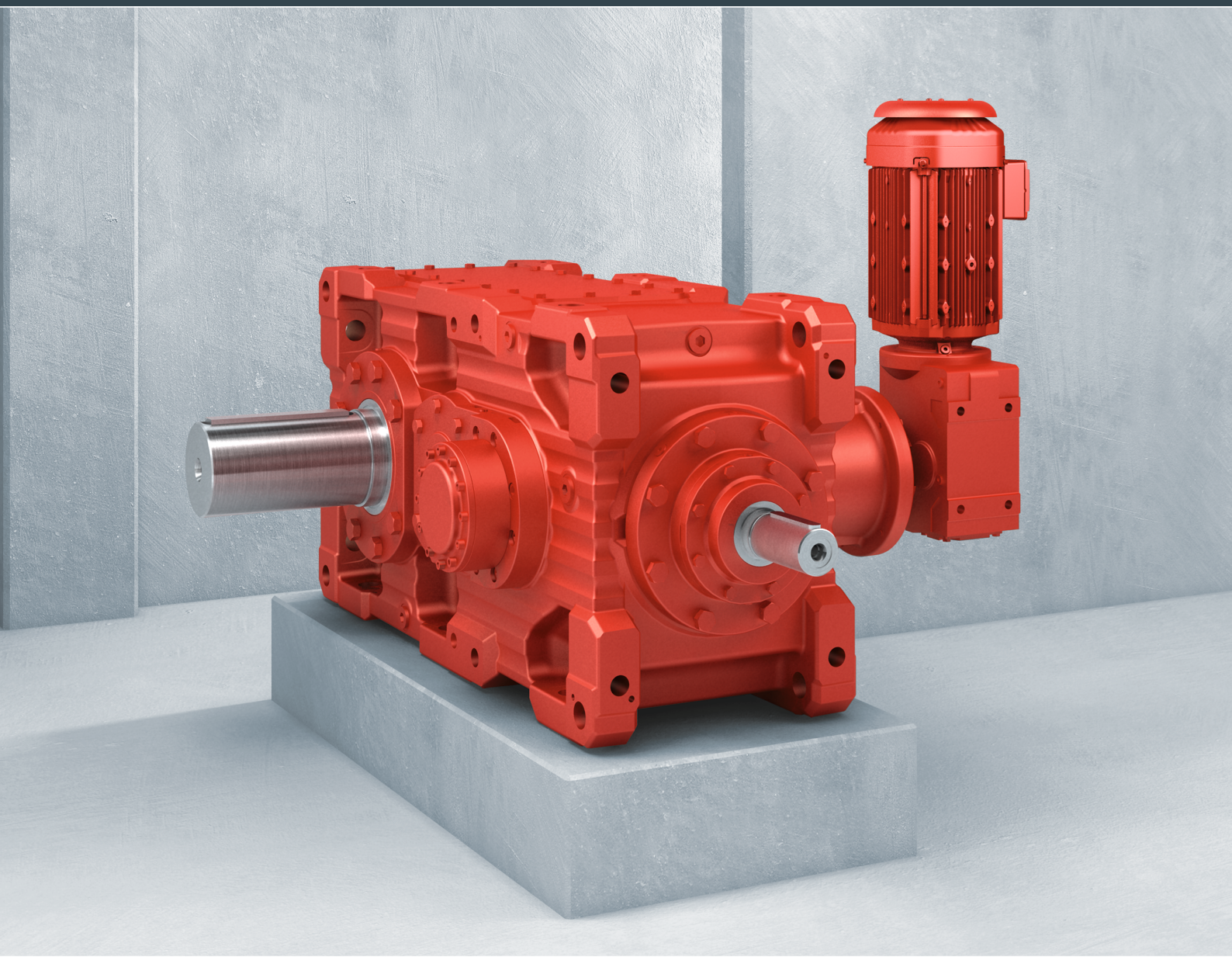
SEW EURODRIVE

Catalog



Industrial Gear Units

X.. Series Bevel-Helical Gear Units Bucket Elevator Drives

Torque Classes from 6.8 – 270 kNm

Edition 10/2018

24762946/EN



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1 Introduction

1.1 The SEW-EURODRIVE group of companies

1.1.1 Global presence

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

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

1.1.2 Always the right drive solution

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

Gear units and motors

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

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

Inverters

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

Modular automation system

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

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

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

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

Decentralized drive technology

For economical, decentralized installations, SEW-EURODRIVE offers decentralized drive technology components, such as MOVIMOT®, the gearmotor with integrated frequency inverter or MOVI-SWITCH®, the gearmotor with integrated switching and protection function. SEW-EURODRIVE hybrid cables have been designed specifically to ensure cost-effective solutions, independent of the philosophy behind or the size of the system.

The decentralized drive technology portfolio is complemented by the DRC.. electronic motor, MOVIGEAR® mechatronic drive system, MOVIFIT® decentralized drive controller, MOVIPRO® decentralized drive, positioning, and application controller, as well as MOVITRANS® system components for contactless energy transfer.

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

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

Industrial gear units

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

Individual system solutions with MAXOLUTION®

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

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

Safe – flexible – effective: safetyDRIVE

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

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

1.1.3 Your ideal partner

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

For detailed information on the entire SEW-EURODRIVE product portfolio, refer to our website www.sew-eurodrive.com where you can find out about components, system solutions, services and industries. Via the Online Support, you can access a large selection of documents and tools such as the product configurator and different selection guides as well as all documentation in different languages for download.

1.2 Documentation

1.2.1 Contents of this publication

This catalog provides a detailed description of the following product groups offered by SEW-EURODRIVE:

- Industrial gear units: X.. series bevel-helical gear units Bucket elevator drives, torque classes from 6.8 to 270 kNm

1.2.2 Additional documentation

The following catalogs and brochures are available on the SEW-EURODRIVE website under "Online Support" in the category "Data and documents" in addition to this "X.. Series Bevel-Helical Gear Units Bucket Elevator Drives" catalog:

- Catalog: "X.. Series Helical and Bevel-Helical Gear Units"
- Catalog: "DRN.. Gearmotors (IE3)"
- Catalog: "External Oil Supply and Oil Cooling Systems"
- Brochure: "Drive systems for conveyor systems"

1.3 Product names and trademarks

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

1.4 Copyright notice

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1.5 Structure of the notes

The notes in this catalog are designed as follows:

Pictogram	Signal word	Meaning
	**INFORMATION**	Useful information or tip. Simplifies handling of the drive system.

1.6 Important information

Note the following points.

INFORMATION



- The illustrations in the catalog are examples. Final dimensions are available from SEW-EURODRIVE on request.
- Oil fill quantities are recommended values. Use the marks on the oil dipstick or oil level glass to determine the oil level.
- The gear units are ready for operation when delivered, but are not filled with oil.
- Oil viscosity and oil grade must comply with those specified on the nameplate.
- The specified weights are guide values. The exact gear unit weight is given on the order-specific dimension sheet. The weight of your basic gear unit including the options mounted to the gear unit is indicated on the nameplate.
- The buyer must provide protection against unintentional contact with moving parts. Observe the applicable safety regulations of the country in which the device will be used.

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2 Product description and overview of types

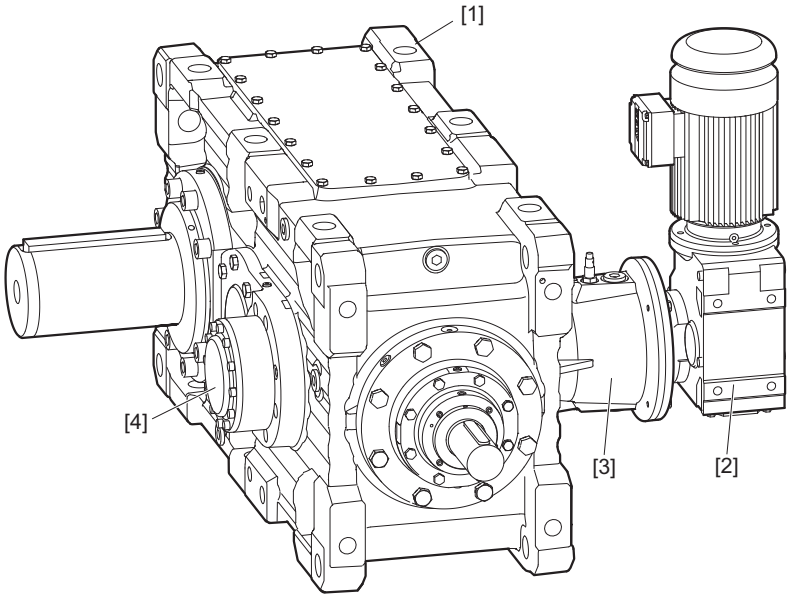
Bucket elevators are conveyor systems that vertically lift large quantities of bulk material. Depending on the volume of the buckets and on the needed conveyor height, high drive powers may be required.

Especially during maintenance, the bucket elevator drive may only be operated at reduced speed. This is the reason why bucket elevator drives are equipped with a directly mounted auxiliary drive. This auxiliary drive provides for the slow movement when the main motor is switched off. The auxiliary drive is available in the types "empty buckets" or "full buckets".

2.1 Gear unit structure

The bucket elevator drive is a standardized application gear unit based on the basic concept of the X gear unit series and covers a gear ratio range of 28 to 90. The auxiliary drive is based on 7-series gear units.

For more information on the X series, refer to the "Helical and Bevel-Helical X.. Series" catalog.



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Unlike the basic design of the X.. gear unit series, bucket elevator drives come equipped with the following components as standard:

[1] X.K.. bevel-helical gear unit

[2] Auxiliary drive

[3] Auxiliary drive adapter with overrunning clutch and incremental encoder for speed monitoring

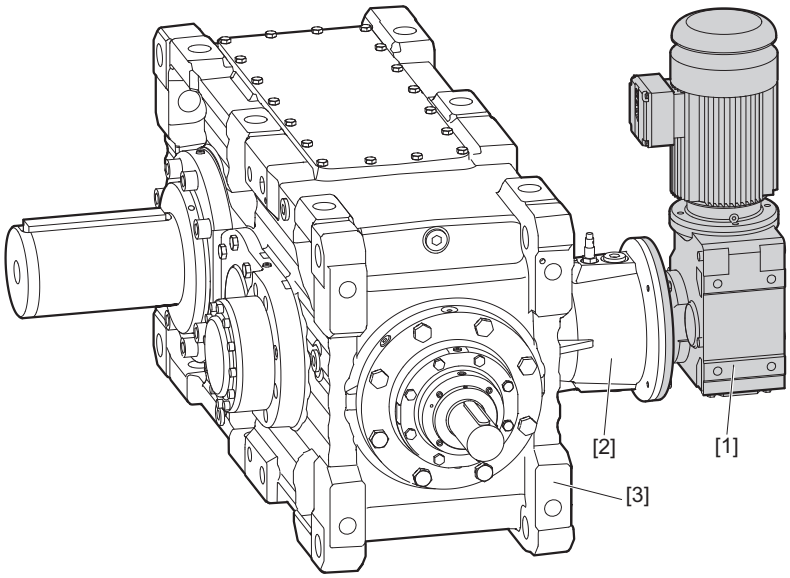
[4] Backstop

These additional options are possible:

Speed monitor, fan (other cooling option on request), torque-limiting backstop, oil heater, oil drain valve, etc.

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2.2 Auxiliary drive / IEC motor standard IE1 and IE3



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The auxiliary drive [1] is available in "empty buckets" design (solely for maintenance purposes) or "full buckets" design. The auxiliary drive is mounted to the bevel-helical gear unit [3] via an auxiliary drive adapter [2]. Refer to the order documents for the exact output torque ratings in auxiliary drive operation.

The auxiliary drive has its own oil circuit which is separated from the oil circuit of the bevel-helical gear unit. The auxiliary drive is delivered filled with oil.

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2.2.1 IEC motor standard IE1 and IE3

DR.. motors comply with all international standards and meet the currently valid IEC motor standard.

As standard, the auxiliary drive is equipped with motors of the DRN.. (IE3) series by SEW-EURODRIVE. For duty types without special requirements on the energy efficiency class, DRS.. (IE1) motors can be used instead. The following table describes both variants.

IE3 motor standard: DRN.. type AC motors
• IE3 (High Efficiency) • Copper or aluminum die-cast rotor cage • Duty type: S1/75

You can also install DRS.. motors:

IE1 motor standard: DRS.. type AC motors
• IE1 (Standard Efficiency) • Copper or aluminum die-cast rotor cage • Duty type: S3/75

INFORMATION

Type and source of the hazard

- As the typical area of application of the auxiliary drive is not S1 continuous duty, the motor is designed for S3/75 duty type. This means the cyclic duration factor (cdf) is 7.5 minutes or less over a period of 10 minutes (max. cdf 75%). An IE1 motor can therefore also be used in countries where an IE1 motor in S1 duty is no longer permitted due to energy efficiency regulations (for example EU Europe).
- The SEW-EURODRIVE website (www.sew-eurodrive.com) provides further information about DR.. motors. If you are unclear about any of the information in this documentation, or if you require further information, consult SEW-EURODRIVE.

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2.3 Drive concepts for bucket elevators

There are two different drive concepts for bucket elevators:

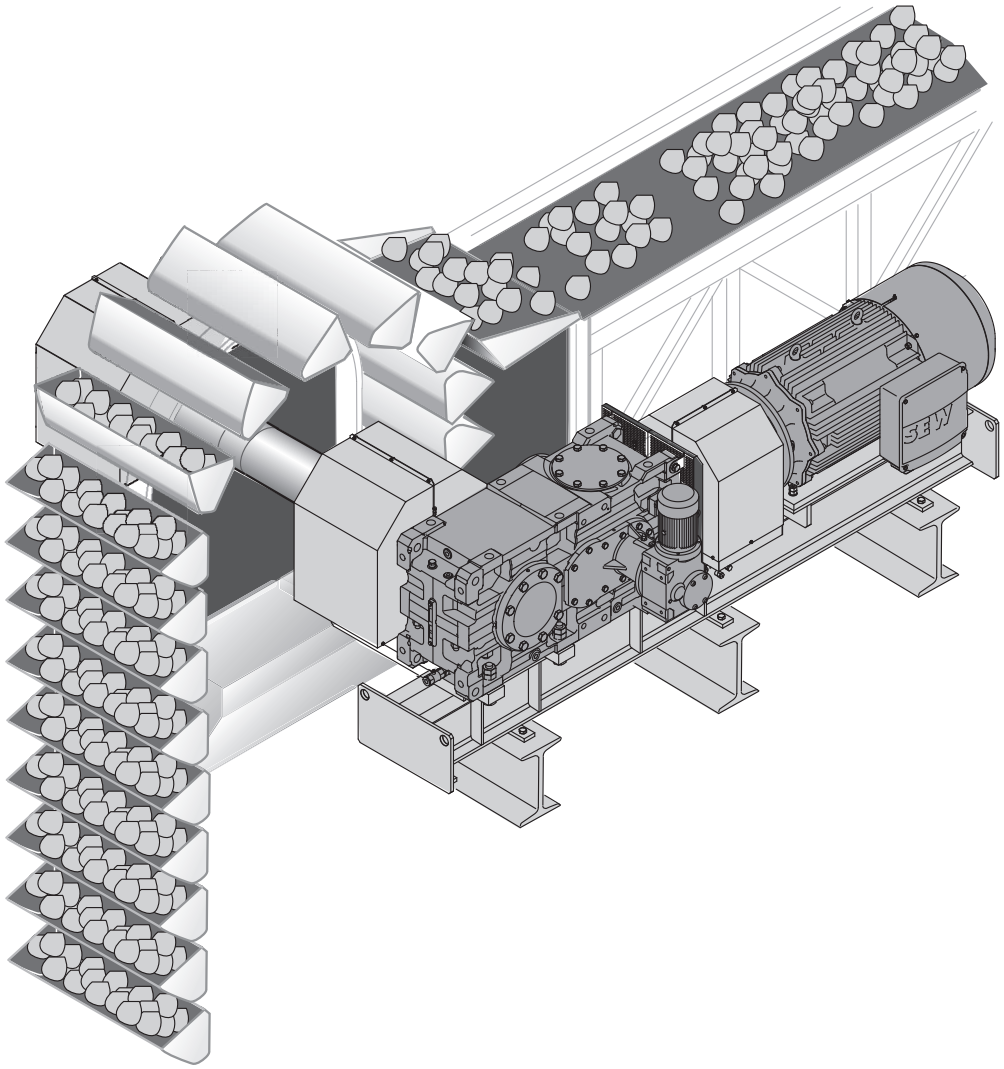
- Single drive
- Dual drive

2.3.1 Single drive

The bucket elevator is driven by a drive that transmits the complete drive power.

The backstop of the main drive is designed in such a way that it is capable of blocking the entire retrodriving torque of the bucket elevator.

In the design "empty buckets", the auxiliary drive can turn the empty bucket during maintenance work. In the design "full buckets", this can also be done in loaded condition.



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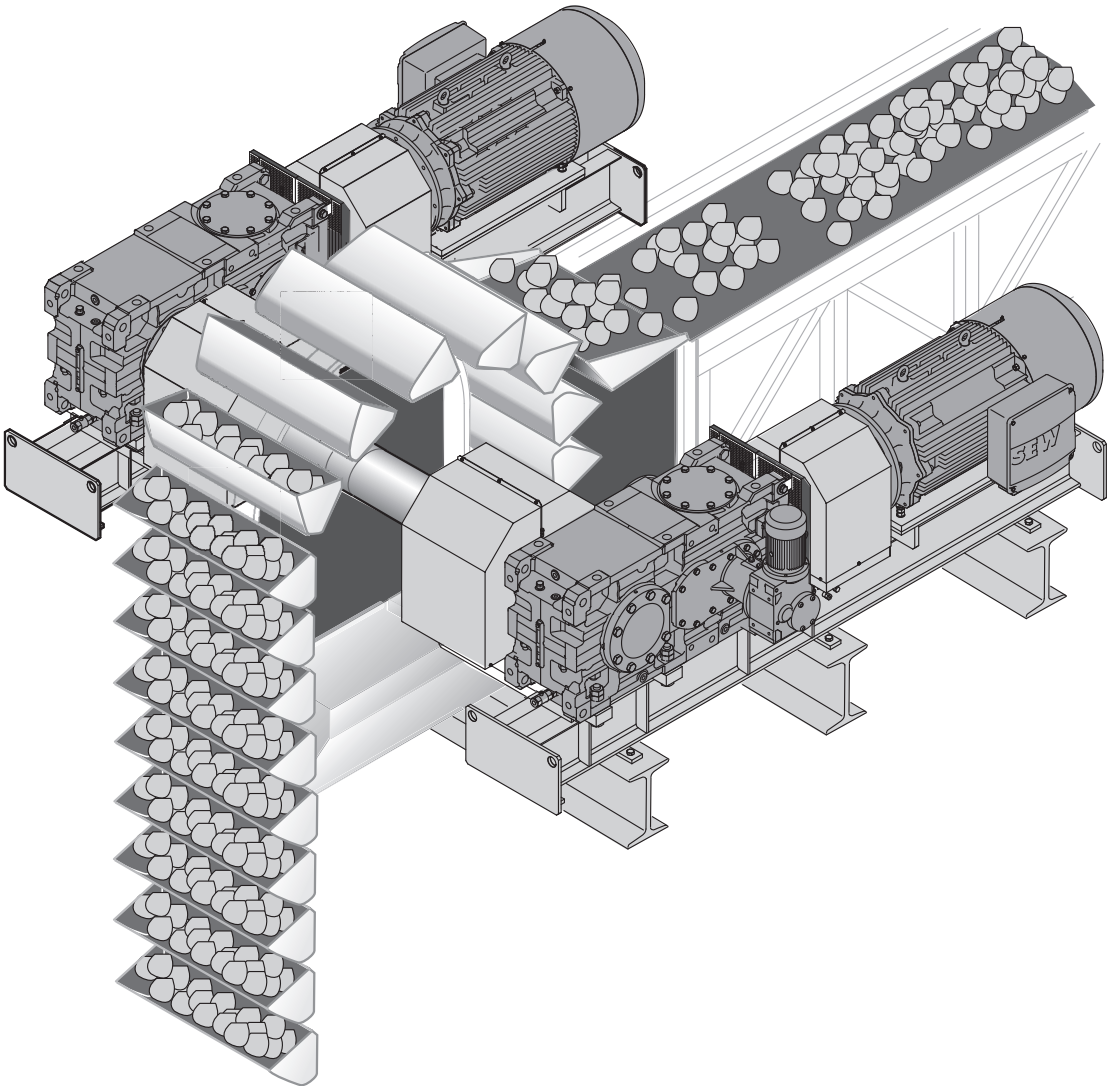
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2.3.2 Dual drive

In dual drives, one drive each is arranged in mirror image to the left and right of the bucket elevator's head. The required drive power is divided among the two drives.

In order to avoid the retrodriving torque from being distributed unevenly to the backstops of the gear unit, SEW-EURODRIVE recommends using torque limiting backstops for dual drives. The retrodriving torque of the bucket elevator is distributed evenly among the two drives due to the torque limitation.

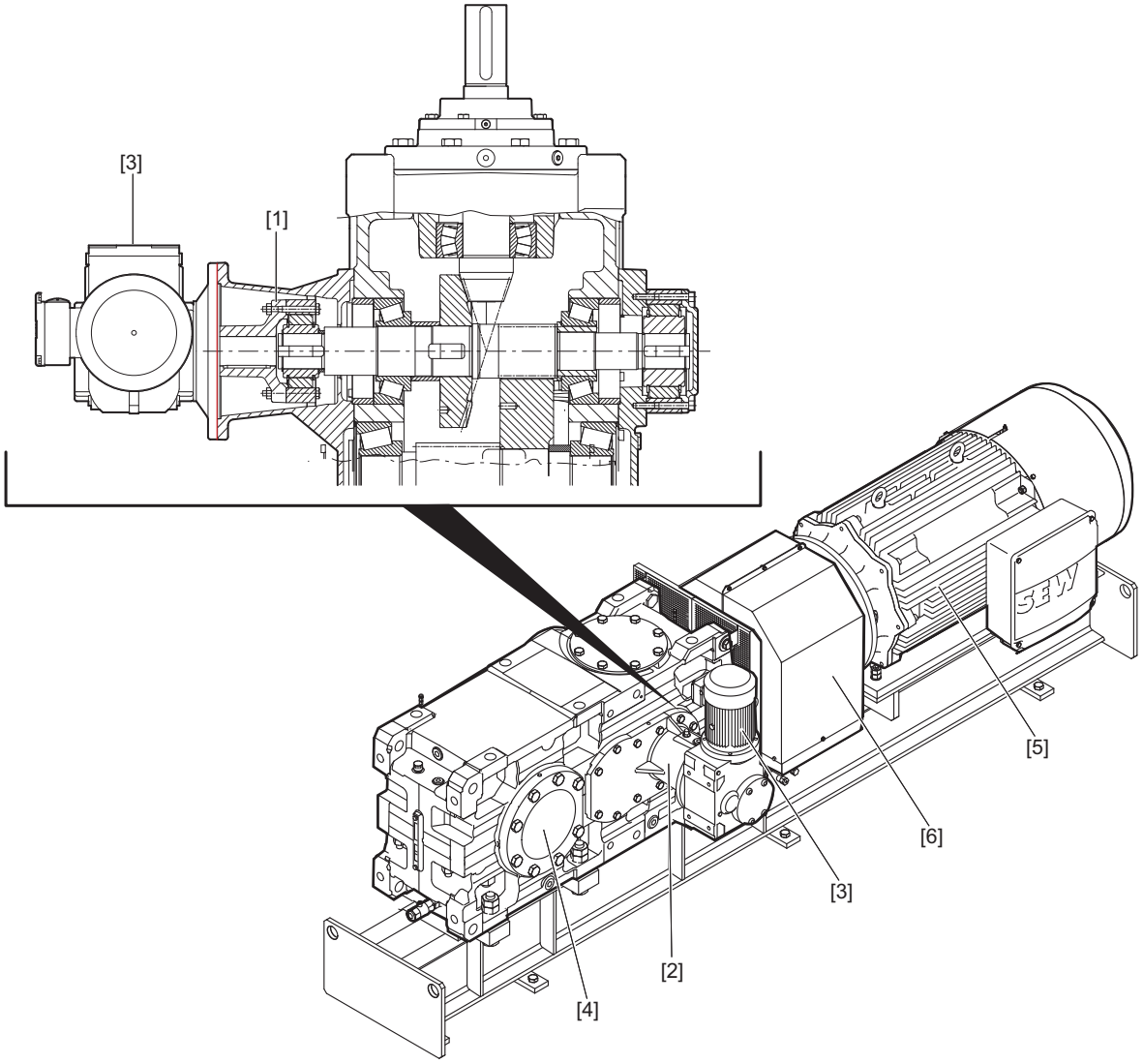
It is usually sufficient to equip only one of the two gear units with an auxiliary drive. The "full buckets" design should be chosen to provide for sufficient power reserves.



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2.3.3 Overrunning clutch



The overrunning clutch [1] is a part of the auxiliary drive adapter [2] and allows for operation in one direction of rotation via the auxiliary drive [3].

The gear unit can be operated in 2 ways:

- Operation via main drive: The overrunning clutch [1] disengages the auxiliary drive [3], preventing the auxiliary drive [3] from rotating. The overrunning clutch is freewheeling.
- Operation via auxiliary drive: The overrunning clutch [1] locks and drives the pinion shaft of the gear unit. In this case, the input shaft of the bevel-helical gear unit [4] is rotating slowly (driving operation).

Electrically interlock the main drive and auxiliary drive in such a way that only one of the two motors can be switched on at the same time.

The rotary motion of the input shaft of the bevel-helical gear unit [4] must not be obstructed. A brake [6] on the input side of the main drive [5] must be released for operation via the auxiliary drive [3].

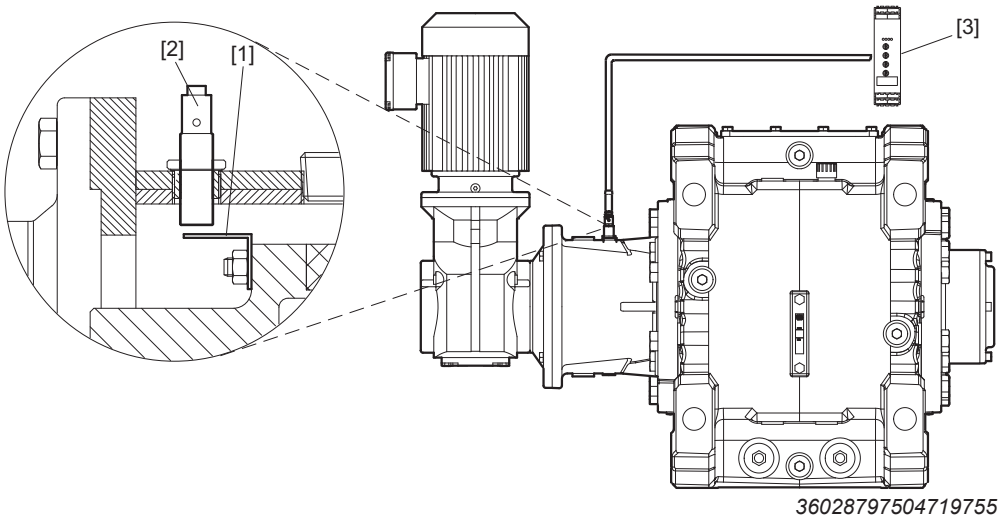
The overrunning clutch [1] is integrated in the oil circuit of the bevel-helical gear unit [4]. This means maintenance and oil change for the overrunning clutch and the bevel-helical gear unit are carried out at the same time.

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2.3.4 Speed monitoring

INFORMATION

For safety reasons, the overrunning clutch must be equipped with speed monitoring. This is because the overrunning clutch may be damaged due to overspeed in case of a malfunction.



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[1] Trigger cam
[2] Inductive incremental encoder
[3] Speed monitor (optional)

The speed of the overrunning clutch is detected in a contactless manner via trip cam [1] and an inductive incremental encoder [2]. The speed monitor [3] compares the encoder pulses with a defined switching speed.

If the switching speed is exceeded (e.g. due to a malfunction of the overrunning clutch), the output relay switches (optionally NC contact or NO contact). The connection must be made in such a way that the main drive is switched off in this situation. Overspeed at the auxiliary drive will be prevented in this way.

INFORMATION

The incremental encoder is included in the delivery. The speed monitor, which is not included in the delivery, can be ordered separately. For further information, refer to chapter "Speed monitor" (→ 🗎 100).

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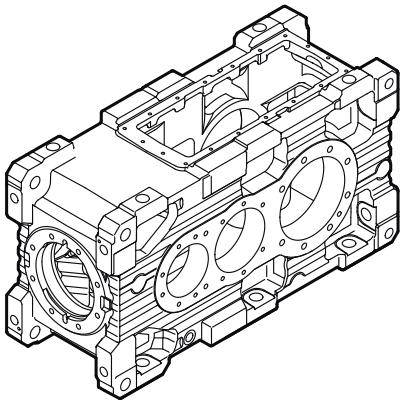
2.4 Housing designs

SEW-EURODRIVE distinguishes between the following housing types:

2.4.1 Horizontal housing /HH

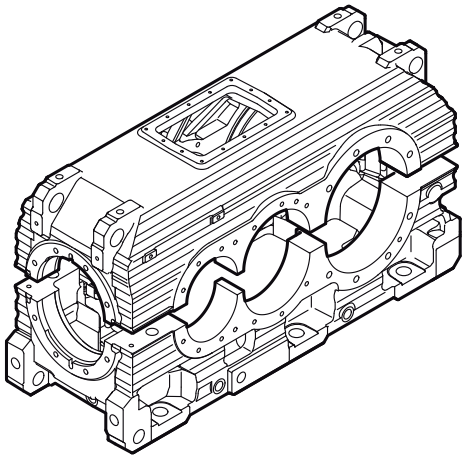
The horizontal housing is designed for mounting position M1. This housing design is non-reversible. For further information, see chapter Reversible gear units.

The following figure shows an example of a single-piece housing for sizes X100 to 210:



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The following figure shows an example of a two-piece housing for sizes X220 to 320:



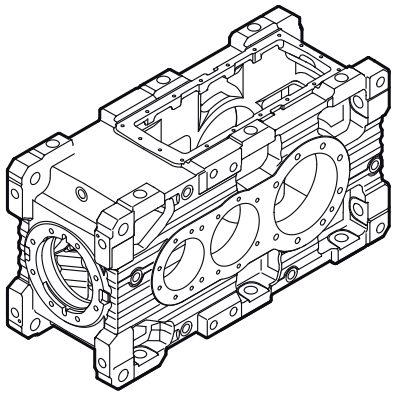
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2.4.2 Universal housing /HU

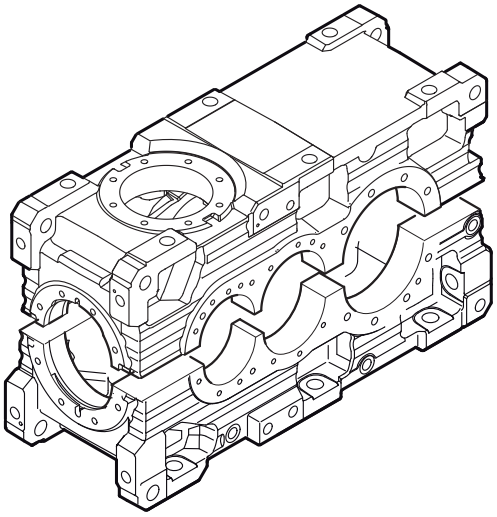
The universal housing can be installed in any mounting position (M1 to M6). The housings can be reversible if required. For further information, see chapter Reversible gear units.

The following figure shows an example of a single-piece housing for sizes X100 to 210:



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The following figure shows an example of a two-piece housing for sizes X220 to 320:



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2.5 Torques and input speeds

The nominal power and nominal torque values mentioned in the catalog depend on the input speed and are valid for a service factor of F_S = 1.0 at constant load. The overview shows nominal power values and nominal torques for input speeds of 1000 min^{-1} to 1800 min^{-1}. The nominal torques are also applicable for drive speeds 3% less than the synchronous speed. For speeds > 1800 min^{-1}, contact SEW-EURODRIVE.

The following table provides an overview of the technical data.

Size X3K..	Nominal torque class kNm	Nominal gear ratio ranges
100	6.8	20 – 80
110	8.5	22.4 – 90
120	12.8	20 – 71
130	16	25 – 90
140	22	20 – 71
150	27.5	25 – 90
160	36	20 – 71
170	45	25 – 90
180	58	25 – 71
190	65	28 – 80
200	79	25 – 71
210	90	28 – 80
220	112	25 – 71
230	131	28 – 80
240	156	25 – 71
250	175	28 – 80
260	205	28 – 71
270	240	28 – 80
280	270	31.5 – 90

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2.6 Assignment of bevel-helical gear units and auxiliary drives

INFORMATION

In the "full buckets" design, the auxiliary drive motors of sizes DRN. 90 to 160 are equipped with a flywheel fan /Z (increased mass inertia). Auxiliary drive motors of sizes DRN. 180 to 225 are not equipped with a flywheel fan.

All motors come equipped with a canopy because the motors are installed vertically as standard.

Main drive	Auxiliary drives/full buckets			Auxiliary drives/empty buckets		
Gear units X3K..	Gear unit	Motor	i	Gear unit	Motor	i
100 – 110	KF57	DRNL90L4/Z/C	35.7	KF37	DRN80M4/C	28.83
120 – 130	KF67	DRN100L4/Z/C	35.62	KF47	DRN90S4/C	31.30
140 – 150	KF77	DRN112M4/Z/C	38.39	KF57	DRNL90L4/C	35.70
160 – 170	KF87	DRN132S4/Z/C	36.52	KF67	DRN100L4/C	35.62
180 – 190	KF97	DRN132L4/Z/C	38.3	KF77	DRN100L4/C	38.39
200 – 210	KF97	DRN160M4/C	38.3	KF77	DRN112M4/C	38.39
220 – 230	KF107	DRN180M4/C	37.0	KF87	DRN112M4/C	36.52
240 – 250	KF127	DRN200L4/C	36.25	KF87	DRN132S4/C	36.52
260 – 280	KF127	DRN225S4/C	36.25	KF87	DRN132S4/C	36.52

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2.7 Combination overview of housing designs and options

2.7.1 Horizontal housing /HH and universal housing /HU

Single-piece and split gear unit housings for horizontal applications **(HH)** as well as universal housings **(HU)** offer a wide range of possible variants. The following table shows the options that can also be combined with horizontal housings **(HH)** and the options that can only be combined with universal housings **(HU)**.

Installing options later may lead to impairments. Not all options can be mounted to the housing design. Contact SEW-EURODRIVE.

Options		Sizes																
		X100 – 210						X220 – 250						X260 – 280				
		2F	2K	3F	3K	4F	4K	2F	2K	3F	3K	4F	4K	2F	2K	3F	3K	4F
BF	Base frame	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	HU	**HH**	**HH**	**HH**	**HH**
BS	Backstop	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	HU	**HH**	**HH**	**HH**	**HH**
APL	Torque limiting backstop	–	–	–	HH	–	–	–	–	–	HH	–	–	–	–	**HH**	**–**	–
CCV	Water cooling cover	HU	HU	**HH**	**HH**	HU	HU	–	–	–	–	–	–	–	–	–	–	–
CCT	Water cooling cartridge	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
FC	Flange coupling	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	HU	**HH**	**HH**	**HH**	**HH**
FAN	Fan	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
FAN-ADV	Fan version Advanced	–	–	–	HH	–	–	–	–	–	HH	–	–	–	–	**HH**	**–**	–
HSST	Through-going input shaft	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**
LSST	Through-going output shaft	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**
MA	Motor adapter	HU	HU	**HH**	**HH**	HU	HU	HU	HU	HU	HU	HU	HU	HU	HU	HU	HU	HU
SB	Swing base	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
SEP	Shaft end pump	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
T	Torque arm	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
OAC	Oil-air cooler	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
OWC	Oil-water cooler	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
OAP	Oil-air cooler	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
OWP	Oil-water cooler	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
ONP	Motor pump	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
OD	Oil dipstick	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
ODV	Oil drain valve	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
OH	Oil heater	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
OLG	Oil level glass	HU	HU	**HH**	**HH**	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
PT100	Temperature sensor	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
NTB	Temperature switch	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
TSK	Temperature switch	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**
DUO10A	Diagnostic unit	HU	HU	HU	HU	HU	HU	**HH**	HU	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**	**HH**

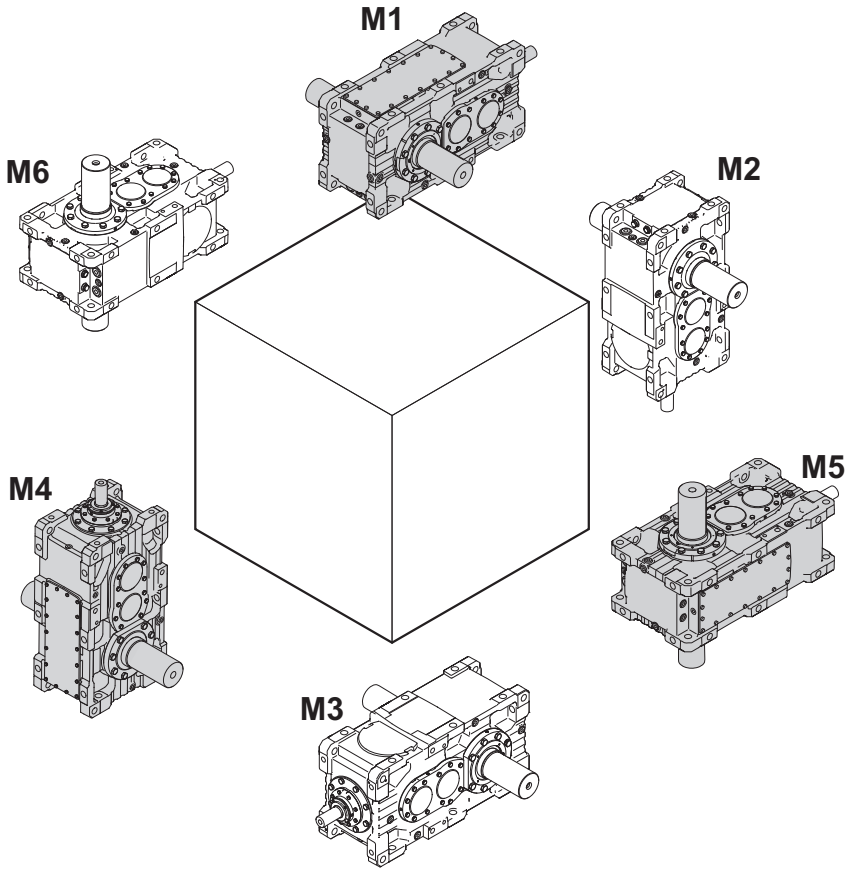
□ Options are available in all gear unit sizes.
▨ Options are not available in all gear unit sizes.
HH Horizontal and universal housings are available.
HU Only universal housing is available.

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2.8 Mounting positions

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

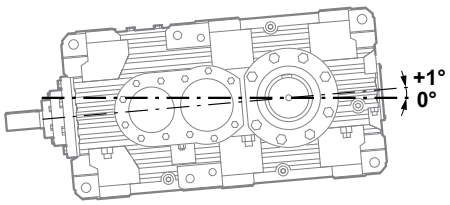
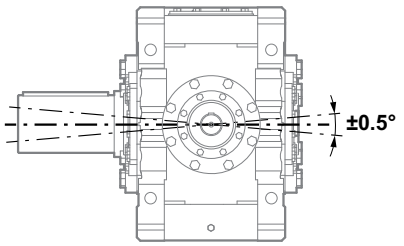
With the alternative mounting positions, there might be limitations regarding certain options. Consult SEW-EURODRIVE in this case.



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2.8.1 Deviating mounting positions

Note that the following deviating mounting positions are permitted for X3K.. gear units in mounting positions M1 and M3. Data is based on a gear unit without pivoted mounting position.

X3K100 – 280	
Mounting position M1 and M3	**Mounting position M1 and M3**
	

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2.9 Type designations

2.9.1 Gear unit

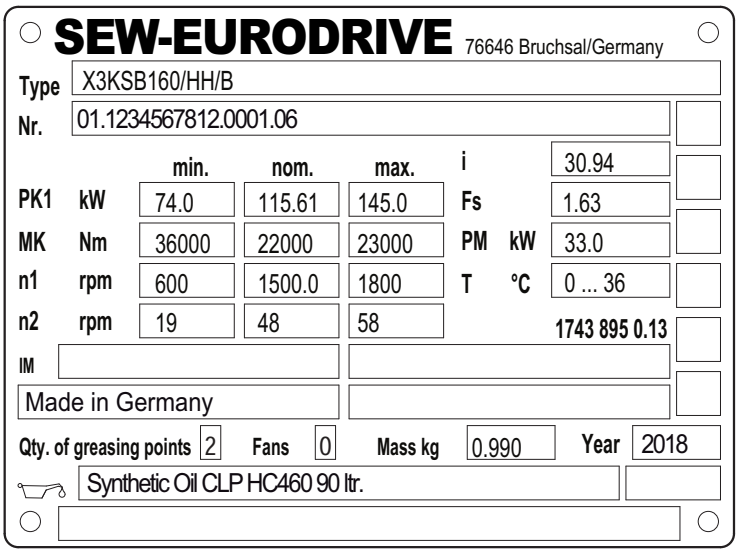
The following example shows the structure of the type designation:

X3KSB260 /HU /B	
X	Industrial gear unit series
3	Number of gear unit stages • 3 = 3 stages
K	Gear unit design • K = Bevel-helical gear unit
S	Type of output shaft • S = Solid shaft with key • R = Smooth solid shaft • L = Splined solid shaft • A = Hollow shaft with keyway • H = Hollow shaft with shrink disk • V = Splined hollow shaft
B	Application: • B = Bucket elevator drive
260	Gear unit sizes • 100 – 280
HU	Housing design • HU = Universal housing • HH = Horizontal housing
B	Gear unit mounting • /B = Foot mounting • /T = Torque arm

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2.10 X.. series nameplate

The following example shows the structure of the nameplate. The oil quantity specified on the nameplate refers only to the basic unit.



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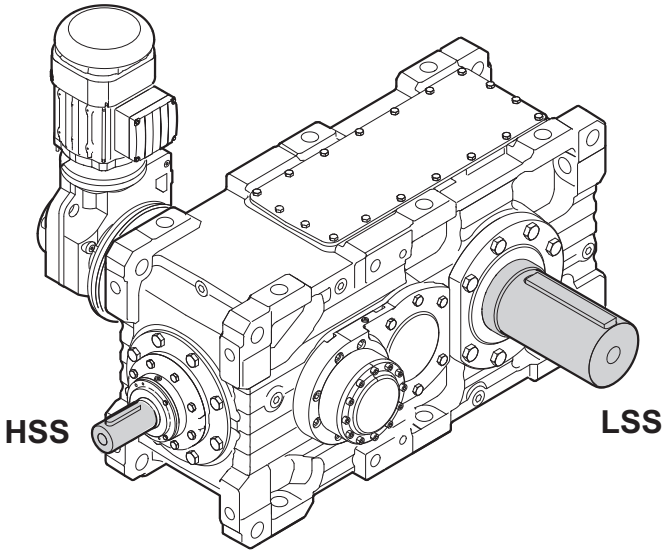
Type		Type designation
No.		Serial number
P_{K1}	kW	Operating power on the input shaft (HSS)
M_{K2}	Nm	Gear unit output torque
n_1	rpm	Input speed (HSS)
n_2	rpm	Output speed (LSS)
min.		Minimum operating point
norm.		Normal operating point
max.		Maximum operating point
i		Exact gear unit ratio
F_S		Service 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 regreasing
		Oil grade and viscosity class/oil quantity
Year		Year of manufacture
IM		Mounting position and mounting surface

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2.11 Input and output shaft

Two types of shafts are differentiated in the catalog:

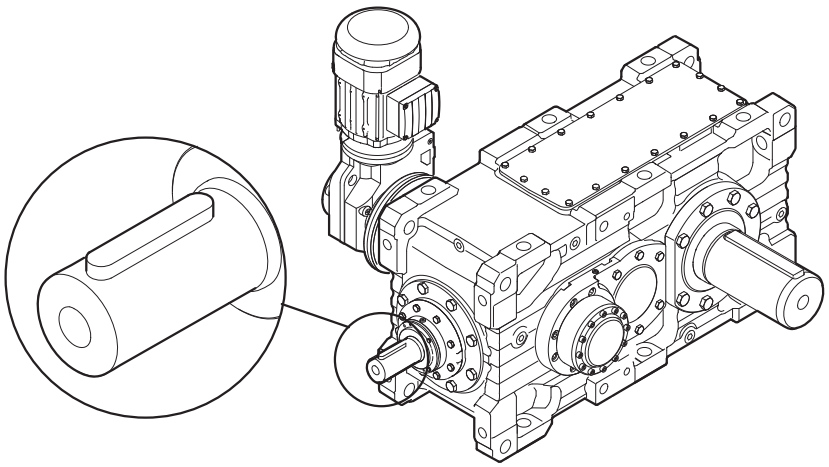
- High-speed shaft (**HSS**)
- Low-speed shaft (**LSS**)



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2.11.1 Input shaft

The input shaft is provided with a closed keyway according to DIN 6885/T1 and a centering bore according to DIN 332. The matching key according to DIN 6885/T1 - form A is included in the delivery.



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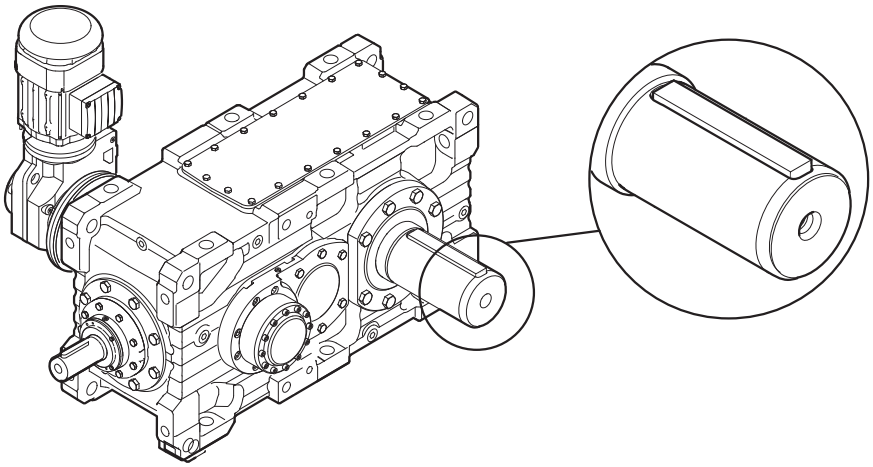
2.11.2 Optional input shaft ends

If the standard input shaft is too short because axial fans, brakes and a hydraulic coupling are used, the extended input shaft can be selected as an option. For further information, refer to the dimension sheet chapter: "Optional input shaft ends /HSS in mm" (→ 🗎 165)

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2.11.3 Output shaft as a solid shaft with key /..S

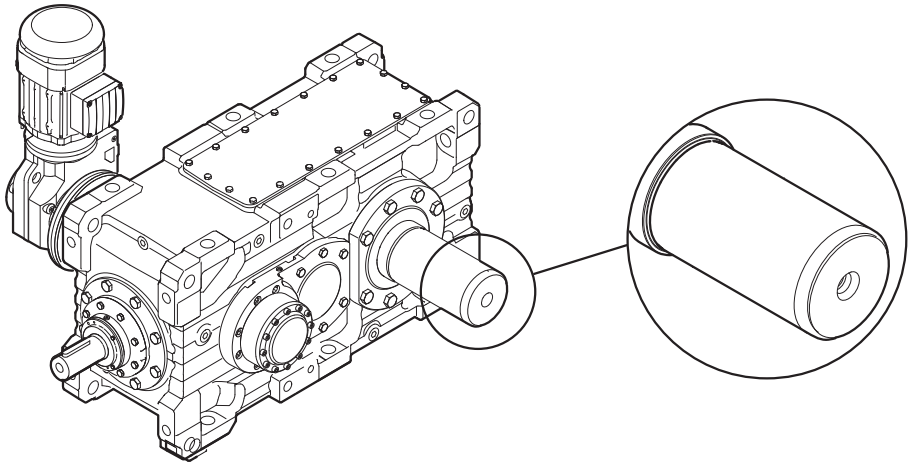
The output shaft is provided with a closed keyway according to DIN 6885/T1 and a centering bore (according to DIN 332). The delivery includes a key according to DIN 6885/T1 – form B. The shaft has an insertion area with a reduced diameter to simplify the mounting of output elements, such as a coupling hub.



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2.11.4 Smooth output shaft /..R

The gear units are available with a smooth output shaft to install non-positive output elements, such as flange couplings with a cylindrical interference fit. The shaft's face has a centering bore according to DIN 332. The insertion area with reduced diameter facilitates the mounting of output elements.

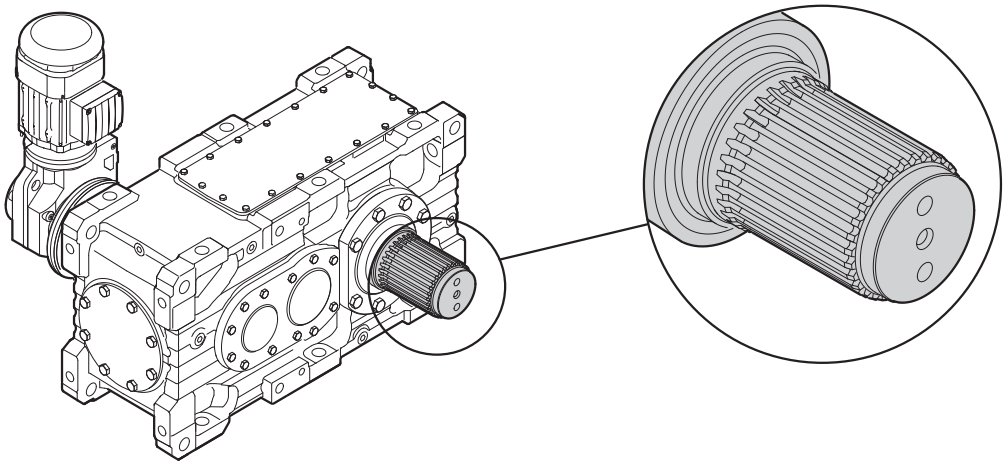


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2.11.5 Output shaft as a splined solid shaft /..L

The output shaft is a splined shaft according to DIN 5480. There is a centering in front of and behind the splined shaft to improve the guide of the output element. Two threads are available on the front end of the shaft for mounting an end plate.



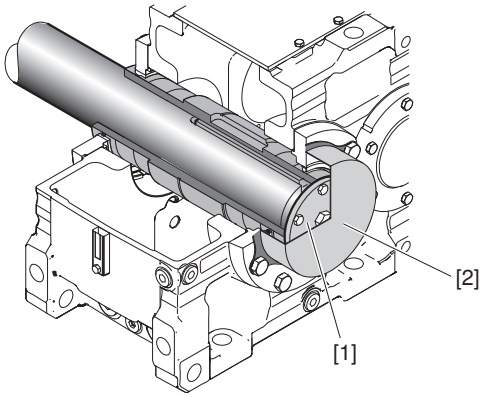
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2.11.6 Output shaft as a hollow shaft with keyway /..A

The hollow shaft is equipped with a keyway according to DIN 6885/T1.

Included in the delivery:

- Protection cover [2]
- Retaining screws [1] or
- 2 retaining rings



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The protection cover is dust-tight. The standard sealing system is therefore normally used on the protection guard side.

INFORMATION

For detailed specifications on the geometry of the machine shaft, refer to chapter Hollow shaft with key X...A [mm]. Dimension L14 refers to the length of the load bearing key.

In case of a through-going machine shaft, the gear unit is delivered without endplate and protection cover. In this case, both gear unit sides are equipped with the same sealing system.

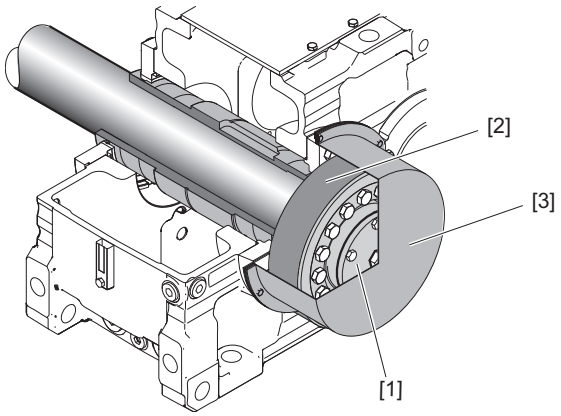
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2.11.7 Output shaft as a hollow shaft with shrink disk /..H

The shrink disk is positioned on the side opposite to the machine shaft.

Included in the delivery:

- Shrink disk [2] and protection cover [3]
- Endplate with retaining screws [1] or
- 2 retaining rings



9007207847897483

The protection cover is dust-tight. The standard sealing system is therefore normally used on the protection guard side.

INFORMATION

For detailed specifications on the geometry of the machine shaft, refer to chapter Hollow shaft with shrink disk X..H [mm].

In case of a through-going machine shaft, the gear unit is delivered without endplate and protection cover. In this case, both gear unit sides are equipped with the same sealing system.

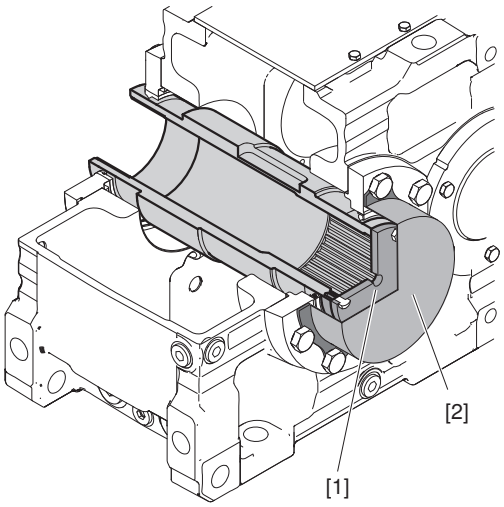
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2.11.8 Output shaft as a splined hollow shaft /..V

The output shaft is a splined shaft according to DIN 5480.

Included in the delivery:

- Protection cover [2]
- Endplate with retaining screws [1] or
- 2 retaining rings



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INFORMATION

For detailed specifications on the geometry of the machine shaft, refer to chapter Splined hollow shaft X..V [mm].

In case of a through-going machine shaft, the gear unit is delivered without endplate and protection cover. In this case, both gear unit sides are equipped with the same sealing system.

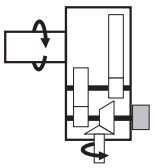
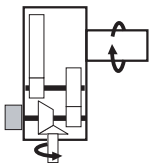
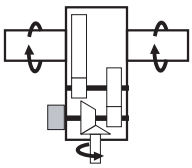
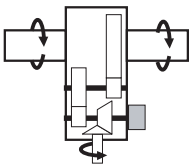
The protection cover is dust-tight, see previous page.

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2.12 Direction of rotation dependencies

2.12.1 X.K..

Standard

Shaft position	03	04	034[1)]	043[1)]
Position of final gear	4	3	3	4
X3K..				

▯ = Position of the backstop

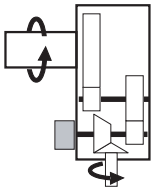
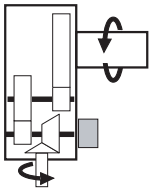
▨ = Alternative backstop position (depending on size and gear ratio)

* = Contact SEW-EURODRIVE when using a backstop

1) Note the restrictions regarding external forces on the LSS

INFORMATION: For more information and a 3D view of the gear unit, refer to chapter "Shaft position, directions of rotation, backstop, auxiliary drive" (→ 🗎 31).

Direction of rotation reversal

Shaft position	03[1)]	04[1)]
Position of final gear	3	4
X3K..		

▯ = Position of the backstop

▨ = Alternative backstop position (depending on size and gear ratio)

* = Contact SEW-EURODRIVE when using a backstop

1) Note the restrictions regarding external forces on the LSS

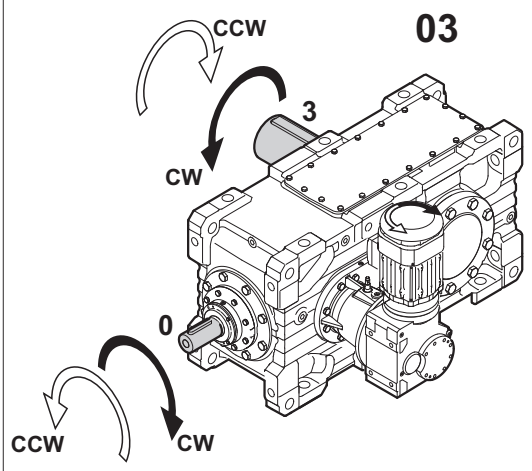
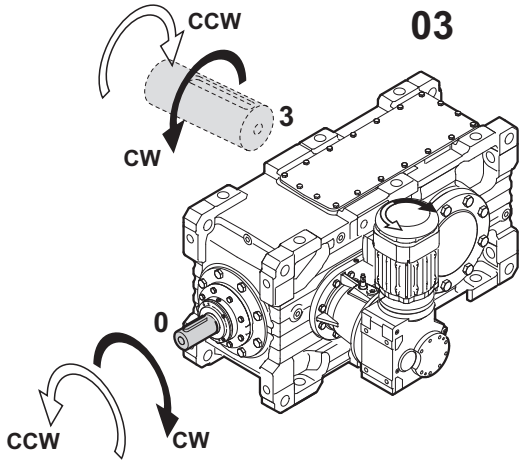
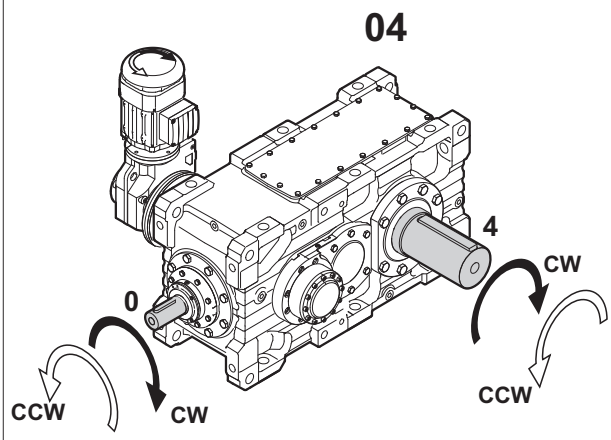
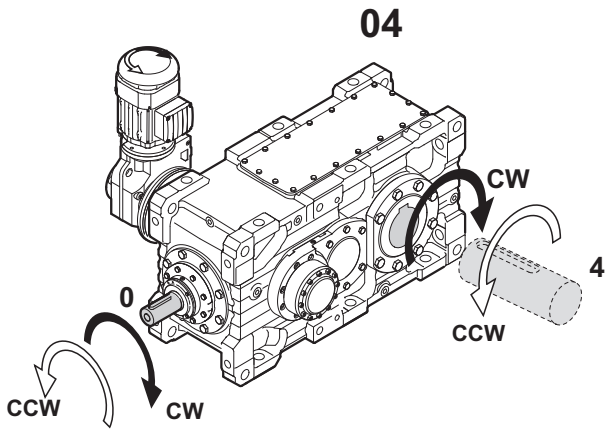
INFORMATION: For more information and a 3D view of the gear unit, refer to chapter "Shaft position, directions of rotation, backstop, auxiliary drive" (→ 🗎 31).

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2.13 Shaft position, directions of rotation, backstop, auxiliary drive

The following figures show the standard variants of the bucket elevator gear units. The auxiliary drives are mounted in mounting position M4A with motor terminal box position 0°.

The shaft positions (**03** and **04**) and corresponding directions of rotation shown in the following diagrams apply to solid and hollow output shaft designs (LSS).

Shaft position 03/X.KS..	Shaft position 03/X.KH../X.KA..
	
Shaft position 04/X.KS..	**Shaft position 04/X.KH../X.KA..**
	

INFORMATION

The auxiliary drive and the shrink disk (X.KH.. version) are always located opposite the output side of the gear unit. The backstop is installed opposite the auxiliary drive.

For bucket elevator drives without auxiliary drive, the backstop is installed opposite the output side of the gear unit.

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2.14 Position of motor terminal box and cable entry

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

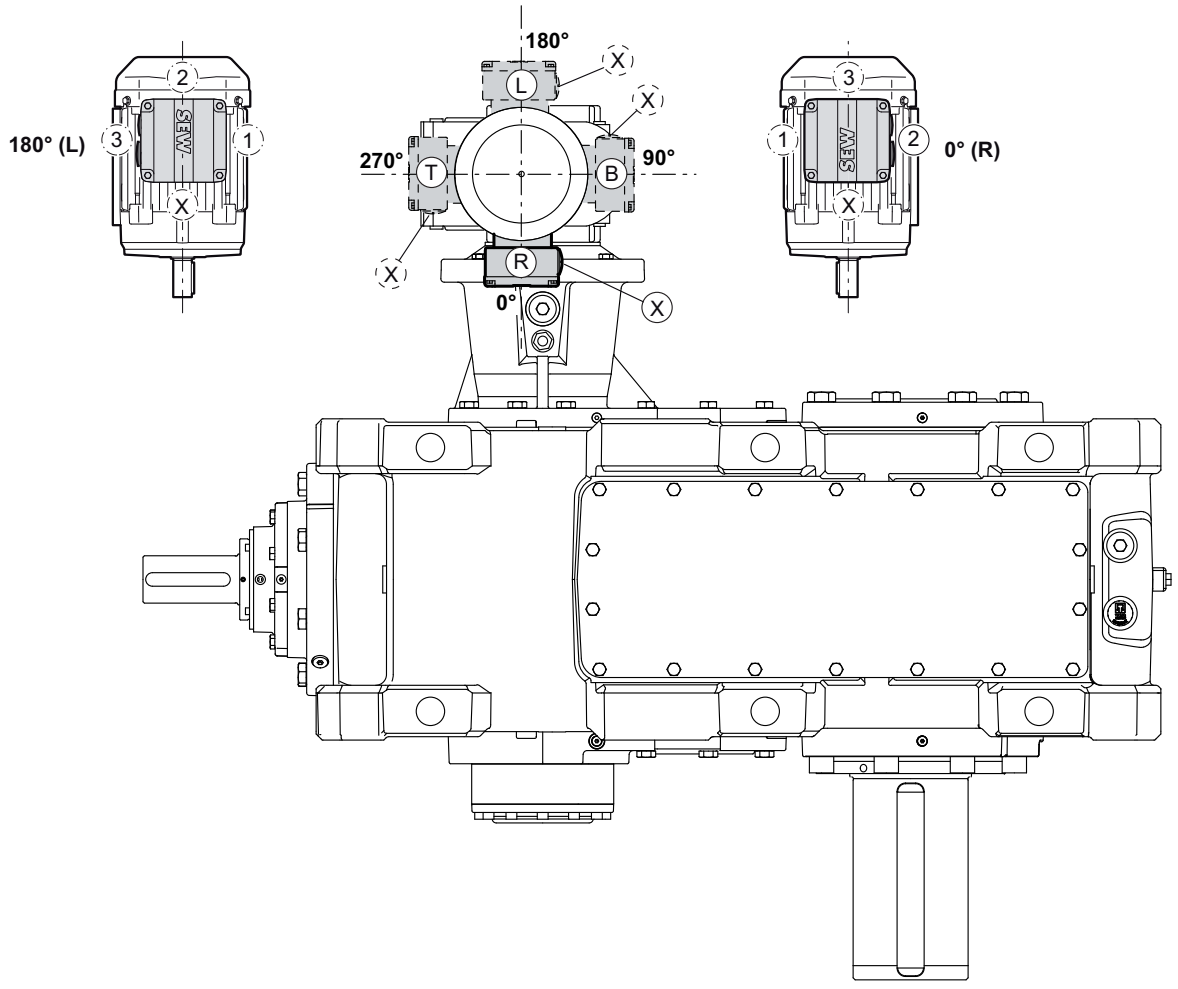
- As viewed onto the output shaft = A-side
- Designation as R (right), B (bottom), L (left) and T (top)

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

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

INFORMATION

Unless other information is given regarding the terminal box, the 0° type (R) with "X" cable entry will be supplied.

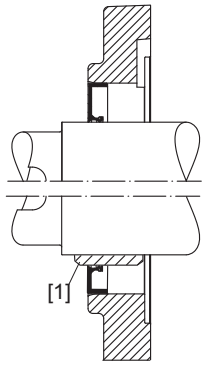
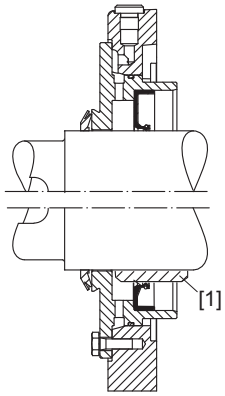
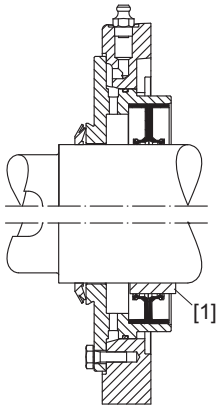
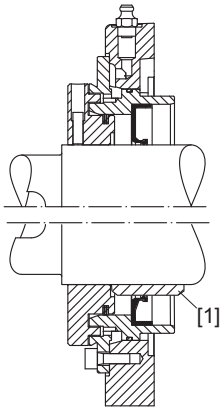


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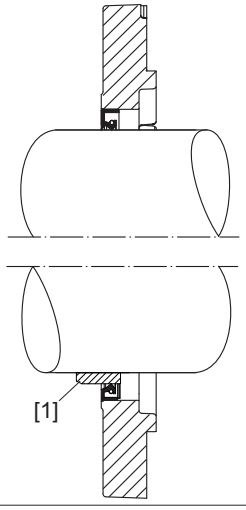
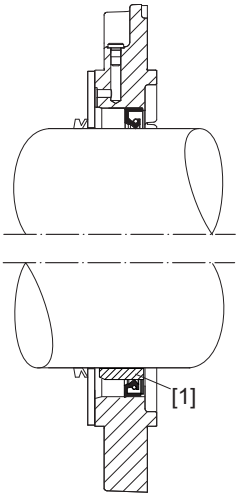
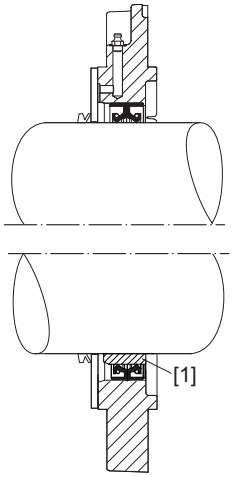
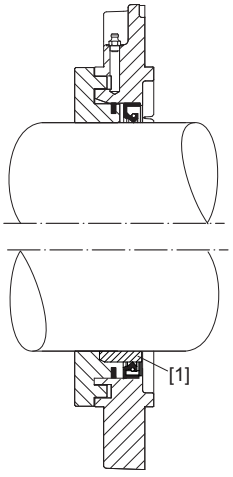
2.15 Sealing systems

2.15.1 Input shaft

Standard	Dust-protected	Dust-protected regreasable	Radial labyrinth seal (Taconite) regreasable
Single oil seal with dust protection lip	Single oil seal with dust protection cover	Double lip seal with dust protection cover	Single oil seal with radial labyrinth seal
• Normal environment	• **Medium** dust load with abrasive particles	• **High** dust load with abrasive particles	• **Very high** dust load with abrasive particles
			

[1] Optional with oil seal sleeve

2.15.2 Output shaft

Standard	Dust-proof	Dust-proof Regreasable	Radial labyrinth seal (Taconite) Regreasable
Single oil seal with dust protection lip	Single oil seal with dust protection cover	Double oil seal with dust protection cover	Single oil seal with radial labyrinth seal.
• Normal environment	• **Medium** dust load with abrasive particles	• **High** dust load with abrasive particles	• **Very high** dust load with abrasive particles
			

[1] Optional with oil seal sleeve

INFORMATION

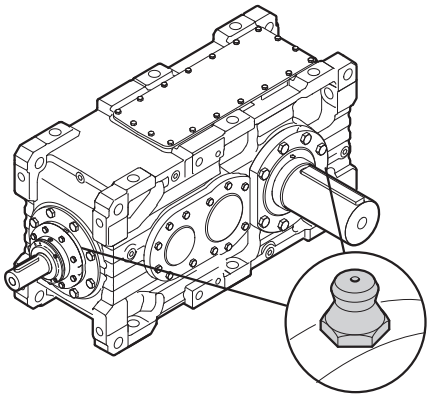
Make sure that the gear shaft is rotating during the regreasing process.

2.15.3 Position of lubrication points

Grease nipple on gear unit cover

Regreasable sealing systems are usually equipped with taper greasing nipples according to DIN 71412 A R1/8. Regreasing should be carried out at regular intervals. The lubrication points are located near the input and output shafts.

Example



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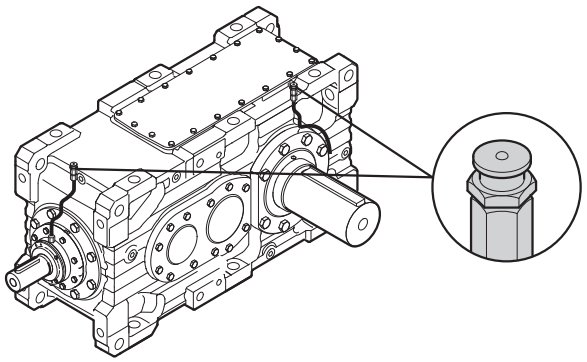
Grease nipple on the top side of the gear unit

If installation space is limited, the lubrication points can be relocated to the top side of the gear unit. Flat grease nipples according to DIN 3404 A G1/8 are used. Regreasing should be carried out at regular intervals.

Note the following points:

- This option is normally used on drives with fans, motor adapters, or V-belt drives.
- The option applies to both input and output shaft(s).

Example



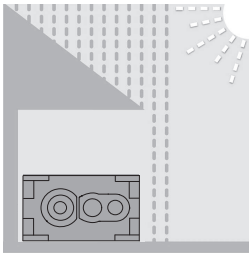
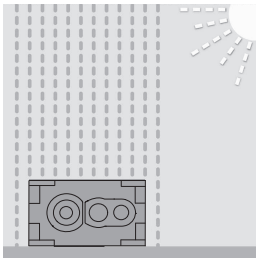
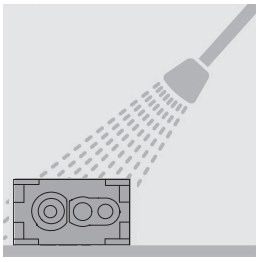
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2.16 Coating and surface protection systems

Gear units are available with surface protection OS1, OS2, and OS3.

The following table gives an overview of coating and surface protection systems.

SEW design	OS 1 Low environmental pollution	OS 2 Medium environmental pollution	OS 3 High environmental pollution
Used as surface protection under typical ambient conditions Corrosivity categories DIN EN ISO 12944-2	 Suited 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)	 Suited for environments with high humidity or moderate atmospheric contamination, such as applications outdoors subject to direct weathering. According to corrosivity category: C3 (moderate)	 Suitable for environments with high humidity and occasionally severe atmospheric and chemical contamination. Occasionally acidic or caustic wet cleaning. Also for applications in coastal areas with moderate salt load. According to corrosivity category: C4 (high)
Sample applications	• Systems in saw mills • Agitators and mixers	• Applications in gravel plants • Cableways	• Port cranes • Sewage treatment plants • Mining applications
Condensation test ISO 6270	120 h	120 h	240 h
Salt spray test ISO 7253	–	240 h	480 h
Top coat color[1)]	RAL 7031	RAL 7031	RAL 7031
Color according to RAL	Yes	Yes	Yes
Uncoated parts, shaft end/flanges	Water and hand perspiration repelling anticorrosion agent applied at the factory for external preservation.		

1) Standard color, can deviate depending on the order, see order documents.

INFORMATION

Sheet metal parts (e.g. protection covers) are painted in RAL 1003.

Special surface protection is also available, please 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

- During storage up to startup, the gear unit must be stored in a shock-free manner to prevent damage to the rolling bearing races.
- The output shaft must be rotated at least one full revolution every 6 months so that the position of the rolling elements in the bearings of the input and output shafts changes.
- 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 roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 60 °C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). No aggressive vapors, no shocks.	Max. 6 months with intact surface protection.
Long-term corrosion protection + Standard packaging	Under roof and enclosed at constant temperature and atmospheric humidity (5 °C < ϑ < 60 °C, < 50% relative humidity). No sudden temperature fluctuations. Controlled ventilation with filter (free from dust and dirt). No aggressive vapors, no shocks.	Max. 3 years with regular inspection and checking for intactness.
Long-term corrosion protection + Long-term packaging	With roof, protected against rain and 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 for differing requirements.

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2.18 Lubrication

The lubrication type "splash lubrication" is used for bucket elevator drives as standard. Pressure or bath lubrication may optionally be used with these gear units.

2.19 Thermal rating/cooling

The thermal rating needs to be checked for every gear unit. The relevant values are listed in chapter "Selection tables" (→ 🗎 105).

If the thermal rating of the gear unit is insufficient, it can be operated either with a fan on the input shaft (depending on the direction of rotation) or with an oil-air cooler. In this case you will have to make sure that there is enough space left for unimpeded air admission both in axial and radial direction. Please contact SEW-EURODRIVE for information on other cooling options.

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3 Options and accessories

3.1 Backstop /BS

INFORMATION

For information on the exact position, direction of rotation dependencies, and dimensions of the backstop, see chapter Backstop X.F.. /BS [mm] .

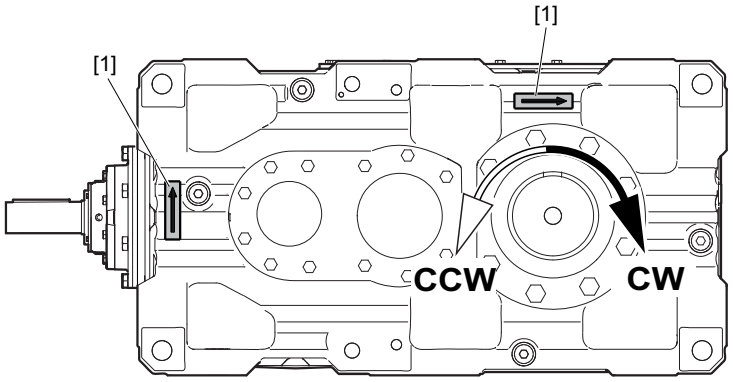
3.1.1 Use

The purpose of a backstop is to prevent unwanted directions of rotation. During operation, the backstop permits rotation in only one specified direction of rotation.

3.1.2 Description

The backstop operates with centrifugal lift-off sprags. Once the lift-off speed is reached, the sprags completely lift off from the contact surface of the outer ring. The backstop is lubricated with gear oil.

3.1.3 Direction of rotation



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SEW-EURODRIVE installs backstops according to the specifications given with the order. This means that it is necessary to specify the direction of rotation for the output shaft. The customer must check that the connected electric motor rotates in the correct direction. If not, the electric motor might damage the backstop.

The direction of rotation is specified as viewed onto the output shaft (LSS):

- CW = Clockwise rotation
- CCW = Counterclockwise rotation

The permitted direction of rotation [1] is indicated on the housing.

INFORMATION

If the drive has a continuous output shaft, the direction of rotation of the backstop should be given as one views shaft position 3.

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3.1.4 Dimensioning

The backstop is dimensioned according to the following basic rules:

- Speed of the gear unit's input shaft: 0 – 1800 min^{-1}
- Maximum permitted torque of the backstop in relation to the output shaft:

  At least 2.8 times the nominal gear unit torque.

Contact SEW-EURODRIVE for differing requirements.

The backstop might wear off when operated below lift-off speed.

In the following cases **always** contact SEW-EURODRIVE for specifying the maintenance intervals:

- Input speed rates n_1 < 950 min^{-1}
- or any of the following gear unit designs:

n_1 min^{-1}	Size X3K..	
950 – 1150	X100 – 130 X140 – 170 X180 – 280	All i_N $i_N \geq 31.5$ $i_N \geq 50$
1150 – 1400	X100 – 110 X120 – 130 X140 – 170 X180 – 280	$i_N \geq 25$ $i_N \geq 40$ $i_N \geq 50$ $i_N \geq 63$
> 1400	X100 – 130 X140 – 170	$i_N \geq 35.5$ $i_N \geq 63$

n_1 = Input speed (HSS) i_N = Nominal gear unit ratio

INFORMATION

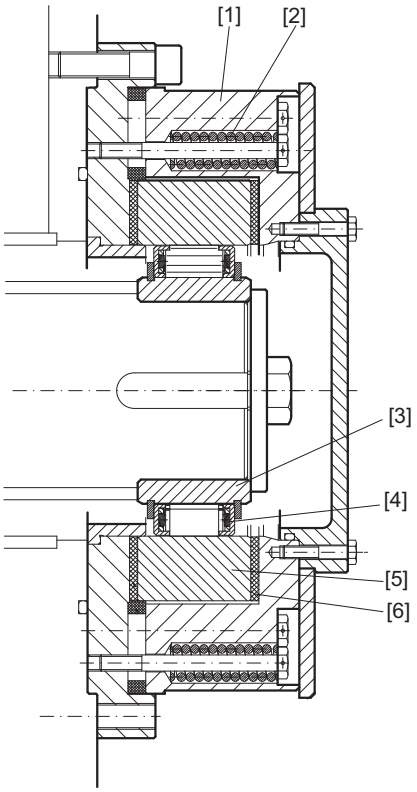
For information on torque limiting backstops, for example for dual drives, contact SEW-EURODRIVE.

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3.2 Torque limiting backstop /BSL

Torque limiting backstops are used in dual drives where both drives are equipped with a backstop.

The torque limitation prevents the restoring torque from being unevenly distributed to the individual backstops. Dynamic torque peaks are also reduced during the blocking phase.



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[1]	Housing	[4]	Freewheel cage
[2]	Compression springs	[5]	Outer ring
[3]	Inner ring	[6]	Friction lining

As with a backstop without torque limitation, the locking torque is transmitted to the outer ring via sprags.

However, for a torque limiting backstop, the outer ring [5] is not securely bolted on the gear unit housing but is held between two friction linings [6]. The friction linings are loaded via a housing [1] with screws and compression springs [2].

INFORMATION

The slip torque is set at the factory. Changing the slip torque is not permitted.

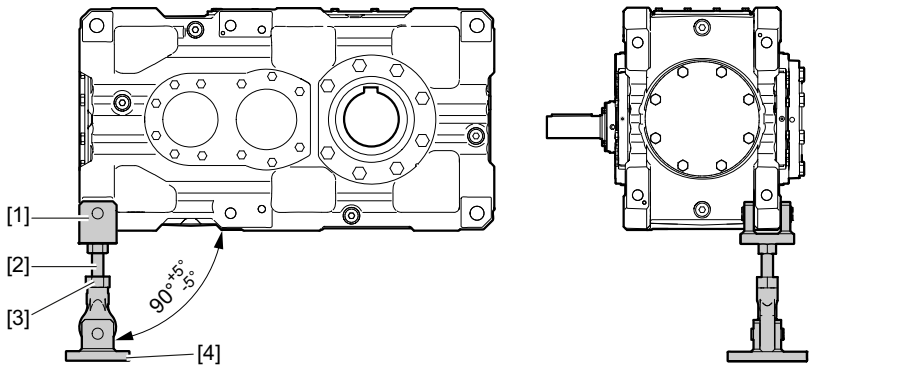
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3.3 Torque arm /T

A torque arm is available as option for shaft-mounted gear units to support the reaction torque. The torque arm can bear tensile stress as well as thrust loads.

The length of the torque arm can be adjusted within a certain range.

The torque arm consists of a yoke with bolt [1], a threaded bolt [2], a maintenance-free joint head [3], and a yoke plate with bolt [4]. The design using the joint head allows for compensating assembly tolerances and operational displacements. Constraining forces on the output shaft are avoided in this way.



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[1] Yoke with bolt
[2] Threaded bolt with nut
[3] Joint head
[4] Yoke plate with bolt

INFORMATION

Fan version X.K.. Advanced cannot be used together with a torque arm because the fan guard is mounted to the attachment point of the torque arm.

3.4 Drive packages on a steel construction

For gear units in a horizontal mounting position, complete preassembled drive packages on a steel frame (swing base or base frame) are available from SEW-EURODRIVE.

INFORMATION

The dimensions of the swing base and the base frame are determined by SEW-EURODRIVE specifically for each order.

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3.4.1 Swing base /SB

A swing base is a steel frame [1] that accommodates the gear unit, (hydro) coupling and motor (and brake, if required), including a protection device, such as a cover. A swing base is normally used for

- Hollow shaft gear units or
- Solid shaft gear units with flange coupling on the output shaft

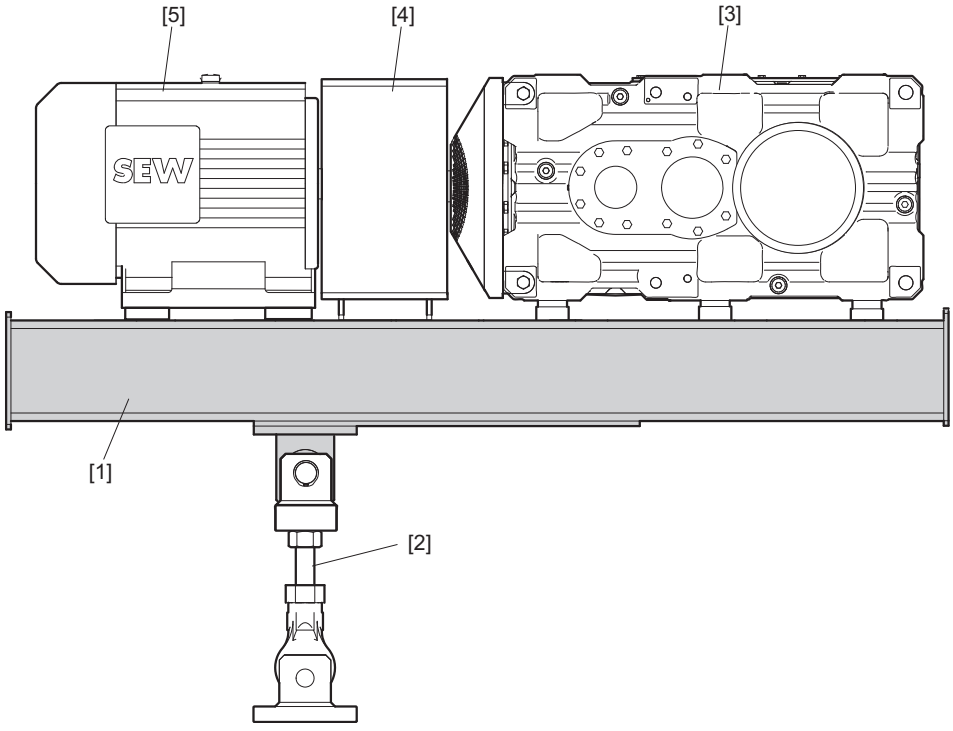
The steel frame [1] is supported by a torque arm [2].

INFORMATION

Observe that

- the system frame is sufficiently dimensioned to absorb the torque
- the swing base is not deformed during installation (hazard of damage to gear unit and coupling).

The following figure shows an example of a gear unit with swing base.



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[1] Swing base
[2] torque arm (optional)
[3] Bevel-helical gear unit
[4] Coupling with protection cover
[5] Motor

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3.4.2 Base frame /BF

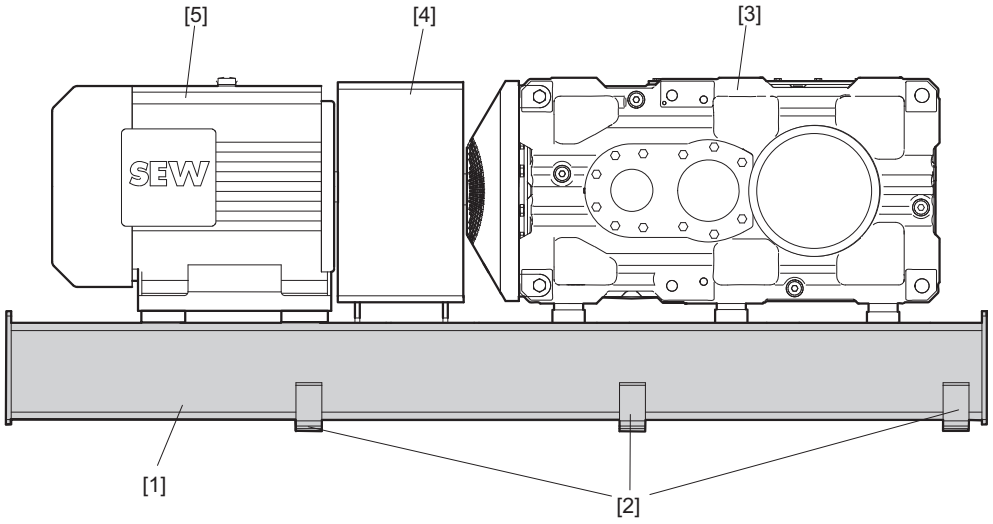
A base frame is a steel frame [1] that accommodates the gear unit, coupling and motor (and brake, if required), including a protection device, such as a cover. The steel frame is supported by several foot mountings [2]. Such a frame is usually used for solid shaft gear units with elastic coupling on the output shaft.

INFORMATION

Make sure that

- the support structure of the foot mounting is adequately dimensioned and rigid,
- the base frame is not deformed during installation (hazard of damage to gear unit and coupling).

The following figure shows an example of a gear unit with base frame and coupling.



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[1] Base frame
[2] Foot mounting
[3] Bevel-helical gear unit
[4] Coupling with protection cover
[5] Motor

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3.5 Accessories

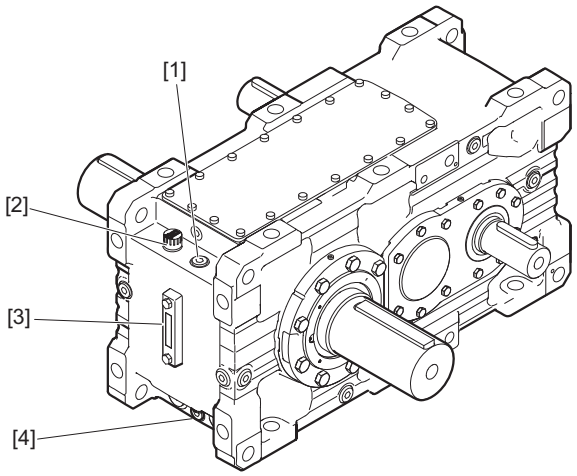
The following section describes the accessories for the several lubrication types.

INFORMATION

The position of the accessories may vary depending on gear unit design and gear unit size. For dimensions of oil dipstick, oil drain valve, and oil level glass, refer to chapter Oil drain valve ODV / oil level glass OLG / oil dipstick OD [mm].

3.5.1 General accessories

The following figure shows the general accessories.



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[1] Oil dipstick (optional)
[2] Gear unit venting
[3] Oil level glass
[4] Oil drain

Visual oil level check

The following types are available as standard for gear units in **M1** mounting position with splash lubrication:

- Oil dipstick for gear unit sizes X100 to 170
- Oil level glass for sizes X180 to 280

For other mounting positions and lubrication types, the gear unit is equipped with an oil dipstick as standard.

Gear unit venting

The purpose of gear unit venting is to prevent that non-permitted pressure occurs from heating during operation. The gear units are equipped with a high-quality breather filter as standard.

Oil drain

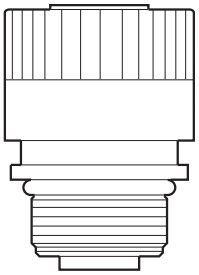
The gear unit is equipped with an oil drain plug as standard. An oil drain valve may be provided as option. This valve allows for a drain pipe to be easily attached when changing the gear unit oil.

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3.6 Breather /BPG

The following breathers can be used.

3.6.1 Standard

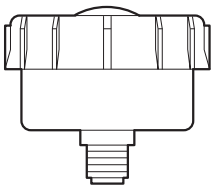


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Structure

Features	
Housing material	Polyamide
Filter inserts	Polyester filter, not exchangeable
Filter size	2 µm
Threads	3/4" or 1"

3.6.2 Breather with filter insert /PI



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The breather has the following characteristics:

- Corrosion-resistant
- Robust filter housing
- High dirt-absorbing capacity

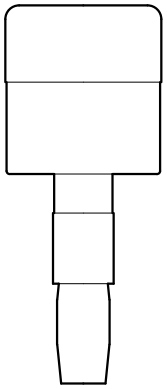
Structure

The breather has a corrosion-proof housing with air intake opening at the top. The cover with protection lip keeps splashing water off.

Features	
Housing material	Polyamide
Filter inserts	Wire mesh, galvanized
Filter size	10 µm
Threads	3/4" or 1"

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3.6.3 Desiccant breather filter /DC



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The breather has the following characteristics:

- Absorbs water moisture and humidity
- Reduces oil mist

Structure

Features	
Housing material	Polycarbonate
Filter inserts	• Polyester filter: Removes air particles > 3 µm • Silica gel: Absorbs water moisture and humidity. Saturation is indicated by the color changing from blue to pink. • Foam pad: Absorbs oil mist.
Threads	3/8" or 1"

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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 homepage (http://www.sew-eurodrive.de).

4.1.1 Drive Engineering – Practical Implementation

The publication "Drive Engineering – Practical Implementation – Drive Selection with SEW-EURODRIVE Gear Units" provides extensive information on characteristics, distinguishing features, and application areas of drives by SEW-EURODRIVE. A comprehensive collection and assignment of the most important equations for drive calculation as well as detailed examples of the most frequently used applications make this documentation an important tool for project planning and an essential addition to SEW-EURODRIVE product catalogs.

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4.1.2 Explanation of the designations

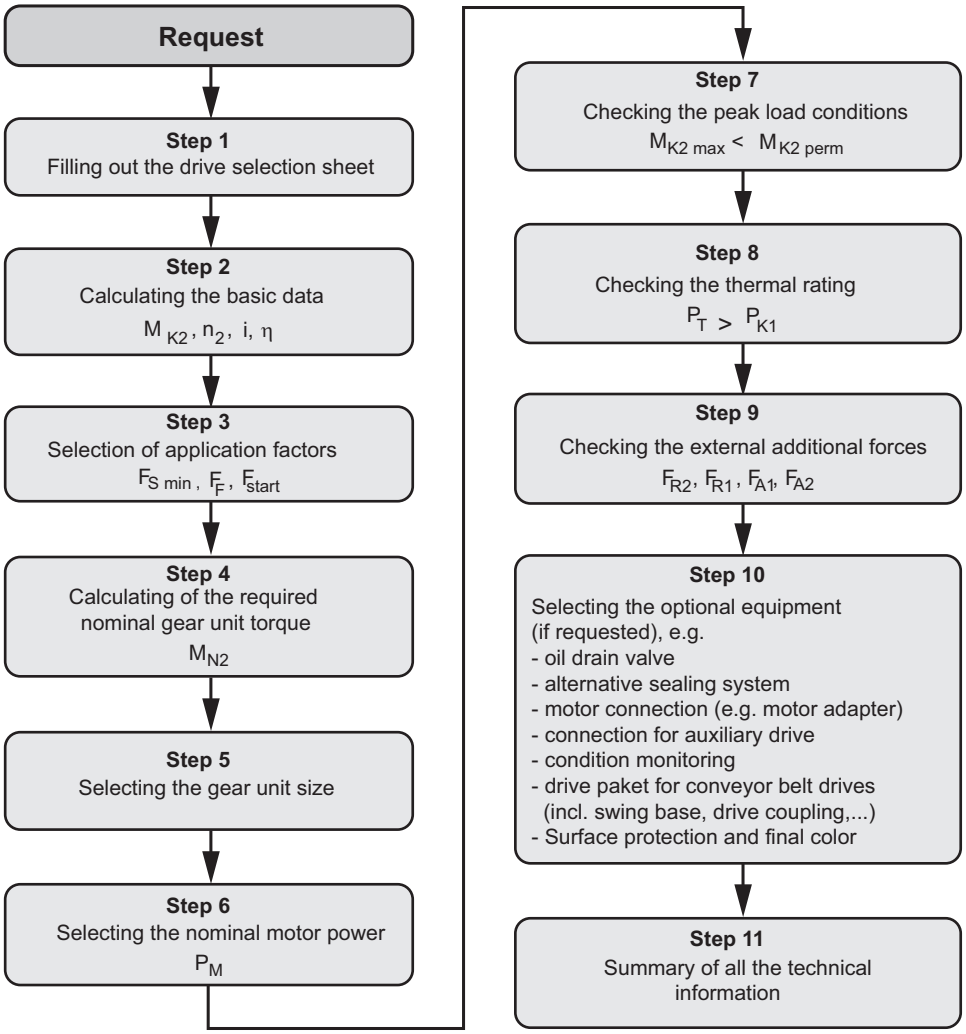
The table below describes the designations.

Designation	Explanation	
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 shaft (usually input shaft)	-
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 on HSS)	kNm
$M_{K1\ max}$	Peak input torque (= peak operating torque at HSS)	kNm
M_{K2}	Output torque (= operating torque on 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 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

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4.2 Project planning sequence

The following flow diagram illustrates the project planning procedure for a bucket elevator drive.



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4.2.1 Step 1: Drive selection data

1.0 Machine on LSS (normally a driven machine)

Legend: [...] = Values to be filled in
[X] = Mark your selection with ☒

1.1 Field of application/industry [...]

1.2 Application [...]

1.3 Ambient temperature [°C] [...]

normal | min. | max.

1.4 Installation altitude [m] [...]

1.5 Gear unit installation [X]

- ☐ Small space ($v_a \geq 0.5$ m/s)
- ☐ Large spaces and halls ($v_a \geq 1.4$ m/s)
- ☐ Outdoors with protection against the sun ($v_a \geq 3$ m/s)

1.6 Ambient conditions [X]

- ☐ normal
- ☐ dusty
- ☐ damp
- ☐ corrosive
- ☐ dry

2.0 Load characteristics

2.2 Drive concept

- ☐ Single drive
- ☐ Dual drive

For dual drive, enter the following data for one drive only!

2.2 Required speed n_2 [rpm] [...]

normal | min. | max.

2.3 Operating power on HSS P_{K1} [kW] [...]

normal | min. | max.

2.4 Operating torque on LSS M_{K2} [kNm] [...]

normal | min. | max.

2.5 Frequency of peak loads ($M_{K2\ max.}$ or $P_{K1\ max.}$)

per hour

2.6 Number of startup per hour [...]

start-ups

2.7 Direction of rotation under load (LSS) [X]

- ☐ Clockwise (CW)
- ☐ Counterclockwise (CCW)

2.8 Operating time/day [X]

- ☐ ≤ 3 hours
- ☐ 3 ... 10 hours
- ☐ > 10 hours

2.9 Backstop [X]

- ☐ Standard backstop
- ☐ Torque-limiting backstop (recommended for dual drive)

2.10 Auxiliary drive [X]

- ☐ "Empty" buckets
- ☐ "Full" buckets
- ☐ Auxiliary drive on both drives (optional for dual drives)
- ☐ Speed monitoring required for encoder
- ☐ Output torque on LSS via auxiliary drive M_{K3}

3.0 Machine on HSS (normally a drive machine)

3.1 Type: [X]

- ☐ AC motor
- ☐ AC motor/inverter
- ☐ DC motor
- ☐ Hydraulic motor
- ☐ Servomotor

3.2 Motor power P_M [kW] [...]

normal | min. | max.

3.3 Motor speed n_M [kW] [...]

normal | min. | max.

3.4 Motord torque M_M [kNm] [...]

normal | min. | max.

3.5 Input speed n_1 [rpm] [...]

normal | min. | max.

3.6 If electric motor: [X] [...]

- ☐ IEC
- ☐ NEMA

Motor size (IEC or NEMA code):

3.7 Motor mounting position [X] [...]

- ☐ B3
- ☐ B5
- ☐ V1
- ☐ Other:

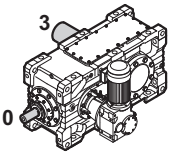
4.0 Gear unit requirements

4.1 Mounting position if other than M1

4.2 Shaft position [X]

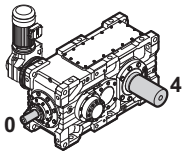
For dual drive, enter only shaft position of drive with auxiliary drive

☐ 03



For dual drive,
second gear unit shaft position 04

☐ 04



For dual drive,
second gear unit shaft position 03

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4.6 Required service factor $F_{S\ min.}$ [X] [...]

based on

☐ Motor power P_M/motor torque M_M

☐ Operating power P_{K1}/ operating torque M_{K1}

4.7 Required bearing service life $L_{h\ min}$ [...]

hours

4.8 Gear unit fixation / torque arm [X]

☐ Foot-mounted

☐ Torque arm

4.9 LSS connection to customer machine shaft [X] [...]

☐ Elastic coupling (claw or pin coupling)

☐ Flexible coupling

☐ Rigid flange coupling

☐ Drum coupling

☐ Chain sprocket

☐ Pinion

☐ Hollow shaft - torque arm

☐ Hollow shaft - foot-mounted

☐ Other

4.10 LSS gear unit version [X] [...]

LSS version (if solid shaft)

☐ Solid shaft with keyay

☐ Solid shaft without keyway

☐ Splined solid shaft DIN 5480

☐ Other

LSS version (if hollow shaft)

☐ Hollow shaft with keyway

☐ Hollow shaft for shrink disk connection, incl. shrink disk

☐ Splined hollow shaft DIN 5480

☐ Other

4.11 HSS connection to motor [X]

☐ Customer installation (base frame)

☐ Motor adapter with elastic coupling

☐ Swing base/base frame

☐ Motor scoop with V-belt drive

☐ Motor scoop

☐ Other, see diagram

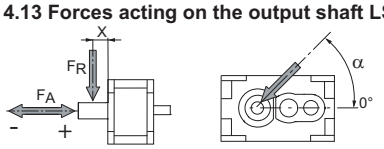
4.12 Machine shaft bearings

☐ 2 bearings, gear unit transfers only torque

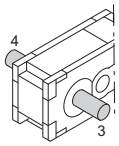
☐ 1 bearing opposite gear unit; gear unit acts as a bearing point

☐ 1 bearing directly on the gear unit; gear unit acts as a bearing point

4.13 Forces acting on the output shaft LSS [X] [...]

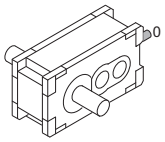


	Shaft 3	Shaft 4
Axial force F_A [kN]		
Radial force F_R [kN]		
Distance from shaft shoulder X [mm]		
Application angle of the radial force α [°]		
or variable	☐	☐



4.14 Forces acting on the input shaft HSS [X] [...]

	Shaft 0	Shaft 3	Shaft 4
Axial force F_A [kN]			
Radial force F_R [kN]			
Distance from shaft shoulder X [mm]			
Application angle of the radial force α [°]			
or variable	☐	☐	☐



4.15 Electrical supply [X] [...]

	AC 3-phase	AC 1-phase	DC		
Mains supply V_{mains}	☐	☐	☐	V	HZ
Auxiliary voltage V_{aux}	☐	☐	☐	V	HZ

Degree of protection: IP

Expl. protection required: ☐ Yes ☐ No

4.16 Permitted cooling (if required) [X]

	Permitted	Not permitted
Fan	☐	☐
Cooling cover/cartridge	☐	☐
External oil-air cooler	☐	☐
External oil-water cooler	☐	☐

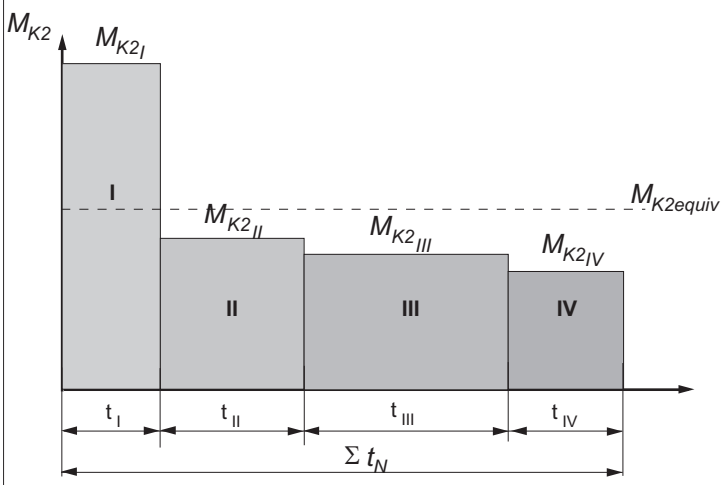
Cooling water available: ☐ Yes ☐ No

Cooling water temperature: °C

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

Constant torque	$M_{K2} = \frac{P_{K1} \times 9550 \times \eta}{n_2}\ Nm$ Comment: If P_{K1} is unknown → $P_{K1} = P_M$ M_{K2} = Operating torque on LSS in Nm P_{K1} = Operating power on HSS in kW n_2 = Output speed (LSS) in min^{-1} P_M = Nominal motor power in kW η = Efficiency
Equivalent torque with load spectrum and constant speed n2 for bearing service life calculation	$M_{K2equiv} = \sqrt[\frac{10}{3}]{(M_{K2_I})^{\frac{10}{3}} \times \frac{t_I}{\Sigma\ t_N} + (M_{K2_{II}})^{\frac{10}{3}} \times \frac{t_{II}}{\Sigma\ t_N} + \ldots. (M_{K2_n})^{\frac{10}{3}} \times \frac{t_n}{\Sigma\ t_N}}$ The following figure shows a load example:  M_{K2} = Operating torque on LSS in Nm $\frac{t_I}{\Sigma\ t_N} \ldots \frac{t_I}{\Sigma\ t_N}$ = Time slice of the load I, II,...n = Load situations Safety of gearing, shafts and keys have to be checked with the highest torque of the load spectrum. If single load situations exceed the nominal torque of the gear unit, contact SEW-EURODRIVE.
Gear ratio	$i = \frac{n_1}{n_2}$ n_1 = Input speed (HSS) min^{-1} n_2 = Output speed (LSS) in min^{-1}
The following efficiencies – n apply to gear units	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: X3K.. = 0.955

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4.2.3 Step 3: Selecting the application factors

Application-specific service factor	$F_{S\ min}$	
Peak load factor	F_F	See next page
Startup factor	F_{start}	See next page

$F_{S\ min}$ – Application-specific service factor

The application-specific service factor $F_{S\ min}$ 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 given in the following table.

INFORMATION

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

Area of application	Type of application (driven machine)	User-specific service factor $F_{S\ min}$ operating hours/day		
		< 3 h	3-10 h	> 10 h
Conveyors	Bucket elevators	-	1.40	1.50
	Vertical conveyors - other	-	1.50	1.80
	Belt conveyors ≤ 100 kW	1.15	1.25	1.40
	Belt conveyors > 100 kW	1.15	1.30	1.50
	Apron feeders	-	1.25	1.50
	Screw feeders	1.15	1.25	1.50
	Shakers, screens	1.55	1.75	2.00
	Escalators	1.25	1.25	1.50
	Passenger elevators	1)	1)	1)

1) Contact SEW-EURODRIVE

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Peak load factor F_F

The peak load factor F_F takes account of the overload capacity of the gearing and the rotating parts.

Peak load factor F_F					
Frequency of peak load per hour					
1 – 5	6 – 20	21 – 40	41 – 80	81 – 160	> 160
1.0	1.2	1.3	1.5	1.75	2.0

Startup factor – F_{start}

The startup factor F_{start} takes account of the overload caused by startup.

The following startup factors are guide values. The actual values are application-specific.

Startup mode	Startup factor – F_{start}
Direct	3.0
Soft start	1.8
Frequency inverter	1.5 – 2.0[1)]
Star/delta	1.3
Hydraulic coupling without delay chamber	2.0
Hydraulic coupling with delay chamber	1.6

1) Depending on settings

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
$F_{S\ min}$ = Application-specific service factor

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

The selection of the gear unit size is based on the nominal gear unit torque M_{N2} according to the tables in chapter "Selection tables" (→ 🖹 105).

If the input speed n_1 < 1000 min^{-1}, then the value for 1000 min^{-1} can be used for M_{N2}.

The following selection table is exemplary for gear unit size X3K100:

X.K100..													6.80 kNm
					KF37 i=28.83		**KF57** i=35.7						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 1/min (50Hz)					DRN80M4 .75 kW S3 I_N=1.75 A (400V)		DRN90L4/Z 1.5 kW S3 I_N=3.45 A (400V)						IE3
20	**19.09**	52	6.80	39	3.6	1.88	3.0	4.60	53	39	83	61	
22.4	**21.09**	47	6.80	35	3.3	2.08	2.7	5.09	47	35	74	55	
25	**24.55**	41	6.80	30	3.6	1.88	3.0	4.60	49	36	76	56	
28	**27.12**	37	6.80	27	3.3	2.08	2.7	5.09	44	32	68	50	
31.5	**30.35**	33	6.80	24	2.9	2.33	2.4	5.69	43	32	67	50	
35.5	**34.35**	29	6.80	21	3.3	2.08	2.7	5.09	37	28	58	43	
40	**38.45**	26	6.80	19.2	2.9	2.33	2.4	5.69	39	29	60	45	
45	**42.96**	23	6.80	17.2	2.6	2.60	2.2	6.36	34	25	52	39	
50	**48.08**	21	6.80	15.3	2.4	2.92	1.9	7.12	35	26	54	40	
56	**52.49**	19	6.80	14.2	2.6	2.60	2.2	6.36	31	23	49	36	
63	**58.74**	17	6.80	12.7	2.4	2.92	1.9	7.12	32	24	50	37	
71	**67.2**	15	6.80	11.1	2.6	2.60	2.2	6.36	28	20	43	32	
80	**75.21**	13	6.80	9.9	2.4	2.92	1.9	7.12	28	21	44	32	

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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

INFORMATION

For gear units with bath lubrication, please contact SEW-EURODRIVE.

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4.2.7 Step 7: Checking the peak load conditions – $M_{K2\ per}$; $M_{K2\ max}$

Permitted peak output torque $M_{K2\ per}$:

Constant load direction

$$M_{K2per} = \frac{2xM_{N2}}{F_F}$$

M_{K2per} = Permitted peak output torque in kNm
M_{N2} = Nominal gear unit torque in kNm
F_F = Peak load factor

Reversing load direction:

$$M_{K2per} = \frac{2xM_{N2}}{F_F} \times 0.7$$

M_{K2per} = Permitted peak output torque in kNm
M_{N2} = Nominal gear unit torque in kNm
F_F = Peak load factor

Calculating the peak output torque $M_{K2\ max}$:

$$M_{K\max} = \frac{P_M \times 9550 \times \eta}{n_2} \times F_{start}\ *$$

M_{K2max} = Peak output torque in kNm
P_M = Nominal motor power in kW
F_{start} = Startup factor
n_2 = Output speed in min^{-1}
η = Efficiency

* If the startup factor F_{start} is not specified, observe the information in chapter Step 3: Selection of application factors.

Check the gear unit selection:

$$M_{K\max} \leq M_{K2perm}$$

M_{K2max} = Peak output torque in kNm
M_{K2per} = Permitted peak output torque in kNm

4.2.8 Step 8: 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

For the following ambient conditions, the thermal rating can be directly read from the selection tables:

- Ambient temperature 20 °C
- Installation in a large hall (air velocity ≥ 1.4 m/s)
- Natural cooling or cooling via fan, integrated cooler (water cooling cover or water cooling cartridge), or combination of fan and water cooling cartridge.
- Foundation as steel support structure
- Installation altitude < 1000 m above sea level

INFORMATION

- For other ambient temperatures and types of lubricants, you can calculate the thermal rating P_T using the temperature factor f_T and the lubrication factor f_L. The resulting calculation results are approximate values. Contact SEW-EURODRIVE to determine the exact values.
- Sufficient protection from direct sunlight is absolutely necessary when installed outdoors. If the gear unit cannot be protected against direct sunlight, then the thermal calculation must be performed taking account of the actual sunlight in kW/m^2.

Thermal rating P_{TH} of the gear unit in kW for the following lubrication types and mounting position M1 is given in the selection tables in chapter Selection tables. The thermal rating for other combinations can be determined using factors.

Types of lubrication / mounting positions	
X.K..	
X.K100 – 150	SL 
X.K160 – 280	PL 

SL  = Splash lubrication

PL  = Pressure lubrication

$$P_T = P_{TH} \times f_1 \times f_T$$

P_T = Thermal rating of the gear unit in kW

P_{TH} = Nominal thermal rating of the gear unit in kW. The values in the selection tables depend on type of cooling, mounting position and lubrication type.

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f_1 = Altitude factor
f_T = Temperature factor

Altitude factor f_1

The following table shows the altitude factor f_1.

Altitude factor	Altitude H meters above sea level				
	to 999	1000 – 2000	2000 – 3000	3000 – 4000	4000 – 5000
f_1	1.00	0.95	0.91	0.87	0.83

Temperature factor f_T

The following table shows the temperature factor f_{MOT_T} depending on the lubrication type, ambient temperature, and cooling option.

Temperature factor f_{MOT_T}										
Type of lubrication	Without additional cooling or with fan					With water cooling cover or with water cooling cartridge or with water cooling cartridge and fan				
	Ambient temperature °C					Ambient temperature °C				
	10	20	30	40	50	10	20	30	40	50
Splash and pressure lubrication[1)]	1.15	1	0.85	0.7	0.55	1.1	1	0.9	0.8	0.7
Bath lubrication	1.18	1	0.85	0.65	0.48					

1) For detailed information, refer to the vertical and upright gear unit catalog

at

$$P_T < \frac{1}{3} \times P_{N1}$$

→ Contact SEW-EURODRIVE

P_T = Thermal rating of the gear unit in kW
P_{N1} = Nominal gear unit power

The gear unit's thermal rating must be at least as large as the operating power on the input shaft HSS.

$$P_T \geq P_{K1}$$

P_T = Thermal rating of the gear unit in kW
P_{K1} = Operating power at HSS in kW

INFORMATION

For other gear unit sizes and mounting positions with pressure lubrication that are not listed in the selection tables chapter, the thermal rating P_T can be calculated with pressure lubrication factor f_L.

Selecting the cooling system

If the thermal rating P_T of a gear unit is not sufficient with cooling by fan, water cooling cover, or water cooling cartridge, you can use a cooling system with circulation cooling; see chapter Cooling.

The proper size of the cooling system can be determined by approximation by means of the power loss P_V of the gear unit.

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$$P_V = P_{K1} x (1 - \eta)$$

P_V = Power loss in kW

P_{K1} = Operating power at HSS in kW

η = efficiency see (applies only to splash or pressure lubrication)

The cooling requirements are determined by means of this power loss P_V. The selection of the required cooling system is then made in the chapter Cooling.

The power loss P_V of the gear unit must be smaller than the cooling capacity of the cooling system.

P_V< cooling capacity of cooling system in kW

The selection of an appropriate cooling system also depends on the following factors:

- Actual power loss to be cooled
- Present cooling water temperature and volume flow
- Ambient temperature
- Ratio of oil quantity in the gear unit to oil volume flow of cooling system > 2

INFORMATION

Contact SEW-EURODRIVE for selecting the appropriate cooling system based on the ambient conditions of your system.

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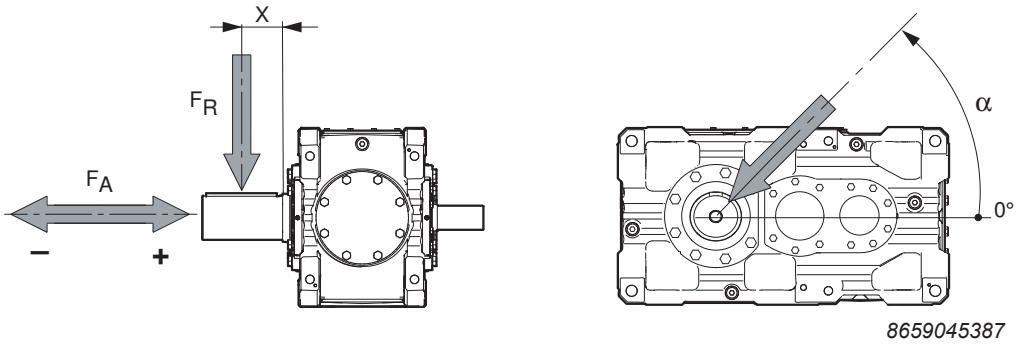
4.2.9 Step 9: Checking the external additional forces – F_R:

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



INFORMATION

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

Determining the overhung load

When determining the resulting overhung load, the type of transmission element mounted on the shaft end must be considered. The following transmission element factors f_Z must be considered for various transmission elements.

Drive component	Factor of the drive component f_Z	Comments
Gear unit	1.15	< 17 teeth
Sprockets	1.40	< 13 teeth
Sprockets	1.25	< 20 teeth
Narrow V-belt pulleys	1.75	Influence of pre-tensioning
Flat V-belt pulleys	2.50	Influence of pre-tensioning
Toothed belt pulleys	1.50	Influence of pre-tensioning

The overhung load acting on the gear shaft is calculated as follows:

$$F_R = \frac{M_{K2} \times 2000}{d_0} \times f_z$$

F_R = Overhung load in kN
M_{K2} = Output torque in Nm
d_0 = Mean diameter of the installed transmission element in mm
f_Z = Transmission element factor

Permitted overhung loads – output shaft (LSS)

The following table shows two values for the permitted overhung force on standard solid shafts that apply under the following conditions:

- 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 unfavorable.

For the force F_{Ra}

- The shaft speed is less than or equal to the given value

For the force $F_{Ra\ max}$

- Applies only to foot-mounted gear units in mounting position M1
- Max. possible peak value under more advantageous service conditions

	F_R in kN		F_{Rmax} in kN
Size	**X3KS..**		**X..S.**
Rotational speed n_2	**≤ 70 min^{-1}**		**–**
Shaft position	**03, 04**		**All shaft positions**
Bearing	**STD**	**HD**	
X.K100	16	–	17
X.K110	22	–	25
X.K120	32	–	55
X.K130	44	–	68
X.K140	45	–	77
X.K150	53	–	97
X.K160	75	–	125
X.K170	69	–	115
X.K180	93	–	170
X.K190	91	–	170
X.K200	105	–	190
X.K210	99	–	190
X.K220	128	195	230
X.K230	116	183	230
X.K240	184	276	280
X.K250	172	269	280
X.K260	151	271	290
X.K270	213	310	310
X.K280	208	310	310

F_R = Overhung load
n_2 = Output speed
STD = Standard bearings
HD = Reinforced bearings

INFORMATION

Contact SEW-EURODRIVE in case of deviating conditions.

General information

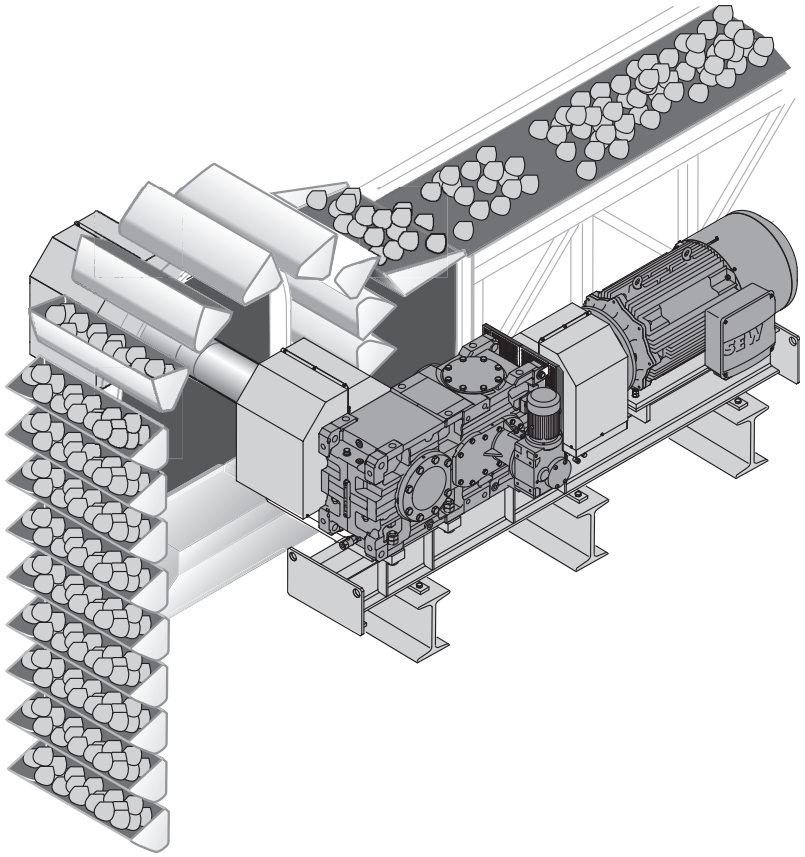
Contact SEW-EURODRIVE in case of the following:

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

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4.3 Project planning example: Bucket elevator drive

The following project planning example shows the planning of a bucket elevator drive.



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4.3.1 Technical data and application conditions

Main gear unit

- Bevel-helical gear unit, foot-mounted, solid shaft with key
- Output speed n_2 = 30 min^{-1}
- Input speed motor n_1 = 1470 min^{-1}
- Operating power on the output shaft LSS P_{K2} = 135 kW
- Peak operating torque on the output shaft LSS $M_{K2\ max}$ = 55 kNm
- Operating time: 24 hours a day
- The gear unit is started up five times per hour (frequency of maximum output torque).
- The gear unit is to be operated in a large hall under very dusty conditions and an ambient temperature range of 0 °C – 40 °C.
- Installation altitude H = 1200 m
- Oil drain valve

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Auxiliary drive

- "Full buckets" design
- Output speed when operated via auxiliary drive $n_3 \approx 2\ min^{-1}$
- Output torque when operated via auxiliary drive $M_{K3} \approx 30$ kNm

4.3.2 Step 1: Filling out the drive selection sheet

4.3.3 Step 2: Calculating the basic data

Constant operating torque M_{K2}:

$$M_{K2} = \frac{P_{K2} \times 9550 \times \eta}{n_2} = \frac{135kW \times 9550}{30\,min^{-1}} = 43.0kNm$$

M_{K2} = Operating torque at LSS in kNm
P_{K2} = Output power in kW
n_2 = Output speed LSS in min^{-1}

Calculate the gear unit ratio using the following formula:

$$i = \frac{n_1}{n_2} = \frac{1470}{30} = 49$$

i = Gear ratio
n_1 = Input speed (HSS) in min^{-1}
n_2 = Output speed (LSS) in min^{-1}

This value is used to determine the nominal gear ratio after having specified the gear unit size.

4.3.4 Step 3: Selection of application factors

User-specific service factor (Belt conveyor P > 100 kW, t > 10 h/day)	$F_{S\,min} = 1.5$
Peak load factor (1 – 5 peak loads per hour)	$F_F = 1.0$
Startup factor (frequency inverter)	$F_{start} = 1.6$

4.3.5 Step 4: Calculating the required nominal gear unit torque

Required nominal gear unit torque M_{N2}:

$$M_{N2} \geq M_{K2} \times F_{Smin} = 43kNm \times 1.5 = 64.5kNm$$

M_{N2} = Nominal gear unit torque in kNm
M_{K2} = Operating torque at LSS in kNm
$F_{S\,min}$ = Application-specific service factor

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4.3.6 Step 5: Selecting the gear unit size

Select a gear unit of the next larger torque class using the foldout page at the end of this catalog.

- Nominal gear unit torque M_{N2} = 65 kNm

See selection table in chapter 10

- Gear unit type **X3KSB190/B**
- Nominal gear ratio i_N = 50 → exact gear ratio i_{ex} = 48.85
- Auxiliary drive **KF97DRN132S4/Z**
- n_3 = 1.8 min^{-1}, M_{K3} = 47.3 kNm

4.3.7 Step 6: Selecting the nominal motor power

Required motor power:

$$P_M \geq P_{K1} = \frac{P_{K2}}{\eta} = \frac{135kW}{0.955} = 141.4kW$$

P_M = Nominal motor power in kW
P_{K2} = Operating power at LSS in kW
P_{K1} = Operating power at HSS in kW
η = Efficiency from chapter Step 2: Calculation of basic data – MK2, n2, i, η

Select a motor of the next larger power class: P_M = 160 kW

4.3.8 Step 7: Checking the peak load conditions

Permitted peak output torque $M_{K2\,per}$:

$$M_{K2zul} = \frac{2 \times M_{N2}}{F_F} = \frac{2 \times 65kNm}{1} = 130kNm$$

M_{K2per} = Permitted peak output torque in kNm
M_{N2} = Nominal gear unit torque in kNm
F_F = Peak load factor

Calculating the peak output torque $M_{K2\,max}$ based on the motor power:

$$M_{K2\max} = \frac{P_M \times 9.55 \times \eta \times F_{start}}{n_2} = \frac{160kW \times 9.55 \times 0.955 \times 1.6}{30\,min^{-1}} = 77.8kNm$$

The peak output torque $M_{K2\,max}$ must not exceed the permitted peak output torque $M_{K2\,per}$.

$$M_{K\max} \leq M_{K2perm}$$

M_{K2max} = Peak output torque in kNm
M_{K2per} = Permitted peak output torque in kNm

$$77.8kNm \leq 130kNm$$

→ This means you may use the selected gear unit size.

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4.3.9 Step 8: Checking the thermal rating

$$P_T = P_{TH} \times f_1 = 105kW \times 0.95 = 100kW$$

P_T = Thermal rating in kW
P_{TH} = Nominal thermal rating in kW
f_1 = Altitude factor = 0.95, see chapter "Step 8: Checking the thermal rating – PT" (→ 🗎 58)

The operating power P_{K1} must not exceed the thermal rating P_T ($P_{K1} \leq P_T$). Additional cooling is required if $P_{K1} > P_T$

$141.4kW > 100kW$

→ Thermal rating is not sufficient at 40 °C without additional cooling.

$$P_T = P_{TH} \times f_1 = 213kW \times 0.95 = 202.4kW$$

$141.4kW < 202.4kW$

With one fan:

→ Thermal rating sufficient at 40 °C with a fan

4.3.10 Step 9: Checking the external additional forces

There are no external additional forces.

4.3.11 Step 10: Selecting the optional equipment

- Oil drain valve

4.3.12 Step 11: Summary of all the technical information

- Gear unit type: X3KSB190/B
- Gear ratio i_{ex} = 48.85
- Nominal gear unit torque M_{N2} = 65 kNm
- Motor: P_M = 160 kW
- Oil drain valve
- Fan on the input shaft
- Auxiliary drive KF97DRN132S4/Z
  n_3 = 1.8 min^{-1}, M_{K3} = 47.3 kNm

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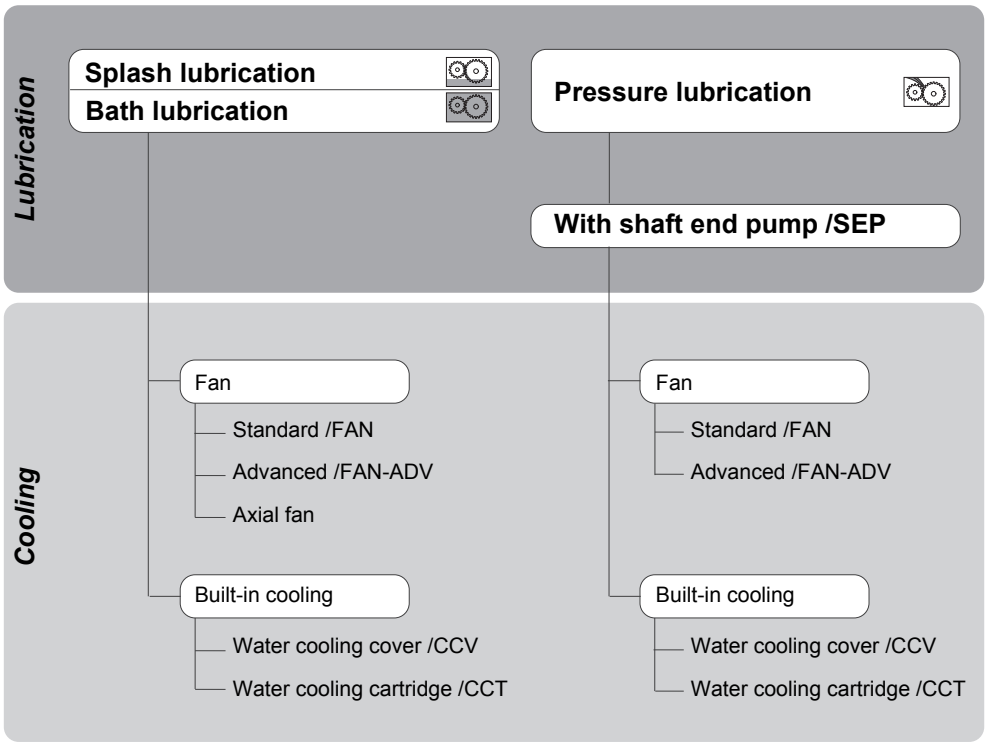
5 Lubrication, cooling, heating and seal

5.1 Overview of the lubrication and cooling types

Depending on the special application requirements, the following types of lubrication and cooling are available.

5.1.1 Overview: Internal oil cooling systems, shaft end pumps and fans

The following combinations of lubrication and cooling types are possible: Further information can be found on the following pages.

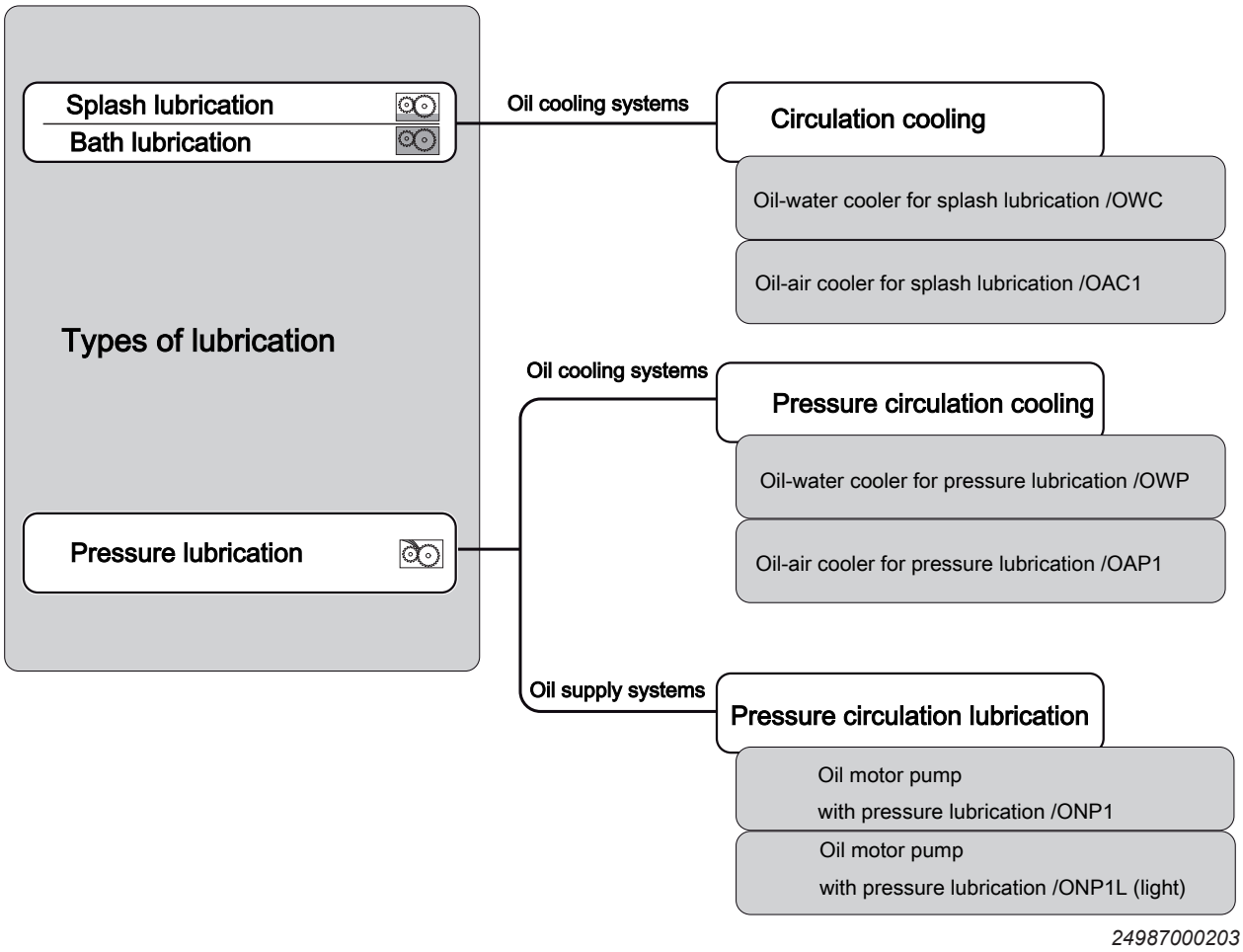


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5.1.2 Overview: External oil supply and oil cooling systems

More information can be found in the "External Oil supply and Oil Cooling Systems" catalog.



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5.2 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.

5.2.1 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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5.2.2 Permitted lubricants

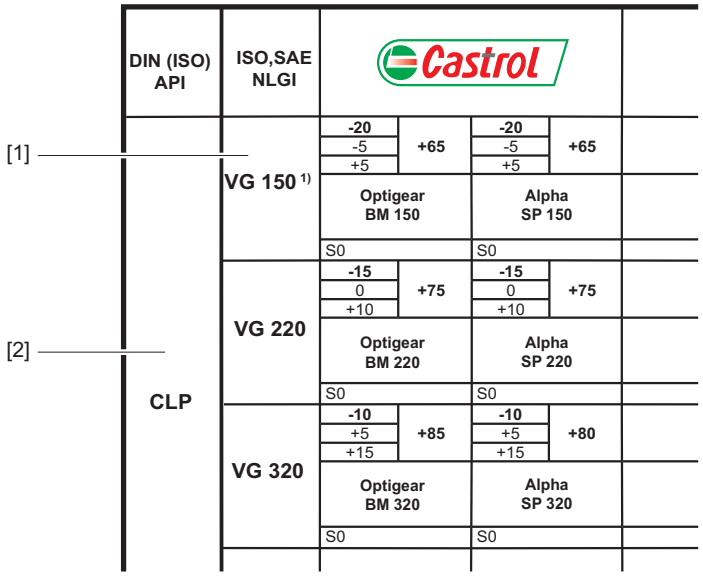
This chapter describes the permitted lubricants and the permitted temperatures for industrial gear units from SEW-EURODRIVE.

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 greases and oils used.
- 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 are 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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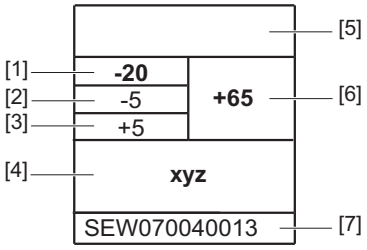
[1] Viscosity class
[2] Lubricant type

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*
[2] Lowest cold start temperature in °C for drives with pumps up to a max. oil viscosity of 5000 cSt*
[3] Lowest cold start temperature in °C for drives with pumps up to a max. oil viscosity of 2000 cSt*
[4] Trade name
[5] Manufacturer
[6] Highest oil bath temperature in °C. MUST NOT BE EXCEEDED.
[7] Approvals

*In case of low temperatures, the oil must be heated to the specified minimum temperature, for example by using an oil heater. The maximally permitted oil viscosity per pump type is specified in the following chapter.

Explanation of the oil supply systems and the oil viscosity

The following pressure lubrications are designed for an oil viscosity of 2000 cSt:

- Motor pump incl. water cooler for pressure lubrication /OWP

The following pressure lubrications are designed for an oil viscosity of 5000 cSt:

- Motor pump for pressure lubrication /ONP1
- Motor pump for pressure lubrication /ONP1L
- Motor pump incl. air cooler for pressure lubrication /OAP1
- Shaft end pumps

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Lubricant tables

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

[1]	[2]	SEW EURODRIVE	Castrol	FUCHS	Mobil®	KLÜBER LUBRICATION	Shell	TOTAL
CLP	VG 150 [1]	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65	-20 -5 +5 +65		
		SEW GearOil Base 150 E[1]	Optigear BM 150	Alpha SP 150	Renolin CLP 150 Plus	Renolin HighGear 150	Mobilgear 600 XP 150	Klüberoil GEM 1-150 N		
		SEW07004001 3					SEW07003001 3			
	VG 220	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	-15 0 +10 +75	Shell Omala Oil F 220	Carter EP 220
		SEW GearOil Base 220 E[1]	Optigear BM 220	Alpha SP 220	Renolin CLP 220 Plus	Renolin HighGear 220	Mobilgear 600 XP 220	Klüberoil GEM 1-220 N		
		SEW07004001 3					SEW07003001 3			
	VG 320	-10 +5 +15 +85	-10 +5 +15 +85	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	-10 +5 +15 +80	Shell Omala Oil F 320	Carter EP 320
		SEW GearOil Base 320 E[1]	Optigear BM 320	Alpha SP 320	Renolin CLP 320 Plus	Renolin HighGear 320	Mobilgear 600 XP 320	Klüberoil GEM 1-320 N		
		SEW07004001 3					SEW07003001 3			
	VG 460	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	-5 +10 +20 +90	Shell Omala Oil F 460	Carter EP 460
		SEW GearOil Base 480 E[1]	Optigear BM 460	Alpha SP 460	Renolin CLP 460 Plus	Renolin HighGear 460	Mobilgear 600 XP 460	Klüberoil GEM 1-460 N		
		SEW07004001 3					SEW07003001 3			
	VG 680	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90	0 +15 +25 +90		Carter EP 680
		SEW GearOil Base 680 E[1]	Optigear BM 680	Alpha SP 680	Renolin CLP 680 Plus	Renolin HighGear 680	Mobilgear 600 XP 680	Klüberoil GEM 1-680 N		
		SEW07004001 3					SEW07003001 3			
	VG 1000	+5 +20 +30 +90								
			Optigear BM 1000							

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

[1]	[2]	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 Renolin Unisyn CLP 68	-40 -25 -15	+50 SHC 626	-35 -20 -10	+50 Klübersynth GEM 4-68 N	-40 -20 -10	+50 Omala S4 GX 68		
	VG 150 [1]	-25 -10 0	+70 Alphasyn EP 150	-30 -10 +0	+70 Renolin Unisyn CLP 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	-25 -5 +5	+80 Alphasyn EP 220	-25 -5 +5	+80 Renolin Unisyn CLP 220	-20 0 +10	+75 HighGear Synth 220	-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	-20 0 +10	+90 Alphasyn EP 320	-20 0 +10	+90 Renolin Unisyn CLP 320	-15 0 +15	+85 HighGear Synth 320	-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	-15 +5 +15	+100 Alphasyn EP 460	-15 +5 +15	+100 Renolin Unisyn CLP 460	-10 +5 +20	+95 HighGear Synth 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	-10 +10 +25	+110 Optigear Synthetic X 680	-10 +10 +25	+110 Renolin Unisyn CLP 680	-5 +10 +25	+110 HighGear Synth 680	-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				

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[1]	[2]	[3]	bremer & leguil	Castrol	FUCHS	KLÜBER LUBRICATION
	CLP HC NSF H1	VG 68 [1]	-35 -20 -10 +45 Cassida Fluid HF 68 S0	-40 -25 -15 +45 Optileb HY 68 S0		-35 -20 -10 +45 Klüberoil 4UH1-68 N S0
			-20 -5 +5 +75 Cassida Fluid GL 220 S0	-25 -5 +5 +75 Optileb GT 220 S0		-25 -5 +5 +75 Klüberoil 4UH1-220 N S0
		VG 460 [1]	-15 +5 +20 +90 Cassida Fluid GL 460 S0	-15 +5 +20 +95 Optileb GT 460 S0		-15 +5 +15 +95 Klüberoil 4UH1-460 N S0
	E	VG 460			-15 +5 +15 +95 Plantogear 460 S S0	-15 +5 +15 +95 Klüberbio CA2-460 S0

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5.2.3 Horizontal housing /HH and universal housing /HU

Mounting position M1

X.K..

X3K..	Oil quantity in liters	
	Splash lubrication	Pressure lubrication
X3K100	12	–
X3K110	14	–
X3K120	20	–
X3K130	22	–
X3K140	34	–
X3K150	34	–
X3K160	59	59
X3K170	59	59
X3K180	74	74
X3K190	77	77
X3K200	105	105
X3K210	105	105
X3K220	135	135
X3K230	139	139
X3K240	175	175
X3K250	175	175
X3K260	279	279
X3K270	279	279
X3K280	330	330

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5.3 Sealing greases/rolling bearing greases

The table shows the grease types recommended by SEW-EURODRIVE for operating temperatures from the lower limit temperature to 100 °C.

Area of operation	Manufacturer	Grease	Lower limit temperature °C
Standard	Fuchs	**Renolit CX TOM 15 OEM**[1)]	-40
	BP	Energrease LS EP-2	-30
	Castrol	Longtime PD 2	-35
		Spheerol EPL 2	-20
	Klüber	Centoplex EP 2	-25
		Petamo GHY 133 N	-40
	Mobil	Moliux EP 2	-20
	Shell	Gadus S2 V220 2	-20
	Total	Multis EP 2	-20
	Bremer & Leguil	Cassida Grease GTS2[1)]	-40
	Fuchs	**Plantogel 2**[1)]	-40

1) Grease used by the factory should be preferred.



INFORMATION

- Do not mix permitted greases from different areas of application.
- If the lubricant used is not listed in the above table, you have to make sure that it is suitable for the intended application.

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5.4 Cooling

If the permitted thermal rating of the gear unit is exceeded, additional cooling measures must be applied.

The following cooling methods are possible as standard:

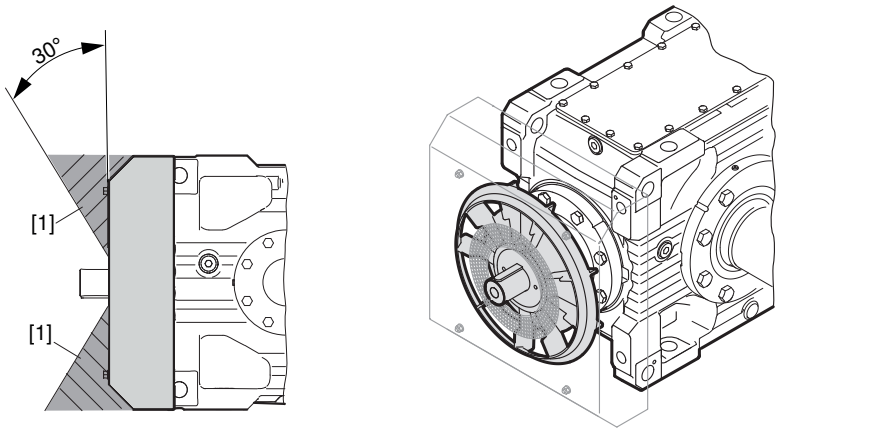
- Water cooling cartridge
- Circulation cooling with oil-water cooler with motor pump
- Circulation cooling oil-air cooler with motor pump
- A fan in combination with a water cooling cartridge
- Fan on the input shaft HSS

5.4.1 Fan /FAN

Fans with optimized noise and flow engineering geometry are used. A fan may be retrofitted to raise the thermal rating or when the ambient conditions change after gear unit startup. The direction of rotation of the gear unit does not influence the operation of the fan.

SEW-EURODRIVE offers the following fan variants:

X.K.. Fan (standard) /FAN



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INFORMATION

On request, the fan guard is available flush with the gear unit housing on one side. Contact SEW-EURODRIVE, if required. Observe the restricted thermal rating involved.

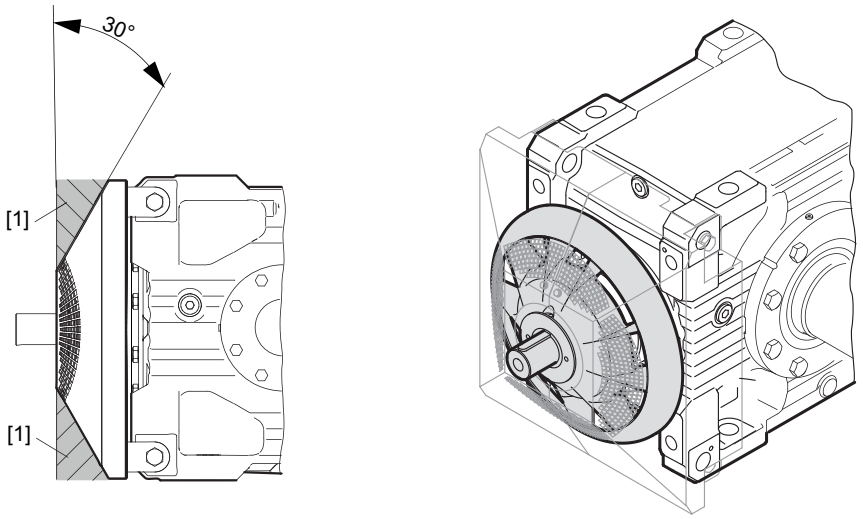
X3K.. Advanced (option) /FAN-ADV

When the type X3K.. Advanced is used, the connection element (e.g. hydraulic start-up coupling) can be mounted flush to the fan guard.

INFORMATION

The Advanced design is available for motor sizes X100 – 210.

The air intake clearance is integrated into the fan guard.



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[1] Air intake clearance

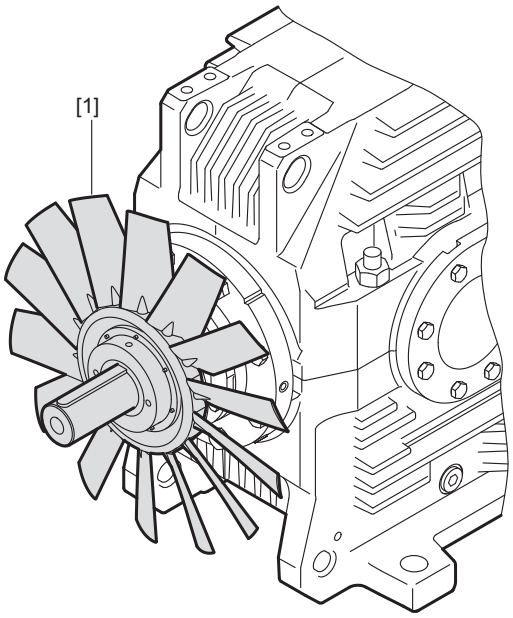
INFORMATION

The fan design X3K.. Advanced cannot be used together with a torque arm because the fan guard is mounted to the attachment point of the torque arm.

Axial fan

An axial fan [1] is integrated to increase the thermal rating. The fan depends on the direction of rotation. This is the reason why fans are available for CW or CCW rotation. Refer to the information on the order documents.

Universal housing HU / horizontal housing HH / thermal housing HT



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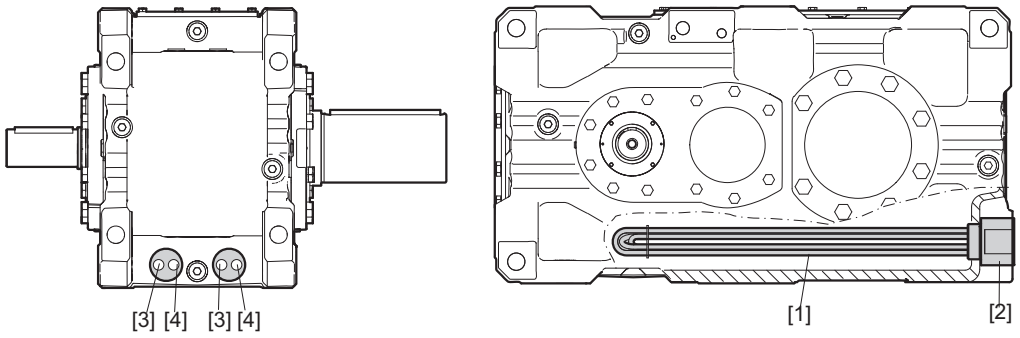
5.4.2 Built-in cooling, water cooling cartridge /CCT

The water cooling cartridge is mounted in the oil sump of the gear unit and is supplied with cooling water through a water connection that is provided by the user. It is available for sizes X140 to 320. For the connection dimensions, refer to chapter Water cooling cover, water cooling cartridge and oil heater [mm].

The amount of heat that can be dissipated depends on the intake temperature and the flow rate of the cooling medium that flows through the unit. For the permitted thermal rating, refer to chapter Selection tables.

Structure

The figure shows an example of a gear unit with water cooling cartridge.



[1] Cooling pipes
[2] Connection piece
[3] Supply
[4] Return

The water cooling cartridge consists of 3 main parts:

- Cooling pipes (CuNi alloy)
- Tube plate (brass)
- Connection piece (brass; gray cast iron; steel)

Two bores with pipe threads are available to connect to the cooling circuit:

- Pipe thread G1/4" for sizes X140 – 170
- Pipe thread G1/2" for sizes X180 – 320

. The piping is not included in the delivery.

Gear units with water cooling cartridge are delivered completely assembled.

Water cooling cartridges can be retrofitted to a certain extent. Contact SEW-EURODRIVE.

INFORMATION

- For gear unit sizes 140, 160, 180, 200, 220, 240, 260, 290, 310, the water cooling cartridge option comprises two cartridges as standard; for sizes 150, 170, 190, 210, 230, 250, 270, 280, 300, 320, it comprises one cartridge.
- The possible use as well as the maximum number of water cooling cartridges depends among others from the gear unit size, mounting position, end gear position, and lubrication type. Not all combinations of accessory options might be possible depending on the mounting position and mounting surface. Contact SEW-EURODRIVE.

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Notes on connection and operation

To achieve the thermal rating specified in the selection tables, different cooling water flow rates are necessary depending on gear unit size, mounting position, and lubrication type. The following table lists the approximate values for the volume flow required for the M5 mounting position (water inflow temperature 15 °C).

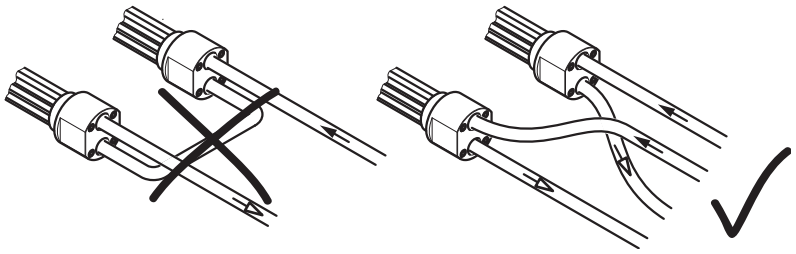
INFORMATION

Contact SEW-EURODRIVE when using another cooling water flow rate, another cooling water temperature, special cooling media (the cooling capacity of the water cooling cartridge changes), aggressive cooling media, such as brackish water or salt water.

Size	Cooling water flow rate l/min / per cooling cartridge	Max. cooling water flow rate l/min
X140 – 150	8	15
X160 – 170	10	
X180 – 190	13	28
X200 – 210	15	
X220 – 230	19	
X240 – 250	21	
X260 – 270	16	25
X280	18	

The cooling circuit must be connected in parallel for gear units with 2 water cooling cartridges.

The table lists the cooling water volume flow for one water cooling cartridge. Twice the cooling water volume flow is required when using 2 water cooling cartridges.



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Requirements on the water quality

INFORMATION

Special measures have to be taken when using sea water or brackish water. Contact SEW-EURODRIVE.

The following requirements on the water quality are recommendations. In exceptional cases, certain concentrations of substances of content might cause unforeseen reactions.

The quality of the water as well as its substances are important factors for assessing the cooling water available for water cooling cartridges. The water quality is determined by the water hardness and the pH value of the water.

Water hardness

Water hardness is defined by the amount of hardeners (carbonates and bicarbonates) in the water. Hardeners accumulate on the surface of the water cooling cartridge in particular at high temperatures and in this way impair the performance. Take these deposits into account when selecting the water cooling cartridge for extremely hard water.

The following table shows the classification of German degrees of hardness to water quality °dH:

Degree of hardness[1)]	Water quality
0 – 5 °dH	Very soft water
5 – 10 °dH	Soft water
10 – 20 °dH	Medium hard water
20 – 30 °dH	Hard water
> 30 °dH	Very hard water

1) 10 mg/l of hardener corresponds to 1 °dH

pH value

- The water cooling cartridge partially consists of a copper and nickel alloy, to which the following applies:

  → Corrosion problems when **pH value < 6**
- With alkaline water:

  → Corrosion problems when **water hardness < 6°dH**

  Smaller values can cause corrosion due to free carbonic acid.

  The following table describes the classification of the water quality based on the pH value:

pH Value	Water quality
4.5	Very acidic
4.5 – 6.0	Acidic
6.0 – 6.8	Slightly acidic
7.0	Neutral
7.2 – 7.7	Slightly alkaline
7.7 – 8.2	Alkaline
8.2	Very alkaline

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Cooling water assessment based on water substances

The following table provides an overview of the resistance of copper-nickel pipes against substances in non-potable water.

Assessment criterion	Approximate concentration mg/l	Evaluation CuNi10Fe1Mn
pH value	< 6	0
	6 to 9	+
	> 9	0
Chloride	up to 1000	+
	> 1000	+ (< 25000 mg/l)
Sulfate	to 70	+
	70 to 300	+
	> 300	+ (< 25000 mg/l)
Nitrate	Up to 100	+
	> 100	0
Free (aggressive) carbonic acid	to 20	+
	20 to 50	0
	> 50	–
Oxygen	up to 2	+
	> 2	+
Ammonium	up to 2	+
	2 to 20	+
	> 20	–
Iron (dissolved)	to 10	0
	> 10	–
Manganese (dissolved)	to 1	0
	> 1	–
Free chlorine	to 5	permanently < 0.5 mg/l
	> 5	intermittently < 3.0 mg/l
Sulfide		0
Ammonia		+ (< 15 mg/l)

\+ = usually good resistivity

0 = corrosion problems can occur in particular if several factors are assessed with 0

– = we advise against use

Types of cooling water/characteristics

Note the following conditions:

Industrial water

- Usually untreated water (no drinking water)
- Often very contaminated
- A water analysis is necessary for assessment
- Copper, brass and steel are very resistant against industrial water

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Stream water and river water

- We recommend using copper brass pipes
- Cast iron parts must be protected against corrosion by suitable coating
- Usually untreated water (no drinking water)
- Often very contaminated
- A water analysis is necessary for assessment

5.5 Oil heater /OH

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

INFORMATION

Note the oil viscosity outside of the gear unit (e.g. in the oil pipes) when performing a cold gear unit startup.

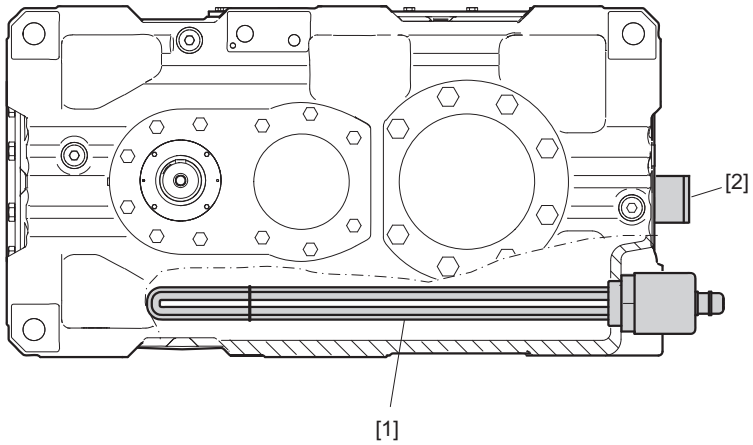
Results

The heater is screwed into the gear unit housing at the factory and is controlled by a thermostat. The trip temperature of the heater is set at the factory depending on the lubricant used.

5.5.1 Structure

The oil heater consists of 2 basic parts:

1. Heating element in the oil sump (oil heater) with terminal box
2. Thermostat with integrated temperature sensor



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[1] Oil heater
[2] Thermostat with integrated temperature sensor

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INFORMATION

- It is essential that the heating elements are fully immersed in the oil sump to prevent any damage.
- The position of the thermostat varies depending on the design and mounting position of the gear unit.
- The possible use as well as the maximum number of heating elements depends among others on the size, mounting position, end gear position, and lubrication type. Not all combinations of accessory options might be possible depending on the mounting position and mounting surface. Contact SEW-EURODRIVE.
- **1 heating element** is used with the following sizes as standard: 110, 130, 150, 170, 190, 210, 230, 250, 270, 280. **2 heating elements** are used with the following sizes as standard: 100, 120, 140, 160, 180, 200, 220, 240, 260.
- To keep the gear unit startup temperature, the thermostat can be energized continuously. The heating process can take several hours.
- For dimensions of the heating elements, refer to chapter "Water cooling cartridge / CCT and oil heater /OH in mm" (→ 🗎 177).

5.5.2 Information on the function of the oil heater

- The trip point of the oil heater thermostat is factory-set to a temperature of about 5 K above the respective "initial temperature for gear unit startup", see chapter "Limit temperature for gear unit startup" (→ 🗎 87).

  At this temperature, the thermostat disables the oil heater, see chapter "Limit temperature for gear unit startup" (→ 🗎 87). Only then the gear unit may be started up. The thermostat activates the oil heater again once the temperatures is about 5 K below the switching point.
- In order to prevent the oil from burning, the heating elements of the heater have a maximum surface load. This is why the heating process for cold gear unit oil can take between one and several hours. The exact duration of the heating process before the start varies depending on the gear unit size, type, mounting position, oil quantity, and ambient temperature.
- Thermostat and oil heater are installed in the gear unit and ready for operation. Prior to startup, wire them properly and connect them to the current supply.
- Contact SEW-EURODRIVE if a differing oil viscosity class is used or if ambient temperatures fall below the specified limit temperature.

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5.5.3 Connection power

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

Size X3K..	P_{inst}		P_{inst}	
	1 heating element		2 heating elements	
	kW	K/h	kW	K/h
X100	1 x 0.4	6	2 × 0.4	11
X110	1 x 0.6	6	–	–
X120	1 x 0.7	6	2 × 0.7	11
X130	1 x 0.7	5	–	–
X140	1 x 0.8	5	2 × 0.8	10
X150	1 x 0.9	5	–	–
X160	1 x 1.1	4	2 × 1.1	8
X170	1 x 1.1	4	–	–
X180	1 x 1.6	5	2 × 1.6	10
X190	1 x 1.6	5	–	–
X200	1 x 1.8	4	2 × 1.8	8
X210	1 x 1.8	4	–	–
X220	1 x 2.2	4	2 × 2.2	8
X230	1 x 2.2	4	–	–
X240	1 x 2.2	3	2 × 2.2	6
X250	1 x 2.6	3	–	–
X260	1 x 3.8	4	2 × 3.8	8
X270	1 x 3.8	4	–	–
X280	1 x 4.2	4	–	–

K/h = Heating capacity in Kelvin/hour

P_{inst} = Power of the installed heater

5.5.4 Limit temperature for gear unit start

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" (→ 🗎 71). For the design and dimensioning of the required oil heater, contact SEW-EURODRIVE.
- For the minimally permitted initial temperature for mineral and synthetic oil, refer to the chapter "Permitted lubricants" (→ 🗎 71).

6 Condition monitoring

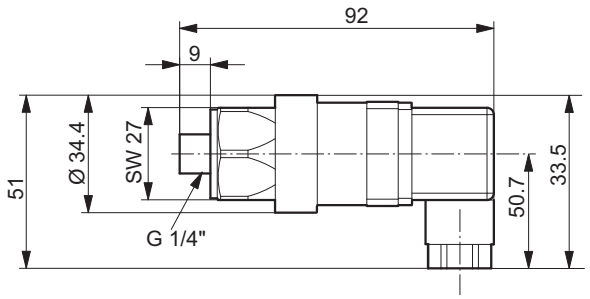
6.1 Pressure switch /PS

All gear units with pressure lubrication are equipped with a pressure switch for function monitoring.

The pressure switch is to be connected and integrated into the system in such a way that the gear unit can only be operated when the oil pump is building up pressure. A short-term compensation (max 20 s) during startup is permitted.

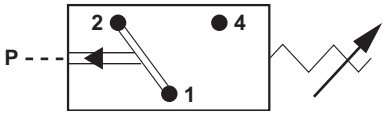
The electrical connection as well as evaluation of the switching signal are to be implemented by the customer.

6.1.1 Dimensions



721994635

6.1.2 Electrical connection



722003723

[1][2] NC contact
[1][4] NO contact

6.1.3 Technical data

- Switching pressure: 0.5 ± 0.2 bar
- Maximum switching capacity: 4 A – V_{AC} 250; 4 A – V_{DC} 24
- Plug connector: DIN EN 175301-803
- The tightening torque for the retaining screw in the back of the plug connector for electrical connection is 0.25 Nm.

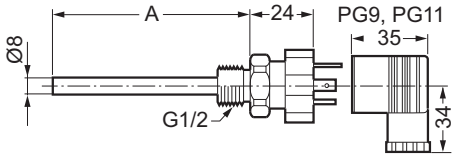
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6.2 Temperature sensor /PT100

The PT100 temperature sensor can be used to measure the temperature of the gear unit oil.

The temperature sensor is located in the oil sump of the gear unit. The exact position depends on the gear unit design and shaft position.

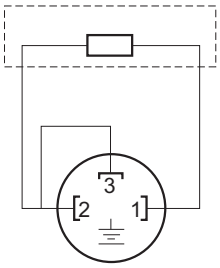
6.2.1 Dimensions



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A in mm
50
150

6.2.2 Electrical connection



359158539

[1][2] Resistor element connection

6.2.3 Technical data

- Design with thermowell and changeable measuring insert
- Sensor tolerance in K ± (0.3 + 0.005 × T), (corresponds to DIN IEC 751 class B),

  T = Oil temperature in °C
- Plug connector: DIN EN 175301-803 PG9 (IP65)
- The tightening torque for the retaining screw in the back of the plug connector for electrical connection is 0.25 Nm.

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6.3 Temperature switch /NTB

A temperature switch with preset switching temperatures of 70, 80, 90 or 100 °C is used for monitoring the gear unit oil temperature.

For various functions, the temperature switch is also used as limit value switch, for example

- for a pre-alarm

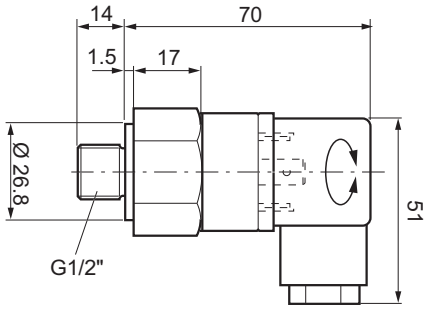
  or

- for a main alarm for switching off the main motor.

To guarantee a long service life and functioning under all conditions, it is recommended to use a relay in the power circuit instead of a direct connection through the temperature switch.

The temperature switch is located in the oil sump of the gear unit. The exact position depends on the gear unit design and shaft position.

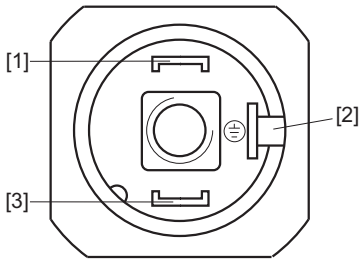
6.3.1 Dimensions



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6.3.2 Electrical connection

To guarantee a long service life and trouble-free functioning, we recommend that you use a relay in the power circuit instead of a direct connection through the temperature switch.



366532491

[1] [3] NC contact
[2] Grounding terminal 6.3 x 0.8

6.3.3 Technical data

- Trip temperature: 70 °C, 80 °C, 90 °C, 100 °C ± 5 °C
- Contact capacity: 10 A – AC 240 V

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- Plug connector: DIN EN 175301-803 PG9 (IP65)
- The tightening torque for the retaining screw in the back of the plug connector for electrical connection is 0.25 Nm.

6.4 Temperature switch /TSK

The TSK temperature switch is used with oil supply systems for circulation cooling. It is provided with 2 fixed trip points (60 °C and 90 °C) for controlling and monitoring the system.

The temperature switch is integrated in the circuit of the oil supply system as follows:

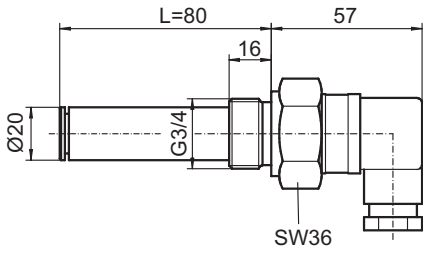
- The cooling system is activated when the oil temperature reaches 60 °C.
- Warning signal or disconnection of the gear unit when the oil temperature exceeds 90 °C (usually a sign of malfunction in the oil supply system)

The temperature switch is located in the gear unit's oil sump. The exact position depends on the gear unit version and position of the shaft.

INFORMATION

With sizes X100 – 210, the temperature switch is only possible in combination with the universal housing.

6.4.1 Dimensions

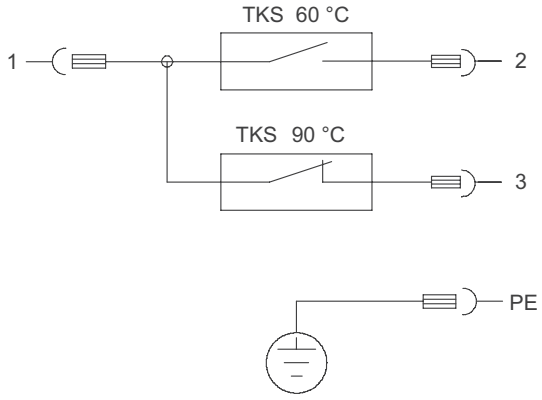


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6.4.2 Electrical connection

To guarantee a long service life and trouble-free functioning, we recommend that you use a relay in the power circuit instead of a direct connection through the temperature switch.



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[1][2] Switch 60 °C NO contact
[1][3] Switch 90 °C NC contact
PE Grounding terminal

6.4.3 Technical data

- Switching temperatures: 60 °C and 90 °C
- Contact capacity: 2 A – AC 240 V
- Plug connector: DIN EN 175301-803 PG11 (IP65)
- The tightening torque for the retaining screw in the back of the plug connector for electrical connection is 0.25 Nm.

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6.5 Diagnostic unit DUO10A (oil ageing)

The DUO10A diagnostic unit was developed for timely planning of oil changes.

The diagnostic unit consists of a PT100 temperature sensor and an evaluation unit. The PT100 temperature sensor installed in the gear unit measures the oil temperature present in the gear unit. The diagnostic unit uses the oil temperature values to calculate the predicted remaining service life of the oil. This calculated value is continuously displayed on the evaluation unit display. If required, the display can display the current gear unit oil temperature.

The oil types used by SEW-EURODRIVE are recorded in the evaluation unit, wherein a type of oil approved by SEW-EURODRIVE can be customized.

Oil grades:

Oil type	Designation	Limit temperature
Mineral oil CLP/ Bio oil	OIL1	100 °C
Synthetic oil CLPHC/CLPPAO	OIL2	130 °C
Polyglycol oil CLPPG	OIL3	130 °C
Food grade oil	OIL4	100 °C
Customer-specific	OIL5	Default setting = OIL1

4 switching outputs (NC/NO contact) with the following functions are available to connect the evaluation unit:

- Early warning:

  Is set to a few days before expiration of the remaining service life. The number of days can be set directly on the evaluation unit.

- Main alarm:

  Is set when the estimated remaining service life reaches zero.

- Limit temperature:

  Shows when the permitted oil temperature has been exceeded.

- Ready for operation:

  Displays errors in the wiring and recognizable faults in the evaluation unit.

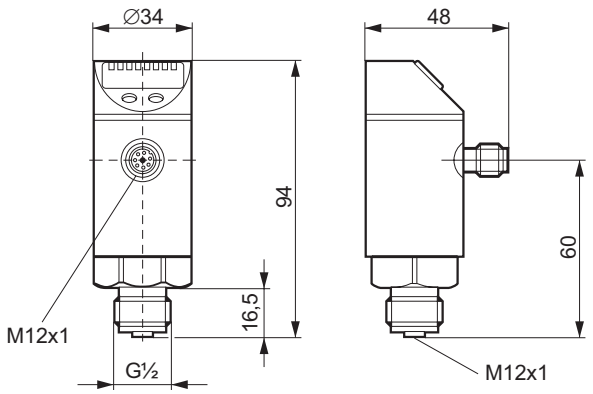
INFORMATION



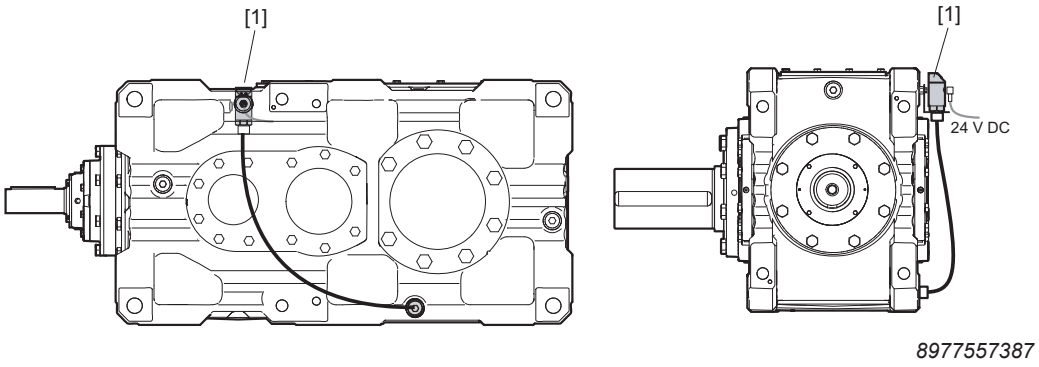
For further information on the evaluation unit and accessories, refer to the "DUO10A Diagnostic Unit" manual, part no. 11473428.

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6.5.1 Dimensions



6.5.2 Mounting examples



[1] DUO10A diagnostic unit

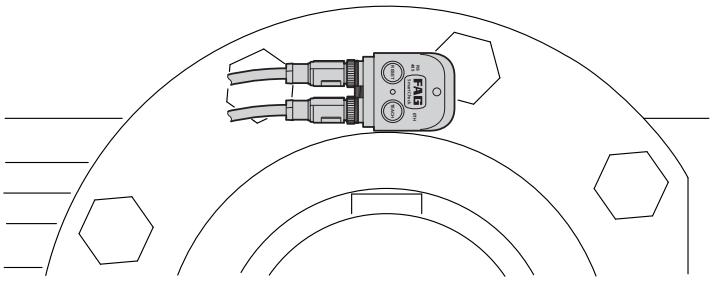
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6.6 Vibration SmartCheck

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

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

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



INFORMATION

Further information about the evaluation unit and accessories can be found in the "Vibration SmartCheck" supplement (installation instructions).

6.6.1 Scope of delivery

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

INFORMATION

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

6.6.2 Technical data

Vibration SmartCheck	
Housings	Fiberglass-reinforced plastic
Fastening	Hexagon socket head screw M6 × 45 Contact surface on the machine: 25 mm Ø
Current consumption	< 200 mA at 24 V
Ambient temperature	-20 to +70 °C
Internal operating temperature	-20 to +85 °C
Voltage supply	11 – 32 VDC or Power over Ethernet (PoE) based on 802.3af Mode A
Size	44 mm x 57 mm x 55 mm
Weight	Approx. 210 g
Degree of protection	IP 67
Operating system	Embedded Linux
Software	FAG SmartWeb (Mozilla Firefox ESR 38 (recommended), Internet Explorer 11, Internet Explorer 9 not recommended due to performance reasons) Vibration SmartUtility Light or optionally Vibration SmartUtility Languages: German, English, Chinese, Spanish, and French

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

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

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

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

Memory	
Program and data	64 MB RAM, 128 MB Flash

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

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

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6.6.3 Part numbers

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

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

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

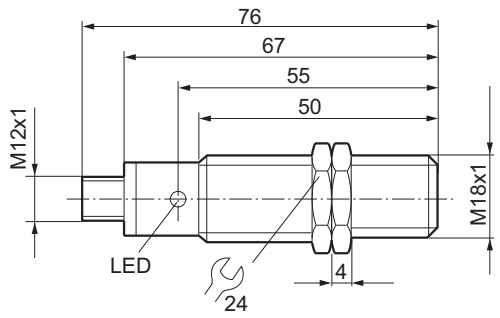
	Description	Part number
Base for mounting on standard motors	Mounting base M5	21014175
	Mounting base M6	21014167
	Mounting base M8	20593503
	Mounting base M10	21014248
	Mounting base M12	20593473
	Mounting base M16	20593481
	Mounting base M20	20593511

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6.7 Inductive incremental encoder

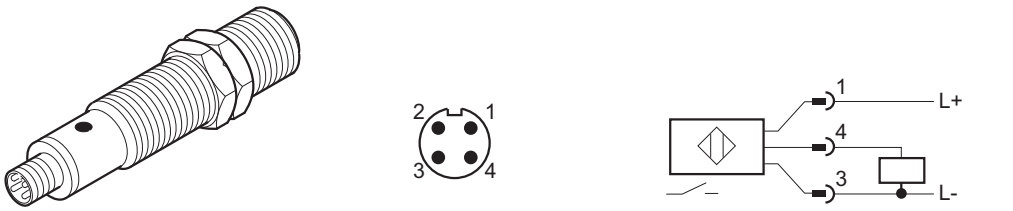
The speed of the overrunning clutch is monitored using an inductive encoder.

6.7.1 Dimensions



9007208232278795

6.7.2 Electrical connection



8977540491

6.7.3 Technical data

- Electrical design DC PNP (N.O. contact)
- Operating voltage DC 10 – 36 V
- Maximum current carrying capacity 250 mA
- Working distance 0 – 4 mm
- Degree of protection IP67
- Connection via three-core cable with a cable cross section of 1.5 mm^2 and a maximum cable length of 500 m.

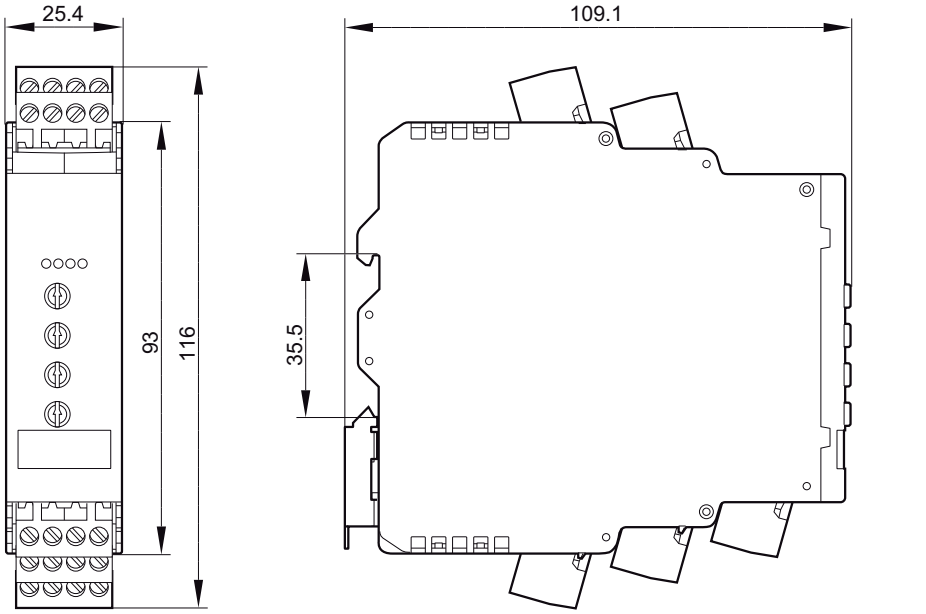
INFORMATION

The connecting cable and the M12 plug connector are not included in the delivery.

Make sure that the signal line is installed separately (not in multi-core cables), and shield them if necessary.

6.8 Speed monitor

6.8.1 Dimensions



25301730571

6.8.2 Technical data

Speed monitor: Manufacturer ifm type D200	
Nominal voltage AC	110 – 240 V
Nominal frequency	50 – 60 Hz
Voltage tolerance	-20%/+10%
Power consumption	6 W
Nominal voltage DC (alternative)	27 V (typ. 24)
Voltage tolerance	-20%/+10%
Power consumption	4 W
Auxiliary power for sensors	18.5 – 30 V DC SELV, ≤ 100 mA
Sensor type (pulse input)	PNP (type 2 according to IEC 61131-2)
Input frequency	≤ 5000 Hz

INFORMATION

For more information on the speed monitor, refer to the manufacturer's documentation delivered with the speed monitor and to the manufacturer's web page www.ifm.com.

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7 Design and operating notes

7.1 General information

Not included in the delivery:

- Set of wrenches
- Torque wrench
- Mounting device
- Compensation elements (shims, spacing rings)
- Fasteners for input and output elements
- Lubricant, e.g. NOCO® fluid from SEW → except for hollow shaft gear units
- For hollow shaft gear units → aids for assembly / disassembly on the machine shaft
- Fastening parts for the gear unit base

7.2 Auxiliary drive

All motors come equipped with a canopy because the motors are installed vertically as standard.

7.3 Dimensioning the machine shaft for hollow shaft gear units

7.3.1 Output shaft as a hollow shaft with keyed connection /..A

The material and the keyed connection of the machine shaft (for design X..A) should be dimensioned by the customer according to the loads (e.g. impacts) that will occur.

Depending on the gear unit size, the material of the shaft must have the following minimum yield point for transferring the nominal torque:

- 320 N/mm^2 for sizes X..A100 – X..A280

The material of the key must be selected according to the loads that will occur.

The minimum key length given in the dimension sheets must be observed. If a longer key is used, it should be aligned symmetrically to the hollow shaft.

With a continuous machine shaft or axial forces, SEW-EURODRIVE recommends that the machine shaft is designed with a contact shoulder. To prevent the retaining screw of the machine shaft from loosening upon a reversing load direction, it should be secured with a suitable threadlocker. If necessary, two eccentric retaining screws may be used.

INFORMATION

For detailed information on machine shaft design, refer to the dimension sheets in chapter Hollow shaft with key X...A.

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7.3.2 Output shaft as a hollow shaft with shrink disk /..H

The material of the machine shaft should be dimensioned by the customer according to the loads that will occur (e.g. impact).

The shaft material must have the following minimum yield point for transferring the nominal torque.

- 360 N/mm^2 for sizes X..100 to X..280

7.3.3 Output shaft as a splined hollow shaft /..V

The material of the machine shaft should be dimensioned by the customer according to the loads that will occur (e.g. impact).

The shaft material must have the following minimum yield point for transferring the nominal torque.

- 320 N/mm^2 for sizes X..100 to X..280

7.4 Dimensioning the customer hub of solid shaft gear units

The material of the customer hub should be dimensioned according to the loads that will occur.

7.5 Dimensioning the machine shaft with flange coupling

The material of the machine shaft as well as the keyed connection (of versions with key) should be dimensioned by the customer according to the loads that will occur. The shaft material should have a yield point of at least 320 N/mm². Choose the dimensions of the machine shaft according to the smooth solid shaft X..R.

INFORMATION

Detailed information regarding the design of the machine shaft can be provided by SEW-EURODRIVE upon request.

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8 Important notes

8.1 Dimension sheet information

INFORMATION

- Dimension sheets and gear unit models can be found on https://www.drivegate.biz
- Unless specified otherwise, all dimensions are given in **mm**. NEMA motor adapters are an exception to this rule: Their dimensions are given in **inches**.

8.1.1 General information

Scope of delivery


= Standard parts supplied by SEW-EURODRIVE.


= Standard parts not supplied by SEW-EURODRIVE.

Mounting positions

The dimension sheets show horizontal gear units (mounting position M1)

For other mounting positions, or inclined or changing mounting positions (see chapter Fixed and variable pivoted mounting positions) as can occur with drives in booms, information and dimension sheets are available from SEW-EURODRIVE.

Weight

The specified weight data are guide values. The information on the nameplate is binding.

INFORMATION

The weight data in the selection tables do not include the oil fill.

Options: Shaft types

Chapter Dimension sheets: options shows the options in connection with gear unit X.S.. with a solid shaft. Unless indicated otherwise, all options are also possible for gear units with other shaft types.

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8.1.2 Tolerances

Shaft ends

Diameter tolerance according to DIN 748:

- Ø = Smooth output shaft /..R → ISO k6
- Ø = Output shaft as a solid shaft with key /..S → ISO m6

Center bores according to DIN 332, part 2 (type D..):

Ø	> 16...21 mm	→ M6
Ø	> 21...24 mm	→ M8
Ø	> 24...30 mm	→ M10
Ø	> 30...38 mm	→ M12
Ø	> 38...50 mm	→ M16
Ø	> 50...85 mm[1)]	→ M20
Ø	> 85...130 mm[1)]	→ M24
Ø	> 130...225 mm[1)]	→ M30

1) Dimensions not according to DIN 332; the thread depth including the counterbore is at least twice that of the nominal thread diameter

Keys according to DIN 6885 (domed type)

Hollow shafts

Diameter tolerance:

- Ø → ISO H7 for hollow shafts for shrink disk
- Ø → ISO H8 for hollow shafts with keyway

Mounting flange

Centering shoulder tolerance: ISO f7

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9 Selection tables

9.1 Information on the selection tables

The thermal rating P_{TH} depends on several influencing factors. Contact SEW-EURODRIVE for information on your specific application.

X.K100..													6.80 kNm
					KF37 i=28.83		**KF57** i=35.7						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[1/min]	[kNm]	[kW]	[1/min]	[kNm]	[1/min]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 1/min (50Hz)					DRN80M4 .75 kW S3 [1] I_N=1.75 A (400V)		DRN90L4/Z 1.5 kW S3 [1] I_N=3.45 A (400V)						IE3
31.5	**30.35**	33	6.80	24	2.9	2.33	2.4	5.69	43	32	67	50	
35.5	**34.35**	29	6.80	21	3.3	2.08	2.7	5.09	37	28	58	43	
40	**38.45**	26	6.80	19.2	2.9	2.33	2.4	5.69	39	29	60	45	
45	**42.96**	23	6.80	17.2	2.6	2.60	2.2	6.36	34	25	52	39	
50	**48.08**	21	6.80	15.3	2.4	2.92	1.9	7.12	35	26	54	40	[15]
56	**52.49**	19	6.80	14.2	2.6	2.60	2.2	6.36	31	23	49	36	[16]
63	**58.74**	17	6.80	12.7	2.4	2.92	1.9	7.12	32	24	50	37	
71	**67.2**	15	6.80	11.1	2.6	2.60	2.2	6.36	28	20	43	32	
80	**75.21**	13	6.80	9.9	2.4	2.92	1.9	7.12	28	21	44	32	
[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]	

Key:

P_{TH} Thermal rating at 20 °C and 40 °C ambient temperature:
[1] Type and technical data
[2] Nominal gear unit ratio
[3] Exact gear unit ratio
[4] Output speed (LSS)
[5] Nominal gear unit torque
[6] Nominal gear unit power
[7] Output speed when operated with auxiliary drive (empty buckets)
[8] Output torque when operated with auxiliary drive (empty buckets)
[9] Output speed when operated with auxiliary drive (full buckets)
[10] Output torque when operated with auxiliary drive (full buckets)
[11] Thermal rating: Without additional cooling for 20 °C ambient temperature
[12] Thermal rating: Without additional cooling for 40 °C ambient temperature
[13] Thermal rating: With fan for 20 °C ambient temperature
[14] Thermal rating: With fan for 40 °C ambient temperature
[15] Page reference to the main dimension sheet: Empty buckets
[16] Page reference to the main dimension sheet: Full buckets

Symbols

Empty buckets
Full buckets
Splash lubrication
Fan

Footnotes in the selection tables:

1) Pressure lubrication required; contact SEW-EURODRIVE
*) Contact SEW-EURODRIVE

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9.2 IE1 motor standard

X.K100..													6.80 kNm
					KF37 i=28.83		KF57 i=35.7						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS80S4 .8 kW S3 I_N=1.87 A (400V)		DRS90M4/Z 1.6 kW S3 I_N=3.55 A (400V)						IE1
20	**19.09**	52	6.80	39	3.5	2.07	2.8	5.20	53	39	83	61	
22.4	**21.09**	47	6.80	35	3.2	2.29	2.6	5.75	47	35	74	55	
25	**24.55**	41	6.80	30	3.5	2.07	2.8	5.20	49	36	76	56	
28	**27.12**	37	6.80	27	3.2	2.29	2.6	5.75	44	32	68	50	
31.5	**30.35**	33	6.80	24	2.9	2.57	2.3	6.43	43	32	67	50	
35.5	**34.35**	29	6.80	21	3.2	2.29	2.6	5.75	37	28	58	43	
40	**38.45**	26	6.80	19.2	2.9	2.57	2.3	6.43	39	29	60	45	148 150
45	**42.96**	23	6.80	17.2	2.6	2.87	2.0	7.19	34	25	52	39	
50	**48.08**	21	6.80	15.3	2.3	3.21	1.8	8.04	35	26	54	40	
56	**52.49**	19	6.80	14.2	2.6	2.87	2.0	7.19	31	23	49	36	
63	**58.74**	17	6.80	12.7	2.3	3.21	1.8	8.04	32	24	50	37	
71	**67.2**	15	6.80	11.1	2.6	2.87	2.0	7.19	28	20	43	32	
80	**75.21**	13	6.80	9.9	2.3	3.21	1.8	8.04	28	21	44	32	
n_1 = 1200 min^{-1} (60Hz)					DRS80S4 .8 kW S3 I_N=1.82 A (460V)		DRS90M4/Z 1.6 kW S3 I_N=3.5 A (460V)						IE1
20	**19.09**	63	6.80	46	4.3	1.69	3.5	4.20	54	39	93	68	
22.4	**21.09**	57	6.80	42	3.9	1.86	3.2	4.64	49	35	83	61	
25	**24.55**	49	6.80	36	4.3	1.69	3.5	4.20	50	36	85	63	
28	**27.12**	44	6.80	33	3.9	1.86	3.2	4.64	45	33	77	57	
31.5	**30.35**	40	6.80	29	3.5	2.09	2.8	5.19	45	33	76	56	
35.5	**34.35**	35	6.80	26	3.9	1.86	3.2	4.64	39	28	65	48	
40	**38.45**	31	6.80	23	3.5	2.09	2.8	5.19	40	29	68	50	148 150
45	**42.96**	28	6.80	21	3.1	2.33	2.5	5.80	35	26	59	44	
50	**48.08**	25	6.80	18.4	2.8	2.61	2.3	6.49	36	27	61	45	
56	**52.49**	23	6.80	17.0	3.1	2.33	2.5	5.80	33	24	55	41	
63	**58.74**	20	6.80	15.2	2.8	2.61	2.3	6.49	34	25	57	42	
71	**67.2**	18	6.80	13.3	3.1	2.33	2.5	5.80	29	21	48	36	
80	**75.21**	16	6.80	11.9	2.8	2.61	2.3	6.49	29	22	49	37	
n_1 = 1500 min^{-1} (50Hz)					DRS80S4 .8 kW S3 I_N=1.87 A (400V)		DRS90M4/Z 1.6 kW S3 I_N=3.55 A (400V)						IE1
20	**19.09**	79	6.80	58	3.5	2.07	2.8	5.20	55	39	105	77	
22.4	**21.09**	71	6.80	52	3.2	2.29	2.6	5.75	49	35	94	69	
25	**24.55**	61	6.80	45	3.5	2.07	2.8	5.20	52	37	97	71	
28	**27.12**	55	6.80	41	3.2	2.29	2.6	5.75	47	33	87	64	
31.5	**30.35**	49	6.80	36	2.9	2.57	2.3	6.43	46	33	86	63	
35.5	**34.35**	44	6.80	32	3.2	2.29	2.6	5.75	40	29	75	55	
40	**38.45**	39	6.80	29	2.9	2.57	2.3	6.43	42	30	77	57	148 150
45	**42.96**	35	6.80	26	2.6	2.87	2.0	7.19	37	26	67	50	
50	**48.08**	31	6.80	23	2.3	3.21	1.8	8.04	38	27	70	51	
56	**52.49**	29	6.80	21	2.6	2.87	2.0	7.19	34	25	63	46	
63	**58.74**	26	6.80	19.0	2.3	3.21	1.8	8.04	35	26	65	48	
71	**67.2**	22	6.80	16.6	2.6	2.87	2.0	7.19	30	22	55	41	
80	**75.21**	20	6.80	14.8	2.3	3.21	1.8	8.04	31	22	56	42	

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n_1 = 1800 min^{-1} (60Hz)					DRS80S4 .8 kW S3 I_N=1.82 A (460V)		DRS90M4/Z 1.6 kW S3 I_N=3.5 A (460V)						IE1
20	**19.09**	94	6.80	70	4.3	1.69	3.5	4.20	54	37	115	81	
22.4	**21.09**	85	6.80	63	3.9	1.86	3.2	4.64	49	33	100	73	
25	**24.55**	73	6.80	54	4.3	1.69	3.5	4.20	52	37	105	76	
28	**27.12**	66	6.80	49	3.9	1.86	3.2	4.64	47	33	95	69	
31.5	**30.35**	59	6.80	44	3.5	2.09	2.8	5.19	47	33	93	68	
35.5	**34.35**	52	6.80	39	3.9	1.86	3.2	4.64	41	29	81	60	
40	**38.45**	47	6.80	35	3.5	2.09	2.8	5.19	43	31	84	62	148
45	**42.96**	42	6.80	31	3.1	2.33	2.5	5.80	37	27	73	54	150
50	**48.08**	37	6.80	28	2.8	2.61	2.3	6.49	39	28	76	56	
56	**52.49**	34	6.80	26	3.1	2.33	2.5	5.80	35	25	69	51	
63	**58.74**	31	6.80	23	2.8	2.61	2.3	6.49	36	26	71	52	
71	**67.2**	27	6.80	20	3.1	2.33	2.5	5.80	31	22	60	44	
80	**75.21**	24	6.80	17.8	2.8	2.61	2.3	6.49	32	23	62	45	

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X.K110..													8.50 kNm
					KF37 i=28.83		KF57 i=35.7						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRS80S4 0.8 kW S3 I_N=1.87 A (400V)		DRS90M4/Z 1.6 kW S3 I_N=3.55 A (400V)						IE1
22.4	**21.97**	46	8.50	42	3.1	2.39	2.4	5.99	56	41	88	65	
25	**24.26**	41	8.50	38	2.8	2.64	2.2	6.61	50	36	78	58	
28	**28.26**	35	8.50	33	3.1	2.39	2.4	5.99	51	38	80	59	
31.5	**31.21**	32	8.50	30	2.8	2.64	2.2	6.61	46	34	72	53	
35.5	**34.94**	29	8.50	26	2.5	2.95	2.0	7.40	46	33	71	52	
40	**39.53**	25	8.50	23	2.8	2.64	2.2	6.61	39	29	61	45	
45	**44.26**	23	8.50	21	2.5	2.95	2.0	7.40	41	30	63	47	148 150
50	**49.44**	20	8.50	18.6	2.2	3.30	1.8	8.27	36	27	56	42	
56	**55.35**	18	8.50	16.6	2.0	3.70	1.6	9.26	37	27	57	42	
63	**60.4**	17	8.50	15.4	2.2	3.30	1.8	8.27	33	25	51	38	
71	**67.62**	15	8.50	13.8	2.0	3.70	1.6	9.26	34	25	53	39	
80	**77.33**	13	8.50	12.0	2.2	3.30	1.8	8.27	29	21	45	33	
90	**86.58**	12	8.50	10.7	2.0	3.70	1.6	9.26	29	22	45	33	
n_1 = 1200 min^{-1} (60Hz)					DRS80S4 0.8 kW S3 I_N=1.82 A (460V)		DRS90M4/Z 1.6 kW S3 I_N=3.5 A (460V)						IE1
22.4	**21.97**	55	8.50	50	3.8	1.94	3.0	4.83	57	41	98	72	
25	**24.26**	49	8.50	46	3.4	2.14	2.7	5.33	51	37	88	65	
28	**28.26**	42	8.50	39	3.8	1.94	3.0	4.83	53	38	90	66	
31.5	**31.21**	38	8.50	35	3.4	2.14	2.7	5.33	48	35	81	60	
35.5	**34.94**	34	8.50	32	3.0	2.40	2.5	5.97	47	34	80	59	
40	**39.53**	30	8.50	28	3.4	2.14	2.7	5.33	41	30	69	51	
45	**44.26**	27	8.50	25	3.0	2.40	2.5	5.97	42	31	71	53	148 150
50	**49.44**	24	8.50	22	2.7	2.68	2.2	6.67	38	28	64	47	
56	**55.35**	22	8.50	20	2.4	3.01	2.0	7.47	38	28	64	48	
63	**60.4**	20	8.50	18.5	2.7	2.68	2.2	6.67	35	25	58	43	
71	**67.62**	18	8.50	16.5	2.4	3.01	2.0	7.47	36	26	60	44	
80	**77.33**	16	8.50	14.4	2.7	2.68	2.2	6.67	30	22	51	38	
90	**86.58**	14	8.50	12.9	2.4	3.01	2.0	7.47	30	22	51	38	
n_1 = 1500 min^{-1} (50Hz)					DRS80S4 0.8 kW S3 I_N=1.87 A (400V)		DRS90M4/Z 1.6 kW S3 I_N=3.55 A (400V)						IE1
22.4	**21.97**	68	8.50	63	3.1	2.39	2.4	5.99	58	41	110	81	
25	**24.26**	62	8.50	57	2.8	2.64	2.2	6.61	52	37	99	72	
28	**28.26**	53	8.50	49	3.1	2.39	2.4	5.99	55	39	100	75	
31.5	**31.21**	48	8.50	44	2.8	2.64	2.2	6.61	49	35	92	67	
35.5	**34.94**	43	8.50	40	2.5	2.95	2.0	7.40	49	35	91	67	
40	**39.53**	38	8.50	35	2.8	2.64	2.2	6.61	43	31	79	58	
45	**44.26**	34	8.50	31	2.5	2.95	2.0	7.40	44	32	81	60	148 150
50	**49.44**	30	8.50	28	2.2	3.30	1.8	8.27	39	29	73	54	
56	**55.35**	27	8.50	25	2.0	3.70	1.6	9.26	40	29	73	54	
63	**60.4**	25	8.50	23	2.2	3.30	1.8	8.27	36	26	66	49	
71	**67.62**	22	8.50	21	2.0	3.70	1.6	9.26	37	27	68	50	
80	**77.33**	19	8.50	18.0	2.2	3.30	1.8	8.27	32	23	58	43	
90	**86.58**	17	8.50	16.1	2.0	3.70	1.6	9.26	32	23	58	43	

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n_1 = 1800 min^{-1} (60Hz)					DRS80S4 0.8 kW S3 I_N=1.82 A (460V)		DRS90M4/Z 1.6 kW S3 I_N=3.5 A (460V)						IE1
22.4	**21.97**	82	8.50	75	3.8	1.94	3.0	4.83	58	39	120	86	
25	**24.26**	74	8.50	68	3.4	2.14	2.7	5.33	52	36	105	77	
28	**28.26**	64	8.50	59	3.8	1.94	3.0	4.83	55	39	110	81	
31.5	**31.21**	58	8.50	53	3.4	2.14	2.7	5.33	50	35	100	73	
35.5	**34.94**	52	8.50	47	3.0	2.40	2.5	5.97	49	35	98	72	
40	**39.53**	46	8.50	42	3.4	2.14	2.7	5.33	44	31	86	63	148
45	**44.26**	41	8.50	37	3.0	2.40	2.5	5.97	45	32	89	65	150
50	**49.44**	36	8.50	34	2.7	2.68	2.2	6.67	40	29	79	58	
56	**55.35**	33	8.50	30	2.4	3.01	2.0	7.47	41	29	80	59	
63	**60.4**	30	8.50	28	2.7	2.68	2.2	6.67	37	27	72	53	
71	**67.62**	27	8.50	25	2.4	3.01	2.0	7.47	38	28	74	55	
80	**77.33**	23	8.50	22	2.7	2.68	2.2	6.67	33	24	63	47	
90	**86.58**	21	8.50	19.3	2.4	3.01	2.0	7.47	33	24	64	47	

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X.K120..													12.8 kNm
					KF47 i=31.3		KF67 i=35.62						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRS80M4 1.2 kW S3 I_N=2.6 A (400V)		DRS90L4/Z 2.5 kW S3 I_N=5.5 A (400V)						IE1
20	**20.02**	50	12.1	66	3.1	3.54	2.7	8.51	68	49	110	79	
22.4	**22.79**	44	12.3	59	2.7	4.03	2.4	9.69	70	50	110	81	
25	**25.75**	39	12.4	52	3.1	3.54	2.7	8.51	64	46	100	74	
28	**29.32**	34	12.4	46	2.7	4.03	2.4	9.69	65	47	100	75	
31.5	**30.96**	32	12.4	43	2.6	4.25	2.2	10.2	57	42	89	66	
35.5	**35.25**	28	12.4	38	2.3	4.84	2.0	11.6	58	42	91	67	148
40	**40.01**	25	12.4	34	2.6	4.25	2.2	10.2	49	36	77	57	150
45	**45.55**	22	12.8	30	2.3	4.84	2.0	11.6	51	38	80	59	
50	**47.92**	21	12.8	29	2.6	4.25	2.2	10.2	45	33	71	52	
56	**54.55**	18	12.8	26	2.3	4.84	2.0	11.6	46	33	71	53	
63	**61.35**	16	12.8	23	2.6	4.25	2.2	10.2	41	30	63	47	
71	**69.84**	14	12.8	20	2.3	4.84	2.0	11.6	41	30	63	47	
n_1 = 1200 min^{-1} (60Hz)					DRS80M4 1.2 kW S3 I_N=2.7 A (460V)		DRS90L4/Z 2.5 kW S3 I_N=5.3 A (460V)						IE1
20	**20.02**	60	12.1	79	3.8	2.87	3.3	6.85	69	49	120	88	
22.4	**22.79**	53	12.3	70	3.4	3.27	2.9	7.80	70	50	125	90	
25	**25.75**	47	12.4	63	3.8	2.87	3.3	6.85	65	47	110	82	
28	**29.32**	41	12.4	55	3.4	3.27	2.9	7.80	66	48	115	83	
31.5	**30.96**	39	12.4	52	3.2	3.45	2.8	8.23	59	42	100	74	
35.5	**35.25**	34	12.4	46	2.8	3.93	2.4	9.37	59	43	100	75	148
40	**40.01**	30	12.4	40	3.2	3.45	2.8	8.23	51	37	87	64	150
45	**45.55**	26	12.8	37	2.8	3.93	2.4	9.37	53	38	90	66	
50	**47.92**	25	12.8	35	3.2	3.45	2.8	8.23	47	34	80	59	
56	**54.55**	22	12.8	31	2.8	3.93	2.4	9.37	47	34	80	59	
63	**61.35**	20	12.8	27	3.2	3.45	2.8	8.23	42	31	71	53	
71	**69.84**	17	12.8	24	2.8	3.93	2.4	9.37	42	31	71	53	
n_1 = 1500 min^{-1} (50Hz)					DRS80M4 1.2 kW S3 I_N=2.6 A (400V)		DRS90L4/Z 2.5 kW S3 I_N=5.5 A (400V)						IE1
20	**20.02**	75	12.1	98	3.1	3.54	2.7	8.51	68	45	135	97	
22.4	**22.79**	66	12.3	88	2.7	4.03	2.4	9.69	69	47	140	99	
25	**25.75**	58	12.4	78	3.1	3.54	2.7	8.51	66	46	125	92	
28	**29.32**	51	12.4	69	2.7	4.03	2.4	9.69	67	47	130	93	
31.5	**30.96**	48	12.4	65	2.6	4.25	2.2	10.2	60	42	115	83	
35.5	**35.25**	43	12.4	57	2.3	4.84	2.0	11.6	60	42	115	84	148
40	**40.01**	37	12.4	50	2.6	4.25	2.2	10.2	53	38	99	72	150
45	**45.55**	33	12.8	46	2.3	4.84	2.0	11.6	54	39	100	75	
50	**47.92**	31	12.8	44	2.6	4.25	2.2	10.2	49	35	91	67	
56	**54.55**	27	12.8	39	2.3	4.84	2.0	11.6	49	35	91	67	
63	**61.35**	24	12.8	34	2.6	4.25	2.2	10.2	44	31	81	60	
71	**69.84**	21	12.8	30	2.3	4.84	2.0	11.6	44	32	81	60	
n_1 = 1800 min^{-1} (60Hz)					DRS80M4 1.2 kW S3 I_N=2.7 A (460V)		DRS90L4/Z 2.5 kW S3 I_N=5.3 A (460V)						IE1
20	**20.02**	90	12.1	118	3.8	2.87	3.3	6.85	65	35	145	100	
22.4	**22.79**	79	12.3	105	3.4	3.27	2.9	7.80	66	39	145	105	
25	**25.75**	70	12.4	94	3.8	2.87	3.3	6.85	65	44	135	98	
28	**29.32**	61	12.4	83	3.4	3.27	2.9	7.80	66	45	140	99	
31.5	**30.96**	58	12.4	78	3.2	3.45	2.8	8.23	59	40	120	88	
35.5	**35.25**	51	12.4	69	2.8	3.93	2.4	9.37	60	41	125	89	148
40	**40.01**	45	12.4	60	3.2	3.45	2.8	8.23	53	37	105	78	150
45	**45.55**	40	12.8	55	2.8	3.93	2.4	9.37	55	39	110	80	
50	**47.92**	38	12.8	53	3.2	3.45	2.8	8.23	49	35	98	72	
56	**54.55**	33	12.8	46	2.8	3.93	2.4	9.37	50	35	99	72	
63	**61.35**	29	12.8	41	3.2	3.45	2.8	8.23	44	32	88	64	
71	**69.84**	26	12.8	36	2.8	3.93	2.4	9.37	45	32	88	65	

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X.K130..													16.0 kNm
					KF47 i=31.3		KF67 i=35.62						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS80M4 1.2 kW S3 I_N=2.6 A (400V)		DRS90L4/Z 2.5 kW S3 I_N=5.5 A (400V)						IE1
25	**25.03**	40	15.2	66	2.5	4.42	2.2	10.6	73	53	115	85	
28	**28.43**	35	15.5	59	2.2	5.02	1.9	12.0	75	54	120	87	
31.5	**32.19**	31	15.5	52	2.5	4.42	2.2	10.6	68	50	105	79	
35.5	**36.56**	27	15.5	46	2.2	5.02	1.9	12.0	69	50	110	80	
40	**38.71**	26	15.5	43	2.1	5.31	1.8	12.7	63	46	98	72	
45	**43.96**	23	15.5	38	1.8	6.04	1.6	14.5	60	44	94	70	148
50	**50.02**	20	15.5	34	2.1	5.31	1.8	12.7	54	40	84	62	150
56	**56.81**	18	16.0	31	1.8	6.04	1.6	14.5	53	39	83	62	
63	**59.9**	17	16.0	29	2.1	5.31	1.8	12.7	48	36	75	56	
71	**68.03**	15	16.0	26	1.8	6.04	1.6	14.5	49	36	76	56	
80	**76.69**	13	16.0	23	2.1	5.31	1.8	12.7	43	32	67	50	
90	**87.09**	11	16.0	20	1.8	6.04	1.6	14.5	43	32	67	50	
n_1 = 1200 1/min (60Hz)					DRS80M4 1.2 kW S3 I_N=2.7 A (460V)		DRS90L4/Z 2.5 kW S3 I_N=5.3 A (460V)						IE1
25	**25.03**	48	15.2	79	3.1	3.59	2.7	8.56	74	53	130	94	
28	**28.43**	42	15.5	71	2.7	4.07	2.4	9.72	76	54	130	96	
31.5	**32.19**	37	15.5	63	3.1	3.59	2.7	8.56	70	50	120	88	
35.5	**36.56**	33	15.5	55	2.7	4.07	2.4	9.72	71	51	120	89	
40	**38.71**	31	15.5	52	2.5	4.31	2.2	10.2	65	47	110	81	
45	**43.96**	27	15.5	46	2.2	4.90	2.0	11.6	62	45	105	78	148
50	**50.02**	24	15.5	40	2.5	4.31	2.2	10.2	56	41	95	70	150
56	**56.81**	21	16.0	37	2.2	4.90	2.0	11.6	55	40	94	69	
63	**59.9**	20	16.0	35	2.5	4.31	2.2	10.2	50	37	85	63	
71	**68.03**	18	16.0	31	2.2	4.90	2.0	11.6	51	37	85	63	
80	**76.69**	16	16.0	27	2.5	4.31	2.2	10.2	45	33	76	56	
90	**87.09**	14	16.0	24	2.2	4.90	2.0	11.6	45	33	76	56	
n_1 = 1500 min^{-1} (50Hz)					DRS80M4 1.2 kW S3 I_N=2.6 A (400V)		DRS90L4/Z 2.5 kW S3 I_N=5.5 A (400V)						IE1
25	**25.03**	60	15.2	99	2.5	4.42	2.2	10.6	74	50	145	105	
28	**28.43**	53	15.5	89	2.2	5.02	1.9	12.0	75	51	150	105	
31.5	**32.19**	47	15.5	78	2.5	4.42	2.2	10.6	71	50	135	99	
35.5	**36.56**	41	15.5	69	2.2	5.02	1.9	12.0	72	51	140	100	
40	**38.71**	39	15.5	65	2.1	5.31	1.8	12.7	66	47	125	91	
45	**43.96**	34	15.5	57	1.8	6.04	1.6	14.5	63	45	120	87	148
50	**50.02**	30	15.5	50	2.1	5.31	1.8	12.7	58	41	110	79	150
56	**56.81**	26	16.0	46	1.8	6.04	1.6	14.5	57	41	105	78	
63	**59.9**	25	16.0	44	2.1	5.31	1.8	12.7	52	38	97	71	
71	**68.03**	22	16.0	39	1.8	6.04	1.6	14.5	52	38	97	72	
80	**76.69**	20	16.0	34	2.1	5.31	1.8	12.7	47	34	86	64	
90	**87.09**	17	16.0	30	1.8	6.04	1.6	14.5	47	34	87	64	
n_1 = 1800 min^{-1} (60Hz)					DRS80M4 1.2 kW S3 I_N=2.7 A (460V)		DRS90L4/Z 2.5 kW S3 I_N=5.3 A (460V)						IE1
25	**25.03**	72	15.2	118	3.1	3.59	2.7	8.56	71	41	155	110	
28	**28.43**	63	15.5	106	2.7	4.07	2.4	9.72	72	45	160	110	
31.5	**32.19**	56	15.5	94	3.1	3.59	2.7	8.56	71	49	145	105	
35.5	**36.56**	49	15.5	83	2.7	4.07	2.4	9.72	72	49	150	105	
40	**38.71**	46	15.5	78	2.5	4.31	2.2	10.2	66	45	135	97	
45	**43.96**	41	15.5	69	2.2	4.90	2.0	11.6	63	43	130	93	148
50	**50.02**	36	15.5	60	2.5	4.31	2.2	10.2	58	41	115	85	150
56	**56.81**	32	16.0	55	2.2	4.90	2.0	11.6	58	41	115	84	
63	**59.9**	30	16.0	53	2.5	4.31	2.2	10.2	53	38	105	77	
71	**68.03**	26	16.0	46	2.2	4.90	2.0	11.6	53	38	105	77	
80	**76.69**	23	16.0	41	2.5	4.31	2.2	10.2	48	34	94	69	
90	**87.09**	21	16.0	36	2.2	4.90	2.0	11.6	48	34	94	69	

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X.K140..													22.0 kNm
					KF57 i=35.7		KF77 i=38.39						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRS90M4 1.6 kW S3 I_N=3.55 A (400V)		DRS112M4/Z 4.4 kW S3 I_N=9 A (400V)						IE1
20	**21.13**	47	21.9	112	3.3	4.48	3.2	12.7	93	66	160	120	
22.4	**22.6**	44	22.0	106	3.1	4.79	3.0	13.6	92	66	160	120	
25	**26.42**	38	22.0	90	2.6	5.60	2.5	15.9	88	63	150	115	
28	**28.25**	35	22.0	84	2.4	5.99	2.4	17.0	87	63	150	110	
31.5	**33.46**	30	22.0	71	2.6	5.60	2.5	15.9	77	56	130	100	
35.5	**35.78**	28	22.0	67	2.4	5.99	2.4	17.0	77	56	130	99	148
40	**40.78**	25	22.0	58	2.1	6.82	2.1	19.4	72	52	120	92	150
45	**43.61**	23	22.0	55	2.0	7.30	1.9	20.7	71	52	120	91	
50	**49.82**	20	22.0	48	2.1	6.82	2.1	19.4	66	48	110	84	
56	**53.28**	19	22.0	45	2.0	7.30	1.9	20.7	65	48	110	83	
63	**63.79**	16	22.0	38	2.1	6.82	2.1	19.4	58	42	97	74	
71	**68.21**	15	22.0	35	2.0	7.30	1.9	20.7	58	43	98	74	
n_1 = 1200 min^{-1} (60Hz)					DRS90M4 1.6 kW S3 I_N=3.5 A (460V)		DRS112M4/Z 4.4 kW S3 I_N=8.6 A (460V)						IE1
20	**21.13**	57	21.9	135	4.1	3.61	3.8	10.4	94	66	180	135	
22.4	**22.6**	53	22.0	127	3.8	3.86	3.6	11.2	93	66	175	130	
25	**26.42**	45	22.0	108	3.2	4.52	3.1	13.1	89	63	170	125	
28	**28.25**	42	22.0	101	3.0	4.83	2.9	14.0	88	63	165	125	
31.5	**33.46**	36	22.0	86	3.2	4.52	3.1	13.1	79	57	150	110	
35.5	**35.78**	34	22.0	80	3.0	4.83	2.9	14.0	79	56	145	110	148
40	**40.78**	29	22.0	70	2.7	5.50	2.5	15.9	74	53	135	105	150
45	**43.61**	28	22.0	66	2.5	5.89	2.4	17.0	73	52	135	100	
50	**49.82**	24	22.0	58	2.7	5.50	2.5	15.9	68	49	125	95	
56	**53.28**	23	22.0	54	2.5	5.89	2.4	17.0	67	48	125	94	
63	**63.79**	19	22.0	45	2.7	5.50	2.5	15.9	59	43	110	83	
71	**68.21**	18	22.0	42	2.5	5.89	2.4	17.0	60	44	110	84	
n_1 = 1500 min^{-1} (50Hz)					DRS90M4 1.6 kW S3 I_N=3.55 A (400V)		DRS112M4/Z 4.4 kW S3 I_N=9 A (400V)						IE1
20	**21.13**	71	21.9	169	3.3	4.48	3.2	12.7	93	56	200	150	
22.4	**22.6**	66	22.0	158	3.1	4.79	3.0	13.6	92	58	200	145	
25	**26.42**	57	22.0	135	2.6	5.60	2.5	15.9	89	59	190	140	
28	**28.25**	53	22.0	127	2.4	5.99	2.4	17.0	88	60	190	140	
31.5	**33.46**	45	22.0	107	2.6	5.60	2.5	15.9	80	56	170	125	
35.5	**35.78**	42	22.0	100	2.4	5.99	2.4	17.0	80	56	165	125	148
40	**40.78**	37	22.0	88	2.1	6.82	2.1	19.4	75	53	155	115	150
45	**43.61**	34	22.0	82	2.0	7.30	1.9	20.7	74	52	155	115	
50	**49.82**	30	22.0	72	2.1	6.82	2.1	19.4	69	49	140	105	
56	**53.28**	28	22.0	68	2.0	7.30	1.9	20.7	69	49	140	105	
63	**63.79**	24	22.0	57	2.1	6.82	2.1	19.4	61	44	125	94	
71	**68.21**	22	22.0	53	2.0	7.30	1.9	20.7	62	44	125	95	
n_1 = 1800 min^{-1} (60Hz)					DRS90M4 1.6 kW S3 I_N=3.5 A (460V)		DRS112M4/Z 4.4 kW S3 I_N=8.6 A (460V)						IE1
20	**21.13**	85	20.7	191	4.1	3.61	3.8	10.4	86	*)	215	155	
22.4	**22.6**	80	21.1	182	3.8	3.86	3.6	11.2	88	*)	210	155	
25	**26.42**	68	22.0	162	3.2	4.52	3.1	13.1	86	48	205	150	
28	**28.25**	64	22.0	152	3.0	4.83	2.9	14.0	85	49	200	150	
31.5	**33.46**	54	22.0	128	3.2	4.52	3.1	13.1	80	51	180	135	
35.5	**35.78**	50	22.0	120	3.0	4.83	2.9	14.0	79	52	180	135	148
40	**40.78**	44	22.0	105	2.7	5.50	2.5	15.9	74	51	170	125	150
45	**43.61**	41	22.0	98	2.5	5.89	2.4	17.0	74	51	165	125	
50	**49.82**	36	22.0	87	2.7	5.50	2.5	15.9	69	48	155	115	
56	**53.28**	34	22.0	81	2.5	5.89	2.4	17.0	69	48	155	115	
63	**63.79**	28	22.0	68	2.7	5.50	2.5	15.9	62	43	135	100	
71	**68.21**	26	22.0	64	2.5	5.89	2.4	17.0	62	44	135	100	

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X.K150..													27.5 kNm
					KF57 i=35.7		KF77 i=38.39						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS90M4 1.6 kW S3 I_N=3.55 A (400V)		DRS112M4/Z 4.4 kW S3 I_N=9 A (400V)						IE1
25	**26.25**	38	27.2	112	2.6	5.56	2.5	15.8	99	72	170	130	
28	**28.1**	36	27.5	106	2.5	5.95	2.4	16.9	99	71	170	125	
31.5	**32.81**	30	27.5	91	2.1	6.95	2.0	19.7	94	68	160	120	
35.5	**35.13**	28	27.5	85	2.0	7.45	1.9	21.1	93	67	160	120	
40	**41.56**	24	27.5	72	2.1	6.95	2.0	19.7	85	62	145	110	
45	**44.5**	22	27.5	67	2.0	7.45	1.9	21.1	82	60	140	105	148
50	**50.65**	20	27.5	59	1.7	8.47	1.7	24.1	77	56	130	99	150
56	**54.23**	18	27.5	55	1.6	9.07	1.6	25.8	76	56	130	98	
63	**61.88**	16	27.5	49	1.7	8.47	1.7	24.1	71	52	120	90	
71	**66.26**	15	27.5	45	1.6	9.07	1.6	25.8	70	51	120	89	
80	**79.22**	13	27.5	38	1.7	8.47	1.7	24.1	63	46	105	80	
90	**84.83**	12	27.5	35	1.6	9.07	1.6	25.8	62	46	105	80	
n_1 = 1200 min^{-1} (60Hz)					DRS90M4 1.6 kW S3 I_N=3.5 A (460V)		DRS112M4/Z 4.4 kW S3 I_N=8.6 A (460V)						IE1
25	**26.25**	46	27.2	135	3.3	4.49	3.1	13.0	100	72	190	145	
28	**28.1**	43	27.5	127	3.1	4.80	2.9	13.9	100	71	190	140	
31.5	**32.81**	37	27.5	109	2.6	5.61	2.5	16.2	96	68	180	135	
35.5	**35.13**	34	27.5	102	2.4	6.01	2.3	17.4	95	68	180	135	
40	**41.56**	29	27.5	86	2.6	5.61	2.5	16.2	87	63	160	120	
45	**44.5**	27	27.5	80	2.4	6.01	2.3	17.4	85	61	155	120	148
50	**50.65**	24	27.5	71	2.1	6.84	2.0	19.8	79	57	145	110	150
56	**54.23**	22	27.5	66	2.0	7.32	1.9	21.2	78	57	145	110	
63	**61.88**	19	27.5	58	2.1	6.84	2.0	19.8	73	53	135	100	
71	**66.26**	18	27.5	54	2.0	7.32	1.9	21.2	72	52	135	100	
80	**79.22**	15	27.5	46	2.1	6.84	2.0	19.8	65	47	120	91	
90	**84.83**	14	27.5	43	2.0	7.32	1.9	21.2	65	47	120	90	
n_1 = 1500 min^{-1} (50Hz)					DRS90M4 1.6 kW S3 I_N=3.55 A (400V)		DRS112M4/Z 4.4 kW S3 I_N=9 A (400V)						IE1
25	**26.25**	57	27.2	168	2.6	5.56	2.5	15.8	100	64	215	160	
28	**28.1**	53	27.5	159	2.5	5.95	2.4	16.9	100	66	215	160	
31.5	**32.81**	46	27.5	136	2.1	6.95	2.0	19.7	96	66	205	150	
35.5	**35.13**	43	27.5	127	2.0	7.45	1.9	21.1	95	66	200	150	
40	**41.56**	36	27.5	108	2.1	6.95	2.0	19.7	89	63	185	140	
45	**44.5**	34	27.5	100	2.0	7.45	1.9	21.1	86	61	180	135	148
50	**50.65**	30	27.5	88	1.7	8.47	1.7	24.1	81	57	165	125	150
56	**54.23**	28	27.5	82	1.6	9.07	1.6	25.8	80	57	165	125	
63	**61.88**	24	27.5	73	1.7	8.47	1.7	24.1	75	53	150	115	
71	**66.26**	23	27.5	68	1.6	9.07	1.6	25.8	74	53	150	115	
80	**79.22**	19	27.5	57	1.7	8.47	1.7	24.1	67	48	135	105	
90	**84.83**	18	27.5	53	1.6	9.07	1.6	25.8	67	48	135	100	
n_1 = 1800 min^{-1} (60Hz)					DRS90M4 1.6 kW S3 I_N=3.5 A (460V)		DRS112M4/Z 4.4 kW S3 I_N=8.6 A (460V)						IE1
25	**26.25**	69	27.2	202	3.3	4.49	3.1	13.0	97	*)	230	170	
28	**28.1**	64	27.5	191	3.1	4.80	2.9	13.9	97	52	230	170	
31.5	**32.81**	55	27.5	164	2.6	5.61	2.5	16.2	94	56	220	160	
35.5	**35.13**	51	27.5	153	2.4	6.01	2.3	17.4	93	57	215	160	
40	**41.56**	43	27.5	129	2.6	5.61	2.5	16.2	89	60	200	150	
45	**44.5**	40	27.5	121	2.4	6.01	2.3	17.4	86	59	190	145	148
50	**50.65**	36	27.5	106	2.1	6.84	2.0	19.8	81	56	180	135	150
56	**54.23**	33	27.5	99	2.0	7.32	1.9	21.2	80	55	180	135	
63	**61.88**	29	27.5	88	2.1	6.84	2.0	19.8	75	52	165	125	
71	**66.26**	27	27.5	82	2.0	7.32	1.9	21.2	74	52	165	120	
80	**79.22**	23	27.5	68	2.1	6.84	2.0	19.8	68	48	150	110	
90	**84.83**	21	27.5	64	2.0	7.32	1.9	21.2	67	48	145	110	

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X.K160..													36.0 kNm
					KF67 i=35.62		KF87 i=36.52						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS90L4 2.5 kW S3 I_N=5.5 A (400V)		DRS132S4/Z 6.0 kW S3 I_N=12.2 A (400V)						IE1
20	**20.23**	49	36.0	193	3.4	6.69	3.5	15.7	150	105	260	195	
22.4	**22.8**	44	36.0	171	3.0	7.53	3.1	17.7	145	100	250	185	
25	**24.77**	40	36.0	158	2.8	8.18	2.8	19.3	140	99	240	180	
28	**27.91**	36	36.0	140	2.5	9.22	2.5	21.7	135	97	235	175	
31.5	**30.94**	32	36.0	126	2.8	8.18	2.8	19.3	130	93	220	165	
35.5	**34.87**	29	36.0	112	2.5	9.22	2.5	21.7	125	90	215	160	148
40	**39.12**	26	36.0	100	2.2	10.3	2.3	24.4	105	78	185	140	150
45	**44.08**	23	36.0	89	2.0	11.6	2.0	27.5	105	76	180	135	
50	**48.46**	21	36.0	81	2.2	10.3	2.3	24.4	94	69	160	120	
56	**54.62**	18	36.0	72	2.0	11.6	2.0	27.5	95	69	160	120	
63	**62.05**	16	36.0	63	2.2	10.3	2.3	24.4	85	62	145	110	
71	**69.92**	14	36.0	56	2.0	11.6	2.0	27.5	85	62	145	110	
n_1 = 1200 min^{-1} (60Hz)					DRS90L4 2.5 kW S3 I_N=5.3 A (460V)		DRS132S4/Z 6.0 kW S3 I_N=11.9 A (460V)						IE1
20	**20.23**	59	36.0	231	4.3	5.38	4.2	12.9	150	105	290	215	
22.4	**22.8**	53	36.0	205	3.8	6.06	3.8	14.5	145	100	280	205	
25	**24.77**	48	36.0	189	3.5	6.58	3.5	15.8	140	97	265	200	
28	**27.91**	43	36.0	168	3.1	7.42	3.1	17.8	135	96	265	195	
31.5	**30.94**	39	36.0	151	3.5	6.58	3.5	15.8	130	94	250	185	
35.5	**34.87**	34	36.0	134	3.1	7.42	3.1	17.8	125	90	240	180	148
40	**39.12**	31	36.0	120	2.8	8.33	2.7	20.0	110	78	205	155	150
45	**44.08**	27	36.0	106	2.4	9.38	2.4	22.5	110	77	200	150	
50	**48.46**	25	36.0	98	2.8	8.33	2.7	20.0	97	70	180	135	
56	**54.62**	22	36.0	87	2.4	9.38	2.4	22.5	97	70	180	135	
63	**62.05**	19	36.0	76	2.8	8.33	2.7	20.0	87	63	160	120	
71	**69.92**	17	36.0	68	2.4	9.38	2.4	22.5	88	63	160	120	
n_1 = 1500 min^{-1} (50Hz)					DRS90L4 2.5 kW S3 I_N=5.5 A (400V)		DRS132S4/Z 6.0 kW S3 I_N=12.2 A (400V)						IE1
20	**20.23**	74	36.0	289	3.4	6.69	3.5	15.7	145	80	325	240	
22.4	**22.8**	66	36.0	257	3.0	7.53	3.1	17.7	140	79	310	230	
25	**24.77**	61	36.0	236	2.8	8.18	2.8	19.3	135	83	300	220	
28	**27.91**	54	36.0	210	2.5	9.22	2.5	21.7	135	84	295	215	
31.5	**30.94**	48	36.0	189	2.8	8.18	2.8	19.3	130	91	280	210	
35.5	**34.87**	43	36.0	168	2.5	9.22	2.5	21.7	125	87	270	200	148
40	**39.12**	38	36.0	150	2.2	10.3	2.3	24.4	110	76	230	175	150
45	**44.08**	34	36.0	133	2.0	11.6	2.0	27.5	110	75	230	170	
50	**48.46**	31	36.0	122	2.2	10.3	2.3	24.4	98	69	205	155	
56	**54.62**	27	36.0	108	2.0	11.6	2.0	27.5	99	70	205	155	
63	**62.05**	24	36.0	95	2.2	10.3	2.3	24.4	89	64	185	140	
71	**69.92**	21	36.0	85	2.0	11.6	2.0	27.5	90	64	185	140	
n_1 = 1800 min^{-1} (60Hz)					DRS90L4 2.5 kW S3 I_N=5.3 A (460V)		DRS132S4/Z 6.0 kW S3 I_N=11.9 A (460V)						IE1
20	**20.23**	89	36.0	347	4.3	5.38	4.2	12.9	125	*)	345	250	
22.4	**22.8**	79	36.0	308	3.8	6.06	3.8	14.5	120	*)	330	240	
25	**24.77**	73	36.0	284	3.5	6.58	3.5	15.8	125	*)	320	230	
28	**27.91**	64	36.0	252	3.1	7.42	3.1	17.8	125	*)	315	225	
31.5	**30.94**	58	36.0	227	3.5	6.58	3.5	15.8	130	76	300	220	
35.5	**34.87**	52	36.0	201	3.1	7.42	3.1	17.8	125	75	290	210	148
40	**39.12**	46	36.0	180	2.8	8.33	2.7	20.0	110	67	250	185	150
45	**44.08**	41	36.0	159	2.4	9.38	2.4	22.5	105	69	245	180	
50	**48.46**	37	36.0	146	2.8	8.33	2.7	20.0	98	66	220	165	
56	**54.62**	33	36.0	130	2.4	9.38	2.4	22.5	99	68	220	165	
63	**62.05**	29	36.0	114	2.8	8.33	2.7	20.0	90	63	200	150	
71	**69.92**	26	36.0	101	2.4	9.38	2.4	22.5	90	63	200	150	

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X.K170..													45.0 kNm
					KF67 i=35.62		KF87 i=36.52						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS90L4 2.5 kW S3 I_N=5.5 A (400V)		DRS132S4/Z 6.0 kW S3 I_N=12.2 A (400V)						IE1
25	**25.15**	40	45.0	194	2.8	8.31	2.8	19.6	155	110	270	205	
28	**28.26**	35	45.0	173	2.5	9.34	2.5	22.0	155	110	265	200	
31.5	**30.78**	32	45.0	158	2.3	10.1	2.3	24.0	145	105	245	185	
35.5	**34.6**	29	45.0	141	2.0	11.4	2.0	26.9	140	100	245	185	
40	**38.45**	26	45.0	127	2.3	10.1	2.3	24.0	135	97	230	175	
45	**43.22**	23	45.0	113	2.0	11.4	2.0	26.9	130	96	225	170	148
50	**48.62**	21	45.0	100	1.8	12.8	1.8	30.3	110	80	190	145	150
56	**54.64**	18	45.0	89	1.6	14.4	1.6	34.1	110	79	185	140	
63	**60.23**	17	45.0	82	1.8	12.8	1.8	30.3	97	71	165	125	
71	**67.69**	15	45.0	73	1.6	14.4	1.6	34.1	98	71	165	125	
80	**77.11**	13	45.0	64	1.8	12.8	1.8	30.3	88	64	150	110	
90	**86.67**	12	45.0	57	1.6	14.4	1.6	34.1	86	63	145	110	
n_1 = 1200 min^{-1} (60Hz)					DRS90L4 2.5 kW S3 I_N=5.3 A (460V)		DRS132S4/Z 6.0 kW S3 I_N=11.9 A (460V)						IE1
25	**25.15**	48	45.0	233	3.4	6.69	3.4	16.0	155	110	300	225	
28	**28.26**	42	45.0	207	3.0	7.51	3.0	18.0	155	110	300	220	
31.5	**30.78**	39	45.0	190	2.8	8.18	2.8	19.6	145	100	275	205	
35.5	**34.6**	35	45.0	169	2.5	9.20	2.5	22.1	140	100	270	205	
40	**38.45**	31	45.0	152	2.8	8.18	2.8	19.6	135	97	255	195	
45	**43.22**	28	45.0	135	2.5	9.20	2.5	22.1	135	96	255	190	148
50	**48.62**	25	45.0	120	2.2	10.3	2.2	24.8	115	81	215	160	150
56	**54.64**	22	45.0	107	2.0	11.6	2.0	27.9	110	80	210	155	
63	**60.23**	20	45.0	98	2.2	10.3	2.2	24.8	100	72	185	140	
71	**67.69**	18	45.0	87	2.0	11.6	2.0	27.9	100	73	185	140	
80	**77.11**	16	45.0	77	2.2	10.3	2.2	24.8	90	65	165	125	
90	**86.67**	14	45.0	68	2.0	11.6	2.0	27.9	89	64	165	125	
n_1 = 1500 min^{-1} (50Hz)					DRS90L4 2.5 kW S3 I_N=5.5 A (400V)		DRS132S4/Z 6.0 kW S3 I_N=12.2 A (400V)						IE1
25	**25.15**	60	45.0	291	2.8	8.31	2.8	19.6	155	87	340	250	
28	**28.26**	53	45.0	259	2.5	9.34	2.5	22.0	150	92	335	245	
31.5	**30.78**	49	45.0	238	2.3	10.1	2.3	24.0	140	88	310	230	
35.5	**34.6**	43	45.0	211	2.0	11.4	2.0	26.9	140	91	305	225	
40	**38.45**	39	45.0	190	2.3	10.1	2.3	24.0	135	95	290	215	
45	**43.22**	35	45.0	169	2.0	11.4	2.0	26.9	135	94	285	215	148
50	**48.62**	31	45.0	150	1.8	12.8	1.8	30.3	115	80	240	180	150
56	**54.64**	27	45.0	134	1.6	14.4	1.6	34.1	115	79	235	175	
63	**60.23**	25	45.0	123	1.8	12.8	1.8	30.3	100	72	210	160	
71	**67.69**	22	45.0	109	1.6	14.4	1.6	34.1	105	73	210	160	
80	**77.11**	19	45.0	96	1.8	12.8	1.8	30.3	93	66	190	145	
90	**86.67**	17	45.0	85	1.6	14.4	1.6	34.1	91	65	185	140	
n_1 = 1800 min^{-1} (60Hz)					DRS90L4 2.5 kW S3 I_N=5.3 A (460V)		DRS132S4/Z 6.0 kW S3 I_N=11.9 A (460V)						IE1
25	**25.15**	72	45.0	349	3.4	6.69	3.4	16.0	135	*)	360	260	
28	**28.26**	64	45.0	311	3.0	7.51	3.0	18.0	140	*)	355	255	
31.5	**30.78**	58	45.0	285	2.8	8.18	2.8	19.6	135	*)	330	240	
35.5	**34.6**	52	45.0	254	2.5	9.20	2.5	22.1	135	69	325	235	
40	**38.45**	47	45.0	228	2.8	8.18	2.8	19.6	135	81	310	230	
45	**43.22**	42	45.0	203	2.5	9.20	2.5	22.1	135	85	305	225	148
50	**48.62**	37	45.0	181	2.2	10.3	2.2	24.8	110	71	260	190	150
56	**54.64**	33	45.0	161	2.0	11.6	2.0	27.9	110	73	255	190	
63	**60.23**	30	45.0	147	2.2	10.3	2.2	24.8	100	70	230	170	
71	**67.69**	27	45.0	131	2.0	11.6	2.0	27.9	105	71	230	170	
80	**77.11**	23	45.0	115	2.2	10.3	2.2	24.8	93	65	205	155	
90	**86.67**	21	45.0	102	2.0	11.6	2.0	27.9	92	64	200	150	

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X.K180..													58.0 kNm
					KF77 i=38.39		KF97 i=38.3						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS100M4 3.3 kW S3 I_N=7 A (400V)		DRS132MC4/Z 10.0 kW S3 I_N=20.5 A (400V)						IE1
25	**25.55**	39	58.0	246	2.5	12.0	2.7	34.2	160	115	260	195	
28	**28.61**	35	58.0	220	2.2	13.4	2.4	38.3	165	120	265	195	
31.5	**32.36**	31	58.0	194	2.5	12.0	2.7	34.2	145	105	230	170	
35.5	**36.24**	28	58.0	173	2.2	13.4	2.4	38.3	150	110	240	180	
40	**38.93**	26	58.0	161	2.1	14.4	2.2	41.1	135	99	215	160	148
45	**43.6**	23	58.0	144	1.9	16.1	2.0	46.1	135	100	215	160	150
50	**47.57**	21	58.0	133	2.1	14.4	2.2	41.1	120	90	190	145	
56	**53.27**	19	58.0	119	1.9	16.1	2.0	46.1	125	93	195	150	
63	**60.9**	16	58.0	104	2.1	14.4	2.2	41.1	110	80	170	125	
71	**68.2**	15	58.0	93	1.9	16.1	2.0	46.1	110	82	170	130	
n_1 = 1200 min^{-1} (60Hz)					DRS100M4 3.3 kW S3 I_N=6.9 A (460V)		DRS132MC4/Z 10.0 kW S3 I_N=19.5 A (460V)						IE1
25	**25.55**	47	58.0	295	3.1	9.63	3.2	28.3	160	105	290	210	
28	**28.61**	42	58.0	264	2.8	10.7	2.9	31.8	165	110	290	215	
31.5	**32.36**	37	58.0	233	3.1	9.63	3.2	28.3	145	105	255	190	
35.5	**36.24**	33	58.0	208	2.8	10.7	2.9	31.8	150	110	265	200	
40	**38.93**	31	58.0	194	2.6	11.5	2.7	34.1	135	98	240	175	148
45	**43.6**	28	58.0	173	2.3	12.9	2.4	38.2	135	99	240	180	150
50	**47.57**	25	58.0	160	2.6	11.5	2.7	34.1	125	91	215	160	
56	**53.27**	23	58.0	143	2.3	12.9	2.4	38.2	125	93	220	165	
63	**60.9**	20	58.0	125	2.6	11.5	2.7	34.1	110	82	190	140	
71	**68.2**	18	58.0	112	2.3	12.9	2.4	38.2	115	83	195	145	
n_1 = 1500 min^{-1} (50Hz)					DRS100M4 3.3 kW S3 I_N=7 A (400V)		DRS132MC4/Z 10.0 kW S3 I_N=20.5 A (400V)						IE1
25	**25.55**	59	58.0	369	2.5	12.0	2.7	34.2	145	*)	320	230	
28	**28.61**	52	58.0	330	2.2	13.4	2.4	38.3	155	90	320	235	
31.5	**32.36**	46	58.0	291	2.5	12.0	2.7	34.2	145	92	285	210	
35.5	**36.24**	41	58.0	260	2.2	13.4	2.4	38.3	150	99	295	220	
40	**38.93**	39	58.0	242	2.1	14.4	2.2	41.1	135	89	265	195	148
45	**43.6**	34	58.0	216	1.9	16.1	2.0	46.1	135	92	270	200	150
50	**47.57**	32	58.0	200	2.1	14.4	2.2	41.1	125	87	240	180	
56	**53.27**	28	58.0	179	1.9	16.1	2.0	46.1	130	91	250	185	
63	**60.9**	25	58.0	156	2.1	14.4	2.2	41.1	110	81	215	160	
71	**68.2**	22	58.0	140	1.9	16.1	2.0	46.1	115	83	220	165	
n_1 = 1800 min^{-1} (60Hz)					DRS100M4 3.3 kW S3 I_N=6.9 A (460V)		DRS132MC4/Z 10.0 kW S3 I_N=19.5 A (460V)						IE1
25	**25.55**	70	58.0	443	3.1	9.63	3.2	28.3	120	*)	330	235	
28	**28.61**	63	58.0	396	2.8	10.7	2.9	31.8	125	*)	335	235	
31.5	**32.36**	56	58.0	350	3.1	9.63	3.2	28.3	130	*)	305	220	
35.5	**36.24**	50	58.0	312	2.8	10.7	2.9	31.8	140	79	315	225	
40	**38.93**	46	58.0	291	2.6	11.5	2.7	34.1	125	73	285	205	148
45	**43.6**	41	58.0	260	2.3	12.9	2.4	38.2	130	77	285	205	150
50	**47.57**	38	58.0	240	2.6	11.5	2.7	34.1	120	77	260	190	
56	**53.27**	34	58.0	214	2.3	12.9	2.4	38.2	125	82	265	195	
63	**60.9**	30	58.0	188	2.6	11.5	2.7	34.1	110	77	230	170	
71	**68.2**	26	58.0	167	2.3	12.9	2.4	38.2	115	80	235	175	

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X.K190..													65.0 kNm
					KF77 i=38.39		KF97 i=38.3						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS100M4 3.3 kW S3 I_N=7 A (400V)		DRS132MC4/Z 10.0 kW S3 I_N=20.5 A (400V)						IE1
28	**28.53**	35	65.0	247	2.3	13.4	2.4	38.2	170	125	275	205	
31.5	**32.06**	31	65.0	220	2.0	15.0	2.1	42.9	170	125	275	205	
35.5	**36.14**	28	65.0	195	2.3	13.4	2.4	38.2	150	110	240	180	
40	**40.61**	25	65.0	174	2.0	15.0	2.1	42.9	155	115	250	185	
45	**43.48**	23	65.0	162	1.9	16.1	2.0	45.9	140	105	225	165	148
50	**48.85**	20	65.0	144	1.7	18.1	1.8	51.6	140	105	225	170	150
56	**53.11**	19	65.0	134	1.9	16.1	2.0	45.9	130	96	205	155	
63	**59.68**	17	65.0	119	1.7	18.1	1.8	51.6	130	97	205	155	
71	**68**	15	65.0	105	1.9	16.1	2.0	45.9	110	84	175	130	
80	**76.41**	13	65.0	93	1.7	18.1	1.8	51.6	115	85	180	135	
n_1 = 1200 min^{-1} (60Hz)					DRS100M4 3.3 kW S3 I_N=6.9 A (460V)		DRS132MC4/Z 10.0 kW S3 I_N=19.5 A (460V)						IE1
28	**28.53**	42	65.0	296	2.8	10.7	2.9	31.7	170	115	300	225	
31.5	**32.06**	37	65.0	264	2.5	12.0	2.6	35.6	170	120	305	225	
35.5	**36.14**	33	65.0	234	2.8	10.7	2.9	31.7	155	110	270	200	
40	**40.61**	30	65.0	208	2.5	12.0	2.6	35.6	160	115	280	205	
45	**43.48**	28	65.0	194	2.3	12.9	2.4	38.1	140	105	250	185	148
50	**48.85**	25	65.0	173	2.1	14.5	2.1	42.8	145	105	250	185	150
56	**53.11**	23	65.0	161	2.3	12.9	2.4	38.1	130	97	230	170	
63	**59.68**	20	65.0	143	2.1	14.5	2.1	42.8	135	97	230	170	
71	**68**	18	65.0	126	2.3	12.9	2.4	38.1	115	85	195	150	
80	**76.41**	16	65.0	112	2.1	14.5	2.1	42.8	115	87	200	150	
n_1 = 1500 min^{-1} (50Hz)					DRS100M4 3.3 kW S3 I_N=7 A (400V)		DRS132MC4/Z 10.0 kW S3 I_N=20.5 A (400V)						IE1
28	**28.53**	53	65.0	370	2.3	13.4	2.4	38.2	155	*)	335	240	
31.5	**32.06**	47	65.0	330	2.0	15.0	2.1	42.9	160	97	340	245	
35.5	**36.14**	42	65.0	292	2.3	13.4	2.4	38.2	150	98	300	220	
40	**40.61**	37	65.0	260	2.0	15.0	2.1	42.9	155	105	310	230	
45	**43.48**	34	65.0	243	1.9	16.1	2.0	45.9	140	95	280	205	148
50	**48.85**	31	65.0	216	1.7	18.1	1.8	51.6	140	98	280	205	150
56	**53.11**	28	65.0	201	1.9	16.1	2.0	45.9	130	94	255	190	
63	**59.68**	25	65.0	179	1.7	18.1	1.8	51.6	135	95	260	190	
71	**68**	22	65.0	157	1.9	16.1	2.0	45.9	115	85	220	165	
80	**76.41**	20	65.0	140	1.7	18.1	1.8	51.6	120	86	225	170	
n_1 = 1800 min^{-1} (60Hz)					DRS100M4 3.3 kW S3 I_N=6.9 A (460V)		DRS132MC4/Z 10.0 kW S3 I_N=19.5 A (460V)						IE1
28	**28.53**	63	65.0	445	2.8	10.7	2.9	31.7	130	*)	350	245	
31.5	**32.06**	56	65.0	396	2.5	12.0	2.6	35.6	135	*)	355	250	
35.5	**36.14**	50	65.0	351	2.8	10.7	2.9	31.7	135	*)	320	230	
40	**40.61**	44	65.0	312	2.5	12.0	2.6	35.6	145	85	330	240	
45	**43.48**	41	65.0	292	2.3	12.9	2.4	38.1	130	78	295	215	148
50	**48.85**	37	65.0	260	2.1	14.5	2.1	42.8	135	82	300	215	150
56	**53.11**	34	65.0	241	2.3	12.9	2.4	38.1	130	84	275	200	
63	**59.68**	30	65.0	215	2.1	14.5	2.1	42.8	130	86	275	205	
71	**68**	26	65.0	188	2.3	12.9	2.4	38.1	115	81	240	180	
80	**76.41**	24	65.0	168	2.1	14.5	2.1	42.8	120	84	245	180	

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X.K200..													79.0 kNm
					KF77 i=38.39		KF97 i=38.3						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS112M4 4.4 kW S3 I_N=9 A (400V)		DRS160M4/Z 12.0 kW S3 I_N=24 A (400V)						IE1
25	**25.72**	39	79.0	333	2.7	15.2	2.7	40.7	190	130	315	230	
28	**29.17**	34	79.0	294	2.3	17.2	2.4	46.1	190	135	305	225	
31.5	**31.97**	31	79.0	268	2.7	15.2	2.7	40.7	180	130	285	210	
35.5	**36.26**	28	79.0	236	2.3	17.2	2.4	46.1	175	130	280	210	
40	**39.61**	25	79.0	216	2.1	18.8	2.2	50.4	175	125	275	205	148
45	**44.92**	22	79.0	191	1.9	21.3	1.9	57.1	165	120	265	200	150
50	**48.39**	21	79.0	179	2.1	18.8	2.2	50.4	160	120	250	190	
56	**54.88**	18	79.0	158	1.9	21.3	1.9	57.1	160	120	255	190	
63	**61.95**	16	79.0	140	2.1	18.8	2.2	50.4	145	110	230	175	
71	**70.26**	14	79.0	123	1.9	21.3	1.9	57.1	145	105	225	170	
n_1 = 1200 min^{-1} (60Hz)					DRS100L4 4.4 kW S3 I_N=9.2 A (460V)		DRS160M4/Z 12.0 kW S3 I_N=23 A (460V)						IE1
25	**25.72**	47	79.0	400	3.2	12.7	3.3	33.7	185	115	345	250	
28	**29.17**	41	79.0	352	2.8	14.4	2.9	38.2	185	120	340	245	
31.5	**31.97**	38	79.0	321	3.2	12.7	3.3	33.7	180	125	315	235	
35.5	**36.26**	33	79.0	283	2.8	14.4	2.9	38.2	175	125	310	230	
40	**39.61**	30	79.0	259	2.6	15.7	2.6	41.8	175	125	305	230	148
45	**44.92**	27	79.0	229	2.3	17.8	2.3	47.4	165	120	295	220	150
50	**48.39**	25	79.0	214	2.6	15.7	2.6	41.8	160	120	280	210	
56	**54.88**	22	79.0	189	2.3	17.8	2.3	47.4	165	120	285	210	
63	**61.95**	19	79.0	167	2.6	15.7	2.6	41.8	150	110	255	195	
71	**70.26**	17	79.0	148	2.3	17.8	2.3	47.4	145	105	250	190	
n_1 = 1500 min^{-1} (50Hz)					DRS112M4 4.4 kW S3 I_N=9 A (400V)		DRS160M4/Z 12.0 kW S3 I_N=24 A (400V)						IE1
25	**25.72**	58	79.0	499	2.7	15.2	2.7	40.7	155	*)	375	265	
28	**29.17**	51	79.0	440	2.3	17.2	2.4	46.1	160	*)	370	260	
31.5	**31.97**	47	79.0	402	2.7	15.2	2.7	40.7	170	110	350	260	
35.5	**36.26**	41	79.0	354	2.3	17.2	2.4	46.1	170	110	345	255	
40	**39.61**	38	79.0	324	2.1	18.8	2.2	50.4	170	110	340	250	148
45	**44.92**	33	79.0	286	1.9	21.3	1.9	57.1	165	110	330	240	150
50	**48.39**	31	79.0	268	2.1	18.8	2.2	50.4	160	110	315	235	
56	**54.88**	27	79.0	236	1.9	21.3	1.9	57.1	165	115	320	235	
63	**61.95**	24	79.0	209	2.1	18.8	2.2	50.4	150	105	290	215	
71	**70.26**	21	79.0	185	1.9	21.3	1.9	57.1	145	105	285	210	
n_1 = 1800 min^{-1} (60Hz)					DRS100L4 4.4 kW S3 I_N=9.2 A (460V)		DRS160M4/Z 12.0 kW S3 I_N=23 A (460V)						IE1
25	**25.72**	70	77.2	586	3.2	12.7	3.3	33.7	*)	*)	385	255	
28	**29.17**	62	78.5	525	2.8	14.4	2.9	38.2	*)	*)	380	260	
31.5	**31.97**	56	79.0	482	3.2	12.7	3.3	33.7	150	*)	370	270	
35.5	**36.26**	50	79.0	425	2.8	14.4	2.9	38.2	155	*)	365	265	
40	**39.61**	45	79.0	389	2.6	15.7	2.6	41.8	160	*)	365	260	148
45	**44.92**	40	79.0	343	2.3	17.8	2.3	47.4	155	87	350	250	150
50	**48.39**	37	79.0	322	2.6	15.7	2.6	41.8	155	96	340	245	
56	**54.88**	33	79.0	284	2.3	17.8	2.3	47.4	160	100	340	250	
63	**61.95**	29	79.0	251	2.6	15.7	2.6	41.8	145	98	310	230	
71	**70.26**	26	79.0	221	2.3	17.8	2.3	47.4	145	99	305	225	

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X.K210..													90.0 kNm
					KF77 i=38.39		KF97 i=38.3						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS112M4 4.4 kW S3 I_N=9 A (400V)		DRS160M4/Z 12.0 kW S3 I_N=24 A (400V)						IE1
28	**29.13**	34	90.0	335	2.3	17.2	2.4	46.0	195	135	320	235	
31.5	**32.97**	30	90.0	296	2.1	19.5	2.1	52.1	185	130	305	225	
35.5	**36.2**	28	90.0	269	2.3	17.2	2.4	46.0	180	135	290	215	
40	**40.99**	24	90.0	238	2.1	19.5	2.1	52.1	180	130	285	210	
45	**44.85**	22	90.0	218	1.9	21.3	1.9	57.1	175	130	280	210	148
50	**50.78**	20	90.0	192	1.7	24.1	1.7	64.6	170	125	270	200	150
56	**54.79**	18	90.0	180	1.9	21.3	1.9	57.1	165	120	255	195	
63	**62.03**	16	90.0	159	1.7	24.1	1.7	64.6	165	120	260	195	
71	**70.15**	14	90.0	140	1.9	21.3	1.9	57.1	150	110	235	175	
80	**79.42**	13	90.0	124	1.7	24.1	1.7	64.6	145	110	230	175	
n_1 = 1200 min^{-1} (60Hz)					DRS100L4 4.4 kW S3 I_N=9.2 A (460V)		DRS160M4/Z 12.0 kW S3 I_N=23 A (460V)						IE1
28	**29.13**	41	90.0	402	2.8	14.4	2.9	38.2	190	120	350	255	
31.5	**32.97**	36	90.0	355	2.5	16.3	2.5	43.2	185	120	335	245	
35.5	**36.2**	33	90.0	323	2.8	14.4	2.9	38.2	185	130	320	240	
40	**40.99**	29	90.0	286	2.5	16.3	2.5	43.2	180	130	315	235	
45	**44.85**	27	90.0	261	2.3	17.8	2.3	47.3	180	130	310	235	148
50	**50.78**	24	90.0	231	2.0	20.2	2.1	53.6	170	125	300	225	150
56	**54.79**	22	90.0	216	2.3	17.8	2.3	47.3	165	120	290	215	
63	**62.03**	19	90.0	191	2.0	20.2	2.1	53.6	165	120	290	215	
71	**70.15**	17	90.0	168	2.3	17.8	2.3	47.3	150	110	260	195	
80	**79.42**	15	90.0	149	2.0	20.2	2.1	53.6	150	110	255	195	
n_1 = 1500 min^{-1} (50Hz)					DRS112M4 4.4 kW S3 I_N=9 A (400V)		DRS160M4/Z 12.0 kW S3 I_N=24 A (400V)						IE1
28	**29.13**	51	90.0	502	2.3	17.2	2.4	46.0	160	*)	385	270	
31.5	**32.97**	45	90.0	444	2.1	19.5	2.1	52.1	160	*)	365	260	
35.5	**36.2**	41	90.0	404	2.3	17.2	2.4	46.0	175	110	360	265	
40	**40.99**	37	90.0	357	2.1	19.5	2.1	52.1	175	115	350	260	
45	**44.85**	33	90.0	326	1.9	21.3	1.9	57.1	175	115	350	255	148
50	**50.78**	30	90.0	288	1.7	24.1	1.7	64.6	170	110	335	245	150
56	**54.79**	27	90.0	270	1.9	21.3	1.9	57.1	165	115	325	240	
63	**62.03**	24	90.0	238	1.7	24.1	1.7	64.6	165	120	325	240	
71	**70.15**	21	90.0	211	1.9	21.3	1.9	57.1	155	110	295	220	
80	**79.42**	19	90.0	186	1.7	24.1	1.7	64.6	150	110	290	215	
n_1 = 1800 min^{-1} (60Hz)					DRS100L4 4.4 kW S3 I_N=9.2 A (460V)		DRS160M4/Z 12.0 kW S3 I_N=23 A (460V)						IE1
28	**29.13**	62	87.4	585	2.8	14.4	2.9	38.2	*)	*)	395	265	
31.5	**32.97**	55	88.6	524	2.5	16.3	2.5	43.2	*)	*)	375	260	
35.5	**36.2**	50	90.0	485	2.8	14.4	2.9	38.2	155	*)	380	275	
40	**40.99**	44	90.0	428	2.5	16.3	2.5	43.2	160	*)	375	270	
45	**44.85**	40	90.0	392	2.3	17.8	2.3	47.3	160	*)	370	270	148
50	**50.78**	35	90.0	346	2.0	20.2	2.1	53.6	155	90	355	255	150
56	**54.79**	33	90.0	324	2.3	17.8	2.3	47.3	160	100	345	250	
63	**62.03**	29	90.0	286	2.0	20.2	2.1	53.6	160	105	345	255	
71	**70.15**	26	90.0	253	2.3	17.8	2.3	47.3	150	100	315	235	
80	**79.42**	23	90.0	223	2.0	20.2	2.1	53.6	150	100	310	230	

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X.K220..													112 kNm
					KF87 i=36.52		KF107 i=37						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRS112M4 4.4 kW S3 I_N=9 A (400V)		DRS180M4 20 kW S3 I_N=37.5 A (400V)						IE1
25	**25.28**	40	112	480	2.8	14.5	2.8	65.4	250	165	420	305	
28	**27.9**	36	112	435	2.5	16.0	2.5	72.1	255	175	425	310	
31.5	**32.02**	31	112	379	2.8	14.5	2.8	65.4	245	180	390	290	
35.5	**35.34**	28	112	344	2.5	16.0	2.5	72.1	240	175	385	290	
40	**39.55**	25	112	307	2.3	17.9	2.3	80.7	220	160	350	265	152
45	**43.65**	23	112	278	2.0	19.7	2.1	89.1	220	160	345	260	154
50	**48.32**	21	112	254	2.3	17.9	2.3	80.7	210	155	330	250	
56	**53.33**	19	112	230	2.0	19.7	2.1	89.1	205	150	325	245	
63	**61.86**	16	112	198	2.3	17.9	2.3	80.7	180	135	285	215	
71	**68.27**	15	112	180	2.0	19.7	2.1	89.1	180	130	280	210	
n_1 = 1200 min^{-1} (60Hz)					DRS100L4 4.4 kW S3 I_N=9.2 A (460V)		DRS180M4 20 kW S3 I_N=37 A (460V)						IE1
25	**25.28**	47	112	576	3.3	12.1	3.4	54.1	230	*)	460	330	
28	**27.9**	43	112	522	3.0	13.3	3.1	59.7	245	145	465	335	
31.5	**32.02**	37	112	455	3.3	12.1	3.4	54.1	245	165	435	320	
35.5	**35.34**	34	112	412	3.0	13.3	3.1	59.7	240	165	430	320	
40	**39.55**	30	112	368	2.7	14.9	2.7	66.8	220	155	390	290	152
45	**43.65**	27	112	334	2.4	16.5	2.5	73.8	220	155	385	285	154
50	**48.32**	25	112	304	2.7	14.9	2.7	66.8	210	155	370	275	
56	**53.33**	23	112	276	2.4	16.5	2.5	73.8	210	150	365	270	
63	**61.86**	19	112	238	2.7	14.9	2.7	66.8	185	135	320	240	
71	**68.27**	18	112	215	2.4	16.5	2.5	73.8	180	135	315	235	
n_1 = 1500 min^{-1} (50Hz)					DRS112M4 4.4 kW S3 I_N=9 A (400V)		DRS180M4 20 kW S3 I_N=37.5 A (400V)						IE1
25	**25.28**	59	112	720	2.8	14.5	2.8	65.4	*)	*)	490	340	
28	**27.9**	54	112	653	2.5	16.0	2.5	72.1	190	*)	500	350	
31.5	**32.02**	47	112	569	2.8	14.5	2.8	65.4	230	*)	485	350	
35.5	**35.34**	42	112	515	2.5	16.0	2.5	72.1	230	140	475	345	
40	**39.55**	38	112	460	2.3	17.9	2.3	80.7	210	125	435	320	152
45	**43.65**	34	112	417	2.0	19.7	2.1	89.1	210	130	430	315	154
50	**48.32**	31	112	380	2.3	17.9	2.3	80.7	210	140	410	305	
56	**53.33**	28	112	345	2.0	19.7	2.1	89.1	205	140	405	300	
63	**61.86**	24	112	297	2.3	17.9	2.3	80.7	185	130	360	265	
71	**68.27**	22	112	269	2.0	19.7	2.1	89.1	185	130	355	265	
n_1 = 1800 min^{-1} (60Hz)					DRS100L4 4.4 kW S3 I_N=9.2 A (460V)		DRS180M4 20 kW S3 I_N=37 A (460V)						IE1
25[1)]	**25.28**	71	112	864	3.3	12.1	3.4	54.1	*)	*)	490	300	
28[1)]	**27.9**	65	112	783	3.0	13.3	3.1	59.7	*)	*)	500	320	
31.5	**32.02**	56	112	682	3.3	12.1	3.4	54.1	190	*)	510	360	
35.5	**35.34**	51	112	618	3.0	13.3	3.1	59.7	195	*)	500	355	
40	**39.55**	46	112	553	2.7	14.9	2.7	66.8	180	*)	460	330	152
45	**43.65**	41	112	501	2.4	16.5	2.5	73.8	185	*)	450	325	154
50	**48.32**	37	112	457	2.7	14.9	2.7	66.8	195	*)	440	320	
56	**53.33**	34	112	414	2.4	16.5	2.5	73.8	195	115	430	315	
63	**61.86**	29	112	357	2.7	14.9	2.7	66.8	180	115	385	285	
71	**68.27**	26	112	323	2.4	16.5	2.5	73.8	180	115	380	280	

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X.K230..													131 kNm
					KF87 i=36.52		KF107 i=37						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRS112M4 4.4 kW S3 I_N=9 A (400V)		DRS180M4 20 kW S3 I_N=37.5 A (400V)						IE1
28	**28.63**	35	131	496	2.5	16.4	2.5	74.0	260	175	430	315	
31.5	**31.43**	32	131	452	2.2	18.0	2.3	81.3	255	175	425	310	
35.5	**36.26**	28	131	392	2.5	16.4	2.5	74.0	250	185	400	300	
40	**39.82**	25	131	357	2.2	18.0	2.3	81.3	250	180	395	295	
45	**44.78**	22	131	317	2.0	20.2	2.0	91.4	225	165	360	270	152
50	**49.17**	20	131	289	1.8	22.2	1.8	100	225	165	355	265	154
56	**54.71**	18	131	262	2.0	20.2	2.0	91.4	210	155	330	250	
63	**60.08**	17	131	239	1.8	22.2	1.8	100	205	155	325	245	
71	**70.05**	14	131	205	2.0	20.2	2.0	91.4	185	140	290	220	
80	**76.91**	13	131	186	1.8	22.2	1.8	100	180	135	285	215	
n_1 = 1200 min^{-1} (60Hz)					DRS100L4 4.4 kW S3 I_N=9.2 A (460V)		DRS180M4 20 kW S3 I_N=37 A (460V)						IE1
28	**28.63**	42	131	595	2.9	13.7	3.0	61.3	245	150	470	340	
31.5	**31.43**	38	131	542	2.7	15.0	2.7	67.3	245	150	465	335	
35.5	**36.26**	33	131	470	2.9	13.7	3.0	61.3	250	175	445	330	
40	**39.82**	30	131	428	2.7	15.0	2.7	67.3	250	175	440	325	
45	**44.78**	27	131	381	2.4	16.9	2.4	75.7	230	160	400	300	152
50	**49.17**	24	131	347	2.2	18.6	2.2	83.1	225	160	395	295	154
56	**54.71**	22	131	314	2.4	16.9	2.4	75.7	210	155	370	275	
63	**60.08**	20	131	286	2.2	18.6	2.2	83.1	210	150	365	270	
71	**70.05**	17	131	246	2.4	16.9	2.4	75.7	190	140	325	245	
80	**76.91**	16	131	224	2.2	18.6	2.2	83.1	185	140	320	240	
n_1 = 1500 min^{-1} (50Hz)					DRS112M4 4.4 kW S3 I_N=9 A (400V)		DRS180M4 20 kW S3 I_N=37.5 A (400V)						IE1
28	**28.63**	52	131	744	2.5	16.4	2.5	74.0	195	*)	510	350	
31.5	**31.43**	48	131	678	2.2	18.0	2.3	81.3	200	*)	500	350	
35.5	**36.26**	41	131	587	2.5	16.4	2.5	74.0	240	150	495	360	
40	**39.82**	38	131	535	2.2	18.0	2.3	81.3	240	155	490	355	
45	**44.78**	33	131	476	2.0	20.2	2.0	91.4	220	140	445	325	152
50	**49.17**	31	131	433	1.8	22.2	1.8	100	220	140	440	320	154
56	**54.71**	27	131	393	2.0	20.2	2.0	91.4	210	145	415	305	
63	**60.08**	25	131	358	1.8	22.2	1.8	100	205	145	405	300	
71	**70.05**	21	131	307	2.0	20.2	2.0	91.4	190	135	365	275	
80	**76.91**	20	131	280	1.8	22.2	1.8	100	190	135	360	270	
n_1 = 1800 min^{-1} (60Hz)					DRS100L4 4.4 kW S3 I_N=9.2 A (460V)		DRS180M4 20 kW S3 I_N=37 A (460V)						IE1
28[1)]	**28.63**	63	126	862	2.9	13.7	3.0	61.3	*)	*)	510	320	
31.5[1)]	**31.43**	57	129	801	2.7	15.0	2.7	67.3	*)	*)	500	325	
35.5	**36.26**	50	129	694	2.9	13.7	3.0	61.3	210	*)	520	375	
40	**39.82**	45	131	642	2.7	15.0	2.7	67.3	210	*)	510	370	
45	**44.78**	40	131	571	2.4	16.9	2.4	75.7	195	*)	470	340	152
50	**49.17**	37	131	520	2.2	18.6	2.2	83.1	195	*)	465	335	154
56	**54.71**	33	131	472	2.4	16.9	2.4	75.7	200	120	440	320	
63	**60.08**	30	131	429	2.2	18.6	2.2	83.1	200	120	435	315	
71	**70.05**	26	131	368	2.4	16.9	2.4	75.7	190	125	395	290	
80	**76.91**	23	131	335	2.2	18.6	2.2	83.1	185	125	385	285	

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X.K240..													156 kNm
					KF87 i=36.52		KF127 i=36.25						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS132S4 6 kW S3 I_N=12.2 A (400V)		DRS180LC4 33 kW S3 I_N=63 A (400V)						IE1
25	**25.64**	39	156	660	2.8	19.9	2.8	106	280	180	485	350	
28	**29.51**	34	156	573	2.4	23.0	2.5	123	275	180	475	340	
31.5	**32.47**	31	156	521	2.8	19.9	2.8	106	280	200	460	340	
35.5	**37.38**	27	156	452	2.4	23.0	2.5	123	275	195	450	330	
40	**39.96**	25	156	423	2.2	24.5	2.3	131	275	195	445	330	152
45	**46**	22	156	368	1.9	28.3	2.0	151	260	185	425	315	154
50	**48.83**	20	156	350	2.2	24.5	2.3	131	250	180	400	295	
56	**56.2**	18	156	304	1.9	28.3	2.0	151	240	175	380	285	
63	**62.51**	16	156	273	2.2	24.5	2.3	131	230	170	360	270	
71	**71.95**	14	156	237	1.9	28.3	2.0	151	220	160	345	260	
n_1 = 1200 min^{-1} (60Hz)					DRS132S4 6 kW S3 I_N=11.9 A (460V)		DRS180LC4 33 kW S3 I_N=61 A (460V)						IE1
25	**25.64**	47	156	791	3.4	16.3	3.4	88.7	245	*)	520	365	
28	**29.51**	41	156	688	2.9	18.8	3.0	102	245	*)	510	360	
31.5	**32.47**	37	156	625	3.4	16.3	3.4	88.7	270	180	500	370	
35.5	**37.38**	32	156	543	2.9	18.8	3.0	102	270	180	495	360	
40	**39.96**	30	156	508	2.7	20.1	2.8	109	265	175	490	360	152
45	**46**	26	156	441	2.4	23.2	2.4	125	255	170	470	340	154
50	**48.83**	25	156	419	2.7	20.1	2.8	109	245	170	440	325	
56	**56.2**	21	156	364	2.4	23.2	2.4	125	235	165	420	310	
63	**62.51**	19	156	328	2.7	20.1	2.8	109	230	165	405	300	
71	**71.95**	17	156	285	2.4	23.2	2.4	125	220	160	385	290	
n_1 = 1500 min^{-1} (50Hz)					DRS132S4 6 kW S3 I_N=12.2 A (400V)		DRS180LC4 33 kW S3 I_N=63 A (400V)						IE1
25[1)]	**25.64**	59	156	989	2.8	19.9	2.8	106	*)	*)	540	350	
28[1)]	**29.51**	51	156	860	2.4	23.0	2.5	123	*)	*)	530	345	
31.5	**32.47**	46	156	781	2.8	19.9	2.8	106	235	*)	550	390	
35.5	**37.38**	40	156	679	2.4	23.0	2.5	123	235	*)	540	380	
40	**39.96**	38	156	635	2.2	24.5	2.3	131	235	*)	540	380	152
45	**46**	33	156	551	1.9	28.3	2.0	151	230	*)	510	365	154
50	**48.83**	31	156	524	2.2	24.5	2.3	131	235	145	490	355	
56	**56.2**	27	156	456	1.9	28.3	2.0	151	225	140	465	340	
63	**62.51**	24	156	410	2.2	24.5	2.3	131	225	150	450	330	
71	**71.95**	21	156	356	1.9	28.3	2.0	151	215	145	430	315	
n_1 = 1800 min^{-1} (60Hz)					DRS132S4 6 kW S3 I_N=11.9 A (460V)		DRS180LC4 33 kW S3 I_N=61 A (460V)						IE1
25[1)]	**25.64**	70	156	1187	3.4	16.3	3.4	88.7	*)	*)	510	*)	
28[1)]	**29.51**	61	156	1031	2.9	18.8	3.0	102	*)	*)	510	280	
31.5	**32.47**	55	156	937	3.4	16.3	3.4	88.7	*)	*)	560	380	
35.5	**37.38**	48	156	814	2.9	18.8	3.0	102	*)	*)	550	375	
40	**39.96**	45	156	762	2.7	20.1	2.8	109	*)	*)	550	375	152
45	**46**	39	156	662	2.4	23.2	2.4	125	175	*)	520	360	154
50	**48.83**	37	156	629	2.7	20.1	2.8	109	200	*)	510	360	
56	**56.2**	32	156	547	2.4	23.2	2.4	125	195	*)	490	345	
63	**62.51**	29	156	492	2.7	20.1	2.8	109	210	125	480	345	
71	**71.95**	25	156	427	2.4	23.2	2.4	125	200	120	460	330	

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X.K250..													175 kNm
					KF87 i=36.52		KF127 i=36.25						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS132S4 6 kW S3 I_N=12.2 A (400V)		DRS180LC4 33 kW S3 I_N=63 A (400V)						IE1
28	**27.55**	36	175	689	2.6	21.4	2.6	114	285	180	495	355	
31.5	**31.64**	32	175	600	2.2	24.6	2.3	131	270	175	470	340	
35.5	**34.89**	29	175	544	2.6	21.4	2.6	114	285	200	465	345	
40	**40.08**	25	175	473	2.2	24.6	2.3	131	275	195	445	330	
45	**42.95**	23	175	442	2.1	26.4	2.1	141	270	195	440	325	152
50	**49.33**	20	175	385	1.8	30.3	1.9	162	260	185	420	310	154
56	**52.47**	19	175	365	2.1	26.4	2.1	141	245	180	395	295	
63	**60.27**	17	175	318	1.8	30.3	1.9	162	240	175	385	290	
71	**67.18**	15	175	285	2.1	26.4	2.1	141	225	165	360	270	
80	**77.17**	13	175	248	1.8	30.3	1.9	162	220	165	350	265	
n_1 = 1200 min^{-1} (60Hz)					DRS132S4 6 kW S3 I_N=11.9 A (460V)		DRS180LC4 33 kW S3 I_N=61 A (460V)						IE1
28	**27.55**	44	175	826	3.1	17.6	3.2	95.3	250	*)	530	370	
31.5	**31.64**	38	175	719	2.7	20.2	2.8	109	240	*)	510	355	
35.5	**34.89**	34	175	652	3.1	17.6	3.2	95.3	275	180	510	375	
40	**40.08**	30	175	568	2.7	20.2	2.8	109	265	175	490	355	
45	**42.95**	28	175	530	2.5	21.6	2.6	117	265	175	485	355	152
50	**49.33**	24	175	461	2.2	24.9	2.2	134	255	170	465	340	154
56	**52.47**	23	175	438	2.5	21.6	2.6	117	245	170	440	325	
63	**60.27**	20	175	381	2.2	24.9	2.2	134	240	170	430	315	
71	**67.18**	18	175	342	2.5	21.6	2.6	117	230	165	400	300	
80	**77.17**	16	175	298	2.2	24.9	2.2	134	225	160	395	295	
n_1 = 1500 min^{-1} (50Hz)					DRS132S4 6 kW S3 I_N=12.2 A (400V)		DRS180LC4 33 kW S3 I_N=63 A (400V)						IE1
28[1)]	**27.55**	54	175	1033	2.6	21.4	2.6	114	*)	*)	560	355	
31.5[1)]	**31.64**	47	175	899	2.2	24.6	2.3	131	*)	*)	530	340	
35.5	**34.89**	43	175	816	2.6	21.4	2.6	114	240	*)	560	395	
40	**40.08**	37	175	710	2.2	24.6	2.3	131	235	*)	530	380	
45	**42.95**	35	175	662	2.1	26.4	2.1	141	230	*)	530	380	152
50	**49.33**	30	175	577	1.8	30.3	1.9	162	225	*)	510	360	154
56	**52.47**	29	175	547	2.1	26.4	2.1	141	230	145	485	350	
63	**60.27**	25	175	477	1.8	30.3	1.9	162	230	145	475	345	
71	**67.18**	22	175	428	2.1	26.4	2.1	141	225	150	450	330	
80	**77.17**	19	175	372	1.8	30.3	1.9	162	220	150	440	325	
n_1 = 1800 min^{-1} (60Hz)					DRS132S4 6 kW S3 I_N=11.9 A (460V)		DRS180LC4 33 kW S3 I_N=61 A (460V)						IE1
28[1)]	**27.55**	65	174	1232	3.1	17.6	3.2	95.3	*)	*)	520	*)	
31.5[1)]	**31.64**	57	175	1079	2.7	20.2	2.8	109	*)	*)	500	275	
35.5	**34.89**	52	175	979	3.1	17.6	3.2	95.3	*)	*)	570	385	
40	**40.08**	45	175	852	2.7	20.2	2.8	109	*)	*)	550	370	
45	**42.95**	42	175	795	2.5	21.6	2.6	117	*)	*)	540	370	152
50	**49.33**	36	175	692	2.2	24.9	2.2	134	175	*)	520	360	154
56	**52.47**	34	175	657	2.5	21.6	2.6	117	200	*)	510	360	
63	**60.27**	30	175	572	2.2	24.9	2.2	134	200	*)	495	350	
71	**67.18**	27	175	513	2.5	21.6	2.6	117	205	*)	475	345	
80	**77.17**	23	175	447	2.2	24.9	2.2	134	205	125	465	335	

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X.K260..													205 kNm
					KF87 i=36.52		KF127 i=36.25						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRS132S4 6 kW S3 I_N=12.2 A (400V)		DRS225S4 40 kW S3 I_N=75 A (400V)						IE1
28	**29.51**	34	205	753	2.4	23.0	2.5	148	285	*)	570	405	
31.5	**30.68**	33	205	724	2.3	23.9	2.4	154	285	*)	570	405	
35.5	**34.7**	29	205	640	2.0	27.0	2.1	174	280	165	560	400	
40	**38.86**	26	205	572	2.3	23.9	2.4	154	305	205	550	405	156
45	**43.96**	23	205	505	2.0	27.0	2.1	174	290	195	530	390	158
50	**47.48**	21	205	472	2.3	23.9	2.4	154	285	200	510	380	
56	**53.7**	19	205	418	2.0	27.0	2.1	174	280	195	495	370	
63	**60.78**	16	205	369	2.3	23.9	2.4	154	260	185	450	340	
71	**68.75**	15	205	326	2.0	27.0	2.1	174	250	175	435	325	
n_1 = 1200 min^{-1} (60Hz)					DRS132S4 6 kW S3 I_N=11.9 A (460V)		DRS225S4 40 kW S3 I_N=73 A (460V)						IE1
28	**29.51**	41	205	904	2.9	18.8	3.0	123	225	*)	610	410	
31.5	**30.68**	39	205	869	2.8	19.6	2.9	128	235	*)	610	415	
35.5	**34.7**	35	205	768	2.5	22.2	2.5	145	230	*)	600	405	
40	**38.86**	31	205	686	2.8	19.6	2.9	128	285	180	600	440	
45	**43.96**	27	205	607	2.5	22.2	2.5	145	275	170	580	420	156
50	**47.48**	25	205	567	2.8	19.6	2.9	128	280	185	560	415	158
56	**53.7**	22	205	501	2.5	22.2	2.5	145	275	180	550	405	
63	**60.78**	20	205	443	2.8	19.6	2.9	128	260	180	500	375	
71	**68.75**	17	205	392	2.5	22.2	2.5	145	250	170	485	360	
n_1 = 1500 1/min (50Hz)					DRS132S4 6 kW S3 I_N=12.2 A (400V)		DRS225S4 40 kW S3 I_N=75 A (400V)						IE1
28[1)]	**29.51**	51	205	1130	2.4	23.0	2.5	148	*)	*)	600	370	
31.5[1)]	**30.68**	49	205	1086	2.3	23.9	2.4	154	*)	*)	610	375	
35.5[1)]	**34.7**	43	205	961	2.0	27.0	2.1	174	*)	*)	600	370	
40	**38.86**	39	205	858	2.3	23.9	2.4	154	240	*)	650	460	
45	**43.96**	34	205	758	2.0	27.0	2.1	174	230	*)	620	440	156
50	**47.48**	32	205	709	2.3	23.9	2.4	154	255	*)	620	445	158
56	**53.7**	28	205	627	2.0	27.0	2.1	174	250	*)	600	435	
63	**60.78**	25	205	554	2.3	23.9	2.4	154	250	160	560	415	
71	**68.75**	22	205	489	2.0	27.0	2.1	174	240	150	540	400	
n_1 = 1800 min^{-1} (60Hz)					DRS132S4 6 kW S3 I_N=11.9 A (460V)		DRS225S4 40 kW S3 I_N=73 A (460V)						IE1
28[1)]	**29.51**	61	205	1355	2.9	18.8	3.0	123	*)	*)	530	*)	
31.5[1)]	**30.68**	59	205	1304	2.8	19.6	2.9	128	*)	*)	540	*)	
35.5[1)]	**34.7**	52	205	1153	2.5	22.2	2.5	145	*)	*)	530	*)	
40[1)]	**38.86**	46	205	1029	2.8	19.6	2.9	128	*)	*)	660	440	
45[1)]	**43.96**	41	205	910	2.5	22.2	2.5	145	*)	*)	630	425	156
50	**47.48**	38	205	850	2.8	19.6	2.9	128	*)	*)	640	450	158
56	**53.7**	34	205	752	2.5	22.2	2.5	145	205	*)	630	440	
63	**60.78**	30	205	664	2.8	19.6	2.9	128	225	*)	600	430	
71	**68.75**	26	205	587	2.5	22.2	2.5	145	215	*)	570	415	

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X.K270..													240 kNm
					KF87 i=36.52		KF127 i=36.25						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRS132S4 6 kW S3 I_N=12.2 A (400V)		DRS225S4 40 kW S3 I_N=75 A (400V)						IE1
28	**28.65**	35	240	908	2.5	22.3	2.5	144	300	*)	600	425	
31.5	**32.07**	31	240	811	2.2	25.0	2.3	161	295	*)	590	420	
35.5	**33.7**	30	240	772	2.1	26.2	2.2	169	295	*)	590	420	
40	**37.72**	27	240	690	1.9	29.4	1.9	190	290	175	580	410	
45	**42.68**	23	240	610	2.1	26.2	2.2	169	305	205	550	405	156
50	**47.78**	21	240	544	1.9	29.4	1.9	190	305	205	550	405	158
56	**52.14**	19	240	504	2.1	26.2	2.2	169	295	205	520	385	
63	**58.37**	17	240	450	1.9	29.4	1.9	190	290	200	510	380	
71	**66.76**	15	240	393	2.1	26.2	2.2	169	260	185	450	340	
80	**74.73**	13	240	351	1.9	29.4	1.9	190	260	185	450	340	
n_1 = 1200 1/min (60Hz)					DRS132S4 6 kW S3 I_N=11.9 A (460V)		DRS225S4 40 kW S3 I_N=73 A (460V)						IE1
28	**28.65**	42	240	1090	3.0	18.3	3.1	119	*)	*)	640	435	
31.5	**32.07**	37	240	973	2.7	20.5	2.7	134	*)	*)	620	425	
35.5	**33.7**	36	240	926	2.6	21.5	2.6	141	245	*)	620	430	
40	**37.72**	32	240	828	2.3	24.1	2.3	157	240	*)	610	420	
45	**42.68**	28	240	731	2.6	21.5	2.6	141	290	*)	600	440	156
50	**47.78**	25	240	653	2.3	24.1	2.3	157	290	180	600	440	158
56	**52.14**	23	240	604	2.6	21.5	2.6	141	285	190	570	425	
63	**58.37**	21	240	540	2.3	24.1	2.3	157	280	185	560	415	
71	**66.76**	18	240	472	2.6	21.5	2.6	141	260	180	500	375	
80	**74.73**	16	240	422	2.3	24.1	2.3	157	260	180	500	380	
n_1 = 1500 min^{-1} (50Hz)					DRS132S4 6 kW S3 I_N=12.2 A (400V)		DRS225S4 40 kW S3 I_N=75 A (400V)						IE1
28[1)]	**28.65**	52	240	1362	2.5	22.3	2.5	144	*)	*)	640	390	
31.5[1)]	**32.07**	47	240	1217	2.2	25.0	2.3	161	*)	*)	620	385	
35.5[1)]	**33.7**	45	240	1158	2.1	26.2	2.2	169	*)	*)	630	395	
40[1)]	**37.72**	40	240	1035	1.9	29.4	1.9	190	*)	*)	620	385	
45	**42.68**	35	240	914	2.1	26.2	2.2	169	240	*)	650	460	156
50	**47.78**	31	240	817	1.9	29.4	1.9	190	240	*)	660	465	158
56	**52.14**	29	240	755	2.1	26.2	2.2	169	260	*)	630	455	
63	**58.37**	26	240	675	1.9	29.4	1.9	190	255	*)	620	450	
71	**66.76**	22	240	590	2.1	26.2	2.2	169	250	160	560	415	
80	**74.73**	20	240	527	1.9	29.4	1.9	190	250	160	560	415	
n_1 = 1800 min^{-1} (60Hz)					DRS132S4 6 kW S3 I_N=11.9 A (460V)		DRS225S4 40 kW S3 I_N=73 A (460V)						IE1
28[1)]	**28.65**	63	240	1634	3.0	18.3	3.1	119	*)	*)	560	*)	
31.5[1)]	**32.07**	56	240	1460	2.7	20.5	2.7	134	*)	*)	550	*)	
35.5[1)]	**33.7**	53	240	1390	2.6	21.5	2.6	141	*)	*)	560	*)	
40[1)]	**37.72**	48	240	1241	2.3	24.1	2.3	157	*)	*)	550	*)	
45[1)]	**42.68**	42	240	1097	2.6	21.5	2.6	141	*)	*)	660	445	156
50[1)]	**47.78**	38	240	980	2.3	24.1	2.3	157	*)	*)	670	450	158
56	**52.14**	35	240	907	2.6	21.5	2.6	141	*)	*)	660	460	
63	**58.37**	31	240	810	2.3	24.1	2.3	157	210	*)	650	455	
71	**66.76**	27	240	708	2.6	21.5	2.6	141	225	*)	600	430	
80	**74.73**	24	240	633	2.3	24.1	2.3	157	225	*)	600	435	

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X.K280..													270 kNm
					KF87 i=36.52		KF127 i=36.25						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRS132S4 6 kW S3 I_N=12.2 A (400V)		DRS225S4 40 kW S3 I_N=75 A (400V)						IE1
31.5	**32.07**	31	270	913	2.2	25.0	2.3	161	370	*)	710	510	
35.5	**35.92**	28	270	815	2.0	28.0	2.0	180	350	220	680	485	
40	**37.72**	27	270	776	1.9	29.4	1.9	190	365	230	690	500	
45	**42.25**	24	270	693	1.7	32.9	1.7	212	355	225	680	490	
50	**47.78**	21	270	613	1.9	29.4	1.9	190	360	250	640	475	156
56	**53.51**	19	270	547	1.7	32.9	1.7	212	355	245	630	465	158
63	**58.37**	17	270	506	1.9	29.4	1.9	190	345	245	600	450	
71	**65.38**	15	270	452	1.7	32.9	1.7	212	330	235	570	430	
80	**74.73**	13	270	395	1.9	29.4	1.9	190	305	220	520	395	
90	**83.7**	12	270	353	1.7	32.9	1.7	212	300	215	510	385	
n_1 = 1200 min^{-1} (60Hz)					DRS132S4 6 kW S3 I_N=11.9 A (460V)		DRS225S4 40 kW S3 I_N=73 A (460V)						IE1
31.5	**32.07**	37	270	1095	2.7	20.5	2.7	134	320	*)	760	530	
35.5	**35.92**	33	270	978	2.4	22.9	2.4	150	305	*)	730	510	
40	**37.72**	32	270	931	2.3	24.1	2.3	157	315	*)	750	520	
45	**42.25**	28	270	831	2.0	27.0	2.1	176	310	*)	730	510	
50	**47.78**	25	270	735	2.3	24.1	2.3	157	350	225	700	520	156
56	**53.51**	22	270	656	2.0	27.0	2.1	176	340	225	690	510	158
63	**58.37**	21	270	607	2.3	24.1	2.3	157	340	230	670	495	
71	**65.38**	18	270	542	2.0	27.0	2.1	176	325	225	640	475	
80	**74.73**	16	270	474	2.3	24.1	2.3	157	305	215	580	435	
90	**83.7**	14	270	424	2.0	27.0	2.1	176	300	210	570	430	
n_1 = 1500 min^{-1} (50Hz)					DRS132S4 6 kW S3 I_N=12.2 A (400V)		DRS225S4 40 kW S3 I_N=75 A (400V)						IE1
31.5[1)]	**32.07**	47	270	1369	2.2	25.0	2.3	161	*)	*)	780	510	
35.5[1)]	**35.92**	42	270	1222	2.0	28.0	2.0	180	*)	*)	750	485	
40[1)]	**37.72**	40	270	1164	1.9	29.4	1.9	190	*)	*)	770	510	
45[1)]	**42.25**	36	270	1039	1.7	32.9	1.7	212	*)	*)	760	500	
50	**47.78**	31	270	919	1.9	29.4	1.9	190	310	*)	770	550	156
56	**53.51**	28	270	820	1.7	32.9	1.7	212	305	*)	760	540	158
63	**58.37**	26	270	759	1.9	29.4	1.9	190	320	200	740	540	
71	**65.38**	23	270	678	1.7	32.9	1.7	212	305	190	710	520	
80	**74.73**	20	270	593	1.9	29.4	1.9	190	300	195	650	485	
90	**83.7**	18	270	529	1.7	32.9	1.7	212	295	195	640	475	
n_1 = 1800 min^{-1} (60Hz)					DRS132S4 6 kW S3 I_N=11.9 A (460V)		DRS225S4 40 kW S3 I_N=73 A (460V)						IE1
31.5[1)]	**32.07**	56	270	1643	2.7	20.5	2.7	134	*)	*)	730	*)	
35.5[1)]	**35.92**	50	270	1467	2.4	22.9	2.4	150	*)	*)	700	390	
40[1)]	**37.72**	48	270	1397	2.3	24.1	2.3	157	*)	*)	720	415	
45[1)]	**42.25**	43	270	1247	2.0	27.0	2.1	176	*)	*)	710	410	
50[1)]	**47.78**	38	270	1103	2.3	24.1	2.3	157	*)	*)	800	550	156
56[1)]	**53.51**	34	270	985	2.0	27.0	2.1	176	*)	*)	780	540	158
63	**58.37**	31	270	911	2.3	24.1	2.3	157	280	*)	780	560	
71	**65.38**	28	270	813	2.0	27.0	2.1	176	270	*)	750	530	
80	**74.73**	24	270	712	2.3	24.1	2.3	157	280	*)	700	510	
90	**83.7**	22	270	635	2.0	27.0	2.1	176	275	165	680	500	

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9.3 IE3 motor standard

X.K100..													6.80 kNm
					KF37 i=28.83		KF57 i=35.7						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRN80M4 .75 kW S1 I_N=1.75 A (400V)		DRN90L4/Z 1.5 kW S1 I_N=3.45 A (400V)						IE3
20	**19.09**	52	6.80	39	3.6	1.88	3.0	4.60	53	39	83	61	
22.4	**21.09**	47	6.80	35	3.3	2.08	2.7	5.09	47	35	74	55	
25	**24.55**	41	6.80	30	3.6	1.88	3.0	4.60	49	36	76	56	
28	**27.12**	37	6.80	27	3.3	2.08	2.7	5.09	44	32	68	50	
31.5	**30.35**	33	6.80	24	2.9	2.33	2.4	5.69	43	32	67	50	
35.5	**34.35**	29	6.80	21	3.3	2.08	2.7	5.09	37	28	58	43	
40	**38.45**	26	6.80	19.2	2.9	2.33	2.4	5.69	39	29	60	45	148 150
45	**42.96**	23	6.80	17.2	2.6	2.60	2.2	6.36	34	25	52	39	
50	**48.08**	21	6.80	15.3	2.4	2.92	1.9	7.12	35	26	54	40	
56	**52.49**	19	6.80	14.2	2.6	2.60	2.2	6.36	31	23	49	36	
63	**58.74**	17	6.80	12.7	2.4	2.92	1.9	7.12	32	24	50	37	
71	**67.2**	15	6.80	11.1	2.6	2.60	2.2	6.36	28	20	43	32	
80	**75.21**	13	6.80	9.9	2.4	2.92	1.9	7.12	28	21	44	32	
n_1 = 1200 min^{-1} (60Hz)					DRN80M4 .75 kW S1 I_N=1.56 A (460V)		DRN90L4/Z 1.5 kW S1 I_N=3 A (460V)						IE3
20	**19.09**	63	6.80	46	4.4	1.55	3.6	3.81	54	39	93	68	
22.4	**21.09**	57	6.80	42	4.0	1.71	3.3	4.21	49	35	83	61	
25	**24.55**	49	6.80	36	4.4	1.55	3.6	3.81	50	36	85	63	
28	**27.12**	44	6.80	33	4.0	1.71	3.3	4.21	45	33	77	57	
31.5	**30.35**	40	6.80	29	3.6	1.91	2.9	4.71	45	33	76	56	
35.5	**34.35**	35	6.80	26	4.0	1.71	3.3	4.21	39	28	65	48	
40	**38.45**	31	6.80	23	3.6	1.91	2.9	4.71	40	29	68	50	148 150
45	**42.96**	28	6.80	21	3.2	2.14	2.6	5.26	35	26	59	44	
50	**48.08**	25	6.80	18.4	2.9	2.40	2.3	5.89	36	27	61	45	
56	**52.49**	23	6.80	17.0	3.2	2.14	2.6	5.26	33	24	55	41	
63	**58.74**	20	6.80	15.2	2.9	2.40	2.3	5.89	34	25	57	42	
71	**67.2**	18	6.80	13.3	3.2	2.14	2.6	5.26	29	21	48	36	
80	**75.21**	16	6.80	11.9	2.9	2.40	2.3	5.89	29	22	49	37	
n_1 = 1500 min^{-1} (50Hz)					DRN80M4 .75 kW S1 I_N=1.75 A (400V)		DRN90L4/Z 1.5 kW S1 I_N=3.45 A (400V)						IE3
20	**19.09**	79	6.80	58	3.6	1.88	3.0	4.60	55	39	105	77	
22.4	**21.09**	71	6.80	52	3.3	2.08	2.7	5.09	49	35	94	69	
25	**24.55**	61	6.80	45	3.6	1.88	3.0	4.60	52	37	97	71	
28	**27.12**	55	6.80	41	3.3	2.08	2.7	5.09	47	33	87	64	
31.5	**30.35**	49	6.80	36	2.9	2.33	2.4	5.69	46	33	86	63	
35.5	**34.35**	44	6.80	32	3.3	2.08	2.7	5.09	40	29	75	55	
40	**38.45**	39	6.80	29	2.9	2.33	2.4	5.69	42	30	77	57	148 150
45	**42.96**	35	6.80	26	2.6	2.60	2.2	6.36	37	26	67	50	
50	**48.08**	31	6.80	23	2.4	2.92	1.9	7.12	38	27	70	51	
56	**52.49**	29	6.80	21	2.6	2.60	2.2	6.36	34	25	63	46	
63	**58.74**	26	6.80	19.0	2.4	2.92	1.9	7.12	35	26	65	48	
71	**67.2**	22	6.80	16.6	2.6	2.60	2.2	6.36	30	22	55	41	
80	**75.21**	20	6.80	14.8	2.4	2.92	1.9	7.12	31	22	56	42	

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n_1 = 1800 min^{-1} (60Hz)					DRN80M4 .75 kW S1 I_N=1.56 A (460V)		DRN90L4/Z 1.5 kW S1 I_N=3 A (460V)						IE3
20	**19.09**	94	6.80	70	4.4	1.55	3.6	3.81	54	37	115	81	
22.4	**21.09**	85	6.80	63	4.0	1.71	3.3	4.21	49	33	100	73	
25	**24.55**	73	6.80	54	4.4	1.55	3.6	3.81	52	37	105	76	
28	**27.12**	66	6.80	49	4.0	1.71	3.3	4.21	47	33	95	69	
31.5	**30.35**	59	6.80	44	3.6	1.91	2.9	4.71	47	33	93	68	
35.5	**34.35**	52	6.80	39	4.0	1.71	3.3	4.21	41	29	81	60	
40	**38.45**	47	6.80	35	3.6	1.91	2.9	4.71	43	31	84	62	148 150
45	**42.96**	42	6.80	31	3.2	2.14	2.6	5.26	37	27	73	54	
50	**48.08**	37	6.80	28	2.9	2.40	2.3	5.89	39	28	76	56	
56	**52.49**	34	6.80	26	3.2	2.14	2.6	5.26	35	25	69	51	
63	**58.74**	31	6.80	23	2.9	2.40	2.3	5.89	36	26	71	52	
71	**67.2**	27	6.80	20	3.2	2.14	2.6	5.26	31	22	60	44	
80	**75.21**	24	6.80	17.8	2.9	2.40	2.3	5.89	32	23	62	45	

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X.K110..													8.50 kNm
					KF37 i=28.83		KF57 i=35.7						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRN80M4 .75 kW S1 I_N=1.75 A (400V)		DRN90L4/Z 1.5 kW S1 I_N=3.45 A (400V)						IE3
22.4	**21.97**	46	8.50	42	3.2	2.17	2.6	5.30	56	41	88	65	
25	**24.26**	41	8.50	38	2.9	2.40	2.3	5.85	50	36	78	58	
28	**28.26**	35	8.50	33	3.2	2.17	2.6	5.30	51	38	80	59	
31.5	**31.21**	32	8.50	30	2.9	2.40	2.3	5.85	46	34	72	53	
35.5	**34.94**	29	8.50	26	2.6	2.68	2.1	6.56	46	33	71	52	
40	**39.53**	25	8.50	23	2.9	2.40	2.3	5.85	39	29	61	45	
45	**44.26**	23	8.50	21	2.6	2.68	2.1	6.56	41	30	63	47	148 150
50	**49.44**	20	8.50	18.6	2.3	3.00	1.9	7.32	36	27	56	42	
56	**55.35**	18	8.50	16.6	2.0	3.36	1.7	8.20	37	27	57	42	
63	**60.4**	17	8.50	15.4	2.3	3.00	1.9	7.32	33	25	51	38	
71	**67.62**	15	8.50	13.8	2.0	3.36	1.7	8.20	34	25	53	39	
80	**77.33**	13	8.50	12.0	2.3	3.00	1.9	7.32	29	21	45	33	
90	**86.58**	12	8.50	10.7	2.0	3.36	1.7	8.20	29	22	45	33	
n_1 = 1200 min^{-1} (60Hz)					DRN80M4 .75 kW S1 I_N=1.56 A (460V)		DRN90L4/Z 1.5 kW S1 I_N=3 A (460V)						IE3
22.4	**21.97**	55	8.50	50	3.8	1.78	3.1	4.38	57	41	98	72	
25	**24.26**	49	8.50	46	3.5	1.97	2.8	4.84	51	37	88	65	
28	**28.26**	42	8.50	39	3.8	1.78	3.1	4.38	53	38	90	66	
31.5	**31.21**	38	8.50	35	3.5	1.97	2.8	4.84	48	35	81	60	
35.5	**34.94**	34	8.50	32	3.1	2.21	2.5	5.42	47	34	80	59	
40	**39.53**	30	8.50	28	3.5	1.97	2.8	4.84	41	30	69	51	
45	**44.26**	27	8.50	25	3.1	2.21	2.5	5.42	42	31	71	53	148 150
50	**49.44**	24	8.50	22	2.8	2.46	2.3	6.05	38	28	64	47	
56	**55.35**	22	8.50	20	2.5	2.76	2.0	6.78	38	28	64	48	
63	**60.4**	20	8.50	18.5	2.8	2.46	2.3	6.05	35	25	58	43	
71	**67.62**	18	8.50	16.5	2.5	2.76	2.0	6.78	36	26	60	44	
80	**77.33**	16	8.50	14.4	2.8	2.46	2.3	6.05	30	22	51	38	
90	**86.58**	14	8.50	12.9	2.5	2.76	2.0	6.78	30	22	51	38	
n_1 = 1500 min^{-1} (50Hz)					DRN80M4 .75 kW S1 I_N=1.75 A (400V)		DRN90L4/Z 1.5 kW S1 I_N=3.45 A (400V)						IE3
22.4	**21.97**	68	8.50	63	3.2	2.17	2.6	5.30	58	41	110	81	
25	**24.26**	62	8.50	57	2.9	2.40	2.3	5.85	52	37	99	72	
28	**28.26**	53	8.50	49	3.2	2.17	2.6	5.30	55	39	100	75	
31.5	**31.21**	48	8.50	44	2.9	2.40	2.3	5.85	49	35	92	67	
35.5	**34.94**	43	8.50	40	2.6	2.68	2.1	6.56	49	35	91	67	
40	**39.53**	38	8.50	35	2.9	2.40	2.3	5.85	43	31	79	58	
45	**44.26**	34	8.50	31	2.6	2.68	2.1	6.56	44	32	81	60	148 150
50	**49.44**	30	8.50	28	2.3	3.00	1.9	7.32	39	29	73	54	
56	**55.35**	27	8.50	25	2.0	3.36	1.7	8.20	40	29	73	54	
63	**60.4**	25	8.50	23	2.3	3.00	1.9	7.32	36	26	66	49	
71	**67.62**	22	8.50	21	2.0	3.36	1.7	8.20	37	27	68	50	
80	**77.33**	19	8.50	18.0	2.3	3.00	1.9	7.32	32	23	58	43	
90	**86.58**	17	8.50	16.1	2.0	3.36	1.7	8.20	32	23	58	43	

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n_1 = 1800 min^{-1} (60Hz)					DRN80M4 .75 kW S1 I_N=1.56 A (460V)		DRN90L4/Z 1.5 kW S1 I_N=3 A (460V)						IE3
22.4	**21.97**	82	8.50	75	3.8	1.78	3.1	4.38	58	39	120	86	
25	**24.26**	74	8.50	68	3.5	1.97	2.8	4.84	52	36	105	77	
28	**28.26**	64	8.50	59	3.8	1.78	3.1	4.38	55	39	110	81	
31.5	**31.21**	58	8.50	53	3.5	1.97	2.8	4.84	50	35	100	73	
35.5	**34.94**	52	8.50	47	3.1	2.21	2.5	5.42	49	35	98	72	
40	**39.53**	46	8.50	42	3.5	1.97	2.8	4.84	44	31	86	63	148
45	**44.26**	41	8.50	37	3.1	2.21	2.5	5.42	45	32	89	65	150
50	**49.44**	36	8.50	34	2.8	2.46	2.3	6.05	40	29	79	58	
56	**55.35**	33	8.50	30	2.5	2.76	2.0	6.78	41	29	80	59	
63	**60.4**	30	8.50	28	2.8	2.46	2.3	6.05	37	27	72	53	
71	**67.62**	27	8.50	25	2.5	2.76	2.0	6.78	38	28	74	55	
80	**77.33**	23	8.50	22	2.8	2.46	2.3	6.05	33	24	63	47	
90	**86.58**	21	8.50	19.3	2.5	2.76	2.0	6.78	33	24	64	47	

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X.K120..													12.8 kNm
					KF47 i=31.3		KF67 i=35.62						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRN90S4 1.1 kW S1 I_N=2.6 A (400V)		DRN100L4/Z 2.2 kW S1 I_N=4.8 A (400V)						IE3
20	**20.02**	50	12.1	66	3.2	3.12	2.8	7.08	68	49	110	79	
22.4	**22.79**	44	12.3	59	2.8	3.55	2.5	8.06	70	50	110	81	
25	**25.75**	39	12.4	52	3.2	3.12	2.8	7.08	64	46	100	74	
28	**29.32**	34	12.4	46	2.8	3.55	2.5	8.06	65	47	100	75	
31.5	**30.96**	32	12.4	43	2.7	3.75	2.4	8.52	57	42	89	66	
35.5	**35.25**	28	12.4	38	2.4	4.27	2.1	9.70	58	42	91	67	148
40	**40.01**	25	12.4	34	2.7	3.75	2.4	8.52	49	36	77	57	150
45	**45.55**	22	12.8	30	2.4	4.27	2.1	9.70	51	38	80	59	
50	**47.92**	21	12.8	29	2.7	3.75	2.4	8.52	45	33	71	52	
56	**54.55**	18	12.8	26	2.4	4.27	2.1	9.70	46	33	71	53	
63	**61.35**	16	12.8	23	2.7	3.75	2.4	8.52	41	30	63	47	
71	**69.84**	14	12.8	20	2.4	4.27	2.1	9.70	41	30	63	47	
n_1 = 1200 min^{-1} (60Hz)					DRN90S4 1.1 kW S1 I_N=2.3 A (460V)		DRN100L4/Z 2.2 kW S1 I_N=4.15 A (460V)						IE3
20	**20.02**	60	12.1	79	3.9	2.57	3.4	5.85	69	49	120	88	
22.4	**22.79**	53	12.3	70	3.4	2.93	3.0	6.67	70	50	125	90	
25	**25.75**	47	12.4	63	3.9	2.57	3.4	5.85	65	47	110	82	
28	**29.32**	41	12.4	55	3.4	2.93	3.0	6.67	66	48	115	83	
31.5	**30.96**	39	12.4	52	3.3	3.10	2.9	7.04	59	42	100	74	
35.5	**35.25**	34	12.4	46	2.9	3.52	2.5	8.01	59	43	100	75	148
40	**40.01**	30	12.4	40	3.3	3.10	2.9	7.04	51	37	87	64	150
45	**45.55**	26	12.8	37	2.9	3.52	2.5	8.01	53	38	90	66	
50	**47.92**	25	12.8	35	3.3	3.10	2.9	7.04	47	34	80	59	
56	**54.55**	22	12.8	31	2.9	3.52	2.5	8.01	47	34	80	59	
63	**61.35**	20	12.8	27	3.3	3.10	2.9	7.04	42	31	71	53	
71	**69.84**	17	12.8	24	2.9	3.52	2.5	8.01	42	31	71	53	
n_1 = 1500 min^{-1} (50Hz)					DRN90S4 1.1 kW S1 I_N=2.6 A (400V)		DRN100L4/Z 2.2 kW S1 I_N=4.8 A (400V)						IE3
20	**20.02**	75	12.1	98	3.2	3.12	2.8	7.08	68	45	135	97	
22.4	**22.79**	66	12.3	88	2.8	3.55	2.5	8.06	69	47	140	99	
25	**25.75**	58	12.4	78	3.2	3.12	2.8	7.08	66	46	125	92	
28	**29.32**	51	12.4	69	2.8	3.55	2.5	8.06	67	47	130	93	
31.5	**30.96**	48	12.4	65	2.7	3.75	2.4	8.52	60	42	115	83	
35.5	**35.25**	43	12.4	57	2.4	4.27	2.1	9.70	60	42	115	84	148
40	**40.01**	37	12.4	50	2.7	3.75	2.4	8.52	53	38	99	72	150
45	**45.55**	33	12.8	46	2.4	4.27	2.1	9.70	54	39	100	75	
50	**47.92**	31	12.8	44	2.7	3.75	2.4	8.52	49	35	91	67	
56	**54.55**	27	12.8	39	2.4	4.27	2.1	9.70	49	35	91	67	
63	**61.35**	24	12.8	34	2.7	3.75	2.4	8.52	44	31	81	60	
71	**69.84**	21	12.8	30	2.4	4.27	2.1	9.70	44	32	81	60	
n_1 = 1800 min^{-1} (60Hz)					DRN90S4 1.1 kW S1 I_N=2.3 A (460V)		DRN100L4/Z 2.2 kW S1 I_N=4.15 A (460V)						IE3
20	**20.02**	90	12.1	118	3.9	2.57	3.4	5.85	65	35	145	100	
22.4	**22.79**	79	12.3	105	3.4	2.93	3.0	6.67	66	39	145	105	
25	**25.75**	70	12.4	94	3.9	2.57	3.4	5.85	65	44	135	98	
28	**29.32**	61	12.4	83	3.4	2.93	3.0	6.67	66	45	140	99	
31.5	**30.96**	58	12.4	78	3.3	3.10	2.9	7.04	59	40	120	88	
35.5	**35.25**	51	12.4	69	2.9	3.52	2.5	8.01	60	41	125	89	148
40	**40.01**	45	12.4	60	3.3	3.10	2.9	7.04	53	37	105	78	150
45	**45.55**	40	12.8	55	2.9	3.52	2.5	8.01	55	39	110	80	
50	**47.92**	38	12.8	53	3.3	3.10	2.9	7.04	49	35	98	72	
56	**54.55**	33	12.8	46	2.9	3.52	2.5	8.01	50	35	99	72	
63	**61.35**	29	12.8	41	3.3	3.10	2.9	7.04	44	32	88	64	
71	**69.84**	26	12.8	36	2.9	3.52	2.5	8.01	45	32	88	65	

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X.K130..													16.0 kNm
					KF47 i=31.3		KF67 i=35.62						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRN90S4 1.1 kW S1 I_N=2.6 A (400V)		DRN100L4/Z 2.2 kW S1 I_N=4.8 A (400V)						IE3
25	**25.03**	40	15.2	66	2.6	3.90	2.3	8.85	73	53	115	85	
28	**28.43**	35	15.5	59	2.3	4.43	2.0	10.0	75	54	120	87	
31.5	**32.19**	31	15.5	52	2.6	3.90	2.3	8.85	68	50	105	79	
35.5	**36.56**	27	15.5	46	2.3	4.43	2.0	10.0	69	50	110	80	
40	**38.71**	26	15.5	43	2.1	4.69	1.9	10.6	63	46	98	72	
45	**43.96**	23	15.5	38	1.9	5.33	1.7	12.0	60	44	94	70	148
50	**50.02**	20	15.5	34	2.1	4.69	1.9	10.6	54	40	84	62	150
56	**56.81**	18	16.0	31	1.9	5.33	1.7	12.0	53	39	83	62	
63	**59.9**	17	16.0	29	2.1	4.69	1.9	10.6	48	36	75	56	
71	**68.03**	15	16.0	26	1.9	5.33	1.7	12.0	49	36	76	56	
80	**76.69**	13	16.0	23	2.1	4.69	1.9	10.6	43	32	67	50	
90	**87.09**	11	16.0	20	1.9	5.33	1.7	12.0	43	32	67	50	
n_1 = 1200 min^{-1} (60Hz)					DRN90S4 1.1 kW S1 I_N=2.3 A (460V)		DRN100L4/Z 2.2 kW S1 I_N=4.15 A (460V)						IE3
25	**25.03**	48	15.2	79	3.1	3.22	2.8	7.32	74	53	130	94	
28	**28.43**	42	15.5	71	2.8	3.66	2.4	8.31	76	54	130	96	
31.5	**32.19**	37	15.5	63	3.1	3.22	2.8	7.32	70	50	120	88	
35.5	**36.56**	33	15.5	55	2.8	3.66	2.4	8.31	71	51	120	89	
40	**38.71**	31	15.5	52	2.6	3.87	2.3	8.80	65	47	110	81	
45	**43.96**	27	15.5	46	2.3	4.40	2.0	10.0	62	45	105	78	148
50	**50.02**	24	15.5	40	2.6	3.87	2.3	8.80	56	41	95	70	150
56	**56.81**	21	16.0	37	2.3	4.40	2.0	10.0	55	40	94	69	
63	**59.9**	20	16.0	35	2.6	3.87	2.3	8.80	50	37	85	63	
71	**68.03**	18	16.0	31	2.3	4.40	2.0	10.0	51	37	85	63	
80	**76.69**	16	16.0	27	2.6	3.87	2.3	8.80	45	33	76	56	
90	**87.09**	14	16.0	24	2.3	4.40	2.0	10.0	45	33	76	56	
n_1 = 1500 min^{-1} (50Hz)					DRN90S4 1.1 kW S1 I_N=2.6 A (400V)		DRN100L4/Z 2.2 kW S1 I_N=4.8 A (400V)						IE3
25	**25.03**	60	15.2	99	2.6	3.90	2.3	8.85	74	50	145	105	
28	**28.43**	53	15.5	89	2.3	4.43	2.0	10.0	75	51	150	105	
31.5	**32.19**	47	15.5	78	2.6	3.90	2.3	8.85	71	50	135	99	
35.5	**36.56**	41	15.5	69	2.3	4.43	2.0	10.0	72	51	140	100	
40	**38.71**	39	15.5	65	2.1	4.69	1.9	10.6	66	47	125	91	
45	**43.96**	34	15.5	57	1.9	5.33	1.7	12.0	63	45	120	87	148
50	**50.02**	30	15.5	50	2.1	4.69	1.9	10.6	58	41	110	79	150
56	**56.81**	26	16.0	46	1.9	5.33	1.7	12.0	57	41	105	78	
63	**59.9**	25	16.0	44	2.1	4.69	1.9	10.6	52	38	97	71	
71	**68.03**	22	16.0	39	1.9	5.33	1.7	12.0	52	38	97	72	
80	**76.69**	20	16.0	34	2.1	4.69	1.9	10.6	47	34	86	64	
90	**87.09**	17	16.0	30	1.9	5.33	1.7	12.0	47	34	87	64	
n_1 = 1800 min^{-1} (60Hz)					DRN90S4 1.1 kW S1 I_N=2.3 A (460V)		DRN100L4/Z 2.2 kW S1 I_N=4.15 A (460V)						IE3
25	**25.03**	72	15.2	118	3.1	3.22	2.8	7.32	71	41	155	110	
28	**28.43**	63	15.5	106	2.8	3.66	2.4	8.31	72	45	160	110	
31.5	**32.19**	56	15.5	94	3.1	3.22	2.8	7.32	71	49	145	105	
35.5	**36.56**	49	15.5	83	2.8	3.66	2.4	8.31	72	49	150	105	
40	**38.71**	46	15.5	78	2.6	3.87	2.3	8.80	66	45	135	97	
45	**43.96**	41	15.5	69	2.3	4.40	2.0	10.0	63	43	130	93	148
50	**50.02**	36	15.5	60	2.6	3.87	2.3	8.80	58	41	115	85	150
56	**56.81**	32	16.0	55	2.3	4.40	2.0	10.0	58	41	115	84	
63	**59.9**	30	16.0	53	2.6	3.87	2.3	8.80	53	38	105	77	
71	**68.03**	26	16.0	46	2.3	4.40	2.0	10.0	53	38	105	77	
80	**76.69**	23	16.0	41	2.6	3.87	2.3	8.80	48	34	94	69	
90	**87.09**	21	16.0	36	2.3	4.40	2.0	10.0	48	34	94	69	

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X.K140..													22.0 kNm
					KF57 i=35.7		KF77 i=38.39						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRN90L4 1.5 kW S1 I_N=3.45 A (400V)		DRN112M4/Z 4.0 kW S1 I_N=8.1 A (400V)						IE3
20	**21.13**	47	21.9	112	3.5	3.96	3.2	11.3	93	66	160	120	
22.4	**22.6**	44	22.0	106	3.2	4.24	3.0	12.1	92	66	160	120	
25	**26.42**	38	22.0	90	2.8	4.96	2.6	14.1	88	63	150	115	
28	**28.25**	35	22.0	84	2.6	5.30	2.4	15.1	87	63	150	110	
31.5	**33.46**	30	22.0	71	2.8	4.96	2.6	14.1	77	56	130	100	
35.5	**35.78**	28	22.0	67	2.6	5.30	2.4	15.1	77	56	130	99	148
40	**40.78**	25	22.0	58	2.3	6.04	2.1	17.3	72	52	120	92	150
45	**43.61**	23	22.0	55	2.1	6.46	2.0	18.5	71	52	120	91	
50	**49.82**	20	22.0	48	2.3	6.04	2.1	17.3	66	48	110	84	
56	**53.28**	19	22.0	45	2.1	6.46	2.0	18.5	65	48	110	83	
63	**63.79**	16	22.0	38	2.3	6.04	2.1	17.3	58	42	97	74	
71	**68.21**	15	22.0	35	2.1	6.46	2.0	18.5	58	43	98	74	
n_1 = 1200 min^{-1} (60Hz)					DRN90L4 1.5 kW S1 I_N=3 A (460V)		DRN112M4/Z 4.0 kW S1 I_N=7.2 A (460V)						IE3
20	**21.13**	57	21.9	135	4.2	3.28	3.9	9.39	94	66	180	135	
22.4	**22.6**	53	22.0	127	3.9	3.50	3.6	10.0	93	66	175	130	
25	**26.42**	45	22.0	108	3.4	4.10	3.1	11.7	89	63	170	125	
28	**28.25**	42	22.0	101	3.1	4.38	2.9	12.5	88	63	165	125	
31.5	**33.46**	36	22.0	86	3.4	4.10	3.1	11.7	79	57	150	110	
35.5	**35.78**	34	22.0	80	3.1	4.38	2.9	12.5	79	56	145	110	148
40	**40.78**	29	22.0	70	2.8	4.99	2.6	14.3	74	53	135	105	150
45	**43.61**	28	22.0	66	2.6	5.34	2.4	15.3	73	52	135	100	
50	**49.82**	24	22.0	58	2.8	4.99	2.6	14.3	68	49	125	95	
56	**53.28**	23	22.0	54	2.6	5.34	2.4	15.3	67	48	125	94	
63	**63.79**	19	22.0	45	2.8	4.99	2.6	14.3	59	43	110	83	
71	**68.21**	18	22.0	42	2.6	5.34	2.4	15.3	60	44	110	84	
n_1 = 1500 min^{-1} (50Hz)					DRN90L4 1.5 kW S1 I_N=3.45 A (400V)		DRN112M4/Z 4.0 kW S1 I_N=8.1 A (400V)						IE3
20	**21.13**	71	21.9	169	3.5	3.96	3.2	11.3	93	56	200	150	
22.4	**22.6**	66	22.0	158	3.2	4.24	3.0	12.1	92	58	200	145	
25	**26.42**	57	22.0	135	2.8	4.96	2.6	14.1	89	59	190	140	
28	**28.25**	53	22.0	127	2.6	5.30	2.4	15.1	88	60	190	140	
31.5	**33.46**	45	22.0	107	2.8	4.96	2.6	14.1	80	56	170	125	
35.5	**35.78**	42	22.0	100	2.6	5.30	2.4	15.1	80	56	165	125	148
40	**40.78**	37	22.0	88	2.3	6.04	2.1	17.3	75	53	155	115	150
45	**43.61**	34	22.0	82	2.1	6.46	2.0	18.5	74	52	155	115	
50	**49.82**	30	22.0	72	2.3	6.04	2.1	17.3	69	49	140	105	
56	**53.28**	28	22.0	68	2.1	6.46	2.0	18.5	69	49	140	105	
63	**63.79**	24	22.0	57	2.3	6.04	2.1	17.3	61	44	125	94	
71	**68.21**	22	22.0	53	2.1	6.46	2.0	18.5	62	44	125	95	
n_1 = 1800 min^{-1} (60Hz)					DRN90L4 1.5 kW S1 I_N=3 A (460V)		DRN112M4/Z 4.0 kW S1 I_N=7.2 A (460V)						IE3
20	**21.13**	85	20.7	191	4.2	3.28	3.9	9.39	86	*)	215	155	
22.4	**22.6**	80	21.1	182	3.9	3.50	3.6	10.0	88	*)	210	155	
25	**26.42**	68	22.0	162	3.4	4.10	3.1	11.7	86	48	205	150	
28	**28.25**	64	22.0	152	3.1	4.38	2.9	12.5	85	49	200	150	
31.5	**33.46**	54	22.0	128	3.4	4.10	3.1	11.7	80	51	180	135	
35.5	**35.78**	50	22.0	120	3.1	4.38	2.9	12.5	79	52	180	135	148
40	**40.78**	44	22.0	105	2.8	4.99	2.6	14.3	74	51	170	125	150
45	**43.61**	41	22.0	98	2.6	5.34	2.4	15.3	74	51	165	125	
50	**49.82**	36	22.0	87	2.8	4.99	2.6	14.3	69	48	155	115	
56	**53.28**	34	22.0	81	2.6	5.34	2.4	15.3	69	48	155	115	
63	**63.79**	28	22.0	68	2.8	4.99	2.6	14.3	62	43	135	100	
71	**68.21**	26	22.0	64	2.6	5.34	2.4	15.3	62	44	135	100	

X.K150..													27.5 kNm
					KF57 i=35.7		KF77 i=38.39						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRN90L4 1.5 kW S1 I_N=3.45 A (400V)		DRN112M4/Z 4.0 kW S1 I_N=8.1 A (400V)						IE3
25	**26.25**	38	27.2	112	2.8	4.92	2.6	14.1	99	72	170	130	
28	**28.1**	36	27.5	106	2.6	5.27	2.4	15.1	99	71	170	125	
31.5	**32.81**	30	27.5	91	2.2	6.16	2.1	17.6	94	68	160	120	
35.5	**35.13**	28	27.5	85	2.1	6.59	1.9	18.8	93	67	160	120	
40	**41.56**	24	27.5	72	2.2	6.16	2.1	17.6	85	62	145	110	
45	**44.5**	22	27.5	67	2.1	6.59	1.9	18.8	82	60	140	105	148
50	**50.65**	20	27.5	59	1.8	7.50	1.7	21.4	77	56	130	99	150
56	**54.23**	18	27.5	55	1.7	8.03	1.6	23.0	76	56	130	98	
63	**61.88**	16	27.5	49	1.8	7.50	1.7	21.4	71	52	120	90	
71	**66.26**	15	27.5	45	1.7	8.03	1.6	23.0	70	51	120	89	
80	**79.22**	13	27.5	38	1.8	7.50	1.7	21.4	63	46	105	80	
90	**84.83**	12	27.5	35	1.7	8.03	1.6	23.0	62	46	105	80	
n_1 = 1200 min^{-1} (60Hz)					DRN90L4 1.5 kW S1 I_N=3 A (460V)		DRN112M4/Z 4.0 kW S1 I_N=7.2 A (460V)						IE3
25	**26.25**	46	27.2	135	3.4	4.07	3.1	11.6	100	72	190	145	
28	**28.1**	43	27.5	127	3.2	4.36	2.9	12.4	100	71	190	140	
31.5	**32.81**	37	27.5	109	2.7	5.09	2.5	14.5	96	68	180	135	
35.5	**35.13**	34	27.5	102	2.5	5.45	2.3	15.6	95	68	180	135	
40	**41.56**	29	27.5	86	2.7	5.09	2.5	14.5	87	63	160	120	
45	**44.5**	27	27.5	80	2.5	5.45	2.3	15.6	85	61	155	120	148
50	**50.65**	24	27.5	71	2.2	6.20	2.1	17.7	79	57	145	110	150
56	**54.23**	22	27.5	66	2.1	6.64	1.9	19.0	78	57	145	110	
63	**61.88**	19	27.5	58	2.2	6.20	2.1	17.7	73	53	135	100	
71	**66.26**	18	27.5	54	2.1	6.64	1.9	19.0	72	52	135	100	
80	**79.22**	15	27.5	46	2.2	6.20	2.1	17.7	65	47	120	91	
90	**84.83**	14	27.5	43	2.1	6.64	1.9	19.0	65	47	120	90	
n_1 = 1500 min^{-1} (50Hz)					DRN90L4 1.5 kW S1 I_N=3.45 A (400V)		DRN112M4/Z 4.0 kW S1 I_N=8.1 A (400V)						IE3
25	**26.25**	57	27.2	168	2.8	4.92	2.6	14.1	100	64	215	160	
28	**28.1**	53	27.5	159	2.6	5.27	2.4	15.1	100	66	215	160	
31.5	**32.81**	46	27.5	136	2.2	6.16	2.1	17.6	96	66	205	150	
35.5	**35.13**	43	27.5	127	2.1	6.59	1.9	18.8	95	66	200	150	
40	**41.56**	36	27.5	108	2.2	6.16	2.1	17.6	89	63	185	140	
45	**44.5**	34	27.5	100	2.1	6.59	1.9	18.8	86	61	180	135	148
50	**50.65**	30	27.5	88	1.8	7.50	1.7	21.4	81	57	165	125	150
56	**54.23**	28	27.5	82	1.7	8.03	1.6	23.0	80	57	165	125	
63	**61.88**	24	27.5	73	1.8	7.50	1.7	21.4	75	53	150	115	
71	**66.26**	23	27.5	68	1.7	8.03	1.6	23.0	74	53	150	115	
80	**79.22**	19	27.5	57	1.8	7.50	1.7	21.4	67	48	135	105	
90	**84.83**	18	27.5	53	1.7	8.03	1.6	23.0	67	48	135	100	
n_1 = 1800 min^{-1} (60Hz)					DRN90L4 1.5 kW S1 I_N=3 A (460V)		DRN112M4/Z 4.0 kW S1 I_N=7.2 A (460V)						IE3
25	**26.25**	69	27.2	202	3.4	4.07	3.1	11.6	97	*)	230	170	
28	**28.1**	64	27.5	191	3.2	4.36	2.9	12.4	97	52	230	170	
31.5	**32.81**	55	27.5	164	2.7	5.09	2.5	14.5	94	56	220	160	
35.5	**35.13**	51	27.5	153	2.5	5.45	2.3	15.6	93	57	215	160	
40	**41.56**	43	27.5	129	2.7	5.09	2.5	14.5	89	60	200	150	
45	**44.5**	40	27.5	121	2.5	5.45	2.3	15.6	86	59	190	145	148
50	**50.65**	36	27.5	106	2.2	6.20	2.1	17.7	81	56	180	135	150
56	**54.23**	33	27.5	99	2.1	6.64	1.9	19.0	80	55	180	135	
63	**61.88**	29	27.5	88	2.2	6.20	2.1	17.7	75	52	165	125	
71	**66.26**	27	27.5	82	2.1	6.64	1.9	19.0	74	52	165	120	
80	**79.22**	23	27.5	68	2.2	6.20	2.1	17.7	68	48	150	110	
90	**84.83**	21	27.5	64	2.1	6.64	1.9	19.0	67	48	145	110	

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X.K160..													36.0 kNm
					KF67 i=35.62		KF87 i=36.52						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRN100L4 2.2 kW S1 I_N=4.8 A (400V)		DRN132S4/Z 5.5 kW S1 I_N=10.5 A (400V)						IE3
20	**20.23**	49	36.0	193	3.6	5.56	3.5	14.2	150	105	260	195	
22.4	**22.8**	44	36.0	171	3.2	6.27	3.1	16.0	145	100	250	185	
25	**24.77**	40	36.0	158	3.0	6.81	2.9	17.4	140	99	240	180	
28	**27.91**	36	36.0	140	2.6	7.68	2.6	19.6	135	97	235	175	
31.5	**30.94**	32	36.0	126	3.0	6.81	2.9	17.4	130	93	220	165	
35.5	**34.87**	29	36.0	112	2.6	7.68	2.6	19.6	125	90	215	160	148
40	**39.12**	26	36.0	100	2.3	8.61	2.3	22.0	105	78	185	140	150
45	**44.08**	23	36.0	89	2.1	9.71	2.0	24.8	105	76	180	135	
50	**48.46**	21	36.0	81	2.3	8.61	2.3	22.0	94	69	160	120	
56	**54.62**	18	36.0	72	2.1	9.71	2.0	24.8	95	69	160	120	
63	**62.05**	16	36.0	63	2.3	8.61	2.3	22.0	85	62	145	110	
71	**69.92**	14	36.0	56	2.1	9.71	2.0	24.8	85	62	145	110	
n_1 = 1200 min^{-1} (60Hz)					DRN100L4 2.2 kW S1 I_N=4.15 A (460V)		DRN132S4/Z 5.5 kW S1 I_N=9.5 A (460V)						IE3
20	**20.23**	59	36.0	231	4.4	4.60	4.3	11.7	150	105	290	215	
22.4	**22.8**	53	36.0	205	3.9	5.18	3.8	13.2	145	100	280	205	
25	**24.77**	48	36.0	189	3.6	5.63	3.5	14.4	140	97	265	200	
28	**27.91**	43	36.0	168	3.2	6.34	3.1	16.2	135	96	265	195	
31.5	**30.94**	39	36.0	151	3.6	5.63	3.5	14.4	130	94	250	185	
35.5	**34.87**	34	36.0	134	3.2	6.34	3.1	16.2	125	90	240	180	148
40	**39.12**	31	36.0	120	2.8	7.12	2.8	18.2	110	78	205	155	150
45	**44.08**	27	36.0	106	2.5	8.02	2.5	20.5	110	77	200	150	
50	**48.46**	25	36.0	98	2.8	7.12	2.8	18.2	97	70	180	135	
56	**54.62**	22	36.0	87	2.5	8.02	2.5	20.5	97	70	180	135	
63	**62.05**	19	36.0	76	2.8	7.12	2.8	18.2	87	63	160	120	
71	**69.92**	17	36.0	68	2.5	8.02	2.5	20.5	88	63	160	120	
n_1 = 1500 min^{-1} (50Hz)					DRN100L4 2.2 kW S1 I_N=4.8 A (400V)		DRN132S4/Z 5.5 kW S1 I_N=10.5 A (400V)						IE3
20	**20.23**	74	36.0	289	3.6	5.56	3.5	14.2	145	80	325	240	
22.4	**22.8**	66	36.0	257	3.2	6.27	3.1	16.0	140	79	310	230	
25	**24.77**	61	36.0	236	3.0	6.81	2.9	17.4	135	83	300	220	
28	**27.91**	54	36.0	210	2.6	7.68	2.6	19.6	135	84	295	215	
31.5	**30.94**	48	36.0	189	3.0	6.81	2.9	17.4	130	91	280	210	
35.5	**34.87**	43	36.0	168	2.6	7.68	2.6	19.6	125	87	270	200	148
40	**39.12**	38	36.0	150	2.3	8.61	2.3	22.0	110	76	230	175	150
45	**44.08**	34	36.0	133	2.1	9.71	2.0	24.8	110	75	230	170	
50	**48.46**	31	36.0	122	2.3	8.61	2.3	22.0	98	69	205	155	
56	**54.62**	27	36.0	108	2.1	9.71	2.0	24.8	99	70	205	155	
63	**62.05**	24	36.0	95	2.3	8.61	2.3	22.0	89	64	185	140	
71	**69.92**	21	36.0	85	2.1	9.71	2.0	24.8	90	64	185	140	
n_1 = 1800 min^{-1} (60Hz)					DRN100L4 2.2 kW S1 I_N=4.15 A (460V)		DRN132S4/Z 5.5 kW S1 I_N=9.5 A (460V)						IE3
20	**20.23**	89	36.0	347	4.4	4.60	4.3	11.7	125	*)	345	250	
22.4	**22.8**	79	36.0	308	3.9	5.18	3.8	13.2	120	*)	330	240	
25	**24.77**	73	36.0	284	3.6	5.63	3.5	14.4	125	*)	320	230	
28	**27.91**	64	36.0	252	3.2	6.34	3.1	16.2	125	*)	315	225	
31.5	**30.94**	58	36.0	227	3.6	5.63	3.5	14.4	130	76	300	220	
35.5	**34.87**	52	36.0	201	3.2	6.34	3.1	16.2	125	75	290	210	148
40	**39.12**	46	36.0	180	2.8	7.12	2.8	18.2	110	67	250	185	150
45	**44.08**	41	36.0	159	2.5	8.02	2.5	20.5	105	69	245	180	
50	**48.46**	37	36.0	146	2.8	7.12	2.8	18.2	98	66	220	165	
56	**54.62**	33	36.0	130	2.5	8.02	2.5	20.5	99	68	220	165	
63	**62.05**	29	36.0	114	2.8	7.12	2.8	18.2	90	63	200	150	
71	**69.92**	26	36.0	101	2.5	8.02	2.5	20.5	90	63	200	150	

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X.K170..													45.0 kNm
					KF67 i=35.62		KF87 i=36.52						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRN100L4 2.2 kW S1 I_N=4.8 A (400V)		DRN132S4/Z 5.5 kW S1 I_N=10.5 A (400V)						IE3
25	**25.15**	40	45.0	194	2.9	6.92	2.9	17.6	155	110	270	205	
28	**28.26**	35	45.0	173	2.6	7.77	2.5	19.8	155	110	265	200	
31.5	**30.78**	32	45.0	158	2.4	8.47	2.3	21.6	145	105	245	185	
35.5	**34.6**	29	45.0	141	2.1	9.52	2.1	24.3	140	100	245	185	
40	**38.45**	26	45.0	127	2.4	8.47	2.3	21.6	135	97	230	175	
45	**43.22**	23	45.0	113	2.1	9.52	2.1	24.3	130	96	225	170	148
50	**48.62**	21	45.0	100	1.9	10.7	1.8	27.3	110	80	190	145	150
56	**54.64**	18	45.0	89	1.7	12.0	1.6	30.7	110	79	185	140	
63	**60.23**	17	45.0	82	1.9	10.7	1.8	27.3	97	71	165	125	
71	**67.69**	15	45.0	73	1.7	12.0	1.6	30.7	98	71	165	125	
80	**77.11**	13	45.0	64	1.9	10.7	1.8	27.3	88	64	150	110	
90	**86.67**	12	45.0	57	1.7	12.0	1.6	30.7	86	63	145	110	
n_1 = 1200 min^{-1} (60Hz)					DRN100L4 2.2 kW S1 I_N=4.15 A (460V)		DRN132S4/Z 5.5 kW S1 I_N=9.5 A (460V)						IE3
25	**25.15**	48	45.0	233	3.5	5.72	3.4	14.6	155	110	300	225	
28	**28.26**	42	45.0	207	3.1	6.42	3.1	16.4	155	110	300	220	
31.5	**30.78**	39	45.0	190	2.9	7.00	2.8	17.9	145	100	275	205	
35.5	**34.6**	35	45.0	169	2.6	7.87	2.5	20.1	140	100	270	205	
40	**38.45**	31	45.0	152	2.9	7.00	2.8	17.9	135	97	255	195	
45	**43.22**	28	45.0	135	2.6	7.87	2.5	20.1	135	96	255	190	148
50	**48.62**	25	45.0	120	2.3	8.85	2.2	22.6	115	81	215	160	150
56	**54.64**	22	45.0	107	2.0	9.95	2.0	25.4	110	80	210	155	
63	**60.23**	20	45.0	98	2.3	8.85	2.2	22.6	100	72	185	140	
71	**67.69**	18	45.0	87	2.0	9.95	2.0	25.4	100	73	185	140	
80	**77.11**	16	45.0	77	2.3	8.85	2.2	22.6	90	65	165	125	
90	**86.67**	14	45.0	68	2.0	9.95	2.0	25.4	89	64	165	125	
n_1 = 1500 min^{-1} (50Hz)					DRN100L4 2.2 kW S1 I_N=4.8 A (400V)		DRN132S4/Z 5.5 kW S1 I_N=10.5 A (400V)						IE3
25	**25.15**	60	45.0	291	2.9	6.92	2.9	17.6	155	87	340	250	
28	**28.26**	53	45.0	259	2.6	7.77	2.5	19.8	150	92	335	245	
31.5	**30.78**	49	45.0	238	2.4	8.47	2.3	21.6	140	88	310	230	
35.5	**34.6**	43	45.0	211	2.1	9.52	2.1	24.3	140	91	305	225	
40	**38.45**	39	45.0	190	2.4	8.47	2.3	21.6	135	95	290	215	
45	**43.22**	35	45.0	169	2.1	9.52	2.1	24.3	135	94	285	215	148
50	**48.62**	31	45.0	150	1.9	10.7	1.8	27.3	115	80	240	180	150
56	**54.64**	27	45.0	134	1.7	12.0	1.6	30.7	115	79	235	175	
63	**60.23**	25	45.0	123	1.9	10.7	1.8	27.3	100	72	210	160	
71	**67.69**	22	45.0	109	1.7	12.0	1.6	30.7	105	73	210	160	
80	**77.11**	19	45.0	96	1.9	10.7	1.8	27.3	93	66	190	145	
90	**86.67**	17	45.0	85	1.7	12.0	1.6	30.7	91	65	185	140	
n_1 = 1800 min^{-1} (60Hz)					DRN100L4 2.2 kW S1 I_N=4.15 A (460V)		DRN132S4/Z 5.5 kW S1 I_N=9.5 A (460V)						IE3
25	**25.15**	72	45.0	349	3.5	5.72	3.4	14.6	135	*)	360	260	
28	**28.26**	64	45.0	311	3.1	6.42	3.1	16.4	140	*)	355	255	
31.5	**30.78**	58	45.0	285	2.9	7.00	2.8	17.9	135	*)	330	240	
35.5	**34.6**	52	45.0	254	2.6	7.87	2.5	20.1	135	69	325	235	
40	**38.45**	47	45.0	228	2.9	7.00	2.8	17.9	135	81	310	230	
45	**43.22**	42	45.0	203	2.6	7.87	2.5	20.1	135	85	305	225	148
50	**48.62**	37	45.0	181	2.3	8.85	2.2	22.6	110	71	260	190	150
56	**54.64**	33	45.0	161	2.0	9.95	2.0	25.4	110	73	255	190	
63	**60.23**	30	45.0	147	2.3	8.85	2.2	22.6	100	70	230	170	
71	**67.69**	27	45.0	131	2.0	9.95	2.0	25.4	105	71	230	170	
80	**77.11**	23	45.0	115	2.3	8.85	2.2	22.6	93	65	205	155	
90	**86.67**	21	45.0	102	2.0	9.95	2.0	25.4	92	64	200	150	

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X.K180..													58.0 kNm
					KF77 i=38.39		KF97 i=38.3						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRN100L4 3 kW S1 I_N=6.6 A (400V)		DRN132L4/Z 9.2 kW S1 I_N=11.1 A (400V)						IE3
25	**25.55**	39	58.0	246	2.7	10.3	2.7	31.3	160	115	260	195	
28	**28.61**	35	58.0	220	2.4	11.5	2.4	35.1	165	120	265	195	
31.5	**32.36**	31	58.0	194	2.7	10.3	2.7	31.3	145	105	230	170	
35.5	**36.24**	28	58.0	173	2.4	11.5	2.4	35.1	150	110	240	180	
40	**38.93**	26	58.0	161	2.2	12.4	2.2	37.7	135	99	215	160	148
45	**43.6**	23	58.0	144	2.0	13.9	2.0	42.2	135	100	215	160	150
50	**47.57**	21	58.0	133	2.2	12.4	2.2	37.7	120	90	190	145	
56	**53.27**	19	58.0	119	2.0	13.9	2.0	42.2	125	93	195	150	
63	**60.9**	16	58.0	104	2.2	12.4	2.2	37.7	110	80	170	125	
71	**68.2**	15	58.0	93	2.0	13.9	2.0	42.2	110	82	170	130	
n_1 = 1200 min^{-1} (60Hz)					DRN100L4 4 kW S1 I_N=7.2 A (460V)		DRN132L4/Z 9.2 kW S1 I_N=16.8 A (460V)						IE3
25	**25.55**	47	58.0	295	3.2	11.3	3.2	25.9	160	105	290	210	
28	**28.61**	42	58.0	264	2.9	12.7	2.9	29.0	165	110	290	215	
31.5	**32.36**	37	58.0	233	3.2	11.3	3.2	25.9	145	105	255	190	
35.5	**36.24**	33	58.0	208	2.9	12.7	2.9	29.0	150	110	265	200	
40	**38.93**	31	58.0	194	2.7	13.6	2.7	31.2	135	98	240	175	148
45	**43.6**	28	58.0	173	2.4	15.3	2.4	35.0	135	99	240	180	150
50	**47.57**	25	58.0	160	2.7	13.6	2.7	31.2	125	91	215	160	
56	**53.27**	23	58.0	143	2.4	15.3	2.4	35.0	125	93	220	165	
63	**60.9**	20	58.0	125	2.7	13.6	2.7	31.2	110	82	190	140	
71	**68.2**	18	58.0	112	2.4	15.3	2.4	35.0	115	83	195	145	
n_1 = 1500 min^{-1} (50Hz)					DRN100L4 3 kW S1 I_N=6.6 A (400V)		DRN132L4/Z 9.2 kW S1 I_N=11.1 A (400V)						IE3
25	**25.55**	59	58.0	369	2.7	10.3	2.7	31.3	145	*)	320	230	
28	**28.61**	52	58.0	330	2.4	11.5	2.4	35.1	155	90	320	235	
31.5	**32.36**	46	58.0	291	2.7	10.3	2.7	31.3	145	92	285	210	
35.5	**36.24**	41	58.0	260	2.4	11.5	2.4	35.1	150	99	295	220	
40	**38.93**	39	58.0	242	2.2	12.4	2.2	37.7	135	89	265	195	148
45	**43.6**	34	58.0	216	2.0	13.9	2.0	42.2	135	92	270	200	150
50	**47.57**	32	58.0	200	2.2	12.4	2.2	37.7	125	87	240	180	
56	**53.27**	28	58.0	179	2.0	13.9	2.0	42.2	130	91	250	185	
63	**60.9**	25	58.0	156	2.2	12.4	2.2	37.7	110	81	215	160	
71	**68.2**	22	58.0	140	2.0	13.9	2.0	42.2	115	83	220	165	
n_1 = 1800 min^{-1} (60Hz)					DRN100L4 4 kW S1 I_N=7.2 A (460V)		DRN132L4/Z 9.2 kW S1 I_N=16.8 A (460V)						IE3
25	**25.55**	70	58.0	443	3.2	11.3	3.2	25.9	120	*)	330	235	
28	**28.61**	63	58.0	396	2.9	12.7	2.9	29.0	125	*)	335	235	
31.5	**32.36**	56	58.0	350	3.2	11.3	3.2	25.9	130	*)	305	220	
35.5	**36.24**	50	58.0	312	2.9	12.7	2.9	29.0	140	79	315	225	
40	**38.93**	46	58.0	291	2.7	13.6	2.7	31.2	125	73	285	205	148
45	**43.6**	41	58.0	260	2.4	15.3	2.4	35.0	130	77	285	205	150
50	**47.57**	38	58.0	240	2.7	13.6	2.7	31.2	120	77	260	190	
56	**53.27**	34	58.0	214	2.4	15.3	2.4	35.0	125	82	265	195	
63	**60.9**	30	58.0	188	2.7	13.6	2.7	31.2	110	77	230	170	
71	**68.2**	26	58.0	167	2.4	15.3	2.4	35.0	115	80	235	175	

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X.K190..													65.0 kNm
					KF77 i=38.39		KF97 i=38.3						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRN100L4 3 kW S1 I_N=6.6 A (400V)		DRN132L4/Z 9.2 kW S1 I_N=11.1 A (400V)						IE3
28	**28.53**	35	65.0	247	2.4	11.5	2.4	35.0	170	125	275	205	
31.5	**32.06**	31	65.0	220	2.1	12.9	2.1	39.3	170	125	275	205	
35.5	**36.14**	28	65.0	195	2.4	11.5	2.4	35.0	150	110	240	180	
40	**40.61**	25	65.0	174	2.1	12.9	2.1	39.3	155	115	250	185	
45	**43.48**	23	65.0	162	2.0	13.9	2.0	42.1	140	105	225	165	148
50	**48.85**	20	65.0	144	1.8	15.6	1.8	47.3	140	105	225	170	150
56	**53.11**	19	65.0	134	2.0	13.9	2.0	42.1	130	96	205	155	
63	**59.68**	17	65.0	119	1.8	15.6	1.8	47.3	130	97	205	155	
71	**68**	15	65.0	105	2.0	13.9	2.0	42.1	110	84	175	130	
80	**76.41**	13	65.0	93	1.8	15.6	1.8	47.3	115	85	180	135	
n_1 = 1200 min^{-1} (60Hz)					DRN100L4 4 kW S1 I_N=7.2 A (460V)		DRN132L4/Z 9.2 kW S1 I_N=16.8 A (460V)						IE3
28	**28.53**	42	65.0	296	2.9	12.6	2.9	29.0	170	115	300	225	
31.5	**32.06**	37	65.0	264	2.6	14.2	2.6	32.6	170	120	305	225	
35.5	**36.14**	33	65.0	234	2.9	12.6	2.9	29.0	155	110	270	200	
40	**40.61**	30	65.0	208	2.6	14.2	2.6	32.6	160	115	280	205	
45	**43.48**	28	65.0	194	2.4	15.2	2.4	34.9	140	105	250	185	148
50	**48.85**	25	65.0	173	2.1	17.1	2.1	39.2	145	105	250	185	150
56	**53.11**	23	65.0	161	2.4	15.2	2.4	34.9	130	97	230	170	
63	**59.68**	20	65.0	143	2.1	17.1	2.1	39.2	135	97	230	170	
71	**68**	18	65.0	126	2.4	15.2	2.4	34.9	115	85	195	150	
80	**76.41**	16	65.0	112	2.1	17.1	2.1	39.2	115	87	200	150	
n_1 = 1500 min^{-1} (50Hz)					DRN100L4 3 kW S1 I_N=6.6 A (400V)		DRN132L4/Z 9.2 kW S1 I_N=11.1 A (400V)						IE3
28	**28.53**	53	65.0	370	2.4	11.5	2.4	35.0	155	*)	335	240	
31.5	**32.06**	47	65.0	330	2.1	12.9	2.1	39.3	160	97	340	245	
35.5	**36.14**	42	65.0	292	2.4	11.5	2.4	35.0	150	98	300	220	
40	**40.61**	37	65.0	260	2.1	12.9	2.1	39.3	155	105	310	230	
45	**43.48**	34	65.0	243	2.0	13.9	2.0	42.1	140	95	280	205	148
50	**48.85**	31	65.0	216	1.8	15.6	1.8	47.3	140	98	280	205	150
56	**53.11**	28	65.0	201	2.0	13.9	2.0	42.1	130	94	255	190	
63	**59.68**	25	65.0	179	1.8	15.6	1.8	47.3	135	95	260	190	
71	**68**	22	65.0	157	2.0	13.9	2.0	42.1	115	85	220	165	
80	**76.41**	20	65.0	140	1.8	15.6	1.8	47.3	120	86	225	170	
n_1 = 1800 min^{-1} (60Hz)					DRN100L4 4 kW S1 I_N=7.2 A (460V)		DRN132L4/Z 9.2 kW S1 I_N=16.8 A (460V)						IE3
28	**28.53**	63	65.0	445	2.9	12.6	2.9	29.0	130	*)	350	245	
31.5	**32.06**	56	65.0	396	2.6	14.2	2.6	32.6	135	*)	355	250	
35.5	**36.14**	50	65.0	351	2.9	12.6	2.9	29.0	135	*)	320	230	
40	**40.61**	44	65.0	312	2.6	14.2	2.6	32.6	145	85	330	240	
45	**43.48**	41	65.0	292	2.4	15.2	2.4	34.9	130	78	295	215	148
50	**48.85**	37	65.0	260	2.1	17.1	2.1	39.2	135	82	300	215	150
56	**53.11**	34	65.0	241	2.4	15.2	2.4	34.9	130	84	275	200	
63	**59.68**	30	65.0	215	2.1	17.1	2.1	39.2	130	86	275	205	
71	**68**	26	65.0	188	2.4	15.2	2.4	34.9	115	81	240	180	
80	**76.41**	24	65.0	168	2.1	17.1	2.1	39.2	120	84	245	180	

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X.K200..													79.0 kNm
					KF77 i=38.39		KF97 i=38.3						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRN112M4 4 kW S1 I_N=8.1 A (400V)		DRN160M4 11.0 kW S1 I_N=22 A (400V)						IE3
25	**25.72**	39	79.0	333	2.7	13.5	2.7	36.9	190	130	315	230	
28	**29.17**	34	79.0	294	2.4	15.3	2.4	41.9	190	135	305	225	
31.5	**31.97**	31	79.0	268	2.7	13.5	2.7	36.9	180	130	285	210	
35.5	**36.26**	28	79.0	236	2.4	15.3	2.4	41.9	175	130	280	210	
40	**39.61**	25	79.0	216	2.2	16.8	2.2	45.8	175	125	275	205	148
45	**44.92**	22	79.0	191	1.9	19.0	1.9	51.9	165	120	265	200	150
50	**48.39**	21	79.0	179	2.2	16.8	2.2	45.8	160	120	250	190	
56	**54.88**	18	79.0	158	1.9	19.0	1.9	51.9	160	120	255	190	
63	**61.95**	16	79.0	140	2.2	16.8	2.2	45.8	145	110	230	175	
71	**70.26**	14	79.0	123	1.9	19.0	1.9	51.9	145	105	225	170	
n_1 = 1200 min^{-1} (60Hz)					DRN112M4 4 kW S1 I_N=7.2 A (460V)		DRN160M4 11.0 kW S1 I_N=19.1 A (460V)						IE3
25	**25.72**	47	79.0	400	3.3	11.2	3.3	30.6	185	115	345	250	
28	**29.17**	41	79.0	352	2.9	12.7	2.9	34.7	185	120	340	245	
31.5	**31.97**	38	79.0	321	3.3	11.2	3.3	30.6	180	125	315	235	
35.5	**36.26**	33	79.0	283	2.9	12.7	2.9	34.7	175	125	310	230	
40	**39.61**	30	79.0	259	2.6	13.9	2.7	38.0	175	125	305	230	148
45	**44.92**	27	79.0	229	2.3	15.7	2.3	43.0	165	120	295	220	150
50	**48.39**	25	79.0	214	2.6	13.9	2.7	38.0	160	120	280	210	
56	**54.88**	22	79.0	189	2.3	15.7	2.3	43.0	165	120	285	210	
63	**61.95**	19	79.0	167	2.6	13.9	2.7	38.0	150	110	255	195	
71	**70.26**	17	79.0	148	2.3	15.7	2.3	43.0	145	105	250	190	
n_1 = 1500 min^{-1} (50Hz)					DRN112M4 4 kW S1 I_N=8.1 A (400V)		DRN160M4 11.0 kW S1 I_N=22 A (400V)						IE3
25	**25.72**	58	79.0	499	2.7	13.5	2.7	36.9	155	*)	375	265	
28	**29.17**	51	79.0	440	2.4	15.3	2.4	41.9	160	*)	370	260	
31.5	**31.97**	47	79.0	402	2.7	13.5	2.7	36.9	170	110	350	260	
35.5	**36.26**	41	79.0	354	2.4	15.3	2.4	41.9	170	110	345	255	
40	**39.61**	38	79.0	324	2.2	16.8	2.2	45.8	170	110	340	250	148
45	**44.92**	33	79.0	286	1.9	19.0	1.9	51.9	165	110	330	240	150
50	**48.39**	31	79.0	268	2.2	16.8	2.2	45.8	160	110	315	235	
56	**54.88**	27	79.0	236	1.9	19.0	1.9	51.9	165	115	320	235	
63	**61.95**	24	79.0	209	2.2	16.8	2.2	45.8	150	105	290	215	
71	**70.26**	21	79.0	185	1.9	19.0	1.9	51.9	145	105	285	210	
n_1 = 1800 min^{-1} (60Hz)					DRN112M4 4 kW S1 I_N=7.2 A (460V)		DRN160M4 11.0 kW S1 I_N=19.1 A (460V)						IE3
25	**25.72**	70	77.2	586	3.3	11.2	3.3	30.6	*)	*)	385	255	
28	**29.17**	62	78.5	525	2.9	12.7	2.9	34.7	*)	*)	380	260	
31.5	**31.97**	56	79.0	482	3.3	11.2	3.3	30.6	150	*)	370	270	
35.5	**36.26**	50	79.0	425	2.9	12.7	2.9	34.7	155	*)	365	265	
40	**39.61**	45	79.0	389	2.6	13.9	2.7	38.0	160	*)	365	260	148
45	**44.92**	40	79.0	343	2.3	15.7	2.3	43.0	155	87	350	250	150
50	**48.39**	37	79.0	322	2.6	13.9	2.7	38.0	155	96	340	245	
56	**54.88**	33	79.0	284	2.3	15.7	2.3	43.0	160	100	340	250	
63	**61.95**	29	79.0	251	2.6	13.9	2.7	38.0	145	98	310	230	
71	**70.26**	26	79.0	221	2.3	15.7	2.3	43.0	145	99	305	225	

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X.K210..													90.0 kNm
					KF77 i=38.39		KF97 i=38.3						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRN112M4 4 kW S1 I_N=8.1 A (400V)		DRN160M4 11.0 kW S1 I_N=22 A (400V)						IE3
28	**29.13**	34	90.0	335	2.4	15.3	2.4	41.8	195	135	320	235	
31.5	**32.97**	30	90.0	296	2.1	17.3	2.1	47.4	185	130	305	225	
35.5	**36.2**	28	90.0	269	2.4	15.3	2.4	41.8	180	135	290	215	
40	**40.99**	24	90.0	238	2.1	17.3	2.1	47.4	180	130	285	210	
45	**44.85**	22	90.0	218	1.9	19.0	1.9	51.8	175	130	280	210	148
50	**50.78**	20	90.0	192	1.7	21.5	1.7	58.7	170	125	270	200	150
56	**54.79**	18	90.0	180	1.9	19.0	1.9	51.8	165	120	255	195	
63	**62.03**	16	90.0	159	1.7	21.5	1.7	58.7	165	120	260	195	
71	**70.15**	14	90.0	140	1.9	19.0	1.9	51.8	150	110	235	175	
80	**79.42**	13	90.0	124	1.7	21.5	1.7	58.7	145	110	230	175	
n_1 = 1200 min^{-1} (60Hz)					DRN112M4 4 kW S1 I_N=7.2 A (460V)		DRN160M4 11.0 kW S1 I_N=19.1 A (460V)						IE3
28	**29.13**	41	90.0	402	2.9	12.7	2.9	34.7	190	120	350	255	
31.5	**32.97**	36	90.0	355	2.5	14.3	2.6	39.3	185	120	335	245	
35.5	**36.2**	33	90.0	323	2.9	12.7	2.9	34.7	185	130	320	240	
40	**40.99**	29	90.0	286	2.5	14.3	2.6	39.3	180	130	315	235	
45	**44.85**	27	90.0	261	2.3	15.7	2.3	43.0	180	130	310	235	148
50	**50.78**	24	90.0	231	2.1	17.8	2.1	48.7	170	125	300	225	150
56	**54.79**	22	90.0	216	2.3	15.7	2.3	43.0	165	120	290	215	
63	**62.03**	19	90.0	191	2.1	17.8	2.1	48.7	165	120	290	215	
71	**70.15**	17	90.0	168	2.3	15.7	2.3	43.0	150	110	260	195	
80	**79.42**	15	90.0	149	2.1	17.8	2.1	48.7	150	110	255	195	
n_1 = 1500 min^{-1} (50Hz)					DRN112M4 4 kW S1 I_N=8.1 A (400V)		DRN160M4 11.0 kW S1 I_N=22 A (400V)						IE3
28	**29.13**	51	90.0	502	2.4	15.3	2.4	41.8	160	*)	385	270	
31.5	**32.97**	45	90.0	444	2.1	17.3	2.1	47.4	160	*)	365	260	
35.5	**36.2**	41	90.0	404	2.4	15.3	2.4	41.8	175	110	360	265	
40	**40.99**	37	90.0	357	2.1	17.3	2.1	47.4	175	115	350	260	
45	**44.85**	33	90.0	326	1.9	19.0	1.9	51.8	175	115	350	255	148
50	**50.78**	30	90.0	288	1.7	21.5	1.7	58.7	170	110	335	245	150
56	**54.79**	27	90.0	270	1.9	19.0	1.9	51.8	165	115	325	240	
63	**62.03**	24	90.0	238	1.7	21.5	1.7	58.7	165	120	325	240	
71	**70.15**	21	90.0	211	1.9	19.0	1.9	51.8	155	110	295	220	
80	**79.42**	19	90.0	186	1.7	21.5	1.7	58.7	150	110	290	215	
n_1 = 1800 min^{-1} (60Hz)					DRN112M4 4 kW S1 I_N=7.2 A (460V)		DRN160M4 11.0 kW S1 I_N=19.1 A (460V)						IE3
28	**29.13**	62	87.4	585	2.9	12.7	2.9	34.7	*)	*)	395	265	
31.5	**32.97**	55	88.6	524	2.5	14.3	2.6	39.3	*)	*)	375	260	
35.5	**36.2**	50	90.0	485	2.9	12.7	2.9	34.7	155	*)	380	275	
40	**40.99**	44	90.0	428	2.5	14.3	2.6	39.3	160	*)	375	270	
45	**44.85**	40	90.0	392	2.3	15.7	2.3	43.0	160	*)	370	270	148
50	**50.78**	35	90.0	346	2.1	17.8	2.1	48.7	155	90	355	255	150
56	**54.79**	33	90.0	324	2.3	15.7	2.3	43.0	160	100	345	250	
63	**62.03**	29	90.0	286	2.1	17.8	2.1	48.7	160	105	345	255	
71	**70.15**	26	90.0	253	2.3	15.7	2.3	43.0	150	100	315	235	
80	**79.42**	23	90.0	223	2.1	17.8	2.1	48.7	150	100	310	230	

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X.K220..													112 kNm
					KF87 i=36.52		KF107 i=37						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRN112M4 4 kW S1 I_N=8.1 A (400V)		DRN180M4 18.5 kW S1 I_N=34.5 A (400V)						IE3
25	**25.28**	40	112	480	2.8	12.9	2.8	59.9	250	165	420	305	
28	**27.9**	36	112	435	2.6	14.2	2.6	66.1	255	175	425	310	
31.5	**32.02**	31	112	379	2.8	12.9	2.8	59.9	245	180	390	290	
35.5	**35.34**	28	112	344	2.6	14.2	2.6	66.1	240	175	385	290	
40	**39.55**	25	112	307	2.3	15.9	2.3	74.0	220	160	350	265	152
45	**43.65**	23	112	278	2.1	17.6	2.1	81.7	220	160	345	260	154
50	**48.32**	21	112	254	2.3	15.9	2.3	74.0	210	155	330	250	
56	**53.33**	19	112	230	2.1	17.6	2.1	81.7	205	150	325	245	
63	**61.86**	16	112	198	2.3	15.9	2.3	74.0	180	135	285	215	
71	**68.27**	15	112	180	2.1	17.6	2.1	81.7	180	130	280	210	
n_1 = 1200 min^{-1} (60Hz)					DRN112M4 4 kW S1 I_N=7.2 A (460V)		DRN180M4 18.5 kW S1 I_N=30 A (460V)						IE3
25	**25.28**	47	112	576	3.4	10.6	3.4	49.7	230	*)	460	330	
28	**27.9**	43	112	522	3.1	11.8	3.1	54.9	245	145	465	335	
31.5	**32.02**	37	112	455	3.4	10.6	3.4	49.7	245	165	435	320	
35.5	**35.34**	34	112	412	3.1	11.8	3.1	54.9	240	165	430	320	
40	**39.55**	30	112	368	2.8	13.2	2.8	61.4	220	155	390	290	152
45	**43.65**	27	112	334	2.5	14.5	2.5	67.8	220	155	385	285	154
50	**48.32**	25	112	304	2.8	13.2	2.8	61.4	210	155	370	275	
56	**53.33**	23	112	276	2.5	14.5	2.5	67.8	210	150	365	270	
63	**61.86**	19	112	238	2.8	13.2	2.8	61.4	185	135	320	240	
71	**68.27**	18	112	215	2.5	14.5	2.5	67.8	180	135	315	235	
n_1 = 1500 min^{-1} (50Hz)					DRN112M4 4 kW S1 I_N=8.1 A (400V)		DRN180M4 18.5 kW S1 I_N=34.5 A (400V)						IE3
25	**25.28**	59	112	720	2.8	12.9	2.8	59.9	*)	*)	490	340	
28	**27.9**	54	112	653	2.6	14.2	2.6	66.1	190	*)	500	350	
31.5	**32.02**	47	112	569	2.8	12.9	2.8	59.9	230	*)	485	350	
35.5	**35.34**	42	112	515	2.6	14.2	2.6	66.1	230	140	475	345	
40	**39.55**	38	112	460	2.3	15.9	2.3	74.0	210	125	435	320	152
45	**43.65**	34	112	417	2.1	17.6	2.1	81.7	210	130	430	315	154
50	**48.32**	31	112	380	2.3	15.9	2.3	74.0	210	140	410	305	
56	**53.33**	28	112	345	2.1	17.6	2.1	81.7	205	140	405	300	
63	**61.86**	24	112	297	2.3	15.9	2.3	74.0	185	130	360	265	
71	**68.27**	22	112	269	2.1	17.6	2.1	81.7	185	130	355	265	
n_1 = 1800 min^{-1} (60Hz)					DRN112M4 4 kW S1 I_N=7.2 A (460V)		DRN180M4 18.5 kW S1 I_N=30 A (460V)						IE3
25[1)]	**25.28**	71	112	864	3.4	10.6	3.4	49.7	*)	*)	490	300	
28[1)]	**27.9**	65	112	783	3.1	11.8	3.1	54.9	*)	*)	500	320	
31.5	**32.02**	56	112	682	3.4	10.6	3.4	49.7	190	*)	510	360	
35.5	**35.34**	51	112	618	3.1	11.8	3.1	54.9	195	*)	500	355	
40	**39.55**	46	112	553	2.8	13.2	2.8	61.4	180	*)	460	330	152
45	**43.65**	41	112	501	2.5	14.5	2.5	67.8	185	*)	450	325	154
50	**48.32**	37	112	457	2.8	13.2	2.8	61.4	195	*)	440	320	
56	**53.33**	34	112	414	2.5	14.5	2.5	67.8	195	115	430	315	
63	**61.86**	29	112	357	2.8	13.2	2.8	61.4	180	115	385	285	
71	**68.27**	26	112	323	2.5	14.5	2.5	67.8	180	115	380	280	

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X.K230..													131 kNm
					KF87 i=36.52		KF107 i=37						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRN112M4 4 kW S1 I_N=8.1 A (400V)		DRN180M4 18.5 kW S1 I_N=34.5 A (400V)						IE3
28	**28.63**	35	131	496	2.5	14.6	2.5	67.9	260	175	430	315	
31.5	**31.43**	32	131	452	2.3	16.0	2.3	74.5	255	175	425	310	
35.5	**36.26**	28	131	392	2.5	14.6	2.5	67.9	250	185	400	300	
40	**39.82**	25	131	357	2.3	16.0	2.3	74.5	250	180	395	295	
45	**44.78**	22	131	317	2.0	18.0	2.0	83.8	225	165	360	270	152
50	**49.17**	20	131	289	1.8	19.8	1.8	92.1	225	165	355	265	154
56	**54.71**	18	131	262	2.0	18.0	2.0	83.8	210	155	330	250	
63	**60.08**	17	131	239	1.8	19.8	1.8	92.1	205	155	325	245	
71	**70.05**	14	131	205	2.0	18.0	2.0	83.8	185	140	290	220	
80	**76.91**	13	131	186	1.8	19.8	1.8	92.1	180	135	285	215	
n_1 = 1200 min^{-1} (60Hz)					DRN112M4 4 kW S1 I_N=7.2 A (460V)		DRN180M4 18.5 kW S1 I_N=30 A (460V)						IE3
28	**28.63**	42	131	595	3.0	12.1	3.0	56.3	245	150	470	340	
31.5	**31.43**	38	131	542	2.8	13.2	2.7	61.8	245	150	465	335	
35.5	**36.26**	33	131	470	3.0	12.1	3.0	56.3	250	175	445	330	
40	**39.82**	30	131	428	2.8	13.2	2.7	61.8	250	175	440	325	
45	**44.78**	27	131	381	2.5	14.9	2.4	69.6	230	160	400	300	152
50	**49.17**	24	131	347	2.2	16.4	2.2	76.4	225	160	395	295	154
56	**54.71**	22	131	314	2.5	14.9	2.4	69.6	210	155	370	275	
63	**60.08**	20	131	286	2.2	16.4	2.2	76.4	210	150	365	270	
71	**70.05**	17	131	246	2.5	14.9	2.4	69.6	190	140	325	245	
80	**76.91**	16	131	224	2.2	16.4	2.2	76.4	185	140	320	240	
n_1 = 1500 min^{-1} (50Hz)					DRN112M4 4 kW S1 I_N=8.1 A (400V)		DRN180M4 18.5 kW S1 I_N=34.5 A (400V)						IE3
28	**28.63**	52	131	744	2.5	14.6	2.5	67.9	195	*)	510	350	
31.5	**31.43**	48	131	678	2.3	16.0	2.3	74.5	200	*)	500	350	
35.5	**36.26**	41	131	587	2.5	14.6	2.5	67.9	240	150	495	360	
40	**39.82**	38	131	535	2.3	16.0	2.3	74.5	240	155	490	355	
45	**44.78**	33	131	476	2.0	18.0	2.0	83.8	220	140	445	325	152
50	**49.17**	31	131	433	1.8	19.8	1.8	92.1	220	140	440	320	154
56	**54.71**	27	131	393	2.0	18.0	2.0	83.8	210	145	415	305	
63	**60.08**	25	131	358	1.8	19.8	1.8	92.1	205	145	405	300	
71	**70.05**	21	131	307	2.0	18.0	2.0	83.8	190	135	365	275	
80	**76.91**	20	131	280	1.8	19.8	1.8	92.1	190	135	360	270	
n_1 = 1800 min^{-1} (60Hz)					DRN112M4 4 kW S1 I_N=7.2 A (460V)		DRN180M4 18.5 kW S1 I_N=30 A (460V)						IE3
28[1)]	**28.63**	63	126	862	3.0	12.1	3.0	56.3	*)	*)	510	320	
31.5[1)]	**31.43**	57	129	801	2.8	13.2	2.7	61.8	*)	*)	500	325	
35.5	**36.26**	50	129	694	3.0	12.1	3.0	56.3	210	*)	520	375	
40	**39.82**	45	131	642	2.8	13.2	2.7	61.8	210	*)	510	370	
45	**44.78**	40	131	571	2.5	14.9	2.4	69.6	195	*)	470	340	152
50	**49.17**	37	131	520	2.2	16.4	2.2	76.4	195	*)	465	335	154
56	**54.71**	33	131	472	2.5	14.9	2.4	69.6	200	120	440	320	
63	**60.08**	30	131	429	2.2	16.4	2.2	76.4	200	120	435	315	
71	**70.05**	26	131	368	2.5	14.9	2.4	69.6	190	125	395	290	
80	**76.91**	23	131	335	2.2	16.4	2.2	76.4	185	125	385	285	

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X.K240..													156 kNm
					KF87 i=36.52		KF127 i=36.25						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRN132S4 5.5 kW S1 I_N=10.5 A (400V)		DRN200L4 30 kW S1 I_N=57 A (400V)						IE3
25	**25.64**	39	156	660	2.8	18.0	2.8	96.5	280	180	485	350	
28	**29.51**	34	156	573	2.4	20.7	2.5	111	275	180	475	340	
31.5	**32.47**	31	156	521	2.8	18.0	2.8	96.5	280	200	460	340	
35.5	**37.38**	27	156	452	2.4	20.7	2.5	111	275	195	450	330	
40	**39.96**	25	156	423	2.3	22.1	2.3	118	275	195	445	330	152
45	**46**	22	156	368	2.0	25.5	2.0	136	260	185	425	315	154
50	**48.83**	20	156	350	2.3	22.1	2.3	118	250	180	400	295	
56	**56.2**	18	156	304	2.0	25.5	2.0	136	240	175	380	285	
63	**62.51**	16	156	273	2.3	22.1	2.3	118	230	170	360	270	
71	**71.95**	14	156	237	2.0	25.5	2.0	136	220	160	345	260	
n_1 = 1200 min^{-1} (60Hz)					DRN132S4 5.5 kW S1 I_N=9.5 A (460V)		DRN200L4 30 kW S1 I_N=50 A (460V)						IE3
25	**25.64**	47	156	791	3.4	14.9	3.4	80.1	245	*)	520	365	
28	**29.51**	41	156	688	2.9	17.1	3.0	92.2	245	*)	510	360	
31.5	**32.47**	37	156	625	3.4	14.9	3.4	80.1	270	180	500	370	
35.5	**37.38**	32	156	543	2.9	17.1	3.0	92.2	270	180	495	360	
40	**39.96**	30	156	508	2.7	18.3	2.8	98.5	265	175	490	360	152
45	**46**	26	156	441	2.4	21.1	2.4	113	255	170	470	340	154
50	**48.83**	25	156	419	2.7	18.3	2.8	98.5	245	170	440	325	
56	**56.2**	21	156	364	2.4	21.1	2.4	113	235	165	420	310	
63	**62.51**	19	156	328	2.7	18.3	2.8	98.5	230	165	405	300	
71	**71.95**	17	156	285	2.4	21.1	2.4	113	220	160	385	290	
n_1 = 1500 min^{-1} (50Hz)					DRN132S4 5.5 kW S1 I_N=10.5 A (400V)		DRN200L4 30 kW S1 I_N=57 A (400V)						IE3
25[1)]	**25.64**	59	156	989	2.8	18.0	2.8	96.5	*)	*)	540	350	
28[1)]	**29.51**	51	156	860	2.4	20.7	2.5	111	*)	*)	530	345	
31.5	**32.47**	46	156	781	2.8	18.0	2.8	96.5	235	*)	550	390	
35.5	**37.38**	40	156	679	2.4	20.7	2.5	111	235	*)	540	380	
40	**39.96**	38	156	635	2.3	22.1	2.3	118	235	*)	540	380	152
45	**46**	33	156	551	2.0	25.5	2.0	136	230	*)	510	365	154
50	**48.83**	31	156	524	2.3	22.1	2.3	118	235	145	490	355	
56	**56.2**	27	156	456	2.0	25.5	2.0	136	225	140	465	340	
63	**62.51**	24	156	410	2.3	22.1	2.3	118	225	150	450	330	
71	**71.95**	21	156	356	2.0	25.5	2.0	136	215	145	430	315	
n_1 = 1800 min^{-1} (60Hz)					DRN132S4 5.5 kW S1 I_N=9.5 A (460V)		DRN200L4 30 kW S1 I_N=50 A (460V)						IE3
25[1)]	**25.64**	70	156	1187	3.4	14.9	3.4	80.1	*)	*)	510	*)	
28[1)]	**29.51**	61	156	1031	2.9	17.1	3.0	92.2	*)	*)	510	280	
31.5	**32.47**	55	156	937	3.4	14.9	3.4	80.1	*)	*)	560	380	
35.5	**37.38**	48	156	814	2.9	17.1	3.0	92.2	*)	*)	550	375	
40	**39.96**	45	156	762	2.7	18.3	2.8	98.5	*)	*)	550	375	152
45	**46**	39	156	662	2.4	21.1	2.4	113	175	*)	520	360	154
50	**48.83**	37	156	629	2.7	18.3	2.8	98.5	200	*)	510	360	
56	**56.2**	32	156	547	2.4	21.1	2.4	113	195	*)	490	345	
63	**62.51**	29	156	492	2.7	18.3	2.8	98.5	210	125	480	345	
71	**71.95**	25	156	427	2.4	21.1	2.4	113	200	120	460	330	

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X.K250..													175 kNm
					KF87 i=36.52		KF127 i=36.25						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRN132S4 5.5 kW S1 I_N=10.5 A (400V)		DRN200L4 30 kW S1 I_N=57 A (400V)						IE3
28	**27.55**	36	175	689	2.6	19.3	2.7	103	285	180	495	355	
31.5	**31.64**	32	175	600	2.3	22.2	2.3	119	270	175	470	340	
35.5	**34.89**	29	175	544	2.6	19.3	2.7	103	285	200	465	345	
40	**40.08**	25	175	473	2.3	22.2	2.3	119	275	195	445	330	
45	**42.95**	23	175	442	2.1	23.8	2.2	127	270	195	440	325	152
50	**49.33**	20	175	385	1.8	27.3	1.9	146	260	185	420	310	154
56	**52.47**	19	175	365	2.1	23.8	2.2	127	245	180	395	295	
63	**60.27**	17	175	318	1.8	27.3	1.9	146	240	175	385	290	
71	**67.18**	15	175	285	2.1	23.8	2.2	127	225	165	360	270	
80	**77.17**	13	175	248	1.8	27.3	1.9	146	220	165	350	265	
n_1 = 1200 min^{-1} (60Hz)					DRN132S4 5.5 kW S1 I_N=9.5 A (460V)		DRN200L4 30 kW S1 I_N=50 A (460V)						IE3
28	**27.55**	44	175	826	3.1	16.0	3.2	86.0	250	*)	530	370	
31.5	**31.64**	38	175	719	2.7	18.4	2.8	98.8	240	*)	510	355	
35.5	**34.89**	34	175	652	3.1	16.0	3.2	86.0	275	180	510	375	
40	**40.08**	30	175	568	2.7	18.4	2.8	98.8	265	175	490	355	
45	**42.95**	28	175	530	2.6	19.7	2.6	105	265	175	485	355	152
50	**49.33**	24	175	461	2.2	22.6	2.3	121	255	170	465	340	154
56	**52.47**	23	175	438	2.6	19.7	2.6	105	245	170	440	325	
63	**60.27**	20	175	381	2.2	22.6	2.3	121	240	170	430	315	
71	**67.18**	18	175	342	2.6	19.7	2.6	105	230	165	400	300	
80	**77.17**	16	175	298	2.2	22.6	2.3	121	225	160	395	295	
n_1 = 1500 min^{-1}(50Hz)					DRN132S4 5.5 kW S1 I_N=10.5 A (400V)		DRN200L4 30 kW S1 I_N=57 A (400V)						IE3
28[1)]	**27.55**	54	175	1033	2.6	19.3	2.7	103	*)	*)	560	355	
31.5[1)]	**31.64**	47	175	899	2.3	22.2	2.3	119	*)	*)	530	340	
35.5	**34.89**	43	175	816	2.6	19.3	2.7	103	240	*)	560	395	
40	**40.08**	37	175	710	2.3	22.2	2.3	119	235	*)	530	380	
45	**42.95**	35	175	662	2.1	23.8	2.2	127	230	*)	530	380	152
50	**49.33**	30	175	577	1.8	27.3	1.9	146	225	*)	510	360	154
56	**52.47**	29	175	547	2.1	23.8	2.2	127	230	145	485	350	
63	**60.27**	25	175	477	1.8	27.3	1.9	146	230	145	475	345	
71	**67.18**	22	175	428	2.1	23.8	2.2	127	225	150	450	330	
80	**77.17**	19	175	372	1.8	27.3	1.9	146	220	150	440	325	
n_1 = 1800 min^{-1} (60Hz)					DRN132S4 5.5 kW S1 I_N=9.5 A (460V)		DRN200L4 30 kW S1 I_N=50 A (460V)						IE3
28[1)]	**27.55**	65	174	1232	3.1	16.0	3.2	86.0	*)	*)	520	*)	
31.5[1)]	**31.64**	57	175	1079	2.7	18.4	2.8	98.8	*)	*)	500	275	
35.5	**34.89**	52	175	979	3.1	16.0	3.2	86.0	*)	*)	570	385	
40	**40.08**	45	175	852	2.7	18.4	2.8	98.8	*)	*)	550	370	
45	**42.95**	42	175	795	2.6	19.7	2.6	105	*)	*)	540	370	152
50	**49.33**	36	175	692	2.2	22.6	2.3	121	175	*)	520	360	154
56	**52.47**	34	175	657	2.6	19.7	2.6	105	200	*)	510	360	
63	**60.27**	30	175	572	2.2	22.6	2.3	121	200	*)	495	350	
71	**67.18**	27	175	513	2.6	19.7	2.6	105	205	*)	475	345	
80	**77.17**	23	175	447	2.2	22.6	2.3	121	205	125	465	335	

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X.K260..													205 kNm
					KF87 i=36.52		KF127 i=36.25						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRN132S4 5.5 kW S1 I_N=10.5 A (400V)		DRN225S4 37 kW S1 I_N=67 A (400V)						IE3
28	**29.51**	34	205	753	2.4	20.7	2.5	136	285	*)	570	405	156 158
31.5	**30.68**	33	205	724	2.3	21.5	2.4	142	285	*)	570	405	
35.5	**34.7**	29	205	640	2.1	24.3	2.1	160	280	165	560	400	
40	**38.86**	26	205	572	2.3	21.5	2.4	142	305	205	550	405	
45	**43.96**	23	205	505	2.1	24.3	2.1	160	290	195	530	390	
50	**47.48**	21	205	472	2.3	21.5	2.4	142	285	200	510	380	
56	**53.7**	19	205	418	2.1	24.3	2.1	160	280	195	495	370	
63	**60.78**	16	205	369	2.3	21.5	2.4	142	260	185	450	340	
71	**68.75**	15	205	326	2.1	24.3	2.1	160	250	175	435	325	
n_1 = 1200 1/min (60Hz)					DRN132S4 5.5 kW S1 I_N=9.5 A (460V)		DRN225S4 37 kW S1 I_N=58 A (460V)						IE3
28	**29.51**	41	205	904	2.9	17.1	3.0	113	225	*)	610	410	156 158
31.5	**30.68**	39	205	869	2.8	17.8	2.9	118	235	*)	610	415	
35.5	**34.7**	35	205	768	2.5	20.2	2.5	133	230	*)	600	405	
40	**38.86**	31	205	686	2.8	17.8	2.9	118	285	180	600	440	
45	**43.96**	27	205	607	2.5	20.2	2.5	133	275	170	580	420	
50	**47.48**	25	205	567	2.8	17.8	2.9	118	280	185	560	415	
56	**53.7**	22	205	501	2.5	20.2	2.5	133	275	180	550	405	
63	**60.78**	20	205	443	2.8	17.8	2.9	118	260	180	500	375	
71	**68.75**	17	205	392	2.5	20.2	2.5	133	250	170	485	360	
n_1 = 1500 min^{-1} (50Hz)					DRN132S4 5.5 kW S1 I_N=10.5 A (400V)		DRN225S4 37 kW S1 I_N=67 A (400V)						IE3
28[1)]	**29.51**	51	205	1130	2.4	20.7	2.5	136	*)	*)	600	370	156 158
31.5[1)]	**30.68**	49	205	1086	2.3	21.5	2.4	142	*)	*)	610	375	
35.5[1)]	**34.7**	43	205	961	2.1	24.3	2.1	160	*)	*)	600	370	
40	**38.86**	39	205	858	2.3	21.5	2.4	142	240	*)	650	460	
45	**43.96**	34	205	758	2.1	24.3	2.1	160	230	*)	620	440	
50	**47.48**	32	205	709	2.3	21.5	2.4	142	255	*)	620	445	
56	**53.7**	28	205	627	2.1	24.3	2.1	160	250	*)	600	435	
63	**60.78**	25	205	554	2.3	21.5	2.4	142	250	160	560	415	
71	**68.75**	22	205	489	2.1	24.3	2.1	160	240	150	540	400	
n_1 = 1800 min^{-1} (60Hz)					DRN132S4 5.5 kW S1 I_N=9.5 A (460V)		DRN225S4 37 kW S1 I_N=58 A (460V)						IE3
28[1)]	**29.51**	61	205	1355	2.9	17.1	3.0	113	*)	*)	530	*)	156 158
31.5[1)]	**30.68**	59	205	1304	2.8	17.8	2.9	118	*)	*)	540	*)	
35.5[1)]	**34.7**	52	205	1153	2.5	20.2	2.5	133	*)	*)	530	*)	
40[1)]	**38.86**	46	205	1029	2.8	17.8	2.9	118	*)	*)	660	440	
45[1)]	**43.96**	41	205	910	2.5	20.2	2.5	133	*)	*)	630	425	
50	**47.48**	38	205	850	2.8	17.8	2.9	118	*)	*)	640	450	
56	**53.7**	34	205	752	2.5	20.2	2.5	133	205	*)	630	440	
63	**60.78**	30	205	664	2.8	17.8	2.9	118	225	*)	600	430	
71	**68.75**	26	205	587	2.5	20.2	2.5	133	215	*)	570	415	

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X.K270..													240 kNm
					KF87 i=36.52		KF127 i=36.25						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH} 20°C	P_{TH} 40°C	P_{TH} 20°C	P_{TH} 40°C	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]					
n_1 = 1000 min^{-1} (50Hz)					DRN132S4 5.5 kW S1 I_N=10.5 A (400V)		DRN225S4 37 kW S1 I_N=67 A (400V)						IE3
28	**28.65**	35	240	908	2.5	20.1	2.6	132	300	*)	600	425	
31.5	**32.07**	31	240	811	2.2	22.5	2.3	148	295	*)	590	420	
35.5	**33.7**	30	240	772	2.1	23.6	2.2	156	295	*)	590	420	
40	**37.72**	27	240	690	1.9	26.5	1.9	174	290	175	580	410	
45	**42.68**	23	240	610	2.1	23.6	2.2	156	305	205	550	405	156
50	**47.78**	21	240	544	1.9	26.5	1.9	174	305	205	550	405	158
56	**52.14**	19	240	504	2.1	23.6	2.2	156	295	205	520	385	
63	**58.37**	17	240	450	1.9	26.5	1.9	174	290	200	510	380	
71	**66.76**	15	240	393	2.1	23.6	2.2	156	260	185	450	340	
80	**74.73**	13	240	351	1.9	26.5	1.9	174	260	185	450	340	
n_1 = 1200 min^{-1} (60Hz)					DRN132S4 5.5 kW S1 I_N=9.5 A (460V)		DRN225S4 37 kW S1 I_N=58 A (460V)						IE3
28	**28.65**	42	240	1090	3.0	16.6	3.1	110	*)	*)	640	435	
31.5	**32.07**	37	240	973	2.7	18.6	2.7	123	*)	*)	620	425	
35.5	**33.7**	36	240	926	2.6	19.6	2.6	129	245	*)	620	430	
40	**37.72**	32	240	828	2.3	21.9	2.3	145	240	*)	610	420	
45	**42.68**	28	240	731	2.6	19.6	2.6	129	290	*)	600	440	156
50	**47.78**	25	240	653	2.3	21.9	2.3	145	290	180	600	440	158
56	**52.14**	23	240	604	2.6	19.6	2.6	129	285	190	570	425	
63	**58.37**	21	240	540	2.3	21.9	2.3	145	280	185	560	415	
71	**66.76**	18	240	472	2.6	19.6	2.6	129	260	180	500	375	
80	**74.73**	16	240	422	2.3	21.9	2.3	145	260	180	500	380	
n_1 = 1500 min^{-1} (50Hz)					DRN132S4 5.5 kW S1 I_N=10.5 A (400V)		DRN225S4 37 kW S1 I_N=67 A (400V)						IE3
28[1)]	**28.65**	52	240	1362	2.5	20.1	2.6	132	*)	*)	640	390	
31.5[1)]	**32.07**	47	240	1217	2.2	22.5	2.3	148	*)	*)	620	385	
35.5[1)]	**33.7**	45	240	1158	2.1	23.6	2.2	156	*)	*)	630	395	
40[1)]	**37.72**	40	240	1035	1.9	26.5	1.9	174	*)	*)	620	385	
45	**42.68**	35	240	914	2.1	23.6	2.2	156	240	*)	650	460	156
50	**47.78**	31	240	817	1.9	26.5	1.9	174	240	*)	660	465	158
56	**52.14**	29	240	755	2.1	23.6	2.2	156	260	*)	630	455	
63	**58.37**	26	240	675	1.9	26.5	1.9	174	255	*)	620	450	
71	**66.76**	22	240	590	2.1	23.6	2.2	156	250	160	560	415	
80	**74.73**	20	240	527	1.9	26.5	1.9	174	250	160	560	415	
n_1 = 1800 min^{-1} (60Hz)					DRN132S4 5.5 kW S1 I_N=9.5 A (460V)		DRN225S4 37 kW S1 I_N=58 A (460V)						IE3
28[1)]	**28.65**	63	240	1634	3.0	16.6	3.1	110	*)	*)	560	*)	
31.5[1)]	**32.07**	56	240	1460	2.7	18.6	2.7	123	*)	*)	550	*)	
35.5[1)]	**33.7**	53	240	1390	2.6	19.6	2.6	129	*)	*)	560	*)	
40[1)]	**37.72**	48	240	1241	2.3	21.9	2.3	145	*)	*)	550	*)	
45[1)]	**42.68**	42	240	1097	2.6	19.6	2.6	129	*)	*)	660	445	156
50[1)]	**47.78**	38	240	980	2.3	21.9	2.3	145	*)	*)	670	450	158
56	**52.14**	35	240	907	2.6	19.6	2.6	129	*)	*)	660	460	
63	**58.37**	31	240	810	2.3	21.9	2.3	145	210	*)	650	455	
71	**66.76**	27	240	708	2.6	19.6	2.6	129	225	*)	600	430	
80	**74.73**	24	240	633	2.3	21.9	2.3	145	225	*)	600	435	

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X.K280..													270 kNm
					KF87 i=36.52		KF127 i=36.25						
									P_{TH}[kW]				
i_N	i_{ex}	n_2	M_{N2}	P_{N1}	n_3	M_{K3}	n_3	M_{K3}	P_{TH}	P_{TH}	P_{TH}	P_{TH}	
		[min^{-1}]	[kNm]	[kW]	[min^{-1}]	[kNm]	[min^{-1}]	[kNm]	20°C	40°C	20°C	40°C	
n_1 = 1000 min^{-1} (50Hz)					DRN132S4 5.5 kW S1 I_N=10.5 A (400V)		DRN225S4 37 kW S1 I_N=67 A (400V)						IE3
31.5	**32.07**	31	270	913	2.2	22.5	2.3	148	370	*)	710	510	
35.5	**35.92**	28	270	815	2.0	25.2	2.0	166	350	220	680	485	
40	**37.72**	27	270	776	1.9	26.5	1.9	174	365	230	690	500	
45	**42.25**	24	270	693	1.7	29.6	1.7	195	355	225	680	490	
50	**47.78**	21	270	613	1.9	26.5	1.9	174	360	250	640	475	156
56	**53.51**	19	270	547	1.7	29.6	1.7	195	355	245	630	465	158
63	**58.37**	17	270	506	1.9	26.5	1.9	174	345	245	600	450	
71	**65.38**	15	270	452	1.7	29.6	1.7	195	330	235	570	430	
80	**74.73**	13	270	395	1.9	26.5	1.9	174	305	220	520	395	
90	**83.7**	12	270	353	1.7	29.6	1.7	195	300	215	510	385	
n_1 = 1200 min^{-1} (60Hz)					DRN132S4 5.5 kW S1 I_N=9.5 A (460V)		DRN225S4 37 kW S1 I_N=58 A (460V)						IE3
31.5	**32.07**	37	270	1095	2.7	18.6	2.7	123	320	*)	760	530	
35.5	**35.92**	33	270	978	2.4	20.9	2.5	138	305	*)	730	510	
40	**37.72**	32	270	931	2.3	21.9	2.3	145	315	*)	750	520	
45	**42.25**	28	270	831	2.1	24.5	2.1	162	310	*)	730	510	
50	**47.78**	25	270	735	2.3	21.9	2.3	145	350	225	700	520	156
56	**53.51**	22	270	656	2.1	24.5	2.1	162	340	225	690	510	158
63	**58.37**	21	270	607	2.3	21.9	2.3	145	340	230	670	495	
71	**65.38**	18	270	542	2.1	24.5	2.1	162	325	225	640	475	
80	**74.73**	16	270	474	2.3	21.9	2.3	145	305	215	580	435	
90	**83.7**	14	270	424	2.1	24.5	2.1	162	300	210	570	430	
n_1 = 1500 min^{-1} (50Hz)					DRN132S4 5.5 kW S1 I_N=10.5 A (400V)		DRN225S4 37 kW S1 I_N=67 A (400V)						IE3
31.5[1)]	**32.07**	47	270	1369	2.2	22.5	2.3	148	*)	*)	780	510	
35.5[1)]	**35.92**	42	270	1222	2.0	25.2	2.0	166	*)	*)	750	485	
40[1)]	**37.72**	40	270	1164	1.9	26.5	1.9	174	*)	*)	770	510	
45[1)]	**42.25**	36	270	1039	1.7	29.6	1.7	195	*)	*)	760	500	
50	**47.78**	31	270	919	1.9	26.5	1.9	174	310	*)	770	550	156
56	**53.51**	28	270	820	1.7	29.6	1.7	195	305	*)	760	540	158
63	**58.37**	26	270	759	1.9	26.5	1.9	174	320	200	740	540	
71	**65.38**	23	270	678	1.7	29.6	1.7	195	305	190	710	520	
80	**74.73**	20	270	593	1.9	26.5	1.9	174	300	195	650	485	
90	**83.7**	18	270	529	1.7	29.6	1.7	195	295	195	640	475	
n_1 = 1800 min^{-1} (60Hz)					DRN132S4 5.5 kW S1 I_N=9.5 A (460V)		DRN225S4 37 kW S1 I_N=58 A (460V)						IE3
31.5[1)]	**32.07**	56	270	1643	2.7	18.6	2.7	123	*)	*)	730	*)	
35.5[1)]	**35.92**	50	270	1467	2.4	20.9	2.5	138	*)	*)	700	390	
40[1)]	**37.72**	48	270	1397	2.3	21.9	2.3	145	*)	*)	720	415	
45[1)]	**42.25**	43	270	1247	2.1	24.5	2.1	162	*)	*)	710	410	
50[1)]	**47.78**	38	270	1103	2.3	21.9	2.3	145	*)	*)	800	550	156
56[1)]	**53.51**	34	270	985	2.1	24.5	2.1	162	*)	*)	780	540	158
63	**58.37**	31	270	911	2.3	21.9	2.3	145	280	*)	780	560	
71	**65.38**	28	270	813	2.1	24.5	2.1	162	270	*)	750	530	
80	**74.73**	24	270	712	2.3	21.9	2.3	145	280	*)	700	510	
90	**83.7**	22	270	635	2.1	24.5	2.1	162	275	165	680	500	

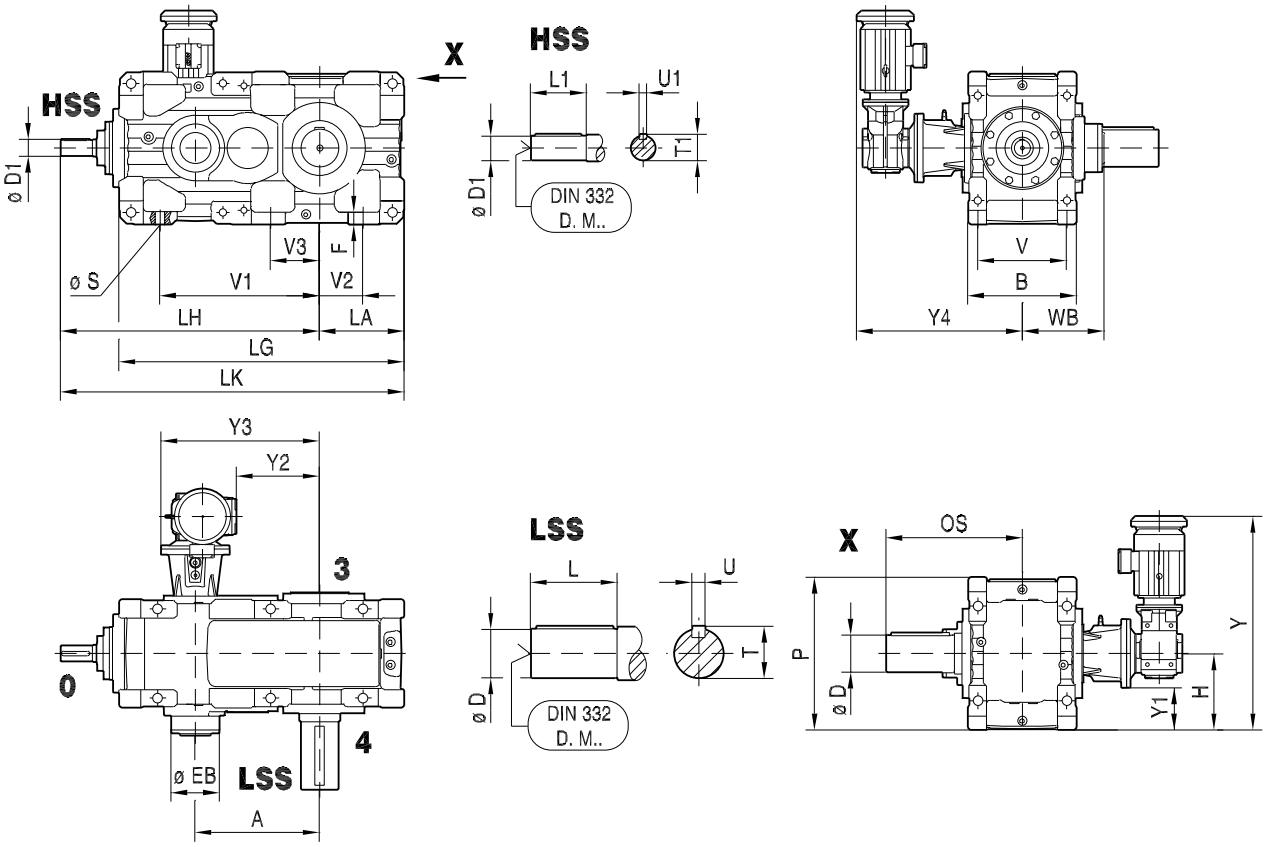
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10 Dimension sheets: Gear unit

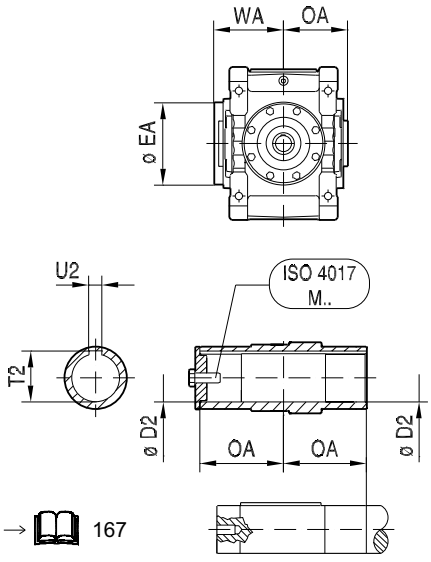
10.1 X3K100 – 210 Empty buckets

X3KS..

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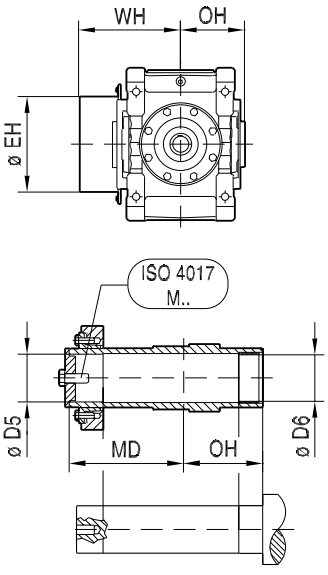


X3KA..



→ 📖 167

X3KH..



→ 📖 168

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X3K..	A	B	Ø EB	F	H	LA	LG	LH	LK	P	Ø S	V	V1	V2	V3	W B		Y	Y1	Y2	Y3	Y4
X3K.100	278	260	133	29	$190_{-0.5}$	$190_{-0.5}$	658	632	822	380	24 (4x)	210	370	90	-	213	KF37DRN80M4	643	109	178	359	439
X3K.110	298	260	133	29	$190_{-0.5}$	$215_{-0.5}$	703	652	867	380	24 (4x)	210	390	115	-	213	KF37DRN80M4	643	109	198	379	439
X3K.120	327	300	153	33	$225_{-0.5}$	$215_{-0.5}$	767	745	960	450	28 (4x)	245	440	105	-	235	KF47DRN90S4	703	125	215	427	483
X3K.130	363	300	153	33	$225_{-0.5}$	$250_{-0.5}$	838	781	1031	450	28 (4x)	245	475	140	-	235	KF47DRN90S4	703	125	251	463	483
X3K.140	388	360	175	42	$265_{-0.5}$	$250_{-0.5}$	903	879	1129	530	35 (4x)	290	510	110	-	284	KF57DRN90L4	782	140	256	513	541
X3K.150	430	360	175	42	$265_{-0.5}$	$295_{-0.5}$	990	921	1216	530	35 (4x)	290	555	155	-	284	KF57DRN90L4	782	140	298	555	541
X3K.160	474	425	190	50	$315_{-0.5}$	$355_{-0.5}$	1144	1036	1391	630	42 (4x)	345	620	185	-	320	KF67DRN100L4	884	190	334	599	618
X3K.170	525	425	190	50	$315_{-0.5}$	$355_{-0.5}$	1195	1087	1442	630	42 (4x)	345	670	185	-	320	KF67DRN100L4	884	190	385	650	618
X3K.180	544	475	210	55	$335_{-0.5}$	$370_{-0.5}$	1249	1135	1505	670	42 (6x)	390	710	190	215	360	KF77DRN100L4	920	185	364	694	701
X3K.190	576	475	210	55	$335_{-0.5}$	$370_{-0.5}$	1281	1167	1537	670	42 (6x)	390	740	190	215	360	KF77DRN100L4	920	185	396	726	701
X3K.200	614	515	210	60	$375_{-0.5}$	$420_{-0.5}$	1409	1286	1706	750	48 (6x)	420	780	205	230	381	KF77DRN112M4	991	225	434	764	729
X3K.210	650	515	210	60	$375_{-0.5}$	$420_{-0.5}$	1445	1322	1742	750	48 (6x)	420	815	205	230	381	KF77DRN112M4	991	225	470	800	729

[I]	M1	M4
X3K.100	14	1.5
X3K.110	15	1.5
X3K.120	21	2.2
X3K.130	22	2.2
X3K.140	34	3.15
X3K.150	35	3.15
X3K.160	61	3.7
X3K.170	61	3.7
X3K.180	76	5.9
X3K.190	76	5.9
X3K.200	102	5.9
X3K.210	102	5.9

HSS	Ø D1	L1	T1	U1	DIN 332 D. M..
X3K.100	32_{k6}	80	35	10_{h9}	M12
X3K.110	32_{k6}	80	35	10_{h9}	M12
X3K.120	38_{k6}	100	41	10_{h9}	M12
X3K.130	38_{k6}	100	41	10_{h9}	M12
X3K.140	50_{k6}	110	53.5	14_{h9}	M16
X3K.150	50_{k6}	110	53.5	14_{h9}	M16
X3K.160	60_{m6}	140	64	18_{h9}	M20
X3K.170	60_{m6}	140	64	18_{h9}	M20
X3K.180	70_{m6}	140	74.5	20_{h9}	M20
X3K.190	70_{m6}	140	74.5	20_{h9}	M20
X3K.200	80_{m6}	170	85	22_{h9}	M20
X3K.210	80_{m6}	170	85	22_{h9}	M20

LSS	Ø D	L	OS	T	U	DIN 332 D. M..	kg
X3KS100	80_{m6}	170	343	85	22_{h9}	M20	263
X3KS110	90_{m6}	170	346	95	25_{h9}	M24	283
X3KS120	100_{m6}	210	401	106	28_{h9}	M24	400
X3KS130	110_{m6}	210	404	116	28_{h9}	M24	450
X3KS140	120_{m6}	210	432	127	32_{h9}	M24	650
X3KS150	130_{m6}	250	475	137	32_{h9}	M24	690
X3KS160	140_{m6}	250	506	148	36_{h9}	M30	1047
X3KS170	160_{m6}	300	556	169	40_{h9}	M30	1192
X3KS180	170_{m6}	300	592	179	40_{h9}	M30	1504
X3KS190	170_{m6}	300	592	179	40_{h9}	M30	1614
X3KS200	180_{m6}	300	612	190	45_{h9}	M30	2126
X3KS210	190_{m6}	350	662	200	45_{h9}	M30	2226

X3KA..								
LSS	Ø D2	Ø EA	OA	T2	U2	WA	ISO 4017 M..	kg
X3KA100	75^{H8}	158	173	80.4	22^{JS9}	207	M20x60-8.8	253
X3KA110	85^{H8}	170	176	90.4	22^{JS9}	209	M24x70-8.8	273
X3KA120	95^{H8}	202	190.5	100.4	25^{JS9}	223	M24x70-8.8	380
X3KA130	105^{H8}	222	194	111.4	28^{JS9}	225	M24x70-8.8	425
X3KA140	115^{H8}	222	222	122.4	32^{JS9}	253	M24x70-8.8	615
X3KA150	125^{H8}	250	224.5	132.4	32^{JS9}	255	M24x70-8.8	640
X3KA160	135^{H8}	270	256	143.4	36^{JS9}	319	M30x90-8.8	977
X3KA170	150^{H8}	270	256	158.4	36^{JS9}	319	M30x90-8.8	1112
X3KA180	165^{H8}	278	292	174.4	40^{JS9}	356	M30x90-8.8	1404
X3KA190	165^{H8}	278	292	174.4	40^{JS9}	356	M30x90-8.8	1514
X3KA200	180^{H8}	332	319.5	190.4	45^{JS9}	383	M30x90-8.8	2041
X3KA210	190^{H8}	332	319.5	200.4	45^{JS9}	383	M30x90-8.8	2111

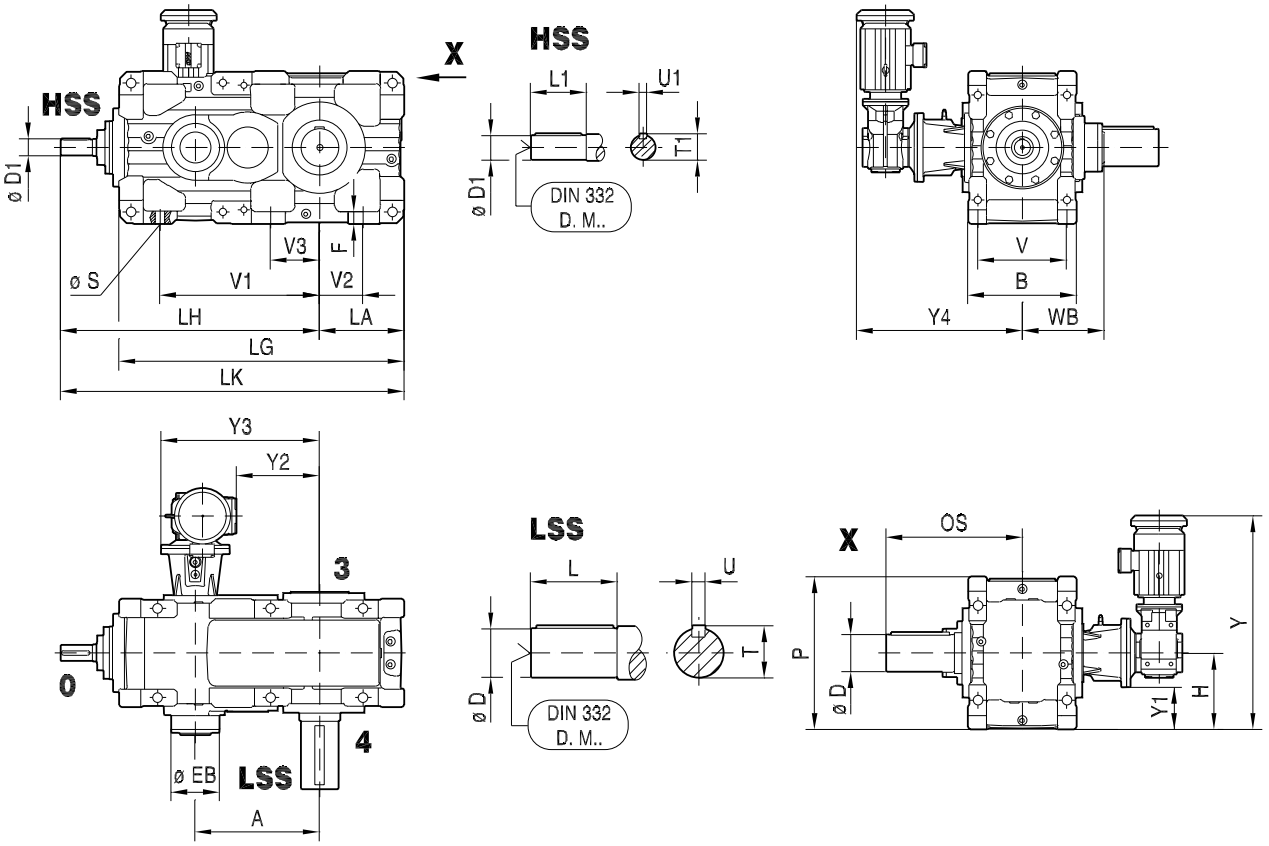
X3KH..								
LSS	Ø D5	Ø D6	Ø EH	MD	OH	WH	ISO 4017 M..	kg
X3KA100	80^{H7}	81^{H9}	220	261	173	294	M24x70-8.8	263
X3KA110	90^{H7}	91^{H9}	225	265	176	298	M24x70-8.8	283
X3KA120	100^{H7}	101^{H9}	272	286.5	190.5	319	M24x70-8.8	390
X3KA130	110^{H7}	111^{H9}	292	297	194	328	M24x70-8.8	440
X3KA140	120^{H7}	121^{H9}	304	329	222	356	M24x70-8.8	640
X3KA150	130^{H7}	131^{H9}	322	337.5	224.5	368	M24x70-8.8	670
X3KA160	140^{H7}	141^{H9}	368	375	256	427	M30x90-8.8	1007
X3KA170	150^{H7}	151^{H9}	368	364	256	427	M30x90-8.8	1167
X3KA180	165^{H7}	166^{H9}	382	400	292	463	M30x60-8.8	1454
X3KA190	165^{H7}	166^{H9}	382	400	292	463	M30x60-8.8	1564
X3KA200	180^{H7}	181^{H9}	446	450.5	319.5	517	M30x60-8.8	2111
X3KA210	190^{H7}	191^{H9}	446	453.5	319.5	517	M30x60-8.8	2196

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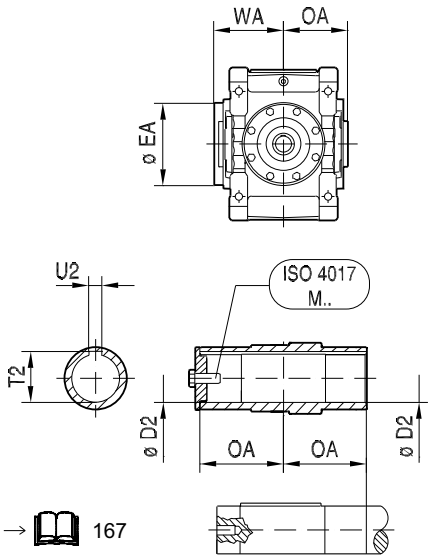
10.2 X3K100 – 210 Full buckets

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X3KS..

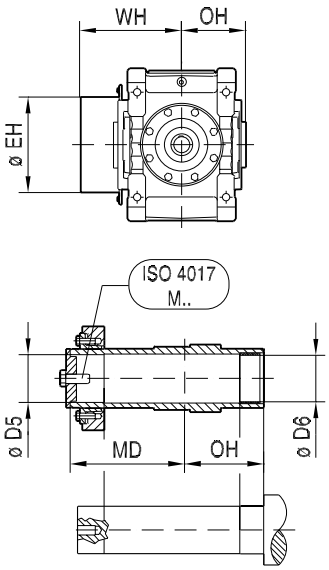


X3KA..



→ 167

X3KH..



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X3K..	A	B	Ø EB	F	H	LA	LG	LH	LK	P	Ø S	V	V1	V2	V3	W B		Y	Y1	Y2	Y3	Y4
X3K.100	278	260	133	29	$190_{-0.5}$	$190_{-0.5}$	658	632	822	380	24 (4x)	210	370	90	-	213	KF57DRN90L4	707	65	146	403	494
X3K.110	298	260	133	29	$190_{-0.5}$	$215_{-0.5}$	703	652	867	380	24 (4x)	210	390	115	-	213	KF57DRN90L4	707	65	166	423	494
X3K.120	327	300	153	33	$225_{-0.5}$	$215_{-0.5}$	767	745	960	450	28 (4x)	245	440	105	-	235	KF67DRN100L4	794	100	187	452	435
X3K.130	363	300	153	33	$225_{-0.5}$	$250_{-0.5}$	838	781	1031	450	28 (4x)	245	475	140	-	235	KF67DRN100L4	794	100	223	488	435
X3K.140	388	360	175	42	$265_{-0.5}$	$250_{-0.5}$	903	879	1129	530	35 (4x)	290	510	110	-	284	KF77DRN112M4	881	115	208	538	633
X3K.150	430	360	175	42	$265_{-0.5}$	$295_{-0.5}$	990	921	1216	530	35 (4x)	290	555	155	-	284	KF77DRN112M4	881	115	250	580	633
X3K.160	474	425	190	50	$315_{-0.5}$	$355_{-0.5}$	1144	1036	1391	630	42 (4x)	345	620	185	-	320	KF87DRN132S4	1031	140	262	649	735
X3K.170	525	425	190	50	$315_{-0.5}$	$355_{-0.5}$	1195	1087	1442	630	42 (4x)	345	670	185	-	320	KF87DRN132S4	1031	140	313	700	735
X3K.180	544	475	210	55	$335_{-0.5}$	$370_{-0.5}$	1249	1135	1505	670	42 (6x)	390	710	190	215	360	KF97DRN132L4	1117	110	279	769	860
X3K.190	576	475	210	55	$335_{-0.5}$	$370_{-0.5}$	1281	1167	1537	670	42 (6x)	390	740	190	215	360	KF97DRN132L4	1117	110	311	801	860
X3K.200	614	515	210	60	$375_{-0.5}$	$420_{-0.5}$	1409	1286	1706	750	48 (6x)	420	780	205	230	381	KF97DRN160M4	1224	150	349	839	879
X3K.210	650	515	210	60	$375_{-0.5}$	$420_{-0.5}$	1445	1322	1742	750	48 (6x)	420	815	205	230	381	KF97DRN160M4	1124	150	385	875	879

 [l]	 M1	 M4
X3K.100	14	3.15
X3K.110	15	3.15
X3K.120	22	5.9
X3K.130	23	5.9
X3K.140	35	5.9
X3K.150	36	5.9
X3K.160	63	11.9
X3K.170	63	11.9
X3K.180	79	21.5
X3K.190	79	21.5
X3K.200	105	21.5
X3K.210	105	21.5

HSS 	Ø D1	L1	T1	U1	DIN 332 D. M..
X3K.100	32_{k6}	80	35	10_{h9}	M12
X3K.110	32_{k6}	80	35	10_{h9}	M12
X3K.120	38_{k6}	100	41	10_{h9}	M12
X3K.130	38_{k6}	100	41	10_{h9}	M12
X3K.140	50_{k6}	110	53.5	14_{h9}	M16
X3K.150	50_{k6}	110	53.5	14_{h9}	M16
X3K.160	60_{m6}	140	64	18_{h9}	M20
X3K.170	60_{m6}	140	64	18_{h9}	M20
X3K.180	70_{m6}	140	74.5	20_{h9}	M20
X3K.190	70_{m6}	140	74.5	20_{h9}	M20
X3K.200	80_{m6}	170	85	22_{h9}	M20
X3K.210	80_{m6}	170	85	22_{h9}	M20

LSS 	Ø D	L	OS	T	U	DIN 332 D. M..	kg
X3K.100	80_{m6}	170	343	85	22_{h9}	M20	285
X3K.110	90_{m6}	170	346	95	25_{h9}	M24	305
X3K.120	100_{m6}	210	401	106	28_{h9}	M24	422
X3K.130	110_{m6}	210	404	116	28_{h9}	M24	472
X3K.140	120_{m6}	210	432	127	32_{h9}	M24	706
X3K.150	130_{m6}	250	475	137	32_{h9}	M24	746
X3K.160	140_{m6}	250	506	148	36_{h9}	M30	1141
X3K.170	160_{m6}	300	556	169	40_{h9}	M30	1286
X3K.180	170_{m6}	300	592	179	40_{h9}	M30	1651
X3K.190	170_{m6}	300	592	179	40_{h9}	M30	1761
X3K.200	180_{m6}	300	612	190	45_{h9}	M30	2307
X3K.210	190_{m6}	350	662	200	45_{h9}	M30	2407

X3KA..

LSS 	Ø D2	Ø EA	OA	T2	U2	WA	ISO 4017 M..	kg
X3KA100	75^{H8}	158	173	80.4	22^{JS9}	207	M20x60-8.8	275
X3KA110	85^{H8}	170	176	90.4	22^{JS9}	209	M24x70-8.8	295
X3KA120	95^{H8}	202	190.5	100.4	25^{JS9}	223	M24x70-8.8	402
X3KA130	105^{H8}	222	194	111.4	28^{JS9}	225	M24x70-8.8	447
X3KA140	115^{H8}	222	222	122.4	32^{JS9}	253	M24x70-8.8	671
X3KA150	125^{H8}	250	224.5	132.4	32^{JS9}	255	M24x70-8.8	696
X3KA160	135^{H8}	270	256	143.4	36^{JS9}	319	M30x90-8.8	1071
X3KA170	150^{H8}	270	256	158.4	36^{JS9}	319	M30x90-8.8	1206
X3KA180	165^{H8}	278	292	174.4	40^{JS9}	356	M30x90-8.8	1551
X3KA190	165^{H8}	278	292	174.4	40^{JS9}	356	M30x90-8.8	1661
X3KA200	180^{H8}	332	319.5	190.4	45^{JS9}	383	M30x90-8.8	2222
X3KA210	190^{H8}	332	319.5	200.4	45^{JS9}	383	M30x90-8.8	2292

X3KH..

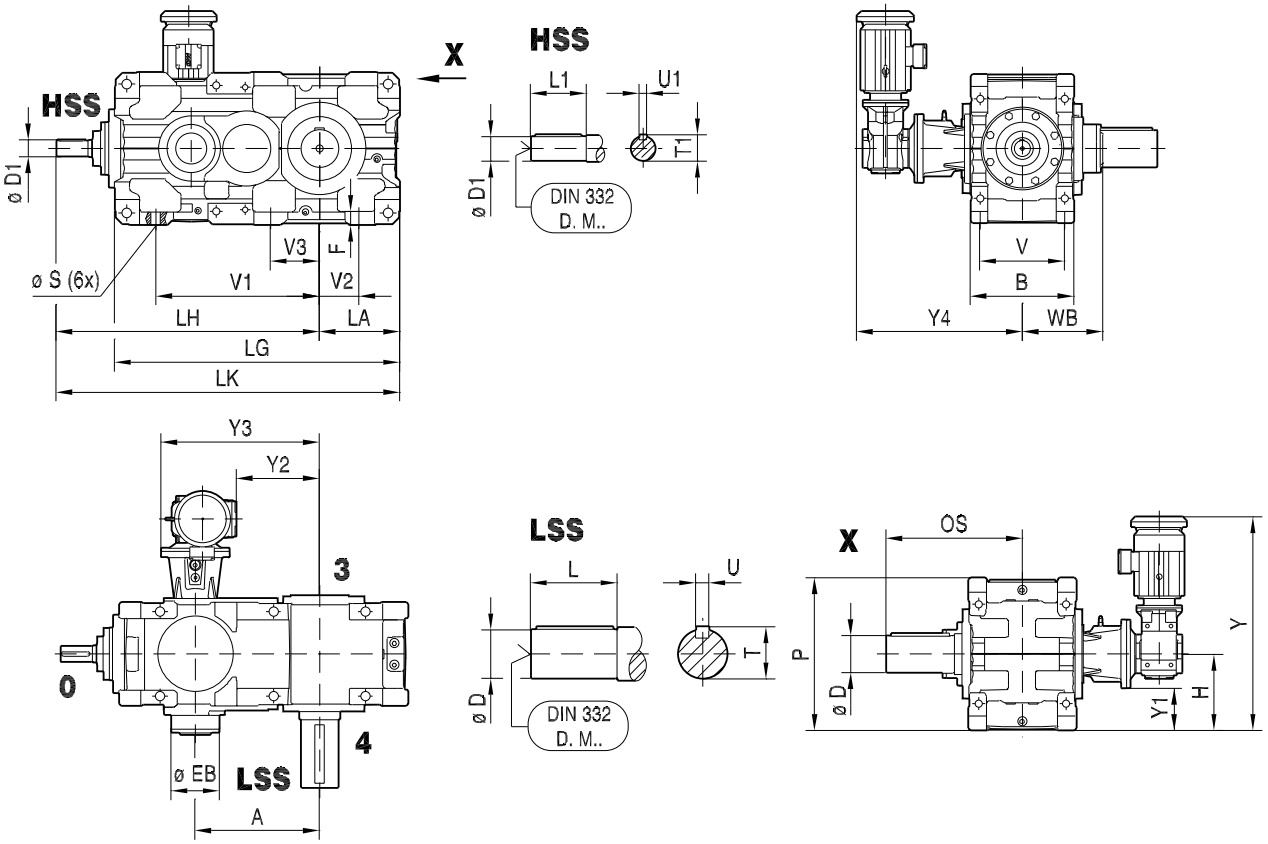
LSS 	Ø D5	Ø D6	Ø EH	MD	OH	WH	ISO 4017 M..	kg
X3KA100	80^{H7}	81^{H9}	220	261	173	294	M24x70-8.8	285
X3KA110	90^{H7}	91^{H9}	225	265	176	298	M24x70-8.8	305
X3KA120	100^{H7}	101^{H9}	272	286.5	190.5	319	M24x70-8.8	412
X3KA130	110^{H7}	111^{H9}	292	297	194	328	M24x70-8.8	462
X3KA140	120^{H7}	121^{H9}	304	329	222	356	M24x70-8.8	696
X3KA150	130^{H7}	131^{H9}	322	337.5	224.5	368	M24x70-8.8	726
X3KA160	140^{H7}	141^{H9}	368	375	256	427	M30x90-8.8	1101
X3KA170	150^{H7}	151^{H9}	368	364	256	427	M30x90-8.8	1261
X3KA180	165^{H7}	166^{H9}	382	400	292	463	M30x60-8.8	1601
X3KA190	165^{H7}	166^{H9}	382	400	292	463	M30x60-8.8	1711
X3KA200	180^{H7}	181^{H9}	446	450.5	319.5	517	M30x60-8.8	2292
X3KA210	190^{H7}	191^{H9}	446	453.5	319.5	517	M30x60-8.8	2377

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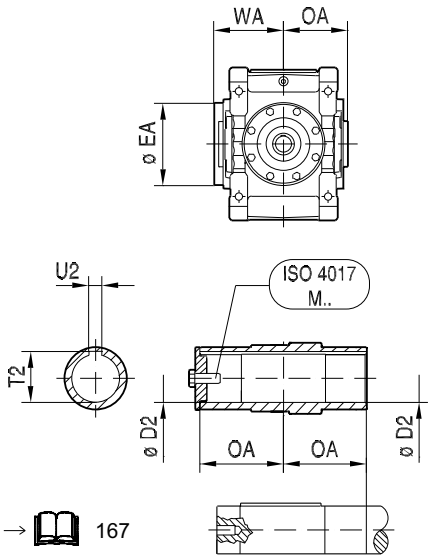
10.3 X3K220 – 250 Empty buckets

X3KS..

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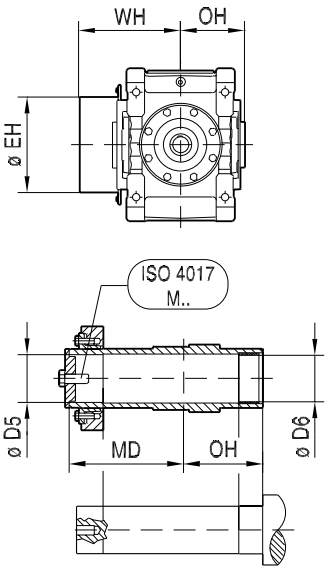


X3KA..



→ 📖 167

X3KH..



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X3K..	A	B	Ø EB	F	H	LA	LG	LH	LK	P	Ø S	V	V1	V2	V3	WB		Y	Y1	Y2	Y3	Y4
X3K.220	694	540	245	62	$425_{-0.5}$	$465_{-0.5}$	1584	1430	1895	850	48	440	910	250	280	426	KF87DRN112M4	1091	250	482	689	828
X3K.230	734	540	245	62	$425_{-0.5}$	$465_{-0.5}$	1624	1470	1935	850	48	440	950	250	280	426	KF87DRN112M4	1091	250	522	909	828
X3K.240	776	625	290	68	$450_{-0.5}$	$495_{-0.5}$	1721	1597	2092	900	56	510	990	250	305	472	KF87DRN132S4	1166	275	564	951	873
X3K.250	799	625	290	68	$450_{-0.5}$	$495_{-0.5}$	1744	1620	2115	900	56	510	1010	250	305	472	KF87DRN132S4	1166	275	587	974	873

Oil [l]	M1	M4
X3K.220	131	11.9
X3K.230	131	11.9
X3K.240	171	11.9
X3K.250	171	11.9

HSS	Ø D1	L1	T1	U1	DIN 332 D. M..
X3K.220	85_{m6}	170	90	22_{h9}	M20
X3K.230	85_{m6}	170	90	22_{h9}	M20
X3K.240	100_{m6}	210	106	28_{h9}	M24
X3K.250	100_{m6}	210	106	28_{h9}	M24

LSS	Ø D	L	OS	T	U	DIN 332 D. M..	kg
X3K.220	210_{m6}	350	703	221	50_{h9}	M30	3036
X3K.230	230_{m6}	410	763	241	50_{h9}	M36	3206
X3K.240	230_{m6}	410	811	241	50_{h9}	M36	4066
X3K.250	240_{m6}	410	811	252	56_{h9}	M36	4196

X3KA..								
LSS	Ø D2	Ø EA	OA	T2	U2	WA	ISO 4017 M..	kg
X3KA220	210^{H8}	360	352.5	221.4	50^{JS9}	417	M30x90-8.8	2856
X3KA230	210^{H8}	360	352.5	221.4	50^{JS9}	417	M30x90-8.8	2986
X3KA240	230^{H8}	420	400.5	241.4	50^{JS9}	469	M36x110-8.8	3781
X3KA250	240^{H8}	420	400.5	252.4	56^{JS9}	469	M36x110-8.8	3891

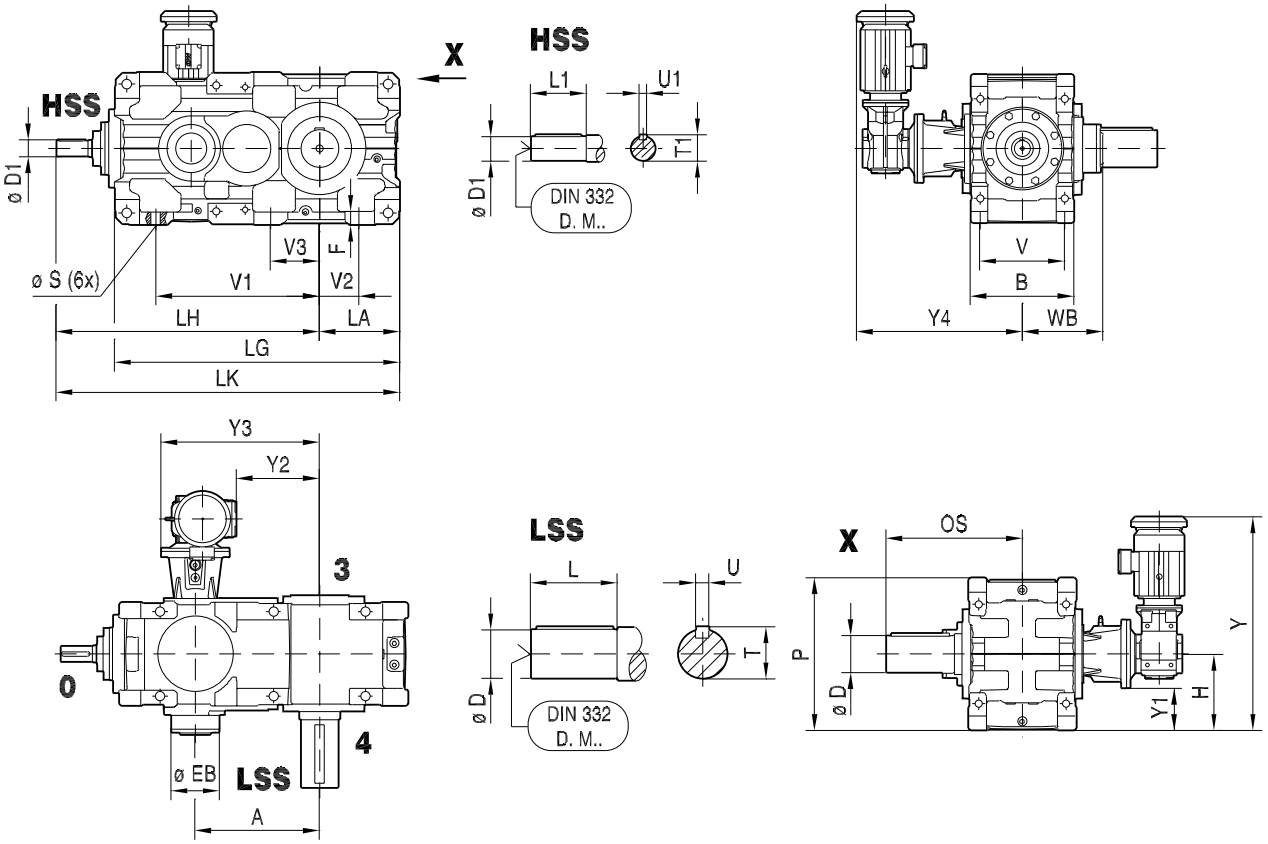
X3KH..								
LSS	Ø D5	Ø D6	Ø EH	MD	OH	WH	ISO 4017 M..	kg
X3KA220	210^{H7}	211^{H9}	484	497.5	352.5	562	M30x90-8.8	2961
X3KA230	210^{H7}	211^{H9}	484	497.5	352.5	562	M30x90-8.8	3096
X3KA240	230^{H7}	231^{H9}	558	571.5	400.5	654	M36x110-8.8	3946
X3KA250	240^{H7}	241^{H9}	558	571.5	400.5	654	M36x110-8.8	4051

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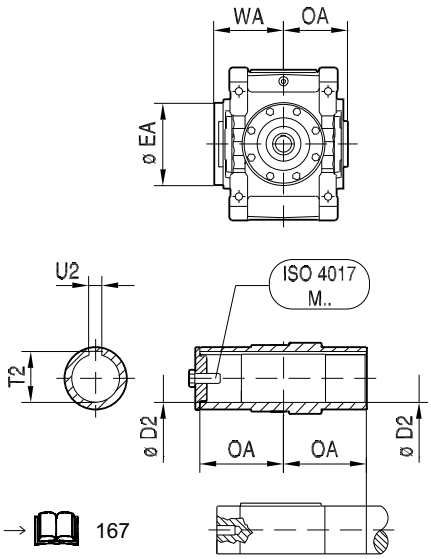
10.4 X3K220 – 250 Full buckets

48 045 01 07
1(2)

X3KS..

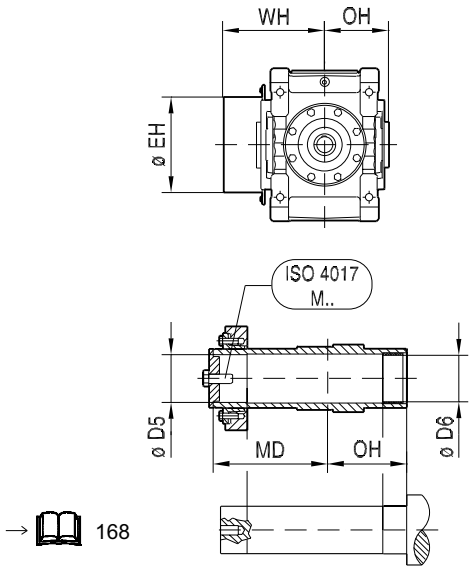


X3KA..



→ 167

X3KH..



→ 168

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X3K..	A	B	Ø EB	F	H	LA	LG	LH	LK	P	Ø S	V	V1	V2	V3	WB		Y	Y1	Y2	Y3	Y4
X3K.220	694	540	245	62	$425_{-0.5}$	$465_{-0.5}$	1584	1430	1895	850	48	440	910	250	280	426	KF107DRN180M4	1355	200	379	919	987
X3K.230	734	540	245	62	$425_{-0.5}$	$465_{-0.5}$	1624	1470	1935	850	48	440	950	250	280	426	KF107DRN180M4	1355	200	419	959	987
X3K.240	776	625	290	68	$450_{-0.5}$	$495_{-0.5}$	1721	1597	2092	900	56	510	990	250	305	472	KF127DRN200L4	1524	175	401	1051	1158
X3K.250	799	625	290	68	$450_{-0.5}$	$495_{-0.5}$	1744	1620	2115	900	56	510	1010	250	305	472	KF127DRN200L4	1524	175	424	1074	1158

Oil [l]	M1	M4
X3K.220	137	35.1
X3K.230	137	35.1
X3K.240	179	55
X3K.250	179	55

HSS	Ø D1	L1	T1	U1	DIN 332 D. M..
X3K.220	85_{m6}	170	90	22_{h9}	M20
X3K.230	85_{m6}	170	90	22_{h9}	M20
X3K.240	100_{m6}	210	106	28_{h9}	M24
X3K.250	100_{m6}	210	106	28_{h9}	M24

LSS	Ø D	L	OS	T	U	DIN 332 D. M..	kg
X3K.220	210_{m6}	350	703	221	50_{h9}	M30	3317
X3K.230	230_{m6}	410	763	241	50_{h9}	M36	3487
X3K.240	230_{m6}	410	811	241	50_{h9}	M36	4623
X3K.250	240_{m6}	410	811	252	56_{h9}	M36	4753

X3KA..								
LSS	Ø D2	Ø EA	OA	T2	U2	WA	ISO 4017 M..	kg
X3KA220	210^{H8}	360	352.5	221.4	50^{JS9}	417	M30x90-8.8	3137
X3KA230	210^{H8}	360	352.5	221.4	50^{JS9}	417	M30x90-8.8	3267
X3KA240	230^{H8}	420	400.5	241.4	50^{JS9}	469	M36x110-8.8	4338
X3KA250	240^{H8}	420	400.5	252.4	56^{JS9}	469	M36x110-8.8	4448

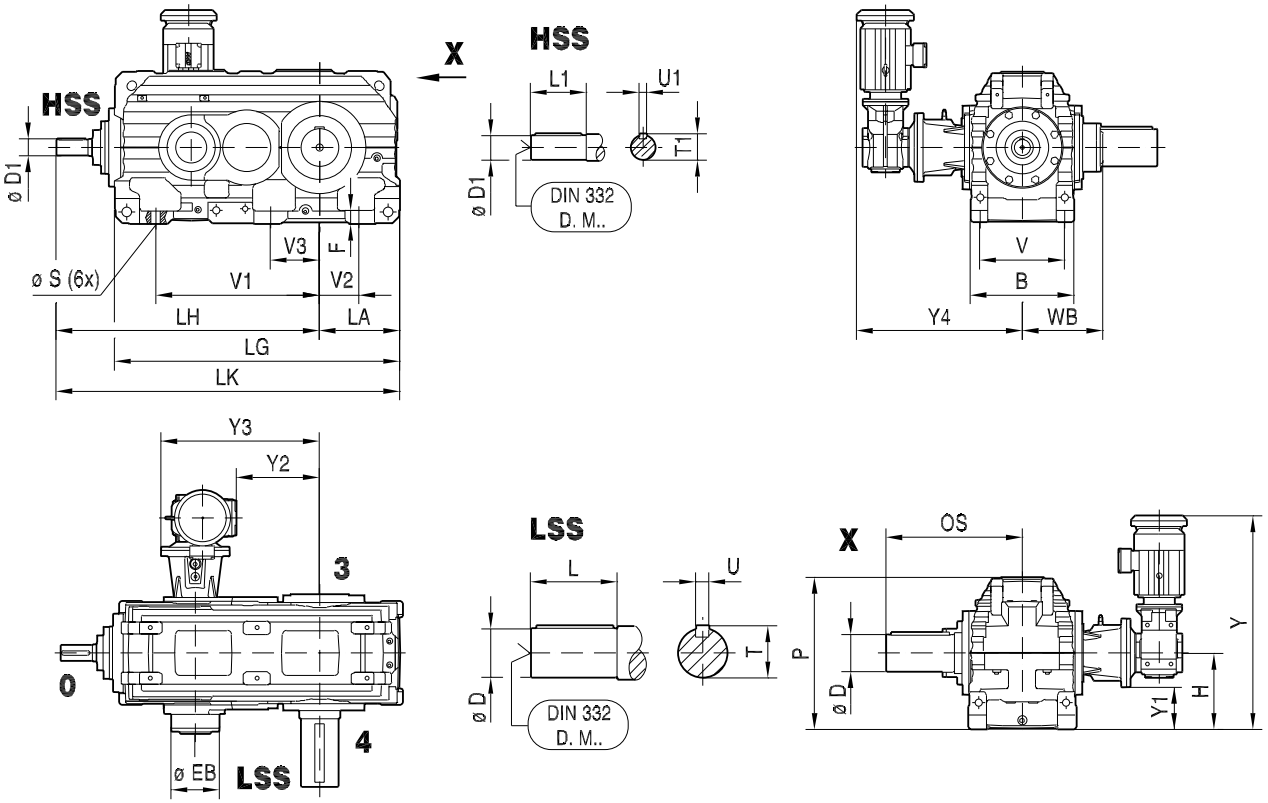
X3KH..								
LSS	Ø D5	Ø D6	Ø EH	MD	OH	WH	ISO 4017 M..	kg
X3KA220	210^{H7}	211^{H9}	484	497.5	352.5	562	M30x90-8.8	3242
X3KA230	210^{H7}	211^{H9}	484	497.5	352.5	562	M30x90-8.8	3377
X3KA240	230^{H7}	231^{H9}	558	571.5	400.5	654	M36x110-8.8	4503
X3KA250	240^{H7}	241^{H9}	558	571.5	400.5	654	M36x110-8.8	4608

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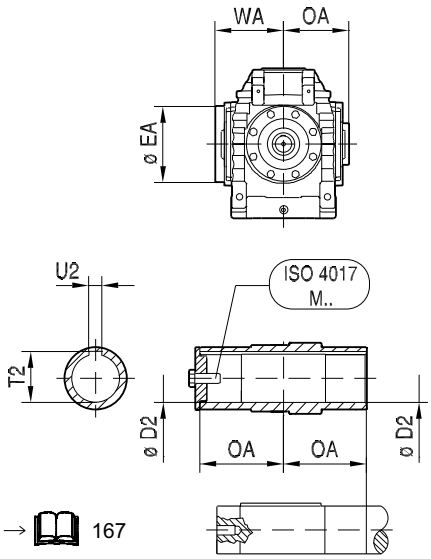
10.5 X3K260 – 280 Empty buckets

X3KS../HH

48 024 01 09
1(2)

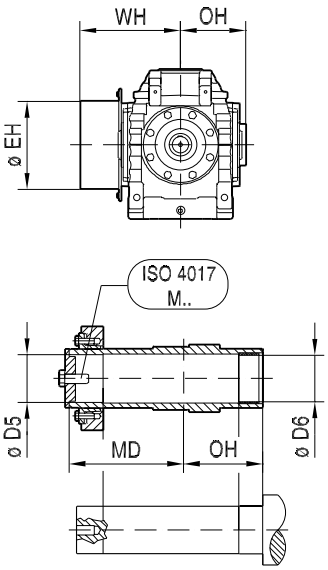


X3KA../HH



→ 167

X3KH../HH



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X3K..	A	B	Ø EB	F	H	LA	LG	LH	LK	P	Ø S	V	V1	V2	V3	W B		Y	Y1	Y2	Y3	Y4
X3K.260	855	705	288	73	$500_{-0.5}$	$545_{-0.5}$	1900	1767	2312	1000	56	590	1110	300	350	553	KF87DRN132S4	1216	325	643	1030	951
X3K.270	890	705	288	73	$500_{-0.5}$	$545_{-0.5}$	1935	1802	2347	1000	56	590	1110	300	350	553	KF87DRN132S4	1216	325	678	1065	951
X3K.280	942	705	288	73	$555_{-0.5}$	$610_{-0.5}$	2052	1854	2464	1110	56	590	1190	360	380	553	KF87DRN132S4	1271	380	730	1117	951

Oil [l]	M1	M4
X3K.260	257	11.9
X3K.270	257	11.9
X3K.280	327	11.9

HSS	Ø D1	L1	T1	U1	DIN 332 D. M..
X3K.260	110_{m6}	210	116	28_{h9}	M24
X3K.270	110_{m6}	210	116	28_{h9}	M24
X3K.280	110_{m6}	210	116	28_{h9}	M24

LSS	Ø D	L	OS	T	U	DIN 332 D. M..	kg
X3K.260	250_{m6}	410	847	262	56_{h9}	M36	4706
X3K.270	270_{m6}	470	920	282	63_{h9}	M36	5206
X3K.280	290_{m6}	470	920	302	63_{h9}	M30	5656

X3KA..

LSS	Ø D2	Ø EA	OA	T2	U2	WA	ISO 4017 M..	kg
X3KA260	240^{H8}	420	437	252.4	56^{JS9}	509	M36x110-8.8	4256
X3KA270	275^{H8}	460	450	287.4	63^{JS9}	523	M36x110-8.8	4706
X3KA280	275^{H8}	460	450	287.4	63^{JS9}	523	M36x110-8.8	5056

X3KH..

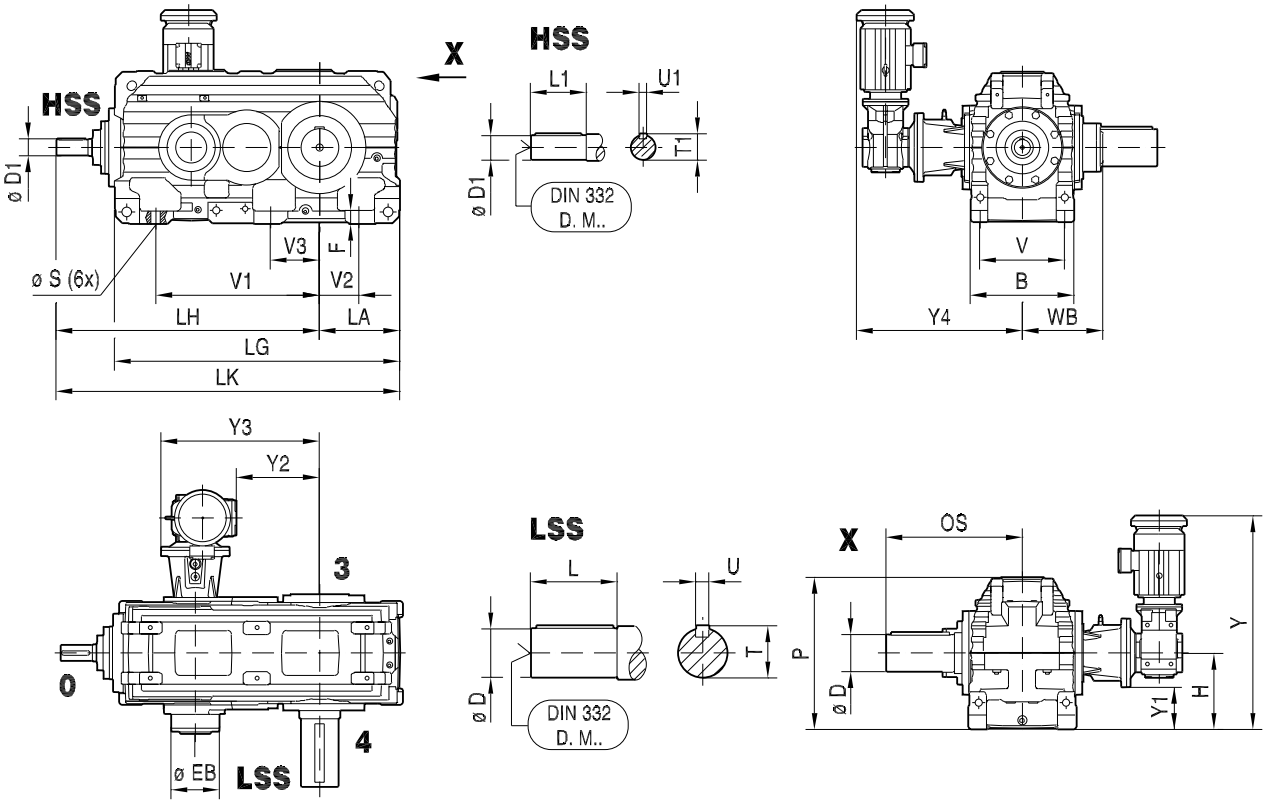
LSS	Ø D5	Ø D6	Ø EH	MD	OH	WH	ISO 4017 M..	kg
X3KA260	250^{H7}	255^{H9}	558	608	437	694	M36x110-8.8	4406
X3KA270	280^{H7}	285^{H9}	602	630	450	706	M36x110-8.8	4956
X3KA280	280^{H7}	285^{H9}	602	630	450	706	M36x110-8.8	4756

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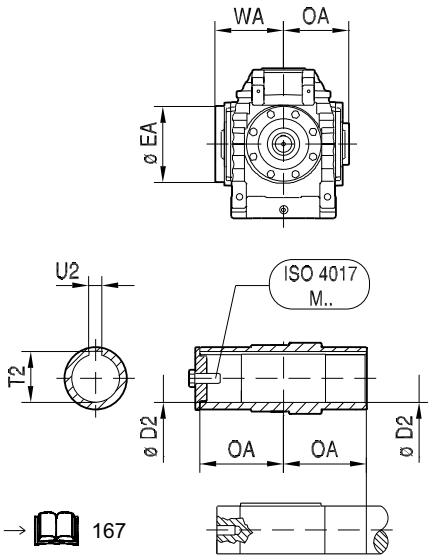
10.6 X3K260 – 280 Full buckets

X3KS../HH

48 024 01 09
1(2)

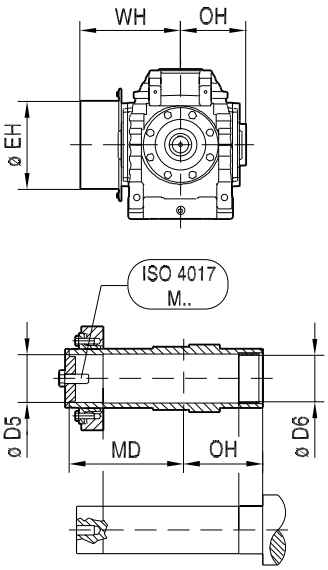


X3KA../HH



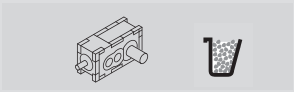
→ 167

X3KH../HH



→ 168

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X3K..	A	B	Ø EB	F	H	LA	LG	LH	LK	P	Ø S	V	V1	V2	V3	WB		Y	Y1	Y2	Y3	Y4
X3K.260	855	705	288	73	$500_{-0.5}$	$545_{-0.5}$	1900	1767	2312	1000	56	590	1110	300	350	553	KF127DRN225S4	1548	225	480	1130	1235
X3K.270	890	705	288	73	$500_{-0.5}$	$545_{-0.5}$	1935	1802	2347	1000	56	590	1110	300	350	553	KF127DRN225S4	1548	225	515	1165	1235
X3K.280	942	705	288	73	$555_{-0.5}$	$610_{-0.5}$	2052	1854	2464	1110	56	590	1190	360	380	553	KF127DRN225S4	1603	280	567	1217	1235

Oil [l]	M1	M4	HSS	Ø D1	L1	T1	U1	DIN 332 D. M..	LSS	Ø D	L	OS	T	U	DIN 332 D. M..	kg
X3K.260	267	55	**X3K.260**	110_{m6}	210	116	28_{h9}	M24	**X3K.260**	250_{m6}	410	847	262	56_{h9}	M36	5293
X3K.270	267	55	**X3K.270**	110_{m6}	210	116	28_{h9}	M24	**X3K.270**	270_{m6}	470	920	282	63_{h9}	M36	5793
X3K.280	337	55	**X3K.280**	110_{m6}	210	116	28_{h9}	M24	**X3K.280**	290_{m6}	470	920	302	63_{h9}	M30	6243

X3KA..										X3KH..								
LSS	Ø D2	Ø EA	OA	T2	U2	WA	ISO 4017 M..	kg		LSS	Ø D5	Ø D6	Ø EH	MD	OH	WH	ISO 4017 M..	kg
X3KA260	240^{H8}	420	437	252.4	56^{JS9}	509	M36x110-8.8	4843		**X3KA260**	250^{H7}	255^{H9}	558	608	437	694	M36x110-8.8	4993
X3KA270	275^{H8}	460	450	287.4	63^{JS9}	523	M36x110-8.8	5293		**X3KA270**	280^{H7}	285^{H9}	602	630	450	706	M36x110-8.8	5543
X3KA280	275^{H8}	460	450	287.4	63^{JS9}	523	M36x110-8.8	5643		**X3KA280**	280^{H7}	285^{H9}	602	630	450	706	M36x110-8.8	5943

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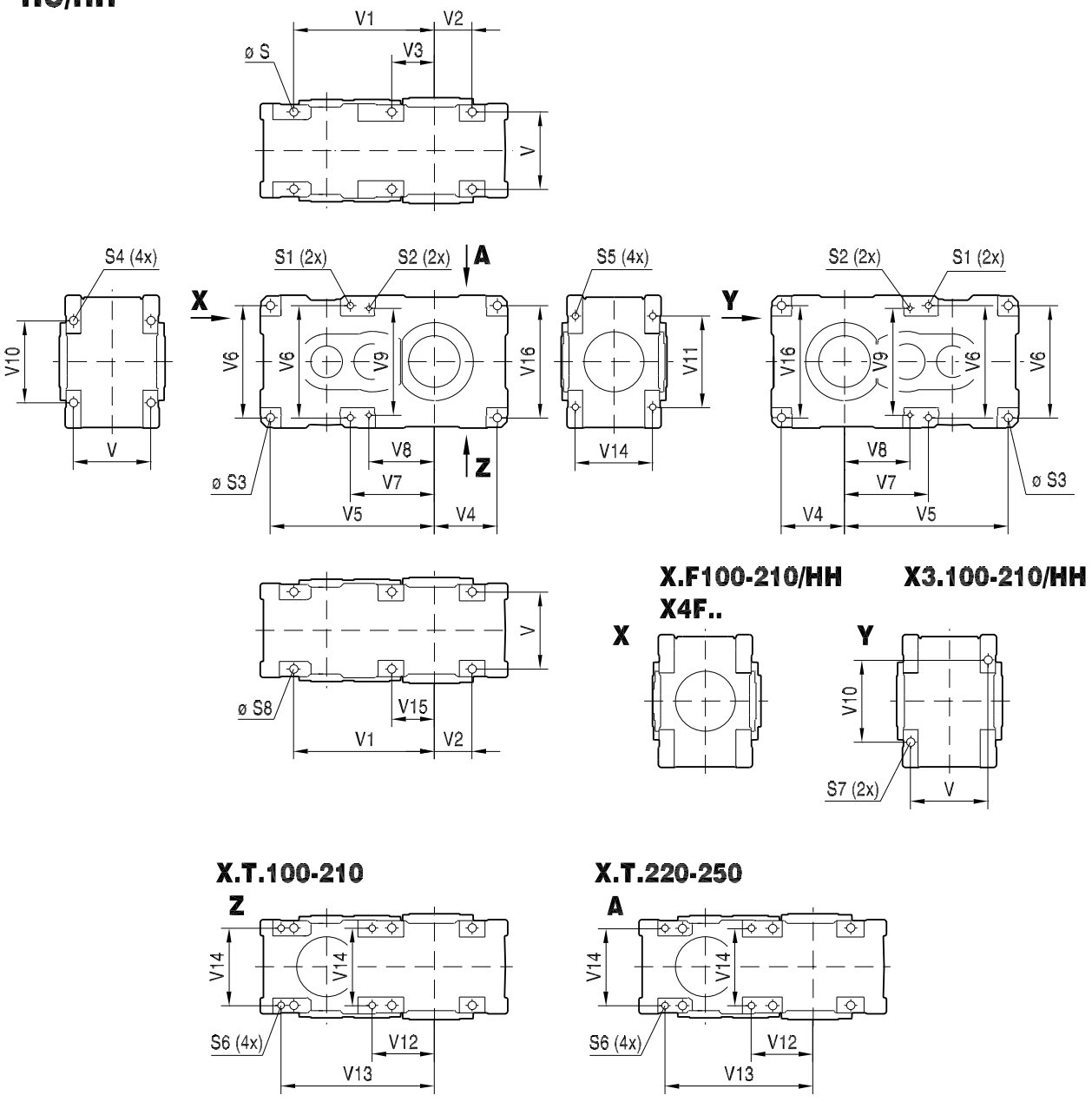
11 Dimension sheets: Options

11.1 Housing bores in mm

11.1.1 Universal and horizontal housing X100 – 280 HU/HH

HU/HH

48 037 01 13



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Universal housing X100 – 280 /HU

	Ø S	S1 (2x)	S2 (2x)	Ø S3	S4 (4x)	S5 (4x)	S7 (2x)	Ø S8	V	V1	V2	V3	V4	V5
X100	24 (4x)	M20	-	24 (4x)	ø 24	M20	-	24 (4x)	210	370	90	-	160	441
X110	24 (4x)	M20	-	24 (4x)	ø 24	M20	-	24 (4x)	210	390	115	-	185	461
X120	28(4x)	M24	-	28 (4x)	ø 28	M24	-	28(4x)	245	440	105	-	184	521
X130	28 (4x)	M24	-	28 (4x)	ø 28	M24	-	28 (4x)	245	475	140	-	219	557
X140	35 (4x)	M30	-	35 (4x)	ø 35	M30	-	35 (4x)	290	510	110	-	210	613
X150	35 (4x)	M30	M20	35 (4x)	ø 35	M30	-	35 (4x)	290	555	155	-	255	655
X160	42 (4x)	M36	M24	42 (4x)	ø 42	M36	-	42 (4x)	340	620	185	-	303	737
X170	42 (4x)	M36	M24	42 (4x)	ø 42	M36	-	42 (4x)	340	670	185	-	303	788
X180	42 (6x)	M36	M30	42 (4x)	ø 42	M36	-	42 (6x)	390	710	190	215	318	827
X190	42 (6x)	M36	M30	42 (4x)	ø 42	M36	-	42 (6x)	390	740	190	215	318	859
X200	48 (6x)	M42	M30	48 (4x)	ø 48	M42	-	48 (6x)	420	780	205	230	360	930
X210	48 (6x)	M42	M30	48 (4x)	ø 48	M42	-	48 (6x)	420	815	205	230	360	966
X220	48 (6x)	M42	M36	48 (4x)	M42x63	M42	-	48 (6x)	440	910	250	280	403	1057
X230	48 (6x)	M42	M36	48 (4x)	M42x63	M42	-	48 (6x)	440	950	250	280	403	1097
X240	56 (6x)	M48	M36	56(4x)	M48x72	M48	-	56 (6x)	510	990	250	305	425	1155
X250	56 (6x)	M48	M36	56 (4x)	M48x72	M48	-	56 (6x)	510	1010	250	305	425	1178
X260	56 (6x)	M48	M48	56 (4x)	M48x72	M48	-	56 (6x)	590	1110	300	350	475	1285
X270	56 (6x)	M48	M48	56 (4x)	M48x72	M48	-	56 (6x)	590	1110	300	350	475	1320
X280	56 (6x)	M48	-	56 (4x)	M48x72	M48	-	56 (6x)	590	1190	360	380	540	1372

	V6	V7	V8	V9	V10	V11	V14	V15	V16
X100	315	197	-	-	250	250	210	-	315
X110	315	217	-	-	250	250	210	-	315
X120	380	233	-	-	300	310	245	-	380
X130	380	269	-	-	300	310	245		380
X140	445	277	-	-	335	350	290	-	445
X150	445	319	250	430	335	350	290	-	445
X160	525	348	265	500	400	415	345	-	525
X170	525	399	265	500	400	415	345		525
X180	565	424	333	546	415	460	390	215	565
X190	565	456	333	546	415	460	390	215	565
X200	630	478	350	610	455	510	420	230	630
X210	630	514	350	610	455	510	420	230	630
X220	725	531	415	680	610	600	440	280	725
X230	725	571	415	680	610	600	440	280	725
X240	760	625	450	740	600	600	510	305	760
X250	760	648	450	740	600	600	510	305	760
X260	860	683	500	860	710	710	590	350	860
X270	860	718	500	860	710	710	590	350	860
X280	970	569	-	970	710	710	590	380	970

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Horizontal housing X100 – 210 /HH

	Ø S	S1 (2x)	S2 (2x)	Ø S3	S4 (4x)	S5 (4x)	Ø S7 (2x)	Ø S8	V	V1	V2	V3
X100	24 (4x)	-	-	24 (2x)	-	M20	24	24 (4x)	210	370	90	-
X110	24 (4x)	-	-	24 (2x)	-	M20	24	24 (4x)	210	390	115	-
X120	28 (4x)	-	-	28 (2x)	-	M24	28	28 (4x)	245	440	105	-
X130	28(4x)	-	-	28 (2x)	-	M24	28	28 (4x)	245	475	140	-
X140	35 (4x)	-	-	35 (2x)	-	M30	35	35 (4x)	290	510	110	-
X150	35 (4x)	-	-	35 (2x)	-	M30	35	35 (4x)	290	555	155	-
X160	42 (4x)	-	-	42 (2x)	-	M36	42	42 (4x)	340	620	185	-
X170	42 (4x)	-	-	42 (2x)	-	M36	42	42 (4x)	340	670	185	-
X180	42 (6x)	-	-	42 (2x)	-	M36	42	42 (4x)	390	710	190	215
X190	42 (6x)	-	-	42 (2x)	-	M36	42	42 (4x)	390	740	190	215
X200	48 (6x)	-	-	48 (2x)	-	M42	48	48 (4x)	420	780	205	230
X210	4 8(6x)	-	-	48 (2x)	-	M42	48	48 (4x)	420	815	205	230

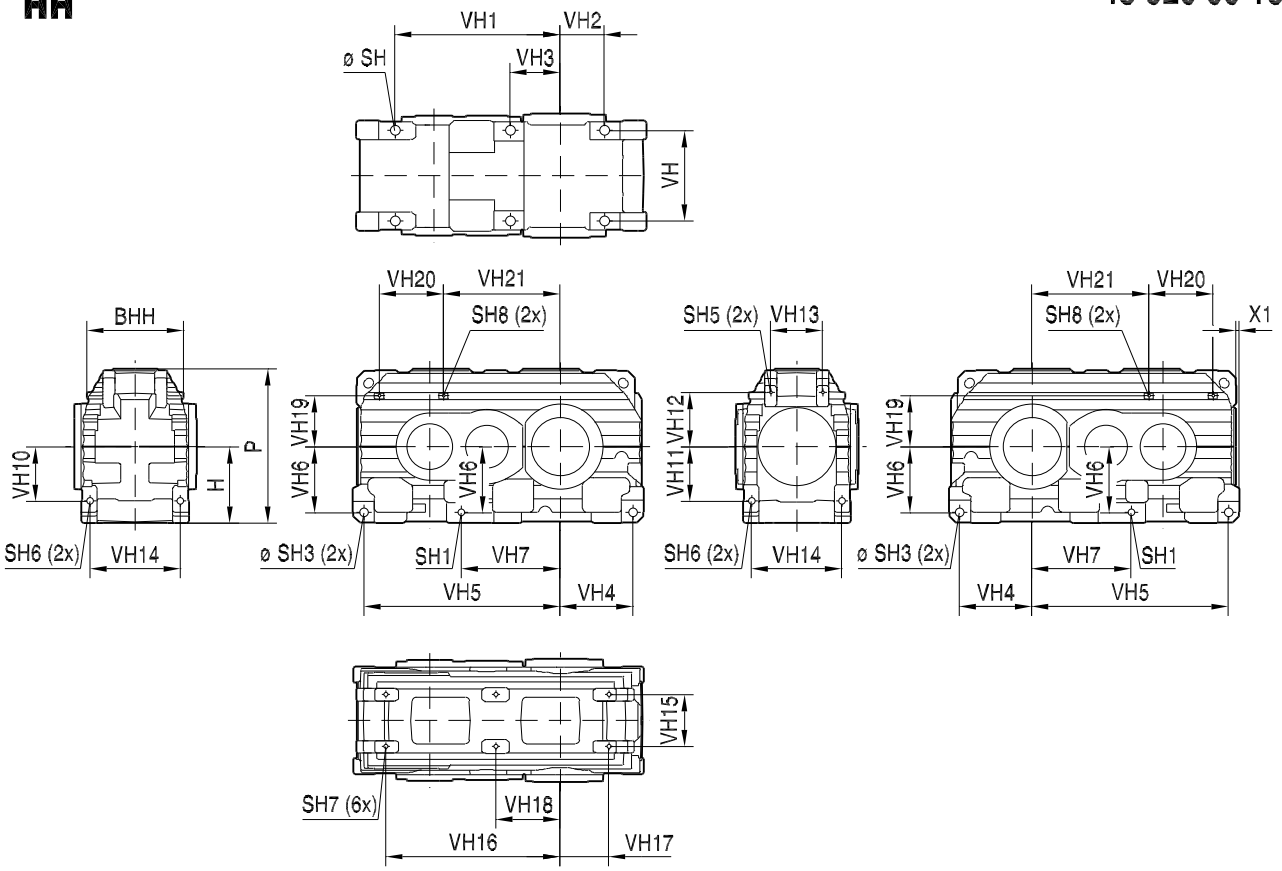
	V4	V5	V6	V7	V8	V9	V10	V11	V14	V15
X100	-	441	315	197	-	-	250	250	210	-
X110	-	461	315	217	-	-	250	250	210	-
X120	-	521	380	233	-	-	300	310	245	-
X130	-	557	380	269	-	-	300	310	245	-
X140	-	613	445	277	-	-	335	350	290	-
X150	-	655	445	319	-	-	335	350	290	-
X160	-	737	525	348	-	-	400	415	345	-
X170	-	788	525	399	-	-	400	415	345	-
X180	-	827	565	424	-	-	415	460	390	-
X190	-	859	565	456	-	-	415	460	390	-
X200	-	930	630	478	-	-	455	510	420	-
X210	-	966	630	514	-	-	455	510	420	-

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Horizontal housing X220 – 280 /HH

HH

48 020 00 18



	VH	VH1	VH2	VH3	VH4	VH5	VH6	VH7	VH10	VH11	VH12	VH13	VH14	VH15	VH16	VH17	VH18
X220	440	910	250	440	-	1057	362.5	531	305	300	274	245	440	-	980	300	245
X230	440	950	250	440	-	1097	362.5	571	305	300	274	245	440	-	1080	300	-
X240	510	990	250	510	-	1155	380	625	300	300	280	314	510	-	1097	320	-
X250	510	1010	250	510	-	1178	380	648	300	300	280	314	510	-	1120	320	-
X260	590	1110	300	350	475	1285	430	683	355	355	355	340	590	422	1142	318	340
X270	590	1110	300	350	475	1320	430	718	355	355	355	340	590	457	1177	283	340
X280	590	1190	360	380	540	1372	485	569	355	355	355	340	590	435	1235	365	340

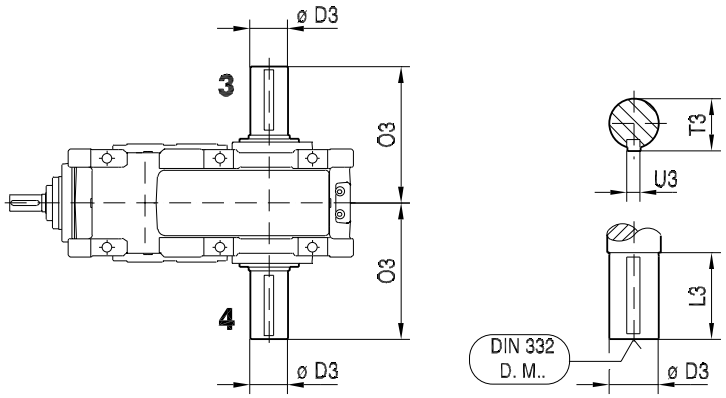
	VH19	VH20	VH21	Ø SH (6x)	SH1	Ø SH3	SH5 (2x)	SH6 (2x)	SH7	SH8 (2x)	BHH
X220	269	316	636	48	M42	48 (1x)	M16	M42	M24 (4x)	M16	488
X230	269	316	676	48	M42	48 (1x)	M16	M42	M24 (4x)	M16	488
X240	277	350	715	56	M48	56 (1x)	M16	M48	M30 (4x)	M16	568
X250	277	350	738	56	M48	56 (1x)	M16	M48	M30 (4x)	M16	568
X260	334	420	764	56	M48	56 (2x)	M20	M48	M30 (6x)	M20	632
X270	334	420	799	56	M48	56 (2x)	M20	M48	M30 (6x)	M20	632
X280	377	420	851	56	M48	56 (2x)	M20	M48	M30 (6x)	M20	632

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11.2 Output shaft /LSST in mm

LSST

48 022 00 18



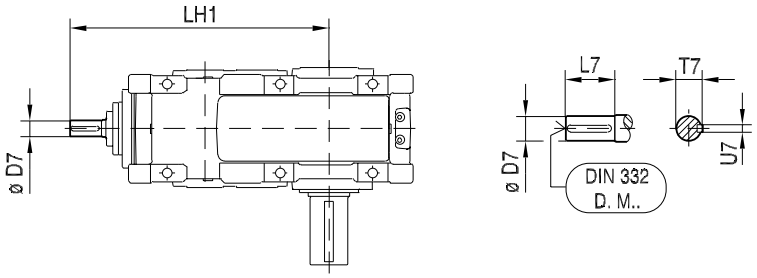
	Ø D3	L3	O3	T3	U3	DIN 332 D.M..
X100	80_{m6}	170	343	85	22_{h9}	M20
X110	90_{m6}	170	346	95	25_{h9}	M24
X120	100_{m6}	210	401	106	28_{h9}	M24
X130	110_{m6}	210	404	116	28_{h9}	M24
X140	120_{m6}	210	432	127	32_{h9}	M24
X150	130_{m6}	250	475	137	32_{h9}	M24
X160	140_{m6}	250	506	148	36_{h9}	M30
X170	160_{m6}	300	556	169	40_{h9}	M30
X180	170_{m6}	300	592	179	40_{h9}	M30
X190	170_{m6}	300	592	179	40_{h9}	M30
X200	180_{m6}	300	612	190	45_{h9}	M30
X210	190_{m6}	350	662	200	45_{h9}	M30
X220	210_{m6}	350	703	221	50_{h9}	M30
X230	230_{m6}	410	763	241	50_{h9}	M36
X240	230_{m6}	410	811	241	50_{h9}	M36
X250	240_{m6}	410	811	252	56_{h9}	M36
X260	250_{m6}	410	847	262	56_{h9}	M36
X270	270_{m6}	470	920	282	63_{h9}	M36
X280	290_{m6}	470	920	302	63_{h9}	M36

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11.3 Optional input shaft ends /HSS in mm

HSS

48 018 00 18

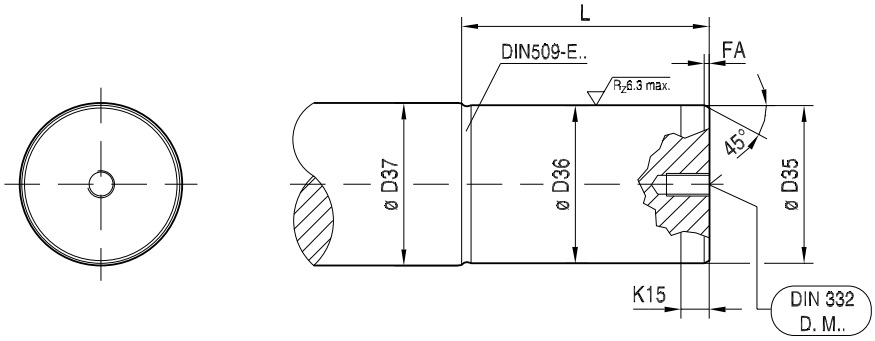


X3K..	Ø D7	L7	LH1	T7	U7	DIN 332 D.M..
X100	32_{k6}	100	652	35	10_{h9}	M12
X110	32_{k6}	100	672	35	10_{h9}	M12
X120	38_{m6}	130	775	41	10_{h9}	M12
X130	38_{m6}	130	811	41	10_{h9}	M12
X140	50_{k6}	140	909	53.5	14_{h9}	M16
X150	50_{k6}	140	951	53.5	14_{h9}	M16
X160	60_{m6}	180	1076	64	18_{h9}	M20
X170	60_{m6}	180	1127	64	18_{h9}	M20
X180	70_{m6}	200	1195	74.5	20_{h9}	M20
X190	70_{m6}	200	1227	74.5	20_{h9}	M20
X200	80_{m6}	200	1316	85	22_{h9}	M20
X210	80_{m6}	200	1352	85	22_{h9}	M20
X220	85_{m6}	210	1470	90	22_{h9}	M20
X230	85_{m6}	210	1510	90	22_{h9}	M20
X240	100_{m6}	250	1637	106	28_{h9}	M24
X250	100_{m6}	250	1660	106	28_{h9}	M24
X260	110_{m6}	300	1857	116	28_{h9}	M24
X270	110_{m6}	300	1892	116	28_{h9}	M24
X280	110_{m6}	300	1944	116	28_{h9}	M24

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11.4 Solid shaft, smooth design /R in mm

48 003 00 12



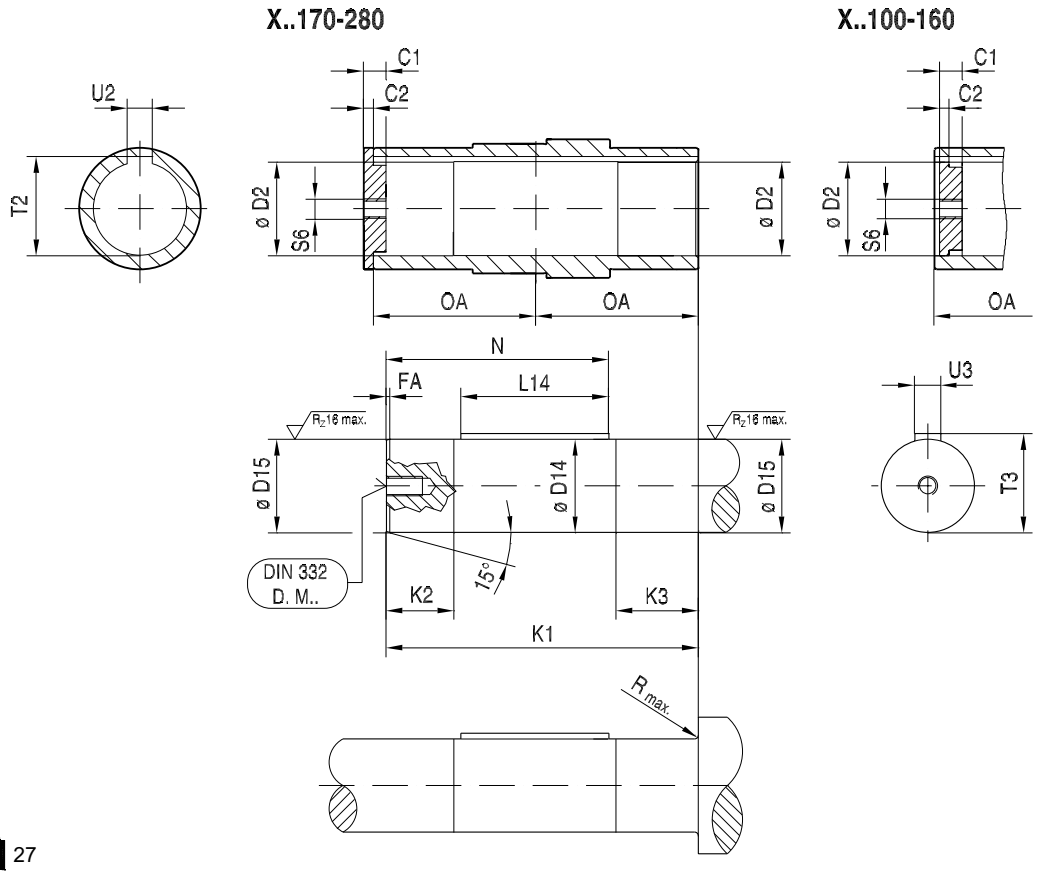
→ 26

	Ø D35	Ø D36	Ø D37	FA	K15	L	DIN 332 D.M..	DIN 509
X100	85_{h9}	85_{v6}	90	2	9	131	M20	E2.5x0.4
X110	85_{h9}	85_{v6}	100	2	9	131	M20	E2.5x0.4
X120	115_{h9}	115_{v6}	120	2	9	165	M24	E2.5x0.4
X130	115_{h9}	115_{v6}	130	2	9	165	M24	E2.5x0.4
X140	135_{h9}	135_{v6}	140	3	11	202	M30	E2.5x0.4
X150	135_{h9}	135_{v6}	160	3	11	202	M30	E2.5x0.4
X160	165_{h9}	165_{v6}	170	3	11	222	M30	E2.5x0.4
X170	165_{h9}	165_{v6}	170	3	11	222	M30	E2.5x0.4
X180	175_{h9}	175_{v6}	180	3	14	253	M30	E2.5x0.4
X190	175_{h9}	175_{v6}	180	3	14	253	M30	E2.5x0.4
X200	195_{h9}	195_{v6}	200	3	14	283	M30	E2.5x0.4
X210	195_{h9}	195_{v6}	200	3	14	283	M30	E2.5x0.4
X220	235_{h9}	235_{v6}	240	3	14	298	M36	E2.5x0.4
X230	235_{h9}	235_{v6}	240	3	14	298	M36	E2.5x0.4
X240	275_{h9}	275_{v6}	280	4	14	318	M36	E2.5x0.4
X250	275_{h9}	275_{v6}	280	4	14	318	M36	E2.5x0.4
X260	275_{h9}	275_{v6}	280	4	14	318	M36	E2.5x0.4
X270	295_{h9}	295_{v6}	300	4	19	343	M36	E2.5x0.4
X280	295_{h9}	295_{v6}	300	4	19	343	M36	E2.5x0.4

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11.5 Hollow shaft with key /A in mm

48 004 00 12



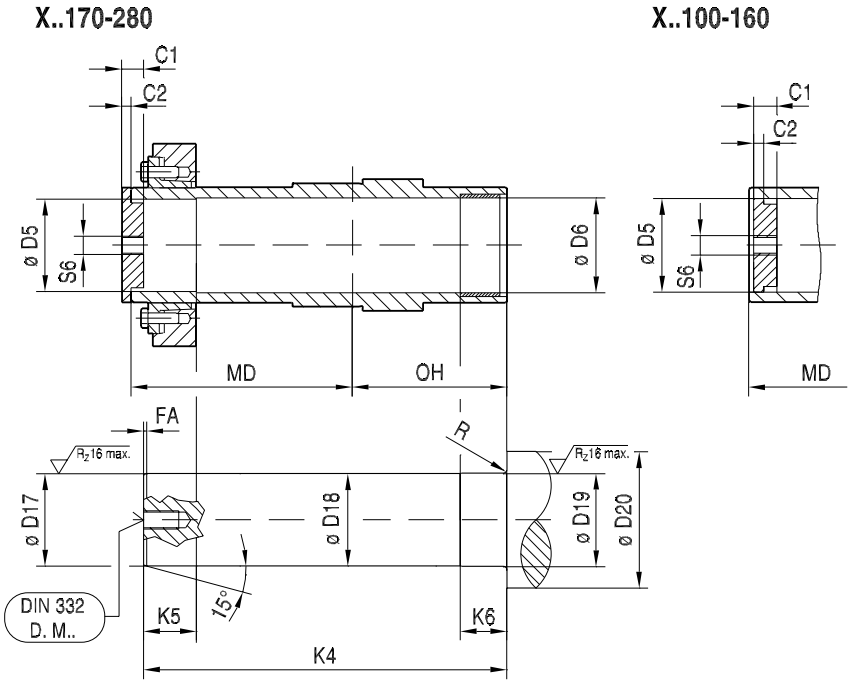
→ 27

	C1	C2	Ø D2	Ø D14	Ø D15	FA	K1	K2	K3	L14	N	OA	$R_{max.}$	S6	T2	T3	U2	U3	DIN 332 D.M..
X100	25	12	75^{H8}	75_{h11}	75_{js7}	2	312	47.5	81	120	220	173	1.6	M24	79.9	79.5	20^{JS9}	20_{h9}	M20
X110	30	14	85^{H8}	85_{h11}	85_{js7}	2	312.5	45	84	100	210	176	1.6	M30	90.4	90	22^{JS9}	22_{h9}	M20
X120	30	14	95^{H8}	95_{h11}	95_{js7}	2	342	53	92	140	244.5	190.5	1.6	M30	100.4	100	25^{JS9}	25_{h9}	M24
X130	30	14	105^{H8}	105_{h11}	105_{js7}	2	347	68	109	160	258	194	1.6	M30	111.4	111	28^{JS9}	28_{h9}	M24
X140	30	14	115^{H8}	115_{h11}	115_{js7}	2	403	61	102	200	306	222	1.6	M30	122.4	122	32^{JS9}	32_{h9}	M24
X150	30	14	125^{H8}	125_{h11}	125_{js7}	3	408	76	117	200	308.5	224.5	1.6	M30	132.4	132	32^{JS9}	32_{h9}	M24
X160	36	16	135^{H8}	135_{h11}	135_{js7}	3	465	80	127	250	361	256	1.6	M36	143.4	143	36^{JS9}	36_{h9}	M30
X170	36	17	150^{H8}	150_{h11}	150_{js7}	3	493	96	115	280	377	256	1.6	M36	158.4	158	36^{JS9}	36_{h9}	M30
X180	36	17	165^{H8}	165_{h11}	165_{js7}	3	565	109	128	300	423	292	2	M36	174.4	174	40^{JS9}	40_{h9}	M30
X190	36	17	165^{H8}	165_{h11}	165_{js7}	3	565	109	128	300	423	292	2	M36	174.4	174	40^{JS9}	40_{h9}	M30
X200	36	17	180^{H8}	180_{h11}	180_{js7}	3	620	130	149	320	460.5	319.5	2	M36	190.4	190	45^{JS9}	45_{h9}	M30
X210	36	17	190^{H8}	190_{h11}	190_{js7}	3	620	130	149	320	460.5	319.5	2	M36	200.4	200	45^{JS9}	45_{h9}	M30
X220	36	17	210^{H8}	210_{h11}	210_{js7}	3	686	133	152	370	518.5	352.5	2.5	M36	221.4	221	50^{JS9}	50_{h9}	M30
X230	36	17	210^{H8}	210_{h11}	210_{js7}	3	686	133	152	370	518.5	352.5	2.5	M36	221.4	221	50^{JS9}	50_{h9}	M30
X240	45	22	230^{H8}	230_{h11}	230_{js7}	3	778	147	170	370	562.5	400.5	2.5	M42	241.4	241	50^{JS9}	50_{h9}	M36
X250	45	22	240^{H8}	240_{h11}	240_{js7}	3	778	147	170	370	562.5	400.5	2.5	M42	252.4	252	56^{JS9}	56_{h9}	M36
X260	45	22	240^{H8}	240_{h11}	240_{js7}	3	851	143	166	450	639	437	2.5	M42	252.4	252	56^{JS9}	56_{h9}	M36
X270	45	22	275^{H8}	275_{h11}	275_{js7}	4	877	158	181	450	652	450	5	M42	287.4	287	63^{JS9}	63_{h9}	M36
X280	45	22	275^{H8}	275_{h11}	275_{js7}	4	877	158	181	500	677	450	5	M42	287.4	287	63^{JS9}	63_{h9}	M36

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11.6 Hollow shaft with shrink disk /H in mm

48 005 00 12



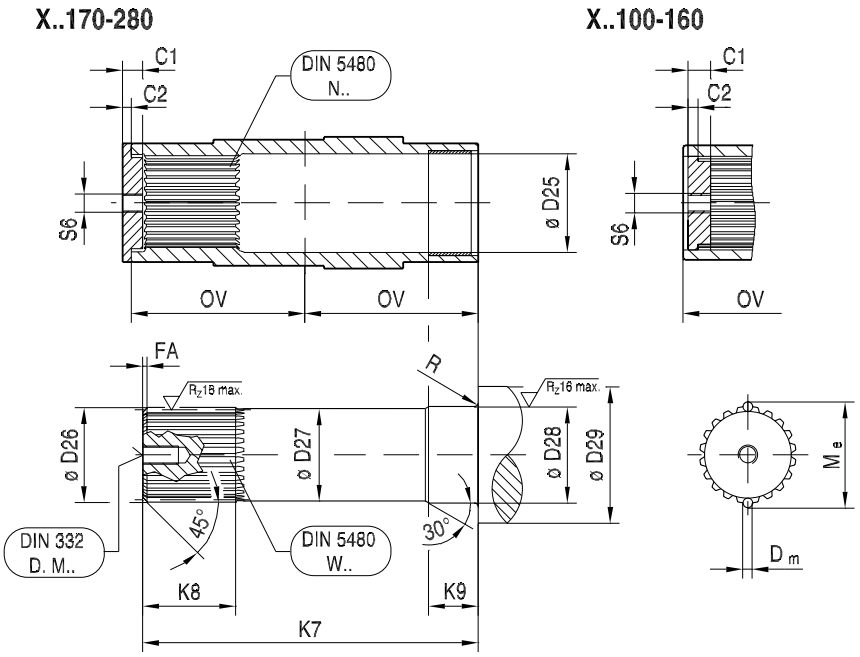
→ 28

	C1	C2	Ø D5	Ø D6	Ø D17	Ø D18	Ø D19	Ø D20	FA	K4	K5	K6	MD	OH	R	S6	DIN 332 D.M..
X100	30	14	80^{H7}	81^{H9}	80_{h6}	80_{h11}	81_{m6}	95	2	394.5_{-1}	46	42_{-1}	261	173	3	M30	M24
X110	30	14	90^{H7}	91^{H9}	90_{h6}	90_{h11}	91_{m6}	105	2	400.5_{-1}	46	42_{-1}	265	176	3	M30	M24
X120	30	14	100^{H7}	10^{H9}	100_{h6}	100_{h11}	101_{m6}	115	2	437_{-1}	51	52_{-1}	286.5	190.5	3	M30	M24
X130	30	14	110^{H7}	111^{H9}	110_{h6}	110_{h11}	111_{m6}	125	2	449_{-1}	55	52_{-1}	297	194	3	M30	M24
X140	30	14	120^{H7}	121^{H9}	120_{h6}	120_{h11}	121_{m6}	135	2	509_{-1}	59	62_{-1}	329	222	3	M30	M24
X150	30	14	130^{H7}	131^{H9}	130_{h6}	130_{h11}	131_{m6}	145	3	520_{-1}	66	62_{-1}	337.5	224.5	3	M30	M24
X160	36	16	140^{H7}	141^{H9}	140_{h6}	140_{h11}	141_{m6}	155	3	583_{-1}	66	73_{-1}	375	256	4	M36	M30
X170	36	17	150^{H7}	151^{H9}	150_{h6}	150_{h11}	151_{m6}	165	3	600_{-1}	83	73_{-1}	364	256	4	M36	M30
X180	36	17	165^{H7}	166^{H9}	165_{g6}	165_{h11}	166_{m6}	180	3	672_{-1}	83	83_{-1}	400	292	4	M36	M30
X190	36	17	165^{H7}	166^{H9}	165_{g6}	165_{h11}	166_{m6}	180	3	672_{-1}	83	83_{-1}	400	292	4	M36	M30
X200	36	17	180^{H7}	181^{H9}	180_{g6}	180_{h11}	181_{m6}	195	3	750_{-1}	101	83_{-1}	450.5	319.5	4	M36	M30
X210	36	17	190^{H7}	191^{H9}	190_{g6}	190_{h11}	191_{m6}	205	3	753_{-1}	106	83_{-1}	453.5	319.5	4	M36	M30
X220	36	17	210^{H7}	211^{H9}	210_{g6}	210_{h11}	211_{m6}	230	3	830_{-1}	118	108_{-1}	497.5	352.5	5	M36	M30
X230	36	17	210^{H7}	211^{H9}	210_{g6}	210_{h11}	211_{m6}	230	3	830_{-1}	118	108_{-1}	497.5	352.5	5	M36	M30
X240	45	22	230^{H7}	231^{H9}	230_{g6}	230_{h11}	231_{m6}	250	3	948_{-1}	140	108_{-1}	571.5	400.5	5	M42	M36
X250	45	22	240^{H7}	241^{H9}	240_{g6}	240_{h11}	241_{m6}	260	3	948_{-1}	140	108_{-1}	571.5	400.5	5	M42	M36
X260	45	22	250^{H7}	255^{H9}	250_{g6}	250_{h11}	255_{m6}	280	4	1021_{-1}	140	108_{-1}	608	437	5	M42	M36
X270	45	22	280^{H7}	285^{H9}	280_{g6}	280_{h11}	285_{m6}	310	4	1056_{-1}	146	143_{-1}	630	450	5	M42	M36
X280	45	22	280^{H7}	285^{H9}	280_{g6}	280_{h11}	285_{m6}	310	4	1056_{-1}	146	143_{-1}	630	450	5	M42	M36

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11.7 Splined hollow shaft /V in mm

48 006 00 12



→ 29

	Ø D25	Ø D26	Ø D27	Ø D28	Ø D29	FA	K7	K8	K9
X100	81^{H9}	74.4_{h10}	73	81_{m6}	95	3	306_{-1}	81	42_{-1}
X110	91^{H9}	84.4_{h10}	83	91_{m6}	105	3	311.5_{-1}	81	42_{-1}
X120	101^{H9}	94.4_{h10}	93	101_{m6}	115	3	341_{-1}	91	52_{-1}
X130	111^{H9}	109.4_{h10}	108	111_{m6}	125	3	346_{-1}	86	52_{-1}
X140	121^{H9}	119.4_{h10}	118	121_{m6}	135	3	402_{-1}	101	62_{-1}
X150	131^{H9}	129.4_{h10}	128	131_{m6}	145	3	407_{-1}	101	62_{-1}
X160	141^{H9}	139.4_{h10}	138	141_{m6}	155	3	464_{-1}	111	73_{-1}
X170	151^{H9}	149.4_{h10}	148	151_{m6}	165	3	492_{-1}	121	73_{-1}
X180	166^{H9}	159_{h10}	158	166_{m6}	180	5	564_{-1}	166	83_{-1}
X190	166^{H9}	159_{h10}	158	166_{m6}	180	5	564_{-1}	166	83_{-1}
X200	191^{H9}	179_{h10}	178	191_{m6}	205	5	619_{-1}	176	83_{-1}
X210	191^{H9}	179_{h10}	178	191_{m6}	205	5	619_{-1}	176	83_{-1}
X220	211^{H9}	199_{h10}	198	211_{m6}	230	5	685_{-1}	201	108_{-1}
X2KV220	211^{H9}	199_{h10}	198	211_{m6}	230	5	755_{-1}	201	108_{-1}
X230	211^{H9}	199_{h10}	198	211_{m6}	230	5	685_{-1}	201	108_{-1}
X2KV230	211^{H9}	199_{h10}	198	211_{m6}	230	5	755_{-1}	201	108_{-1}
X240	231^{H9}	219_{h10}	218	231_{m6}	250	5	777_{-1}	216	108_{-1}
X2KV240	231^{H9}	219_{h10}	218	231_{m6}	250	5	852_{-1}	216	108_{-1}
X250	241^{H9}	219_{h10}	218	241_{m6}	260	5	777_{-1}	216	108_{-1}
X2KV250	241^{H9}	219_{h10}	218	241_{m6}	260	5	852_{-1}	216	108_{-1}
X260	255^{H9}	239_{h10}	238	255_{m6}	275	5	850_{-1}	216	108_{-1}
X270	285^{H9}	258.4_{h10}	258	285_{m6}	305	8	876_{-1}	248	143_{-1}
X280	285^{H9}	258.4_{h10}	258	285_{m6}	305	8	876_{-1}	248	143_{-1}

	Dm	M e	OV	R	C1	C2	S6	DIN 332 D.M..	DIN 5480
X100	6	$81.326^{-0.069}_{-0.125}$	173	3	30	14	M30	M24	W 75x3x30x24x8f N 75x3x30x24x9H
X110	6	$91.092^{-0.068}_{-0.123}$	176	3	30	14	M30	M24	W 85x3x30x27x8f N 85x3x30x27x9H
X120	6	$101.141^{-0.068}_{-0.122}$	190.5	3	30	14	M30	M24	W 95x3x30x30x8f N 95x3x30x30x9H
X130	6	$116.076^{-0.078}_{-0.139}$	194	3	30	14	M30	M24	W 110x3x30x35x8f N 110x3x30x35x9H
X140	6	$126.095^{-0.078}_{-0.138}$	222	3	30	14	M30	M24	W 120x3x30x38x8f N 120x3x30x38x9H

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Dimension sheets: Options

Splined hollow shaft /V in mm

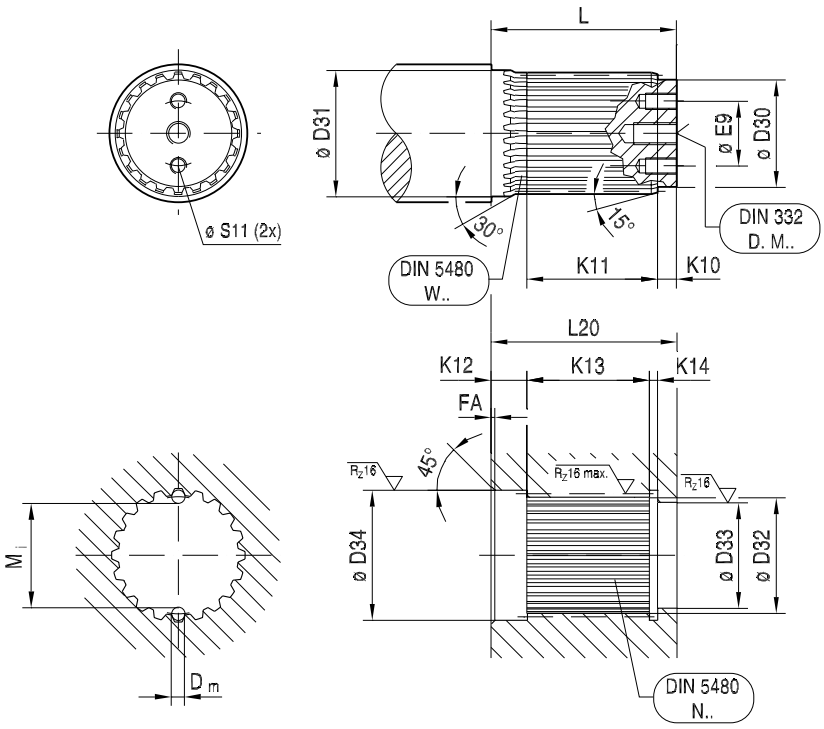
	Dm	M e	OV	R	C1	C2	S6	DIN 332 D.M..	DIN 5480
X150	6	$136.329^{-0.081}_{-0.144}$	224.5	3	30	14	M30	M24	W 130x3x30x42x8f N 130x3x30x42x9H
X160	6	$146.167^{-0.080}_{-0.143}$	256	4	36	16	M36	M30	W 140x3x30x45x8f N 140x3x30x45x9H
X170	6	$156.172^{-0.079}_{-0.141}$	256	4	36	17	M36	M30	W 150x3x30x48x8f N 150x3x30x48x9H
X180	10	$170.009^{-0.086}_{-0.152}$	292	4	36	17	M36	M30	W 160x5x30x30x8f N 160x5x30x30x9H
X190	10	$170.009^{-0.086}_{-0.152}$	292	4	36	17	M36	M30	W 160x5x30x30x8f N 160x5x30x30x9H
X200	10	$190.090^{-0.087}_{-0.155}$	319.5	4	36	17	M36	M30	W 180x5x30x34x8f N 180x5x30x34x9H
X210	10	$190.090^{-0.087}_{-0.155}$	319.5	4	36	17	M36	M30	W 180x5x30x34x8f N 180x5x30x34x9H
X220	10	$210.158^{-0.088}_{-0.157}$	352.5	5	36	17	M36	M30	W 200x5x30x38x8f N 200x5x30x38x9H
X2KV220	10	$210.158^{-0.088}_{-0.157}$	387.5	5	36	17	M36	M30	W 200x5x30x38x8f N 200x5x30x38x9H
X230	10	$210.158^{-0.088}_{-0.157}$	352.5	5	36	17	M36	M30	W 200x5x30x38x8f N 200x5x30x38x9H
X2KV230	10	$210.158^{-0.088}_{-0.157}$	387.5	5	36	17	M36	M30	W 200x5x30x38x8f N 200x5x30x38x9H
X240	10	$230.215^{-0.102}_{-0.179}$	400.5	5	45	22	M42	M36	W 220x5x30x42x8f N 220x5x30x42x9H
X2KV240	10	$230.215^{-0.102}_{-0.179}$	438	5	45	22	M42	M36	W 220x5x30x42x8f N 220x5x30x42x9H
X250	10	$230.215^{-0.102}_{-0.179}$	400.5	5	45	22	M42	M36	W 220x5x30x42x8f N 220x5x30x42x9H
X2KV250	10	$230.215^{-0.102}_{-0.179}$	438	5	45	22	M42	M36	W 220x5x30x42x8f N 220x5x30x42x9H
X260	10	$250.264^{-0.102}_{-0.180}$	437	5	45	22	M42	M36	W 240x5x30x46x8f N 240x5x30x46x9H
X270	16	$276.230^{-0.101}_{-0.177}$	450	5	45	22	M42	M36	W 260x8x30x31x8f N 260x8x30x31x9H
X280	16	$276.230^{-0.101}_{-0.177}$	450	5	45	22	M42	M36	W 260x8x30x31x8f N 260x8x30x31x9H

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SEW EURODRIVE

11.8 Splined solid shaft /L in mm

48 084 05 07



→ 📖 29

	Ø D30	Ø D31	Ø D32	Ø D33	Ø D34	Ø E9	FA	K10	K11	K12	K13	K14
X100	60_{k6}	80_{k6}	69^{H10}	60^{H7}	80^{H7}	-	2	12	71	28	65	10
X110	70_{k6}	90_{k6}	79^{H10}	70^{H7}	90^{H7}	-	2	12	71	28	65	10
X120	85_{k6}	105_{k6}	94^{H10}	85^{H7}	105^{H7}	-	2	15	76	31	70	10
X130	95_{k6}	115_{k6}	104^{H10}	95^{H7}	115^{H7}	-	2	15	81	31	75	10
X140	100_{k6}	125_{k6}	110^{H10}	100^{H7}	125^{H7}	-	2	20	103	38	95	12
X150	110_{k6}	135_{k6}	120^{H10}	110^{H7}	135^{H7}	-	2	20	108	38	100	12
X160	120^{k6}	145_{k6}	130^{H10}	120^{H7}	145^{H7}	-	2	25	118	43	110	12
X170	130_{k6}	155_{k6}	140^{H10}	130^{H7}	155^{H7}	-	2	25	128	43	120	12
X180	140_{k6}	165_{k6}	150^{H10}	140^{H7}	165^{H7}	80	3	25	163	48	155	12
X190	140_{k6}	165_{k6}	150^{H10}	140^{H7}	165^{H7}	80	3	25	163	48	155	12
X200	155_{k6}	185_{k6}	170^{H10}	155^{H7}	185^{H7}	95	3	25	173	48	165	12
X210	155_{k6}	185_{k6}	170^{H10}	155^{H7}	185^{H7}	95	3	25	173	48	165	12
X220	195_{k6}	225_{k6}	210^{H10}	195^{H7}	225^{H7}	125	3	30	163	53	155	12
X230	195_{k6}	225_{k6}	210^{H10}	195^{H7}	225^{H7}	125	3	30	163	53	155	12
X240	225_{k6}	255_{k6}	240^{H10}	225^{H7}	25^{H7}	140	3	35	168	58	160	12
X250	225_{k6}	255_{k6}	240^{H10}	225^{H7}	255^{H7}	140	3	35	168	58	160	12
X260	230_{k6}	265_{k6}	244^{H10}	230^{H7}	265^{H7}	160	3	35	193	64	183	12
X270	250_{k6}	285_{k6}	264^{H10}	250^{H7}	285^{H7}	160	3	35	203	64	193	12
X280	250_{k6}	285_{k6}	264^{H10}	250^{H7}	285^{H7}	160	3	35	203	64	193	12

	L	L20	Dm	M i	Ø S11 (2x)	DIN 332 D.M..	DIN 5480
X100	110	111^{+1}	5.25	$63.932^{0.160}_{0.060}$	-	M20	W 75x3x30x24x8m N 75x3x30x24x9H
X110	110	111^{+1}	5.25	$73.922^{0.148}_{0.056}$	-	M20	W 85x3x30x27x8m N 85x3x30x27x9H
X120	121	122^{+1}	5.25	$89.066^{0.146}_{0.055}$	-	M20	W 100x3x30x32x8m N 100x3x30x32x9H
X130	126	127^{+1}	5.25	$99.001^{0.158}_{0.060}$	-	M24	W 110x3x30x35x8m N 110x3x30x35x9H
X140	160	161^{+1}	9	$101.103^{0.173}_{0.064}$	-	M24	W 120x5x30x22x8m N 120x5x30x22x9H
X150	165	166^{+1}	9	$111.103^{0.173}_{0.064}$	-	M24	W 130x5x30x24x8m N 130x5x30x24x9H
X160	185	186^{+1}	9	$121.003^{0.173}_{0.064}$	-	M24	W 140x5x30x26x8m N 140x5x30x26x9H
X170	195	196^{+1}	9	$131.103^{0.173}_{0.064}$	-	M24	W 150x5x30x28x8m N 150x5x30x28x9H

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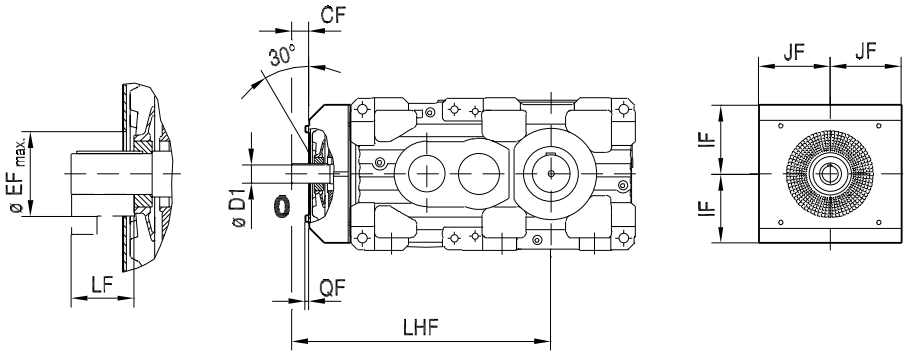
	L	L20	Dm	M i	Ø S11 (2x)	DIN 332 D.M..	DIN 5480
X180	230	231^{+1}	9	$141.103^{0.173}_{0.064}$	M24x30	M30	W 160x5x30x30x8m N 160x5x30x30x9H
X190	230	231^{+1}	9	$141.103^{0.173}_{0.064}$	M24x30	M30	W 160x5x30x30x8m N 160x5x30x30x9H
X200	240	241^{+1}	9	$161.103^{0.173}_{0.064}$	M24x30	M30	W 180x5x30x34x8m N 180x5x30x34x9H
X210	240	241^{+1}	9	$161.103^{0.173}_{0.064}$	M24x30	M30	W 180x5x30x34x8m N 180x5x30x34x9H
X220	240	241^{+1}	9	$201.103^{0.194}_{0.071}$	M24x30	M30	W 220x5x30x42x8m N 220x5x30x42x9H
X230	240	241^{+1}	9	$201.103^{0.194}_{0.071}$	M24x30	M30	W 220x5x30x42x8m N 220x5x30x42x9H
X240	255	256^{+1}	9	$231.103^{0.194}_{0.071}$	M30x36	M36	W 250x5x30x48x8m N 250x5x30x48x9H
X250	255	256^{+1}	9	$231.103^{0.194}_{0.071}$	M30x36	M36	W 250x5x30x48x8m N 250x5x30x48x9H
X260	283	284^{+1}	14	$230.592^{0.202}_{0.074}$	M30x36	M36	W 260x8x30x31x8m N 260x8x30x31x9H
X270	293	294^{+1}	14	$250.650^{0.213}_{0.078}$	M30x36	M36	W 280x8x30x34x8m N 280x8x30x34x9H
X280	293	294^{+1}	14	$250.650^{0.213}_{0.078}$	M30x36	M36	W 280x8x30x34x8m N 280x8x30x34x9H

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11.9 Fan X..K /FAN in mm

X..K /FAN

48 007 00 12



→ 79

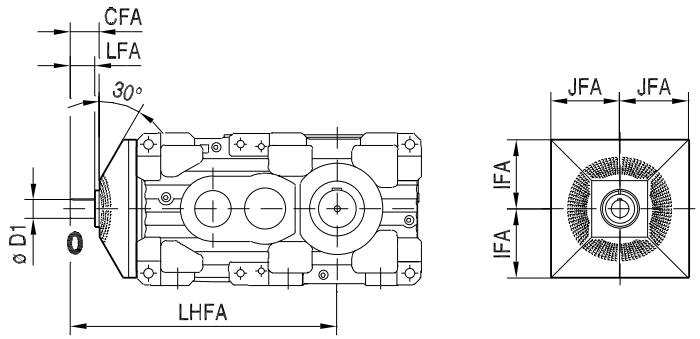
/FAN									
X3K..	**CF**	**Ø D1**	**Ø $EF_{max.}$**	**IF**	**JF**	**LF**	**LHF**	**QF**	**i**
X100	31	32_{k6}	105	185	165	50	632	11	–
X110	31	32_{k6}	105	185	165	50	652	11	–
X120	46	38_{k6}	135	220	200	65	745	11	–
X130	46	38_{k6}	135	220	200	65	781	11	–
X140	51	50_{k6}	155	260	230	70	879	11	–
X150	51	50_{k6}	155	260	230	70	921	11	–
X160	76	60_{m6}	170	310	270	95	1036	11	–
X170	76	60_{m6}	170	310	270	95	1087	11	–
X180	71	70_{m6}	190	330	303	90	1135	11	–
X190	71	70_{m6}	190	330	303	90	1167	11	–
X200	96	80_{m6}	215	370	338	115	1286	11	–
X210	96	80_{m6}	215	370	338	115	1322	11	–
X220	96	85_{m6}	245	420	350	115	1430	16	–
X230	96	85_{m6}	245	420	350	115	1470	16	–
X240	131	100_{m6}	245	445	398	150	1597	14	–
X250	131	100_{m6}	245	445	398	150	1620	14	–
X260	124	110_{m6}	245	495	438	145	1767	14	–
X270	124	110_{m6}	245	495	438	145	1802	14	–
X280	124	110_{m6}	245	495	438	145	1854	14	–

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11.10 Fan X..K /FAN-ADV in mm

X..K /FAN-ADV

48 008 00 12



→ 80

/FAN–ADV							
X3K..	**CFA**	**Ø D1**	**IFA**	**JFA**	**LFA**	**LHFA**	**i**
X100	54	32_{k6}	189	167	50	632	–
X110	54	32_{k6}	189	167	50	652	–
X120	71	38_{k6}	224	192	65	745	–
X130	71	38_{k6}	224	192	65	781	–
X140	69	50_{k6}	264	232	65	879	–
X150	69	50_{k6}	264	232	65	921	–
X160	100	60_{m6}	314	277	95	1036	–
X170	100	60_{m6}	314	277	95	1087	–
X180	91	70_{m6}	334	304	85	1135	–
X190	91	70_{m6}	334	304	85	1167	–
X200	116	80_{m6}	374	327	110	1286	–
X210	116	80_{m6}	374	327	110	1322	–
X220	116	85_{m6}	424	345	110	1430	–
X230	116	85_{m6}	424	345	110	1470	–
X240	146	100_{m6}	449	392	140	1597	–
X250	146	100_{m6}	449	392	140	1620	–
X260	141	110_{m6}	499	438	135	1767	–
X270	141	110_{m6}	499	438	135	1802	–
X280	141	110_{m6}	554	438	135	1854	–

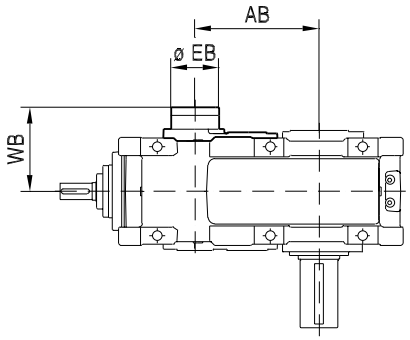
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11.11 Backstop X.K../BS in mm

X.K../BS

48 013 00 12

Fig. A
extern



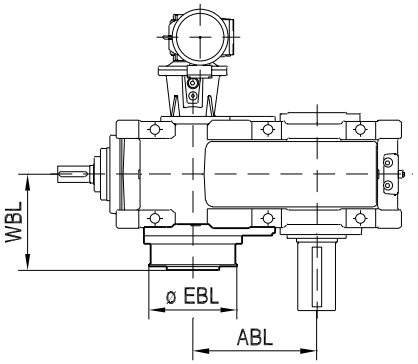
X3K..	i_{ges}	Fig	AB	Ø EB	WB
X100	28 – 71	A	278	133	213
X110	31.5 – 90	A	298	133	213
X120	28 – 71	A	327	153	235
X130	31.5 – 90	A	363	153	235
X140	28 – 71	A	388	175	284
X150	31.5 – 90	A	430	175	284
X160	28 – 71	A	474	190	320
X170	31.5 – 90	A	525	190	320
X180	28 – 71	A	544	210	360
X190	28 – 80	A	576	210	360
X200	28 – 71	A	614	210	381
X210	28 – 80	A	650	210	381
X220	28 – 71	A	694	245	426
X230	28 – 80	A	734	245	426
X240	28 – 35.5	A	776	290	472
	40 – 71	A	776	245	470
X250	28 – 80	A	799	290	472
X260	28 – 71	A	855	288	553
X270	28 – 80	A	890	288	553
X280	31.5 – 90	A	942	288	553

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11.12 Torque limiting backstop X.K../BSL in mm

BSL

48 004 01 11



→ 41

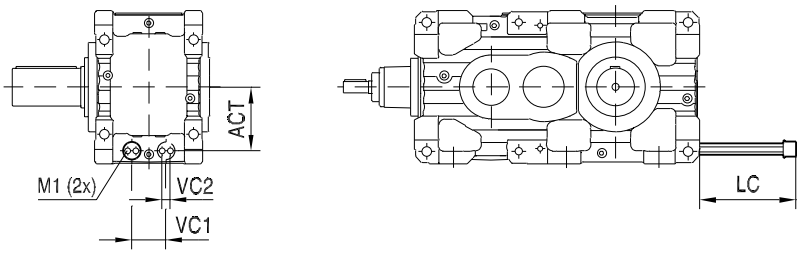
X3K..	i_{ges}	ABL	Ø EBL	WBL
X120	28 – 71	327	280	317
X130	31.5 – 90	363	280	317
X140	28 – 71	388	311	352
X150	31.5 – 90	430	311	352
X160	28 – 71	474	345	391
X170	31.5 – 90	525	345	391
X180	28 – 71	544	386	427
X190	28 – 80	576	386	427
X200	28 – 71	614	462	466
X210	28 – 80	650	462	466
X220	28 – 71	694	462	493
X230	28 – 80	734	462	493
X240	28 – 71	776	516	563
X250	28 – 80	799	516	563
X260	28 – 71	855	630	600
X270	28 – 80	890	630	600
X280	31.5 – 90	942	630	600

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11.13 Water cooling cartridge /CCT and oil heater /OH in mm

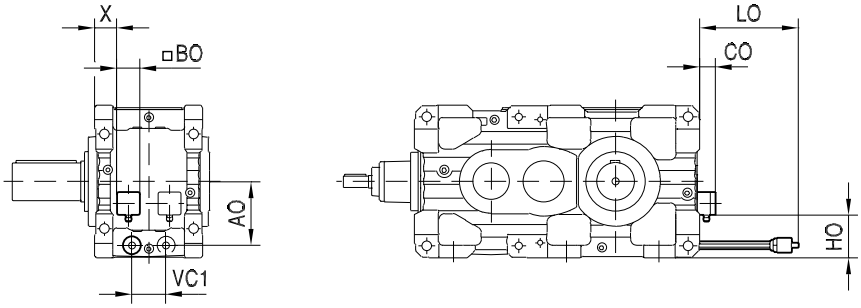
CCT

48 021 00 18



→ 81

OH



→ 101

11.13.1 Water cooling cartridge /CCT

	ACT	LC	M1 (2x)	VC2	VC1	VC
X140	209	695	G1/4"	24	100	2
X150	209	825	G1/4"	24	100	1
X160	250	945	G1/4"	24	115	2
X170	250	945	G1/4"	24	115	1
X180	280	950	G1/2"	34	150	2
X190	280	1000	G1/2"	34	150	1
X200	320	1100	G1/2"	34	150	2
X210	320	1150	G1/2"	34	150	1
X220	362	1350	G1/2"	34	180	2
X230	362	1350	G1/2"	34	180	1
X240	385	1400	G1/2"	34	200	2
X250	385	1450	G1/2"	34	200	1
X260	430	1600	G1/2"	35	280	2
X270	430	1600	G1/2"	35	280	1
X280	485	1750	G1/2"	35	280	1

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11.13.2 Oil heater /OH in mm

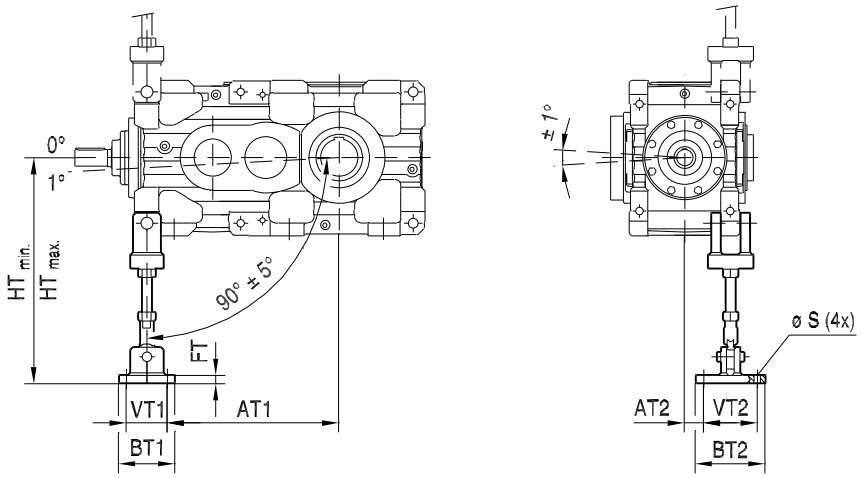
	AO	BO	CO	HO	LO	LO	VC1	X	max.
X100	151	100	91	82	490	490	75	13	2
X110	151	100	91	82	580	580	75	13	1
X120	175	100	112	75	680	680	90	35	2
X130	175	100	112	75	680	680	90	35	1
X140	209	100	85	80	780	780	100	75	2
X150	209	100	85	85	890	890	100	75	1
X160	250	100	85	115	1010	1010	115	90	2
X170	250	100	85	115	1010	1010	115	90	1
X180	280	100	82	120	960	960	150	90	2
X190	280	100	82	120	960	960	150	90	1
X200	320	100	82	130	1110	1110	150	110	2
X210	320	100	82	130	1110	1110	150	110	1
X220	362	100	82	140	1310	1310	180	110	2
X230	362	100	82	140	1310	1310	180	110	1
X240	380	100	82	150	1310	1310	200	130	2
X250	380	100	82	150	1510	1510	200	130	1
X260	430	100	77	170	1660	1660	280	122.5	2
X270	430	100	77	170	1660	1660	280	122.5	1
X280	485	100	77	170	1810	1810	280	122.5	1

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11.14 Torque arm /T in mm

T

48 011 01 12



→ 67

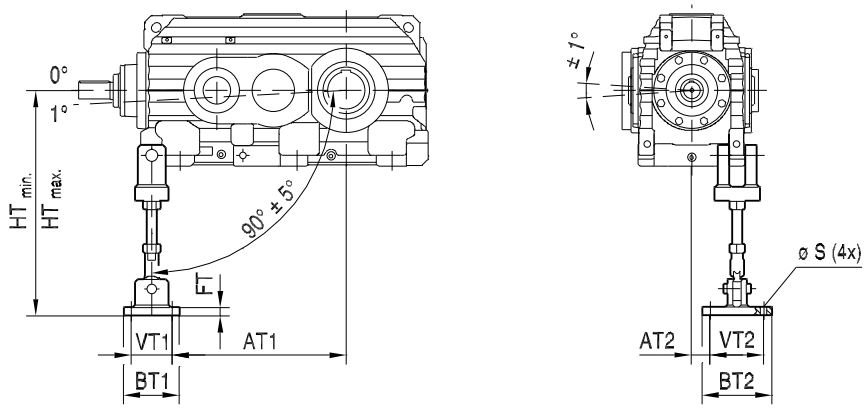
	AT1	AT2	BT1	BT2	FT	$HT_{min.}$	$HT_{max.}$	Ø S (4x)	VT1	VT2
X100	406	46.5	120	160	25	435	475	13.5	70	120
X110	426	46.5	120	160	25	435	475	13.5	70	120
X120	486	63.5	120	160	25	509	549	13.5	70	120
X130	522	63.5	120	160	25	509	549	13.5	70	120
X140	578	86.5	120	160	25	547	587	13.5	70	120
X150	620	86.5	120	160	25	547	587	13.5	70	120
X160	672	78	180	240	30	725	775	22	130	188
X170	723	78	180	240	30	725	775	22	130	188
X180	762	103	180	240	30	745	795	22	130	188
X190	794	103	180	240	30	745	795	22	130	188
X200	865	118	200	250	30	795	845	22	130	188
X210	901	118	200	250	30	795	845	22	130	188
X220	992	126	200	250	30	840	890	22	130	188
X230	1032	126	200	250	30	840	890	22	130	188
X240	1045	150	300	300	30	920	970	26	220	220
X250	1068	150	300	300	30	920	970	26	220	220
X260	1175	190	300	300	30	970	1020	26	220	220
X270	1210	190	300	300	30	970	1020	26	220	220
X280	1262	190	300	300	30	1025	1075	26	220	220

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11.15 Torque arm /T-HH in mm

T-HH

48 012 01 12



→ 67

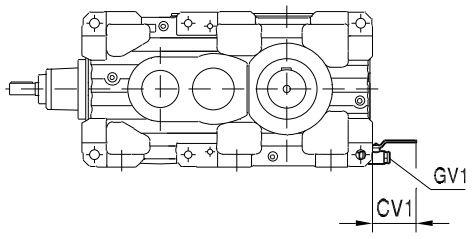
	AT1	AT2	BT1	BT2	FT	$HT_{min.}$	$HT_{max.}$	Ø S (4x)	VT1	VT2
X220	992	126	200	250	30	840	890	22	130	188
X230	1032	126	200	250	30	840	890	22	130	188
X240	1045	150	300	300	30	920	970	26	220	220
X250	1068	150	300	300	30	920	970	26	220	220
X260	1175	190	300	300	30	970	1020	26	220	220
X270	1210	190	300	300	30	970	1020	26	220	220
X280	1262	190	300	300	30	1025	1075	26	220	220

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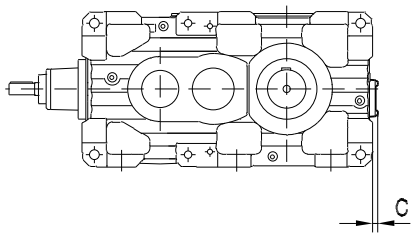
11.16 Oil dipstick /OD, oil level glass /OLG, oil drain valve /ODV, and breather /BPG in mm

48 035 01 13

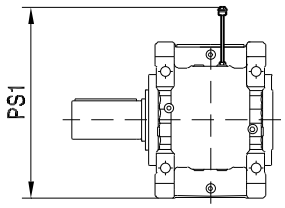
ODV



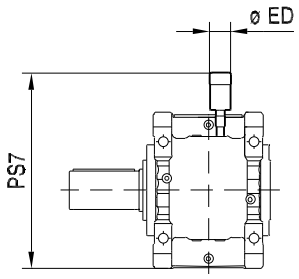
OLG



OD



BPG



11.16.1 Oil drain valve /ODV

	CV1	GV1
X100	89	G1/2"
X110	89	G1/2"
X120	83	G1/2"
X130	83	G1/2"
X140	66	G1/2"
X150	66	G1/2"
X160	91	G1"
X170	91	G1"
X180	92	G1"
X190	92	G1"
X200	75	G1"
X210	75	G1"
X220	107	G1 1/4"
X230	107	G1 1/4"
X240	86	G1 1/4"
X250	86	G1 1/4"
X260	85	G1 1/4"
X270	85	G1 1/4"
X280	85	G1 1/4"

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11.16.2 Oil level glass /OLG

	C
X100	-
X110	-
X120	-
X130	-
X140	-
X150	-
X160	-
X170	-
X180	17^{+2}
X190	17^{+2}
X200	17^{+2}
X210	17^{+2}
X220	16^{+2}
X230	16^{+2}
X240	16^{+2}
X250	16^{+2}
X260	13^{+2}
X270	13^{+2}
X280	13^{+2}

11.16.3 Oil dipstick /OD

	OD					
	M1	M5		M4		
	PS1	PS5	PS6	PS4	PSK	COD
X100	520	620	420	790	1060	-
X110	520	620	420	830	1100	-
X120	620	660	480	880	1270	54
X130	620	660	480	950	1240	54
X140	710	750	560	1040	1370	41
X150	710	750	560	1120	1450	41
X160	830	810	660	1300	1620	49
X170	830	810	660	1350	1670	49
X180	890	970	750	1470	1830	51
X190	890	970	750	1500	1865	51
X200	980	1010	800	1640	1985	48
X210	980	1010	800	1680	2020	48
X220	1120	1100	1000	1940	2220	90
X230	1120	1100	1000	1980	2260	90
X240	1150	1170	1150	2110	2380	92
X250	1150	1170	1150	2130	2400	92
X260	1300	-	1180	2270	-	89
X270	1300	-	1180	2300	-	89
X280	1470	-	1180	2420	-	89

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11.16.4 Breather /BPG

	BPG	ø ED	PS7	Gear unit housing
X100 – 110	DC HG-8	104	633^{+5}	HU/HH
	DC2	102	542^{+5}	HU/HH
	DC3	102	593^{+5}	HU/HH
	DC4	102	644^{+5}	HU/HH
	PI	118	480^{+5}	HU/HH
	Stainless steel	62	453^{+5}	HU/HH
X120 – 130	DC HG-8	104	693^{+5}	HU/HH
	DC2	102	602^{+5}	HU/HH
	DC3	102	653^{+5}	HU/HH
	DC4	102	704^{+5}	HU/HH
	PI	118	540 $^{+5}$	HU/HH
	Stainless steel	62	513^{+5}	HU/HH
X140 – 150	DC HG-8	104	758^{+5}	HU/HH
	DC2	102	667^{+5}	HU/HH
	DC3	102	718^{+5}	HU/HH
	DC4	102	769^{+5}	HU/HH
	PI	118	605^{+5}	HU/HH
	Stainless steel	62	578^{+5}	HU/HH
X160 – 170	DC HG-8	104	882^{+5}	HU/HH
	DC2	102	791^{+5}	HU/HH
	DC3	102	842^{+5}	HU/HH
	DC4	102	893^{+5}	HU/HH
	PI	118	729^{+5}	HU/HH
	Stainless steel	71	689^{+5}	HU/HH
X180 – 190	DC HG-8	104	922^{+5}	HU/HH
	DC2	102	831^{+5}	HU/HH
	DC3	102	882 $^{+5}$	HU/HH
	DC4	102	933 $^{+5}$	HU/HH
	PI	118	769 $^{+5}$	HU/HH
	Stainless steel	71	729 $^{+5}$	HU/HH
X200 – 210	DC HG-8	104	987^{+5}	HU/HH
	DC2	102	896^{+5}	HU/HH
	DC3	102	947 $^{+5}$	HU/HH
	DC4	102	998^{+5}	HU/HH
	PI	118	834^{+5}	HU/HH
	Stainless steel	71	662^{+5}	HU/HH
X220 – 230	DC HG-8	104	1072^{+5}	HU/HH
	DC2	102	981^{+5}	HU/HH
	DC3	102	1032^{+5}	HU/HH
	DC4	102	1083^{+5}	HU/HH
	PI	118	919^{+5}	HU/HH
	Stainless steel	71	747^{+5}	HU/HH
X240 – 250	DC HG-8	104	1066^{+5}	HU/HH
	DC2	102	975^{+5}	HU/HH
	DC3	102	1024 $^{+5}$	HU/HH
	DC4	102	1077 $^{+5}$	HU/HH
	PI	118	911^{+5}	HU/HH
	Stainless steel	71	779^{+5}	HU/HH

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Dimension sheets: Options

Oil dipstick /OD, oil level glass /OLG, oil drain valve /ODV, and breather /BPG in mm

	BPG	ø ED	PS7	Gear unit housing
X260 – 270	DC HG-8	104	1204^{+5}	HH
	DC HG-8	104	1166^{+5}	HU
	DC2	102	1113^{+5}	HH
	DC2	102	1075 $^{+5}$	HU
	DC3	102	1164 $^{+5}$	HH
	DC3	102	1124 $^{+5}$	HU
	DC4	102	1215 $^{+5}$	HH
	DC4	102	1177 $^{+5}$	HU
	PI	118	1051^{+5}	HH
	PI	118	1011^{+5}	HU
	Stainless steel	71	879^{+5}	HU/HH
X280	DC HG-8	104	1314^{+5}	HH
	DC HG-8	104	1276^{+5}	HU
	DC2	102	1223^{+5}	HH
	DC2	102	1185^{+5}	HU
	DC3	102	1274 $^{+5}$	HH
	DC3	102	1234^{+5}	HU
	DC4	102	1325^{+5}	HH
	DC4	102	1287^{+5}	HU
	PI	118	1161^{+5}	HH
	PI	118	1211^{+5}	HU
	Stainless steel	71	989^{+5}	HU/HH

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	Lower Normandie	SEW-USOCOME	Tel. +33 2 31 37 92 86 Fax +33 2 31 74 68 15
	Brittany	SEW-USOCOME	Tel. +33 2 40 78 42 04 Fax +33 2 40 78 42 20
	Burgundy	SEW-USOCOME	Tel. +33 3 85 49 92 18 Fax +33 3 85 49 92 19
	Centre / Poitou	SEW-USOCOME	Tel. +33 2 40 78 42 11 Fax +33 2 40 78 42 20
	Champagne-Ardenne	SEW-USOCOME	Tel. +33 3 25 79 63 24 Fax +33 3 25 79 63 25
	Franche-Comté	SEW-USOCOME	Tel. +33 3 84 68 57 71 Fax +33 3 84 68 57 95
	Île-de-France East / Aisne	SEW-USOCOME	Tel. +33 3 23 62 81 24 Fax +33 3 23 62 81 44
	Île-de-France North / Picardie	SEW-USOCOME	Tel. +33 1 41 05 92 74 Fax +33 1 41 05 92 75
	Île-de-France South	SEW-USOCOME	Tel. +33 1 60 81 10 56 Fax +33 1 60 81 10 57
	Lorraine / Alsace North	SEW-USOCOME	Tel. +33 3 83 96 28 04 Fax +33 3 83 96 28 07
	Midi-Pyrénées / Roussillon	SEW-USOCOME	Tel. +33 5 61 08 15 85 Fax +33 5 61 08 16 44
	Nord-Pas-de-Calais	SEW-USOCOME	Tel. +33 3 21 10 86 86 Fax +33 3 21 10 86 87

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	Paris / Île-de-France West	SEW-USOCOME	Tel. +33 1 30 90 89 86 Fax +33 1 30 90 93 15
	Pays de la Loire	SEW-USOCOME	Tel. +33 2 40 78 42 03 Fax +33 2 40 78 42 20
	Provence-Alpes-Côte d'Azur	SEW-USOCOME	Tel. +33 4 91 18 00 11 Fax +33 4 91 18 00 12
	Rhône-Alpes East	SEW-USOCOME	Tel. +33 4 75 05 65 95 Fax +33 4 75 05 65 96
	Rhône-Alpes North	SEW-USOCOME	Tel. +33 4 74 99 60 03 Fax +33 4 74 99 60 15
	Rhône-Alpes West	SEW-USOCOME	Tel. +33 4 74 99 60 04 Fax +33 4 74 99 60 15
Gabon			
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Production / Industrial Gears	Bruchsal	SEW-EURODRIVE GmbH & Co KG Christian-Pähr-Str. 10 76646 Bruchsal	Tel. +49 7251 75-0 Fax +49 7251 75-2970
Production	Graben	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-0 Fax +49 7251-2970
	Östringen	SEW-EURODRIVE GmbH & Co KG, Werk Östringen Franz-Gurk-Straße 2 76684 Östringen	Tel. +49 7253 9254-0 Fax +49 7253 9254-90 oestringen@sew-eurodrive.de
Service Competence Center	Mechanics / Mechatronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 1 76676 Graben-Neudorf	Tel. +49 7251 75-1710 Fax +49 7251 75-1711 scc-mechanik@sew-eurodrive.de
	Electronics	SEW-EURODRIVE GmbH & Co KG Ernst-Blickle-Straße 42 76646 Bruchsal	Tel. +49 7251 75-1780 Fax +49 7251 75-1769 scc-elektronik@sew-eurodrive.de
Drive Technology Center	North	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Straße 40-42 30823 Garbsen (Hannover)	Tel. +49 5137 8798-30 Fax +49 5137 8798-55 dtc-nord@sew-eurodrive.de
	East	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg 1 08393 Meerane (Zwickau)	Tel. +49 3764 7606-0 Fax +49 3764 7606-30 dtc-ost@sew-eurodrive.de
	South	SEW-EURODRIVE GmbH & Co KG Domagkstraße 5 85551 Kirchheim (München)	Tel. +49 89 909552-10 Fax +49 89 909552-50 dtc-sued@sew-eurodrive.de
	West	SEW-EURODRIVE GmbH & Co KG Siemensstraße 1 40764 Langenfeld (Düsseldorf)	Tel. +49 2173 8507-30 Fax +49 2173 8507-55 dtc-west@sew-eurodrive.de
Drive Center	Berlin	SEW-EURODRIVE GmbH & Co KG Alexander-Meißner-Straße 44 12526 Berlin	Tel. +49 306331131-30 Fax +49 306331131-36 dc-berlin@sew-eurodrive.de
	Ludwigshafen	SEW-EURODRIVE GmbH & Co KG c/o BASF SE Gebäude W130 Raum 101 67056 Ludwigshafen	Tel. +49 7251 75 3759 Fax +49 7251 75 503759 dc-ludwigshafen@sew-eurodrive.de
	Saarland	SEW-EURODRIVE GmbH & Co KG Gottlieb-Daimler-Straße 4 66773 Schwalbach Saar – Hülzweiler	Tel. +49 6831 48946 10 Fax +49 6831 48946 13 dc-saarland@sew-eurodrive.de
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	Bremen	SEW-EURODRIVE GmbH & Co KG Bornstr.19 ... 22 28195 Bremen	Tel. +49 421 33918-10 Fax +49 421 33918-22 tb-bremen@sew-eurodrive.de
	Dortmund	SEW-EURODRIVE GmbH & Co KG Hildastraße 8 44145 Dortmund	Tel. +49 231 229028-10 Fax +49 231 229028-20 tb-dortmund@sew-eurodrive.de
	Dresden	SEW-EURODRIVE GmbH & Co KG Hauptstraße 32 01445 Radebeul	Tel. +49 351 26338-0 Fax +49 351 26338-38 tb-dresden@sew-eurodrive.de
	Erfurt	SEW-EURODRIVE GmbH & Co KG Dubliner Straße 12 99091 Erfurt	Tel. +49 361 21709-70 Fax +49 361 21709-79 tb-erfurt@sew-eurodrive.de
	Güstrow	SEW-EURODRIVE GmbH & Co KG Glasewitzer Chaussee 33 B 18273 Güstrow P.O. Box Postfach 1216 – D-18262 Güstrow	Tel. +49 3843 8557-80 Fax +49 3843 8557-88 tb-guestrow@sew-eurodrive.de
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	Hannover / Garbsen	SEW-EURODRIVE GmbH & Co KG Alte Ricklinger Str.40-42 30823 Garbsen	Tel. +49 5137 8798-10 Fax +49 5137 8798-50 tb-hannover@sew-eurodrive.de
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	Karlsruhe	SEW-EURODRIVE GmbH & Co KG Ettlinger Weg 2 76467 Bietigheim P.O. Box Postfach 43 – D-76463 Bietigheim	Tel. +49 7245 9190-10 Fax +49 7245 9190-20 tb-karlsruhe@sew-eurodrive.de
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	Lahr	SEW-EURODRIVE GmbH & Co KG Europastraße 3/1 77933 Lahr / Schwarzwald	Tel. +49 7821 90999-60 Fax +49 7821 90999-79 tb-lahr@sew-eurodrive.de
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	Mannheim	SEW-EURODRIVE GmbH & Co KG Besselstraße 26 68219 Mannheim	Tel. +49 621 71683-10 Fax +49 621 71683-22 tb-mannheim@sew-eurodrive.de

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	Regensburg	SEW-EURODRIVE GmbH & Co KG Im Gewerbepark A15 93059 Regensburg	Tel. +49 941 46668-68 Fax +49 941 46668-66 tb-regensburg@sew-eurodrive.de
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	Stuttgart	SEW-EURODRIVE GmbH & Co KG Friedrich-List-Straße 46 70771 Leinfelden-Echterdingen	Tel. +49 711 16072-0 Fax +49 711 16072-72 tb-stuttgart@sew-eurodrive.de
	Zwickau / Meerane	SEW-EURODRIVE GmbH & Co KG Dänkritzer Weg1 08393 Meerane	Tel. +49 3764 7606-0 Fax +49 3764 7606-20 tb-zwickau@sew-eurodrive.de
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	Drive Service Hotline / 24 Hour Service		Tel. 01924 896911
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	Scotland	SEW-EURODRIVE Ltd. No 37 Enterprise House Springkerse Business Park Stirling FK7 7UF	Tel. +44 17 8647-8730 Fax +44 17 8645-0223
	Northern Ireland	Heyn Engineering (NI) Ltd. 1 Corry Place, Belfast, BT3 9AH	Tel. +44 02890350022 Fax +44 02890350012 http://www.heyn.co.uk info@heyn.co.uk
Greece			
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Technical Office	Thessaloniki	Christ. Boznos & Son S.A. Asklipiou 26 562 24 Evosmos, Thessaloniki	Tel. +30 2 310 7054-00 Fax +30 2 310 7055-15 info@boznos.gr
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Sales Service	Budapest	SEW-EURODRIVE Kft. Csillaghegyí út 13. 1037 Budapest	Tel. +36 1 437 06-58 Fax +36 1 437 06-50 http://www.sew-eurodrive.hu office@sew-eurodrive.hu

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Assembly Sales Service	Chennai	SEW-EURODRIVE India Private Limited Plot No. K3/1, Sipcot Industrial Park Phase II Mambakkam Village Sriperumbudur - 602105 Kancheepuram Dist, Tamil Nadu	Tel. +91 44 37188888 Fax +91 44 37188811 saleschennai@seweurodriveindia.com
	Pune	SEW-EURODRIVE India Private Limited Plant: Plot No. D236/1, Chakan Industrial Area Phase- II, Warale, Tal- Khed, Pune-410501, Maharashtra	Tel. +91 21 35 628700 Fax +91 21 35 628715 salespune@seweurodriveindia.com
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	Aurangabad	SEW-EURODRIVE India Private Limited Flat.No.403 , Prism Appt. The Venus Housing Society. Beed Bypass Road, Behind Nishant Park Hotel, Aurangabad – 431003, Maharashtra.	Tel. +91 86000 12333 salesaurangabad@seweurodriveindia.com
	Bangalore	SEW-EURODRIVE India Private Limited Sy.no:41-P3, Peenya1, Phase 1A, Peenya Village, Yeswanthapura Hobli, Bangalore North Taluk, Bangalore - 560058, Karnataka	Tel. +91 80 28370664 Fax +91 80 28370665 salesbangalore@seweurodriveindia.com
	Bangalore	SEW-EURODRIVE India Private Limited # C-104, 3rd Block, KSSIDC Complex, Electronic City. Bangalore – 560100, Karnataka	Tel. +91 80 28522662 / 28522663 salesbangalore@seweurodriveindia.com
	Bangladesch	SEW-EURODRIVE India Private Limited Genetic Udayanchal, House-96 (6th Floor), Road-23/A, Block-B, Banani, Dhaka-1213, Bangladesh	Tel. +88 01729 097309 salesdhaka@seweurodrivebangladesh.com
	Bellary	SEW-EURODRIVE India Private Limited Door no-56/279 Ward No-15, Sindhigi compound, Near Raghavendra talkies, Bellary-583101, Karnataka	Tel. +91 77609 88668 salesbellary@seweurodriveindia.com
	Chandigarh	SEW-EURODRIVE India Private Limited #699, Type -3, Power Colony, Chandigarh - Rupnagar Highway Rupnagar - 140001, Punjab	Tel. +91 81462 67606 saleschandigarh@seweurodriveindia.com
	Chennai	SEW-EURODRIVE India Private Limited 2nd Floor, Josmans Complex, No. 5, McNichols Road, Chetpet Chennai - 600031, Tamil Nadu	Tel. +91 44 42849812 / 13 / 14 / 15 Fax +91 44 42849816 saleschennai@seweurodriveindia.com
	Kochi	SEW-EURODRIVE India Private Limited House No: 30/1168 A Kaniyampuzha Road Vyttila Post Office Cochin – 682019, Kerala	Tel. +91 98951 30375 salescochin@seweurodriveindia.com
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	Ranchi	SEW-EURODRIVE India Private Limited 1D- Shail Madhuri Apartment, Near Kokar Pool, H.B Road, Kokar Ranchi - 834001, Jharkhand.	Tel. +91 82946 30772 salesranchi@seweurodriveindia.com
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	Vizag	SEW-EURODRIVE India Private Limited D.No.7-13-50/1, Near Padmaja hospital, Ramalayam street, Chittinaidu colony,Old gajuwaka, Visakhapatnam – 530026, Andhra Pradesh	Tel. +91 99895 01748 salesvizag@seweurodriveindia.com
Indonesia			
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	Jakarta	PT. Cahaya Sukses Abadi Komplek Rukan Puri Mutiara Blok A no 99, Sunter Jakarta 14350	Tel. +62 21 65310599 Fax +62 21 65310600 csajkt@cbn.net.id
	Jakarta	PT. Agrindo Putra Lestari JL.Pantai Indah Selatan, Komplek Sentra Industri Terpadu, Pantai indah Kapuk Tahap III, Blok E No. 27 Jakarta 14470	Tel. +62 21 2921-8899 Fax +62 21 2921-8988 aplindo@indosat.net.id http://www.aplindo.com
	Surabaya	PT. TRIAGRI JAYA ABADI Jl. Sukosemolo No. 63, Galaxi Bumi Permai G6 No. 11 Surabaya 60111	Tel. +62 31 5990128 Fax +62 31 5962666 sales@triagri.co.id http://www.triagri.co.id
	Surabaya	CV. Multi Mas Jl. Raden Saleh 43A Kav. 18 Surabaya 60174	Tel. +62 31 5458589 Fax +62 31 5317220 sianhwa@sby.centrin.net.id http://www.cvmultimas.com
Ireland			
Sales Service	Dublin	Alperton Engineering Ltd. 48 Moyle Road Dublin Industrial Estate Glasnevin, Dublin 11	Tel. +353 1 830-6277 Fax +353 1 830-6458 http://www.alperton.ie info@alperton.ie

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Drive Center	Bologna	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via della Grafica, 47 40064 Ozzano dell'Emilia (Bo)	Tel. +39 051 65-23-801 Fax +39 02 96 980 499 bologna@sew-eurodrive.it
	Caserta	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Viale Carlo III Km. 23,300 81020 S. Nicola la Strada (Caserta)	Tel. +39 0823 219011 Fax +39 02 96 980 599 caserta@sew-eurodrive.it
	Pescara	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Viale Europa,132 65010 Villa Raspa di Spoltore (PE)	Tel. +39 085 41-59-427 Fax +39 02 96 980 699 pescara@sew-eurodrive.it
	Turin	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Filiale Torino c.so Unione Sovietica 612/15 - int. C 10135 Torino	Tel. +39 011 3473780 Fax +39 02 96 980 799 torino@sew-eurodrive.it
	Verona	SEW-EURODRIVE di R. Blickle & Co.s.a.s. Via Antonio Meucci, 5 37042 - Caldiero (VR)	Tel. +39 045 89-239-11 Fax +39 02 96 980 814 verona@sew-eurodrive.it
Ivory Coast			
Sales	Abidjan	SEW-EURODRIVE SARL Ivory Coast Rue des Pêcheurs, Zone 3 26 BP 916 Abidjan 26	Tel. +225 21 21 81 05 Fax +225 21 25 30 47 info@sew-eurodrive.ci http://www.sew-eurodrive.ci
Japan			
Assembly Sales Service	Iwata	SEW-EURODRIVE JAPAN CO., LTD 250-1, Shimoman-no, Iwata Shizuoka 438-0818	Tel. +81 538 373811 Fax +81 538 373814 http://www.sew-eurodrive.co.jp sewjapan@sew-eurodrive.co.jp hamamatsu@sew-eurodrive.co.jp
Technical Offices	Fukuoka	SEW-EURODRIVE JAPAN CO., LTD C-go, 5th-floor, Yakuin-Hiruzu-Bldg. 1-5-11, Yakuin, Chuo-ku Fukuoka, 810-0022	Tel. +81 92 713-6955 Fax +81 92 713-6860 fukuoka@sew-eurodrive.co.jp
	Kyoto	SEW-EURODRIVE JAPAN CO., LTD Kyoto Operation Center 9-1-11 Seikadai, Seika-cho, Souraku-gun, Kyoto 619-0238	Tel. +81 774 98-2750 Fax +81 774 93-2100 sewjapan@sew-eurodrive.co.jp
	Osaka	SEW-EURODRIVE JAPAN CO., LTD Higobashi Shimizu Bldg. 10th flor 1-3-7 Tosabori, Nishi-ku Osaka, 550-0001	Tel. +81 6 6444--8330 Fax +81 6 6444--8338 osaka@sew-eurodrive.co.jp
	Tokio	SEW-EURODRIVE JAPAN CO., LTD Renai Partire Shiodome 5th floor 2-18-3 Higashi-Shinbashi, Minato-Ku, Tokyo 105-0021	Tel. +81 3 3239-0469 Fax +81 3 3239-0943 tokyo@sew-eurodrive.co.jp
Kazakhstan			
Sales	Almaty	SEW-EURODRIVE LLP 291-291A, Tole bi street 050031, Almaty	Tel. +7 (727) 350 5156 Fax +7 (727) 350 5156 http://www.sew-eurodrive.kz sew@sew-eurodrive.kz
	Tashkent	SEW-EURODRIVE LLP Representative office in Uzbekistan 96A, Sharaf Rashidov street, Tashkent, 100084	Tel. +998 71 2359411 Fax +998 71 2359412 http://www.sew-eurodrive.uz sew@sew-eurodrive.uz

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	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230	Tel. +976-77109997 Fax +976-77109997 imt@imt.mn
Technical Offices	Karagandy	SEW-EURODRIVE LLP 82, Molokov Street 100004, Karagandy	Tel. +7 (7212) 955 956 Fax +7 (7212) 955 956 karagandy@sew-eurodrive.kz
	Oskemen	SEW-EURODRIVE LLP 181/3, Abai avenue, 070005, Oskemen	Tel. +7 (7212) 913 748 Fax +7 (7212) 913 748 oskemen@sew-eurodrive.kz
Kenya			
Sales	Nairobi	SEW-EURODRIVE Pty Ltd Transnational Plaza, 5th Floor Mama Ngina Street P.O. Box 8998-00100 Nairobi	Tel. +254 791 398840 http://www.sew-eurodrive.co.tz info@sew.co.tz
Latvia			
Sales	Riga	SIA Alas-Kuul Katlakalna 11C 1073 Riga	Tel. +371 6 7139253 Fax +371 6 7139386 http://www.alas-kuul.lv info@alas-kuul.com
Lebanon			
Sales (Lebanon)	Beirut	Gabriel Acar & Fils sarl B. P. 80484 Bourj Hammoud, Beirut	Tel. +961 1 510 532 Fax +961 1 494 971 ssacar@inco.com.lb
Sales (Jordan, Kuwait , Saudi Arabia, Syria)	Beirut	Middle East Drives S.A.L. (offshore) Sin El Fil. B. P. 55-378 Beirut	Tel. +961 1 494 786 Fax +961 1 494 971 http://www.medrives.com info@medrives.com
Lithuania			
Sales	Alytus	UAB Irseva Statybininku 106C 63431 Alytus	Tel. +370 315 79204 Fax +370 315 56175 http://www.irseva.lt irmantas@irseva.lt
Luxembourg			
representation: Belgium			
Macedonia			
Sales	Skopje	Boznos DOOEL Dime Anicin 2A/7A 1000 Skopje	Tel. +389 23256553 Fax +389 23256554 http://www.boznos.mk
Malaysia			
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

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	Ipoh	SEW-EURODRIVE SDN BHD West Malaysia	Tel. +60 19 7177366 sewsa@sew-eurodrive.com.my
Mexiko			
Assembly Sales Service	Quéretaro	SEW-EURODRIVE MEXICO S.A. de C.V. SEM-981118-M93 Tequisquiapan No. 102 Parque Industrial Quéretaro C.P. 76220 Querétaro, México	Tel. +52 442 1030-300 Fax +52 442 1030-301 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Sales Service	Puebla	SEW-EURODRIVE MEXICO S.A. de C.V. Calzada Zavaleta No. 3922 Piso 2 Local 6 Col. Santa Cruz Buenavista C.P. 72154 Puebla, México	Tel. +52 (222) 221 248 http://www.sew-eurodrive.com.mx scmexico@seweurodrive.com.mx
Mongolia			
Technical Office	Ulaanbaatar	IM Trading LLC Olympic street 28B/3 Sukhbaatar district, Ulaanbaatar 14230	Tel. +976-77109997 Tel. +976-99070395 Fax +976-77109997 http://imt.mn/ imt@imt.mn
Morocco			
Sales Service	Bouskoura	SEW-EURODRIVE Morocco Parc Industriel CFCIM, Lot 55 and 59 Bouskoura	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 Services Einstein Street Strauss Industrial Park Unit1 Swakopmund	Tel. +264 64 462 738 Fax +264 64 462 734 anton@dbminingnam.com
Netherlands			
Assembly Sales Service	Rotterdam	SEW-EURODRIVE B.V. Industrieweg 175 3044 AS Rotterdam Postbus 10085 3004 AB Rotterdam	Tel. +31 10 4463-700 Fax +31 10 4155-552 Service: 0800-SEWHELP http://www.sew-eurodrive.nl info@sew-eurodrive.nl
New Zealand			
Assembly Sales Service	Auckland	SEW-EURODRIVE NEW ZEALAND LTD. P.O. Box 58-428 82 Greenmount drive East Tamaki Auckland	Tel. +64 9 2745627 Fax +64 9 2740165 http://www.sew-eurodrive.co.nz sales@sew-eurodrive.co.nz
	Christchurch	SEW-EURODRIVE NEW ZEALAND LTD. 30 Lodestar Avenue, Wigram Christchurch	Tel. +64 3 384-6251 Fax +64 3 384-6455 sales@sew-eurodrive.co.nz
Technical Office	Palmerston North	SEW-EURODRIVE NEW ZEALAND LTD. C/-Grant Shearman, RD 5, Aronui Road Palmerston North	Tel. +64 6 355-2165 Fax +64 6 355-2316 sales@sew-eurodrive.co.nz
Nigeria			
Sales	Lagos	Greenpeg Nig. Ltd Plot 296A, Adeyemo Akapo Str. Omole GRA Ikeja Lagos-Nigeria	Tel. +234-701-821-9200-1 http://www.greenpegltd.com bolaji.adekunle@greenpegltd.com
Norway			
Assembly Sales Service	Moss	SEW-EURODRIVE A/S Solgaard skog 71 1599 Moss	Tel. +47 69 24 10 20 Fax +47 69 24 10 40 http://www.sew-eurodrive.no sew@sew-eurodrive.no

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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 De la Victoria 112, Esquina nueva Asunción Departamento Central Fernando de la Mora, Barrio Bernardino	Tel. +595 991 519695 Fax +595 21 3285539 sewpy@sew-eurodrive.com.py
Peru			
Assembly Sales Service	Lima	SEW EURODRIVE DEL PERU S.A.C. Los Calderos, 120-124 Urbanizacion Industrial Vulcano, ATE, Lima	Tel. +51 1 3495280 Fax +51 1 3493002 http://www.sew-eurodrive.com.pe sewperu@sew-eurodrive.com.pe
Philippines			
Sales	Makati	P.T. Cerna Corporation 4137 Ponte St., Brgy. Sta. Cruz Makati City 1205	Tel. +63 2 519 6214 Fax +63 2 890 2802 mech_drive_sys@ptcerna.com http://www.ptcerna.com
Poland			
Assembly Sales Service	Łódź	SEW-EURODRIVE Polska Sp.z.o.o. ul. Techniczna 5 92-518 Łódź	Tel. +48 42 293 00 00 Fax +48 42 293 00 49 http://www.sew-eurodrive.pl sew@sew-eurodrive.pl
	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
	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
	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. Słowackiego 84 26-600 Radom	Tel. +48 48 679 47 00 Fax +48 48 679 47 09
	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
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

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Sales Service	Bucharest	Sialco Trading SRL str. Brazilia nr. 36 011783 Bucuresti	Tel. +40 21 230-1328 Fax +40 21 230-7170 sialco@sialco.ro
Russia			
Assembly Sales Service	St. Petersburg	ЗАО «СЕВ-ЕВРОДРАЙФ» а. я. 36 195220 Санкт-Петербург	Tel. +7 812 3332522 / +7 812 5357142 Fax +7 812 3332523 http://www.sew-eurodrive.ru sew@sew-eurodrive.ru
Technical Offices	Ekaterinburg	ЗАО «СЕВ-ЕВРОДРАЙФ» Kominterna Str. 16 Office 614 620078 Ekaterinburg	Tel. +7 343 310 3977 Fax +7 343 310 3978 eso@sew-eurodrive.ru
	Irkutsk	ЗАО «СЕВ-ЕВРОДРАЙФ» 5-Armii Str., 31 664011 Irkutsk	Tel. +7 3952 25 5880 Fax +7 3952 25 5881 iso@sew-eurodrive.ru
	Moscow	ЗАО «СЕВ-ЕВРОДРАЙФ» Malaja Semjonowskaja Str. д. 9, корпус 2 107023 Moskau	Tel. +7 495 9337090 Fax +7 495 9337094 mso@sew-eurodrive.ru
	Novosibirsk	ЗАО «СЕВ-ЕВРОДРАЙФ» pr. K Marksa 30 630087 Novosibirsk	Tel. +7 383 3350200 Fax +7 383 3462544 nso@sew-eurodrive.ru
	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
Sambia			
representation: South Africa			
Senegal			
Sales	Dakar	SENEMECA Mécanique Générale Km 8, Route de Rufisque B.P. 3251, Dakar	Tel. +221 338 494 770 Fax +221 338 494 771 http://www.senemeca.com senemeca@senemeca.sn
Serbia			
Sales	Belgrade	DIPAR d.o.o. Ustanicka 128a PC Košum, IV floor 11000 Beograd	Tel. +381 11 347 3244 / +381 11 288 0393 Fax +381 11 347 1337 office@dipar.rs
Singapore			
Assembly Sales Service	Singapore	SEW-EURODRIVE PTE. LTD. No 9, Tuas Drive 2 Jurong Industrial Estate Singapore 638644	Tel. +65 68621701 Fax +65 68612827 http://www.sew-eurodrive.com.sg sewsingapore@sew-eurodrive.com
Slovakia			
Sales	Bratislava	SEW-Eurodrive SK s.r.o. Rybničná 40 831 06 Bratislava	Tel.+421 2 33595 202, 217, 201 Fax +421 2 33595 200 http://www.sew-eurodrive.sk sew@sew-eurodrive.sk
	Košice	SEW-Eurodrive SK s.r.o. Slovenská ulica 26 040 01 Košice	Tel. +421 55 671 2245 Fax +421 55 671 2254 Mobile +421 907 671 976 sew@sew-eurodrive.sk
Slovenia			
Sales Service	Celje	Pakman - Pogonska Tehnika d.o.o. Ul. XIV. divizije 14 3000 Celje	Tel. +386 3 490 83-20 Fax +386 3 490 83-21 pakman@siol.net

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South Africa			
Assembly Sales Service	Johannesburg	SEW-EURODRIVE (PROPRIETARY) LIMITED Eurodrive House Cnr. Adcock Ingram and Aerodrome Roads Aeroton Ext. 2 Johannesburg 2013 P.O.Box 90004 Bertsham 2013	Tel. +27 11 248-7000 Fax +27 11 248-7289 http://www.sew.co.za info@sew.co.za
	Cape Town	SEW-EURODRIVE (PROPRIETARY) LIMITED Rainbow Park Cnr. Racecourse & Omuramba Road Montague Gardens Cape Town P.O.Box 36556 Chempet 7442	Tel. +27 21 552-9820 Fax +27 21 552-9830 Telex 576 062 bgriffiths@sew.co.za
	Durban	SEW-EURODRIVE (PROPRIETARY) LIMITED 48 Prospecton Road Isipingo Durban P.O. Box 10433, Ashwood 3605	Tel. +27 31 902 3815 Fax +27 31 902 3826 cdejager@sew.co.za
	Nelspruit	SEW-EURODRIVE (PROPRIETARY) LIMITED 7 Christie Crescent Vintonia P.O.Box 1942 Nelspruit 1200	Tel. +27 13 752-8007 Fax +27 13 752-8008 robermeyer@sew.co.za
Technical Office	Port Elizabeth	SEW-EURODRIVE (PROPRIETARY) LIMITED 8 Ruan Access Park Old Cape Road Greenbushes 6000 Port Elizabeth	Tel. +27 41 3722246 Fax +27 41 3722247 http://www.sew.co.za fsieberhagen@sew-co-za
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
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 16, porta 1 Eix Macià – "Torre Milenium" 08208 Sabadell (Barcelona)	Tel. +34 93 7162200 Fax +34 93 7233007

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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 PO Box 2960 Manzini M200	Tel. +268 2 518 6343 Fax +268 2 518 5033 engineering@cgtrading.co.sz
Sweden			
Assembly Sales Service	Jönköping	SEW-EURODRIVE AB Gnejsvägen 6-8 553 03 Jönköping Box 3100 S-550 03 Jönköping	Tel. +46 36 34 42 00 Fax +46 36 34 42 80 http://www.sew-eurodrive.se jonkoping@sew.se
Sales	Gothemburg	SEW-EURODRIVE AB Gustaf Werners gata 8 421 32 Västra Frölunda	Tel. +46 31 709 68 80 Fax +46 31 709 68 93 goteborg@sew.se
	Stockholm	SEW-EURODRIVE AB Björkholmsvägen 10 141 46 Huddinge	Tel. +46 8 449 86 80 Fax +46 8 449 86 93 stockholm@sew.se
	Malmö	SEW-EURODRIVE AB Borrgatan 5 211 24 Malmö	Tel. +46 40 680 64 80 Fax +46 40 680 64 93 malmo@sew.se
	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

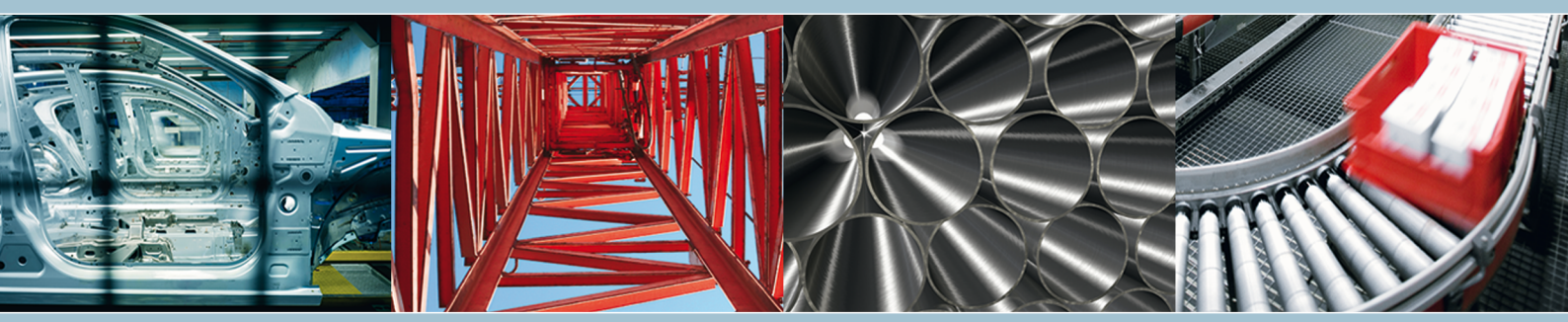
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Tanzania			
Sales	Daressalam	SEW-EURODRIVE PTY LIMITED TANZANIA Plot 52, Regent Estate PO Box 106274 Dar Es Salaam	Tel. +255 0 22 277 5780 Fax +255 0 22 277 5788 http://www.sew-eurodrive.co.tz info@sew.co.tz
Thailand			
Assembly Sales Service	Chonburi	SEW-EURODRIVE (Thailand) Ltd. 700/456, Moo.7, Donhuaroh Muang Chonburi 20000	Tel. +66 38 454281 Fax +66 38 454288 sewthailand@sew-eurodrive.com
Technical Offices	Bangkok	SEW-EURODRIVE (Thailand) Ltd. 6th floor, TPS Building 1023, Phattanakarn Road Suanluang Bangkok,10250	Tel. +66 2 7178149 Fax +66 2 7178152 sewthailand@sew-eurodrive.com
	Hat Yai	SEW-EURODRIVE (Thailand) Ltd. Hadyai Country Home Condominium 59/101 Soi.17/1 Rachas-Utid Road. Hadyai, Songkhla 90110	Tel. +66 74 359441 Fax +66 74 359442 sewthailand@sew-eurodrive.com
	Khon Kaen	SEW-EURODRIVE (Thailand) Ltd. 4th Floor, Kaow-U-HA MOTOR Bldg, 359/2, Mitraphab Road. Muang District Khonkaen 40000	Tel. +66 43 225745 Fax +66 43 324871 sewthailand@sew-eurodrive.com
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-EURODRİVE Hareket Sistemleri San. Ve TIC. Ltd. Sti 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	Adana	SEW-EURODRİVE Hareket	Tel. +90 533 491 81 77 / +90 542 660 34 89 Fax +90 262 999 10 09
	Ankara	SEW-EURODRİVE Hareket Sistemleri San. Ve TIC. Ltd. Sti 1368.Cadde Eminel İşmerkezi No: 18/68 İvogsan / Ankara	Tel. +90 312 385 33 90 Fax +90 312 385 32 58
	Bursa	SEW-EURODRİVE Hareket Sistemleri San. Ve TIC. Ltd. Sti Üçevler Mah. Bayraktepe Sok. Akay İş Merkezi Kat:3 No: 7/6 Nilüfer / Bursa	Tel. +90 224 443 45 60 Fax +90 224 443 45 58
	Istanbul	SEW-EURODRİVE Hareket Sistemleri San. Ve TIC. Ltd. Sti Tekstilkent Ticaret Merkezi B-13 Blok No:70 Esenler / İstanbul	Tel. +90 262 9991000 04 Fax +90 262 9991009
	Izmir	SEW-EURODRİVE Hareket IAOSB Küçük Parseller Grubu Sosyal Tesis merkezi merkezi 10030 sokak No: 16 / 110 Kara Hasan Atlı İş Merkezi Kat :6 Çigli / İzmir	Tel. +90 232 469 62 64 Fax +90 232 433 61 05
United Arab Emirates			
Sales Service	Dubai	SEW-EURODRIVE FZE PO Box 263835 Office No. S3A1SR03 Jebel Ali Free Zone – South, Dubai, United Arab Emirates	Tel. +971 (0)4 8806461 Fax +971 (0)4 8806464 http://www.sew-eurodrive.ae info@sew-eurodrive.ae

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Ukraine			
Assembly Sales Service	Dnipropetrovsk	ООО «СЕВ-Евродрайв» ул. Рабочая, 23-В, офис 409 49008 Днепр	Tel. +380 56 370 3211 Fax +380 56 372 2078 http://www.sew-eurodrive.ua sew@sew-eurodrive.ua
Sales	Kiev	ООО «СЕВ-Евродрайв» ул. С.Олейника, 21 02068 Киев	Tel. +380 44 503 95 77 Fax +380 44 503 95 78 kso@sew-eurodrive.ua
	Ivano-Frankivsk	ООО «СЕВ-Евродрайв» ул. Независимости, 4, оф.303 76000 Ивано-Франковск	Tel. +380 342 725 190 Fax +380 342 725 191 ifso@sew-eurodrive.ua
Uruguay			
Assembly Sales	Montevideo	SEW-EURODRIVE Uruguay, S. A. Jose Serrato 3569 Esqina Corumbe CP 12000 Montevideo	Tel. +598 2 21181-89 Fax +598 2 21181-90 sewuy@sew-eurodrive.com.uy
USA			
Production Assembly Sales Service	Southeast Region	SEW-EURODRIVE INC. 1295 Old Spartanburg Highway P.O. Box 518 Lyman, S.C. 29365	Tel. +1 864 439-7537 Fax Sales +1 864 439-7830 Fax Production +1 864 439-9948 Fax Assembly +1 864 439-0566 Fax Confidential/HR +1 864 949-5557 http://www.seweurodrive.com cslyman@seweurodrive.com
Assembly Sales Service	Northeast Region	SEW-EURODRIVE INC. Pureland Ind. Complex 2107 High Hill Road, P.O. Box 481 Bridgeport, New Jersey 08014	Tel. +1 856 467-2277 Fax +1 856 845-3179 csbridgeport@seweurodrive.com
	Midwest Region	SEW-EURODRIVE INC. 2001 West Main Street Troy, Ohio 45373	Tel. +1 937 335-0036 Fax +1 937 332-0038 cstroy@seweurodrive.com
	Southwest Region	SEW-EURODRIVE INC. 3950 Platinum Way Dallas, Texas 75237	Tel. +1 214 330-4824 Fax +1 214 330-4724 csdallas@seweurodrive.com
	Western Region	SEW-EURODRIVE INC. 30599 San Antonio St. Hayward, CA 94544	Tel. +1 510 487-3560 Fax +1 510 487-6433 cshayward@seweurodrive.com
	Wellford	SEW-EURODRIVE INC. 148/150 Finch Rd. Wellford, S.C. 29385	Tel. +1 864 439-7537 Fax +1 864 661 1167 IGOrders@seweurodrive.com
	Additional addresses for service provided on request!		
Vietnam			
Sales	Ho Chi Minh City	Nam Trung Co., Ltd Huế - South Vietnam / Construction Materials 250 Binh Duong Avenue, Thu Dau Mot Town, Binh Duong Province HCM office: 91 Tran Minh Quyen Street District 10, Ho Chi Minh City	Tel. +84 8 8301026 Fax +84 8 8392223 khanh-nguyen@namtrung.com.vn http://www.namtrung.com.vn
	Hanoi	MICO LTD Quảng Trị - North Vietnam / All sectors except Construction Materials 8th Floor, Ocean Park Building, 01 Dao Duy Anh St, Ha Noi, Viet Nam	Tel. +84 4 39386666 Fax +84 4 3938 6888 nam_ph@micogroup.com.vn http://www.micogroup.com.vn

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