

## APPLICATION

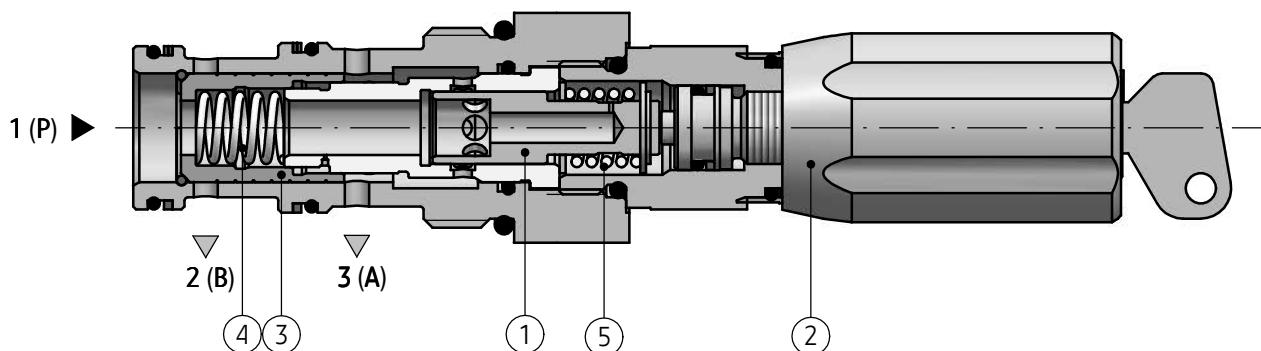
3-way flow control valve type **UDUD10...** is used to adjust the fluid flow rate irrespective of pressure on the supply (pump) in a hydraulic system. It allows to control the velocity of the actuator movement – mostly of the piston rod or hydraulic motor. The inlet fluid (port **1**) is divided into two fluid streams: main fluid stream directed to port **3** and the remaining (residual) fluid stream directed via port **2** to the drain or to the supply of to the other actuator.

The flow control valve type **UDUD10...** is designed for mounting in connections in hydraulic manifold blocks in any desired working position.



## DESCRIPTION OF OPERATION

UDUD10 - 02/90 - 3 M1



The 3-way flow control valve is used to divide the inlet fluid (port **1**) into main fluid directed to port **3** and into remaining (residual) fluid (port **2**).

The 3-way flow control valve type **UDUD10...** is composed of two valves working together: throttle valve and differential valve and throttle valve.

The throttle valve is used for measurement and consists of a throttle (1) made as a spool with suitable holes and an adjustment (2). The spring (5) allows for return of the throttle (1) when the setting of the flow control valve is decreased.

The differential valve is used as a control valve and consists of a spool (3) and a spring (4).

Hydraulic fluid passing through the valve from port **1** to port **3** causes the pressure drop at the throttle (1) that depends on the setting and the current flow rate via the throttle (1). The pressure difference before and behind the throttle (1) affects the spool (3). After the initial spring tension (4) is overcome, the pressure difference affects opening the port **1** to port **2**, and thus the remaining (residual) fluid can flow.

The spool (3) is held in the equilibrium position when the pressure drop at the measurement throttle (1) corresponds to the initial spring tension (spring pre-tension) (4).

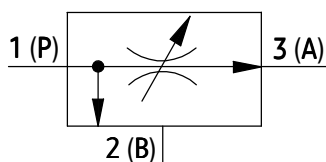
Therefore, the rate of fluid flow passing through the port **3** is constant irrespective of the pressure on the supply (port **1**) and depends only on the position of the adjustment of flow control valve (2).

## TECHNICAL DATA

Hydraulic fluid	mineral oil		
<b>Required filtration</b>	<b>up to 16 μm</b>		
Recommended filtration	up to 10 μm		
Nominal fluid viscosity	37 mm <sup>2</sup> /s at temperature 55 °C		
Viscosity range	2,8 up to 380 mm <sup>2</sup> /s		
Fluid temperature range (in a tank)	recommended	40 °C do 55 °C	
	max	-20 °C do +70 °C	
Ambient temperature range	- 20 °C do +70 °C		
<b>Maximum operating pressure</b>	<b>31,5 MPa</b>		
<b>Minimum operating pressure</b>	1,8 MPa		
<b>Maximum flow rate</b>	<b>version</b>	<b>flow rate in port 1 (P)</b>	<b>flow rate in port 3 (A)</b>
	UDUD10.../25...	60 dm <sup>3</sup> /min	25 dm <sup>3</sup> /min
	UDUD10.../50...	90 dm <sup>3</sup> /min	50 dm <sup>3</sup> /min
	UDUD10.../90...	150 dm <sup>3</sup> /min	90 dm <sup>3</sup> /min
Weight	0,7 kg		

## SCHEMES

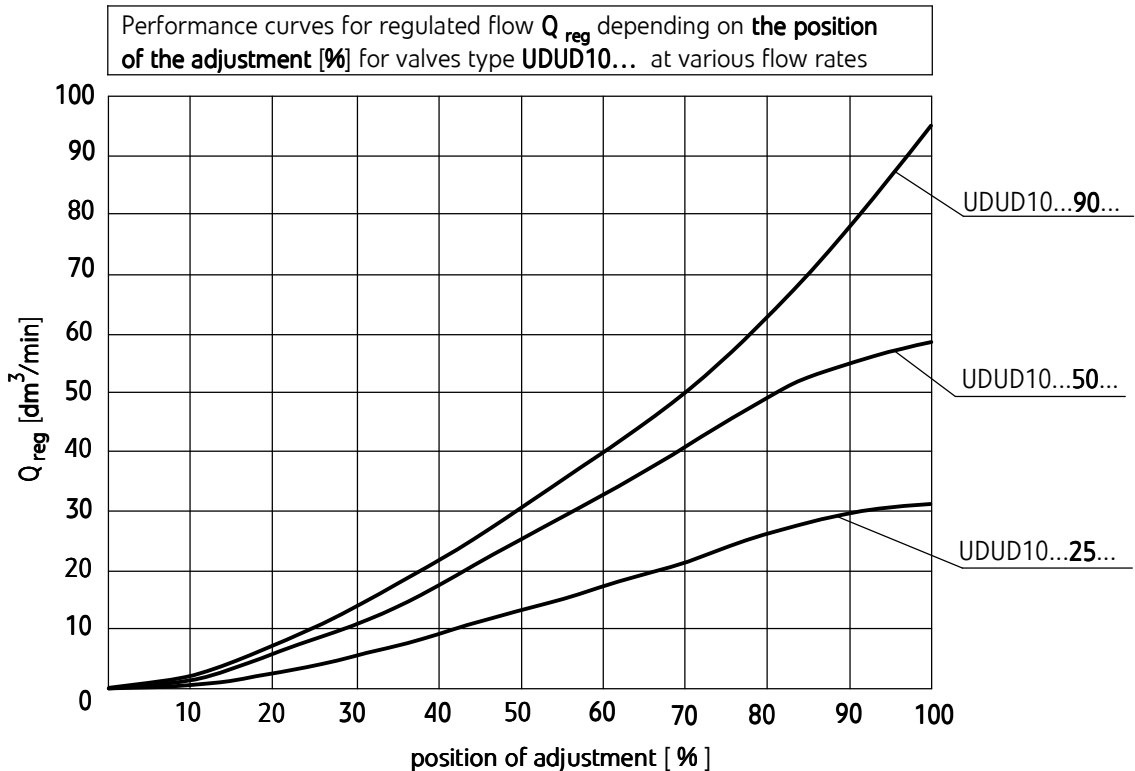
Graphical symbol of flow control valve type UDUD10...



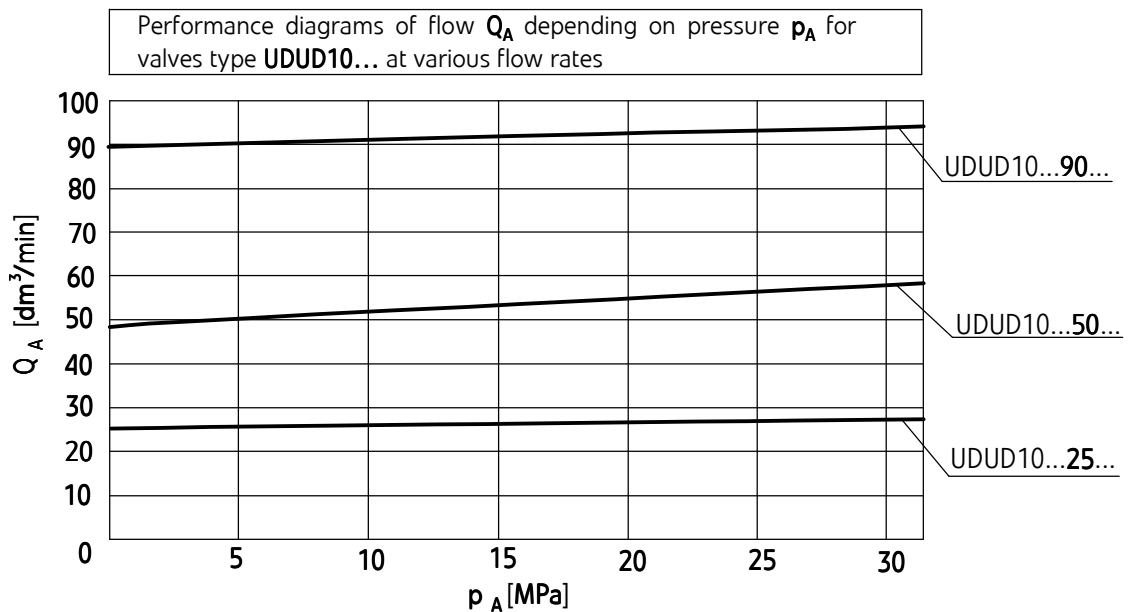
## PERFORMANCE CURVES

measured at viscosity  $\nu = 41 \text{ mm}^2/\text{s}$  and temperature  $t = 50^\circ\text{C}$

Performance curves for flow rate depending on the indication on adjustment scale

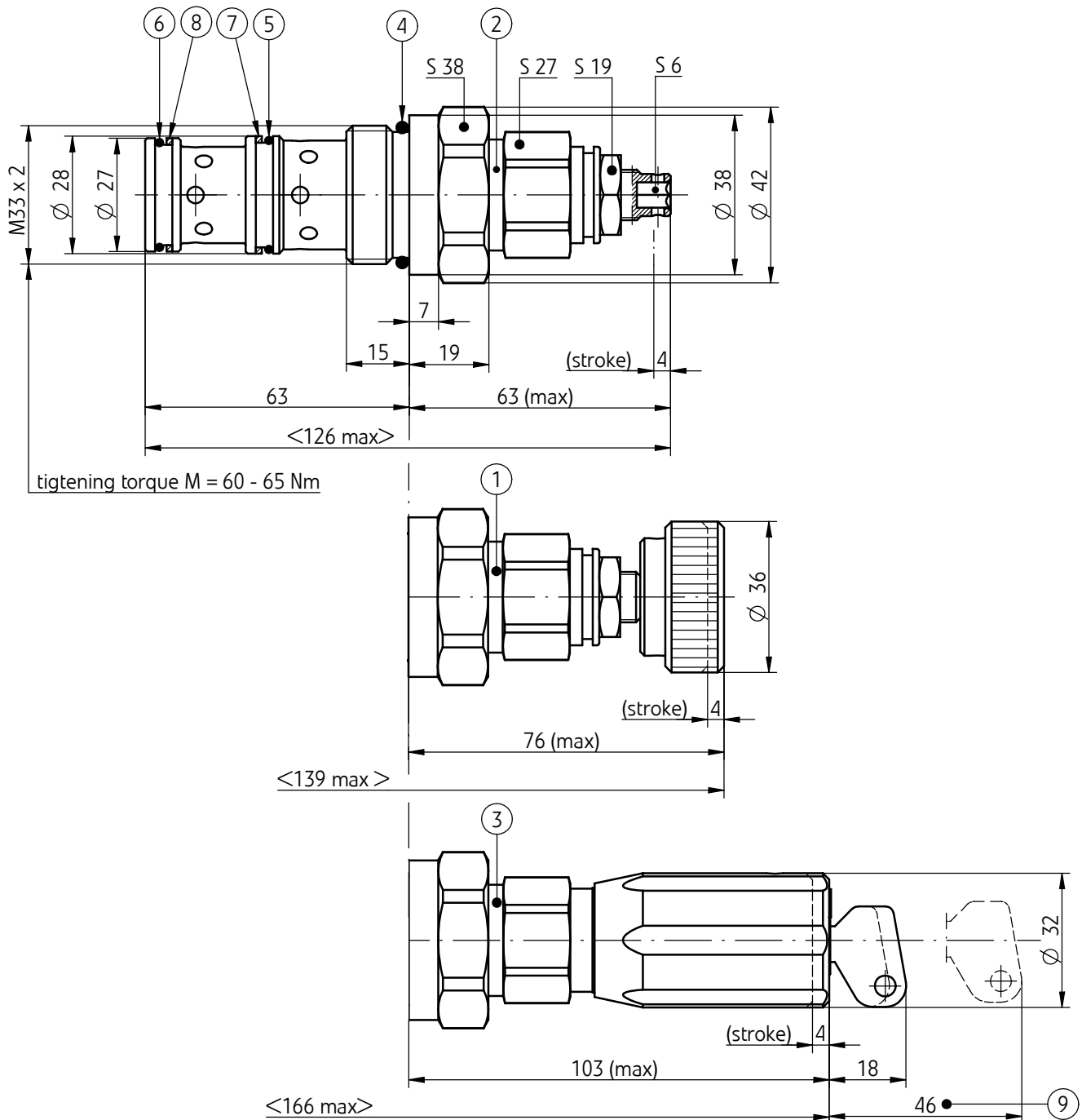


Performance diagrams of stable flow rate




## OVERALL AND CONNECTION DIMENSIONS

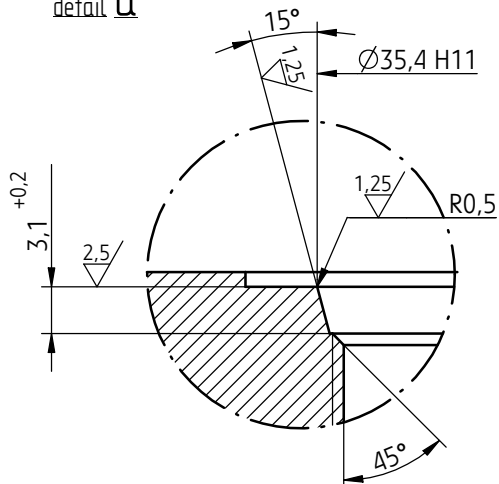
version UDUD10...M1...



- 1 - Adjustment 1 (rotary knob)
- 2 - Adjustment 2 (hexagon set screw)
- 3 - Adjustment 3 (lockable rotary knob)
- 4 - O-ring 29,2 x 3
- 5 - O-ring 24 x 2
- 6 - O-ring 23 x 2
- 7 - Retaining ring 28 x 25 x 1,4
- 8 - Retaining ring 27 x 24 x 1,4
- 9 - Distance for removing the key from lock of adjustment 3

version UDUD10...M1...  
cavity M33 x 2 (size M-10-3)

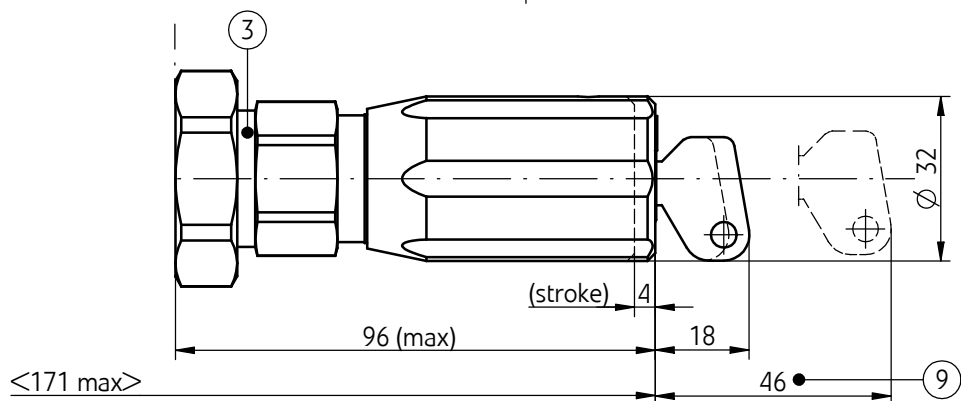
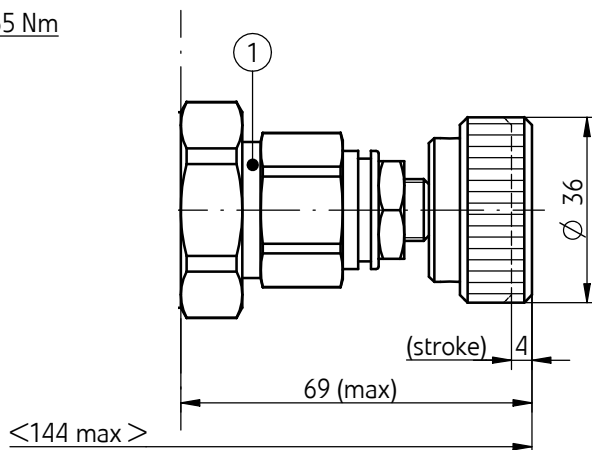
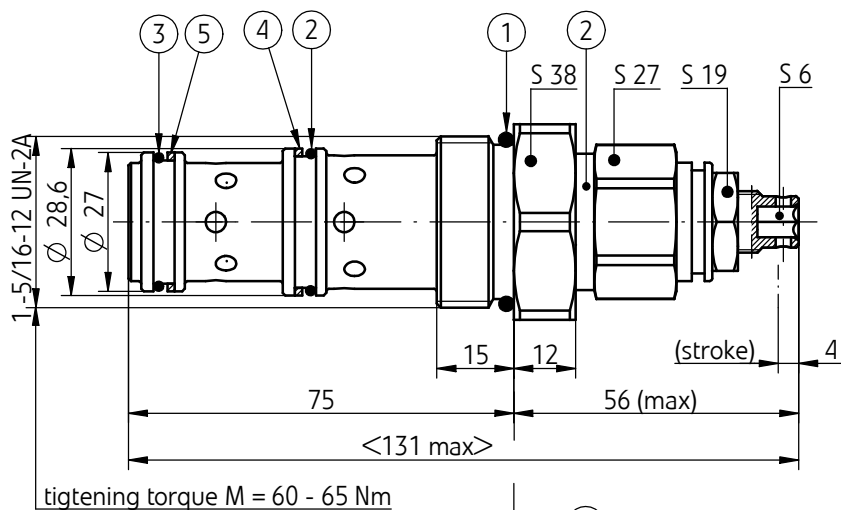
  $\phi$  0,025 - applied to all diameters of main hole and bevels



(\*) - Max depth hole according to overall dimensions of the valve.

## OVERALL AND CONNECTION DIMENSIONS

version UDUD10...U1...



- 1 - Adjustment 1 (rotary knob)
- 2 - Adjustment 2 (hexagon set screw)
- 3 - Adjustment 3 (lockable rotary knob)
- 4 - O-ring 29,2 x 3
- 5 - O-ring 24 x 2
- 6 - O-ring 23 x 2
- 7 - Retaining ring 28,6 x 25,6 x 1,4
- 8 - Retaining ring 27 x 24 x 1,4
- 9 - Distance for removing the key from lock of adjustment 3

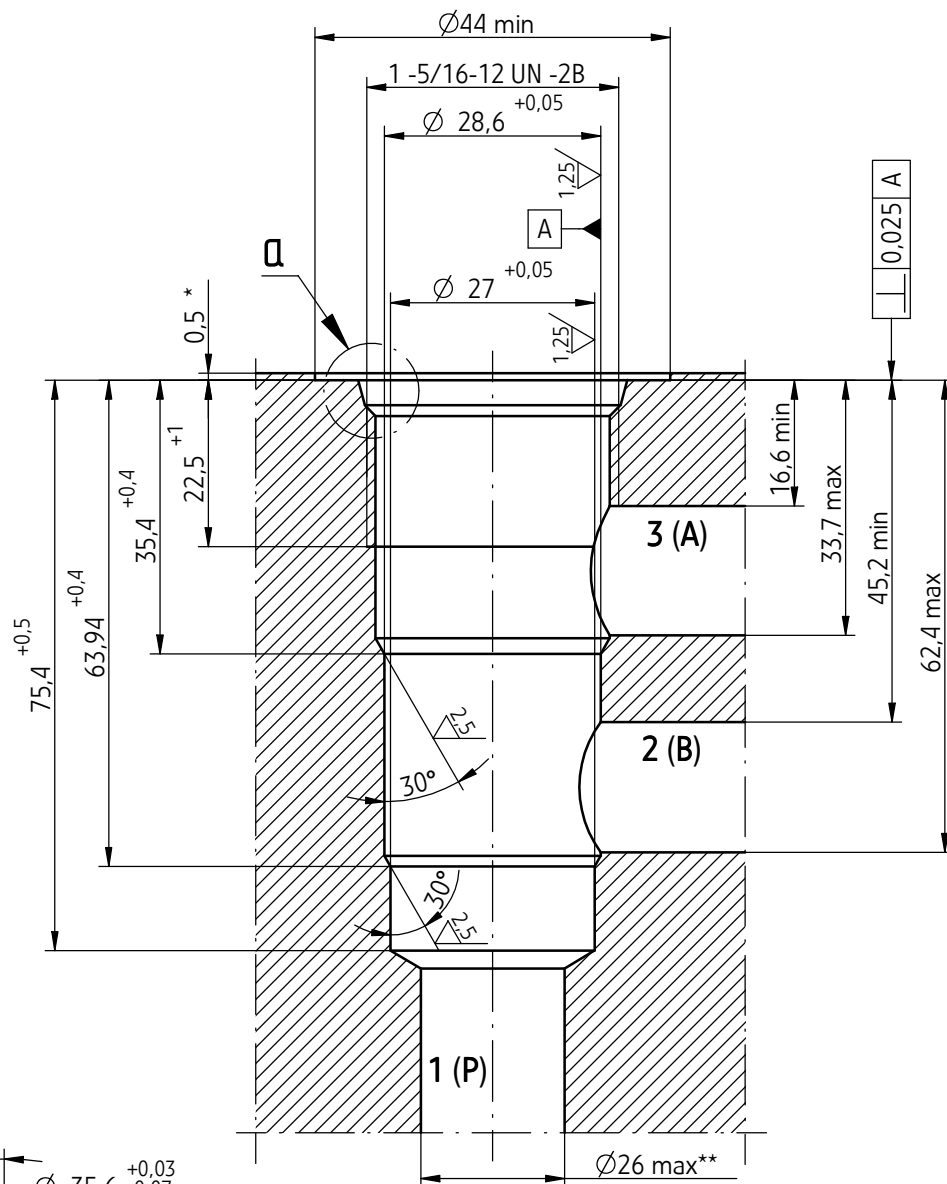
# OVERALL AND CONNECTION DIMENSIONS

version UDUD10...U1...

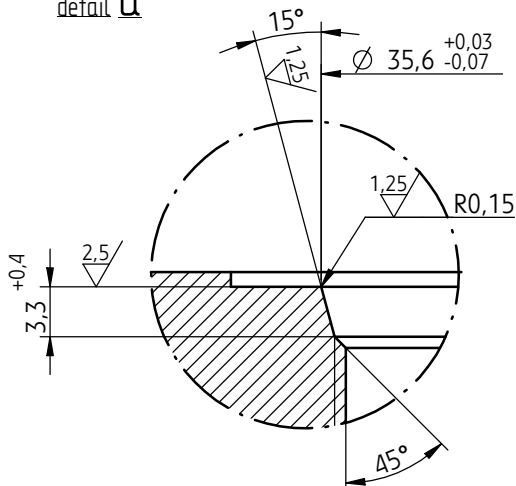
cavity 1- 5/16-12 UN -2B (size U-10 -3)

tightening torque **M = 60 - 65 Nm**

$\odot \phi 0,025$  - applied to all diameters of main hole and bevels



detail Q



## NOTES:

(\*) - Max depth hole according to overall dimensions of the valve.

(\*\*) - Diameter of ports: 1 (P), 2 (B), 3 (A) located in the given range of limit dimensions- min  $\phi 13$ .

## HOW TO ORDER

<b>UDUD</b>		<b>10</b>	+	/	+				★
<b>Nominal size (NS)</b>									
<b>NS10</b>		<b>= 10</b>							
<b>Series number</b>									
(00-09) - connection and installation dimensions									
unchanged		<b>= 0X</b>							
<b>series 02</b>		<b>= 02</b>							
<b>Flow range</b>									
<b>up to 25 dm<sup>3</sup>/min</b>		<b>= 25</b>							
<b>up to 50 dm<sup>3</sup>/min</b>		<b>= 50</b>							
<b>up to 90 dm<sup>3</sup>/min</b>		<b>= 90</b>							
<b>Adjustment element</b>									
rotary knob		<b>= 1</b>							
<b>hexagon set screw</b>		<b>= 2</b>							
lockable rotary knob		<b>= 3</b>							
<b>Type of connection</b>									
<b>cavity M33 x 2</b>		<b>= M1</b>							
cavity 1 -5/16 -12 UN -2B		<b>= U1</b>							
<b>Sealing</b>									
<b>NBR</b> (for fluids on mineral oil base)		<b>= no designation</b>							
FKM (for fluids on phosphate ester base)		<b>= V</b>							
Further requirements in clear text (to be agreed with the manufacturer)									

### NOTES:

Flow control valve should be ordered according to the above coding.

The symbols in bold are preferred versions in short delivery time.

Coding example: UDUD10 - 02/90 – 2 M1

### PLATES

The plates - available only for version UDUD10.../...M1...

should be ordered according to the following data sheets:

WK 217 558 - plate 3UL10/4

(3 threaded connections G 3/4)

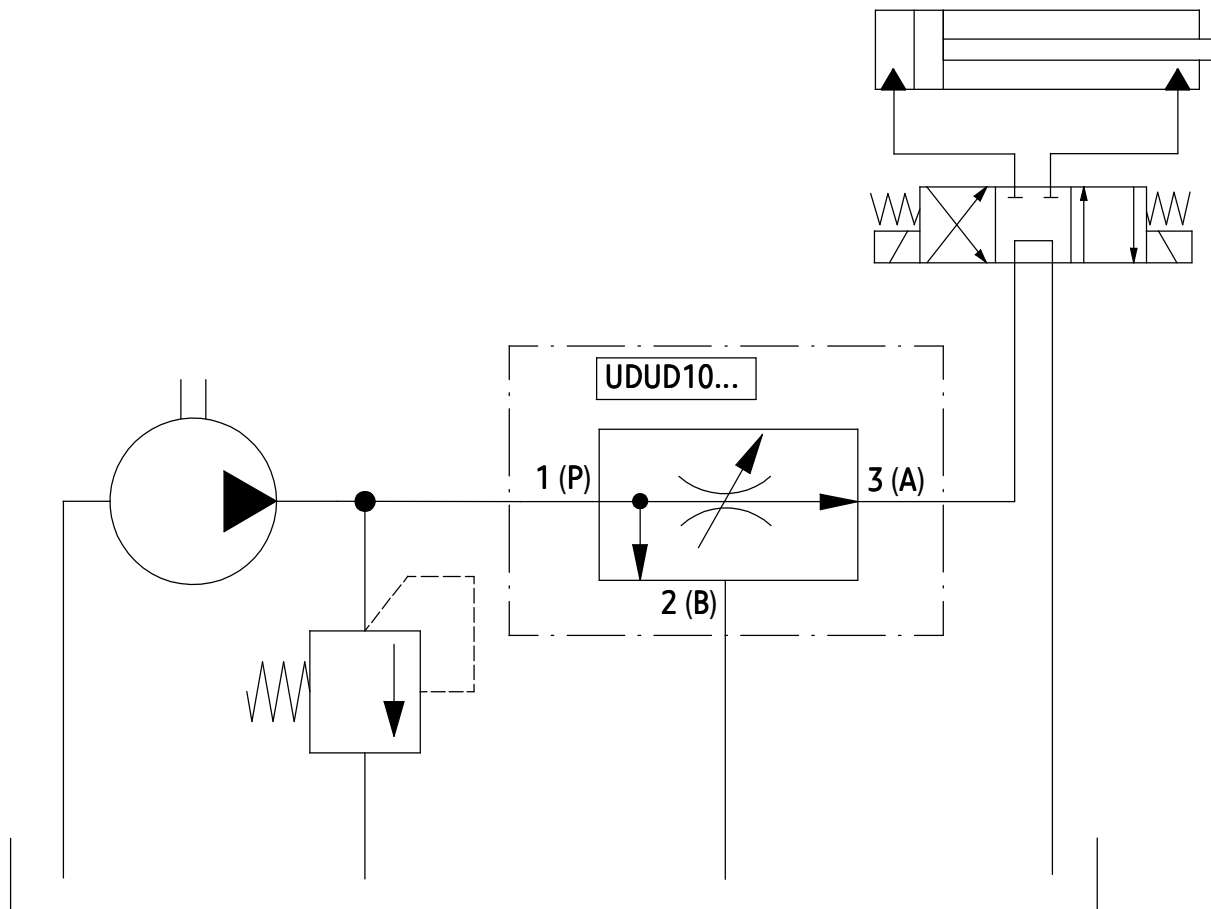
WK 217 559 - plate 3UL10/5

(4 threaded connections G 3/4)

Above plates must be ordered separately.



## EXAMPLE OF APPLICATION IN A HYDRAULIC SYSTEM



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