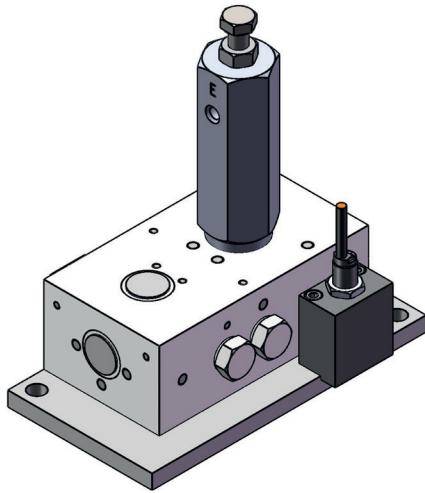


## Pressure-controlled change-over device Type DU1



951-171-011-EN  
2017/11/23  
Version 03

## EC Declaration of incorporation following machinery directive 2006/42/EC, annex II, part 1 B

The manufacturer, SKF Lubrication Systems Germany GmbH, Walldorf Facilities, Heinrich-Hertz-Str. 2-8, DE - 69190 Walldorf, hereby declares that the partly completed machinery

Designation: Pressure-controlled change-over device to supply lubricant within a dual-line lubrication system

Type: DU1-G / DU1-GK / DU1-GKS / DU1-GKN

Part number: 617-XXXX-X

Year of construction: See type identification plate

complies with the following basic safety and health requirements of the EC machinery directive 2006/42/EC at the time when first being launched in the market.

1.1.2 · 1.1.3 · 1.3.2 · 1.3.4 · 1.5.1 · 1.5.6 · 1.5.8 · 1.5.9 · 1.6.1 · 1.7.1 · 1.7.3 · 1.7.4

The special technical documents were prepared following Annex VII part B of this directive. Upon justifiable request, these special technical documents can be forwarded electronically to the respective national authorities. The person empowered to assemble the technical documentation on behalf of the manufacturer is the head of standardization, See manufacturer's address.

Furthermore, the following directives and harmonized standards were applied in the respective applicable areas:

2011/65/EU

RoHS II

2014/108/EU

Electromagnetic compatibility | Industry

Standard	Edition	Standard	Edition	Standard	Edition	Standard	Edition
DIN EN ISO 12100	2011	DIN EN ISO 50581	2013	DIN EN 61000-6-1	2007	DIN EN 61000-6-4	2011
DIN EN 809-1	2012	DIN EN 60947-5-1	2010	DIN EN 61000-6-2	2006	DIN EN 60947-5-1	2010
DIN EN ISO 60204	2007	DIN EN 61131-2	2008	Amendment	2011		
DIN EN 60204-1	2007	Amendment	2009	DIN EN 61000-6-3	2011		
Amendment	2010	DIN EN 60034-1	2011	Amendment	2012		

The partly completed machinery must not be put into service until the final machinery into which it is to be incorporated has been declared in conformity with the provisions of machinery directive 2006/42/EC and any other applicable directives.

Walldorf, April 20, 2016

Jürgen Kreutzkämper  
Manager R&D Germany  
SKF Lubrication Business Unit



Stefan Schürmann  
Manager R&D Hockenheim/Walldorf  
SKF Lubrication Business Unit



## Legal disclosure

The instructions following machinery directive 2006/42/EC are part of the described products and must be kept at an accessible location for further use.

### Warranty

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

© Copyright SKF  
All rights reserved.

### Manufacturer

SKF Lubrication Systems Germany GmbH  
Walldorf Facilities  
Heinrich-Hertz-Str. 2-8  
DE - 69190 Walldorf  
Phone: +49 (0) 6227 33-0  
Fax: +49 (0) 6227 33-259  
E-mail: [Lubrication-germany@skf.com](mailto:Lubrication-germany@skf.com)  
[www.skf.com/lubrication](http://www.skf.com/lubrication)

### Sales and Service Regions

Europe/ Africa/ Middle East/ India  
SKF Lubrication Systems Germany GmbH

Americas / Asia / Pacific  
Lincoln Industrial, 5148 North Hanley Road  
St. Louis, MO 63134 USA  
Tel: +1.314.679.4200  
Fax: +1.800.424.5359  
E-mail: [lincoln@lincolnindustrial.com](mailto:lincoln@lincolnindustrial.com)  
[www.lincolnindustrial.com](http://www.lincolnindustrial.com)  
[www.skf.com/lubrication](http://www.skf.com/lubrication)

## Table of contents

EC Declaration of incorporation following machinery directive 2006/42/ EC, annex II, part 1 B .....	2
Explanation of symbols and signs .....	5




<b>1. Safety instructions.....</b>	<b>7</b>
1.1 General safety instructions .....	7
1.2 General behaviour when handling the product .....	7
1.3 Qualified technical personnel .....	8
1.4 Electric current hazard .....	9
1.5 System pressure hazard .....	9
1.6 Operation .....	9
1.7 Assembly, maintenance, malfunctions, modification, shutdown, disposal .....	10
1.8 Intended use .....	10
1.9 Foreseeable misuse .....	11
1.10 Disclaimer of liability .....	11
1.11 Other applicable documents .....	11
1.12 Residual risks .....	12
<b>2. Lubricants.....</b>	<b>14</b>
2.1 General information .....	14
2.2 Selection of lubricants .....	14
2.3 Approved lubricants .....	15
2.4 Lubricants and the environment .....	16
<b>3. Overview, functional description .....</b>	<b>17</b>
<b>4. Technical data .....</b>	<b>20</b>
4.1 General technical data .....	20
4.2 Notes related to the type identification plate .....	21
4.3 Notes related to the CE marking .....	21
4.4 Limit switch .....	22
4.5 Proximity switch .....	23

<b>5. Delivery, returns, and storage .....</b>	<b>24</b>
5.1 Delivery .....	24
5.2 Returns .....	24
5.3 Storage .....	24
5.4 General notes related to storage .....	24
<b>6. Installation .....</b>	<b>25</b>
6.1 General information .....	25
6.2 Attachment .....	25
6.3 Electrical connection .....	26
<b>7. Start-up.....</b>	<b>27</b>
<b>8. Operation, shutdown and disposal .....</b>	<b>28</b>
8.1 Temporary shutdown .....	28
8.2 Shutdown and disposal .....	28
<b>9. Maintenance, cleaning and repair .....</b>	<b>29</b>
9.1 General information .....	29
9.2 Maintenance .....	29
9.3 Cleaning .....	29
9.4 Repair .....	29
<b>10. Troubleshooting .....</b>	<b>30</b>
<b>11. Spare parts .....</b>	<b>31</b>
<b>12. Dimensional drawings .....</b>	<b>34</b>




## 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 in these operating instructions.

Please read these instructions thoroughly and heed the warning and safety notes. Please observe the warning and safety notes and exercise particular caution in these cases. Inform also other users accordingly.

Warning level		Consequence	Probability
	<b>DANGER</b>	Death/ serious injury	imminent
	<b>WARNING</b>	Death/ serious injury	possible
	<b>CAUTION</b>	Minor injury	possible
	<b>NOTICE</b>	Property damage	possible

Symbol	Meaning
●	Prompts an action
○	Used for itemizing
☞	Refers to other facts, causes, or consequences
→	Provides additional information within procedures

Symbols	
Symbol	Meaning
	General warning
	Electrical component hazard, electrical shock hazard
	Slipping hazard
	Hazard from hot surfaces
	Hazard from unintentional intake
	Crushing hazard
	Pressure injection hazard
	Wear personal protective equipment (goggles)
	Note
	Environmentally sound disposal recycling
	Environmentally sound disposal of waste electrical and electronic equipment

## Abbreviations and conversion factors

## Abbreviations

re.	regarding
approx.	approx.
°C	degrees Celsius
cu.in	cubic inch
dB (A)	Sound pressure level
i.e.	that is
etc.	et cetera
poss.	possibly
°F	degrees Fahrenheit
fl.ou	fluid ounce
fpsec	feet per second
gal.	gallon
if appl.	if applicable
hp	horse power
a.a.r.	as a rule
in.	inch
incl.	including
K	Kelvin
kg	Kilogram
kp	kilopond
kW	kilowatt
l	litre
lb.	pound
max.	maximum
min.	minimum
min.	minute
ml	millilitre
ml/d	millilitre per day
mm	millimetre
N	Newton
Nm	Newtonmeter

oz.	Ounce
psi	pounds per square inch
rh	relative humidity
s	second
sq.in.	square inch
e.g.	for example
>	greater than
<	less than
±	plus or minus
Ø	Diameter
mph	miles per hour
rpm	revolutions per minute

## Conversion factors

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

# 1. Safety instructions

## 1.1 General safety instructions

The owner must ensure that safety information has been read by any persons entrusted with works on the product or by those persons who supervise or instruct the before-mentioned group of persons. In addition, the owner must also ensure that the relevant personnel are fully familiar with and have understood the contents of the Instructions.

The instructions must be kept at hand together with the product for future reference.

The Instructions are part of the product and must accompany the product when selling it.

The described products were manufactured according to the state of the art. Risks may, however, arise from its usage and may result in harm to persons or damage to material assets.

Any malfunctions which may affect safety must be remedied immediately. In addition to these Instructions, general statutory regulations and other regulations for accident prevention and environmental protection must be observed.

## 1.2 General behaviour when handling the product

- The product may be used only in awareness of the potential dangers, in proper technical condition, and according to the information in these instructions.
- Technical personnel must familiarize themselves with the functions and operation of the product. The specified assembly and operating steps and their sequences must be observed.
- Any unclear points regarding proper condition or correct assembly/ operation must be clarified. Operation is prohibited until issues have been clarified.
- Unauthorized persons must be kept away.
- Precautionary operational measures and instructions for the respective work must be observed.
- Responsibilities for different activities must be clearly defined and observed. Uncertainty seriously endangers safety.
- Safety-related protective and emergency devices must not be removed, modified or affected otherwise in their function and are to be checked at regular intervals for completeness and function.
- If protective and safety equipment has to be dismantled, it must be reassembled immediately after finishing the work, and then checked for correct function.
- Remedy occurring faults in the frame of responsibilities. Immediately inform your superior in the case of faults beyond your competence.
- Wear personal protective equipment always.
- When handling lubricants, adhere to the respective safety data sheets.

### 1.3 Qualified technical personnel

Only qualified technical personnel may install, operate, maintain, and repair the products described in this document.

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

Relevant country-specific definitions of qualified technical personnel apply for countries outside the scope of DIN VDE 0105 or IEC 364.

The core principles of these country-specific qualification requirements for technical personnel cannot be below those of the two standards mentioned above.



The operator of the final product is responsible for assigning tasks and areas of responsibility and for the responsibility and monitoring of the personnel. These areas must be precisely specified by the operator.

The personnel must be trained and instructed if they do not possess the required knowledge.

Product training can also be performed by SKF in exchange for costs incurred.





## 1.4 Electric current hazard

	 <b>WARNING</b>
	<b>Electric shock</b> Working on products not disconnected from the power supply may cause personal injury and damage to property. Assembly, maintenance, and repair works may be performed by qualified and authorized personnel only on products previously disconnected from the power supply.

Electrical connection may be carried out only by a qualified electrician authorized by the operator under consideration of the local connection conditions and legal prescriptions (e.g. VDE/ IEC).

## 1.5 System pressure hazard

	 <b>WARNING</b>
	<b>System pressure</b> The product is pressurized during operation. It must be de-pressurized before starting assembly, maintenance, or repair works.

## 1.6 Operation

The following must be observed during commissioning and operation.

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

## 1.7 Assembly, maintenance, malfunctions, modification, shutdown, disposal

- All relevant persons (e.g. operating personnel, supervisors) must be informed of the activity prior to starting any work. Precautionary operational measures and work instructions must be observed.
- Ensure through suitable measures that movable or detached parts are immobilized during the work and that no limbs can be caught in between by inadvertent movements.
- Assemble the product only outside of the operating range of moving parts, at an adequate distance from sources of heat or cold.
- Prior to performing work, the product and the machine or system in which the product is or will be integrated must be depressurized and secured against unauthorized activation.
- Carry out all works on electrical components using voltage insulated tools only.
- Ensure proper grounding of the product.
- Undertake drilling at non-critical, non-load bearing parts only.
- Other units of the superior machine must not be damaged or impaired in their function by the installation of the product.
- No parts of the centralized lubrication system may be subjected to torsion, shear, or bending.
- Use adequate lifting devices when working with heavy components.
- Repairs may be performed with original SKF spare parts only.
- Any malfunctions which may affect safety and functionality must be remedied immediately.
- Avoid mixing up or wrong assembly of disassembled parts. Mark these parts accordingly.
- Modifications or changes to the change-over device are allowed only upon prior consultation with the manufacturer.

## 1.8 Intended use

Supply of lubricants within a dual-line system following the specifications regarding the pressure and flow range made in these Instructions:

The limit values specified in the technical data, particularly the maximum operating pressure of 350 bar, must never be exceeded.

Any other or exceeding use is considered to be improper use.

For ranges going beyond the specified ones, the electromotive change-over device type EM-U3 can be used in combination with end-of-line pressure switches.

### 1.9 Foreseeable misuse

Any usage of the product differing from the aforementioned conditions and stated purpose is strictly prohibited. Particularly prohibited are:

- Use in an explosive atmosphere
- Use in continuous operation
- Painting the change-over device.  
Remove or tape change-over device completely before painting the machine.
- Use to feed, forward, or store hazardous substances and mixtures in accordance with annex I part 2-5 of the CLP regulation (EC 1272/2008)
- to feed, forward, or store gases, liquefied gases, dissolved gases, vapours, or fluids whose vapour pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at the maximum permissible operating temperature.

### 1.10 Disclaimer of liability

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

- inappropriate usage
- wrong or improper assembly, operation, adjustment, or programming
- improper or late response to malfunctions
- unauthorized modification of system components
- the installation of non-original spare parts.

### 1.11 Other applicable documents

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

- Operational instructions and approval rules
- Instructions of the suppliers of purchased parts
- Safety data sheet (MSDS) of the lubricant or material used
- If applicable, project planning documents and other relevant documents

The operator must supplement these documents with the relevant applicable national regulations of the country of use. When selling or forwarding the product, make sure to attach these Instructions to it.

## 1.12 Residual risks

Residual risks	Remedy
Life cycle transport, assembly, start-up, operation, malfunction, troubleshooting, repair, maintenance, shutdown, disposal	
Dropping of lifted parts or tools	<ul style="list-style-type: none"> <li>No people may remain under suspended loads. Keep unauthorized persons away. Secure suspended loads using suitable hoisting equipment (e.g. tapes, belts, ropes, etc.).</li> </ul>
Falling of parts through insufficient fixing to the machine	<ul style="list-style-type: none"> <li>Fix parts only to machine parts with sufficient load capacity. Observe the weight. Observe the stated tightening torques. If no tightening torques are stated, the tightening torques are to be applied to the screw size for 8.8 screws. Literature, see screw manufacturer.</li> </ul>
Electrical shock due to defective connection cable	<ul style="list-style-type: none"> <li>Check connection cable for damages.</li> </ul>
People slipping due to floor contamination with spilled or leaked lubricant	<ul style="list-style-type: none"> <li>Be careful when connecting or disconnecting hydraulic connections</li> <li>Promptly apply suitable binding agents to remove the leaked or spilled lubricant</li> <li>Follow the operational instructions for handling lubricants and contaminated parts</li> </ul>
Tearing or damaging of lines when installed on moving machine parts	<ul style="list-style-type: none"> <li>If possible, do not install on moving parts. If this cannot be avoided, use flexible hose lines</li> </ul>
Ripping out/ damage to lines due to assembly at chafing points or assembly with too little bending radius	<ul style="list-style-type: none"> <li>Use protective pipes or spring coils</li> </ul>
Lubricant spraying out due to faulty component fitting or line connection	<ul style="list-style-type: none"> <li>Use suitable hydraulic screw connections and lines for the stated pressures. Check these prior to commissioning for correct connection and damage.</li> </ul>

Residual risks	Remedy
Life cycle transport, assembly, start-up, operation, malfunction, troubleshooting, repair, maintenance, shutdown, disposal	
Contamination of the environment with lubricant and wetted parts	<ul style="list-style-type: none"><li>○ Dispose of the parts following the relevant legal/ operational regulations</li></ul>

## 2. Lubricants

### 2.1 General information

#### NOTICE

All products may be used only for their intended purpose and in accordance with the Instructions.

Intended use is the use of the products to lubricate bearings and friction points with lubricants within the physical limits that can be found in the relevant product documentation, e.g. operating instructions and product descriptions, e.g. technical drawings and catalogues.

Particular attention is called to the fact that hazardous materials of any kind, especially those materials classified as hazardous by CLP Regulation EC 1272/2008 annex I, part 2-5 may be filled into SKF centralized lubrication systems and components and delivered and/ or distributed with such systems and components only after consulting with and obtaining written approval from SKF.

All products manufactured by SKF are not admitted for use in combination with gases, liquefied gases, dissolved gases, vapours, or fluids whose vapour pressure exceeds normal atmospheric pressure (1013 mbar) by more than 0.5 bar at the maximum permissible operating temperature.

Other material which is neither lubricant nor hazardous substance may be fed only after consultation with and written approval by SKF.

SKF considers lubricants to be an element of system design that must always be factored when selecting components and designing a centralized lubrication system. The lubricating properties of the lubricants are critically important when making these selections.

### 2.2 Selection of lubricants

#### NOTICE

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

The amount of lubricant required at the lube point is specified by the bearing or machine manufacturer. It must be ensured that the required lubricant volume is provided to the lubrication point. Otherwise the lubrication point may not receive adequate lubrication, which can lead to damage and failure of the bearing.

Selection of a lubricant suitable for the lubrication task is made by the machine or system manufacturer and/or the operator of the machine or system in cooperation with the lubricant supplier.

When selecting a lubricant, the type of bearings or friction points, the expected load during operation, and the anticipated ambient conditions must be taken into account. All economic and environmental aspects must also be considered.

### 2.3 Approved lubricants

#### NOTICE

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

Please contact SKF if you have further questions regarding lubricants. It is possible for lubricants to be tested in the company's laboratory for their suitability for being pumped in centralized lubrication systems (e.g. "bleeding").

You can request an overview of the lubricant tests offered by SKF from the company's service department.

#### NOTICE

Only lubricants approved for the product may be used. Unsuitable lubricants can lead to failure of the product and to property damage.

#### NOTICE


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

The product described here can be operated using lubricants that meet the specifications in the technical data. Depending on the product design, these lubricants may be oils, fluid greases, or greases.

Mineral, synthetic, and/or rapidly biodegradable oils and base oils can be used. Consistency agents and additives may be added depending on the operating conditions.

Note that in rare cases there may be lubricants whose properties are within permissible limit values but whose other characteristics render them unsuitable for use in centralized lubrication systems. For example, synthetic lubricants may be incompatible with elastomers.

## 2.4 Lubricants and the environment

	<b>WARNING</b>
	<b>Risk of slipping and injury</b> Leaking lubricant is hazardous due to the risk of slipping and injury. Seal leaks without delay and remove spilled or leaked lubricant.

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

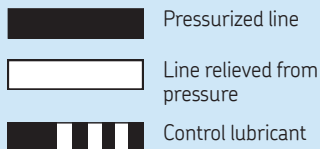
<b>NOTICE</b>
Lubricants may pollute ground and waters. Lubricants have to be handled and disposed of properly. Observe the instructions by the machine manufacturer regarding the lubricants to be used.



### 3. Overview, functional description

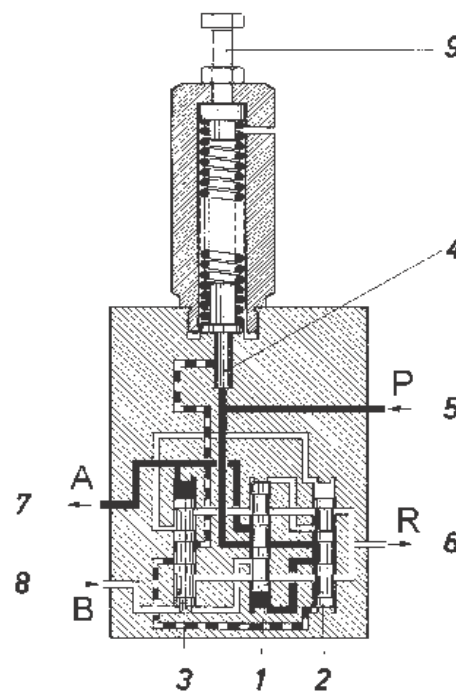
In its principle the change-over device corresponds to a pressure-controlled 4/2-way valve. It alternately dispenses the lubricant fed by the pump to one of the two main lines while the other main line is connected to the return line connection of the pump.

Figures 1 and 2 show a schematic of the change-over device's function. The lines marked in black are pressure lines, the white lines are relief lines:



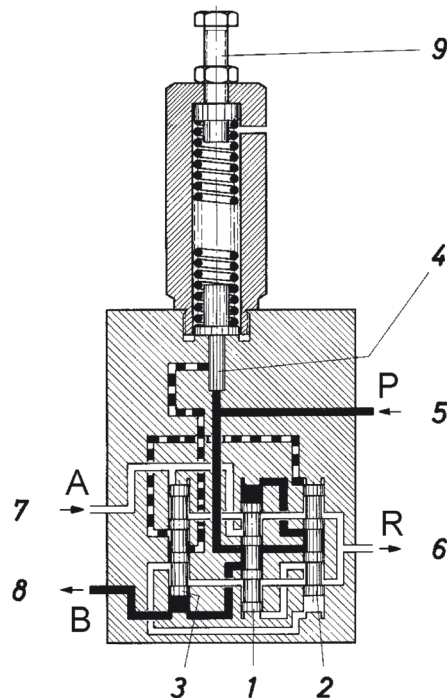
The centralized lubrication pump feeds the lubricant via the pressure line (5) to the change-over device. The lubricants moves via the pre-selection piston (2), the change-over piston (1) and through the main line (7) to the lubricant metering devices, while the main line (8) is connected to the reservoir of the centralized lubrication pump via the relief line (6) and is thus depressurized.

Overview Fig. 1



Lubricant pressure actuates the pistons of the connected dual-line metering devices. The corresponding lubrication points are provided with metered lubricant volumes. As soon as all pistons in the metering devices have reached their final position, pressure in the main line (7), in the change-over device and in the pressure line (5) rises until it overcomes the force of the spring that presses the valve piston (4) down. The spring force, and thus the change-over pressure, can be modified by means of the adjusting screw (9). The valve piston (4) releases the connection between the pressure line (5) and the pre-selection piston (2) via the switching piston (3). The pre-selection piston (2) is pushed upward and connects the pressure line (5) to the upper front face of the change-over piston (1). The change-over piston is pushed downward and opens the connection between the pressure line (5) and the main line (8), while the main line (7) is connected to the reservoir of the centralized lubrication pump via the relief line (6). The lubricant in main line (7) can now relieve. When the pressure in the main line (8) rises, the switching piston (3) is pushed upward. The described procedure repeats for main line (8).

Overview Fig. 2



Change-over device DU1 is available in 4 different versions:

Type	Part no.
DU1-G on base plate	617-28683-1
DU1-GK with indicator pin mounted on base plate	617-28619-1
DU1-GKS with indicator pin and limit switch mounted on base plate	617-28620-1
DU1-GKN with indicator pin and proximity switch mounted on base plate	617-36148-9

## 4. Technical data

### 4.1 General technical data

Flow rate	14 dm <sup>3</sup> /h max.
Change-over pressure	min. 140 bar 350 bar max.
Factory setting	170 bar
Operating pressure	350 bar max.
Connection thread	G 1/2
Flow media	Lubricating oils as of 60 mm <sup>2</sup> /s at +40°C Grease up to NLGI class 3 (depending on the operation temperature)
Operation temperature	- 20 °C to +80 °C - 20 °C to +70°C (in combination with proximity switch 234-10812-8)
Installation position	any

#### 4.2 Notes related to the type identification plate

The type identification plate states important characteristics such as type designation, order number, etc.

To ensure that the loss of data due to an illegible type identification plate is avoided, the characteristics should be entered in the Instructions.

P. No. \_\_\_\_\_

S. No. \_\_\_\_\_

Model \_\_\_\_\_

#### 4.3 Notes related to the CE marking

CE marking is effected following the requirements of the applied directives:

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

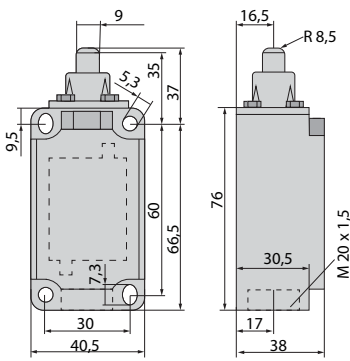

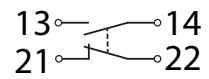
##### Reference on Low Voltage Directive 2014/35/EU

The protective regulations of Low Voltage Directive 2014/35/EU are fulfilled according to annex I (1.5.1) of Machinery Directive 2006/42/EC.

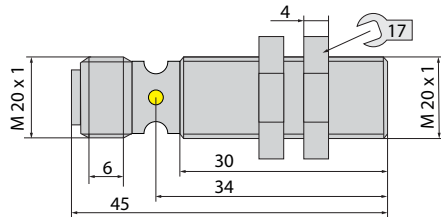
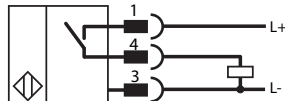
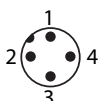
##### Reference on Pressure Equipment Directive 2014/68/EU

Because of its performance data the product does not achieve the limit values defined in Article 4 (1) (a) (i) and is therefore excluded from the scope of application of Pressure Equipment Directive 2014/68/EU following Article 4 (3).

## 4.4 Limit switch

Part number	236-13262-4		
Design	Following EN 50041		
Electrical data			
Version of the switching element	(NO) contact, (NC) contact		
Switching principle	Positively driven (NC) contact		
Number of auxiliary contacts	1		
Number of safety contacts	1		
Rated impulse voltage withstand	U <sub>imp</sub>	6 kV	
Rated insulation voltage	U <sub>i</sub>	500 V	
Thermal continuous current	I <sub>the</sub>	10 A	Mechanical data
Utilization category	AC-15: 230 V / 4 A DC-13: 24 V / 4 A		Cross section of connection with wire-end sleeve
Double insulated			min. 0.75 mm <sup>2</sup>   max. 2.5 mm <sup>2</sup> min. 0.75 mm <sup>2</sup>   max. 1.5 mm <sup>2</sup>
Rated conditional short-circuit current	1000 A		Housing
Short-circuit protection	6A gG D fuse		Plastic, fibre glass reinforced thermoplast
Ambient conditions			Contact material
Ambient temperature	-30 up to +80 °C		Silver
Contact pattern			Switching frequency
			max. 5000/h
			Mechanical endurance
			30 000 000 switching cycles
			Actuating force
			12 N
			Change-over time
			< 2 ms
			Actuating speed
			max. 0.5 m/s
			Cable entry
			20 x 1.5

## 4.5 Proximity switch

Part number		234-10812-8			
<b>General data</b>					
Function of switching element		PNP normally open contact			
Rated operating distance	Sn	2 mm			
Installation		flush	<b>Mechanical data</b>		
Output polarity		DC			
Secured switching distance	Sa	0 to 1.62 mm			
Reduction factor	r <sub>AL</sub>	0.3			
Reduction factor	r <sub>CU</sub>	0.2	Type of connection		M12 x 1 plug; 4-pole
Reduction factor	r <sub>V2A</sub>	0.7	Housing material		Nickel-plated brass
<b>Characteristics</b>			Front face		PBT
Operating voltage	UB	10 to 30 V	Type of protection		IP 67
Switching frequency	f	0 to 800 Hz	<b>Compliance with standards</b>		
Hysteresis	H	Typically 10 %	Standards		EN 60 60957-5-2
Reverse polarity protection		Reverse-polarity protected	<b>Approvals</b>		
Voltage drop	Ud	≤ 15 mA	UL		cULus Listed, General Purpose
Operating current	IL	0 to 200 mA	CSA		cULus Listed, General Purpose
Residual current	I <sub>r</sub>	0 to 0.5 A typically 0.1 μA at 25 °C	CCC		
<b>Functional safety</b>			Products the operating voltage of which still is ≤ 36 V, do not need to be approved and are therefore still provided with a CCC marking.		
MTTF		2690 a	<b>Connection / core colour (EN 60947-5-2)</b>		
Service life		20 a	<div><div>1 = BN (brown) 2 = WH (white) 3 = BU (blue) 4 = BK (black)</div></div>		
Diagnostic coverage	DC	0 %			
<b>Ambient conditions</b>					
Ambient temperature		-25 °C to 70 °C			

## 5. Delivery, returns, and storage

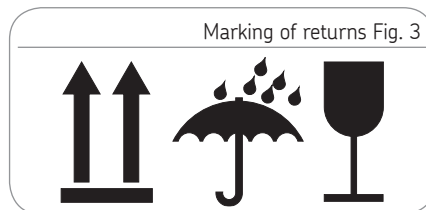
### 5.1 Delivery

The products are packaged following the standard commercial practice according to the regulations of the recipient's country. During transport safe handling must be ensured.

After receipt of the shipment, the product(s) must be inspected for damage and for completeness according to the shipping documents. Keep the packaging material until any discrepancies are resolved.

### 5.2 Returns

Clean all parts and pack them properly before returning them. Protect the product against mechanical influences such as impacts. There are no restrictions for land, sea or air transport. Mark returns on the packaging as follows.



### 5.3 Storage

SKF products are subject to the following storage conditions:

- dry and dust-free surroundings, storage in well ventilated dry area
- Storage time: 24 months max.
- Permissible humidity: < 65% (rh)
- Permissible storage temperature: min. - 25 °C/ max. + 70 °C
- avoid direct sun or UV exposure
- shield product from nearby sources of heat and coldness.

### 5.4 General notes related to storage

- The product(s) can be wrapped in plastic film to provide low-dust storage.
- Protection against ground moisture by storing on a shelf or wooden pallet.



## 6. Installation

### 6.1 General information

Only qualified technical personnel may install, operate, maintain, and repair the products described in these Instructions. Qualified technical personnel are persons who have been trained, assigned, and instructed by the operator of the final product, into which the described product shall be integrated.

Such persons are familiar with the relevant standards, rules, accident prevention regulations, and operating conditions as a result of their training, experience, and instruction. They are qualified to carry out the required activities and in doing so recognize and avoid any potential hazards.

Before assembling the product, the packaging material as well as possible transport locking devices must be removed.

Keep the packaging material until any discrepancies are resolved.

#### NOTE

Technical data (see chapter 4).



### 6.2 Attachment

Protect the product against humidity (observe IP protection class) and vibration and install it in an easily accessible position to ensure all other installations can be carried out without any problem. For indications on the maximum admissible ambient temperature see the technical data.

- During assembly and particularly during any drilling work always pay attention to the following:

Other units must not be damaged by the assembly.



- The product must not be installed within the range of moving parts.
- The product must be installed at an adequate distance from sources of heat and coldness.
- Adhere to safety distances and legal prescriptions on assembly and prevention of accidents.

		<b>CAUTION</b>
<p><b>Electric shock</b>          Make sure to disconnect the pump from the power supply before carrying out works on electrical parts.          Connection of the pump must be provided by a safe galvanic isolation (PELV) always.</p>		

#### Installation position:

- any
- Minimum length of tube line between pump and change-over device: 2 m

### 6.3 Electrical connection

		<b>CAUTION</b>
<p><b>Personal injuries caused by incorrect installation</b> Assembly and installation of electrical devices may be carried out by a commissioned and qualified electrician only!</p> <p>Observe the relevant standard engineering practice and the respective occupational health and safety acts.</p>		

Before connecting the change-over device:

- Disconnect the system from the power supply.
- Electrical connections must be done in such way that no tensile forces are transferred to the product (tension-free connection).

**Connect limit switch:**

following the wiring diagram

**NOTE**

Observe the electrical characteristics (see chapter 4).

## 7. Start-up

After connection of the tube lines the change-over device is ready for operation.

The start-up is effected by switching on the superior machine.

## 8. Operation, shutdown and disposal

### Settings

#### NOTICE

##### Property damage

The change-over pressure must not exceed the maximum admissible system pressure.

#### NOTE

The change-over pressure must always exceed the actuation pressure of the dual-line metering devices.

For safe function set the change-over pressure 30 bar higher than the actuation pressure of the last metering device in the system.

#### Set the change-over pressure:

Factory setting: 170 bar

#### Increase the change-over pressure:

- Loosen the counter nut (11).
- Turn adjusting screw (12) clockwise until the desired pressure is reached (350 bar max.).

- Secure the new setting by means of counter nut (11).

#### Reduce the change-over pressure:

- Loosen the counter nut (11).
- Turn adjusting screw (12) anticlockwise until the desired pressure is reached (140 bar min.).
- Secure the new setting by means of counter nut (11).

### 8.1 Temporary shutdown

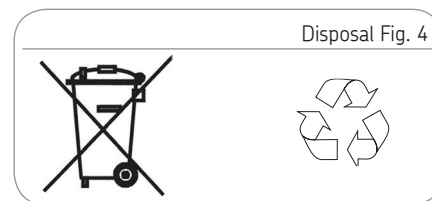
Temporarily shut the system down by disconnecting it from the power supply.

### 8.2 Shutdown and disposal

Shutdown is effected by switching the superior machine or vehicle off.



In case of final shutdown follow the applicable rules and regulations on disposal. The product can also be returned to the manufacturer for proper disposal, in which case the customer is responsible for reimbursing the costs incurred. The parts are recyclable.



Disposal Fig. 4



## 9. Maintenance, cleaning and repair

### 9.1 General information

	 <b>CAUTION</b>
<b>Electric shock</b> Prior to performing any repair work on the change-over device disconnect the system from the power supply and secure it against unintentional operation.	

	 <b>CAUTION</b>
<b>Lubricant squirting out</b> Prior to performing any repair work on the change-over device depressurize the pump and system pressure to 0 bar. To do so loosen the tube connections on the change-over device (observing the pressure gauge on the pump).	

Liability is excluded for any damage or faults arising from inappropriate maintenance, repair or cleaning.

### 9.2 Maintenance

- Provided that clean lubricant is supplied only, the change-over device does not require any particular care.

### 9.3 Cleaning

- Thorough cleaning of all outer surfaces. Do not use aggressive cleaning agents.
- Interior cleaning is required only in case of accidental use of contaminated lubricant.

### 9.4 Repair

- Repair works may be performed by qualified and authorized personnel only by using original spare parts.
- The change-over pistons and valve pistons are subject to natural wear depending on the operating time and pressure adjustment.
- The pistons have been factory-fitted with precise tolerances and are thus not replaceable. In case of repairs replace the change-over block.

## 10. Troubleshooting

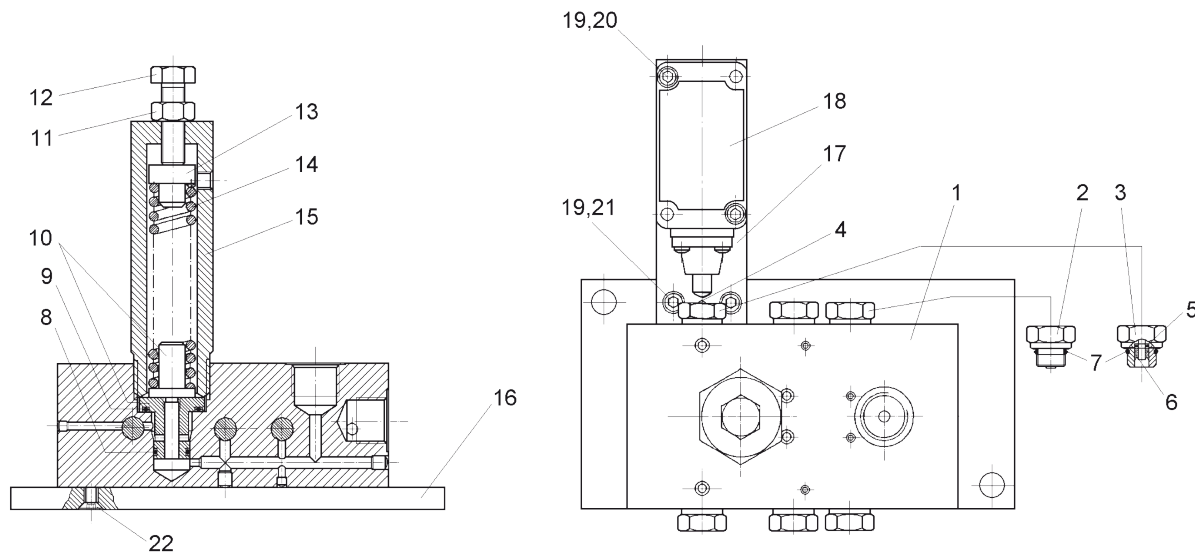
In case of any malfunction, first of all, check whether the pump achieves the full pressure.

Fault	Possible causes of the fault/ identification	Remedy
Change-over device does not change over, no pressurization of the system	<ul style="list-style-type: none"> <li>Worn change-over piston Note: Lubricant is supplied to the pump via the return line connection</li> </ul>	<ul style="list-style-type: none"> <li>Replace change-over device</li> </ul>
Change-over device does not change over, lubricant leaking from safety valve of pump	<ul style="list-style-type: none"> <li>Change-over piston clogged, e. g. by foreign particle</li> </ul>	<ul style="list-style-type: none"> <li>Dismantle and clean change-over device Attention: Do not mix up pistons</li> <li>In case of damages to the piston: Replace change-over device</li> </ul>
No signal of the limit switch to the controller	<ul style="list-style-type: none"> <li>Defective limit switch</li> </ul>	<ul style="list-style-type: none"> <li>Check limit switch and electrical connections, if necessary, replace limit switch</li> </ul>
No signal of the proximity switch to the controller	<ul style="list-style-type: none"> <li>Cable rupture</li> </ul>	<ul style="list-style-type: none"> <li>Check proximity switch and replace, if necessary</li> </ul>
Change-over device switches early or late	<ul style="list-style-type: none"> <li>Adjusted change-over pressure is too low</li> <li>Valve piston or sealing on valve bushing is worn</li> <li>Valve spring is broken</li> </ul>	<ul style="list-style-type: none"> <li>Increase the change-over pressure</li> <li>Replace bushing with valve piston (Item 10 spare parts list)</li> <li>Replace valve spring (Item 14 spare parts list)</li> </ul>
If the fault cannot be determined and remedied, please contact our Customer Service.		

## 11. Spare parts

The spare parts of the DU1 may be used exclusively for replacement of identical defective parts.  
Modifications with spare parts on existing change-over devices are not allowed.

Spare parts Fig. 5



Item	Designation	Qty.	Part number
1	Change-over housing assy with pin (DU1-GK and GKS)	1	517-32043-1
	Change-over housing without pin (DU1-G)	1	517-32044-1
2	Hexagon closure screw G1/4	5	303-19666-1
3	Stop screw	1	417-24361-1
4	Indicator pin	1	301-17341-1
5	Sealing ring 2.8x7x1.5	1	306-17800-1
6	Groove ring 3x7x5x3.5	1	220-12234-1
7	O-ring 10 x 1.5	6	219-12223-3
8	O-ring 12.3 x 2.4	1	219-12451-1
9	O-ring 20.3 x 2.4	1	219-12451-2
10	Bushing with valve piston	1	517-32042-1
11	Hexagon nut M10 C	1	207-12136-1
12	Hexagon screw M10 x 40 C	1	200-12523-3
13	Pressure piece	1	417-21034-2
14	Pressure spring	1	300-17223-1
15	Spring sleeve	1	417-21033-1
16	Base plate	1	307-19631-1
	<b>For change-over device DU1-GKS only:</b>		
17	Bracket	1	307-19630-1
18	Limit switch	1	236-13262-4
19	Hexagon socket head screw M5 x 40 C	2	201-12594-2
20	Washer 5C -200 HV	2	209-13077-3
21	Hexagon socket head screw M5 x 20 C	2	201-12016-8
22	Countersunk screw with hexagon socket M6 x 20 C	4	202-12049-6



**Note**  
Item numbers, see Fig. 5



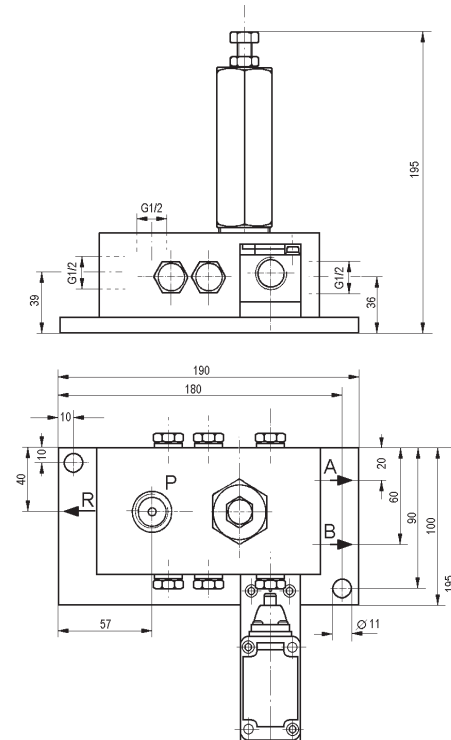
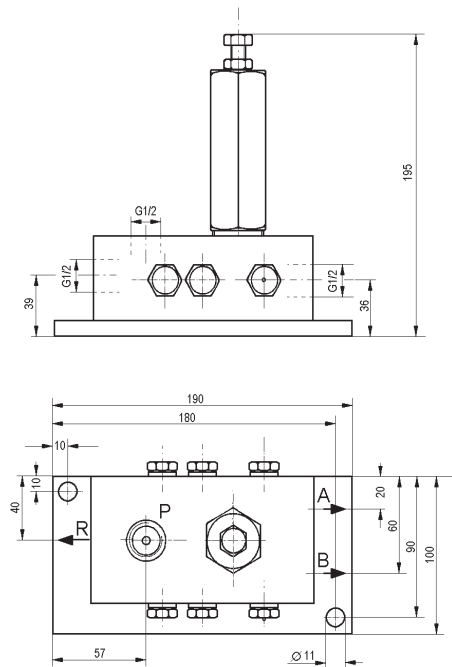
Item	Designation	Qty.	Part number
<b>For change-over device DU1-GKN only:</b>			
23	Proximity switch 10-30 VDC M12 PNP SN = 2 mm	1	234-10812-8
24	Mounting block for sensor M12x1	1	417-73711-1
25	Hexagon socket head screw 8.8 M5 X 45 C	2	201-12017-4

**Note**

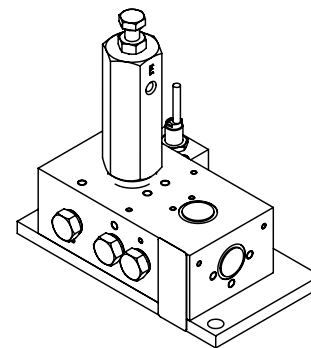
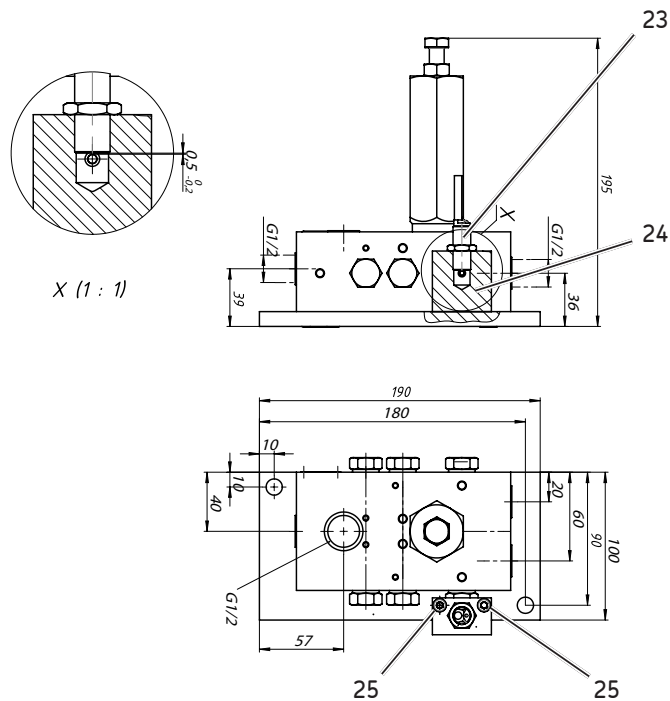
Item numbers, see Fig. 8

## 34

DU1-GKS Fig. 7



DU1-GKN Fig. 8



951-171-011-EN  
2017/11/13  
Version 03

SKF Lubrication Systems Germany GmbH  
Walldorf Facilities  
Heinrich-Hertz-Str. 2-8  
DE - 69190 Walldorf  
Phone: +49 (0) 6227 33-0  
Fax: +49 (0) 6227 33-259  
E-mail: [Lubrication-germany@skf.com](mailto:Lubrication-germany@skf.com)  
[www.skf.com/lubrication](http://www.skf.com/lubrication)

