

Lubrication pump P215EEX

Operating Instructions
following ATEX directive 2014/34/EU

EN



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Version 18
06.01.2025



EU Declaration of conformity following ATEX directive 2014/34/EU, annex X

The manufacturer, SKF Lubrication Systems Germany GmbH, Walldorf Plant, Heinrich-Hertz-Str. 2-8, DE - 69190 Walldorf hereby declares under sole responsibility that the electrical equipment

Designation: Electrically driven pump to supply lubricant within a centralized lubrication system
Types: P215xxxEEX
Part numbers: 660-xxxxx-x | 6600-xxxxxxx

complies with the following basic safety and health requirements of ATEX directive 2014/34/EU and the safety and health requirements of machinery directive 2006/42/EC (see appendix to the EU declaration of conformity) at the time of placing on the market.

The technical documents according to:

- ATEX Directive 2014/34/EU Annex VIII No. 2 has been compiled and filed with the conformity assessment body (CE0123) has been compiled and filed with the conformity assessment body (CE0123).
- Machinery Directive 2006/42/EC Annex VII Part B has been compiled.

We undertake to transmit these in electronic form in response to a reasoned request by the national authorities.
The manufacturer is authorized for the technical documentation.

The following regulations and standards were applied in the applicable areas:

Directives**2011/65/EU****RoHS II****2014/30/EU****Electromagnetic compatibility****Standards**

EN ISO 12100:2010

EN 1127-1:2019

EN 61000-6-2:2005

EN IEC 63000:2018

EN 809:1998+A1:2009/AC2010

EN ISO 80079-36:2016

EN 61000-6-4:2007/A1:2011

EN 60204-1:2018

EN ISO 80079-37:2016

EN IEC 60947-5-2:2020

The device must not be put into service until it has been established that the machinery into which it is to be incorporated is in compliance with the provisions of ATEX Directive 2014/34/EU, Machinery Directive 2006/42/EC, and all other applicable Directives.

Walldorf, 2022/11/24

Jürgen Kreutzkämper
Manager R&D Germany



Stefan Schürmann
Manager PD Germany South



UK Declaration of Conformity following to Regulation the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 (2016 No. 1107)

The manufacturer, SKF Lubrication Systems Germany GmbH, Walldorf Plant, Heinrich-Hertz-Str. 2- 8, DE - 69190 Walldorf hereby declares, under its sole responsibility, conformity of the device

Designation: Electrically operated pump for the supply of lubricants within a centralized lubrication system
 Type: P215xxxEEX
 Part numbers: 660-xxxx-x | 6600-xxxxxxx

with all essential safety and health requirements of the regulation The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 No. 1107, and the applicable health and safety requirements of the Supply of Machinery (Safety) Regulations 2008 No. 1597 (see appendix to the EU declaration of conformity) at the time of placing on the market.

The technical documents according to:

- The Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 No. 1107 has been compiled and filed with the conformity assessment body (CE0123).
- Supply of Machinery (Safety) Regulations 2008 No. 1597 has been compiled.

We undertake to transmit these in electronic form in response to a reasoned request by the national authorities. The authorized representative for the compilation of the technical documentation is SKF (U.K.) Limited, 2 Canada Close, Banbury, Oxfordshire, OX16 2RT, GBR.

The following regulations and standards were applied in the applicable areas:

Regulations

The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 No. 3032

Electromagnetic Compatibility Regulations 2016 No. 1091

Standards

EN ISO 12100:2010	EN 1127-1:2019	EN 61000-6-2:2005	EN IEC 63000:2018
EN 809:1998+A1:2009/AC2010	EN ISO 80079-36:2016	EN 61000-6-4:2007/A1:2011	
EN 60204-1:2018	EN ISO 80079-37:2016	EN IEC 60947-5-2:2020	

The device must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016 (2016 No. 1107), of the Supply of Machinery (Safety) Regulations 2008 No. 1597 and all other applicable regulations
 Walldorf, 2022/11/24

Jürgen Kreutzkämper
 Manager R&D Germany



Stefan Schürmann
 Manager PD Germany South



Description of the essential health and safety requirements according to 2006/42/EC, Annex I, which have been applied and fulfilled. Any essential health and safety requirements not listed here are not relevant to this product.

No.:	Essential health and safety requirement	Applicable:	Fulfilled:
1.1.1	Definitions	YES	YES
1.1.2	Principles of safety integration	YES	YES
1.1.3	Materials and products	YES	Partially
Regarding 1.1.3: Hazards due to the lubricant used must be assessed by the operator on the basis of the Safety Data Sheet (SDS) and, if necessary, protective measures must be taken.			
1.1.5	Design of machinery to facilitate its handling	YES	YES
1.1.6	Ergonomics	YES	Partially
Regarding 1.1.6 Not completely fulfilled: The operator must ensure that the pump is integrated into the higher-level machine in such a way that the pump can be operated and filled ergonomically.			
1.2	Control systems	YES	YES
1.2.1	Safety and reliability of control systems	YES	YES
1.2.3	Starting	YES	YES
1.2.6	Failure of the power supply	YES	YES
1.3	Protection against mechanical hazards	YES	YES
1.3.1	Risk of loss of stability	YES	YES
1.3.2	Risk of break-up during operation	YES	Partially
Regarding 1.3.2 Not completely fulfilled: The operator must protect the lubrication system against excessive pressure. For this purpose, a pressure relief valve with max. 350 bar opening pressure must be provided on each pump element.			
1.3.4	Risks due to surfaces, edges or angles	YES	YES
1.3.7	Risks related to moving parts	YES	YES
1.3.9	Risks of uncontrolled movements	YES	YES
1.5	Risks due to other hazards	YES	YES
1.5.1	Electricity supply	YES	YES
1.5.6	Fire	YES	YES

No.:	Essential health and safety requirement	Applicable:	Fulfilled:
1.5.8	Noise	YES	YES
1.5.11	External radiation	YES	YES
1.5.13	Emissions of hazardous materials and substances	YES	YES
1.5.15	Risk of slipping, tripping, or falling	YES	YES
1.6	Servicing	YES	YES
1.6.1	Machinery maintenance	YES	YES
1.6.2	Access to operating positions and servicing points	YES	YES
Regarding 1.6.2 Not completely fulfilled: The operator must ensure that the pump is integrated into the higher-level machine in such a way that the pump can be operated without danger.			
1.6.4	Operator interventions	YES	YES
1.7	Information	YES	YES
1.7.1	Information and warnings on the machinery	YES	YES
1.7.1.1	Information and information devices	YES	YES
1.7.2	Warning of residual risks	YES	YES
1.7.3	Marking of machinery	YES	YES
1.7.4	Operating instructions/assembly instructions	YES	YES
1.7.4.1	General principles for the drafting of operating instructions/assembly instructions	YES	YES
1.7.4.2	Contents of the operating instructions/assembly instructions	YES	YES
1.7.4.3	Sales literature	YES	YES

Manufacturer

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Training courses

In order to provide a maximum of safety and economic viability, SKF carries out detailed training courses. It is recommended that the training courses are attended. For more information please contact the respective SKF Service address.

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Warranty

The instructions do not contain any information on the warranty. This can be found in our general terms and conditions.

Warranty

The instructions do not contain any information on the warranty. This can be found in our general terms and conditions.

Disclaimer

The manufacturer shall not be held responsible for damages caused by:

- Non appropriate use
faulty assembly, operation, setting, maintenance, repair or accidents
- Use of inappropriate lubricants
- Improper or late response to malfunctions
- Unauthorized modifications of the product
- Intent or negligence
- Use of non-original SKF spare parts
- Faulty planning or layout of the centralized lubrication system

Liability for loss or damage resulting from the use of our products is limited to the maximum purchase price. Liability for consequential damages of whatever kind is excluded.

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Explanation of symbols, signs and abbreviations

The following abbreviations may be used within these instructions. Symbols within safety notes mark the kind and source of the hazard.

	General warning		Dangerous electrical voltage		Risk of falling		Hot surfaces
	Unintentional intake		Crushing hazard		Pressure injection		Suspended load
	Electrostatically sensitive components		Risk of explosion		Explosion-protected component		
	Wear personal protective equipment (goggles)		Wear personal protective equipment (face shield)		Wear personal protective equipment (gloves)		Wear personal protective equipment (protective clothes)
	Wear personal protective equipment (safety shoes)		Disconnect product from mains		General obligation		
	Keep unauthorized persons away		Protective earth		Safety extra-low voltage (SELV)		Safe galvanic isolation (SELV)
	CE marking		Disposal, recycling		Disposal of waste electrical and electronic equipment		

	Warning level	Consequence	Probability	Symbol	Meaning
	DANGER	Death, serious injury	imminent	●	Chronological guidelines
	WARNING	Death, serious injury	possible	○	Lists
	CAUTION	Minor injury	possible	☞	Refers to other facts, causes, or consequences
	NOTICE	Property damage	possible		

Abbreviations and conversion factors

re.	regarding	°C	degrees Celsius	°F	degrees Fahrenheit
approx.	approximately	K	Kelvin	Oz.	Ounce
i.e.	that is	N	Newton	fl. oz.	fluid ounce
etc.	et cetera	h	hour	in.	inch
poss.	possibly	s	second	psi	pounds per square inch
if appl.	if applicable	d	day	sq.in.	square inch
a.a.r.	as a rule	Nm	Newtonmeter	cu. in.	cubic inch
incl.	including	ml	millilitre	mph	miles per hour
min.	minimum	ml/d	millilitre per day	rpm	revolutions per minute
max.	maximum	cc	cubic centimetre	gal.	gallon
min.	minute	mm	millimetre	lb.	pound
etc.	et cetera	l	litre	hp	horse power
e.g.	for example	dB (A)	sound pressure level	kp	kilopond
kW	kilowatt	>	greater than	fpsec	feet per second
U	Voltage	<	less than	conversion factors	
R	resistance	±	plus/minus	Length	1 mm = 0.03937 in.
I	current	Ø	diameter	Area	1 cm ² = 0.155 sq.in
V	volt	kg	kilogram	Volume	1 ml = 0.0352 fl.oz.
W	watt	rh	relative humidity		1 l = 2.11416 pints (US)
AC	alternating current	≈	about	Mass	1 kg = 2.205 lbs
DC	direct current	=	equal to		1 g = 0.03527 oz.
A	ampere	%	per cent	Density	1 kg/cc = 8.3454 lb./gal(US)
Ah	ampere hour	‰	per mille		1 kg/cc = 0.03613 lb./cu.in.
Hz	frequency [Hertz]	≥	greater than	Force	1 N = 0.10197 kp
nc	normally closed	≤	less than	Pressure	1 bar = 14.5 psi
no	normally open contact	mm ²	square millimetre	Temperature	°C = (°F - 32) x 5/9
OR	logical OR	rpm	revolutions per minute	Output	1 kW = 1.34109 hp
&	logical AND			Acceleration	1 m/s ² = 3.28084 ft./s ²
N/A	Not applicable			Speed	1 m/s = 3.28084 fpsec.
					1 m/s = 2.23694 mph

1. Safety instructions

1.1 General safety instructions

- The owner must ensure that safety information has been read by any persons entrusted with works on the product or by those persons who supervise or instruct the before-mentioned group of persons. In addition, the owner must also ensure that the relevant personnel are fully familiar with and have understood the contents of the Instructions. It is prohibited to commission or operate the product prior to reading the Instructions.
- These Instructions must be kept for further use.
- The described products were manufactured according to the state of the art. Risks may, however, arise from a usage not according to the intended purpose and may result in harm to persons or damage to material assets.
- Any malfunctions which may affect safety must be remedied immediately. In addition to these Instructions, general statutory regulations for accident prevention and environmental protection must be observed.

1.2 General behaviour when handling the product

- The product may be used only in awareness of the potential dangers, in proper technical condition, and according to the information in these instructions.
- Familiarize yourself with the functions and operation of the product. The specified assembly and operating steps and their sequences must be observed.
- Any unclear points regarding proper condition or correct assembly/ operation must be clarified. Operation is prohibited until issues have been clarified.
- Unauthorized persons must be kept away.
- Precautionary operational measures and instructions for the respective work must be observed.
- Responsibilities for different activities must be clearly defined and observed. Uncertainty seriously endangers safety.
- Remedy occurring faults in the frame of responsibilities. Immediately inform your superior in the case of faults beyond your competence.
- Wear personal protective equipment.
- Never use parts of the centralized lubrication system or of the machine as standing or climbing aids.

1.3 Intended use

Supply of lubricants within a centralized lubrication system following the specifications, technical data and limits stated in these Instructions:

Usage is allowed exclusively for professional users in the frame of commercial and economic activities.

1.4 Foreseeable misuse

Any usage differing from the one stated in these Instructions is strictly prohibited. It is expressly forbidden to be used:

- outside the indicated temperature range
- with non-specified means of operation
- with contaminated lubricants or lubricants with air inclusions
- with lubricants the temperature of which exceeds the maximum admissible ambient temperature
- without adequate pressure control valve
- in areas with aggressive or corrosive materials (e.g. high ozone pollution). These may affect seals and painting.
- in areas with harmful radiation (e. g. ionising radiation)
- to supply, transport, or store hazardous substances and mixtures in accordance with annex I part 2–5 of the CLP regulation (EG 1272/2008) and marked with GHS01 – GHS06 and GHS08 hazard pictograms.
- to feed, forward, or store gases, liquefied gases, dissolved gases, vapours, or fluids whose vapour pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at the maximum permissible operating temperature.
- to feed, forward, or store lubricants containing volatile solvents
- in explosive gas and vapour atmospheres, the ignition temperature of which is smaller than 125 % of the maximum surface temperature
- in explosive dust atmospheres, the minimum ignition and glow temperature of which is smaller than 150 % of the maximum surface temperature
- In a different, more critical potentially explosive atmosphere than stated on the type identification plate of the pump used.
- with damaged or lacking ATEX painting or ATEX painting done wrongly later on. The painting must comply with the standards valid for ATEX.

1.5 Painting of plastic parts

Painting of any plastic parts or seals of the described products is expressly prohibited. Remove or tape plastic parts completely before painting the superior machine

1.6 Modifications of the product

Unauthorized conversions or modifications may result in unforeseeable impacts on safety. Therefore, any unauthorized conversions or modifications are expressly prohibited.

1.7 Prohibition of certain activities

Due to potential sources of faults that may not be visible or due to legal regulations the following activities may be carried out by manufacturer specialists or authorized persons only:

- Repairs or changes to the drive
- Replacement of or changes on the pistons of the pump elements

1.8 Inspections prior to delivery

The following inspections were carried out prior to delivery:

- Safety and functional tests
- Electrical inspections following DIN EN 60204-1:2007 / VDE 0113-1:2007.
- In case of explosion-protected products: Inspections following the requirements of the ATEX Directive.

1.9 Other applicable documents

In addition to these instructions, the following documents must be observed by the respective target group:

- Operational instructions and approval rules
- Safety data sheet of the lubricant used

Where appropriate:

- Project planning documents
- Any documents of other components required to set up the centralized lubrication system
- Operator's explosion protection document
- Reh fuss gear:
Instructions for the SM type series
- SEW motor:
Explosion-protected three-phase motors EDR71 documentation no.: 19402007
- ABB motor:
Low-voltage motors for explosive atmospheres documentation no.: 3GZF500730-47
- SIEMENS motor:
Loher CHEMSTAR Type 1PS2
Edition 08/2016

1.10 Markings on the product



Warning of dangerous electrical voltage



Warning of hand injuries when reaching into the reservoir



Rotational direction of the pump



Equipotential bonding connections

1.11 Notes related to the UKCA marking



The UKCA conformity marking confirms the product's conformity with the applicable legal provisions of Great Britain.

1. Safety instructions

1.12 Notes related to the type identification plate

The type identification plate states important characteristics such as type designation, order number, and regulatory characteristics.
To ensure that the loss of data due to an illegible type identification plate is avoided, the characteristics should be entered in the Instructions.

Model: _____

P. No.: _____

Series: _____

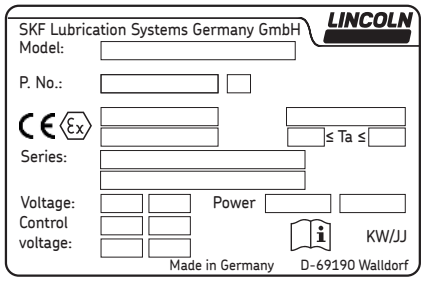
Year of construction (KW/YY)

Voltage: _____

Control voltage: _____

Power: _____

_____ °C ≤ Ta ≤ _____ °C



1.13 Notes related to the CE marking

- CE marking is effected following the requirements of the applied directives:
- 2014/34/EU
Directive relating to equipment and protective systems for use in explosive atmospheres (ATEX)
 - 2014/30/EU
Electromagnetic compatibility
 - 2011/65/EU
(RoHS II) Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment

- Reference on Low Voltage Directive 2014/35/EU

The protective regulations of Low Voltage Directive 2014/35/EU are fulfilled according to annex II (1.2.7) of ATEX Directive 2014/34/EU.

- Reference on Pressure Equipment Directive 2014/68/EU

Because of its performance data the product does not achieve the limit values defined in Article 4 (1) (a) (ii) and is therefore excluded from the scope of application of Pressure Equipment Directive 2014/68/EU following Article 1 (2) (f).

1.14 Persons authorized to operate the pump

1.14.1 Operator

A person who is qualified by training, knowledge and experience to carry out the functions and activities related to normal operation. This includes avoiding possible hazards that may arise during operation.

1.14.2 Specialist in mechanics

Person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise during transport, installation, start-up, operation, maintenance, repair and disassembly.

1.14.3 Specialist in electrics

Person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise from electricity.

1.14.4 Specialist for maintenance and repairs in potentially explosive atmospheres

A person who is qualified by training, knowledge and experience to identify and assess possible risks and hazards during work on the machine or partial components in potentially explosive areas and to initiate suitable measures to prevent such risks. The specialist has knowledge of the different ignition protection types, installation procedures and zone divisions. He is familiar with the rules and regulations relevant for his activities and explosion protection, in particular with ATEX directives 2014/34/EU and 1999/92/EC.

1.15 Briefing of external technicians

Prior to commencing the activities, external technicians must be informed by the operator of the company safety provisions, the applicable accident prevention regulations to be maintained, and the functions of the superordinate machine and its protective devices.

1.16 Provision of personal protective equipment

The operator must provide suitable personal protective equipment for the respective location of operation and the purpose of operation. For work in potentially explosive atmospheres this also includes ESD clothing and ESD tools.

1. Safety instructions

1.17 Operation

The following must be observed during commissioning and operation:

- Any information within this manual and the information within the referenced documents
- All laws and regulations to be complied with by the user

1.18 Emergency stopping

In case of an emergency stop the pump station by:

- Switching off the superior machine or system in which the pump station has been integrated.
- Actuating the emergency stop switch of the superior machine.

1.19 Transport, installation, maintenance, malfunctions, repair, shutdown, disposal

- All relevant persons must be informed of the activity prior to starting any work. Observe the precautionary operational measures and work instructions.

- Carry out transport using suitable transport and hoisting equipment on suitable ways only.
- Maintenance and repair work can be subject to restrictions in low or high temperatures (e.g. changed flow properties of the lubricant). Therefore, where possible, try to carry out maintenance and repair work at room temperature.
- Prior to performing work, the product and the machine, into which the product will be integrated, must be depressurized and secured against unauthorized activation.
- Ensure through suitable measures that movable or detached parts are immobilized during the work and that no limbs can be caught in between by inadvertent movements.
- Assemble the product only outside of the operating range of moving parts, at an adequate distance from sources of heat or cold. Other units of the machine or vehicle must not be damaged or impaired in their function by the installation.
- Dry or cover wet, slippery surfaces accordingly.
- Cover hot or cold surfaces accordingly.
- Work on electrical components must be carried out by electrical specialists only. Observe any waiting periods for discharging, if necessary. Carry out works on electrical components only while the system is depressurized and use voltage isolated tools suitable for electrical works only.
- Carry out electrical connections only according to the information in the valid wiring diagram and taking the relevant regulations and the local connection conditions into account.

- Do not touch cables or electrical components with wet or damp hands.
- Fuses must not be bypassed Replace defective fuses always by fuses of the same type.
- Ensure proper grounding of the product.
- Ensure proper connection of the protective conductor.
- Undertake drilling only at non-critical, non-load bearing parts of the operator's machine/ infrastructure. Use any available boreholes. Do not damage lines and cables when drilling. Changes to SKF products are prohibited. This includes all drilling, welding, flame-cutting, and grinding work.
- Observe possible abrasion points. Protect the parts accordingly.
- All components used must be designed for:
 - maximum operating pressure
 - max / min ambient temperature
 - the lubricant to be supplied
 - the ATEX zone required
- the operating / ambient conditions at the place of usage
- No parts of the centralized lubrication system may be subjected to torsion, shear, or bending.
- Check all parts prior to their usage for contamination and clean, if necessary.
- Lubricant lines should be primed with lubricant prior to installation. This makes the subsequent ventilation of the system easier.
- Observe the specified tightening torques. When tightening, use a calibrated torque wrench.
- When working with heavy parts use suitable lifting tools.
- Avoid mixing up or wrong assembly of dismantled parts. Mark these parts accordingly.

1.20 Initial commissioning, daily start-up

Ensure that:

- All safety devices are completely available and functional
- All connections are correctly connected
- All parts are correctly installed
- All warning labels on the product are present completely, highly visible and undamaged
- Illegible or missing warning labels are to be replaced without delay

1.21 Cleaning

- Risk of fire and explosion when using inflammable cleaning agents Only use non-flammable cleaning agents suitable for the purpose.
- Do not use aggressive cleaning agents.
- Thoroughly remove residues of cleaning agents from the product.
- Do not use steam jet and high pressure cleaners. Electrical components may be damaged. Observe the IP type of protection of the pump.
- Cleaning work may not be carried out on energized components.
- Mark damp areas accordingly.

1.22 Safety-related protective and emergency devices must

- Safety-related protective and emergency devices must not be removed, modified or affected otherwise in their function and are to be checked at regular intervals for completeness and function.
- If protective and safety equipment has to be dismantled, it must be reassembled immediately after finishing the work, and then checked for correct function.

Depending on the equipment variant of the pump the following safety-related protective and emergency devices are available:

- Sensors for filling-level monitoring
- Mechanical indication of the filling level
- Overload / thermal circuit breaker of the electric motor
- Pressure relief valves
- Equipotential bonding

1.23 Special safety instructions regarding explosion protection

- Always behave so that explosion hazards are avoided.
- A written work approval from the operator is required prior to working in potentially explosive areas. Keep unauthorized persons away
- There must be no indications that parts of the explosion protection are missing or are not working. Should such indications become apparent, switch off the machine and inform a superior without delay.
- Measures for explosion protection must never be deactivated, modified or bypassed.
- Transport damages can result in the loss of the explosion protection. If transport damages can be seen, do not assemble the product nor put it into operation.
- It is forbidden to bring in ignition sources such as sparks, open flames and hot surfaces in potentially explosive areas.
- Check the machine at regular intervals in line with the operating conditions for damage which may represent an ignition risk as well as with regard to correct functioning. An inspection must be carried out every 12 months at the latest.
- The ignition temperature of the ambient explosive gas and vapour atmospheres must be greater than 125 % of the maximum surface temperature.
- The minimum ignition and glow temperature of the ambient explosive dust atmospheres must be greater than 150 % of the maximum surface temperature
- The limits of use related to explosion protection are clearly defined by the device categories, gas and dust groups as well as temperature classes stated in the explosion protection marking. In any case, also if dust group IIIC is specified, light-metal dusts as explosive ambient media are prohibited
- The filling-level monitoring must be ensured by the operator at a high degree of safety.
- The product may be filled via the reservoir lid only, if there is no potentially explosive atmosphere. Filling via the filling port is also possible with a potentially explosive atmosphere. Connect the filler pump to the equipotential bonding of the pump.
- The product may be cleaned only, if there is no potentially explosive atmosphere.
- The ignition temperature of the lubricant must lie at least 50 K over the maximum surface temperature of the components.
- In case of products without electrical filling level control make sure to check the lubricant filling level at regular intervals.

- Only use tools and clothing which are permitted for use in potentially explosive areas (ESD).
- Transport, installation, repairs and work on electrical components may only be carried out, if it has been ensured that the atmosphere is not potentially explosive.
- Repairs or modifications to machines which are protected against explosions may be carried out only by the manufacturer or by a workshop recognized by a named institution and confirmed in writing. If the work is not carried out by the manufacturer, the repairs must be approved by a named expert and confirmed in writing. The repairs are to be marked by a repair sign on the machine, stating the following:
 - Date
 - Executing company
 - Type of repair
 - If applicable, expert's code
- All parts of the earthing concept must be correctly available and connected with the superordinate machine.
- If transport lugs are dismantled after set-up, the threaded bores must be permanently sealed in accordance with the protection class.
- Handle the materials so that no sparks generated by tilting, falling, sliding, rubbing, impacting, etc. If needed, cover materials with suitable means.
- Never disconnect plug-in connections when energized. Secure plug-in connections against inadvertent manual disconnection with the safety clips.
- The operator must check critically whether operation without a low-level signal might lead to a new risk potential (e.g. through heat-up of bearing points on the machine in the area of ignition temperature in the case of lacking lubrication). If this cannot be ascertained, provide a low-level signal or suitable organisational measures for monitoring of the bearing point temperature.
- Avoid dust accumulation and remove dust immediately. Dust accumulations have a thermally insulating effect and, if whirled up, generate the formation of a potentially explosive atmosphere.
- The product must be integrated in the operator's lightning protection concept.
- All parts are to be checked regularly for corrosion. Replace the affected parts.
- Terminal boxes must be firmly closed and the cable breakthroughs correctly sealed.
- Additional electrical monitoring devices must be firmly connected and correctly adjusted.

1.24 Expiry of the ATEX approval

The ATEX certificate for this product expires through:

- Inappropriate usage
- Unauthorized modifications
- Use of non-original SKF spare parts
- non-observance of these instructions and other applicable documents.
- Use of non-specified lubricants
- Non-observance of the specified maintenance and repair intervals
- Operation with damaged or lacking ATEX painting or ATEX painting done wrongly later on and not complying with the standards applicable for ATEX

1.25 Operation in explosion-protected areas

Operation is permitted only, if in compliance with:

- All information given in these instructions or stated in the referenced documents.
- All laws and regulations to be complied with by the user.
- Information on explosion protection according to directive 1999/92/EC (ATEX 137).
- ATEX approval.

1.26 Explosion protection marking

The explosion protection marking is found in chapter "Technical data" and on the type identification plate of the pump.

1.27 Residual risks

Residual risk	Possible in life cycle										Prevention/ remedy
Personal injury/ material damage due to falling of raised parts	A	B	C				G	H	K		Keep unauthorized persons away. No people may remain under suspended loads. Lift parts with adequate lifting devices.
Personal injury/ material damage due to tilting or falling of the product because of non-observance of the stated tightening torques		B	C				G				Observe the specified tightening torques. Fix the product only to components with sufficient load capacity. Fasten the components. If no tightening torques are stated, apply tightening torques according to the screw size characteristics for 8.8 screws. +
Personal injury/ material damage due to electric shock in case of damage to the connection cable		B	C	D	E	F	G	H			Check the connection cable with regard to damages before the first usage and then at regular intervals. Do not mount cable to moving parts or friction points. If this cannot be avoided, use spring coils respectively protective conduits.
Personal injury/ damage to material due to spilled or leaked lubricant		B	C	D		F	G	H	K		Be careful when filling the reservoir and when connecting or disconnecting lubricant feed lines. Always use suitable hydraulic screw connections and lubrication lines for the stated pressures. Do not mount lubrication lines to moving parts or friction points. If this cannot be avoided, use spring coils respectively protective conduits.

Life phases:

A = transport, B = installation, C = initial start-up, D = operation, E = cleaning, F = maintenance, G = fault, repair, H = shutdown, K = disposal

1.28 Residual risks ATEX

Residual risk	Possible in life cycle					Prevention/ remedy
Usage in a potentially explosive atmosphere without testing the equipotential bonding with regard to electrical continuity	C	D			G	Check the equipotential bonding with regard to electrical continuity before the initial start-up, after each repair and additionally at regular intervals to be determined by the operator.
Operation with damaged, lacking ATEX painting or ATEX painting done wrongly later on and not complying with the standards applicable for ATEX	C	D	E	F	G	Before the first start-up and later at regular intervals check the painting and let it be renewed by authorized personnel, where appropriate.
Heat-up of non-lubricated lubrication points in the area of ignition temperature through undetected faults within the centralized lubrication system.	C	D			G	The operator must check critically whether an operation without corresponding detection options might lead to a new risk potential (e.g. through heat-up of non-lubricated bearing points on the machine up to the ignition temperature range). If this cannot be excluded with certainty, provide adequate countermeasures.
Heat-up of components in the area of ignition temperature or formation of a potentially explosive atmosphere through whirling up of dust.	C	D	E	F	G	Avoid dust accumulation and remove dust immediately. Select a location of installation with as little dust as possible.

Life cycle: A = transport, B = installation, C = initial start-up, D = operation, E = cleaning, F = maintenance, G = fault, repair, H = shutdown, K = disposal

Residual risk	Possible in life cycle						Prevention/ remedy
Generation of electrostatic charges and sparks through dropping parts.		C	D	E	F	G	Secure parts against falling. Where appropriate, cover parts in order to avoid the formation of sparks.
Bringing catalytic, unstable or pyrophoric substances into a potentially explosive area.		C	D	E	F	G	Ensure that none of these substances gets into the potentially explosive area. Have all substances approved by the operator first.
Use of isolating amplifiers to operate the capacitive sensor in potentially explosive areas.		C	D			G	Mount isolating amplifiers outside potentially explosive areas only.
Deviating installation position. Loss of correct filling-level signal function.		C	D			G	Observe the specified installation position ($\pm 5^\circ$). If needed, correct installation position.
Using a lubricant not suitable for low temperatures. In case of low temperatures too high lubricant viscosity may result in a functional failure of the pump.			C	D		F G	Only use lubricants suitable for the respective actual operating temperature.
Filling of the reservoir via the reservoir lid in case of a potentially explosive atmosphere	B	C	D		F		Fill the reservoir via the reservoir lid only, if there is no explosive atmosphere

Life cycle: A = transport, B = installation, C = initial start-up, D = operation, E = cleaning, F = maintenance, G = fault, repair, H = shutdown, K = disposal

2. Lubricants

2.1 General information

Lubricants are used specifically for certain application purposes. In order to fulfil their tasks, lubricants must fulfil various requirements to varying extents. The most important requirements for lubricants are:

- Reduction of abrasion and wear
- Corrosion protection
- Noise minimisation
- protection against contamination or penetration of foreign objects
- Cooling (primarily with oils)
- longevity (physical/ chemical stability)
- economic and ecological aspects

2.2 Selection of lubricants

SKF considers lubricants to be an element of system design. A suitable lubricant is selected already when designing the machine and forms the basis for the planning of a centralized lubrication system.

The selection is made by the manufacturer or operator of the machine, preferably together with the lubricant supplier based on the requirement profile defined.

Should you have little or no experience with the selection of lubricants for centralized lubrication systems, please contact SKF. If required we will be glad to support customers to select suitable components for feeding the selected lubricant and to plan and design their centralized lubrication system.

You will avoid possible downtimes through damage to your machine or system or damage to the centralized lubrication system.

2.3 Material compatibility

Lubricants must generally be compatible with the following materials:

- steel, grey iron, brass, copper, aluminium
- NBR, FPM, ABS, PA, PU

2.4 Temperature characteristics

The lubricant used must be suitable for the specific operating temperature of the product. The viscosity required for proper operation of the product must be adhered to and must not be exceeded in case of low temperatures nor fall below specification in case of high temperatures. Specified viscosities, see chapter Technical data.



The ignition temperature of the lubricant must lie at least 50 K over the maximum surface temperature of the components.

2.5 Ageing of lubricants

After a prolonged downtime of the machine, the lubricant must be inspected prior to re-commissioning as to whether it is still suitable for use due to chemical or physical ageing. We recommend that you undertake this inspection already after a machine downtime of 1 week.

If doubts arise as to a further suitability of the lubricant, please replace it prior to re-commissioning and, if necessary, undertake initial lubrication by hand.

It is possible for lubricants to be tested in the company's laboratory for their suitability for being pumped in centralized lubrication systems (e.g. "bleeding").

Please contact SKF if you have further questions regarding lubricants.

You may request an overview of the lubricants tested by SKF.



Only lubricants specified for the product (see chapter Technical data) may be used. Unsuitable lubricants may lead to a failure of the product.



Do not mix lubricants. This may have unforeseeable effects on the usability and therefore on the function of the centralized lubrication system.



When handling lubricants the relevant safety data sheets and hazard designations, if any, on the packaging have to be observed.



Due to the multitude of possible additives, individual lubricants, which according to the manufacturer's data sheets fulfil the necessary specification, may not, in fact, be suitable for use in centralized lubrication systems (e. g. incompatibility between synthetic lubricants and materials). In order to avoid this, always use lubricants tested by SKF.

3. Overview, functional description

1 Reservoir lid with earthing

The terminal box for connection of the low-level indication and any further filling-level sensors is located on the reservoir lid. The reservoir lid is connected to the reservoir and the pump earthing system via an earth strap.

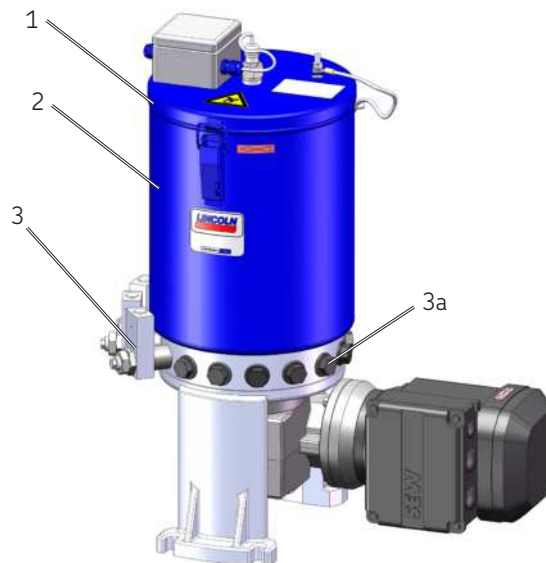
2 Reservoir with earthing

The lubricant is stored in the reservoir. Depending on the pump version there are different types of reservoirs.

3 Pump elements

The pump can be operated with up to 15 pump elements, Type and number of the pump elements installed to the newly supplied pumps, see type identification code. Unused outlets are closed with closure screws (3a).

Overview Fig. 1



4 Pump housing

The pump housing serves to fasten the pump to the base. Either pump elements or closure screws are screwed into the pump housing.

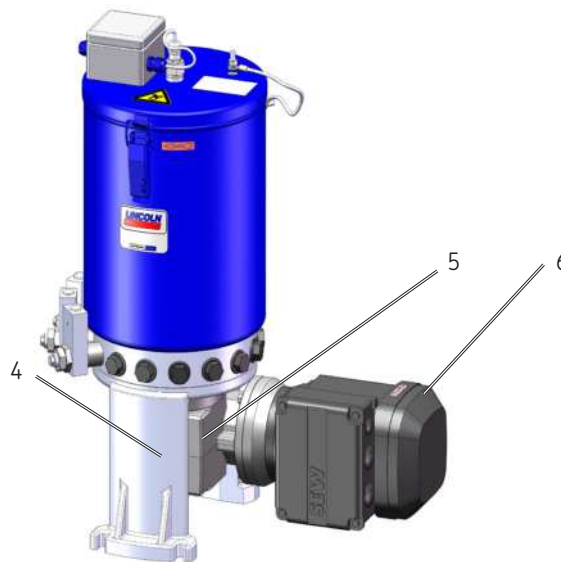
5 Gear

The gear reduces the motor speed to the necessary speed of the pump.

6 Motor

The motor drives the pump. Depending on the pump version there are available different types of motors

Overview Fig. 2



Operating principle:

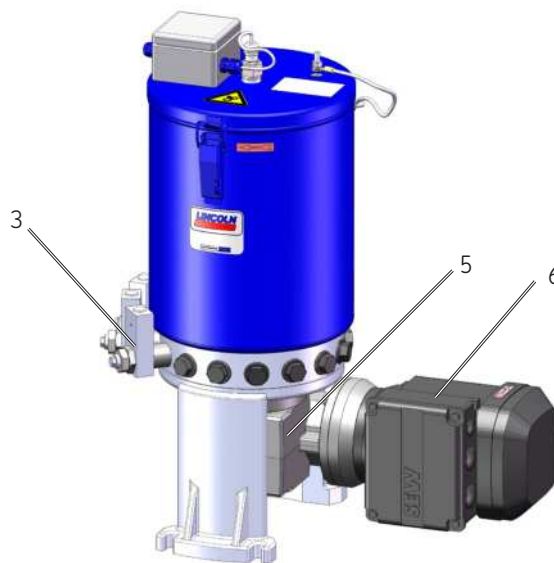
The gear (5) reduces the speed of the motor (6) to the required speed of the pump's eccentric shaft. The eccentric shaft drives the pump elements (3) and the stirring paddle in the reservoir.

The stirring paddle homogenizes and ventilates the lubricant and pushes it in the direction of the suction boreholes of the pump elements (3).

The pump elements (3) supply the lubricant via the pistons' movements. Here it is distinguished between the suction phase (suction of lubricant out of the reservoir) and the pressure phase (supply of lubricant into the lubrication line).

Where applicable, one or two sensors detect the filling level of the lubricant in the reservoir. When reaching the minimum or maximum admissible quantity a low-level respectively high-level signal is given.

Overview Fig. 3



4. Technical data

4.1 Mechanical data

Admissible operating pressure	max. 350 bar ¹⁾	
Pump elements	max. 15	
Approved lubricant consistencies	Reservoir variants for grease	Lubricating greases up to NLGI 2
	Reservoir variants for oil	Lubrication oils of at least 40 mm ² /s at operating temperature
Installation position	Vertical, i.e. reservoir at top. Deviation 5 ° max.	
Direction of rotation	Clockwise. Observe the arrow on the reservoir.	
sound pressure level	< 70 dB (A)	
Filling	Reservoir lid / if available, filling port When using less than 15 pump elements, one outlet can be used as a filling connection. Pump without reservoir, filling port G 1/2"	
Installation height	max. 1.000 m above sea level	
Weight of the empty pump	Between 28 kg and 45 kg ²⁾	
Maximum dust thickness	< 5 mm ³⁾	
Ratio	i = 97:1 When supplying the pump without motor/ gear, the following speeds must be maintained absolutely by selecting a suitable motor and gear	
Permitted speeds		Minimum speed Maximum speed
	Grease	2.0 rpm 25 rpm
	Oil	2.0 rpm 25 rpm
Painting	All (painted) components of the pump are painted following the requirements of DIN EN 60079-0:2014 (electrostatic charge). Should a new painting be required, for example, after repair or corrosion, etc., make sure to comply with the requirements of DIN EN 60079-0:2014. Carefully mask all seals before painting. Ensure that the painting is compatible with the sealing materials employed.	

¹⁾All systems parts must be designed for the maximum operating pressure. Each pump element must be secured against higher pressures using a suitable pressure control valve.

²⁾Weight depending on the equipment variant (number of pump elements, motor and gear variants, reservoir size). Further to this weight there must be added the weight of the lubricant in the reservoir and, if applicable, the weight of the base plate and of the coupling.

³⁾When planning the temperature range, additionally consider the thermally insulating dust.

4.2 Electrics:



Connection must be done in such way that a permanent, safe electrical connection can be maintained (use safe protective conductor connection and dedicated cable ends; avoid protruding wire ends). Make sure that there are no foreign particles, dirt or humidity in the terminal box. Close the terminal box dust- and watertight.

	In addition to the general valid installation prescriptions for electrical systems, the electrical connection is carried out in accordance with the respective applicable ATEX regulations, for example:		
Electrical connection	DIN EN 60079-14:2014, VDE 0165-1:2014 DIN EN 60079-17:2014 ExeV		
Tolerance of input voltage	±5 %	The waveform and mains symmetry must be maintained so that the motor heat-up remains within the permitted limits.	
Tolerance of supply voltage	±2 %		
Electrical connection ratings of the motor	See type identification plate or rating plate of the motor or corresponding part number in chapter Technical data of the motors		
IP types of protection	Gear 65	Sensors 67	Motor see Technical data of the motors
Low level indication / high level indication	The low-level signal / full signal are implemented either with one or two capacitive proximity switches, or with a float switch, depending on the equipment version.		
Minimum distance to live parts	following DIN EN 60079-7:2014 / VDE 0170-6:2014		
	Nominal voltage		Distance of motor Ex-category 2
	≤ 500 V AC		5.0 mm
	> 500 V AC ≤ 690 V AC		5.5 mm

Nominal output volumes

Pump element	K6	K7
Nominal output per pump element and stroke	0.16 cc	0.23 cc

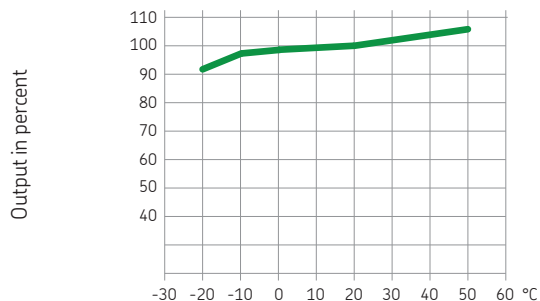
The stated nominal outputs per stroke refer to NLGI II lubricating greases at an operating temperature of + 20 °C and a backpressure of 100 bar on the pump element. Deviating operating conditions or deviating pump configuration result in a changed motor speed and thus in a change of the actual output per time unit. If as a consequence of the changed motor speed the output per time unit needs to be adapted, this will be done by adapting the lubrication and pause time settings of the pump.

4.2.1 Influencing variables on the actual output volume

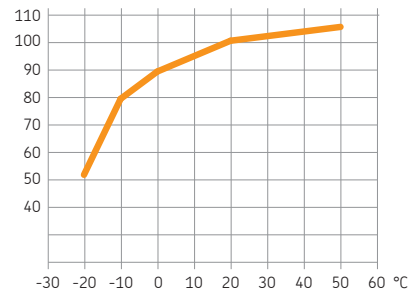
Operating temperature	> + 20 °C	↑	< + 20 °C	↓	Consistency class of lubricant	> NLGI 2	↓	< NLGI 2	↑
Number of pump elements	> 1 piece	↓			Back pressure	< 100 bar	↑	> 100 bar	↓

4.2.2 Output diagrams of typical NLGI 2 lubricants

Low temperature lubrication grease



High temperature lubrication grease



Example: high temperature grease

Nominal speed of the pump motor per minute x nominal output of the K7 pump element per stroke x efficiency in percent at an assumed operating temperature of -10 °C = 20 rpm x 0.22 cc x 80 % = 3.50 cc/min.

4.3 Tightening torques

The stated tightening torques must be adhered to.

Pump element with housing	25 Nm - 2,5 Nm
Pressure control valve	6 Nm ± 0,6 Nm
Closure screw with housing	14 Nm ± 0,1 Nm
Filling connection / return line	10 Nm ± 0,1 Nm
Lubrication fitting / adaptor for lubrication fitting	10 Nm ± 0,1 Nm
Reservoir with pump housing	8 Nm ± 0,8 Nm
Terminal box with reservoir lid	4 Nm ± 0,4 Nm
Earthing connection lid / reservoir	8 Nm ± 0,8 Nm

If no tightening torques are stated for screw connections, the tightening torques are to be applied according to the properties of 8.8 screws.

4.4 Overview of pump versions

Part number	Designation on the type identification plate	Motor	reservoir	Sensor	Ambient temperature range		Explosion protection marking
					min.	max.	
660-46690-4	P215-MG97-10XL-2K7-400 KAP.EEX	1	3	A	- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T135°C Db
660-46690-6	P215-MG97-10XL-4K7-400 KAP.EEX	1	2	A	- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T135°C Db
660-41264-1	P215-F097-10XYN-2K7 EEX		1		- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T120°C Db
660-41269-1	P215-F097-30XL-1K6KAP.EEX		4	B	- 20 °C	+ 40 °C	II 2G Ex h IIB T4 Gb II 2D Ex h IIIC T120°C Db
660-41270-1	P215-MG97-30XL-3K7-000KAP. EEX		5	A	- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T135°C Db
660-41269-2	P215-F097-30XYN-5K7 EEX		7		- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T120°C Db
660-46647-6	P215-F097-30XYN-5K7-400 GRD.PL EEX	10	7		- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T125°C Db
660-41270-2	P215-MG97-30XYN -.....-000 EEX		7		- 20 °C	+ 55 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T120°C Db
660-46776-3	P215-MG97-30XL-8K7-500 KAP.EEX	5	5	A	- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T135°C Db
660-46776-4	P215-MG97-30YLP-4K6-500 KAP.EEX	5	6	A	- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T135°C Db
660-41270-3	P215-MG97-10XL-4K6-415 KAP.EEX	4	3	A	- 20 °C	+ 55 °C	II 2G Ex h IIC T3 Gb II 2D Ex h IIIC T135°C Db
660-41270-4	P215-MG97-30XYN-2K7-480 EEX	6	7		- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T120°C Db
660-46776-8	P215-MG97-30YLP-14K6-400 KAP.EEX	1	6	A	- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T135°C Db
660-41270-6	P215-MG97-30XL-1K7-690 KAP.EEX	3	5	A	- 20 °C	+ 55 °C	II 2G Ex h IIC T3 Gb II 2D Ex h IIIC T135°C Db
660-41378-1	P215-MG97 -30XL-4K7-400 KAP.EEX	9	5	A	- 20 °C	+ 55 °C	II 2G Ex h IIC T3 Gb II 2D Ex h IIIC T135°C Db
660-41378-2	P215-MG97-30XB-3K7-400 KAP.EEX	9	9	A	- 20 °C	+ 55 °C	II 2G Ex h IIC T3 Gb II 2D Ex h IIIC T135°C Db
660-41378-3	P215-MG97-30XL-4K7-400 KAP.EEX	1	5	A	- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T135°C Db
660-41378-4	P215-MG97-10XL-1K7-400 KAP.EEX	1	2	A	- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T135°C Db
660-46776-6	P215-MG97-10XL-2K6-480 KAP.EEXVN1410	2	3	A	- 20 °C	+ 55 °C	II 2G Ex h IIC T3 Gb II 2D Ex h IIIC T135°C Db
660-46776-9	P215-MG97-10XL-1K7-400 KAP.EEXVN1410	8	3	A	- 20 °C	+ 40 °C	II 2G Ex h IIC T4 Gb II 2D Ex h IIIC T135°C Db
660-41270-5	P215-MG97-10XL-4K6-690 KAP.VA9005 EEX	7	3	A	- 20 °C	+ 55 °C	II 2G Ex h IIC T3 Gb II 2D Ex h IIIC T135°C Db



The indicated temperature range of the pump presupposes the suitability of the lubricant used for the respective actually existing ambient temperature. Using a lubricant not suitable for the actual ambient temperature may, in case of low temperatures, result in a blockade of the pump due to a too high lubricant viscosity. The ignition temperature of the lubricant must lie at least 50 K over the maximum surface temperature of the components.

Part number	Designation on the type identification plate	Motor	reservoir	Sensor	Ambient temperature range		Explosion protection marking	
					min.	max.		
660-41270-7	P215-MG97-30XL-6K7-400 KAP.EEX	9	5	A	- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT135°C Db
660-41270-8	P215-MG97-10XL-1K6-400 KAP. EEX	9	2	A	- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT135°C Db
660-41270-9	P215-MG97-10XYN-1K7-400 EEX	11	1		- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT120°C Db
660-46907-3	P215-MG97-10XL-2K6-690 KAP.EEX X	12	2	A	- 20 °C	+ 45 °C	II 2G Ex h IICT3 Gb	
660-46776-7	P215-MG97-30XL-1K7-000 KAP.EEX		8	C	- 20 °C	+ 55 °C	II 3G Ex h IICT4 Gc	II 3D Ex h IIICT120°C Dc
660-46907-1	P215-MG97-10XL-2K6- 690 KAP.EEX GEDAX	13	2	A	- 20 °C	+ 50 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT135°C Db
660-46907-7	P215-MG97-30XB -1K6-500 KAP.EEX BASF	5	9	A	- 20 °C	+ 40 °C	II 2G Ex h IICT4 Gb	II 2D Ex h IIICT135°C Db
660-46907-8	P215-MG97-30XB-1K6-500 KAP.EEX BASF	5	9	A	- 20 °C	+ 40 °C	II 2G Ex h IICT4 Gb	II 2D Ex h IIICT135°C Db
660-47157-1	P215-MG97-10XB-4K7-400 KAP.EEX	8	10	A	- 20 °C	+ 40 °C	II 2G Ex h IICT4 Gb	II 2D Ex h IIICT135°C Db
660-47157-2	P215-MG97-10XL-2K6-415 KAP.EEX N1410 7035	14	3	A	- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT135°C Db
6600-00000005	P215-MG97-10XL-2K6-500 KAP. EEX	5	2	A	- 20 °C	+ 40 °C	II 2G Ex h IICT4 Gb	II 2D Ex h IIICT135°C Db
6600-90000003	P215-MG97-10XL-2K6-400 KAP. EEX N1410 7035	15	3	A	- 20 °C	+ 55 °C	II 3G Ex h IIB T3 Gc	II 3D Ex h IIICT135°C Dc
6600-00000010	P215-MG97-10XL-6K6-415KAP.EEXVN1410	4	3	A	- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT135°C Db
6600-90000074	P215-MG97-10XB-1K7-690 KAP. SEE7032 EEX	16	11	A	- 20 °C	+ 40 °C	II 2G Ex h IICT3 Gb	
6600-00000048	P215-MG97- 10XB - 1K7-400 KAP.EEX	17	10	A	- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT135°C Db
6600-00000049	P215-MG97- 30YLP -10K6-400 KAP. EEX	18	3	A	- 20 °C	+ 40 °C	II 2G Ex h IICT4 Gb	
6600-00000055	P215-MG97-30XYN-10K7-400 KAP.EEX	17	7		- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT120°C Db
6600-00000067	P215-MG97- 10XL - 2K6-400 KAP.EEX	17	2	A	- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT135°C Db
6600-00000083	P215-MG97-30XL-4K7-400 KAP.EEX N1410	9	13	A	- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT135°C Db
6600-00000087	P215-MG97- 30XL- 3K7-400/50 KAP.SEE. EEX	20	13	A	- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT135°C Db
6600-00000088	P215-MG97- 30XL- 3K7-400/60 KAP.SEE. EEX	21	13	A	- 20 °C	+ 55 °C	II 2G Ex h IICT3 Gb	II 2D Ex h IIICT135°C Db
6600-90000132	P215-F97-.....-3K7/2K6 EEX				- 20 °C	+ 40 °C	II 2G Ex h IICT4 Gb	



The indicated temperature range of the pump presupposes the suitability of the lubricant used for the respective actually existing ambient temperature. Using a lubricant not suitable for the actual ambient temperature may, in case of low temperatures, result in a blockade of the pump due to a too high lubricant viscosity. The ignition temperature of the lubricant must lie at least 50 K over the maximum surface temperature of the components.

4.5 Technical data of motor variants



Assignment to a certain pump type, see table 4.4 Overview of pump variants

Part number	Type of motor				Manufacturer			1
245-13997-4	EDRS71S4				SEW			
Rated voltage	V	230	400	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1405	1405	rpm	Insulation class	F / B		
Nominal current	I _N	1.5	0.86	A	Flange	105		
Starting current		5.55	3.18	A	Shaft	$\varnothing 14 \times 30$	mm	
Efficiency	η	66.4		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			2
245-00100-7	EDRS71S4				SEW			
Rated voltage	V	277	480	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	60	60	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1705	1705	rpm	Insulation class	F / B		
Nominal current	I _N	0.72	0.72	A	Flange	105		
Starting current		2.88	2.88	A	Shaft	$\varnothing 14 \times 30$	mm	
Efficiency	η	72.2		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			3
245-00105-1	EDRS71S4/FT/2GD/AL				SEW			
Rated voltage	V	380-420	655-725	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1405	1405	rpm	Insulation class	F / B		
Nominal current	I _N	0.86	0.5	A	Flange	105		
Starting current		3.7 x rated current		A	Shaft	Ø 14 x 30	mm	
Efficiency	η	66		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			4
245-00104-3	EDRS71S4				SEW			
Rated voltage	V	240	415	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	60	60	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1405	1405	rpm	Insulation class	F / B		
Nominal current	I _N	1.43	0.83	A	Flange	105		
Starting current		05:29	03:07	A	Shaft	Ø 14 x 30	mm	
Efficiency	η	66.4		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			5
245-13919-9	EDRS71S4				SEW			
Rated voltage	V	290	500	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1405	1405	rpm	Insulation class	F / B		
Nominal current	I _N	1.19	0.69	A	Flange	105		
Starting current		4.40	2.55	A	Shaft	Ø 14 x 30	mm	
Efficiency	η	66.4		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			6
245-00104-4	EDRS71S4				SEW			
Rated voltage	V	277	480	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	60	60	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1705	1705	rpm	Insulation class	F / B		
Nominal current	I _N	1.24	0.72	A	Flange	105		
Starting current		4.96	2.88	A	Shaft	Ø 14 x 30	mm	
Efficiency	η	72.2		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			7
245-00104-6	EDRS71S4				SEW			
Rated voltage	V	400	690	V AC	Operating mode	S1		
Circuit		$\triangle$	Y		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1405	1405	rpm	Insulation class	F / B		
Nominal current	I _N	0.86	0.5	A	Flange	105		
Starting current		3.18	1.85	A	Shaft	$\varnothing 14 \times 30$	mm	
Efficiency	η	66.4		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			8
245-13960-9	EDRS71S4				SEW			
Rated voltage	V	230	400	V AC	Operating mode	S1		
Circuit		$\triangle$	Y		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1405	1405	rpm	Insulation class	F / B		
Nominal current	I _N	1.5	0.86	A	Flange	105		
Starting current		5.55	3.18	A	Shaft	$\varnothing 14 \times 30$	mm	
Efficiency	η	66.4		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			9
245-00104-8	EDRS71S4				SEW			
Rated voltage	V	230	400	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1405	1405	rpm	Insulation class	F / B		
Nominal current	I _N	1.5	0.86	A	Flange	105		
Starting current		5.55	3.18	A	Shaft	Ø 14 x 30 mm		
Efficiency	η	66.4		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			10
245-13997-7	M3KP80MA4				ABB			
Rated voltage	V	230	400	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B3		
Rated frequency	f	50	50	Hz	Size	80		
Rated power	P	0.55	0.55	KW	Degree of protection	IP	65	
Rated speed	n	1500	1418	rpm	Insulation class	F / B		
Nominal current	I _N	1.41	1.41	A	Flange	105		
Starting current		6.62	6.62	A	Shaft	Ø 14 x 30 mm		
Efficiency	η	75.2		%				
Performance factor	cos φ	0.71						

Part number	Type of motor				Manufacturer			11
245-00105-6	EDRS71S4				SEW			
Rated voltage	V	230	400	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	66	
Rated speed	n	1405	1405	rpm	Insulation class	F / B		
Nominal current	I _N	1.50	0.86	A	Flange	105		
Starting current		5.55	3.2	A	Shaft	Ø 14 x 30 mm		
Efficiency	η	66.4		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			12
245-00105-8	ENGV-071BS-04E				SIEMENS			
Rated voltage	V	400	690	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0.37	0.37	KW	Degree of protection	IP	56	
Rated speed	n	1395	1395	rpm	Insulation class	F / B		
Nominal current	I _N	1.50	0.86	A	Flange	105		
Starting current		4.7 x nominal current		A	Shaft	Ø 14 x 30 mm		
Efficiency	η	75		%				
Performance factor	cos φ	0.75						

Part number	Type of motor				Manufacturer			13
245-00105-3	EDRS71S4/FT/2GD/AL				SEW			
Rated voltage	V	400	690	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1405	1405	rpm	Insulation class	F / B		
Nominal current	I _N	0.86	0.5	A	Flange	105		
Starting current		3.7 x rated current		A	Shaft	Ø 14 x 30 mm		
Efficiency	η	66		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			14
245-00109-7	EDRS71S4				SEW			
Rated voltage	V	240	415	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	60	60	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1405	1405	rpm	Insulation class	F / B		
Nominal current	I _N	1.43	0.83	A	Flange	105		
Starting current		05:29	03:07	A	Shaft	Ø 14 x 30	mm	
Efficiency	η	66.4		%				
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer			15
2450-00000003	EDRN71MS4/FT/3GD/KCC/AL				SEW			
Rated voltage	V	230	400	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0.25	0.25	KW	Degree of protection	IP	65	
Rated speed	n	1400	1400	rpm	Insulation class	F / B		
Nominal current	I _N	1.41	0.81	A	Flange	105		
Starting current		5,92	3,4	A	Shaft	Ø 14 x 30 mm		
Efficiency 50/75/100 %	η	70,1 / 73,5 / 73,5		%	Efficiency class	IE3		
Performance factor	cos φ	0.67						

Part number	Type of motor				Manufacturer		16
2450-00000031	1CE3073B				SIEMENS		
Rated voltage	V	400	690	V AC	Operating mode	S1	
Circuit		$\triangle$	Υ		Design	B14	
Rated frequency	f	50	50	Hz	Size	71	
Rated power	P	0.37	0.37	KW	Degree of protection	IP	55
Rated speed	n	1400	1400	rpm	Insulation class	F / B	
Nominal current	I _N	1,02	0,59	A	Flange	105	
Starting current	4,9 x nominal current			A	Shaft	Ø 14 x 30 mm	
Efficiency 50/75/100 %	η	73.0 / 76.7 / 77.3		%	Efficiency class	IE3	
Performance factor 50/75/100 %	cos φ	0.49 / 0.63 / 0.70					

Part number	Type of motor				Manufacturer			17
2450-00000045	EDRS71MS4/FT/2GD/KCC/AL				SEW			
Rated voltage	V	220-240	380-415	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0,25	0,25	KW	Degree of protection	IP	65	
Rated speed	n	1400	1400	rpm	Insulation class	F		
Nominal current	I _N	1,41	0,81	A	Flange	105		
Starting current		4.2 x rated current		A	Shaft	Ø 14x 30	mm	
Efficiency (50/75/100%)	η	70,1 / 73,5 / 73,5		%				
Performance factor	cos φ	0,67						

Part number	Type of motor				Manufacturer			18
2450-00000043	EDRS71MS4/FT/2G/KCC/TF				SEW			
Rated voltage	V	220-240	380-415	V AC	Operating mode	S1		
Circuit		$\triangle$	Υ		Design	B14		
Rated frequency	f	50	50	Hz	Size	71		
Rated power	P	0,25	0,25	KW	Degree of protection	IP	65	
Rated speed	n	1400	1400	rpm	Insulation class	F		
Nominal current	I _N	1,41	0,81	A	Flange	105		
Starting current		4,2 x rated current		A	Shaft	Ø 14x 30	mm	
Efficiency (50/75/100%)	η	70,1 / 73,5 / 73,5		%				
Performance factor	cos φ	0,67						

Part number	Type of motor				Manufacturer			19
245-00100-3	EDRN71MS4/FT/2GD-B/KCC/TF/AL				SEW			
Rated voltage	V	266	460	VAC	Operating mode		S1	
Circuit		$\triangle$	Υ		Design		B14	
Rated frequency	f	60	60	Hz	Size		71	
Rated power	P	0,25	0,25	KW	Degree of protection		IP 65	
Rated speed	n	1700	1700	U/min	Insulation class		F	
Nominal current	I _N	1,22	0,71	A	Flange		105	
Starting current		4,5		A	Shaft		Ø 14x 30 mm	
Efficiency 50/75/100 %	η	69,2 / 73,1 / 74		%	Efficiency class		IE3	
Performance factor	cos φ	0,67						

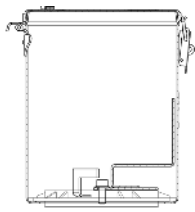
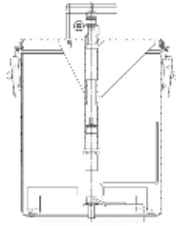
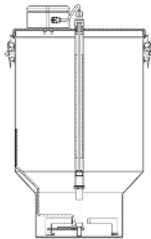
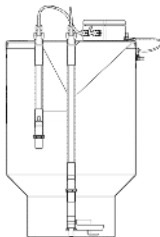
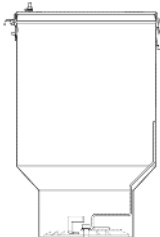
Part number	Type of motor				Manufacturer			20
2450-00000084	EDRN71MS4/FT/2GD/KCC/TF/AL				SEW			
Rated voltage	V	230	400	VAC	Operating mode		S1	
Circuit		$\triangle$	Υ		Design		B14	
Rated frequency	f	50	50	Hz	Size		71	
Rated power	P	0,25	0,25	KW	Degree of protection		IP 65	
Rated speed	n	1 400	1 400	U/min	Insulation class		F	
Nominal current	I _N	1,41	0,81	A	Flange		105	
Starting current		4,2		A	Shaft		Ø 14x 30 mm	
Efficiency 50/75/100 %	η	70,1 / 73,5 / 73,5		%				
Performance factor	cos φ	0,67						

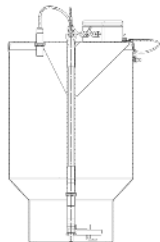
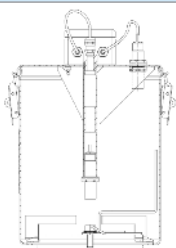
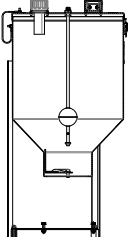
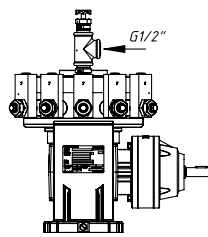
Part number	Type of motor				Manufacturer			21
2450-00000083	EDRN71MS4/FT/2GD/KCC/TF/AL				SEW			
Rated voltage	V	230	400	VAC	Operating mode		S1	
Circuit		$\triangle$	Υ		Design		B14	
Rated frequency	f	60	60	Hz	Size		71	
Rated power	P	0,25	0,25	KW	Degree of protection		IP 65	
Rated speed	n	1 700	1 700	U/min	Insulation class		F	
Nominal current	I _N	1,41	0,81	A	Flange		105	
Starting current		4,5		A	Shaft		Ø 14x 30 mm	
Efficiency 50/75/100 %	η	69,2 / 73,1 / 74,0			%			
Performance factor	cos φ	0,67						

4.6 Reservoir versions



Assignment to a certain pump type, see table 4.4 Overview of pump variants

10 XYN		10 XL		30 XL		30 YLP		30 XYN	
									
No.	Part number	No.	Part number	No.	Part number	No.	Part number	No.	Part number
1	660-77404-1	2	660-46720-1	4	660-46720-4	6	660-46308-1	7	660-77423-1
		3	660-46720-2	5	660-46611-9				
				8	660-46808-4				
				13	5600-00000141				

30 XB		10 XB		100 YB		Pump without reservoir
						
No.	Part number	No.	Part number	No.	Part number	
9	660-78133-1	10	660-46720-3	12	5600-00000121	
		11	5600-00000076			

4.7 Capacitive sensors

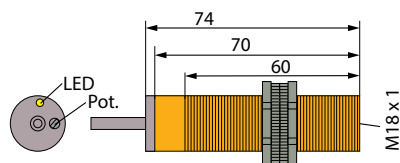


Assignment to a certain pump type, see table 4.4 Overview of pump variants

Part numbers 664-34621-2 (aligned for grease) / 664-34621-5 (aligned for oil)

A

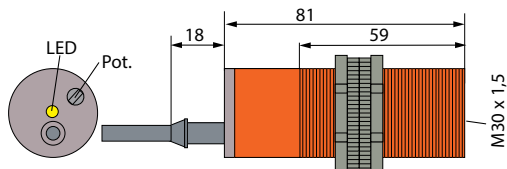
Rated operating distance S_n			
flush installation	5 mm	Explosion protection marking	II 2G Ex ia IIC T6 Gb
non-flush installation	7.5 mm		II 1D Ex ia IIC IP 67 T 135 °C Da
Secured switching distance	(0.72 x S_n) mm	Design	Threaded tube M 18 x 1
Hysteresis	1.....20 %	Dimensions	74 mm
Temperature drift	$\leq \pm 20$ %	Housing material	Plastic PA12-GF30
Repeatability	≤ 2 %	Material of active surface	Plastic PA12-GF30
Ambient temperature	-25 °C - +70 °C	Admissible pressure onto front cap	≤ 6 bar
Voltage	nominal 8.2 VDC	Max. tightening torque of housing nut	2 Nm
Current consumption, not activated	≤ 1.2 mA	Connection	Cable
Current consumption, activated	≥ 2.1 mA	Cable quality	Ø 5.2 LiYY, PVC, 2 m
Switching frequency	0.1 kHz	Cable cross section	2 x 0.34 mm ²
Output function	2-wire NAMUR	Vibration resistance	55 Hz (1mm)
Internal capacity (Ci)	150 nF	Shock resistance	30 g (11ms)
Inductivity (Li)	150 µH	Degree of protection	IP 67
Approvals	KEMA 02 ATEX 1090X	MTTF	448 years following SN 29500 40 °C
Fine adjustment	Potentiometer	Switching status display	LED, yellow



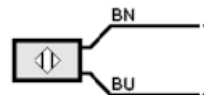
Connection diagram



Part number	664-34621-4 (aligned for grease)			B
Installation	flush installation	Explosion protection marking	II 2G Ex ia IIC T6 Ga	
Rated switching distance	15 mm (adjustable)		II 1D Ex ia IIIC T 90 °C Da	
Secured switching distance (Sr)	15 mm ± 10 %	Design	Plastic thread M30 x 1,5	
Hysteresis	1.....15 %	Dimensions	99 mm	
Temperature drift	≤ ± 15 %	Housing material	PBT	
Repeatability	≤ 2 %	Connection	Cable	
Ambient temperature	-20 °C - +60 °C	Cable quality	PVC, 2 m	
Voltage	8.2 V DC (1 kΩ)	Cable cross section	2 x 0.5 mm ²	
Current consumption, not activated	≤ 1 mA	Degree of protection	IP 65	
Current consumption, activated	≥ 2.2 mA	MTTF	841 years	
Switching frequency	0.04 kHz	Switching status display	LED, yellow	
Output function	2-wire NAMUR	Fine adjustment	Potentiometer	
Internal capacity (Ci)	375 nF	Inductivity (Li)	1 μH	
Approvals	DMT 01 ATEX E 020 / TIIS TC15627 / IECEx BVS 06.0003			



Connection diagram

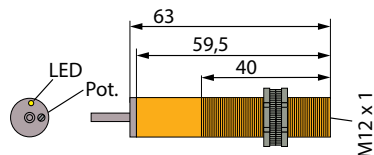


Connection only to certified intrinsically safe circuits with maximum values
 $U = 15 \text{ V} / I = 50 \text{ mA} / P 0.120 \text{ mW}$

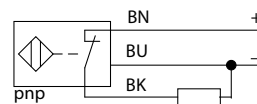
Part numbers 664-34621-6 (aligned for grease)

C

Rated operating distance S_n			
flush installation	3 mm	Explosion protection marking	II 3G Ex nA IICT5 Gc
non-flush installation	4,5 mm		II 3D Ex t IIIC T 91 °C Dc
Secured switching distance	$\leq (0,72 \times S_n) \text{ mm}$	Design	Threaded tube M 12 x 1
Hysteresis	2.....20 %	Dimensions	63 mm
Temperature drift	typ. $\pm 20 \%$	Housing material	Plastic PA
Repeatability	$\leq 2 \%$	Material of active surface	Plastic PA
Ambient temperature	-25 °C - +70 °C	Admissible pressure onto front cap	$\leq 8 \text{ bar}$
Voltage	10...30 V DC	Max. tightening torque of housing nut	1 Nm
No-load current	$\leq 15 \text{ mA}$	Connection	Cable
Residual current	$\leq 0,1 \text{ mA}$	Cable quality	$\varnothing 5,2 \text{ LiYY-11Y, PUR, 2 m}$
Switching frequency	0,1 kHz	Cable cross section	$3 \times 0,34 \text{ mm}^2$
Output function	3-wire, NC contact, PNP	Vibration resistance	55 Hz (1mm)
Short-circuit protection	Yes, clocking	Shock resistance	30 g (11ms)
Wire breaks protection/ reverse polarity protection	Yes / Complete	Degree of protection	IP 67
Approvals	TURCK Ex-03025HX	MTTF	1080 years following SN 29500 40 °C
Fine adjustment	Potentiometer	Switching status display	LED, yellow
Residual ripple	$\leq 10 \% U_{ss}$	DC rated operating current	$\leq 200 \text{ mA}$
Isolation test voltage	$\leq 0,5 \text{ kV}$	Voltage drop at I_e	$\leq 1,8 \text{ V}$



Connection diagram



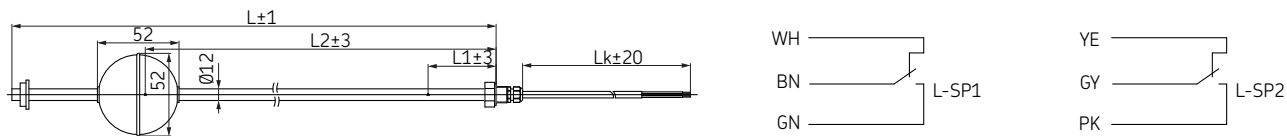
4.8 Float switch

Item numbers 2340-00000174 (calibrated for oil)

D

Type	Float switch	Explosion protection marking	II 1/2G, Ex ia IIC T3-T6 Ga/Gb
Contact type	2 changeover contacts		II 2D Ex ib IIIC T85°C - T150°C Db
Length of guide tube	600 mm		
Switching voltage	30 V		
Switched current	100 mA		
Switching capacity	0.9 W		
Ambient temperature	-20 °C to +80 °C		
Degree of protection	IP 67		
Cable length	2 m		
Float	Ball float Ø 52 mm		

Connection diagram



5. Delivery, returns, and storage

5.1 Delivery

After receipt of the shipment, check the shipment for damage and completeness according to the shipping documents. Immediately report any transport damages to the forwarding agent.

Keep the packaging material until any discrepancies are resolved. During in-house transport ensure safe handling.

5.2 Returns

Clean all parts and pack them properly (i.e. following the regulations of the recipient country) before returning them. Protect the product against mechanical influences such as impacts. There are no restrictions for land, sea or air transport. Mark returns on the packaging as follows.



5.3 Storage



Before application inspect the products with regard to possible damages occurred during their storage. This particularly applies for parts made out of plastic and rubber (embrittlement) as well as for components primed with lubricant (ageing).

SKF products are subject to the following storage conditions:

- the admissible storage temperature range corresponds to that of the operating temperature (see Technical data)
- dry, dust- and vibration-free in closed premises
- no corrosive, aggressive materials at the place of storage (e. g. UV rays, ozone)
- protected against pests and animals
- in the original product packaging
- shielded from nearby sources of heat and coldness
- in case of high temperature fluctuations or high humidity take adequate measures (e. g. heater) to prevent the formation of condensation water.

5.3.1 Corrosion protection

The corrosion protection (e. g. on the inside of the reservoir) should be verified and renewed every 6 - 12 months corresponding to the conditions at the place of storage.

We recommend:

- Henkel Teroson FLuid DS 150 ML VE 12
- OKS 450 chain and adhesive lubricating oil

5.3.2 Special storage conditions of the motor

- Do not store the motor on the fan cover.
- After a longer period of storage, make sure to check the insulation resistance of the motor.
- In case of a storage > 1 year make sure to consider the bearing grease's service life that will be reduced by 10% per year.

5.4 Special storage conditions for parts primed with lubricant

The conditions mentioned in the following will have to be adhered to when storing products primed with lubricant,

5.4.1 Storage period of up to 6 months

The primed products can be used without having to take further measures.

5.4.2 Storage period from 6 to 18 months

Pump

- Connect the pump electrically.
- Switch the pump on and let it run until about 4 cc of lubricant will leak from each pump element.
- Switch the pump off and disconnect it from the electrical grid.
- Remove and dispose of leaked lubricant.

Metering device

- Remove all connection lines and closure screws, if any.
- Connect the pump primed with new lubrication grease suitable for the application purpose to the divider bar in such way that the opposite port of the divider bar remains open.
- Let the pump run until new lubricant leaks from the divider bar.
- Remove leaked lubricant.
- Reinstall closure screws and connection lines.

Lines

- Dismantle preassembled lines.
- Ensure that both line ends remain open.
- Prime lines with new lubricant.

5.4.3 Storage period exceeding 18 months

To avoid dysfunctions consult the manufacturer before commissioning. The general procedure to remove the old grease filling corresponds to that of a storage period from 6 to 18 months.

6. Installation

6.1 General information

Only qualified technical personnel may install the products described in these Instructions.

During assembly pay attention to the following:

- Other units must not be damaged by the assembly.
- The product must not be installed within the range of moving parts.
- The product must be installed at an adequate distance from sources of heat and coldness.
- Observe the product's IP type of protection.
- Adhere to safety distances and legal prescriptions on assembly and prevention of accidents.

- Possibly existing visual monitoring devices, e.g. pressure gauges, MIN/MAX markings or piston detectors, must be clearly visible.
- Observe prescriptions in the Technical data (chapter 4) regarding the installation position.

	 WARNING
	Risk of explosion When carrying out installation works on explosion-protected machines, observe the legal and operational prescriptions. If the works are not carried out by the manufacturer, authorized and qualified personnel only is allowed to carry out such works. Works then have to be reviewed by a qualified and officially recognised person. Any installation work may be carried out only provided there is no explosive atmosphere at the place of installation.

6.2 Place of installation

Protect the product against humidity, dust and vibrations and install it in an easily accessible position to facilitate other installation and maintenance works.

6.3 Mechanical connection

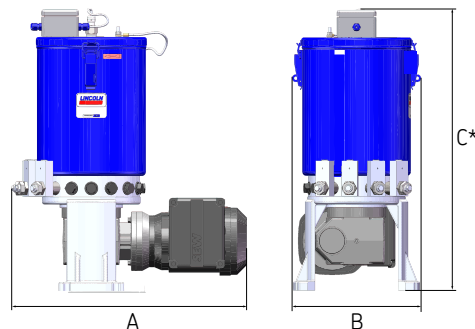
6.3.1 Minimum assembly dimensions

Ensure sufficient space for maintenance or repair work or for assembly of further components of the centralized lubrication system by leaving a free space of at least 100 mm into each direction in addition to the stated dimensions.



The distance between the motors' air intakes and any obstacle must total to at least 40 mm. Ensure that the air can flow into the motor without hindrance. Out-flowing air must not be sucked in again directly.

Minimum assembly dimensions Fig. 4



reservoir	SEW motor			ABB motor			SIEMENS motor			Without motor		
	A Width (mm)	B Depth (mm)	C# Height (mm)	A Width (mm)	B Depth (mm)	C# Height (mm)	A Width (mm)	B Depth (mm)	C# Height (mm)	A Width (mm)	B Depth (mm)	C# Height (mm)
10 XYN										360	260	545
10 XL	480	260	580				550	260	580			
10 XB												
30 XYN	485	330	780	800*	600*	900*				330	325	780
30 XL	485	330	815							380	325	815
30 YLP	485	330	815									
30 XB	485	330	815									
100 YB	630	580	1111									

additional free space requirement to remove the reservoir lid upwards = 190 mm

* with base plate

6.3.2 Installation bores

NOTICE**Damage to the pump**

Fastening may not be done on two parts moving against one another (machine bed and machine assembly).

The product is fastened to the 4 mounting bores (7). Drill the mounting bores on non load-bearing parts only.

Fastening is done by means of:

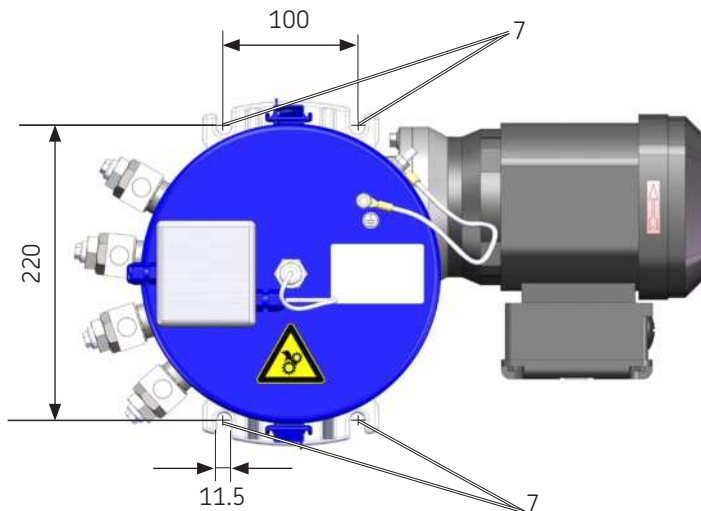
4 x screw M10 (screw strength class 8.8)

4 x hex nut M10

4 x washer 10C

Tightening torque = 30 Nm $\pm$ 3 Nm

Installation bores Fig. 5



6.3.3 Pump to base plate

NOTICE**Damage to the pump**

Fastening may not be done on two parts moving against one another (machine bed and machine assembly).

The product is fastened to the 4 mounting bores (7). Drill the mounting bores on non load-bearing parts only.

Fastening is done by means of:

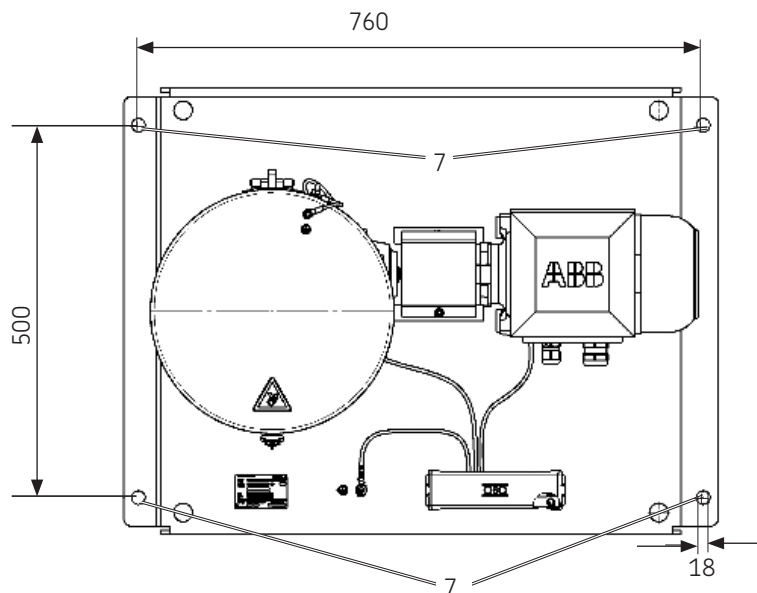
4 x screw M16 (screw strength class 8.8)

4 x hex nut M16

4 x washer 16C

Tightening torque = $100 \text{ Nm} \pm 10 \text{ Nm}$

Installation bores Fig. 6



6.3.4 Pump with 100 l reservoir

NOTICE**Damage to the pump**

Do not mount on two parts that move in opposite directions to one another (such as the machine base and machine superstructure).

The product is secured at the 3 mounting points (7). Drill the required mounting holes only on non-load-bearing parts.

Mounting requires the following:

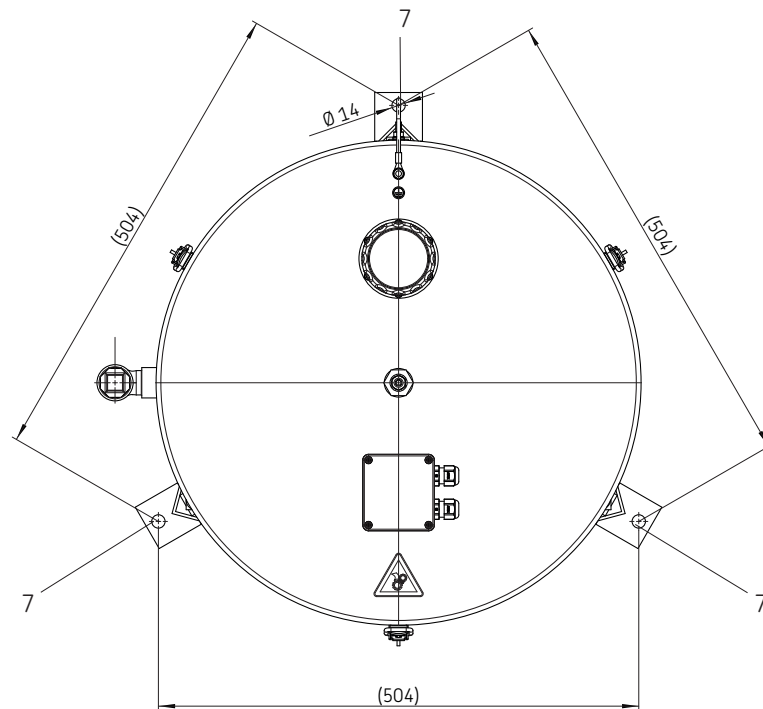
3x M16 screws (strength class 8.8)

3x M16 hexagon nuts

3x 16C washers

Tightening torque = 100 Nm $\pm$ 10 Nm

Mounting holes, Fig. 7



6.4 Electrical connection ratings of the motor



WARNING



Electric shock

Make sure to disconnect the product from the power supply before carrying out any works on electrical components.



WARNING



Risk of explosion

Connect the product to the equipotential bonding of the superior machine. Check the electrical continuity before the initial start-up.

Electrical connection of the motor follows the indications on the connection diagram in the terminal box (8) of the motor.

Electrical connection, Fig. 7



6.5 Protective conductor connection of SEW motors

To connect the protective conductor in the terminal box (8) of the motor use a cable lug. The cable lug and the motor housing must be separated by means of a washer (9).

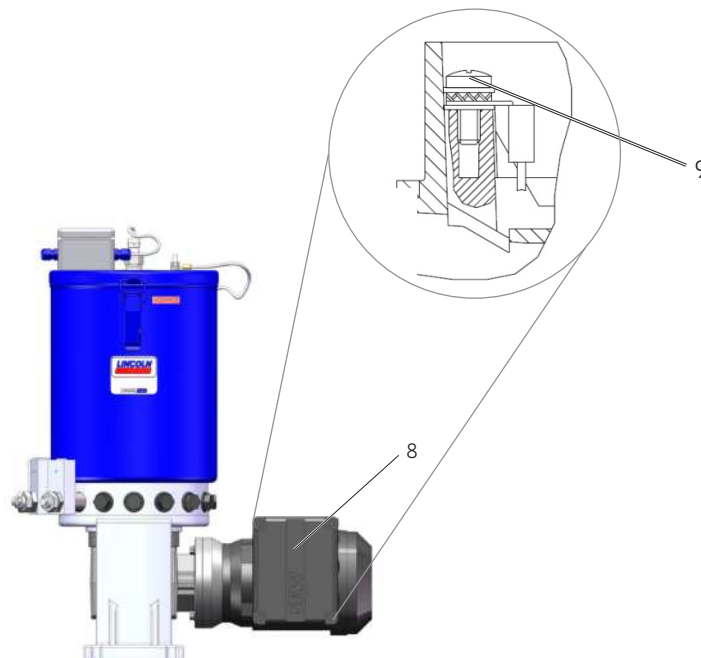


Connect the cables in such way that no mechanical forces are transferred to the product.

6.6 Electrical connection of the low-level indication

Electrical connection of the low-level indication follows the respective technical data of the sensor in these instructions. In addition, indications regarding the switch amplifier and, if applicable, those of other devices to be connected by the operator have to be observed.

Correct connection of the protective conductor in the terminal box Fig. 8



6.7 Lubrication line connection

	CAUTION
	Risk of falling Exercise care when dealing with lubricants. Immediately absorb and remove any leaked lubricant.



Connect lubrication lines in such way that no forces are transferred to the product (tension-free connection).

All components of the centralized lubrication system must be laid out for:

- the maximum arising pressure
- the admissible temperature range
- the output volume and the lubricant to be supplied



Protect the centralized lubrication system against too high pressure by means of a suitable pressure relief valve.

Observe the following installation instructions for safe and smooth operation.

- Use clean components and primed lubrication lines only.
- The main lubrication line should be laid preferably rising with a possibility to vent it at its highest point. Lubrication lines shall generally be laid in such way that there can never be created air pockets at any point.
- Mount the lubricant metering devices at the end of the main lubrication line in such way that the outlets of the lubricant metering devices show upwards.
- If lubricant metering devices have to be mounted below the main lubrication line, then this should not be done at the end of the main lubrication line.
- The lubricant flow should not be impeded by the installation of sharp elbows, angle valves, gaskets protruding to the inside, or cross-section changes (big to small). Provide unavoidable changes of the cross sections in the lubrication lines with as smooth transitions as possible.
- Use grounded steel tube lines only.

6.8 Adjusting the output volume on the pump element



The output of the pump elements can be modified also during pump operation.

To set the output volume proceed as follows:

- Loosen the counter nut (10).
- Adjust the output volume by screwing the spindle (11) according to the following table.
- After adjusting the output volume, retighten the counter nut (10).

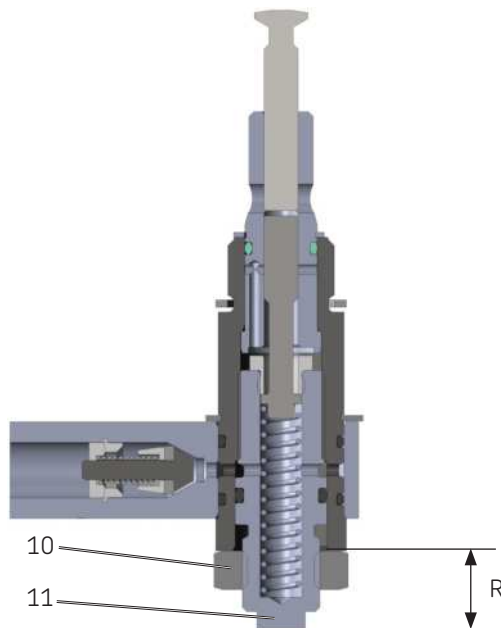
Tightening torque = 15 Nm $\pm$ 1 Nm

	=	lower output volume
	=	higher output volume

Measure R states the approximate flow rate,

R	=	22	mm	Full supply
R	=	20.5	mm	75 % supply
R	=	19.0	mm	50 % supply
R	=	17.5	mm	25 % supply

Adjusting the output volume on the pump element Fig. 9



6.9 Filling with lubricant

	 WARNING
Risk of explosion The ignition temperature of the lubricant must lie at least 50 K over the maximum surface temperature of the components. Connect the filler pump to the equipotential bonding of the pump in case of filling through a filling port. Filling is allowed only, if there is no explosive atmosphere.	

6.9.1 Filling via the reservoir lid

	 WARNING
Hand injuries caused by the stirring paddle Fill lubricant via the lid only when the pump is not moving. Never reach into the reservoir while the pump is running.	

- Switch the pump off.
- Open the reservoir lid (1).
- Ensure that no dirt enters the reservoir or the inner side of the reservoir lid. In case of reservoirs equipped with a sensor, the sensor must not be damaged or contaminated.
- Fill in lubricant up to a maximum of 1 cm below the reservoir rim.
- Reposition and close the reservoir lid (1). Make sure not to crush the grounding cable.

6.9.2 Filling via filling port

Automatic filling

The filler pump is controlled by the pump's high-/ low-level indication.

Manual filling:

Connect filling pump to filling adapter.

- Open the reservoir lid.
- Switch the filling pump on.
- Fill in lubricant up to a maximum of 1 cm below the reservoir rim.
- Switch off and remove the filling pump.
- Switch the pump on.

6.9.3 Inadvertent filling with incorrect lubricant

Should incorrect lubricant have been filled, please proceed as follows:

- Switch off the pump and secure it against being switched on.
- Remove the lubricant from the reservoir.
- Loosen lubricant lines from the pump elements.
- Switch on the pump and let it run until the wrong lubricant has been fully supplied.
- Switch off the pump and secure it against being switched on.
- Fill reservoir with lubricant of correct specification.
- Switch on the pump and let it run until correct lubricant leaks from the pump elements.
- Switch off the pump and secure it against being switched on.
- Reconnect the lubricant lines
- Switch the pump on again.
- Inform your superior to ensure that the error won't occur again.

7. Initial start-up

In order to warrant safety and function, a person assigned by the operator must carry out the following inspections. Remedy detected defects before the initial start-up. Deficiencies may be remedied by an authorized and qualified specialist only.

Checklist – Inspections prior to the initial start-up

7.1 Inspections prior to initial start-up

YES NO

Electrics

Electrical connection of the motor carried out correctly following the connection diagram in the terminal box.	☐	☐
Cable ducts of terminal box carried out and sealed professionally.	☐	☐
The voltage and frequency of the power network correspond to the information on the type identification plate / rating plate of the motor.	☐	☐
Equipotential bonding fully present, properly connected and electrically conductive	☐	☐
Possibly existing monitoring devices and additional equipment (e.g. motor circuit breaker) are correctly connected and adjusted.	☐	☐

Mechanics:

Mechanical connection of the pump and the base carried out correctly	☐	☐
Minimum distance of parts to the air inlet of the motor has been observed. No loose parts remaining in the suction area of the motor	☐	☐
Supply lines and lubrication points primed in order to avoid damages to the superior machine.	☐	☐
All components, such as lubrication lines and metering devices, have been correctly installed	☐	☐
Product protected with adequate pressure relief valve	☐	☐
No visible damages, contamination and corrosion. Painting of pump is not damaged	☐	☐
No dust accumulations > 5 mm existing	☐	☐
Any dismantled protection and monitoring equipment has been reassembled and checked for correct function	☐	☐
The lubricant used corresponds to the planned lubricant.	☐	☐
The lubricant used is free from contaminations and air inclusions	☐	☐

Check list - Inspections during the initial start-up

7.2 Inspections during initial start-up

	YES	NO
No unusual noises, vibrations, accumulation of moisture, or odours present	☐	☐
No smoke or smouldering spots	☐	☐
No unwanted escape of lubricant from connections (leakages).	☐	☐
Lubricant is supplied free from bubbles	☐	☐
Bearings and friction points are provided with the planned amount of lubricant	☐	☐

8. Operation

SKF products operate automatically to the greatest possible extent.

Basically, activities during standard operation are limited to the control of the filling level and the timely refilling of lubricant as well as the outside cleaning of the product in case of contamination.

8.1 Activation of the pump

The pump is activated:

- by switching on the machine contact
- by a control provided by the customer

8.2 Refill lubricant

Description, see chapter Filling with lubricant

9. Cleaning

	 WARNING
  	Risk of electric shock, fire and explosion Risk of fire and explosion when using inflammable cleaning agents. Carry out cleaning works only on depressurized products that have been disconnected from the power supply. Do not touch cables or electrical components with wet or damp hands. Use steam-jet cleaners or high-pressure cleaners only in accordance with the IP protection class of the product. Otherwise electrical components may be damaged. Performance of cleaning, required personal protective equipment, cleaning agents and devices following the valid operational regulations of the operator.

9.1 Cleaning agents

Cleaning agents compatible with the material may be used only (materials, see chapter 2.3).



Thoroughly remove residues of cleaning agents from the product and rinse off with clear water.

9.2 Exterior cleaning



Make sure to keep the reservoir closed during the cleaning procedure.

- Mark and secure wet areas.
- Keep unauthorized persons away.
- Thorough cleaning of all outer surfaces with a damp cloth.

9.3 Interior cleaning

Normally, interior cleaning is not required. Should incorrect or contaminated lubricant have been filled, inside cleaning of the product will be required. To do so, contact the SKF Customer Service.

9.4 Cleaning of capacitive sensors

If the active sensor face is contaminated with lubricant, clean it with a cloth.

10. Maintenance

	 WARNING
	Risk of explosion Inspections and maintenance of electrical equipment in explosive atmospheres may be carried out following the criteria of IEC/EN 60079-17 only. If the works are not carried out by the manufacturer, authorized and qualified personnel only is allowed to carry out such works. Works then have to be reviewed by a qualified and officially recognised person. Before starting any work on the motor or on the driven components make sure to switch off and block the motor. Carry out work on electrical parts only, if the atmosphere is not potentially explosive.

Regular and appropriate maintenance is a prerequisite to detect and clear faults in time. As it is not possible for us to exactly define the operating conditions, we cannot indicate any definite deadlines. The specific timelines have to be determined, verified at regular intervals and adapted, if necessary, by the operator based on the local operating conditions. If needed, copy the table "Maintenance check list" for regular maintenance activities.

10.1 Pump maintenance

Checklist pump maintenance

Activity to be done	YES	NO
Electrical connection carried out correctly	☐	☐
Mechanical connection carried out correctly	☐	☐
The performance data of the previously indicated connections correspond to the specifications stated in the Technical data	☐	☐
All components, such as lubrication lines and metering devices, have been correctly installed	☐	☐
Product protected with adequate pressure relief valve	☐	☐
No visible damage, contamination and corrosion	☐	☐
Any dismantled protection and monitoring equipment has been reassembled and checked for correct function	☐	☐
All warning labels on the product are available and in proper condition	☐	☐
No unusual noises, vibrations, accumulation of moisture, or odours present	☐	☐
No unwanted escape of lubricant from connections	☐	☐
Lubricant is supplied free from bubbles	☐	☐
Bearings and friction points are provided with the planned amount of lubricant	☐	☐
Painting complete, no parts of painting missing.	☐	☐
Protective conductor system fully present, properly connected and electrically conductive.	☐	☐
No dust accumulations present.	☐	☐

10.2 Maintenance of gear unit

Check list maintenance of Reh fuss gear

Activity to be done	Interval / deadline
Visual check for leakages	Every 3,000 hours, but at least once a year
Visual check for damage of the surface protection/ corrosion protection	Depending on the type of application and ambient conditions

For further relevant information on maintenance, see original Instructions by the gear manufacturer.

10.3 Cleaning of capacitive sensors

The capacitive sensors are maintenance-free.

10.4 Maintenance of float switch

The float switch is virtually maintenance-free.

10.5 Motor maintenance

10.5.1 Measurement of the insulation resistance

	WARNING
	Electric shock Do not touch the terminals when measuring the insulation resistance. Wear insulating gloves. Observe the manual of the insulation measurement device.

NOTICE

Risk of damage to the motor

The voltage applied for the insulation test must not exceed 500 V.

Before the first start-up and after longer downtimes measure the insulation resistance following the standards (e. g. VDE 0100 / DIN EN 61557-1:2007) valid in the country of use.

If the insulation resistance falls below the required minimum value, determine and eliminate the cause (e.g. appropriate drying of the coil, etc.).

10.5.2 SEW motor maintenance

Checklist maintenance of SEW motor

Activity to be done	Interval / deadline
Inspection of the cooling air ways of the motor with regard to contamination	Every 4 weeks Depending on the local contamination load significantly shorter intervals may be required
Check condensation water and, if any, drain off If necessary, dry winding	Interval depends on climatic conditions at the place of use, should be carried out at the latest, however, in the frame of the main inspection
Re-lubricate motor bearing	Can be omitted as the motor bearings are lifetime-lubricated
Main inspection	Every 1000 operating hours or once a year: ○ Check rolling bearing and replace, if necessary ○ Change radial sealing ring ○ Clean cooling airways

For further relevant information on maintenance, see original Instructions by the gear manufacturer.

10.5.3 ABB motor maintenance

Checklist maintenance of ABB motor

Activity to be done		Interval / deadline		
Inspection of the cooling air ways of the motor with regard to contamination		Every 4 weeks. Depending on the local contamination load significantly shorter intervals may be required		
Check condensation water and, if any, drain off		Interval depends on climatic conditions at the place of use, should be carried out at the latest, however, in the frame of the main inspection		
If necessary, dry winding				
Re-lubricate motor bearing	2-pol	Operating hours at 25 °C 100,000	Operating hours at 40 °C 65,000	
	4-8 pol	100,000	96,000	
Recommended lubricating grease	Mobil	Unirex N2 or N3	Lubcon	Turmogrease L802 EP Plus
	Shell	Gadus S5 V 100 2	Total	Multiplex S2 A
	Klüber	Klüberplex BEM 41-132	Rhenus	Renus LKZ 2
Main inspection		Every 1000 operating hours or once a year: ○ Check rolling bearing and replace, if necessary ○ Change radial sealing ring ○ Clean cooling airways		
Lubrication		If the machine has been provided with an information sign for lubrication, the values stated there must be adhered to. During initial start or after a bearing lubrication a temporary rise in temperature may occur for about 10 to 20 hours. After relubrication make sure to clean the motor and the bearing plates		
For further relevant information on maintenance, see original Instructions by the gear manufacturer.				

10.5.4 SIEMENS motor maintenance

Check list - maintenance of Siemens motor

Activity to be done		Interval / deadline										
Inspection of the cooling air ways of the motor		To be determined by the owner depending on the level of contamination at the place of use										
Check condensation water and, if any, drain off		Interval depends on climatic conditions at the place of use, should be carried out at the latest, however, in the frame of the main inspection										
If necessary, dry winding												
A	Initial inspection	500 operating hours, at the latest after one year				C	= during operation	A	B	C	D	
B	Main inspection	16,000 operating hours, at the latest after two years				D	= during downtime					
The electrical characteristics are adhered to									X	X	X	
The admissible temperatures at the bearings are not exceeded									X	X	X	
No damages, e.g. cracks, visible on the base plate									X	X	X	X
All fastening screws have been firmly tightened, potential- and grounding connections have been mounted correctly and are electrically conductive										X		X
Check isolation resistance of the winding, if necessary, drain condensation water and check winding										X		X
Lines and isolation parts are in proper conditions and do not show any discolourations										X		X
The painting is undamaged										X		X
Relubrication intervals of the roller bearings												
The relubrication intervals and the type of grease are stated on the lubrication plate of the motor. Independent of the operating hours the roller bearings have to be relubricated at least once a year. The space for waste grease has been designed for a calculated service life of the roller bearings of 40,000 operating hours.												
Initial filling		Alternative										
Gadus S2 V100 3		SKF LGMT 3; Aral Aralube HL3; BP Energrease LS3; Mobilux EP3; OMV Signum L3; Optimo Olista Longtime 3										
Gadus S5 V100 2		Exxon Mobil Mobilith SHC 100										
Gadus S3 T100 2		SKF LGHP2; BP Energrease SY2202; Castrol Firetemp XT2; Chevron Grease SRI2; Klüber Petamo GHY133N										
Unirex N3		Exxon Mobil Mobilgrease XHP 103; Shell Gadus S5 V100 2										
For further relevant information on maintenance and the inspections required, see original Instructions by the manufacturer.												

10.5.5 Maintenance of the BoWex coupling

	 WARNING
Risk of explosion When exceeding the wear limits proper operation in terms of explosion protection cannot be ensured any more. Therefore the system must be shut down immediately.	

The first inspection of the torsional backlash must take place at the latest after 2,000 operating hours or after 3 months. If only little or no wear is detected and provided the operating conditions remain the same, the next inspection must take place after 4,000 operating hours or 12 months. In case of deviating operating conditions the next inspection will have to take place after 2,000 operating hours or after 3 months at the latest.



During inspection make sure not to move the sleeve out of the wear position.

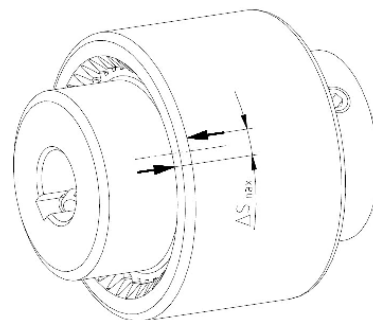
Check drive end

- Turn the hub against the driving direction.
- Mark the sleeve and hub.
- Turn the hub in the driving direction and measure the torsional backlash $\Delta s_{\max}$.

Check driven end

- Turn the hub in the driving direction.
- Mark the sleeve and hub.
- Turn the hub against the driving direction and measure the torsional backlash $\Delta s_{\max}$.

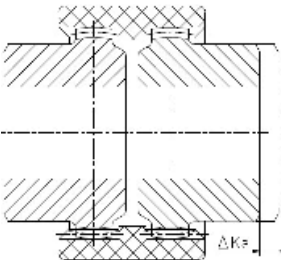
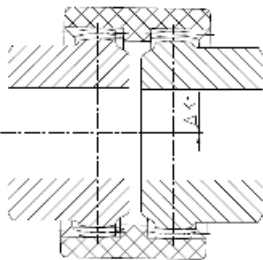
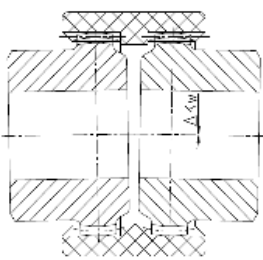
Wear test BoWex coupling Fig. 10



$\Delta s_{\max} = 1.5 \text{ mm}$

If an increased wear is detected, change the sleeve and verify the correct installation following the indications of the following table. Protect all set screws, hub and screw connections against unintended loosening, e.g. with Loctite (medium strength).

Wear test BoWex coupling Fig. 11

Maximum axial displacement	Maximum radial displacement	Maximum angular displacement
		
$\Delta K_a \pm 1 \text{ mm}$	Speed $n = 1500 \text{ rpm}$ $\Delta K_r = \pm 0.35 \text{ mm}$	Speed $n = 1500 \text{ rpm}$ $\Delta K_w = \pm 0.9 \text{ mm}$
	Speed $n = 3000 \text{ rpm}$ $\Delta K_r = \pm 0.23 \text{ mm}$	Speed $n = 3000 \text{ rpm}$ $\Delta K_w = \pm 0.6 \text{ mm}$

11. Troubleshooting

Fault table of pump

Fault	Possible cause	Remedy
No supply	Reservoir empty	Check visually, refill if necessary.
Bad suction behaviour Little pressurization	Air bubbles in the lubricant	Vent
	Suction bore of pump element is clogged.	Disassemble and clean the pump elements.
	Inappropriate lubricant	Check and, if necessary, use a different type of lubricant.
	Defective or dirty check valve	Replace check valve.
	Worn pump element	Replace the pump element
	Too high viscosity of the lubricant	Lubricant is not suitable for the present temperature range. Use suitable lubricant only.
Lubricant leaking from the pressure relief valve	Defective pressure relief valve/ fault at the lubrication point / blockade in the downstream lubrication system	Determine cause. Replace pressure control valve

Fault table of the Reh fuss gear

Fault	Possible cause	Remedy
Constant unusual running noise	Bearing damage (grinding noise)	Check oil and oil level, if required, change bearing Consult the manufacturer
	Irregular toothing (knocking noise)	Consult the manufacturer
Inconstant unusual running noise	Foreign particle in the gear oil	Check oil and oil level (see original instructions of the gear manufacturer) Consult the manufacturer
Oil / grease leaking from shaft seal#	Defective seal	Consult the manufacturer
Oil leaking from vent valve	Too much oil in the gear; vent valve dirty; frequent cold starts (foaming oil)	Consult the manufacturer
Output shaft does not rotate although motor is on	Defective shaft-hub joint	Send gear to manufacturer for repair

For further relevant information on maintenance, see original Instructions by the gear manufacturer.

Document number, see chapter: Other applicable documents

Oil/ grease leaking from the radial sealing ring (small quantities) during the run-in phase (24 hours runtime) is deemed normal (DIN 3761).

Fault table of SEW motor

Fault	Possible cause	Remedy
Motor does not start	Feed line interrupted	Check and correct connections, if necessary.
	Blown fuse	Replace fuse
	Motor circuit breaker has responded	Check correct adjustment of motor circuit breaker. If necessary, remedy the fault
	Motor circuit breaker does not switch; fault in the control program.	Check control program of motor circuit breaker and, if necessary, remedy the fault
Motor is hard to start	Motor has been designed for delta connection, but has been wired to star connection	Correct the wiring
	Voltage or frequency largely differ from the target value at least when starting the motor	Provide better grid conditions; check cross section of the feed line
Motor does not start in the star connection, but in the delta connection only	In case of star connection torque is not sufficient	Provided the delta starting current is not too high, immediately switch the motor on. Otherwise use larger motor or special version (after consultation)
	Contact fault on star respectively delta connection	Remedy the fault
Wrong direction of motor rotation	Motor connected wrongly	Reverse two phases
Motor hums and has a high power consumption	Defective winding	Consult the manufacturer. Motor must be sent to the workshop for repair
	Rotor touches	
Fuse is tripped or motor circuit breaker trips immediately	Short circuit in the line	Remedy the short circuit
	Short circuit in the motor	Consult the manufacturer. Motor must be sent to the workshop for repair
	Lines connected wrongly	Correct the wiring
	Short circuit on the motor	Consult the manufacturer. Motor must be sent to the workshop for repair

Fault table of SEW motor

Fault	Possible cause	Remedy
Speed decreasing significantly in case of load	Overload	Measure performance, if necessary, use larger motor or reduce load
	Voltage drops out	Increase cross section of feed line
Motor heats up too much (measure the temperature)	Overload	Measure performance, if necessary, use larger motor or reduce load
	Insufficient cooling	Correct cooling air supply or open cooling air ways, if necessary, retrofit external fan
	Ambient temperature is too high	Observe admissible temperature range
	Motor is wired to delta connection instead of planned star connection	Correct the wiring
	Feed line has a loose contact (one phase is missing)	Remedy the loose contact
	Blown fuse	Search the cause and remedy (see above); replace fuse
	Main s voltage deviates by more than 5 % from the rated motor voltage. Higher voltage is very unfavourable in case of high-pole motors, as in case of a normal voltage their no-load current is already close to the rated current.	Adapt the motor to the mains voltage
	Nominal operating mode (S1 to S10) exceeded, e.g. because of too high switching frequency	Adapt the nominal operating mode of the motor to the required operating conditions; if necessary, consult an expert to determine the appropriate type of drive

Fault table of SEW motor

Fault	Possible cause	Remedy
Extreme noise emission	Ball bearing strained, contaminated or damaged	Realign the motor, inspect the ball bearing and replace it, if necessary (see original instructions of the motor manufacturer)
	Vibration of the rotating parts	Determine cause, e.g. imbalance, and eliminate it.
	Foreign particle in the cooling airways	Clean cooling airways

Fault table of ABB motor

Fault	Possible cause	Remedy
Motor does not start	Blown fuse	Insert new appropriate fuses with the required rating.
	Overload triggering	Check and reset overload in the starter
	Faulty power supply	Verify whether the power supply corresponds to the motor rating plate and whether it is suitable for the respective load factor
	Faulty grid connections	Check connections following the wiring diagram supplied with the motor
	Circuit interruptions in the winding or control switch	Recognisable by a humming when switching the switch on. Check wiring with regard to loose connections. Check whether all contacts can be closed
	Mechanical fault	Check whether the motor and the drive rotate freely. Check bearings and lubrication
	Short circuit of stator, bad connection to stator winding	Recognisable by blown fuses. Motor must be wound newly. Remove bearing plates; localize fault.
	Defective rotor	Check for broken rotor bars or end rings
	Motor overloaded	Reduce load
Motor does not accelerate	Phase failure	Check lines for open phases
	Wrong application	Consult the supplier of the device for correct type and size and use appropriate device
	Overload	Reduce load
	Undervoltage	Verify whether the voltage stated on the rating plate is adhered to. Check connection
	Open circuit	Check blown fuses, overload relay, stator and pushbuttons.

Fault table of ABB motor

Fault	Possible cause	Remedy
Motor runs for a short period of time only	Power failure	Check for loose connections to the grid, to the fuses and to the control unit
Motor does not accelerate	Wrong application	Consult the supplier of the device for correct type and size.
	Undervoltage at the motor terminals due to a voltage drop	Use higher voltage or higher stage of transformer. Check connections. Check lines with regard to appropriate cross section.
	Starting load too high	Check motor layout with regard to motor idling.
	Broken rotor bars or loose rotor	Check whether there are cracks near the rings. A new rotor may be required, as in this case a lasting repair is not possible.
	Open primary circuit	Localize and remedy fault by means of testing instrument.
Motor accelerates too slowly and/or draws too much current	Too high load	Reduce load
	Too low voltage during start	Check for too high resistance. Use adequate line cross section.
	Defective cage rotor	Install new rotor
	Too low mains voltage	Clarify voltage supply
Wrong direction of motor rotation	Incorrect phase sequence	Change connections on motor respectively on switch panel

Fault table of ABB motor

Fault	Possible cause	Remedy
Motor overheats when being operated under load	Overload	Reduce load
	Venting bores may be clogged by dirt and prevent proper cooling of the motor	Clean and verify that a continuous air flow from the vent bores cools the motor down.
	Possibly a motor phase failed	Check whether all connection lines are properly connected
	Earth fault	Motor must be wound newly.
	Unbalanced terminal voltage	Check connection lines, terminals and transformers with regard to faults.
Noises	Fan rubs on fan flap	Correct the fan mounting
	Loose seat on base plate	Tighten foot screws
Operating noise level is too high	Air gap is not even	Check and if necessary correct bearing or bearing plate fixation.
	Imbalance in the rotor	Rebalance the rotor

Fault table of ABB motor

Fault	Possible cause	Remedy
Motor vibrations	Motor badly aligned	Realign the motor
	Poor stability of substructure	Reinforce substructure
	Imbalance in coupling	Balance the coupling
	Imbalance in driven unit	Rebalance driven unit
	Defective bearings	Replace bearings
	Bearings badly aligned	Repair the motor
	Displaced balance weights	Rebalance the rotor
	Balancing of rotor and coupling not aligned (half-key or full-key balancing)	Rebalance the coupling or rotor
	Multi-phase motor runs with single phase	Check for open circuit
	Axial backlash too big	Readjust bearing or insert compensating spring washer.

Fault table of ABB motor

Fault	Possible cause	Remedy
Too high bearing temperature	Shaft is bent or damaged	Readjust or replace shaft
	Too strong belt pull	Reduce belt tension
	Belt pulleys too far away from shaft shoulder	Place belt pulleys closer to the motor bearing
	Too small diameter of belt pulleys	Use larger belt pulleys
	Poor alignment	Correct by realigning the drive unit
	Insufficient lubrication grease	Ensure adequate quality of lubrication grease inside the bearing
	Poor quality or contamination of lubrication grease	Remove old lubrication grease Thoroughly wash bearings in kerosene and lubricate them with new grease
	Excessive lubrication grease	Reduce lubrication grease quantity. The bearing should be filled no more than half.
	Bearing overloaded	Check alignment, radial and axial thrust.
	Defective ball or rough ball tracks	Replace bearing. Thoroughly clean bearing housing before installing the new bearing.

Fault table of SIEMENS motor

Electrical faults

↓ Motor does not start

↓ Motor is hard to start

↓ Buzzing noise when the motor starts

↓ Buzzing noise during operation

↓ Strong heat generation when idling

↓ Strong heat generation under load

↓ Strong heat generation under load

						Possible fault	Remedy
X	X		X		X	Overload	Reduce load
X	X	X	X		X	Interruption of a phase	Check phases and feed lines
	X					Mains voltage too low, too high frequency	Check power supply
				X		Mains voltage too high/ too low frequency	Check power supply
X	X	X	X			X Stator winding switched wrongly	Check switch in terminal box
	X	X	X			X Shorted winding or shorted phase in the stator winding	Replace motor by a new one
					X	Wrong direction of motor rotation	Check phases

Fault table of SIEMENS motor

Mechanical faults

↓ Bearing is too warm

			↓ Bearing whistles	
			↓ Knocking bearing	
			Possible fault	Remedy
X			Contaminated bearing	Clean bearing or replace against new one
X	X		Too small bearing clearance	Please contact our Service Center
		X	Too big bearing clearance	Please contact our Service Center
X			Bearing filled with too much grease	Remove leaked grease
X			Bearing filled with wrong grease	Use correct grease
X	X	X	Bearing damaged	Replace bearing by new one

Fault table of BoWex coupling

Fault	Possible cause	Remedy
Changed running noises/ vibration occurrence	Misalignment, micro friction on the toothing of the plastic sleeve	Correct misalignment (e.g. Breakage of the motor fixation, heat extension of system components). Then carry out wear test.
	Bolts to secure hub axially are loose	Check alignment of coupling. Tighten bolts to secure hub axially and ensure locking against loosening. Then carry out wear test.
Breakage of the plastic sleeve/ the toothing	Overload	Eliminate the cause of the overload. Dismantle coupling, remove residues of the plastic sleeve, if necessary. Mount new plastic sleeve
	Operating parameters do not correspond to coupling performance	Check operating parameters and adapt, if necessary. Dismantle coupling, remove residues of the plastic sleeve, if necessary. Mount new plastic sleeve.
Excessive wear on toothing of sleeve	Drive oscillations	Determine cause of oscillations, check alignment, dismantle coupling, remove residues of plastic sleeve, if necessary. Mount new plastic sleeve.
	Inadmissibly high contact temperatures on the plastic sleeve	Check alignment, dismantle coupling, remove residues of plastic sleeve, if necessary. Mount new plastic sleeve.
	Contact with material resulting in a change of the physical properties of the plastic, e.g. Aggressive fluids, oils ozone, etc.	Ensure that there is no contact with material that may cause a change of the physical properties of the plastic. Check alignment, dismantle coupling, remove residues of plastic sleeve, if necessary. Mount new plastic sleeve.

12. Repairs

	 WARNING
	Risk of injury Before carrying out any repair work, take at least the following safety measures:
	○ Keep unauthorized persons away
	○ Mark and secure work area
	○ De-pressurize the product
	○ Disconnect the product from the power supply and secure it against being switched on
	○ Verify that no power is being applied
	○ Earth and short-circuit the product
	○ Where needed, cover neighbouring units that are live



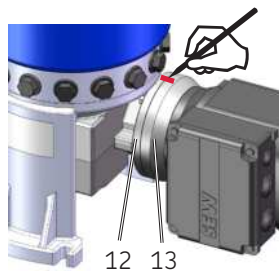
The work described shall be carried out by a specialist for maintenance and repairs in potentially explosive atmospheres. The work described should possibly be done at room temperature in a workshop. At low temperatures the work may be subject to restrictions.

12.1 Replacement of SEW motor

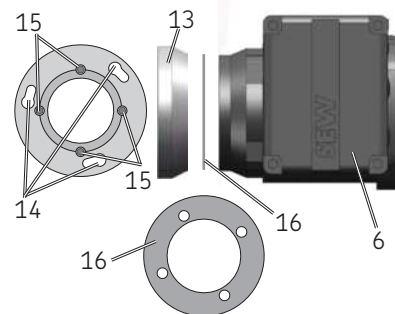
To replace the capacitive sensor proceed as follows:

- Check the entire system for accordance with the documentation and the intended purpose.
- Implement the safety measures as specified in the warning notice at the beginning of this chapter.
- Open the terminal box by unscrewing the screws and remove connection cable.
- Mark the mounting position of the gear flange (12) to the motor adaptor (13) (e.g. with a felt marker).
- Loosen the 3 hexagon head screws (14) from the gear flange and remove the motor (6) together with the motor adaptor (13) from the gear shaft.
- Remove the motor adaptor (13) by loosening the 4 hexagon socket head screws (15).
- Remove the gasket (16) between the motor (6) and the motor adaptor (13).

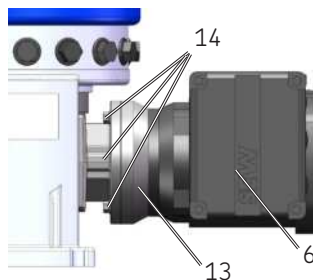
Mark the mounting position Fig. 12



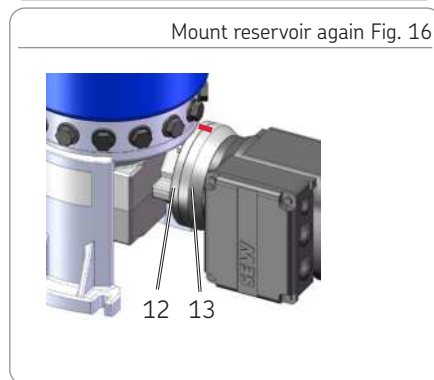
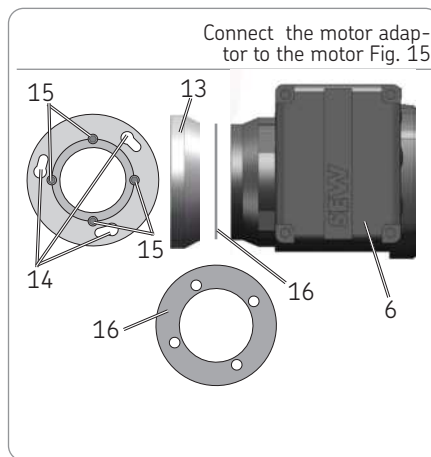
Loosen motor adaptor from motor Fig. 14



Loosen motor from gear Fig. 13



- Position new gasket (16) (see spare parts) onto motor adaptor (13) (observe bores).
- Attach the motor adaptor (13) by means of the 4 hexagonal socket head screws (15) to the motor.
- Lightly grease the gear and motor shaft. Align the hub of the gear shaft and the key of the motor shaft to each other.
- Push the motor shaft about 1 cm into the gear shaft.
- Turn the motor that much that the marking of the motor adaptor (13) again coincides with the marking on the gear flange (12) (see Fig. 13).
- Now push the motor shaft fully into the gear shaft and use the 3 hexagon head screws (14) to screw it to the rear side of the gear flange.
- Reconnect the connection cable and close the lid on the terminal box by means of the screws.



12.2 Replacement of capacitive sensor

To replace the capacitive sensor proceed as follows:

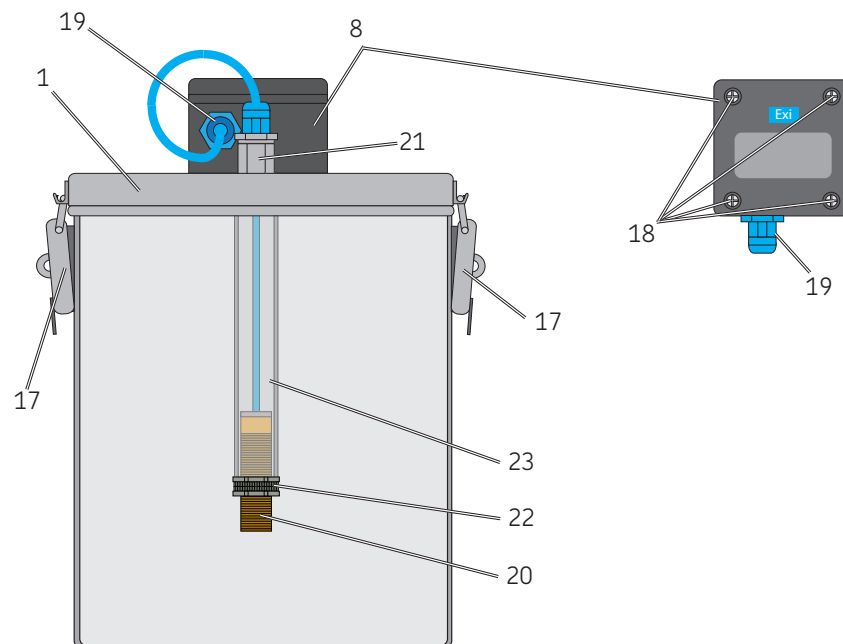
- Check the new sensor for accordance with the documentation and the intended purpose.
- Implement the safety measures as specified in the warning notice at the beginning of this chapter.
- Open the reservoir lid (1) on the two locks (17) and remove it.



Make sure not to damage the earthing cable when removing it or later when mounting the reservoir lid.

- Open the terminal box (8) by unscrewing the 4 screws (18) and disconnect the two cores of the cable.
- Loosen the cable duct (19) on the terminal box (8).

Replacement of capacitive sensor Fig 17



- Loosen the sensor (20) by loosening the fitting (21) on the reservoir lid.
- Loosen the sensor (20) by means of its counter fitting (22) from the sensor pipe (23), unscrew it completely out of the sensor pipe and remove it downwards.
- Guide the cable of the new sensor up-wards through the sensor pipe (23).



When mounting the sensor in the sensor pipe, it must be sealed with Loctite 5331.

- Screw sensor into sensor pipe until the correct adjusting measure R is reached.

Sensor	Adjusting measure R
*M12 x 1 M18 x 1	35 mm ± 5 mm
M30 x 1.5	37 mm ± 5 mm

- Tighten the sensor (20) by tightening its counter fitting (22) on the sensor pipe.

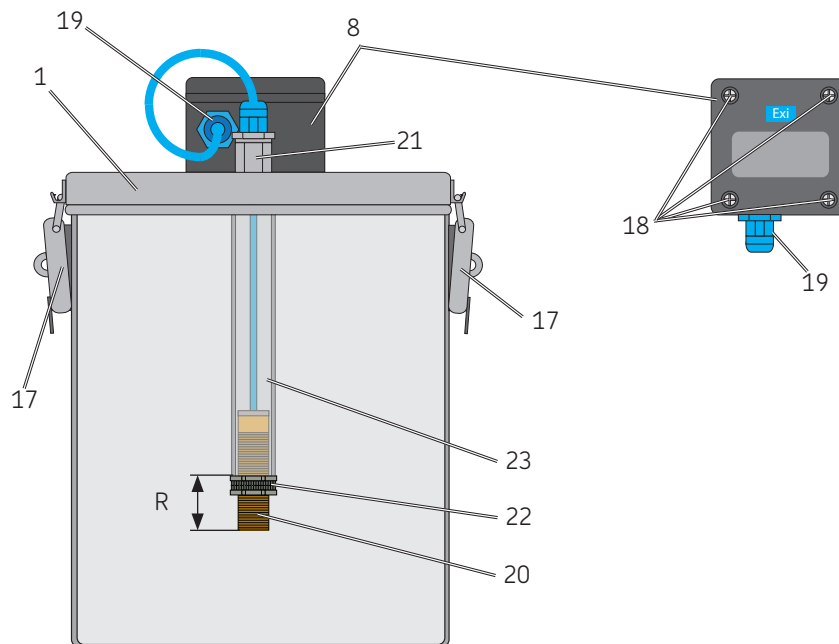
*Sensor M12 x 1 = 01 Nm ± 0.1 Nm

Sensor M18 x 1 = 02 Nm ± 0.1 Nm

Sensor M18 x 1 = 010 Nm ± 1.0 Nm

* Sensor M12 x 1 only in case of reservoir type 30 XL

Replacement of capacitive sensor Fig 18



- Guide the cable through the cable duct (20) on the terminal box (18).
- Mount the cable in the terminal box (see connection diagram in the Technical data)
- Tighten the cable duct (20) on the terminal box (18) correctly again.

Tightening torque = $1.5 \text{ Nm} \pm 0.1 \text{ Nm}$

- Firmly screw lid to terminal box (18) by means of the 4 screws (19).
- Tighten the sensor fitting on the reservoir lid (21).

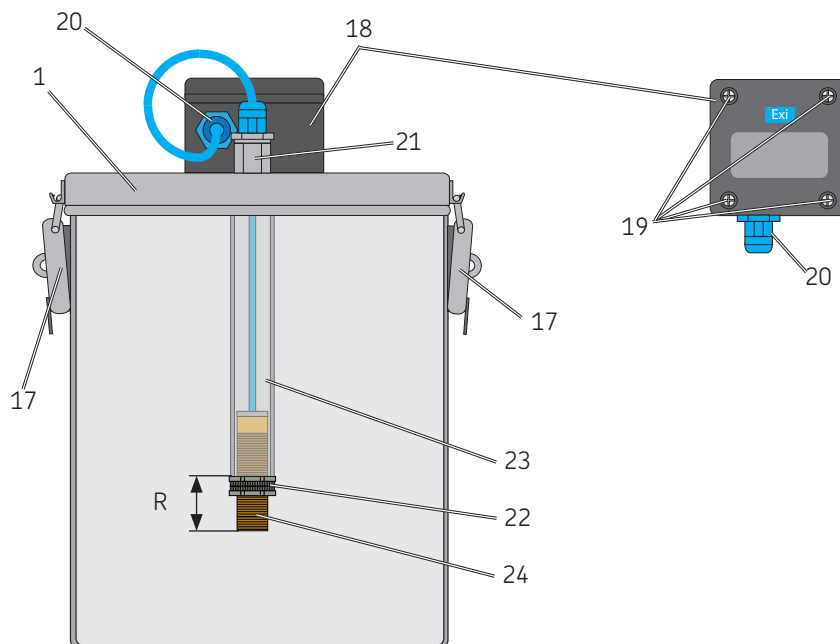
Sensor M12 x 1.0 = $20 \text{ Nm} \pm 1 \text{ Nm}$

Sensor M18 x 1.0 = $20 \text{ Nm} \pm 1 \text{ Nm}$

Sensor M30 x 1.5 = $35 \text{ Nm} \pm 1 \text{ Nm}$

- Place reservoir lid (1) on reservoir again and lock it.

Replacement of capacitive sensor Fig 19



Reservoir variant 30 YLP

These pumps have 2 capacitive sensors.

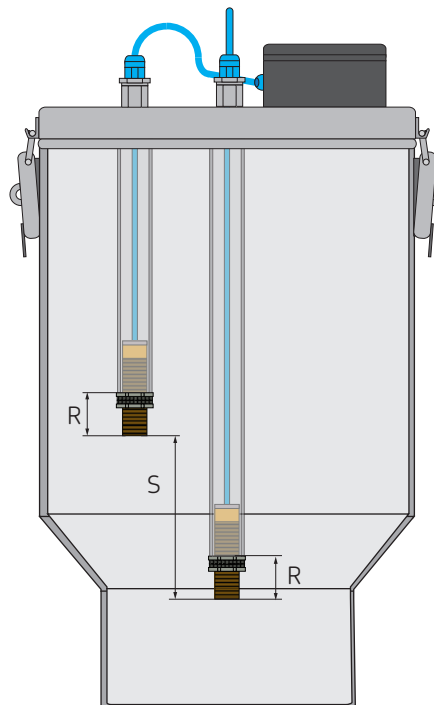
In addition to the previously described actions, the correct distance measure S of the two sensors must be adjusted.

Distance measure $S = 143 \text{ mm}$

Adjusting measure $R = 35 \text{ mm} \pm 5 \text{ mm}$

- Adjust the two sensors within the tolerance of adjusting measure R in such way that the distance measure S is adhered to.

Adjusting the sensors for reservoir variant 30 YLP Fig. 20

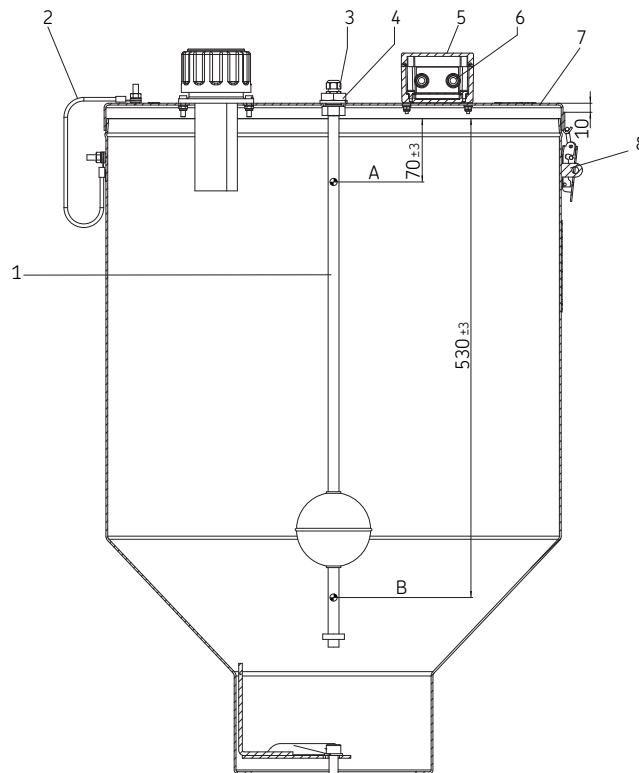


Setting of the flow switch on reservoir version 100 YB, Fig. 22

12.3 Replacement of float switch

Proceed as follows for replacement:

- Check that the new float switch matches the documentation and the intended use.
- Take safety measures as specified in the warning at the beginning of this Chapter.
- Open the reservoir cover (7) at the three locking points (8) and remove it.
- Do not damage the grounding cable (2) when removing the reservoir cover or when reinstalling it later.
- Open the terminal box (5) by undoing the 4 screws and disconnect the six wires of the cable (note down the position of the wires beforehand).
- Undo the cable gland (6) on the terminal box (5).
- Detach the float switch (1) by undoing its screw union (4) on the reservoir cover. (Locknut and washer)
- Draw the float switch down and out of the reservoir cover
- Insert a new float switch (with cable) up into the cover



- Place the screw union (washer and lock-nut) on the float switch and tighten
- Pass the cable through the cable gland (6) on the terminal box (5).
- Connect the cable in the terminal box (see the circuit diagram, "Technical data").
- Correctly tighten the cable gland (20) on the terminal box (18) again.

Tightening torque = $1.5 \text{ Nm} \pm 0.1 \text{ Nm}$

- Screw the cover of the terminal box (5) firmly in place with the 4 screws.

Tightening torque = $1.5 \text{ Nm} \pm 0.1 \text{ Nm}$

- Tighten the screw union of the switch on the reservoir cover (4).

Tightening torque = $20 \text{ Nm} \pm 2 \text{ Nm}$

12.4 Replacement of pump element



In case of pumps with grease filling, the grease may remain in the reservoir. In case of pumps with oil filling, the oil must be collected with an adequate collecting bin when unscrewing the pump element.

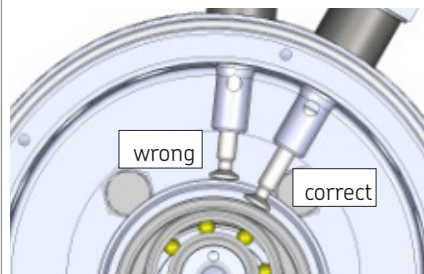
NOTICE

Risk of damage to the pump. Make sure that each pump element is seated correctly in the notch of the catch ring (see Fig. 21).



In case of pumps with stirring paddle, turn the stirring paddle to the opposite side of the pump element. This facilitates mounting the piston into the notch of the catch ring.

Mounting of the pump element Fig. 21

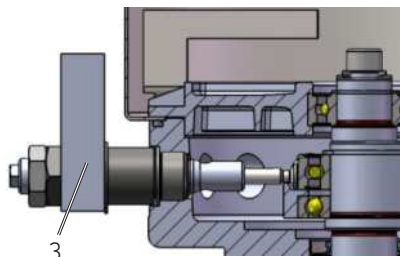


- Fully unscrew the pump element (3) at the hexagon out of the pump.
- Press pump element (3) down as shown so that the piston disengages from the notch of the catch ring.
- Remove the pump element (3).
- Pull piston of the new pump element about 30 mm out of the pump element (3).
- Insert the pump element (3) obliquely until the piston is located above the catch ring.
- Now hold the pump element horizontally so that the piston of the pump element engages in the notch of the catch ring.
- Screw in the pump element (3).

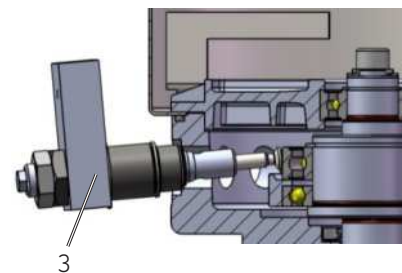
Tightening torque = 25 Nm -2.5 Nm

Then check the pump element (3) for proper function. To do so, switch the pump on and check, whether the pump element supplies lubricant. If needed, refill lubricant.

Unscrew the pump element Fig. 22



Pump element pressed down Fig. 23



13. Shutdown and disposal

13.1 Temporary shutdown

Temporarily shut the system down by:

- Switching off the superior machine
- Disconnecting the product from the power supply

13.2 Final shutdown and disassembly

The final shutdown and disassembly of the product must be professionally planned and carried out by the operator in compliance with all regulations to be observed.

13.3 Disposal

Countries within the European Union

Disposal should be avoided or minimized wherever possible. Disposal of products contaminated with lubricant must be effected via a licensed waste disposal contractor in accordance with environmental requirements and waste disposal regulations as well as local authority requirements.



The specific classification of the waste is in the waste producer's responsibility, as the European Waste Catalogue provides different waste disposal codes for the same type of waste but of different origin.

Electrical components

have to be disposed of or recycled following WEEE directive 2012/19/EU.

Plastic or metal parts

can be disposed of with the commercial waste.

Countries outside the European Union

The disposal has to be done according to the valid national regulations and laws of the country where the product is used.

14. Spare parts

The spare parts assemblies may be used exclusively for replacement of identical defective parts. Modifications with spare parts on existing products are not allowed.

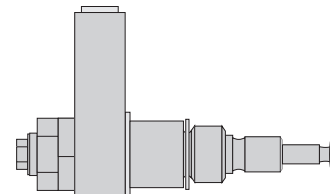


Assignment of the spare parts to the respective pump type: See table 4.4 Overview of pump variants

14.1 Pump element

Designation	Qty.	Part number
Pump element K6	1	600-25046-3
Pump element K7	1	600-25047-3

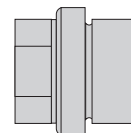
Pump element Fig. 24



14.2 Closure screw M22 x 1

Designation	Qty.	Part number
Closure screw M22 x 1 to close unneeded ports for pump elements	1	303-19285-1

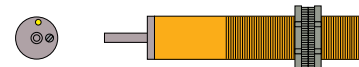
Closure screw M22 x 1 Fig. 25



14.3 Capacitive sensor M12 x 1

Designation	Qty.	Part number
Capacitive sensor M12x 1, with LED and potentiometer incl. 2 m connection cable aligned for grease	1	664-34621-6

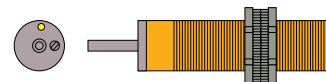
Capacitive sensor M12 x 1 Fig. 26



14.4 Capacitive sensor M18 x 1

Designation	Qty.	Part number
Capacitive sensor M18x 1, with LED and potentiometer incl. 2 m connection cable aligned for grease	1	664-34621-2
Capacitive sensor M18x 1, with LED and potentiometer incl. 2 m connection cable aligned for oil	1	664-34621-5

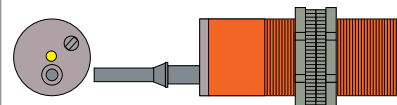
Capacitive sensor M18x1 Fig. 27



14.5 Capacitive sensor M30 x 1.5

Designation	Qty.	Part number
Capacitive sensor M30x 1.5, with LED and potentiometer incl. 2 m connection cable aligned for grease	1	664-34621-4

Capacitive sensor M30x1.5 Fig. 28



14.6 Float switch

Designation	Pcs.	Item number
Float switch with 2 switching points, incl. 2 m power cable, calibrated for oil	1	2340-00000174

Float switch, Fig. 31

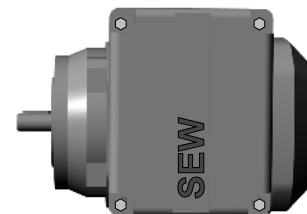


14.7 SEW motors

Designation	Motor number	Qty.	Part number
EDRS71S4	1	1	245-13997-4
EDRS71S4	2	1	245-00100-7
EDRS71S4	3	1	245-00105-1
EDRS71S4	4	1	245-00104-3
EDRS71S4	5	1	245-13919-9
EDRS71S4	6	1	245-00104-4
EDRS71S4	7	1	245-00104-6
EDRS71S4	8	1	245-13960-9
EDRS71S4	9	1	245-00104-8
EDRS71S4	11	1	245-00105-6
EDRS71S4	13	1	245-00105-3
EDRS71S4	14	1	245-00109-7
EDRN71MS4/	15	1	2450-00000003
EDRN71MS4	17	1	2450-00000045
EDRN71MS4	18	1	2450-00000043
EDRN71MS4	19	1	245-00100-3
EDRN71MS4	20	1	2450-00000084
EDRN71MS4	21	1	2450-00000083

ABB and Siemens motors on request

SEW motors Fig. 29

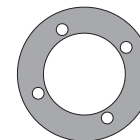


14.8 Gasket Abil

Designation	Qty.	Part number
Gasket Abil 60 x 90 x 0.5	1	306-19415-1

Required in case of motor replacement. Make sure to always order the gasket together with the motor directly.

Gasket Abil Fig. 30



Annexes purchase parts

Declaration of conformity of gear make Rehfuß

Carl Rehfuß GmbH + Co. KG Antriebstechnik

Buchholzallee 5
D-72461 Albstadt
Tel. + 49 (0) 71432 / 70 14-0
Fax + 49 (0) 71432 / 70 15-0
Email: info@rehfuss.com
Url: www.rehfuss.com



EU-Konformitätserklärung EU Declaration of conformity

CARL REHFUSS GmbH + Co.KG

erklärt in alleiniger Verantwortung, das die SR, FG, S, SM, SS, SSM-Getriebe für Getriebegruppe II der Kategorien 2G,2D und 3G,3D, auf die sich diese Erklärung bezieht, mit der

declares in sole responsibility that the SR,FG, S, SM,SS,SSM-gearboxes for equipment group II in category 2G,2D and 3G,3D that are subject to this declaration are meeting the requirements set forth in

ATEX – Richtlinie 2014/34/EU
ATEX – Directive 2014/34/EU

übereinstimmen, to conform.

Angewandte Norm;
Applicable standard:

EN 1127-1:2011
EN 13463-1:2009
EN 13463-5:2011
EN 13463-8:2003
EN 60529:2000

Die technische Dokumentation für Getriebe der Kategorie 2 ist hinterlegt bei notified Stelle:
The technical documentation for category 2 gearboxes is stored at the notified location.

TÜV PRODUKT SERVICE GmbH, EU-Code 0123

Ort und Datum der Ausstellung
place and date of issuing

Abstrakt 20.04.2016

Berechtigter zur Ausstellung dieser Erklärung im Namen des Herstellers
authorized representative for issuing this declaration on behalf of the manufacturer

Berechtigter zur Zusammenstellung der technischen Unterlagen
authorized representative for compiling the technical documents



Dipl.-Ing. (FH) M. Fink
Funktion: Bereichsteilr. Technik
Function: Technical Director

Getriebe und Getriebebestandteile mit kundenspezifischen Drehzahlen / Flange speed gearboxes and geared motors

Elektronisch und mechanisch regelbare Antriebe / Electronic and mechanical variable speed drives

Sonderantriebe und kundenspezifische Lösungen / Special drives and customized solutions

Generalization: Gear Boxes, Gear Pumps, Dial Units, Ing. (FH) Technical Power, Dial Units, Ing. (FH) Technical Power

Vollständige Abstrakt 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016

Complete data 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016 01.2.2016

Technische Dokumentation für Getriebe der Kategorie 2 ist hinterlegt bei notified Stelle:
Technical documentation for category 2 gearboxes is stored at the notified location.

Declaration of conformity of motor make SEW

EU-Konformitätserklärung

Originaltext

SEW
EURODRIVE

900890810/DE

SEW-EURODRIVE GmbH & Co. KG
Ernst-Blickle-Straße 42, D-76646 Bruchsal
erklärt in alleiniger Verantwortung die Konformität der folgenden Produkte

Motoren der Baureihe EDRS71.. – EDRE225..
in der Ausführung /2GD, /2G oder /2D
Kennzeichnung II2G Ex eb IIB T3 Gb
II2G Ex eb IIC T3 Gb
II2G Ex eb IIB T4 Gb
II2G Ex eb IIC T4 Gb
II2D Ex tb IIC T120°C Db
II2D Ex tb IIC T140°C Db

nach

ATEX-Richtlinie 2014/34/EU
(L 96, 29.03.2014, 309-356)

RoHS-Richtlinie 2011/65/EU
(L 174, 01.07.2011, 88-110)

angewandte harmonisierte Normen:
EN 60079-0:2012/A11:2013
EN 60079-7:2015
EN 60034-1:2010
EN 60079-31:2014
EN 50581:2012

Bruchsal	02.07.2018	
Ort	Datum	
Dr. Hans Krattenmacher		a) b)
Geschäftsführer Innovation/Mechatronik		

a) Bevollmächtigter zur Ausstellung dieser Erklärung im Namen des Herstellers
b) Bevollmächtigter zur Zusammenstellung der technischen Unterlagen mit identischer Adresse des Herstellers

EU Declaration of Conformity

SEW
EURODRIVE

900860810/EN

Translation of the original text	
SEW-EURODRIVE GmbH & Co. KG Ernst-Blickle-Straße 42, D-76646 Bruchsal declares under sole responsibility that the following products	
Motors of the series	EDRS71.. – EDRE315..
Possibly in connection with brake of the series	BE..
Variant	/3GD, /3G or /3D
Designation	II3G Ex ec IIB T3 Gc
	II3G Ex ec IIC T3 Gc
	II3D Ex tc IIB T120°C Dc
	II3D Ex tc IIB T140°C Dc
	II3D Ex tc IIC T120°C Dc II3D Ex tc IIC T140°C Dc
in accordance with	
ATEX Directive	2014/34/EU (L 96, 29.03.2014, 309-356)
RoHS Directive	2011/65/EU
	(L 174, July 1, 2011, 88-110)
	EN 60079-0:2012/A11:2013 EN 60079-7:2015 EN 60034-1:2010 EN 60079-31:2014 EN 50581:2012
Applied harmonized standards:	
Bruchsal	02.07.2018
Place	Date
	
Dr. Hans Krattenmacher Managing Director Innovation/Mechatronics	
a) Authorized representative for issuing this declaration on behalf of the manufacturer	
b) Authorized representative for compiling the technical documents	
a) b)	

Declaration of conformity of motor make ABB open



EU DECLARATION OF CONFORMITY

The Manufacturer:

ABB Oy
Motors and Generators
P.O. Box 633
Strömbergin Puistotie 5A
FIN - 65101 Vaasa, Finland

ABB Sp.z o.o
27 Placydowska Str.
PL-95-070 Aleksandrow Lodzki
Poland

This declaration of conformity is issued under the sole responsibility of the manufacturer.

The products: 3-phase induction motors of series M3AA, M3DP, M3GP, M3HP, M3JP, M3JC, M3JM, M3KP and M3KC as listed in this document on the pages 2...3 having correspondent name plate markings covered by those as listed.

The motors of the declaration described above are in conformity with the relevant Union harmonisation legislation:

Directive 94/EC (until April 19th, 2016) and Directive 2014/34/EU (from April 20th of April 2016)

Directive 2009/125/EC (ErP of 20th November 2009)

The motors that are marked as IE2, IE3 or IE4 are in conformity with the requirements set in the Commission Regulation (EU) No. 4/2014 of 5 January 2014 amending Regulation (EC) No. 640/2009.

Efficiency classes as defined in the standard EN 60034-30:2009.

Directive 2011/65/EU

Motors are in conformity with the Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment. Technical documentation based on the standard EN 50581:2012.

The following harmonised standards are applied in relation to which conformity is declared:

EN 60078-0:2012, EN 60078-1:2007, EN 60079-7:2007, EN 60079-15:2010, EN 60079-31:2009 and relevant parts of the EN 60034 –series of standards.

The conformity of the end product according to the Directive 2006/42/EC has to be established by the commissioning party when the motor is fitted to the machinery.

Note: Motors have to be installed and maintained according to the relevant standards and instructions of ABB Oy, Motors and Generators. When installed in converter supplied applications, additional requirements must be respected regarding the motor as well as the installation as described in the appropriate dedicated addendum.

Notified Bodies (ENAB): LCIE (0081), Av. Du Général Leclerc, 33, 92266 Fontenay-aux-Roses, France and VTT Expert Services Ltd (0537), Otakaari 7B, 02044 Espoo, Finland

Signed for and on behalf of: ABB Oy, Motors and Generators and ABB Sp.z o.o

Place and date of issue: Vaasa, Finland, 2015-11-26

Title

Harri Mykkanen
Vice President

ABB Oy

Motors and Generators	Visiting Address	Telephone:	Internet	Business Identity Code:
Postal address	Strömbergin Puistotie 5 A	+358 10 22 11	www.abb.fi	0763403-0
P.O. Box 633	FI-65320 Vaasa	Telefax	e-mail:	Domicile: Helsinki
FI-65101 Vaasa	FINLAND	+358 10 22 47372	first name last name	
FINLAND			@fi.abb.com	

Document 3GZF500930-359G

SKF

EG/EU-Konformitätserklärung

N/A 45F03870465A

Notifizierte Stelle:
Drittlandszertifikat: *
siehe Anhang
siehe Anhang

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.

Wir bestätigen die Konformität des oben genannten Produktes mit den Normen:

Das bezeichnete Produkt ist bestimmt zum Einbau in eine andere Maschine für den Einsatz in explosionsgefährdeten Bereichen der Zone 1 nach EN 60079-10-1 und Richtlinie 1999/92/EG. Weitere Angaben über die Einhaltung dieser Richtlinie enthält der Anhang, der ein integraler Bestandteil dieser Konformitätserklärung ist.

1102

Fritz Winkler
Werksteller/Head of Manufacturing

Unterschrift/Signature
Dr. Harmut Vogel
Produktsicherheitsbeauftragter/Product safety officer

Siemens Aktiengesellschaft; Vorsitzender des Aufsichtsrats: Gerhard Cromm; Vorstand: Joe Kasser, Vorsitzender, Roland Busch, Lisa Davis, Klaus Heinrich, Janina Kugel, Siegfried Ruessom, Ralf P. Homb, Sürz der Gesellschaft; Berlin und München, Deutschland; Berlin, Chieftokuhm, HGB 12100 München, HBB 6684, WEEF, B50, Nr. DE 27501132

Declaration of conformity of motor make SIEMENS 1#3

SIEMENS

Englisch / English

EU Declaration of Conformity (according to Annex VII of EU Directive 2014/34/EU, Directive 2011/65/EU and Commission Regulation (EU) 2019/1781¹⁾)

Manufacturer, Address and Product identification: see page 1

The object of the declaration described above is in conformity with the relevant Union harmonization legislation:**ATEX Directive:**
2014/34/EU

Directive of the European Parliament and of the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres.
Official Journal of the EU, L96 29.03.2014, p. 309-356

RoHS Directive:
2011/65/EU

Directive of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment;
Official Journal of the EU L174, 1.07.2011, p. 88-110

ErP Directive¹⁾:
(EU) 2019/1781

Commission Regulation of 1 October 2019 on establishing ecodesign requirements for electric motors and variable speed drives on the basis of Directive 2009/125/EC of the European Parliament and of the Council,
Official Journal of the EU L 272, 25/10/2019, p. 74–94

¹⁾ Compliance with the ErP Directive (EU) 2019/1781 is declared for the products covered by the scope (information given on the nameplate: 3-phase line motor, 50 Hz, 60 Hz, 50/60 Hz, 10" position product A-D and power rating from 0.12 kW to 1000 kW).

This declaration of conformity is issued under the sole responsibility of the manufacturer.
We confirm conformity of the product indicated above with the standards: see annex

The product indicated is intended to be installed in another machine for use in hazardous areas of zone 21 in accordance with EN 60079-10-2 and Directive 1999/92/EC. Further information about the conformity to this Directive is given in the annex, which is an integral part of this declaration of conformity.
Commissioning is prohibited until conformity of this machine with Directive 2014/34/EU has been confirmed.

This declaration is an attestation of conformity with the indicated Directive(s) but does not imply any guarantees of quality or durability.
The safety instructions of the accompanying product documentation shall be observed.

Declaration of conformity of motor make SIEMENS 2#3



**Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.
Wir bestätigen die Konformität des oben genannten Produktes mit den Normen:**

siehe Anhang / see annex

Das bezeichnete Produkt ist bestimmt zum Einbau in eine andere Maschine für den Einsatz in explosionsgefährdeten Bereichen der Zone 21 nach EN 60079-10-2 und Richtlinie 1999/92/EG. Weitere Angaben über die Einhaltung dieser Richtlinie enthält der Anhang, der ein integraler Bestandteil dieser Konformitätserklärung ist. Die Inbetriebnahme ist solange untersagt, bis die Konformität dieser Maschine mit der Richtlinie 2014/34/EU festgestellt ist.

Unterschrift für und im Namen von: / Signed for and on behalf of:
Siemens Aktiengesellschaft
Nürnberg, den 08.06.2021

I.V. **Vietsaecker Dirk**

Digital unterschrieben von
Vietsaecker Dirk
Datum: 2021.06.08 17:58:01
+02'00'

Dirk Vietsaecker
Head of DI MC TTi

Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinie(n). Ist jedoch keine Beschaffenheits- oder Haltbarkeitsgarantie. Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten.

Siemens Aktiengesellschaft, Vorstand der Aufsichtsrats: Im Hagenmann Saal, Vorstand: Roland Busch, Vorsitzender: Cécile Neike, Matthias Reibellus, Ralf P. Thomas, Judith Wiese, Sitz der Gesellschaft: Berlin und München, Deutschland, Registergericht: Berlin Charlottenburg, HRB 12300, München, HRB 6684, WEEE-Reg.-Nr. DE 23691322

I.V. **Heinzelmann Thomas**

Digital unterschrieben von
Heinzelmann Thomas
Datum: 2021.06.08 14:34:22
+02'00'

Thomas Heinzelmann
Head of DI MC OM

Declaration of conformity of motor make SIEMENS 3#3

SIEMENS**Anhang zur EU-Konformitätserklärung /
Annex to EU Declaration of Conformity**

Nr. / No. ASE43985983A

Wir bestätigen die Konformität des oben genannten Produktes mit den Normen:
We confirm conformity of the product indicated above with the standards:

Richtlinie / Verordnung Directive / Regulation	Harmonisierte Norm Harmonised standard
2011/65/EU	EN IEC 63000:2018
(EU)2019/1781 ¹⁾ gemäß 2009/125/EC	EN 60034-2-1:2007
(EU) 2019/1781 ¹⁾ pursuant to 2009/125/EC	EN 60034-30:2009

¹⁾ Die Erfüllung der ErP Verordnung (EU) 2019/1781 wird erklärt für die im Anwendungsbereich erfassten Produkte (Angaben auf dem Typenschild: 3-phasiger netzbetriebener Asynchronmotor, 50Hz, 60Hz, 50/60Hz, 10-Stelle Produkt A-D und Leistung 0,12 kW bis 1000 kW).

¹⁾ Compliance with the ErP Directive (EU) 2019/1781 is declared for the products covered by the scope (information given on the nameplate: 3-phase line motor, 50 Hz, 60 Hz, 50/60 Hz, 10th position product A-D and power rating from 0,12 kW to 1000 kW).

Die Drittstellenzertifikate wurden ausgestellt von den folgenden notifizierten Stellen:
The Third-Party Certificates were issued by the following notified bodies:

Typenreihe / Type series	Achshöhe / Frame size	Drittstellenzertifikat / Third-Party Certificate	Notifizierte Stelle Nr. / Notified body No.	Harmonisierte Norm im Anhang der EU / Harmonised standard in Third-Party Certificate
1MB15/6..-0C....	071	PTB 18 ATEX 3005	PTB 0102	EN IEC 60079-0:2018 EN 60079-31:2014
1MB15/6..-0D....	080	PTB 18 ATEX 3006	PTB 0102	
1MB15/6..-0E....	090	PTB 18 ATEX 3007	PTB 0102	
1MB15/6..-1A....	100	PTB 18 ATEX 3008	PTB 0102	
1MB15/6..-1B....	112	PTB 18 ATEX 3009	PTB 0102	
1MB15/6..-1C....	132	PTB 18 ATEX 3010	PTB 0102	
1MB15/6..-1D....	160	PTB 18 ATEX 3011	PTB 0102	
1MB15/6..-1E....	180	PTB 18 ATEX 3012	PTB 0102	
1MB15/6..-2A....	200	PTB 18 ATEX 3013	PTB 0102	

^{*)} mit allen vorhandenen Ergänzungen und Datenblättern / with all available supplements and data sheets

Declaration of conformity of capacitive sensor make Turck

EU-Konformitätserklärung Nr. 5021M **TURCK** EU Declaration of Conformity No.:

Wir/We HANS TURCK GMBH & CO KG
WITZLEBENSTR. 7, D – 45472 MÜLHEIM A.D. RUHR

erklären in alleiniger Verantwortung, dass die Produkte
declare under our sole responsibility that the products

Zweidraht Näherungsschalter Typ Y1...Y1... (gemäß EN 60947-5-6 NAMUR)

Two Wire Proximity Sensors Type Y1...Y1... (according to EN 60947-5-6 NAMUR)

auf die sich die Erklärung bezieht, den Anforderungen der folgenden EU-Richtlinien durch Einhaltung der
folgenden Normen genügen:
to which this declaration relates are in conformity with the requirements of the following EU-directives by compliance with the following standards:

EMV – Richtlinie / EMC Directive	2004 / 108 / EG	15. Dez.2004 ¹
EMV – Richtlinie / EMC Directive	2014 / 30 / EU	26. Feb. 2014 ²
EN 60947-5-6:2000		
Richtlinie / Directive ATEX 100a	94 / 19 / EG	23. März 1994 ¹
Richtlinie / Directive ATEX	2014 / 34 / EU	26. Feb. 2014 ²
EN 60079-0:2012	EN 60079-11:2012	

¹: bis zum / until 19. April 2016

²: ab / as from 20. April 2016

Weitere Normen, Bemerkungen
additional standards, remarks

Zusätzliche Informationen: Supplementary information:

Angewandtes ATEX-Konformitätsbewertungsverfahren / ATEX conformity assessment procedure applied:

Modul B + Modul D / E / module B + module D / E

EU-Baumusterprüfbescheinigung (Modul B) KEPA 02 ATEX 1090 X / EC-type examination certificate (module B):

ausgestellt von / issued by DEKRA Certification B.V., Kenn-Nr. / number 0344,

Unrechtsweg 310, NL-6812 AR Arnhem

Zertifizierung des QS-Systems gemäß Modul D durch:

certification of the QS-system in accordance with module D by:

Physikalisch Technische Bundesanstalt, Kenn-Nr. / number 0102,
Bundesallee 100, D-38116 Braunschweig

Mülheim, den 01.04.2016

I./V. Dr. M. Linde, Leiter Zulassungen / Manager Approvals

Name, Funktion und Unterschrift des Befugten /
Name, function and signature of authorized person



Declaration of conformity of capacitive sensor M12 make Turck

EU-Konformitätserklärung Nr.: 5160-1M **TURCK**

Wir/We: HANS TURCK GMBH & CO KG
WITZLEBENSTR. 7, 45472 MÜLHEIM A.D. RUHR

erklären in alleiniger Verantwortung, dass die Produkte
declare under our sole responsibility that the products

Näherungssensoren;
Proximity Sensors;
BC3-S12-RP6X/S90/3GD
BC3-M12-AP6X/S90/3GD

auf die sich die Erklärung bezieht, den Anforderungen der folgenden EU-Richtlinien durch Einhaltung der
folgenden Normen genügen;
to which this declaration relates are in conformity with the requirements of the following EU-directives by compliance with the following
standards:

EMV - Richtlinie /EMC Directive EN 60947-5-2:2007/A1:2012	2014 / 30 / EU	26.02.2014
ATEX - Richtlinie /Directive ATEX EN 60079-0:2012-A11:2013	2014 / 34 / EU EN 60079-31:2014	26.02.2014
RoHS – Richtlinie /RoHS Directive	2011 / 65 / EU	08.06.2011

Weitere Normen, Bemerkungen:
additional standards, remarks:

Zusätzliche Informationen:
Supplementary information:

Angewandtes ATEX-Konformitätsbewertungsverfahren:
ATEX - conformity assessment procedure applied:
Modul A /module A

Baumusterprüfbescheinigung:
examination certificate
TURCK Ex-03025H X

ausgestellt:
issued by:
Hersteller:
Hans Turck GmbH & Co. KG

Mülheim, den 03.07.2017

Ort und Datum der Ausstellung /
Place and date of issue


i.V. Dr. M. Linde, Leiter Zulassungen /Manager Approvals
Name, Funktion und Unterschrift des Belegten /
Name, function and signature of authorized person

Declaration of conformity of capacitive sensor make ifm



ifm electronic

EU – Konformitätserklärung

EU declaration of conformity

Déclaration de conformité UE

ifm electronic gmbh
Friedrichstraße 1
45128 Essen
Germany

Telefon: +49 (0)201 / 24 22 - 0
Telefax: +49 (0)201 / 24 22 - 1200
Internet: www.ifm.com

Die EU-Konformitätserklärung gilt
für folgende Geräte:

The EU declaration of conformity
applies to the following units:

Kapazitive Sensoren der Produktfamilie
Capacitive sensors of the product family
Détecteurs capacitifs de la famille de produits

Wir bestätigen die
Übereinstimmung mit den
wesentlichen Anforderungen der
europäischen Richtlinie(n).

We confirm the conformity to the
essential requirements of the
European directive(s):

gültig bis 19.04.2016;
2004/108/EG
94/9EG

valid until 19/04/2016;
2004/108/EC
94/9EC

gültig ab 20.04.2016;
2014/30/EU
2014/34/EU

variable(s) jusqu'au 19.04.2016;
2004/108/CE
94/9/CE

variable(s) à partir du 20.04.2016;
2014/30/UE
2014/34/UE

Folgende
angewandt:

The following
(were) applied:

EN 60947-5-2 : 2007 +A1 : 2012
EN60947-5-6:2000
EN60079-26:2007

IEC60079-0:2011
IEC60079-11:2011

Kennzeichnung

Marking

Marquage

II 1G Ex ia IIB T6 Ga
II 1D Ex ia IIIC T90°C Da

Certificat d'examen UE de type:

EU type test certificate:

DMT 01 ATEX E 020

DEKRA EXAM GmbH / Dinnendahlstr. 9 / 44809 Bochum / Germany (Notified body No. 0158)

Physikalisch Technische Bundesanstalt / Bundesallee 100 / 38118 Braunschweig / Germany (Notified body No. 0102)

Produktion zertifiziert durch:

Production certified par:

DEKRA EXAM GmbH / Dinnendahlstr. 9 / 44809 Bochum / Germany
(Notified body number: 0158)

Artikel - Nr.: 80232797

Tetthang, 19.10.2015

(Ort und Datum der Ausstellung)
(Place and date of issue)
(Lieu et date de l'établissement)

(Unterschrift) I.V. Rolf Fensterle

(Signature) Head of Development

(Signature)

Dokument-Nr.: 8001442

Declaration of conformity of terminal box make Bartec

EU Konformitätserklärung EU Declaration of Conformity Déclaration UE de conformité		BARTEC VARNOST BARTEC Varnost d.o.o. Cesta 9, Avgusta 59 1410 Zagorje ob Savi Slovenia	
N° VS-02 02 099E			
Wir	Wa	Nous	
BARTEC Varnost d.o.o., erklären in alleiniger Verantwortung, dass das Produkt Abzweig- und Verbindungskasten		attestons sous notre seule responsabilité que le produit Boîtes de dérivation et coffrets de jonction	
Typ: 07-5103-***j***, 07-5105-***j***, 07-5106-***j*** and 07-5107-***j*** auf das sich diese Erklärung bezieht den Anforderungen der folgenden Richtlinien (RL) entspricht ATEX-Richtlinie 2014/34/EU (gültig ab 20. April 2015) RoHS-Richtlinie 2011/65/EU Maschinen-Richtlinie 2006/42/EG		se référant à cette attestation correspond aux dispositions des directives (D) suivantes ATEX-Directive 2014/34/UE (valable à partir du 20. Avril 2015) RoHS-Directive 2011/65/UE Directive Européenne de l'Equipment 2006/42/CE	
und mit folgenden Normen oder normativen Dokumenten übereinstimmt EN 60079-0:2012 EN 60079-7:2007	and is in conformity with the following standards or other normative documents EN 60079-11:2012 EN 60079-31 :2014	et est conforme aux normes ou documents normatifs ci-dessous EN 60528:1991 +A1:2000+ A2:2013	
Kennzeichnung	Marking	Marquage	
 II 2G Ex e Ia/Ib IIA, IIB, IIC T6, T5 Gb II 2G Ex Ia/Ib IIA, IIB, IIC T6, T5 Gb II 2D Ex tb IIC T80°C, T95°C Db IP66 II 2D Ex Ia/Ib IIC T80°C, T95°C Db IP66	II 2G Ex e Ia/Ib IIA, IIB, IIC T6, T5 Gb II 2G Ex Ia/Ib IIA, IIB, IIC T6, T5 Gb II 2D Ex tb IIC T80°C, T95°C Db IP66 II 2D Ex Ia/Ib IIC T80°C, T95°C Db IP66		
Verfahren der EU-Baumuster- prüfung / Benannte Stelle	Procedure of EU-Type Examina- tion / Notified Body	Procédure d'examen UE de type / Organisme Notifié	
0102 PTB, Bundesallee 100, 38116 Braunschweig, D		PTB 08 ATEX 1064 0102 PTB, Bundesallee 100, 38116 Braunschweig, D	
 1304		James Gajski Technical Manager	
Zagorje, den 19.04.2016			

WB-02 02 099E-01010-EN-31 - EU (April 2016)

Seite 1 page 1 page 1 out of 1 des 1

Declaration of conformity of BoWex curved-tooth gear coupling

EU-Konformitätserklärung

im Sinne der EU-Richtlinie 2014/34/EU vom 26.02.2014
und mit den zu ihrer Umsetzung erlassenen Rechtsvorschriften

Der Hersteller - KTR Systems GmbH, D-48432 Rheine - erklärt, dass die in dieser Betriebs-/
Montageanleitung beschriebenen, explosionsgeschützt ausgeführten

BoWex® - Bogenzahn-Kupplungen®

Geräte im Sinne des Artikels 2, 1. der RL 2014/34/EU sind und die grundlegenden Sicherheits- und
Gesundheitsanforderungen gemäß Anhang II der RL 2014/34/EU erfüllen.

Die hier benannte Kupplung erfüllt die Anforderungen der folgenden Normen/Richtlinien:

DIN EN 1127-1
DIN EN 1127-2
DIN EN 13463-1
DIN EN 13463-5

Die BoWex® stimmt mit den Anforderungen der RL 2014/34/EU überein. Eine oder mehrere der in der
zugehörigen Baumusterprüfbescheinigung IBExU13ATEXB007 X genannten Normen wurden zum
Teil durch neue Ausgaben ersetzt.

Die KTR Systems GmbH als Hersteller erklärt für das vorstehend genannte Produkt auch die Überein-
stimmung mit den Anforderungen der neuen Normenausgaben.

Entsprechend Artikel 13 (1) b) ii) der RL 2014/34/EU ist die technische Dokumentation bei der be-
nannten Stelle hinterlegt.

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02.01.2017
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