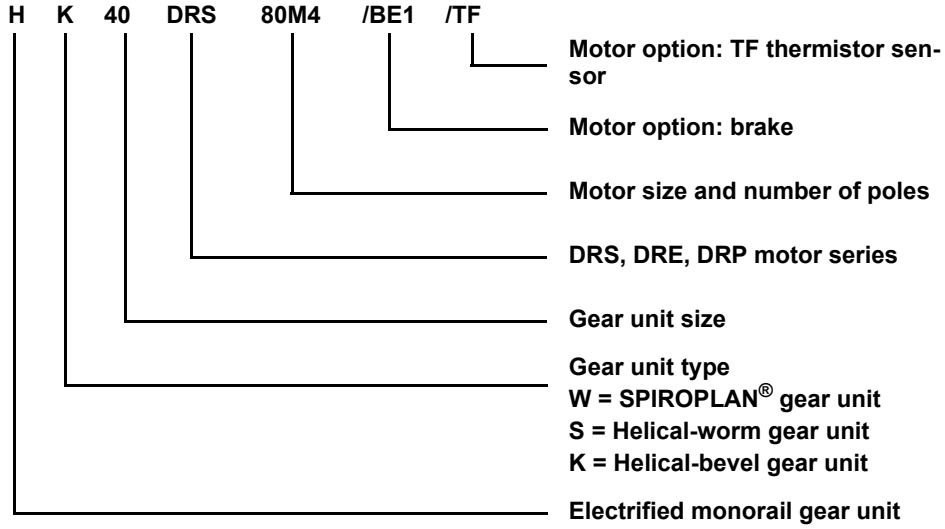
i		= Gear unit reduction ratio
IM		= Mounting position
IP..		= Degree of protection
n_a	[r/min]	= Output speed
M_{amax}	[Nm]	= Output torque

3.3 Type designation

The following diagram shows a type designation:



3.4 Overview of electrified monorail drives

Features of electrified monorail gear units:

- Smooth running for operation without vibration
- Compact for space-saving installations
- Designed with positive shaft-hub connection
- Can be ordered with integrated MOVIMOT® inverter as an option
- MOVI-SWITCH® gearmotors with integrated switching and protection function can be ordered as an option

The following table provides an overview of electrified monorail systems:

Gear unit type	Maximum continuous torque M_{amax} [Nm]	Permitted wheel load [N]	Ratio range i	Force application X[1] [mm]	Shaft d x l [mm]	Complies with VDI guideline 3643 (C1 standard)
SPIROPLAN® gear units: (details from (page 48)						
HW10	20	2500	6.57 – 16.5	10	14 x 28	x
HW30	70	5600	8.2 – 75	13	20 x 35 25 x 35	x[2]
Helical-worm gear units: (details from (page 54)						
HS41	185	10000	7.28 – 201	13	25 x 35	x[2]
Helical-bevel gear unit: (details from (page 58)						
HK37	200 220	10000 14500	13.1 – 106.38	18 18	25 x 35 30 x 50	x[2]
HK40	400	18500	12.2 – 131.87	18[3] 28[4]	30 x 60 35 x 70	–
HK50	600	25000	7.28 – 145.14	28	45 x 90	–
HK60	820	40000	13.22 – 144.79	32	55 x 110	–

1) X = center of the carrying wheel (page 26)

2) Only with DR80 motors, the C1 standard only applies for the combination with the small terminal box.

3) Value is valid for shaft diameter of 30 x 60.

4) Value is valid for shaft diameter of 35 x 70.

4 Project Planning Information

Project planning has to be carried out for all gear units. The data specified in this catalog only applies if project planning was carried out correctly. Project planning is particularly important for gear units with increased ambient temperatures, for helical-worm gear units, SPIROPLAN® gear units, and self-locking helical-worm gear units.

SEW-EURODRIVE is happy to carry out this project planning for you.

4.1 Determining the application data

It is necessary to have data on the machine to be driven (mass, speed, setting range, etc.) to project the drive correctly.

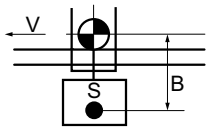
This data helps to determine the required power, torque and speed. Refer to the SEW publication "Drive Engineering - Practical Implementation / Drive Planning" or the SEW project planning tool SEW Workbench for assistance.

4.1.1 Examples for trolleys

The type of trolley is mainly important for calculation of the overhung load at the input end. The center of gravity for the load is usually at A/2. Please indicate any deviating load distribution in your order. Values A and B are necessary to calculate the shifting of the load when starting, braking, and in the ascending sections.

Trolley principle 1:

- 1 carrying wheel, 1 driven wheel



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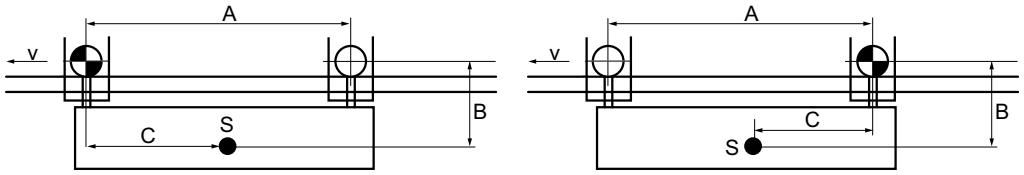
S Center of gravity of the load

B Value B, vertical distance from the center of the carrying wheel to the center of gravity

Driven carrying wheel

Trolley principle 2:

- 2 carrying wheels; 1 of them driven at the front
- 2 carrying wheels; 1 of them driven at the rear



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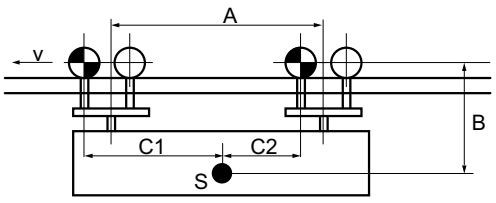
S Center of gravity of the load
A Value A, distance of carrying wheels
B Value B, vertical distance from the center of the carrying wheel to the center of gravity
C Value C, horizontal distance from the center of the carrying wheel to the center of gravity
Driven carrying wheel
Non-driven carrying wheel

Trolley principle 3

- 4 carrying wheels; 2 of them are driven wheels



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S Center of gravity of the load
A Value A, distance of carrying wheels
B Value B, vertical distance from the center of the carrying wheel to the center of gravity
C1, C2 Values C, horizontal distance from the center of the carrying wheel to the center of gravity
Driven carrying wheel
Non-driven carrying wheel

If the application requires another arrangement of carrying wheels than depicted in the examples, please contact SEW-EURODRIVE.

4.1.2 Questionnaire - Required application data

The questionnaire is also available in the internet at www.sew-eurodrive.com. Please fill in this questionnaire and send it to the SEW branch near you.

Customer,company:.....

Contact person: .....

Phone/fax:.....

Email: .....

Street: .....

Zipcode:.....

Place, date: .....

Request form for electrified monorail drive with request for:

☐ Return call ☐ Project planning of drive ☐ Review

Curve travel needs to be closely analyzed with two or more driving wheels because there can be different output speeds particularly with small curve radii.

Structure:			
• Trolley principle (1, 2 or 3)		.....	
• Distances	A:	.....	[mm]
	B:	.....	[mm]
	C1:	.....	[mm]
	C2:	.....	[mm]
• Wheel base		.....	[mm]
• Number of drives		.....	

Operating conditions:			
• Degree of protection	IP	.....	
• Installation altitude ca.	H	.....	[m]
• Average ambient temperature	T_{Amb}	.....	[°C]
• Maximum ambient temperature	T_{Amax}	.....	[°C]
• Line voltage	U_N	.....	[V_{AC}]
• Line frequency	f_N	.....	[Hz]
• Country-specific regulation(s)		.....	

Drive selection data:			
• Vehicle weight	m_0	.....	[kg]
• Weight of additional load	m_L	.....	[kg]
• Wheel load of the drive wheel on the track	F_R	.....	[N]
• Distance between force application point and shaft shoulder	X	.....	[mm]
• Carrying wheel diameter	D	.....	[mm]
• Material of the carrying wheel		.....	
• Curve radius (min.)	R	.....	[mm]
• Length of the entire track, horizontal	s_m	.....	[m]
• Travelling speed	v_{max}	.....	[m/min]
• Cyclic duration factor at v_{max}	cdf	.....	[%]
• Travelling speed	v_{min}	.....	[m/min]
• Cyclic duration factor at v_{min}	cdf	.....	[%]
• Acceleration	a_A	.....	[m/s²]
• Deceleration	a_V	.....	[m/s²]
• Deceleration emergency switching off	$a_{Emergency\ switching\ off}$	.....	[m/s²]
• Number of starts per circulation	Z	.....	
• permitted max. acceleration mech. Brake	a_B	.....	[m/s²]
• Stopping accuracy	s_x	.....	[± mm]
• Drive is moved[1)]	☐ Yes ☐ No		

1) If a drive is moved or positioned via an external device, please consult SEW-EURODRIVE.

Inclining tracks:			
• Inclination	α	.....	[°]
• Length of inclination	S_S	.....	[m]
• Travelling speed	v	.....	[m/min]
• Cyclic duration factor	cdf	.....	[%]
• Acceleration	a_{AS}	.....	[m/s²]
• Deceleration	a_{VS}	.....	[m/²]
• Number of starts	Z	.....	

Declining tracks:			
• Gradient	α	.....	[°]
• Long decline	S_a	.....	[m]
• Travelling speed	v	.....	[m/min]
• Cyclic duration factor	cdf	.....	[%]
• Acceleration	a_{AG}	.....	[m/s²]
• Deceleration	a_{VG}	.....	[m/s²]
• Number of starts	Z	.....	

Drive design:			
• Mechanical brake	☐ with	☐ none	
• Manual brake release	☐ with	☐ none	
• Coupling	☐ with	☐ none	
• (Dis)engaging under load	☐ Yes	☐ No	
• Output shaft	☐ Hollow shaft	☐ Solid shaft	
• Key	☐ with	☐ none	
• Dimensions d x l	.....		[mm]
• Mounting position (M1 to M6)	.....		
• Length of coupling lever (page 33)	.....		[°]
• Terminal box position	.....		[°]
• Cable entry on the terminal box	.....		
• Coating (standard RAL 7031)	☐ Standard	☐ Special coating:	

4.2 Selecting the correct drive

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

4.3 Project planning information

4.3.1 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.

HK gear units

The efficiency of helical-bevel gear units is up to 96% depending on the number of gear stages.

HS and HW gear units

The gearing in helical-worm and SPIROPLAN® gear units produces a high proportion of sliding friction. That is the reason why these gear units have higher gearing losses and lower efficiencies than HK gear units.

The efficiency depends on the following factors:

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

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

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

Self-locking

Retrodriving torques on helical-worm or SPIROPLAN® gear units produce an efficiency of $\eta' = 2 - 1/\eta$, which is significantly less favorable than the forward efficiency η. The helical-worm or SPIROPLAN® gear unit is self-locking if the forward efficiency $\eta \leq 0.5$. Some SPIROPLAN® gear units are dynamically self-locking. Contact SEW-EURODRIVE if you wish to make technical use of the braking effect of self-locking characteristics.

Run-in phase

The tooth flanks of new helical-worm and 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:

	Helical-worm gear units		SPIROPLAN® gear units	
	i range	η reduction	i range	η reduction
1-start	ca. 50 ... 280	ca. 12 %	ca. 40 ... 75	ca. 15 %
2-start	ca. 20 ... 75	ca. 6 %	ca. 20 ... 30	ca. 10 %
3-start	ca. 20 ... 90	ca. 3 %	ca. 15	ca. 8 %
4-start	–	–	ca. 10	ca. 8 %
5-start	ca. 6 ... 25	ca. 3 %	ca. 8	ca. 5 %
6-start	ca. 7 ... 25	ca. 2 %	–	–

The run-in phase usually lasts 48 hours. Helical-worm and 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 (page 31), 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 wish to use gear units of this type.

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

4.3.2 Axial and overhung loads

Determining 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 have to 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 force
Flat belt pulleys	2.50	Influence of the pre-tensioning force
Toothed belt pulleys	2.00 - 2.50	Influence of the pre-tensioning force
Gear rack pinion, prestressed	2.00	Influence of the pre-tensioning force

Permitted overhung load

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

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

INFORMATION

The data refers to force application < L/2. The values for the force application angle α and direction of rotation are based on the most unfavorable conditions.

Higher permitted overhung loads

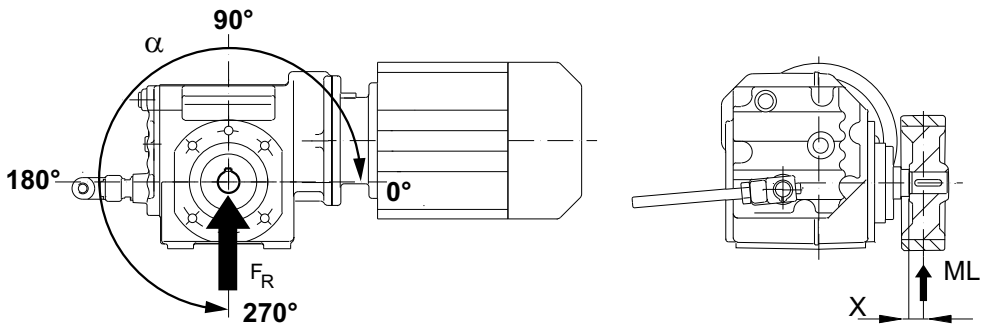
Exactly considering the force application angle α and the direction of rotation makes it possible to achieve a higher overhung load than listed in the selection tables.

Furthermore, higher output shaft loads are permitted if heavy duty bearings are installed, especially with HK gear units.

Contact SEW-EURODRIVE in such cases.

Definition of the force application

Force application X is defined as shown in the following figure:



1188479883

F_R Wheel load
α Force application angle
ML Middle of the carrying wheel

Refer to the overview table (page 18) for values of force application X depending on the gear unit.

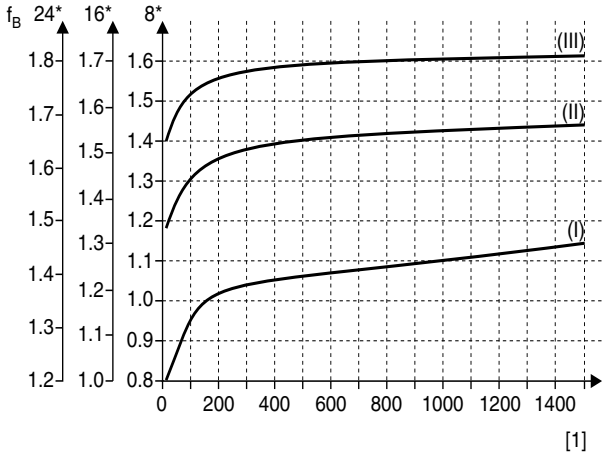
4.3.3 Determining the service factor

The effect of the trolley on the gear unit is taken into account to a sufficient level of accuracy using the service factor f_B. The service factor is determined according to the daily operating time and the starting frequency [1]. Three load classifications are taken into account depending on the mass acceleration factor. You can read off the service factor applicable to your application in the following figure. The service factor determined from this diagram must be smaller than or equal to the service factor according to the selection tables.

INFORMATION

The diagram of the operating factors only applies to drives in line operation.

Contact SEW-EURODRIVE for differing operating conditions.



9007200443235467

* Daily operating time in hours/day

[1] Starting frequency Z in 1/h:
The cycles include all starting and braking procedures as well as changeovers from low to high speed and vice versa.

Load classification

Three load classifications are distinguished:

(I) Uniform, permitted mass acceleration factor ≤ 0.2
(II) Non-uniform, permitted mass acceleration factor ≤ 3
(III) Heavy shock load, permitted mass acceleration factor ≤ 10

Mass acceleration factor

The mass acceleration factor is calculated as follows:

$$\text{Mass acceleration factor} = \frac{\text{all external mass moment of inertia}}{\text{Mass moment of inertia on motor side}}$$

"All external mass moments of inertia" are the mass moments of inertia of the driven machine and the gear unit, scaled down to the motor speed. The calculation for scaling down to motor speed is performed using the following formula:

$$J_X = J \times \left(\frac{n}{n_M}\right)^2$$

J_X = Mass moment of inertia scaled down to the motor shaft
J = Mass moment of inertia with reference to the output speed of the gear unit
n = Output speed of the gear unit
n_M = Motor speed

"Mass moment of inertia at the motor end" is the mass moment of inertia of the motor and, if installed, the brake and the flywheel fan (Z fan).

Service factors f_B > 2.0 may occur with large mass acceleration factors (> 10), high levels of backlash in the transmission elements or large overhung loads. Contact SEW-EURODRIVE in such cases.

4.3.4 Service factor: SEW f_B

The method for determining the maximum permitted continuous torque $M_{a\ max}$ and using this value to derive the service factor $f_B = M_{a\ max}/M_a$ is not defined in a standard and varies greatly from manufacturer to manufacturer. With their SEW service factor f_B = 1, SEW gear units in any case afford an extremely high level of safety and reliability in the fatigue strength range (exception: wearing of the worm wheel in helical-worm gear units). The SEW service factor may differ from specifications of other gear unit manufacturers. If you have doubts, contact SEW-EURODRIVE for more detailed information on your specific application.

Example

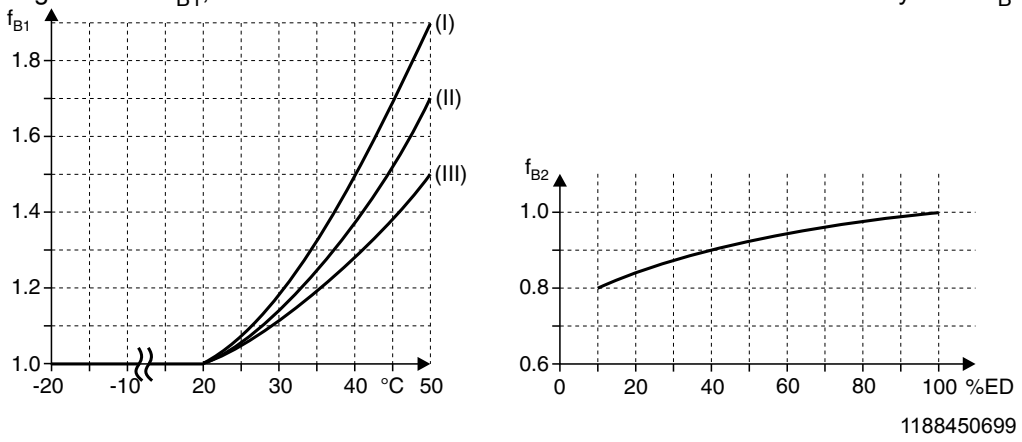
Mass acceleration factor 2.5 (load classification II), 14 hours of daily operation (read at 16 h/d) and 300 cycle times/hour result in the service factor f_B = 1.43. According to the selection tables, the selected gearmotor must then have an SEW f_B value = 1.43 or greater.

4.3.5 HS.. helical-worm and SPIROPLAN® HW.. gear units

With HS.. helical-worm gear units and SPIROPLAN® HW.. gear units, two more service factors have to be taken into account in addition to the service factor f_B shown in the previous figure. These are:

- f_{B1} = Service factor from ambient temperature
- f_{B2} = Service factor from cyclic duration factor

The additional service factors f_{B1} and f_{B2} can be determined by referring to the following diagrams. For f_{B1}, the load classification is taken into account in the same way as for f_B.



INFORMATION

The diagram of the service factors only applies to drives in line operation.

If operating conditions differ, for example if temperatures are below +20 °C (see f_{B1}), contact SEW-EURODRIVE.

$$\text{cdf (\%)} = \frac{\text{Load time in min/h}}{60} \times 100$$

The total service factor for helical-worm gear units is calculated as follows:

$f_{Btot} = f_B \ f_{B1} \ f_{B2}$

Example

The gearmotor with the service factor f_B = 1.43 in the previous example is to be a helical-worm gearmotor.

Ambient temperature ϑ = 25 °C → f_{B1} = 1.05 (read off at load classification II)

Time under load = 30 min/h → cdf = 50 % → f_{B2} = 1.02

The total service factor is f_{Btot} = 1.43 x 1.05 x 1.02 = 1.53

According to the selection tables, the selected helical-worm gearmotor must have an SEW f_B = 1.5 or higher.

4.4 Additional documentation

In addition to the information in this catalog, SEW-EURODRIVE offers extensive documentation covering the entire topic of electrical drive engineering. These are mainly the publications in the "Drive Engineering - Practical Implementation" series as well as the manuals and catalogs for electronically controlled drives.

You will find additional links to a wide selection of our documentation in many languages for download on the SEW-EURODRIVE homepage (http://www.sew-eurodrive.com). The list below includes other documents that are of interest in terms of project planning. You can order these publications from SEW-EURODRIVE.

4.4.1 Technical data for motors and gear units

The following catalogs are available from SEW-EURODRIVE in addition to this "Gear Units for HW.., HS.., HK.. Electrified Monorail Systems":

- AC Motors
- Gear units
- MOVIMOT®

4.4.2 Drive Engineering – Practical Implementation

- Project Planning for Drives

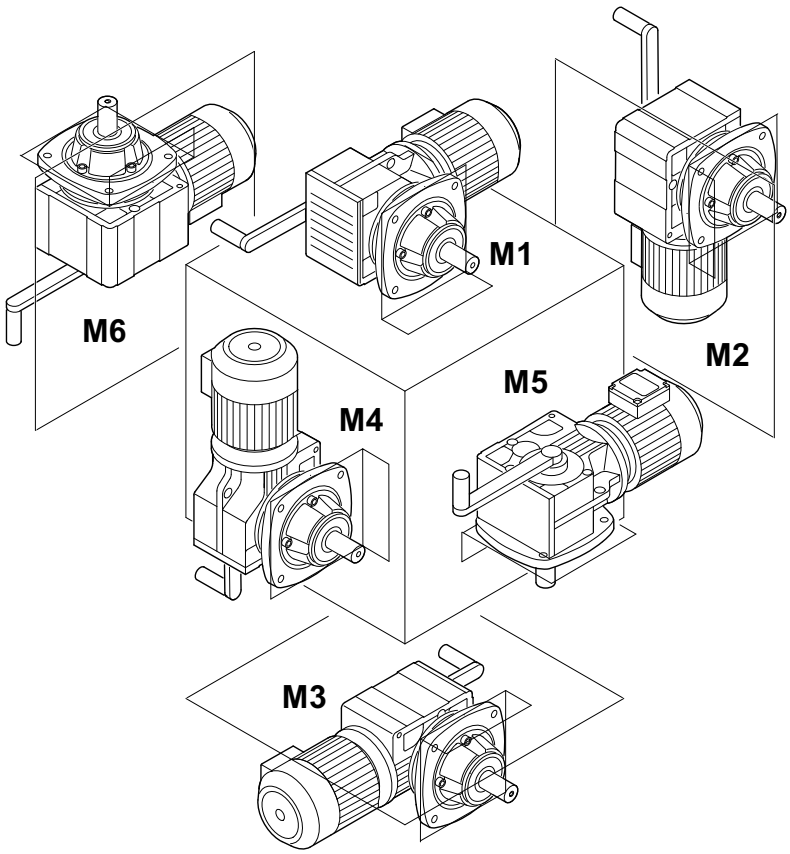
5 Mounting Positions

5.1 General information on mounting positions

In the case of right-angle gear units for electrified monorail systems, SEW-EURODRIVE distinguishes between four mounting positions M1 – M4.

Mounting positions M5 and M6 are available for electrified monorail drives HW10 and HS30 as well as mounting position M5 for electrified monorail drive HS41.

The figure below shows the position of the electrified monorail drive for mounting positions M1 – M6:



1503091851

INFORMATION

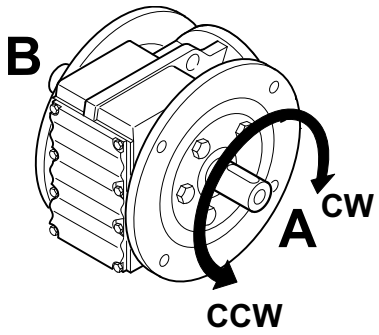
Please contact SEW customer service if you wish to change the mounting positions of HS41 helical-worm gear units to M2 or M3 mounting position.

5.2 Order information

INFORMATION

The following order information is required for HW, HS, and HK gear units in addition to the mounting position to exactly determine the design of the drive.

5.2.1 Direction of rotation of the output shaft



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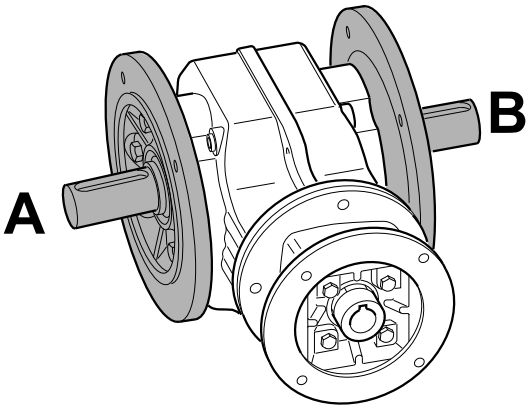
As viewed at the output shaft:
Clockwise (CW) = Rotating clockwise
Counterclockwise (CCW) = Rotating counterclockwise

5.2.2 Position of the output shaft and output flange

Only output shaft position **A** is available for electrified monorail drives HW10, HW30 and HS41. Output shaft positions **A** or **B** are possible for HK37, HK40, HK50 and HK60 electrified monorail drives.

	HW10	HW30	HS41	HK37	HK40	HK50	HK60
Output shaft position A	X	X	X	X	X	X	X
Output shaft position B	–	–	–	X	X	X	X

The following figure shows the position of the output shaft:



1642876939

5.2.3 Position of operating lever

⚠ CAUTION

Destruction of the clutch.

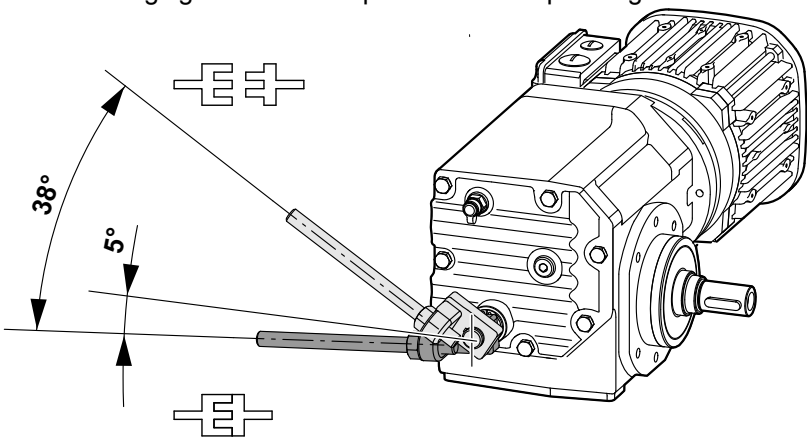
Possible damage to the unit.

- Engage the clutch at low output speeds when using pole-changing motors and motors controlled by a frequency inverter.
- Disengage the clutch of electrified monorail systems for heavy loads only without load and not under strain.

Position according to VDI guideline 3643

The position of the operating lever or the actuator travel correspond to VDI guideline 3643 for electrified monorail gear units HW10, HW30, HS41 and HK37 (heavy load range).

The following figure shows the position of the operating lever when mounted at the front:



1661840779

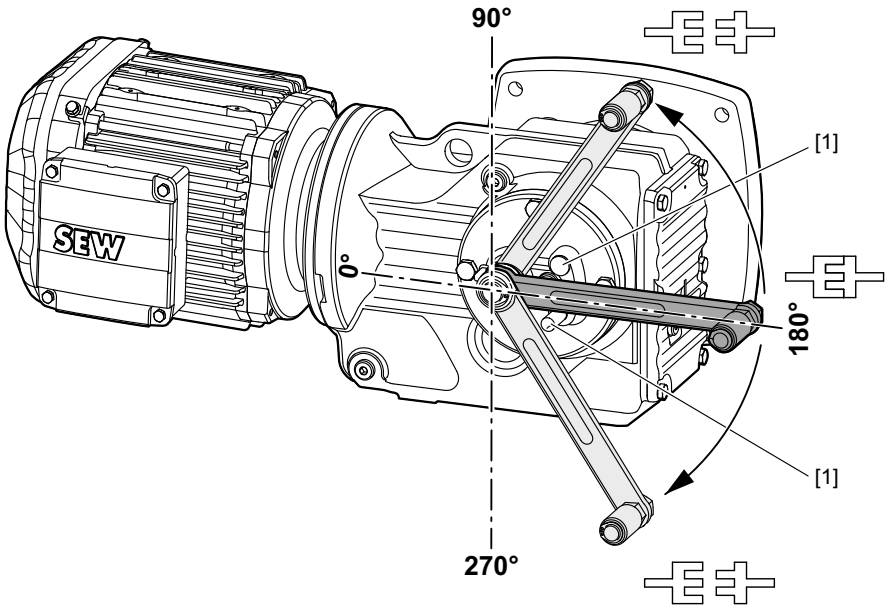
Clutch disengaged
Clutch engaged

Position with heavy-load gear units

The possible operating lever positions for electrified monorail drives HK40, HK50, and HK60 as viewed onto the sealing flange are 0° and 180°.

In mounting position M1, the operating lever is positioned at 180° as standard (see figure below). HK40 can additionally be switched in 90° and 270°. The position can be limited using the setscrew [1] for gear units HK50 and HK60.

The following figure shows the position of the operating lever when mounted at the side:



1661843211

[1] Mounting position-specific setscrew for limiting the operating lever downwards

Coupling disengaged

Coupling engaged

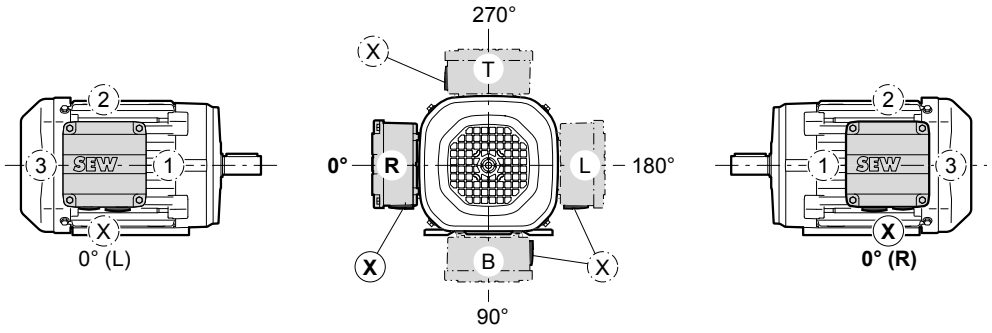
5.2.4 Position of motor terminal box and cable entry

The position of the motor terminal box has so far been specified with 0°, 90°, 180° or 270° as viewed onto the fan guard = B-end (see figure below). A change in the product standard EN 60034 specifies that the following designations will have to be used for terminal box positions for foot-mounted motors in the future:

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

This new designation applies to foot-mounted motors without a gear unit in mounting position B3 (= M1). The previous designation is maintained for gearmotors. The following figure shows both designations. If the mounting position of the motor changes, R, B, L and T are rotated accordingly. In motor mounting position B8 (= M3), T is at the bottom.

The position of the cable entry can be selected as well. The possibilities are "X" (= standard position), "1", "2" or "3" (see figure below).



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Unless other information is given regarding the terminal box, the 0° type (R) with "X" cable entry will be supplied. SEW-EURODRIVE recommends selecting cable entry "2" with mounting position M3.

INFORMATION

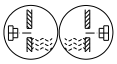
- **When the terminal box is in the 90° (B) position**, check to see if the gearmotor has to be supported.
- **Only** cable entries **"X"** and **"2"** are possible with the **DR63** motor. **Exception: Cable entry "3"** is also possible for DR63 **with IS plug connector**.
- The following cable entries are possible with **DRS71..BMG** motors with gear unit flange diameters of 160 mm and 200 mm:

Position of the terminal box	0° (R)	90° (B)	180° (L)	270° (T)
Possible cable entries	"X", "1", "3"	"X", "1", "3"	"1", "2", "3"	"X", "1", "3"

5.3 Key to the mounting position sheets

5.3.1 Symbols used

The following table shows the symbols used in the mounting position sheets and their meaning:

Symbol	Meaning
	Breather valve
	Oil level plug
	Oil drain plug

INFORMATION

Information on the illustrated shafts.

For gear units with solid shaft: On the mounting position sheets, the shafts and the flanges are illustrated on the A-side.

INFORMATION

SPIROPLAN® gear units in M4 are not dependent on the mounting position. However, mounting positions M1 to M6 are also shown for SPIROPLAN® gear units to assist you in working with this documentation.

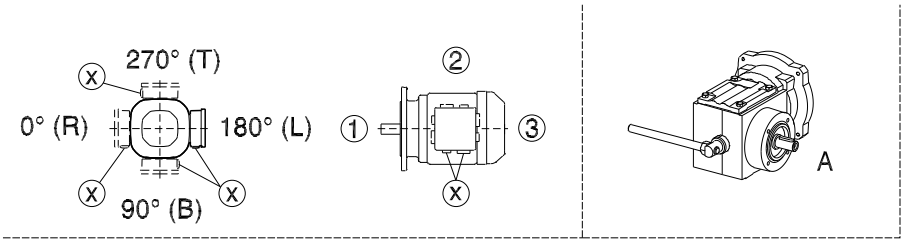
INFORMATION

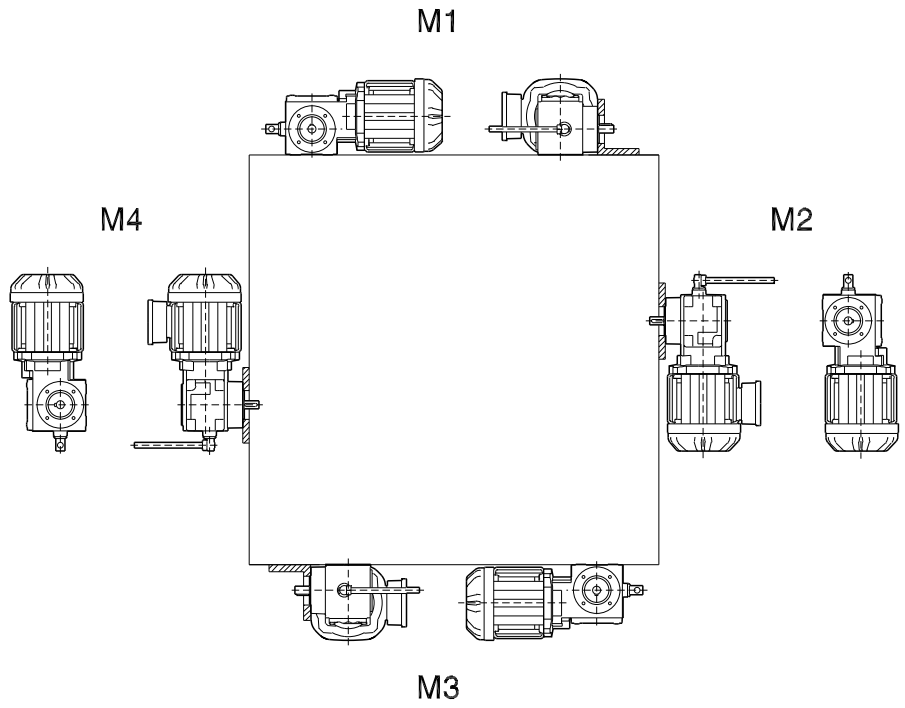
Notes on the illustrated motors.

Motors are only represented symbolically on the mounting position sheets.

5.4 HW10 DR..

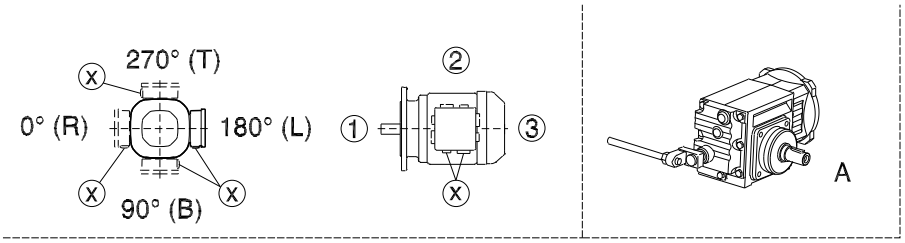
06 005 00 11

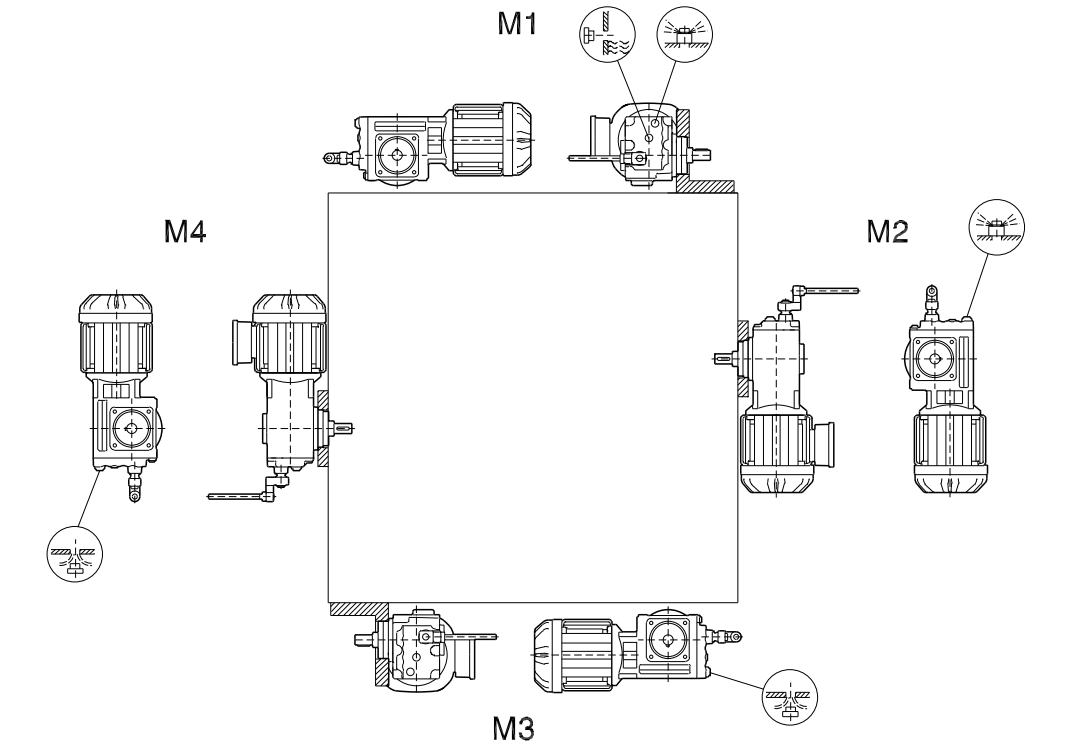


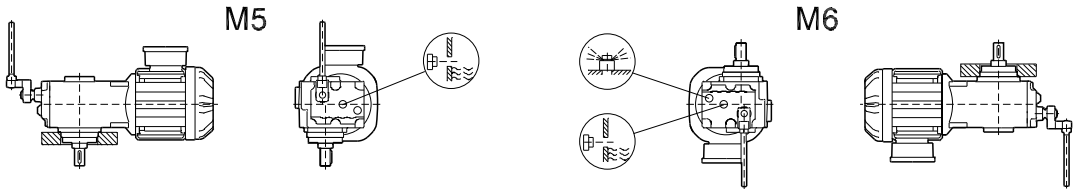


5.5 HW30 DR..

06 007 05 00





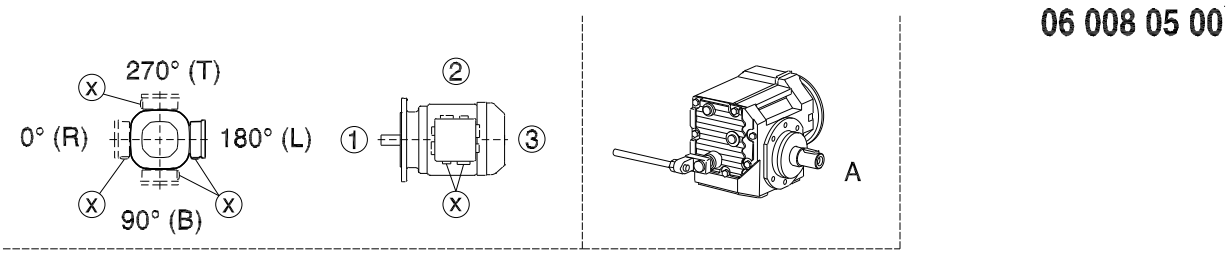


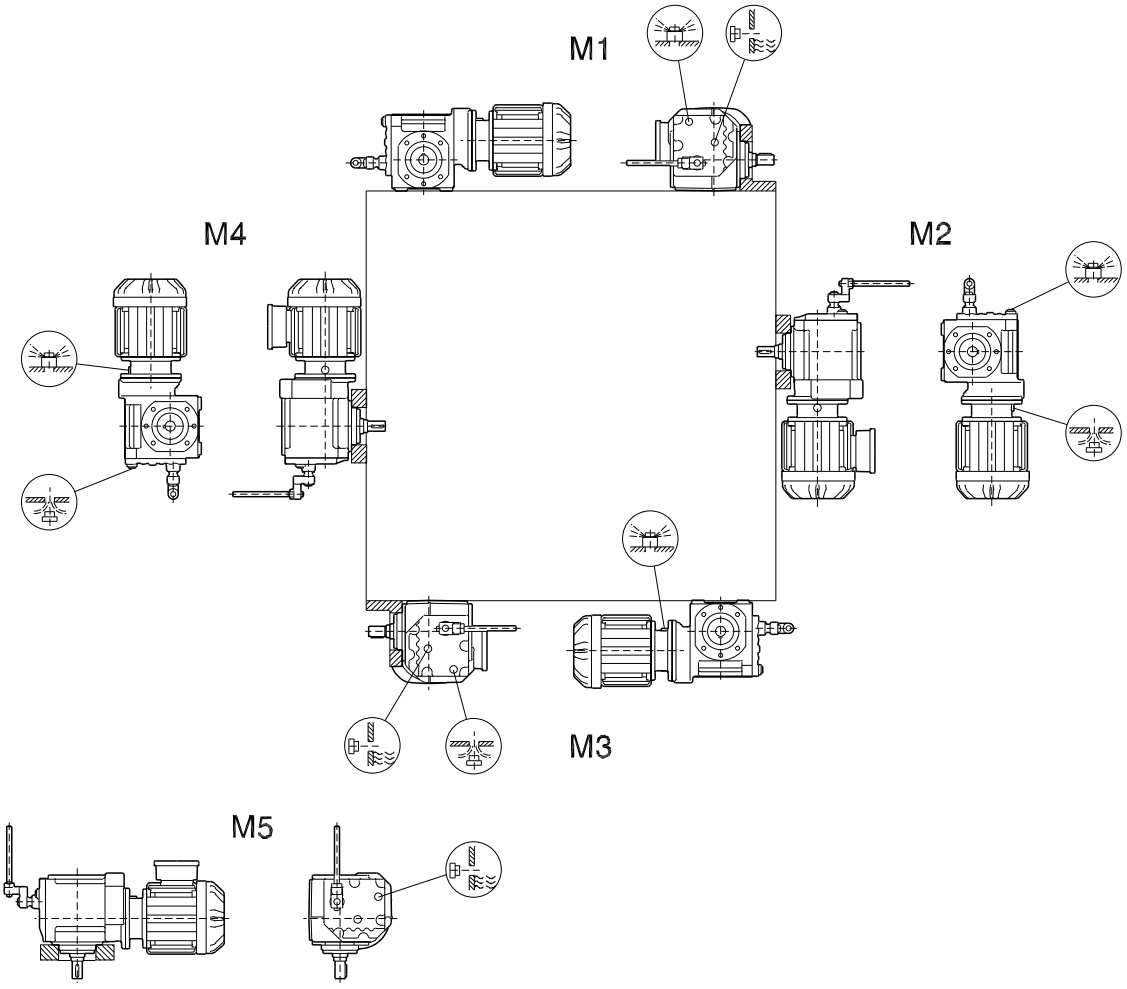
M3, M4, M5

M2, M3, M4

M1, M2, M5, M6

5.6 HS41 DR..





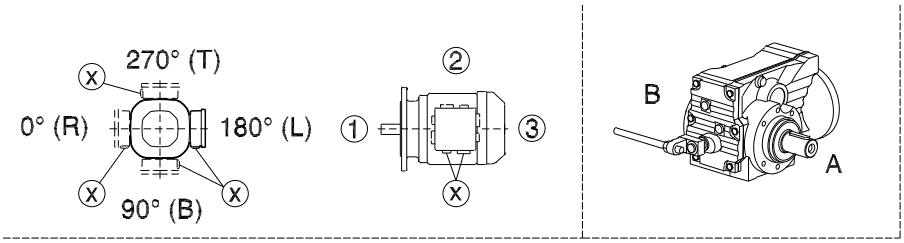
M5

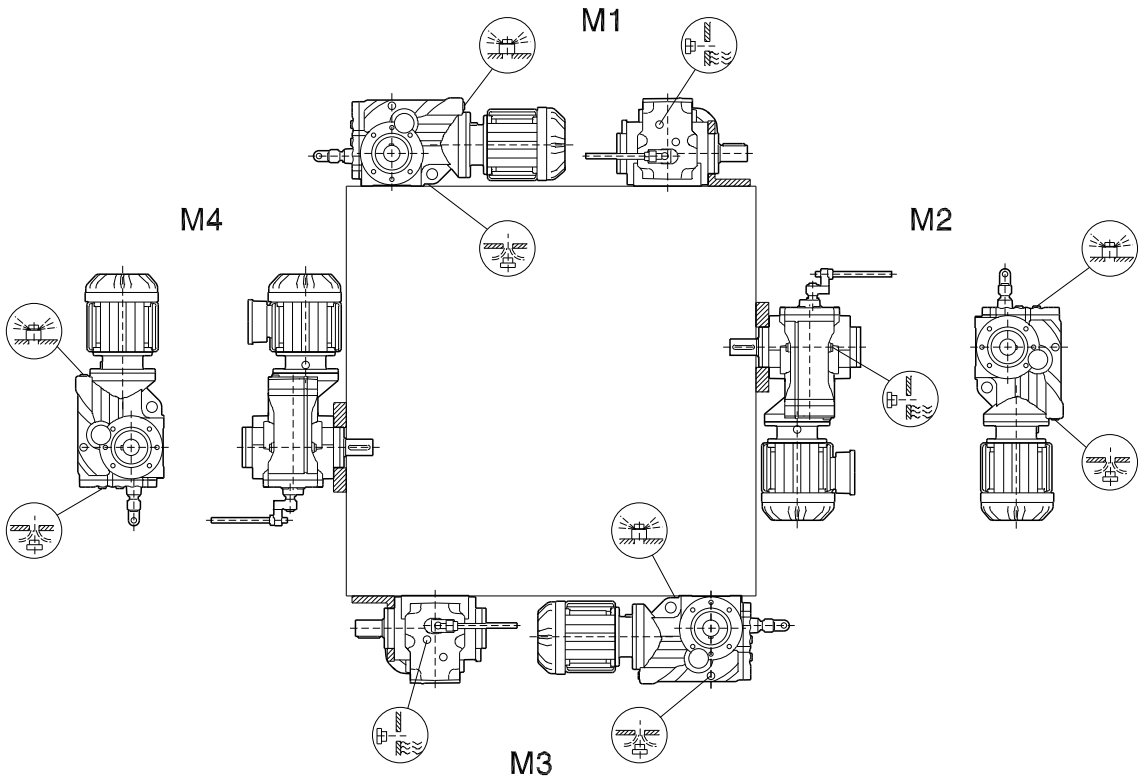
M2, M4

M1, M3, M5

5.7 HK37 DR..

06 006 00 11

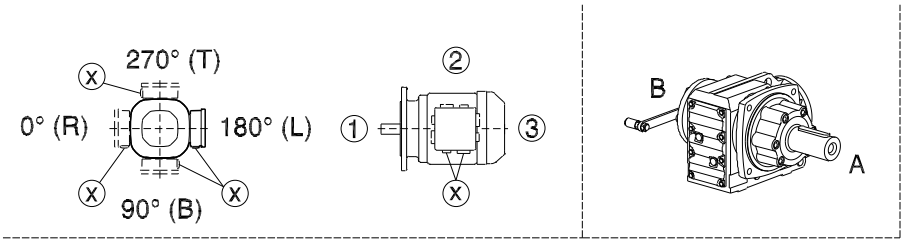


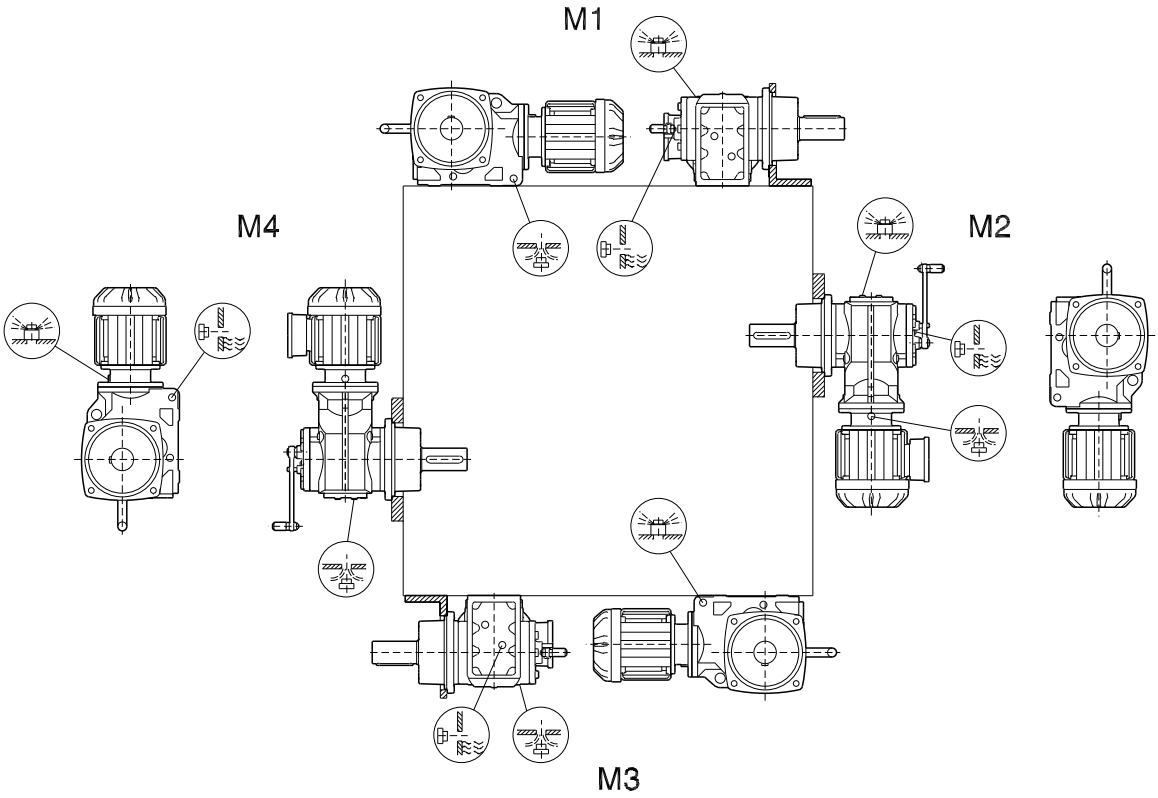


M4

5.8 HK40, HK50, HK60 DR..

06 009 05 00





6 Design and Operating Notes

6.1 Lubricants and fill quantities

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 specified when ordering the drive. You must adapt the lubricant fill in case of any subsequent changes made to the mounting position (see "Lubricant fill quantities").

6.1.1 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.

	Ambient temperature	Manufacturer	Type
Gear unit rolling bearings	-40 °C to +80 °C	Fuchs	Renolit CX-TOM 15
	-40 °C to +80 °C	Klüber	Petamo GHY 133 N
	-40 °C to +40 °C	Castrol	Obeen FS 2
	-20 °C to +40 °C	Fuchs	Plantogel 2S

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 (gear unit output end): Fill the cavities between the rolling elements two-thirds full with grease.

6.1.2 Lubricant table

The lubricant table on the following page shows the permitted lubricants for SEW-EURODRIVE gear units. Observe the following legend with regards 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: please consult SEW
2)	Special lubricant for SPIROPLAN® gear units only
3)	Recommendation: Select SEW $f_B \geq 1.2$
4)	Observe the critical starting behavior at low temperatures.
5)	Low-viscosity grease
6)	Ambient temperature
7)	Grease
	Lubricant for the food industry (food grade oil)
	Biodegradable oil (lubricant for agriculture, forestry, and water management)

Lubricant table

01 751 08 04

Gear unit	Note	6) Temperature range °C (-50 … +100)	DIN (ISO)	ISO,NLGI	Mobil®	Shell	bp	Klüber	Texaco	Castrol Tribol	Castrol Optimol	Fuchs	Total
R...		Standard -15 … +40	CLP (CC)	VG 220	Mobilgear 600 XP 220	Shell Omala S2 G 220	BP Energol GR-XP 220	Klüberoil GEM 1-220 N	Meropa 220	Tribol 1100/220	Optigear BM 220	Renolin CLP 220	Carter EP 220
		-20 … +80	CLP PG	VG 220	Mobil Glygoyle 220	Shell Omala S4 WE 220	BP Enersyn SG-XP 220	Klübersynth GH 6-220	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 S4 GX 220		Klübersynth GEM 4-220 N	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 S4 GX 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	Mobilgear 600 XP 150	Shell Omala S2 G 150	BP Energol GR-XP 150	Klüberoil GEM 1-150 N	Meropa 150	Tribol 1100/150	Optigear BM 100	Renolin CLP 150	Carter EP 150
F...	4)	-40 … +20	CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 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
S...(HS...)		Standard 0 … +40	CLP (CC)	VG 680	Mobilgear 600 XP 680	Shell Omala S2 G 680	BP Energol GR-XP 680	Klüberoil GEM 1-680 N	Meropa 680	Tribol 1100/680	Optigear BM 680	Renolin SEW 680	Carter EP 680
	1)	-20 … +80	CLP PG	VG 680	Mobil Glygoyle 680	Shell Omala S4 WE 680	BP Enersyn SG-XP 680	Klübersynth GH 6-680	Synlube CLP 680	Tribol 800/680	Optiflex A 680	Renolin PG 680	
	4)	-20 … +60	CLP HC	VG 460	Mobil SHC 634	Shell Omala S4 GX 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 S4 GX 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	Mobilgear 600 XP 150	Shell Omala S2 G 150	BP Energol GR-XP 150	Klüberoil GEM 1-150 N	Meropa 150	Tribol 1100/150	Optigear BM 150	Renolin CLP 150	Carter EP 150
	1)	-20 … +40	CLP PG	VG 220	Mobil Glygoyle 220	Shell Omala S4 WE 220	BP Enersyn SG-XP 220	Klübersynth GH 6-220	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 S4 GX 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
R...,K...(HK...), F...,S...(HS...)	4)	-10 … +40	CLPHC NSF H1	VG 460				Klüberoil 4UH1-460 N			Optileb GT 460	Cassida Fluid GL 460	
		-20 … +30		VG 220				Klüberoil 4UH1-220 N			Optileb GT 220	Cassida Fluid GL 220	
		-40 … 0		VG 68				Klüberoil 4UH1-68 N			Optileb HY 68	Cassida Fluid HF 68	
		-20 … +40	E	VG 460		Shell Naturelle Gear Fluid EP460		Klüberbio CA2-460				Plantogear 460 S	
W...(HW...)	2)	Standard -20 … +40	SEW PG	VG 460				Klüber SEW HT-460-5					
	4)	-40 … +10	API GL5	SAE 75W90 (~VG 100)	Mobil Synth Gear Oil 75 W90								
	2) 3)	-20 … +60	H1 PG	VG 460				Klübersynth UH1 6-460					
PS.F..		Standard -20 … +80	CLP PG	VG 220				Klübersynth GH 6-220					
	2) 3)	-20 … +60	H1 PG	VG 460				Klübersynth UH1 6-460					
		-40 … 0	CLP HC	VG 32	Mobil SHC 624								
PS.C..		Standard -10 … +40	CLP (CC)	VG 220	Mobilgear 600 XP 220								
	5)	-20 … +40	DIN 51 818	00	Mobillux EP 004								
	7)	-20 … +40	DIN 51 818	1				Klübersynth UH1 14-151					
		-40 … 0	CLP HC	VG 32	Mobil SHC 624								
BS.F..		Standard -20 … +60	CLP PG	VG 220				Klübersynth GH 6-220					
	2) 3)	-20 … +60	H1 PG	VG 460				Klübersynth UH1 6-460					

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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. Check the **oil level plug for the exact oil quantity**.

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

Gear unit type	Fill quantity in liters					
	M1	M2	M3	M4	M5	M6
HW10	0.16					
HW30	0.50	0.50	0.50	0.55	0.50	0.50
HS41	1.00	1.00	0.80	1.35	1.35	–
HK37	1.40	1.00	0.80	1.57	1.10	1.10
HK40	1.60	1.60	1.75	2.20	–	–
HK50	2.40	2.60	2.70	3.40	–	–
HK60	2.70	2.90	3.10	3.90	–	–

7 Important Notes on Selection Tables and Dimension Drawings

7.1 Information on the selection tables

P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra}[1)] [N]	$F_{Ra}90$[1)] [N]	$F_{Ra}270$[1)] [N]	SEW-f_B					m [kg]	
0.18	**10**	172	131.87	18400	18500	18500	2.3						
	11	158	121.48	18400	18500	18500	2.5	**HK**	**40**	**DR**	**63M4**	29	63
	13	136	104.37	18500	18500	18500	2.9						

1) Overhung load for foot-mounted gear unit with solid shaft. Overhung loads for other gear unit types on request.

P_m	Nominal power driving motor in kW
n_a	Output speed, in rpm
M_a	Permitted output torque for continuous duty, in Nm
i	Gear unit reduction ratio
F_{Ra}	Permitted overhung load at the output shaft for continuous duty, any force application angle, in N
$F_{Ra}90$	Permitted overhung load at the output shaft for continuous duty, 90° force application angle, in N
$F_{Ra}270$	Permitted overhung load at the output shaft for continuous duty, 270° force application angle, in N
SEW f_B	SEW service factor
m	Weight, in kg

The selection tables list the gear units with the common service factors. If your application requires gear units with another service factor, please contact SEW-EURODRIVE.

7.2 Dimension sheet information

7.2.1 Scope of delivery

= Standard parts supplied by SEW-EURODRIVE.

= Standard parts not supplied by SEW-EURODRIVE.

7.2.2 Tolerances

Shaft heights

The following tolerances apply to the indicated dimensions:

h	≤ 250 mm	≤ -0.5 mm

Shaft ends

Diameter tolerance:

Ø	≤ 50 mm	→ ISO k6
Ø	> 50 mm	→ ISO m6
Keys:		according to DIN 6885 (domed type)
Center bores		according to DIN 332, shape DR

Flanges

Tolerance for centering shoulder diameter:

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

For helical-worm, helical-bevel, and SPIROPLAN® gear units, up to 2 different flange dimensions are available per size. The respective dimension drawings will show the flanges approved for each size.

7.2.3 Lifting eyes

SPIROPLAN® HW10 and HW30 gearmotors are delivered without special transportation fixtures. All other gear units and gearmotors are equipped with cast-on suspension eye lugs or screw-on suspension eye lugs.

Gear unit/motor type	Screw-on eyebolts	cast-on eyebolts
HW10	–	–
HW30	•	–
HS41	•	–
HK37	–	•
HK40	–	•
HK50	–	•
HK60	–	•

7.2.4 Breather valves

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

7.3 Gearmotor dimensions

7.3.1 Motor options

The motor dimensions may change when installing motor options. Refer to the dimension drawings of the motor options.

7.3.2 Special designs

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

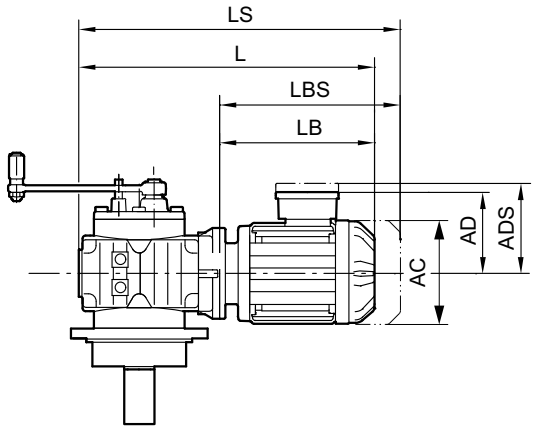
7.3.3 EN 50347

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.

7.3.4 Gearmotor dimensions

The dimensions of the gearmotors are described below:



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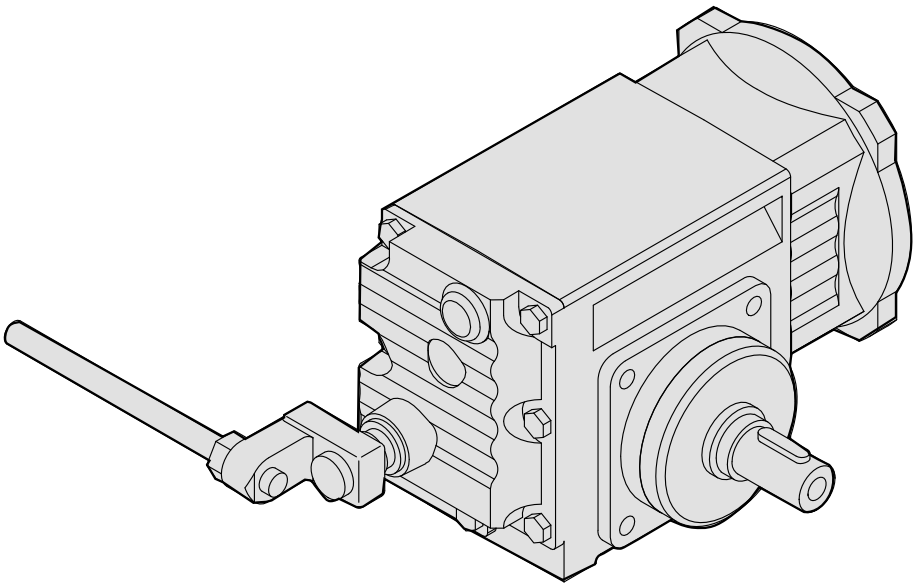
L	Total length of gearmotor	AD	Center of motor shaft to top part of terminal box
LS	Total length of gearmotor including brake	ADS	Center of brakemotor shaft to top part of terminal box
LB	Length of motor	AC	Diameter of motor
LBS	Length of brakemotor		

INFORMATION

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

8 SPIROPLAN® HW.. Gear Units

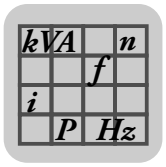
8.1 HW.. variants



HW..

8.2 Selection table HW10 and HW30 [Nm]

P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
0.09	**79**	8.4	16.50	2290	2500	2500	2.4						
	91	7.6	14.33	2290	2500	2500	2.9	**HW**	**10**	**DT**	**56M4**	6.2	51
	127	5.8	10.25	2300	2440	2410	2.2						
	159	4.8	8.20	2210	2270	2230	2.5						
0.12	**18**	28	75.00	5600	5600	5600	2.5						
	23	26	60.00	5600	5600	5600	2.7	**HW**	**30**	**DR**	**63S4**	13	52
	29	22	48.00	5600	5600	5600	3.1						
	35	20	39.00	5600	5600	5600	3.4						
0.12	**84**	11	16.50	2280	2500	2500	1.90						
	96	9.5	14.33	2280	2500	2500	2.3						
	135	7.3	10.25	2290	2400	2360	1.80	**HW**	**10**	**DR**	**63S4**	6.8	51
	168	6.0	8.20	2150	2220	2180	2.0						
	210	5.0	6.57	2010	2060	2030	2.4						
0.12	**79**	11	16.50	2270	2500	2500	1.80						
	91	10	14.33	2280	2500	2500	2.2						
	127	7.7	10.25	2290	2450	2400	1.70	**HW**	**10**	**DT**	**56L4**	6.2	51
	159	6.3	8.20	2190	2270	2230	1.90						
	198	5.3	6.57	2050	2100	2070	2.3						
0.18	**18**	44	75.00	5600	5600	5600	1.60						
	22	40	60.00	5600	5600	5600	1.75						
	28	35	48.00	5600	5600	5600	2.00						
	34	32	39.00	5600	5600	5600	2.2						
	41	27	32.50	5560	5600	5600	2.6						
	48	25	27.50	5260	5570	5440	2.8	**HW**	**30**	**DR**	**63M4**	13	52
	54	23	24.50	5070	5360	5250	3.0						
	68	20	19.50	4730	4970	4880	3.6						
	81	17	16.33	4480	4680	4600	3.5						
	92	15	14.33	4300	4480	4410	3.9						
0.18	**80**	17	16.50	2240	2500	2500	1.20						
	92	15	14.33	2250	2500	2500	1.50						
	129	11	10.25	2270	2450	2380	1.15	**HW**	**10**	**DR**	**63M4**	6.8	51
	161	9.4	8.20	2150	2260	2200	1.30						
	201	7.8	6.57	2020	2090	2050	1.55						
0.25	**17**	62	75.00	4700	5600	5600	1.15						
	22	57	60.00	5020	5600	5600	1.25						
	27	50	48.00	5420	5600	5600	1.40						
	33	45	39.00	5600	5600	5600	1.55						
	40	38	32.50	5480	5600	5600	1.85						
	47	35	27.50	5180	5600	5440	2.00						
	53	33	24.50	5000	5400	5240	2.1	**HW**	**30**	**DR**	**63L4**	14	52
	67	28	19.50	4670	5010	4880	2.5						
	80	24	16.33	4440	4720	4610	2.5						
	91	22	14.33	4270	4510	4420	2.8						
	127	16	10.25	3850	4020	3950	3.1						
	159	13	8.20	3610	3730	3670	3.0						
0.25	**79**	23	16.50	2160	2440	2440	0.85						
	91	21	14.33	2190	2460	2460	1.05						
	127	16	10.25	2240	2470	2370	0.80	**HW**	**10**	**DR**	**63L4**	7.5	51
	159	13	8.20	2120	2280	2200	0.90						
	198	11	6.57	2000	2110	2050	1.10						



P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
0.37	**18**	86	75.00	3080	5170	5600	0.80						
	23	80	60.00	3540	5600	5600	0.90						
	29	70	48.00	4100	5600	5600	1.00						
	35	63	39.00	4580	5600	5600	1.10						
	42	53	32.50	5200	5600	5590	1.30						
	50	49	27.50	4920	5530	5270	1.40	**HW**	**30**	**DRS**	**71S4**	16	52
	56	46	24.50	4760	5320	5090	1.55						
	71	39	19.50	4460	4930	4740	1.80						
	84	33	16.33	4250	4640	4490	1.80						
	96	30	14.33	4100	4440	4310	2.00						
	135	23	10.25	3720	3960	3850	2.2						
	168	19	8.20	3490	3670	3580	2.1						
0.55	**42**	79	32.50	3900	5600	5490	0.90						
	50	73	27.50	4150	5570	5170	0.95						
	56	68	24.50	4510	5360	5000	1.05						
	71	58	19.50	4270	4970	4680	1.20						
	84	50	16.33	4090	4670	4440	1.20	**HW**	**30**	**DRS**	**71M4**	17	52
	96	45	14.33	3960	4460	4270	1.35						
	135	34	10.25	3620	3970	3820	1.45						
	168	28	8.20	3420	3680	3540	1.45						

8.3 HW10 [mm]

HW10..

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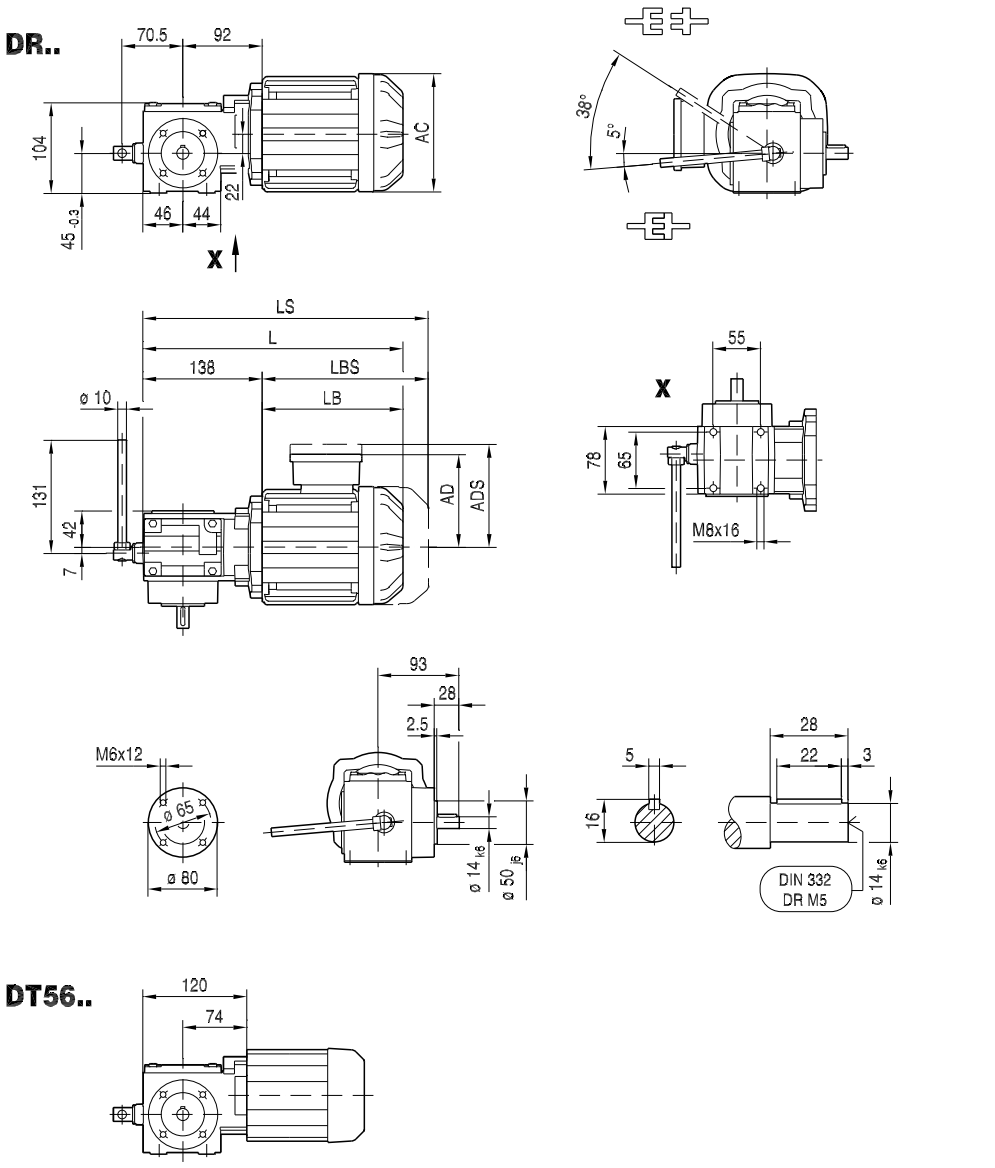
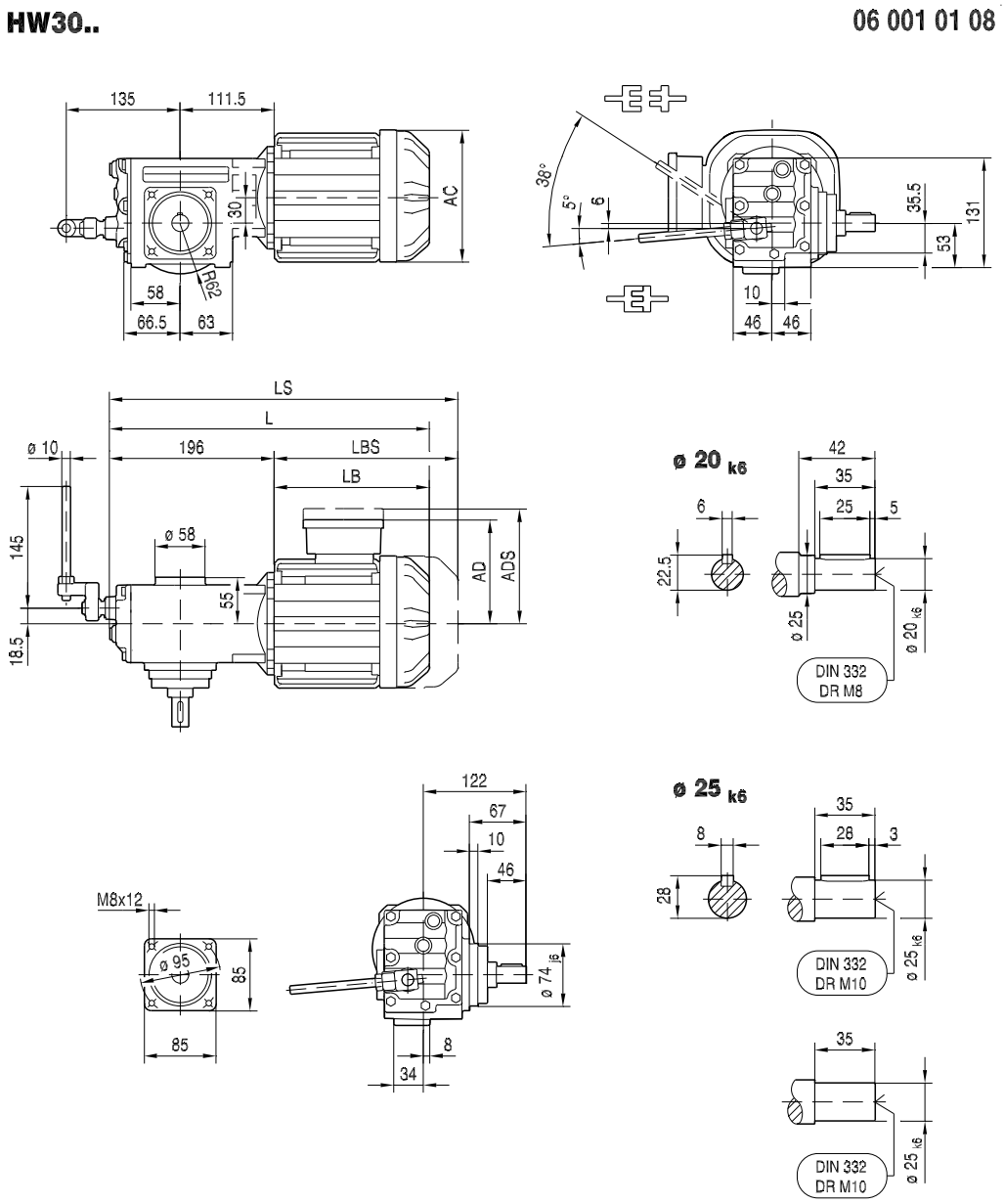


DT56..

(→ 45)	DT56..	DR63..						
AC	109	132						
AD	87	105						
ADS	87	105						
L	256	287						
LS	292	342						
LB	136	149						
LBS	172	204						

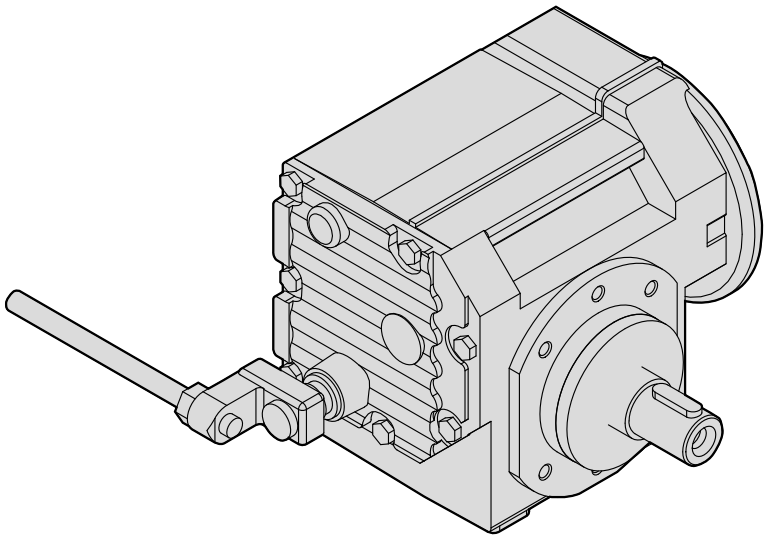
8.4 HW30 [mm]



(→ 45)	DR63..	DR71S	DR71M					
AC	132	139	139					
AD	105	119	119					
ADS	105	129	129					
L	345	356	381					
LS	400	424	449					
LB	149	160	185					
LBS	204	228	253					

9 HS.. Helical-Worm Gear Units

9.1 HS.. variants

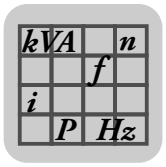


HS41

9.2 Selection table HS41 [Nm]

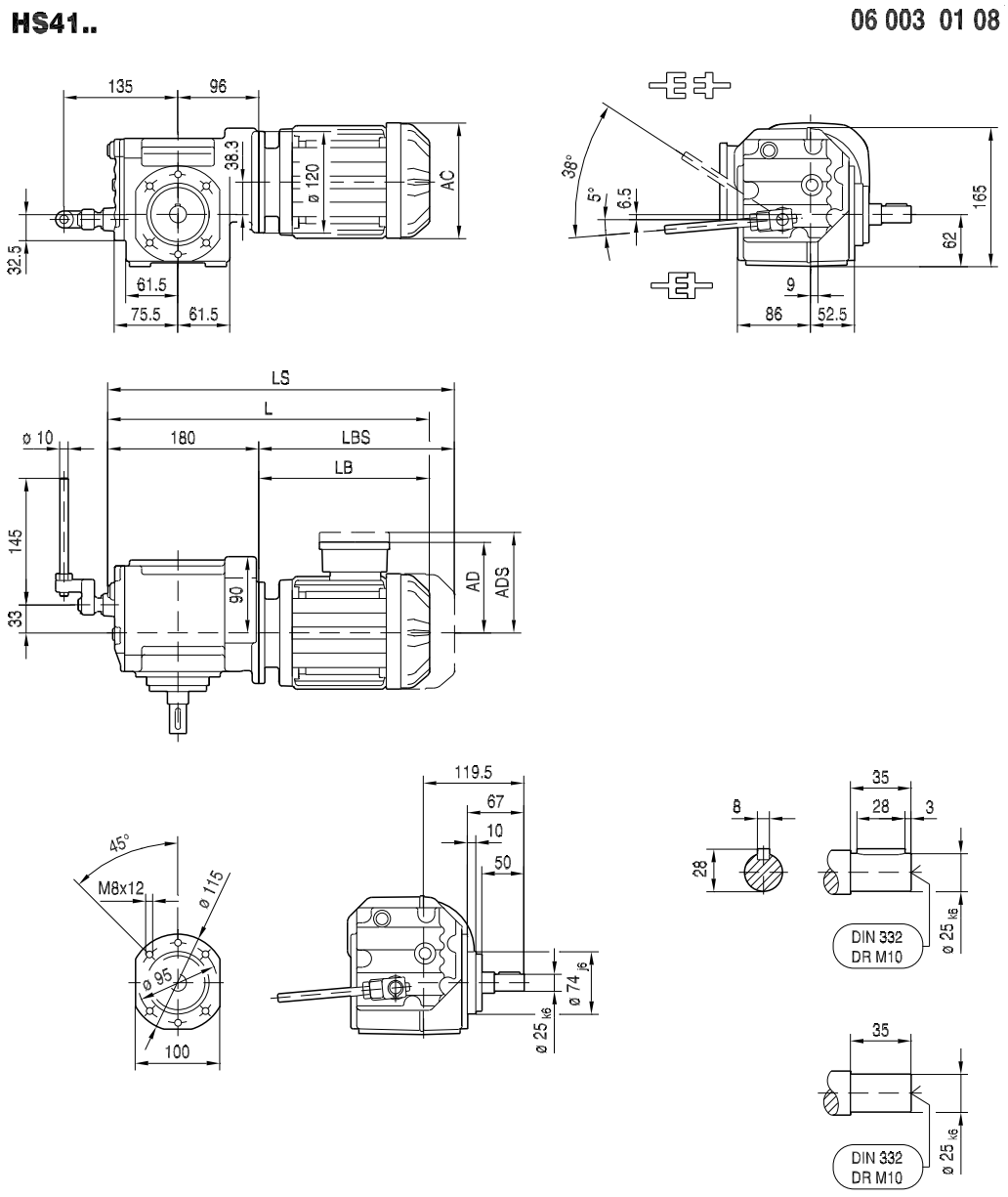
P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
0.12	**6.9**	95	201.00	10000	10000	10000	1.90						
	7.5	89	184.80	10000	10000	10000	2.0						
	8.7	77	158.12	10000	10000	10000	2.3						
	10	68	137.05	10000	10000	10000	2.6						
	11	64	128.10	10000	10000	10000	2.8	**HS**	**41**	**DR**	**63S4**	17	57
	12	57	110.73	10000	10000	10000	3.2						
	15	49	94.08	10000	10000	10000	3.7						
	16	44	84.00	10000	10000	10000	4.0						
0.18	**6.6**	149	201.00	9880	10000	9940	1.20						
	7.1	138	184.80	9900	10000	9960	1.30						
	8.4	121	158.12	9940	10000	10000	1.50						
	9.6	106	137.05	9970	10000	10000	1.70						
	10	100	128.10	9990	10000	10000	1.80						
	12	88	110.73	10000	10000	10000	2.0						
	14	77	94.08	10000	10000	10000	2.4						
	16	69	84.00	10000	10000	10000	2.6	**HS**	**41**	**DR**	**63M4**	17	57
	18	60	71.75	10000	10000	10000	2.9						
	19	69	69.39	10000	10000	10000	2.6						
	20	57	67.20	10000	10000	10000	3.1						
	21	64	63.80	10000	10000	10000	2.8						
	24	55	54.59	10000	10000	10000	3.2						
	28	48	47.32	10000	10000	10000	3.7						
	30	46	44.22	10000	10000	10000	4.0						
0.25	**6.5**	205	201.00	9710	9940	9800	0.85						
	7.0	194	184.80	9750	9970	9840	0.95						
	8.2	170	158.12	9820	10000	9900	1.05						
	9.5	150	137.05	9870	10000	9940	1.20						
	10	141	128.10	9900	10000	9960	1.25						
	12	124	110.73	9940	10000	9990	1.45						
	14	108	94.08	9970	10000	10000	1.65						
	15	98	84.00	9990	10000	10000	1.85						
	18	85	71.75	10000	10000	10000	2.1						
	19	97	69.39	9970	10000	10000	1.85						
	19	80	67.20	10000	10000	10000	2.2						
	20	90	63.80	9980	10000	10000	2.0	**HS**	**41**	**DR**	**63L4**	18	57
	24	78	54.59	10000	10000	10000	2.3						
	27	68	47.32	10000	10000	10000	2.6						
	29	64	44.22	10000	10000	10000	2.8						
	34	56	38.23	10000	10000	10000	3.2						
	40	48	32.48	10000	10000	10000	3.5						
	45	43	29.00	10000	10000	10000	3.8						
	52	37	24.77	10000	10000	10000	4.2						
	56	35	23.20	10000	10000	10000	4.3						
	64	33	20.33	10000	10000	10000	3.5						
	74	28	17.62	10000	10000	10000	4.0						

P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
0.37	**10**	210	137.05	9710	9940	9800	0.85						
	11	198	128.10	9740	9970	9830	0.90						
	12	175	110.73	9810	10000	9890	1.05						
	15	151	94.08	9870	10000	9940	1.20						
	16	137	84.00	9910	10000	9970	1.30						
	19	119	71.75	9950	10000	10000	1.50						
	20	136	69.39	9870	10000	9920	1.30						
	21	112	67.20	9960	10000	10000	1.55						
	22	126	63.80	9900	10000	9940	1.45						
	25	109	54.59	9940	10000	9980	1.65						
	29	96	47.32	9970	10000	10000	1.90	**HS**	**41**	**DRS**	**71S4**	20	57
	31	90	44.22	9980	10000	10000	2.0						
	36	78	38.23	10000	10000	10000	2.3						
	42	67	32.48	10000	10000	10000	2.5						
	48	60	29.00	10000	10000	10000	2.7						
	56	52	24.77	10000	10000	10000	3.0						
	59	49	23.20	10000	10000	10000	3.1						
	68	46	20.33	10000	10000	10000	2.5						
	78	40	17.62	9900	10000	10000	2.9						
	84	37	16.47	9780	10000	10000	3.1						
	97	32	14.24	9520	10000	10000	3.6						
0.55	**15**	225	94.08	9670	9920	9770	0.80						
	16	200	84.00	9730	9960	9820	0.90						
	19	177	71.75	9810	10000	9890	1.00						
	20	200	69.39	8830	9900	9750	0.90						
	21	167	67.20	9840	10000	9910	1.05						
	22	188	63.80	9100	9940	9790	0.95						
	25	162	54.59	9470	9980	9860	1.10						
	29	142	47.32	9700	10000	9910	1.25						
	31	133	44.22	9780	10000	9930	1.35						
	36	116	38.23	9880	10000	9970	1.55						
	42	100	32.48	9910	10000	10000	1.70						
	48	90	29.00	9880	10000	10000	1.85	**HS**	**41**	**DRS**	**71M4**	21	57
	56	77	24.77	9790	10000	10000	2.0						
	59	73	23.20	9730	10000	10000	2.1						
	68	68	20.33	8770	10000	9790	1.70						
	78	59	17.62	8710	10000	9630	1.95						
	84	56	16.47	8660	10000	9540	2.1						
	97	48	14.24	8540	10000	9330	2.4						
	114	41	12.10	8370	9620	9060	2.8						
	128	37	10.80	8230	9310	8860	3.1						
	150	32	9.23	8020	8910	8570	3.6						
	160	30	8.64	7920	8740	8450	3.8						



P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
0.75	**25**	192	56.61	8800	9980	9850	0.85						
	26	215	54.59	6440	9870	9380	0.80						
	30	191	47.32	7040	9930	9790	0.95						
	32	180	44.22	7280	9950	9820	1.00						
	37	157	38.23	7690	10000	9880	1.15						
	43	134	32.48	8020	10000	9930	1.25						
	48	121	29.00	8180	10000	9960	1.35						
	57	104	24.77	8320	10000	9990	1.50						
	60	98	23.20	8350	10000	10000	1.55						
	69	91	20.33	7260	10000	8440	1.25	**HS**	**41**	**DRS**	**80S4**	23	57
	72	83	19.54	8380	10000	10000	1.75						
	79	80	17.62	7390	10000	8480	1.45						
	85	75	16.47	7430	10000	8480	1.55						
	98	65	14.24	7470	9920	8420	1.75						
	116	55	12.10	7450	9490	8300	2.1						
	130	50	10.80	7400	9200	8180	2.3						
	152	43	9.23	7300	8800	8000	2.7						
	162	40	8.64	7250	8640	7910	2.8						
	192	34	7.28	7090	8230	7670	3.0						
1.1	**43**	196	32.48	4760	9920	7190	0.85						
	49	176	29.00	5250	9960	7660	0.95						
	57	152	24.77	5790	10000	8110	1.05						
	61	142	23.20	5980	10000	8240	1.05						
	69	133	20.33	3400	9920	4400	0.85						
	72	121	19.54	6360	10000	8450	1.20						
	80	116	17.62	4580	9960	5700	1.00						
	86	109	16.47	5060	9970	6200	1.05	**HS**	**41**	**DRS**	**80M4**	26	57
	99	94	14.24	5620	9710	6720	1.20						
	117	81	12.10	5870	9310	6890	1.45						
	131	72	10.80	5980	9030	6950	1.60						
	153	62	9.23	6090	8660	6960	1.85						
	163	58	8.64	6110	8510	6950	1.95						
	194	49	7.28	6120	8120	6870	2.1						
1.5	**71**	167	19.54	4010	9980	6080	0.85						
	98	130	14.24	1410	9360	1960	0.90						
	115	111	12.10	2810	9110	3650	1.05						
	129	100	10.80	3620	8890	4540	1.15	**HS**	**41**	**DRS**	**90M4**	30	57
	151	86	9.23	4560	8540	5520	1.35						
	161	80	8.64	4790	8400	5740	1.40						
	192	68	7.28	5020	8030	5890	1.50						
2.2	**152**	125	9.23	0	8080	0	0.90						
	162	117	8.64	38	8000	57	0.95	**HS**	**41**	**DRS**	**90L4**	33	57
	192	99	7.28	1440	7780	1960	1.05						

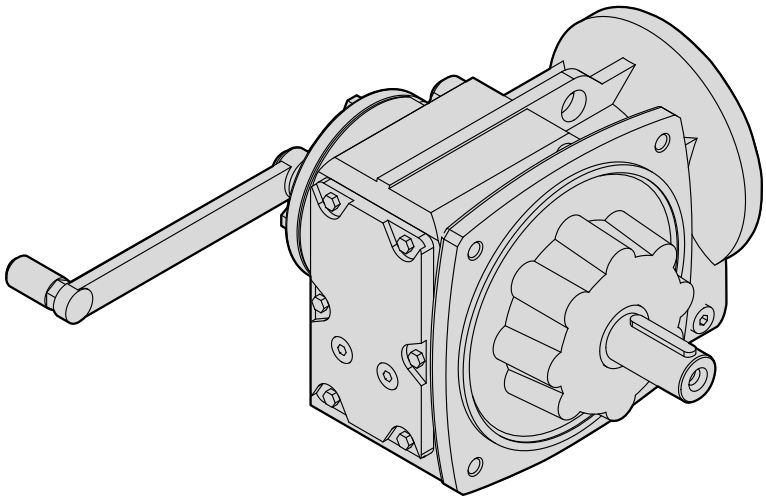
9.3 HS41 [mm]



(→ 45)	DR63..	DR71S	DR71M	DR80S	DR80M	DR90M	DR90L	
AC	132	139	139	156	156	179	179	
AD	105	119	119	128	128	140	140	
ADS	105	129	129	139	139	150	150	
L	371	382	407	417	448	452	472	
LS	426	450	475	498	529	545	565	
LB	191	202	227	237	268	272	292	
LBS	246	270	295	318	349	365	385	

10 HK.. Helical-Bevel Gear Units

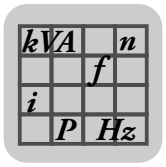
10.1 HK.. variants



HK..

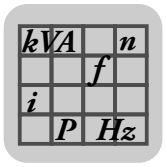
10.2 Selection table HK37, HK40, HK50, HK60 [Nm]

P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
0.12	**10**	110	131.87	18500	18500	18500	3.6	**HK**	**40**	**DR**	**63S4**	29	68
	11	101	121.48	18500	18500	18500	4.0						
	13	88	106.38	13400	13500	13400	1.70						
	14	81	97.81	13400	13500	13400	1.85						
	16	70	83.69	13400	13500	13500	2.2						
	19	60	72.54	13500	13500	13500	2.5	**HK**	**37**	**DR**	**63S4**	18	67
	20	56	67.80	13500	13500	13500	2.7						
	24	49	58.60	13500	13500	13500	3.1						
	28	41	49.79	13500	13500	13500	3.6						
0.18	**9.1**	189	145.14	25000	25000	25000	3.2	**HK**	**50**	**DR**	**63M4**	33	69
	11	161	123.85	25000	25000	25000	3.7						
	10	172	131.87	18400	18500	18500	2.3						
	11	158	121.48	18400	18500	18500	2.5						
	13	136	104.37	18500	18500	18500	2.9	**HK**	**40**	**DR**	**63M4**	29	68
	15	118	90.86	18500	18500	18500	3.4						
	16	111	85.12	18500	18500	18500	3.6						
	12	138	106.38	13300	13400	13300	1.10						
	14	127	97.81	13300	13400	13400	1.20						
	16	109	83.69	13400	13400	13400	1.40						
	18	94	72.54	13400	13500	13400	1.60						
	19	88	67.80	13400	13500	13400	1.70						
	23	76	58.60	13400	13500	13400	1.95	**HK**	**37**	**DR**	**63M4**	18	67
	27	65	49.79	13500	13500	13500	2.3						
	30	58	44.46	13500	13500	13500	2.6						
	35	49	37.97	13500	13500	13500	3.0						
	37	46	35.57	13500	13500	13500	3.2						
	44	39	29.96	13500	13500	13500	3.8						
0.25	**9.0**	265	144.79	40000	40000	40000	3.1	**HK**	**60**	**DR**	**63L4**	45	70
	11	225	123.54	40000	40000	40000	3.6						
	9.0	265	145.14	25000	25000	25000	2.2						
	10	225	123.85	25000	25000	25000	2.6						
	12	199	108.29	25000	25000	25000	3.0	**HK**	**50**	**DR**	**63L4**	34	69
	13	189	102.88	25000	25000	25000	3.2						
	14	166	90.26	25000	25000	25000	3.6						
	9.9	240	131.87	18300	18400	18500	1.65						
	11	220	121.48	18300	18400	18500	1.80						
	12	192	104.37	18400	18400	18500	2.1						
	14	167	90.86	18400	18500	18500	2.4						
	15	156	85.12	18400	18500	18500	2.6	**HK**	**40**	**DR**	**63L4**	29	68
	17	138	75.20	18400	18500	18500	2.9						
	19	128	69.84	18500	18500	18500	3.1						
	21	116	63.30	18500	18500	18500	3.4						
	23	104	56.83	18500	18500	18500	3.8						
	13	180	97.81	13200	13300	13300	0.85						
	16	154	83.69	13300	13400	13300	1.00						
	18	133	72.54	13300	13400	13300	1.15						
	19	124	67.80	13300	13400	13400	1.20						
	22	108	58.60	13400	13400	13400	1.40						
	26	91	49.79	13400	13500	13400	1.65	**HK**	**37**	**DR**	**63L4**	19	67
	29	82	44.46	13400	13500	13400	1.85						
	34	70	37.97	13400	13500	13500	2.2						
	37	65	35.57	13500	13500	13500	2.3						
	43	55	29.96	13500	13500	13500	2.7						
	45	53	28.83	13500	13500	13500	4.0						



P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
0.37	**9.5**	370	144.79	40000	40000	40000	2.2						
	11	315	123.54	40000	40000	40000	2.6						
	13	275	108.03	40000	40000	40000	3.0	**HK**	**60**	**DRS**	**71S4**	47	70
	13	260	102.62	40000	40000	40000	3.1						
	15	230	90.04	40000	40000	40000	3.6						
	9.5	370	145.14	25000	25000	25000	1.60						
	11	315	123.85	25000	25000	25000	1.90						
	13	275	108.29	25000	25000	25000	2.2						
	13	260	102.88	25000	25000	25000	2.3						
	15	230	90.26	25000	25000	25000	2.6	**HK**	**50**	**DRS**	**71S4**	35	69
	18	196	76.56	25000	25000	25000	3.1						
	20	177	69.12	25000	25000	25000	3.4						
	23	156	60.81	25000	25000	25000	3.8						
	10	335	131.87	18100	18200	18500	1.20						
	11	310	121.48	18100	18300	18500	1.30						
	13	265	104.37	18200	18300	18500	1.50						
	15	230	90.86	18300	18400	18500	1.70						
	16	215	85.12	18300	18400	18500	1.85						
	18	192	75.20	18400	18400	18500	2.1						
	20	179	69.84	18400	18500	18500	2.2	**HK**	**40**	**DRS**	**71S4**	31	68
	22	162	63.30	18400	18500	18500	2.5						
	24	146	56.83	18400	18500	18500	2.8						
	28	125	48.95	18500	18500	18500	3.2						
	30	118	46.03	18500	18500	18500	3.4						
	35	101	39.61	18500	18500	18500	3.9						
	19	186	72.54	13200	13300	13200	0.80						
	20	174	67.80	13200	13400	13300	0.85						
	24	150	58.60	13300	13400	13300	1.00						
	28	128	49.79	13300	13400	13400	1.20						
	31	114	44.46	13400	13400	13400	1.30						
	36	97	37.97	13400	13500	13400	1.55	**HK**	**37**	**DRS**	**71S4**	21	67
	39	91	35.57	13400	13500	13400	1.65						
	46	77	29.96	13400	13500	13400	1.95						
	48	74	28.83	13400	13500	13400	2.8						
	55	64	24.99	13500	13500	13500	3.3						
	59	60	23.36	13500	13500	13500	3.5						
0.55	**9.5**	550	144.79	40000	40000	40000	1.50						
	11	470	123.54	40000	40000	40000	1.75						
	13	410	108.03	40000	40000	40000	2.00						
	13	390	102.62	40000	40000	40000	2.1						
	15	340	90.04	40000	40000	40000	2.4	**HK**	**60**	**DRS**	**71M4**	48	70
	18	290	76.37	40000	40000	40000	2.8						
	20	260	68.95	40000	40000	40000	3.1						
	23	230	60.66	40000	40000	40000	3.6						
	24	215	57.28	40000	40000	40000	3.8						
	9.5	550	145.14	25000	25000	25000	1.10						
	11	470	123.85	25000	25000	25000	1.25						
	13	410	108.29	25000	25000	25000	1.45						
	13	390	102.88	25000	25000	25000	1.55						
	15	340	90.26	25000	25000	25000	1.75						
	18	290	76.56	25000	25000	25000	2.1	**HK**	**50**	**DRS**	**71M4**	37	69
	20	260	69.12	25000	25000	25000	2.3						
	23	230	60.81	25000	25000	25000	2.6						
	24	215	57.42	25000	25000	25000	2.8						
	28	186	48.89	25000	25000	25000	3.2						
	31	169	44.43	25000	25000	25000	3.6						

P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
0.55	**10**	500	131.87	17700	17900	18200	0.80						
	11	460	121.48	17800	18000	18300	0.85						
	13	395	104.37	17900	18100	18400	1.00						
	15	345	90.86	18100	18200	18400	1.15						
	16	320	85.12	18100	18300	18500	1.25						
	18	285	75.20	18200	18300	18500	1.40						
	20	265	69.84	18200	18300	18500	1.50						
	22	240	63.30	18300	18400	18500	1.65	**HK**	**40**	**DRS**	**71M4**	32	68
	24	215	56.83	18300	18400	18500	1.85						
	28	186	48.95	18400	18500	18500	2.2						
	30	175	46.03	18400	18500	18500	2.3						
	35	151	39.61	18400	18500	18500	2.6						
	39	135	35.39	18500	18500	18500	3.0						
	44	119	31.30	18200	18500	18500	3.4						
	47	112	29.32	17900	18500	18100	3.6						
	31	169	44.46	13200	13400	13300	0.90						
	36	144	37.97	13300	13400	13300	1.05						
	39	135	35.57	13300	13400	13300	1.10						
	46	114	29.96	13400	13400	13400	1.30						
	48	110	28.83	13400	13400	13400	1.90						
	55	95	24.99	13400	13500	13400	2.2						
	59	89	23.36	13400	13500	13400	2.4	**HK**	**37**	**DRS**	**71M4**	22	67
	68	77	20.19	13000	13100	13400	2.7						
	80	65	17.15	12400	12600	12900	3.2						
	90	58	15.31	12100	12200	12500	3.6						
	114	46	12.14	11300	11400	11700	3.1						
	132	40	10.49	10900	11000	11200	3.6						
0.75	**11**	630	123.54	40000	40000	40000	1.30						
	13	550	108.03	40000	40000	40000	1.50						
	14	525	102.62	40000	40000	40000	1.55						
	16	460	90.04	40000	40000	40000	1.80						
	18	390	76.37	40000	40000	40000	2.1						
	20	350	68.95	40000	40000	40000	2.3	**HK**	**60**	**DRS**	**80S4**	51	70
	23	310	60.66	40000	40000	40000	2.6						
	24	290	57.28	40000	40000	40000	2.8						
	29	245	48.77	40000	40000	40000	3.3						
	32	225	44.32	40000	40000	40000	3.6						
	11	630	123.85	25000	25000	25000	0.95						
	13	550	108.29	25000	25000	25000	1.10						
	14	525	102.88	25000	25000	25000	1.15						
	16	460	90.26	25000	25000	25000	1.30						
	18	390	76.56	25000	25000	25000	1.55						
	20	350	69.12	25000	25000	25000	1.70						
	23	310	60.81	25000	25000	25000	1.95	**HK**	**50**	**DRS**	**80S4**	39	69
	24	290	57.42	25000	25000	25000	2.0						
	29	250	48.89	25000	25000	25000	2.4						
	32	225	44.43	25000	25000	25000	2.6						
	36	197	38.49	25000	25000	25000	3.0						
	39	183	35.70	25000	25000	25000	3.3						
	46	155	30.28	25000	25000	25000	3.9						

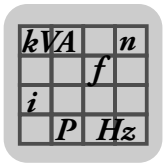


P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
0.75	**15**	460	90.86	17800	18000	18300	0.85						
	16	435	85.12	17800	18000	18300	0.90						
	19	380	75.20	18000	18100	18400	1.05						
	20	355	69.84	18000	18200	18400	1.10						
	22	320	63.30	18100	18300	18500	1.25						
	25	290	56.83	18200	18300	18500	1.40						
	29	250	48.95	18300	18400	18500	1.60						
	30	235	46.03	18300	18400	18500	1.70	**HK**	**40**	**DRS**	**80S4**	35	68
	35	200	39.61	18300	18400	18500	1.95						
	40	181	35.39	18400	18500	18500	2.2						
	45	160	31.30	17900	18500	18300	2.5						
	48	150	29.32	17600	18400	17900	2.7						
	54	132	25.91	17000	17700	17300	3.0						
	58	123	24.06	16700	17300	17000	3.2						
	64	112	21.81	16300	16800	16500	3.6						
	72	100	19.58	15800	16300	16000	4.0						
	39	182	35.57	13200	13300	13200	0.80						
	47	153	29.96	13300	13400	13300	1.00						
	49	148	28.83	13300	13400	13300	1.40						
	56	128	24.99	13300	13400	13400	1.65						
	60	120	23.36	13100	13300	13400	1.75						
	69	103	20.19	12700	12900	13400	2.0						
	82	88	17.15	12200	12300	12800	2.4	**HK**	**37**	**DRS**	**80S4**	24	67
	91	78	15.31	11800	12000	12400	2.7						
	107	67	13.08	11300	11500	11900	3.0						
	115	62	12.14	11100	11300	11600	2.3						
	133	54	10.49	10700	10800	11100	2.7						
	157	46	8.91	10200	10300	10600	3.2						
	176	41	7.96	9920	10000	10300	3.6						
1.1	**11**	920	123.54	40000	40000	40000	0.90						
	13	800	108.03	40000	40000	40000	1.00						
	14	760	102.62	40000	40000	40000	1.05						
	16	670	90.04	40000	40000	40000	1.20						
	18	565	76.37	40000	40000	40000	1.45						
	20	510	68.95	40000	40000	40000	1.60						
	23	450	60.66	40000	40000	40000	1.80	**HK**	**60**	**DRS**	**80M4**	53	70
	25	425	57.28	40000	40000	40000	1.90						
	29	360	48.77	40000	40000	40000	2.3						
	32	330	44.32	40000	40000	40000	2.5						
	37	285	38.39	40000	40000	40000	2.8						
	40	265	35.62	40000	40000	40000	3.1						
	47	225	30.22	39400	40000	39900	3.6						
	16	670	90.26	24700	25000	25000	0.90						
	18	570	76.56	25000	25000	25000	1.05						
	20	510	69.12	25000	25000	25000	1.15						
	23	450	60.81	25000	25000	25000	1.30						
	25	425	57.42	25000	25000	25000	1.40						
	29	360	48.89	25000	25000	25000	1.65						
	32	330	44.43	25000	25000	25000	1.80	**HK**	**50**	**DRS**	**80M4**	42	69
	37	285	38.49	25000	25000	25000	2.1						
	39	265	35.70	25000	25000	25000	2.3						
	47	225	30.28	25000	25000	25000	2.7						
	52	200	27.34	25000	25000	25000	3.0						
	59	179	24.05	25000	25000	25000	3.4						
	62	169	22.71	25000	25000	25000	3.6						
	73	144	19.34	25000	25000	25000	4.0						

P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
1.1	**22**	470	63.30	17800	18000	18300	0.85						
	25	420	56.83	17900	18100	18400	0.95						
	29	360	48.95	18000	18200	18400	1.10						
	31	340	46.03	18100	18200	18400	1.15						
	36	295	39.61	18200	18300	18500	1.35						
	40	260	35.39	18000	18300	18500	1.50						
	45	230	31.30	17500	18400	18000	1.70						
	48	215	29.32	17200	18300	17700	1.85						
	54	193	25.91	16700	17600	17100	2.1	**HK**	**40**	**DRS**	**80M4**	37	68
	59	179	24.06	16400	17300	16700	2.2						
	65	162	21.81	16000	16800	16300	2.5						
	72	146	19.58	15500	16200	15800	2.7						
	84	126	16.86	14900	15500	15200	3.0						
	89	118	15.86	14700	15200	14900	3.2						
	103	102	13.65	14100	14600	14300	3.5						
	116	91	12.19	13600	14100	13800	3.8						
	49	210	28.83	13100	13300	13200	1.00						
	56	186	24.99	12700	13100	13200	1.15						
	60	174	23.36	12600	12900	13300	1.20						
	70	150	20.19	12200	12500	13300	1.40						
	82	128	17.15	11700	12000	12700	1.65						
	92	114	15.31	11400	11700	12300	1.85						
	108	98	13.08	11000	11200	11800	2.0						
	116	90	12.14	10800	11000	11600	1.60	**HK**	**37**	**DRS**	**80M4**	27	67
	134	78	10.49	10400	10600	11100	1.85						
	158	66	8.91	9990	10200	10600	2.2						
	177	59	7.96	9710	9860	10200	2.4						
	184	57	7.66	9640	9750	10100	3.0						
	207	51	6.80	9320	9450	9760	2.9						
	221	47	6.37	9160	9280	9570	3.0						
	263	40	5.36	8750	8860	9100	3.5						
1.5	**15**	920	90.04	40000	40000	40000	0.90						
	18	780	76.37	40000	40000	40000	1.05						
	20	705	68.95	40000	40000	40000	1.15						
	23	620	60.66	40000	40000	40000	1.30						
	24	585	57.28	40000	40000	40000	1.40						
	29	500	48.77	40000	40000	40000	1.65						
	31	455	44.32	40000	40000	40000	1.80						
	36	390	38.39	40000	40000	40000	2.0	**HK**	**60**	**DRS**	**90M4**	58	70
	39	365	35.62	40000	40000	40000	2.2						
	46	310	30.22	39200	40000	39900	2.6						
	51	280	27.28	38100	39400	38700	2.9						
	58	245	24.00	36800	37900	37300	3.2						
	62	230	22.66	36200	37200	36700	3.4						
	72	198	19.30	34600	35500	35000	3.8						

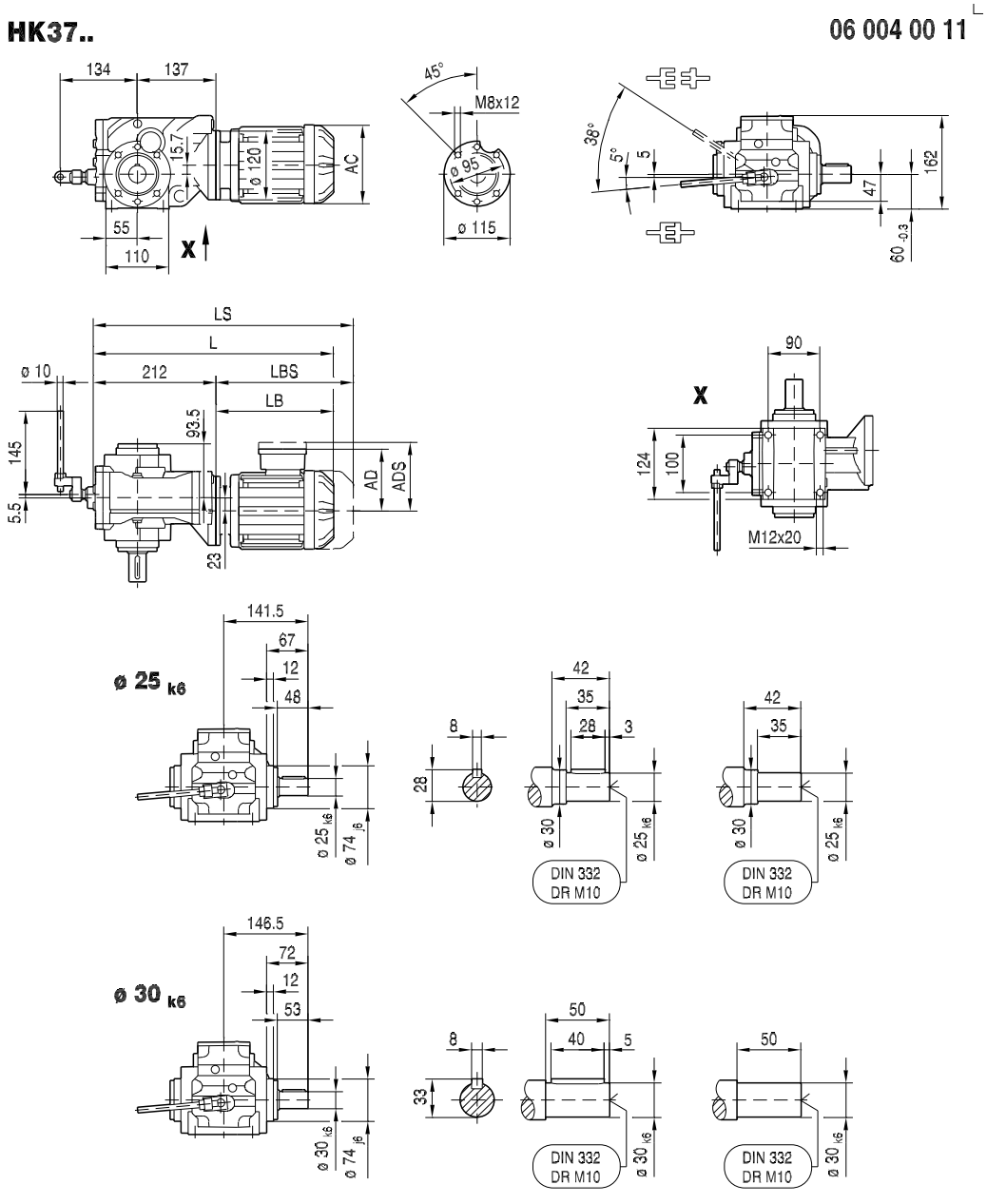
P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
1.5	**20**	705	69.12	24100	25000	25000	0.85						
	23	620	60.81	25000	25000	25000	0.95						
	24	585	57.42	25000	25000	25000	1.00						
	29	500	48.89	25000	25000	25000	1.20						
	31	455	44.43	25000	25000	25000	1.30						
	36	395	38.49	25000	25000	25000	1.50						
	39	365	35.70	25000	25000	25000	1.65						
	46	310	30.28	25000	25000	25000	1.95	**HK**	**50**	**DRS**	**90M4**	47	69
	51	280	27.34	25000	25000	25000	2.1						
	58	245	24.05	25000	25000	25000	2.4						
	61	230	22.71	25000	25000	25000	2.6						
	72	199	19.34	25000	25000	25000	2.9						
	79	180	17.57	25000	25000	25000	3.1						
	92	156	15.22	24300	25000	24700	3.4						
	105	136	13.25	23400	24000	23700	3.8						
	28	500	48.95	17700	17900	18200	0.80						
	30	470	46.03	17800	18000	18300	0.85						
	35	405	39.61	17900	18100	18400	1.00						
	39	360	35.39	17600	18200	18300	1.10						
	45	320	31.30	17100	18300	17700	1.25						
	48	300	29.32	16800	18300	17400	1.35						
	54	265	25.91	16400	17600	16900	1.50						
	58	245	24.06	16100	17300	16600	1.60	**HK**	**40**	**DRS**	**90M4**	42	68
	64	220	21.81	15700	16800	16100	1.80						
	71	200	19.58	15300	16300	15700	2.00						
	83	173	16.86	14700	15600	15000	2.2						
	88	163	15.86	14500	15300	14800	2.3						
	102	140	13.65	13900	14600	14200	2.6						
	114	125	12.19	13500	14100	13800	2.8						
	56	255	24.99	12100	12600	13100	0.80						
	60	235	23.36	12000	12400	13100	0.90						
	69	205	20.19	11700	12100	13200	1.00						
	81	176	17.15	11300	11700	12600	1.20						
	91	157	15.31	11100	11400	12200	1.35						
	107	134	13.08	10700	11000	11700	1.50						
	115	125	12.14	10500	10800	11500	1.15						
	133	108	10.49	10200	10400	11100	1.35	**HK**	**37**	**DRS**	**90M4**	31	67
	157	92	8.91	9780	10000	10600	1.60						
	175	82	7.96	9520	9720	10200	1.75						
	182	79	7.66	9460	9620	10100	2.2						
	205	70	6.80	9160	9340	9760	2.1						
	219	65	6.37	9010	9180	9570	2.1						
	260	55	5.36	8630	8770	9100	2.5						
2.2	**23**	910	60.66	40000	40000	40000	0.90						
	24	850	57.28	40000	40000	40000	0.95						
	29	730	48.77	40000	40000	40000	1.10						
	32	665	44.32	40000	40000	40000	1.25						
	36	575	38.39	40000	40000	40000	1.40						
	39	530	35.62	40000	40000	40000	1.55						
	46	450	30.22	38600	40000	39600	1.80						
	51	405	27.28	37600	39300	38500	2.0	**HK**	**60**	**DRS**	**90L4**	61	70
	58	360	24.00	36300	37900	37100	2.2						
	62	340	22.66	35700	37300	36500	2.3						
	73	285	19.30	34200	35500	34800	2.6						
	80	260	17.54	33300	34500	33900	2.8						
	92	225	15.19	32000	33000	32500	3.1						
	106	198	13.22	30700	31600	31200	3.4						

P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
2.2	**29**	730	48.89	23700	25000	25000	0.80						
	32	665	44.43	24800	25000	25000	0.90						
	36	575	38.49	25000	25000	25000	1.05						
	39	535	35.70	25000	25000	25000	1.10						
	46	450	30.28	25000	25000	25000	1.30						
	51	410	27.34	25000	25000	25000	1.45	**HK**	**50**	**DRS**	**90L4**	49	69
	58	360	24.05	25000	25000	25000	1.65						
	62	340	22.71	25000	25000	25000	1.75						
	72	290	19.34	25000	25000	25000	2.00						
	80	260	17.57	24900	25000	25000	2.1						
	92	225	15.22	24000	25000	24500	2.3						
	106	199	13.25	23100	24000	23600	2.6						
	54	385	25.91	15700	17500	16400	1.05						
	64	325	21.81	15100	16700	15700	1.20						
	72	290	19.58	14800	16200	15300	1.35						
	83	250	16.86	14300	15500	14800	1.50	**HK**	**40**	**DRS**	**90L4**	45	68
	88	235	15.86	14000	15200	14500	1.60						
	103	200	13.65	13600	14600	14000	1.75						
	115	183	12.19	13200	14100	13500	1.90						
	82	255	17.15	10500	11000	12400	0.80						
	91	225	15.31	10400	10800	12000	0.90						
	107	196	13.08	10100	10500	11500	1.00						
	133	157	10.49	9650	10000	10900	0.90						
	157	134	8.91	9350	9670	10500	1.10	**HK**	**37**	**DRS**	**90L4**	34	67
	176	119	7.96	9130	9420	10100	1.20						
	183	115	7.66	9100	9320	9970	1.50						
	206	102	6.80	8830	9080	9690	1.40						
	220	96	6.37	8700	8940	9510	1.45						
	261	80	5.36	8370	8570	9050	1.75						
3.0	**29**	990	48.77	40000	40000	40000	0.80						
	32	900	44.32	40000	40000	40000	0.90						
	36	785	38.39	40000	40000	40000	1.00						
	39	725	35.62	39600	40000	40000	1.15						
	46	615	30.22	38000	39100	39300	1.35						
	51	555	27.28	37000	38300	38200	1.45	**HK**	**60**	**DRS**	**100M4**	66	70
	58	490	24.00	35800	37100	36900	1.65						
	62	460	22.66	35200	36600	36300	1.70						
	73	390	19.30	33800	35200	34600	1.95						
	80	355	17.54	32900	34400	33700	2.1						
	92	310	15.19	31600	33000	32300	2.2						
	106	270	13.22	30500	31700	31100	2.5						
	39	730	35.70	23800	25000	25000	0.80						
	46	615	30.28	25000	25000	25000	0.95						
	51	555	27.34	25000	25000	25000	1.05						
	58	490	24.05	25000	25000	25000	1.20						
	62	460	22.71	25000	25000	25000	1.30	**HK**	**50**	**DRS**	**100M4**	54	69
	72	395	19.34	25000	25000	25000	1.45						
	80	355	17.57	24600	25000	25000	1.55						
	92	310	15.22	23700	25000	24400	1.70						
	106	270	13.25	22800	24100	23400	1.90						
	64	445	21.81	14500	16600	15300	0.90						
	72	400	19.58	14200	16100	14900	1.00						
	83	345	16.86	13800	15400	14400	1.10	**HK**	**40**	**DRS**	**100M4**	50	68
	88	320	15.86	13600	15100	14200	1.15						
	103	275	13.65	13200	14500	13700	1.30						
	115	245	12.19	12800	14000	13300	1.40						



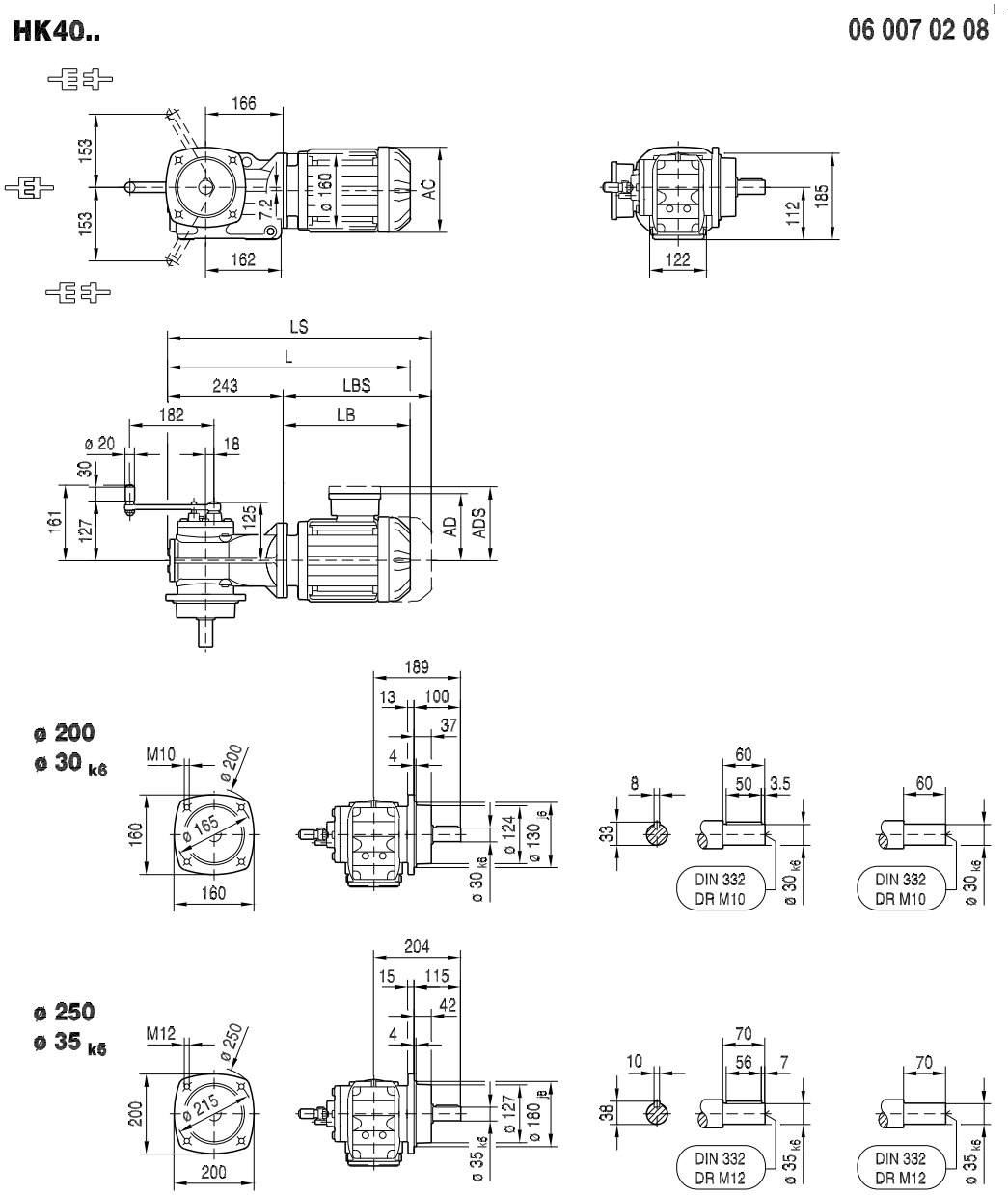
P_m [kW]	n_a rpm	M_a [Nm]	i	F_{Ra} [N]	$F_{Ra}90$ [N]	$F_{Ra}270$ [N]	SEW-f_B					m [kg]	
3.0	**176**	163	7.96	8700	9080	10000	0.90						
	183	157	7.66	8710	8990	9860	1.10						
	206	139	6.80	8460	8790	9610	1.05	**HK**	**37**	**DRS**	**100M4**	39	67
	220	130	6.37	8360	8670	9440	1.05						
	261	110	5.36	8080	8340	8990	1.30						
4.0	**48**	800	30.22	37000	37500	38700	1.00						
	53	725	27.28	36100	36700	37600	1.15						
	60	635	24.00	34900	35800	36300	1.25						
	63	600	22.66	34400	35300	35800	1.30	**HK**	**60**	**DRS**	**112M4**	80	70
	74	510	19.30	33000	34100	34200	1.50						
	82	465	17.54	32200	33400	33300	1.60						
	94	400	15.19	31000	32300	31900	1.75						
	109	350	13.22	29900	31200	30700	1.90						
	48	795	30.22	36900	37400	38600	1.05						
	53	720	27.28	36000	36700	37600	1.15						
	60	630	24.00	34900	35700	36300	1.25						
	64	595	22.66	34400	35300	35700	1.30	**HK**	**60**	**DRS**	**100LC4**	71	70
	75	505	19.30	33000	34100	34100	1.50						
	82	460	17.54	32200	33300	33200	1.60						
	95	400	15.19	31000	32200	31900	1.75						
	109	345	13.22	29900	31200	30600	1.90						
	52	725	27.34	23800	25000	25000	0.80						
	60	640	24.05	25000	25000	25000	0.95						
	63	600	22.71	25000	25000	25000	1.00						
	74	510	19.34	24500	25000	25000	1.10	**HK**	**50**	**DRS**	**112M4**	68	69
	82	465	17.57	23900	25000	25000	1.20						
	94	405	15.22	23100	25000	24100	1.30						
	108	350	13.25	22300	23900	23100	1.45						
	53	720	27.34	23900	25000	25000	0.85						
	60	635	24.05	25000	25000	25000	0.95						
	64	600	22.71	25000	25000	25000	1.00						
	75	510	19.34	24500	25000	25000	1.10	**HK**	**50**	**DRS**	**100LC4**	59	69
	82	460	17.57	23900	25000	25000	1.20						
	95	400	15.22	23100	24900	24000	1.35						
	109	350	13.25	22300	23900	23100	1.45						
	85	445	16.86	13100	15200	13900	0.85						
	90	420	15.86	12900	14900	13800	0.90	**HK**	**40**	**DRS**	**112M4**	64	68
	105	360	13.65	12600	14300	13300	1.00						
	118	320	12.19	12300	13900	12900	1.10						
	86	445	16.86	13100	15200	13900	0.85						
	91	415	15.86	12900	14900	13700	0.90	**HK**	**40**	**DRS**	**100LC4**	55	68
	106	360	13.65	12600	14300	13300	1.00						
	119	320	12.19	12300	13800	12900	1.10						
5.5	**60**	870	24.00	33900	34000	35800	0.90						
	64	820	22.66	33500	33600	35300	0.95						
	75	700	19.30	32300	32700	33800	1.10	**HK**	**60**	**DRS**	**132S4**	84	70
	82	635	17.54	31500	32100	32900	1.15						
	95	550	15.19	30400	31200	31600	1.25						
	109	480	13.22	29400	30200	30400	1.40						
	75	700	19.34	23700	25000	25000	0.80						
	82	635	17.57	23200	25000	24700	0.85	**HK**	**50**	**DRS**	**132S4**	72	69
	95	550	15.22	22500	25000	23700	0.95						
	109	480	13.25	21700	24000	22900	1.05						
7.5	**82**	860	17.54	30200	30400	32500	0.85						
	95	750	15.19	29600	29700	31300	0.95	**HK**	**60**	**DRS**	**132M4**	97	70
	109	655	13.22	28700	29000	30100	1.00						
9.2	**111**	790	13.22	27700	27800	29700	0.85	**HK**	**60**	**DRS**	**132MC4**	100	70

10.3 HK37 [mm]



(→ 45)	DR63..	DR71S	DR71M	DR80S	DR80M	DR90M	DR90L	DR100M
AC	132	139	139	156	156	179	179	197
AD	105	119	119	128	128	140	140	157
ADS	105	129	129	139	139	150	150	158
L	403	414	439	449	480	484	504	534
LS	458	482	507	530	561	577	597	627
LB	191	202	227	237	268	272	292	322
LBS	246	270	295	318	349	365	385	415

10.4 HK40 [mm]

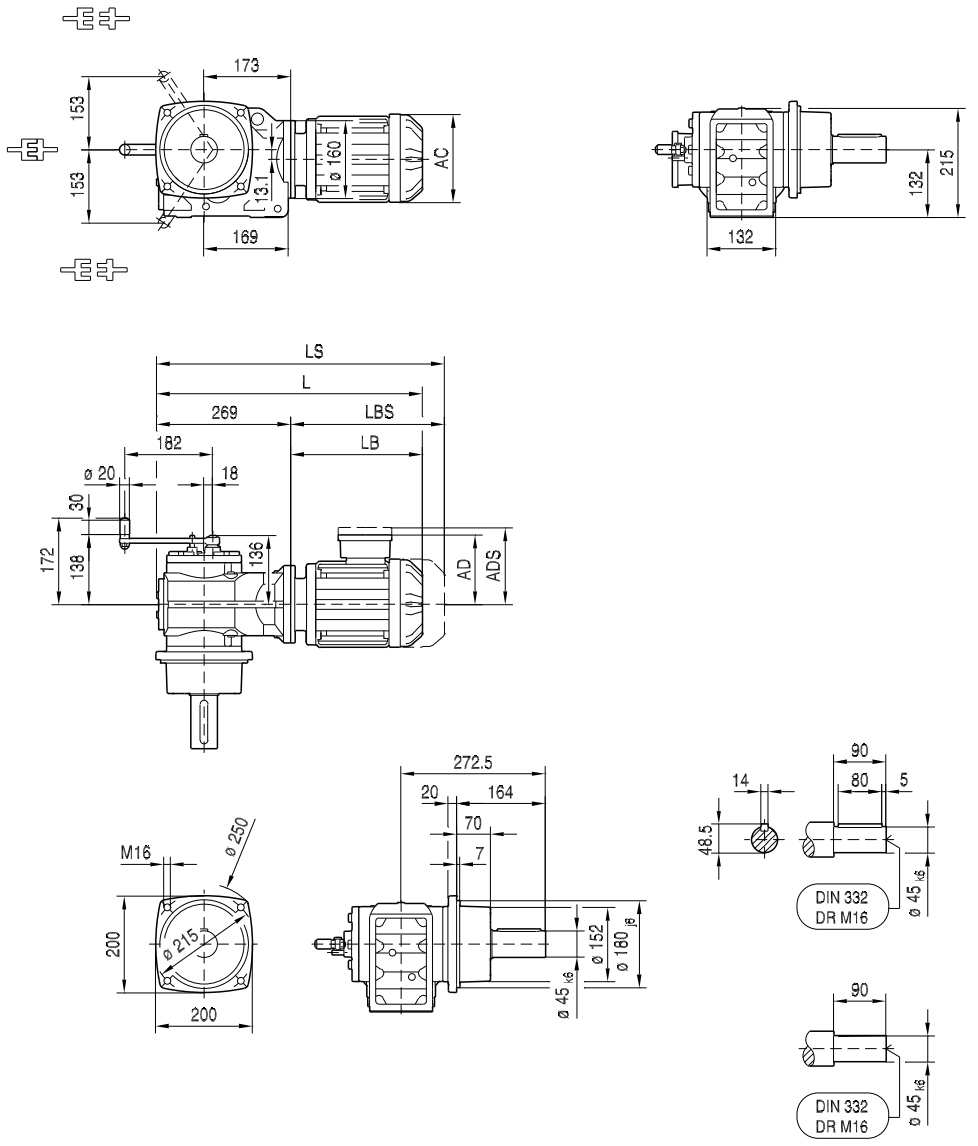


(→ 54)	DR63..	DR71S	DR71M	DR80S	DR80M	DR90M	DR90L	DR100M	DR100L/LC	DR112M
AC	132	139	139	156	156	179	179	197	197	221
AD	105	119	119	128	128	140	140	157	157	170
ADS	105	129	129	139	139	150	150	158	158	172
L	428	439	464	473	504	506	526	556	586	598
LS	483	507	532	554	585	599	619	649	679	710
LB	185	196	221	230	261	263	283	313	343	355
LBS	240	264	289	311	342	356	376	406	436	467

10.5 HK50 [mm]

HK50..

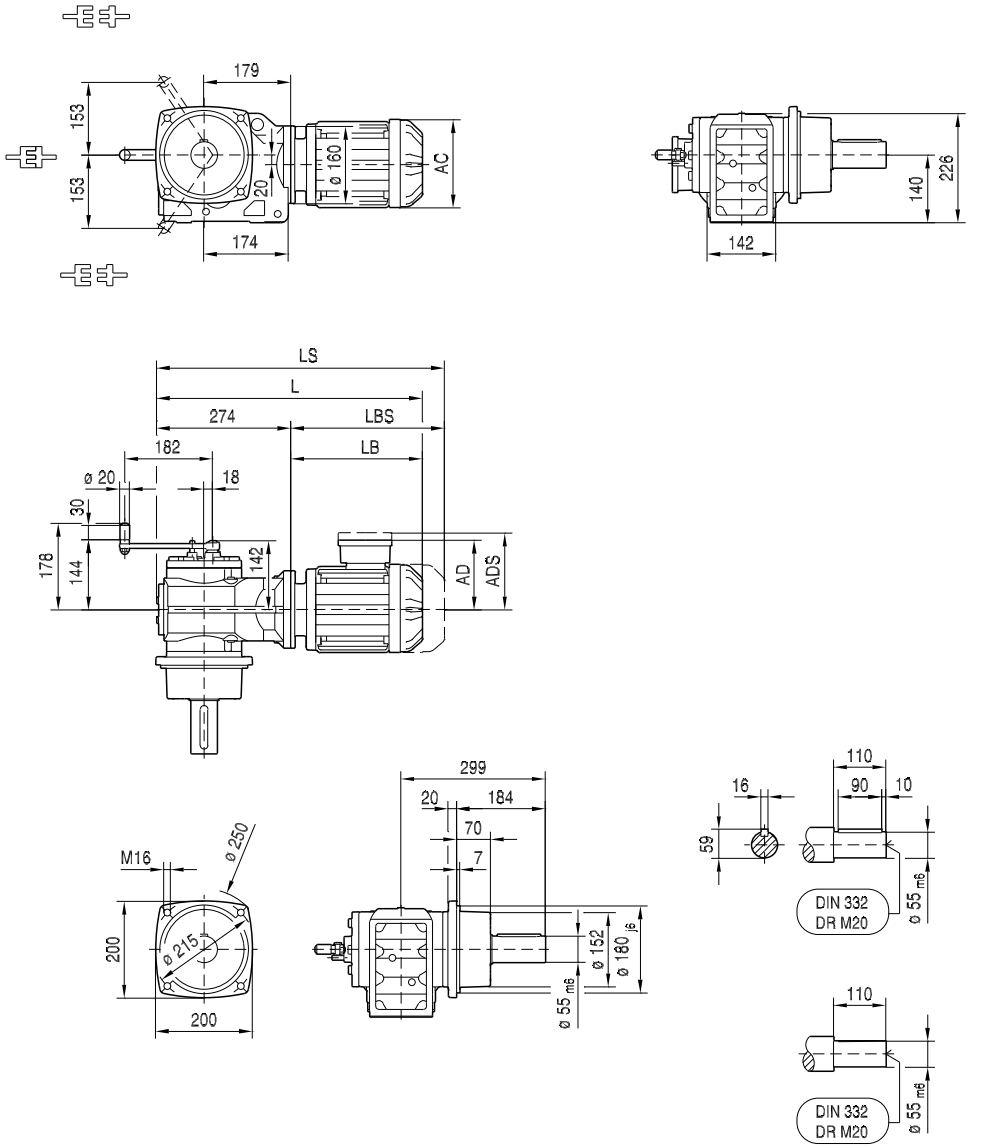
06 008 01 08



(→ 45)	DR63..	DR71S	DR71M	DR80S	DR80M	DR90M	DR90L	DR100M	DR100L/LC	DR112M	DR132S
AC	132	139	139	156	156	179	179	197	197	221	221
AD	105	119	119	128	128	140	140	157	157	170	170
ADS	105	129	129	139	139	150	150	158	158	172	172
L	454	465	490	499	530	532	552	582	612	624	659
LS	509	533	558	580	611	625	645	675	705	736	771
LB	185	196	221	230	261	263	283	313	343	355	390
LBS	240	264	289	311	342	356	376	406	436	467	502

10.6 HK60 [mm]

HK60.. 06 009 01 08



(→ 45)	DR63..	DR71S	DR71M	DR80S	DR80M	DR90M	DR90L	DR100M	DR100L/LC	DR112M	DR132S	DR132M, MC
AC	132	139	139	156	156	179	179	197	197	221	221	221
AD	105	119	119	128	128	140	140	157	157	170	170	170
ADS	105	129	129	139	139	150	150	158	158	172	172	172
L	459	470	495	504	535	537	557	587	617	629	664	714
LS	514	538	563	585	616	630	650	680	710	741	776	826
LB	185	196	221	230	261	263	283	313	343	355	390	440
LBS	240	264	289	311	342	356	376	406	436	467	502	552

11 Technical Data

11.1 AC motors DRS / DRE / DRP

11.1.1 Key to the data of the global motor / energy efficient motor

The following table lists the short symbols used in the "Technical data" tables.

P_N	Rated power
M_N	Rated torque
n_N	Rated speed
I_N	Rated current
cosφ	Power factor
$\eta_{50\%}$	Efficiency at 50% of the rated power
$\eta_{75\%}$	Efficiency at 75% of the rated power
$\eta_{100\%}$	Efficiency at 100% of the rated power
I_A/I_N	Starting current ratio
M_A/M_N	Starting torque ratio
M_H/M_N	Ramp-up torque ratio
M_U/M_N	Ratio of the switching torque from high to low speed
m	Weight of the motor
J_{Mot}	Mass moment of inertia of the motor
BE..	Brake used
Z_0 BG	Switching frequency for operation with BG brake controller
Z_0 BGE	Switching frequency for operation with BGE brake controller
M_B	Braking torque
m_B	Weight of the brakemotor
J_{MOT_BE}	Mass moment of inertia of the brakemotor
	Global motor for the use in the EU, the US, Canada, Australia, New Zealand
	Global motor for the use in the EU, the US, Canada, Australia, New Zealand, China
	Global motor for the use in Brazil

11.1.2 DT, DR, DRS, DRE, DRP motors, 50 Hz, 4-pole, S1

4-pole DT, DR, DRS motors for 50 Hz, IE1

Motor type DRS	P_N kW	M_N Nm	n_N rpm	I_N 400 V A	I_N 380-420 V A	cosφ	IE class	$\eta_{50\%}$ %	$\eta_{75\%}$ %	$\eta_{100\%}$ %	I_A/I_N	M_A/M_N M_H/M_N
DT 56M 4	0.09	0.66	1300	0.29	0.31	0.68	-	-	-	-	2.6	2.1 1.8
DT 56M 4	0.12	0.88	1300	0.42	0.46	0.68	-	-	-	-	2.6	2.2 1.9
DR 63S 4	0.12	0.83	1380	0.39	0.39	0.69	-	-	-	-	3.3	2.4 2.2
DR 63M 4	0.18	1.3	1320	0.55	0.55	0.78	-	-	-	-	2.9	1.8 1.7
DR 63L4	0.25	1.8	1300	0.68	0.73	0.81	-	-	-	-	2.8	1.8 1.7
DRS 71S 4	0.18	1.25	1380	0.64	0.66	0.70	-	-	-	-	3.5	1.8 1.8
DRS 71S 4	0.25	1.72	1390	0.67	0.69	0.75	-	68.6	72.6	72.6	4.1	1.9 1.9
DRS 71S 4	0.37	2.55	1380	1.14	1.24	0.70	-	59.1	65.3	66.6	3.5	1.8 1.8
DRS 71M 4	0.55	3.8	1380	1.55	1.62	0.72	-	69.1	71.9	70.6	3.6	2.1 2.1
DRS 80S 4	0.75	5.1	1400	1.8	1.82	0.81	IE1	74.6	76.6	75.3	4.3	1.9 1.9
DRS 80M 4	1.1	7.4	1410	2.4	2.5	0.84	IE1	77.7	78.6	77.0	5.1	2.2 1.7
DRS 90M 4	1.5	10.3	1395	3.3	3.4	0.82	IE1	82.0	82.0	79.6	5.0	2.3 2.0
DRS 90L 4	2.2	15	1400	4.85	4.95	0.81	IE1	82.9	83.1	81.1	5.1	2.5 2.2
DRS 100M 4	3	20.5	1400	6.4	6.5	0.82	IE1	85.2	84.7	82.4	5.3	2.8 2.4
DRS 100LC 4	4	26.5	1445	8.4	8.5	0.81	IE1	84.1	84.6	83.5	6.5	2.5 2.3
DRS 112M 4	4	26.5	1435	8.1	8.4	0.84	IE1	86.1	85.6	83.8	6.0	2.0 1.7
DRS 132S 4	5.5	36.5	1445	11.1	11.6	0.82	IE1	86.4	86.7	85.7	6.7	2.4 2.1
DRS 132M 4	7.5	49.5	1445	14.4	15.1	0.85	IE1	90.0	89.1	87.1	6.6	2.4 1.9
DRS 132MC 4	9.2	60	1465	18.6	19.3	0.81	IE1	87.9	88.5	87.6	7.2	2.1 1.6
DRS 160S 4	9.2	60	1460	18.9	19.2	0.79	IE1	87.9	89.0	88.0	6.4	2.5 2.0
DRS 160M 4	11	72	1460	22	22.5	0.81	IE1	89.2	89.1	88.0	6.8	2.7 2.3
DRS 160MC 4	15	97	1470	30	31	0.80	IE1	90.3	90.2	89.1	6.3	2.1 1.7
DRS 180S 4	15	98	1460	29	29.5	0.83	IE1	90.0	90.3	89.5	6.2	2.3 2.0
DRS 180M 4	18.5	121	1465	34.5	35.5	0.85	IE1	90.6	90.8	90.0	6.5	2.2 1.8
DRS 180L 4	22	143	1465	41.5	42.5	0.84	IE1	90.9	91.2	90.5	6.9	2.4 2.0

Table continued on next page.

Motor type DRS	P_N kW	M_N Nm	n_N rpm	I_N 400 V A	I_N 380-420 V A	cosφ	IE class	$\eta_{50\%}$ %	$\eta_{75\%}$ %	$\eta_{100\%}$ %	I_A/I_N	M_A/M_N M_H/M_N
DRS 180LC 4	30	195	1470	57	59	0.84	IE1	92.2	92.0	90.9	5.6	1.8 1.5
DRS 200L 4	30	194	1475	57	59	0.82	IE1	91.6	91.9	91.3	6.4	2.1 1.9
DRS 225S 4	37	240	1475	70	72	0.82	IE1	92.2	92.0	91.6	7.1	2.4 1.9
DRS 225M 4	45	290	1480	84	86	0.83	IE1	92.8	92.7	92.3	7.4	2.5 2.2
DRS 225MC 4	55	355	1480	106	108	0.81	IE1	92.4	92.8	92.4	6.8	2.4 1.8
DV 250M 4	55	356	1475	102	106	0.83	IE1	-	92.7	92.5	6.0	2.7 2.0
DV 280S 4	75	484	1480	138	142	0.83	IE1	-	93.1	93.3	7.2	3.2 2.2
DV 280M 4	90	581	1480	170	173	0.81	IE1	-	93.4	93.5	7.1	3.3 2.2
DRS 315K 4	110	710	1482	200	210	0.84	IE1	93.7	94.2	94.0	6.1	2.2 1.7
DRS 315S 4	132	850	1484	232	240	0.86	IE1	93.4	94.2	94.2	6.5	2.4 1.9
DRS 315M 4	160	1030	1483	280	290	0.87	IE1	94.6	94.8	94.6	6.9	2.1 1.7
DRS 315L 4	200	1290	1481	350	375	0.88	IE1	94.7	94.9	94.6	6.4	2.1 1.7

4-pole DT, DR, DRS motors for 50 Hz, IE1

Motor type DRS	P_N kW	M_N Nm	n_N rpm	m kg	J_{Mot} 10^{-4} kgm^2	BE..	Z_0 BG BGE 1/h	M_B Nm	m_B kg	J_{Mot_BE} 10^{-4} kgm^2
DT 56M 4	0.09	0.66	1300	-	1.1	-	10000 -	0.8	-	1.2
DT 56M 4	0.12	0.88	1300	-	1.1	-	10000 -	1.2	-	1.2
DR 63S 4	0.12	0.83	1380	6.1	3.6	-	10000 -	2.4	7.6	4.8
DR 63M 4	0.18	1.3	1320	6.1	3.6	-	10000 -	3.2	7.6	4.8
DR 63L4	0.25	1.8	1300	6.7	4.4	-	10000 -	3.2	8.2	5.6
DRS 71S 4	0.18	1.25	1380	7.8	4.9	BE05	6000 9500	2.5	10.2	6.2
DRS 71S 4	0.25	1.72	1390	7.8	4.9	BE05	6000 9500	3.5	10.2	6.2
DRS 71S 4	0.37	2.55	1380	7.8	4.9	BE05	6000 9500	5	10.2	6.2
DRS 71M 4	0.55	3.8	1380	9.1	7.1	BE1	4100 11000	10	11.7	8.4
DRS 80S 4	0.75	5.1	1400	11.5	14.9	BE1	3500 9000	10	14.5	16.4
DRS 80M 4	1.1	7.4	1410	14.3	21.4	BE2	3500 9000	14	18	25.9
DRS 90M 4	1.5	10.3	1395	18.4	35.4	BE2	2900 7500	20	23	40.1
DRS 90L 4	2.2	15	1400	21.4	43.7	BE5	- 5600	40	27.3	49.7
DRS 100M 4	3	20.5	1400	26	56	BE5	- 8500	40	31.9	62
DRS 100LC 4	4	26.5	1445	31.2	89.8	BE5	- 3800	55	37.1	95.8
DRS 112M 4	4	26.5	1435	41.3	146	BE5	- 3100	55	48.5	150.8
DRS 132S 4	5.5	36.5	1445	44.2	190	BE11	- 2800	80	58.7	200.5
DRS 132M 4	7.5	49.5	1445	60	253	BE11	- 2000	110	74.5	263.5
DRS 132MC 4	9.2	60	1465	63	342	BE11	- 1500	110	77.5	352.5
DRS 160S 4	9.2	60	1460	79.5	370	BE20	- 1100	150	106.2	421.1
DRS 160M 4	11	72	1460	91.5	448	BE20	- 1000	150	118.2	499.1
DRS 160MC 4	15	97	1470	93.5	593	BE20	- 900	200	120.2	644.1
DRS 180S 4	15	98	1460	121.9	895	BE20	- 900	200	153.9	955
DRS 180M 4	18.5	121	1465	141.1	1110	BE30	- 800	300	181.1	1245
DRS 180L 4	22	143	1465	152.1	1300	BE30	- 590	300	192.1	1435

Table continued on next page.

Motor type DRS	P_N kW	M_N Nm	n_N rpm	m kg	J_{Mot} 10^{-4} kgm^2	BE..	Z_0 BG BGE 1/h	M_B Nm	m_B kg	J_{Mot_BE} 10^{-4} kgm^2
DRS 180LC 4	30	195	1470	161.1	1680	BE32	- 520	400	206.1	1910
DRS 200L 4	30	194	1475	258	2360	BE32	- 550	400	313	2590
DRS 225S 4	37	240	1475	294.5	2930	BE32	- 320	500	349.5	3160
DRS 225M 4	45	290	1480	315.5	3430	BE32	- 270	600	370.5	3660
DRS 225MC 4	55	355	1480	329	4330	BE32	- 200	600	384	4560
DV 250M 4	55	356	1475	448	6300	-	- 200	600 1200	528 538	6600 6730
DV 280S 4	75	484	1480	329	4330	-	- 200	600 1200	600 610	9225 9355
DV 280M 4	90	581	1480	329	4330	-	- 200	600 1200	600 610	9225 9355
DRS 315K 4	110	710	1482	850	18400	BE122	- 65	1600	975	19495
DRS 315S 4	132	850	1484	930	22500	BE122	- 50	2000	1055	23595
DRS 315M 4	160	1030	1483	1085	27900	BE122	- 35	2000	1210	28995
DRS 315L 4	200	1290	1481	1165	31900	BE122	- 25	2000	1290	32995

4-pole DRE motors for 50 Hz, IE2

Motor type DRE	P_N kW	M_N Nm	n_N rpm	I_N 400 V A	I_N 380-420 V A	cosφ	IE class	$\eta_{50\%}$ %	$\eta_{75\%}$ %	$\eta_{100\%}$ %	I_A/I_N	M_A/M_N M_H/M_N
DRE 80S 4	0.37	2.45	1435	0.87	-	0.77	-	76.5	78.5	78.8	4.9	2.6 2.1
DRE 80M 4	0.75	5	1435	1.68	1.75	0.79	IE2	79.2	81.3	81.0	6.2	2.8 2.1
DRE 90M 4	1.1	7.4	1420	2.45	2.55	0.79	IE2	82.5	83.5	82.4	5.9	2.8 2.3
DRE 90L 4	1.5	10	1430	3.35	3.45	0.77	IE2	83.5	84.7	84.0	6.6	3.2 2.8
DRE 100M 4	2.2	14.7	1425	4.6	4.7	0.80	IE2	86.3	86.7	85.4	6.4	3.3 2.7
DRE 100LC 4	3	19.7	1455	6.2	6.3	0.81	IE2	86.3	87.1	86.3	7.5	2.7 2.4
DRE 112M 4	3	19.7	1455	6	6.2	0.83	IE2	87.7	87.4	86.5	7.3	2.4 2.0
DRE 132S 4	4	26	1460	8	8.2	0.82	IE2	87.6	88.2	87.4	8.0	2.7 2.4
DRE 132M 4	5.5	36	1455	10.5	11	0.85	IE2	89.8	89.6	88.5	7.7	2.6 1.9
DRE 132MC 4	7.5	48.5	1470	14.8	15.2	0.82	IE2	88.9	89.5	89.0	8.2	2.2 1.8
DRE 160S 4	7.5	49	1465	14.7	15.3	0.82	IE2	90.3	90.3	89.3	6.5	2.4 1.8
DRE 160M 4	9.2	60	1470	18.3	18.7	0.80	IE2	90.4	90.7	90.0	7.7	2.9 2.2
DRE 160MC 4	11	71	1475	21.5	22	0.81	IE2	90.3	90.6	90.2	7.7	2.6 1.9
DRE 180S 4	11	71	1470	21	21.5	0.83	IE2	89.5	90.4	90.2	7.2	2.6 2.2
DRE 180M 4	15	97	1470	28	29	0.85	IE2	90.9	91.5	91.0	7.1	2.4 2.0
DRE 180L 4	18.5	120	1470	34	35.5	0.85	IE2	91.4	92.0	91.7	7.1	2.5 2.1
DRE 180LC 4	22	142	1480	42	43	0.82	IE2	91.7	92.2	91.8	7.1	2.3 1.9
DRE 200L 4	30	194	1475	57	59	0.82	IE2	92.6	92.9	92.4	6.3	2.1 1.9
DRE 225S 4	37	240	1477	70	72	0.82	IE2	93.0	93.4	93.0	7.0	2.5 2.0
DRE 225M 4	45	290	1478	84	86	0.83	IE2	93.5	93.7	93.3	7.3	2.5 2.1
DV 250M4	45	290	1480	86	88	0.81	IE2	-	93.2	93.4	7.1	3.3 2.5
DV 250M4	55	356	1475	102	106	0.83	IE2	-	94	93.7	6.0	2.7 0
DV 280S4	75	484	1480	137	142	0.83	IE2	-	94.2	94.2	7.2	3.2 2.2
DV 280M4	90	581	1480	168	171	0.81	IE2	-	94.6	94.5	7.1	3.3 2.2

Table continued on next page.

Motor type DRE	P_N kW	M_N Nm	n_N rpm	I_N 400 V A	I_N 380-420 V A	cosφ	IE class	$\eta_{50\%}$ %	$\eta_{75\%}$ %	$\eta_{100\%}$ %	I_A/I_N	M_A/M_N M_H/M_N
DRE 315K 4	110	710	1483	196	205	0.85	IE2	94.4	94.9	94.7	6.0	2.3 1.8
DRE 315S 4	132	850	1483	229	235	0.87	IE2	94.3	95.0	95.0	6.6	2.4 2.0
DRE 315M 4	160	1030	1484	275	285	0.88	IE2	95.3	95.5	95.3	6.8	2.2 1.8
DRE 315L 4	200	1290	1482	345	360	0.89	IE2	95.4	95.7	95.3	6.3	2.2 1.8

4-pole DRE motors for 50 Hz, IE2

Motor type DRE	P_N kW	M_N Nm	n_N rpm	m kg	J_{Mot} 10^{-4} kgm^2	BE..	Z_0 BG BGE 1/h	M_B Nm	m_B kg	J_{Mot_BE} 10^{-4} kgm^2
DRE 80S 4	0.37	2.45	1435	11.5	14.9	BE05	3500 9000	5	14.3	16.4
DRE 80M 4	0.75	5	1435	14.3	21.4	BE1	3500 9000	10	17.3	22.9
DRE 90M 4	1.1	7.4	1420	18.4	35.4	BE2	3000 8000	14	23	40.1
DRE 90L 4	1.5	10	1430	21.4	43.7	BE2	3000 8000	20	26	48.4
DRE 100M 4	2.2	14.7	1425	26	56	BE5	- 8000	28	31.9	62
DRE 100LC 4	3	19.7	1455	31.2	89.8	BE5	- 3800	40	37.1	95.8
DRE 112M 4	3	19.7	1455	41.3	146	BE5	- 3100	40	48.5	150.8
DRE 132S 4	4	26	1460	46.3	190	BE5	- 2800	55	53.5	194.8
DRE 132M 4	5.5	36	1455	60	253	BE11	- 2000	80	74.5	263.5
DRE 132MC 4	7.5	48.5	1470	63	342	BE11	- 1500	110	77.5	352.5
DRE 160S 4	7.5	49	1465	79.5	370	BE11	- 1100	110	98.2	391.9
DRE 160M 4	9.2	60	1470	88.5	448	BE20	- 1000	150	115.2	499.1
DRE 160MC 4	11	71	1475	93.5	593	BE20	- 900	150	120.2	644.1
DRE 180S 4	11	71	1470	121.9	895	BE20	- 900	150	153.9	955
DRE 180M 4	15	97	1470	138.3	1110	BE20	- 800	200	170.3	1170
DRE 180L 4	18.5	120	1470	152.1	1300	BE30	- 590	300	192.1	1435
DRE 180LC 4	22	142	1480	161.1	1680	BE30	- 520	300	201.1	1815
DRE 200L 4	30	194	1475	258	2360	BE32	- 550	400	313	2590
DRE 225S 4	37	240	1477	294.5	2930	BE32	- 320	500	349.5	3160
DRE 225M 4	45	290	1478	315.5	3430	BE32	- 270	600	370.5	3660
DV 250M4	45	290	1480	448	6300	-	-	300 600	528 538	6600 6730
DV 250M4	55	356	1475	520	6300	-	-	600 1200[1)]	600 610	6600 6730
DV 280S4	75	484	1480	520	8925	-	-	600 1200	600 610	9225 9355
DV 280M4	90	581	1480	520	8925	-	-	600 1200	600 610	9225 9355

Table continued on next page.

Motor type DRE	P_N kW	M_N Nm	n_N rpm	m kg	J_{Mot} 10^{-4} kgm^2	BE..	Z_0 BG BGE 1/h	M_B Nm	m_B kg	J_{Mot_BE} 10^{-4} kgm^2
DRE 315K 4	110	710	1483	850	18400	BE122	- 65	1600	975	19495
DRE 315S 4	132	850	1483	930	22500	BE122	- 50	2000	1055	23595
DRE 315M 4	160	1030	1484	1085	27900	BE122	- 35	2000	1210	28995
DRE 315L 4	200	1290	1482	1165	31900	BE122	- 25	2000	1290	32995

1) Double disk brake

4-pole DRP motors for 50 Hz, IE3

Motor type DRP	P_N kW	M_N Nm	n_N rpm	I_N 400 V A	I_N 380-420 V A	cosφ	IE class	$\eta_{50\%}$ %	$\eta_{75\%}$ %	$\eta_{100\%}$ %	I_A/I_N	M_A/M_N M_H/M_N
DRP 90M 4	0.75	4.95	1450	1.81	1.86	0.72	IE3	79.8	82.7	83.3	7.3	3.7 3.1
DRP 90L 4	1.1	7.3	1440	2.4	2.5	0.78	IE3	84.8	86.0	85.3	6.8	3.2 2.7
DRP 100M 4	1.5	9.9	1440	3.2	3.3	0.79	IE3	86.4	87.2	86.6	7.4	3.6 3.1
DRP 100L 4	2.2	14.6	1440	4.75	4.85	0.77	IE3	86.4	87.5	87.1	7.7	4.2 3.2
DRP 112M 4	3	19.7	1455	6	6.2	0.82	IE3	88.2	88.7	88.0	7.3	2.4 2.0
DRP 132M 4	4	26	1465	7.7	8	0.84	IE3	89.9	90.4	89.7	8.9	2.6 2.0
DRP 132MC 4	5.5	35.5	1475	11	11.4	0.84	IE3	90.2	90.8	90.3	8.8	2.3 1.9
DRP 160S 4	5.5	35.5	1475	10.9	11.2	0.80	IE3	90.3	91.1	90.7	8.0	3.0 2.2
DRP 160M 4	7.5	48.5	1470	14.7	15.2	0.81	IE3	90.9	91.3	90.7	8.1	3.1 2.3
DRP 160MC 4	9.2	60	1475	17.5	18.2	0.84	IE3	91.9	92.0	91.3	7.6	2.5 1.8
DRP 180S 4	9.2	60	1475	17.5	18.1	0.82	IE3	91.0	92.0	92.0	7.8	2.8 2.3
DRP 180M 4	11	71	1475	20.5	21.5	0.84	IE3	91.2	92.5	92.0	8.1	2.9 2.2
DRP 180L 4	15	97	1475	27.5	28.5	0.84	IE3	92.6	93.1	92.7	7.7	2.7 2.0
DRP 180LC 4	18.5	119	1480	35	36	0.82	IE3	92.7	93.4	93.2	8.0	2.6 2.0
DRP 200L 4	18.5	119	1483	34.5	36	0.83	IE3	92.7	93.5	93.3	7.8	2.6 2.2
DRP 200L 4	22	142	1482	41	42.5	0.83	IE3	92.7	93.5	93.4	7.9	2.7 2.3
DRP 225S 4	30	194	1480	55	57	0.85	IE3	94.0	94.3	93.9	7.4	2.6 2.2
DRP 225M 4	37	240	1482	69	71	0.83	IE3	93.5	94.1	94.0	8.4	2.9 2.6
DRP 315K 4	90	580	1484	159	169	0.86	IE3	0.0	95.1	95.2	6.7	2.4 1.9
DRP 315S 4	110	710	1486	192	200	0.87	IE3	0.0	95.6	95.5	7.1	2.3 1.8
DRP 315M 4	132	850	1488	230	240	0.87	IE3	94.7	95.6	95.6	8.1	2.5 2.0
DRP 315L 4	160	1030	1488	275	280	0.88	IE3	95.5	96.0	96.1	8.0	2.8 2.2

4-pole DRP motors for 50 Hz, IE3

Motor type DRP	P_N kW	M_N Nm	n_N rpm	m kg	J_{Mot} 10^{-4} kgm^2	BE..	Z_0 BG BGE 1/h	M_B Nm	m_B kg	J_{Mot_BE} 10^{-4} kgm^2
DRP 90M 4	0.75	4.95	1450	18.4	35.4	BE1	2900 7500	10	21.3	37
DRP 90L 4	1.1	7.3	1440	21.4	43.7	BE2	2300 5600	14	26	48.4
DRP 100M 4	1.5	9.9	1440	26	56	BE2	1800 8500	20	30.6	60.7
DRP 100L 4	2.2	14.6	1440	29	68.3	BE5	- 7600	28	34.9	74.3
DRP 112M 4	3	19.7	1455	41.3	146	BE5	- 3100	40	48.5	150.8
DRP 132M 4	4	26	1465	60	253	BE5	- 2000	55	67.2	257.8
DRP 132MC 4	5.5	35.5	1475	63	342	BE11	- 1500	80	77.5	352.5
DRP 160S 4	5.5	35.5	1475	79.5	370	BE11	- 1100	80	98.2	391.9
DRP 160M 4	7.5	48.5	1470	88.5	448	BE11	- 1000	110	107.2	469.9
DRP 160MC 4	9.2	60	1475	93.5	593	BE20	- 900	150	120.2	644.1
DRP 180S 4	9.2	60	1475	121.9	895	BE20	- 900	150	153.9	955
DRP 180M 4	11	71	1475	138.3	1110	BE20	- 800	150	170.3	1170
DRP 180L 4	15	97	1475	152.1	1300	BE20	- 590	200	184.1	1360
DRP 180LC 4	18.5	119	1480	161.1	1680	BE30	- 520	300	201.1	1815
DRP 200L 4	18.5	119	1483	258	2360	BE30	- 550	300	308	2495
DRP 200L 4	22	142	1482	258	2360	BE30	- 550	300	308	2495
DRP 225S 4	30	194	1480	287.7	2930	BE32	- 320	400	342.7	3160
DRP 225M 4	37	240	1482	315.5	3430	BE32	- 270	500	370.5	3660
DRP 315K 4	90	580	1484	850	18400	BE122	- 65	1200	975	19495
DRP 315S 4	110	710	1486	930	22500	BE122	- 50	1600	1055	23595
DRP 315M 4	132	850	1488	1085	27900	BE122	- 35	2000	1210	28995
DRP 315L 4	160	1030	1488	1165	31900	BE122	- 25	2000	1290	32995

11.2 SEW brake motor options

On request, SEW motors and gearmotors can be supplied with an integrated mechanical brake. The following table shows the technical data of SEW brakes. The type and number of brake springs determines the level of the braking torque. Maximum braking torque $M_{B\ max}$ is installed as standard, unless specified otherwise in the order. Other brake spring combinations can produce the reduced braking torque values $M_{B\ red}$.

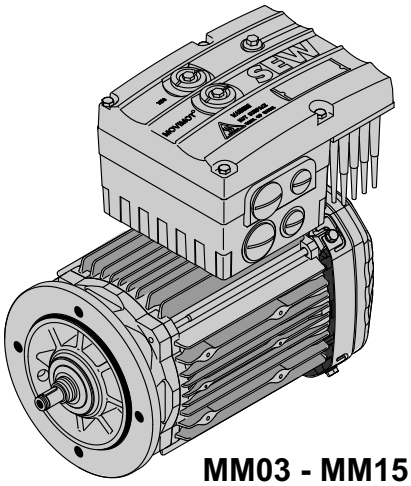
Brake	with motor	$M_{B\ max}$ [Nm]	Reduced braking torques $M_{B\ red}$ [Nm]				W_{Insp} [10^6J]	t_1 [10^{-3}s]		t_2 [10^{-3}s]		P_B [W]
								t_1II	t_1I	t_2II	t_2I	
BR03	**DR63**	3.2	2.4	1.6	0.8		200	–	25	3	30	**26**
BE05	**DR71** **DR80**	5.0	3.5	2.5	1.8		120	15	34	10	42	32
BE1	**DR71** **DR80** **DR90**	10	7.0	5.0			120	10	55	12	76	32
BE2	**DR80** **DR90/100**	20	14	10	7.0		165	17	73	10	68	43
BE5	**DR90/100** **DR112/132**	55	40	28	20	14	260	37	–	10	70	49
BE11	**DR112/132** **DR160**	110	80	55	40		640	41	–	15	82	76
BE20	**DR160** **DR180**	200	150	110	80		1000	57	–	20	88	100

$M_{B\ max}$ Maximum braking torque
$M_{B\ red}$ Reduced braking torque
W_{Insp} Braking work until inspection/maintenance
t_1I Response time for standard excitation
t_1II Response time for high-speed excitation
t_2I Brake application time for cut-off in the AC circuit
t_2II Brake application time for cut-off in the DC and AC circuits
P_B Electrical power loss

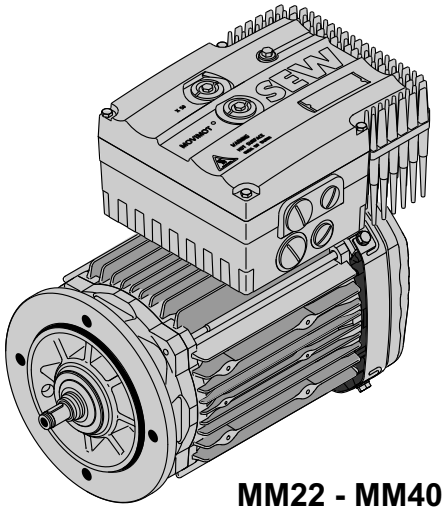
The response and application times are recommended values in relation to the maximum braking torque.

11.3 MOVIMOT®

MOVIMOT® is the combination of an AC (brake) motor and a digital frequency inverter in the power range 0.37 – 4.0 kW. It is the perfect match for decentralized drive configurations.



MM03 - MM15



MM22 - MM40

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11.3.1 Benefits

MOVIMOT® MM..D has the following advantages:

- Small total volume
- Interference-free connection between inverter and motor
- Closed design with integrated protection functions
- Inverter cooling independent of the motor speed
- No space required in the control cabinet
- Optimally preset parameters for the expected applications
- Compliance with EMC standards EN 50 081 (interference suppression level A) and EN 50 082
- Easy installation, startup and maintenance
- Easy to service for retrofitting and replacement

MOVIMOT® can be used to equip extensive systems or can be integrated into existing systems. MOVIMOT® is also the electronic replacement for pole-changing motors or mechanical variable speed drives.

MOVIMOT® is available as a gearmotor / geared brakemotor in many different standard versions and mounting positions.

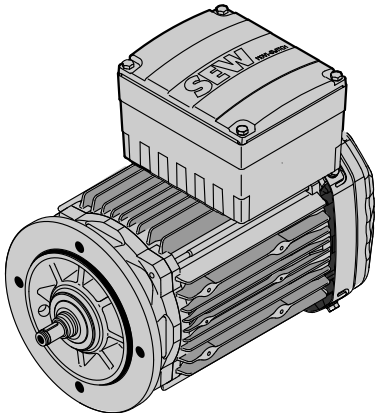
11.3.2 Performance characteristics

For detailed information and project planning instructions for MOVIMOT®, please refer to the "Drive Systems for Decentralized Installation" and “MOVIMOT® Gearmotors” catalogs.

- Available power range: 0.37 ... 4.0 kW
- Supply voltages: 3 × 200 ... 240 V and 3 × 380 ... 500 V, 50 / 60 Hz
- Nominal speeds 1400 and 2900 rpm
- Available with optional AS-Interface
- According to NEMA (UL-listed) on request
- Available for dust/explosion protection 3D for zone 22

11.4 MOVI-SWITCH®

MOVI-SWITCH® is the gearmotor with integrated switching and protection function. Single speed AC (brake) motors in sizes DT71 to DV100 can be combined with all appropriate gear units in the modular concept as part of the MOVI-SWITCH® product range. Refer to the "Drive Systems for Decentralized Installation" manual for detailed information about MOVI-SWITCH®.



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11.4.1 Benefits

MOVI-SWITCH® provides the following advantages:

- Circuit breaker and protection functions are completely integrated, saving control cabinet space and cabling.
- Robust and compact, resulting in space-saving installation.
- Use MOVI-SWITCH® to operate motors in the voltage range 3 × 380 ... 500 V, 50/60 Hz.
- AC motors and AC brake motors with the same connection configuration, therefore simple installation.

11.4.2 Variants

Two MOVI-SWITCH® versions are available: one for operation with one direction of rotation (MSW-1E) and one for operation with direction of rotation reversal (MSW-2S).

The supply system and control connections are the same for motors with or without brake.

MSW-1E

MOVI-SWITCH® MSW-1E is switched on and off without changing direction by means of a short circuit-proof star bridge switch. A thermal winding monitor (TF) is also integrated, which acts directly on the switch.

MSW-2S

The direction of rotation is reversed in MOVI-SWITCH® MSW-2S using a reversing relay combination with a long service life. Supply system monitoring, phase-sequence monitoring, brake control, circuit breaker and protection functions are grouped together in the controller. The various operating states are indicated by the diagnostic LED.

The pin assignment for clockwise direction of rotation (CW) is compatible with that of MSW-1E. The integrated AS interface connection is compatible with MLK11A.

11.5 EMS electric monorail system

The EMS combines gearmotors with decentralized drive controls, contactless energy transfer, data transfer via WLAN and user-friendly system software. The result is a modular system that can be designed to suit different applications in a wide range of industries.

1859843595

11.5.1 Benefits

The EMS system provides the following advantages:

- Increased productivity, efficiency, and flow rate in the plant
- Flexibility due to decentralized intelligence
- Implementation of time-critical functions, such as absolute positioning with repeat accuracy
- Reduction in costs and time required for installation due to stationary system component
- Homogenous structures with fewer interfaces
- Complete solutions from one source
- Reduced planning and implementation phases
- Flexibility and planning security

11.5.2 System components

SEW-EURODRIVE has combined the following components to form a system in order to implement the customer-specific EMS solution:

- Energy transfer
  - Contactless with MOVITRANS® or contact-based with conductor rail
- Drives
  - Standard and electrified monorail gearmotors
  - Decentralized drive technology with MOVIMOT®
- Information transfer and control technology
  - MOVIPRO® trolley and switch controller
  - MOVIPRO® segment controller
  - MOVIPRO® LSI operator panel
  - MOVIPRO® information transfer components
- Software
  - MOVIVISION® parameterizable plant software

12 Address List

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
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.
	Additional addresses for service in Germany provided on request!		

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

France			
	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
	Additional addresses for service in France provided on request!		

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

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

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 Competence 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 Presidente 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

China			
	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
	Additional addresses for service in China provided on request!		

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

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
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

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

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

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

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

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

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

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

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

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

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

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 RUS-195220 St. Petersburg	Tel. +7 812 3332522 +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru

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 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

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

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

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

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

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

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

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

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 offshore:** 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
		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

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