

DATA SHEET - SERVICE MANUAL

APPLICATION

2-way, 2-position directional valve type **URZS50...** can be used in hydraulic systems as a pilot operated check valve or by combination of several elements as a multiple directional control system.

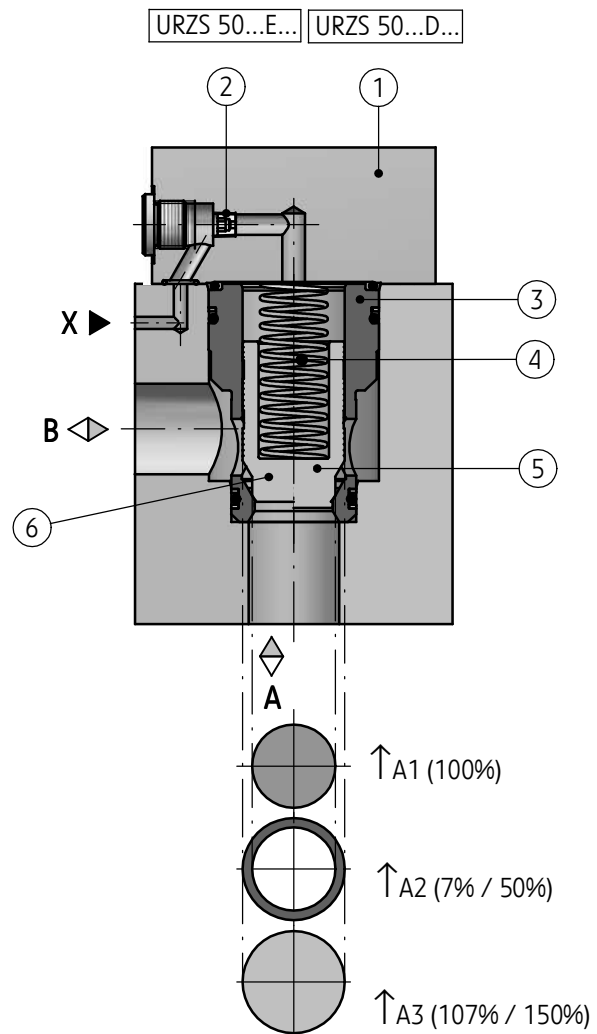
2-way, 2-position directional valve is complied with the regulations of directive **2006/95/WE** for the following voltages:

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



DESCRIPTION OF OPERATION

2/2 way directional valves comprise of cartridge assembly type **URZS50...** - sleeve (3), spring (4), poppet with dumping nose (5) or without dumping nose (6) and cover (1) with control bores - type **ULZS50...** (versions: **ULZS50D...**; **ULZS50WE...**; **ULZS50H...**). 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			
Required filtration	16 µm			
Recommended filtration	10 µm			
Nominal fluid viscosity	37 mm ² /s at temperature 55 °C			
Viscosity range	2,8 up to 380 mm ² /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 50 D /ULZS 50 H	- 20 °C do +70 °C		
	version URZS 50 + ULZS 50 WE	- 20 °C do +50 °C		
Max operating pressure in ports A, B	42 MPa			
Max operating pressure in port X	versions: ULZS 50 D /ULZS 50 H	42 MPa		
	version ULZS 50 WE	35 MPa		
Max operating pressure in port Y	version ULZS 50 WE	21 MPa		
Nominal flow	1800 dm³/min			
Valve poppet surface	surface	A1	A2	A3
	version URZS 50 A ...	16,40 cm ²	8,23 cm ²	24,63 cm ²
	version URZS 50 B ...	22,99 cm ²	1,64 cm ²	24,63 cm ²
Stroke of valve poppet	2,90 cm			
Weight	URZS 50	ULZS 50 D	ULZS 50 WE	ULZS 50 H
	2,84 kg	9,2 kg	10,66 kg	11,0 kg

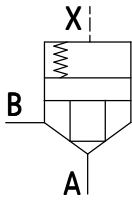
ASSEMBLY AND APPLICATION REQUIREMENTS

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).

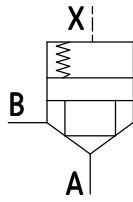
DIRECTIONAL VALVE TYPE URZS 50...

SCHEMES

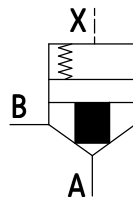
Graphic symbols for directional valve type URZS50...



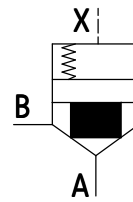
version URZS 50 A...E...



version URZS 50 B...E...



version URZS 50 A...D...

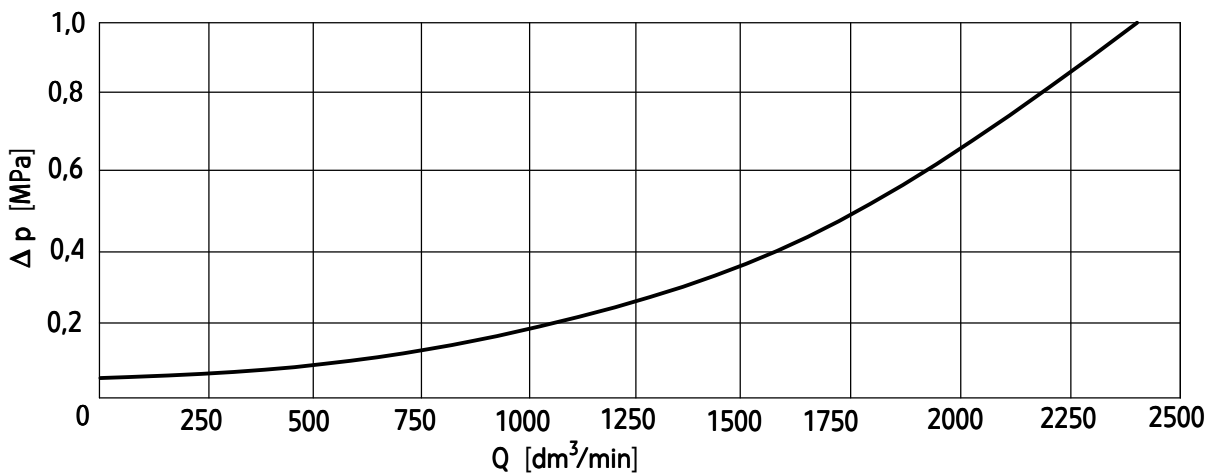


version URZS 50 B...D...

PERFORMANCE CURVES

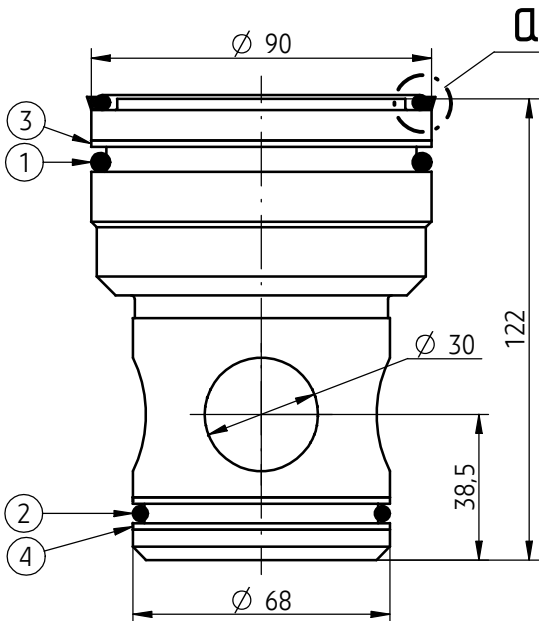
measured at viscosity $\nu = 41 \text{ mm}^2/\text{s}$ and temperature $t = 50^\circ\text{C}$

Flow resistance curve

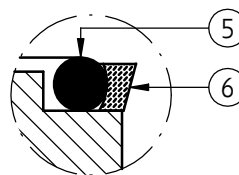


OVERALL AND CONNECTION DIMENSIONS

cartridge valve type URZS 50...



detail Q

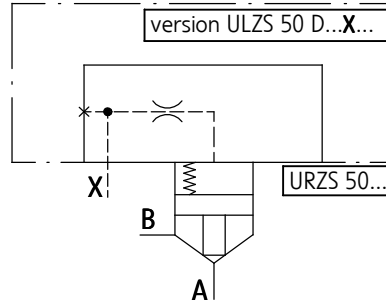
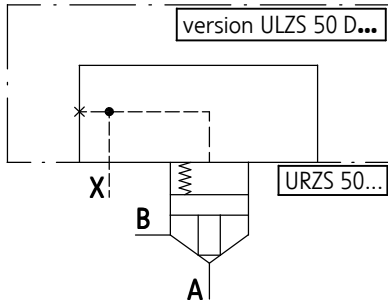


1 - O-ring 80 x 5	- 1 pc
2 - O-ring 60 x 4	- 1 pc
3 - Back-up ring BH4000900 - PTFE 90 x 82 x 1,7	- 1 pc
4 - Back-up ring BH3100680 - PTFE 68 x 61,8 x 1,7	- 2 pcs
5 - O-ring 80 x 4	- 1 pc
6 - Special back-up ring 1614-02204560	- 1 pc

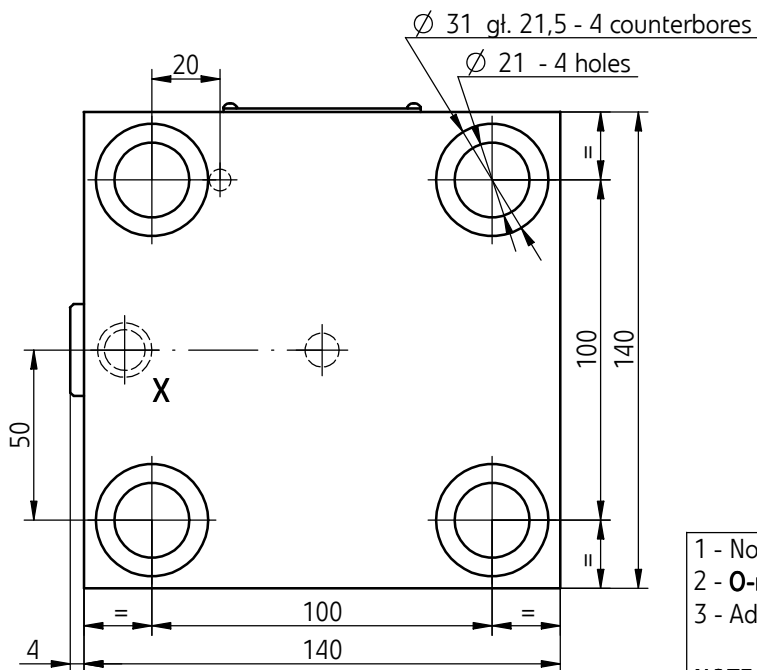
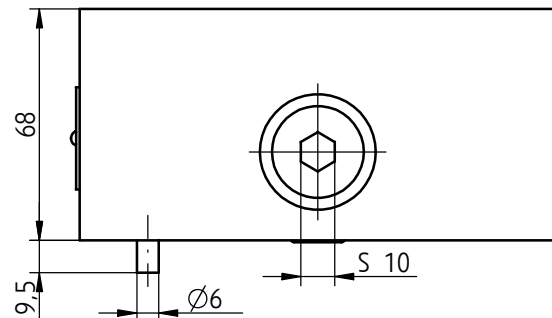
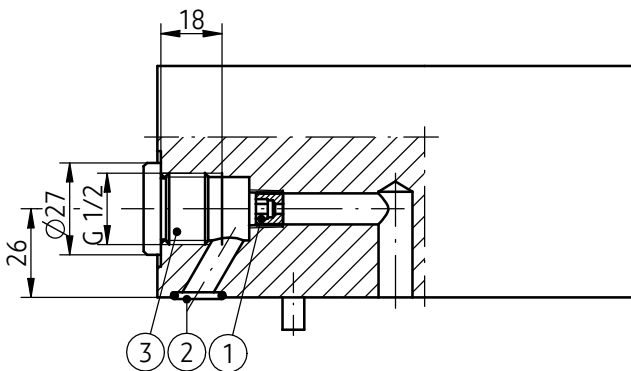
DIRECTIONAL VALVE COVER - VERSION ULZS 50 D...

SCHEMES

Hydraulic schemes of directional valves type URZS 50... with covers - versions ULZS 50 D...



OVERALL AND CONNECTION DIMENSIONS



- 1 - Nozzle (only in version ULZS 50 D.../X...)
- 2 - O-ring 12 x 2 - 1 pc
- 3 - Additional external port X (plug G1/2)

NOTE:
mounting screws **M20 x 80 -10.9** according 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 50 D...

HOW TO ORDER

ULZS	50	D	/			*
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Nominal size (NS)
NS50 = 50

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

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

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

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

NOTES:

Directional valve should be ordered according to the above coding.

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

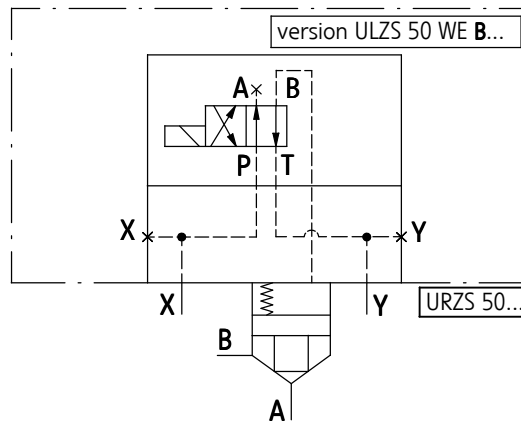
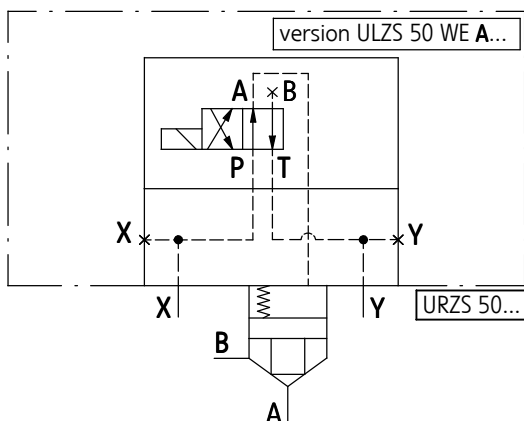
In case of ordering the cover together with the valve, please quote the codes of both elements.

Example: ULZS 50 D 12 /12 + URZS 50 B 05 E 22

DIRECTIONAL VALVE COVER - VERSION ULZS 50 WE...

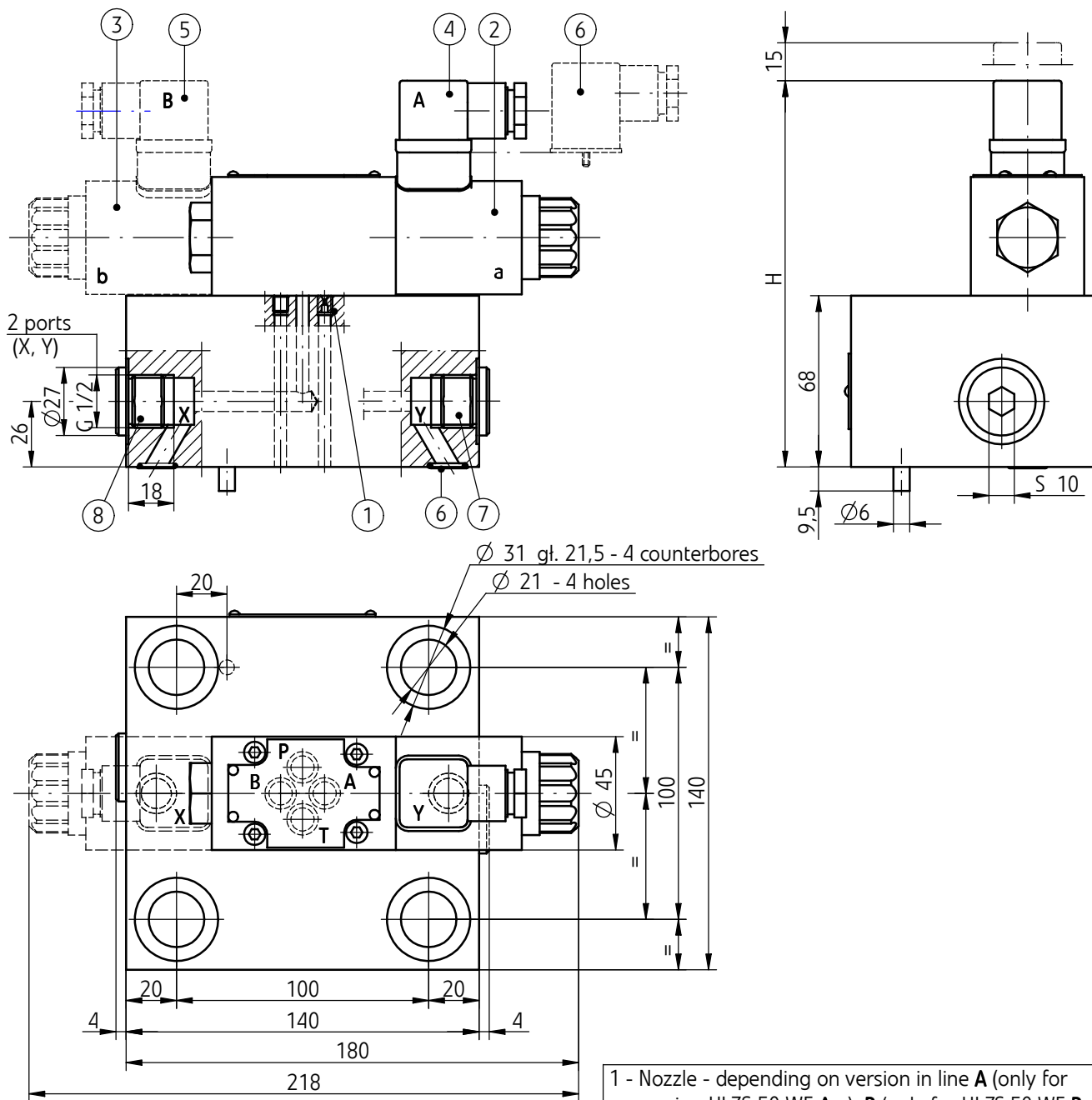
SCHEMES

Hydraulic schemes of directional valves type URZS 50... with covers - versions ULZS 50 WE...



DIRECTIONAL VALVE COVER - VERSION ULZS 50 WE...

OVERALL AND CONNECTION DIMENSIONS



- 1 - Nozzle - depending on version in line **A** (only for version ULZS 50 WE **A**...); **B** (only for ULZS 50 WE **B**...); **P** or **T** (on the drawing is shown version ULZS 50 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: ULZS50 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)

Type of electric connection		dimension H
plug type ISO 4400 (DIN 43650 - A)	control voltage (DC) 12V, 24V, 110V	154
plug type ISO 4400 (DIN 43650 - A) with rectifier	control voltage (AC) 110V, 220V, 230V	161

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**

DIRECTIONAL VALVE COVER - VERSION ULZS 50 WE...

HOW TO ORDER

ULZS	50	WE		/							*
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Nominal size (NS)
NS50 = 50

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

Manual override of solenoid

without manual override = no designation
with manual override = N

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

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 = OF

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.

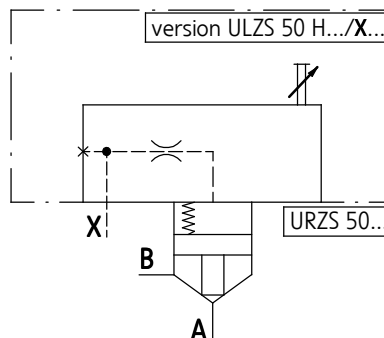
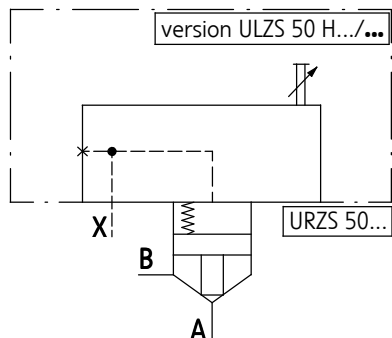
Example: ULZS 50 WE A 12/A 12 W230R + URZS 50 B 05 E22

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

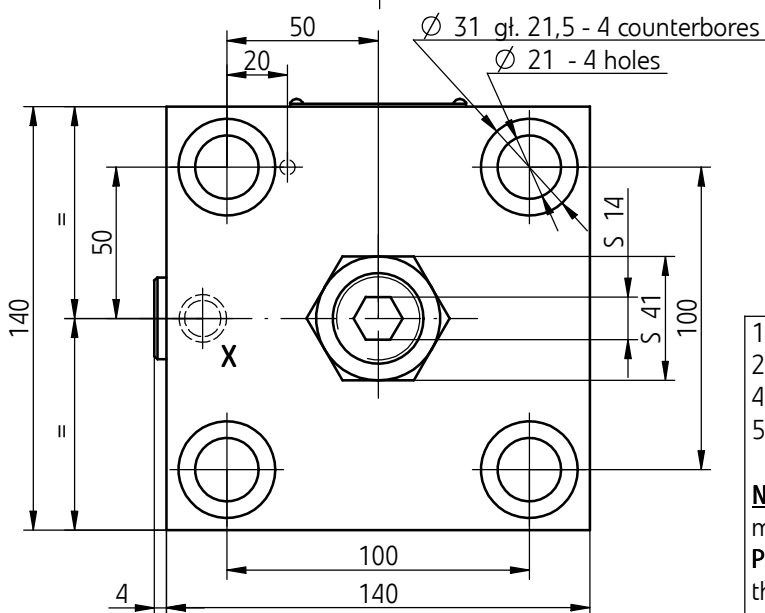
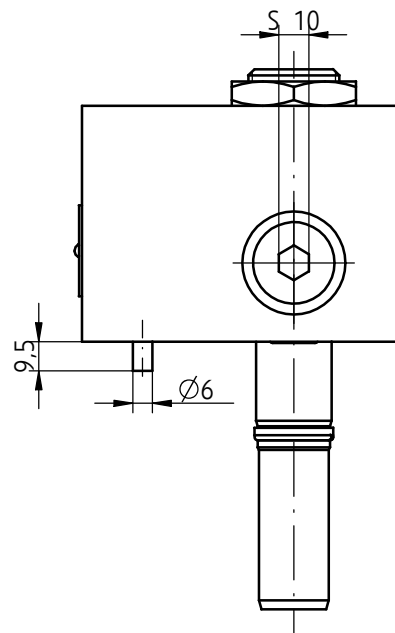
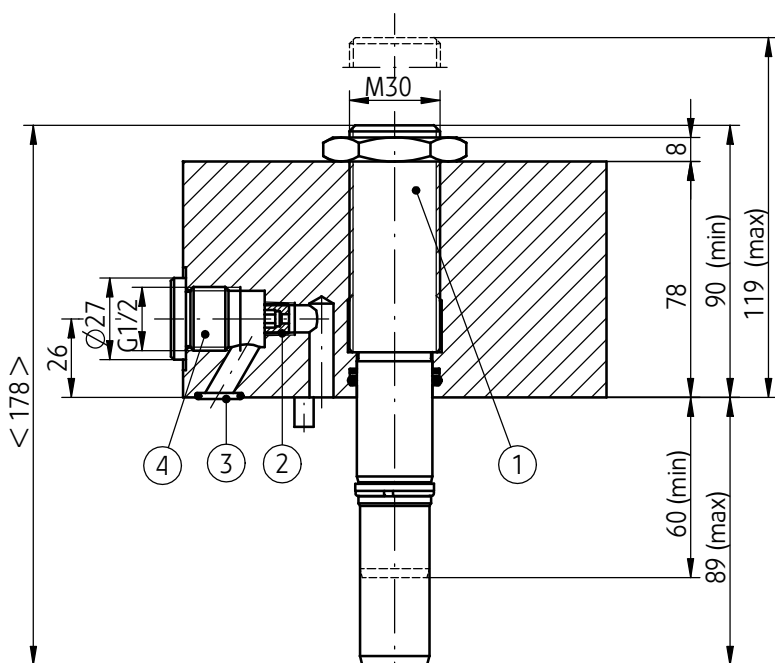
DIRECTIONAL VALVE COVER - VERSION ULZS 50 H...

SCHEMES

Hydraulic schemes of directional valves type URZS 50... with covers - versions ULZS50 H...



OVERALL AND CONNECTION DIMENSIONS



- 1 - Setting 2 (screw with hexagon socket)
- 2 - Nozzle (only in version ULZS 50 H.../X...)
- 4 - O-ring 12 x 2 - 1 pc
- 5 - Additional external port X (plug G1/2)

NOTE:
mounting screws **M20 x 90 -10.9** according 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 H...

HOW TO ORDER

ULZS	50	H2	-	/				*
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Nominal size (NS)

NS50 = **50**

Type of setting

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 50 H2 - 12/12 + URZS 50 B 05 E22

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

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