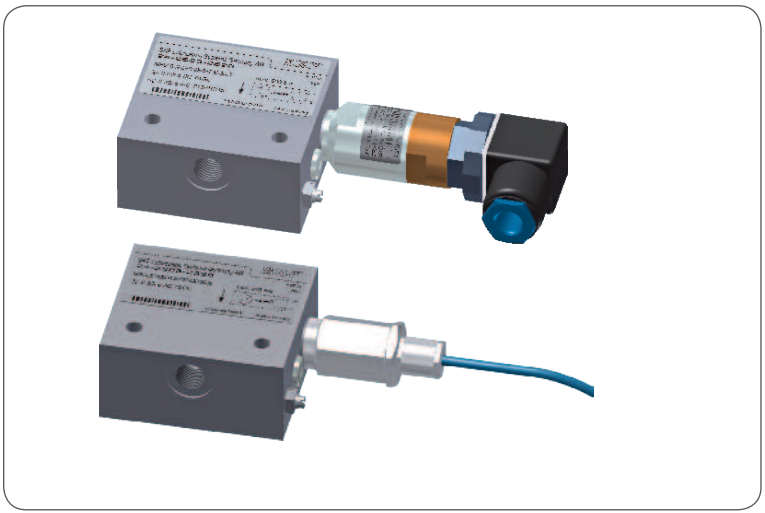
Assembly instructions

EN

Pulse Generator of the Series SP/SFE 30/3003 and SP/SFE 30/3006

for ATEX-compliant applications in centralized lubrication systems with consumption volumes of 0,1 to 50 cm^3/min



Version 03

Assignment as simple electrical equipment according to EN 60079-14:2014 Item 16.4

for potentially explosive atmospheres according to ATEX Directive 94/9/EC
We hereby confirmed that
pulse generators: **24-2583-2526**
of the Series SP/SFE 30/3003
24-2583-2528
of the Series SP/SFE 30/3006

are merely passive switching elements with a max. internal capacitance of
pulse generators:
24-2583-2526 = C_i = 1nF
24-2583-2528 = C_i = 50nF
and an internal inductance of:
pulse generators:
24-2583-2526 = L_i = 5µH
24-2583-2528 = L_i = 60µH
and in their entirety do not contain any own ignition sources.
The pulse generator is a passive component that, for the purpose of intrinsically safe protection type "i," is a piece of simple electrical equipment and is treated in standard DIN EN 60079-11, Para. 5.7, when connected to an intrinsically safe electrical circuit with maximum values:

pulse generator: 24-2583-2526
P_i=1 W; U_i=30 V and I_i=100 mA
pulse generator: 24-2583-2528
P_i=34 mW; U_i=16 V and I_i=25 mA

Such simple means of operation are independent of the equipment level. Simple means of operation must be clearly identifiable by permanent marking. The marking as a simple means of operation can be made by the installer and by any marking or coding preferred for the installation, so that the signal transmitter is clearly recognisable as a simple means of operation.

The pulse generator may, with reference to EC Directive 97/23/EC concerning pressure equipment, only be used in accordance with its intended use and in conformity with the instructions provided in the documentation. The following must be observed in this regard:
The product is neither designed nor approved for use in conjunction with fluids of Group 1 (Dangerous Fluids) as defined in Article 2, Para. 2 of Directive 67/548/EEC of June 27, 1967. The product is neither designed nor approved for use in conjunction with gases, liquefied gases, pressurized gases in solution, vapors, or such fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible temperature. When used in conformity with their intended use, the products supplied by SKF Lubrication Systems Germany GmbH do not reach the limit values listed in Article 3, Para. 1, Clauses 1.1 to 1.3 and Para. 2 of Directive 97/23/EC. They are therefore not subject to the requirements of Annex 1 of the Directive.
Consequently, they do not bear a CE marking in respect of Directive 97/23/EC.
SKF Lubrication Systems Germany GmbH-classifies them according to Article 3, Para. 3 of the Directive.

Masthead

Warranty

The instructions do not contain any information on the warranty. This can be found in the General Conditions of Sales, which are available at:
www.skf.com/lubrication.

Manufacturer and service address

If you have questions, please contact:

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Explanation of symbols and signs

Activities that present specific hazards to persons or material assets are indicated with warnings.

Read the instructions completely and follow all operating instructions and the warning and safety instructions.

Warning level		Consequence	Probability
⚠	DANGER	Death / serious injury	Immediate
⚠	WARNING	Serious injury	Possible
⚠	CAUTION	Minor injury	Possible
	NOTE	Property damage	Possible

Text formats	
Symbol	**Meaning**
●	Prompts an action
○	Used for itemizing
☞	Refers to causes / consequence or other facts
→	Provides additional information within procedures

Possible symbols	
Symbol	**Meaning**
	Note
	Electric shock hazard
	Slipping hazard
	Hazard from hot surfaces
	Risk of being drawn into machinery
	Crushing hazard
	Danger from suspended load
	Pressure injection hazard
	Explosion-proof component
	Electrostatic sensitive components
	Wear personal safety equipment (goggles)
	Secure (lock) the machine against accidental starting
	Environmentally sound disposal

Instructions placed on a unit, machine, or equipment, such as:

- Arrow indicators
- Fluid connection labels
- Warnings

must be followed and kept in fully legible condition.

Read the instructions thoroughly and follow them.

Abbreviations and conversion factors

Abbreviations

re	regarding
approx.	approximately
°C	degrees Celsius
s	seconds
dB (A)	sound pressure level
i.e.	that is
etc.	et cetera
poss.	possibly
<	less than
±	plus or minus
>	greater than
e.g.	for example
if necessary	if necessary
etc.	et cetera
usually	usually
Ø	diameter
incl.	including
K	Kelvin
kg	kilogram
rh	relative humidity
kW	kilowatt
l	liter
Min.	minute
max.	maximum
min.	minimum
mm	millimeter
ml	milliliter
N	Newton
Nm	Newton meter
oz.	ounce
psi	pounds per square inch
hp	horsepower
lb.	pound
sq.in.	square inch
kp	kilogram-force
cu.in.	cubic inch
mph	miles per hour
fpsec	feet per second
°F	degrees Fahrenheit
fl.oz.	fluid ounce
in.	inch
gal.	gallon

Conversion factors

Length	1 mm = 0.03937 in.
Area	1 cm^2 = 0.155 sq.in.
Volume	1 ml = 0.0352 fl.oz.
	1 l = 2.11416 pints (US)
Mass	1 kg = 2.205 lbs
	1 g = 0.03527 oz.
Density	1 kg/cm^3 = 8.3454 lb./gal. (US)
	1 kg/cm^3 = 0.03613 lb./cu.in.
Force	1 N = 0.10197 kp
Speed	1 m/s = 3.28084 fpsec
	1 m/s = 2.23694 mph
Acceleration	1 m/s^2 = 3.28084 $ft./s^2$
Pressure	1 bar = 14.5 psi
Temperature	°C = (°F-32) x 5/9
Power	1 kW = 1.34109 hp

1. Safety instructions

1.1 General safety instructions

The components described here, pulse generators **24-2583-2526** of the Series SP/SFE 30/3003 and **24-2583-2528** of the Series SP/SFE 30/3006, were manufactured according to the state of the art.
Risks may, however, arise from usage of the components and may result in personal injury or damage to property.
Any malfunctions which may affect safety must be remedied immediately. In addition to the assembly instructions.
manual, statutory regulations and general regulations for accident prevention and environmental protection must be observed.

1.2 General behavior when handling the components

- The components may only be used in awareness of the potential dangers, in proper technical condition, and according to the information in this manual.
- Personnel must familiarize themselves with the functions and operation of the components.
- 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.
- Responsibilities for different activities must be clearly defined and observed. Uncertainty seriously endangers safety.
- Protective and safety mechanisms cannot be removed, modified, nor disabled during operation and must be checked for proper function and completeness at regular intervals.
  If protective and safety mechanisms must be removed, they must be reinstalled immediately following conclusion of work and checked for proper function.
- Any malfunctions that occur must be resolved according to responsibility. The supervisor must be notified immediately in case of malfunctions outside one's individual scope of responsibility.
- Wear personal protective equipment.
- Observe the relevant safety data sheets when handling lubricants/equipment.

1.3 Qualified technical personnel

Only qualified technical personnel may install, operate, and maintain the components described in the assembly instructions. Qualified technical personnel are persons who have been trained, assigned and instructed by the operator of the final product into which the described components are incorporated. Such persons are familiar with the relevant standards, rules, accident prevention regulations, and assembly conditions as a result of their training, experience, and instruction. They are qualified to carry out the required activities and in doing so recognize and avoid any potential hazards. The definition of qualified electricians and the prohibition against employing non-qualified personnel are laid down in DIN VDE 0105 and IEC 364.

Relevant country-specific qualifications for technical personnel apply for countries outside the scope of IEC 364.

The core principles of these country-specific qualification requirements for technical personnel cannot be below those of the two standards mentioned above.
The operator of the final product is responsible for assigning tasks and areas of responsibility and for the responsibility and monitoring of the personnel. These areas must be precisely specified by the operator. The personnel must be trained and instructed if they do not possess the requisite knowledge.
Product training can also be performed by SKF in exchange for costs incurred.
The operator must ensure that its personnel have fully understood the content of the assembly instructions.

1.4 Electric shock hazard

WARNING

Electric shock
The supply voltage must be switched off before opening any of the product's components.

1.5 System pressure or hydraulic pressure hazard

WARNING

System pressure/ Hydraulic pressure
The product described here is pressurized during operation. Depressurize the product before starting any assembly, maintenance, or repair work.

1.6 Intended use

Pulse generators **24-2583-2526** of the Series SP/SFE 30/3003 and **24-2583-2528** of the Series SP/SFE 30/3006 are used to monitor volumetric oil and grease flows from 0,1 to 50 cm^3/min at a maximum permissible operating pressure of 600 bar (24-2583-2526) or 350 bar (24-2583-2528).
The pulse generators with built-in potential-free contact are classified as simple electrical equipment. They meet the requirements of the standard EN 60079-11, paragraph 5.7 and may be used in intrinsically safe circuits only.
The data and values listed in the "Technical data" chapter must be observed.
Any other usage is deemed non-compliant with the intended use and could result in damage, malfunction, or even injury.
Hazardous materials of any kind, especially the materials classified as hazardous by CLP Regulation EC 1272/2008 may only be used to fill SKF centralized lubrication systems and components and deliv-ered and/or distributed with the same after consulting with and receiving written approval from SKF.
The described product is neither designed nor approved for use in conjunction with gases, liquefied gases, pressurized gases in solution, vapors, or such fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible temperature.

1.7 Operation

The following must be observed while working on the product.

- All information within this manual and the information within the referenced documents
- All laws and regulations that the operator must observe
- The information on explosion protection according to Directive 1999/92/EC (ATEX 137), if necessary.

1.8 Explosion protection

- Always behave so as to avoid fire and explosion hazards.
- Explosion protection measures must never be deactivated, changed, or bypassed.
- The introduction of ignition sources such as sparks, open flames, and hot surfaces into potentially explosive atmospheres is prohibited.
- Use only tools and clothing approved for use in potentially explosive atmospheres (ESD).
- A written work authorization from the operator is required prior to starting installation in potentially explosive atmospheres.
- Assembly work can be performed only if it is ensured that no explosive atmosphere is present.

1.9 Assembly / maintenance / malfunction / decommissioning / disposal

- All relevant persons (e.g., operating personnel, supervisors) must be informed of the activity prior to beginning work. Precautionary operational measures / work instructions must be observed.
- Take appropriate measures to ensure that moving/detached parts are immobilized during the work and that no body parts can be pinched by unintended movements.
- Install the component only outside the operating range of moving parts, at an adequate distance from sources of heat or cold.
- Prior to performing work, the component and the machine/system in which the component will be integrated must be depressurized and secured against unauthorized activation.
- Drill holes required for assembly only on non-critical, non-load-bearing parts.
- Other units of the machine must not be damaged or impaired in their function by the installation.
- No parts of the centralized lubrication system may be subjected to torsion, shear, or bending.
- Use suitable lifting gear when working with heavy parts.
- Avoid mixing up/incorrectly assembling disassembled parts. Label parts.
- Use only non-flammable cleaning agents that are suitable for the intended purpose.
- Do not use harsh cleaning agents.
- Do not use sharp tools for cleaning.
- Do not use steam-jet equipment or high-pressure cleaners. Observe the IP protection class.
- Do not touch cables with wet or moist hands.
- Remove accumulated dust on a regular basis. Do not stir up dust in the process.

1.10 Foreseeable misuse

- Any usage of the product differing from the aforementioned conditions and stated purpose is strictly prohibited. Particularly prohibited are:
- In another, more critical explosion protection zone
- To feed / forward / store Group 1 dangerous fluids according to Directive 67/548/EEC
- Use to feed / forward / store gases, liquefied gases, dissolved gases, vapors, or fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible operating temperature

1.11 Disclaimer of liability

The manufacturer shall not be held liable for damage resulting from:

- Resulting from failure to comply with these instructions
- The use of lubricants/media not approved for the unit type
- Contaminated or unsuitable lubricants
- Installation of non-original SKF components
- Inappropriate usage
- Resulting from improper assembly, configuration, or filling
- Improper response to malfunctions
- Non-observance of maintenance intervals
- Independent modification of system components

1.12 Obligations of the operator

The operator must identify all hazards resulting from integration into the main machine as well as the hazards at the machine's place of installation. The operator must take necessary measures for safety and health protection. Based on a comprehensive assessment of the work area, the operator ensures that the equipment and all installation material are suitable for operation in potentially explosive atmospheres and are assembled, installed, and operated in such a way that they do not cause an explosion.

1.13 Modifications / changes

Unauthorized modifications/changes can have an unpredictable effect on safety. Unauthorized modifications/changes are therefore prohibited.

1.14 Referenced documents

In addition to this manual, the following documents must be observed by the respective target group:

- The explosion protection document of the operator
- Operational instructions / approval rules
- Instructions from suppliers of purchased parts
- Manual for the insulation resistance tester
- Safety data sheet of the lubricant / equipment used
- Project planning documents and other relevant documents

The operator must supplement these documents with applicable regulations for the country of use. The documentation must be included if the product is transferred to a new operator.

1.15 Residual risks

Residual risk	Remedy
Life cycle: Assembly	
People slipping due to floor contamination with spilled/leaked lubricant	• Exercise caution when connecting the product's hydraulic connections • Promptly apply suitable binding agents and remove the leaked/spilled lubricant. • Follow operational instructions for handling lubricants and contaminated parts
Tearing/damage to lines when installed on moving machine components	• If possible, do not install on moving parts; if this cannot be avoided, use flexible hose lines.
Life cycle: Commissioning / operation	
Lubricating oil spraying out due to faulty component fitting/line connection.	• Tighten all components securely or using the specified torques. Use hydraulic connections and lines suitable for the indicated pressures. These must be checked for proper connection and for damage prior to commissioning.
Life cycle: Setup/retrofit/malfunction/troubleshooting/maintenance, repair/shutdown/disposal	
Environmental contamination by lubricants and wetted parts	• Dispose of contaminated parts according to the applicable legal/company rules
Lubricating oil spraying out due to faulty component fitting/line connection.	• Tighten all components securely or using the specified torques. Use hydraulic connections and lines suitable for the indicated pressures. These must be checked for proper connection and for damage prior to commissioning.
People slipping due to floor contamination with spilled/leaked lubricant	• Dispose of contaminated parts according to the applicable legal/company rules

2. Lubricants

2.1 General information

NOTE

All products from SKF Lubrication Systems may be used only for their intended purpose and in accordance with the information in the product's operating instructions.

Intended use is the use of the products for the purpose of providing centralized lubrication/lubrication of bearings and friction points using lubricants within the physical usage limits which can be found in the documentation for the devices, e.g., operating instructions and the product descriptions, e.g., technical drawings and catalogs.
Particular attention is called to the fact that hazardous materials of any kind, especially those materials classified as hazardous by EC Directive 67/548/EEC, Article 2, Para. 2, may only be filled into SKF centralized lubrication systems and components and delivered and/or distributed with such systems and components after consulting with and obtaining written approval from SKF Lubrication Systems.
No products manufactured by SKF Lubrication Systems are approved for use in conjunction with gases, liquefied gases, pressurized gases in solution, vapors, or such fluids whose vapor pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at their maximum permissible temperature.
Other media which are neither lubricant nor hazardous substance may only be fed after consultation with and written approval from SKF Lubrication Systems.
SKF Lubrication Systems considers lubricants to be an element of system design that must always be factored into the selection of components and the design of centralized lubrication systems. The lubricating properties of the lubricants are critically important in making these selections.

2.2 Selection of lubricants

NOTE

Observe the instructions from the machine manufacturer regarding the lubricants that are to be used.
The amount of lubricant required at a lubrication point is specified by the bearing or machine manufacturer. It must be ensured that the required quantity of lubricant is provided to the lubrication point. The lubrication point may otherwise not receive adequate lubrication, which can lead to damage and failure of the bearing.

Selection of a lubricant suitable for the lubrication task is made by the machine/system manufacturer and/or the operator of the machine/system in cooperation with the lubricant supplier.
When selecting a lubricant, the type of bearings/friction points, the expected load during operation, and the anticipated ambient conditions must be taken into account. All economic and environmental aspects must also be considered.

2.3 Approved lubricants

NOTE

If necessary, SKF Lubrication Systems can help customers to select suitable components for feeding the selected lubricant and to plan and design their centralized lubrication system.

Please contact SKF Lubrication Systems if you have further questions regarding lubricants. It is possible for lubricants to be tested in the company's laboratory for their suitability for pumping in centralized lubrication systems (e.g., "bleeding").
You can request an overview of the lubricant tests offered by SKF Lubrication Systems from the company's Service department.

NOTE

Only lubricants approved for the product may be used; see the "Technical data" chapter. Unsuitable lubricants can lead to failure of the product and damage to property.

NOTE

Different lubricants must not be mixed together. Doing so can cause damage and require costly and complicated cleaning of the product/lubrication
system. It is recommended that an indication of the lubricant in use be attached to the lubricant reservoir in order to prevent accidental mixing of lubricants.

The product described here can be operated using lubricants that meet the specifications in the technical data. Depending on the product design, these lubricants may be oils, fluid greases, or greases.
Mineral, synthetic, and/or and rapidly biodegradable oils and base oils can be used. Consistency agents and additives may be added depending on the operating conditions.
Note that in rare cases, there may be lubricants whose properties are within the permissible limits values but whose other characteristics render them unsuitable for use in centralized lubrication systems. For example, synthetic lubricants may be incompatible with elastomers.

2.4 Lubricants and the environment

NOTE

Lubricants can contaminate soil and waterways. Lubricants must be used and disposed of properly. Observe the local regulations and laws regarding the disposal of lubricants.

It is important to note that lubricants are environmentally hazardous, flammable substances which require special precautionary measures during transport, storage, and processing. Consult the safety data sheet from the lubricant manufacturer for information regarding transport, storage, processing, and environmental hazards of the lubricant that will be used.
The safety data sheet for a lubricant can be requested from the lubricant manufacturer.

2.5 Lubricant hazards

WARNING

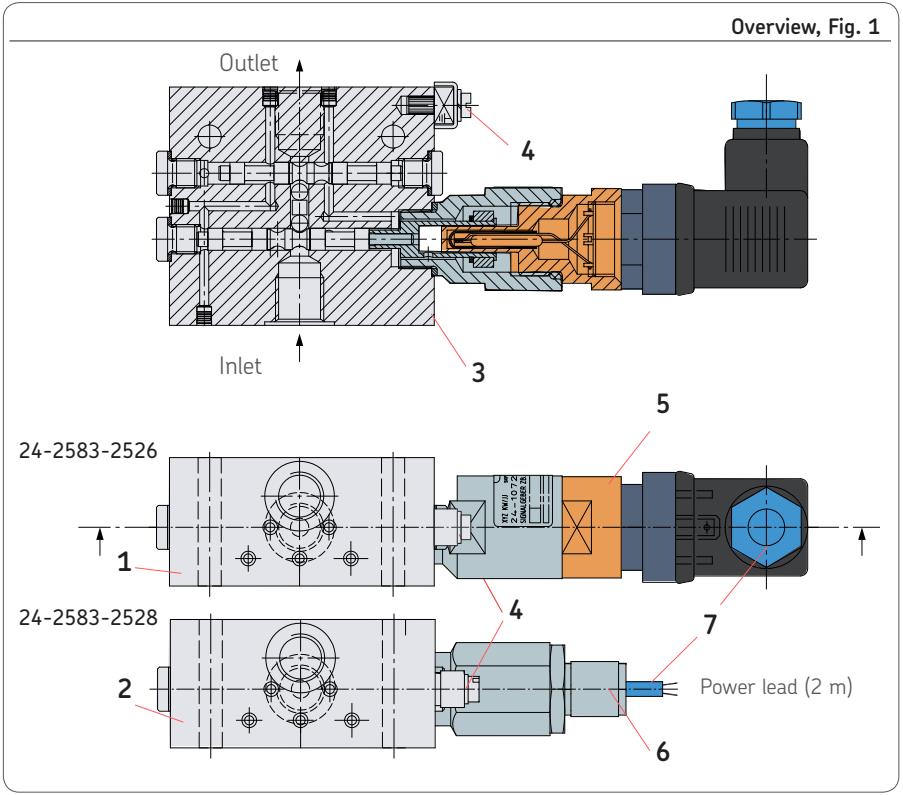
Lubricants
Pulse generators must always be free of leaks. Leaking lubricant is hazardous due to the risk of slipping and injury. Beware of any lubricant leaking out during assembly, operation, maintenance, or repair of centralized lubrication systems. Leaks must be sealed off without delay.

Leaking lubricant is a serious hazard. Leaking lubricant can create risks that may result in physical harm to persons or damage to other material assets.

NOTE

Follow the safety instructions on the lubricant's safety data sheet.

3. Overview / functional description



Item	Description
1	**Pulse generator 24-2583-2526** (complete)
2	**Pulse generator 24-2583-2528** (complete)
3	Housing with change-over piston
4	Ground terminal
5	Electrical generator unit with plug connector
6	Electrical generator unit with 2 m power lead
7	Screw connection/cabel (blue)

The marking (**7**) as simple electrical means of operation is provided by SKF by a blue screw connection on the corresponding connection plug (24-2583-2526) or by a blue connection cable (24-2583-2528).

3.1 Pulse generator operation

☞ **See Figure 2**

The lubricant flows from the inlet, through duct **KR**, and into outlet chamber **D4**. Piston **K1** moves to the left. The control bolt with balls **E1** locks piston **K2**. The lubricant in outlet chamber **D1** is pressed through the right-hand annular groove of **K2** to the outlet. When piston **K1** reaches the end position on the left, the locking of piston **K2** is terminated.

☞ **See Figure 3**

The lubricant flows from the inlet, through duct **KML**, and into outlet chamber **D2**. Piston **K2** moves to the right. The control bolt with balls **E1** locks piston **K1**. The lubricant in outlet chamber **D3** is pressed through the right-hand annular groove of piston **K1** to the outlet. When piston **K2** reaches the end position on the right, the locking of piston **K1** is terminated. The lubricant flows from the inlet, through duct **KL**, and into outlet chamber **D1**. Piston **K1** moves to the right.

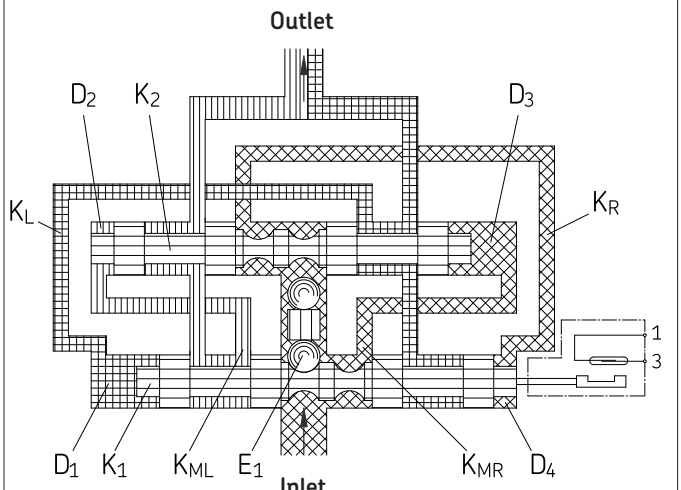
The control bolt with balls **E1** locks piston **K2**. The lubricant in outlet chamber **D4** is pressed through the left-hand annular groove of **K2** to the outlet. When piston **K1** reaches the end position on the right, the locking of piston **K2** is terminated.

☞ **See Figure 2 - K1 in right position**

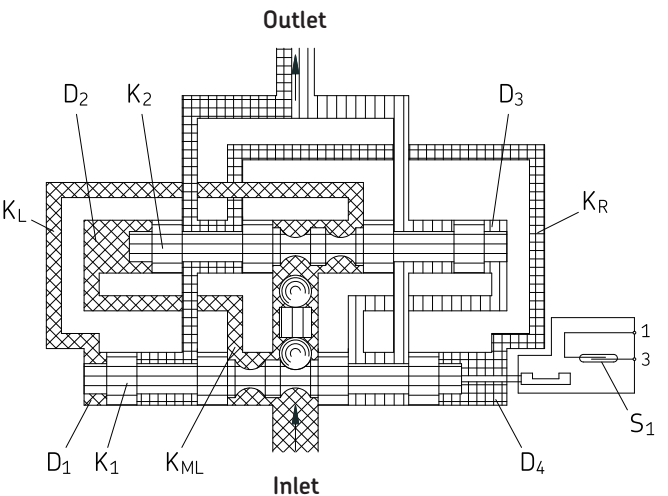
The lubricant flows from the inlet, through duct **KMR**, and into outlet chamber **D3**. Piston **K2** moves to the left. The control bolt with balls **E1** locks piston **K1**. The lubricant in outlet chamber **D2** is pressed through the left-hand annular groove of **K1** to the outlet.

The sequence described above is repeated as long as lubricant flows.
With each procedure as described above, reed contact **S1** in the switch part is closed and opened once by the ring magnet affixed to piston **K1**. The switching pulses are generated at a rate proportional to the volumetric flow. They are fed to the connected pulse evaluator and monitored by the built-in timer.
A fault signal is issued if the switching period is longer than the set monitoring time.

Pulse generator operation, Fig. 2



Pulse generator operation, Fig. 3



4. Technical data

4.1 General technical data

General characteristics of both sensors

Mounting position	Any
Ambient temperature range	-20 to + 40°C
Lubricant temperature range	- 15 to +70°C
Weight	1.1 kg
Ground terminal 1)	M4
Hydraulic system	
Pressure loss	Approx. 4 bar
Lubricant	Mineral oils, synthetic and environmentally friendly oils, greases based on mineral oil
Operating viscosity	> 12 mm^2/s
Worked penetration	> 260 1/10 mm
Volumetric flow range	0,1 to 50 cm^3/min

1) The customer must determine the required cross-section and the quality and length of the grounding cable to be connected to the pulse generator according to the particular operating conditions.

Sensor 24-2583-2526

General	
Hydraulic system	
Operating pressure	4 to 600 bar
Volume/pulse 2)	0,68 cm^3
Electrical system	
Contact type	Reed contact
Voltage U_i	30 V DC
Current I_i	100 mA
Capacitance C_i	1 nF
Inductance L_i	5 µH
Connection type	DIN 43650-A plug
Plugs	3 + PE
Conductor cross-section cable to be connected (max.)	2 x 0,75 mm^2

2) A pulse comprises the opening or closing of the reed contact.

Sensor 24-2583-2528

General	
Sensor protection class	
	CE Ex II 2G IIC T6Gb
	CE Ex II 1D IIIC T135°C Ga
Hydraulic system	
Operating pressure	4 to 350 bar
Volume/pulse 3)	0,64 cm^3
Electrical system	
Switching element function	
NAMUR NC contact	
Nominal distance S_n	1,5 mm, flush mountable
Assured operating distance S_a	0 to 1,22 mm
Rated voltage U_o	8.2 V DC
Voltage U_i	16 V DC
Current I_i	25 mA
Power consumption	
-Measuring plate not detected	
≥ 3 mA	
-Measuring plate detected	
≤ 1 mA	
Capacitance C_i	50 pF 4)
Inductance L_i	60 µH 4)
Power lead	PVC, 2 m, 2 x 0,34 mm^2

3) A pulse comprises the opening or closing of the reed contact.
4) A cable length of 10 m is taken into account.

5. Delivery, returns, and storage

5.1 Checking the delivery

Immediately after receipt, the delivery must be checked for completeness according to the shipping documents. Any transport damage must be reported to the transport company immediately. The packaging material should be preserved until any discrepancies are resolved.

5.2 Returns

All parts must be cleaned and properly packed before return shipment (i.e., according to the requirements of the recipient country). There are no restrictions for land, air, or sea transport.

The following must be marked on the packaging of return shipments:

	Do not top load / This side up
	Keep dry
	Handle with care, Do not drop

The following conditions apply to storage:

5.3 Storage

5.3.1 Lubrication units

- o dry and dust-free surroundings, storage in well ventilated dry area
- o Storage time: Max. 24 months
- o Relative humidity: < 65%
- o Storage temperature: + 10 to +40°C
- o No direct sun or UV exposure
- o Protected against nearby sources or heat or cold

5.3.2 Electronic and electrical devices

- o dry and dust-free surroundings, storage in well ventilated dry area
- o Storage time: Max. 24 months
- o Relative humidity: < 65%
- o Storage temperature: + 10 to +40°C
- o No direct sun or UV exposure
- o Protected against nearby sources or heat or cold

5.3.3 General notes

- o The product(s) can be enveloped in plastic film to provide low-dust storage.
- o Protect against ground moisture by storing on a shelf or wooden pallet.
- o Bare metallic surfaces must be protected using anti-corrosion agents. Check corrosion protection every 6 months and reapply if necessary.
- o Motors must be protected from mechanical damage. Do not store motors on the fan cowl.

6. Assembly

6.1 General information

Pulse generators **24-2583-2526** of the Series SP/SFE 30/3003 and **24-2583-2528** of the Series SP/SFE 30/3006 can be used to monitor the volumetric flow within an ATEX-compliant machine/system.
The signal transmitters with built-in potential-free contact are classified as simple electrical equipment.
They meet the requirements of the standard EN 60079-11, paragraph 5.7.

The marking as a simple means of operation can be made by the installer and by any marking or coding preferred for the installation, so that the signal transmitter is clearly recognisable as a simple means of operation.
The signal transmitters may be used in intrinsically safe circuits only.
The permissible switching voltage of max. 30 VDC (24-2583-2526) respectively 16 VDC (24-2583-2528) must not be exceeded.
The sensor can be mounted in any position.

The values given for the sensors in Chapter 4 “Technical data” must be observed.

NOTE

Observe the technical data (Chapter 4).

Only in the technical personnel may mount, connect, and put into operation the pulse generator described in this assembly instructions. The technical personnel must have detailed knowledge of the various types of protection and the rules and regulations for devices and equipment in potentially explosive atmospheres. The applicable national regulations and rules must be observed.
Before assembling/setting up the product, the packaging material and any shipping braces (e.g., plugs) must be removed.

DANGER

Excessive switching voltage hazard
An isolating amplifier must be inserted if the sensor will be used in a potentially explosive atmosphere (ATEX). The maximum permissible voltage U_i of 30 VDC (24-2583-2526) or 16 VDC (24-2583-2528) must not be exceeded.

DANGER

Hazard from incorrect tool or equipment
Use only tools and clothing approved for use in potentially explosive atmospheres (ESD).

6.2 Assembly of the pulse generators

☞ See Figures 4 and 5

During assembly and especially when drilling, always pay attention to the following:

- o Existing lines must not be damaged.
- o Other units must not be damaged.
- o The product must not be installed within range of moving parts.
- o The product must be installed at an adequate distance from sources of heat or cold.
- o Maintain safety clearances and comply with regulations for assembly and accident prevention.

NOTE

The inlet and outlet screw unions, as well as the inlet and outlet lines, must be designed according to the maximum permissible operating pressure.

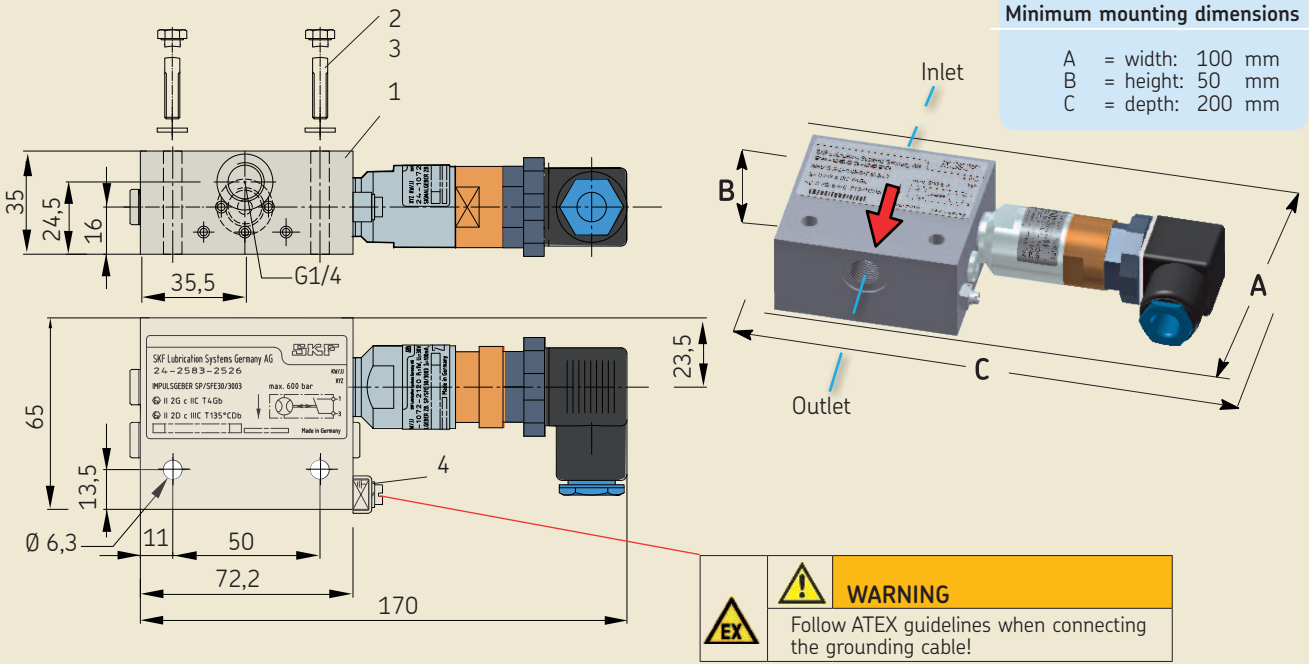
Follow ATEX guidelines when connecting the grounding cable.

The switching circuits of the pulse generator must be supplied by an intrinsically safe circuit, e.g., through the installation of an ATEX-compliant isolating switch by the customer. While working, use only tools intended for use in potentially explosive spaces or else make certain that there are no potentially explosive atmospheres present. The operator must make sure through the choice of the lubricant to be delivered that no chemical reactions capable of serving as ignition sources will occur in conjunction with the anticipated explosive atmosphere.

- Check the parallelism of the surface on which the component is to be installed. Stress-free installation of the component must be ensured.
- Place pulse generator (**1**) onto the mounting surface and fasten it finger-tight using two galvanized hexagon head screws, DIN EN ISO 4017, M6x50-8.8 (**2**) and washers (2x) DIN EN ISO 7090 6-200 (**3**).
- Align the pulse generator and tighten the hexagon head screws (**2**) with a torque of 10 Nm.
- Apply inlet screw union G1/4 to the pulse generator inlet (see direction arrow on pulse generator) and tighten with a torque of 35 Nm.
- Connect the inlet line (provided by customer) to the inlet screw union.
- Apply outlet screw union G1/4 to the pulse generator input and tighten with a torque of 35 Nm.
- Connect the supply line (provided by customer) to the inlet screw union.
- Connect the outlet line (provided by customer) to the outlet screw union.
- Connect the grounding cable (**4**) (provided by customer).

6.2.1 Pulse generator 24-2583-2526, port dimensions, assembly holes, and minimum mounting dimensions

Dimension drawing of pulse generator 24-2583-2526, Fig. 4



Minimum mounting dimensions

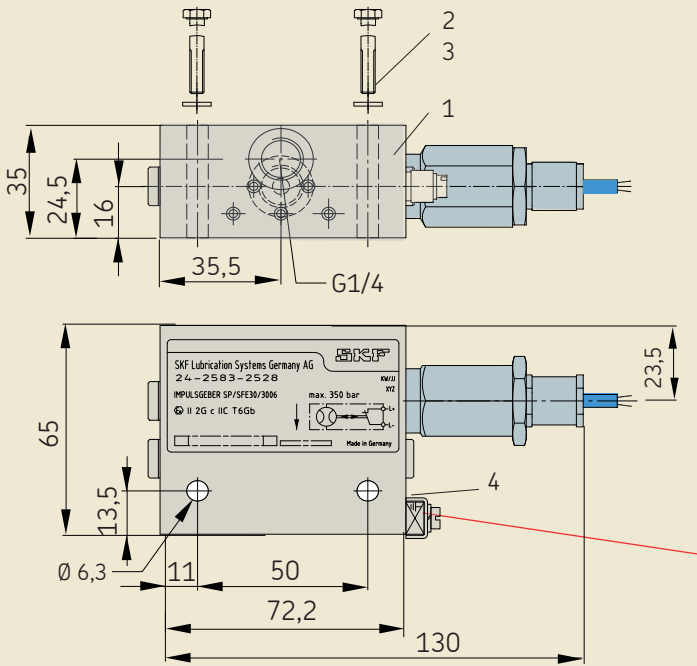
A	= width:	100	mm
B	= height:	50	mm
C	= depth:	200	mm

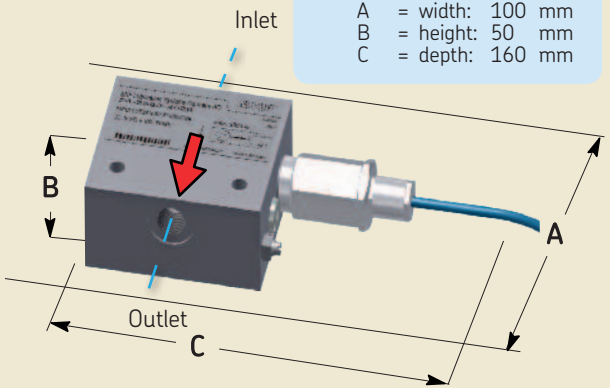
WARNING

Follow ATEX guidelines when connecting the grounding cable!

6.2.2 Pulse generator 24-2583-2528, port dimensions, assembly holes, and minimum mounting dimensions

Dimension drawing of pulse generator 24-2583-2528, Fig. 5





Minimum mounting dimensions

A	= width:	100	mm
B	= height:	50	mm
C	= depth:	160	mm

WARNING

Follow ATEX guidelines when connecting the grounding cable!

6.3 Electrical connection of pulse generator 24-2583-2526

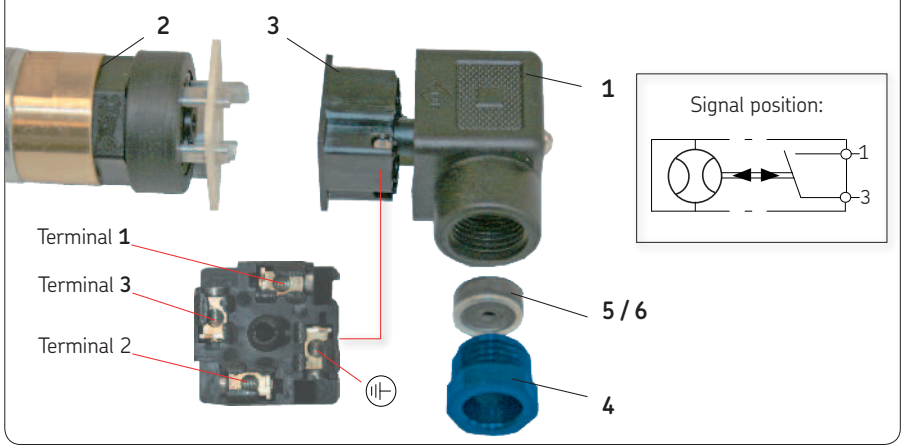
☞ See Figure 6

- Unscrew the cable socket (**1**) from the pulse generator (**2**) and push the housing (**3**) out of the cable socket.
- Unscrew the pressure screw (**4**) with clamping disk (**5**) and cable gland (**6**) from the cable socket (**1**).
- Compare the clamping range of the cable gland (**6**) with the diameter of the cable that will be inserted by the customer; only use a cable with an appropriate diameter.
- Pull the customer-provided cable through the pressure screw (**4**), clamping disk (**5**), cable gland (**6**), and cable socket (**1**)

☞ Observe the maximum clamping limit for the terminal clamps ("Technical data" chapter).

- Connect the flexible cable leads to the housing (**3**) according to the connection diagram, Figure 5, (terminals 1 / terminal 3).
- Carefully insert the housing (**3**) into the cable socket (**1**).
- Screw the pressure screw (**4**) into the cable socket (**1**) and tighten securely.
- Check the cable/screw union to make sure they are sealed properly.

Electrical connection of pulse generator 24-2583-2526, Fig. 6



6.4 Electrical connection of pulse generator 24-2583-2528

☞ See Figure 7

- Arrange the ATEX power lead (**1**) from the pulse generator to the port without any kinks.

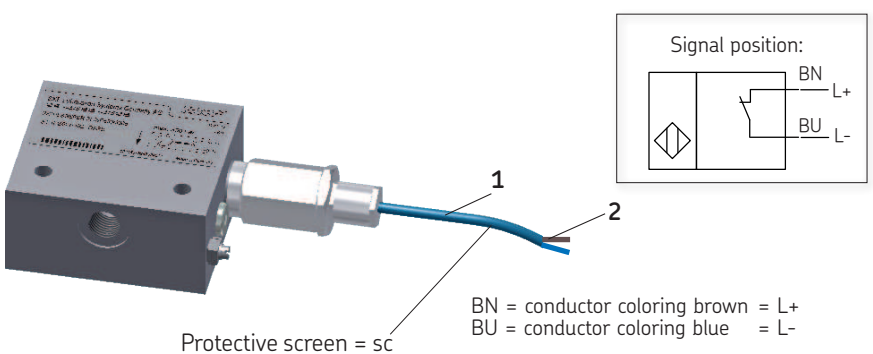
☞ Observe the maximum clamping limit for the terminal clamps (“Technical data” chapter).

- Connect flexible cable leads (**2**) (BN = brown /BU = blue) according to the connection diagram.

☞ The protective screen (sc) of the ATEX cable is already connected to the pulse generator.

☞ Ensure that the ATEX power lead (**1**) is secured against strain and twisting. Secure the cable accordingly if necessary.

Electrical connection of pulse generator 24-2583-2528, Fig. 7



6.5 Note on the rating plate

NOTE

Environmental pollution
Lubrication lines must always be free of leaks. Lubricants can contaminate soil and waterways. Lubricants must be used and disposed of properly. Observe the local regulations and laws regarding the disposal of lubricants.

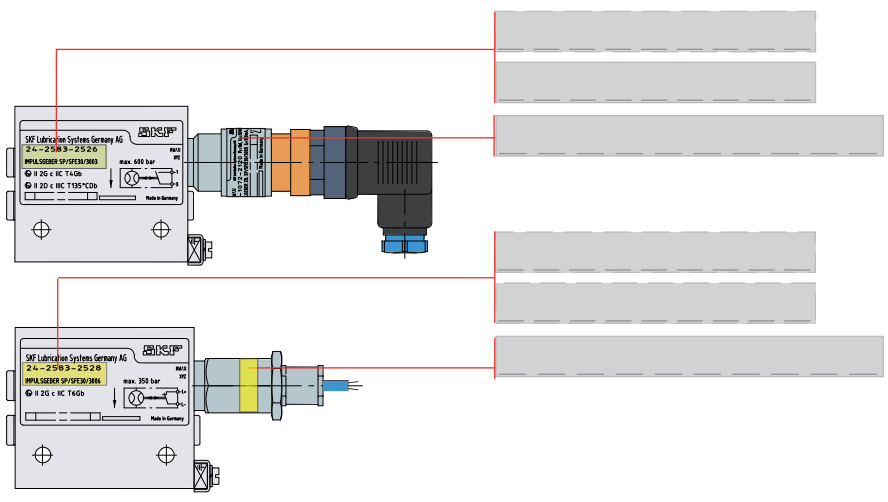
CAUTION

Slipping hazard
Centralized lubrication systems must always be free of leaks. Leaking lubricant is hazardous. Beware of any lubricant leaking out during assembly, operation, maintenance, or repair of centralized lubrication systems. Leaks must be sealed off without delay.

The rating plate provides important data such as the type designation, order number, barcode, and serial number.
To avoid loss of this data in case the rating plate becomes illegible, these characteristics should be entered in the following table.

- Enter key data from rating plate in the following table.

Key data from rating plate, Fig. 8



6

7. Commissioning

NOTE

Observe the instructions from the machine manufacturer regarding the lubricants that are to be used.

NOTE

Only fill using clean lubricant and an appropriate device. Contaminated lubricants lead to system malfunctions.

7.1 Commissioning

Pulse generators **24-2583-2526** of the Series SP/SFE 30/3003 and **24-2583-2528** of the Series SP/SFE 30/3006 are delivered in an operational state and can be used immediately following proper installation. Ensure that the pulse generators and their connections are properly sealed.

8. Shutdown and disposal

8.1 Temporary shutdown

Pulse generator(s) SP/SFE 3003 and SP/SFE 3006 can be temporarily shut down only by shutting down the system in which the pulse generator(s) is (are) installed.

8.2 Permanent shutdown

If the pulse generators are to be shut down permanently, the local regulations and laws regarding the disposal of contaminated equipment must be observed.

NOTE

Lubricants must be used and disposed of properly. Observe the local regulations and laws regarding the disposal of lubricants.

The product can also be returned to SKF for disposal, in which case the customer is responsible for reimbursing the costs incurred.

The parts are recyclable.

9. Maintenance

9.1 General information

Pulse generators of series SP/SFE 3003 and SP/SFE 3006 function without maintenance, though the following points must be observed:

WARNING

System pressure
The described component is pressurized during operation.
Depressurize the component before starting maintenance work.

WARNING

Hot surface
Due the installation conditions, the mechanical part of the pulse generators can reach a surface temperature of up to 70°C.
Wear protective gloves.

The pulse generators, as well as all connections and fittings, must be regularly inspected for proper seating to ensure proper function. If necessary, the outside of the pulse generators can be cleaned using mild cleaning agents that are compatible with the materials (non-alkaline, non-soap).
Do not allow any cleaning agent to enter the interior of the pulse generators during cleaning. The interior of the pulse generator is not designed to be cleaned.

NOTE

Dismantling of a pulse generator of series SP/SFE 3003 or SP/SFE 3006 into individual components is prohibited and voids any claims.

NOTE

Only original SKF spare parts may be used. Unauthorized alterations and the use of non-original spare parts and accessories are prohibited and nullify the statutory warranty.

10. Malfunctions, causes, and remedies

The following table provides an overview of possible malfunctions and their causes. Contact the SKF Service department if you cannot remedy the malfunction.

WARNING

System pressure
The described component is pressurized during operation.
Depressurize the component before starting maintenance work.

WARNING

Hot surface
Due the installation conditions, the mechanical part of the pulse generator can reach a surface temperature of up to 70°C.
Wear protective gloves.

10.1 Commissioning, product, and system malfunctions

Malfunction	Cause	Remedy
No Signal	**Pulse generator 24-2583-2526**:	See Chapter 6.3
	o Cable socket is not installed correctly	• Remount the cable socket and tighten with a mounting screw.
	o Pigtails in the cable socket are not connected or are connected incorrectly	• Check the pigtails and connect if necessary.
	o Customer did not/did not correctly connect pigtails.	• Check/correct customer's connection of pigtails.
	o Pulse generator is defective	• Replace the entire pulse generator.
	Pulse generator 24-2583-2528:	
	o Customer did not/did not correctly connect pigtails.	• Check for correct connection of pigtails and connect if necessary.
	o Pulse generator is defective	• Replace the entire pulse generator.

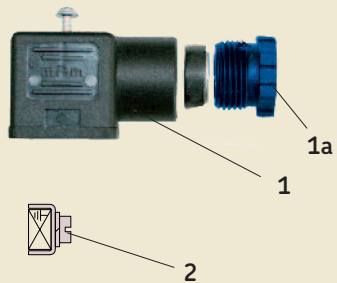
11. Spare parts

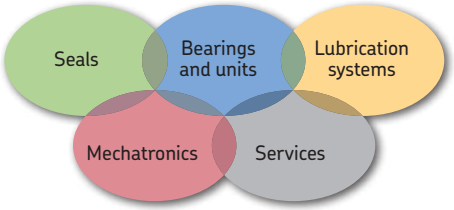
Cable socket

Item	Design	Weight [kg/each]	Order No.
1	Connector socket cpl. [1]		179-990-033
1a	Screw connection (blue)		2370-00000002
2	Ground terminal		MS-6060-00002

1) Supplied with Connector socket cpl. the blue screw connection is not included. Order these separately.

Fig. 9





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