

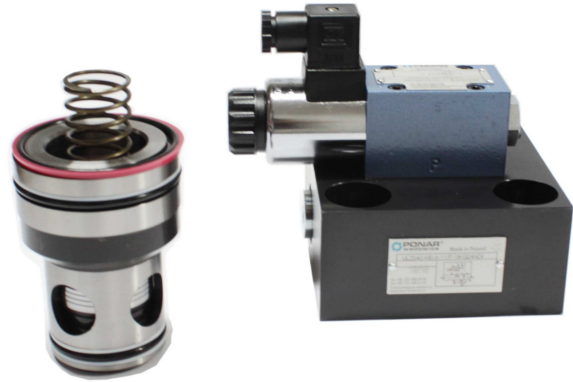
**DATA SHEET - SERVICE MANUAL**

**APPLICATION**

2-way, 2-position directional valve type **URZS40...** can be used in hydraulic systems as a pilot operated check valve or by combination of several elements as a multiple directional control system.

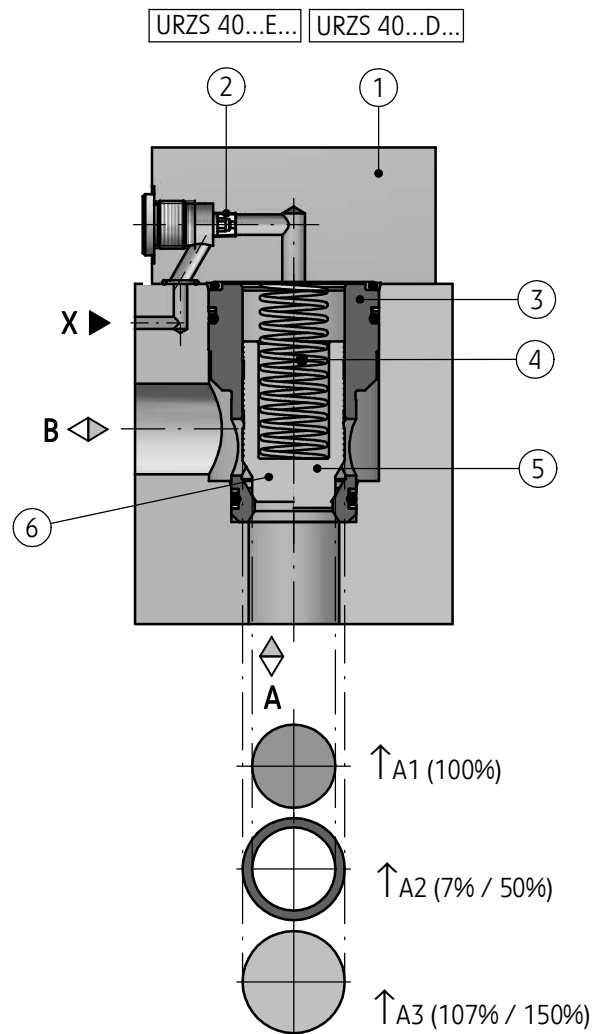
2-way, 2-position directional valve is complied with the regulations of directive **2006/95/WE** for the following voltages:

- 50 – 250 V for AC
- 75 – 250 V for DC



**DESCRIPTION OF OPERATION**

2/2 way directional valves comprise of cartridge assembly type **URZS40...** - sleeve (3), spring (4), poppet with dumping nose (5) or without dumping nose (6) and cover (1) with control bores - type **ULZS40...** (versions: **ULZS40D...**; **ULZS40WE...**; **ULZS40H...**). The valve poppet is held on its seat by means of the spring (4). The valve allows for free flow from **A** to **B** or reversely from **B** to **A**. The valve poppet is graded. There are three important surfaces important for its operation. The area seat **A1** is assumed as **100%**. The annulus area **A2**, resulting from the grading is **7%** or **50%** of area **A1**, depending on the version. The area ration **A1 : A2** is therefore either **14,3 :1** or **2:1**. The area **A3** is **A1 + A2** and can be either **107%** or **150%** of area **A1**. The area **A3** remains unchanged. When the annulus area is changed, then the surface area **A1**, which is regarded as **100%** also is changed. The valve opens in both flow directions if the surface **A3** is not affected by pressure (the port **X** is without pressure) and the pressure force acting on the adequate surfaces **A1** or **A2** exceeds the spring force (4). If control pressure affects surface **A3**, then the poppet is pushed onto its seat irrespective to the spring force (4). The valve may be opened by unloading surface **A3** or by suitably high pressure in port **A** or **B**. The orifice insert (2) fitted in port **X** allows to select the opening curve and the valve opening time.



## TECHNICAL DATA

Hydraulic fluid	mineral oil			
<b>Required filtration</b>	<b>16 µm</b>			
Recommended filtration	<b>10 µm</b>			
Nominal fluid viscosity	37 mm <sup>2</sup> /s at temperature 55 °C			
Viscosity range	2,8 do 380 mm <sup>2</sup> /s			
Fluid temperature range (in a tank)	recommended	40 °C up to 55 °C		
	max	-20 °C up to +80 °C		
Ambient temperature range	versions: URZS 40 + ULZS 40 D/ULZS 40 H	- 20 °C do +70 °C		
	version URZS 40 + ULZS 40 WE	- 20 °C do +50 °C		
<b>Max operating pressure in ports A, B</b>	<b>42 MPa</b>			
<b>Max operating pressure in port X</b>	versions: ULZS 40 D/ULZS 40 H	<b>42 MPa</b>		
	version ULZS 40 WE	<b>35 MPa</b>		
<b>Max operating pressure in port Y</b>	version ULZS 40 WE	<b>21 MPa</b>		
<b>Nominal flow</b>	<b>1300 dm<sup>3</sup>/min</b>			
Valve poppet surface	surface	<b>A1</b>	<b>A2</b>	<b>A3</b>
	version URZS 40 A...	10,58 cm <sup>2</sup>	5,32 cm <sup>2</sup>	15,90 cm <sup>2</sup>
	version URZS 40 B...	14,86 cm <sup>2</sup>	1,04 cm <sup>2</sup>	15,90 cm <sup>2</sup>
Stroke of valve poppet	2,53 cm			
Weight	URZS 40	ULZS 40 D	ULZS 40 WE	ULZS 40 H
	1,8 kg	6,3 kg	7,8 kg	6,9 kg

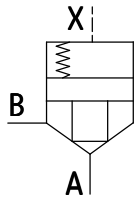
## ASSEMBLY AND APPLICATION REQUIREMENTS

1. Only valve working properly and suitably installed may be connected to an electric system. Only skilled workers are allowed to connect and disconnect electric system.
2. Ground connection (⏏) must be connected with protective earth wire (PE ⏏) in supply system according to appropriate instructions.
3. It is forbidden to apply directional spool valve if the supply cable in the gland of plug-in-connector is not properly tightened.
4. It is forbidden to apply directional spool valve if the plug-in-connector is not properly tightened to the solenoid socket and is not secured by screwing bolt tightly.
5. Due to heating solenoid coils, directional spool valves should be placed in order to eliminate the possibility of incidental touch while using, or, they should be equipped with the coil covers (in accordance with the European standards PN - EN ISO 13732-1 and PN - EN 982).

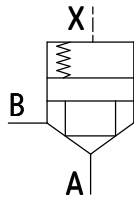
# DIRECTIONAL VALVE TYPE URZS 40...

## SCHEMES

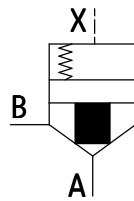
Graphic symbols for directional valve type URZS40...



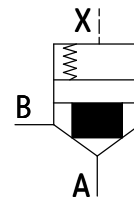
version URZS 40 A...E...



version URZS 40 B...E...



version URZS 40 A...D...

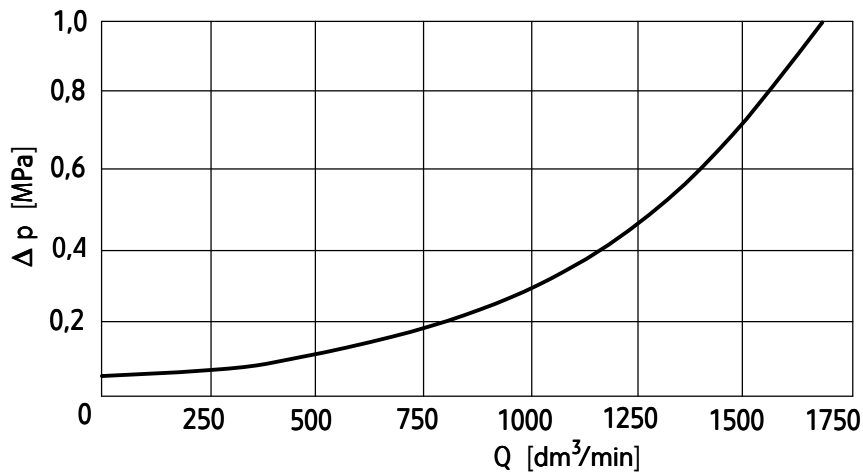


version URZS 40 B...D...

## PERFORMANCE CURVES

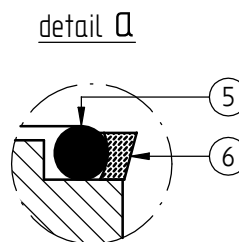
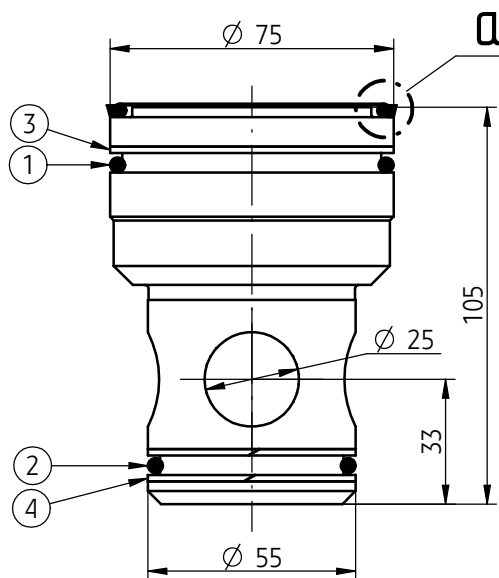
measured at viscosity  $\nu = 41 \text{ mm}^2/\text{s}$  and temperature  $t = 50^\circ\text{C}$

Flow resistance curve



## OVERALL AND CONNECTION DIMENSIONS

cartridge valve type URZS 40...



1 - O-ring 67 x 4	- 1 pc
2 - O-ring 47 x 4	- 1 pc
3 - Back-up ring BH3100750 - PTFE 75 x 68,8 x 1,7	- 1 pc
4 - Back-up ring BH3100550 - PTFE 55 x 48,8 x 1,7	- 2 pcs
5 - O-ring 66,27 x 3,53	- 1 pc
6 - Special back-up ring 1614-02204130	- 1 pc



# DIRECTIONAL VALVE TYPE URZS 40...

## HOW TO ORDER

<b>URZS</b>	<b>40</b>									*
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<b>Nominal size (NS)</b>										
<b>NS40</b>	= <b>40</b>									
<b>Area ratio (A1: A2 - wg ark. 1)</b>										
2 : 1 (50%)	= <b>A</b>									
<b>14,3 : 1 (7%)</b>	= <b>B</b>									
<b>Cracking pressure</b>										
0,00 MPa (without spring)	= 00									
<b>0,05 MPa</b>	= <b>05</b>									
0,10 MPa	= 10									
<b>0,20 MPa</b>	= <b>20</b>									
0,40 MPa	= 40									
<b>Valve poppet</b>										
<b>without dumping nose</b>	= <b>E</b>									
with dumping nose	= D									
<b>Series number</b>										
(20-29) - connection and installation dimensions unchanged	= 2X									
<b>series 22</b>	= <b>22</b>									
<b>Sealing</b>										
<b>NBR</b> (for fluids on mineral oil base)	= <b>no designation</b>									
FKM (for fluids on phosphate ester base)	= V									
Further requirements in clear text (to be agreed with the manufacturer)										

### NOTES:

Directional valve should be ordered according to the above coding.

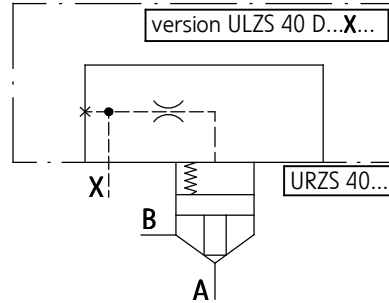
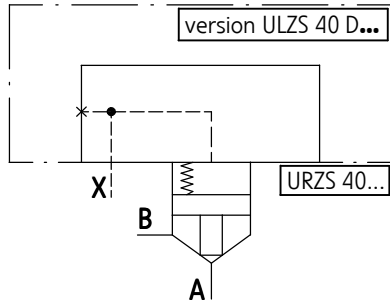
**The symbols in bold are preferred versions in short delivery time.**

Coding example: URZS40 B 05 E 22

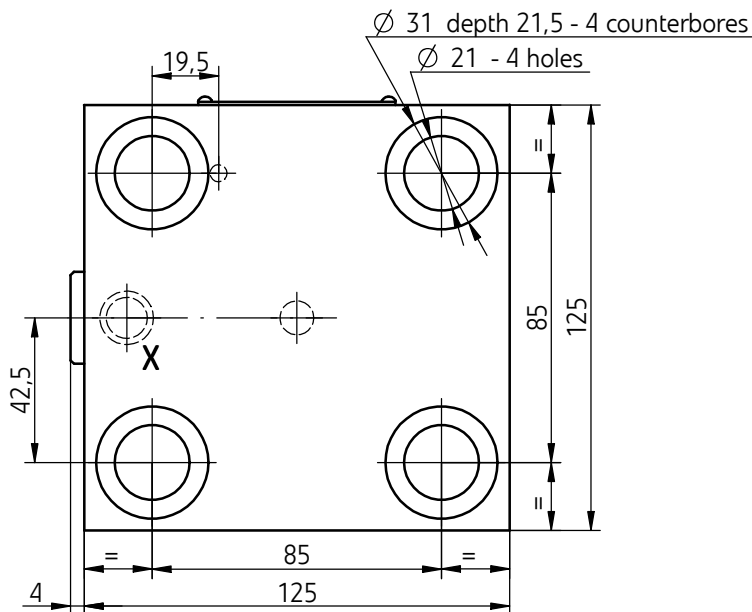
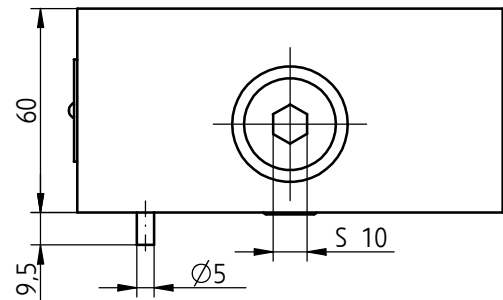
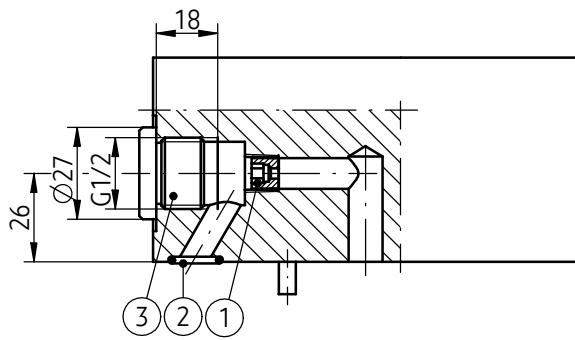
# DIRECTIONAL VALVE COVER - VERSION ULZS 40 D...

## SCHEMES

Hydraulic schemes of directional valves type URZS 40... with covers - versions ULZS40 D...



## OVERALL AND CONNECTION DIMENSIONS



- 1 - Nozzle (only in version ULZS 40 D.../X...)
- 2 - O-ring 12 x 2 - 1 pc
- 3 - Additional external port X (plug G1/2)

### NOTE:

mounting screws **M20 x 70 -10.9** acc. to **PN-EN ISO 4762**  
4 pcs/complete, not specified on the drawing delivered on separate order, tightening torque **Md = 520 Nm**

# DIRECTIONAL VALVE COVER - VERSION ULZS 40 D...

## HOW TO ORDER

<b>ULZS</b>	<b>40</b>	<b>D</b>	<b>/</b>			<b>*</b>
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**Nominal size (NS)**  
**NS40** = 40

**Series number**  
 (10-19) - connection and installation dimensions unchanged = 1X  
**series 12** = 12

**Control port**  
**without nozzle** = no designation  
 with nozzle = X

**Nozzle diameter**

φ 0,5 mm	= 05
φ 0,6 mm	= 06
φ 0,7 mm	= 07
φ 0,8 mm	= 08
φ 1,0 mm	= 10
<b>φ 1,2 mm</b>	<b>= 12</b>
φ 1,5 mm	= 15
φ 1,8 mm	= 18
φ 2,0 mm	= 20
φ 2,5 mm	= 25
φ 3,0 mm	= 30
φ 3,5 mm	= 35
φ 4,0 mm	= 40

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

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

**NOTES:**

Directional valve should be ordered according to the above coding.

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

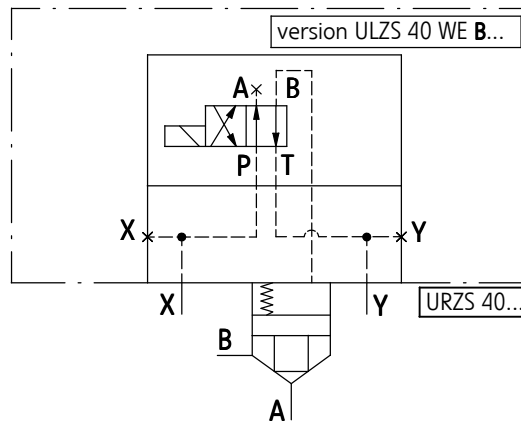
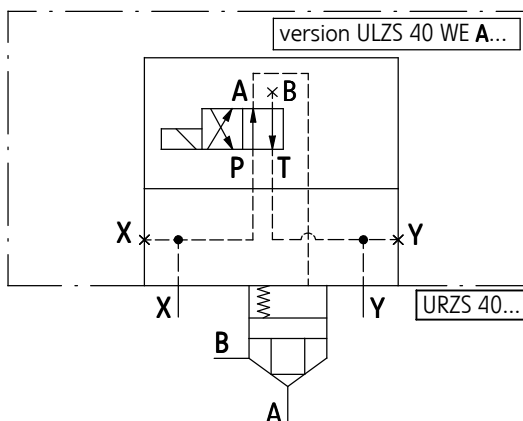
In case of ordering the cover together with the valve, please quote the codes of both elements.

Example: ULZS 40 D 12 /12 + URZS 40 B 05 E 22

# DIRECTIONAL VALVE COVER - VERSION ULZS 40 WE...

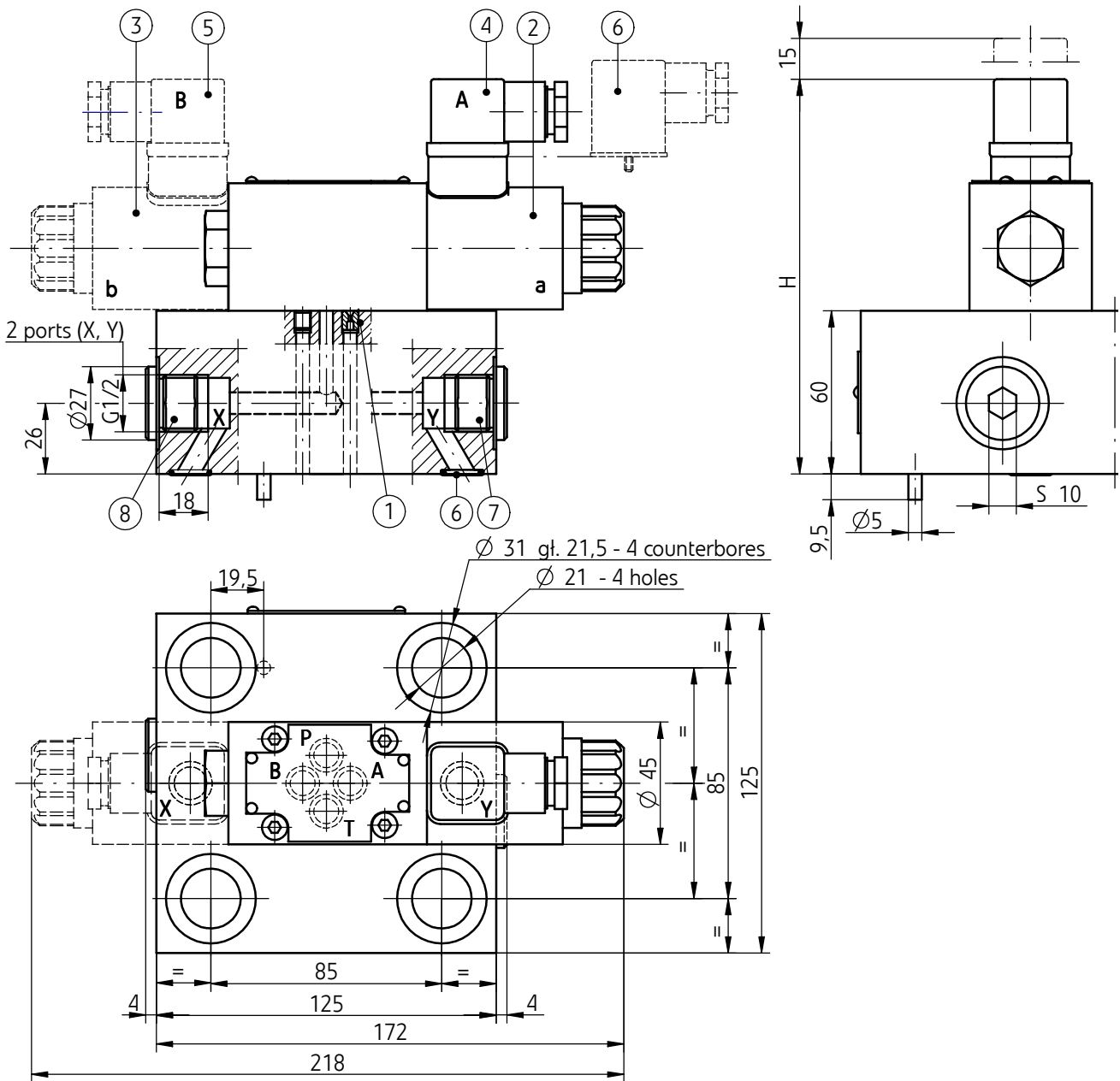
## SCHEMES

Hydraulic schemes of directional valves type URZS 40... with covers - versions ULZS40 WE...



# DIRECTIONAL VALVE COVER - VERSION ULZS 40 WE...

## OVERALL AND CONNECTION DIMENSIONS



Type of electric connection		dimension H
plug type ISO 4400 (DIN 43650 - A)	control voltage (DC) <b>12V, 24V, 110V</b>	146
plug type ISO 4400 (DIN 43650 - A) with rectifier	control voltage (AC) <b>110V, 220V, 230V</b>	153

**NOTE:**  
mounting screws **M20 x 70 -10.9** acc. to **PN-EN ISO 4762**  
pcs 4 /complete, not shown on drawing delivered on  
separate order, tightening torque **Md = 520 Nm**

- 1 - Nozzle - depending on version in line **A** (only for version ULZS 40 WE **A...**); **B** (only for ULZS 40 WE **B...**); **P** or **T** (on the drawing is shown version ULZS 40 WE **A.../A...** with nozzle mounted in line **A**)
- 2 - Solenoid **a**
- 3 - Solenoid **b** - execution with z 2 solenoids (**a, b**) only in versions: ULZS40 WE.../...**O...**; ...**OF...**
- 4 - Plug **A** - type **ISO 4400** (DIN 43650-A)
- 5 - Plug **B** - type **ISO 4400** (DIN 43650-A) - concerns only to version as item 3
- 6 - Plug - type **ISO 4400** (DIN 43650-A) with rectifier for version with electric connection **AC** (version concerns item 4 and 5)
- 7 - **O-ring 12 x 2** - pc 1. /complete (**X, Y**)
- 8 - Additional external port **X** (plug **G1/2**)
- 9 - Additional external port **Y** (plug **G1/2**)



# DIRECTIONAL VALVE COVER - VERSION ULZS 40 WE...

## HOW TO ORDER

ULZS	40	WE		/							*
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**Nominal size (NS)**  
NS40 = 40

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

### Unloading method

**directional valve in de-energized position closed = A**  
**directional valve in de-energized position opened = B**

### Sealing

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

### Series number

(10-19) - connection and installation dimensions unchanged = 1X  
**series 12 = 12**

### Electrical connection - plug

**ISO 4400** (DIN 43650-A) **without LED** = Z4  
**ISO 4400** (DIN 43650-A) **with LED** = Z4L

### Control port

**without nozzle = no designation**

with nozzle in line A

(applicable only for version ULZS 40WEA...) = A

with nozzle in line B

(applicable only for version ULZS 40WEB...) = B

with nozzle in line P = P

with nozzle in line T = T

### Manual override of solenoid

without manual override = no designation

**with manual override = N**

### Supply voltage of solenoids

12V DC

= G12

**24V DC**

= **G24**

110V DC

= G110

110V AC 50Hz (plug with rectifier)

= W110R

220V AC 50Hz (plug with rectifier)

= W220R

**230V AC 50Hz** (plug with rectifier)

= **W230R**

### Nozzle diameter

φ 0,5 mm = 05

φ 0,6 mm = 06

φ 0,7 mm = 07

φ 0,8 mm = 08

φ 1,0 mm = 10

**φ 1,2 mm = 12**

φ 1,5 mm = 15

φ 1,8 mm = 18

φ 2,0 mm = 20

φ 2,5 mm = 25

φ 3,0 mm = 30

### Version of directional valve

**standard = no designation**

without reverse spring = 0

with detent = 0F

### NOTES:

Cover should be ordered according to code, established with symbols according to above diagram.

In case of ordering the cover together with the valve, please quote the codes of the both elements.

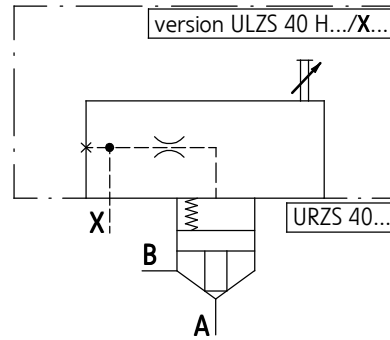
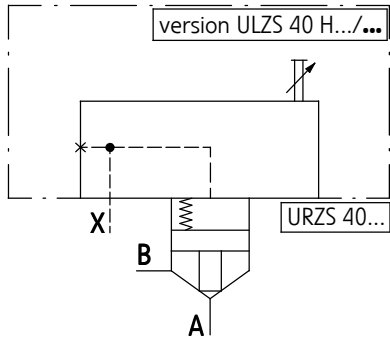
Example: ULZS 40 WE A 12/A 12 W230R + URZS 40 B 05 E22

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

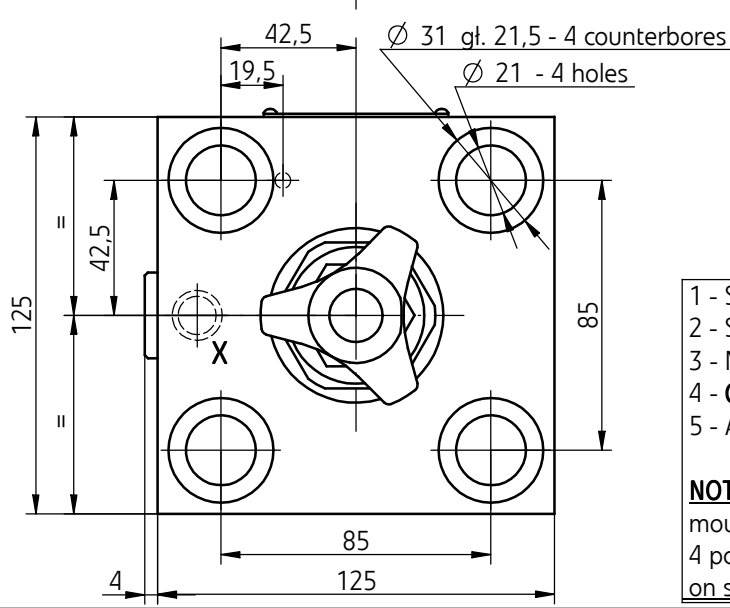
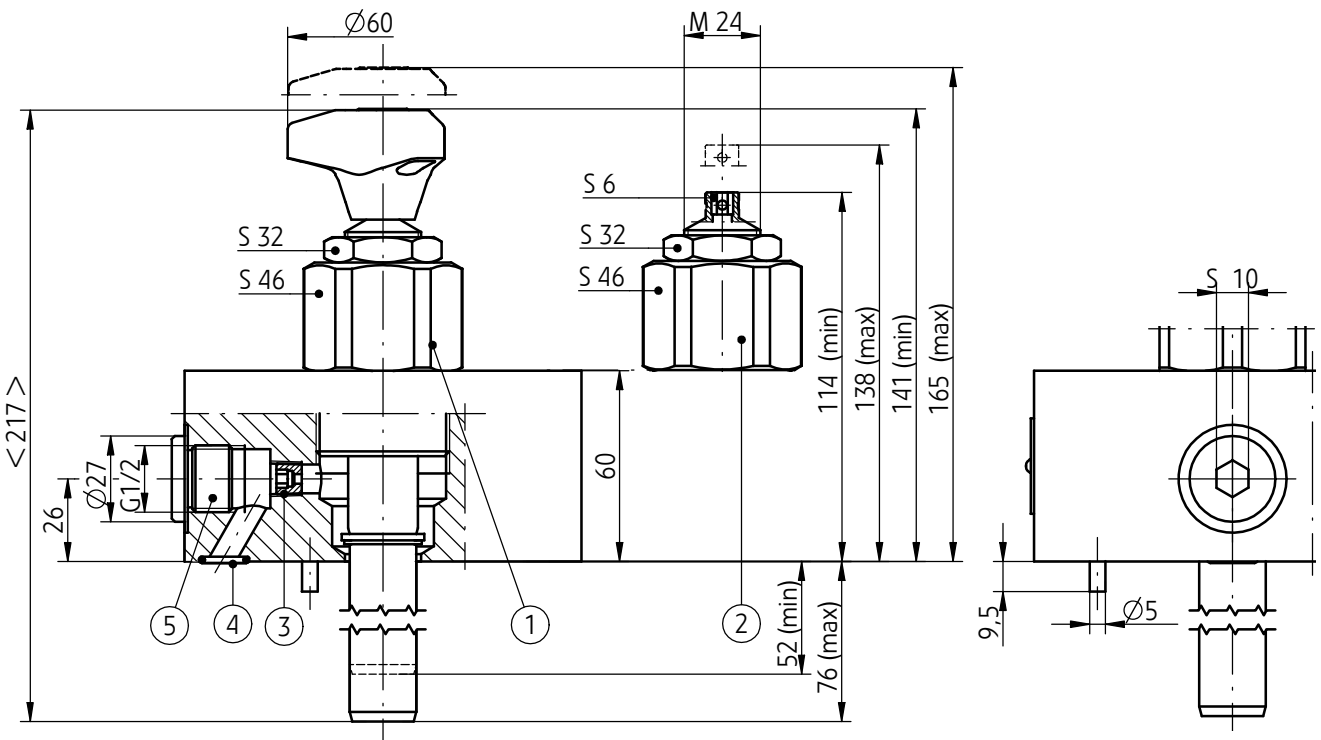
# DIRECTIONAL VALVE COVER - VERSION ULZS 40 H...

## SCHEMES

Hydraulic schemes of directional valves type URZS 40... with covers - versions ULZS40 H...



## OVERALL AND CONNECTION DIMENSIONS



1 - Setting 1 (handknob)  
 2 - Setting 2 (screw with hexagon socket)  
 3 - Nozzle (only in version ULZS 40 H.../X...)  
 4 - O-ring 12 x 2 - 1 pc  
 5 - Additional external port X (plug G1/2)

**NOTE:**  
 mounting screws M20 x 70 -10.9 acc. to PN-EN ISO 4762  
 4 pcs/complete, not specified on the drawing delivered  
 on separate order, tightening torque  $M_d = 520 \text{ Nm}$

# DIRECTIONAL VALVE COVER - VERSION ULZS 40 H...

## HOW TO ORDER

<b>ULZS</b>	<b>40</b>	<b>+</b>	<b>/</b>			<b>*</b>
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### Nominal size (NS)

**NS40** = **40**

### Type of setting

setting 1 (handknob) = H1

**setting 2** (adjusting screw) = **H2**

### Series number

(10-19) - connection and installation dimensions unchanged = 1X

**series 12** = **12**

### Control port

**without nozzle** = **no designation**

with nozzle = X

### Nozzle diameter

φ 0,5 mm = 05

φ 0,6 mm = 06

φ 0,7 mm = 07

φ 0,8 mm = 08

φ 1,0 mm = 10

**φ 1,2 mm = 12**

φ 1,5 mm = 15

φ 1,8 mm = 18

φ 2,0 mm = 20

φ 2,5 mm = 25

φ 3,0 mm = 30

φ 3,5 mm = 35

φ 4,0 mm = 40

### Sealing

**NBR** (for fluids on mineral oil base) = **no designation**

FKM (for fluids on phosphate ester base) = V

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

### NOTES:

Cover should be ordered according to code, established with symbols according to above diagram.

In case of ordering the cover together with the valve, please quote the codes of the both elements.

Example: ULZS 40 H2 - 12/12 + URZS 40 B 05 E22

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

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