








Version 07  
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## EU Declaration of Conformity pursuant to 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 the conformity of the device:

|                               |                          |      |       |                      |       |                      |       |                      |
|-------------------------------|--------------------------|------|-------|----------------------|-------|----------------------|-------|----------------------|
| Designation:                  | JM Oil Lubrication Pump, | type | A4067 | II 2G Ex h IIC T3 Gb | A4068 | II 2G Ex h IIC T4 Gb | A4071 | II 2G Ex h IIB T4 Gb |
| part number:                  | 739-*                    |      | A4072 | II 3G Ex h IIC T3 Gc | A4073 | II 2G Ex h IIC T4 Gb |       |                      |
| Year of manufacture:          | See type plate           |      |       |                      |       |                      |       |                      |
| Explosion protection marking: |                          |      |       |                      |       |                      |       |                      |

 II 2G Ex h IIC T3 Gb /  II 2G Ex h IIC T4 Gb /  II 2G Ex h IIB T4 Gb /  II 3G Ex h IIC T3 Gc /  II 2G Ex h IIC T4 Gb

with all essential safety and health requirements of ATEX Directive 2014/34/EU as well as the basic safety and health protection requirements of Machinery Directive 2006/42/EC specified below at the time of placing on the market.

1.1.2 · 1.1.3 · 1.3.2 · 1.3.4 · 1.5.6 · 1.5.8 · 1.5.9 · 1.6.1 · 1.7.1 · 1.7.3 · 1.7.4

The technical documentation pursuant to:

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

We undertake to transmit these in electronic form in response to a reasoned request by the national authorities. The Head of Standardization is the authorized representative for the technical documentation. See the manufacturer information for the address.

Furthermore, the following Directives and (harmonized) standards were applied in the applicable areas:

### 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 60947-5-2:2007/A1:2012 |                   |

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 Machinery Directive 2006/42/EC, ATEX Directive 2014/34/EU and all other applicable Directives.

Walldorf, 03/11/2021

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## Masthead

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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.

### Notes on operating instructions

These operating instructions are manufacturer operating instructions in accordance with ATEX Directive 2014/34/EU, Annex X. The instructions are an integral part of the described products and must be kept for future use.

### Disclaimer of liability

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

- Improper usage, assembly, operation, configuration, maintenance, repair, negligence, or accidents
- Improper reaction to malfunctions
- Unauthorized modifications to the product
- Intentional or gross negligence
- Use of non-original SKF spare/replacement components

The maximum liability for loss or damage resulting from the use of our products is limited to the purchase price. Liability for indirect damage of any kind is excluded.

# Table of contents






















|  |           |
|--|-----------|
| EU Declaration of Conformity pursuant to ATEX Directive .....                                | 2         |
| Masthead.....  | 3         |
| Explanation of symbols and signs .....   | 7         |
| <b>1. Safety instructions.....</b>   | <b>9</b>  |
| 1.1 General safety instructions.....   | 9         |
| 1.2 General behavior when handling the product .....   | 9         |
| 1.3 Intended use.....  | 10        |
| 1.4 Modifications to the product.....  | 11        |
| 1.5 Foreseeable misuse.....  | 11        |
| 1.6 Prohibition of certain activities.....   | 12        |
| 1.7 Painting plastic components .....  | 12        |
| 1.8 Inspections prior to delivery .....  | 12        |
| 1.9 Referenced documents .....   | 12        |
| 1.10 Markings on the product.....  | 13        |
| 1.11 Notes on the type plate .....   | 13        |
| 1.12 Notes on CE marking.....  | 13        |
| 1.13 Persons authorized to use the product .....   | 14        |
| 1.13.1 Operator.....   | 14        |
| 1.13.2 Qualified mechanic .....  | 14        |
| 1.13.3 Qualified electrician .....   | 14        |
| 1.13.4 Specialist in maintenance and servicing in potentially<br>explosive atmospheres ..... | 14        |
| 1.14 Instruction of outside fitters .....  | 15        |
| 1.15 Provision of personal protective gear .....   | 15        |
| 1.16 Operation.....  | 15        |
| 1.17 Emergency shutdown .....  | 15        |
| 1.18 Transport, assembly, maintenance, malfunction, repair,<br>shutdown, disposal.....       | 15        |
| 1.19 First start-up, daily start-up .....  | 17        |
| 1.20 Cleaning.....   | 17        |
| 1.21 Special safety instructions regarding explosion protection .....                        | 18        |
| 1.22 Nullification of ATEX approval.....   | 20        |
| 1.23 Operation in potentially explosive atmospheres .....                                    | 20        |
| 1.24 Explosion protection marking.....   | 20        |
| 1.25 Obligations of the operator .....   | 21        |
| 1.25.1 Identification of hazards.....  | 21        |
| 1.25.2 Explosion protection measures.....  | 21        |
| 1.25.4 Duty to provide instruction and training .....  | 22        |
| 1.25.3 Provision of necessary information .....  | 22        |
| 1.26 Residual risks .....  | 23        |
| 1.27 Residual ATEX risks.....  | 24        |
| <b>2. Lubricants.....</b>  | <b>26</b> |
| 2.1 General information .....  | 26        |
| 2.2 Selection of lubricants.....   | 26        |
| 2.3 Material compatibility.....  | 26        |
| 2.5 Aging of lubricants .....  | 27        |

|           |  |           |           |  |           |
|-----------|--|-----------|-----------|--|-----------|
| <b>3.</b> | <b>Overview, functional description</b> .....  | <b>28</b> | <b>6.</b> | <b>Assembly</b> .....  | <b>47</b> |
| 3.1       | JM oil lubrication pump with gear train.....   | 28        | 6.1       | General information .....  | 47        |
| 3.2       | Type code for drive gear train.....  | 29        | 6.2       | Assembly location .....  | 49        |
| 3.3       | JM oil lubrication pump with electric motor drive.....                                 | 30        | 6.3       | Setup and attachment .....   | 50        |
| 3.4       | Type code for electric motor drive gear train .....                                    | 31        | 6.4       | Minimum mounting dimensions.....                                       | 50        |
| 3.5       | Special version - JM oil lubrication pump with<br>dual-sided electric motor drive..... | 32        | 6.5       | Electrical connection (motor, equipotential bonding) .....             | 55        |
| 3.6       | Design .....   | 33        | 6.5.1     | General notes .....  | 55        |
| 3.7       | Function .....   | 34        | 6.5.2     | Terminal nomenclature.....   | 56        |
| <b>4.</b> | <b>Technical data</b> .....  | <b>36</b> | 6.5.3     | Motor connection.....  | 57        |
| 4.1       | Rotary drive with gear train.....  | 36        | 6.5.4     | Connecting equipotential bonding with/without cable lug.....           | 58        |
| 4.2       | Electric motor drive with gear train .....   | 38        | 6.6       | Fill pump housing with lubricant.....                                  | 60        |
| <b>5.</b> | <b>Delivery, returns, storage</b> .....  | <b>43</b> | 6.7       | Lubrication line .....   | 61        |
| 5.1       | Checking the delivery .....  | 43        | 6.8       | Connecting a lubrication line .....                                    | 61        |
| 5.2       | Return shipments.....  | 43        | 6.9       | Venting of pump elements.....  | 63        |
| 5.3       | Storage.....   | 44        | 6.10      | Setting the delivery rate.....   | 64        |
| 5.3.1     | Lubrication units.....   | 44        | 6.11      | Determining the delivery rate .....                                    | 64        |
| 5.3.2     | Electronic and electrical devices.....   | 44        | <b>7.</b> | <b>First start-up</b> .....  | <b>65</b> |
| 5.4       | Transport without packaging by pallet truck.....                                       | 45        | 7.1       | Checking the functionality of the customer-side fill level control.... | 65        |
| 5.5       | Transport by forklift .....  | 46        | 7.2       | Inspections before first start-up .....                                | 66        |
|           |  |           | 7.3       | Inspections during initial commissioning.....                          | 66        |




|  |           |   |           |
|--|-----------|---|-----------|
| <b>8. Operation</b> .....                                    | <b>67</b> | <b>11. Malfunctions, causes, and remedies</b> .....                 | <b>75</b> |
| 8.1 General.....   | 67        | <b>12. Repairs</b> .....  | <b>77</b> |
| 8.1.1 Activating the pump .....                              | 67        | 12.1 Replacement of a pump body assy.....                           | 77        |
| 8.2 Refilling lubricant .....                                | 67        | 12.1.1 Removal of a pump body assy.....                             | 77        |
| 8.3 Temporary shutdown .....                                 | 67        | 12.1.2 Mounting a new pump body.....                                | 79        |
| 8.4 Recommissioning.....                                     | 68        | <b>13. Accessories</b> .....  | <b>82</b> |
| 8.4.1 Permanent shutdown .....                               | 68        | 13.1 Pulse generator .....  | 82        |
| 8.4.2 Disposal.....  | 68        | 13.2 Rotation monitor JM-M12 .....                                  | 86        |
| <b>9. Cleaning</b> .....                                     | <b>69</b> | <b>14. Spare parts</b> .....  | <b>87</b> |
| 9.1 Cleaning agents.....                                     | 69        | 14.1 Inspected pump elements, complete with test certificate.....   | 87        |
| 9.2 Exterior cleaning .....                                  | 69        | 14.2 Sight glass with seal from pump element.....                   | 87        |
| 9.3 Interior cleaning.....                                   | 69        | 14.4 Hydraulic screw union.....                                     | 88        |
| <b>10. Maintenance</b> .....                                 | <b>70</b> | 14.5 Coupling.....  | 88        |
| 10.1 General.....  | 71        | 14.3 Seals / eccentric shaft.....                                   | 88        |
| 10.2 Pump unit maintenance schedule .....                    | 71        | 14.6 Gear .....   | 89        |
| 10.3 Breather filter (installation recommended by SKF) ..... | 73        | 14.7 Motor.....   | 90        |
| 10.4 Electric motor maintenance schedule .....               | 74        | <b>15. Appendix</b> .....   | <b>91</b> |
|  |           | 15.1 EU Declaration of Conformity for Siemens asynchronous motor .. | 91        |
|  |           | 15.2 EU Declaration of Conformity for CARL REHFUSS gearbox .....    | 93        |
|  |           | 15.3 Inductive proximity switch 24-1884-2613 .....                  | 94        |
|  |           | 15.4 Associated supplier documentation.....                         | 95        |

## Explanation of symbols and signs

You will find these symbols, which warn of specific dangers to persons, material assets or the environment, next to all safety instructions. Read the safety instructions thoroughly and follow them.

|   |   |   |   |   |   |   |   |
|---|---|---|---|---|---|---|---|
|  | General warning                         |  | Risk of electrical shock                  |  | Risk of slipping                                      |  | Hot surfaces  |
|  | Being drawn into machinery              |  | Crushing hazard                           |  | Pressure injection                                    |  | Suspended load                                      |
|  | Electrostatic sensitive components      |  | Potentially explosive atmosphere          |  | Wear personal protective gear (gloves)                |  | Wear personal protective gear (protective clothing) |
|  | Wear personal protective gear (goggles) |  | Wear personal protective gear (face mask) |  | General notes   |  | Wear personal protective gear (protective footwear) |
|  | Unlock the product                      |  | Disposal, recycling                       |  | Disposal of waste electrical and electronic equipment |  | Unauthorized persons must be kept away.             |
|  | CE marking                              |   |   |   |   |   |   |

|   | Warning level         | Consequence           | Probability | Symbol | Meaning  |
|---|-----------------------|-----------------------|-------------|--------|--|
|  | <b>DANGER</b>         | Death, serious injury | Immediate   | ●      | Chronological instructions                     |
|  | <b>WARNING</b>        | Serious injury        | Possible    | ○      | Bullet list items                              |
|  | <b>CAUTION</b>        | Minor injury          | Possible    | ➔      | Indicates requirements for the action          |
|   | <b>IMPORTANT NOTE</b> | Property damage       | Possible    | ☞      | Refers to other facts, causes, or consequences |

## Abbreviations and conversion factors

|              |                         |                 |                        |                    |   |  |
|--------------|-------------------------|-----------------|------------------------|--------------------|---|--|
| re           | regarding               | °C              | degrees Celsius        | °F                 | 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                | pound per square inch                           |  |
| if necessary | if necessary            | d               | day                    | sq.in.             | square inch                                     |  |
| usually      | usually                 | Nm              | Newton meter           | cu. in.            | cubic inch                                      |  |
| incl.        | including               | ml              | milliliter             | mph                | miles per hour                                  |  |
| min.         | minimum                 | ml/d            | milliliters per day    | RPM                | Revolutions per minute                          |  |
| max.         | maximum                 | ccm             | cubic centimeter       | gal.               | gallon  |  |
| min          | minute                  | mm              | millimeter             | lb.                | pound   |  |
| etc.         | et cetera               | l               | liter                  | hp                 | horsepower                                      |  |
| e.g.         | for example             | db (A)          | sound pressure level   | kp                 | kilopound                                       |  |
| kW           | kilowatt                | >               | greater than           | ft/sec             | feet per second                                 |  |
| U            | voltage                 | <               | less than              | Conversion factors |   |  |
| R            | Resistance              | ±               | plus minus             | Length             | 1 mm = 0.03937 in.                              |  |
| I            | current intensity       | ∅               | diameter               | Area               | 1 cm <sup>2</sup> = 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     | ≈               | approximately          | Mass               | 1 kg = 2.205 lbs                                |  |
| DC           | direct current          | =               | equal to               |                    | 1 g = 0.03527 oz.                               |  |
| A            | ampere                  | %               | percent                | Density            | 1 kg/cm <sup>3</sup> = 8.3454 lb./gal(US)       |  |
| Ah           | ampere hour             | ‰               | per mil (thousandth)   |                    | 1 kg/cm <sup>3</sup> = 0.03613 lb./cu.in.       |  |
| Hz           | Frequency (Hertz)       | ≥               | greater or equal       | Force              | 1 N = 0.10197 kp                                |  |
| NC           | normally closed contact | ≤               | less or equal          | Pressure           | 1 bar = 14.5 psi                                |  |
| NO           | normally open contact   | mm <sup>2</sup> | square millimeter      | Temperature        | °C = (°F-32) x 5/9                              |  |
|              |                         | RPM             | Revolutions per minute | Power              | 1 kW = 1.34109 hp                               |  |
|              |                         |                 |                        | Acceleration       | 1 m/s <sup>2</sup> = 3.28084 ft./s <sup>2</sup> |  |
|              |                         |                 |                        | Speed              | 1 m/s = 3.28084 ft/sec                          |  |
|              |                         |                 |                        |                    | 1 m/s = 2.23694 mph                             |  |



# 1. Safety instructions

## 1.1 General safety instructions

- The operator must ensure that the instructions are read by all persons tasked with working on the product or who supervise or instruct such persons. The operator must also ensure that the staff fully understands the content of the instructions. Putting the products into operation or operating them without having read the instructions is prohibited.
- Retain the instructions for further use.
- The products described here were manufactured according to the state of the art. Risks may, however, arise from non-compliant usage and may result in personal injury or damage to material assets.
- Any malfunctions which may affect safety must be remedied immediately. In addition to these instructions, the statutory regulations for accident prevention and environmental protection must be observed.

## 1.2 General behavior when handling the product

- The product may only be used in awareness of the potential dangers, in proper technical condition, and according to the information in this manual.
- 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.
- Wear personal protective equipment.
- All safety regulations and in-house instructions relevant to the particular activity must be observed.
- Responsibilities for different activities must be clearly defined and observed. Uncertainty seriously endangers safety.
- Protective and safety mechanisms must not 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 then 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.
- Never use any part of the centralized lubrication system as a stand or step or for climbing.

### 1.3 Intended use

The JM oil lubrication pump is a high-pressure pump that produces a maximum continuous operating pressure of 600 bar per outlet.

The pump's main field of application is total loss oil lubrication of the cylinders and packing parts used in piston compressors.

The JM oil lubrication pump can deliver mineral oils with an operating viscosity from 25 to 3000 mm<sup>2</sup>/s.

Lubricant feeding must be free of contamination and air pockets.

The fill level of the pump housing must be monitored.

The pump unit is designed exclusively for the feeding of seal-compatible (NBR) lubricants.

The use of synthetic oils requires prior approval from SKF Lubrication Systems.

Particular attention is called to the fact that hazardous materials of any kind, especially the materials classified as hazardous by the CLP Regulation 1272/2008, may only be filled into SKF centralized lubrication systems and components and delivered and/or distributed with such systems and com-

ponents after consulting with and obtaining written approval from SKF.

Any other usage is deemed non-compliant with the intended use.

All products from SKF Lubrication Systems may be used only for their intended purpose and in accordance with the information in the product's assembly instructions. Lubricants may only be fed in compliance with the specifications, technical data, and limits presented in this manual.

Usage is permitted exclusively in the context of commercial business activity by professional users.

## 1.4 Modifications to the product

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

### 1.5 Foreseeable misuse

Any usage of the product other than as specified in this manual is strictly prohibited. Particularly prohibited are:

- Use outside the specified ambient temperature range
- Use of non-specified equipment
- Use of dirty lubricants or lubricants with air inclusions.
- Use of C3 versions in areas with aggressive, corrosive substances (e.g., high salt load)
- Use of plastic parts in areas with high ozone load or in areas with damaging radiation (e.g., ionizing radiation)
- Use to feed, forward, or store hazardous substances and mixtures as defined in Annex I Part 2-5 of the CLP Regulation (EC 1272/2008) or HCS 29 CFR 1910.1200 that are marked with hazard pictograms GHS01-GHS06 and GHS08
- Use to feed / forward / store gases, liquefied gases, dissolved gases, vapors, or fluids whose vapor pressure exceeds normal atmospheric pressure of 1013 mbar [14.69 psi] by more than 0.5 bar [7.25 psi] at their maximum permissible operating temperature
- Use in another, more critical explosion protection zone than specified on the type plate
- Use with improperly performed subsequent finish
- The finish must meet the requirements of standards applicable to ATEX.
- Use to feed, forward, or store lubricants containing volatile solvents
- Use in potentially explosive gases and vapors whose ignition temperature is less than 125% of the maximum surface temperature
- Use in potentially explosive dusts whose minimum ignition temperature and glow temperature are less than 150% of the maximum surface temperature
- Use of lubricants with temperatures above the maximum permissible ambient temperature.

### 1.6 Prohibition of certain activities

The following activities must be performed only by employees of the manufacturer or authorized persons due to possibly undetectable sources of error or due to statutory requirements:

- Repairs or modifications to the drive

### 1.7 Painting plastic components

The painting of all plastic components and seals of the products described here is prohibited. Completely mask or remove plastic components before painting the main machine.

### 1.8 Inspections prior to delivery

The following tests were performed prior to delivery:

- Safety and functional tests
- For electrically operated products: Electrical tests according to DIN EN 60204-1:2007, VDE 0113-1:2007
- Inspections pursuant to the requirements of the ATEX Directive

### 1.9 Referenced documents

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

- Operational instructions, approval rules
- The safety data sheet of the lubricant used

If necessary:

- Project planning documents
- Instructions from suppliers of purchased parts
- Instructions for other components for setting up the centralized lubrication system
- Other relevant documents for integration of the product into the main machine, system
- The explosion protection document of the operator

## 1.10 Markings on the product



Equipotential bonding connections on the product



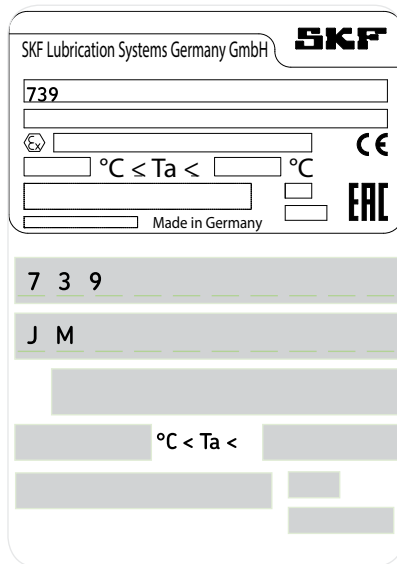
Direction of pump rotation



In accordance with the results of the workstation risk assessment, additional labels (e.g., warnings, safety signs, prohibition signs or labels in accordance with CLP/GHS) are to be attached by the operator if necessary.

## 1.11 Notes on the type plate

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



## 1.12 Notes on CE marking

The CE marking is based on the requirements of the applied Directives:

- ATEX 2014/34 EU
- 2014/30/EU Electromagnetic Compatibility
- RoHS II 2011/65/EU Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment

The protection objectives of Low-Voltage Directive 2014/35/EU are met in accordance with Annex II, No. 1.2.7 of ATEX 2014/34/EU.

Note on Pressure Equipment Directive 2014/68/EU

Due to its performance characteristics, the product does not reach the limit values

defined in Article 4, Paragraph 1, Subparagraph (a) item (ii) and is, pursuant to Article 1, Paragraph 2 Subparagraph f, excluded from the scope of Pressure Equipment Directive 2014/68/EU.

### **1.13 Persons authorized to use the product**

#### **1.13.1 Operator**

A person competent due to training, knowledge, and experience to execute the functions and activities associated with normal operation; this also includes the avoidance of possible hazards that may arise during operation.

#### **1.13.2 Qualified mechanic**

A person with appropriate technical training, knowledge, and experience who can recognize and avoid the hazards that may occur during transport, assembly, first start-up, operation, maintenance, repair, and dismantling

#### **1.13.3 Qualified electrician**

A person with appropriate technical training, knowledge, and experience who can recognize and avoid hazards that may result from electricity

#### **1.13.4 Specialist in maintenance and servicing in potentially explosive atmospheres**

This is a person competent due to qualified technical education, training, and experience to recognize risks and possible hazards when working on the device or subcomponents in potentially explosive atmospheres and to rectify these by taking suitable actions. The specialist has knowledge of the various types of protection, installation procedures, and explosive atmosphere classifications. The specialist is familiar with the rules and requirements relevant to his or her activity and explosion protection, especially ATEX Directives 2014/34/EU and 1999/92/EC.

#### 1.14 Instruction of outside fitters

Before commencing work, the operator must inform outside fitters of the operational safety regulations, applicable accident prevention regulations, and the functions of the main machine and its protective devices.

#### 1.15 Provision of personal protective gear

The operator must provide personal protective gear appropriate for the location and intended application. This also includes ESD clothing and ESD tools for work in a potentially explosive atmosphere.

#### 1.16 Operation

The following must be observed during first start-up and operation:

- All information within this manual and all information within the referenced documents
- All laws and regulations that the operator must observe

#### 1.17 Emergency shutdown

Shut down the product in an emergency by:

- Switching off the main machine in which the product is integrated
- If necessary, pressing the on/off switch on the main machine

#### 1.18 Transport, assembly, maintenance, malfunction, repair, shutdown, disposal

- All relevant persons must be informed of the activity prior to the start of this work. Precautionary operational measures, work instructions must be observed.
- Transport only with suitable transport and lifting gear on suitable paths.
- Maintenance and repair work can be subject to restrictions at low or high temperatures (e.g., altered flow properties of the lubricant). Maintenance and repair work should therefore preferably be performed at room temperature.
- Prior to performing work, the product and the machine in which the product will be integrated must be de-energized, depressurized, and secured against unauthorized activation.

- Take appropriate measures to ensure that moving, detached parts are immobilized during the work and that no limbs can be pinched by unintended movements.
- Assemble the product only outside the operating range of moving parts, at an adequate distance from sources of heat or cold. Other units of the machine, the vehicle must not be damaged or impaired in their function by the installation.
- Dry any wet, slippery surfaces or cover appropriately.
- Cover hot or cold surfaces appropriately.
- Work on electrical components may be performed only by qualified electricians. Note possible waiting times for discharge. Work on electrical components may be performed only in a voltage-free state and using tools suitable for electrical work.
- Establish the electrical connection only in accordance with the valid circuit diagram and in observance of the relevant regulations and the local electrical operating conditions.
- Do not touch cables or electrical components with wet or moist hands.
- Fuses must not be bridged. Always replace defective fuses with fuses of the same type.
- Ensure proper grounding of the product.
- Drill required holes only on non-critical, non-load-bearing parts. Use existing boreholes. Do not damage lines or cables when drilling.
- Observe any possible wearing spots. Protect components appropriately.
- All components used must be designed for:
  - The maximum operating pressure
  - The maximum/minimum ambient temperature
  - The lubricant to be delivered
  - The required ATEX zone
  - The operating and ambient conditions at the place of use.
- No parts may be subjected to torsion, shear, or bending.
- Check parts for contamination before use and clean if necessary.
- Lubrication lines should be filled with lubricant prior to assembly. This simplifies subsequent venting of the system.
- Adhere to the specified torques. Use a calibrated torque wrench when tightening.



- Use suitable hoisting equipment when working with heavy parts.
- Avoid mixing up/incorrectly assembling disassembled parts. Label parts.

#### 1.19 First start-up, daily start-up

Ensure that:

- All safety mechanisms are fully present and functional.
- All connections are properly connected.
- All parts are correctly installed.
- All warning labels on the product are fully present, visible, and undamaged.
- Illegible or missing warning labels are immediately replaced.

#### 1.20 Cleaning

- There is a fire hazard from the use of flammable cleaning agents. Use only non-flammable cleaning agents that are suitable for the intended purpose.
- Do not use corrosive cleaning agents.
- Do not use steam-jet equipment or high-pressure cleaners. This may damage electrical components. Observe the IP protection class.
- Cleaning work must not be performed on conducting components.
- Mark wet areas accordingly.

### 1.21 Special safety instructions regarding explosion protection

- Always behave so as to avoid explosion hazards.
- A written work authorization from the operator is required prior to initiating work in potentially explosive atmospheres. Unauthorized persons must be kept away.
- There must be no evidence that parts of the explosion protection are missing or non-functional. If this is not excluded, switch off the machine and immediately notify the supervisor.
- Explosion protection measures must never be deactivated, changed, or bypassed.
- Shipping damage may lead to the loss of explosion protection. If there is apparent shipping damage, do not install or put into operation the product.
- The introduction of ignition sources such as sparks, open flames, and hot surfaces into potentially explosive atmospheres is prohibited.
- Depending on the operating conditions, check the product for damage that may present a risk of ignition and check for proper function. An inspection must be conducted at least every 12 months.
- The lubricant's ignition temperature has to be at least 50 kelvin above the max. permissible surface temperature.
- The ignition temperature of the surrounding potentially explosive gases and vapors must be greater than 125% of the maximum surface temperature.
- The minimum ignition temperature and the glow temperature and the surrounding potentially explosive dusts must be greater than 150% of the maximum surface temperature.
- The usage limits for explosion protection are clearly defined in the explosion protection marking by the device categories, gas and dust groups and temperature classes. Light metal dusts, as a potentially explosive ambient medium, are always prohibited even when dust group IIIc is specified.
- Use only tools and clothing approved for use in potentially explosive atmospheres (ESD).
- Transport/assembly/repairs and work on electrical components may be performed only if it is ensured that there is no explosive atmosphere present.
- Repairs or modifications to explosion-proof machinery may be performed only by the manufacturer or a workshop rec-

- ognized by a notified body and accepted by the manufacturer. If the work is not performed by the manufacturer itself, the repair must be accepted and approved in writing by a recognized expert. The repair is marked by a repair sign on the machine containing the following information:
  - Date
  - Executing company
  - Type of repair
  - If applicable, mark by expert
- Shipping damage may lead to the loss of explosion protection. If there is apparent shipping damage, do not install or put into operation the product.
- The product may be filled via the reservoir lid only if there is no potentially explosive atmosphere. Filling via the fill connection is also possible if there is a potentially explosive atmosphere. The filling pump must be connected to the equipotential bonding connection of the pump.
- The product may be cleaned only if there is no potentially explosive atmosphere.
- For products without electrical fill level control, the lubricant fill level is to be checked at regular intervals.
- All parts of the grounding concept must be properly present and connected with the main machine.
- If lifting eyes are removed after installation, seal the threaded holes according to the protection class.
- Handle materials in such a way that no sparks may arise from tilting, dropping, slipping, rubbing, or striking. If necessary, cover materials by appropriate means.
- Never disconnect any plug-in connections under electrical voltage. Secure plug-in connections against disconnection by hand using the provided locking clips.
- The operator must critically examine whether operation without an empty signal results in a new hazard potential (e.g., due to heating of bearings on the machine in the range of the ignition temperature). If this cannot be reliably excluded, an empty signal must be provided or appropriate organizational measures taken to monitor the temperature of the bearings.
- Avoid / immediately remove any accumulated dust. Accumulated dust has a thermal insulating effect and promotes the formation of a potentially explosive atmosphere when agitated/swirled.
- The product must be integrated into the operator's lightning protection scheme.
- All parts must be inspected for corrosion on a regular basis. Replace affected parts.
- Junction boxes must be securely closed and the cable glands properly sealed.

- Any additional electrical monitoring equipment must be securely connected and correctly configured.
- At the time of the assembly of the metering device at the utilization site, the equipotential bonding must be ensured by a conductive, sufficiently large metallic contact with the attachments and with the main machine.

### 1.22 Nullification of ATEX approval

The ATEX approval is nullified by:

- Improper usage
- Unauthorized alterations
- Use of non-original SKF spare/replacement components
- Failure to comply with this manual and referenced documents
- Use of non-specified equipment
- Failure to observe the prescribed repair and maintenance intervals
- Operation with a damaged, missing, or improperly performed subsequent finish that does not meet the requirements of the standards applicable to ATEX.

### 1.23 Operation in potentially explosive atmospheres

Operation is only permitted in compliance with:

- 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)
- The ATEX approval

### 1.24 Explosion protection marking

The explosion protection marking is located on the Declaration of Conformity and on the rating plate.

## 1.25 Obligations of the operator

### 1.25.1 Identification of hazards

- 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.

that these modifications, extensions, or conversions fulfill the minimum explosion protection requirements.

- Ensures that only original spare parts are used

The operator

### 1.25.2 Explosion protection measures

- Based on a comprehensive assessment of the work area, the operator ensures that the equipment and all installation materials 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.
- If modifications, extensions, and/or conversions are performed in potentially explosive atmospheres, the operator shall take the necessary measures to ensure

- Documents the measures for explosion protection
- Marks the potentially explosive areas
- Prepares written operating instructions
- Selects suitable employees
- Provides the employees with adequate and appropriate instruction regarding explosion protection
- Employs a release system for hazardous activities and for those that may become dangerous in interaction with other work
- Performs required tests and monitoring

### 1.25.3 Provision of necessary information

- The operator must ensure the relevant required instructions available to all persons assigned with operation, repair, and maintenance.
- The operator must ensure that the persons in question have read and understood the required instructions.
- The same applies to all relevant safety data sheets, operational instructions, accident protection regulations, and instructions from suppliers of purchased parts and consumables.
- Depending on the operational organization, the relevant instructions may need to be made available to further persons and/or departments.

### 1.25.4 Duty to provide instruction and training

- The operator clearly defines the responsibilities of the personnel for operation, installation, maintenance. Prior to the first use of the machine, the operator is obligated to instruct all persons authorized to use the machine on its proper handling in accordance with their respective field of activity and responsibility using practical exercises.

The instruction includes at least:

- Zone classification
- Scope and limits of the area of activity and responsibility for the respective group of people
- Safety-conscious behavior and behavior in an emergency
- Avoidance of hazards when handling the product and the main machine

- Meaning of warnings, warning labels
- Handling operating materials and cleaning agents
- If necessary, use and monitoring of personal protective gear

These instructions must be documented and repeated at regular intervals. New staff may operate the machine only under the supervision and instruction of experienced staff.

## 1.26 Residual risks

| Residual risk  | Possible in lifecycle | Avoidance / Remedy   |
|--|-----------------------|--|
| Personal injury / property damage due to falling of hoisted parts  | A, B, C, G, H, K      | Unauthorized persons must be kept away; nobody is allowed to be present below hoisted parts. Lift parts using suitable and tested lifting gear.  |
| Personal injury/property damage due to tilting or falling product due to non-compliance with specified torques   | B, C, G               | Adhere to the specified torques. Secure the product only to components with a sufficient load-carrying capacity. If no torques are specified, use those specified for the screw size for screws of strength class 8.8.   |
| Personal injury / property damage due to electric shock resulting from power lead damage   | B, C, D, E, F, G, H   | Inspect power leads for damage prior to initial use and then at regular intervals. Do not install the cable on moving parts or wearing spots. If this cannot be avoided, use anti-kink coils and/or conduits.  |
| Personal injury / property damage due to spilled, leaked lubricant   | B, C, D, F, G, H, K   | Be careful when filling the reservoir and then connecting or disconnecting the lubricant lines. Use only hydraulic screw unions and lubrication lines suitable for the specified pressure. Do not install lubrication lines on moving parts or wearing spots. If this cannot be avoided, use flexible hose lines or anti-kink coils and/or conduits. |
| Lifecycles: A = Transport, B = Assembly, C = First start-up, D = Operation, E = Cleaning, F = Maintenance, G = Malfunction, repair, H = Shutdown, K = Disposal |                       |  |

## 1.27 Residual ATEX risks

| Residual risk   | Remedy  |
|---|---|
| Operating in a potentially explosive atmosphere   |   |
| Use in a potentially explosive atmosphere without checking equipotential bonding for electrical continuity  | <ul style="list-style-type: none"> <li>○ Check the equipotential bonding for continuity before initial commissioning, after every repair, and additionally at regular intervals defined by the operator</li> </ul>  |
| Use of non-standard-compliant ATEX varnishing of grounded metals or a conductive surface  | <ul style="list-style-type: none"> <li>○ Prior to initial commissioning and then at regular intervals, inspect the varnishing and if necessary have it replaced by a person competent to do so</li> </ul>   |
| Heating of non-supplied lubrication points to the ignition temperature range by an undetected malfunction within the centralized lubrication system | <ul style="list-style-type: none"> <li>○ The operator must critically examine whether operation without corresponding detection options results in a new hazard potential (e.g., due to heating of non-supplied bearings on the machine to the range of the ignition temperature); if this cannot be reliably excluded, take appropriate countermeasures</li> </ul> |
| Heating of components to the ignition temperature range / formation of a potentially explosive atmosphere by agitated/swirled dust                  | <ul style="list-style-type: none"> <li>○ Avoid accumulated dust / remove accumulated dust on a regular basis; select an installation location with the lowest possible dust level</li> </ul>  |



| Residual risk  | Remedy   |
|--|--|
| Operating in a potentially explosive atmosphere  |  |
| Generation of electrostatic charges, sparks by dropping of parts   | <ul style="list-style-type: none"> <li>Secure parts against falling; if necessary, cover parts to avoid sparking</li> </ul>  |
| Introduction of catalytic, unstable, or pyrophoric substances into the potentially explosive atmosphere                                | <ul style="list-style-type: none"> <li>Ensure that none of these substances enter the potentially explosive atmosphere; have all substances approved by the operator in advance</li> </ul> |
| Use of isolating amplifiers, for example to operate a capacity sensor in the potentially explosive atmosphere                          | <ul style="list-style-type: none"> <li>Install isolating amplifiers only outside of the potentially explosive atmosphere</li> </ul>  |
| Incorrect mounting position Loss of proper fill level reporting function   | <ul style="list-style-type: none"> <li>Follow the prescribed mounting position (tolerance range <math>\pm 5^\circ</math>) / correct mounting position as necessary</li> </ul>              |
| Use of an unsuitable lubricant at low temperatures; At low temperatures, excessive lubricant viscosity can cause loss of pump function | <ul style="list-style-type: none"> <li>Use only lubricants suitable for the specific operating temperature in each case</li> </ul>   |

## 2. Lubricants

### 2.1 General information

Lubricants are used specially for specific applications. To fulfill the task, lubricants must meet various requirements to varying degrees. The most important requirements for lubricants are:

- Reduction in friction and wear
- Corrosion protection
- Noise reduction
- Protection against contamination/ingress of foreign matter
- Cooling (primarily for oils)
- Durability (physical/chemical stability)
- Economic and environmental aspects

### 2.2 Selection of lubricants

SKF Lubrication Systems considers lubricants to be an element of system design. The selection of a suitable lubricant should reasonably be made during the design of the machine and forms the basis for planning the centralized lubrication system.

The manufacturer/operator of the machine should preferably make the selection with the supplier of the lubricant on the basis of the requirements profile of the specific task.

If you have no or little experience selecting lubricants for centralized lubrication systems, please contact SKF.

We gladly assist our customers in the selection of suitable components for feeding the selected lubricant and in the planning and design of a centralized lubrication system.

This will spare you potentially costly downtime due to damage to the machine/system and/or damage to the centralized lubrication system.

### 2.3 Material compatibility

The lubricants must generally be compatible with the following materials:

- Steel, gray cast iron, brass, copper, aluminum
- NBR, FKM (FPM), ABS, PA, PU

### 2.4

Temperature properties

The lubricant used must be suitable for the specific ambient temperature of the product. The viscosity required for proper functioning of the product must be maintained and must not be exceeded at low temperatures or fall too low at low temperatures. See the "Technical data" chapter for the required viscosities.



The lubricant's ignition temperature has to be at least 50 kelvin above the maximum permissible surface temperature.

## 2.5 Aging of lubricants

In case of extended machine downtime, check before re-commissioning that the lubricant is still suitable for use in terms of chemical or physical signs of aging. We recommend performing this inspection after 1 week of machine downtime.

In case of doubt regarding the further suitability of the lubricant, replace it before putting back into operation and, if necessary, perform an initial lubrication manually.

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").

Please contact SKF if you have further questions regarding lubricants.

An overview of the lubricants we have tested is available on request.



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



Do not mix lubricants. This can have unpredictable effects on the usability and this function of the centralized lubrication system.



Observe the relevant safety data sheets and identifications of hazards on the packaging when handling lubricants.

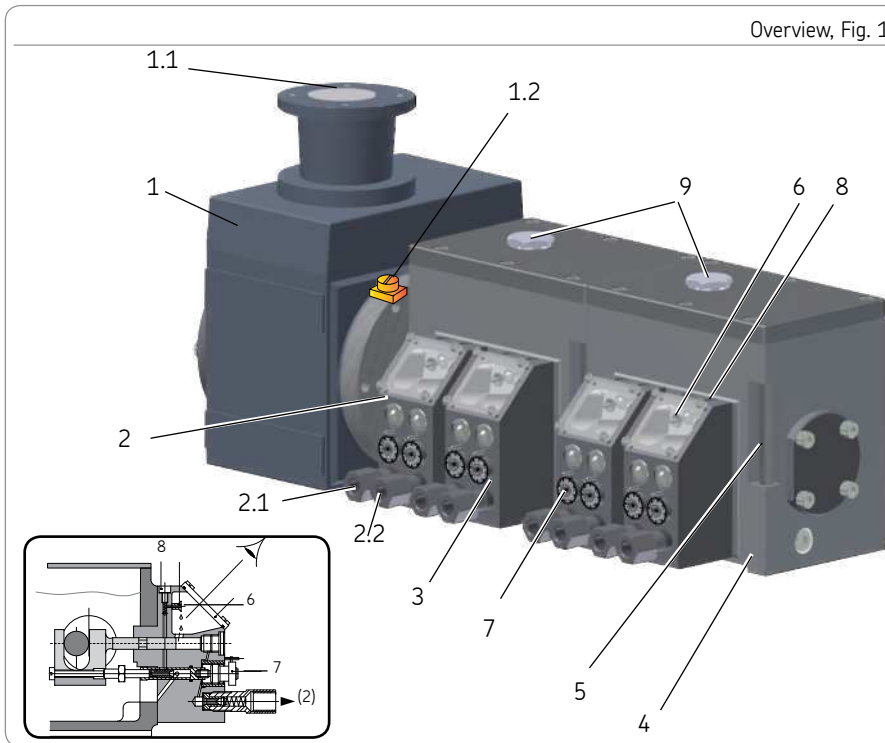


Due to the large number of possible additives, individual lubricants that meet the required specifications according to the manufacturer's data sheet are under some circumstances not suitable for use in centralized lubrication systems (e.g., incompatibility between synthetic lubricants and materials). To avoid this, always use lubricants that have been tested by SKF.

### 3. Overview, functional description

#### 3.1 JM oil lubrication pump with gear train

Overview, Fig. 1



#### Item Description

- | Item | Description                                   |
|------|---|
| 1    | Gear train                                    |
| 1.1  | Drive gear train                              |
| 1.2  | Equipotential bonding connection              |
| 2    | Pump body 1                                   |
| 2.1  | Pump element 1 outlet<br>(counted from drive) |
| 2.2  | Pump element 2 outlet<br>(counted from drive) |
| 3    | Pump body 2                                   |
| 4    | Pump housing/oil reservoir                    |
| 5    | Oil level control                             |
| 6    | Sight glass (drop regulator)                  |
| 7    | Delivery rate setting screw                   |
| 8    | Vent plugs                                    |
| 9    | Fill connection with screw union              |

### 3.2 Type code for drive gear train

|             |    |   |    |    |   |   |    |   |   |   |      |   |
|-------------|----|---|----|----|---|---|----|---|---|---|------|---|
| Example: JM | 02 | A | 5U | 39 | G | 1 | 04 | W | / | A | 4073 |   |
| Code:       | A  | B | C  | D  | E | F | G  | H | K | L | M    | N |

#### A) Type

JM high-pressure pump, max. 600 bar with eccentric shaft drive of the pump pistons, with extensible screwed pump housings (without customer-specific additional or overhead reservoirs)

#### B) Oil reservoir capacity (specifications for one reservoir)

02 = 2 liters  
 04 = 4 liters  
 06 = 6 liters  
 08 = 8 liters  
 10 = 10 liters  
 12 = 12 liters  
 14 = 14 liters  
 16 = 16 liters to 24 = 24 liters, only  
 for drive position (M) central

#### C) Oil reservoir design

A = pressure-tight<sup>1)</sup>  
 B = air-cooled

#### D) Drive type

5U = gear train with rotary shaft  
 (only for electric motor drive)

#### E) Delivery rate key<sup>2)</sup> (reduction ratio)

39 = 35.1:1  
 57 = 62.8:1  
 78 = 83.2:1  
 98 = 100.9:1  
 13 = 125.7:1<sup>3)</sup>  
 17 = 162.1:1<sup>3)</sup>

#### F) Drive position

G = left  
 H = right  
 M = central

#### G) Delivery rate per piston stroke

1 = 0.1 cm<sup>3</sup>/stroke  
 2 = 0.2 cm<sup>3</sup>/stroke  
 3 = 0.07 cm<sup>3</sup>/stroke  
 0 = mixed design<sup>4)</sup>

#### H) Number of outlets

01 = 1 outlet to 28 = 28 outlets  
 29 = 29 outlets to 48 = 48 outlets  
 only for drive position (M) central

#### K) Pipe connection $\varnothing$ and connection type

Y =  $\varnothing$  6 mm solderless  
 Z =  $\varnothing$  6 mm solderable  
 W =  $\varnothing$  8 mm solderless  
 X =  $\varnothing$  8 mm solderable  
 T =  $\varnothing$  6 mm double cutting-sleeve screw union  
 U =  $\varnothing$  8 mm double cutting-sleeve screw union  
 V = G 1/4 double cutting-sleeve screw union  
 - = G 1/4" stainless steel thread

#### L) Prelubrication

/ = without prelubrication

#### M) Modification letter

A = pump housing made of chilled aluminum casting, plain bearings for eccentric shaft

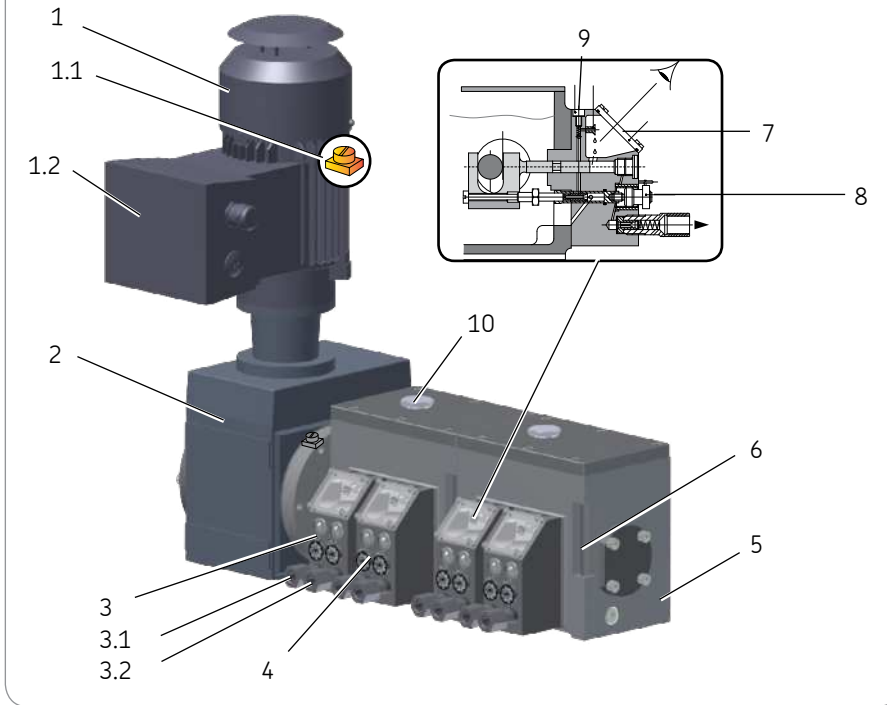
#### N) Design key

A 4073 II 2G Ex h IIC T4 Gb

- 1) For supply via overhead reservoir (max. installation height of 10 m).
- 2) Other designs available on request.
- 3) Approved only after consultation with SKF Engineering.
- 4) For designs with different delivery rates, indicate these (based on the drive side) in addition to the order number.

### 3.3 JM oil lubrication pump with electric motor drive

Overview, Fig. 2



#### Item Description

- | Item | Description                                |
|------|--|
| 1    | ATEX electric motor                        |
| 1.1  | Equipotential bonding connection           |
| 1.2  | Terminal box                               |
| 2    | Gear train                                 |
| 3    | Pump body 1                                |
| 3.1  | Pump element 1 outlet (counted from drive) |
| 3.2  | Pump element 2 outlet (counted from drive) |
| 4    | Pump body 2                                |
| 5    | Pump housing/oil reservoir                 |
| 6    | Oil level control                          |
| 7    | Sight glass (drop regulator)               |
| 8    | Delivery rate setting screw                |
| 9    | Vent plugs                                 |
| 10   | Fill connection with screw union           |

### 3.4 Type code for electric motor drive gear train

|          |    |    |   |    |    |   |   |    |   |   |   |      |    |    |
|----------|----|----|---|----|----|---|---|----|---|---|---|------|----|----|
| Example: | JM | 02 | A | 3M | 39 | G | 1 | 04 | W | / | A | 4068 | AG | 27 |
| Code:    | A  | B  | C | D  | E  | F | G | H  | K | L | M | N    | P  | Q  |

3

#### A) Type

JM high-pressure pump, max. 600 bar with eccentric shaft drive of the pump pistons, with extensible screwed pump housings (without customer-specific additional or overhead reservoirs)

#### B) Oil reservoir capacity

02 = 2L    04 = 4L    06 = 6L    08 = 8L  
 10 = 10L    12 = 12L    14 = 14L  
 16 = 16 liters to 24 = 24 liters, only for drive position (M) central

#### C) Oil reservoir design

A = pressure-tight <sup>1)</sup> B = air-cooled

#### D) Drive type

3M = electric motor drive with gear train

#### E) Delivery rate key <sup>2)</sup> (reduction ratio)

39 = 35.1:1    57 = 62.8:1  
 78 = 83.2:1    98 = 100.9:1  
 13 = 125.7:1 <sup>3)</sup>    17 = 162.1:1 <sup>3)</sup>

#### F) Drive position

G = left    H = right    M = central

#### G) Delivery rate per piston stroke

1 = 0.1 cm<sup>3</sup>/stroke    2 = 0.2 cm<sup>3</sup>/stroke  
 3 = 0.07 cm<sup>3</sup>/stroke    0 = Mixed design <sup>4)</sup>

#### H) Number of outlets

01 = 1 outlet to 28 = 28 outlets  
 29 = 29 outlets to 48 = 48 outlets  
 only for drive position (M) central

#### K) Pipe connection ø and connection type

Y = ø 6 mm solderless  
 Z = ø 6 mm solderable  
 W = ø 8 mm solderless  
 X = ø 8 mm solderable  
 T = ø 6 mm double cutting-sleeve screw union  
 U = ø 8 mm double cutting-sleeve screw union  
 V = G 1/4 double cutting-sleeve screw union  
 - = G 1/4" stainless steel thread

#### L) Prelubrication

/ = without prelubrication

#### M) Modification letter

A = pump housing made of chilled aluminum casting, plain bearings  
 for eccentric shaft, reinforced gear design

#### N) Design key

4067 II 2G Ex h IIC T3 Gb  
 4068 II 2G Ex h IIC T4 Gb  
 4071 II 2G Ex h IIB T4 Gb  
 4072 II 3G Ex h IIC T3 Gc

#### P) Motor order codes

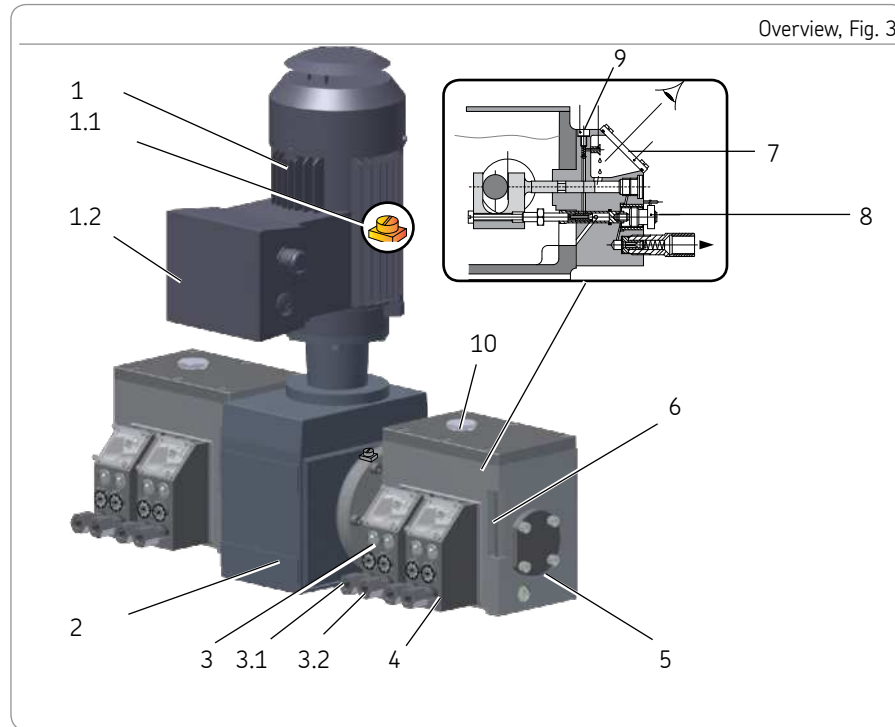
AG = 230/400V, 1000 RPM  
 AF = 230/400V, 1500 RPM  
 AL = 290/500V, 1000 RPM  
 AK = 290/500V, 1500 RPM  
 AP = 400/690V, 1000 RPM  
 AO = 400/690V, 1500 RPM

#### Q) Protection class (motor) <sup>5)</sup>

13 = II 3G Ex nA IIC T3 Gc (IP55)  
 27 = II 2G Ex de IIB T4 Gb (IP55)  
 28 = II 2G Ex de IIB T4 Gb (IP56)  
 29 = II 3G Ex n IIB T3 Gc (IP55)  
 31 = II 2G Ex de IIC T3 Gb (IP55)  
 32 = II 2G Ex de IIC T3 Gb (IP65)  
 34 = II 2G Ex de IIC T4 Gb (IP55)  
 35 = II 2G Ex de IIC T4 Gb (IP65)  
 36 = II 2G Ex de IIC T4 Gb (IP56)

- 1) For supply via overhead reservoir (max. installation height of 10 m)
- 2) Other designs available on request
- 3) Approved only after consultation with SKF Engineering.
- 4) For designs with different delivery rates, indicate these (based on the drive side) in addition to the order number.
- 5) Motor protection class must match the design key.

### 3.5 Special version - JM oil lubrication pump with dual-sided electric motor drive



#### Item Description

- 1 ATEX motor
- 1.1 Equipotential bonding connection
- 1.2 Terminal box
- 2 Gear train
- 3 Pump body 1
  - 3.1 Pump element 1 outlet (counted from drive)
  - 3.2 Pump element 2 outlet (counted from drive)
- 4 Pump body 2
- 5 Pump housing/oil reservoir
- 6 Oil level control
- 7 Sight glass (drop regulator)
- 8 Delivery rate setting screw
- 9 Vent plugs
- 10 Fill connection with screw union



### 3.6 Design

- See Figures 1 to 3

JM pump units are used for total loss oil lubrication of the cylinders and packing parts used in piston compressors.

The JP pump typically consists of 1 to 7 interconnected pump housings, each with 1 to 4 outlet ports. Each pump housing has a capacity of 2 liters.

A maximum of 12 housings can be screwed together to form one pump (central drive position = 2x6 Pump housing).

The housings can be connected to a separate oil reservoir to increase the capacity.

The pump housings and the additional reservoir are available in air-cooled (B) or pressure-tight (A) designs.

They are driven by an electric motor with a reduction gear (gear train).

The installed motor rating is based on the installed gear reduction ratio, the required speed, and the number of pump elements.

To monitor the delivery rate, a pulse generator (see “Accessories” chapter) can be installed into one of the output lines.

This line can continue to the lubrication point or return to the reservoir.

Both of the pulse generator’s pistons move solely when oil is fed. One of the two pistons moves a ring magnet which triggers a reed contact for pulse counting.

For additional monitoring of the pump, the rotation of the pump shaft or the existing pressure can be monitored by appropriate sensors (rotation monitor) - see the “Accessories” chapter.

The delivery rate is regulated via the setting screw that changes the effective stroke of the feed piston via the cylinder bush. The delivery volume can be greatly reduced. The delivery rates are determined primarily by the piston diameter and the speed, along with the setting screw. Since each outlet is supplied separately, the set delivery rate re-

mains constant and independent of the rate set for neighboring setting screws.

The housing of the pump elements for accommodating the delivery pistons are made of gray cast iron. These and the additional reservoir and/or the leak oil pan and its console are, if not made of stainless steel, protected against corrosion by a varnishing.

Devices of group 2G have a maximum layer thickness of 2 mm for group IIA and IIB gases and vapors and is limited to a maximum of 0.2 mm for group IIC gases and vapors.

The Mg content in light metals is below the limit value of 7.5% specified in 6.4.4 of EN ISO 80079-36.

The system operator must connect the unit to an existing ground terminal (equipotential bonding).

On customer request, the additional reservoir can contain a flanged electric heater compliant with the protection class as well as an electric level monitor with a different principle of operation.

#### IMPORTANT NOTE

When using a pressure-tight housing version A, the maximum permissible admission pressure of 1 bar is to be observed.

### 3.7 Function

- See Figure 4

The pump shaft (1) imparts the required stroke motion to both the feed piston (2) and the working piston (3).

The feed piston (2) first presses the lubricant drawn in via duct A into duct B.

The lubricant then flows to duct C via the ring groove (4).

From there, the lubricant moves through a check valve (5) into the drop nozzle (6). The oil drops into the intake duct (8) behind the sight glass (7).

As it continues its movement, the working piston (3) closes the intake duct (8) and presses the apportioned quantity of oil from the cylinder chamber (9) through the delivery duct (10) and the check valve (11) through to the lubrication point.

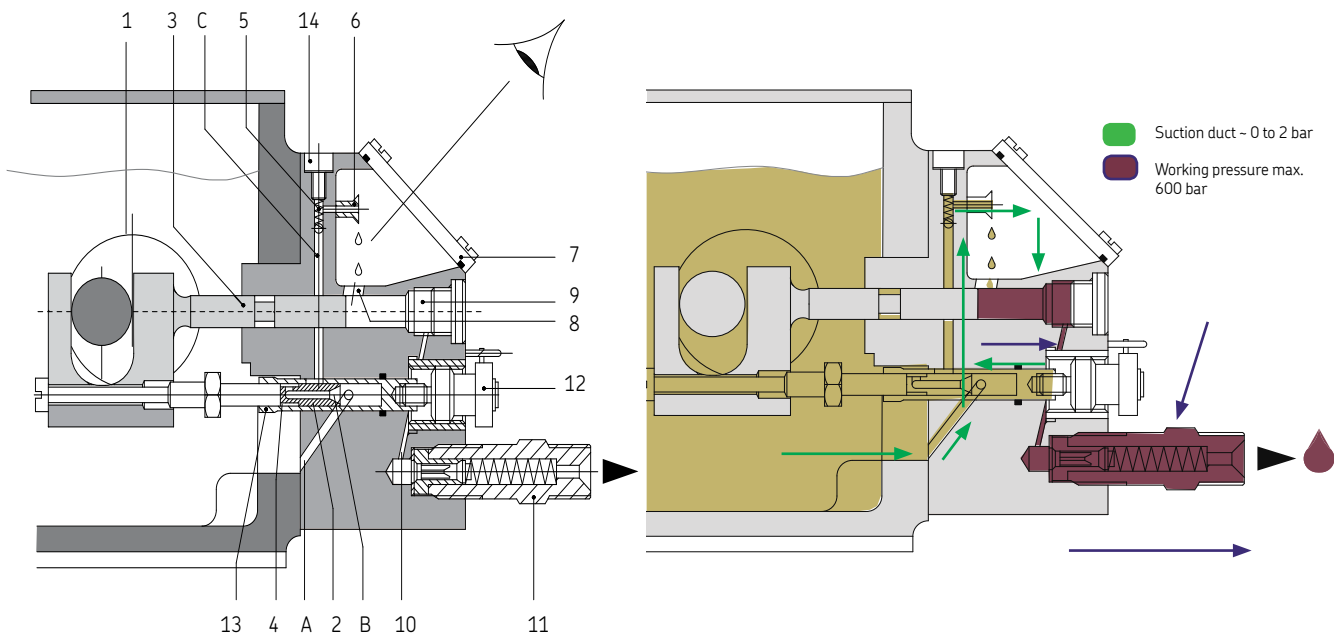
The delivery rate is regulated via the setting screw (12) that increases or decreases the effective stroke of the feed piston (2) via the cylinder bush (13).

Turning the screw clockwise decreases the delivery rate. The delivery rate can be greatly reduced.

In addition to the position of the setting screw, the delivery rate depends on the pump element (0.07, 0.1 or 0.2 cm<sup>3</sup>/full stroke) and the drive speed as well as the selected reduction ratio.

Page 40 contains a table of delivery rates with the delivery rate ranges for the respective pump elements.

Overview, Fig. 4



## 4. Technical data

### 4.1 Rotary drive with gear train

| General                                  |  |
|--|--|
| ATEX protection type                     | EN ISO 80079-37, construction safety Ex h  |
| ATEX temperature class                   | T3 or T4 (depending on motor specification)  |
| Mounting position                        | Standing, fill connection at top of pump housing   |
| Setup location                           | ≤ 1,000 m above sea level (depending on motor specification) > 1000 m above sea level on request   |
| max. surface temperature                 | According to ATEX marking T3/T4; see reference to operating temperature in table row "Lubricant"   |
| Ambient temperature                      | -20 °C to 40 °C  |
| Storage temperature                      | +10 - +40°C  |
| Lubricant temperature range              | -20 °C to + 80 °C NOTE: comply with operating viscosity range!   |
| Operating viscosity                      | 25 to 3000 mm <sup>2</sup> /s  |
| Lubricant                                | Mineral oils, compatible with NBR seals. The use of synthetic oils requires prior approval from SKF Lubrication Systems. The operator must make sure through the choice of the medium to be delivered that no chemical reactions capable of serving as ignition sources can occur in conjunction with the anticipated explosive atmospheres because contact between the media is required due to the system design (spring chamber and reservoir ventilation).<br>The lubricant's ignition temperature has to be at least 50 K above the maximum surface temperature (temperature class) of the JM oil lubrication pump. |
| Pump                                     |  |
| Type                                     | High-pressure pump with eccentric shaft drive of the pump pistons  |
| Number of attachable individual housings | 1 to 7, up to 12 for drive position M  |
| Pump bodies per individual housing       | 1 to 2   |

|  |   |
|--|---|
| Outlet ports per pump body                       | 1 to 2  |
| Total number of outlet ports                     | 1 to 24, up to 48 for drive position M  |
| Reservoir capacity                               | 2, 4, 6, 8, 10, 12, 14 liters, up to 24 liters for drive position M   |
| Operating pressure                               | max. 600 bar. At continuous operating pressure > 400 bar and an operating viscosity < 100 mm <sup>2</sup> /s, please contact the SKF Service Center.  |
| Priming pressure                                 | Reservoir connected inside and pressure-tight up to a maximum inlet pressure of 1 bar   |
| Maximum delivery rate per outlet and full stroke | Pump elements: 3 = 0.07 cm <sup>3</sup> / 2 = 0.2 cm <sup>3</sup> / 1 = 0.1 cm <sup>3</sup>   |
| Delivery rate variability per pump outlet        | Continuously variable, from 25 to 100%  |
| <b>Gear train (gearbox)</b>                      |   |
| Step-down ratio                                  | 35.1:1; 62.8:1; 83.2:1; 100.9:1 (release by SKF Engineering required for 125.7:1; 162:1)  |
| Drive speed n <sub>1</sub> (min.-max.)           | 210 - 4000 rpm  |
| Drive speed n <sub>2</sub> (min.-max.)           | 10 - 25 RPM (< 10 RPM on request, depending on oil used and back pressure)  |
| Protection class                                 | IP 65   |
| Direction of rotation                            | Clockwise or counterclockwise   |
| <b>Weights</b>                                   |   |
| Drive  | Approx. 35.0 kg   |
| Each pump body                                   | 3.1 kg)   |
| Each reservoir (empty)                           | 6.0 kg)   |
| Varnishing                                       | All varnished components of the pump are painted in accordance with the requirements of EN 80079-36 (electrostatic charge). If revarnishing becomes necessary, for example after a repair, corrosion, etc., the requirements of EN 80079-36 must likewise be met. |

## 4.2 Electric motor drive with gear train

### General

|                             |  |
|-----------------------------|--|
| ATEX protection type        | EN ISO 80079-37, construction safety Ex h  |
| ATEX temperature class      | T3 or T4 (depending on design key; see type code)  |
| Mounting position           | Standing, fill connection at top of pump housing   |
| Setup location              | ≤ 1,000 m above sea level (depending on motor specification) > 1000 m above sea level on request |
| Operating temperature       | According to ATEX marking T3/T4; see reference to operating temperature in table row "Lubricant" |
| Ambient temperature         | -20°C to + 40°C  |
| Storage temperature         | +10 - +40°C  |
| Lubricant temperature range | -20°C to + 80°C NOTE: comply with operating viscosity range!                                     |
| Operating viscosity         | 25 to 3000 mm <sup>2</sup> /s  |

|           |  |
|-----------|--|
| Lubricant | Mineral oils, compatible with NBR seals. The use of synthetic oils requires prior approval from SKF Lubrication Systems. The operator must make sure through the choice of the medium to be delivered that no chemical reactions capable of serving as ignition sources can occur in conjunction with the anticipated explosive atmospheres because contact between the media is required due to the system design (spring chamber and reservoir ventilation).<br>The lubricant's ignition temperature has to be at least 50 K above the maximum surface temperature (temperature class) of the JM oil lubrication pump. |
|-----------|--|

### Pump

|  |   |
|--|---|
| Type                                     | High-pressure pump with eccentric shaft drive of the pump pistons |
| Number of attachable individual housings | 1 to 7, up to 12 for drive position M                             |
| Pump bodies per individual housing       | 1 to 2  |

|  |   |
|--|---|
| Outlet ports per pump body                       | 1 to 2  |
| Total number of outlet ports                     | 1 to 24, up to 48 for drive position M  |
| Reservoir capacity                               | 2, 4, 6, 8, 10, 12, 14 liters, up to 24 liters for drive position M   |
| Operating pressure                               | max. 600 bar. At continuous operating pressure > 400 bar and an operating viscosity < 100 mm <sup>2</sup> /s, please contact the SKF Service Center.  |
| priming pressure                                 | Reservoir connected inside and pressure-tight up to a maximum inlet pressure of 1 bar   |
| Maximum delivery rate per outlet and full stroke | Pump elements: 3 = 0.07 cm <sup>3</sup> / 2 = 0.2 cm <sup>3</sup> / 1 = 0.1 cm <sup>3</sup>   |
| Delivery rate variability per pump outlet        | 25 to 100%  |
| <b>Gear train (gearbox)</b>                      |   |
| Step-down ratio                                  | 35.1:1; 62.8:1; 83.2:1; 100.9:1 (release by SKF Engineering required for 125.7:1; 162:1)  |
| Drive speed n <sub>1</sub> (min.-max.)           | 210+0.3 rpm   |
| Drive speed n <sub>2</sub> (min.-max.)           | 10 - 25 RPM (< 10 RPM on request)   |
| Direction of rotation                            | Clockwise or counterclockwise   |
| <b>Weights</b>                                   |   |
| Motor  | See motor operating instructions  |
| Drive  | Approx. 35.0 kg   |
| Each pump body                                   | 3.1 kg)   |
| Each reservoir (empty)                           | 6.0 kg)   |
| Varnishing                                       | All varnished components of the pump are painted in accordance with the requirements of EN 80079-36 (electrostatic charge). If revarnishing becomes necessary, for example after a repair, corrosion, etc., the requirements of EN 80079-36 must likewise be met. |

## Motor

Type

B14/V18

Type of voltage

3-phase AC voltage

| Motor              |                    | Gear train  |             | Pump element                             |  |  |  |  |  |
|--------------------|--------------------|-------------|-------------|--|--|--|--|--|--|
| Rated speed<br>RPM | Rated power<br>kW  | $i=n_1/n_2$ | Drive speed | Q=0.07 cm <sup>3</sup> /stroke           |  | Q=0.1 cm <sup>3</sup> /stroke            |  | Q=0.2 cm <sup>3</sup> /stroke            |  |
|                    |                    |             |             | Q <sub>min</sub><br>cm <sup>3</sup> /min | Q <sub>max</sub><br>cm <sup>3</sup> /min | Q <sub>min</sub><br>cm <sup>3</sup> /min | Q <sub>max</sub><br>cm <sup>3</sup> /min | Q <sub>min</sub><br>cm <sup>3</sup> /min | Q <sub>max</sub><br>cm <sup>3</sup> /min |
| 1000               | 0.18 <sup>1)</sup> | 162         | 17          | 0.09                                     | 0.38                                     | 0.13                                     | 0.53                                     | 0.26                                     | 1.05                                     |
|                    | 0.18 <sup>1)</sup> | 125.7       | 13          | 0.12                                     | 0.47                                     | 0.17                                     | 0.68                                     | 0.34                                     | 1.35                                     |
|                    | 0.25               | 100.9       | 98          | 0.15                                     | 0.60                                     | 0.22                                     | 0.86                                     | 0.43                                     | 1.72                                     |
|                    | 0.25               | 83.2        | 78          | 0.18                                     | 0.73                                     | 0.26                                     | 1.05                                     | 0.52                                     | 2.09                                     |
|                    | 0.37               | 62.8        | 57          | 0.25                                     | 1.01                                     | 0.36                                     | 1.45                                     | 0.72                                     | 2.90                                     |
|                    | 0.55               | 35.1        | 39          | 0.45                                     | 1.80                                     | 0.64                                     | 2.56                                     | 1.28                                     | 5.13                                     |
| 1500               | 0.25 <sup>1)</sup> | 162         | 17          | 0.14                                     | 0.57                                     | 0.20                                     | 0.82                                     | 0.41                                     | 1.64                                     |
|                    | 0.25 <sup>1)</sup> | 125.7       | 13          | 0.18                                     | 0.74                                     | 0.26                                     | 1.05                                     | 0.53                                     | 2.11                                     |
|                    | 0.37               | 100.9       | 98          | 0.24                                     | 0.95                                     | 0.34                                     | 1.36                                     | 0.68                                     | 2.73                                     |
|                    | 0.37               | 83.2        | 78          | 0.29                                     | 1.16                                     | 0.41                                     | 1.65                                     | 0.83                                     | 3.31                                     |
|                    | 0.55               | 62.8        | 57          | 0.39                                     | 1.56                                     | 0.55                                     | 2.22                                     | 1.11                                     | 4.44                                     |
|                    | 0.75               | 35.1        | 39          | 0.70                                     | 2.78                                     | 0.99                                     | 3.97                                     | 1.99                                     | 7.95                                     |

1) Release by SKF Engineering required)



**Performance data according to IEC 60947-4-1 Annex G**

The table shows the values for standard three-phase squirrel cage motors at 1000/1500 RPM, 50 Hz,

The values given are reference values. They depend on the make and number of poles of the motors.

The specifications on the motor type plate take precedence in case of discrepancies.



| Rated speed<br>[RPM] | Frequency<br>[Hz] | Rated power<br>[kW] | Rated current<br>[A] |       |       |       |       |       |       |       |       |       |  |
|----------------------|-------------------|---------------------|----------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|
|                      |                   |                     | 220 V                | 230 V | 240 V | 380 V | 400 V | 415 V | 440 V | 500 V | 660 V | 690 V |  |
| 1500                 | 50                | 0.25                |                      |       |       |       | 0.84  |       |       |       |       |       |  |
|                      |                   | 0.37                |                      |       |       |       | 1.20  |       |       |       |       |       |  |
|                      |                   | 0.55                |                      |       |       |       | 1.75  |       |       |       |       |       |  |
|                      |                   | 0.25                | 1.6                  | 1.5   | 1.4   | 0.9   | 0.85  | 0.82  | 0.74  | 0.68  | 0.51  | 0.49  |  |
|                      |                   | 0.37                | 2.0                  | 1.9   | 1.8   | 1.2   | 1.1   | 1.1   | 1.0   | 0.88  | 0.67  | 0.49  |  |
|                      |                   | 0.55                | 2.7                  | 2.6   | 2.5   | 1.6   | 1.5   | 1.4   | 1.3   | 1.2   | 0.91  | 0.64  |  |
|                      |                   |                     |                      |       |       |       |       |       |       |       |       |       |  |
|                      |                   |                     |                      |       |       |       |       |       |       |       |       |       |  |
|                      |                   |                     |                      |       |       |       |       |       |       |       |       |       |  |

|                                       |  |
|---------------------------------------|--|
| Starting current                      | 3x rated current; see specifications on motor type plate |
| Efficiency                            | See motor type plate                                     |
| Power factor [cos]                    | See motor type plate                                     |
| Operating mode                        | S1   |
| Protection class pursuant to EN 60529 | IP 55  |
| Temperature class                     | F  |

| <b>Electrical connection for motor</b>          | <p>Be sure to establish the connection so as to maintain a continuous safe electrical connection (use secure protective earth connection, assigned cable end fittings, no protruding wire ends). There must be no foreign bodies, contamination, or humidity in the terminal box. Seal the terminal box dust-tight and water-tight. In addition to the generally applicable installation requirements for electrical systems, the electrical connection is established in accordance with the applicable ATEX requirements, such as:</p> <ul style="list-style-type: none"> <li>• DIN EN 60079-14, VDE 0165-1</li> <li>• DIN EN 60079-17</li> <li>• ElexV</li> </ul> |                 |                   |                                |                     |                        |        |  |       |
|---|--|-----------------|-------------------|--------------------------------|---------------------|------------------------|--------|--|-------|
| <b>Tolerance</b>                                | <p>Mains voltage <math>\pm 5\%</math><br/> Mains voltage tolerance <math>\pm 2\%</math> Waveform and network symmetry must be maintained so that motor heating remains within the permissible limits.</p>  |                 |                   |                                |                     |                        |        |  |       |
| <b>Electrical connection ratings</b>            | See motor type plate   |                 |                   |                                |                     |                        |        |  |       |
| <b>Minimum distance to energized components</b> | <p>In accordance with DIN EN 60079-7 / VDE 0170-6</p> <table border="1"> <thead> <tr> <th>Rated voltage<br/>EX category 2</th> <th>Distance from motor</th> </tr> </thead> <tbody> <tr> <td><math>\leq 500 \text{ VAC}</math></td> <td>8.0 mm</td> </tr> <tr> <td><math>&gt; 500 \text{ VAC} \leq 690 \text{ VAC}</math></td> <td>10 mm</td> </tr> </tbody> </table>   |                 |                   | Rated voltage<br>EX category 2 | Distance from motor | $\leq 500 \text{ VAC}$ | 8.0 mm | $> 500 \text{ VAC} \leq 690 \text{ VAC}$ | 10 mm |
| Rated voltage<br>EX category 2                  | Distance from motor  |                 |                   |                                |                     |                        |        |  |       |
| $\leq 500 \text{ VAC}$                          | 8.0 mm   |                 |                   |                                |                     |                        |        |  |       |
| $> 500 \text{ VAC} \leq 690 \text{ VAC}$        | 10 mm  |                 |                   |                                |                     |                        |        |  |       |
| <b>Motor clearance</b>                          | See minimum mounting dimensions, Chapter 6   |                 |                   |                                |                     |                        |        |  |       |
| <b>Gear train (gearbox)</b>                     |  |                 |                   |                                |                     |                        |        |  |       |
| <b>Step-down ratio</b>                          | 35.1:1; 62.8:1; 83.2:1; 100.9:1 (125.7:1; 162:1=release by SKF Engineering required)   |                 |                   |                                |                     |                        |        |  |       |
| <b>Protection class pursuant to EN 60529</b>    | IP 65  |                 |                   |                                |                     |                        |        |  |       |
| <b>Gear oil</b>                                 | ARAL   | Internationally | Degol GS 220      |                                |                     |                        |        |  |       |
|   | BP   | Europe          | Energol SG-XP 220 |                                |                     |                        |        |  |       |
|   | Mobil Oil  | Internationally | Glygole 220       |                                |                     |                        |        |  |       |
|   | Shell  | Internationally | Tivela WB         |                                |                     |                        |        |  |       |

## 5. Delivery, returns, storage

|   |   |                |
|---|---|----------------|
|  |  | <b>WARNING</b> |
|   | <b>Personal injury/property damage</b><br>Do not tilt or drop the product.        |                |

|   |  |                |
|---|--|----------------|
|  |   | <b>WARNING</b> |
|   | <b>Personal injury/property damage</b><br>The forklift or pallet truck must be designed for the total weight of the JM oil lubrication pump + 20%. See the shipping documents for the total weight of the JM oil lubrication pump. |                |

### 5.1 Checking the delivery

After receipt of the supply, it must be inspected for any shipping damage and for completeness according to the shipping documents. Immediately inform the transport carrier of any shipping damage. Keep the packaging material until any discrepancies have been resolved. Safe handling must be ensured during on-site transport.

### 5.2 Return shipments

Before return shipment, all parts must be cleaned and properly packed (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



4

5

The following conditions apply to storage:

### 5.3 Storage

- The product(s) can be wrapped in plastic film to provide low-dust storage.
- Protect against ground moisture by storing on a shelf or wooden pallet.
- Motors must be protected from mechanical damage.

#### 5.3.1 Lubrication units

- dry and dust-free surroundings, storage in well ventilated dry area
- Storage time: Max. 24 months
- Relative humidity: < 65%
- Storage temperature - see "Technical data"
- No direct sun or UV exposure
- Protected against nearby sources or heat or cold

#### 5.3.2 Electronic and electrical devices

- dry and dust-free surroundings, storage in well ventilated dry area
- Storage time: Max. 24 months
- Relative humidity: < 65%
- Storage temperature - see "Technical data"
- No direct sun or UV exposure
- Protected against nearby sources or heat or cold

#### 5.4 Transport without packaging by pallet truck

-See Figure 5

SKF Lubrication Systems Germany GmbH recommends that the customer use a height-adjustable pallet truck for transport of the JM oil lubrication pump to the installation location and for installation. The JM oil lubrication pump unit must be secured against tipping using two ratchet straps. The lifting equipment provided by the customer, such as assembly trolley, ratchet straps, etc. must be designed for the total weight of the JM oil lubrication pump + a 20% safety margin.

The customer must secure/assemble the lifting equipment in accordance with its respective national laws and regulations. SKF Lubrication Systems Germany GmbH is not responsible for improperly designed, assembled, or defective lifting equipment.

Transport by pallet truck, Fig. 5



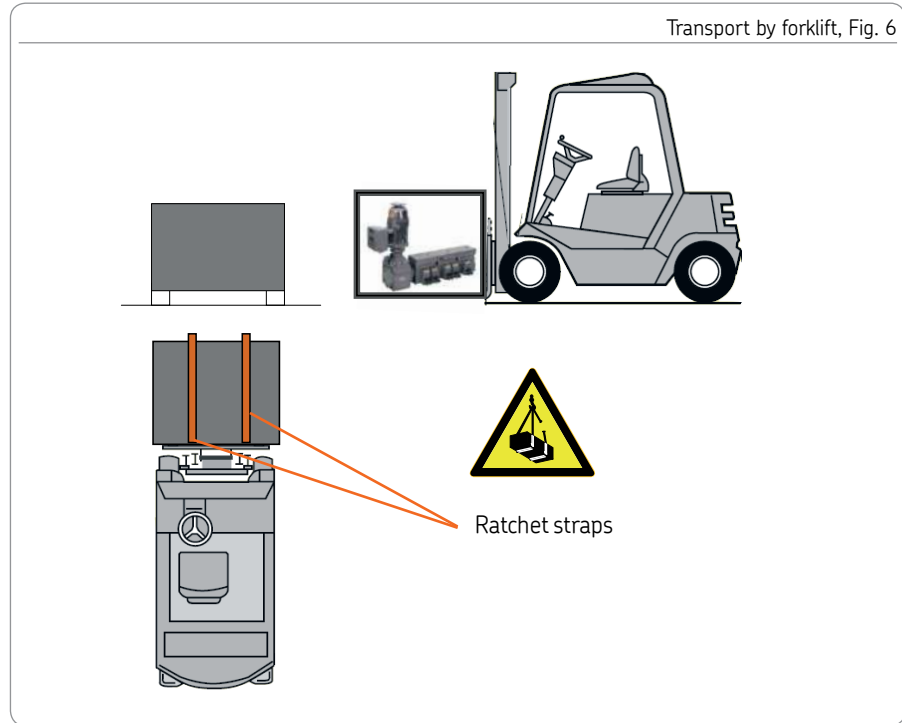
## 5.5 Transport by forklift

-See Figure 6

Use permitted ratchet straps to secure the pallet with the JM oil lubrication pump against tipping on the forklift.

The ratchet straps provided by the customer must be designed for the total weight of the JM oil lubrication pump plus a 20% safety margin.

SKF Lubrication Systems Germany GmbH is not responsible for improperly designed, assembled, or defective ratchet straps.



## 6. Assembly

### 6.1 General information

The JM oil lubrication pumps (with gear train/unit) may be installed only by qualified technical personnel with ATEX training. The specialist is capable due to qualified training of detecting risks in potentially explosive atmospheres and rectifying these by taking suitable actions. The specialist has knowledge of the various types of protection, installation procedures, and zone classifications. The specialist is familiar with the rules and requirements relevant to his or her activity and explosion protection, especially ATEX Directives 2014/34/EU and 1999/92/EC.

During assembly, pay attention to the following:

- Check the JM oil lubrication pump for any shipping damage and for completeness according to the shipping documents.
- The pump unit and its ground connection must be connected to the equipotential bonding of the main machine.
- Other units must not be damaged by assembly work.
- The product must not be installed within range of moving parts.
- The product must be installed at a sufficiently large distance from sources of heat or cold.
- Observe the IP protection class of the product.
- Maintain safety clearances and comply with statutory regulations for assembly and accident prevention.
- Any visual monitoring equipment present, such as pressure gauges, min./max. markings, oil sight glasses, pulse generators, etc. must be clearly visible.
- Follow the mounting position requirements in “Technical data” (Chapter 4).
- The JM oil lubrication pump may only be commissioned and operated with an oil supply. The pump must not run dry.
- The JM oil lubrication pump must be installed in a stress-free position.
- Assess vibrations of the machinery in accordance with ISO 10816-3. However, the maximum permitted vibration velocity is 3.5 mm/s due to the pressure-resistant design of the motors.
- Prior to beginning installation, inspect the full scope of delivery for the JM oil lubrication pump for any damage or corrosion.
- The maximum permissible operating temperature and the lubricant tempera-

ture must not be exceeded. Install a heat exchanger if necessary.

- Carefully clean screw unions and tubing prior to beginning installation.
- It must be ensured that screw unions, connections, and connection elements are leak-free.
- Ensure cleanliness; components must be installed without contamination.
- Do not use any cleaning wipes containing lint.
- Existing supply lines must not be damaged by assembly work.
- The JM oil lubrication pump unit must be set up at a location with the specified ambient temperature (see “Technical data”) and max. 1000 m above sea level. Different ambient temperatures and altitudes

must be specified on the type plate of the motor and the pump. The motor must not be exposed to direct sunlight at ambient temperatures above 30 °C.

- Air inlets and outlets on the motor fan cowl must not be obstructed, as this could cause the temperature to rise above the approved temperature class and reduce the service life of the winding insulation.
- Drill assembly holes in such a way that no lines, units, or moving parts are damaged or their function impaired. Maintain safety clearances and comply with regulations for assembly and accident prevention.



**WARNING**



**Explosion hazard from non-ATEX-compliant attachments and monitoring equipment**

Only ATEX-compliant screw unions, lines, attachments, and monitoring equipment may be installed on the ATEX JM oil lubrication pump.





**WARNING**




**Pump outlets must not be closed**  
Pump outlets not required are to be equipped with return lines to the oil reservoir.



| ! WARNING   |   |
|---|---|
|  | <p><b>Excessive switching voltage hazard</b></p> <p>An isolating amplifier must be inserted if an electrical ATEX fill level indicator will be used in a potentially explosive atmosphere. The maximum permissible voltage <math>U_i</math> must not be exceeded.</p> |

| ! WARNING   |  |
|---|--|
|  | <p><b>Explosion hazard</b></p> <p>The lubricant's ignition temperature has to be at least 50 kelvin above the maximum permissible surface temperature.</p> |


| ! CAUTION   |   |
|---|---|
|  | <p><b>Electric shock</b></p> <p>Disconnect the product electrically from the mains before performing any work on electrical components.</p> |



Connect the motor only in accordance with the circuit diagram from the motor manufacturer.



Connect the power cables in such a way that no forces are transferred to the product (stress-free connection).

| ! CAUTION   |  |
|---|--|
|  | <p><b>Slipping hazard</b></p> <p>Centralized lubrication systems 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.</p> |

## 6.2 Assembly location

The product should, to the extent possible, be protected from humidity and vibration, and should be mounted so that it is easily accessible. This facilitates further installation, inspection, and maintenance work on the product.

### 6.3 Setup and attachment

-See Figure 7

The mounting surface for the JM oil lubrication pump must be free of dust particles, machining chips, rust, and paint residue. If necessary, clean this surface prior to flanging.

#### IMPORTANT NOTE

When designing the flange surface for the JM pump units, ensure that the gear train is 5 mm below the flange surface of the pump housings. If necessary, recess the flange surface in the area of the gear train or increase (line) the flange surface on the pump housings by 5 mm.

The product is secured to the 4 assembly holes.

It is secured using 4 M10 (strength class 8.8) screws.

Fastening materials to be provided by the customer:

- **Hexagon head screws** M10, ISO 4762 , (4x) strength class 8.8
- **Washer** ISO 7090 ID 10, (4x) strength class 200 HV.

#### IMPORTANT NOTE

The maximum engagement depth of the assembly screws into the JM pump housing is 14<sup>-2</sup> mm.

- Drill customer-provided assembly holes in accordance with Figures 7 to 10
- Clean installation surfaces
- Apply the JM oil lubrication pump to the installation surface

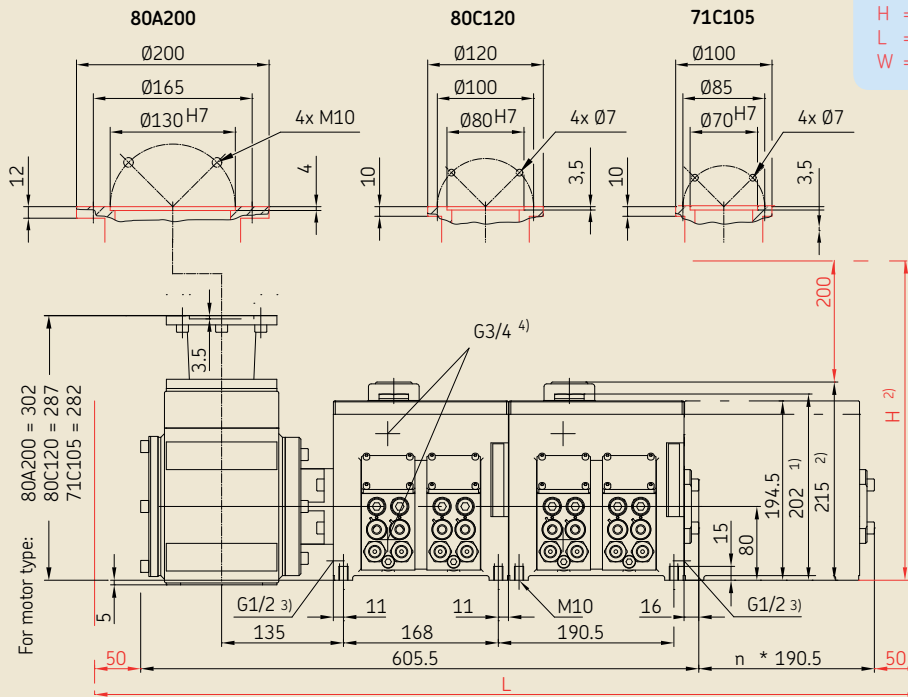
- Pass hexagon head screws (4)x with washers through customer-drilled assembly holes and apply them to the threaded holes on the JM housing.
- Align the JM oil lubrication pump
- Install the JM oil lubrication pump in a stress-free position
- **Tighten hexagon head screws crosswise with a torque of 45 ±2 Nm**

### 6.4 Minimum mounting dimensions

To ensure enough space for maintenance work and possible disassembly of the product, make sure that the minimum mounting dimensions (see the following page) are maintained.

Assembly drawing - rotary drive with gear train, Fig. 7

Attachment for motor type: 71 C 105 (V18), 80 C 120, 80 A 200 compatible



Minimum mounting dimensions  
 H = 415 mm  
 L = 50 mm + 605.5 mm + n \* 190.5 + 50 mm  
 W = 363 mm

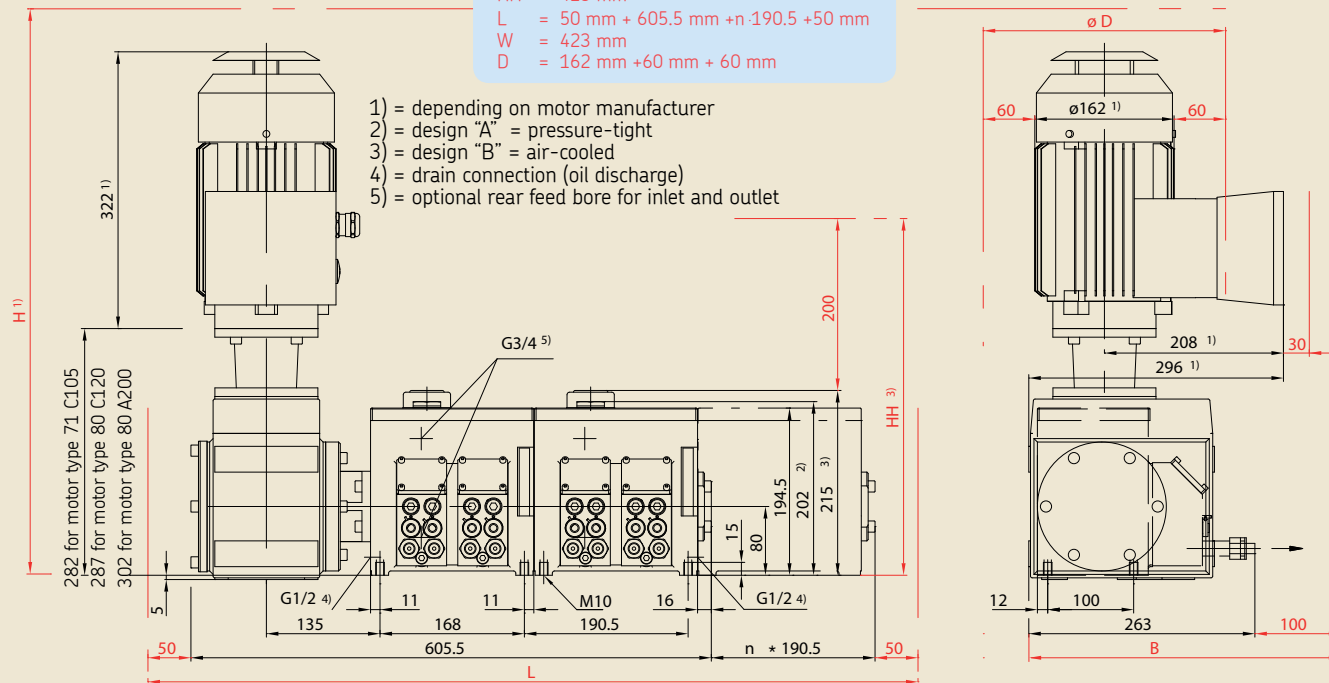
- 1) = design "A" = pressure-tight
- 2) = design "B" = air-cooled
- 3) = drain connection (oil discharge)
- 4) = optional rear feed bore for inlet and outlet

Assembly drawing - electric motor drive, Fig. 8

Minimum mounting dimensions

- H = 660 mm
- HH = 415 mm
- L = 50 mm + 605.5 mm + n·190.5 + 50 mm
- W = 423 mm
- D = 162 mm + 60 mm + 60 mm

- 1) = depending on motor manufacturer
- 2) = design "A" = pressure-tight
- 3) = design "B" = air-cooled
- 4) = drain connection (oil discharge)
- 5) = optional rear feed bore for inlet and outlet

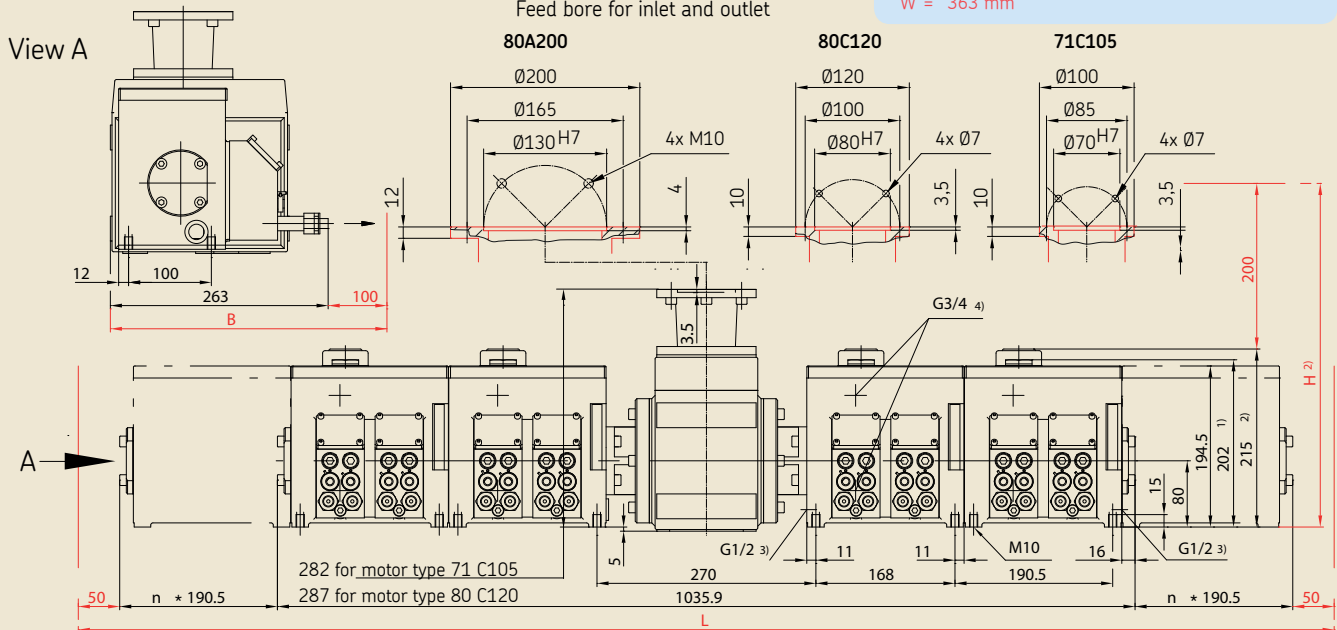


Assembly drawing - special version, drive with gear train, Fig. 9

Attachment for motor type: 71 C 105 (V18),  
80 C 120, 80 A 200 compatible

- 1) = design "A" = pressure-tight
- 2) = design "B" = air-cooled
- 3) = drain connection (oil discharge)
- 4) = rear, optional  
Feed bore for inlet and outlet

**Minimum mounting dimensions**  
 H = 415 mm  
 L = 50 mm + 1035.9 mm + n · 190.5 + 50 + 50 mm  
 W = 363 mm

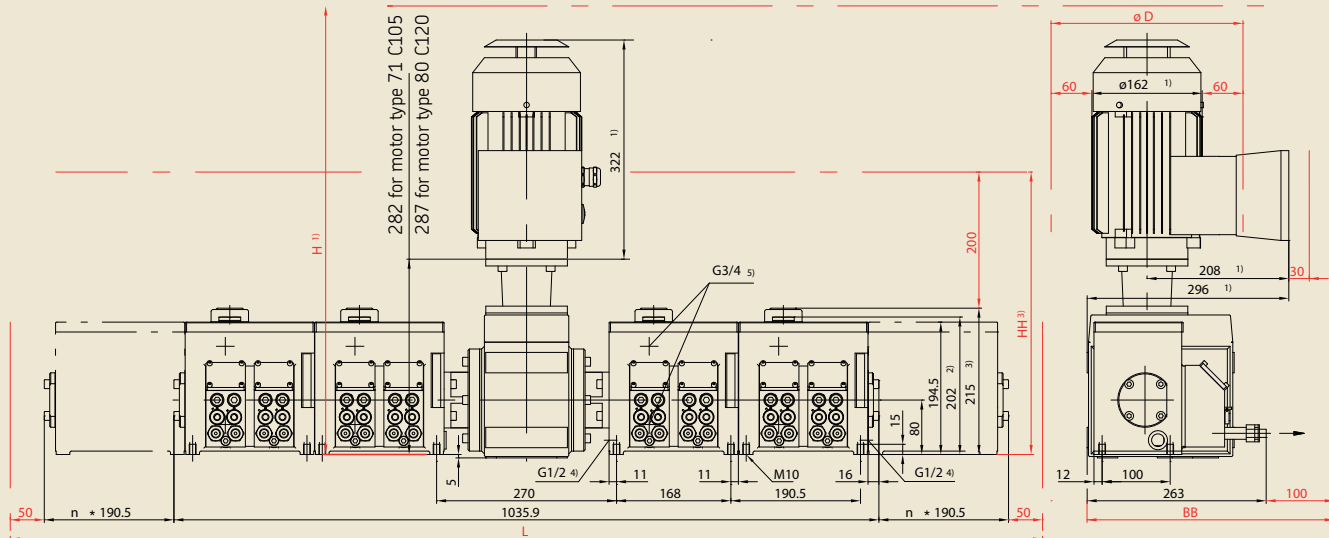


Assembly drawing - special version, electric motor drive with gear train, Fig. 10

- 1) = depending on motor manufacturer
- 2) = design "A" = pressure-tight
- 3) = design "B" = air-cooled
- 4) = drain connection (oil discharge)
- 5) = optional rear feed bore for inlet and outlet



## Minimum mounting dimensions

|    |  |
|----|--|
| H  | = 660 mm                                     |
| HH | = 415 mm                                     |
| L  | = 50 mm + 1035.9 mm + n · 190.5 + 50 + 50 mm |
| W  | = 363 mm                                     |
| D  | = 162 mm + 60 mm + 60 mm                     |





## 6.5 Electrical connection (motor, equipotential bonding)

### 6.5.1 General notes

|   |  |
|---|--|
|   |  <b>WARNING</b>   |
|  | <b>Electric shock</b><br>Electrical connections for the product may only be established by qualified ATEX personnel authorized to do so by the operator. |

#### IMPORTANT NOTE



Refer to the enclosed operating instructions from the motor manufacturer to connect the ATEX motor. The information contained therein must be observed.

|   |   |
|---|---|
|   |  <b>WARNING</b>  |
|  | <b>Electric shock / damage to pump motor</b><br>The available mains voltage (supply voltage) must match the specifications on the type plate of the motor or of the electrical components. It may be connected only via a safe galvanic isolation (PELV). Check the fuse protection of the electrical circuit. Use only fuses with the prescribed amperage. Monitoring equipment that has been triggered (e.g., motor circuit breaker/fuse) must not automatically switch on again. |

Observe the guidelines in EN/ISO 60034 (VDE 0530-1) for operation at the limits of the B ranges (combination of  $\pm 10\%$  voltage deviation and  $+3/-5\%$  frequency deviation). This applies especially with regard to heating and deviations in operating parameters from the ratings on the motor type plate. The limits must never be exceeded.

Be sure to connect the motor so as to guarantee a continuously safe electrical connection (no protruding wire ends); use the assigned cable end fittings (e.g. cable lugs, wire end ferrules). Select connecting cables conforming to DIN VDE 0100, taking into account the rated current and the conditions of the specific system (e.g., ambient temperature, type of routing, etc. in accordance with DIN VDE 0298-4).

## 6.5.2 Terminal nomenclature

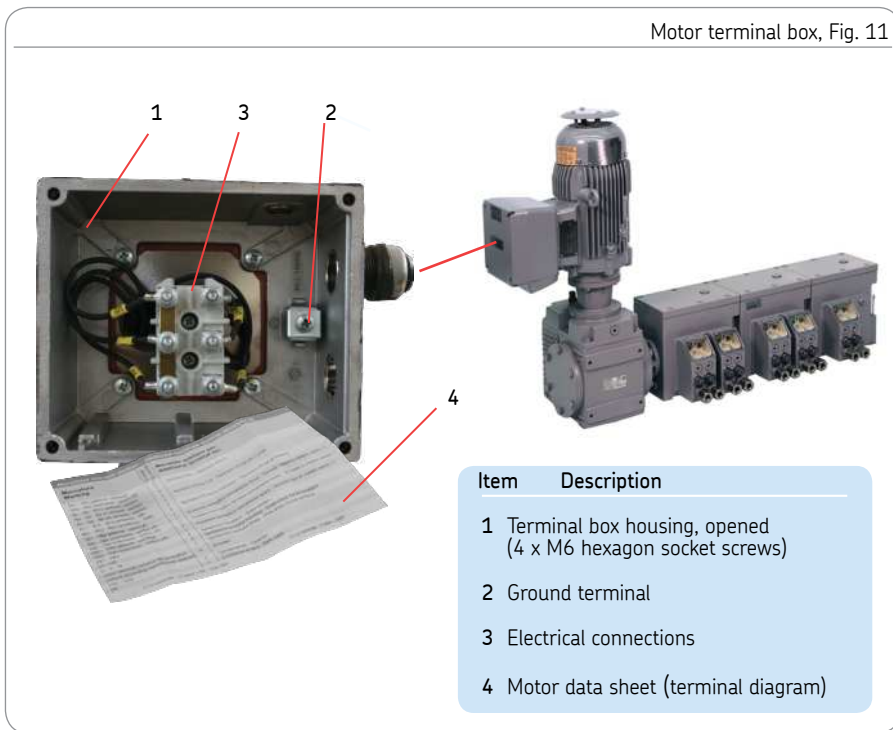
|  |
|--|
|  <b>WARNING</b>   |
|  <p><b>Mains connection for explosion-proof motors</b></p> <p>A mains connection in a potentially explosive atmosphere requires a motor circuit breaker or equivalent protective device, such as a PTC thermistor with triggering device. This must be indicated on the motor type plate together with release time <math>t_A</math>.</p> |

The following basic definitions apply to the terminal nomenclature according to DIN VDE 0530 Part 8 or EN / IEC 60034-8 for three-phase machines:

**Terminal nomenclature (based on example of 1U1-1)**

| 1 | U | 1 | - | 1 | Designation   |
|---|---|---|---|---|---|
| X |   |   |   |   | Code number for pole assignment in pole-changing machines (if applicable; lower code corresponds to lower speed) or, in special cases, for divided winding. |
|   | X |   |   |   | Phase designation (U, V, W)   |
|   |   | X |   |   | Code number for winding start (1)/end or (2) (more than one connection per winding)   |
|   |   |   |   | X | Additional code if connection of parallel power cables is necessary for multiple terminals with otherwise identical designation                             |





### 6.5.3 Motor connection

- See Figure 11

Improper work in the terminal box may result in property damage. Follow / comply with the following instructions to avoid this.

- Do not damage components inside the terminal box.
- There must be no foreign bodies, contamination, or humidity in the terminal box.
- Seal the terminal box dust-tight and water-tight with the original seal.
- Seal cable entries in the terminal box (DIN 42925) and any other open entries with O-rings or suitable flat gaskets.
- Comply with the torques for cable glands (flame-proof enclosure - see operating instructions from motor manufacturer).

Connect the electric motor in accordance with the motor data sheet from the motor manufacturer. It is located in the motor's terminal box.

- Open the motor terminal box (1) and remove the motor data sheet
- Connect the motor in accordance with the motor data sheet
- Mark the terminal diagram used on the motor data sheet and **enclose the completed motor data sheet with these operating instructions.**

Operate pump unit only briefly in jogging mode; while doing so:

- Check that the motor runs smoothly

#### 6.5.4 Connecting equipotential bonding with/without cable lug



- see Fig. 12

For connection terminals with a terminal clamp, distribute the conductors to obtain approximately equal clamping heights on both sides of the bar. This type of connection therefore requires that an individual conductor be bent in a u shape or be connected with a cable lug.

This also applies to the internal and external connection of the grounding conductor.

In case cable lugs are used for the connection, select their size according to the required conductor cross-section and the bolt size. Installation in a slanted position is permissible only if the required air and creepage distances are maintained.

Strip conductor ends so that the remaining insulation extends almost to the cable lug. The current-carrying connection is ensured by direct contact between the cable lug surfaces and the contact nut or contact screw.

|   |   |
|---|---|
|   |  <b>WARNING</b>  |
|  | <b>Contact voltages on the unit</b><br><br>Always connect the protective earth conductor and the equipotential bonding. Ensure that the contact is secure and that the connector diameter is adequate and standard-compliant. |

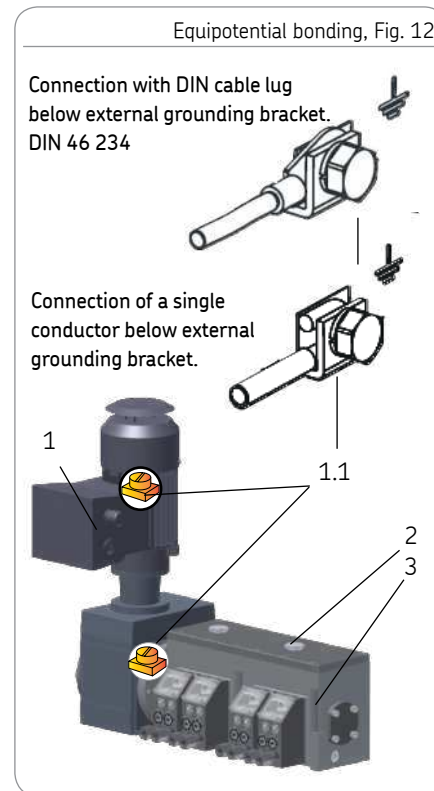
The JM oil lubrication pump must be connected to the equipotential bonding of the main machine using the provided equipotential bonding ports.

- Establish equipotential bonding using the provided equipotential bonding port (1.1) to the main machine. The connections must be metallic and conductive.
- Ensure that the connection surface is bright metal and protected against corrosion using a suitable anticorrosive agent, such as acid-free Vaseline.
- Insert the existing spring ring and washer under the screw head of the equipotential bonding screw.
- Apply the cable lug under the equipotential bonding screw/clamp.

- Tighten the equipotential bonding screw with the torque prescribed for the screw (see table from screw manufacturer).







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





## 6.6 Fill pump housing with lubricant

- See Figure 6

|   |  |
|---|--|
|   |  <b>CAUTION</b>                     |
|  | <b>Risk of slipping</b><br>Exercise caution when handling lubricants; immediately bind/remove any leaked lubricants. |

|   |  |
|---|--|
|   |  <b>WARNING</b>   |
|  | <b>Heating due to dry running of the pump</b><br>The customer is responsible for attaching a fill level monitoring which displays the minimum level. This is at the height of the working piston. If this is not possible at the customer site, then organizational measures are required to prevent the level from falling below the minimum. |

|   |  |
|---|--|
|   |  <b>WARNING</b>   |
|  | <b>Filling process only with non-explosive atmosphere</b><br>The JM oil lubrication pump may be filled only if no Ex atmosphere is present or if equipotential bonding has been used to ensure that no spark can arise between the filling hole and the fitting. |

The filling of the pump housing with lubricant takes place with pump units without auxiliary oil tank either through one of the filling screws in the reservoir lid or through the inlet bore located in the rear wall of the respective pump housing.

The reservoirs are connected inside with one another.



- Undo the filling screw (2), fill the pump housing with lubricant up to the top range of the oil filling level glass (3)
- Place the filling screw (2) onto the pump housing and tighten.

The operating instructions of the main JM oil lubricating pump unit with auxiliary oil tank are to be consulted for the filling process for JM oil lubricating pump units with auxiliary oil tank.

Here, too, the containers are connected inside with one another pressure-tight.

The maximum inlet pressure of 1 bar must not be exceeded at this time.

## 6.7 Lubrication line

|  |
|--|
|  <b>CAUTION</b>   |
|  <p><b>Risk of slipping</b><br/>Exercise caution when handling lubricants; immediately bind/remove any leaked lubricants.</p> |



Connect the lubricant lines in such a way that no forces are transferred to the product (stress-free connection).

All components of the centralized lubrication system must be designed for:

- The maximum pressure that occurs
- The permissible temperature range
- The delivery rate and the lubricant to be fed

Observe the following installation instructions for safe and trouble-free operation:


- The flow of lubricant should not be impeded by the incorporation of sharp bends, angle valves, flap valves, seals protruding inward, or changes in cross-section. Unavoidable changes in the cross-section in lubrication piping must have smooth transitions.
- Use only grounded steel pipes.

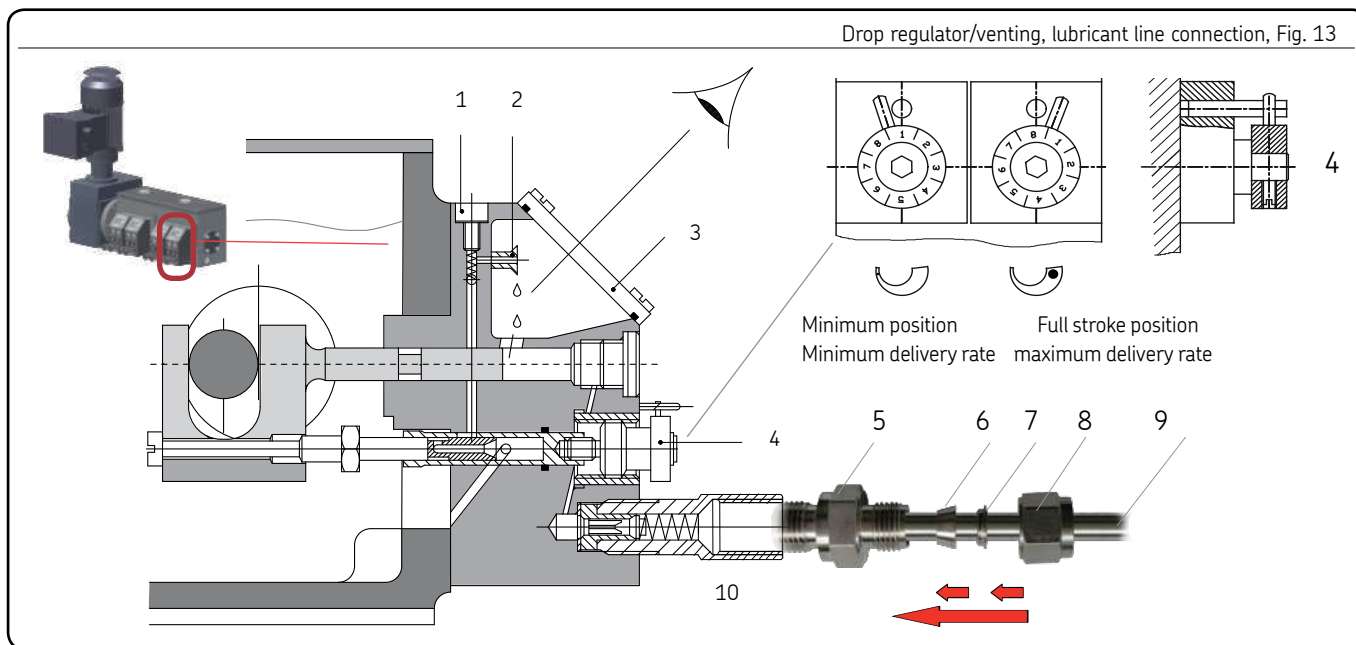
## 6.8 Connecting a lubrication line

See Figure 13

Cutting-sleeve screw unions with double cutting sleeves are typically used for installation of the lubrication lines.



- Remove the union nut (8) with cutting sleeve (6/7) from its cutting-sleeve screw union (5).
- Screw the cutting-sleeve screw union (5) into the pump element (10).
- Insert the customer-provided lubrication line (9) into the union nut (8) and the cutting sleeves (6/7).
- Apply the lubrication line (9) to the cutting-sleeve screw union (5).
- Tighten the union nut (8) gently by hand.
- Align the lubrication line (9).

- Tighten the union nut (8) with the appropriate torque.  See specifications from the screw union manufacturer



## 6.9 Venting of pump elements

See Figure 13

|  |
|--|
|  <b>WARNING</b>   |
| <div style="display: flex; align-items: center;">  <div> <p><b>Explosion hazard</b></p> <p>The lubricant's ignition temperature has to be at least 50 kelvin above the maximum permissible surface temperature. .</p> </div> </div> |

### Requirements:

- Vent plugs must be closed prior to the filling process.
- Pump housings are filled to approx. 2/3 or 3/4 full with appropriate oil.
- The installation processes in accordance with Chapters 6.3 to 6.6 must have been performed and successfully completed.

- The JM oil lubrication pump unit is delivered with all its setting screws set for full stroke to facilitate venting of the pump.
- Then check whether bubble-free oil emerges at the pump body outlet ports when the pump is switched on. If this is not the case, the pump will have to be vented.

### For rotary drive:


- Connection of the pump shaft on the drive side for electric motor drive - Connect lines in accordance with the technical specifications and the local electrical operating conditions and regulations.

After a few minutes (depending on the piston diameter and drive speed), bubble-free oil must emerge at the pump outlet ports. If this is not the case, the pump body affected has to be vented as described in the following.

### Venting procedure:

See Figure 13

- If necessary, open the filling connector (design with/without oil filter) on the pump housing and fill with appropriate oil to approx. 2/3 or 3/4 full.
- Close the filling connector.
- Switch on the JM oil lubrication pump

 Initiate the venting procedure only after pressure has been built up.

- Insert a hexagon socket screw key (WAF 4) into the vent plug (1) (via drop nozzle (2)). Loosen the vent plug (1) 3 to 4 turns (counter-clockwise).
- Turn setting screw (4) to position "8" full stroke (-see Figure 13).
- Switch on the drive.

- Let the pump run until bubble-free oil emerges at the pump outlet ports.

☞ The venting procedure can take several hours depending on the gear ratio, motor speed, and the viscosity of the oil.

- Tighten the vent plug (1).
- Set the setting screw (4) to the specified delivery value- see Chapter 6.9.
- Connect delivery lines to pump body outlet ports.

## 6.10 Setting the delivery rate

☞ See Figure 13

The delivery rate at the pump outlet ports can be adjusted using the setting screw. The engraved figures are for guidance. See Chapter 6.10 for precise adjustment of the delivery rate.

- Set the setting screw (4) to the appropriate value  
 "1" = minimum delivery rate  
 "8" = maximum delivery rate

## 6.11 Determining the delivery rate

See Figure 13

The delivery rate can be easily determined and/or set as follows:



- Loosen and remove the sight glass (3) (in front of the drop nozzle (2)).

- Measure the delivery rate per time at the drop nozzle (2) using a calibrated glass gauge.
- Increase or decrease the delivery rate by turning the setting screw (4).
- Repeat the procedure until the desired delivery rate is reached;  
 setting 1 = Minimum quantity
- Mount and fasten the sight glass (3).

Since each outlet is supplied separately, the set delivery rate remains constant and independent of the rate set for neighboring setting screws.



## 7. First start-up

|  | WARNING   |
|---|---|
|  | <p><b>Heating due to dry running of the pump resulting from absence of lubricant, non-available or defective or non-evaluated fill level monitoring or when putting into operation without pre-filling.</b></p> <p>The customer is responsible for attaching a fill level monitoring which displays at least the minimum level. This is at the height of the working piston.</p> <p>If this is not possible at the customer site, then organizational measures are required to prevent the level from falling below the minimum.</p> <p>Putting into operation is permitted only when the oil filling is above the minimum level (at the height of the working piston).</p> |

### 7.1 Checking the functionality of the customer-side fill level control

An electrical fill level control is to be used to check the reservoir fill level at the customer side. At a minimum, this must display the minimum fill level that is located at the height of the working piston.

If this is not possible at the customer site, then organizational measures are required to prevent the level from falling below the minimum.

- Check the functionality of the customer-side fill level control (minimum fill level at the height of the working piston).

To ensure safety and functionality, the person specified by the operator is required to perform the following inspections. Any detected deficiencies must be remedied prior to initial commissioning. The correction of deficiencies must be done exclusively by a specialist competent and authorized to do so.

## 7.2 Inspections before first start-up

| JM pump/JM pump units  | YES                      | NO                       |
|--|--------------------------|--------------------------|
| Electrical connection established correctly  | <input type="checkbox"/> | <input type="checkbox"/> |
| Mechanical connection established correctly  | <input type="checkbox"/> | <input type="checkbox"/> |
| The performance characteristics for the aforementioned connections match the specifications in "Technical data." | <input type="checkbox"/> | <input type="checkbox"/> |
| All components on the JM oil lubrication pump, such as lubrication lines, are correctly installed                | <input type="checkbox"/> | <input type="checkbox"/> |
| No apparent damage, contamination, or corrosion  | <input type="checkbox"/> | <input type="checkbox"/> |
| Any dismantled protective and monitoring equipment (of the main machine) is fully reinstalled and functional     | <input type="checkbox"/> | <input type="checkbox"/> |
| Equipotential bonding fully present, properly connected, and electrically continuous                             | <input type="checkbox"/> | <input type="checkbox"/> |
| No accumulated dust present  | <input type="checkbox"/> | <input type="checkbox"/> |

## 7.3 Inspections during initial commissioning

|  |                          |                          |
|--|--------------------------|--------------------------|
| No unusual noises, vibrations, moisture accumulation, odors present                        | <input type="checkbox"/> | <input type="checkbox"/> |
| No undesired discharge of lubricant at connections   | <input type="checkbox"/> | <input type="checkbox"/> |
| Lubricant is fed without bubbles   | <input type="checkbox"/> | <input type="checkbox"/> |
| The bearings/friction points requiring lubrication receive the planned amount of lubricant | <input type="checkbox"/> | <input type="checkbox"/> |

## 8. Operation

### 8.1 General

JM pump units operate largely automatically.

Note the following:

- Lubricant feeding must be free of contamination and air pockets.
- The fill level of the pump housing must be monitored.
- Only NBR-compatible lubricants may be used.
- The use of synthetic oils requires prior approval from SKF Lubrication Systems.

Activities required during operation are limited to inspection of the fill level, timely refilling of lubricant, and cleaning the exterior of the product if contaminated.

#### 8.1.1 Activating the pump

Activate the pump by:

- Switching on the machine contact
- Using the customer's control unit

#### 8.2 Refilling lubricant

See Figures 1 to 3

- Keep surfaces around the filling area clean
- Only refill using clean lubricant

#### 8.3 Temporary shutdown

The described product can be temporarily shut down by disconnecting the electrical and hydraulic supply connections. The safety instructions in these operating instructions must be observed when doing so.

- Empty the lubricant reservoir
- Clean any contamination from the JM pump unit

If the product is to be shut down for an extended period of time, follow the instructions in Chapter 5, "Delivery, returns, storage." To recommission the product, follow the instructions in chapters "Assembly" and "Recommissioning."

#### 8.4 Recommissioning

See Figure 13

☞ The following is to be performed on all pump bodies!

- Mark the current position of the setting screw (4) with a marker.
- Turn the setting screw (4) to maximum delivery rate, position “8.”
- Insert a hexagon socket screw key (WAF 4) into the vent plug (1) (via drop nozzle (2)).
- Loosen the vent plug (1) counter-clockwise by 3 to 4 turns.
- **Let the pump run until bubble-free oil emerges at the pump outlet ports.**
- Tighten the vent plug (1) using a hexagon socket screw key (WAF 4).

- Turn the setting screw (4) back to the previous feed value (see marking).

#### 8.4.1 Permanent shutdown

If the product will be permanently shut down, the local regulations and laws regarding the disposal of contaminated equipment must be observed. Lubricants can contaminate soil and waterways.

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

#### 8.4.2 Disposal

Dispose of or recycle electrical components in accordance with WEEE Directive 2002/96/EC.





Plastic or metallic parts can be disposed of as industrial waste.



#### IMPORTANT NOTE

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

## 9. Cleaning

|   |
|---|
|  <b>WARNING</b>  |
|  <p><b>Electric shock</b><br/>         Cleaning work may only be performed on products that have been de-energized and depressurized. Do not touch cables or electrical components with wet or moist hands.<br/>         Cleaning, required personal protective gear, cleaning agents, and equipment are in accordance with the current operating rules of the operator.</p> |

### 9.1 Cleaning agents

Only cleaning agents compatible with the materials can be used for cleaning.



Soaps or alkaline cleaning agents cannot be used.



Thoroughly remove residue of cleaning agents on the product and rinse with clear water.

### 9.2 Exterior cleaning

- Mark and secure wet areas.
- Unauthorized persons must be kept away.
- Thoroughly clean all external surfaces with a moist cloth only.



The reservoir must be kept closed during cleaning.

### 9.3 Interior cleaning

The interior normally does not need to be cleaned.

The interior of the product must be cleaned if incorrect or contaminated lubricant is accidentally filled.

Please contact SKF Customer Service.

## 10. Maintenance

Careful and regular maintenance is required in order to detect and remedy possibly malfunctions in time.

The specific intervals must always be determined by the operator according to the operating conditions and the local conditions and regularly reviewed and adapted where necessary.

Products from SKF Lubrication Systems are low-maintenance. However, all connections and fittings must be regularly inspected for proper seating to ensure proper function and to prevent hazards from arising.

Do not allow any cleaning agent to enter the interior of the product during maintenance. It is not necessary to clean the interior of the product if it is operated normally and inter-compatible lubricants are used. **Rinsing with the applied oil once a year is recommended.**



### IMPORTANT NOTE

Dismantling of the product or individual parts thereof within the statutory warranty period is prohibited and voids any claims.

### IMPORTANT NOTE

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

SKF Lubrication Systems shall not be responsible for any damages resulting from improper assembly, maintenance, and repair of the product.

|   |  |
|---|--|
|   |  <b>WARNING</b>   |
|  | <b>Electric shock</b><br>Performing work on products that have not been de-energized may result in serious injury or death. Assembly, maintenance, and repair work may only be performed on products that have been de-energized by qualified technical personnel. The supply voltage must be switched off before opening any of the product's components. |

## 10.1 General

**Note.**

The following maintenance intervals only apply to the JM oil lubrication pump. They do not apply to the lubricant to be delivered in the JM oil reservoirs. The oil levels of these is to be checked and replenished depending on consumption (setting of the metered quantity).

The oil level is to be checked after every 3000 operating hours for JM oil lubrication pumps with gear trains (gearbox). The gear train has to be filled with gear oil up to the threading of the plug screw. The inspection/maintenance of the gearbox is to be carried out in accordance with the enclosed operating instructions of the gearbox manufacturer.

## 10.2 Pump unit maintenance schedule

## JM pump unit maintenance schedule, 1 of 2

| Item                 | Operating hours [oh]  | Inspection  | Change  |
|----------------------|---|---|---|
| Oil lubrication pump | Semi-annually   |   | Rinsing with the applied oil                                    |
|                      | 1000  | Visual inspection   |   |
| Gear train (Gear)    | 3000,<br>At least once every six months   | Oil and oil level control<br>Visual inspection of the seals for leakage | Top up if necessary<br>Replace if necessary                     |
|                      | 20000, for oil bath continuous temperature (gearbox) up to 70°C<br>15000, for oil bath continuous temperature of 71 to 80°C<br>oil change no later than every 5 years |   | Oil change  |
|                      | Depending on operating conditions, no later than every 5 years  | Rolling bearing inspection  | If necessary, change rolling bearing grease, replace shaft seal |

**We recommend using:**

Fully synthetic gear oil of the lubricant type: CLP PG VG 320

**when used in the food sector**

Fully synthetic gear oil of the lubricant type: CLP H1 VG 320

Only synthetic oils of the above-mentioned lubricant classes are approved for use. Cannot be mixed with mineral oil-based oils.

## JM pump unit maintenance schedule, 2 of 2

| Mark the following with:  | YES or NO                |                          |
|---|--------------------------|--------------------------|
| Electrical connection established correctly   | <input type="checkbox"/> | <input type="checkbox"/> |
| Mechanical connection established correctly   | <input type="checkbox"/> | <input type="checkbox"/> |
| Hydraulic connection established correctly  | <input type="checkbox"/> | <input type="checkbox"/> |
| The performance characteristics for the aforementioned connections match the specifications in "Technical data" | <input type="checkbox"/> | <input type="checkbox"/> |
| Any dismantled protective and monitoring equipment is fully reinstalled and functional                          | <input type="checkbox"/> | <input type="checkbox"/> |
| All warning labels on the product are present and in proper condition   | <input type="checkbox"/> | <input type="checkbox"/> |
| No apparent damage, contamination, or corrosion   | <input type="checkbox"/> | <input type="checkbox"/> |
| No unusual noises, vibrations   | <input type="checkbox"/> | <input type="checkbox"/> |
| Protective earthing system fully present, properly connected, and electrically continuous                       | <input type="checkbox"/> | <input type="checkbox"/> |
| Varnishing is fully present; no parts of the varnishing are missing   | <input type="checkbox"/> | <input type="checkbox"/> |
| No accumulated dust present   | <input type="checkbox"/> | <input type="checkbox"/> |



### 10.3 Breather filter (installation recommended by SKF)

Water may condense in overhead reservoirs in areas with elevated humidity and strong temperature fluctuations.

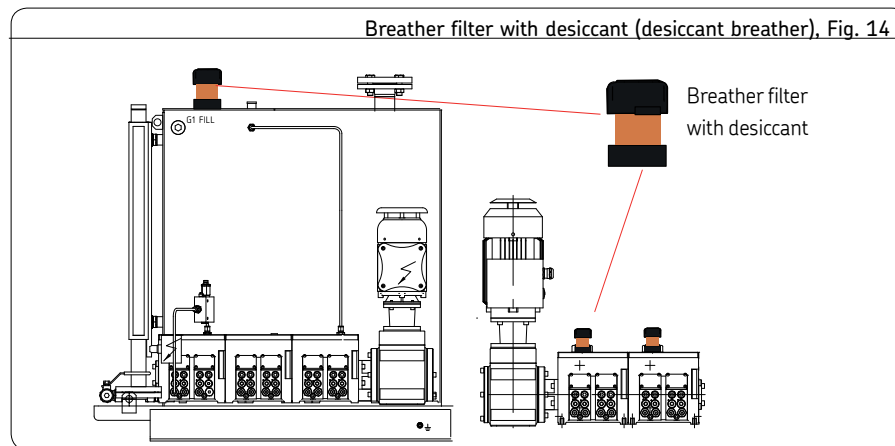
This can greatly reduce the operating viscosity of the lubricating oil. This would result in marginal lubrication on the internal parts under heavy load in the pump, which would increase wear on those parts.

Due to this situation, it is entirely possible that semi-annual rinsing of the JM pump unit (with venting of the free water) is not sufficient. In such cases, SKF Lubrication Systems recommends installing commercial venting filter elements with desiccant. These filters contain a granulate that prevents the formation of condensation water in the reservoir.

The color of the granulate in these filter elements changes according to the degree of water absorption. This provides a visual control method; replace the saturated filter elements if they are strongly discolored. The filter elements should be installed at the locations where the lubricating oil comes

into contact with the outside atmosphere. For overhead reservoirs or additional reservoirs, these filter elements can be screwed into the vent borehole using adapters. For pump units without additional reservoirs, they are screwed into the vent boreholes on the pump housings.

If you have questions, please contact SKF Service (see masthead).



#### 10.4 Electric motor maintenance schedule

Maintenance of the electric motor is performed in accordance with the motor operating instructions included in the scope of delivery for JM pump units.

Additionally, the following maintenance actions must be performed on the motor:

| First-time inspection  | After approximately 500 operating hours, no later than after one year  |
|--|--|
| Inspect the cooling air passages of the motor for contamination. Air inlets and outlets on the motor fan cowl must be checked for cleanliness in a regular inspection. | <p>- See the enclosed operating instructions from the motor manufacturer. If you discover non-approved deviations at the time of the inspection, eliminate them immediately.</p>   |
| The electrical characteristics are met.  |  |
| The approved temperatures at the bearings are not exceeded.  |  |
| The running smoothness and operating noise of the machine have not worsened.   |  |
| Major maintenance  | Approx. 16,000 operating hours, no later than after two years  |
| The electrical characteristics are met.  | <p>- <b>The maintenance is to be carried out in accordance with the enclosed operating instructions of the motor manufacturer!</b></p> <p>If you discover non-approved deviations at the time of the inspection, eliminate them immediately.</p> |
| The approved temperatures at the bearings are not exceeded.  |  |
| The running smoothness and operating noise of the machine have not worsened.   |  |
| All fastening screws for mechanical and electrical connections are securely tightened.   |  |
| All potential connections, grounding connections and shield supports have correct seating and are properly contacted.  |  |
| The insulation resistances of the windings are sufficiently large.   |  |
| If present, bearing insulation is implemented in accordance with the labels.   |  |
| Lines and insulating parts are in proper condition and are not discolored.   |  |

## 11. Malfunctions, causes, and remedies

### IMPORTANT NOTE

In cases of functional failure, always make sure that all technical specifications have been complied with in the existing operating conditions.

### Malfunctions table

| Malfunction  | Possible cause / Detectable   | Remedy   |
|--|---|--|
| Air inclusion in the lubricant or the lubrication system | <ul style="list-style-type: none"> <li>○ Loosen the inlet screw union. Visually inspect for bubbles in the lubricant.</li> <li>○ Loosen the outlet screw union. Visually inspect for bubbles in the lubricant.</li> </ul> | <ul style="list-style-type: none"> <li>• Vent the lubrication system if necessary. Follow the instructions for the upstream pump.</li> <li>• Vent the lubrication system. Trigger interim lubrication, repeatedly if necessary.</li> </ul> |





Please contact our Customer Service if you cannot determine or resolve the error.

Malfunctions table

| Malfunction           | Possible cause / Detectable  | Remedy  |
|-----------------------|--|---|
| No delivery           | <ul style="list-style-type: none"> <li>○ Pump not vented</li> <li>○ Motor stopped</li> <li>○ Piston gummed</li> </ul>  | <ul style="list-style-type: none"> <li>• Vent the pump element - see 6.8</li> <li>• Check power supply on the motor.</li> <li>• Have the pump element cleaned or replaced (only by SKF employees or trained ATEX personnel).</li> </ul> |
| Delivery rate too low | <ul style="list-style-type: none"> <li>○ Pump not vented</li> <li>○ Setting screw (Fig. 13) set incorrectly</li> </ul> | <ul style="list-style-type: none"> <li>• Vent the pump element - see 6.8</li> <li>• Set the delivery rate - see 6.9</li> </ul>  |
| Pump noises           | <ul style="list-style-type: none"> <li>○ Pump shaft not aligned</li> </ul>   | <ul style="list-style-type: none"> <li>• Check flatness of the seating</li> <li>• Check reservoir alignment</li> </ul>  |

Please contact our Customer Service if you cannot determine or resolve the error.



## 12. Repairs

|  |
|--|
|  <b>WARNING</b>   |
|  <b>Risk of injury</b><br>At a minimum, the following safety measures must be taken before any repairs:   |
|  <ul style="list-style-type: none"> <li>○ Unauthorized persons must be kept away.</li> </ul>  |
|  <ul style="list-style-type: none"> <li>○ Mark and secure the work area.</li> <li>○ Depressurize the product.</li> <li>○ Unlock the product and prevent it from being restarted.</li> <li>○ Check to ensure the absence of voltage</li> <li>○ Ground and short-circuit the product</li> <li>○ Cover any live parts in the surrounding area</li> </ul> |

### 12.1 Replacement of a pump body assy.

☞ See Figures 15 to 17

#### 12.1.1 Removal of a pump body assy.

|   |
|---|
|  <b>WARNING</b>  |
|  <b>Burn injury hazard</b><br>Allow the lubricant to cool down to room temperature before commencing the repair tasks. |

- Close the oil feed to the pump in the event of an external oil reservoir
- Place the customer-side oil pan (1) under the pump housing
- Thoroughly clean the surrounding area and the pump housing of the JM oil lubricating pump unit
- Loosen and remove the oil drain plug (2) (hexagon socket WAF 10).

- Loosen and remove the lubrication piping (3)

- Loosen and remove hexagon socket screws (6) (WAF 6) (4x) on the housing cover (4) of the pump body assy. to be replaced (5)

- Carefully lift the housing cover (4) and set it down on a clean surface

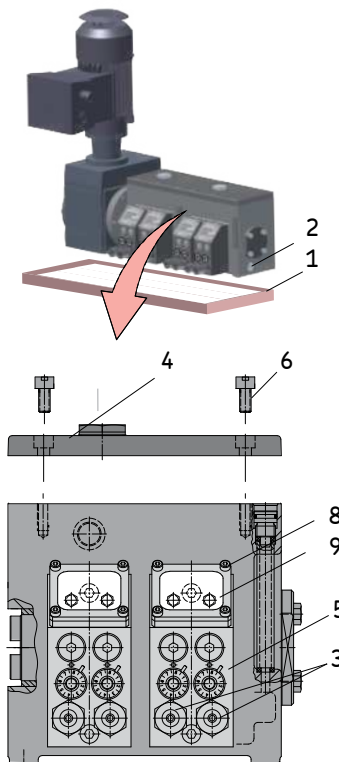
☞ In order to ensure a smooth disassembly of the old pump body, the eccentric shaft of the pump body assy. (5) must be rotated afterwards until the eccentric of the pump element to be replaced faces upwards. The drive/motor is to be switched on briefly in cyclic operation for this purpose.

**WARNING****Risk of injury**

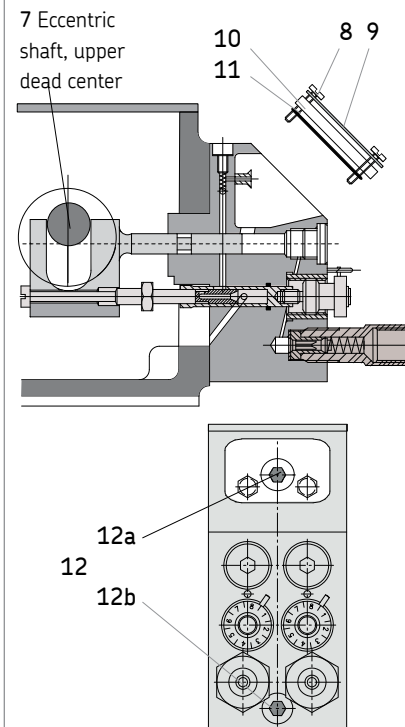
Do not reach into the open container housing during the following brief cyclic operation.

- Switch on the power supply briefly
- Cycle the drive/motor in short cyclic frequencies until the eccentric (7) of the pump body to be replaced has reached its upper dead center
- Switch off the power supply
- Loosen cylinder screws (8) (WAF 3, 4x) on the pump body to be replaced (5)
- Carefully loosen cylinder screws (8) with cover plate (9), sight glass (10), and packing ring (11) from the pump body (5) and set them down on a clean surface

Overview, Fig. 15



Overview, Fig. 16



- Loosen and remove cylinder screws (12 (12a and 12b)) (WAF 6, 2x)

☞ During the subsequent disassembly of the pump body, care must be taken to ensure that its piston (13) does not fall out of the pump body (5).

☞ See Figure 17

- Carefully tilt the pump body assy. (5) upwards until the piston catch (14) of the piston (13) is located underneath the eccentric (15)
- Remove the pump body assy. (5)

### 12.1.2 Mounting a new pump body

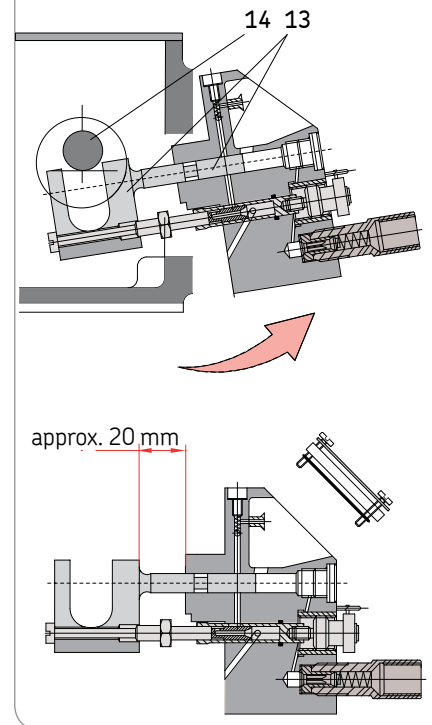
- If necessary, loosen cylinder screws (8) (WAF 3, 4x) on the new pump body (5)
- Carefully loosen cylinder screws (8) with cover plate (9), sight glass (10), and packing ring (11) from the new pump body (5) and set them down on a clean surface



Piston and pump body are matched with one another (lapped). The pistons are therefore not permitted to be pulled out of the pump body.

- Set the clearance between the piston catch (14) and the pump body (5) to approx. 20 mm, the piston (13) is to be shifted for this purpose
- Check the old pump body housing seal, replacing it if necessary (seal no. 44-0406-2015)

Overview, Fig. 17



- Insert the new pump body (5) downward at an angle into the pump housing, while carefully inserting the piston catch (14) from below into the eccentric (15)
- Insert the top cylinder screw (12a) into the top housing bore of the pump body and tighten it slightly
- Align the seal once again if needed
- Insert the bottom cylinder screw (12b) into the bottom housing bore of the pump body and tighten it slightly as well
- Once again, inspect the piston catch (14) for correct seating to the eccentric (15)
- Tighten the two screws (2x) by turns with a torque of 20 Nm.
- Place the packing ring (11), sight glass (10), cover plate (9) and cylinder screws (8) on the pump body (5)
- Tighten the cylinder screws (8) (4x) crosswise with a torque of  $2^{+1}$  Nm .
- Inspect the seal of the old oil drain plug, replacing it if necessary (screw with seal 466-413-001)
- Place the oil drain plug (2) (hexagon socket, WAF 10) on the pump housing and tighten with a torque of 20 Nm
- Fill the pump housing up to the upper edge of the eccentricshaft with corresponding oil



**WARNING**



#### Risk of injury

Do not reach into the open container housing during the following brief cyclic operation.

- Switch on the power supply briefly
- Cycle the drive/motor with short cyclic frequencies, checking the correct functionality between eccentric (7) and piston catch (14) while doing so (test run)
- Switch off the power supply
- Check the old pump body housing seal, replacing it if necessary (seal no. 44-0406-2087)
- Place the housing cover (4) on the pump housing



- Place hexagon socket screws (6) (WAF 6) (4x) on the housing cover and tighten them crosswise with a torque of 20 Nm
- Place the lubricant feed line(s) (3) onto the pump housing and tighten them
- Fill the oil up to the permitted maximum
- Open the oil feed to the pump in the event of an external oil reservoir
- Remove the customer-side oil pan (1)

☞ The delivery rate setting of the new pump body is customized at the factory. SKF nevertheless recommends a test measurement in accordance with Chapter 6.9/ Chapter 6.10.

- Perform test measurement in accordance with Chapter 6.9 and Chapter 6.10
- Ensure equipotential bonding

## 13. Accessories

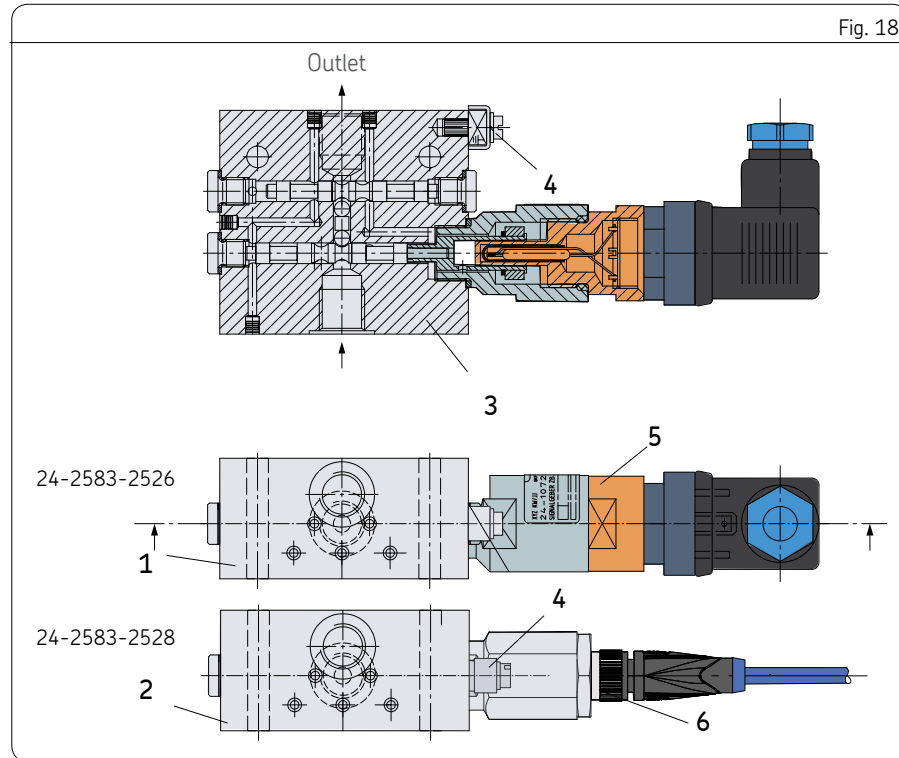
### 13.1 Pulse generator

For electric control of the delivery rate.

#### Note!

You can download detailed assembly instructions for the pulse generators from the SKF.com website with document number: 951-180-087-DE.

| Item | Description                                   |
|------|---|
| 1    | Pulse generator 24-2583-2526                  |
| 2    | Pulse generator 24-2583-2528                  |
| 3    | Housing with change-over piston               |
| 4    | Ground terminal                               |
| 5    | Electrical generator unit with plug connector |
| 6    | Electrical generator unit with power lead     |



## General characteristics of pulse generators

|                                |   |
|--------------------------------|---|
| Mounting position              | Any   |
| Ambient temperature range      | -20 to + 40°C   |
| Lubricant temperature range    | -15 to +70 °C   |
| Weight                         | 1,1 kg  |
| Ground terminal <sup>1)</sup>  | 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 <sup>2</sup> /s   |
| Worked penetration             | > 260 1/10 mm   |
| Volumetric flow range          | 0,1 to 50 cm <sup>3</sup> /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.



**A customer-supplied circuit breaker must be installed at the factory.**

## Pulse generator 24-2583-2526

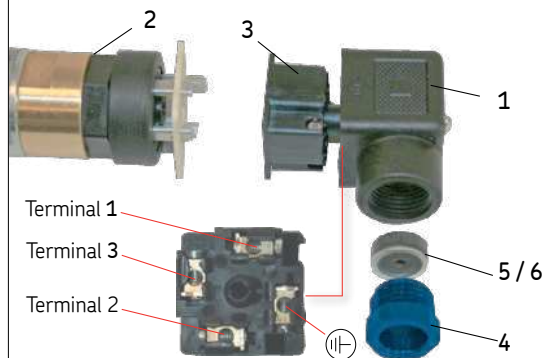
|  |                          |
|--|--------------------------|
| General  |                          |
| Hydraulic  |                          |
| Operating pressure                                   | 4 to 600 bar             |
| Volume/pulse <sup>2)</sup>                           | 0,58 cm <sup>3</sup>     |
| Electrical system                                    |                          |
| Contact type   | Reed contact             |
| max. Voltage U <sub>i</sub>                          | 30 V DC                  |
| max. Current I <sub>i</sub>                          | 100 mA                   |
| Capacitance C <sub>i</sub>                           | 1 nF                     |
| Inductance L <sub>i</sub>                            | 5μH                      |
| max. power P <sub>i</sub>                            | 1W                       |
| Connection type                                      | DIN 43650-A plug         |
| Plugs  | 3 +PE                    |
| Conductor cross-section cable to be connected (max.) | 2 x 0,75 mm <sup>2</sup> |

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

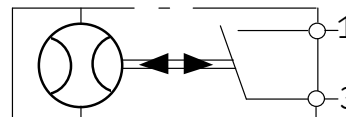
## Pulse generator 24-2583-2528

| Protection class pulse generator 24-2583-2528                                     | Protection class Sensor   |   |
|---|---|---|
| CE 2G IIC T6 Gb   | CE II 2G Ex ia IIC T6...T1 Gb                                   |   |
| CE 1D IIIC T135°C Da<br>-20 ... +70°C   | CE II 1D Ex ia IIIC T135° Da<br>-25 ... 85°C (-13 ... 185°F) 5) |   |
| <b>Technical data sensor</b>  |   |   |
| Operating pressure  | 4 bis 350 bar   |   |
| Volume/pulse 3)   | 0,64 cm <sup>3</sup>  | 3) A pulse comprises the opening or closing of the reed contact..   |
| <b>Electrical system sensor</b>   |   |   |
| Switching element function  | NAMUR NC contact  | 4) A cable length of 10 m is taken into account.  |
| Nominal distance S <sub>n</sub>   | 1,5 mm, flush mountable   |   |
| Assured operating distance S <sub>a</sub>   | 0 to 1,22 mm  | 5) Refer to the EC type examination certificate of the sensor for the relationship between the type of connected electrical circuit, the maximum admissible ambient temperature, the surface temperature and the effective internal reactances. |
| Rated voltage U <sub>o</sub>  | 8,2 V DC  | The registration number of the EC type examination certificate is indicated on the sensor's type plate. (For the positioning of the type plate see fig. 1).   |
| max. Voltage U <sub>i</sub>   | 16 V DC   |   |
| max. Current I <sub>i</sub>   | 25 mA   |   |
| max. Power P <sub>i</sub>   | 64 mW   |   |
| Power consumption<br>- Measuring plate not detected<br>- Measuring plate detected | ≥ 3 mA<br>≤ 1 mA  |   |
| Capacitance C <sub>i</sub>  | 50 nF 4)  |   |
| Inductance L <sub>i</sub>   | 60 μH 4)  |   |
| Power lead  | PVC, 15 m, 2 x 0,34 mm <sup>2</sup>                             |   |
| max. Ambient temperature range T <sub>amb</sub>                                   | see Note 5)   |   |

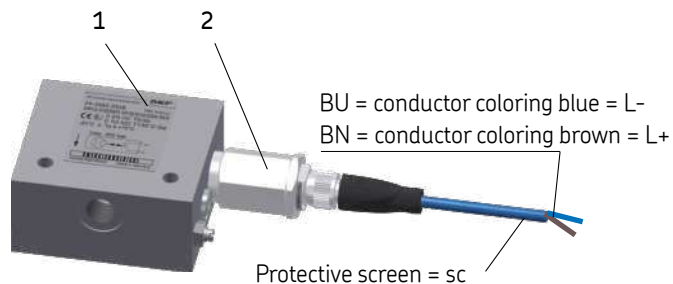
Electrical connection of pulse generator 24-2583-2526, Fig. 19



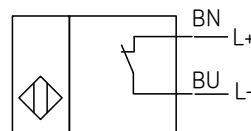
Signal position:



Electrical connection of pulse generator 24-2583-2528, Fig. 20



Signal position:



NC  
connection only via NAMUR  
switching amplifier

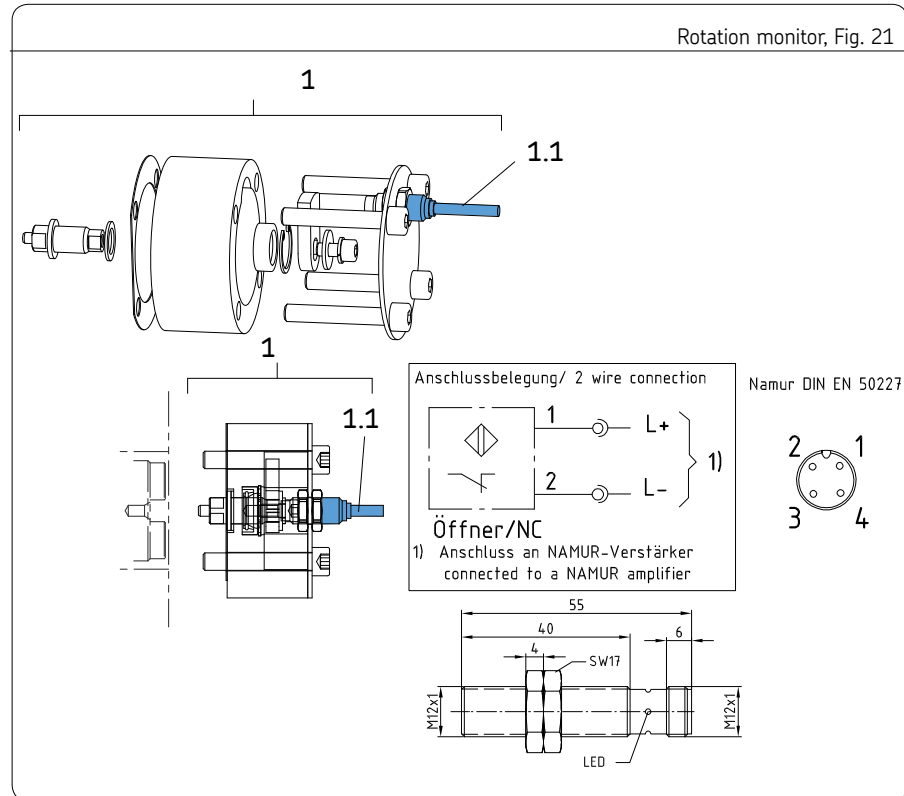
## 13.2 Rotation monitor JM-M12

For electric monitoring of the pump drive.

| Item | Description  |
|------|--|
| 1    | Rotation monitor JM-M12, complete<br>1 revolution = 1 pulse<br>(order number 24-1884-2594) |

### Spare part:

|   |   |       |  |
|---|---|-------|--|
| 1.1 Proximity switch  |   |       |  |
| NAMUR-NCB4-12GM40<br>(order number 24-1884-2593)                                      |   |       |  |
| Only for connection to an intrinsically safe circuit with permissible maximum values: |   |       |  |
| $U_i$   | = | 16 V  |  |
| $I_i$   | = | 25 mA |  |
| $P_i$   | = | 34 mW |  |



## 14. Spare parts

The spare parts groups are used exclusively as replacement for defective parts identical in construction. No modifications to existing products using the spare parts are permitted.

### 14.1 Inspected pump elements, complete with test certificate

| Delivery rate per piston stroke [cm <sup>3</sup> /stroke] | Number of outlets | Quantity | Item number  |
|---|-------------------|----------|--------------|
| 0.1   | 2-port            | 1        | 24-1557-3470 |
|   | 1-port left       |          | 24-1557-3471 |
|   | 1-port right      |          | 24-1557-3472 |
| 0.2   | 2-port            |          | 24-1557-3473 |
|   | 1-port left       |          | 24-1557-3474 |
|   | 1-port right      |          | 24-1557-3475 |
| 0.07  | 2-port            |          | 24-1557-3476 |
|   | 1-port right      |          | 24-1557-3477 |
|   | 1-port left       |          | 24-1557-3478 |

### 14.2 Sight glass with seal from pump element

| Sight glass with seal | Quantity | Item number  |
|-----------------------|----------|--------------|
| Sight glass           | 1        | 44-0758-2040 |
| Sight glass seal      |          | 96-9160-0062 |

Fig. 22

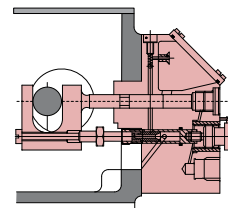
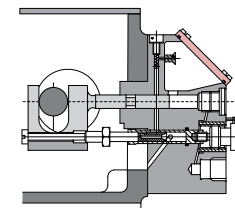
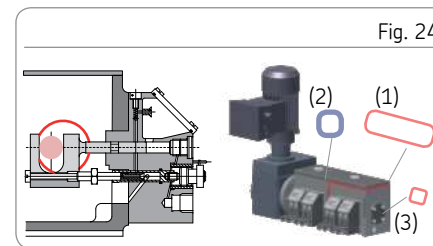


Fig. 23



### 14.3 Seals / eccentric shaft

| Seals           | Item | Quantity | Item number  |
|-----------------|------|----------|--------------|
| Cover seal      | (1)  | 1        | 44-0406-2087 |
| Housing seal    | (2)  |          | 44-0406-2088 |
| Housing seal    | (3)  |          | 44-0404-2089 |
| Eccentric shaft |      | Quantity | Item number  |
| Eccentric shaft |      | 1        | 44-2253-2006 |



### 14.4 Hydraulic screw union

| Outlet screw union with double cutting sleeve |  | Quantity | Item number  |
|---|--|----------|--------------|
| Ø6 mm   |  | 1        | 24-2105-2700 |
| Ø8 mm   |  |          | 24-2105-2702 |
| Ø 6.35 mm (1/4")                              |  |          | 24-2105-2703 |



### 14.5 Coupling

| Coupling                       |  | Quantity | Item number  |
|--------------------------------|--|----------|--------------|
| for gearbox with flange 71C105 |  | 1        | 44-2392-3530 |
| for gearbox with flange 80C120 |  |          | 44-2392-3531 |
| for gearbox with flange 80A200 |  |          | 44-2392-2595 |





## 14.6 Gear

| Gear reduction ratio<br>for motor type IM V18, flange 80C120 |                        | Quantity | Order No.    |
|--|------------------------|----------|--------------|
| 35.1:1   |                        | 1        | 24-0701-3490 |
| 62.8:1   |                        |          | 24-0701-3491 |
| 62.8:1   | Drive position central |          | 24-0701-3512 |
| 83.2:1   |                        |          | 24-0701-3491 |
| 100.9:1  |                        |          | 24-0701-3517 |
| 100.9:1  | Drive position central |          | 24-0701-3548 |

| Gear reduction ratio<br>for motor type IM V1, flange 80A200 |  | Quantity | Order No.    |
|---|--|----------|--------------|
| 35.1:1  |  | 1        | 24-0701-3552 |
| 62.8:1  |  |          | 24-0701-3554 |
| 83.2:1  |  |          | 24-0701-3522 |
| 100.9:1   |  |          | 24-0701-3544 |

| Gear reduction ratio<br>for motor type IM V18, flange 71C105 |                        | Quantity | Order No.    |
|--|------------------------|----------|--------------|
| 35.1:1   |                        | 1        | 24-0701-3555 |
| 62.8:1   |                        |          | 24-0701-3527 |
| 83.2:1   |                        |          | 24-0701-3492 |
| 100.9:1  |                        |          | 24-0701-3493 |
| 100.9:1  | Drive position central |          | 24-0701-3549 |



## 14.7 Motor



| Voltage [V] | Frequency [Hz] | Speed [RPM] | Code number (Order No.) |
|-------------|----------------|-------------|-------------------------|
| (220)/380   | 50             | 1000        | DX                      |
| (230)/400   |                |             | AG                      |
| (240)/415   |                |             | DY                      |
| (255)/440   |                |             | EN                      |
| (290)/500   |                |             | AL                      |
| (220)/380   |                | 1500        | DP                      |
| (230)/400   |                |             | AF                      |
| (240)/415   |                |             | DZ                      |
| (255)/440   |                |             | AV                      |
| (290)/500   |                |             | AK                      |
| (220)/380   | 60             | 1200        | EA                      |
| (230)/400   |                |             | BR                      |
| (255)/440   |                |             | AT                      |
| (265)/460   |                |             | AX                      |
| (275)/480   |                |             | BC                      |
| (220)/380   |                | 1800        | DS                      |
| (230)/400   |                |             | CH                      |
| (255)/440   |                |             | AS                      |
| (265)/460   |                |             | CM                      |
| (275)/480   |                |             | BA                      |



Customer-specific motors and other voltages available on request.

# 15. Appendix

## 15.1 EU Declaration of Conformity for Siemens LOHER CHEMSTAR asynchronous motor type 1PS5

|   |  |                                  |                      |                               |                      |
|---|--|----------------------------------|----------------------|-------------------------------|----------------------|
| <p style="text-align: center;"><b>SIEMENS</b></p> <p style="text-align: center;">(nach Anhang VIII der EG-Richtlinie 94/9/EG bzw. EU-Richtlinie 2014/34/EU)</p> <p style="text-align: center; font-size: small;">Nr. AGE355591/0A</p> | <p style="text-align: center;"><b>EG/EU-Konformitätserklärung</b></p> <p>Hersteller: Siemens Aktiengesellschaft<br/>         Division Process Industries and Drives, Large Drives, PD LD<br/>         Hans-Lober-Strasse 32<br/>         D-94099 Ruhstorf a. d. Rott</p> <p>Anschrift: D-94099 Ruhstorf a. d. Rott</p> <p>Produktbezeichnung: Drehstrom-Asynchronmaschinen<br/>         Zündschutzart Geräte-Staubexplosionsschutz durch Gehäuse „IC“<br/>         Typ: A . . . 071 . . . bis / to A . . . 800 . . .<br/>         E . . . 071 . . . bis / to E . . . 800 . . .<br/>         D . . . 071 . . . bis / to D . . . 910 . . .<br/>         Alternativen Typbezeichnung: bis / to 1PS 01 . . .<br/>         1MD 07 . . . bis / to 1MD 35 . . .<br/>         1AV 35 . . . bis / to 1AV 91 . . .<br/>         Gerätegruppe II<br/>         Gerätekategorie 3D</p> <p>Der oben beschriebene Gegenstand der Erklärung erfüllt die einschlägigen Harmonisierungsrechtsvorschriften der Union:</p> <p>bis 19.04.2016 EG-Richtlinie 94/9/EG;<br/>         Richtlinie des Europäischen Parlaments und des Rates vom 23. März 1994 zur Angleichung der Rechtsvorschriften der Mitgliedstaaten für Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen</p> <p>ab 20.04.2016 EU-Richtlinie 2014/34/EU;<br/>         Richtlinie des Europäischen Parlaments und des Rates vom 26. Februar 2014 zur Harmonisierung der Rechtsvorschriften der Mitgliedstaaten für Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen. Amtsblatt der EU L96, 29.03.2014, S. 309-356</p> <p><b>Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller.</b></p> <p><b>Wir bestätigen die Konformität des oben genannten Produktes mit den Normen:</b></p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">Referenznummer<br/>EN 60079-0+A11</td> <td style="width: 50%;">Ausgabedatum<br/>2013</td> </tr> <tr> <td>Referenznummer<br/>EN 60079-31</td> <td>Ausgabedatum<br/>2014</td> </tr> </table> <p>Das bezeichnete Produkt ist bestimmt zum Einbau in eine andere Maschine für den Einsatz in explosionsgefährdeten Bereichen der Zone 22 nach EN 60079-10-2 und Richtlinie 1999/92/EG.</p> <p>Siemens Aktiengesellschaft<br/>         Ruhstorf, den 08.04.2016</p> <div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="text-align: center;"> <br/>             Fritz Winkler<br/>             Werksleiter/Head of Manufacturing<br/>             Unterschrift/Signature         </div> <div style="text-align: center;"> <br/>             Dr. Harald Vogel<br/>             Produktverantwortlicher/ Product safety officer<br/>             Unterschrift/Signature         </div> </div> <p style="font-size: x-small; margin-top: 10px;">Diese Erklärung bescheinigt die Übereinstimmung mit den genannten Richtlinien, ist jedoch keine Bescheinigung über die Sicherheitsebene der mitgelieferten Produktdokumentation und zu beachten:<br/>         Siemens Aktiengesellschaft, Vorstand: Dr. Josef Kress, Vorsitzender: Roland Busch, Lutz Davis, Klaus Henning, Janna Kupel, Siegfried Rutenfranz, Ralf P. Thomas, Bär-Ar Geiselhart, Berlin und München, Deutschland; Regisierungsgericht: Stein Charité, URB 15300, München, HRB 16584, WEEE-Reg-Nr. DE 23991322</p> | Referenznummer<br>EN 60079-0+A11 | Ausgabedatum<br>2013 | Referenznummer<br>EN 60079-31 | Ausgabedatum<br>2014 |
| Referenznummer<br>EN 60079-0+A11  | Ausgabedatum<br>2013   |                                  |                      |                               |                      |
| Referenznummer<br>EN 60079-31   | Ausgabedatum<br>2014   |                                  |                      |                               |                      |
| <p style="text-align: center;"><b>SKF</b></p>   | <p style="text-align: center;">Konformitätserklärung Zone 21 oder 22</p> <p style="text-align: right;">Seite 1 von 13</p>  |                                  |                      |                               |                      |

LOHER CHEMSTAR 1PS4/1PS5  
Betriebsanleitung 08/2016

# SIEMENS

English / English

## EC/EU Declaration of Conformity (according to Annex VII of EC Directive 94/9/EC, 2014/34/EU)

Manufacturer:

Siemens Aktiengesellschaft  
Hans-Loher-SträÙe 32  
D-94099 Ruhstorf a. d. Rott

**The object of the declaration described above is in conformity with the relevant Union harmonization legislation:**

≤ 19.04.2016 94/9/EC;

Directive of the European Parliament and the Council on the approximation of the laws of the Member States concerning equipment and protective systems intended for use in potentially explosive atmospheres.

≥ 20.04.2016 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

**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 page 1 and annex

The product indicated is intended to be installed in another machine for use in hazardous areas of zone 1 in accordance with EN 60079-10-1 and Directive 1989/92/EC. Further information about the conformity to this Directive is given in the annex, which is an integral part of this declaration of conformity.

This declaration is an attestation of conformity with the indicated Directive(s) but does not imply any guarantee of quality or durability.

The safety instructions of the accompanying product documentation shall be observed.

**Tschechisch / český jazyk**

## ProhláÙení o shodě s předpisy ES/EU (podle dodatku VII směrnice EU 94/9/ES, 2014/34/EU)

Výrobce:

Siemens Aktiengesellschaft  
Hans-Loher-SträÙe 32  
D-94099 Ruhstorf a. d. Rott

**VýÙe uvedený výrobek se shoduje s předpisy následujících harmonizovaných předpisů Evropské unie:**

≤ 19.04.2016 94/9/ES;

směrnice Evropského parlamentu a Rady o sjednocení legislativy členských států EU týkající se přístrojů a ochranných systémů za účelem jejich správného používání v oblastech ohrožených explozí.

≥ 20.04.2016 2014/34/EU;

směrnice Evropského parlamentu a Rady ze dne 26. února 2014 o harmonizaci legislativy členských států EU týkající se zařízení a ochranných systémů za účelem jejich správného používání v oblastech ohrožených nebezpečím výbuchu. Oficiální tisk EU, L96 29.03.2014, str. 309-356.

**Všechnou odpovědnost za vstavení tohoto ProhláÙení o shodě nese výrobce produktu.**

**Potvrzujeme tímto, že se výÙe uvedený výrobek shoduje s normami:** viz stránka 1 a příloha

Uvedený výrobek je určen pro instalaci do jiných strojů pro použití v nebezpečných oblastech zóny 1 podle normy EN 60079-10-1 a směrnice 1989/92/EG. Další informace o shodě podle této směrnice jsou uvedeny v příloze, která je nedílnou součástí tohoto prohláÙení o shodě.

Toto prohláÙení potvrzuje shodu s uvedenými směrnici, neznamená však záruku jakosti nebo trvanlivosti.



Musí být dozorovány bezpečnostní pokyny uvedené v doprovodné dokumentaci tohoto produktu.

PD LD

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Seite 2 von 15

## 15.2 EU Declaration of Conformity for CARL REHFUSS gearbox

|   |   |  |  |   |
|---|---|--|--|---|
| <p><b>Carl Rehfuß GmbH + Co. KG Antriebstechnik</b></p> |  <p>Buchhällengasse 5<br/>42699 Solingen<br/>Tel.: +49 (0) 7432 / 70 15-0<br/>Fax: +49 (0) 7432 / 70 15-4<br/>E-Mail: <a href="mailto:info@carl-rehfuess.com">info@carl-rehfuess.com</a><br/>Url: <a href="http://www.carl-rehfuess.com">www.carl-rehfuess.com</a></p> | <p><b>EU-Konformitätserklärung</b><br/><b>EU Declaration of conformity</b></p> | <p><b>CARL REHFUSS GmbH + Co. KG</b></p> <p>erklärt in alleiniger Verantwortung, das die SR, FG, S, SM, SS, SSM-Getriebe für Gerätegruppe II der Kategorie 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</p> <p><b>ATEX – Richtlinie 2014/34/EU</b><br/><b>ATEX – Directive 2014/34/EU</b></p> <p>übereinstimmen to conform.</p> <p>EN 1127-1:2011<br/>EN 13463-1:2009<br/>EN 13463-5:2011<br/>EN 13463-8:2003<br/>EN 60529:2000</p> <p><b>Angewandte Norm:</b><br/><b>Applicable standard:</b></p> <p>Die technische Dokumentation für Getriebe der Kategorie 2 ist hinterlegt bei notifieder Stelle:<br/>The technical documentation for category 2 gearboxes is stored at the notified location:</p> <p><b>TÜV PRODUKT SERVICE GmbH, EU-Code 0123</b></p> | <p>Bevollmächtigter zur Ausstellung dieser Erklärung im Namen des Herstellers<br/>authorized representative for issuing this declaration on behalf of the manufacturer</p> <p>Ort und Datum der Ausstellung<br/>place and date of issuing</p> <p>Abtadt 20.04.2016</p> <p>Bevollmächtigter zur Zusammenstellung der technischen Unterlagen<br/>authorized representative for compiling the technical documents</p> <p></p> <p>Dipl. Ing. (FH) M. Fink<br/>Funktion: Bereichsteiler Technik<br/>Function: Technical Director</p> <p>Handelsregister: Stuttgart HRB 400233<br/>Personlich haftende Gesellschafter: Fritze, Verwandsky und<br/>Wolfsberg, Handelsregister: Stuttgart HRB 400230<br/>USt-ID-Nr.: DE 146844167 Steuer-Nr.: 53089/0987</p> <p>Geschäftsführer: Gerd Fritze, Dipl.-Wirt.-Ing. (FH) Michael Fritze, Dipl.-Wirt.-Ing. (FH) Tobias Fritze<br/>Wolfsberg, Abtadt (BLZ 633 90) 30130 602 009 - BIC Code: GENODE33<br/>IBAN: DE57 6509 0120 0006 0200 009<br/>Kontokorrent: Carl Rehfuß GmbH, Buchhällengasse 5, 42699 Solingen<br/>Commerzbank AG (BLZ 633 90) 031 387 234 800 - BIC Code: COMDE333<br/>IBAN: DE89 6508 0003 0003 07 2549 00</p> |
|---|---|--|--|---|

## 15.3 Inductive proximity switch 24-1884-2613

**EU-Declaration of conformity**  
*EU-Konformitätserklärung*

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No. / Nr.: DOC-1190  
Date / Datum: 2016.09.29

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www.pepper-fuchs.com

**ANNEK ATEX**  
Notified Body OM-System / Notifiziertes Stelle des OM-Systems  
Physikalisch Technische Bundesanstalt (0102)  
Bundesallee 100  
10557 Berlin  
Germany

**Marking and Certificates / Kennzeichnung und Zertifikate**

| Marking / Kennzeichnung | Certificate / Zertifikat | Issuer ID / Aussteller ID |
|-------------------------|--------------------------|---------------------------|
| 0111D<br>0112 G         | PTB Gg ATEX 2346 X       | 0102                      |

**Key for issuer ID / Schlüssel zur Aussteller ID**

| ID   | Issuer / Aussteller   |
|------|---|
| 0102 | Physikalisch Technische Bundesanstalt<br>Bundesallee 100<br>10557 Berlin<br>Germany |

**en/da**

**PEPPER+FUCHS**

**Declaration of conformity / Konformitätserklärung**  
We, Pepper+Fuchs GmbH, declare under our sole responsibility that the products listed below are in conformity with the listed European Directives and standards.  
Die Pepper+Fuchs GmbH erklärt hiermit in unserer alleinigen Verantwortung, dass die unten aufgeführten Produkte den genannten Europäischen Richtlinien und Normen entsprechen.

**Products / Produkte**

| Product / Produkt  | Item number / Stellung | Description / Beschreibung |
|--------------------|------------------------|----------------------------|
| N.1.5-18CM-N-C     | 105342                 | Inductive sensor           |
| N.1.5-18CM-N-C-12M | 105343                 | Inductive sensor           |
| N.1.5-18CM-N-C-V4  | 105344                 | Inductive sensor           |

**Directives and Standards / Richtlinien und Normen**

| EU-Directive / EU-Richtlinie  | Standards / Normen   |
|-------------------------------|--|
| ATEX 2014/34/EU (1993/68/EEC) | EN 60079-0:2012-11<br>EN 60079-1:2012-08<br>EN 60079-2:2012-01 |
| EMC 2014/53/EU (89/105/EEC)   | EN 60957-5:2012-11<br>EN 50667-9:2007-12                       |

**Affixed CE Marking / Angebrachte CE-Kennzeichnung**

**CE**  
0102

**Signatures / Unterschriften**  
Mannheim, 2016.09.29

*[Signature]*  
Dir. Dr. Tobias Dührer  
Global Product Manager

*[Signature]*  
Psa Wolfgang Helm  
Director, Business Unit Sensors

DOC-1190 / 2016-09-29

## 15.4 Associated supplier documentation

| Associated supplier documentation - standard design |   |                        |                                       |
|---|---|------------------------|---------------------------------------|
| Supplied part                                       | Manufacturer  | Documentation type     | Documentation number / version number |
| Motor   | Siemens AG, Process Industries and Drives, PO Box 48 48, 90026 Nuremberg/Germany  | Operating instructions | 56100000xx000                         |
| Gear train (gearbox)                                | CARL REHFUSS GmbH&Co.KG Antriebstechnik, Buchtalsteige 3, 72461 Albstadt, Germany | Operating instructions | 097.99999.00001.5                     |
|   |   |                        |                                       |
|   |   |                        |                                       |
|   |   |                        |                                       |
|   |   |                        |                                       |

## Associated supplier documentation for customer-specific design

| Supplied part        | Manufacturer | Documentation type     | Documentation number / version number |
|----------------------|--------------|------------------------|---------------------------------------|
| Motor                |              | Operating instructions |                                       |
| Gear train (gearbox) |              | Operating instructions |                                       |
|                      |              |                        |                                       |
|                      |              |                        |                                       |
|                      |              |                        |                                       |
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## Associated supplier documentation for customer-specific design

| Supplied part | Manufacturer | Documentation type | Documentation number / version number |
|---------------|--------------|--------------------|---------------------------------------|
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