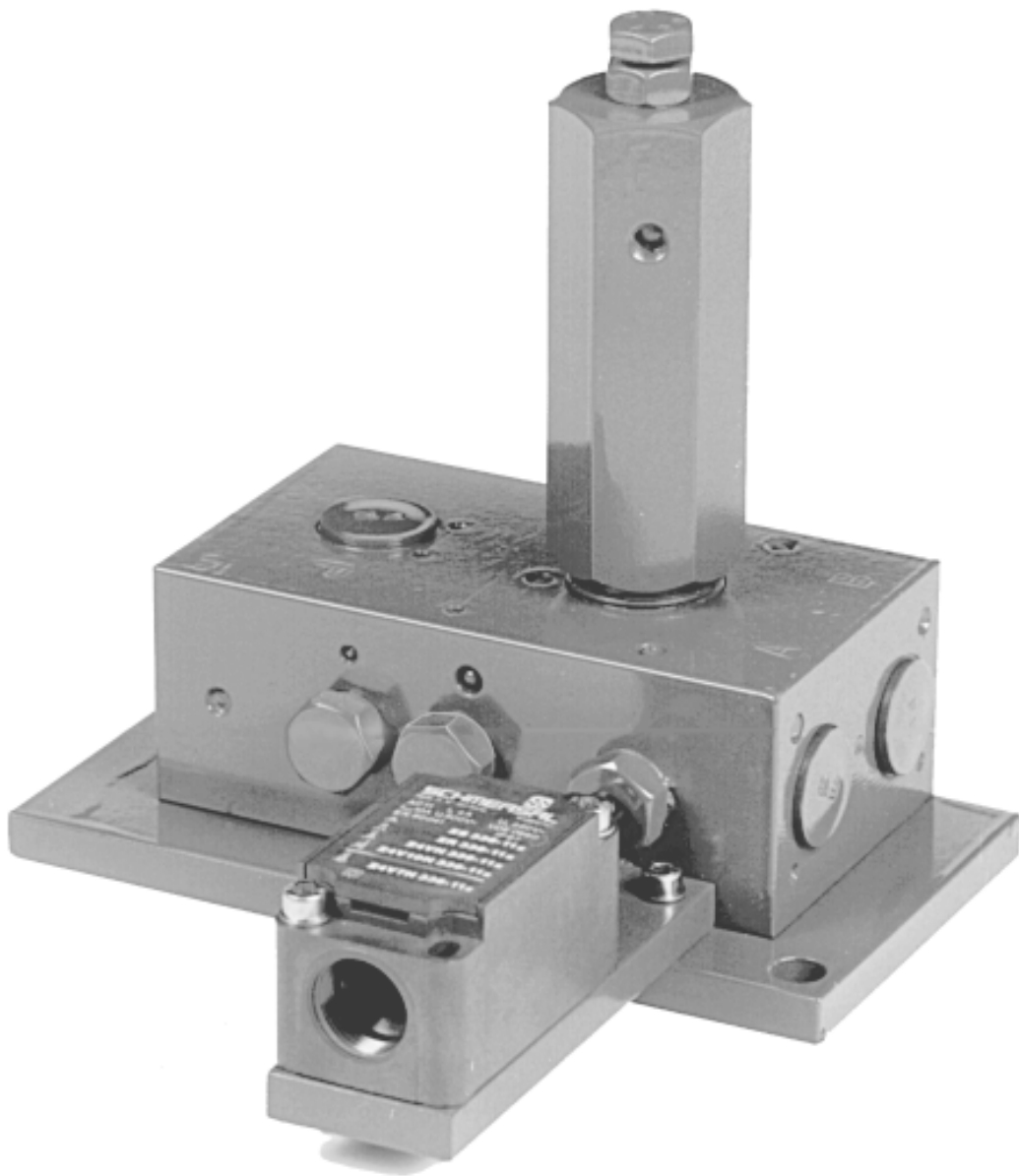


Pressure-Controlled Change-Over Valve Model DU1



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Safety Instructions

The User's Manual as well as the Safety Instructions must be read by the operating and maintenance personnel before any intervention is undertaken at the change-over valve. They must be available on the site where the change-over valve is in operation.

The change-over valve model DU-1 is exclusively designed for use in two-line centralized lubrication systems.

The maximum ratings mentioned in the Technical Data, particularly the operating pressure of 350 bar, must on no account be exceeded.

Any other use is not in accordance with the specified instructions.

The manufacturer is not liable for damages resulting from an improper use.

Alteration or modifications of the change-over valve are only allowed if approved by the manufacturer.

For repairs use only original spare parts. If other spare parts are used, the manufacturer may be released from its liability for the resulting consequences.

The change-over valve should only be used if it is in good technical condition. Defects and faults which may impair its operation and safety must be remedied immediately.

If you need more information than is given in this User's Manual, please contact our company (see address below).

Technical Data

Flow rate: max. 14 dm³/h
 Change-over pressure: min. 140 bar
 max. 350 bar
 Factory setting: 170 bar
 Operating pressure: max. 350 bar
 Threaded connection: G 1/2 i.
 Dispensed media: Lubricating oils
 from 60 cSt on-
 wards at +40°C
 Greases up to
 NLGI-grade 3
 (depending on
 operating tempe-
 rature)

Operating temperature: - 20 ° C to + 80°C
 Mounting position: variable
Position switch:
 Nominal circuit voltage: 500 V, 25-60 Hz
 Continuous current: 10 A
 Operating current: 4 A
 Type of protection: IP 67
 further technical details: refer to Data sheet
 93G-10001-A95

Application

The model DU-1 pressure-controlled change-over valve is designed for use in two-line lubrication systems operating within the above specified pressure range and flow rate. These systems include the central lubrication pumps model ZPU 08/14, ZPU 01/02, HJ 2 and ZPU 75.

For values exceeding the mentioned ranges, one can use the electric motor-operated change-over valve model EM-U2 in conjunction with end-of-line pressure switches.

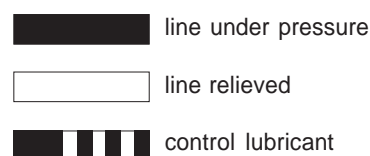
The model DU1 change-over is available in three versions:

Model	Part. No.
DU1-G mounted 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

Structure and Operation

The principle of operation of the change-over valve is similar to that of a 4/2-way valve which alternately discharges the lubricant fed by the pump into one of the two main lines while the other main line is connected to the return line connection of the pump.

The figures 1 and 2 show a schematic illustration of the operation of the DU-1 change-over valve. The lines marked in black represent the pressure lines and the white lines the pressure relief lines.



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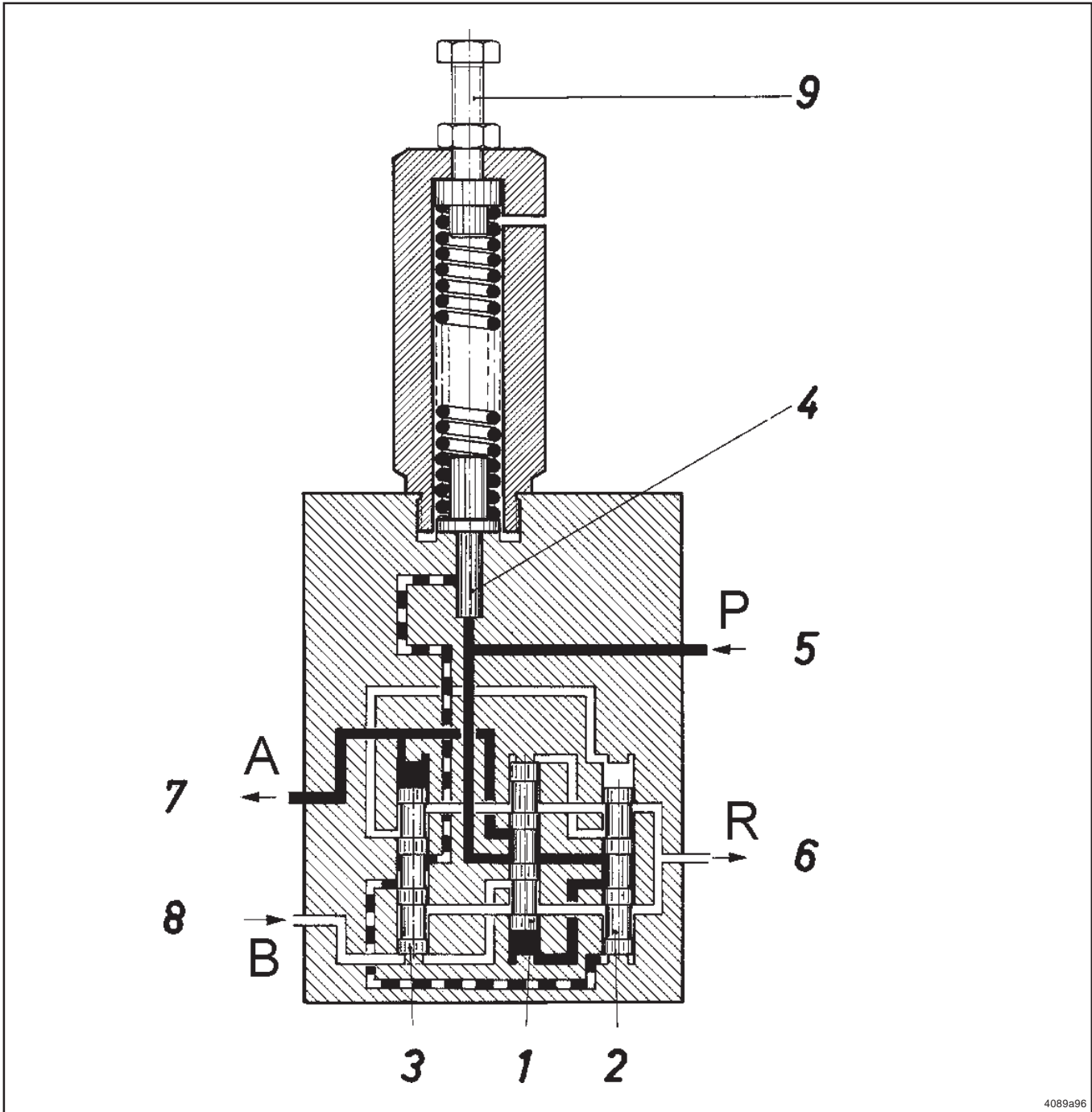


Fig.1: operation of change-over valve DU1

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The central lubrication pump supplies the lubricant to the change-over valve via the pressure line (5). The lubricant travels to the lubricant metering devices via the preselecting piston (2), the change-over piston (1) and the main line (7), while the main line (8) is connected to the reservoir of the central lubrication pump via the pressure relief line (6) and is thus pressureless (see Fig. 1).

The lubricant pressure triggers the pistons of the connected

two-line metering devices and half of the lubrication points are supplied with dosed lubricant quantities. Once all the pistons in the metering devices have reached their final position the pressure increases in the main line (7), in the DU-1 change-over valve and in the pressure line (5) until it overcomes the force of the spring which presses down the valve piston (4). The spring force and thus the change-over pressure can be adjusted by means of the adjusting screw (9).

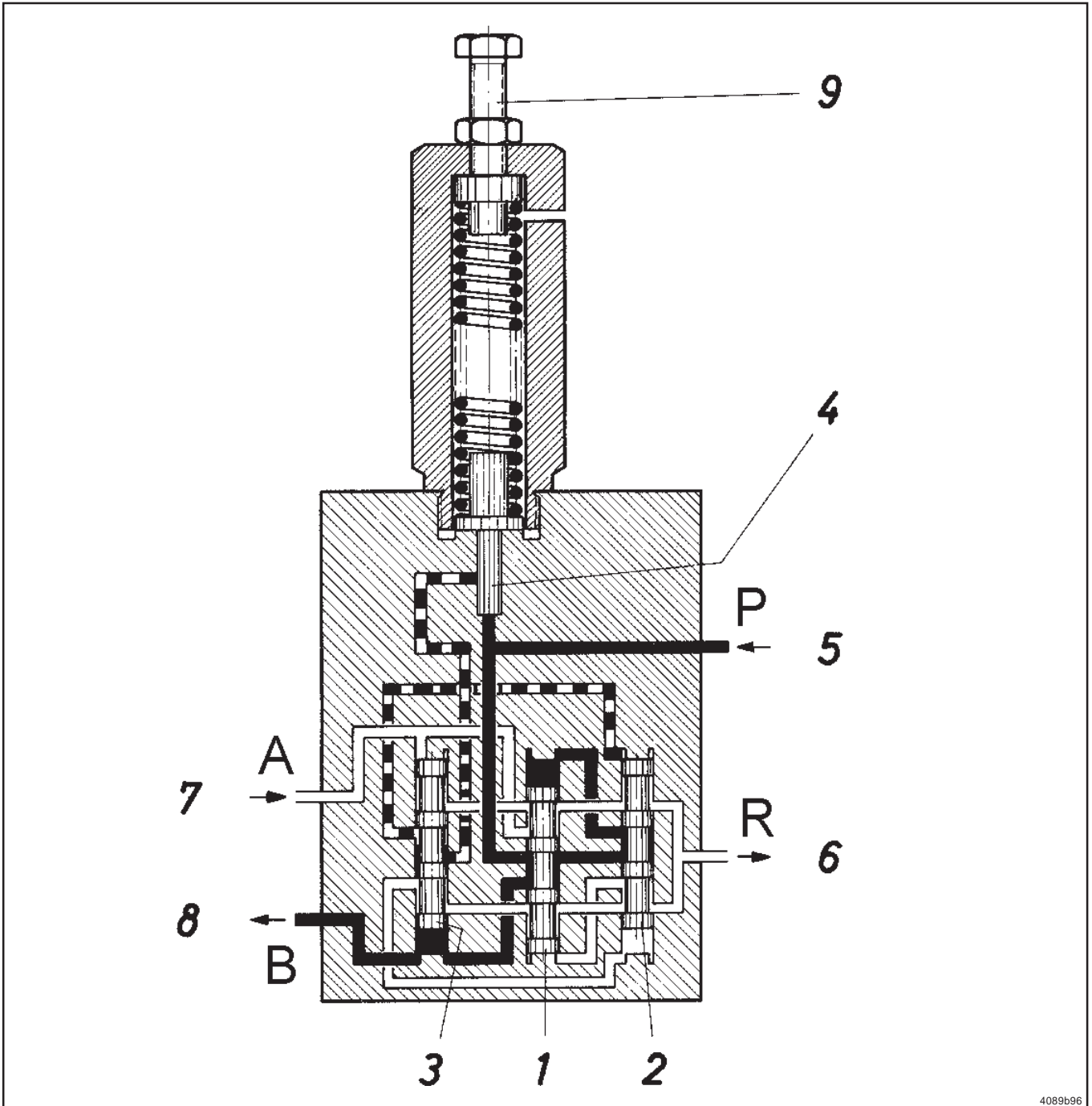


Fig.2: operation of change-over valve DU1

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Now, the valve piston (4) opens the connection between the pressure line (5) and the preselecting piston (2) via the change-over piston (3). The preselecting piston (2) is pushed upwards to make the connection between the pressure line (5) and the upper face of the change-over piston (1). The change-over piston is pushed downwards, thus opening the connection between the pressure line (5) and the main line (8),

while the main line (7) is simultaneously connected to the reservoir of the central lubrication pump via the pressure relief line (6). The lubricant in the main line (7) can be relieved. The pressure rising in the main line (8) pushes up the change-over piston (3)(Fig. 2). The process described above is repeated for the main line (8).

Electric Equipement

Position switch:

technical details refer to leaflet 93A-10001-A95

Mounting position: Variable

The tube line between the pump and the change-over valve should be at least 2 m

Installation of the change-over valve

Installation site requirements

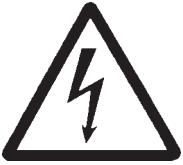
- Even, solid and vibration-free surface of installation
- Protected from dust and dirt
- Safe from atmospheric influences

Electric Connection

Before connecting the change-over valve, disconnect the system from the power supply.

Electric connection of the position switch

- In accordance with the electric wiring diagram



The installation and connection of electric devices should be carried out only by qualified personnel!

Observe the relevant technical aspects and the respective legislation relative to industrial protection regulations (instructions, standards).

Operating Instructions

Start-up

After the tube lines have been connected the change-over valve is ready for operation.

Maintenance and Repair

Before undertaking any repair on the change-over valve, observe the following instructions:



1. Disconnect the system from the power supply, switch the pump drive motor off and make sure that it cannot be restarted in advertently.
2. Disconnect the tube fittings of the change-over valve in order to reduce the pump and system pressure to zero (read the pressure gauge).
Caution: Danger due to splashing lubricant.

Repairs should be carried out only by qualified personnel using original spare parts.

Provided that the pump dispenses only clean lubricant, the change-over valve does not need any particular maintenance. The change-over pistons and valve pistons are subject to a natural wear which depends on the operating time and adjusted pressure.

The pistons are fitted with high precision and, therefore, they are not replaceable. In case of repairs the complete change-over valve housing must be replaced.

Setting

Setting of the change-over pressure:

Factory setting: 170 bar

To increase the change-over pressure (refer to the Spare Parts List, items 11 and 12):

- Unscrew the counter nut.
- Turn the adjusting screw clockwise until the desired pressure is reached (max. 350 bar)
- Tighten the counter nut in order to maintain the new setting.

To decrease the change-over pressure:

- Unscrew the counter nut.
- Turn the adjusting screw counterclockwise until the desired pressure is reached (min. 140 bar)
- Tighten the counter nut in order to maintain the new setting.



Attention: The change-over pressure should not be higher than the maximum system pressure.

Note: The change-over pressure must always be higher than the actuating pressure of the two-line metering devices. In order to have a safety margin, set the change-over pressure in such a way that it is 30 bar higher than the actuating pressure of the last metering device installed in the system.

Troubleshooting

For all defects, first check whether the pump is operating with the full pressure.

• Fault: The change-over valve does not switch over - No pressure rise in the system	
• Cause	• Remedy
<ul style="list-style-type: none"> • Change-over piston worn <p><i>Note: The lubricant is supplied to the pump via the return line connection.</i></p>	<ul style="list-style-type: none"> • piston worn
• Fault: The change-over valve does not switch over - Lubricant leaks at the pump safety valve	
• Cause	• Remedy
<ul style="list-style-type: none"> • Change-over piston blocked by foreign particles 	<ul style="list-style-type: none"> • Disassemble the change-over valve and clean it. Attention: Do not interchange the pistons. If there is any damage to the piston replace the complete change-over valve.
• Fault: No signal of the position switch is transmitted to the electric control unit	
• Cause	• Remedy
<ul style="list-style-type: none"> • Position switch defective 	<ul style="list-style-type: none"> • Check the position switch and the electric connections, replace the switch
• Fault: The change-over valve switches over prematurely or too quickly	
• Cause	• Remedy
<ul style="list-style-type: none"> • Adjusted change-over pressure too low • Valve piston or packing of valve bushing worn • Valve spring broken 	<ul style="list-style-type: none"> • Increase the change-over pressure • Replace the bushing with the valve piston (Item 9 Spare Parts List) • Replace the valve spring (Item 13 Spare Parts List)

Dimensioned drawing

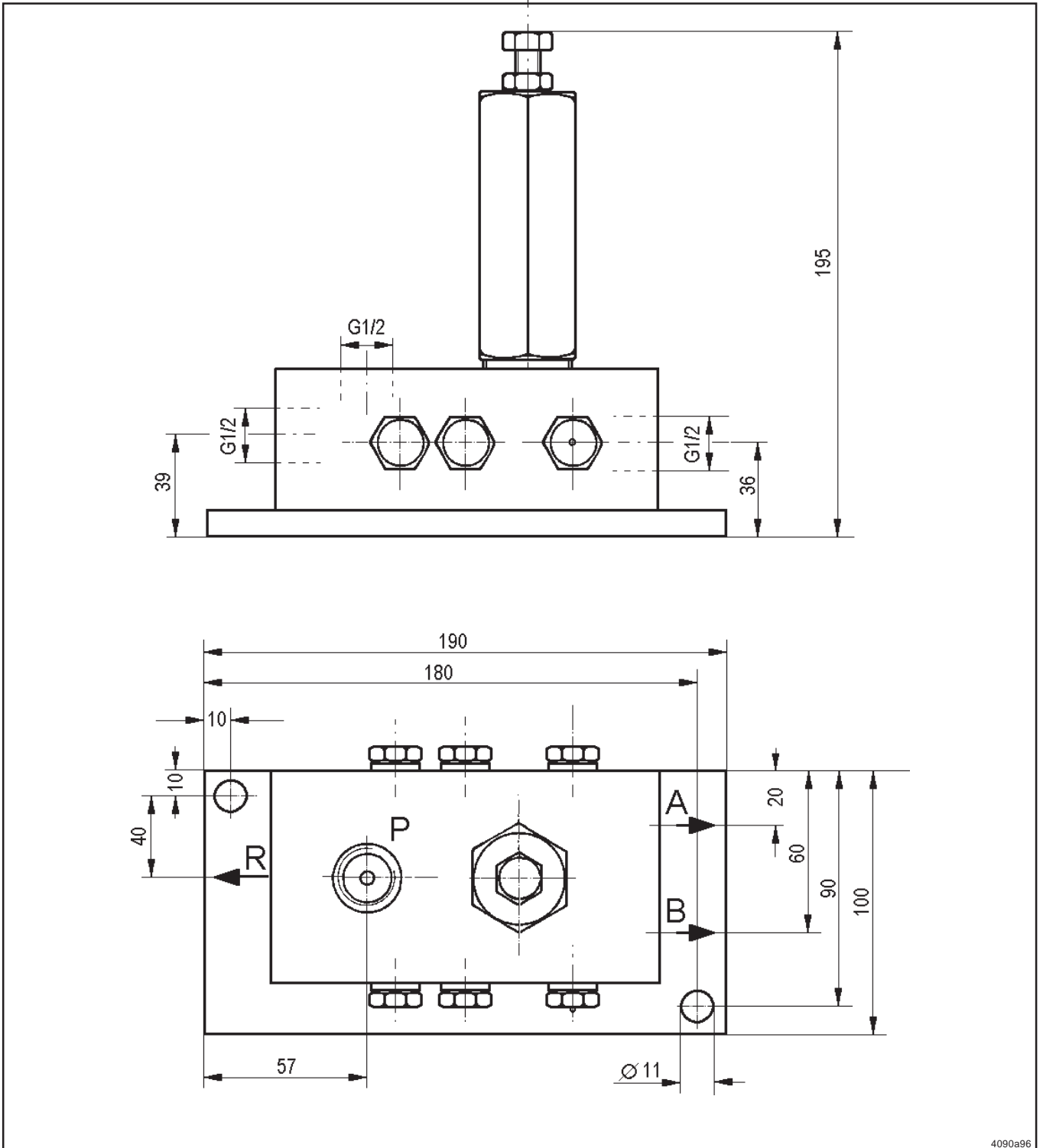


Fig.3: Model DU1-GK (p.no.615-28619-1) change-over valve with indicator pin, mounted on base plate

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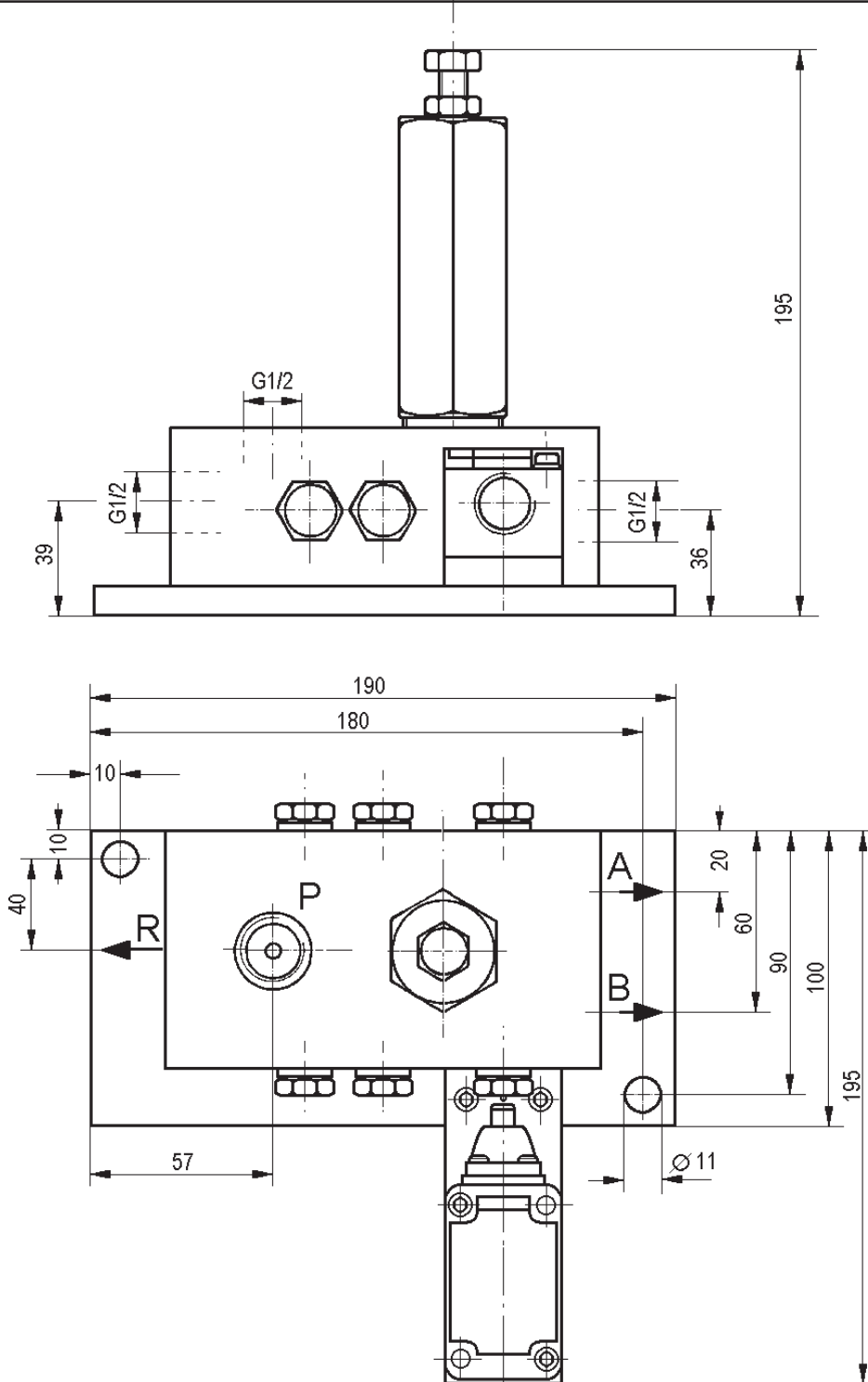


Fig.4: Model DU1-GKS (p.no.617-28620-1) change-over valve with position switch, mounted on base plate

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Spare Parts Drawing

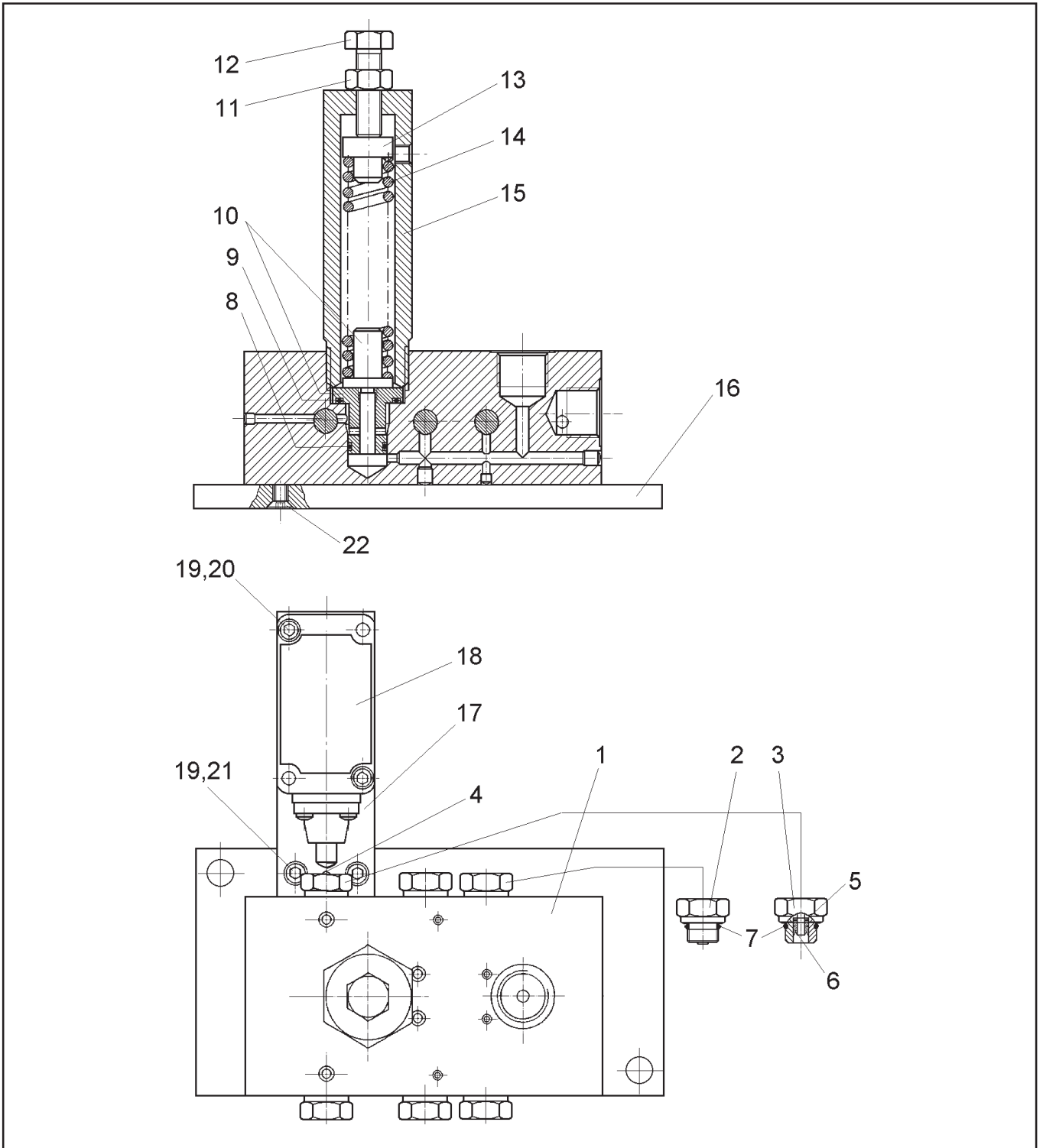


Fig.5: Spare parts drawing

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Spare Parts List

Item.	Designation	Qty.	Part-no..
1	Change-over valve housing assy. with pin (DU1-GK and GKS)	1	517-32043-1
	Change-over valve housing without pin (DU1-G)	1	517-32044-1
2	Closure plug with borehole 6kt G1/4	5	303-19666-1
3	Closure plug without borehole	1	417-24361-1
4	Indicator pin	1	301-17341-1
5	Sealing ring 2,8x7x1,5	1	306-17800-1
6	U-cup sealing 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 M 10 C	1	207-12136-1
12	Hexagon head screw M 10 x 35 C1		200-12008-6
13	Thrust piece	1	417-21034-2
14	Compression spring	1	300-17223-1
15	Spring sleeve	1	417-21033-1
16	Base plate	1	307-19631-1
	only for valid change-over valve model DU1-GKS:		
17	Bracket	1	307-19630-1
18	Position switch	1	236-13262-4
19	Hexagon socket head screw M 5 x 40 C	2	201-12594-2
20	Washer A 5,3 C	2	209-13077-3
21	Hexagon socket head screw M 5 x 20 C	2	201-12016-8
22	Flat head screw with hexagon socket M 6 x 20 C	4	202-12049-6