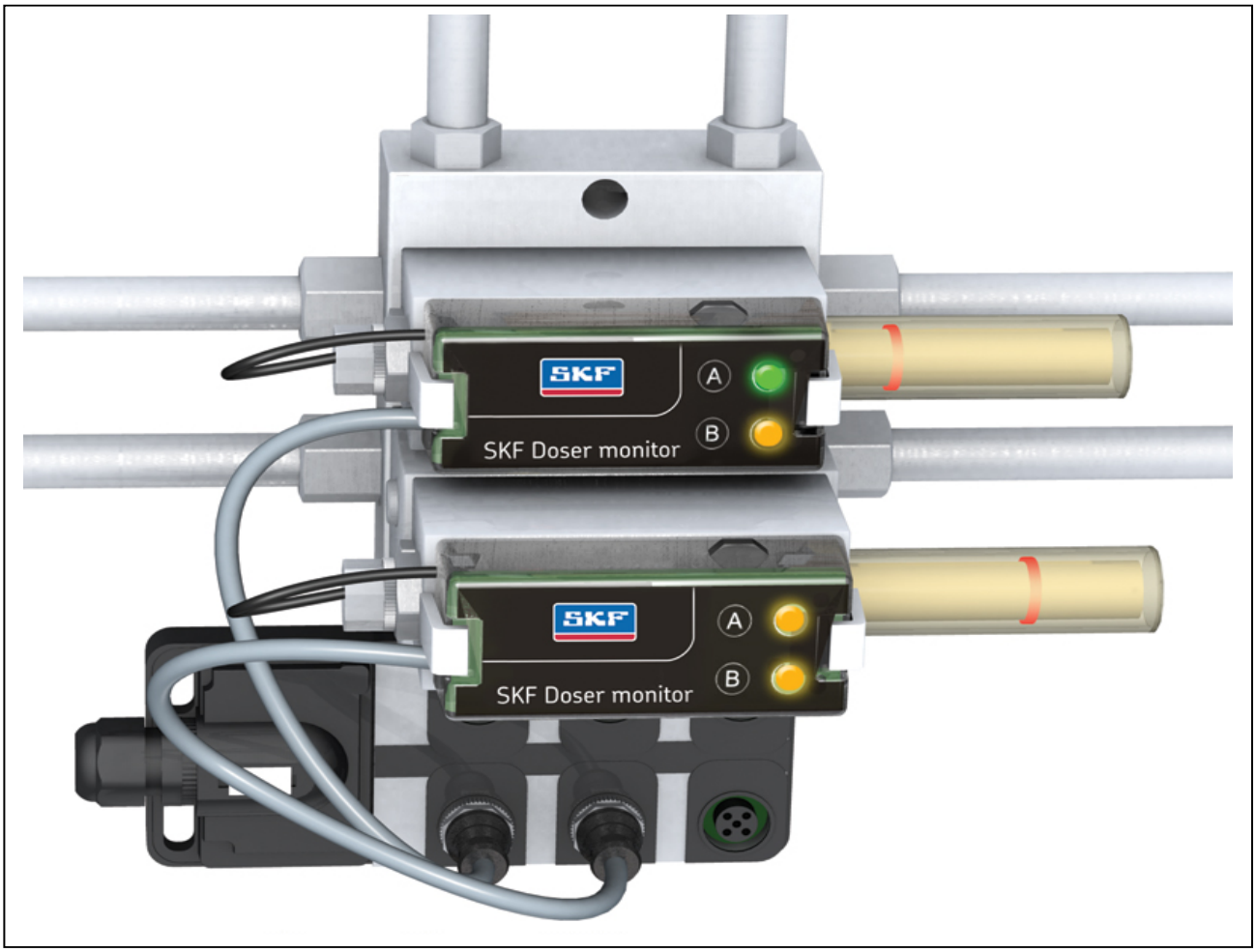
# DOSER MONITOR




| | |
|---|---|
| Date: | **4.5.2023** |
| Document no.: | **DOSERMONITOR_2C_EN** |
| Version: 2C | |

Read this manual before installing or commissioning the product and keep it at hand for later reference!

## EU Declaration of Conformity in accordance with Directives 2014/30/EU

The manufacturer hereby declares under its sole responsibility conformity of the product described below with all relevant harmonization legislation of the European Union at the time of placing on the market.

Designation: Doser Monitor is an operation indicator of the SGA and SG dosers
Type: Doser Monitor

The following Directives and standards were applied in the applicable areas:
2011/65/EU: ROHS II including the addition (EU) 2015/863
2014/30 EU Electromagnetic compatibility

EN 61000-6-4:2001 EN 61000-6-2:1999

Muurame, 10.6.2022
Juha Kärkkäinen
Design Office Manager
SKF Lubrication Management

Anssi Manninen
Product Specialist
Electronic

Manufacturer: Oy SKF Ab Finland Teollisuustie 6 40951 Muurame FINLAND

## UK Declaration of Conformity pursuant to the Electromagnetic Compatibility Regulations 2016 No. 1091

The manufacturer hereby declares under its sole responsibility conformity of the product described below with all relevant harmonization legislation of the United Kingdom at the time of placing on the market.

Designation: Doser Monitor is an operation indicator of the SGA and SG dosers
Type: Doser Monitor

The following regulations and standards were applied in the applicable areas:
- The Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2012 No. 3032
- Electromagnetic Compatibility Regulations 2016 No. 1091

EN 61000-6-4:2001 EN 61000-6-2:1999

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# Legal disclosure

### Manufacturer

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### Training courses

In order to provide a maximum of safety and economic viability, SKF provides detailed training courses. Attending the training courses is recommended. For further information, please contact the provided SKF Service address.

### Copyright



### Notes related to the operating instructions

These operating instructions do not include information on the product warranty. The warranty terms are described in the general terms of use. The instructions are part of the described products and must be kept in an accessible location for further use.

### Disclaimer

The manufacturer shall not accept any liability for damages caused by the following actions by the customer:

- accidents, negligent or inappropriate use, assembly, operation, configuration, maintenance or repairs,
- improper or late response to malfunctions,
- unauthorised modifications to the product,
- intent or negligence, and
- the use of non-original (non-SKF) spare parts.

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

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# 1 EXPLANATION OF SYMBOLS, SIGNS AND ABBREVIATIONS

The following symbols are used in the safety instructions included in this manual to highlight conditions which are potentially harmful to people, materials or the environment.

Please follow the instructions provided especially in the highlighted conditions. Also, relate the safety instructions to other operators.

| | | | |
|---|---|---|---|
|  | General warning |  | Risk of electric shock |
|  | Risk of slipping |  | Hot surface |
|  | Fire hazard |  | Use protective goggles |
|  | General note |  | Environmentally friendly disposal |
|  | Dispose of cartridges in an environmentally friendly way | | |

| | Warning level | Consequence | Probability |
|---|---|---|---|
|  | DANGER | Death, serious injury | imminent |
|  | WARNING | Death, serious injury | possible |
|  | CAUTION | Minor injury | possible |
| | ATTENTION | Property damage | possible |

| Symbol | Meaning |
|---|---|
| ● | Instruction step |
| ○ | List item |
| ✓ | Conditions which must be met before the activities described in the title clause can be completed |
| ☞ | Related factors, causes or consequences |

| | | | | | |
|---|---|---|---|---|---|
| re. | regarding | °C | degrees Celsius | °F | degrees Fahrenheit |
| approx. | approximately | K | Kelvin | Oz. | Ounce |
| i.e. | that is | N | Newton | ≥ | equal to or greater than |
| etc. | et cetera | h | hour | ≤ | equal to or less than |
| poss. | possibly | s | second | $mm^2$ | square millimetre |
| if appl. | if applicable | d | day | fl. oz. | fluid ounce |
| a.a.r. | as a rule | Nm | Newton metre | in. | inch |
| incl. | including | ml | millilitre | Pa | Pascal, newtons per square metre, $N/m^2$ |
| min. | minimum | l/min | litres per minute | bar | bar, 100 kPa |
| max. | maximum | gal/min | gallons per minute | PSI | pounds per square inch |
| min | minute | PINT/MIN | pints per minute | sq.in. | square inch |
| e.g. | for example | CC | cubic centimetre | cu. in. | cubic inch |
| kW | kilowatt | mm | millimetre | mph | miles per hour |
| U | voltage | l | litre | rpm | revolutions per minute |
| W | watt | dB (A) | sound pressure level | gal. | gallon |
| AC | alternating current | > | greater than | lb. | pound |
| DC | direct current | < | less than | hp | horse power |
| A | ampere | ± | plus/minus | kp | kilopond |
| Ah | ampere-hour | Ø | diameter | fpsec | feet per second |
| Hz | frequency [Hertz] | kg | kilogram | cSt | centistoke |
| NC | normally closed | rh | relative humidity | µm | micrometre |
| NO | normally open | ≈ | approximately | | |
| | | = | equal to | | |
| | | % | per cent | | |
| | | ‰ | per mille | | |
| | | | | | |

| Conversion factors | |
|---|---|
| length | 1 mm = 0.03937 in. |
| low | 1 cm² = 0.155 sq.in |
| volume | 1 ml = 0.0352 fl.oz. |
| | 1 l = 2.11416 pints (US),<br>0.264 gallons (US) |
| mass | 1 kg = 2.205 lbs |
| | 1 g = 0.03527 oz. |
| density | 1 kg/cc = 8.3454 lb./gal (US) |
| | 1 kg/cc = 0.03613 lb./cu.in. |
| force | 1 N = 0.10197 kp |
| pressure | 1 bar = 14,5 psi, 100 kPA |
| temperature | °C = (°F–32) x 5/9 |
| output | 1 kW = 1.34109 hp |
| acceleration | 1 m/s² = 3.28084 ft./s² |
| speed | 1 m/s = 3.28084 fpsec. |
| | 1 m/s = 2.23694 mph |

# 2 SAFETY INSTRUCTIONS

## 2.1 General safety instructions

- These safety instructions should be read and followed by any persons entrusted with working on the product and those who supervise or instruct the group of persons mentioned above. In addition, the owner must ensure that the relevant personnel are fully familiar with the contents of the instructions and have understood them. It is prohibited to commission or operate the product prior to reading the instructions.
- These instructions must be kept for further use.
- The described products have been manufactured according to the state of the art. However, if the products are used for other than their intended purpose, there may be risks which may result in personal injury or property damage.
- Any malfunctions which may affect safety must be remedied immediately. In addition to these instructions, general statutory regulations for accident prevention and environmental protection must be observed.

## 2.2 General behaviour when handling the product

- Please follow these instructions whenever you use the product. If the product is not in proper technical condition or you are unaware of the potential hazards, do not use the product.
- Familiarise yourself with the functions and operation of the product. All specified assembly and operating steps must be competed in the indicated order.
- Any unclear points regarding proper condition or correct assembly/operation must be clarified. Operation is prohibited until issues have been clarified.
- Prevent unauthorised operation of the device and unauthorised access to the device.
- Always wear personal protective equipment.
- Take the proper precautions and follow the instructions concerning the relevant task. Responsibilities for different activities must be clearly defined and observed. Uncertainty is a major risk factor for safety.
- Safeguards and other protective and emergency equipment must not be removed, modified, disconnected or otherwise disabled. Their completeness and function must also be checked at regular intervals.
- If a safeguard or other protective equipment has to be detached, it must be reattached and tested immediately after the work is complete.
- Remedy any faults included in your area of responsibility. If the fault is beyond your competence, notify your supervisor immediately of the fault.
- Never use parts of the centralised lubrication system or of the machine as standing or climbing aids.

## 2.3 Intended use

SKF Safeflow is a flowmeter unit for adjusting, measuring and controlling the flow rates of lubricants in circulation lubrication systems. It must be used in accordance with the specifications, technical data and limitations stated in these instructions.
Usage is allowed exclusively for professional users in the frame of commercial and economic activities.

## 2.4 Foreseeable misuse

Any use differing from that stated in these instructions is strictly prohibited, particularly the following:

- use outside the indicated temperature range,
- use of non-specified lubricants,
- exceeding the maximum allowable operating pressure,
- use in continuous operation, excluding circulation lubrication systems,
- use in areas with aggressive or corrosive materials (e.g. high ozone pollution),
- use in areas with harmful radiation (e. g. ionising radiation),
- feeding, forwarding, or storing hazardous substances and mixtures described in annex I part 2-5 of the CLP regulation (EG 1272/2008),
- feeding, forwarding or storing gases, liquefied gases, dissolved gases, vapours or fluids whose vapour pressure exceeds normal atmospheric pressure (1,013 mbar) by more than 0.5 bar at the maximum permissible operating temperature, and
- use in an explosion protection zone.

## 2.5 Painting of plastic parts not allowed

Painting of any plastic parts or seals in the product is expressly prohibited. Remove or protect with care any required parts of the flowmeter unit before painting the piece of machinery onto which the flowmeter unit has been installed.

## 2.6 Modifications to the product

Unauthorised conversions or modifications may have unforeseeable effects on product safety and functionality. Therefore, any unauthorised conversions or modifications are expressly prohibited.

## 2.7 Forbidden measures

Performing the following functions is allowed only for the manufacturer’s experts or for the manufacturer’s authorised persons due to statutory regulations and/or to avoid possible errors. These functions may also be hidden.

- Adjusting, repairing or removing safety valve

## 2.8 Other applicable documents

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

- operational instructions and approval rules
- safety data sheet (MSDS) of the lubricant used

Where appropriate:

- project planning documents
- instructions provided by the suppliers of purchased parts
- any documents of other components required to set up the centralised lubrication system
- other documents relevant for the integration of the product into the machine or system

## 2.9 Notes concerning CE marking

The product bears the CE marking and conforms to the following directives:

- EMC Directive 2014/30/EC
- RoHS II Directive 2011/65/EU, including (EU) 2015/863

CE

## 2.10 Persons authorised to operate the device

### 2.10.1 Operator

An operator is a person who is qualified to carry out the functions and activities related to normal operation based on his or her training, knowledge and experience. This includes avoiding possible hazards that may arise during operation.

### 2.10.2 Mechanical specialist

A mechanical specialist is a person with appropriate professional education, knowledge and experience to detect and avoid the hazards that may arise during transport, installation, commissioning, operation, maintenance, repair and disassembly.

### 2.10.3 Electrician

An electrician is a person with appropriate professional education, knowledge and experience to detect and avoid electrical hazards.

### 2.10.4 Providing briefing for external technicians

Prior to commencing any activities, external technicians must be informed by the end-user of its safety provisions, applicable accident prevention procedures and the functions of the superordinate machine and its protective devices.

### 2.10.5 Provision of personal protective equipment

The end user must provide personal protective equipment suitable for the respective location of operation and the intended use.

## 2.11 Operation

The following must be observed during commissioning and operation:

- any and all information within this manual and the in any referenced documents, and
- all laws and regulations that the end-user must observe.

### 2.11.1 Emergency stopping of the flowmeter unit

In case of an emergency, stop the flowmeter unit as follows:

- Switch off the piece of equipment that uses the flowmeter unit or the piece of equipment to which the flowmeter unit has been connected.

### 2.11.2 Transport, installation, maintenance, malfunctions, repairs, shutdown for maintenance and disposal

- All relevant persons must be informed of the activity prior to starting any work. Observe the precautionary operational measures and work instructions.
- Transport the products with suitable transportation and hoisting equipment using suitable work methods.
- Maintenance and repair work can be subject to restrictions in low or high temperatures (e.g. changed flow properties of the lubricant). Therefore, where possible, try to carry out maintenance and repair work at room temperature.
- Before conducting any work, depressurise the product or machine into which the product will be integrated and secure it against unauthorised activation.
- Ensure through suitable measures that movable or detached parts are immobilised during the work and that no limbs can be caught in between if there are inadvertent movements.
- Assemble the product only outside of the operating range of moving parts, at an adequate distance from sources of heat or cold. Be careful not to damage other units in the machine or impair their function during installation.
- Dry or cover wet, slippery surfaces accordingly.
- Cover hot or cold surfaces accordingly.
- Work on electrical components must be carried out by electrical specialists only. Carry out work on electrical components using voltage insulated tools only.
- Make electrical connections only according to the information in the valid wiring diagram, taking into account relevant regulations of the country of operation and the properties of the local electrical network.
- Do not touch cables or electrical components with wet or damp hands.
- Do not bypass any fuses. Replace fuses with same type and rating only.
- Undertake drilling at non-critical, non-load bearing parts only. Use existing boreholes whenever possible. Be careful not to damage lines and cables when drilling.
- Observe possible abrasion points. Protect the parts accordingly.
- All components used must be suitable for use at:
  – the system’s maximum operating pressure, and
  – the system’s minimum and maximum ambient temperature range.
- No parts of the lubrication system may be subjected to torsion, shear or bending.
- Before using any parts, check them for contamination, clean if necessary.
- Lubricant lines should be primed with lubricant prior to installation. This makes it easier to bleed the system of air afterwards.
- Observe the specified tightening torques. Use a calibrated torque wrench.
- When working with heavy parts, use suitable lifting tools.
- Avoid mixing up or wrong assembly of dismantled parts. Mark these parts accordingly.

## 2.12 Commissioning and daily start-up

Ensure that:

- All safety devices are complete and work properly.
- All connections are correctly connected.
- All parts have been correctly installed.
- All warning labels on the machine are complete, highly visible and undamaged.
- replace illegible or missing warning labels without delay.

## 2.13 Cleaning

- There is a risk of fire and explosion when using flammable cleaning agents. Use only non-flammable cleaning agents suitable for the purpose.
- Do not use aggressive cleaning agents.
- Do not use steam jet or high pressure cleaners. Electrical components may be damaged. Observe the IP protection class.
- Cleaning work on energised components may be carried out by electrical specialists only.
- Mark damp areas accordingly.

## 2.14 Residual risks

| Residual risk | Possible in lifecycle stage | Prevention/remedy |
|---|---|---|
| Personal injury / material damage due to falling of raised parts | A, B, C, G, H, K | Keep unauthorised people away. Make sure no one remains under suspended parts or loads. Lift parts with suitable and tested lifting devices. . |
| Personal injury / material damage due to tilting or falling of the product because of non-observance of the stated tightening torques | B, C, D, G | Observe the specified tightening torques. Fasten the product to components with adequate load-bearing capacities only. If no tightening torques are stated, tightening torques for grade 8.8 screws apply.. |
| Personal injury / material damage due to electric shock from a damaged connection cable | B, C, D, E, F, G, H | Check that the low level switch connection cable is intact before using the switch for the first time and, after that, at regular intervals. Do not mount the cable to moving parts or at an abrasion point. If this cannot be avoided, use either spring coils or protective conduits depending on the circumstances. |
| Personal injury / damage to material due to spilled or leaked lubricant | B, C, D, F, G, H, K | Detach and reattach lubricant feed lines with care when replacing or starting up the device. Always use appropriate hydraulic screw connections and lubrication lines suitable for use in the stated pressures. Do not mount lubrication lines to moving parts or abrasion points. If this cannot be avoided, use either flexible hose lines, spring coils or protective conduits depending on the circumstances. |
| Lifecycle stages: A = transport, B = installation, C = commissioning, D = operation, E = cleaning, F = maintenance, G = fault, repair, H = decommissioning, K= disposal | | |

# 3 DELIVERY, RETURN & STORAGE

## 3.1 Delivery

Inspect the product immediately after reception for any signs of damage during shipment and other defects by comparing the delivery to the shipping documents. Immediately report any damage suffered in transport to the forwarding agent. In case of damage during shipment or other defect, store the original product packaging, until all deviations have been corrected. Ensure the safe handling of the product in the internal transport in the location.

## 3.2 Return

Clean all parts and pack them properly (i.e. following the regulations of the recipient country) before returning the product or its parts. Protect the product from mechanical strain (dents, shocks). Returns can be made via land, sea, or air transport. Add the following symbols to the package of the product to be returned:

## 3.3 Storage

The product must be stored as follows:

- Store in a closed, dry, cool and vibration-free location.
- Ensure that there are no corrosive or aggressive materials at the place of storage (e. g. UV rays, ozone).
- Protect the product from pests and animals (insects, rodents, etc.).
- Can be stored in the original packaging.
- Protect the product from hot and cold.
- In case of significant temperature fluctuations and/or high air humidity, perform the necessary measures in order to prevent condensation (e.g., by using a heater).
- The product's allowed storage temperature range is the same as its operating temperature range (see Technical specifications).

| | |
|---|---|
|  | Before taking the product into use, inspect it for possible damages incurred during storage. This applies to parts made of plastic and rubber (embrittlement) as well as components primed with lubricant (ageing) in particular. |

# 4 LUBRICANTS

## 4.1 General information

Different lubricants are used in different applications. In order to fulfil their tasks, lubricants must fulfil various requirements to varying extents. The most important requirements for lubricants are:

- reduction of abrasion and wear
- corrosion protection
- noise minimisation
- protection against impurities
- cooling (primarily for oils)
- longevity (physical/chemical stability)
- compatibility with as wide range of materials as possible
- economic and ecological aspects

## 4.2 Lubricant selection

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

The selection is made by the manufacturer/end-user of the machine, preferably together with the lubricant supplier based on a defined requirement profile.

Should you have little or no experience with the selection of lubricants for centralised lubrication systems, please contact SKF.

If required, we will be glad to support customers in selecting suitable components for feeding the selected lubricant and planning and designing their centralised lubrication system.

You will avoid possible costly downtimes caused by damage to your machine/system or the centralised lubrication system.

| | ATTENTION |
|---|---|
| | Only lubricants specified for the product may be used. Unsuitable lubricants may lead to product failure. |

| | ATTENTION |
|---|---|
| | Do not mix lubricants. This may have unforeseeable effects on the usability and therefore on the function of the centralised lubrication system. |

| | ATTENTION |
|---|---|
| | Due to the multitude of possible additives, it is possible that individual lubricants, which according to the manufacturer's data sheets match the system’s specification, might not in fact be suitable for use in centralised lubrication systems For example, additives included in synthetic lubricants may not be compatible with the materials used in the system. To avoid this problem, always use lubricants tested by SKF. |

## 4.1 Material compatibility

Lubricants must be compatible with the following materials:

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

## 4.2 Ageing of lubricants

After a prolonged downtime of the machine, check that the physical or chemical composition of the lubricant has not changed before
restarting the machine. We recommend inspecting the lubricant already after a week’s downtime. If you suspect that the lubricant is no longer suitable, replace it prior to recommissioning and, if necessary, perform initial lubrication manually. It is possible for lubricants to be tested in the company's laboratory for their suitability for being pumped in centralised lubrication systems (e.g. no "bleeding"). Please contact SKF if you have further questions regarding lubricants. An overview of the lubricants tested by SKF is also available upon request.

## 5 GENERAL DESCRIPTION

SKF Doser Monitor is an operation indicator of the SGA and SG dosers of a dual-line SKF Duoflex central lubrication system.

## 6 MAIN COMPONENTS

SKF Doser Monitor consists of an electronic part (pos. 1), its fixing plate (pos. 2) and a sensor plug (pos. 3).
The electronic part includes a yellow LED-signal A (pos.4), a green LED-signal B (pos.5), a sensor (pos.6), a sensor cable (pos.7) and a connection cable (pos.8).
SKF Doser Monitors can be connected to a field cable with a junction box (pos. 9).
The junction box is equipped with fixing accessories (pos. 10). The following are available for the connection cable:
an extension cable (1 m or 5 m).

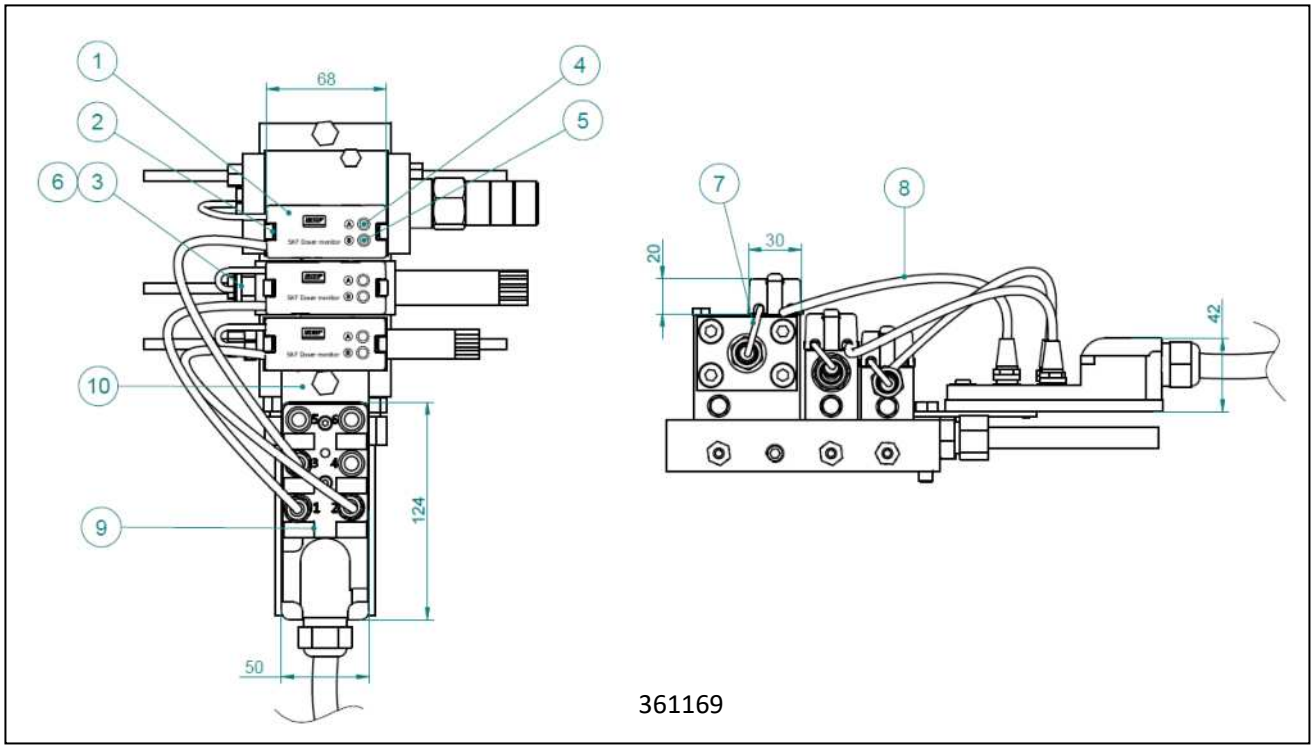



**FIGURE 1. Doser Monitor design**

## 6.1 Installing the SKF Doser Monitor in SGA-01, -1 and -2 dosers

**WARNING!** Make sure that the lubrication system is not pressurised while the SKF Doser Monitor is being installed.

1. Unfasten the doser (1) from the base plate (2).
2. Remove the plug (3) and the O-ring of the doser piston.
3. Attach the SKF Doser Monitor sensor plug (4) and the O-ring (5) to the doser.
4. Place the doser on the base plate.
5. Attach the SKF Doser Monitor fixing plate (6) on top of the doser with the doser fixing screws (7).
6. Fasten the doser on the base plate.
7. Attach the electronic part (8) of the SKF Doser Monitor onto the fixing plate.
8. Attach the SKF Doser Monitor sensor (9) onto the plug, tightening it by hand.

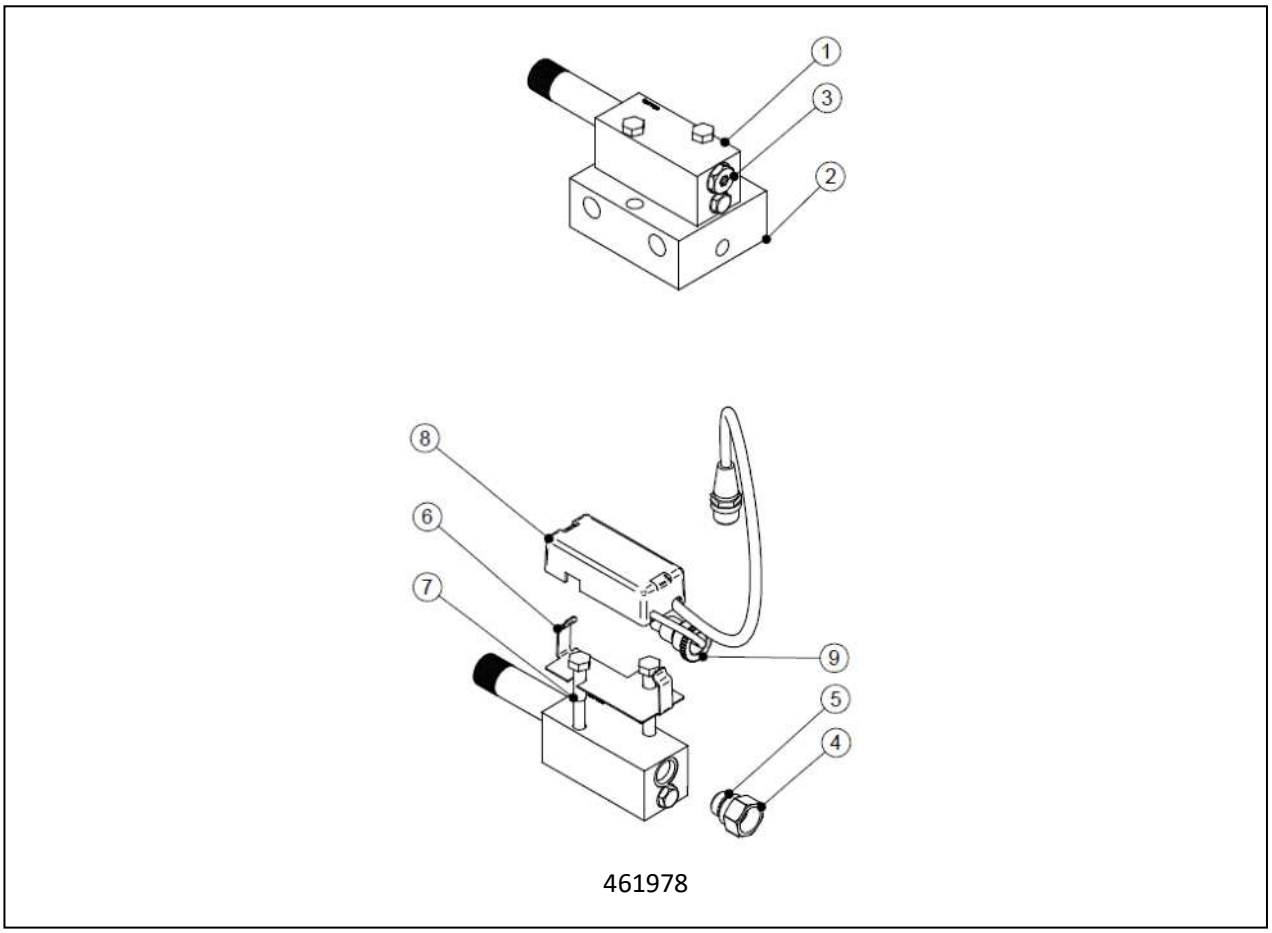



**FIGURE 2. Installation of SGA-01,-1 and -2**

## 6.2 Installing the SKF Doser Monitor in the SG-3, -4 and -5 dosers

1. Unfasten the doser (1) from the base plate (2).
2. Detach the end of the SKF Doser Monitor (3) and the O-ring (4).
3. Remove the end (5) and the O-ring (6) of the doser adjustment screw.
4. Remove the doser piston (7) from the doser body.
5. Replace the piston with a piston equipped with a steel core. Place the lip seal (8, Detail A) on the piston (9). Push the piston gently inside the doser so that the steel core (10) of the piston is towards the indicator end.

| **HUOM!** | To avoid leakage, make sure that the lip seal is installed correctly. |
|---|---|

6. Push the piston to the other side of the doser body and place the other lip seal (11, Detail B) on the piston.
7. Fasten the end (5) and the O-ring (6) of the doser adjustment screw.
8. Attach the new SKF Doser Monitor end (12) and the O-ring (4).
9. Place the doser on the base plate.
10. Attach the SKF Doser Monitor fixing plate (13) on top of the doser with the doser fixing screws (14).
11. Fasten the doser on the base plate.
12. Screw in the sensor plug (15) and the O-ring to the end of the SKF Doser Monitor.
13. Attach the electronic part (16) of the SKF Doser Monitor onto the fixing plate.
14. Attach the SKF Doser Monitor sensor (17) onto the sensor plug by hand.

| **HUOM!** | Replace the O-rings (4 and 6) when necessary. |
|---|---|

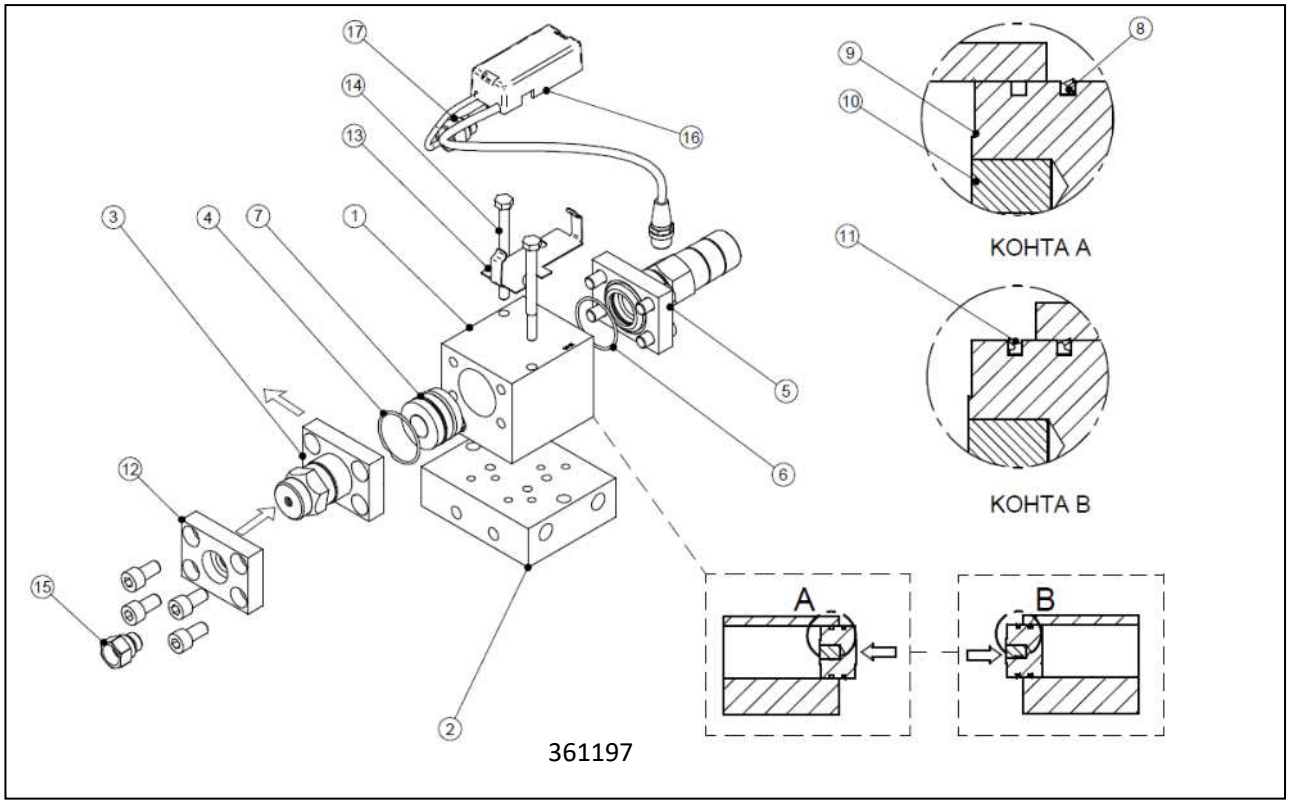



**FIGURE 3. Installation of SG-3, -4 and -5**

## 6.3 Operation of the SKF Doser Monitor

The SKF Doser Monitor sensor senses the movement of the doser piston. The sensor senses the piston moving towards the sensor in which case the relay contact of the electronic part closes.

The status of the doser operation indicator can be seen from the LED-signals of the electronic part:

- yellow LED-signal A: waiting status, relay contact is open
- green LED-signal B: sensing status, relay contact is closed

## 6.4 Latching operation mode

The lubrication cycle in a dual-line central lubrication system consists of two pressurization phases. In the beginning of a lubrication cycle, the control center opens the SKF Doser Monitor relay contacts, which lights up the yellow signal lights of the electronic parts (A). During a lubrication cycle both lines are pressurized in turns, which means that the doser piston moves once away from the sensor and once towards the sensor. The movement of the piston towards the sensor closes the doser operation indicator relay contacts, in which case the green LED-signals B are lit in the electronic parts.

The green LED signals (B) remain lit until the control center opens the operation indicator relay contacts at the beginning of the next lubrication cycle, at which time the yellow LED signals lights (A) light up.

Latching relay contacts enable connecting SKF Doser Monitors in series with a junction box.

If the operation of one of the dosers is not sensed during a lubrication cycle, the operation indicator triggers an alarm at the control center or at the customer's control system.

*See SKF Doser Monitor operation in a SKF ST-1440/ST-1340 control centre.*

*See SKF MAXILUBE/User interface IF-105/Alarms*

*See SKF MULTILUBE/User interface IF-103/Alarms*

The yellow LED-signal A is lit in the doser operation indicator which triggered the alarm. The alarm does not prevent pressurization in the beginning of the next lubrication cycle.

## 6.5 Pulse operation mode

The relay contact closes and the green LED-signal B is lit for about three (3) seconds after doser operation has been sensed. Otherwise the relay contact is open and the yellow LED-signal A is lit.

# 7 TECHNICAL SPECIFICATION

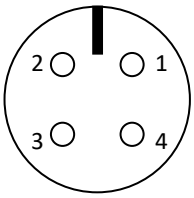
## 7.1 Technical information

| Quantity | Value | Unit | Description |
|---|---|---|---|
| t | –20...+70 | °C | Operating temperature range |
| U | 24 (20…28) | V DC | Control voltage |
| | IP67 | | Protection classification |

## 7.2 Connections

Connections with a 4-pole M12 male connector

- Inputs
  - control voltage, 24 V DC
- Outputs
  - potential-free relay contact




Connections, M12 male connector

| | Latching operation mode | Pulse operation mode |
|---|---|---|
| 1 | 24 V | 0 V |
| 3 | 0 V | 24 V |
| 2 | relay contact | relay contact |
| 4 | relay contact | relay contact |

## 7.3 Connecting the doser monitor and using the junction box

The connection method indicated in Fig. 4 is possible if the doser monitors are used with a latching operating mode where the central lubrication control guides the sensors.

The doser monitors can be controlled to a single control loop with a junction box. The junction box also supplies the operating voltage to all the sensors. In a control loop, the relay contacts of the doser monitors are connected in series. One connection series consists of 6 ports to which a maximum of six doser monitors can be connected. If more than six doser monitors need to be connected to a control loop, several junction boxes must be used. In such a case, one of the junction box ports will be used as an output for the next junction box, as illustrated in Fig. 4.

Junction boxes cannot be used if each sensor is to be connected to a separate control loop and the latching operating mode is used. This connection mode requires separate operating voltage for each of the doser monitor sensors.

The minimum/maximum cable diameters specified in the electrical drawings and instructions of the junction box manufacturer must be taken into account when installing the junction boxes to ensure proper sealing capacity of the junction boxes and operational reliability of the system

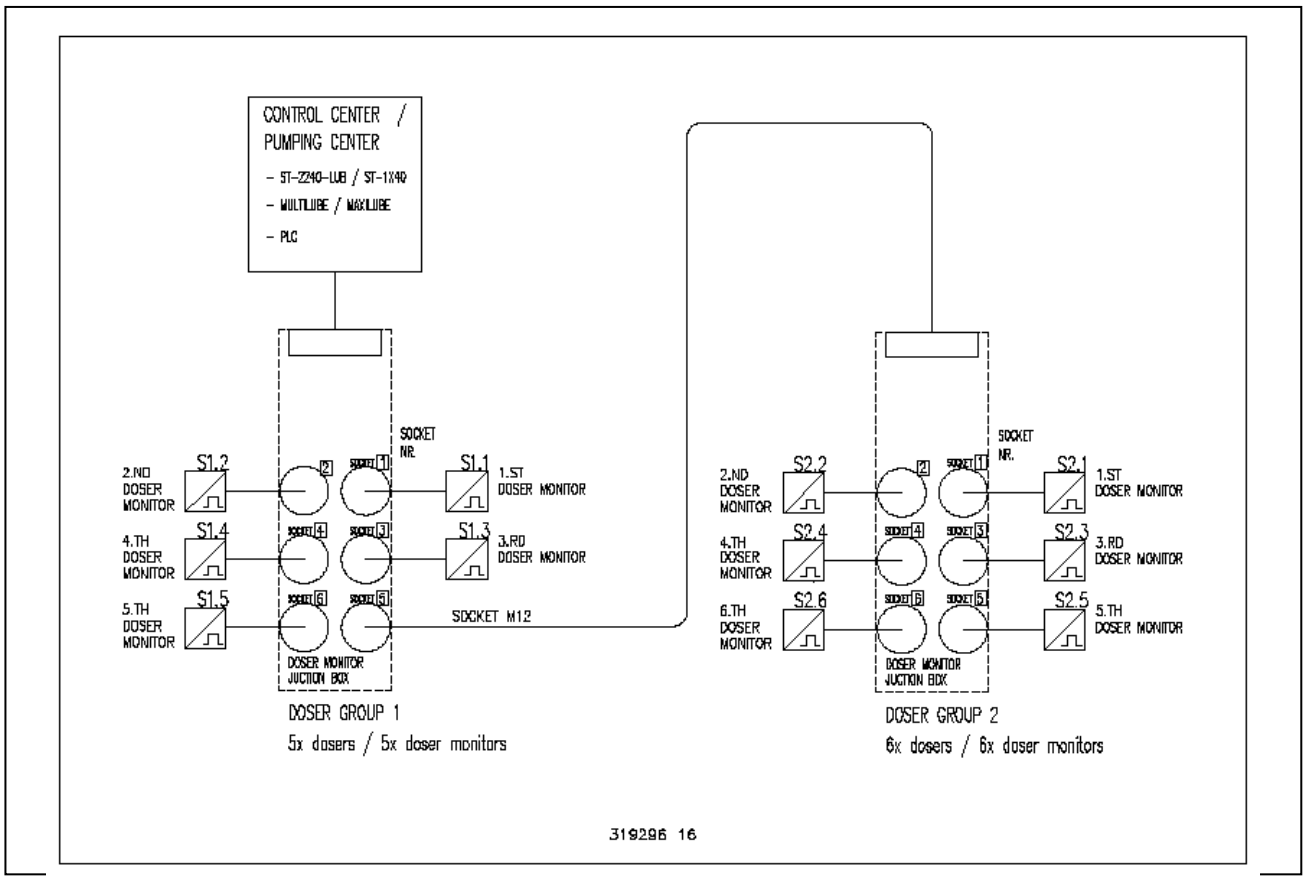



**FIGURE 4. Connection principle of doser monitors**

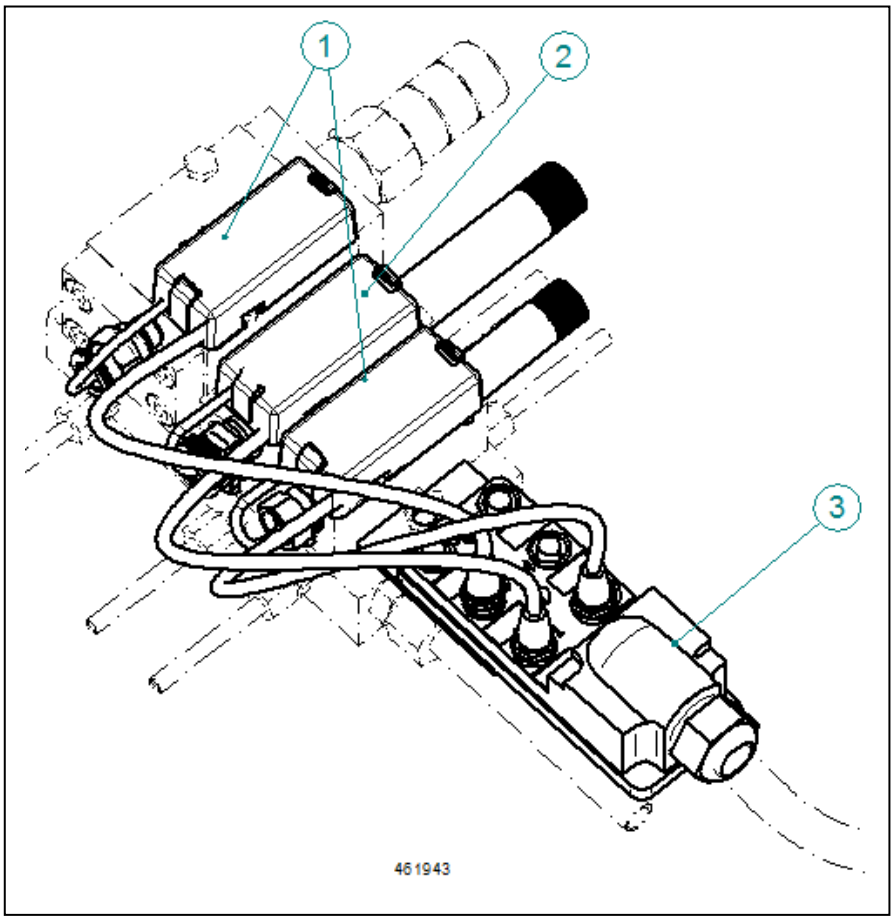
## 7.4 Designation and order codes

The jumper cables listed in the table below are intended for the connection between the doser monitor sensor and the junction box. Depending on the installation, the junction box may have to be placed farther away from the sensors, in which case jumper cables must be used.

M12 connectors may be used if a jumper cable of a specific length is required or if a connection between junction boxes needs to be made.

| Type | Code | Drawing number |
|---|---|---|
| SGA-0-1 | 12388180 | FIGURE 2. |
| SGA-2 | 12388184 | FIGURE 2. |
| SG-3-4-5 | 12388188 | IMAGE 3 |
| JUNCTION BOX | 12388192 | FIGURE 1. |
| JUMPER CABLE M12, L = 1 m | 12771677 | |
| JUMPER CABLE M12, L = 5 m | 12771678 | |
| JUMPER CABLE M12, L = 8 m | 12771679 | |
| M12 4P FEMALE PLASTIC | 12500340 | |
| M12 4P MALE PLASTIC | 12500342 | |

# 8 SPARE PARTS




| Number | Type | Code | Number of items |
|---|---|---|---|
| 3 | LG-IND TERMINAL BOX | 12388192 | 1 |
| 2 | SKF DM SGA-2 KIT | 12388196 | 1 |
| 1 | SKF DM SGA-01,-1, SG-3,-4,-5 KIT | 12388194 | 1 |

# 9 APPENDIX

**China RoHS Table**

| 部件名称 (Part Name) | 有毒害物质或元素 (Hazardous substances) | | | | | |
|---|---|---|---|---|---|---|
| | 铅 | 汞 | 镉 | 六价铬 | 多溴联苯 | 多溴二苯 |
| | Lead (Pb) | Mercury (Hg) | Cadmium (Cd) | Hexavalent Chromium (Cr(VI)) | Polybrominated biphenyls (PBB) | Polybromina diphenyl eth (PBDE) |
| 用钢和黄铜加工的零件 (Components made of machining steel and brass) | X | 0 | 0 | 0 | 0 | 0 |

本表格依据SJ/T11364的规定编制 (This table is prepared in accordance with the provisions of SJ/T 11364.)

O：表示该有毒有害物质在该部件所有均质材料中的含量均在GB/T 26572 规定的限量要求以下。
(Indicates that said hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement of GB/T 265

X：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出GB/T 26572标准规定的限量要求。
(Indicates that said hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requiremer GB/T 26572.)