



SEW
EURODRIVE

Catalog



Industrial Gear Units

Planetary Gear Unit Series XP130 - XP250

Torque Range from 600 to 5200 kNm



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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 reliability for both functionality and investment.

We are represented in the most important branches of industry all over the world: with 14 manufacturing plants and 79 Drive Technology Centers worldwide as well as our customer support, which we consider an integrative service that continues our commitment to outstanding quality.

1.1.2 Always the right drive

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

The modular DR.. motor series includes the energy-efficient motor types IE1 to IE4 and was designed and constructed with all worldwide requirements for energy efficiency classes in mind. The DR.. motor easily meets the requirements for approval and certification in all relevant countries. The energy-efficient drives achieve the highest efficiency in combination with SEW-EURODRIVE gear units.

The gearmotors are electronically enhanced by MOVITRAC® frequency inverters, MOVIDRIVE® drive inverters, and MOVIAxis® multi-axis servo inverters – a combination that blends perfectly with the existing SEW-EURODRIVE program. As is the case with the mechanical systems, all development, production, and assembly is carried out entirely by SEW-EURODRIVE. In combination with our drive electronics, these drives provide the utmost in flexibility.

Products of the servo drive system, such as low backlash servo gear units, compact servomotors, or MOVIAxis® multi-axis servo inverters ensure precision and dynamics. From single-axis or multi-axis applications to synchronized process sequences, servo drive systems from SEW-EURODRIVE enable flexible and customized implementation of your applications.

For economical, decentralized installations, SEW-EURODRIVE offers components from its decentralized drive system, such as MOVIMOT®, the gearmotor with integrated frequency inverter, or MOVI-SWITCH®, the gearmotor with integrated switching and protection function. SEW-EURODRIVE has developed hybrid cables to provide cost-effective functional solutions, irrespective of the system philosophy or scope. The latest developments from SEW-EURODRIVE: 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.

Power, quality, and robustness combined in a single standard product: with SEW-EURODRIVE, powerful movements are delivered by industrial gear units with high torques. The modular concept once again ensures optimum adaptation of industrial gear units to meet a wide range of different applications.

1.1.3 Your ideal partner

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

1.2 Products and systems from SEW-EURODRIVE

The products and systems of SEW-EURODRIVE are divided into four product groups:

- Industrial gear units
- Gearmotors and frequency inverters
- Servo drive systems
- Decentralized drive systems
- VARIOLUTION® and MAXOLUTION®

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

Industrial gear units

- Planetary gear unit series XP130 – XP250
- Planetary gear unit series P.002 – P.102
- X, MC, ML helical and bevel-helical gear units
- P.MC., P.X.. series helical and bevel-helical planetary gear units
- Application solutions with connections
 - Swing base
 - Gearmotor
 - Motor
 - Coupling
 - Brake
 - Lubrication system

For conveyor drives, bucket conveyors, agitators, cooling towers, crane systems, and much more.

Gearmotors and frequency inverters		
Gear units / gearmotors	Motors	Frequency inverters
<ul style="list-style-type: none"> Helical gear units / helical gearmotors Parallel-shaft helical gear units / parallel-shaft helical gearmotors Helical-bevel gear units / helical-bevel gearmotors Helical-worm gear units and gearmotors SPIROPLAN® right-angle gearmotors Drives for electrified monorail systems Geared torque motors Pole-changing gearmotors Variable-speed gear units / variable-speed gearmotors Aseptic gearmotors Explosion-proof gear units / gearmotors Explosion-proof variable-speed gear units / variable-speed gearmotors 	<ul style="list-style-type: none"> Asynchronous AC motors / AC brakemotors Pole-changing AC motors / AC brakemotors Energy-efficient motors Explosion-proof AC motors / AC brakemotors Torque motors Single-phase motors / single-phase brakemotors Asynchronous linear motors 	<ul style="list-style-type: none"> MOVITRAC® frequency inverters MOVI4R-U® frequency inverters MOVIDRIVE® drive inverters Control, technology, and communication options for inverters

Servo drive systems		
Servo gear units and gearmotors	Servomotors	Servo drive inverters / servo inverters
<ul style="list-style-type: none"> Low backlash planetary servo gear units / planetary gearmotors Low backlash helical-bevel servo gear units / helical-bevel gearmotors R, F, K, S, W gear units / gearmotors Explosion-proof servo gear units / servo gearmotors 	<ul style="list-style-type: none"> Asynchronous servomotors / servo brakemotors Synchronous servomotors Explosion-proof servomotors / servo brakemotors Synchronous linear motors 	<ul style="list-style-type: none"> MOVIDRIVE® servo drive inverters MOVIAXIS® multi-axis servo inverters Control, technology, and communication options for servo drive inverters and servo inverters

Decentralized drive systems		
Decentralized drives	Communication and installation	Contactless energy transfer
<ul style="list-style-type: none"> • DRC.. electronic motors / MOVIGEAR® mechatronic drive system <ul style="list-style-type: none"> – DBC – Direct Binary Communication – DAC – Direct AS-Interface Communication – DSC – Direct SBus Communication – SNI – Single Line Network Installation • MOVIMOT® gearmotors with integrated frequency inverter • MOVIMOT® motors / brakemotors with integrated frequency inverter • MOVI-SWITCH® gearmotors with integrated switching and protection function • MOVI-SWITCH® motors / brakemotors with integrated switching and protection function • Explosion-proof MOVIMOT® and MOVI-SWITCH® gearmotors 	<ul style="list-style-type: none"> • Fieldbus interfaces • Field distributors for decentralized installation • MOVIFIT® product line <ul style="list-style-type: none"> – MOVIFIT® FDC for controlling MOVIGEAR® and DRC.. drive units – MOVIFIT® MC for controlling MOVIMOT® drives – MOVIFIT® SC with integrated electronic motor switch – MOVIFIT® FC with integrated frequency inverter • MOVIPRO® product line <ul style="list-style-type: none"> – MOVIPRO® SDC decentralized drive and positioning control 	<ul style="list-style-type: none"> • MOVITRANS® system <ul style="list-style-type: none"> – Stationary components for energy supply – Mobile components for energy consumption – Line cables and installation material

VARIOLUTION® and MAXOLUTION®
<ul style="list-style-type: none"> • VARIOLUTION® packages for high technical solution expertise in plants and machines • MAXOLUTION® systems for customer-specific system solutions and plants

Products and systems covering several product groups
<ul style="list-style-type: none"> • Operator terminals • MOVI-PLC® drive-based control system • Components of the type "functional safety" • Diagnostic units

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

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

Visit our website at

www.sew-eurodrive.com

The website provides comprehensive information and services.

1

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

Copyright © 2015 – All rights reserved.

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

2 Product description and overview of types

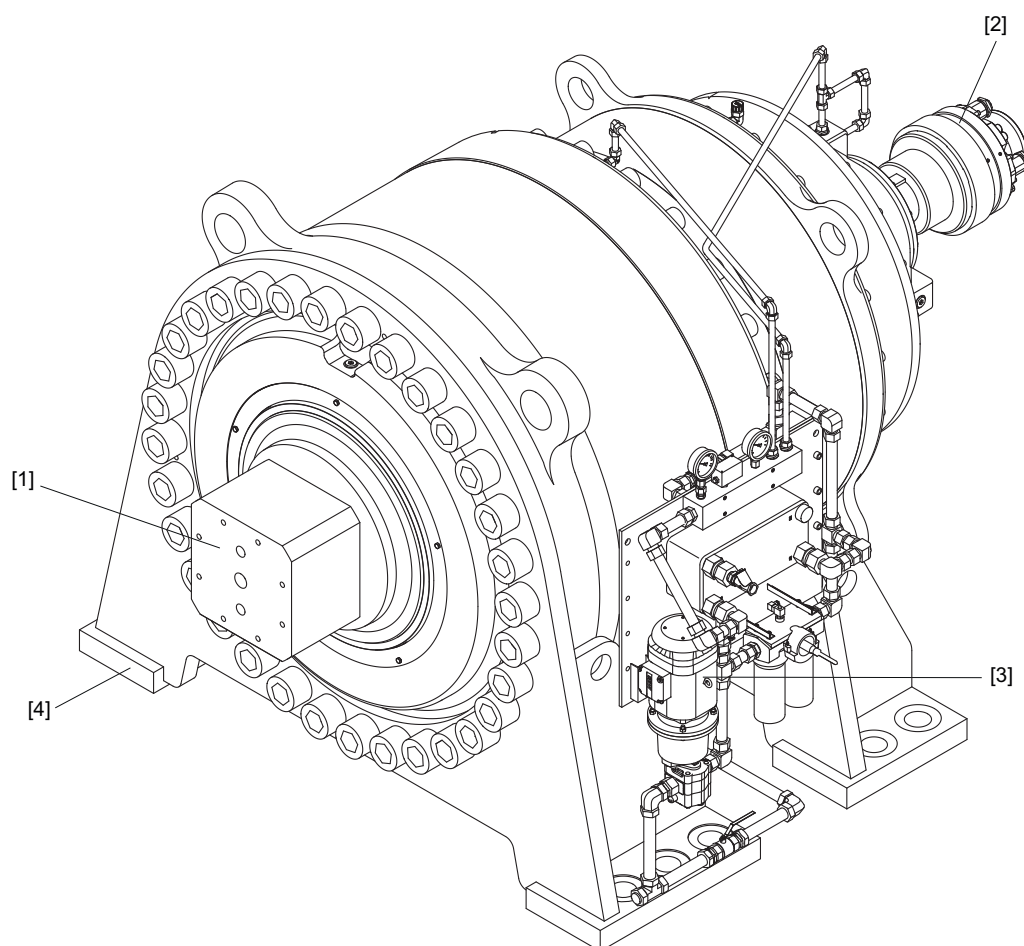
The planetary gear units series comprises 13 sizes with a nominal torque from 600 kNm to 5200 kNm.

The load distribution to several planet wheels results in a significantly higher power density and consequently in smaller dimensions compared to helical and bevel-helical gear units.

Planetary gear units can be mounted with:

- Square output shaft or hollow output shaft with shrink disk, and others
- Foot base or torque arm
- Cooling system
- Cardan shaft
- Safety coupling

The following figure shows a sample combination of a planetary gear unit, with square output shaft, a safety coupling, lubrication unit, and foot base.



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[1] Square output shaft
[2] Safety coupling

[3] Cooling system with pressure lubrication
[4] Foot base

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2.1 Design features

Planetary gear units

- Can transmit a high torque
- Are very compact
- Offer a high degree of torsional rigidity

2.2 Your benefits at a glance

- Short, compact design with high degree of operational reliability.
- Standardized units, which means excellent price/performance ratio and short delivery times

2.3 Application areas

Planetary gear units are mainly used in applications where low output speeds and high torques are required.

For example:

- For mining industry
- For sugar industry
- For drying processes in the construction materials industry
- For filling processes in the cement industry
- For slow-running material processing systems, e.g. mixers, rotary filters
- For all branches of industry with similar requirements
- In the food industry
- And many other more areas

2.4 General information

2.4.1 Important information

- The illustrations in the catalog are examples and are not binding.
- The specified lubricant quantities are guide values only. Use the marks on the oil dipstick or oil level glass to determine the oil level.
- On delivery, the planetary gear units are ready for operation, but not filled with oil. However, it is possible to have the gear units delivered filled with oil.
- Oil viscosity and grade must comply with those specified on the nameplate.
- The weights shown are non-binding average values.
- The buyer must provide protection against unintentional contact with moving parts. The applicable safety regulations of the country in which the unit will be used are to be followed.

2.4.2 Power and torque

The power and torque values listed in the catalog apply to standard design and standard lubrication of the planetary gear unit under normal environmental conditions.

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

2.4.3 Speeds

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

2.4.4 Noise

The noise levels of all planetary gear units are well within the maximum permitted noise levels set forth in ISO 8579-1 for gear units and EN 60034 for motors.

2.4.5 Painting

Planetary gear units are painted in "blue grey" / RAL 7031 as per DIN 1843 as standard. Special paints are available on request.

2.4.6 Weight information

Please note that all weights shown in the catalog exclude the oil fill because the lubricant fill quantity depends on the mounting position.

2.4.7 Accessibility

The planetary gear units must be mounted on the driven machine in such a way that there is enough space for both axially and radially maintenance.

2.5 Sizes and torque ratings

Following nominal torques are valid for maximum input speeds:

$n_1 \leq 1\,800$ rpm and $n_2 \leq 10$ rpm

Other operating conditions on request.

2

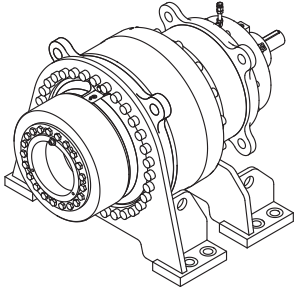
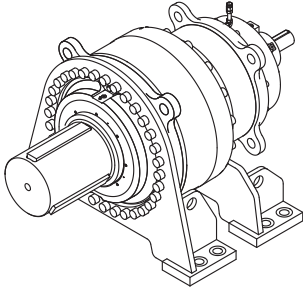
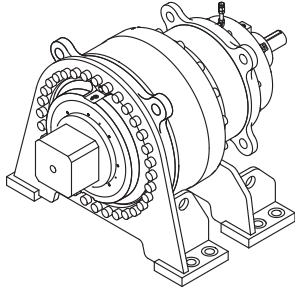
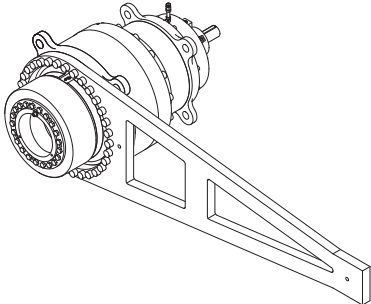
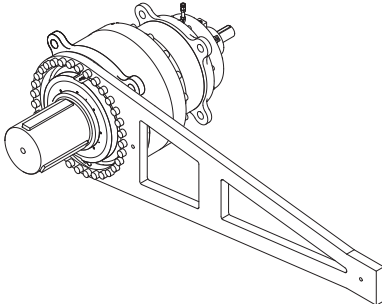
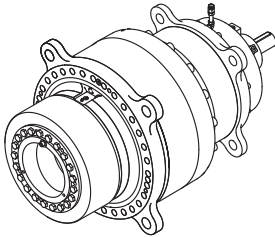
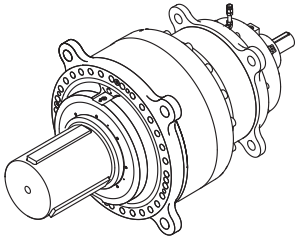
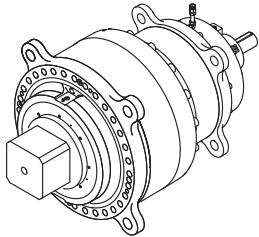
Size	n_1 (max) [rpm]	n_2 [rpm] 10 M_{N2} [kNm]
XP130	1800	600
XP140		730
XP150		900
XP160		1 100
XP170		1 350
XP180		1 600
XP190		1 900
XP200		2 300
XP210		2 850
XP220		3 300
XP230		4 000
XP240		4 600
XP250		5 200

For speed n_2 above 10 rpm, please contact us.

2 Product description and overview of types

Basic design variants of planetary gear units

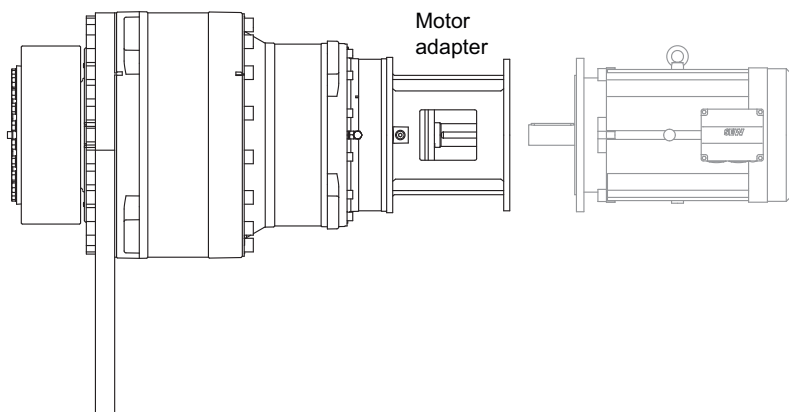
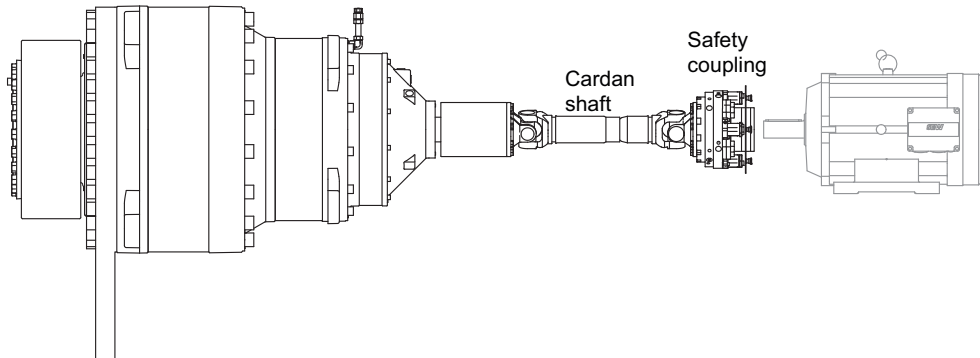
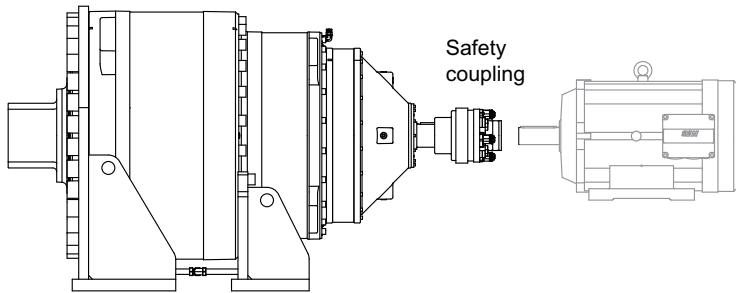
2.6 Basic design variants of planetary gear units

	Hollow shaft with shrink disk	Solid shaft	Square solid shaft
Foot base	XP.H.../B  12502953099	XP.S.../B  12502956683	XP.C.../B  12502960267
Torque arm	XP.H.../T  12503430027	XP.S.../T  12503433611	not available
Flange	XP.H.../F  12822184459	XP.S.../F  12822180875	XP.C.../F  12822177291

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2.6.1 Components on the input side

2

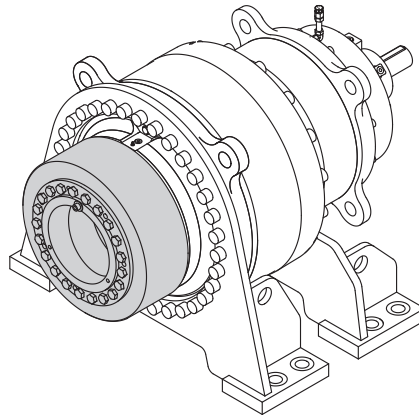


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2.6.2 Output shaft variants

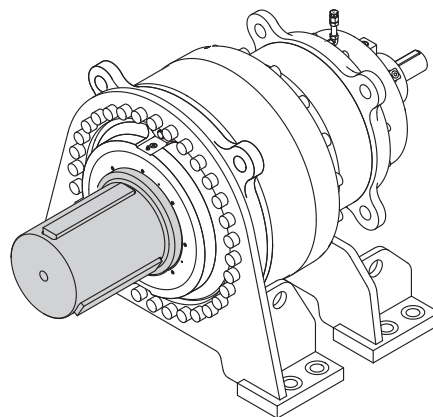
The output shaft [LSS] of the planetary gear unit can have the following design standards. Other options are available on request.

Hollow shaft with shrink disk



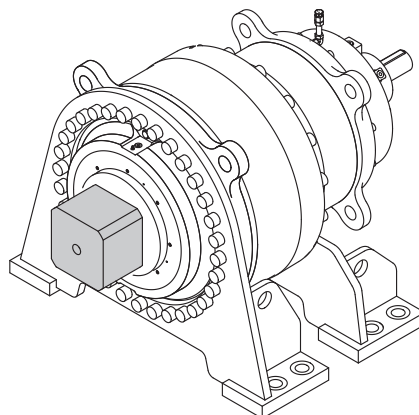
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Solid shaft with key



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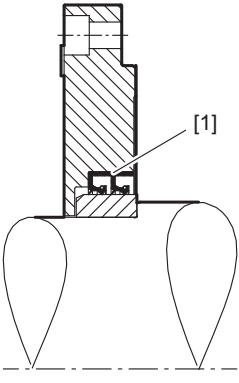
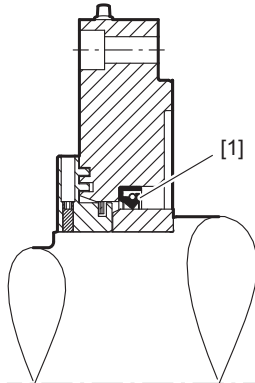
Square solid shaft



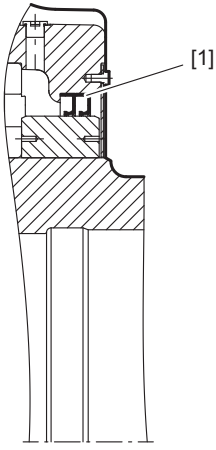
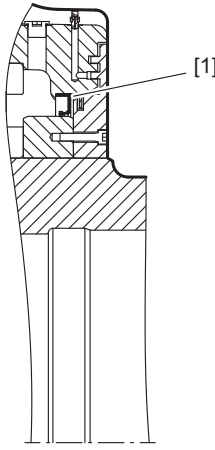
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2.6.3 Overview of sealing systems

Input shaft

Standard	Radial labyrinth seal (Taconite) re-greasable
Double oil seal [1] with dust protection lip and oil sleeve	Single oil [1] seal with radial labyrinth seal and oil sleeve
Normal enviroment	Very high dust load with abrasive parti-cles
 13131821835	 13131953163

Output shaft

Standard	Radial labyrinth seal (Taconite) re-greasable
Double oil seal [1] with dust protection lip and oil sleeve	Single oil seal [1] with radial labyrinth seal and oil sleeve
Normal enviroment	Very high dust load with abrasive parti-cles
 13131957131	 13131960459

2.7 Type designations for planetary gear units and options

Designation	
XP.S.../B	Solid shaft, foot-mounted
XP.H.../B	Hollow shaft with shrink disk, foot-mounted
XP.C.../B	Square solid shaft, foot-mounted
XP.S.../T	Solid shaft, torque arm-mounted
XP.H.../T	Hollow shaft with shrink disk, torque arm-mounted
XP.S.../F	Solid shaft, flange mounted
XP.H.../F	Hollow shaft with shrink disk, flange mounted
XP.C.../F	Square solid shaft, flange mounted

2.8 Type designation

The type designation of planetary gear units starts from the component on the output end.

Example: Type designation for a planetary gear unit with 3 stages, hollow output shaft with shrink disk, mounted by torque arm, and size 160.

XP3H160/T	
XP	XP series
3	Number of stages <ul style="list-style-type: none"> • 1 = 1 stage • 2 = 2 stages • 3 = 3 stages • 4 = 4 stages
H	Output shaft (LSS) <ul style="list-style-type: none"> • H = Hollow shaft with shrink disk • S = Solid shaft with key • C = Square solid shaft
160	Size <ul style="list-style-type: none"> • 130 to 250
/T	Mounting: <ul style="list-style-type: none"> • F = Flange • B = Foot base • T = Torque arm

2.9 Nameplate

The following example shows the layout of the nameplate.

2

○ **SEW-EURODRIVE** Indaiatuba/Brasil ○

Tipo/Type [1] [2]

Nr. [3]

	norm.	min.	max.	i	1:
Pk1 [kW]	[4]	[5]	[6]	Fs	[16]
Mk2 [Nm]	[7]	[8]	[9]	FR1 [N]	[17]
n1 [1/min]	[10]	[11]	[12]	FR2 [N]	[18]
n2 [1/min]	[13]	[14]	[15]	FA1 [N]	[19]
Acionar conforme manual				FA2 [N]	[20]
Operation instructions have to be observed				Mass [kg]	[21]
[22]					[23]
Qty of greasing points [24]	Fans [25]	[26]	[27]		
[28]	Year			[29]	
○ [30] ○					

12512268427

[1]	Planetary gear unit type	[16]	Exact gear unit reduction ratio
[2]	(empty)	[17]	Service factor
[3]	Sales order number	[18]	Radial force, input side
[4]	Operating power on the input shaft	[19]	Radial force, output side
[5]	Operating power on the input shaft	[20]	Axial force, input side
[6]	Operating power on the input shaft	[21]	Axial force, output side
[7]	Gear unit output torque	[22]	Made in Brazil
[8]	Gear unit output torque	[23]	Weight of the gear unit
[9]	Gear unit output torque	[24]	Number of greasing points
[10]	Input speed	[25]	Number of installed fans
[11]	Input speed	[26]	(empty)
[12]	Input speed	[27]	Mounting position
[13]	Output speed	[28]	Type of lubricant, oil volume
[14]	Output speed	[29]	Year of manufacture
[15]	Output speed	[39]	Number of special construction and note

2.10 Corrosion and surface protection

2.10.1 General information

SEW-EURODRIVE offers various optional protective measures for operation of motors and gearmotors and industrial gear units under special ambient conditions.

The protective measures comprise two groups:

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

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

2.10.2 KS corrosion protection

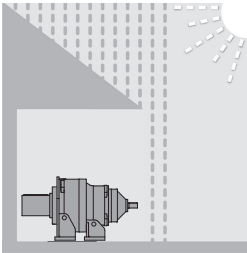
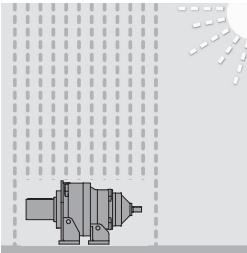
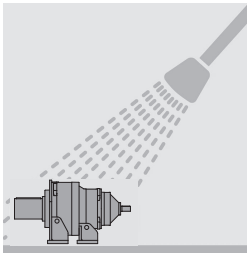
KS corrosion protection for motors comprises the following measures:

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

A sticker labeled "KORROSIONSSCHUTZ" (corrosion protection) on the fan guard indicates special treatment has been applied. Motors with a forced cooling fan and motors with a spread shaft encoder (ES..) cannot be supplied with KS corrosion protection.

2.11 Coating and surface protection systems

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
Use as surface protection with typical environmental conditions Corrosion categories DIN EN ISO 12944-2	 13108195851	 13108199179	 13108202507
	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	<ul style="list-style-type: none"> • Systems in saw mills • Agitators and mixers 	<ul style="list-style-type: none"> • Applications in gravel plants • Cable cars 	<ul style="list-style-type: none"> • 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

INFORMATION



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

2.12 Storage and transport conditions

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

2.12.1 Internal conservation

Standard corrosion protection

After the test run, the test oil fill is drained out of the gear unit. The remaining oil film protects the gear unit against corrosion for a limited period of time. If specified in the order, the gear unit can be delivered with oil. Refer to the order documents for more information.

Long-term corrosion protection

After the test run, the test oil fill 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.

Corrosion protection with VCI anti-corrosion agent is not permitted for gear units that are operated with food grade lubricants. Contact SEW-EURODRIVE in such cases.

2.12.2 External corrosion protection

The following measures are taken for exterior corrosion protection:

- Anti-corrosion agent is applied to bare, non-painted functional surfaces of shafts, flanges, mounting and foot surfaces of the housing. Remove it only using an appropriate solvent that is not harmful to the oil seal.
- Small parts and loose pieces, such as bolts, nuts, etc., are packed in plastic (VCI) corrosion protection bags.
- Threaded holes and blind holes are covered by plastic plugs.
- 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 in which the protective coating and/or painting has been damaged may have to be repainted.

2.12.3 Packaging

Standard packaging

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

Application: Land transport

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 long-term storage

2.12.4 Storage conditions

**NOTICE**

Improper storage may result in damages to the gear unit.

Possible damage to property.

- 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 rotation every 6 months so that the position of the rolling elements in the bearings of the input and output shafts changes.

INFORMATION

The gear units are delivered without oil as standard; 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 ($5\text{ °C} < \vartheta < 60\text{ °C}$, $< 50\%$ 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 ($5\text{ °C} < \vartheta < 60\text{ °C}$, $< 50\%$ relative humidity). No sudden temperature fluctuations. Controlled ventilation of the storage location 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.

2.13 Sealing system

2.13.1 Standard

For the planetary gear unit, radial oil seals according to DIN 3770 of type AS (dust lip) are used as standard.

2.13.2 Option

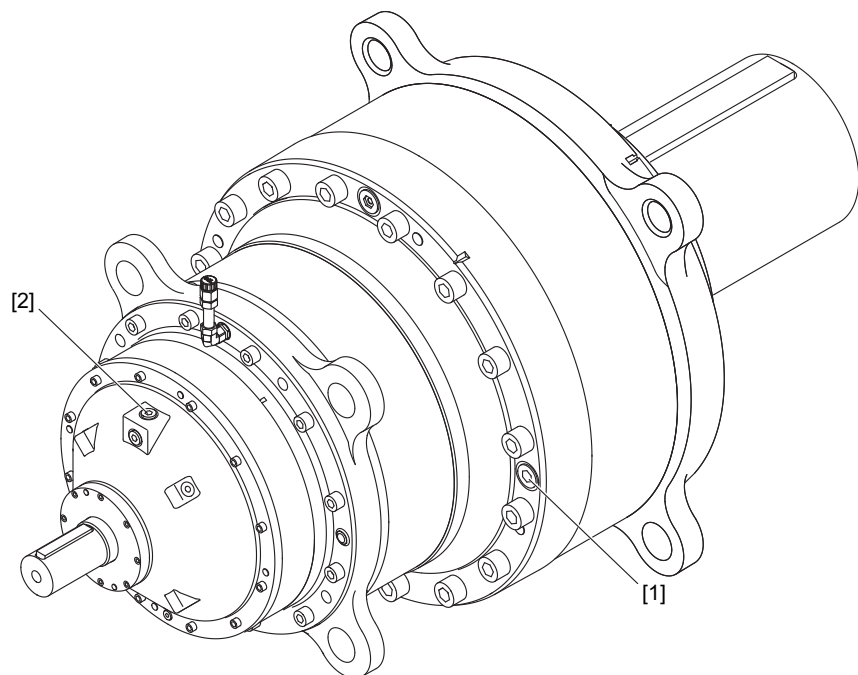
If high demands are placed on the sealing system, e.g. in case of high dust loads with abrasive particles at the place of operation, a labyrinth seal is used to protect the radial oil seal. In this sealing variant, only one radial oil seal is used irrespective of the mounting position. The grease-filled labyrinth protects the oil seal from dirt.

2.14 Lubrication concept

Depending on the mounting position of the planetary gear unit, different lubrication variants are possible.

In horizontal mounting position the gear unit is half filled with oil. Gearing and bearing parts that are not immersed in oil are lubricated by splashing oil. The oil level is checked at the oil sight glass [1] on the intermediate flange. Oil is filled in via the plug [2].

Other lubrication variants are available on request.



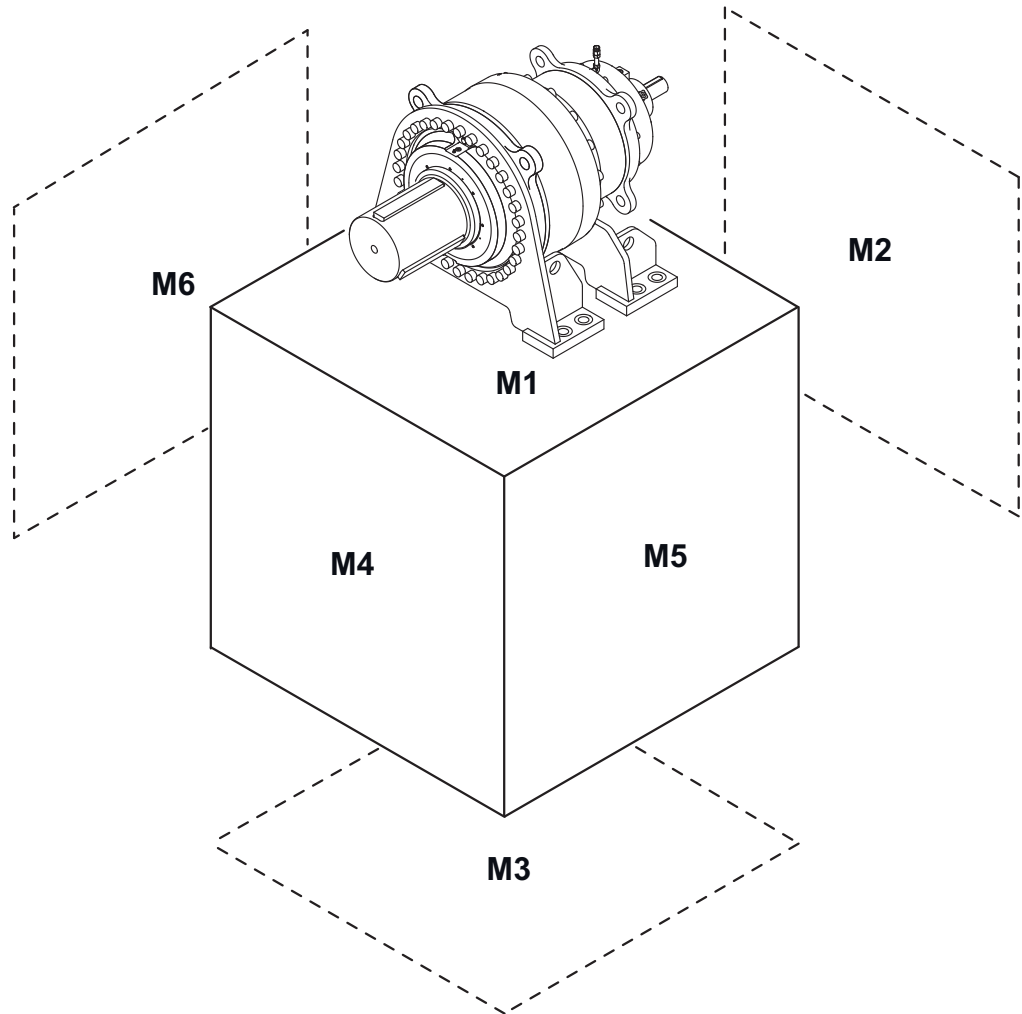
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3 Mounting positions

The mounting position defines the orientation of the gear unit housing and is designated **M1**. The mounting positions apply to planetary gear units with solid shaft and hollow shaft.

For mounting in other positions, contact SEW-EURODRIVE.



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4 Options

4.1 Torque arm

The torque arm can be mounted according to customer requirements.

The retaining screws are included in the delivery.

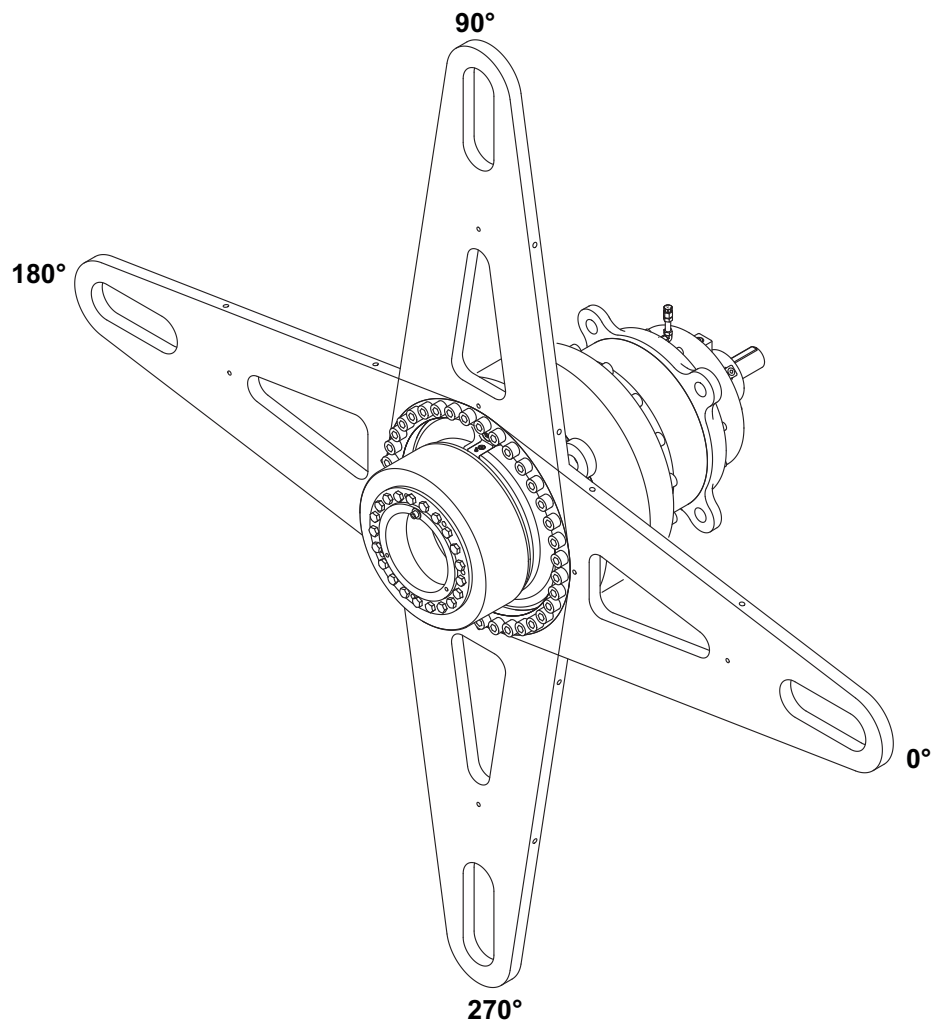
The position of the torque arm is determined as looking onto the output shaft (mounting position 0°, 90°, 180°, 270°).

INFORMATION



Different mounting positions are possible depending on the angle division (number of retaining screws).

The following figure shows a sample mounting position and combination of a planetary gear unit and a torque arm.



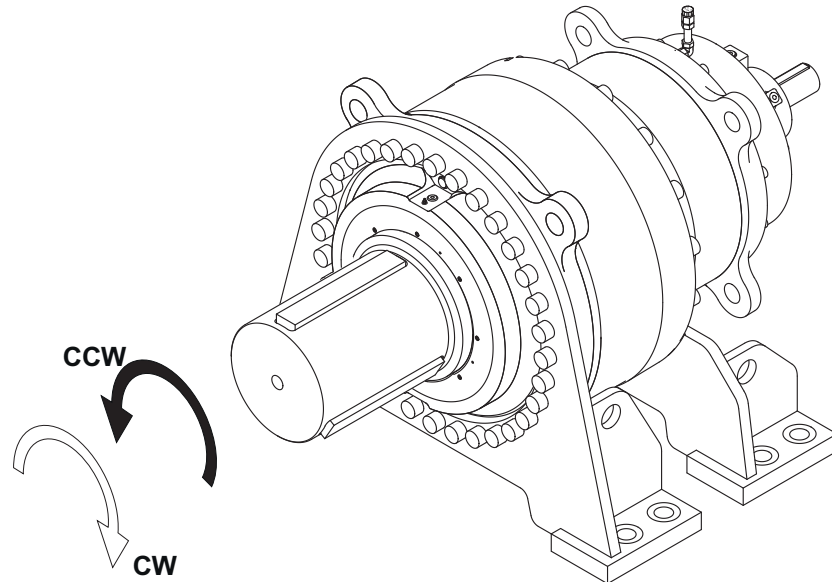
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4.2 Backstop

It is necessary to specify the required direction of rotation of the output shaft. The direction of rotation is specified as viewed onto the output shaft.

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CW Rotating clockwise
CCW Rotating counterclockwise

5 Project planning for drives

5.1 Selecting the application factors

5.1.1 Service factor FS

Field of application	Type of application (driven machine)	Application-specific service factor FS min Operating period / day		
		< 3 h	3-10 h	> 10 h
Sugarcane mill	Grinders	-	-	2.00
	Conveyor belts	1.15	1.30	1.50
	Crystallizers	-	1.50	1.80
	45° tables	-	1.40	1.50
	Shredders	-	-	2.00
	Choppers	-	-	2.00
Waste water treatment	Impeller aerators	-	1.80	2.00
	Thickeners	1.15	1.25	1.50
	Vacuum filters	1.15	1.30	1.50
	Collectors	1.15	1.25	1.50
	Screw pumps	-	1.30	1.50
	Brush aerators	-	-	2.00
Mining	Crushers	1.55	1.75	2.00
	Screens and shakers	1.55	1.75	2.00
	Slewing drives	-	1.55	1.80
	Bucket wheel excavators	1)	1)	1)
Energy sector	Frequency inverters	-	1.80	2.00
	Water wheels (low speed)	-	-	1.70
	Water turbines	-	-	1)
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)
Rubber and plastic industry	Extruders (plastic)	-	1.40	1.60
	Extruders (rubber)	-	1.50	1.80
	Rubber rollers (2 in a row)	1.55	1.75	2.00
	Rubber rollers (3 in a row)	-	1.50	1.75
	Heated rollers	1.35	1.50	1.75
	Calenders	-	1.65	1.65
	Mills	1.55	1.75	2.00
	Mixing rollers	1)	1)	1)
	Slab rollers	1.55	1.75	2.00
	Refiners	1.55	1.75	2.00
	Tire machines	1)	1)	1)
Timber industry	Timber industry	1)	1)	1)
Cranes	Cranes and hoists	2)	2)	2)
Food industry	Crushers and mills	-	-	1.75
	Beet slicers	-	1.25	1.50
	Drying drums	-	1.25	1.50

Field of application	Type of application (driven machine)	Application-specific service factor FS min Operating period / day		
		< 3 h	3-10 h	> 10 h
Metal production and processing	Winders	-	1.60	1.75
	Cutting rollers	1.55	1.75	2.00
	Table conveyors, individual drives	1)	1)	1)
	Table conveyors, group drives	1)	1)	1)
	Table conveyors, reciprocating	1)	1)	1)
	Wire drawing machines	1.35	1.50	1.75
	Rollers	1)	1)	1)
Mills and drums	Cooling and drying drums	-	1.50	1.60
	Rotary kilns	-	-	2.00
	Ball mills	-	-	2.00
	Coal mills	-	1.50	1.75
Pulp and paper industry	Debarking drums and machines	1.55	1.80	-
	Rollers (pick-up, wire drive, wire suction)	-	1.80	2.00
	Drying cylinders (anti-friction bearings)	-	1.80	2.00
	Calenders (anti-friction bearings)	-	1.80	2.00
	Filters (pressure and vacuum)	-	1.80	2.00
	Beaters and chippers	1.55	1.75	2.00
	Jordan mills	-	1.50	1.75
	Presses (bark, felt, glue, suction)	-	-	1.75
	Reels	-	-	1.75
	Pulpers	1)	1)	1)
	Washer filters	-	-	1.50
	Yankee cylinders (dryers)	1)	1)	1)
Pumps	Centrifugal pumps	1.15	1.35	1.45
	Reciprocating pumps (single-cylinder)	1.35	1.50	1.80
	Reciprocating pumps (multi-cylinder)	1.20	1.40	1.50
	Screw pumps	-	1.25	1.50
	Rotary pumps (gear type, vane)	-	-	1.25
Agitators and mixers	Agitators for liquids	1.00	1.25	1.50
	Agitators for liquids (variable density)	1.20	1.50	1.65
	Agitators for solids (non-uniform material)	1.40	1.60	1.70
	Agitators for solids (uniform material)	-	1.35	1.40
	Concrete mixers	-	1.50	1.50
Cablecars	Material ropeways	-	1.40	1.50
	Aerial tramways		1)	1)
	Surface lifts	1)	1)	1)
	Continuous aerial tramways	1)	1)	1)
	Funicular railways	1)	1)	1)
Fans	Heat exchangers	1.50	1.50	1.50
	Dry cooling towers	-	-	2.00
	Wet cooling towers	2.00	2.00	2.00
	Blowers (axial and radial)	1.50	1.50	1.50
Compressors	Reciprocating compressors	-	1.80	1.90
	Radial compressors	-	1.40	1.50
	Screw-type compressors	-	1.50	1.75

1) Consult SEW-EURODRIVE

2) Please contact SEW-EURODRIVE; dimensioning according to FEM1001

5.1.2 Peak load factor

The peak load factor F_F takes account of the overload capacity of the gearing and the torque-transmitting parts.

Peak load frequency per hour					
1 to 5	6 to 20	21 to 40	41 to 80	81 to 160	> 160
1.0	1.2	1.3	1.5	1.75	2.0

5.1.3 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 depend on the application.

Startup mode	Startup factor – F_{start}
Direct	3.0
Soft start	1.8
Frequency inverter	1.5 to 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

5.2 Calculating the basic data

5.2.1 Calculation of ratio

$$i_{ex} = \frac{n_1}{n_2}$$

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n_1 = input speed (HSS) [rpm]
 n_2 = Output speed (LSS) [rpm]

5.2.2 Determination of operating torque of driven machine

$$M_{K2} = 9,55 \times \frac{P_{K2}}{n_2} \text{ [kNm]}$$

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M_{K2} = Operating torque (LSS) [kNm]
 P_{K2} = Operating power at (LSS) [kW]
 n_2 = Output speed (LSS) [rpm]

5.3 Selecting the nominal motor power

$$P_M \geq P_{K1} = \frac{P_{K2}}{\eta} \text{ [kW]}$$

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P_M = Nominal motor power [kW]
 P_{K1} = Operating power at (HSS) [kW]
 P_{K2} = Operating power at (LSS) [kW]
 η = Efficiency (0.975 for 3 stage XP planetary gear unit)

5.4 Calculating the required nominal gear unit torque – M_{N2}

Constant load direction – constant torque:

$$M_{N2} \geq M_{K2} \times F_{S \min} \text{ [kNm]}$$

M_{N2} = Nominal gear unit torque [kNm]
 M_{K2} = Operating torque on the LSS [kNm]
 $F_{S \min}$ = Application-specific service factor

Reversing load direction – constant torque:

$$M_{N2} \geq M_{K2} \times F_{S \min} \times 1.43 \text{ [kNm]}$$

M_{N2} = Nominal gear unit torque [kNm]
 M_{K2} = Operating torque on the LSS [kNm]
 $F_{S \min}$ = Application-specific service factor

Selection of the gear unit size:

Size	M_{N2} [kNm]
XP130	600
XP140	730
XP150	900
XP160	1100
XP170	1350
XP180	1600
XP190	1900
XP200	2300
XP210	2850
XP220	3300
XP230	4000
XP240	4600
XP250	5200

Following nominal torques are valid for maximum input speeds:

$$n_1 \leq 1800 \text{ [rpm]} \text{ and } n_2 \leq 10 \text{ [rpm]}$$

Other operating conditions on request.

5.5 Checking the peak load conditions $M_{K2 \text{ perm}}$; $M_{K2 \text{ max}}$

Permitted peak output torque $M_{K2 \text{ perm}}$:

Constant load direction

$$M_{K2 \text{ perm}} = \frac{2 \times M_{N2}}{F_F} \text{ [kNm]}$$

$M_{K2 \text{ perm}}$ = Permitted peak output torque [kNm]
 M_{N2} = Nominal gear unit torque [kNm]
 F_F = Peak load factor

Calculate the peak output torque $M_{K2 \text{ max}}$

$$M_{K2 \text{ max}} = \frac{P_M \times 9,55 \times \eta}{n_2} \times F_{\text{start}} \text{ [kNm]}$$

$M_{K2 \text{ max}}$ = Peak output torque [kNm]
 F_{start} = Startup factor
 P_M = Nominal motor power [kW]
 η = Efficiency (0.975 for 3-stage XP planetary gear units)

Check the gear unit selection:

$$M_{K2 \text{ max}} \leq M_{K2 \text{ perm}}$$

$M_{K2 \text{ max}}$ = Peak output torque [kNm]
 $M_{K2 \text{ perm}}$ = Permitted peak output torque [kNm]

5.6 Radial and axial forces

5.6.1 Determining the overhung load

An important factor for determining the resulting overhung load is the type of transmission element mounted to the shaft end. The following transmission element factors f_z must be considered for various transmission elements.

Transmission element	Transmission element factor f_z	Comments
Gears	1.15	< 17 teeth
Sprockets	1.40	< 13 teeth
Sprockets	1.25	< 20 teeth
Narrow V-belt pulleys	1.75	Influence of pre-tensioning
Flat belt pulleys	2.50	Influence of pre-tensioning
Toothed belt pulleys	1.50	Influence of pre-tensioning

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

$$F_R = \frac{M_d \times 2000}{d_o} \times f_z \quad [N]$$

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F_R = Overhung load [N]

M_d = Torque [kNm]

d_o = Mean diameter of the installed transmission element in [mm]

f_z = Transmission element factor

5.6.2 Permitted overhung load

The basis for determining the permitted overhung loads is the computation of the nominal life LH10 of the bearings (ISO 281).

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

5.6.3 Permitted overhung and axial loads on the output

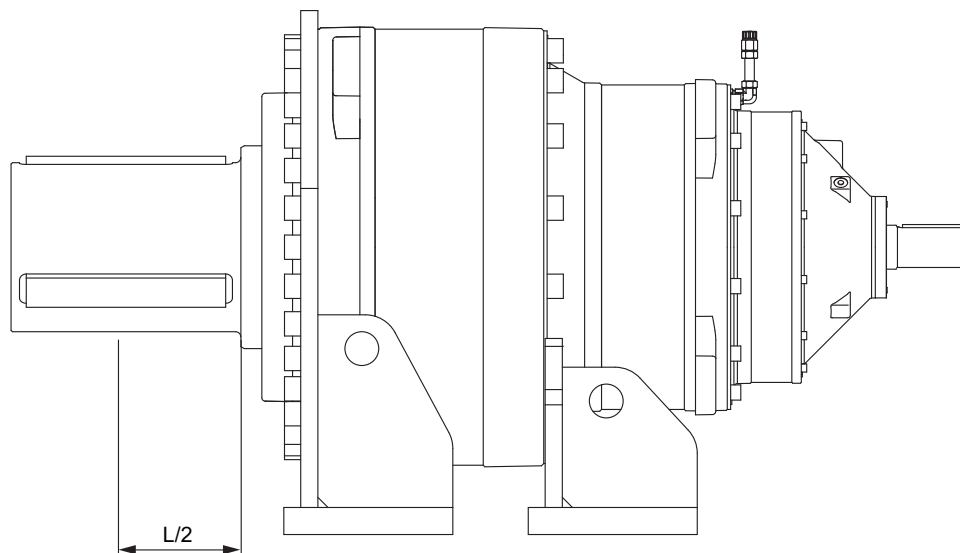
The permitted overhung loads $F_{R \text{ perm}}$ for solid shaft gear units can be calculated accurately. Load values relate to the application of the load in the middle of the shaft end for solid shafts and to the contact end to the gear unit flange for hollow shafts. In planetary gear units, the load application angle and the direction of rotation have no effect on the permitted values, provided no internal gear unit load acts on the output bearings.

Checking the permitted radial load on the output shaft

The desired radial load F_R in the middle of the shaft end is checked in accordance with the table below in order to determine whether it is permitted. The load is permitted if:

$$F_{R\text{ perm}} \geq F_R \text{ [N]}$$

The values apply to force application to the center of the shaft end $L/2$ and to a nominal output speed of $n_2 = 10 \text{ rpm}$.



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Size	130	140	150	160	170	180	190	to	250
$F_{R\text{ perm}} \text{ [N]}$	520 000	615 000	725 000	850 000	1 000 000	1 150 000	by request		

5.7 Checking the thermal rating P_T

The thermal rating P_T of a gear unit is the power that a gear unit can transmit continuously without exceeding a certain oil temperature. The thermal rating 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
- Type of gear unit, size and gear ratio
- Type of gear unit external cooling
- Type of gear unit lubrication
- Kind of lubrication
- Cyclic duration factor

For the following ambient conditions, the thermal rating can be directly read from the selection tables Thermal rating (→ 48):

- Installation in a large hall (air velocity 1.4 m/s)
- Natural cooling
 - Ambient temperature 30 °C
 - Foundation as steel support structure
 - Installation altitude up to 1000 m above sea level
 - Horizontal mounting position (M1)
 - Input speed 750 to 1800 rpm
 - Service factor $F_{S\ min} \leq 2.0$

INFORMATION



It is of fundamental importance that sufficient protection from direct sunlight be provided when installed outdoors. Please contact SEW-EURODRIVE in case of other ambient conditions.

5 Project planning for drives

Checking the thermal rating PT

$$P_T = P_{TH} \times f_1 \times f_T \text{ [kW]}$$

P_T = Thermal rating of the gear unit [kW]
 P_{TH} = Nominal thermal rating of the gear unit [kW]
 f_T = Temperature factor
 f_1 = Altitude factor

Altitude factor f_1

Altitude	Altitude [m above sea level]				
factor f_1	up to 1000	1000 - 2000	2000 - 3000	3000 - 4000	4000 - 5000
	1.00	0.95	0.91	0.87	0.83

Temperature factor
 f_T

Ambient temperature [°C]				
10	20	30	40	50
1.9	1.35	1	0.8	0.45

The thermal rating of the gear unit 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 [kW]
 P_{K1} = Operating power on the HSS [kW]

5.8 Calculation example

Driving machine: Motor with soft starter (10 starts per hour)

Motor power: $P_1 = 2000 \text{ kW}$

Motor speed: $n_1 = 1200 \text{ rpm}$

Operating power at HSS $P_{K1} = 1423 \text{ kW}$

Driven Machine: Grinder

$P_{K2} = 1380 \text{ kW}$

$F_{s \min} = 2.00$ (following table Service factor F_s , page 28)

Output speed: $n_2 = 6 \text{ rpm}$

Ambient condition:

- Ambient temperature: $20 \text{ }^\circ\text{C}$
- Installation altitude: 800 m
- Installation site: Large rooms and halls

5.8.1 Calculation of ratio

$$i_{ex} = \frac{n_1}{n_2} \quad i_{ex} = \frac{1200}{6} \quad i_{ex} = 200$$

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5.8.2 Determination of operating torque of driven machine

$$M_{K2} = \frac{P_{K2} \times 9.55}{n_2} = \frac{1380 \text{ kW} \times 9.55}{6} = 2196.5 \text{ kNm}$$

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M_{K2} = Operating torque (LSS) [kNm]
 P_{K2} = Operating power at (LSS) [kW]
 n_2 = Output speed (LSS) [rpm]

5.8.3 Determination of required nominal gear unit torque

$$M_{N2} \geq M_{K2} \times F_{s \min} = 2196.5 \text{ kNm} \times 2 = 4393 \text{ kNm}$$

M_{N2} = Nominal torque [kNm]
 M_{K2} = Operating torque on the LSS [kNm]
 $F_{s \min}$ = Application-specific service factor

Selected gear unit:

- XP240
- Ratio 205.7 see Gear ratio table (→ 45)
- Nominal gear unit torque 4600 kNm , see data sheet Sizes and torque ratings (→ 13)

5.8.4 Selecting the nominal motor power

$$P_M \geq P_{K1} = \frac{P_{K2}}{\eta} = \frac{1380 \text{ kW}}{0.975} = 1415.4 \text{ kW}$$

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P_M = Nominal motor power [kW]
 P_{K1} = Operating power at (HSS) [kW]
 P_{K2} = Operating power at (LSS) [kW]
 η = Efficiency (0.975 for 3-stage XP planetary gear units)

→ Selected motor with $P_M = 2000 \text{ kW}$ is valid.

5.8.5 Checking the peak load conditions $M_{K2 \text{ perm}} > M_{K2 \text{ max}}$

Permitted peak output torque $M_{K2 \text{ perm}}$

$$M_{K2 \text{ perm}} = \frac{2 \times M_{N2}}{F_F} = \frac{2 \times 4\,600 \text{ kNm}}{1.2} = 7\,667 \text{ kNm}$$

$M_{K2 \text{ perm}}$ = Permitted peak output torque [kNm]
 M_{N2} = Nominal gear unit torque [kNm]
 F_F = Peak load factor

Calculating the output torque $M_{K2 \text{ max}}$

$$M_{K2 \text{ max}} = \frac{P_M \times 9.55 \times \eta}{n_2} \times F_{\text{start}} = \frac{2000 \text{ kW} \times 9.55 \times 0.975}{6 \text{ rpm}} = 5\,886.8 \text{ kNm}$$

$M_{K2 \text{ max}}$ = Peak output torque [kNm]
 F_{start} = Startup factor
 P_M = Nominal motor power [kW]
 η = Efficiency (0.975 for 3-stage XP planetary gear units)

$M_{K2 \text{ perm}} > M_{K2 \text{ max}}$ → selected gear unit size is valid

5.8.6 Checking the thermal rating

$$P_T \geq P_{TH} \times f_1 \times f_T = 1245 \text{ kW} \times 1.00 \times 1.35 = 1680 \text{ kW}$$

$P_{TH} = 1245 \text{ kW}$ see thermal rating table on page (→ 48).

$f_1 = 1.00$ see installation altitude on 800 m on page (→ 35).

$f_T = 1.35$ see ambient temperature for splash lubrication without additional cooling on page (→ 35).

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

$$1680 \text{ kW} > 1415.4 \text{ kW}$$

Thermal rating is sufficient at 20 °C without additional cooling.

6 Lubricants

6.1 Guidelines for lubricant selection

SEW-EURODRIVE delivers the planetary gear units without oil.

INFORMATION



- The oil viscosity and type (mineral/synthetic) that are 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. This lubricant recommendation in chapter "Lubricant table" in no way represents a guarantee as to the quality of the lubricant delivered by each respective supplier. Each lubricant manufacturer is responsible for the quality of its product.
- Ensure that the planetary gear units are filled with the correct oil grade and volume before startup. You can obtain the corresponding information from the gear unit nameplate and the lubricant table on the following pages.
- Do not mix different synthetic lubricants and do not mix synthetic with mineral lubricants.
- Check the compatibility of the used greases and oils.

6.2 Lubricant tables

6.2.1 General information

The permitted lubricants for planetary gear units are:

For output speeds ≤ 2.0 rpm, use mineral oil ISO VG 680 EP

For output speeds > 2.0 rpm, use mineral oil ISO VG 460 E

6.2.2 Permitted lubricants





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).
 - Consult SEW-EURODRIVE if you use bio and food grade lubricants or polyglycol oils.
 - Check the compatibility of the greases and oils used.
 - At least one manufacturer-specific oil type is available for each permitted lubricant variant for planetary gear units delivered with oil.
-

Notes on the lubricant table

The lubricant table shows the permitted lubricants for SEW-EURODRIVE industrial gear units. This information is provided to preselect the lubricant. The proper and final lubricant selection is made by SEW-EURODRIVE to match the specific project. Consider the used abbreviations, meaning of shading and notes.

CLP	= Mineral oil
CLP HC	= Synthetic polyalphaolefin
E	= Ester oil (water hazard classification 1 (German regulation – "WKG)
	= Mineral lubricant
	= Synthetic lubricant
3)	= Lubricants may only be used if service factor $F_s \geq 1.3$
4)	= Take into account critical starting behavior at low ambient temperatures
6)	= Ambient temperature
	= Lubricant for the food industry (food grade oil)
	= Biodegradable oil (lubricant for agriculture, forestry, and water management)

Lubricant table

6)	DIN (ISO)	ISO, NLGI	Mobil®	Shell	bp	KLÜBER LUBRICATION	TEXACO	Castrol	FUCHS	Q8	TOTAL
	CLP CC	VG 320	Mobilgear 600XP 220	Shell Omala F 320	BP Energol GR-XP-320	Klüberoil GEM 1-320 N	Meropa 320	Alpha SP 320 Tribol 1100/320	Reolin CLP 320 Plus Reolin High Gear 320	Goya NT 320	Carter EP 320
3)	CLP CC	VG 150	Mobilgear 600XP 150		BP Energol GR-XP-150	Klüberoil GEM 1-150 N	Meropa 150	Alpha SP 150 Tribol 1100/150	Reolin CLP 150 Plus Reolin High Gear 150	Goya NT 150	
	CLPCC	VG 220	Mobilgear 600XP 220	Shell Omala F 220	BP Energol GR-XP-220	Klüberoil GEM 1-220 N	Meropa 220	Alpha SP 220 Tribol 1100/220	Reolin CLP 220 Plus Reolin High Gear 220	Goya NT 220	Carter EP 220
	CLP CC	VG 460	Mobilgear 600XP 460	Shell Omala F 460	BP Energol GR-XP-460	Klüberoil GEM 1-460 N	Meropa 460	Alpha SP 460 Tribol 1100/460	Reolin CLP 460 Plus Reolin High Gear 460	Goya NT 460	Carter EP 460
	CLP CC	VG 680	Mobilgear 600XP 680		BP Energol GR-XP-680	Klüberoil GEM 1-680 N	Meropa 680	Alpha SP 680 Tribol 1100/680	Reolin CLP 680 Plus Reolin High Gear 680	Goya NT 680	Carter EP 680
	CLP CC	VG 1000						Tribol 1100/1000			
	CLP HC	VG 320	Mobil SHC Gear 320 Mobil SHC 632	Shell Omala S4 GX 320	BP Enersyn EP-XF-320	Klübersynth GEM 4-320 N	Pinnacle EP 320	Alphasyn EP 320	Reolin Unisyn CLP 320 Reolin High Gear Synth 320	El Greco 320	Carter SH 320
3)4)	CLP HC	VG 32	Mobil SHC 624								
3)4)	CLP HC	VG 68	Mobil SHC 626	Shell Omala S4 GX 68	BP Enersyn EP-XF-68	Klübersynth GEM 4-68 N			Reolin Unisyn CLP 68		
	CLP HC	VG 150	Mobil SHC Gear 150 Mobil SHC 628	Shell Omala S4 GX 150	BP Enersyn EP-XF-150	Klübersynth GEM 4-150 N	Pinnacle EP 150	Alphasyn EP 150	Reolin Unisyn CLP 150	El Greco 150	Carter SH 150
	CLP HC	VG 220	Mobil SHC Gear 220 Mobil SHC 630	Shell Omala S4 GX 220	BP Enersyn EP-XF-220	Klübersynth GEM 4-220 N	Pinnacle EP 220	Alphasyn EP 220	Reolin Unisyn CLP 220 Reolin High Gear Synth 220	El Greco 220	Carter SH 220
	CLP HC	VG 460	Mobil SHC Gear 460 Mobil SHC 634	Shell Omala S4 GX 460	BP Enersyn EP-XF-460	Klübersynth GEM 4-460 N	Pinnacle EP 460	Alphasyn EP 460	Reolin Unisyn CLP 460 Reolin High Gear Synth 460	El Greco 460	Carter SH 460
	CLP HC	VG 680	Mobil SHC Gear 680 Mobil SHC 636	Shell Omala S4 GX 680	BP Enersyn EP-XF-680	Klübersynth GEM 4-680 N	Pinnacle EP 680	Alphasyn EP 680	Reolin Unisyn CLP 680	El Greco 680	Carter SH 680
	CLP HC	VG 1000	Mobil SHC Gear 1000 Mobil SHC 639			Klübersynth GEM 4-1000 N					
3)	CLP HC NSF H1	VG 460				Klüberol 4UH1-460 N		Optileb GT 460	Cassida Fluid GL 460		
3)		VG 220				Klüberol 4UH1-220 N		Optileb GT 220	Cassida Fluid GL 220		
3)4)		VG 68				Klüberol 4UH1-68 N		Optileb HY 68	Cassida Fluid GL 68		
	E	VG 460		Shell Naturelle Gear Fluid EP 460		Klüberbio CA2-460			Plantogear 460 S		

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6.2.3 Checking the viscosity when using mineral oil

INFORMATION



If the surface temperature exceeds 100 °C, contact SEW-EURODRIVE.

6.3 Lubricant fill quantity

The specified fill quantities are recommended values. The precise values vary depending on the number of stages and gear ratios.

The mark on the oil sight glass, oil level glass and/or oil dipstick is the decisive indicator for the correct oil level.

INFORMATION



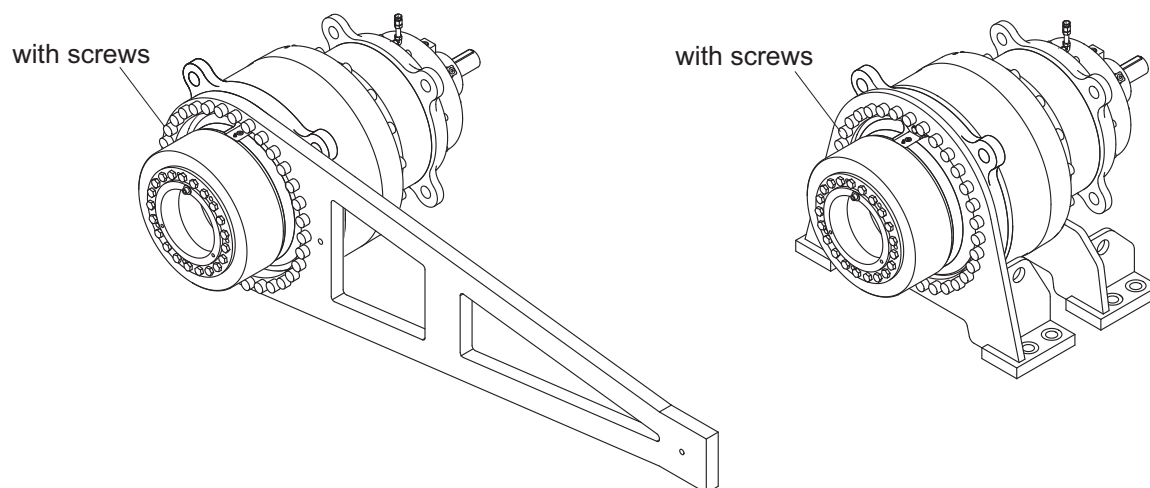
Planetary gear units are supplied without lubricant.

Size	Fill quantity in liters / mounting position M1
XP130	97
XP140	105
XP150	120
XP160	145
XP170	170
XP180	182
XP190	260
XP200	285
XP210	390
XP220	415
XP230	475
XP240	550
XP250	660

7 Design and operating notes

For the following gear unit variants, the screws on the flange side are included in the delivery:

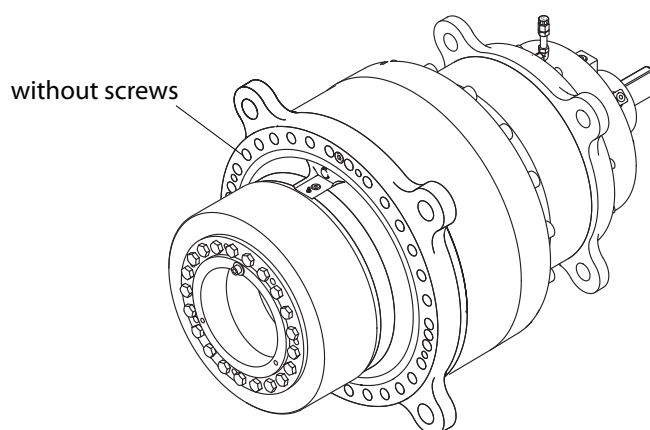
- Foot-mounted gear unit
- Torque arm



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For the following gear unit variants, the screws on the flange side are NOT included in the delivery:

- Flange-mounted gear unit



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8 Gear ratio table

XP Size	Ratio $i_{nom.}$												
	120	130	140	150	160	170	180	200	220	240	260	280	320
	Ratio $i_{ex.}$												
130	123.7	135.9	140.1	153.9	163.0		179.1	199.8	226.3	240.8	263.3	272.7	317.3
140	123.7	135.9	140.1	153.9	163.0		179.1	199.8	226.3	240.8	263.3	272.7	317.3
150	123.7	135.9	140.1	153.9	163.0		179.1	199.8	226.3	240.8	263.3	272.7	317.3
160	123.7	135.9	140.1	153.9	163.0		179.1	199.8	226.3	240.8	263.3	272.7	317.3
170	123.7	135.9	140.1	153.9	163.0		179.1	199.8	226.3	240.8	263.3	272.7	317.3
180	124.5	136.7	141.0	154.8	164.0		180.2	201.1	227.7	242.3	265.0	274.4	319.3
190	123.7	135.9	140.1	153.9	163.0		179.1	199.8	226.3	240.8	263.3	272.7	317.3
200	124.5	136.7	141.0	154.8	164.0		180.2	201.1	227.7	242.3	265.0	274.4	319.3
210	127.4		139.9	144.3	158.5	168.1	184.7	205.7	233.1	247.9	271.5	281.0	327.2
220	128.1		140.8	145.2	159.5	169.2	185.8	207.0	234.6	249.5	273.2	282.7	329.3
230	127.4		139.9	144.3	158.5	168.1	184.7	205.7	233.1	247.9	271.5	281.0	327.2
240	127.4		139.9	144.3	158.5	168.1	184.7	205.7	233.1	247.9	271.5	281.0	327.2
250	127.4		139.9	144.3	158.5	168.1	184.7	205.7	233.1	247.9	271.5	281.0	327.2

9 Power rating data

9.1 Power ratings for motors with a frequency of 50 Hz

i nominal	n1 [rpm]	XP size / power rating [kW]												
		130	140	150	160	170	180	190	200	210	220	230	240	250
120	1500	645	844	1064	1166	1482	1861	2381	2598	3149	4046	4472	4972	6413
	1000	482	618	762	877	1109	1346	1608	1935	2261	2697	3289	3700	4276
	750	381	463	571	698	832	1009	1206	1451	1758	2023	2467	2837	3207
130	1500	604	792	997	1090	1387	1743	2196	2434	3149	4046	4472	4972	6413
	1000	462	562	693	848	1040	1225	1464	1761	2343	2697	3289	3782	4276
	750	347	422	520	636	780	919	1098	1321	1758	2023	2467	2837	3207
140	1500	591	775	977	1069	1359	1705	2130	2382	2950	3682	4187	4654	5839
	1000	449	546	673	822	1009	1189	1420	1709	2133	2455	2994	3443	3892
	750	336	409	505	617	757	891	1065	1281	1600	1841	2246	2582	2919
150	1500	553	725	915	1000	1272	1598	1939	2231	2884	3569	4096	4554	5659
	1000	408	497	612	749	919	1082	1293	1555	2068	2379	2902	3337	3773
	750	306	373	459	561	689	812	970	1167	1551	1784	2177	2503	2829
160	1500	532	703	867	960	1222	1532	1831	2142	2701	3249	3836	4264	5152
	1000	385	469	578	707	867	1021	1221	1468	1882	2166	2642	3038	3434
	750	289	352	434	530	650	766	915	1101	1412	1625	1981	2279	2576
170	1500	532	703	867	960	1222	1532	1831	2142	2570	3064	3681	4093	4859
	1000	385	469	578	707	867	1021	1221	1468	1775	2043	2492	2865	3239
	750	289	352	434	530	650	766	915	1101	1331	1532	1869	2149	2429
180	1500	500	640	790	899	1145	1395	1667	2005	2424	2790	3403	3828	4423
	1000	351	427	526	643	790	930	1111	1337	1616	1860	2268	2609	2949
	750	263	320	395	482	592	697	833	1003	1212	1395	1701	1956	2212
200	1500	448	574	707	825	1030	1250	1493	1796	2176	2504	3054	3436	3970
	1000	314	383	472	576	707	833	996	1198	1451	1669	2036	2342	2647
	750	236	287	354	432	531	625	747	898	1088	1252	1527	1756	1985
220	1500	416	507	625	764	937	1104	1319	1587	1920	2209	2695	3099	3503
	1000	278	338	416	509	625	736	879	1058	1280	1473	1797	2066	2336
	750	208	253	312	382	469	552	659	793	960	1105	1347	1550	1752
240	1500	391	476	587	717	880	1037	1239	1491	1806	2077	2534	2914	3295
	1000	261	317	391	478	587	691	826	994	1204	1385	1690	1943	2196
	750	196	238	293	359	440	519	620	745	903	1039	1267	1457	1647
260	1500	358	435	537	656	805	948	1133	1363	1649	1897	2314	2661	3008
	1000	239	290	358	437	537	632	756	909	1099	1265	1542	1774	2005
	750	179	218	268	328	403	474	567	682	824	949	1157	1330	1504
280	1500	346	420	518	634	778	916	1094	1316	1593	1833	2236	2571	2907
	1000	230	280	346	422	518	611	730	878	1062	1222	1491	1714	1938
	750	173	210	259	317	389	458	547	658	797	917	1118	1286	1453
320	1500	297	361	445	544	668	787	940	1131	1368	1574	1920	2208	2496
	1000	198	241	297	363	445	525	627	754	912	1049	1280	1472	1664
	750	148	181	223	272	334	394	470	566	684	787	960	1104	1248

9.2 Power ratings for motors with a frequency of 60 Hz

i nominal	n1 [rpm]	XP size / power rating [kW]												
		130	140	150	160	170	180	190	200	210	220	230	240	250
120	1800	774	1013	1277	1399	1778	2233	2857	3118	3779	4855	5367	5966	7696
	1200	579	741	914	1052	1331	1615	1930	2322	2713	3237	3947	4539	5131
	900	457	556	686	838	1028	1211	1447	1741	2109	2428	2960	3404	3848
130	1800	725	950	1197	1308	1664	2091	2635	2921	3779	4855	5367	5966	7696
	1200	555	675	832	1017	1248	1470	1757	2114	2713	3237	3947	4539	5131
	900	416	506	624	763	936	1103	1318	1585	2109	2428	2960	3404	3848
140	1800	709	930	1172	1282	1631	2046	2557	2859	3540	4419	5024	5585	7006
	1200	538	655	807	987	1211	1426	1704	2050	2560	2946	3593	4132	4671
	900	404	491	605	740	908	1070	1278	1538	1920	2209	2695	3099	3503
150	1800	664	870	1098	1200	1526	1917	2327	2677	3461	4283	4915	5465	6791
	1200	490	596	735	898	1102	1298	1552	1866	2481	2855	3482	4005	4527
	900	367	447	551	674	827	974	1164	1400	1861	2141	2612	3004	3395
160	1800	638	844	1041	1152	1466	1839	2197	2571	3241	3899	4603	5117	6182
	1200	463	563	694	848	1041	1226	1465	1762	2259	2599	3170	3646	4121
	900	347	422	520	636	781	919	1099	1322	1694	1949	2378	2734	3091
170	1800	638	844	1041	1152	1466	1839	2197	2571	3083	3677	4418	4911	5830
	1200	463	563	694	848	1041	1226	1465	1762	2130	2451	2990	3438	3887
	900	347	422	520	636	781	919	1099	1322	1598	1839	2242	2579	2915
180	1800	600	768	947	1079	1374	1674	2000	2406	2807	3348	4083	4695	5308
	1200	421	512	632	772	947	1116	1333	1604	1939	2232	2722	3130	3539
	900	316	384	474	579	711	837	1000	1203	1455	1674	2042	2348	2654
200	1800	566	689	849	1037	1273	1500	1792	2156	2611	3005	3665	4215	4764
	1200	377	459	566	692	849	1000	1195	1437	1741	2003	2443	2810	3176
	900	283	344	424	519	637	750	896	1078	1306	1502	1832	2107	2382
220	1800	500	608	750	916	1124	1324	1583	1904	2304	2651	3234	3719	4204
	1200	333	405	500	611	750	883	1055	1269	1536	1768	2156	2479	2803
	900	250	304	375	458	562	662	791	952	1152	1326	1617	1859	2102
240	1800	470	571	704	861	1057	1244	1487	1789	2167	2493	3041	3497	3953
	1200	313	381	470	574	704	830	991	1193	1445	1662	2027	2332	2636
	900	235	286	352	430	528	622	744	894	1083	1246	1521	1749	1977
260	1800	429	523	644	787	966	1138	1360	1636	1979	2277	2776	3193	3609
	1200	286	348	429	525	644	759	907	1091	1319	1518	1851	2129	2406
	900	215	261	322	394	483	569	680	818	989	1138	1388	1596	1805
280	1800	415	505	622	760	933	1099	1313	1580	1912	2200	2683	3086	3488
	1200	276	336	415	507	622	733	875	1053	1275	1467	1789	2057	2326
	900	207	252	311	380	467	549	657	790	956	1100	1342	1543	1744
320	1800	356	434	535	653	802	944	1129	1358	1642	1889	2304	2649	2995
	1200	238	289	356	436	535	630	752	905	1094	1259	1536	1766	1997
	900	178	217	267	327	401	472	564	679	821	944	1152	1325	1498

10 Thermal rating

The table below applies to the following conditions:

$$T_{oil} = 90\text{ °C}$$

$$T_{ambient} = 30\text{ °C}$$

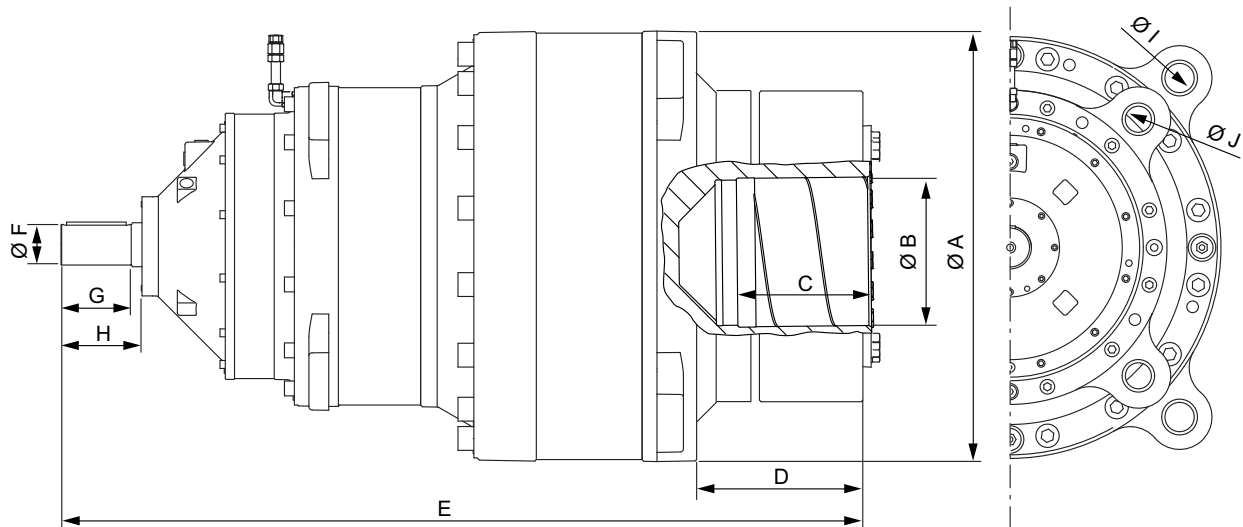
Installation altitude: 0 to 1000 meters

Installation site: large rooms and halls

Input speed: 750 to 1800 rpm

	XP size / thermal power rating [KW]												
i nominal	130	140	150	160	170	180	190	200	210	220	230	240	250
120	345	390	390	430	490	550	630	720	910	1010	1130	1300	1390
130	340	385	385	425	480	545	625	715	910	1010	1130	1300	1390
140	345	420	425	465	530	605	685	785	900	985	1130	1280	1380
150	345	420	420	460	520	595	670	780	780	860	960	1115	1185
160	310	350	355	390	440	500	560	655	775	845	960	1090	1175
170	310	350	355	390	440	500	560	655	810	895	1015	1175	1250
180	300	345	350	380	430	495	560	650	795	885	1000	1145	1230
200	330	375	375	380	460	530	610	680	875	955	1080	1245	1330
220	345	405	405	445	505	570	655	745	745	810	920	1055	1140
240	320	360	365	400	450	505	585	660	835	925	1030	1190	1290
260	295	335	340	370	420	470	550	630	775	850	960	1115	1180
280	345	385	390	430	480	545	630	710	715	790	890	1015	1100
320	285	325	325	360	400	460	525	605	740	815	930	1060	1140

11 Dimension sheets



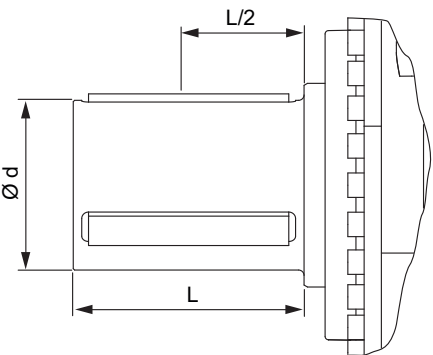
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Dimension [mm]											
XP Size	A	B	C	D	E	Ø F	G	H	Ø I	Ø J	(Kg)
130	1 045	320 ^{H7}	315	442	1 963	100 _{m6}	210	239	80	70	4 930
140	1 045	340 ^{H7}	325	458	2 036	100 _{m6}	210	239	80	70	5 455
150	1 070	360 ^{H7}	325	439	2 168	100 _{m6}	210	239	80	70	6 120
160	1 160	380 ^{H7}	365	485	2 235	100 _{m6}	210	239	85	70	6 955
170	1 260	400 ^{H7}	375	505	2 387	120 _{m6}	210	240	90	85	8 800
180	1 300	450 ^{H7}	405	538	2 466	120 _{m6}	210	240	90	85	9 960
190	1 390	470 ^{H7}	435	529	2 678	150 _{m6}	250	276	90	85	12 825
200	1 500	500 ^{H7}	490	584	2 753	150 _{m6}	250	276	100	85	14 730
210	1 625	530 ^{H7}	500	586	3 035	180 _{m6}	300	331	100	85	19 650
220	1 690	560 ^{H7}	525	612	3 083	180 _{m6}	300	331	120	90	21 845
230	1 740	600 ^{H7}	555	624	3 240	180 _{m6}	300	331	120	90	25 865
240	1 930	640 ^{H7}	565	674	3 280	180 _{m6}	300	331	120	90	29 620
250	1 940	710 ^{H7}	625	724	3 570	180 _{m6}	300	331	120	90	34 125

Keys and keyways on the input shaft following DIN6885/1.

Weight without oil filling.

12 Data sheet for solid output shaft with key

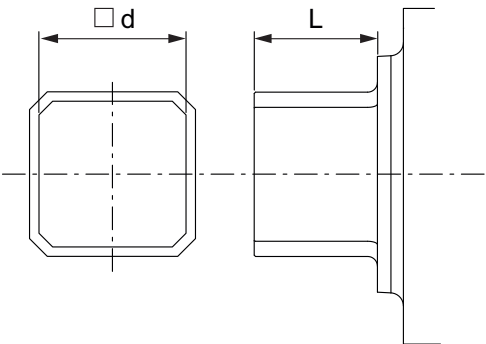


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XP Size	Diameter dimension (Ø d)			L
	Min.	Nominal	Max.	
130	310	340	370	540
140	310	360	410	540
150	350	400	450	540
160	400	440	480	540
170	420	460	500	680
180	450	500	550	680
190	on request			
200				
210				
220				
230				
240				
250				

For complete dimension sheets, please contact SEW-EURODRIVE.

13 Data sheet for square output shaft

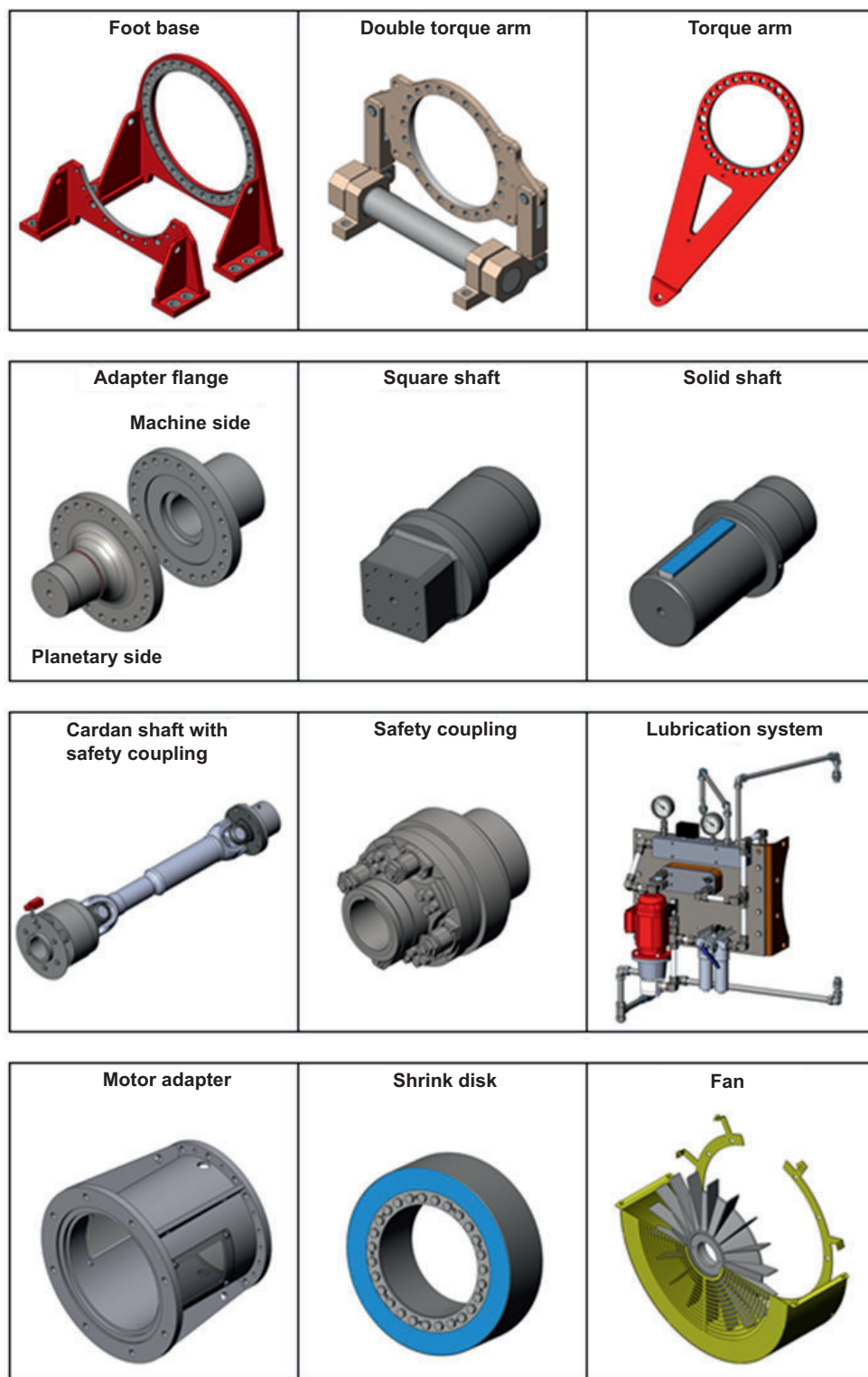


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XP Size	Dimension of square			L
	Min.	Nominal	Max.	
130	130	200	270	220
140	140	210	280	240
150	150	225	300	260
160	310	340	375	280
170	330	360	395	300
180	340	390	425	320
190	on request			
200				
210				
220				
230				
240				
250				

For complete dimension sheets, please contact SEW-EURODRIVE.

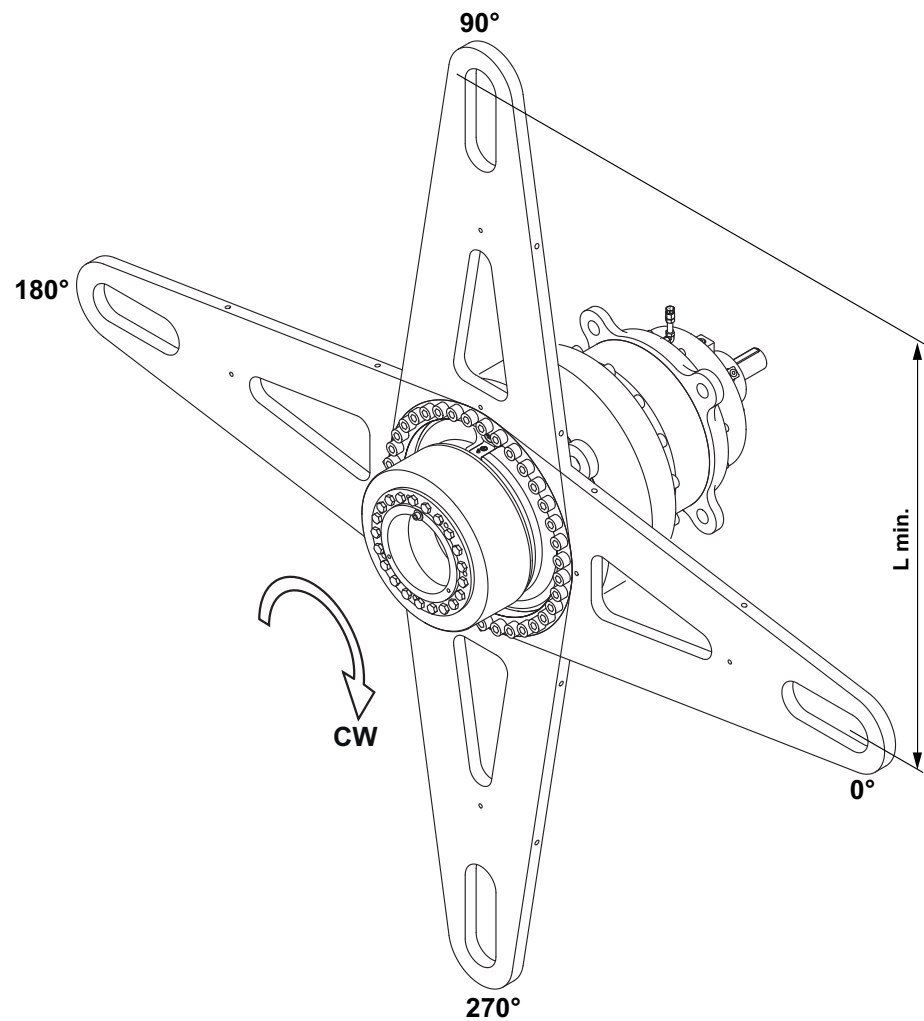
14 Accessories



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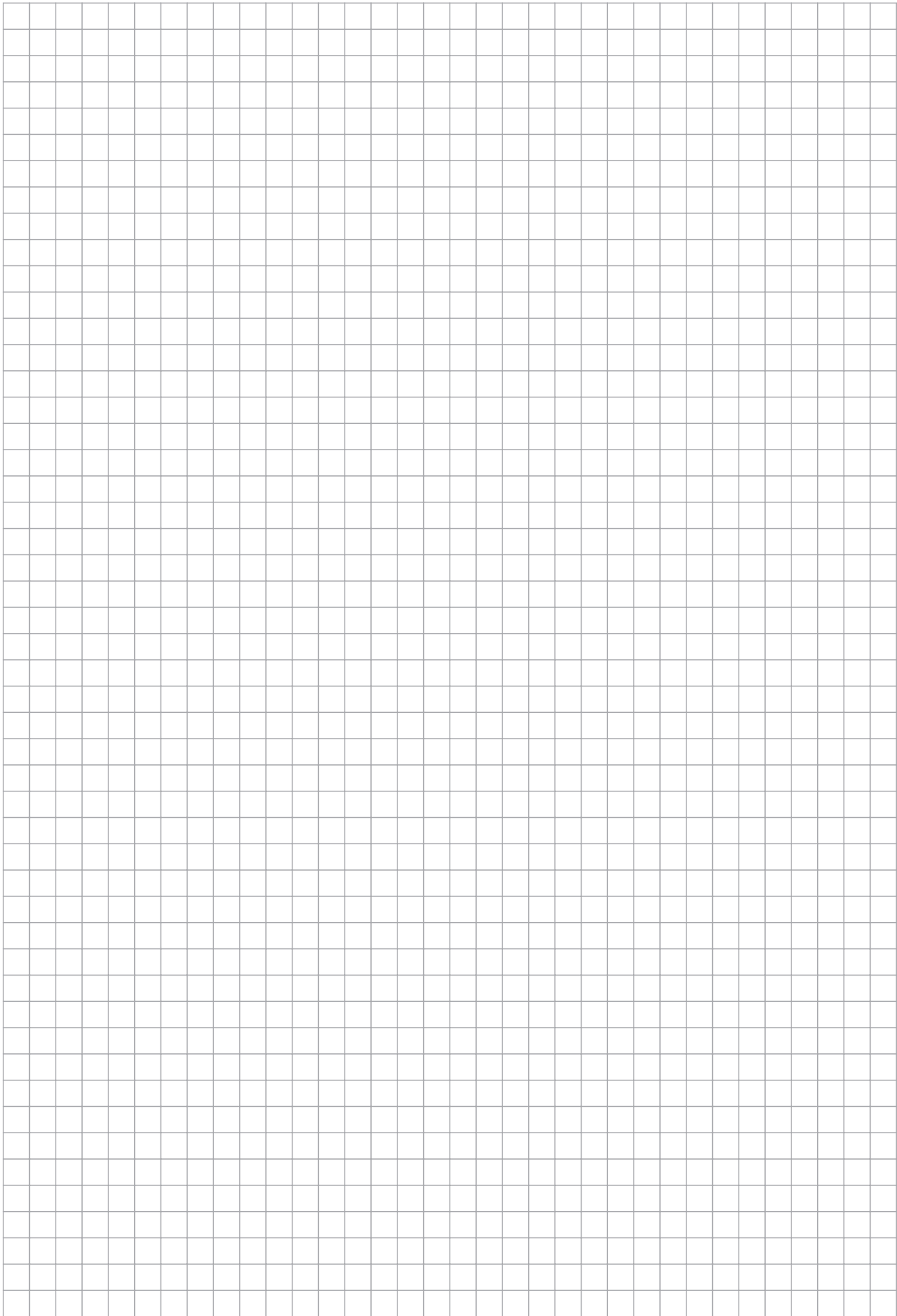
14.1 Torque arm – minimum length

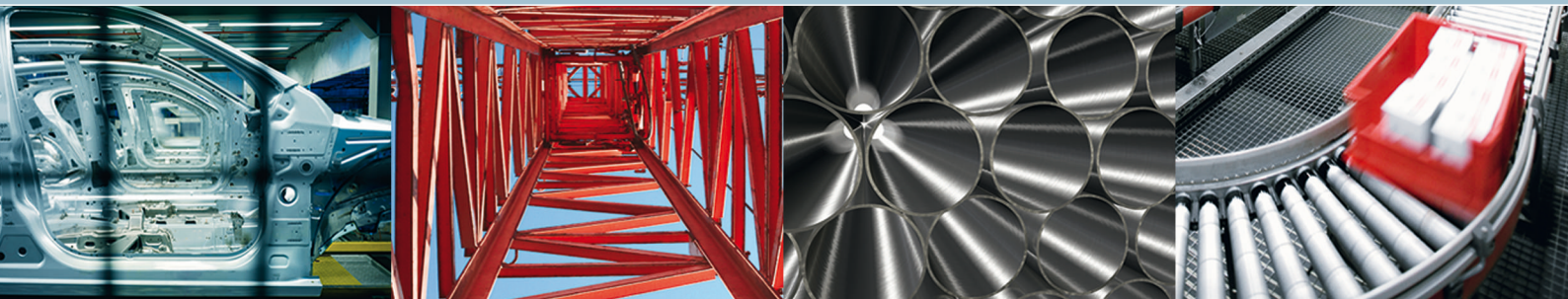
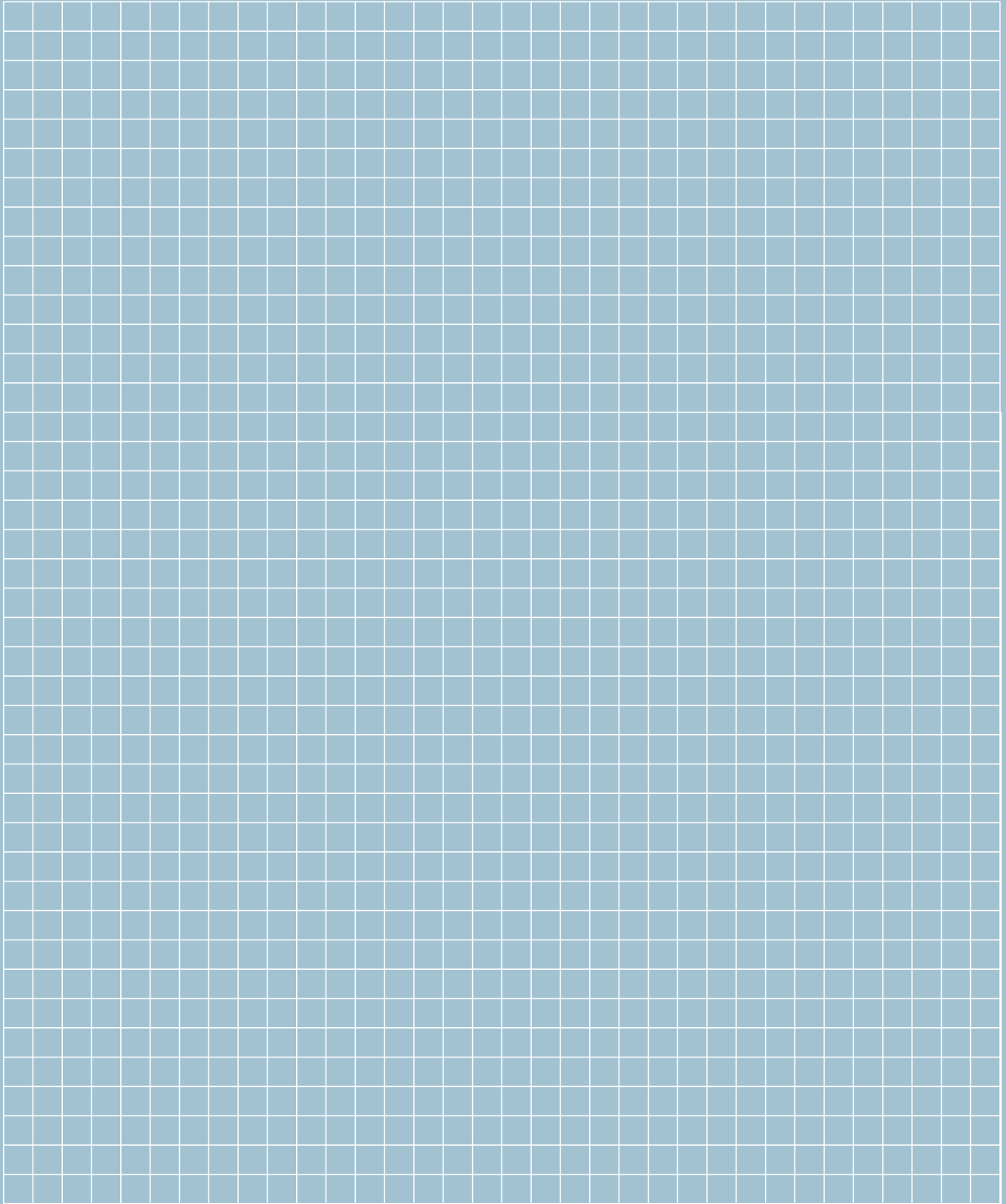


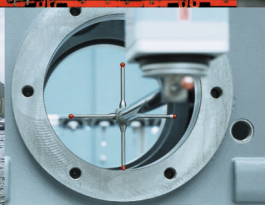
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	XP size / minimum length Lmin [m]												
	130	140	150	160	170	180	190	200	210	220	230	240	250
0°	2.0	2.5	3.0	3.0	4.0	4.5	5.5	6.0	6.5	8.0	8.5	10.0	10.0
45°	2.0	2.5	3.0	3.0	3.5	4.0	5.5	5.5	6.0	7.0	8.0	9.0	9.0
90°	2.0	2.5	2.5	2.5	3.0	3.5	4.5	4.5	5.0	5.5	6.0	6.5	6.5
135°	1.5	2.0	2.5	2.5	3.0	3.0	3.5	4.0	4.0	4.5	5.0	5.0	5.0
180°	1.5	2.0	2.5	2.5	2.5	3.0	3.5	3.5	3.5	4.0	4.5	4.5	4.5
225°	1.5	2.0	2.5	2.5	3.0	3.0	3.5	4.0	4.0	4.5	5.0	5.0	5.0
270°	2.0	2.5	2.5	2.5	3.0	3.5	4.5	4.5	5.0	5.5	6.0	6.5	6.5
315°	2.0	2.5	3.0	3.0	3.5	4.0	5.5	5.5	6.0	7.0	8.0	9.0	9.0

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Driving the world

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