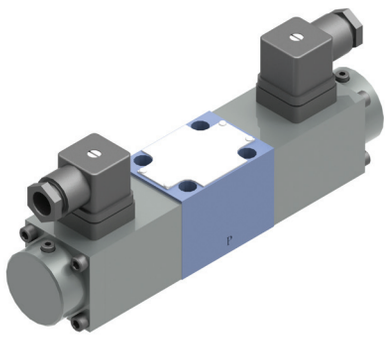
Proportional directional valve USAB 6

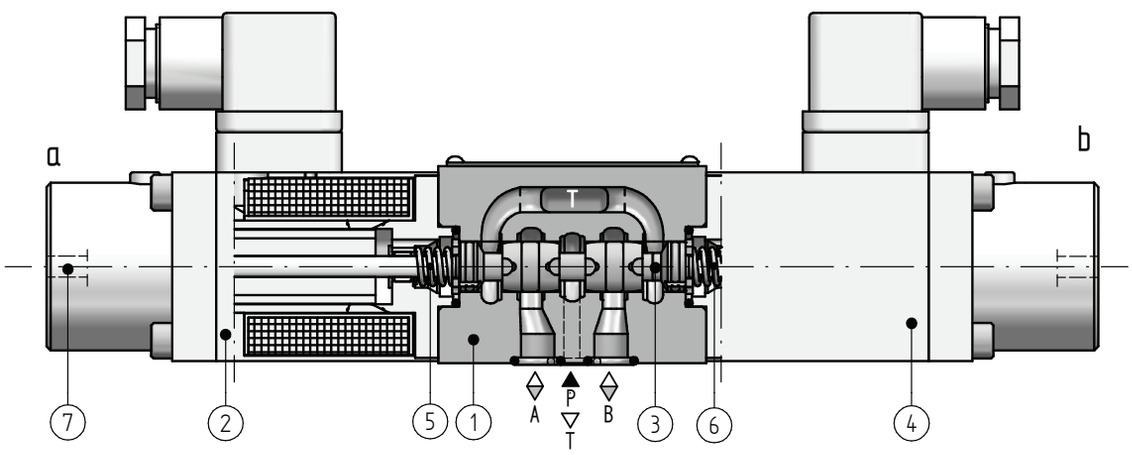
NS 6 | p_{max} 35 MPa | Q_{max} 32 dm³/min | WK 420 520

DATA SHEET - OPERATION MANUAL



APPLICATION

Proportional directional valve type USAB6... is used to control the direction and speed of movement of an actuator. Flow rate of hydraulic oil directed to the actuator is adjusted by change of electric current supplying the solenoid coil.



DESCRIPTION OF OPERATION

The main elements of the proportional directional valve type USAB6... are: the valve body **1**, proportional solenoids **2** and **4** the spool **3** and springs **5** and **6**. Solenoids **2**, **4** move the spool **3** from the neutral position, proportionally to the supplied current. It makes possible to control both the direction and the flow rate of oil in the system, which allows for changing the direction and speed of the actuator motion. Return of the spool **3** to the neutral (de-energized) position is provided by the centering springs **5** and **6**. The shape and location of the spool control edges affects the configuration of connections between the ports: **P, A, B, T** as shown on the hydraulic diagrams (page 2), and different shapes and flow cross-sections influence the nominal performance of the directional valve and the nature of flow change (linear or progressive). A list of electronic controllers that can be used for controlling the proportional solenoids **2** and **4** is shown in the table on page 1. Solenoids **2** and **4** can be equipped with manual override **7** - version USAB6...N... allowing for manual control of the directional valve in the event of power failure.

TECHNICAL DATA

hydraulic fluid required fluid cleanliness class	mineral oil ISO 4406 class 20/18/15
nominal fluid viscosity	37 mm²/s at temperature 55°C
viscosity range	2,8 ÷ 380 mm²/s
fluid temperature range (in the tank)	rec: 40 ÷ 55°C; max.: -20 ÷ 70°C
ambient temperature range	-20 ÷ 50°C
max operating pressure	35 MPa (ports P, A, B); 21 MPa (port T)
hysteresis	<6%
repeatability	<3%

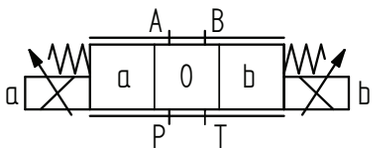
operating position	any position
weight	with 1 solenoid: 1,8kg; with 2 solenoids: 2,5kg
nominal solenoid power	13 W
resistance of solenoid coil	5,4 Ω (for cold solenoid 20°C)
	8,1 Ω (for max. heated solenoid)
electronic controllers	30 RE 20 acc. to data sheet WK 495 773
	30 RE 20 D acc. to data sheet WK 420 830
	30 RC 20 D acc. to data sheet WK 430 340 (when powering with stabilised voltage 24V DC, set the max. value of current I_{max})
	MAP2 acc. to data sheet available on PONAR website; supply voltage: 24V, limit I_{max} to 1,5 A

assembly and operation requirements at: www.operating-conditions.ponar.pl

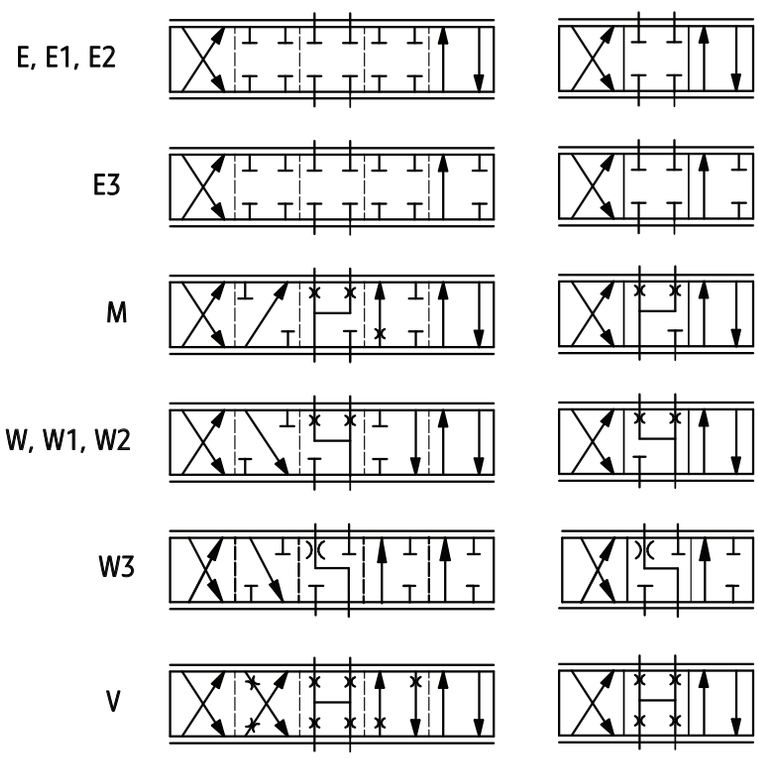
HYDAULIC DIAGRAMS

diagrams of 3-position valves

versions USAB6



positions: working and interim | working



NOTES:

Flow rates for spools **E1**, **W1**:

P → A: Q_{max} B → T: 0,5 Q_{max}

P → B: 0,5 Q_{max} A → T: Q_{max}

Flow rates for spools **E2**, **W2**:

P → A: 0,5 Q_{max} B → T: Q_{max}

P → B: Q_{max} A → T: 0,5 Q_{max}

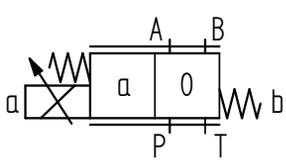
Flow rates for spools **E3**, **W3**:

P → A: Q_{max} B → T: closed

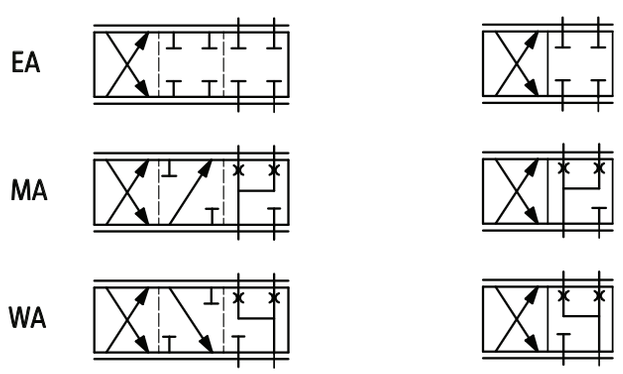
P → B: Q_{max} A → T: Q_{max}

diagrams of 2-position valves

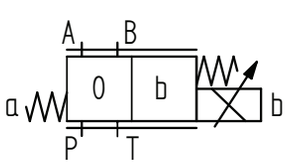
versions USAB6...A...

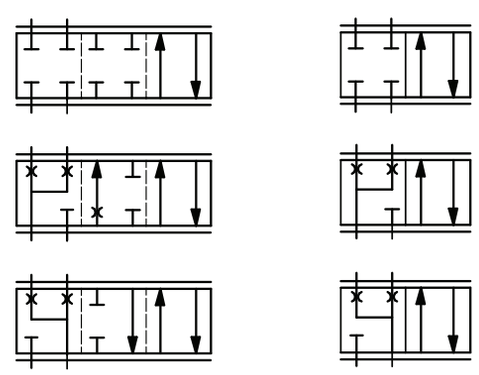


positions: working and interim | working

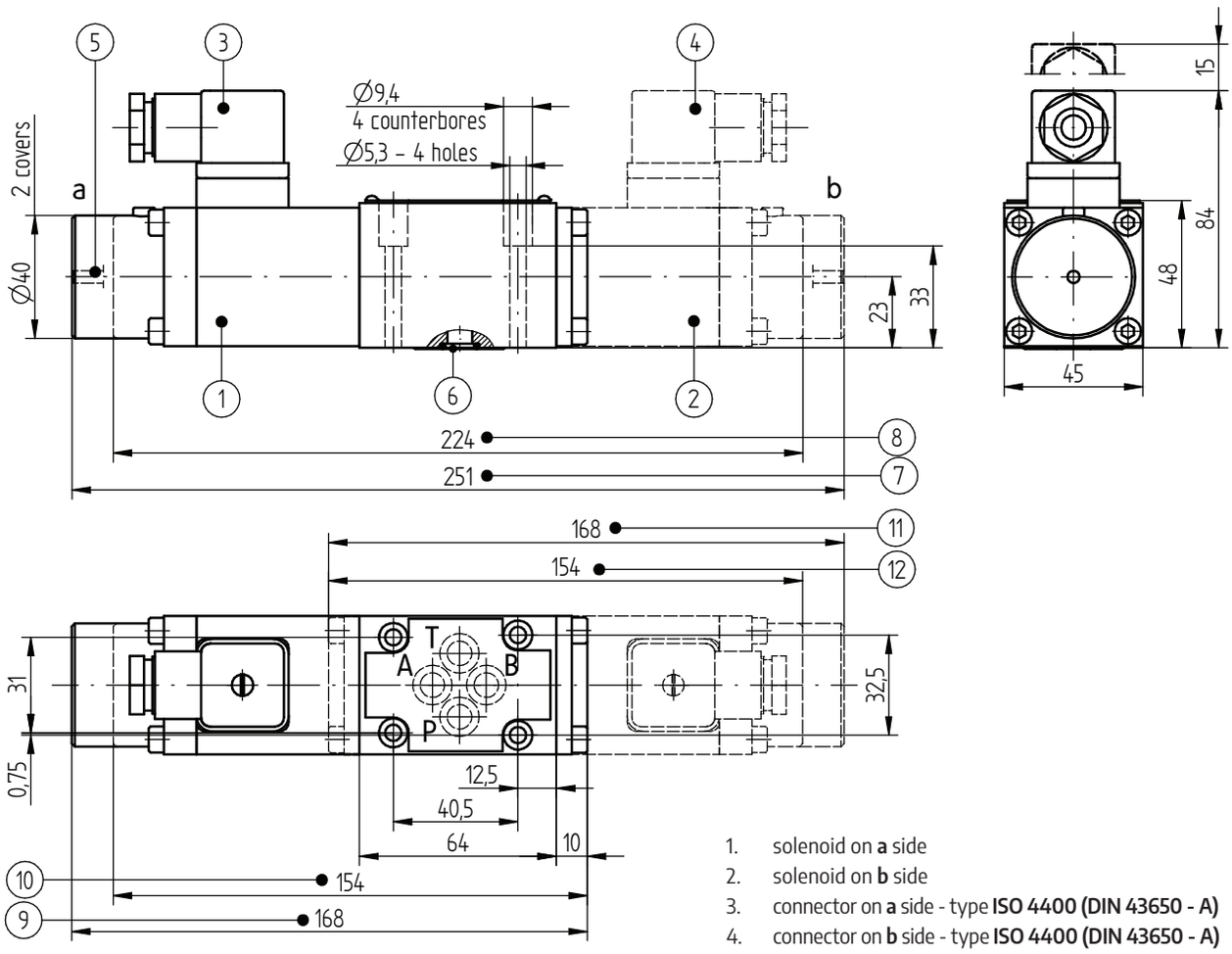


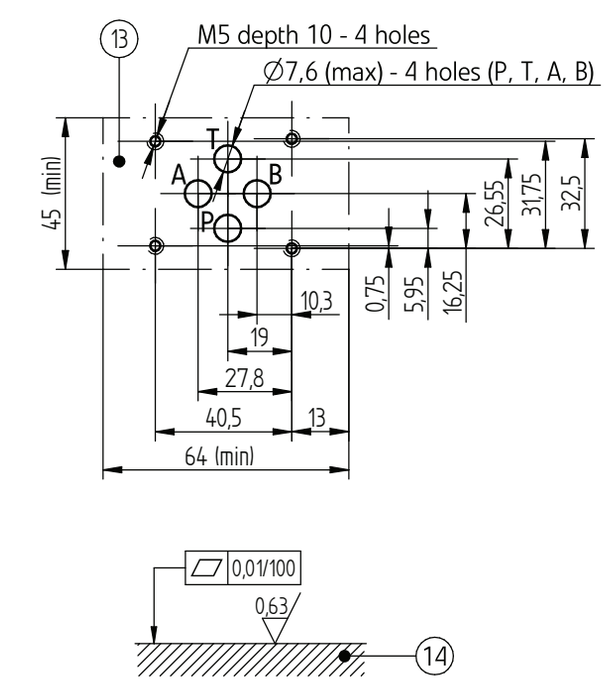
versions USAB6...B...





OVERALL AND CONNECTION DIMENSIONS





1. solenoid on **a** side
2. solenoid on **b** side
3. connector on **a** side - type **ISO 4400 (DIN 43650 - A)**
4. connector on **b** side - type **ISO 4400 (DIN 43650 - A)**
5. manual override
6. o-ring **9,2** × **1,8** - 4 pcs/set (**P, T, A, B**)
7. overall dimension of **3-position valve with 2 solenoids on side a, b** - with manual override (spool diagrams: **E, E1, E2, E3, M, W, W1, W2, W3, V** - acc. to page 3)
8. overall valve dimension as item 7 - **without manual override**
9. overall dimension of **2-position valve with 1 solenoid on a side** - **with manual override** (spool diagrams: **EA, MA, WA** - according to page 3)
10. overall valve dimension as item 9 - **without manual override**
11. overall dimension of **2-position valve with 1 solenoid on b side - with manual o verride** (spool diagrams: **EB , MB, WB** - according to page 2)
12. overall valve dimension as item 11 - **without manual override**

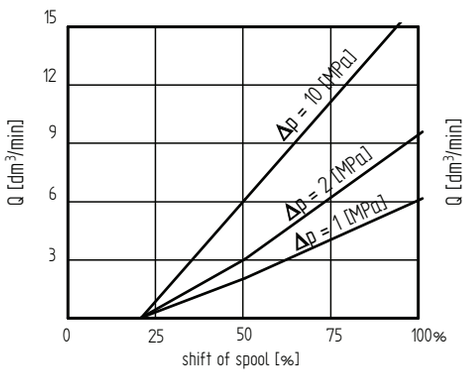
porting pattern - configuration of connection holes in accordance with the standard **ISO 4401** - designation **ISO 4401-03-02-0-94 (nominal size CETOP 03)**

13. required surface quality of the valve contact surface

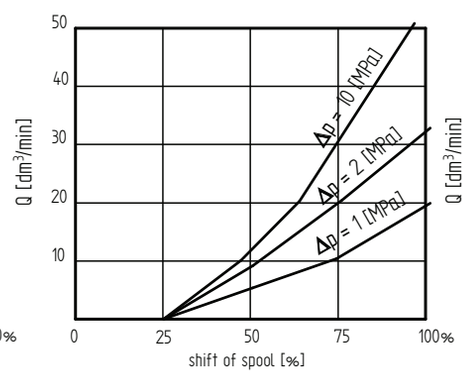
PERFORMANCE CURVES

measured at viscosity of hydraulic fluid ν = 41 mm^2 /s and temperature t = 50°C)

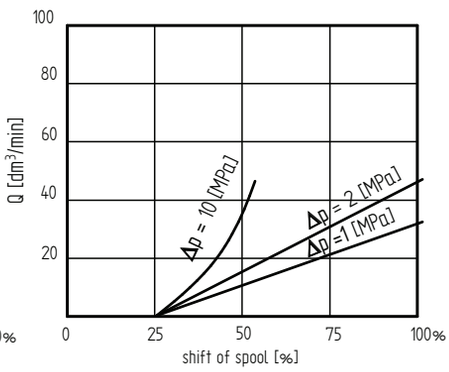
version USAB6...L10...



version USAB6...Q20...



version USAB6...Q32...



HOW TO ORDER

USAB	6	—		/							*
	1		2		3	4	5	6	7	8	

1 nominal size (NS)

NS6 =	6

2 series number

series 32 =	**3X**

series 30 ÷ 39 - connection and installation dimensions unchanged

3 spool symbol

spool diagrams - see page 2

4 flow changes

linear* =	L
progressive =	**Q**

***** only for version with nominal flow 10 dm³/min for version with spool E with nominal flow 20 dm³/min)

5 nominal flow (at Δp = 1MPa)

10 dm³/min =	10
20 dm³/min **=**	**20**
32 dm³/min=	32

6 manual override

without manual override =	**Ø**
with manual override =	N

7 sealing

NBR (for fluids on mineral oil base) =	**Ø**
FKM (for fluids on phosphate ester base) =	V

8 further requirements = *
(agreed upon with the Manufacturer)

Ø indicates that the box should be left blank.
The **symbols in bold** are the preferred versions available in short delivery time.
Coding example: **USAB6-3X/EQ10**

SUBPLATES AND MOUNTING SCREWS

Subplates must be ordered according to data sheet WK 496 480:
G 341/01 - threaded connections G **¼**
G 342/01 - threaded connections G ⅜
G 502/01 - threaded connections G ½

Mounting screws for the directional spool valve :
M5 × 40 - 10.9 acc. to **PN - EN ISO 4762 (PN/M-82302)**
4 pcs/set. delivered on separate order.
Tightening torque of the screws **M_d = 9 Nm**

CONTACT

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34-100 Wadowice

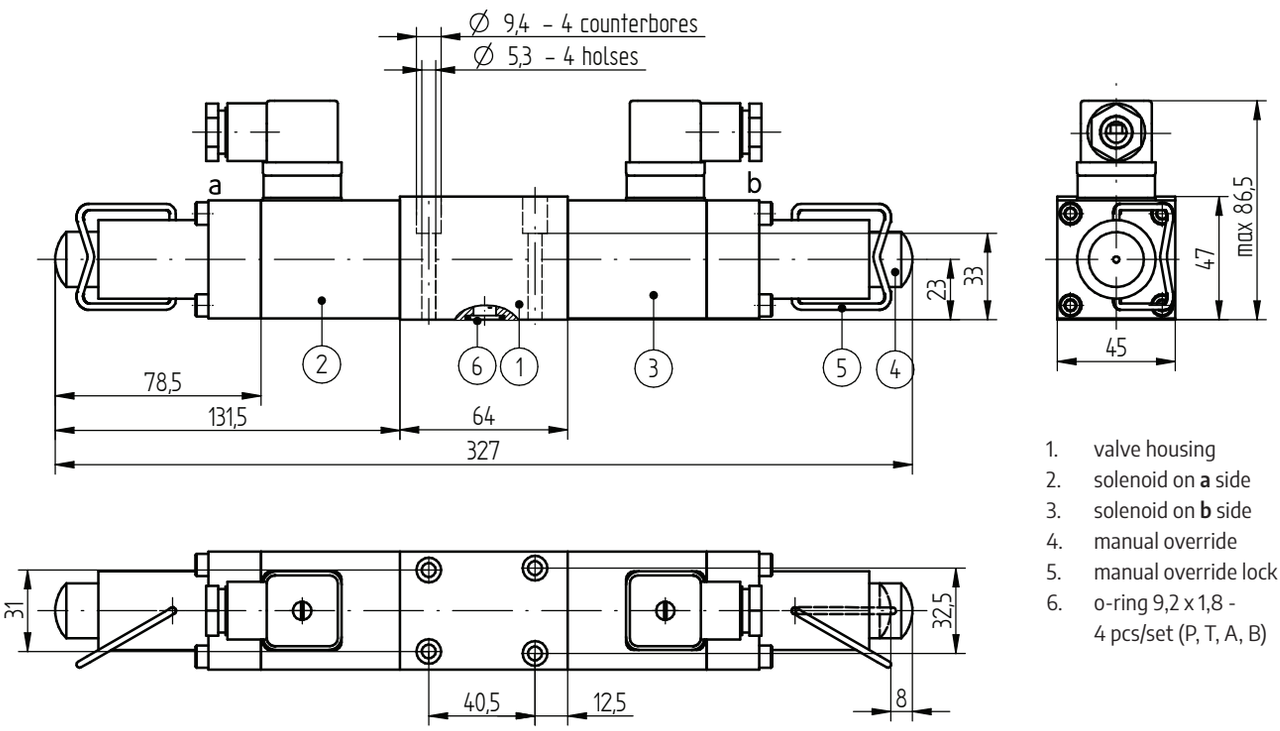
tel. +48 33 488 21 00
www.ponar-wadowice.pl

SPECIAL DESIGN VERSION USAB6...SO.../495

paint coating	USAB6...-SO495:	standard paint coating
	USAB6...-SO7/495:	tropical version: • reactive, polyvinyl primer VERNOL • epoxy primer with high zinc content SIGMACOVER ZINC PRIMER • polyurethane-acrylic primer PU • polyurethane enamel tropicalized PU - T, colour RAL 6003 (olive-green)
electronic controller type		30 RE 20 acc. to data sheet WK 495 773

full technical specification see page 1; assembly and operation requirements at: www.operating-conditions.ponar.pl

OVERALL AND CONNECTION DIMENSIONS - USAB6...SO.../495



1. valve housing
2. solenoid on **a** side
3. solenoid on **b** side
4. manual override
5. manual override lock
6. o-ring 9,2 x 1,8 - 4 pcs/set (P, T, A, B)

HOW TO ORDER

USAB | 6 | / | | | | | | N | V | — | |

1 2 3 4 5 6 7 8

1 nominal size (NS6) **6**

2 series number **3X**

3 spool symbol **see page 2**

4 flow changes

linear* = L

progressive = **Q**

* only for version with nominal flow Q =10 dm³/min for version with spool E with nominal flow Q = 20 dm³/min)

5 nominal flow (at Δp = 1MPa)

10 dm³/min = 10

20 dm³/min = **20**

32 dm³/min= 32

6 manual override

with manual override = N

7 sealing

FKM (for fluids on phosphate ester base)= V

8 special design*

special design in standard version = SO495

special design in tropical version = SO7/495

* solenoids with manual override, standard connector type ISO 4400 (DIN 43650 - A)

Ø indicates that the box should be left blank.
The **symbols in bold** are the preferred versions available in short delivery time.
Coding example: **USAB6/32EQ10NV-SO495**

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