## DATA SHEET - OPERATION MANUAL

APPLICATION

Pressure reducing - relief valve, pilot operated, cartridge type **UZCS10**… is intended for hydraulic systems where reducing of pressure in one leg is required. Additionally it enables discharge of sudden strokes of the pressure on the reduced part, by opening of the flow to the tank.

DESCRIPTION OF OPERATION

Valve **UZCS10**… type is a pressure reducing - relief, pilot operated valve. Inside the valve there is: main step - sleeve (1), spool (2), spring (4), and the initial step - seat (5), poppet (6), spring (7), pressure setting (8). Adjusted pressure acts on the spool of main valve (2) from the side of line **1** (**A**), and through the nozzle (3) also from the spring side (4), and also through the nozzle in the seat (5) on the cone of the pilot valve (6). At standstill the pressure on both sides of the main spool (2) is equal. The spring (5) holds the spool in the starting position. Lines **1** (**A**) and **2** (**P**) are connected. Lines **1** (**A**) and **3** (**T**) are separated. If pressure in the line **1** (**A**) reaches the value set by spring tension (7) the pilot valve opens letting the oil flow through the nozzle (3) and nozzle in the seat (5). On the nozzle (3) there appears a force from differential pressure, which by acting on the spool (2) defeats the initial tension force of the spring (4). As a result the main spool (2) moves and closes the connection of lines **1** (**A**) and **2** (**P**). When the pressure in the line **1** (**A**) rises above the pressure setting the spool (2) moves further and opens the way from line **1** (**A**) to the line **3** (**T**) what allows excess oil to be drained from line **1** (**A**) to the tank.
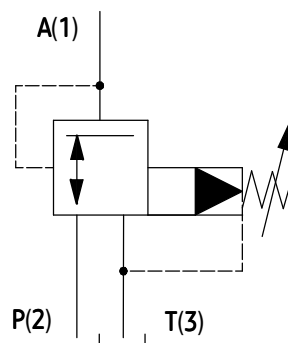
UZCS10/02-200-2M1
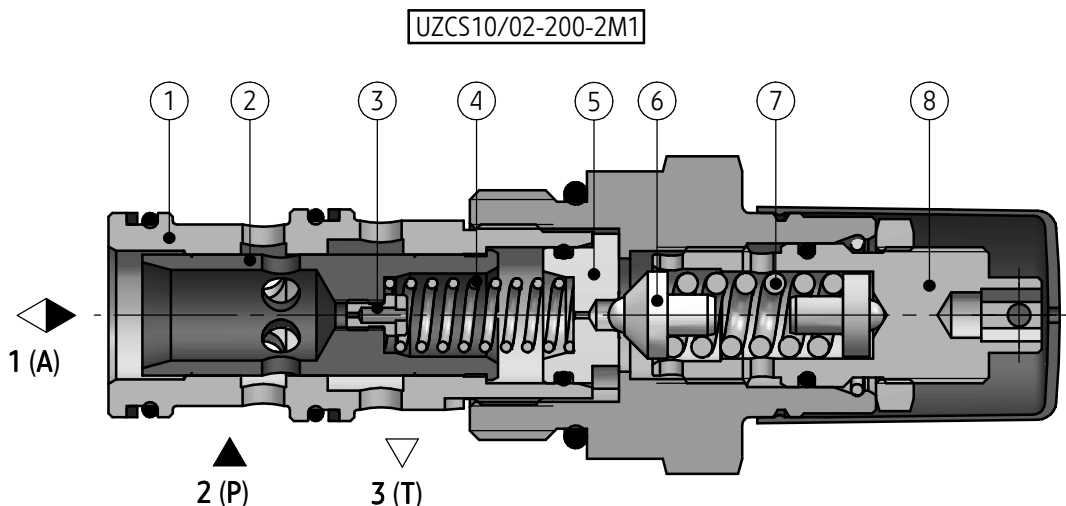
TECHNICAL DATA

Hydraulic fluid	mineral oil			
Required fluid cleanliness class	**ISO 4406**; class **20/18/15**			
Nominal fluid viscosity	37 mm ^{2}/s at temperature 55 $^{\circ}$C			
Viscosity range	2,8 up to 380 mm ^{2}/s			
Fluid temperature range (in a tank)	recommended	40 $^{\circ}$C up to 55 $^{\circ}$C		
	max	-20 $^{\circ}$C up to +70 $^{\circ}$C		
Ambient temperature range	-20 $^{\circ}$C up to +70 $^{\circ}$C			
Pressure setting ranges	5 MPa	10 MPa	20 MPa	35MPa
Max operating pressure	**35 MPa**			
Max flow rate	**120 dm^3/min**			
Weight	0,6 kg			

INSTALLATION AND OPERATION REQUIREMENTS

1. Only fully functional and operational valve must be used.
2. During the period of operation must be kept fluid viscosity acc. to requirements defined in this Data Sheet - Operation Manual
3. In order to ensure failure free and safe operation the following must be checked:
   • proper working of the valve
   • cleanliness of the hydraulic fluid
4. Due to heating of valve body to high temp., the valve shall be placed in such way to eliminate the risk of accidental contact with the valve body during operation or to apply suitable covers acc. to PN - EN ISO 13732 - 1 and PN - EN 4413
5. In order to provide tightness of the valve connection to the hydraulic system, one should keep the dimensions of the sealing rings, tightening torques and work parameters of the valve, specified in this Data Sheet - Operation Manual.
6. A person that operates the valve must be thoroughly familiar with this Data Sheet - Operation Manual.

DIAGRAMS

Graphic symbol of the **UZCS10**... valve

PERFORMANCE CURVES

measured at viscosity $\nu = 41 \text{ mm}^2/\text{s}$ and temperature $t = 50^{\circ}\text{C}$
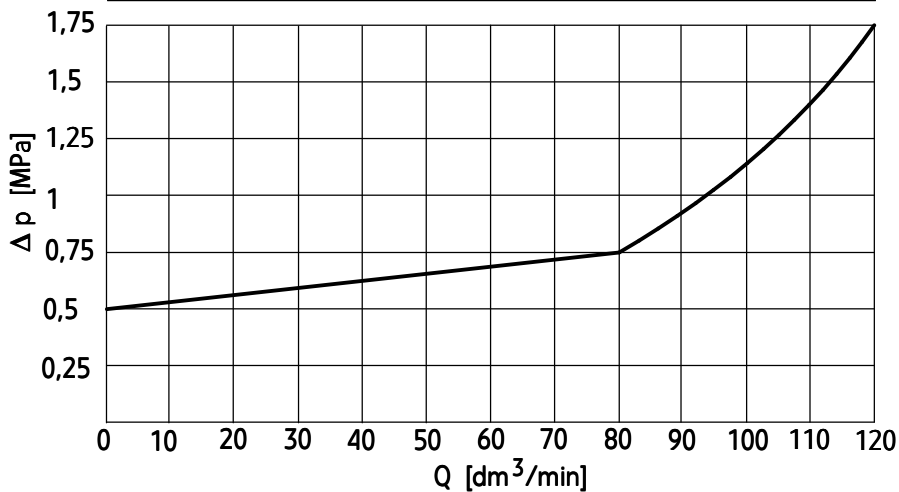
Characteristic curves of outlet pressure in relation to flow rate

characteristic curves of operating pressure in relation to flow rate p - Q for nominal presssure settings; flow direction:	
flow direction **1 (A)** $\rightarrow$ **3 (T)** (relief function)	flow direction **2 (P)** $\rightarrow$ **1 (A)** (reducing function)

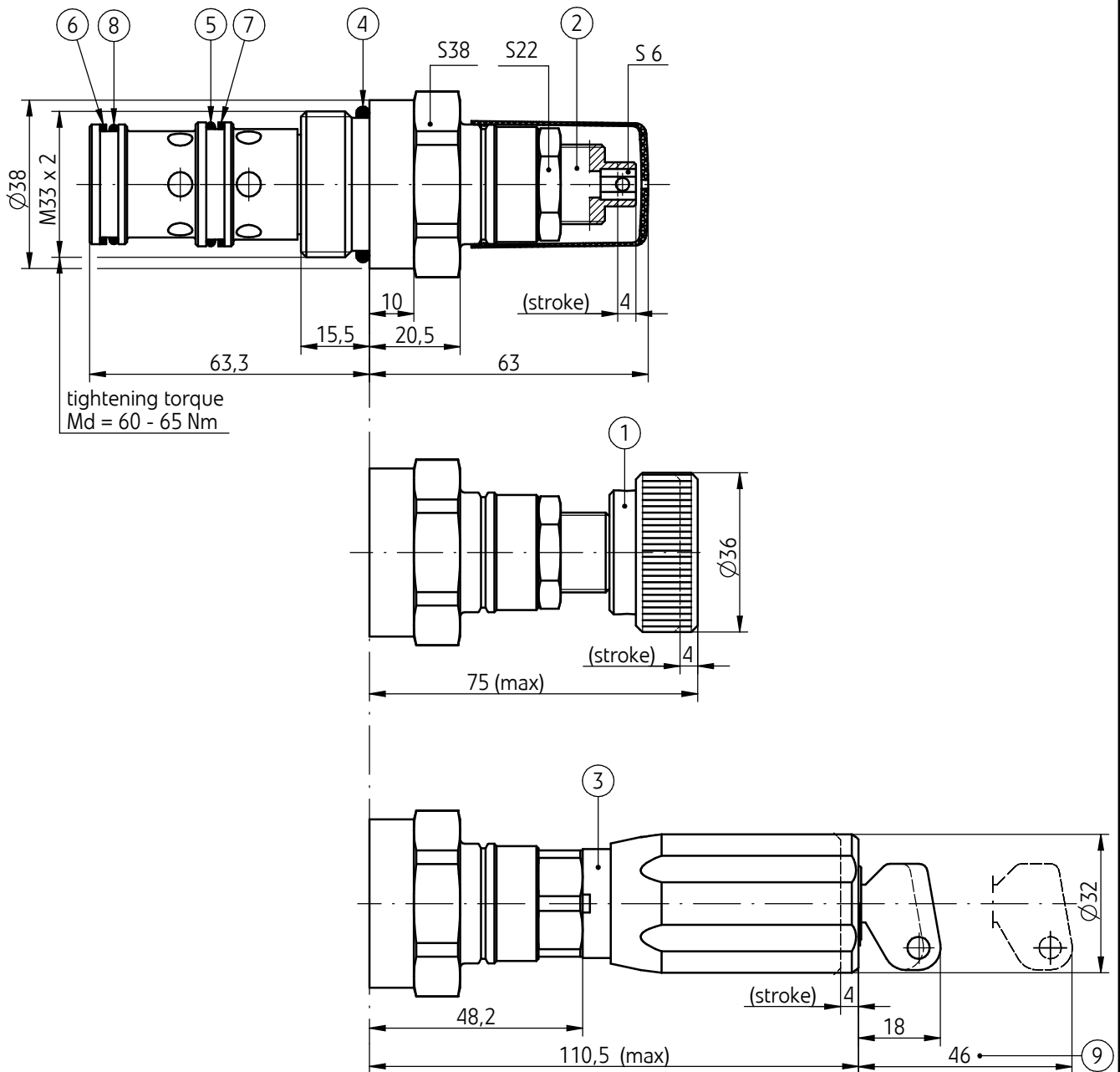p [MPa] vs Q [dm³/min]
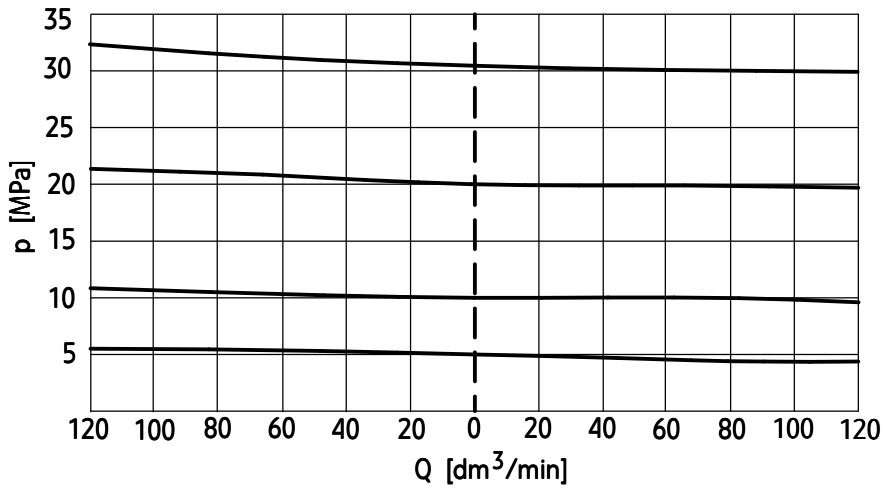
Flow resistance curves

characteristic curve of pressure drop in relation to flow rate Δp - Q for minimal pressure setting; flow direction **1 (A)** $\rightarrow$ **3 (T)**

Δp [MPa] vs Q [dm³/min]

OVERALL AND CONNECTION DIMENSIONS
version UZCS10...**M1**...

S38 S22 S 6

Ø38
M33 x 2

tightening torque
Md = 60 - 65 Nm

10
15,5
20,5
63,3
63

(stroke) 4

Ø36

(stroke) 4
75 (max)

Ø32

48,2
(stroke) 4
18
110,5 (max)
46
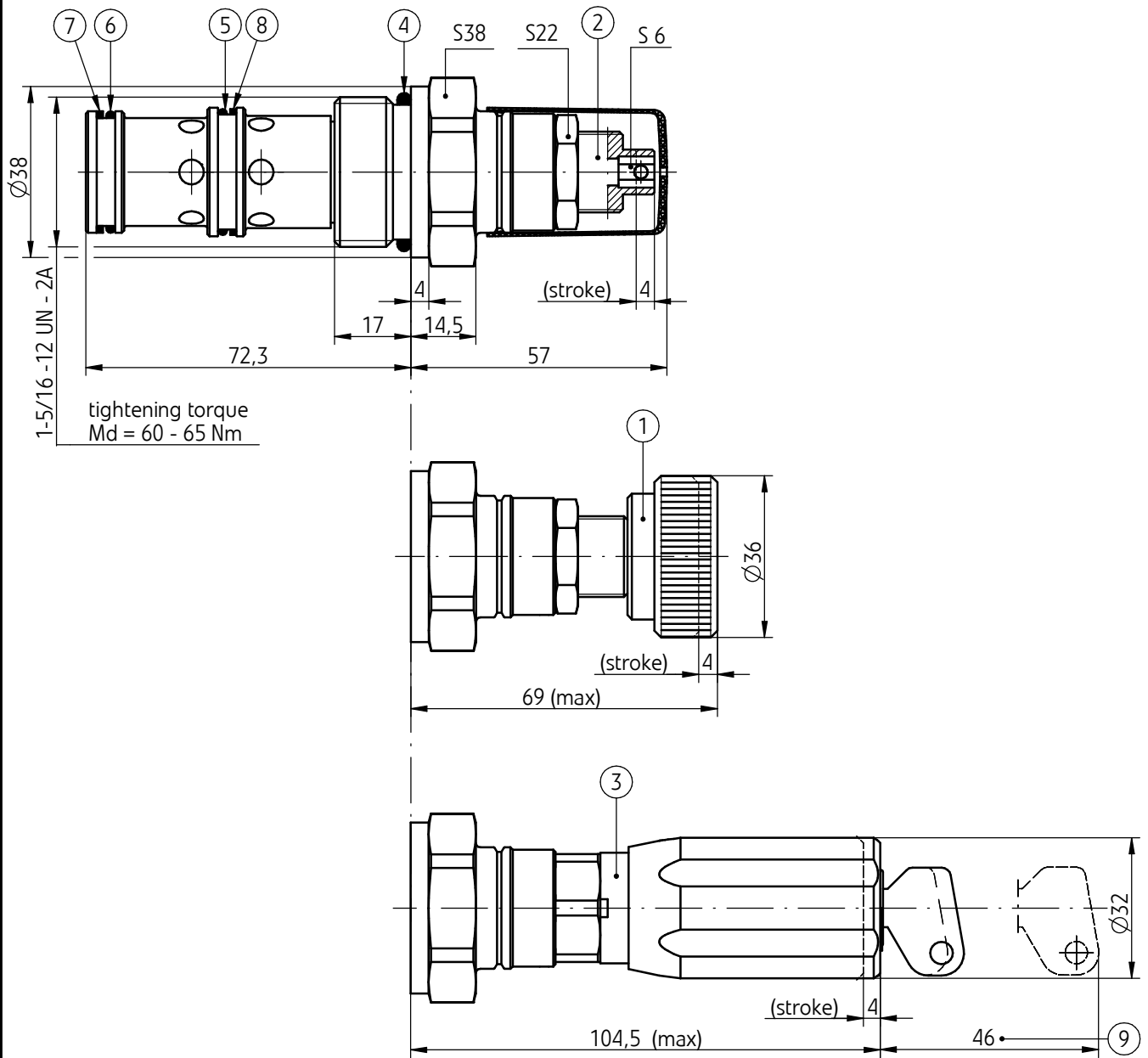
1 - Adjustment **1** (hand knob)
2 - Adjustment **2** (set screw with hexagon socket **S6**)
3 - Adjustment **3** (lockable hand knob)
4 - Sealing ring **o-ring 29,2 x 3** - pcs. 1/set
5 - Sealing ring **o-ring 24 x 2** - pcs. 1/set
6 - Sealing ring **o-ring 23 x 2** - pcs. 1/set
7 - Back-up ring **28 x 25 x 1,4** - pcs. 1/set
8 - Back-up ring **27 x 24 x 1,4** - pcs. 1/set
9 - Space required to remove the key from the lock
    of the adjustment - item 3

OVERALL AND CONNECTION DIMENSIONS

version UZCS10...**U1**...

Ø38

1-5/16 - 12 UN - 2A

tightening torque
Md = 60 - 65 Nm

S38   S22   S 6

4

17   14,5

72,3

(stroke)   4

57

Ø36

(stroke)   4

69 (max)

Ø32

(stroke)   4

104,5 (max)

46

1 - Adjustment **1** - hand knob
2 - Adjustment **2** - set screw with hexagon socket **S6**
3 - Adjustment **3** - lockable hand knob
4 - Sealing ring **o-ring 29,2 x 3** - pcs. 1/set
5 - Sealing ring **o-ring 24 x 2**   - pcs. 1/set
6 - Sealing ring **o-ring 23 x 2**   - pcs. 1/set
7 - Back-up ring **28,6 x 25,6 x 1,4** - pcs. 1/set
8 - Back-up ring **27 x 24 x 1,4**   - pcs. 1/set
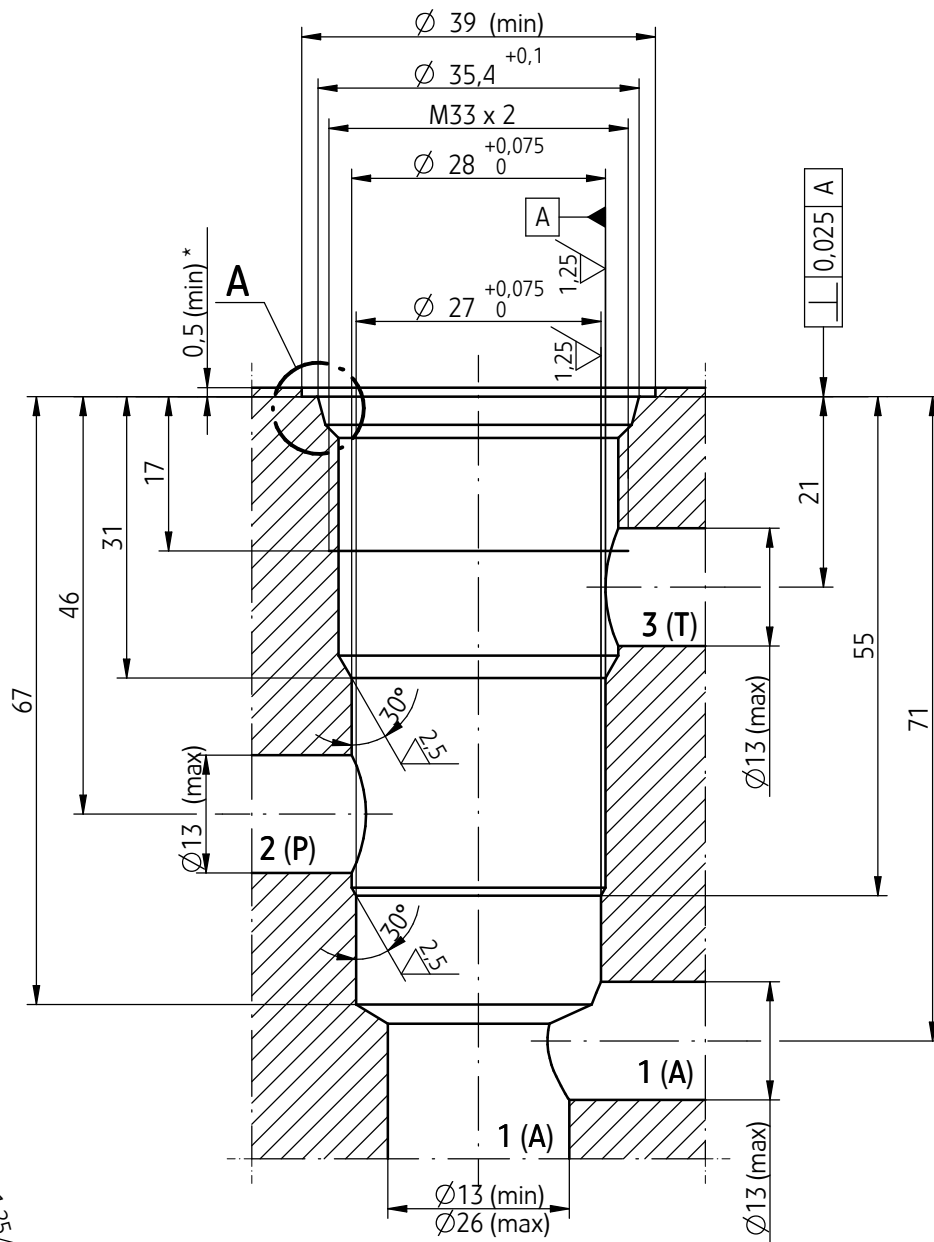9 - Space required to remove the key from the lock
    of the adjustment - item 3
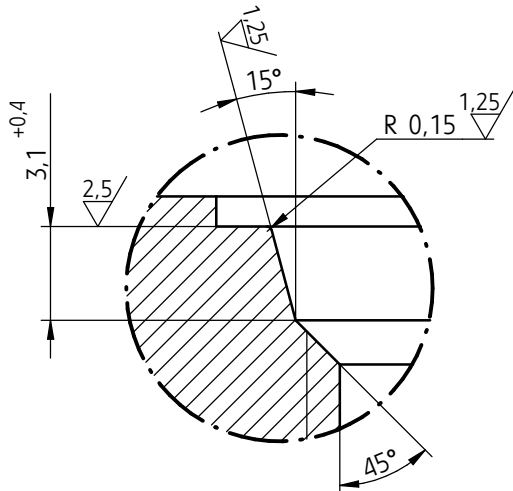
OVERALL AND CONNECTION DIMENSIONS
version UZCS10...**M1**...
cavity **M-10-3** (M33 x 2; 3-way)

tightening torque **60 - 65 Nm**

◎ | ⌀ 0,025 | - refers to all diameters of
the main hole and chamfers

⌀ 39 (min)

⌀ 35,4 $^{+0,1}$

M33 x 2

⌀ 28 $^{+0,075}_{0}$

A

⌀ 27 $^{+0,075}_{0}$

1,25

1,25

⊥ | 0,025 | A

0,5 (min) *

A

A

17

31

46

67

21

55

71

3 (T)

30°

2,5

⌀13 (max)

⌀13 (max)

2 (P)

30°

2,5

1 (A)

1 (A)

⌀13 (min)

⌀26 (max)

⌀13 (max)

NOTE:
(*) - Max depth of the counterbore - **9,9**

detail A
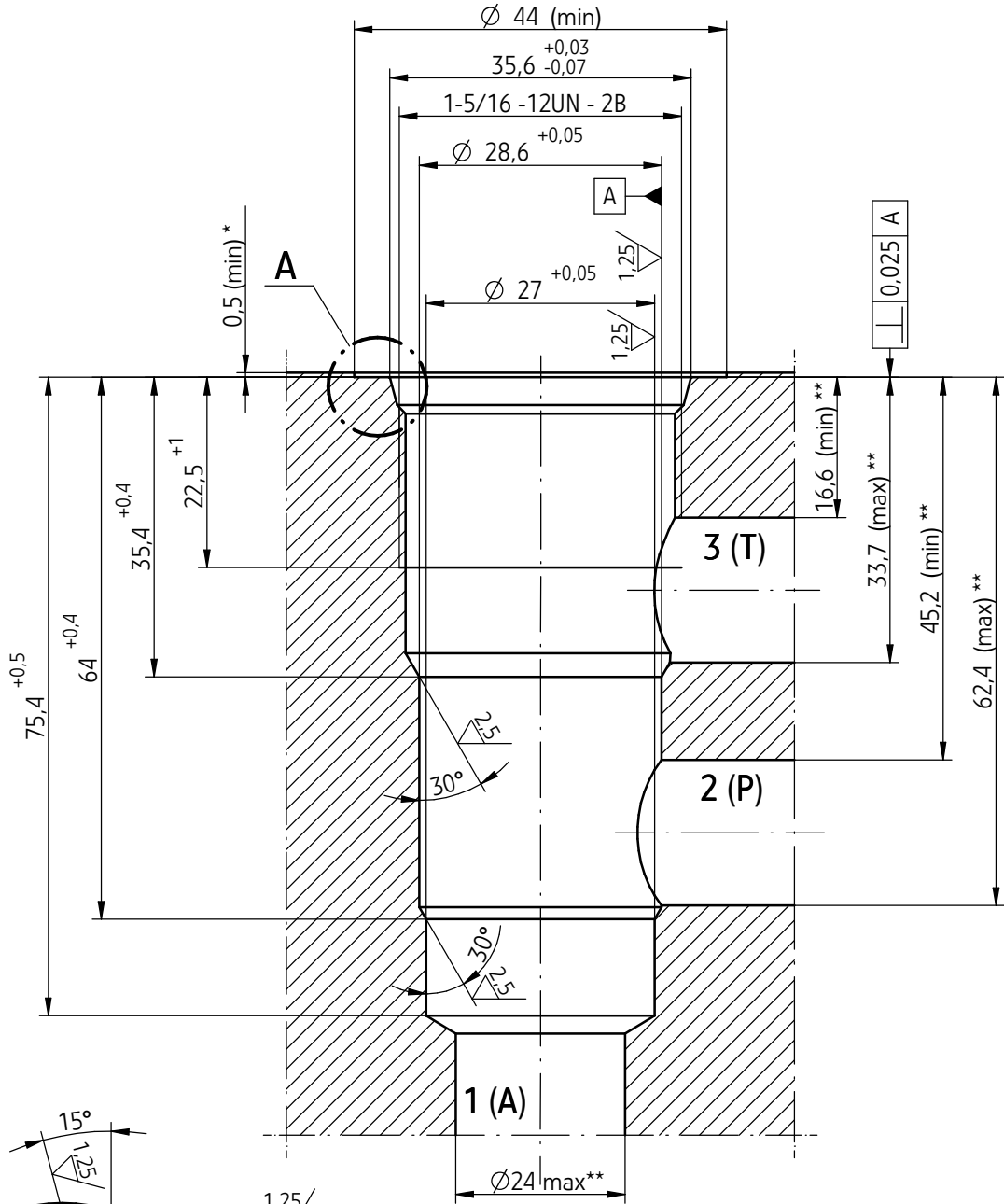
1,25

15°

R 0,15

1,25

3,1 $^{+0,4}$

2,5

45°

OVERALL AND CONNECTION DIMENSIONS
version UZCS10...**U1**...
cavity U-10-3 (1-5/16 -12UN - 2B; 3-way)

tightening torque **60 - 65 Nm**

◎ | ⌀ 0,025 - refers to all diameters of the main hole and chamfers

⌀ 44 (min)

35,6 $^{+0,03}_{-0,07}$

1-5/16 -12UN - 2B

⌀ 28,6 $^{+0,05}$

A

⌀ 27 $^{+0,05}$

1,25

1,25

0,5 (min) *

A

A

⊥ | 0,025 | A

22,5 $^{+1}$

35,4 $^{+0,4}$

64 $^{+0,4}$

75,4 $^{+0,5}$

16,6 (min) **

3 (T)

33,7 (max) **

45,2 (min) **

62,4 (max) **

2,5

30°

2 (P)

30°

2,5

1 (A)

⌀24 max**

detail A

15°

1,25

R 0,15

1,25

2,5

3,3 $^{+0,4}$

45°

NOTES:
(*) - Max depth of the counterbore - **3,9**
(**) - Diameter of ports: **1 (A)**, **2 (P)**,**3 (T)** located on circuit
within specified limit dimensions - **min ϕ13**

HOW TO ORDER

	UZCS	10	/				★

Nominal size (NS)
NS10   = **10**

Series number
(02 - 09) = connection and installation
                    dimensions unchanged   = 0X
series 02   = **02**

Settable pressure range
up to 5 MPa   = 50
up to10 MPa   = 100
up to 20 MPa   = **200**
up to 35 MPa   = **350**

Adjustment element
hand knob   = 1
set screw with hexagon socket   = **2**
lockable hand knob   = 3

Type of connection
cavity M33 x 2   = **M1**
cavity 1- 5/16 -12UN 2B   = U1

Sealing
NBR (for fluids on mineral base)   = **no designation**
FKM   (for fluids on phosphate ester base)   = V

Further requirements in dear text
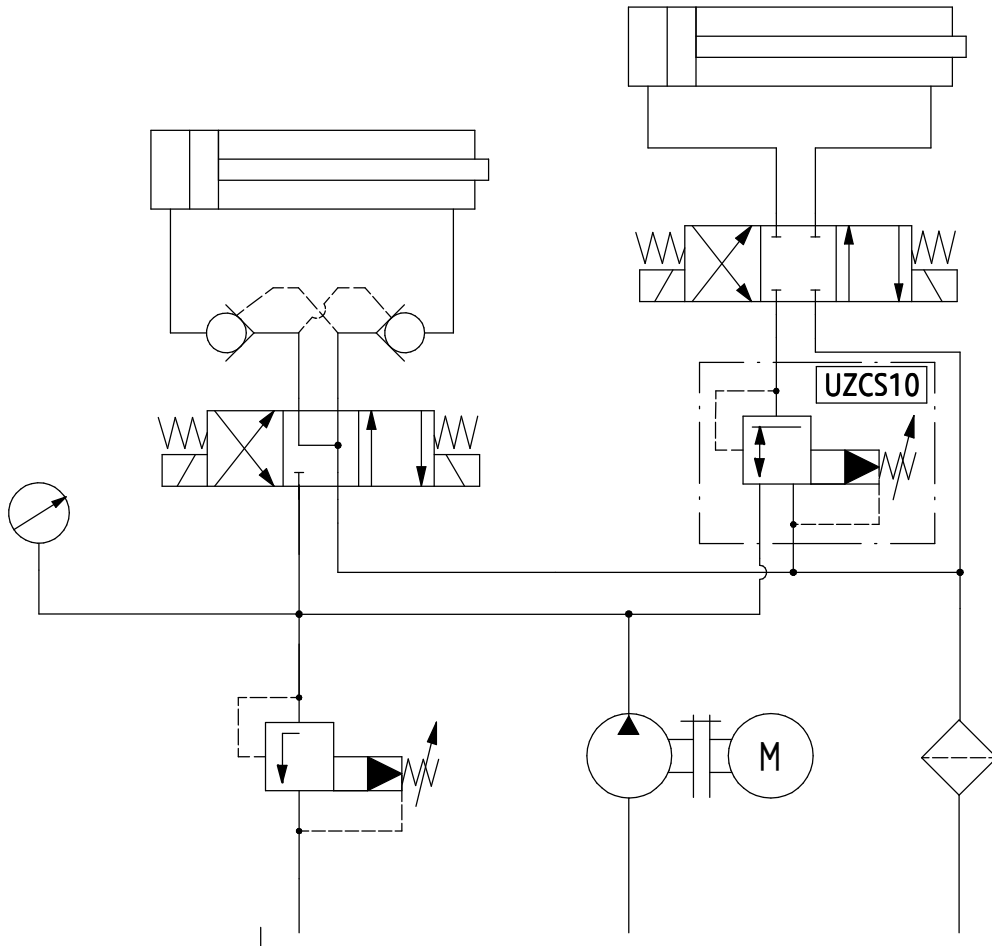(to be agreed with the manufacturer)

NOTES:

The pressure reducing valve should be ordered according to the above coding.
The symbols in bold are the preferred versions available in short delivery time.
Coding example: UZCS10/02 - 200 - 2 M1

EXAMPLE OF APPLICATION IN
HYDRAULIC SYSTEM