SEW EURODRIVE

Catalog



Industrial Gear Units
X..e Series /HC Design

Edition 07/2022

27783294/EN



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1 Introduction

1.1 Who are we?

The reliable partner at your side!

Humanity and partnership, solutions and services, responsibility and quality, tradition and innovation: SEW-EURODRIVE, the owner-managed family business, has stood for all this and much more for more than 90 years.

As one of the market leaders in drive and automation technology, we do much more than move countless applications in almost every industry. With over 19 000 employees, we're also playing a key role in shaping the future of drive technology, For you. to ensure that you and your systems and machines are always up to date. Not just now, but in the future as well. We want you to succeed together with us.



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1.2 Where can you find us?

We are always nearby!

With our 17 production plants and 85 Drive Technology Centers in 52 countries, we are at your service on every continent and in every corner of the world, always working with you as an equal partner and ensuring that everything runs smoothly.

What makes us truly stand out from other manufacturers? Our unique, comprehensive network of service sites and service experts throughout the world ensures you never have to wait long for spare parts, repairs, or professional advice.

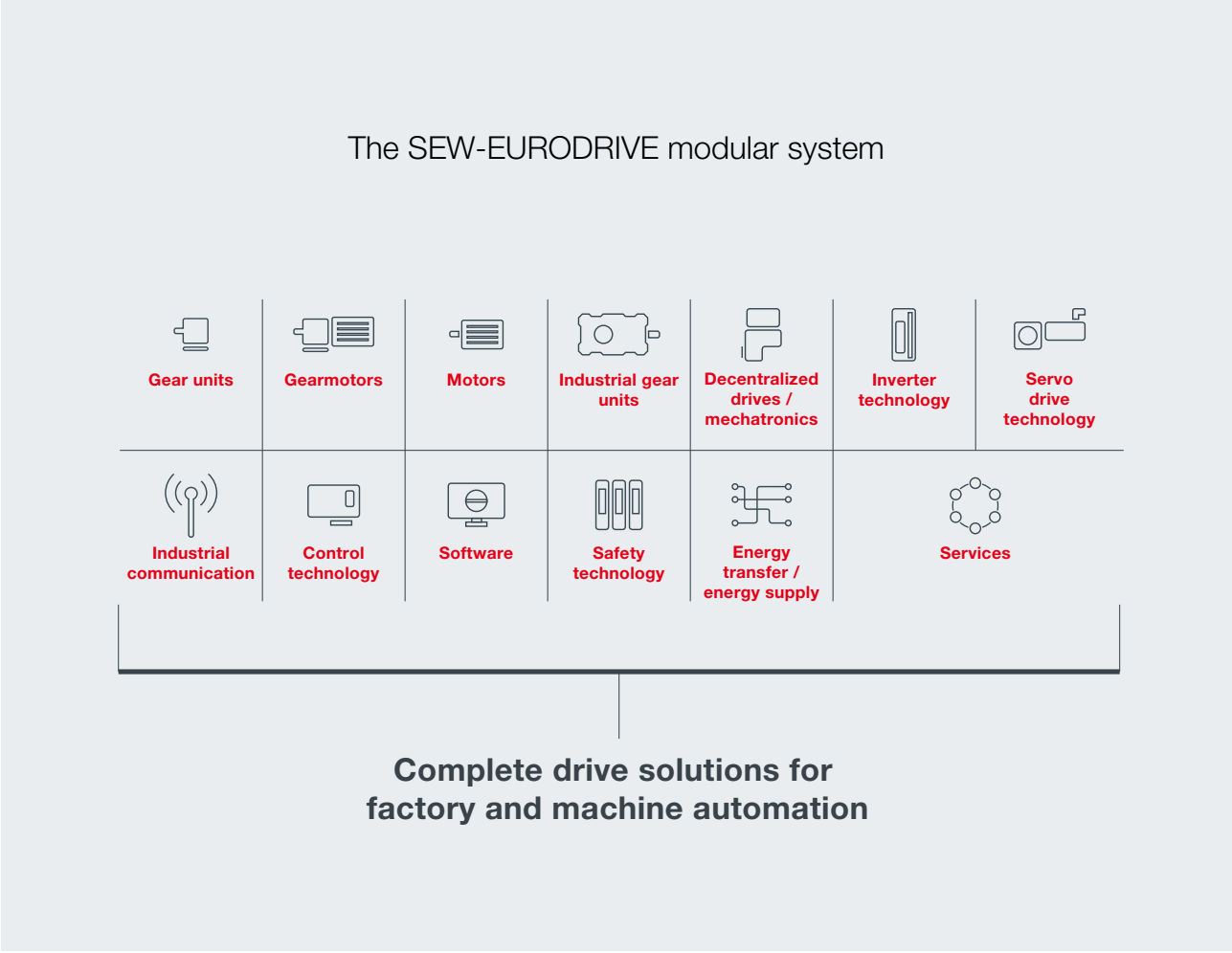
					
52 Countries	**17** Production plants	**85** Drive Technology Centers	**19 000** Employees	**Global** service	**Countless** industries

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1.3 What do we offer?

State-of-the-art drive technology and automation solutions from a single source!

Looking to update your processes or need a new system? We offer you one of the widest ranges of drive technology products, solutions, and services on the market. One contact person for everything – that sounds good, doesn't it?



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1.4 What are the goals we want to reach with you? We want to take you to the top!

Nothing excites us more than the future of production. We are already using Industry 4.0 principles to transform our manufacturing operations. As far as we are concerned, Industry 4.0 ceased to be a distant vision long ago – it is already a successful reality thanks to our smart factory. As a result, we have become one of the world's pioneers in this field.

Yet we do not just focus on increasing our performance to ever greater levels. We also pass on to you the expertise, experience, and technical solutions we have gathered and developed in implementing Industry 4.0 in our production halls. Why not find out more?

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1.5 Why should you choose SEW-EURODRIVE?

Because these ten reasons speak for themselves:

1.5.1 You will be more flexible



However much the requirements for your processes and production systems increase, we're there for you every step of the way. Fast conversion, quick delivery times, increased capacities, quicker format changeover – we provide you with assistance, from assessing your needs to implementing a suitable solution to Life Cycle Services.

1.5.2 You will be more satisfied



Our name stands for the best quality. But we do not rest on our laurels. Quite the contrary, in fact. To ensure we meet all standards – both ours and yours – we undergo annual testing, including certification processes. That's because only one thing matters to us – the satisfaction and trust of our customers.

1.5.3 You will know more



We're happy to share with you the industry and application expertise we have gained over decades and extending far beyond drive technology areas. We work with you to plan and put into practice your tailored solutions in a process where you constantly evolve in tandem with us.

1.5.4 You will be more sustainable



We take responsibility for our employees, customers and business partners but also the environment in which we live and work. As a family business, we think in generations and always look beyond today and tomorrow. With us, you too can drive the future.

1.5.5 You will be more successful



Like you, we cannot afford to stand still. We provide continuous training for our employees and customers. We constantly expand our horizons and enhance our products, solutions and services, and thus your processes. You can only continue to be successful in the future with optimized workflows.

1.5.6 You will be more energy efficient



We go out of our way to find new approaches and make our drives more efficient while always staying well ahead of international regulations. And, if you wish, we work with you to plan your systems and machines so that you can make the best possible use of energy recovery.

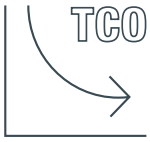
1.5.7 You will be more innovative



What's the point of innovations if they remain out of your reach? We listen to you, which makes us fully aware of your future challenges, and we respond accordingly. With our approximately 600 developers, we drive forward innovative technologies and help bring your processes up to date.

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1.5.8 You will save more money



With us, you can lower your overall operating costs. After all, it isn't just a matter of procurement expenses. Your TCO is significantly determined by the subsequent utilization and service life of your drive technology. We provide you with comprehensive advice on how to reduce your costs through sustainable operations.

1.5.9 You will be close to us



Wherever in the world your system is running, our comprehensive service network and experts mean we're always ready to provide advice and practical assistance when you need it. All-in-one, on-site service that knows no bounds and significantly reduces or even eliminates downtimes.

1.5.10 You will be faster



Throughout the world, our service staff ensure spare parts get to you fast, and faulty drives – including third-party products – are collected and repaired quickly. Software tools make engineering and startup easier for you. Services covering your entire system life cycle help make you faster and more efficient.

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1.6 Added value in the Generation X.e modular system

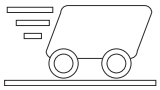
1.6.1 GearOil by SEW-EURODRIVE



GearOil by SEW-EURODRIVE increases the performance of the gear unit with high-quality base oils and the latest additive technologies. The oil reduces friction in rolling and sliding contact, resulting in increased efficiency and wear resistance.

Using GearOil by SEW-EURODRIVE filled at the factory eliminates the need for a first oil change after 500 hours.

1.6.2 Delivery times



The coordinated process chain from order receipt to shipping ensures short delivery times even for customer-specific adjustments.

Replacement parts required during servicing can also be supplied quickly in this way.

1.6.3 Global availability



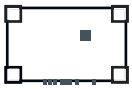
With 4 production plants and 13 assembly plants across the globe, standardized industrial gear units can be made available worldwide in the shortest possible time. Additional service centers can also provide short-term service of any kind.

1.6.4 Detailed calculation



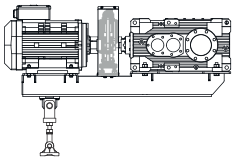
Thanks to the networked calculation landscape, each drive is simulated and calculated with the individually required drive data. Collaboration with research institutes enable us to already use the latest calculation models for series products. The individually tailored product can be created in this way.

1.6.5 Condition monitoring



After a detailed preselection, our IOT Suite DriveRadar® monitors the drive for issues such as vibration and temperature, and can in this way detect any damage to bearings, gearing or temperatures in advance and provide a notification.

1.6.6 Drive packages



With increasing demand for complete drive systems in the industrial gear unit sector, SEW-EURODRIVE can supply everything from a single source, from the motor cable to the customer's interface. In addition to the motor and gear unit, this also includes system components such as couplings, brakes and sensors, all of which are mounted on a steel frame.

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1.7 Documentation

1.7.1 Additional documentation

The following catalogs and brochures are available from SEW-EURODRIVE in addition to this "Helical and Bevel-Helical Gear Units X..e Design /HC" catalog. They are also available on the SEW-EURODRIVE website under "Online Support" > "Data and documents":

- Catalog: "X..e Series Helical and Bevel-Helical Gear Units"
- Catalog: "External Oil Supply and Oil Cooling Systems"
- Catalog: "Flange Couplings"
- Catalog: "Bucket Elevator Drives"
- Catalog: "Drive Packages on Steel Support Constructions"
- Brochure: "Technology for Agitators and Aerators"
- Brochure: "Technology for Cranes"
- Brochure: "Drive Systems for Conveyor Systems"

1.8 Product names and trademarks

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

1.9 Copyright notice

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1.10 Important information

Adhere to the following information:

INFORMATION

- The illustrations in the catalog are examples. Final dimensions are available from SEW-EURODRIVE on request.
- The specified weights are guide values and may deviate slightly.
- When installing a filter in the oil cooling system, make sure there is sufficient height for removing the filter element and the filter housing.

1.11 Decimal separator in numerical values

In this document, a period is used to indicate the decimal separator.

Example: 30.5 kg

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2 Product description

This catalog describes the industrial gear units of the X..e series /HC.

Generation X.e forms the global basis of the industrial helical and bevel-helical gear unit range from SEW-EURODRIVE and, like the gearmotors of smaller torque classes, is characterized by a comprehensive modular system. In addition, the variety of options, the power density and the individual adaptation by means of special designs are decisive features.

The objective of generation X.e was to create an optimum drive for the customer through a fundamental improvement in the hardware and a newly designed calculation landscape that can be designed exactly according to customer requirements, and is available on a global level.

There is always a suitable industrial gear unit available for every application due to the finely stepped sizes.

In combination with the wide range of options, all possibilities are available to meet any needs, even for customer-specific adjustments.

2.1 Gear units of the X..e series /HC

SEW-EURODRIVE has developed and introduced the X..e series gear units in /HC design to meet the weight optimization of crane gear units and to fulfill the requirements regarding the high torques and large center distances of modern cranes.

These gear units are characterized by numerous advantages such as a high power density, finely stepped gear ratios and torques, numerous mounting positions, comprehensive optional accessories, a high degree of standardization and modularization, and short delivery times. They are the ideal alternative for hoist gear units of common cranes.

The area of application includes single- and double-gantry cranes, commercial vehicles, intelligent multi-function vehicles, etc. with different tonnages. These gear units can be used in a wide range of industries such as paper production, energy, light industry, chemical industry, vehicle construction, logistics, and environmental protection.

Parallel-shaft gear units are often used in hoist systems in which the rope drum and motor are arranged on the same side of the gear unit.

The X..e type /HC hoist series for the torque range from 12.8 to 175 kNm offers the crane designer a decisive advantage in the system design thanks to the increased center distance: Optimized gear unit size selection with reduced gear unit weight and, at the same time, sufficient center distance.

Furthermore, the X..e series can be used for a torque range up to 475 kNm.

Project planning with finite fatigue strength and design for load spectrums with defined service life or crane categorization according to relevant standards such as DIN 13001, FEM 1.001 or DIN 15020 are possible.

For detailed information, refer to the technical brochure "Technology for cranes".

2.2 Areas of application

X..e series /HC gear units are used in the following areas of application:

- Single and double gantry cranes
- Process cranes

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- Slewing tower cranes
- Port cranes
- Loading cranes
- Gantry cranes with various tonnages

X..e series /HC gear units can be used in a wide range of industries such as paper production, energy, light industry, chemical industry, vehicle construction, logistics, and environmental protection.

2.3 Your benefits

- Parallel arrangement of the motor and rope drum thanks to a parallel-shaft helical gear unit with a larger center distance.
- Lower costs and weight because the helical gear unit with a larger center distance means it is no longer necessary to oversize the gear units for space reasons.
- Lightweight, low-vibration design due to the gray cast iron housing that has been optimized in terms of weight and rigidity.
- Always the perfect fit thanks to finely stepped torque classes from 12.8 to 175 kNm and a gear ratio range of 14 to 250.
- Quickly available because the hoist gear unit is a standardized catalog product.
- Can be combined flexibly thanks to a range of options that ensure optimum adjustment to the installation situation.

2.4 Technical features

- Load-optimized design based on FEM and load collectives
- 14 sizes with increased center distance based on the basic gear units of the X..e series
- Gear ratio range from 14 to 250
- 3- and 4-stage design
- Horizontal installation (M1) with splash lubrication (other mounting positions on request)
- Monoblock housing for reinforced housing load capacities
- Reinforced output shaft (LSS)
- Optionally prepared encoder interface for speed detection
- Brake bracket according to DIN 15435 for brake drum diameter 250/315/400 mm on continuous input shaft
- Motor connection for IEC 132-355 (including elastic coupling)
- Weight optimized

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2.5 X..e power range

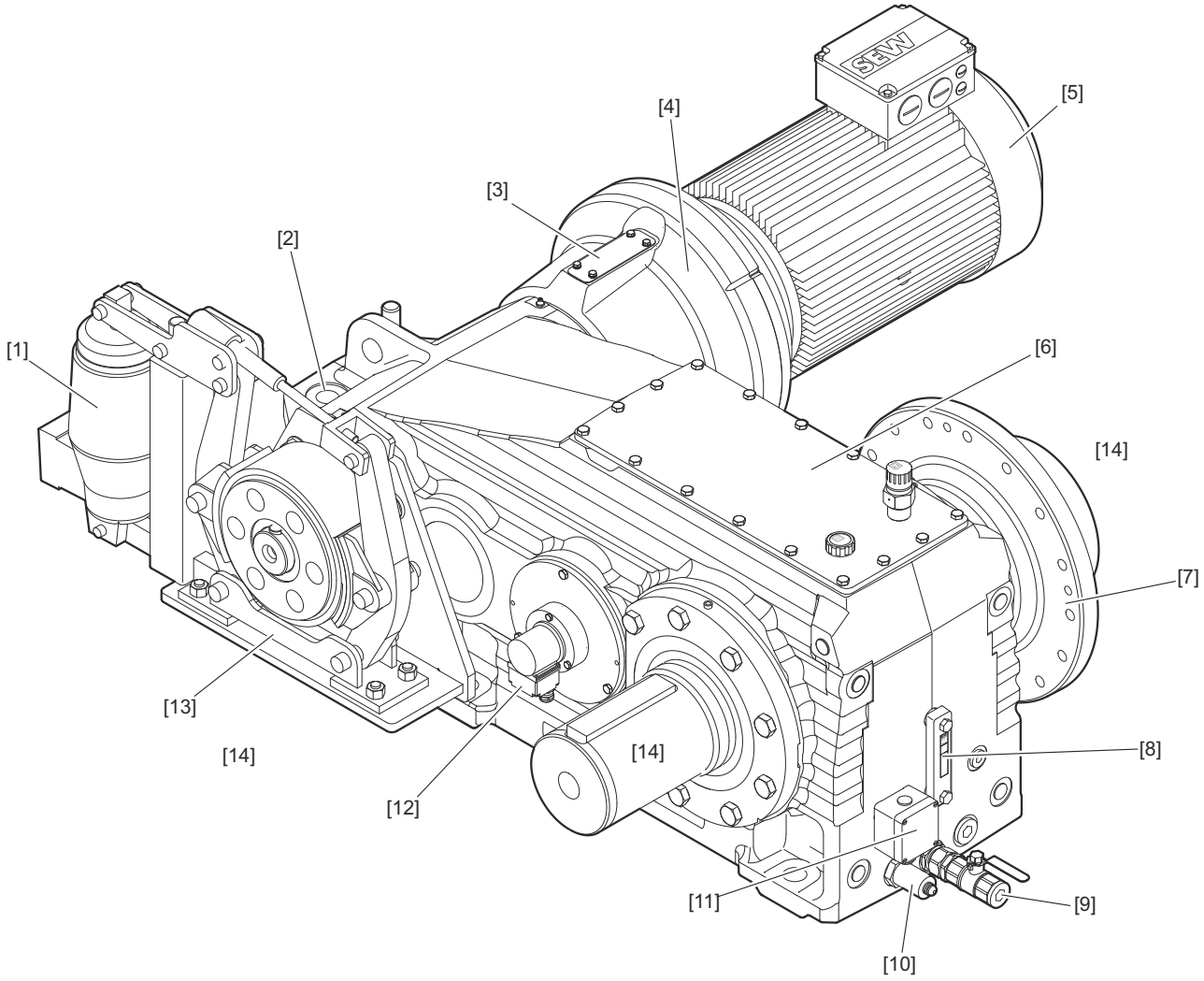
The following table shows an overview.

Size	Nominal torque classes kNm	Nominal gear ratio ranges
		X.F..
X120	12.8	14 – 200
X130	16	18 – 250
X140	22	14 – 200
X150	27.5	18 – 250
X160	36	14 – 200
X170	45	18 – 250
X180	58	16 – 224
X190	65	18 – 250
X200	79	16 – 224
X210	90	18 – 250
X220	112	16 – 224
X230	131	18 – 250
X240	156	14 – 200
X250	175	16 – 225

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2.6 Product components

The following figure is an example and can vary with different options.



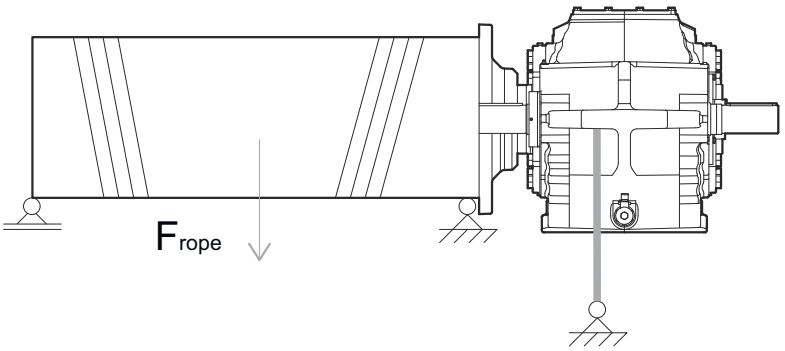
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[1] Drum brake (optional)
[2] Torque arm connection
[3] Intermediate flange with inspection opening
[4] Motor adapter (optional)
[5] Motor
[6] Inspection cover with breather cap and oil dipstick
[7] Flange coupling (optional)
[8] Oil level glass (optional)
[9] Oil drain valve (optional)
[10] Electric heater (optional)
[11] Thermostat (optional)
[12] Encoder (optional)
[13] Brake bracket according to DIN 15435 for drum brake 250/315/400 mm (optional)
[14] Double input or output shaft (optional)

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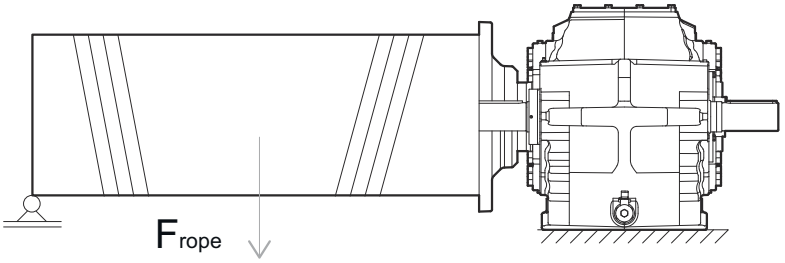
2.7 Mounting positions

2.7.1 Torque arm



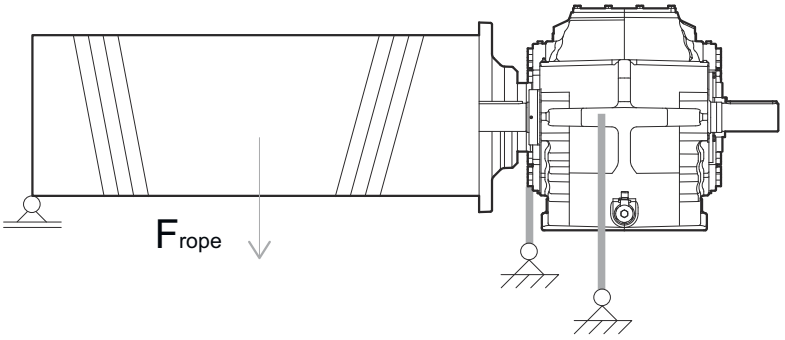
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2.7.2 Foot-mounted design



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2.7.3 Three-point mounting



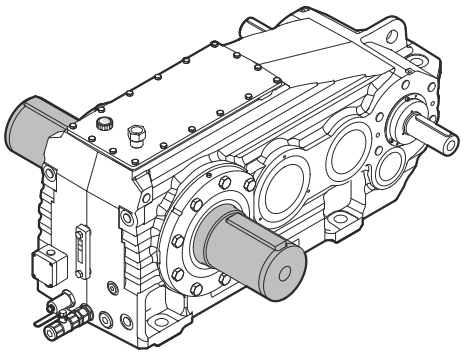
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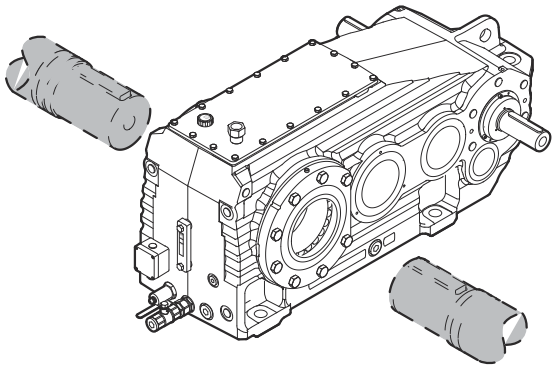
2.8 Output shaft connection type

2.8.1 XFCC: Solid shaft with key

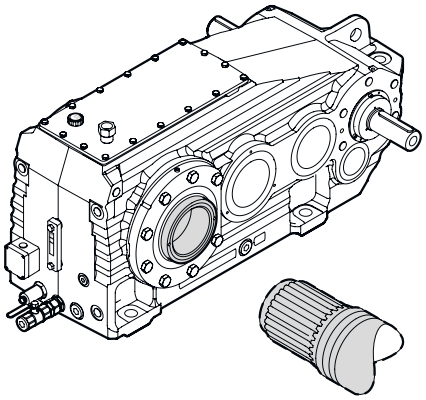
- Reinforced output shaft and bearing.
- Option: Flange coupling for direct drum connection.



2.8.2 XFAC: Hollow shaft with key



2.8.3 XFVC: Splined hollow shaft

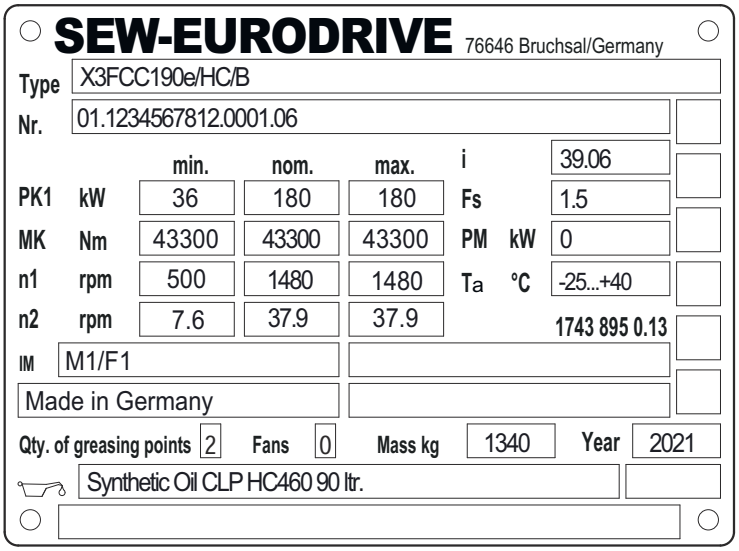


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2.9 Nameplate

2.9.1 Nameplate 1

The following example shows the structure of the nameplate.



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Type		Type designation
No.		Serial number
P_{K1}	kW	Operating power on the input shaft (HSS)
M_{K2}	Nm	Gear unit output torque
n_1	rpm	Input speed (HSS)
n_2	rpm	Output speed (LSS)
min.		Minimum operating point
norm.		Normal operating point
max.		Maximum operating point
i		Exact gear unit ratio
F_S		Service factor
P_M	kW	Nominal motor power
T_a	°C	Deviation from standard temperature range (-20 °C to +40 °C)
Mass	kg	Weight of the gear unit
Greasing points		Number of points that require relubrication
Fan		Number of installed fans
		Oil grade and viscosity class/oil quantity
Year		Year of manufacture
IM		Mounting position and mounting surface

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2.9.2 Nameplate 2

The QR code on the product gives you quick access to the digital services from SEW-EURODRIVE.

In addition to being able to enter the QR code with the camera of your mobile device or an appropriate app, you can also use the "Product ID Plus" app from SEW-EURODRIVE. After scanning, you will see the technical data to identify the product directly.

In addition, the search for product-specific spare parts and documentation, as well as fault diagnostics and direct service requests are simple and fast.

The following figure shows an example of a product label:



18014433531072523

2.10 Type designation

The following example shows the structure of the type designation:

X3FCC160e /HC /T	
X	Industrial gear unit series
3	Number of gear unit stages • 3 = 3 stages • 4 = 4 stages
F	Helical gear unit
C	Type of output shaft • A = Hollow shaft with key • C = Reinforced solid shaft with key • V = Splined hollow shaft
C	Application • C = Hoist gear unit
160	Gear unit sizes • 120 - 250
e	Generation X.e
HC	Housing design • HC = Hoist housing
T	Gear unit mounting • /B = Foot • /T = Torque arm

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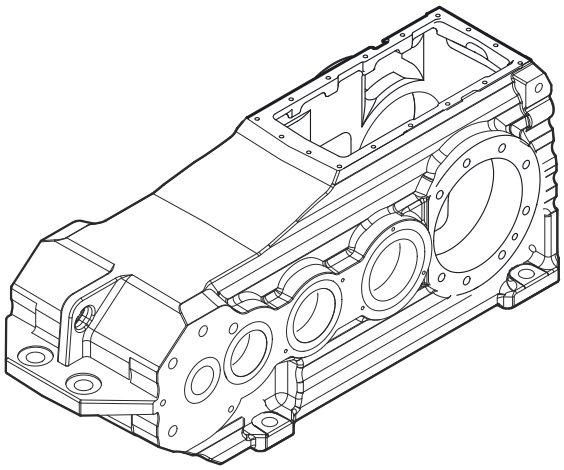
2.11 Housing design

2.11.1 Hoist housing /HC

The housing of the hoist is designed for mounting position M1. This housing design is non-reversible. Due to its extended center distance, the housing offers greater flexibility when cable drums are used.

The gear units are designed as single-piece housings for gear unit sizes X120 to X250.

The following figure shows an example of a housing for gear unit size 150.



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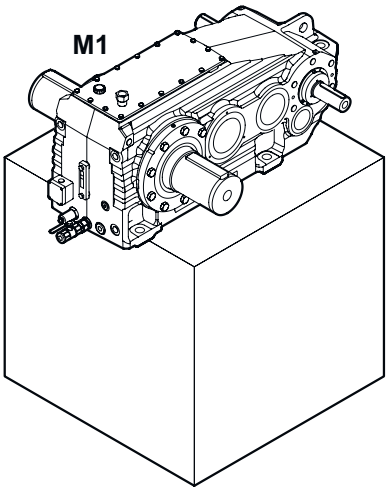
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2.12 Mounting position

2.12.1 Definition

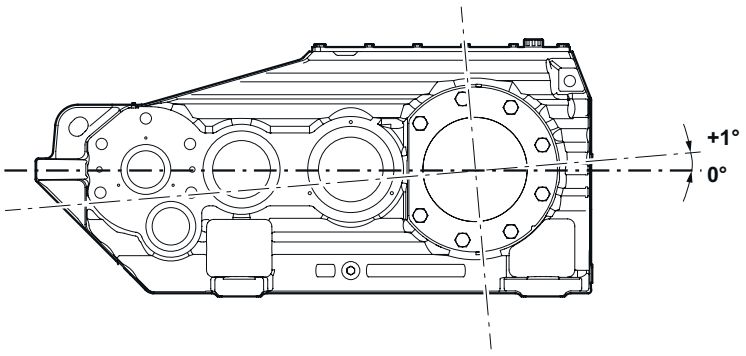
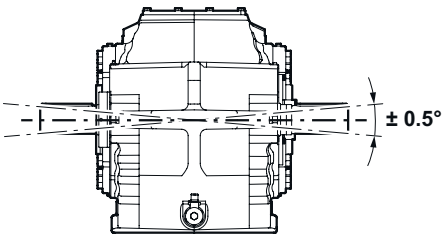
The mounting position defines the spatial position of the gear unit housing and is designated with **M1 – M6**.

X..e series /HC gear units are used in mounting position **M1**.



2.12.2 Deviating mounting positions

Note that the following deviating mounting positions are permitted. The information is based on a gear unit without pivoted mounting position.

X..120 – 250 Mounting position M1



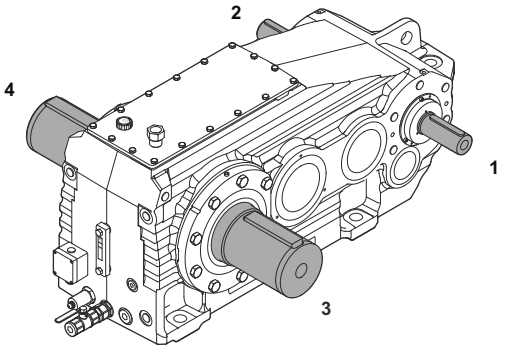
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2.13 Shaft positions

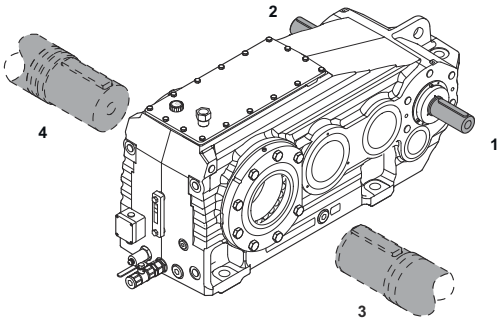
The shaft positions (**1 – 4**) shown in the following figures apply to solid and hollow output shafts. For other shaft positions, contact SEW-EURODRIVE.

2.13.1 X.F..

Shaft position X.FC..



Shaft position X.FA..



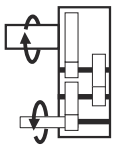
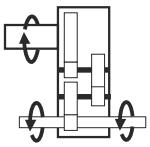
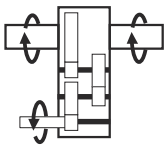
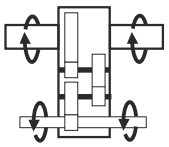
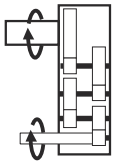
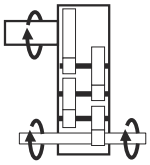
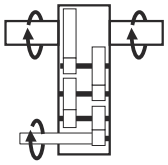
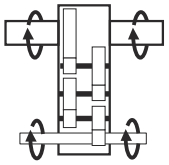
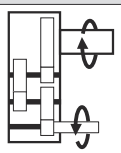
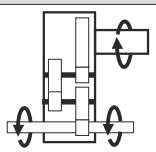
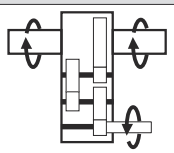
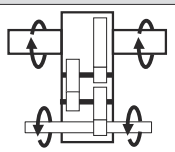
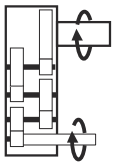
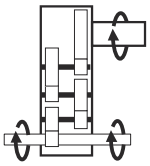
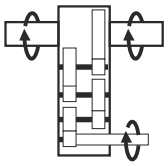
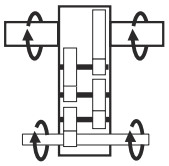
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2.14 Corresponding directions of rotation

The gear unit can be operated in both directions of rotation.

The following tables show the direction of rotation dependencies between input and output shafts. The gear units are schematically depicted as solid shaft design.

2.14.1 X.F..

Shaft position	13	123	143	1243
Position of final gear	3	3	3	3
X3F..				
X4F..				
Shaft position	**24**	**214**	**234**	**2134**
Position of final gear	**4**	**4**	**4**	**4**
X3F..				
X4F..				

For more information and an isometric view of the gear unit, refer to chapter "Shaft positions" (→ 🗎 23).

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2.15 Lubricant selection/lubricant table

INFORMATION

The oil viscosity and type (mineral/synthetic) to be used are determined by SEW-EURODRIVE specifically for each order. This information is noted in the order confirmation and on the gear unit's nameplate. You must contact SEW-EURODRIVE in case of a deviation from this specification.

2.15.1 General information on selecting the oil

Unless a special arrangement is made, SEW-EURODRIVE delivers the drives without oil fill. This does not apply to auxiliary drives and primary gear units.

INFORMATION

This means the gear unit must be filled with the correct oil grade and quantity before startup. You find the corresponding information on the nameplate of the gear unit.

The following tables provide an overview of mineral and synthetic oils.

Mineral oil

Standards

Lubrication oils are divided into ISO VG viscosity classes according to ISO 3448 and DIN 51519.

ISO class	ISO 6743-6 designation	DIN 51517-3 designation	AGMA 9005-D94 designation
150	ISO-L-CKC 150	DIN 51517-CLP 150	AGMA 4 EP
220	ISO-L-CKC 220	DIN 51517-CLP 220	AGMA 5 EP
320	ISO-L-CKC 320	DIN 51517-CLP 320	AGMA 6 EP
460	ISO-L-CKC 460	DIN 51517-CLP 460	AGMA 7 EP
680	ISO-L-CKC 680	DIN 51517-CLP 680	AGMA 8 EP

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Synthetic oil

Standards

Lubrication oils are divided into ISO VG viscosity classes according to ISO 3448 and DIN 51519.

ISO class	ISO 6743-6 designation	DIN 51519 designation	AGMA 9005-D94 designation
150	ISO-L-CKT 150	CLP HC 150	AGMA 4 EP
220	ISO-L-CKT 220	CLP HC 220	AGMA 5 EP
320	ISO-L-CKT 320	CLP HC 320	AGMA 6 EP
460	ISO-L-CKT 460	CLP HC 460	AGMA 7 EP
680	ISO-L-CKT 680	CLP HC 680	AGMA 8 EP

In addition to having the required viscosity, the oil must fulfill the following criteria:

- CLP oils according to DIN 51517-3
- Micro-pitting test according to FVA, FV no. 54/ I-IV, GFT class high, damage force level >10

If synthetic oil is used, SEW-EURODRIVE recommends polyalphaolefin-based oil (CLP HC).

INFORMATION

If required, a cooling system must be used or the oil change interval must be shortened (see chapter "Lubricant change intervals" in the "Helical and Bevel-Helical X.. Series Gear Units" operating instructions).

Observe the operating temperature of the gear unit when specifying the oil change intervals.

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2.15.2 Permitted lubricants

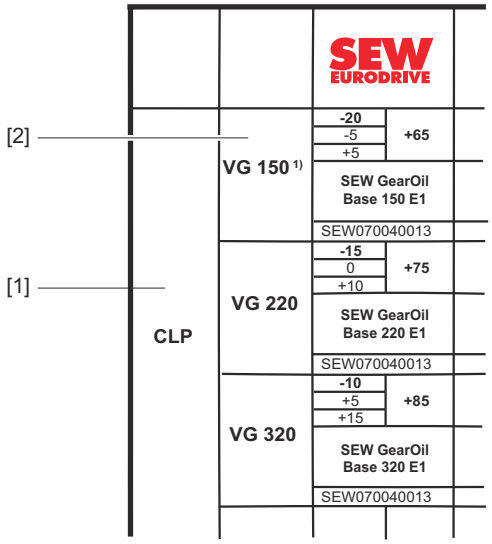
This chapter describes the permitted lubricants and the permitted temperatures for industrial gear units from SEW-EURODRIVE.

INFORMATION

- The standard for viscosity and oil grade is the type of oil that is specified by SEW-EURODRIVE in the order (see order confirmation and nameplate).
- Contact SEW-EURODRIVE if you use bio and food grade lubricants or polyglycol oils.
- Check the compatibility of the used grease and oil.
- The tables contain the lubricants approved by SEW-EURODRIVE.
- Oils of the same viscosity class from different manufacturers do not have the same characteristics. In particular, the minimum permitted oil bath temperatures are manufacturer-specific. These temperatures are specified in the lubricant tables.
- The minimum permitted oil bath temperatures depend on the lubrication type used. These temperatures are specified in the lubricant tables. The values correspond to the maximum viscosity of the individual lubricants.
- The values specified in the lubricant tables apply as of the time of printing of this document. The data of the lubricants is subject to dynamic change on the part of the lubricant manufacturers. For the latest information about the lubricants, visit: www.sew-eurodrive.de/lubricants

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Structure of the tables and abbreviations



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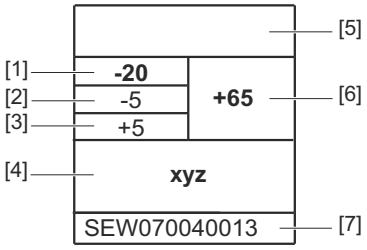
[1] Lubricant type
[2] Viscosity class

Abbreviations

Icons	Designation
CLP	= Mineral oil
CLP HC	= Synthetic polyalphaolefin (PAO)
E	= Ester-based oil
▭	= Mineral lubricant
▬	= Synthetic lubricant
	= Lubricant for the food industry (**NSF H1**-compliant)
	= Biodegradable oil (lubricant for agriculture, forestry, and water management)
1)	= Lubricants may only be used if service factor $F_s \geq 1.3$

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Explanation of the various lubricants



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[1] Lowest cold start temperature in °C for splash lubrication[1)]
[2] Lowest cold start temperature in °C for drives with pumps up to a max. oil viscosity of 5000 cSt[1)]
[3] Lowest cold start temperature in °C for drives with pumps up to a max. oil viscosity of 2000 cSt[1)]
[4] Trade name
[5] Manufacturer
[6] Highest oil bath temperature in °C[2)]
[7] Approvals

1) In case of low temperatures, the oil must be heated to the specified minimum temperature, for example, by using an oil heater. For the maximum permitted oil viscosity per pump type, refer to the following chapter.
2) Service life is significantly reduced when exceeded. Observe chapter "Lubricant change intervals".

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Lubricant compatibility with radial oil seals

GearOil by SEW-EURODRIVE – lubricant for gear units



With decades of experience in gear unit development and construction, as well as numerous customer applications, SEW-EURODRIVE has extensive tribological knowledge. On this basis and in accordance with long-term test runs, SEW-EURODRIVE has developed a special formulation for its own premium gear oil: GearOil by SEW-EURODRIVE – the optimum protection for SEW-EURODRIVE gear units.

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

GearOil by SEW-EURODRIVE increases the performance of the gear unit, regardless of whether it is a standard, servo, or industrial gear unit. The premium gear oil reduces the friction between gear wheels by creating a very good lubrication film. This increases the service life of lubricant and wear parts, such as seals and bearings. The high damage load stage of the mineral lubricants GearOil Base (damage load stage 14) improves protection against pitting of the gearing. At the same time, GearOil increases the efficiency of the gear unit and protects against corrosion and harmful foaming of the oil. The "self-cleaning" properties of the lubricants prevent deposits as they bind water and dirt particles.

Optionally, you can select GearOil by SEW-EURODRIVE as the initial filling for the gear units and gearmotors. The premium gear oil can be ordered in can or barrel containers for service and maintenance purposes. GearOil by SEW-EURODRIVE can be stored for up to 6 years in unopened containers.

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Lubricant tables

This lubricant table is valid when the document is published. Please refer to www.sew-eurodrive.de/schmierstoffe for the latest version of the table.

[1]	[2]	SEW EURODRIVE			Castrol			FUCHS			Mobil			KLÜBER LUBRICATION			SINOPEC			TOTAL		
CLP	VG 150	-20		+65	-20		+65	-20		+65	-20		+65	-20		+65	-20		+65			
		-5			-5			-5			-5			-5			-5					
		+5			+5			+5			+5			+5			+5					
		SEW GearOil Base 150 E1 / US1 / CN1 / BR1			Optigear BM 150			Alpha SP 150			Renolin CLP 150 Plus			Renolin HighGear 150			Mobilgear 600 XP 150			Klüberoil GEM 1-150 N			AP-SGO 150		
		SEW070040013									SEW070030013						SEW070030013					
	VG 220	-15		+75	-15		+75	-15		+75	-15		+75	-15		+75	-15		+75	-15		+75
		0			0			0			0			0			0			0		
		+10			+10			+10			+10			+10			+10			+10		
		SEW GearOil Base 220 E1 / US1 / CN1 / BR1			Optigear BM 220			Alpha SP 220			Renolin CLP 220 Plus			Renolin HighGear 220			Mobilgear 600 XP 220			Klüberoil GEM 1-220 N			AP-SGO 220			Carter EP 220		
		SEW070040013									SEW070030013						SEW070030013											
	VG 320	-10		+85	-10		+80	-10		+80	-10		+80	-10		+80	-10		+80	-10		+80
		+5			+5			+5			+5			+5			+5			+5		
		+15			+15			+15			+15			+15			+15			+15		
		SEW GearOil Base 320 E1 / US1 / CN1 / BR1			Optigear BM 320			Alpha SP 320			Renolin CLP 320 Plus			Renolin HighGear 320			Mobilgear 600 XP 320			Klüberoil GEM 1-320 N			AP-SGO 320			Carter EP 320		
		SEW070040013									SEW070030013						SEW070030013											
	VG 460	-5		+90	-5		+90	-5		+90	-5		+90	-5		+90	-5		+90	-5		+90
		+10			+10			+10			+10			+10			+10			+10		
		+20			+20			+20			+20			+20			+20			+20		
		SEW GearOil Base 320 E1 / US1 / CN1 / BR1			Optigear BM 460			Alpha SP 460			Renolin CLP 460 Plus			Renolin HighGear 460			Mobilgear 600 XP 460			Klüberoil GEM 1-460 N			AP-SGO 460			Carter EP 460		
		SEW070040013									SEW070030013						SEW070030013											
	VG 680	0		+90	0		+90	0		+90	0		+90	0		+90	0		+90	-5		+90
		+15			+15			+15			+15			+15			+15			+10		
		+25			+25			+25			+25			+25			+25			+20		
		SEW GearOil Base 320 E1 / US1 / CN1 / BR1			Optigear BM 680			Alpha SP 680			Renolin CLP 680 Plus			Renolin HighGear 680			Mobilgear 600 XP 680			Klüberoil GEM 1-680 N			AP-SGO 460			Carter EP 680		
		SEW070040013									SEW070030013						SEW070030013											
	VG 1000	+5		+90																		
		+20																				
		+30																				
		Optigear BM 1000																				

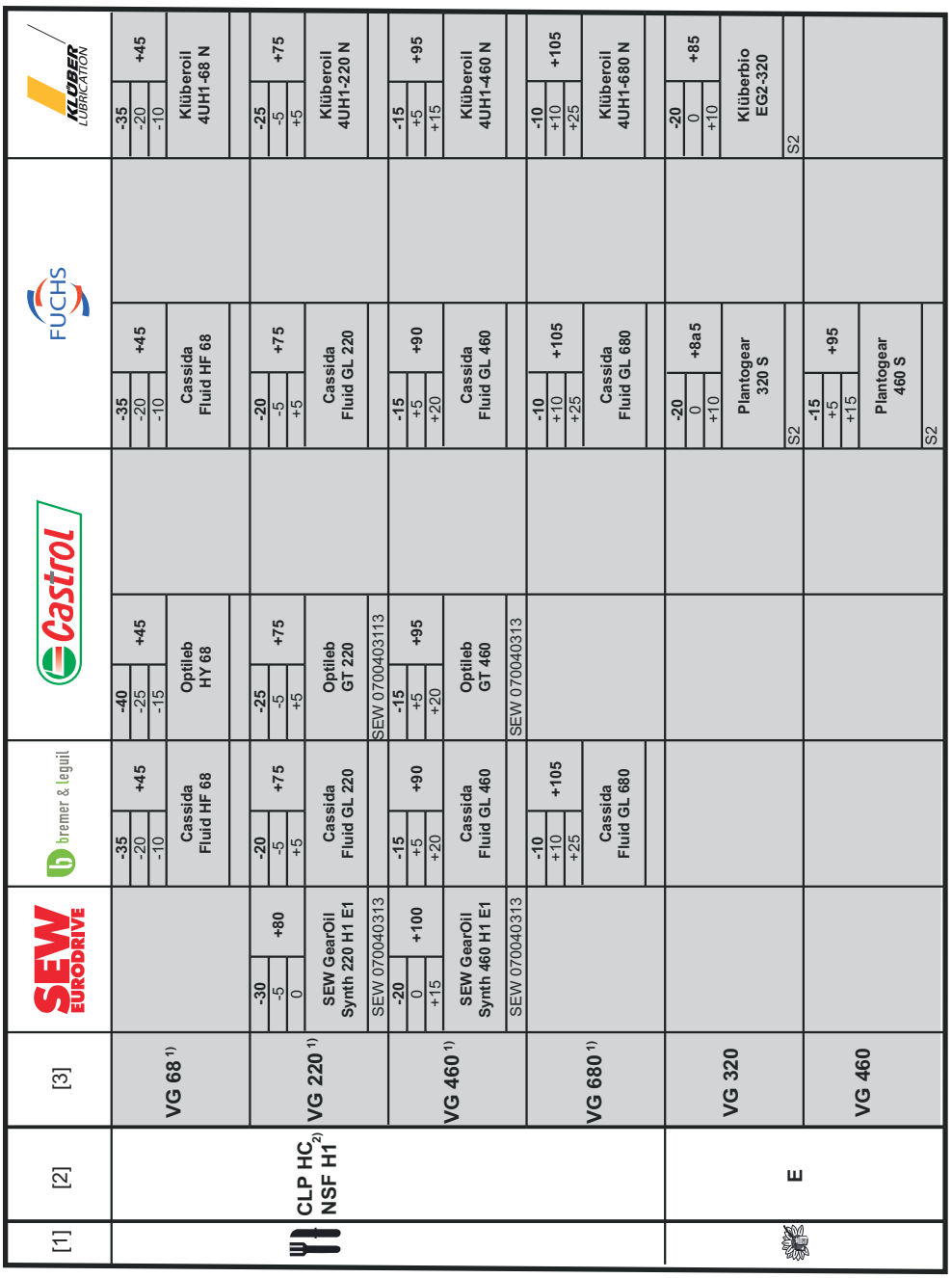
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[1]	[2]	SEW EURODRIVE	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TOTAL
CLP HC	VG 32 [1]				-40 -30 -25 +30 SHC 624			
	VG 68 [1]				-35 -20 -10 +50 SHC 626	-35 -20 -10 +50 Klübersynth GEM 4-68 N		
	VG 150 [1]	-35 -15 -5 +75 GearOil Synth 150 E1 SEW 07004031 3	-25 -10 0 +70 Alphasyn EP 150	-30 -10 0 +70 Optigear Synthetic X 150	-30 -10 0 +75 SHC 629	-25 -10 0 70 Klübersynth GEM 4-150 N	-30 -10 0 +75 Omala S4 GX 150	-35 -15 -5 +75 Carter SH 150
	VG 220	-30 -10 0 +85 GearOil Synth 220 E1 SEW 07004031 3	-25 -5 +5 +80 Alphasyn EP 220	-25 -5 +5 +80 Optigear Synthetic X 220	-25 -5 0 +85 SHC 630	-25 -5 +5 +80 Klübersynth GEM 4-220 N	-25 -5 +5 +85 Omala S4 GX 220	-25 -5 +5 +80 Carter SH 220
	VG 320	-25 -5 +5 +100 GearOil Synth 320 E1 SEW 07004031 3	-20 0 +10 +90 Alphasyn EP 320	-20 0 +10 +90 Optigear Synthetic X 320	-20 0 +10 +90 SHC 632	-20 0 +10 +95 Klübersynth GEM 4-320 N	-20 0 +10 +95 Omala S4 GX 320	-20 0 +10 +90 Carter SH 320
	VG 460	-20 0 +15 +110 GearOil Synth 460 E1 SEW 07004031 3	-15 +5 +15 +100 Alphasyn EP 460	-15 +5 +15 +100 Optigear Synthetic X 460	-15 +5 +15 +100 Renolin Unisyn CLP 460	-15 +5 +20 +105 Klübersynth GEM 4-460 N	-15 +5 +15 +105 Omala S4 GX 460	-15 +5 +15 +100 Carter SH 460
	VG 680	-15 +5 +20 +110 GearOil Synth 680 E1 SEW 07004031 3	-10 +10 +25 +110 Optigear Synthetic X 680	-10 +10 +25 +110 Renolin Unisyn CLP 680	-10 +10 +25 +110 SHC 636	-10 +10 +25 +110 Klübersynth GEM 4-680 N	-10 +10 +25 +110 Omala S4 GX 680	-10 +10 +25 +110 Carter SH 680
	VG 1000				-10 +15 +30 +110 SHC 639	0 +20 +30 +110 Klübersynth EG4-1000		
					-10 +15 +30 +110 SHC Gear 1000	-10 +15 +30 +110 SHC Gear 1000		

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[1]	[2]	[3]	SEW EURODRIVE	bremer & leguil	Castrol	FUCHS	KLÜBER LUBRICATION
	CLP HC 2) NSF H1	VG 68 1)	-30 -5 0 +80 SEW GearOil Synth 220 H1 E1 SEW 070040313	-35 -20 -10 +45 Cassida Fluid HF 68	-40 -25 -15 +45 Optileb HY 68	-35 -20 -10 +45 Cassida Fluid HF 68	-35 -20 -10 +45 Klüberoil 4UH1-68 N
		VG 220 1)	-20 -5 +5 +80 SEW GearOil Synth 220 H1 E1 SEW 070040313	-20 -5 +5 +75 Cassida Fluid GL 220	-25 -5 +5 +75 Optileb GT 220 SEW 0700403113	-20 -5 +5 +75 Cassida Fluid GL 220	-25 -5 +5 +75 Klüberoil 4UH1-220 N
		VG 460 1)	-20 0 +15 +100 SEW GearOil Synth 460 H1 E1 SEW 070040313	-15 +5 +20 +90 Cassida Fluid GL 460	-15 +5 +20 +95 Optileb GT 460 SEW 070040313	-15 +5 +20 +90 Cassida Fluid GL 460	-15 +5 +15 +95 Klüberoil 4UH1-460 N
		VG 680 1)	-10 +10 +25 +105 Cassida Fluid GL 680			-10 +10 +25 +105 Cassida Fluid GL 680	-10 +10 +25 +105 Klüberoil 4UH1-680 N
	E	VG 320				-20 0 +10 +8a5 Plantogear 320 S S2	-20 0 +10 +85 Klüberbio EG2-320 S2
		VG 460				-15 +5 +15 +95 Plantogear 460 S S2	

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1) Lubricants may only be used if the service factor F_s and peak load factor $F_F \geq 1.6$.
The peak output torque $MK2_{per}$ is limited as follows: $F_F \geq 1.6 \rightarrow M_{K2per} \leq 1.25$ x MN2 (nominal torque) $\rightarrow M_{K2per} \leq 2x\ M_{N2}/F_F = 2/1.6x\ M_{N2}$.
In case of deviations, contact SEW-EURODRIVE.

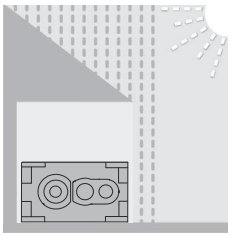
2) NSF-H1 registered oils for the food processing industry cannot be combined with the gear unit option "Extended storage" (a VCI anti-corrosion agent is added).

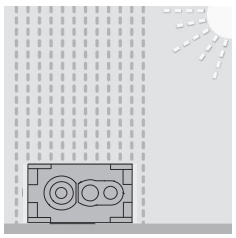
NOTICE:
The thermal operating limits of the oil seal materials must also be taken into account, see chapter "Lubricant compatibility with oil seal".

2.16 Coating and surface protection systems

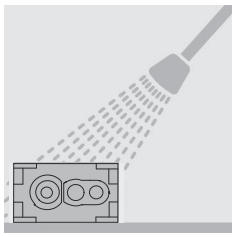
Used as surface protection under typical ambient conditions, corrosivity category DIN EN ISO 12944-2. The following tables give an overview of coating and surface protection systems.

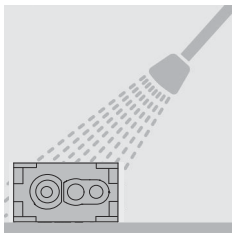
The gear unit is equipped with the following surface protection.

OS 1 low environmental pollution	
	For environments prone to condensation and atmospheres with low humidity or contamination, such as outdoor applications under roof or with protection, unheated buildings where condensation can build up. According to corrosivity category: C2 (low)
Sample applications	• Systems in saw mills • Agitators and mixers
Condensation test ISO 6270	120 h
Salt spray test ISO 7253	–

OS 2 medium environmental pollution	
	For environments with high humidity or moderate atmospheric contamination, such as applications outdoors subject to direct weathering. According to corrosivity category: C3 (moderate)
Sample applications	• Applications in gravel plants • Cableways
Condensation test ISO 6270	120 h
Salt spray test ISO 7253	240 h

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OS 3 high environmental pollution	
	For environments with high humidity and occasionally severe atmospheric and chemical contamination. Occasional acidic or caustic wet cleaning. Also for applications in coastal areas with moderate salt load. According to corrosivity category: C4 (high)
Sample applications	• Port cranes • Sewage treatment plants • Mining applications
Condensation test ISO 6270	240 h
Salt spray test ISO 7253	480 h

OS 4 very high environmental pollution	
	Suitable for environments with permanent humidity or severe atmospheric or chemical contamination. Regular acidic and caustic wet cleaning also with chemical cleaning agents. Based on corrosivity category: C5 (very high)
Example applications	• Drives in malting plants • Wet areas in the beverage industry • Conveyor belts in the food industry
Condensation test ISO 6270	360 h
Salt spray test ISO 7253	600 h

INFORMATION

- Standard top coat color RAL 7031, can deviate depending on the order, see order documents.
- Color according to RAL
- Water and hand perspiration repelling rust preventive for external preservation applied to uncoated parts, shaft ends/flanges.
- Sheet metal parts (such as protection covers) are painted in RAL 1003 as standard.
- If you need surface protection systems of a higher quality, contact SEW-EURODRIVE.

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2.17 Storage and transport conditions

The gear units can be provided with the following protection and packaging types depending on the storage and transport conditions.

2.17.1 Internal conservation

Standard corrosion protection

After the test run, the test oil is drained out of the gear unit. The remaining oil film protects the gear unit against corrosion for a limited period of time.

Long-term corrosion protection

After the test run, the test oil is drained out of the gear unit and the interior space is filled with a vapor phase inhibitor. The breather filter is replaced by a screw plug and enclosed with the gear unit.

2.17.2 Exterior corrosion protection

The following measures are taken for exterior corrosion protection:

- Corrosion protection is applied to bare, non-painted functional surfaces of shafts, flanges, mounting and foot surfaces on the gear unit. Remove it only using an appropriate solvent which is not harmful to the oil seal.
- Small spare parts and loose pieces, such as bolts, nuts, etc., are packed in corrosion protection plastic bags (VCI corrosion protection bags).
- Threaded holes and blind holes are covered by plastic plugs.

INFORMATION

If the gear unit is stored longer than 6 months, regularly check the protective coating of unpainted areas as well as the paint coating. Areas with protective coating and/or paint that has been removed may have to be repainted.

2.17.3 Packaging

Standard packaging

The gear unit is delivered on a pallet, securely attached and without cover.

Use: Transportation by land

Long-term packaging

The gear unit is delivered in a wooden box that is also appropriate for sea transport.

Application: Sea transport and/or for extended storage

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2.17.4 Storage conditions

INFORMATION

- The gear unit must be stored in a shock-free manner during the storage period until startup to prevent damage to the rolling bearing races.
- The gear units are delivered without oil; different protection systems are required depending on the storage period and storage conditions as shown in the table below.

Corrosion protection + packaging	Storage location	Storage duration
Standard corrosion protection + standard packaging	Under a 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 and no shocks.	Max. 6 months with intact surface protection.
Long-term corrosion protection + standard packaging	Under a 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 and no shocks.	Max. 3 years with regular inspection and checking for intactness.
Long-term corrosion protection + long-term packaging	Under a roof, protected against rain and free from shocks.	Max. 3 years with regular inspection and checking for intactness.

INFORMATION

If stored in tropical zones, provide for sufficient protection against insect damage. Contact SEW-EURODRIVE in the case of differing requirements.

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2.18 Ambient conditions

The gear units are designed for an ambient temperature range of -40 °C to +40 °C. Depending on the ambient temperature, modifications of the standard design may be necessary. Further measures are required at an ambient temperature below -20 °C. Contact SEW-EURODRIVE in this case.

When operated in areas with low ambient temperatures, high levels of humidity, aggressive or explosive atmospheres, contact SEW-EURODRIVE.

Sealing, lubrication, ventilation, surface protection, coupling material, and other properties of the gear unit can then be adjusted to the specific ambient conditions.

2.19 Potentially explosive atmospheres (ATEX)

X..e series industrial gear units are available for operation in potentially explosive atmospheres.

The explosion-protected designs comply with the requirements of Directive 2014/34/EU for equipment group I, category M2 and equipment group II, categories 2 and 3.

Contact SEW-EURODRIVE for project planning of the /HC hoist gear units in ATEX areas.

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2.20 Gear unit characteristics

2.20.1 Gearing and shafts

The gearing with edge corrections is made of high-quality, tempered, and ground case hardening steels. The output shafts are made of tough quenched and tempered steel.

2.20.2 Shaft bearings

Self-aligning, cylindrical, and tapered roller bearings from well-known manufacturers are used.

2.20.3 Noise level

Normally, the sound-power levels of the gear unit, according to ISO 8579-1, are below the 50% line given in the standard.

2.21 Technical data

2.21.1 Exact gear ratio

X3F..

i_N	Size									
	X160	X170	X180	X190	X200	X210	X220	X230	X240	X250
	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}
14	13.92	-	-	-	-	-	-	-	14.57	-
16	15.69	-	15.93	-	15.50	-	15.46	-	16.77	15.65
18	17.32	17.30	17.55	17.79	17.58	17.55	17.53	17.51	18.52	17.98
20	19.52	19.44	19.89	19.81	19.21	19.87	19.20	19.82	21.31	19.90
22.4	22.46	21.53	21.92	22.21	21.79	21.75	21.78	21.75	23.42	22.86
25	25.32	24.20	24.48	24.74	24.27	24.63	24.22	24.62	26.96	25.17
28	27.66	27.92	26.98	27.34	27.52	27.48	27.47	27.43	28.51	28.91
31.5	31.18	31.38	29.93	30.44	30.53	31.11	30.38	31.06	32.82	30.64
35.5	35.69	34.38	32.98	33.42	34.63	34.57	34.46	34.40	36.25	35.20
40	40.23	38.64	39.42	37.21	39.18	39.14	39.05	38.95	41.73	38.96
45	-	44.36	43.43	44.02	44.44	44.37	44.29	44.22	-	44.75
50	-	49.86	-	49.02	-	50.23	-	50.07	-	-

X4F..

i_N	Size						
	X120	X130	X140	X150	X160	X170	X180
	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}
14	15.23	-	15.35	-	-	-	-
16	17.40	-	16.42	-	-	-	-
18	18.99	19.03	18.52	19.06	-	-	-
20	21.70	21.68	19.81	20.41	-	-	-
22.4	24.11	23.74	22.98	23.00	-	-	-
25	27.54	27.04	24.57	24.63	-	-	-
28	30.32	30.13	29.22	28.54	-	-	-
31.5	34.64	34.32	31.25	30.56	-	-	-
35.5	38.47	37.89	37.22	36.29	-	-	-
40	43.95	43.16	39.80	38.86	-	-	-
45	46.21	48.08	47.45	46.23	45.94	-	-
50	52.80	54.77	50.74	49.50	51.77	-	49.07

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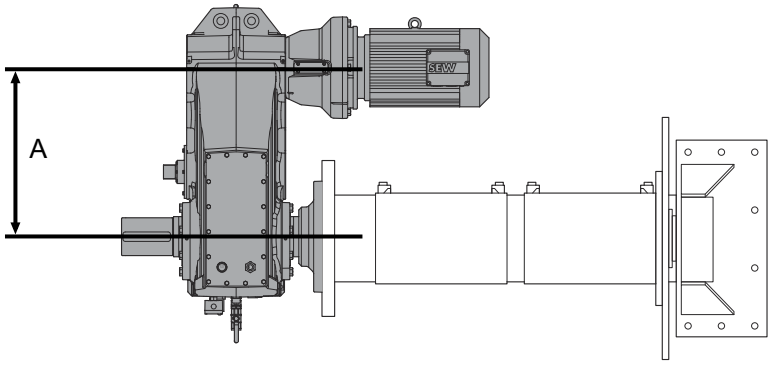
i_N	Size						
	X120	X130	X140	X150	X160	X170	X180
	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}
56	58.63	57.76	59.31	58.93	56.23	57.09	54.07
63	66.99	65.80	63.43	63.10	63.37	64.17	63.52
71	67.85	73.28	72.29	73.67	72.73	69.88	69.99
80	77.52	83.47	77.31	78.88	81.96	78.54	75.58
90	94.55	84.81	92.20	89.78	89.02	90.39	83.27
100	108.03	96.60	98.59	96.14	100.33	101.59	97.84
112	109.42	118.19	112.37	114.50	112.56	110.64	107.80
125	125.02	134.63	120.16	122.61	126.85	124.35	117.70
140	149.38	136.78	143.88	139.56	142.05	139.89	129.69
160	170.68	155.80	153.86	149.43	160.09	157.22	158.47
180	172.87	186.72	175.37	178.69	179.61	176.55	174.61
200	197.52	212.69	187.53	191.34	202.41	198.42	190.64
224	-	216.09	-	217.79	-	223.22	210.06
250	-	246.14	-	233.21	-	250.88	-

i_N	Size						
	X190	X200	X210	X220	X230	X240	X250
	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}	i_{ex}
14	-	-	-	-	-	-	-
16	-	-	-	-	-	-	-
18	-	-	-	-	-	-	-
20	-	-	-	-	-	-	-
22.4	-	-	-	-	-	-	-
25	-	-	-	-	-	-	-
28	-	-	-	-	-	-	-
31.5	-	-	-	-	-	-	-
35.5	-	-	-	-	-	-	-
40	-	-	-	-	-	-	-
45	-	-	-	-	-	48.34	-
50	-	49.88	-	49.29	-	55.64	51.95
56	54.79	56.57	56.48	55.90	55.81	60.86	59.68
63	61.02	62.41	63.95	60.38	63.19	70.05	65.40
71	70.93	70.78	70.67	68.48	68.38	74.31	75.12
80	78.99	75.48	80.01	79.56	77.41	85.53	79.85
90	84.39	85.61	85.48	90.22	90.09	93.54	91.72
100	93.98	94.44	96.77	97.46	101.99	107.66	100.52
112	109.25	107.11	106.94	110.53	110.36	115.12	115.46
125	121.66	117.00	121.08	120.37	124.95	132.51	123.71
140	131.43	132.69	132.48	136.50	136.30	150.59	142.11
160	146.36	155.16	149.99	154.86	154.31	173.33	161.83
180	176.96	175.96	175.69	175.62	175.35	185.34	185.89
200	197.06	192.21	198.91	191.25	198.53	213.33	199.18
224	212.88	217.98	217.65	216.89	216.56	-	228.79
250	237.06	-	246.42	-	245.18	-	-

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2.21.2 Nominal torques, center distances, and weights

X..e /HC gear units have been designed to be precisely optimized according to the operating conditions of lifting applications. The center distance of the gear units has been extended to allow sufficient space for the motor and drum to be mounted on the same side without the gear unit having to be overdimensioned.



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Also refer to chapter "Dimension sheets and dimensions" (→ 🗎 61) in this regard.

Design	Type designation	X120	X130	X140	X150	X160	X170	X180
	M_{N2} in Nm	12800	16000	22000	27500	36000	45000	58000
X3..e/HC	i_N	–	–	–	–	14-40	18-50	16-45
	A in mm	–	–	–	–	715	766	820
	Weight in kg	–	–	–	–	850	940	1270
X4..e/HC	i_N	14-40	18-50	14-200	18-250	45-200	56-250	50-224
	A in mm	595	631	699	741	726	777	833
	i_N	45-200	56-250	–	–	–	–	–
	A in mm	590	626	–	–	–	–	–
	Weight in kg	350	410	530	650	830	960	1310

Design	Type designation	X190	X200	X210	X220	X230	X240	X250
	M_{N2} in Nm	65000	79000	90000	112000	131000	156000	175000
X3..e/HC	i_N	18-50	16-45	18-50	16-45	18-50	14-40	16-45
	A in mm	852	922	958	1042	1082	1172	1195
	Weight in kg	1360	1850	1980	2440	2700	3900	4000
X4..e/HC	i_N	56-250	50-225	56-250	50-225	56-250	45-200	50-225
	A in mm	865	934	970	1057	1097	1195	1218
	i_N	–	–	–	–	–	–	–
	A in mm	–	–	–	–	–	–	–
	Weight in kg	1380	1880	2010	2.550	2900	4100	4200

INFORMATION

The specified nominal torques M_{N2} of the individual gear unit sizes can be reduced for small total gear ratios.

3 Options and accessories

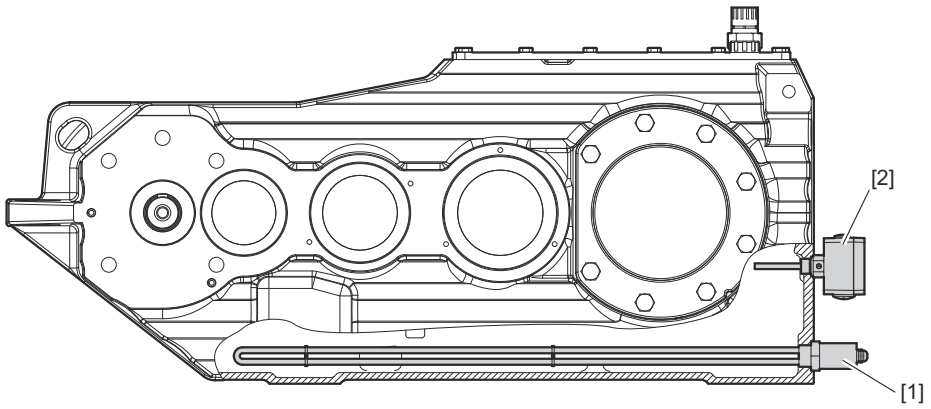
3.1 Oil heater /OH

An oil heater may be required to ensure lubrication during a cold gear unit startup when the ambient temperature is low.

3.1.1 Structure

The oil heater consists of 2 basic parts:

1. Heating element [1] in the oil sump ("oil heater") with connection unit
2. Thermostat with integrated temperature sensor [2]



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3.1.2 Connected load

The table shows the power of the heating that may be installed.

Size	Heating power in kW	Voltage
X120	0.80	230 V/50 Hz
X130 - 140	0.94	230 V/50 Hz
X150 - 170	1.10	230 V/50 Hz
X180 - 210	1.82	230 V/50 Hz
X220 - 230	2.20	230 V/50 Hz
X240 – 250	2.60	230 V/50 Hz

3.1.3 Limit temperature for gear unit startup

The minimum permitted ambient temperature/oil temperature for gear unit startup depends on the viscosity of the oil used and the lubrication type of the gear unit.

INFORMATION

Before startup, it might be necessary to heat up the oil with an oil heater to the temperature specified under "Initial temperature". Observe the lubricant table in chapter "Permitted lubricants" (→ 🗎 27).

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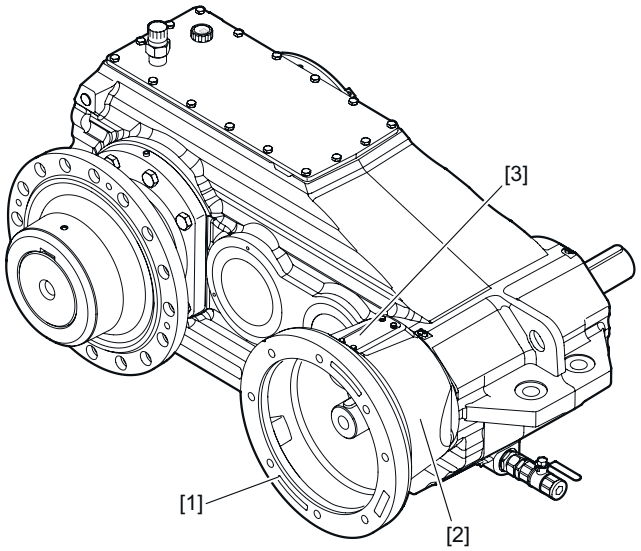
3.2 Motor adapter /MA

The motor adapter [1] is used to mount IEC motors.

The table shows the available motor sizes from 132 to 355:

Motor	Size/motor adapter				IEC Ø in mm
IEC	X120-130	X140-170	X180-230	X240-250	
132	x	x	–	–	300
160 / 180	x	x	x	–	350
200	x	x	x	–	400
225	x	x	x	–	450
250 / 280	x (*)	x	x	x	550
315S-L	-	x (**)	x (**)	x	660
315 / 355	–	–	–	x	800

(*) maximum permitted motor size 280M for flange-mounted motors
(**) maximum permitted motor size 315M for flange-mounted motors
Larger motors may only be mounted in foot-mounted design without overhung load and bending moment load.

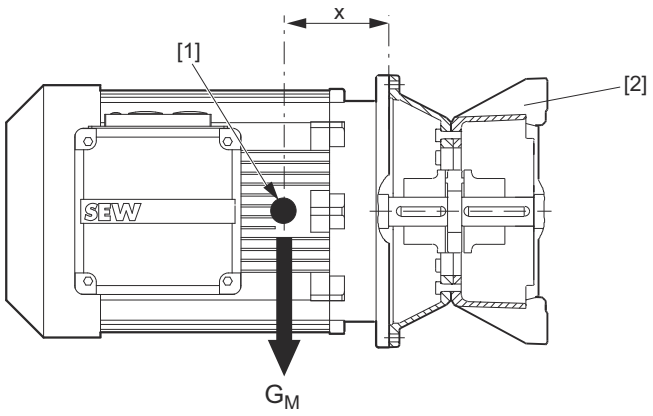


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[1] Motor adapter flange
[2] Motor connection
[3] Inspection opening

3.2.1 Maximum permitted motor weight depends on motor adapter size:

The following maximum loads on the motor adapter must not be exceeded.



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[1] Center of gravity of the motor
[2] Motor adapter
X = Distance from the center of gravity
G_M = Weight of the mounted motor

Valid for sizes X120-230:

Motor adapter	G_M	X
IEC	kg	mm
132	70	200
160/180	170	290
200	220	290
225	300	340
250/280	580	420
315S-M	1200	590

Valid for sizes X240-250

Motor adapter	G_M	X
IEC	kg	mm
250 / 280	820	480
315S-L	1450	680
315	2000	740
355	2500	740

The maximum permitted weight G_M must be linearly reduced if the centroidal distance **X** is increased. G_M cannot be increased if the centroidal distance is reduced.

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3.3 Brake mounting bracket

Drum brake bracket according to DIN 15435.

An emergency stop brake or holding brake can be used.

The drum brake bracket according to DIN 15435 is suitable for brake drums with the sizes 250/315/400 mm.

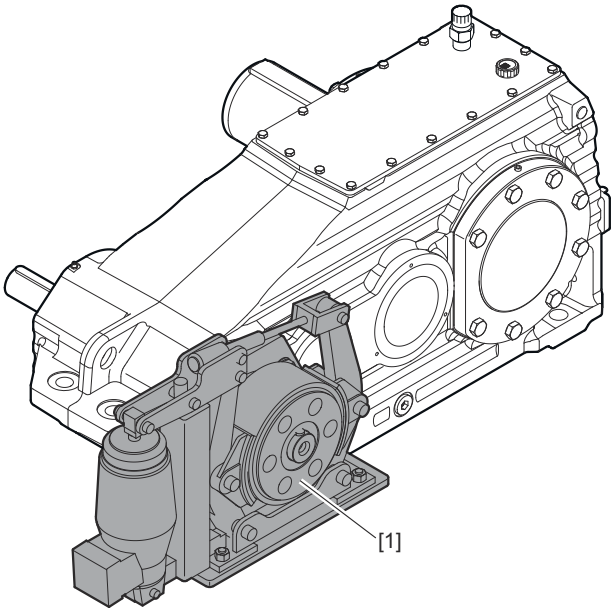
The brake bracket is mounted opposite the drive on shaft 1 or shaft 2 of the gear unit.

Size	Design 250	Design 315	Design 400
X120 – 190	x	x	x
X200 – 250	–	x	x

For other brake types, such as disk brakes, contact SEW-EURODRIVE.

At the time of delivery, the brake bracket is already mounted on the gear unit, and the brake bracket can also be painted in RAL colors according to the customer's requirements.

/HC hoist gear units can optionally be equipped with the corresponding drum brake.



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[1] Brake mounting bracket

3.4 Encoders

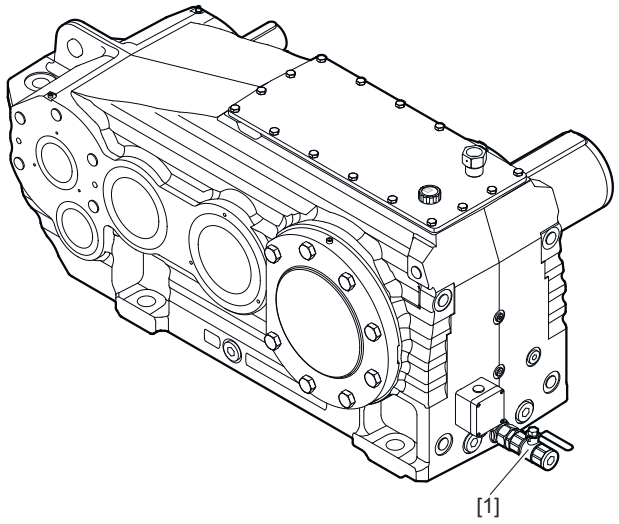
Encoders can be used to monitor either the speed or the position.

Encoders are mounted on the intermediate shaft in front of the LSS output shaft of the gear unit and are available for sizes X120 to 220.

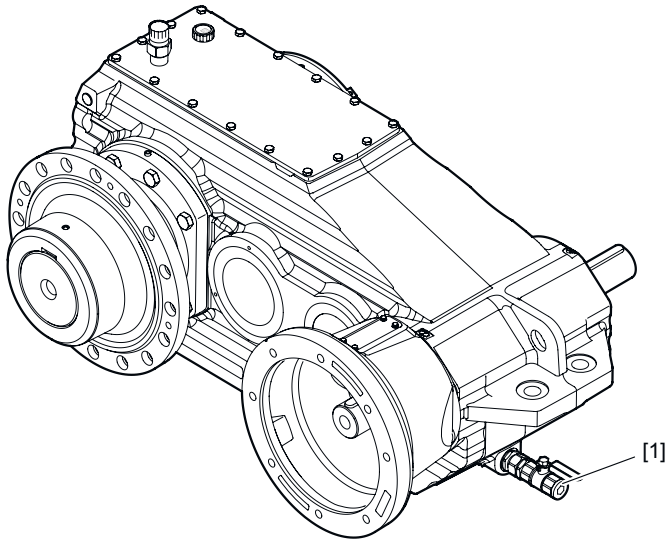
Refer to the order documents for the position of the encoder.

3.5 Oil drain valve

The following mounting positions for the oil drain valve are possible.



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[1] Oil drain valve

Optional:

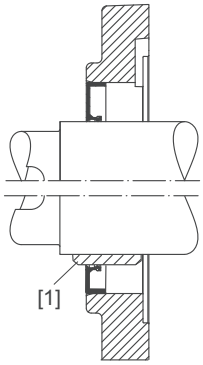
Size	Interface dimensions
X120 – 150	G1/2”
X160 – 190	G1”
X200 – 250	G1 1/4”

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3.6 Sealing system

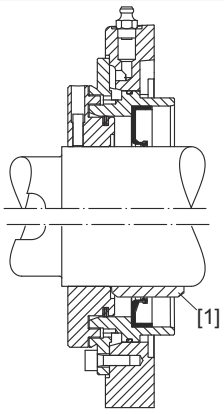
3.6.1 Input shaft

Non-regreasable seal

Designation	Property	Environment	Figure
Standard	Single (optional double) oil seal with dust protection lip	Normal environment	

[1] Optional with oil seal sleeve

Regreasable seal

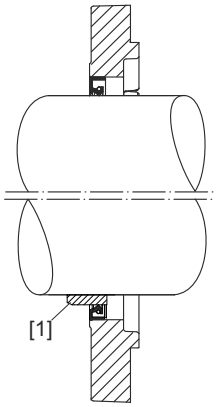
Designation	Property	Environment	Illustration
Radial labyrinth seal (Taconite), regreasable	Single oil seal with radial labyrinth seal	**Very high** dust load with abrasive particles	

[1] Optional with oil seal sleeve

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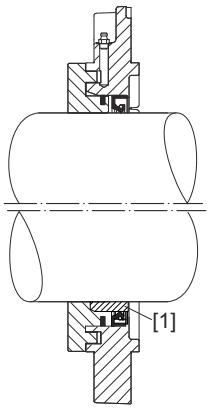
3.6.2 Output shaft

Non-regreasable seal

Designation	Property	Environment	Figure
Standard	Single (optional double) oil seal with dust protection lip	Normal environment	

[1] Optional with oil seal sleeve

Regreasable seal

Designation	Property	Environment	Illustration
Radial labyrinth seal (Taconite), regreasable	Single oil seal with radial labyrinth seal	**Very high** dust load with abrasive particles	

[1] Optional with oil seal sleeve

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4 Project planning for drives

4.1 Additional documentation

In addition to the information in this catalog, SEW-EURODRIVE offers extensive documentation covering the entire topic of electrical drive engineering. This is primarily documentation from the "Drive Engineering – Practical Implementation" series. You can order the latest documentation from SEW-EURODRIVE. The documentation can also be downloaded in PDF format from the SEW-EURODRIVE homepage (www.sew-eurodrive.com).

4.1.1 Explanation of the designations

The table below describes the designations.

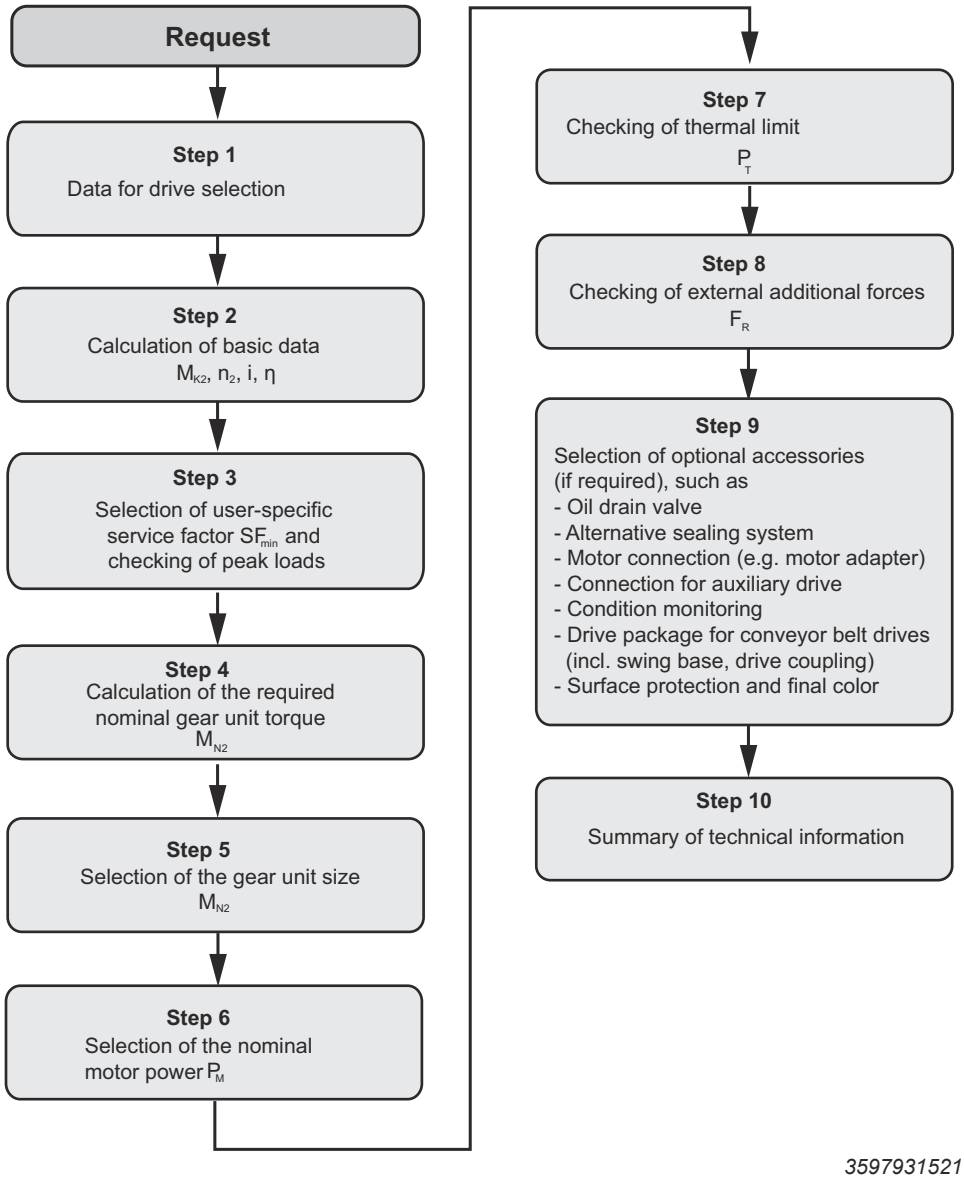
Designation	Explanation	
α	Application angle of the radial load	°
F_A	Axial load	kN
F_R	Overhung load	N
F_{R2}	Overhung load on LSS (distance from the shaft shoulder must be specified)	kN
SF_{min}	Application-specific service factor	–
η	Efficiency	–
HSS	High-speed gear shaft (usually input shaft)	–
f_1	Altitude factor	–
f_t	Thermal factor	–
i	Gear ratio	–
i_{ex}	Exact gear unit ratio	–
i_N	Nominal gear unit ratio	–
LSS	Low-speed gear shaft (usually output shaft)	–
$L_{h\ min}$	Required bearing service life	h
M_{K1}	Input torque (= operating torque at HSS)	kNm
$M_{K1\ max}$	Peak input torque (= peak operating torque at HSS)	kNm
M_{K2}	Output torque (= operating torque at LSS)	kNm
$M_{K2\ max}$	Peak output torque (= peak operating torque at LSS)	kNm
$M_{K2\ per}$	Permitted peak output torque	kNm
M_M	Nominal motor torque	kNm
M_{N2}	Nominal gear unit torque	kNm
n_1	Input speed (HSS)	min^{-1}
n_2	Output speed (LSS)	min^{-1}
n_M	Motor speed	min^{-1}
P_{K1}	Operating power at HSS	kW

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4.2 Project planning procedure

The following flow diagram illustrates the process for the project planning of an X..e series industrial gear unit.

For taking individual application data into account (travel diagram, reeving, load spectrum, etc.) contact SEW-EURODRIVE.



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4.2.1 Step 1: Drive selection data

3 Cranes - Hoist drive description

Industry:

Type of crane:

4 Ambient conditions

4.1 Ambient temperature [°C]

Average: Min.: Max.:

4.2 Installation location

- ☐ In winch house (small rooms (va ≥ 0.5 m/s))
- ☐ Large rooms and halls (va ≥ 1.4 m/s)
- ☐ Outdoors
  - ☐ Protected against sun
  - ☐ Not protected against sun

Installation height [mm]:

4.3 Ambient conditions

☐ Normal ☐ Dusty ☐ Humid ☐ Corrosive ☐ Dry

4.4 Corrosive category acc. to DIN EN ISO 12944

☐ C1 ☐ C2 ☐ C3 ☐ C4 ☐ C5-I ☐ C5-M

☐ Other:

5 Load data

5.1 Regular loads and detailed load spectrum?

☐ Yes

Load spectrum (incl. output torque related to LSS, output speed, time share):	Please attach
Any factors to be considered (e.g. amplifying factor gamma_m, dynamic factors, ...):	
FEM classification L-T-M:	

☐ No – then please fill in:

Either A:

Load capacity (net load [t] and additional weights e.g. weight of ropes, separate lifting accessories, load handling device):	
Reeving of rope system:	
Rope system efficiency:	
Lifting speed of net load [m/min]:	
Lifting speed without load [m/min]:	
Drum diameter [mm]:	
Any factors to be considered (e.g. amplifying factor gamma_m, dynamic factors):	
FEM classification L-T-M:	

Or B:

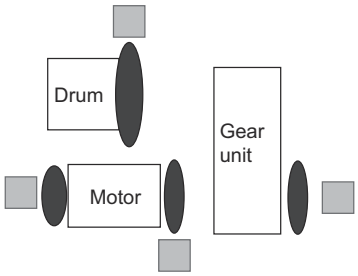
Max. gear unit output torque related to load capacity of the crane [Nm]:	
Gear unit output speed Normal/Min./Max. [1/min]:	
Any factors to be considered (e.g. amplifying factor gamma_m, dynamic factors, ...):	
FEM classification L-T-M:	

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5.2 Brake application

Brake position:



5.3 Brake application at input side (HSS), if applicable

Function:

Holding brake Service brake

Other:

Brake type:

Drum brake Disk brake

Frequency of brake applications:

Set braking torque [Nm]:

Max. braking torque acting on gear unit [Nm]:

Radial load resulting from brake application:

Distance from gear unit shaft shoulder [mm]:

Application angle [°]:

Sketch:

5.4 Brake application at output side (LSS), if applicable

Function:

Frequency of brake applications:

Set brake torque [Nm]:

5.5 External loads from rope drum support at LSS?

No

Yes

Regular loads [N]:

Peak loads [N]:

Frequency of peak loads:

Distance from LSS shoulder [mm]:

Application angle [°]:

Sketch:

Other loads:

5.6 Other peak loads

Type of peak load:

Max. peak load:

Frequency of peak loads:

5.7 Thermal behavior

No. of load cycles/hour:

Breakes between load cycles:

Operating hours/day:

Operating time/year:

Duty cycle cdf [%]:

Further information:

5.8 Standard to be considered

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6 Gear unit requirements

6.1 Gear unit type

☐ Bevel-helical gear unit

☐ Helical gear unit

Min. center distance HSS-LSS: _____

☐ Planetary gear unit

6.2 Mounting position

☐ M1 ☐ Other: _____

6.3 Housing fixation

☐ Foot-mounted

☐ Shaft-mounted (with torque arm)

☐ 3-point support (with torque arm)

6.4 LSS gear unit version

☐ Solid shaft

- ☐ With keyway acc. to DIN 6885.1
  - No. of keyways: _____
- ☐ With spline acc. to DIN 5480
- ☐ Other: _____

☐ Hollow shaft

- ☐ With keyway acc. to DIN 6885.1
- ☐ With spline acc. to DIN 5480
- ☐ Other: _____

Connection to the customer shaft:

→ Type of coupling: _____

7 Machine on HSS (usually driving machine)

7.1 Type:

☐ AC motor/inverter ☐ DC motor

☐ Other: _____

Motor power: _____

Motor speed: _____

7.2 If electric motor:

☐ IEC ☐ NEMA

Motor size (IEC or NEMA code): _____

☐ B3 ☐ B5 Other: _____

7.3 HSS connection to motor

Motor adapter? ☐ Yes ☐ No

Coupling type: _____

Other: _____

7.4 Starting mode/hoist control characteristic:

☐ Precision hoist control

☐ Other (please describe):

Please attach, if available

7.5 Sketch of hoist drive arrangement:

Please attach

7.6 Any further special information

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4.2.2 Step 2: Calculation of basic data – M_{K2}, n_2, i, η

Gear ratio i	$i = \frac{n_1}{n_2}$ n_1 = Input speed (HSS) min^{-1} n_2 = Output speed (LSS) in min^{-1}
The following efficiency levels apply to gear units – η	η = f (i; gear unit type) The efficiency of the gear unit is mainly determined by the gearing and bearing friction as well by churning losses. The following **guide values** apply for calculating splash and pressure lubrication: X3F.. = 0.96 X4F.. = 0.94
Torque at gear unit M_{K2}	Calculation of the dynamic torque at the gear unit [M_{K2}] taking into account the increase coefficients (e.g. dynamic coefficients Φ_i according to DIN EN 13001-2 or vibration coefficients FEM 1001 with [Φ_i] = total dynamic coefficient) due to regular and irregular loads or other dynamic influences known during project planning: $M_{K2} = M_{K2static} \times \Phi_i$

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4.2.3 Step 3: Selection of the application-specific service factor SF_{min} and checking of peak loads

The application-specific service factor SF_{min} takes into account all continuously occurring dynamic torques that are applied to the gear unit from outside beyond rated operation based on the application factor according to DIN 3990/ISO 6336.

These torques depend, among others, on the characteristics of the driving and driven machine, the amount and distribution of the mass moments of inertia, the spring stiffness in the input and output trains (shafts and couplings, etc.), protective measures such as safety couplings, etc., as well as the operating conditions, and apply to gear units with uniform power requirements.

Furthermore, an additional check for peak loads is required if this condition does not apply. This is necessary, for example, for intermittent operation, operation with extreme, repeated shock loads, etc.

Contact SEW-EURODRIVE.

The application-specific service factor SF_{min} takes account of the typical load behavior with regard to the driven machine.

Recommended values with reference to

- Area of application
- Type of driven machine
- Operating hours/day

are listed in the tables below.

INFORMATION

In case of deviations from the typical load behavior, consult SEW-EURODRIVE.

Selection tables for the application-specific service factor SF_{min} of cranes

The following method can be used if the customer does not have a load collective or detailed application data.

A recommendation of the corresponding FEM stage is made depending on the actual load spectrum of the crane operation. This means the M1 – M8 motor groups listed in table 1 can be used to determine the corresponding application-specific service factor (SF_{min}) of the drive train in table 2. The application-specific service factor (SF_{min}) depends primarily on the typical loads (collective class L1 – L4) and the operating time (total operating time T0 – T9).

Table 1 shows drive groups according to FEM 1001:1998

Type of use	Method of use	Mechanism				
		Lifting mechanism	Rotation mechanism	Inclination mechanism	Pendulum mechanism	Running mechanism
Manual pulley		M1	–	–	M1	M1
Installation crane		M2 – M3	M2 – M3	M1 – M2	M1 – M3	M2 – M3
For the installation and dismantling of power plants, machine factories, etc.		M2	–	–	M2	M2
Loader crane	Crane hook	M5 – M6	M4	–	M4 – M5	M5 – M6
Loader crane	Gripper or magnet	M7 – M8	M6	–	M6 – M7	M7 – M8
Workshop crane		M6	M4	–	M4	M5
Mobile crane, mining crane, landfill crane	Gripper or magnet	M8	M6	–	M6 – M7	M7 – M8
Steel and rolling-mill crane		M7 – M8	–	–	M4 – M5	M6 – M7
Clamping crane		M8	M6	–	M7	M8
Stripper crane, crane for loading Siemens-Martin furnaces		M8	M6	–	M7	M8
Casting crane		M8	–	–	M5	M6
Unloading bridge crane, container crane	Crane hook or boom	M6 – M7	M5 – M6	M3 – M4	M6 – M7	M4 – M5
Other bridge crane (with trolley and/or rotatable boom)	Crane hook	M4 – M5	M4 – M5	–	M4 – M5	M4 – M5
Unloading bridge crane, bridge machine (with trolley and/or rotatable boom)	Gripper or magnet	M8	M5 – M6	M3 – M4	M7 – M8	M4 – M5
Shipyard crane, dock crane, demolition crane	Crane hook	M5 – M6	M4 – M5	M4 – M5	M4 – M5	M5 – M6
Harbor crane (rotating, gantry crane), floating crane, floating gantry crane	Crane hook	M6 – M7	M5 – M6	M5 – M6	–	M3 – M4
Harbor crane (rotatable, gantry crane), floating crane, floating gantry crane	Gripper or magnet	M7 – M8	M6 – M7	M6 – M7	–	M4 – M5
Floating crane and floating gantry crane for very large loads (usually more than 100 t)		M3 – M4	M3 – M4	M3 – M4	–	–
Ship crane	Crane hook	M4	M3 – M4	M3 – M4	M2	M3
Ship crane	Gripper or magnet	M5 – M6	M3 – M4	M3 – M4	M4 – M5	M3 – M4
Tower crane for construction sites		M4	M5	M4	M3	M3
Jib crane		M2 – M3	M1 – M2	M1 – M2	–	–
Rail crane		M3 – M4	M2 – M3	M2 – M3	–	–

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Table 2 Application-specific service factor SF_{min}

The data in table 2 depends on the classification of FEM 1.001 (1998.10.1).

				Utilization category									
				T0	T1	T2	T3	T4	T5	T6	T7	T8	T9
				Total operating time T in h									
				≤200	≤400	≤800	≤1600	≤3200	≤6300	≤12500	≤25000	≤50000	≤100000
Collective class	**Collective coefficient**												
L1 – light Rare occurrence of the limit load, the continuous load is a light load.	k ≤ 0.50	Lift	F_{smin}	M1	M1	M1	M2	M3	M4	M5	M6	M7	M8
				1.00	1.00	1.00	1.10	1.20	1.20	1.20	1.20	1.20	1.20
L2 – medium Regular occurrence of the limit load, the continuous load is a medium load.	0.50 < k ≤ 0.63	Lift	F_{smin}	M1	M1	M2	M3	M3	M4	M5	M6	M7	M8
				1.00	1.00	1.00	1.10	1.20	1.20	1.20	1.30	1.30	1.40
L3 – heavy Frequent occurrence of the limit load, continuous load is a heavy load.	0.63 < k ≤ 0.80	Lifting device	F_{smin}	M1	M2	M3	M4	M5	M6	M7	M8	M8	M8
				1.00	1.00	1.10	1.20	1.20	1.20	1.30	1.40	1.50	1.70
L4 – very heavy The load regularly approaches the limit load.	0.80 < k ≤ 1.00	Lifting device	F_{smin}	M2	M3	M4	M5	M6	M7	M8	M8	M8	M8
				1.10	1.10	1.20	1.20	1.20	1.30	1.40	1.60	1.80	2.00

INFORMATION

- The application-specific service factors SF_{min} refer to operation with frequency inverter. If no frequency inverter is used and therefore no soft start is performed, contact SEW-EURODRIVE.
- The user-specific service factors SF_{min} refer to the nominal gear unit torques M_{N2} specified in chapter "Nominal torques, center distances, and weights" (→ 🗎 41).
- The application-specific service factors SF_{min} are only valid for gear units without additional overhung loads.

Peak torque $M_{k2max} \leq 1.6 \times M_{N2}$

The peak torque is the highest value that occurs either during lifting or in case of braking (service brake or safety brake).

This maximum peak load can be used as a limit (1.6 x M_{n2}) for the catalog design.

If there is a load collective with corresponding loads (also higher than 1.6 x M_{n2}), this can be calculated and evaluated for the drive by SEW-EURODRIVE. Contact SEW-EURODRIVE in such cases.

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4.2.4 Step 4: Calculating the required nominal torque – M_{N2}

Constant load direction – constant torque:

$$M_{N2} \geq M_{K2} \times F_{S\min}$$

M_{N2} = Nominal gear unit torque in kNm
M_{K2} = Operating torque at LSS in kNm
SF_{min} = Application-specific service factor

4.2.5 Step 5: Selecting the gear unit size – M_{N2}

Design	Type designation	X120	X130	X140	X150	X160	X170	X180
	M_{N2} in Nm	12800	16000	22000	27500	36000	45000	58000
X3..e/HC	i_N	–	–	–	–	14-40	18-50	16-45
	A in mm	–	–	–	–	715	766	820
	Weight in kg	–	–	–	–	850	940	1270
X4..e/HC	i_N	14-40	18-50	14-200	18-250	45-200	56-250	50-224
	A in mm	595	631	699	741	726	777	833
	i_N	45-200	56-250	–	–	–	–	–
	A in mm	590	626	–	–	–	–	–
	Weight in kg	350	410	530	650	830	960	1310

Design	Type designation	X190	X200	X210	X220	X230	X240	X250
	M_{N2} in Nm	65000	79000	90000	112000	131000	156000	175000
X3..e/HC	i_N	18-50	16-45	18-50	16-45	18-50	14-40	16-45
	A in mm	852	922	958	1042	1082	1172	1195
	Weight in kg	1360	1850	1980	2440	2700	3900	4000
X4..e/HC	i_N	56-250	50-225	56-250	50-225	56-250	45-200	50-225
	A in mm	865	934	970	1057	1097	1195	1218
	i_N	–	–	–	–	–	–	–
	A in mm	–	–	–	–	–	–	–
	Weight in kg	1380	1880	2010	2550	2900	4100	4200

INFORMATION

The specified nominal torques M_{N2} of the individual gear unit sizes can be reduced for small total gear ratios.

4.2.6 Step 6: Selecting the nominal motor power – P_M

$$P_M \geq P_{K1} = \frac{P_{K2}}{\eta}$$

P_M = Nominal motor power in kW
P_{K1} = Operating power at HSS in kW
P_{K2} = Operating power at LSS in kW
η = Efficiency

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4.2.7 Step 7: Checking the thermal rating – P_T

The thermal rating P_T of a gear unit is the power that a gear unit can transmit continuously without exceeding a specific oil temperature.

The thermal rating P_T depends on the following factors:

- Ambient temperature
- Air circulation and sunlight exposure at the installation site
- Installation altitude
- Heat conduction to the foundation at the installation site
- Gear unit type, size and gear ratio
- Type of gear unit external cooling
- Type of gear unit lubrication
- Lubricant type
- Cyclic duration factor

INFORMATION

Contact SEW-EURODRIVE for a detailed analysis.

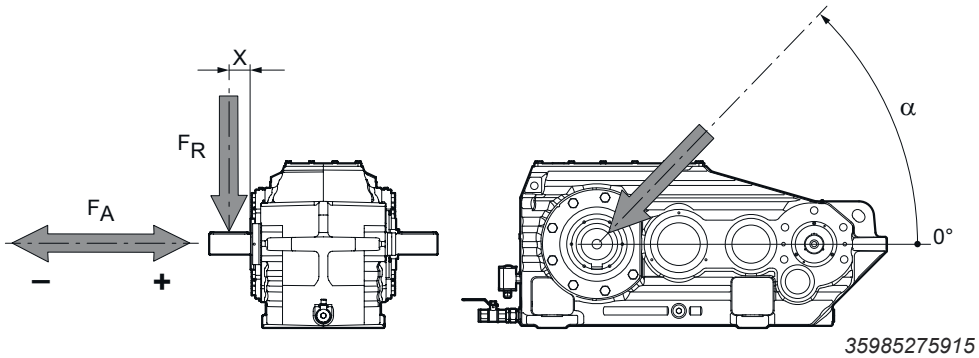
4.2.8 Step 8: Checking the external additional forces – F_R:

Dependencies

The permitted additional forces depend on the following factors:

- Service factor
- Required bearing service life
- Direction of the axial force (from or towards gear unit)
- Application angle of the overhung load (rotating or at a specific application angle)
- Application point of the overhung load in relation to the shaft shoulder
- Relation of axial load and overhung load

Definition of the force application



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INFORMATION

The force application is always defined as viewed onto the output shaft end.

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Maximum permitted overhung load $F_{Rmax\ per}$

The following table shows the permitted overhung loads. The table only applies when using single-sided output shafts and under the following conditions:

- The specified loads only refer to the housing with the material EN-GJL-250.
- Overhung load acts on standard solid shafts (LSS).
- The application point of the overhung load is on the center of the shaft end.
- No external axial force F_A acts on the output shaft.
- The gear unit service factor is 1.3 or higher.
- The application angle of the overhung load is between 45° and 135°.
- Applies only to foot-mounted gear units in mounting position M1 and mounting surface F1.
- Static overhung load ($N_{max} \leq 1000$) with constant direction and value.
- Dynamic overhung load can be sustained ($N \geq 1000\ 000$) for a repeated load.
- Contact SEW-EURODRIVE for differing requirements.

Size	Permitted static overhung load in N	Permitted dynamic overhung load in kN
X120	78	60
X130	78	60
X140	104	92
X150	104	92
X160	162	137
X170	162	137
X180	269	187
X190	269	187
X200	350	249
X210	350	249
X220	496	299
X230	496	299
X240	650	380
X250	650	380

General information

Contact SEW-EURODRIVE in case of the following:

- Permitted axial loads on the output shaft **(LSS)**.
- With permitted overhung and axial loads on the input shaft **(HSS)**.

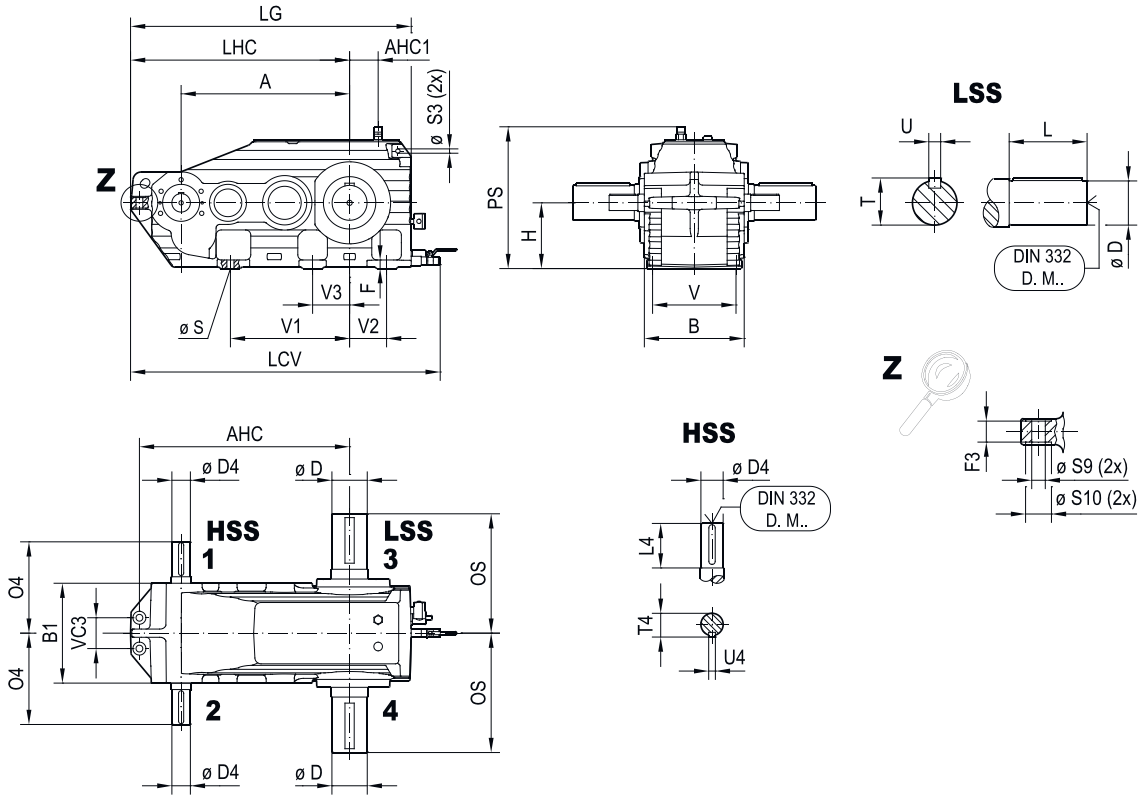
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5 Dimension sheets and dimensions

5.1 Main dimensions X.FC../HC

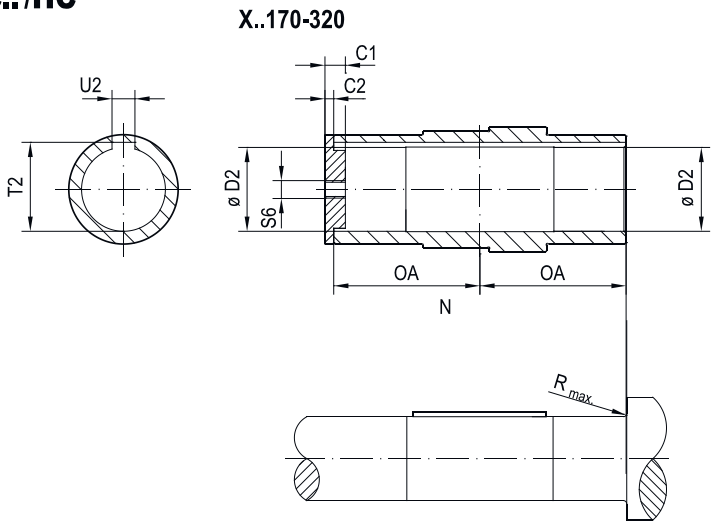
X.FCC../HC

48 025 01 18



X.FAC../HC

48 039 11 07



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5.1.1 X3F..C

X3F..C	A	AHC	AHC1	B	B1	F	F3
X160	715	913	129	409	419	42	40
X170	766	964	190	409	419	42	40
X180	820	1023	139	462	486	42	56
X190	852	1055	169	462	486	42	56
X200	922	1154	197	526	522	62	64
X210	958	1190	197	526	522	62	64
X220	1042	1290	222	602	595	62	72
X230	1082	1360	285	602	595	62	72
X240	1172	1552	285	684	680	68	84
X250	1195	1575	308	684	680	68	84

X3F..C	H	LCV	LG	LHC	PS	Ø S	Ø S3 (2x)
X160	280	1364	1225	969	613	35 (4x)	M20
X170	305	1466	1327	1020	657	35 (4x)	M20
X180	320	1507	1366	1066	690	35 (6x)	M24
X190	320	1569	1428	1098	720	35 (6x)	M24
X200	375	1713	1550	1210	772	48 (6x)	M24
X210	375	1779	1616	1246	812	48 (6x)	M24
X220	440	1895	1733	1351	868	48 (6x)	M30
X230	440	2028	1866	1426	910	48 (6x)	M30
X240	470	2227	2065	1618	965	56 (6x)	M36
X250	470	2273	2111	1641	965	56 (6x)	M36

X3F..C	Ø S9 (2x)	Ø S10 (2x)	V	V1	V2	V3	VC3
X160	33	63	348	520	150	–	130
X170	33	63	348	570	200	–	130
X180	33	63	400	580	180	180	150
X190	33	63	400	615	210	210	150
X200	39	71	434	670	205	235	150
X210	39	71	434	700	230	235	170
X220	39	71	510	805	215	300	170
X230	45	86	510	830	260	300	220
X240	45	86	570	840	260	290	220
X250	45	86	570	860	280	290	220

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5.1.2 X4F..C

X4F..C	A	AHC	AHC1	B	B1	F	F3
X120	595 * 590 **	768	96	294	310	29	28
X130	631 *** 626 ****	804	122.5	294	310	29	28
X140	699	874	118	352	366	33	28
X150	741	916	158	352	366	33	28
X160	726	913	129	409	419	42	40
X170	777	964	190	409	419	42	40
X180	833	1023	139	462	486	42	56
X190	865	1055	169	462	486	42	56
X200	934	1154	197	526	522	62	64
X210	970	1190	197	526	522	62	64
X220	1057	1290	222	602	595	62	72
X230	1097	1360	285	602	595	62	68
X240	1195	1552	285	684	680	68	84
X250	1218	1575	308	684	680	68	84

* i = 14..40

** i = 45..200

*** i = 18..50

**** i = 56..250

X4F..C	H	LCV	LG	LHC	PS	ø S	Ø S3 (2x)
X120	205	1124	1000	805	471	24 (4x)	M20
X130	220	1193	1071	841	521	24 (4x)	M20
X140	240	1257	1133	918	528	28 (4x)	M20
X150	260	1344	1220	960	598	28 (4x)	M20
X160	280	1364	1225	969	613	35 (4x)	M20
X170	305	1466	1327	1020	657	35 (4x)	M20
X180	320	1507	1366	1066	690	35 (6x)	M24
X190	320	1569	1428	1098	720	35 (6x)	M24
X200	375	1713	1550	1210	772	48 (6x)	M24
X210	375	1779	1616	1246	812	48 (6x)	M24
X220	440	1895	1733	1351	868	48 (6x)	M30
X230	440	2028	1866	1426	910	48 (6x)	M30
X240	470	2227	2065	1618	965	56 (6x)	M36
X250	470	2273	2111	1641	965	56 (6x)	M36

X4F..C	Ø S9 (2x)	Ø S10 (2x)	V	V1	V2	V3	VC3
X120	28	48	250	435	130	–	100
X130	28	48	250	455	165	–	100
X140	33	63	300	500	140	–	120
X150	33	63	300	550	180	–	120
X160	33	63	348	520	150	–	130
X170	33	63	348	570	200	–	130
X180	33	63	400	580	180	180	150
X190	33	63	400	615	210	210	150
X200	39	71	434	670	205	235	150
X210	39	71	434	700	230	235	170
X220	39	71	510	805	215	300	170
X230	45	86	510	830	260	300	220
X240	45	86	570	840	260	290	220
X250	45	86	570	860	280	290	220

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5.1.3 HSS input shaft

X3F..C

HSS..	i	Ø D4	L4	O4	T4	U4	DIN 332 DR. M..
X160	14 … 40	70_{m6}	140	381.5	74.5	20_{h9}	M20
X170	18 … 50	70_{m6}	140	381.5	74.5	20_{h9}	M20
X180	16 … 28	90_{m6}	170	444.5	95	25_{h9}	M24
X190	18 … 31.5	90_{m6}	170	444.5	95	25_{h9}	M24
X200	16 – 45	90_{m6}	170	463.5	95	25_{h9}	M24
X210	18 … 50	90_{m6}	170	463.5	95	25_{h9}	M24
X220	16 … 45	100_{m6}	210	538	106	28_{h9}	M24
X230	18 … 50	100_{m6}	210	538	106	28_{h9}	M24
X240	14 … 40	110_{m6}	210	582.5	116	28_{h9}	M24
X250	16 … 45	110_{m6}	210	582.5	116	28_{h9}	M24

HSS..	i	Ø D4	L4	O4	T4	U4	DIN 332 DR. M..
X160	–	–	–	–	–	–	–
X170	–	–	–	–	–	–	–
X180	31.5 … 45	75_{m6}	140	414.5	79.5	20_{h9}	M20
X190	31.5 … 50	75_{m6}	140	414.5	79.5	20_{h9}	M20
X200	–	–	–	–	–	–	–
X210	–	–	–	–	–	–	–
X220	–	–	–	–	–	–	–
X230	–	–	–	–	–	–	–
X240	–	–	–	–	–	–	–
X250	–	–	–	–	–	–	–

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X4F..C

HSS..	i	Ø D4	L4	O4	T4	U4	DIN 332 DR. M..
X120	14 … 40	38_{k6}	90	267.5	41	10_{h9}	M12
X130	18 … 50	38_{k6}	90	267.5	41	10_{h9}	M12
X140	14 … 200	45_{k6}	110	317.5	48.5	14_{h9}	M16
X150	18 … 250	45_{k6}	110	317.5	48.5	14_{h9}	M16
X160	45 … 125	60_{m6}	140	380.5	64	18_{h9}	M20
X170	56 … 160	60_{m6}	140	380.5	64	18_{h9}	M20
X180	50 … 140	60_{m6}	140	410.5	64	18_{h9}	M20
X190	56 … 160	60_{m6}	140	410.5	64	18_{h9}	M20
X200	50 … 140	75_{m6}	140	429.5	79.5	20_{h9}	M20
X210	56 … 160	75_{m6}	140	429.5	79.5	20_{h9}	M20
X220	50 … 140	80_{m6}	170	487	85	22_{h9}	M20
X230	56 … 160	80_{m6}	170	487	85	22_{h9}	M20
X240	45 … 125	90_{m6}	170	531.5	95	25_{h9}	M24
X250	50 … 140	90_{m6}	170	531.5	95	25_{h9}	M24

HSS..	i	Ø D4	L4	O4	T4	U4	DIN 332 DR. M..
X120	45 … 200	38_{k6}	80	257.5	41	10_{h9}	M12
X130	56 … 250	38_{k6}	80	257.5	41	10_{h9}	M12
X140	–	–	–	–	–	–	–
X150	–	–	–	–	–	–	–
X160	140 … 200	50_{k6}	110	350.5	53.5	14_{h9}	M16
X170	180 … 250	50_{k6}	110	350.5	53.5	14_{h9}	M16
X180	160 … 225	55_{k6}	110	380.5	59	16_{h9}	M20
X190	180 … 250	55_{k6}	110	380.5	59	16_{h9}	M20
X200	160 … 225	60_{m6}	140	429.5	64	18_{h9}	M20
X210	180 … 250	60_{m6}	140	429.5	64	18_{h9}	M20
X220	160 … 225	70_{m6}	140	457	74.5	20_{h9}	M20
X230	180 … 250	70_{m6}	140	457	74.5	20_{h9}	M20
X240	140 … 200	75_{m6}	140	501.5	77	20_{h9}	M20
X250	160 … 225	75_{m6}	140	501.5	77	20_{h9}	M20

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5.1.4 LSS output shaft

X3F..C

LSS..	Ø D	L	OS	T	U	DIN 332 DR. M..	kg	ltr.
X160	160_{m6}	220	485	169	40_{h9}	M30	851	53
X170	160_{m6}	220	485	169	40_{h9}	M30	943	64
X180	172_{m6}	270	581	182	45_{h9}	M30	1268	81
X190	172_{m6}	270	581	182	45_{h9}	M30	1363	83
X200	205_{m6}	270	597.5	216	50_{h9}	M30	1854	109
X210	205_{m6}	300	627.5	216	50_{h9}	M30	1984	112
X220	220_{m6}	310	672.5	231	50_{h9}	M30	2441	173
X230	220_{m6}	310	672.5	231	50_{h9}	M30	2700	169
X240	265_{m6}	350	765	277	63_{h9}	M36	3900	228
X250	265_{m6}	350	765	277	63_{h9}	M36	4000	230

X4F..C

LSS..	Ø D	L	OS	T	U	DIN 332 DR. M..	kg	ltr.
X120	110_{m6}	170	361	116	28_{h9}	M24	353	25
X130	130_{m6}	170	364.5	137	32_{h9}	M24	407	29
X140	130_{m6}	180	403	137	32_{h9}	M24	525	39
X150	140_{m6}	180	403	148	36_{h9}	M30	647	47
X160	160_{m6}	220	485	169	40_{h9}	M30	826	51
X170	160_{m6}	220	485	169	40_{h9}	M30	963	65
X180	172_{m6}	270	581	182	45_{h9}	M30	1306	79
X190	172_{m6}	270	581	182	45_{h9}	M30	1377	80
X200	205_{m6}	270	597.5	216	50_{h9}	M30	1875	109
X210	205_{m6}	300	627.5	216	50_{h9}	M30	2006	113
X220	220_{m6}	310	672.5	231	50_{h9}	M30	2548	169
X230	220_{m6}	310	672.5	231	50_{h9}	M30	2900	171
X240	265_{m6}	350	765	277	63_{h9}	M36	4100	230
X250	265_{m6}	350	765	277	63_{h9}	M36	4200	231

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X3F..A

LSS	Ø D2	Ø EA	OA	T2	U2	WA	ISO 4017 M..	kg
X160	135^{H8}	270	256	143.4	36^{JS9}	319	M30x90-8.8	900
X170	150^{H8}	270	256	158.4	36^{JS9}	319	M30x90-8.8	1045
X180	165^{H8}	278	292	174.4	40^{JS9}	356	M30x90-8.8	1.350
X190	165^{H8}	278	292	174.4	40^{JS9}	356	M30x90-8.8	1415
X200	180^{H8}	332	319.5	190.4	45^{JS9}	383	M30x90-8.8	1765
X210	190^{H8}	332	319.5	200.4	45^{JS9}	383	M30x90-8.8	1815
X220	210^{H8}	360	352.5	221.4	50^{JS9}	417	M30x90-8.8	2.450
X230	210^{H8}	360	352.5	221.4	50JS9	417	M30x90-8.8	2700
X240	230^{H8}	420	400.5	241.4	50JS9	469	M36x110-8.8	3340
X250	240^{H8}	420	400.5	252.4	56JS9	469	M36x110-8.8	3415

X4F..A

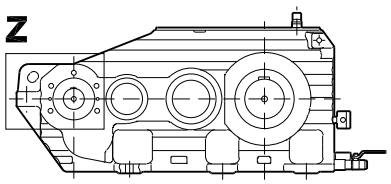
LSS	Ø D2	Ø EA	OA	T2	U2	WA	ISO 4017 M..	kg
X120	95^{H8}	202	190.5	100.4	25^{JS9}	223	M24x70-8.8	335
X130	105^{H8}	222	194	111.4	28^{JS9}	225	M24x70-8.8	370
X140	115^{H8}	222	222	122.4	32^{JS9}	253	M24x70-8.8	525
X150	125^{H8}	250	224.5	132.4	32^{JS9}	255	M24x70-8.8	590
X160	135^{H8}	270	256	143.4	36^{JS9}	319	M30x90-8.8	890
X170	150^{H8}	270	256	158.4	36^{JS9}	319	M30x90-8.8	1080
X180	165^{H8}	278	292	174.4	40^{JS9}	356	M30x90-8.8	1310
X190	165^{H8}	278	292	174.4	40^{JS9}	356	M30x90-8.8	1.350
X200	180^{H8}	332	319.5	190.4	45^{JS9}	383	M30x90-8.8	1815
X210	190^{H8}	332	319.5	200.4	45^{JS9}	383	M30x90-8.8	1975
X220	210^{H8}	360	352.5	221.4	50^{JS9}	417	M30x90-8.8	2500
X230	210^{H8}	360	352.5	221.4	50JS9	417	M30x90-8.8	2530
X240	230^{H8}	420	400.5	241.4	50JS9	469	M36x110-8.8	3540
X250	240^{H8}	420	400.5	252.4	56JS9	469	M36x110-8.8	3615

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5.2 Bore dimensions of motor adapter connection X.FC../HC

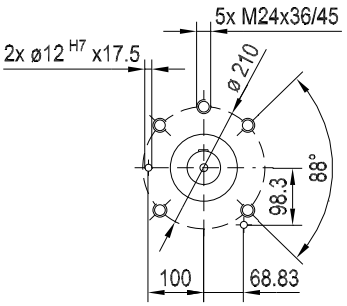
X.FS../HC

48 001 02 21

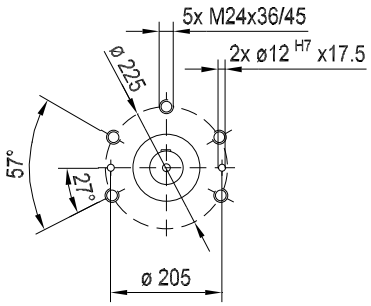




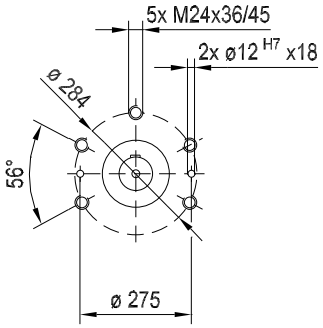
X..120-150



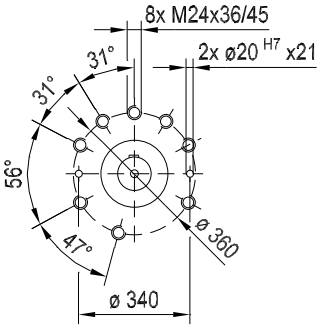
X..160-190



X..200-230



X..240-250

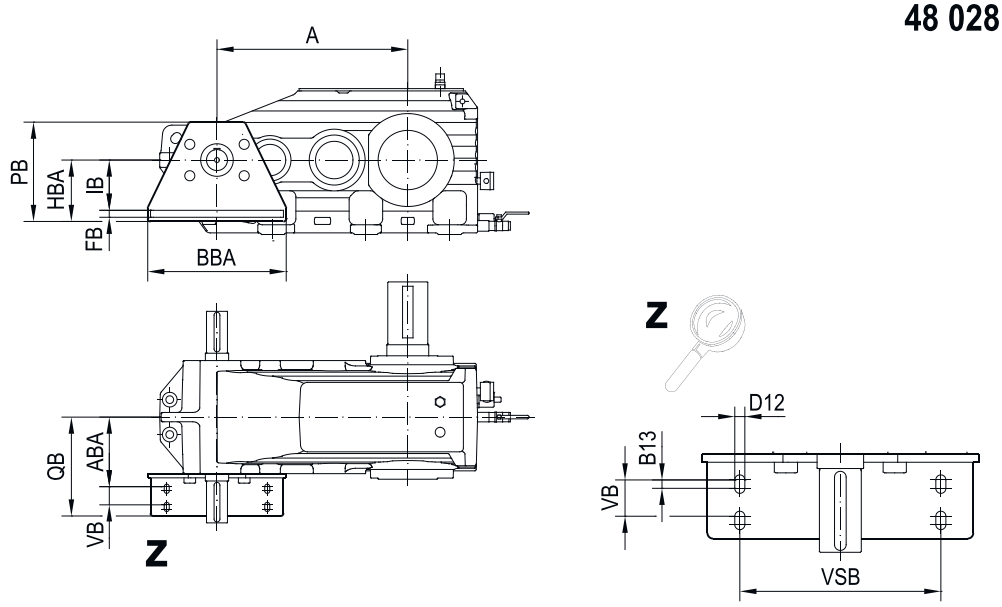


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5.3 Brake support /BA

BA-HC

48 028 00 18



Size	Brake	A		ABA	B13	BBA	D12	FB
		3F	4F					
X120	B.250	–	595 * / 590 **	210	15	496	18	15
	B.315			215	10	620	18	15
	B.400			214	17	720	22	15
X130	B.250	–	631 *** / 626 ****	210	15	496	18	15
	B.315			215	10	620	18	15
	B.400			214	17	720	22	15
X140	B.250	–	699	238	15	496	18	15
	B.315			243	10	620	18	15
	B.400			242	17	720	22	15
X150	B.250	–	741	238	15	496	18	15
	B.315			243	10	620	18	15
	B.400			242	17	720	22	15
X160	B.250	715	726	264.5	15	496	18	15
	B.315			269.5	10	620	18	15
	B.400			268.5	17	720	22	15
X170	B.250	766	777	264.5	15	496	18	15
	B.315			269.5	10	620	18	15
	B.400			268.5	17	720	22	15
X180	B.250	820	833	298	15	496	18	15
	B.315			303	10	620	18	15
	B.400			302	17	720	22	15
X190	B.250	852	865	298	15	496	18	15
	B.315			303	10	620	18	15
	B.400			302	17	720	22	15
X200	B.250	922	934	–	–	–	–	–
	B.315			321	10	620	18	15
	B.400			320	17	720	22	15
X210	B.250	958	970	–	–	–	–	–
	B.315			321	10	620	18	15
	B.400			320	17	720	22	15
X220	B.250	1042	1057	–	–	–	–	–
	B.315			357.5	10	620	18	15
	B.400			356.5	17	720	22	15

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Size	Brake	A		ABA	B13	BBA	D12	FB
		3F	4F					
X230	B.250	1082	1097	–	–	–	–	–
	B.315			357.5	10	620	18	15
	B.400			356.5	17	720	22	15
X240	B.250	1172	1195	–	–	–	–	–
	B.315			400	10	620	18	15
	B.400			399	17	720	22	15
X250	B.250	1195	1218	–	–	–	–	–
	B.315			400	10	620	18	15
	B.400			399	17	720	22	15

* i = 14..40
** i = 45..200
*** i = 18..50
**** i = 56..250

Size	Brake	HBA	IB	PB	QB	VB	VSB
X120	B.250	220	190	350	315	65	360
	B.315	260	230	390	325	80	440
	B.400	310	280	440	360	100	540
X130	B.250	220	190	350	315	65	360
	B.315	260	230	390	325	80	440
	B.400	310	280	440	360	100	540
X140	B.250	220	190	350	343	65	360
	B.315	260	230	390	353	80	440
	B.400	310	280	440	388	100	540
X150	B.250	220	190	350	343	65	360
	B.315	260	230	390	353	80	440
	B.400	310	280	440	388	100	540
X160	B.250	220	190	350	369.5	65	360
	B.315	260	230	390	379.5	80	440
	B.400	310	280	440	414.5	100	540
X170	B.250	220	190	350	369.5	65	360
	B.315	260	230	390	379.5	80	440
	B.400	310	280	440	414.5	100	540
X180	B.250	220	190	350	403	65	360
	B.315	260	230	390	413	80	440
	B.400	310	280	440	448	100	540
X190	B.250	220	190	350	403	65	360
	B.315	260	230	390	413	80	440
	B.400	310	280	440	448	100	540
X200	B.250	–	–	–	–	–	–
	B.315	260	230	420	431	80	440
	B.400	310	280	470	466	100	540
X210	B.250	–	–	–	–	–	–
	B.315	260	230	420	431	80	440
	B.400	310	280	470	466	100	540
X220	B.250	–	–	–	–	–	–
	B.315	260	230	420	467.5	80	440
	B.400	310	280	470	502.5	100	540
X230	B.250	–	–	–	–	–	–
	B.315	260	230	420	467.5	80	440
	B.400	310	280	470	502.5	100	540

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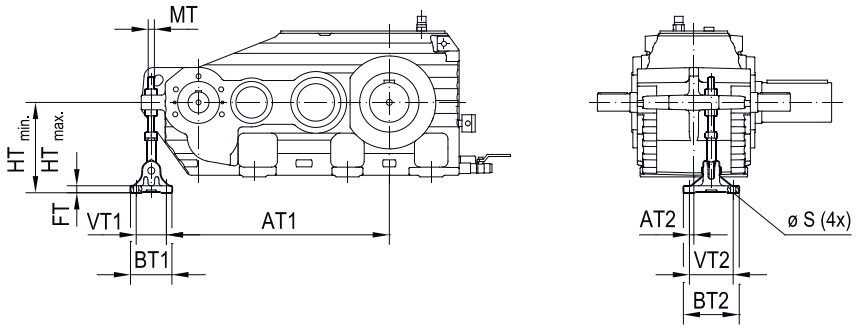
Size	Brake	HBA	IB	PB	QB	VB	VSB
X240	B.250	–	–	–	–	–	–
	B.315	260	230	420	510	80	440
	B.400	310	280	470	545	100	540
X250	B.250	–	–	–	–	–	–
	B.315	260	230	420	510	80	440
	B.400	310	280	470	545	100	540

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5.4 Torque arm /T

T-HC

48 027 00 18



Size	AT1	AT2	BT1	BT2	FT	$HT_{min.}$
X120	733	10	120	160	25	230
X130	769	10	120	160	25	230
X140	809	34	180	240	30	279.2
X150	851	34	180	240	30	279.2
X160	848	29	180	240	30	285.2
X170	899	29	180	240	30	285.2
X180	958	19	180	240	30	293.2
X190	990	19	180	240	30	293.2
X200	1089	19	180	240	30	324
X210	1125	9	180	240	30	324
X220	1225	9	180	240	30	324
X230	1295	19	180	240	30	355
X240	1487	16	180	240	30	355
X250	1510	9	180	240	30	355

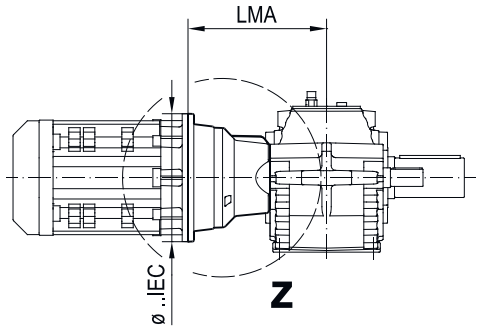
Size	$HT_{max.}$	MT	Ø S (4x)	VT1	VT2
X120	265	M24	13.5	70	120
X130	265	M24	13.5	70	120
X140	324.2	M30	22	130	188
X150	324.2	M30	22	130	188
X160	330.2	M30	22	130	188
X170	330.2	M30	22	130	188
X180	338.2	M30	22	130	188
X190	338.2	M30	22	130	188
X200	369	M36	22	130	188
X210	369	M36	22	130	188
X220	369	M36	22	130	188
X230	400	M42	22	130	188
X240	400	M42	22	130	188
X250	400	M42	22	130	188

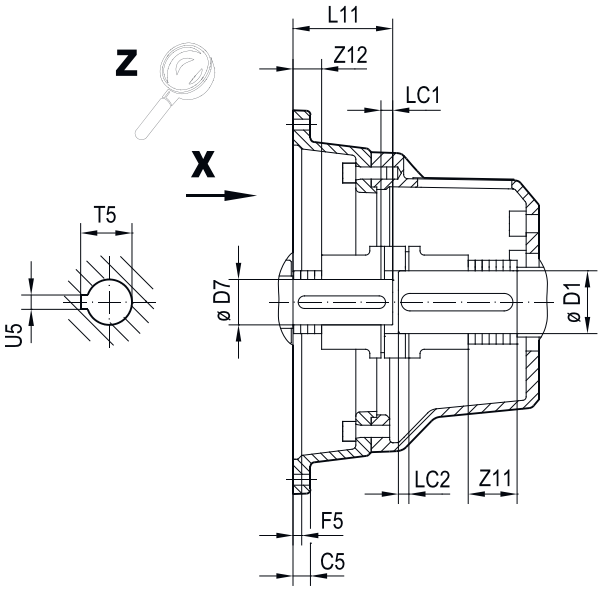
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5.5 Motor adapter /MA

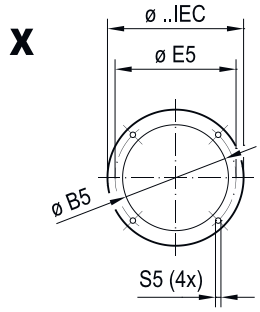
MA-HC

48 026 00 18

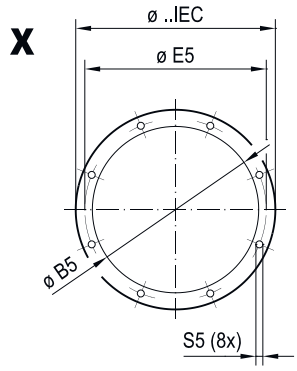




≤ *IEC 200*



≥ *IEC 225*



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5.5.1 X3F..C

X3F..C	i	IEC	Ø IEC	Ø B5	C5	Ø D1	Ø D7	Ø E5	F5
X160 – 170	14...40 18...50	250	550	450^{H7}	25	70	65^{H7}	500	7
		280	550	450^{H7}	25	70	75^{H7}	500	7
		315S-L	660	550^{H7}	25	70	80^{H7}	600	7
X180 - 190	16...28 18...31.5	315S-L	660	550^{H7}	25	90	80^{H7}	600	7
	31.5...45 35.5...50	225	450	350^{H7}	20	75	60^{H7}	400	6
		250	550	450^{H7}	25	75	65^{H7}	500	7
		280	550	450^{H7}	25	75	75^{H7}	500	7
		315S-L	660	550^{H7}	25	75	80^{H7}	600	7
X200 - 210	16...45 18...50	315S-L	660	550^{H7}	25	90	80^{H7}	600	7
X220 - 230	16...45 18...50	315S-L	660	550^{H7}	25	100	80^{H7}	600	7
X240 - 250	14…40 16…45	315S-L	660	550^{H7}	25	110	80^{H7}	600	7
		315	800	680^{H7}	30	110	85^{H7}	740	7
		355	800	680^{H7}	30	110	100^{H7}	740	7

X3F..C	i	IEC	L11	LC1	LC2	LMA	S5	T5	U5	Z11	Z12
X160 - 170	14...40 18...50	250	140	0.5	5	562	M16 (8x)	69.4	18^{JS9}	70	65.5
		280	140	-4.5	5	562	M16 (8x)	79.9	20^{JS9}	60	50.5
		315S-L	170	-5.5	10	601	M20 (8x)	85.4	22^{JS9}	50	64.5
X180 - 190	16...28 18...31.5	315S-L	170	-25	0	634.5	M20 (8x)	85.4	22^{JS9}	70	45
	31.5...45 35.5...50	225	140	-9	0	585.5	M16 (8x)	64.4	18^{JS9}	55	46
		250	140	1	0	595.5	M16 (8x)	69.4	18^{JS9}	55	56
		280	140	1	0	595.5	M16 (8x)	79.9	20^{JS9}	55	56
		315S-L	170	5	0	634.5	M20 (8x)	85.4	22^{JS9}	40	75
X200 - 210	16...45 18...50	315S-L	170	-6	5	677.5	M20 (8x)	85.4	22^{JS9}	75	64
X220 - 230	16...45 18...50	315S-L	170	-39	0	714	M20 (8x)	85.4	22^{JS9}	110	31
X240 – 250	14…40 16…45	315S-L	170	-27	0	770.5	M20 (8x)	85.4	22^{JS9}	110	43
		315	170	4	0	806.5	M20 (8x)	90.4	22^{JS9}	100	64
		355	210	-1	0	846.5	M20 (8x)	106.4	28^{JS9}	90	89

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5.5.2 X4F..C

X4F..C	i	IEC	Ø IEC	Ø B5	C5	Ø D1	Ø D7	Ø E5	F5
X120 - 130	14...40 18...50	200	400	300^{H7}	20	38	55^{H7}	350	6
		225	450	350^{H7}	20	38	60^{H7}	400	6
		250	550	450^{H7}	25	38	65^{H7}	500	7
		280	550	450^{H7}	25	38	75^{H7}	500	7
		315S-L	660	550^{H7}	25	38	80^{H7}	600	7
	45...125 56...160	160	350	250^{H7}	20	38	42^{H7}	300	6
		180	350	250^{H7}	20	38	48^{H7}	300	6
		200	400	300^{H7}	20	38	55^{H7}	350	6
		225	450	350^{H7}	20	38	60^{H7}	400	6
		250	550	450^{H7}	25	38	65^{H7}	500	7
		280	550	450^{H7}	25	38	75^{H7}	500	7
	140...200 180...250	132	300	230^{H7}	15	38	38^{H7}	265	5
		160	350	250^{H7}	20	38	42^{H7}	300	6
		180	350	250^{H7}	20	38	48^{H7}	300	6
		200	400	300^{H7}	20	38	55^{H7}	350	6
		225	450	350^{H7}	20	38	60^{H7}	400	6
		250	550	450^{H7}	25	38	65^{H7}	500	7
		280	550	450^{H7}	25	38	75^{H7}	500	7
X140 - 150	14...200 18...250	180	350	250^{H7}	20	45	48^{H7}	300	6
		200	400	300^{H7}	20	45	55^{H7}	350	6
		225	450	350^{H7}	20	45	60^{H7}	400	6
		250	550	450^{H7}	25	45	65^{H7}	500	7
		280	550	450^{H7}	25	45	75^{H7}	500	7
		315S-L	660	550^{H7}	25	45	80^{H7}	600	7
X160 - 170	45...125 56...160	180	350	250^{H7}	20	60	48^{H7}	300	6
		200	400	300^{H7}	20	60	55^{H7}	350	6
		225	450	350^{H7}	20	60	60^{H7}	400	6
		250	550	450^{H7}	25	60	65^{H7}	500	7
		280	550	450^{H7}	25	60	75^{H7}	500	7
		315S-L	660	550^{H7}	25	60	80^{H7}	600	7
	140...200 180...250	180	350	250^{H7}	20	50	48^{H7}	300	6
		200	400	300^{H7}	20	50	55^{H7}	350	6
		225	450	350^{H7}	20	50	60^{H7}	400	6
		250	550	450^{H7}	25	50	65^{H7}	500	7
		280	550	450^{H7}	25	50	75^{H7}	500	7
		315S-L	660	550^{H7}	25	50	80^{H7}	600	7
X180 - 190	50...140 56...160	225	450	350^{H7}	20	60	60^{H7}	400	6
		250	550	450^{H7}	25	60	65^{H7}	500	7
		280	550	450^{H7}	25	60	75^{H7}	500	7
		315S-L	660	550^{H7}	25	60	80^{H7}	600	7
	160...225 180...250	225	450	350^{H7}	20	55	60^{H7}	400	6
		250	550	450^{H7}	25	55	65^{H7}	500	7
		280	550	450^{H7}	25	55	75^{H7}	500	7
		315S-L	660	550^{H7}	25	55	80^{H7}	600	7
X200 - 210	50..140 56...160	225	450	350^{H7}	20	75	60^{H7}	400	6
		250	550	450^{H7}	25	75	65^{H7}	500	7
		280	550	450^{H7}	25	75	75^{H7}	500	7
		315S-L	660	550^{H7}	25	75	80^{H7}	600	7
	160...225 180...250	225	450	350^{H7}	20	60	60^{H7}	400	6
		250	550	450^{H7}	25	60	65^{H7}	500	7
		280	550	450^{H7}	25	60	75^{H7}	500	7
		315S-L	660	550^{H7}	25	60	80^{H7}	600	7

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X4F..C	i	IEC	Ø IEC	Ø B5	C5	Ø D1	Ø D7	Ø E5	F5
X220 - 230	50...140 56...160	250	550	450^{H7}	25	80	65^{H7}	500	7
		280	550	450^{H7}	25	80	75^{H7}	500	7
		315S-L	660	550^{H7}	25	80	80^{H7}	600	7
	160...225 180...250	250	550	450^{H7}	25	70	65^{H7}	500	7
		280	550	450^{H7}	25	70	75^{H7}	500	7
		315S-L	660	550^{H7}	25	70	80^{H7}	600	7
X240 – 250	45…125 50…140	250	550	450^{H7}	25	90	65^{H7}	500	7
		280	550	450^{H7}	25	90	75^{H7}	500	7
		315S-L	660	550^{H7}	25	90	80^{H7}	600	7
		315	800	680^{H7}	30	90	85^{H7}	740	7
		355	800	680^{H7}	30	90	100^{H7}	740	7
	140…200 160…225	250	550	450^{H7}	25	75	65^{H7}	500	7
		280	550	450^{H7}	25	75	75^{H7}	500	7
		315S-L	660	550^{H7}	25	75	80^{H7}	600	7
		315	800	680^{H7}	30	75	85^{H7}	740	7
		355	800	680^{H7}	30	75	100^{H7}	740	7

X4F..C	i	IEC	L11	LC1	LC2	LMA	S5	T5	U5	Z11	Z12
X120 – 130	14...40 18...50	200	110	13	11	429.5	M16 (4x)	59.3	16^{JS9}	45	67
		225	140	12	10	459.5	M16 (8x)	64.4	18^{JS9}	35	87
		250	140	17	10	469.5	M16 (8x)	69.4	18^{JS9}	25	82
		280	140	12	10	469.5	M16 (8x)	79.9	20^{JS9}	15	67
		315S-L	170	6	20	508.5	M20 (8x)	85.4	22^{JS9}	10	76
	45...125 56...160	160	110	6	5	402.5	M16 (4x)	45.3	12^{JS9}	40	71
		180	110	6	1	402.5	M16 (4x)	51.8	14^{JS9}	25	60
		200	110	18	16	429.5	M16 (4x)	59.3	16^{JS9}	40	72
		225	140	17	15	459.5	M16 (8x)	64.4	18^{JS9}	30	92
		250	140	22	15	469.5	M16 (8x)	69.4	18^{JS9}	20	87
		280	140	17	15	469.5	M16 (8x)	79.9	20^{JS9}	10	72
	140...200 180...250	132	80	8	0	369.5	M12 (4x)	41.3	10^{JS9}	35	43
		160	110	6	5	402.5	M16 (4x)	45.3	12^{JS9}	40	71
		180	110	6	1	402.5	M16 (4x)	51.8	14^{JS9}	25	60
		200	110	18	16	429.5	M16 (4x)	59.3	16^{JS9}	40	72
		225	140	17	15	459.5	M16 (8x)	64.4	18^{JS9}	30	92
		250	140	22	15	469.5	M16 (8x)	69.4	18^{JS9}	20	87
		280	140	17	15	469.5	M16 (8x)	79.9	20^{JS9}	10	72
X140 – 150	14...200 18...250	180	110	-1	-24	430.5	M16 (4x)	51.8	14^{JS9}	30	53
		200	110	1	1	457.5	M16 (4x)	59.3	16^{JS9}	55	55
		225	140	0	0	487.5	M16 (8x)	64.4	18^{JS9}	45	75
		250	140	5	0	497.5	M16 (8x)	69.4	18^{JS9}	35	70
		280	140	0	0	497.5	M16 (8x)	79.9	20^{JS9}	25	55
		315S-L	170	4	0	536.5	M20 (8x)	85.4	22^{JS9}	10	74
X160 - 170	45...125 56...160	180	110	-25.5	0	495	M16 (4x)	51.8	14^{JS9}	75	19.5
		200	110	2.5	1	522	M16 (4x)	59.3	16^{JS9}	85	56.5
		225	140	-3.5	5	552	M16 (8x)	64.4	18^{JS9}	80	71.5
		250	140	1.5	5	562	M16 (8x)	69.4	18^{JS9}	70	66.5
		280	140	-3.5	5	562	M16 (8x)	79.9	20^{JS9}	60	51.5
		315S-L	170	0.5	5	601	M20 (8x)	85.4	22^{JS9}	45	70.5
	140...200 180...250	180	110	1.5	5	495	M16 (4x)	51.8	14^{JS9}	59	55.5
		200	110	12.5	21	522	M16 (4x)	59.3	16^{JS9}	75	66.5
		225	140	11.5	20	552	M16 (8x)	64.4	18^{JS9}	65	86.5
		250	140	16.5	20	562	M16 (8x)	69.4	18^{JS9}	55	81.5
		280	140	11.5	20	562	M16 (8x)	79.9	20^{JS9}	45	66.5
		315S-L	170	35.5	0	601	M20 (8x)	85.4	22^{JS9}	10	105.5

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X4F..C	i	IEC	L11	LC1	LC2	LMA	S5	T5	U5	Z11	Z12
X180 - 190	50...140 56...160	225	140	5	0	585.5	M16 (8x)	64.4	18^{JS9}	75	80
		250	140	10	0	595.5	M16 (8x)	69.4	18^{JS9}	65	75
		280	140	5	0	595.5	M16 (8x)	79.9	20^{JS9}	55	60
		315S-L	170	9	0	634.5	M20 (8x)	85.4	22^{JS9}	40	79
	160...225 180...250	225	140	20	15	585.5	M16 (8x)	64.4	18^{JS9}	60	95
		250	140	25	15	595.5	M16 (8x)	69.4	18^{JS9}	50	90
		280	140	25	10	595.5	M16 (8x)	79.9	20^{JS9}	35	80
		315S-L	170	29	10	634.5	M20 (8x)	85.4	22^{JS9}	20	99
X200 - 210	50..140 56...160	225	140	4	15	628.5	M16 (8x)	64.4	18^{JS9}	70	59
		250	140	14	15	638.5	M16 (8x)	69.4	18^{JS9}	70	69
		280	140	14	15	638.5	M16 (8x)	79.9	20^{JS9}	70	69
		315S-L	170	13	20	677.5	M20 (8x)	85.4	22^{JS9}	60	83
	160...225 180...250	225	140	9	20	628.5	M16 (8x)	64.4	18^{JS9}	95	84
		250	140	14	20	638.5	M16 (8x)	69.4	18^{JS9}	85	79
		280	140	9	20	638.5	M16 (8x)	79.9	20^{JS9}	75	64
		315S-L	170	13	20	677.5	M20 (8x)	85.4	22^{JS9}	60	83
X220 - 230	50...140 56...160	250	140	8	0	675	M16 (8x)	69.4	18^{JS9}	85	63
		280	140	8	0	675	M16 (8x)	79.9	20^{JS9}	85	63
		315S-L	170	7	5	714	M20 (8x)	85.4	22^{JS9}	75	77
	160...225 180...250	250	140	23	20	675	M16 (8x)	69.4	18^{JS9}	85	88
		280	140	18	20	675	M16 (8x)	79.9	20^{JS9}	75	73
		315S-L	170	22	20	714	M20 (8x)	85.4	22^{JS9}	60	92
X240 - 250	45…125 50…140	250	140	5	15	731.5	M16 (8x)	69.4	18^{JS9}	100	60
		280	140	5	15	731.5	M16 (8x)	79.9	20^{JS9}	100	60
		315S-L	170	14	10	770.5	M20 (8x)	85.4	22^{JS9}	80	84
		315	170	20	35	806.5	M20 (8x)	90.4	22^{JS9}	95	80
		355	210	30	20	846.5	M20 (8x)	106.4	28^{JS9}	70	120
	140…200 160…225	250	140	25	25	731.5	M16 (8x)	69.4	18^{JS9}	80	80
		280	140	25	25	731.5	M16 (8x)	79.9	20^{JS9}	80	80
		315S-L	170	24	30	770.5	M20 (8x)	85.4	22^{JS9}	70	94
		315	170	45	40	806.5	M20 (8x)	90.4	22^{JS9}	70	105
		355	210	40	40	846.5	M20 (8x)	106.4	28^{JS9}	60	130

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6 Lubricant fill quantities

INFORMATION

- The specified lubricant fill quantities are guide values. The exact values vary depending on the number of gear stages and the gear ratio.
- The mark on the oil dipstick or the oil level glass is the decisive indicator of the correct oil quantity.
- For pivoted mounting positions, the lubricant fill quantity on the nameplate may deviate from the standard. The fill quantity specified on the nameplate is a guide value. The mark on the oil dipstick or the oil level glass is the decisive indicator of the correct oil quantity.

Size	Oil quantity splash lubrication in liters	
	3F	4F
X120	–	25
X130	–	29
X140	–	39
X150	–	47
X160	53	51
X170	64	65
X180	81	79
X190	83	80
X200	109	109
X210	112	113
X220	173	169
X230	169	171
X240	228	230
X250	230	231

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7 Mass moments of inertia

The mass moment of inertia in kgm^2 is reduced to X.F.. helical gear units. These refer to the HSS input shaft.

7.1 Sizes X120 – 140

Size	iN	Mass moment of inertia	Size	iN	Mass moment of inertia	Size	iN	Mass moment of inertia
X120	15.2	0.0390	X130	19.0	0.0404	X140	15.4	0.0840
	17.4	0.0385		21.7	0.0395		16.4	0.0837
	19.0	0.0292		23.7	0.0301		18.5	0.0727
	21.7	0.0289		27.0	0.0295		19.8	0.0725
	24.1	0.0232		30.1	0.0238		23.0	0.0567
	27.5	0.0231		34.3	0.0234		24.6	0.0565
	30.3	0.0201		37.9	0.0204		29.2	0.0459
	34.6	0.0200		43.2	0.0202		31.3	0.0458
	38.5	0.0164		48.1	0.0166		37.2	0.0382
	44.0	0.0163		54.8	0.0164		39.8	0.0381
	46.2	0.0101		57.8	0.0103		47.5	0.0213
	52.8	0.0101		65.8	0.0102		50.7	0.0213
	58.6	0.0092		73.3	0.0093		59.3	0.0191
	67.0	0.0091		83.5	0.0092		63.4	0.0191
	67.9	0.0087		84.8	0.0087		72.3	0.0169
	77.5	0.0086		96.6	0.0087		77.3	0.0169
	94.6	0.0048		118.2	0.0048		92.2	0.0111
	108.0	0.0048		134.6	0.0048		98.6	0.0111
	109.4	0.0046		136.8	0.0046		112.4	0.0102
	125.0	0.0046		155.8	0.0046		120.2	0.0102
	149.4	0.0028		186.7	0.0029		143.9	0.0059
	170.7	0.0028		212.7	0.0028		153.9	0.0059
	172.9	0.0028		216.1	0.0028		175.4	0.0056
	197.5	0.0028		246.1	0.0028		187.5	0.0056

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7.2 Sizes X150 – 170

Size	iN	Mass moment of inertia	Size	iN	Mass moment of inertia	Size	iN	Mass moment of inertia
X150	19.1	0.0867	X160	13.9	0.2288	X170	17.3	0.2340
	20.4	0.0862		15.7	0.2256		19.4	0.2303
	23.0	0.0746		17.3	0.1532		21.5	0.1566
	24.6	0.0742		19.5	0.1511		24.2	0.1541
	28.5	0.0579		22.5	0.1124		27.9	0.1144
	30.6	0.0576		25.3	0.1112		31.4	0.1130
	36.3	0.0466		27.7	0.0854		34.4	0.0867
	38.9	0.0465		31.2	0.0846		38.6	0.0858
	46.2	0.0386		35.7	0.0626		44.4	0.0634
	49.5	0.0385		40.2	0.0622		49.9	0.0629
	58.9	0.0216		45.9	0.0592		57.1	0.0596
	63.1	0.0216		51.8	0.0589		64.2	0.0593
	73.7	0.0193		56.2	0.0532		69.9	0.0535
	78.9	0.0192		63.4	0.0530		78.5	0.0533
	89.8	0.0170		72.7	0.0320		90.4	0.0322
	96.1	0.0170		82.0	0.0318		101.6	0.0320
	114.5	0.0112		89.0	0.0296		110.6	0.0297
	122.6	0.0111		100.3	0.0295		124.4	0.0296
	139.6	0.0102		112.6	0.0280		139.9	0.0281
	149.4	0.0102		126.9	0.0280		157.2	0.0281
	178.7	0.0060		142.1	0.0149		176.6	0.0149
	191.3	0.0060		160.1	0.0149		198.4	0.0149
	217.8	0.0056		179.6	0.0143		223.2	0.0143
	233.2	0.0056		202.4	0.0143		250.9	0.0143

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7.3 Sizes X180 – 200

Size	iN	Mass moment of inertia	Size	iN	Mass moment of inertia	Size	iN	Mass moment of inertia
X180	15.9	0.4079	X190	17.8	0.4114	X200	15.5	0.7243
	17.6	0.4039		19.8	0.4088		17.6	0.7145
	19.9	0.2907		22.2	0.2929		19.2	0.5077
	21.9	0.2881		24.7	0.2912		21.8	0.5013
	24.5	0.2195		27.3	0.2210		24.3	0.3644
	27.0	0.2178		30.5	0.2199		27.5	0.3604
	29.9	0.1522		33.4	0.1532		30.5	0.2879
	33.0	0.1510		37.2	0.1524		34.6	0.2854
	39.4	0.1153		44.0	0.1158		39.2	0.2158
	43.4	0.1146		49.0	0.1154		44.4	0.2142
	49.1	0.1156		54.8	0.1159		49.9	0.1780
	54.1	0.1151		61.0	0.1156		56.6	0.1770
	63.5	0.1033		70.9	0.1035		62.4	0.1651
	70.0	0.1030		79.0	0.1033		70.8	0.1645
	75.6	0.0570		84.4	0.0572		75.5	0.0853
	83.3	0.0569		94.0	0.0571		85.6	0.0849
	97.8	0.0518		109.3	0.0519		94.4	0.0797
	107.8	0.0517		121.7	0.0519		107.1	0.0794
	117.7	0.0489		131.4	0.0490		117.0	0.0722
	129.7	0.0489		146.4	0.0490		132.7	0.0720
	158.5	0.0272		177.0	0.0273		155.2	0.0375
	174.6	0.0272		197.1	0.0272		176.0	0.0374
	190.6	0.0261		212.9	0.0261		192.2	0.0347
	210.1	0.0261		237.1	0.0261		218.0	0.0346

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7.4 Sizes X210 – 220

Size	iN	Mass moment of inertia	Size	iN	Mass moment of inertia
X210	17.6	0.7340	X220	15.5	1.3129
	19.9	0.7233		17.5	1.2976
	21.8	0.5141		19.2	0.9012
	24.6	0.5071		21.8	0.8913
	27.5	0.3684		24.2	0.6997
	31.1	0.3640		27.5	0.6935
	34.6	0.2904		30.4	0.5194
	39.1	0.2877		34.5	0.5155
	44.4	0.2173		39.1	0.3771
	50.2	0.2156		44.3	0.3747
	56.5	0.1789		49.3	0.3502
	64.0	0.1779		55.9	0.3487
	70.7	0.1657		60.4	0.3048
	80.0	0.1650		68.5	0.3038
	85.5	0.0857		79.6	0.1751
	96.8	0.0853		90.2	0.1745
	106.9	0.0800		97.5	0.1577
	121.1	0.0797		110.5	0.1573
	132.5	0.0724		120.4	0.1482
	150.0	0.0722		136.5	0.1479
	175.7	0.0376		154.9	0.0727
	198.9	0.0374		175.6	0.0726
	217.7	0.0347		191.3	0.0690
	246.4	0.0347		216.9	0.0689

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7.5 Size X230 – 250

Size	iN	Mass moment of inertia	Size	iN	Mass moment of inertia	Size	iN	Mass moment of inertia
X230	17.5	1.3368	X240	14.6	2.8384	X250	15.7	2.8628
	19.8	1.3181		16.8	2.8080		18.0	2.8323
	21.8	0.9167		18.5	1.7907		19.9	1.8059
	24.6	0.9045		21.3	1.7719		22.9	1.7870
	27.4	0.7094		23.4	1.2945		25.2	1.3040
	31.1	0.7018		27.0	1.2828		28.9	1.2922
	34.4	0.5256		28.5	1.0899		30.6	1.0963
	39.0	0.5208		32.8	1.0820		35.2	1.0884
	44.2	0.3809		36.3	0.7598		39.0	0.7637
	50.1	0.3780		41.7	0.7549		44.8	0.7588
	55.8	0.3526		48.3	0.6261		52.0	0.6284
	63.2	0.3507		55.6	0.6234		59.7	0.6256
	68.4	0.3064		60.9	0.5610		65.4	0.5624
	77.4	0.3052		70.1	0.5593		75.1	0.5607
	90.1	0.1760		74.3	0.3420		79.9	0.3429
	102.0	0.1753		85.5	0.3408		91.7	0.3417
	110.4	0.1583		93.5	0.3144		100.5	0.3150
	125.0	0.1578		107.7	0.3137		115.5	0.3143
	136.3	0.1486		115.1	0.2922		123.7	0.2926
	154.3	0.1483		132.5	0.2917		142.1	0.2921
	175.4	0.0730		150.6	0.1429		161.8	0.1432
	198.5	0.0728		173.3	0.1427		185.9	0.1429
	216.6	0.0691		185.3	0.1344		199.2	0.1345
	245.2	0.0690		213.3	0.1342		228.8	0.1343

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8 Abbreviation key

α	Application angle of the radial load	°
f_1	Altitude factor (= correction factor for calculation of the thermal rating of the gear unit)	-
F_A	Axial load	kN
F_F	Peak load factor	-
F_R	Overhung load	N
F_{R1}	Overhung load on HSS (Distance from the shaft shoulder must be given)	kN
F_{R2}	Overhung load on LSS (Distance from the shaft shoulder must be given)	kN
F_S	Service factor = M_{N2} / M_{K2} = P_{N1} / P_{K1}	-
$F_{S\ min}$	Application-specific service factor	-
F_{start}	Startup factor	-
f_z	Transmission element factor	-
η	Efficiency	-
H	Installation altitude above sea level	m
HSS	High-speed gear unit shaft (usually input shaft)	-
i	Gear ratio	-
i_{ex}	Exact gear unit ratio	-
i_N	Nominal gear unit ratio	-
LSS	Low-speed gear unit shaft (usually output shaft)	-
$L_{h\ min}$	Required bearing service life	h
M_{K1}	Input torque (= operating torque on HSS)	kNm
$M_{K1\ max}$	Peak input torque (= peak operating torque on HSS)	kNm
M_{K2}	Output torque (= operating torque on LSS)	kNm
$M_{K2\ max}$	Peak output torque (= peak operating torque on LSS)	kNm
$M_{K2\ per}$	Permitted peak output torque	kNm
M_M	Nominal motor torque	kNm
M_{N2}	Nominal gear unit torque	kNm
n_1	Input speed (HSS)	min^{-1}
n_2	Output speed (LSS)	min^{-1}
n_M	Motor speed	min^{-1}
P_{K1}	Operating power on HSS	kW
$P_{K1\ max}$	Peak operating power on HSS	kW
$P_{K1\ per}$	Permitted peak operating power on HSS	kW
P_{K2}	Operating power on LSS	kW
P_M	Nominal motor power	kW
P_T	Nominal gear unit power (referring to HSS)	kW
P_{TH}	Thermal rating of the gear unit at defined ambient conditions	kW

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8.1 Abbreviations for optional accessories

The table shows the abbreviations used and what they mean.

Abbreviation	Meaning
BF	Base frame
BS	Backstop
BPG	Breather
CCV	Water cooling cover
CCT	Water cooling cartridge
F	Mounting flange
FC	Flange coupling
FAN	Fan
ET	Oil expansion tank
HH	Horizontal housing
HU	Universal housing
HA	Agitator housing
HT	Thermal housing
MA	Motor adapter
SB	Swing base
SEP	Shaft end pump
T	Torque arm
OAC1	Circulation cooling oil-air cooler with motor pump
OAP1	Circulation cooling oil-air cooler with pressure lubrication and motor pump
OWC1	Circulation cooling oil-water cooler with motor pump
OW1	Circulation cooling oil-water cooler with pressure lubrication and motor pump
ONP1/ONP1L	Pressure lubrication and motor pump
OD	Oil dipstick
ODV	Oil drain valve
OLG	Oil level glass
OH	Oil heater
VBD	V-belt drives

All options are not part of the type designation except for mounting flange, torque arm, horizontal housing, and universal housing.

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Greece			
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	Verona	SEW-EURODRIVE S.a.s. di SEW S.r.l. & Co. Via Antonio Meucci, 5 37042 - Caldiero (VR)	Tel. +39 045 89-239-11 Fax +39 02 96 980 814 verona@sew-eurodrive.it
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	Tokio	SEW-EURODRIVE JAPAN CO., LTD Renai Partire Shiodome 5th floor 2-18-3 Higashi-Shinbashi, Minato-Ku, Tokyo 105-0021	Tel. +81 3 5408-0521 Fax +81 3 5408-7550 tokyo@sew-eurodrive.co.jp
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Sales (Jordan, Kuwait , Saudi Arabia, Syria)	Beirut	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com
Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
Representation: Belgium			
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Malaysia			
Assembly Sales Service	Johor	SEW-EURODRIVE SDN BHD No. 95, Jalan Seroja 39, Taman Johor Jaya 81000 Johor Bahru, Johor West Malaysia	Tel. +60 7 3549409 Fax +60 7 3541404 sales@sew-eurodrive.com.my
Technical Offices	Kuala Lumpur	SEW-EURODRIVE SDN BHD No. 2, Jalan Anggerik Mokara 31/46 Kota Kemuning Seksyen 31 40460 Shah Alam Selangor Darul Ehsan West Malaysia	Tel. +60 3 51229633 Fax +60 3 51229622 sewsa@sew-eurodrive.com.my
	Penang	SEW-EURODRIVE SDN BHD No. 38, Jalan Bawal Kimsar Garden 13700 Prai, Penang West Malaysia	Tel. +60 4 3999349 Fax +60 4 3999348 sewpg@sew-eurodrive.com.my
	Kuching	SEW-EURODRIVE SDN BHD No. 69, Lot 10899 1st Floor, Jalan Tun Jugah 93350 Kuching Sarawak East Malaysia	Tel. +60 82 572780 Fax +60 82 571780 sewswk@sew-eurodrive.com.my
	Kota Kinabalu	SEW-EURODRIVE SDN BHD East Malaysia	Tel. +60 19 7539395 sales@sew-eurodrive.com.my
	Ipoh	SEW-EURODRIVE SDN BHD West Malaysia	Tel. +60 19 7177366 sewsa@sew-eurodrive.com.my
Mexico			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calzada Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx

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Mongolia			
Technical Office	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230, MN	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
Morocco			
Sales Service Assembly	Bouskoura	SEW-EURODRIVE Morocco SARL Parc Industriel CFCIM, Lot. 55/59 27182 Bouskoura Grand Casablanca	Tel. +212 522 88 85 00 Fax +212 522 88 84 50 http://www.sew-eurodrive.ma sew@sew-eurodrive.ma
Namibia			
Sales	Swakopmund	DB MINING & INDUSTRIAL SUPPLIES CC Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Technical Office	Palmerston North	SEW-EURODRIVE NEW ZEALAND LTD. C/-Grant Shearman, RD 5, Aronui Road Palmerston North	Tel. +64 6 355-2165 Fax +64 6 355-2316 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd 64C Toyin Street Opebi-Allen Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com sales@greenpegltd.com
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Hornebergvegen 11 B 7038 Trondheim	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no
Pakistan			
Sales	Karachi	Industrial Power Drives Al-Fatah Chamber A/3, 1st Floor Central Commercial Area, Sultan Ahmed Shah Road, Block 7/8, Karachi	Tel. +92 21 452 9369 Fax +92-21-454 7365 seweurodrive@cyber.net.pk
Paraguay			
Sales	Fernando de la Mora	SEW-EURODRIVE PARAGUAY S.R.L Nu Guazu No. 642 casi Campo Esperanza Santisima Trinidad Asuncion	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe

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Philippines			
Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	Service	Tel. +48 42 293 0030 Fax +48 42 293 0043	24 Hour Service Tel. +48 602 739 739 (+48 602 SEW SEW) serwis@sew-eurodrive.pl
Technical Offices	Tychy	SEW-EURODRIVE Polska Sp.z.o.o. ul. Strzelecka 66 43-109 Tychy	Tel. +48 32 32 32 610 Fax +48 32 32 32 648 tychy@sew-eurodrive.pl
	Bydgoszcz	SEW-EURODRIVE Polska Sp.z.o.o. ul. Fordońska 246 85-766 Bydgoszcz	Tel.+48 52 567 30 00 Fax +48 52 567 30 09 bydgoszcz@sew-eurodrive.pl
	Gdansk	SEW-EURODRIVE Polska Sp.z.o.o. ul. Galaktyczna 30A 80-299 Gdańsk	Tel. +48 58 762 70 00 Fax +48 58 762 70 09
	Posen	SEW-EURODRIVE Polska Sp.z.o.o. ul. Wschodnia 7B 62-080 Swadzim k. Poznania	Tel. +48 61 6465500 Fax +48 61 6465519
	Radom	SEW-EURODRIVE Polska Sp.z.o.o. ul. Wrocławska 10, biuro nr 7 26-600 Radom	Tel. +48 48 679 47 00 Fax +48 48 679 47 09 radom@sew-eurodrive.pl
	Rzeszów	SEW-EURODRIVE Polska Sp.z.o.o. ul. Armii Krajowej 80 35-307 Rzeszów	Tel. +48 17 784 27 00 Fax +48 17 784 27 09 rzeszow@sew-eurodrive.pl
Portugal			
Assembly Sales Service	Coimbra	SEW-EURODRIVE, LDA. Av. da Fonte Nova, n.º 86 3050-379 Mealhada	Tel. +351 231 20 9670 Fax +351 231 20 3685 http://www.sew-eurodrive.pt infosew@sew-eurodrive.pt
Service Competence Center	Lisbon	SEW-EURODRIVE, LDA. Núcleo Empresarial I de São Julião do Tojal Rua de Entremuros, 54 Fracção I 2660-533 São Julião do Tojal	Tel. +351 21 958-0198 / +351 939 598 717 Fax +351 21 958-0245 esc.lisboa@sew-eurodrive.pt
Technical Office	Porto	SEW-EURODRIVE, LDA. Rua Monte da Bela, N.º 191, Fração X 4445-294 Ermesinde	Tel. +351 229 350 383 / +351 932 559 110 Fax +351 229 350 384 esc.porto@sew-eurodrive.pt
Romania			
Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 http://www.sialco.ro sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» 188660, Russia, Leningrad Region, Vse-volozhsky District, Korabselki, Aleksandra Nevskogo str. building 4, block 1 P.O. Box 36 195220 St. Petersburg	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Technical Offices	Ekaterinburg	ЗАО «СЕВ-ЕВРОДРАЙФ» Kominterna Str. 16 Office 614 620078 Ekaterinburg	Tel. +7 343 310 3977 Fax +7 343 310 3978 eso@sew-eurodrive.ru

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Moscow	ЗАО «СЕВ-ЕВРОДРАЙФ» Malaja Semjonowskaja Str. д. 9, корпус 2 107023 Moskau	Tel. +7 495 9337090 Fax +7 495 9337094 mso@sew-eurodrive.ru
Novosibirsk	ЗАО «СЕВ-ЕВРОДРАЙФ» pr. K Marksa 30 630087 Novosibirsk	Tel. +7 383 3350200 Fax +7 383 3462544 nso@sew-eurodrive.ru
Perm	ЗАО «СЕВ-ЕВРОДРАЙФ» Stakhanovskaya str., 45 Office 512 614066 Perm	Tel. +7 342 2219494 Fax +7 342 2219444 pso@sew-eurodrive.ru
Togliatti	ЗАО «СЕВ-ЕВРОДРАЙФ» Sportivnaya Str. 4B, office 2 Samarskaya obl. 445057 Togliatti	Tel. +7 8482 710529 Fax +7 8482 810590 tso@sew-eurodrive.ru

Zambia

Representation: South Africa

Senegal

Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 http://www.senemeca.com senemeca@senemeca.sn

Serbia

Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor 11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs

Singapore

Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. 9, Tuas Drive 2 Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com

Slovakia

Sales	Bernolákovo	SEW-Eurodrive SK s.r.o. Priemyselná ulica 6267/7 900 27 Bernolákovo	Tel.+421 2 48 212 800 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk

Slovenia

Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. UI. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

South Africa

Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED 32 O'Connor Place Eurodrive House Aeroton Johannesburg 2190 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za

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South Africa			
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za
Technical Office	Port Elizabeth	SEW-EURODRIVE (PROPRIETARY) LIMITED 8 Ruan Access Park Old Cape Road Greenbushes 6000 Port Elizabeth	Tel. +27 41 3722246 Fax +27 41 3722247 http://www.sew.co.za fsieberhagen@sew-co-za
South Korea			
Assembly Sales Service	Ansan	SEW-EURODRIVE Korea Co., Ltd. 7, Dangjaengi-ro, Danwon-gu, Ansan-si, Gyeonggi-do, Zip 425-839	Tel. +82 31 492-8051 Fax +82 31 492-8056 http://www.sew-eurodrive.kr master.korea@sew-eurodrive.com
	Busan	SEW-EURODRIVE Korea Co., Ltd. 28, Noksansandan 262-ro 50beon-gil, Gangseo-gu, Busan, Zip 618-820	Tel. +82 51 832-0204 Fax +82 51 832-0230
Assembly Service	Siheung	SEW-EURODRIVE Korea Co., Ltd. 35, Emtibeui 26-ro 58beon-gil, Siheung-si, Gyeonggi-do	http://www.sew-eurodrive.kr
Technical Offices	Daegu	SEW-EURODRIVE Korea Co., Ltd. No.303 Sungan officetel, 1834, Dalgubeol-daero, Dalseo-gu, Daegu, Zip 704-712	Tel. +82 53 650-7111 Fax +82 53 650-7112
	Daejeon	SEW-EURODRIVE Korea Co., Ltd. No.302 Hongin officetel, 28, Daehak-ro, Yuseong-gu, Daejeon, Zip 305-710	Tel. +82 42 828-6461 Fax +82 42 828-6463
	Gwangju	SEW-EURODRIVE Korea Co., Ltd. 5fl., Hyundai B/D B, 40, Bungmun-daero, Buk-gu, Gwangju, Zip 500-855	Tel. +82 62 511-9172 Fax +82 62 511-9174
	Seoul	SEW-EURODRIVE Korea Co., Ltd. No.1804 Ace Hiend Tower 8th, 84, Gasan digital 1-ro, Geumcheon-gu, Seoul, Zip 153-797	Tel. +82 2 862-8051 Fax +82 2 862-8199
Spain			
Assembly Sales Service	Bilbao	SEW-EURODRIVE ESPAÑA, S.L. Parque Tecnológico, Edificio, 302 48170 Zamudio (Vizcaya)	Tel. +34 94 43184-70 http://www.sew-eurodrive.es sew.spain@sew-eurodrive.es
Technical Offices	Barcelona	SEW-EURODRIVE ESPAÑA, S.L. Avda. Francesc Macià, 60 – Planta 12, porta 3 Eix Macià – “Torre Milenium” 08208 Sabadell (Barcelona)	Tel. +34 93 7162200
	Madrid	SEW-EURODRIVE ESPAÑA, S.L. Gran Via. 48-2° A-D 28220 Majadahonda (Madrid)	Tel. +34 91 6342250
Sri Lanka			
Sales	Colombo	SM International (Pte) Ltd 254, Galle Raod Colombo 4, Sri Lanka	Tel. +94 1 2584887 Fax +94 1 2582981
Swaziland			
Sales	Manzini	C G Trading Co. (Pty) Ltd Simunye street Matsapha, Manzini	Tel. +268 7602 0790 Fax +268 2 518 5033 charles@cgtrading.co.sz www.cgtradingswaziland.com

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Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Sales	Gothemburg	SEW-EURODRIVE AB Stora Åvägen 21 436 34 Askim	Tel. +46 31 709 68 80 Fax +46 31 709 68 93 goteborg@sew.se
	Stockholm	SEW-EURODRIVE AB Björkholmsvägen 10 141 46 Huddinge	Tel. +46 8 449 86 80 Fax +46 8 449 86 93 stockholm@sew.se
	Malmö	SEW-EURODRIVE AB Borrgatan 5 211 24 Malmö	Tel. +46 40 680 64 80 Fax +46 40 680 64 93 malmo@sew.se
	Skellefteå	SEW-EURODRIVE AB Trädgårdsgatan 8 931 31 Skellefteå	Tel. +46 910 71 53 80 Fax +46 910 71 53 93 skelleftea@sew.se
Switzerland			
Assembly Sales Service	Basel	Alfred Imhof A.G. Jurastrasse 10 4142 Münchenstein bei Basel	Tel. +41 61 417 1717 Fax +41 61 417 1700 http://www.imhof-sew.ch info@imhof-sew.ch
Technical Offices	Rhaetian Switzerland	Ivan Grumelli Z.I. Moulin du choc C 1122 Romanel-sur-Morges, VD	Tel. +41 79 725 4499 Fax +41 61 417 1700
	Bern / Solothurn	Rudolf Bühler Muntersweg 5 2540 Grenchen	Tel. +41 32 652 2339 Fax +41 32 652 2331
	Central Switzerland, Aargau	Armin Pfister Stierenweid 4950 Huttwil, BE	Tel. +41 62 962 54 55 Fax +41 62 962 54 56
	Zürich, Ticino	Gian-Michele Muletta Fischerstrasse 61 8132 Egg bei Zürich	Tel. +41 44 994 81 15 Fax +41 44 994 81 16
	Lake Constance and East Switzerland	Markus Künzle Eichweg 4 9403 Goldach	Tel. +41 71 845 2808 Fax +41 71 845 2809
Taiwan			
Sales	Taipei	Ting Shou Trading Co., Ltd. 6F-3, No. 267, Sec. 2 Tung Huw S. Road Taipei	Tel. +886 2 27383535 Fax +886 2 27368268 Telex 27 245 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
	Nan Tou	Ting Shou Trading Co., Ltd. No. 55 Kung Yeh N. Road Industrial District Nan Tou 540	Tel. +886 49 255353 Fax +886 49 257878 sewtwn@ms63.hinet.net http://www.tingshou.com.tw
Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz info@sew.co.tz
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com https://www.sew-eurodrive.co.th
Technical Offices	Bangkok	SEW-EURODRIVE (Thailand) Ltd. 6th floor, TPS Building 1023, Phattanakarn Road Suanluang Bangkok,10250	Tel. +66 2 7178149 Fax +66 2 7178152 sewthailand@sew-eurodrive.com

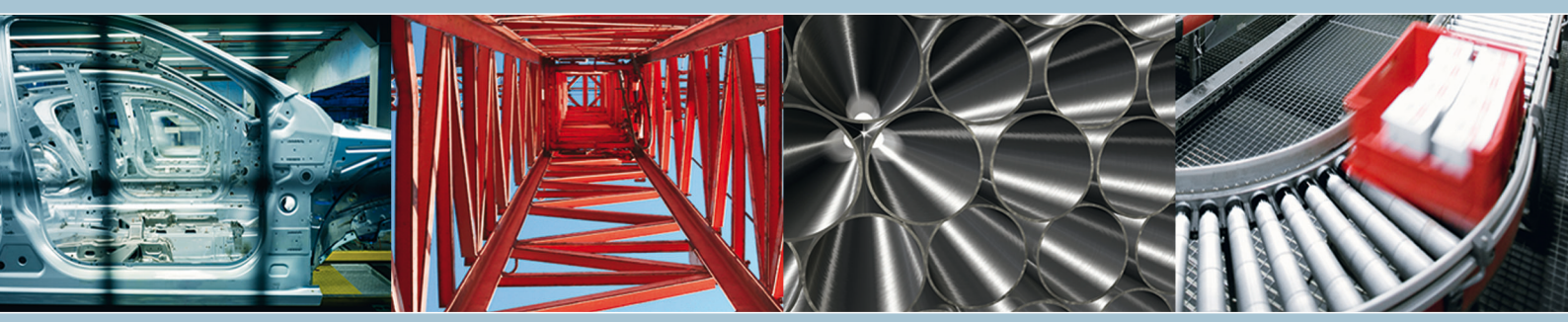
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	Hat Yai	SEW-EURODRIVE (Thailand) Ltd. Hadyai Country Home Condominium 59/101 Soi.17/1 Rachas-Utid Road. Hadyai, Songkhla 90110	Tel. +66 74 359441 Fax +66 74 359442 sewthailand@sew-eurodrive.com
	Khon Kaen	SEW-EURODRIVE (Thailand) Ltd. 4th Floor, Kaow-U-HA MOTOR Bldg, 359/2, Mitraphab Road. Muang District Khonkaen 40000	Tel. +66 43 225745 Fax +66 43 324871 sewthailand@sew-eurodrive.com
	Surat Thani	SEW-EURODRIVE (Thailand) Ltd. 66/58 Moo.4, Wat Pradu Muang district Surat Thani 84000	Tel. +66 80 928 9463 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	Kocaeli-Gebze	SEW-EURODRIVE Ana Merkez Gebze Organize Sanayi Böl. 400 Sok No. 401 41480 Gebze Kocaeli	Tel. +90 262 9991000 04 Fax +90 262 9991009 http://www.sew-eurodrive.com.tr sew@sew-eurodrive.com.tr
Technical Offices		SEW-EURODRIVE Home Ofis	Tel. +90 533 491 81 77 / +90 542 660 34 89
	Ankara	SEW-EURODRIVE Ankara Ofis 1368.Cadde Eminel İş Merkezi No: 18/68 İvedik OSB/Yenimahalle/Ankara	Tel. +90 312 385 33 90
	Bursa	SEW-EURODRIVE Bursa Ofis Beşevler Mah. Yıldırım Cd. No: 254 Karya Güçlü İş Merkezi B Blok Kat:5 No: 28 Nilüfer/Bursa	Tel. +90 224 443 45 60
	Istanbul	SEW-EURODRIVE İstanbul Ofis Yakuplu Merkez Mh. Hürriyet Bulvarı Skyport Residence No:1 D:66 Beylikdüzü/ISTANBUL	Tel. +90 212 438 41 62-63
	Izmir	SEW-EURODRIVE İzmir Ofis IAOSB Küçük Parseller Grubu Sosyal Tesis merkezi 1030 Sokak No: 16 / 110 Kara Hasan Atlı İş Merkezi Kat:6 Çiğli/İzmir	Tel. +90 232 469 62 64
United Arab Emirates			
Drive Technology Center	Dubai	SEW-EURODRIVE FZE PO Box 263835 Jebel Ali Free Zone – South, P.O. Box Dubai, United Arab Emirates	Tel. +971 (0)4 8806461 Fax +971 (0)4 8806464 info@sew-eurodrive.ae
Ukraine			
Assembly Sales Service	Dnipropetrovsk	SEW-EURODRIVE, LLC Robochya str., bld. 23-B, office 409 49008 Dnipro	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
Sales	Kiev	SEW-EURODRIVE, LLC Velyka Vasylkivska street, 77-A 03150 Kiev	Tel. +380 44 503 95 77 Fax +380 44 503 95 78 kso@sew-eurodrive.ua
	Ivano-Frankivsk	SEW-EURODRIVE, LLC Symona Petlyury Str. 27 76018 Ivano-Frankivsk	Tel. +380 342 725 190 Fax +380 342 725 191 ifso@sew-eurodrive.ua

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Uruguay			
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USA			
Production Sales Service	Southeast Region	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Production +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	Northeast Region	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	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. 202 W. Danieldale Rd. DeSoto, TX 75115	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Wellford	SEW-EURODRIVE INC. 148/150 Finch Rd. Wellford, S.C. 29385	Tel. +1 864 439-7537 Fax +1 864 661 1167 IGOrders@seweurodrive.com
		SEW-EURODRIVE INC. 220 Finch Rd. Wellford, S.C. 29385-9630	
	Additional addresses for service provided on request!		
Vietnam			
Sales	Ho Chi Minh City	SEW-EURODRIVE PTE. LTD. RO at Hochiminh City Floor 8, KV I, Loyal building, 151-151 Bis Vo Thi Sau street, ward 6, District 3, Ho Chi Minh City, Vietnam	Tel. +84 937 299 700 huytam.phan@sew-eurodrive.com
	Hanoi	MICO LTD Quảng Trị - North Vietnam / All sectors except Construction Materials 8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam	Tel. +84 4 39386666 Fax +84 4 3938 6888 nam_ph@micogroup.com.vn http://www.micogroup.com.vn

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