

Proportional directional spool valve USAB 10

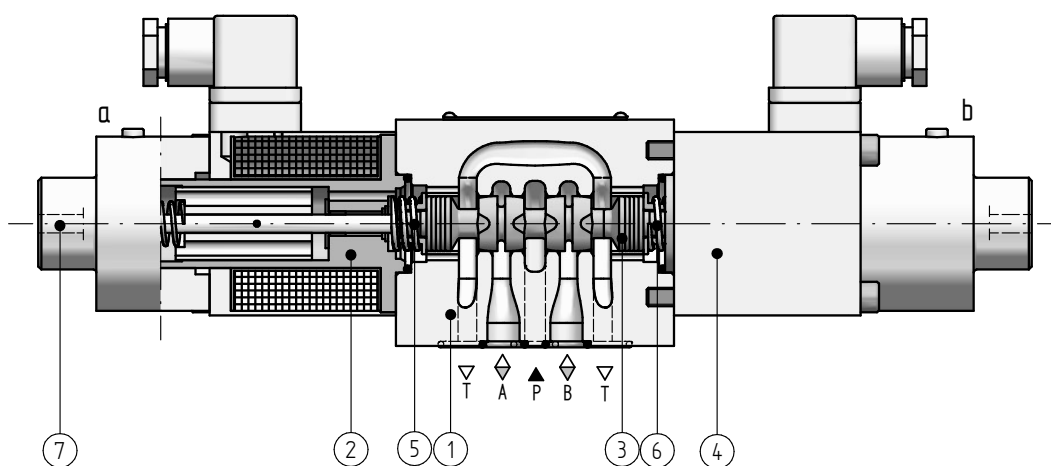
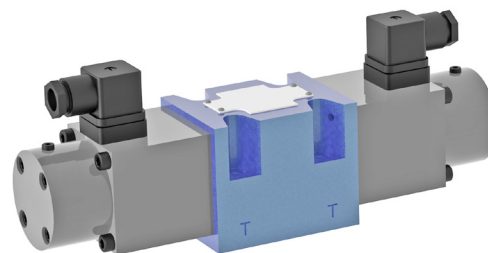
NS 10 | p_{max} 35 MPa | Q_{max} 64 dm³/min | WK 420 570



DATA SHEET - OPERATION MANUAL

APPLICATION

Proportional directional valve type USAB10... 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 USAB10... 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 USAB10...N... allowing for manual control of the directional valve in the event of power failure.

TECHNICAL DATA

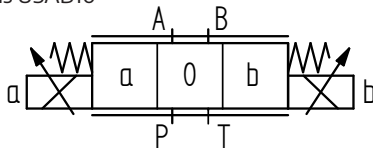
hydraulic fluid required fluid cleanliness class	mineral oil ISO 4406 class 20/18/15	operating position	any position
nominal fluid viscosity	37 mm ² /s at temperature 55 °C	weight	with 1 solenoid: 5,2 kg; with 2 solenoids: 7,2 kg
viscosity range	2,8 ÷ 380 mm ² /s	nominal solenoid power	22,5W
fluid temperature range (in the tank)	reco.: 40 ÷ 55°C; max.: -20 ÷ 70 °C	resistance of solenoid coil	10 Ω (for cold solenoid 20 °C) 14 Ω (for max. heated solenoid)
ambient temperature range	-20 ÷ 50 °C	electronic controllers	32 RE 20 acc. to data sheet WK 495 773 30 RE 20 D acc. to data sheet WK 420 830
max operating pressure	35 MPa (ports P, A, B); 21 MPa (port T)		MAP2 acc. to data sheet - electronic joystick; supply voltage: 24V, limit I_{max} to 1,5 A
hysteresis	<6%		
repeatability	<3%		

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

HYDAULIC DIAGRAMS

diagrams of 3-position valves

versions USAB10



NOTES:

Flow rates for spools E1 and W1:

$P \rightarrow A: Q_{max}$ $B \rightarrow T: 0,5 Q_{ma}$

$P \rightarrow B: 0,5 Q_{ma}$ $A \rightarrow T: Q_{ma}$

Flow rates for spools E2 and W2:

$P \rightarrow A: 0,5 Q_{ma}$ $B \rightarrow T: Q_{ma}$

$P \rightarrow B: Q_{ma}$ $A \rightarrow T: 0,5 Q_{ma}$

Flow rates for spools E3 and W3:

$P \rightarrow A: Q_{ma}$ $B \rightarrow T: \text{closed}$

$P \rightarrow B: Q_{ma}$ $A \rightarrow T: Q_{ma}$

for M spool in the middle position:

flow cross sections $P \rightarrow A$ and $P \rightarrow B$ are about 3%

of their nominal flow cross sections

for W spool in the middle position:

flow cross sections $A \rightarrow T$ and $B \rightarrow T$ are about 3%

of their nominal cross sections

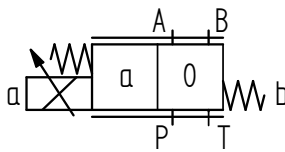
For V spool in the middle position:

flow cross sections $A \rightarrow T$; $B \rightarrow T$; $P \rightarrow A$ and $P \rightarrow B$

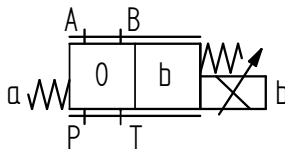
are about 3% of their nominal cross sections

diagrams of 2-position valves

versions USAB10...A...



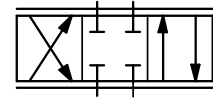
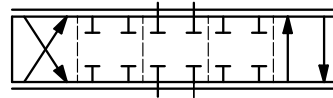
versions USAB10...B...



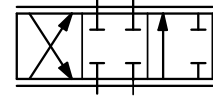
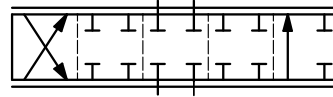
positions: working and interim

working

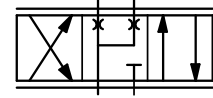
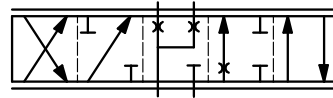
E, E1, E2



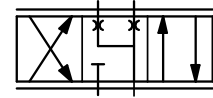
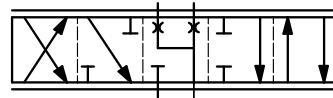
E3



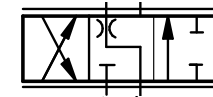
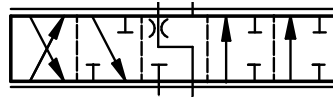
M



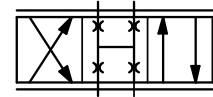
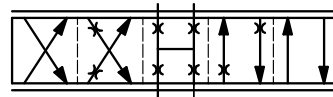
W, W1, W2



W3



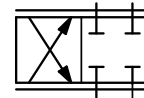
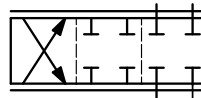
V



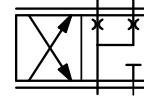
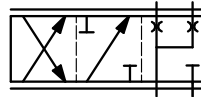
positions: working and interim

interim

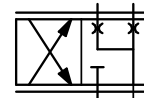
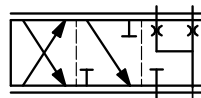
EA



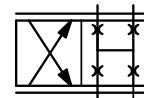
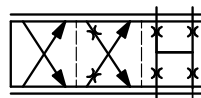
MA



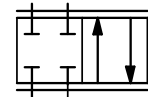
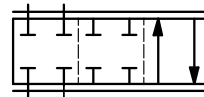
WA



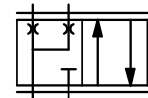
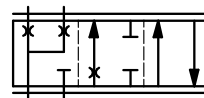
VA



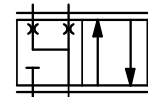
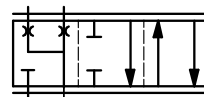
EB



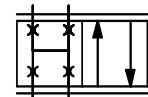
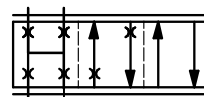
MB



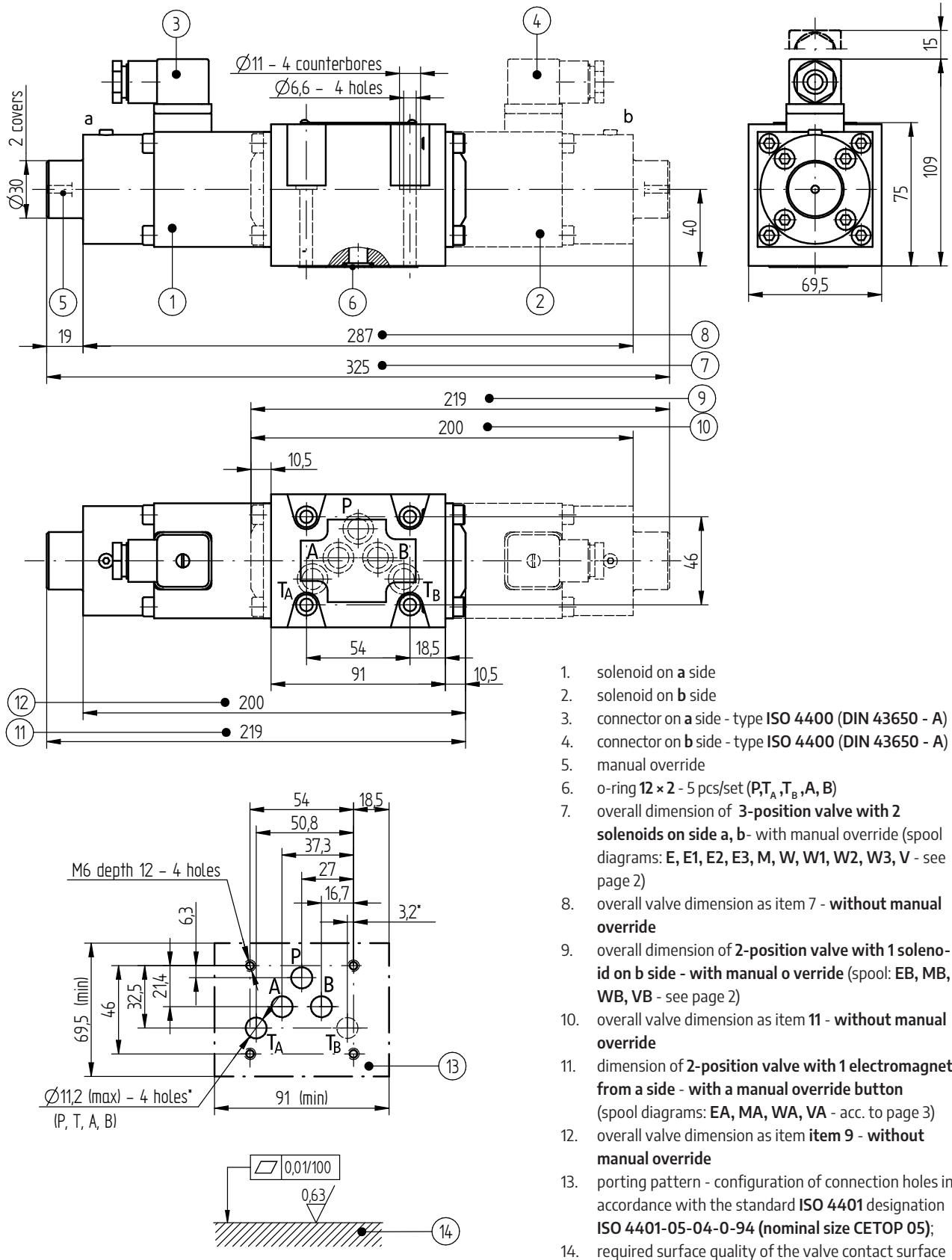
WB



VB



OVERALL AND CONNECTION DIMENSIONS

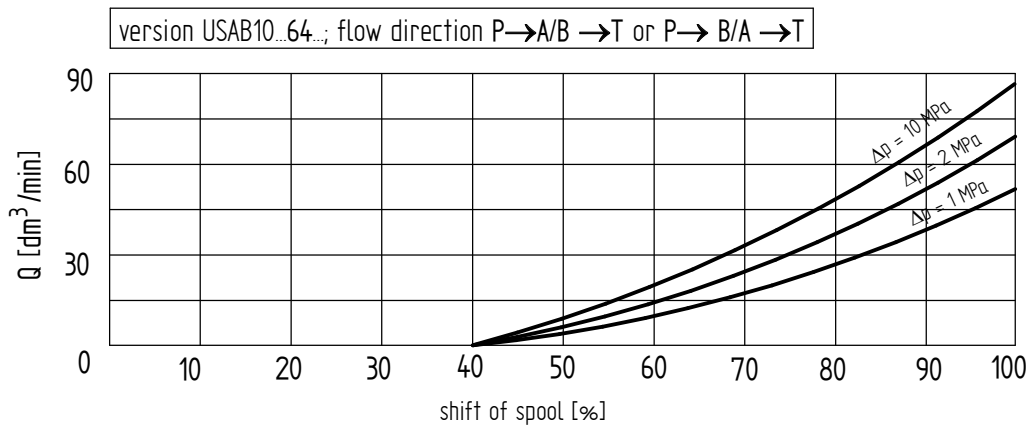
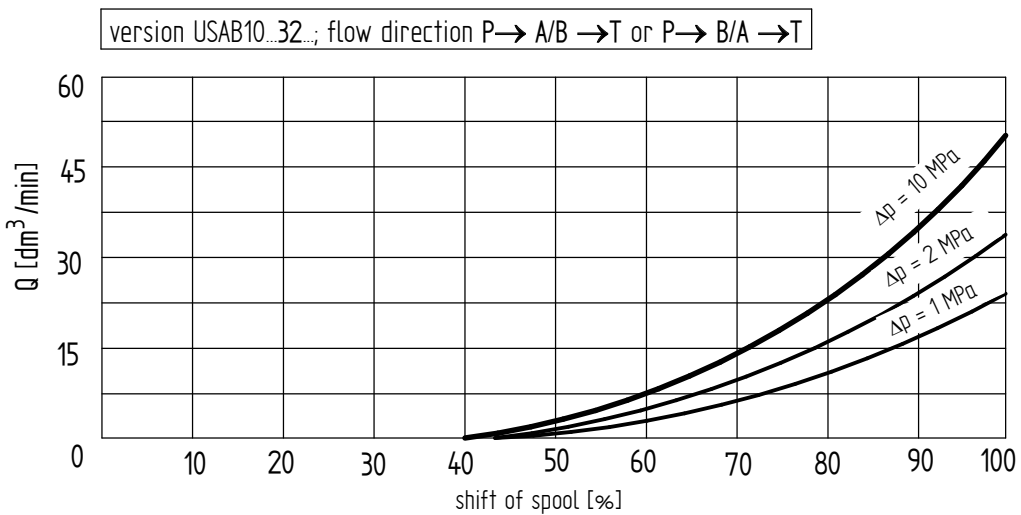
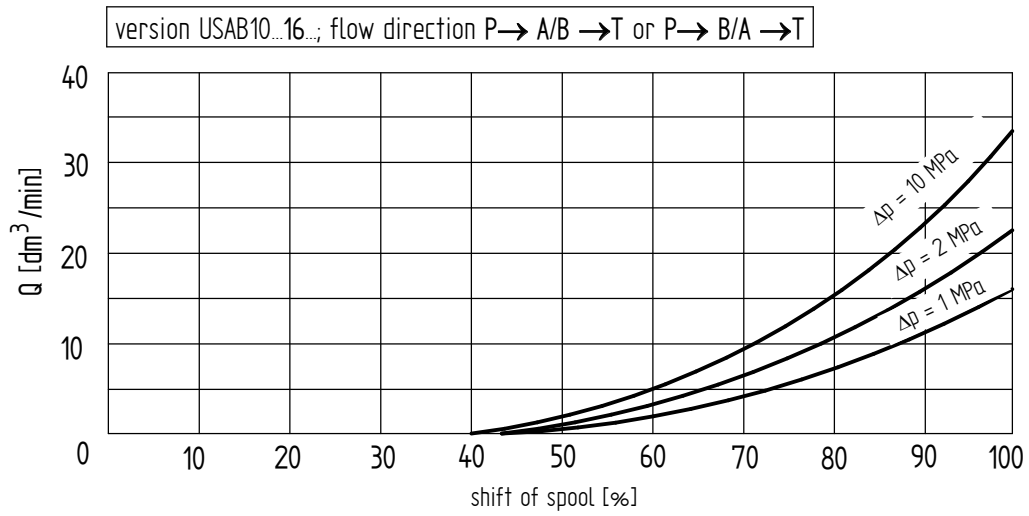


NOTE:

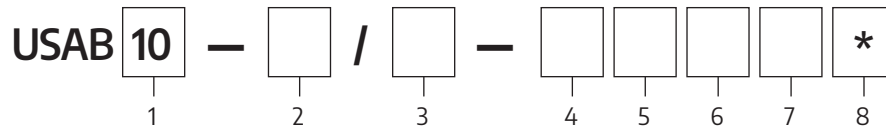
(*) - port T - optional

PERFORMANCE CURVES

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



HOW TO ORDER



1 nominal size (NS)		4 nominal flow (at $\Delta p = 1\text{MPa}$)		7 sealing
WN10 =	10	16 dm ³ /min =	16	NBR (for fluids on mineral oil base) = Ø
2 series number		32 dm ³ /min =	32	FKM (for fluids on phosphate ester base) = V
series 32 =	3X	64 dm ³ /min =	64	
series 30÷39 connection and installation dimensions unchanged		6 manual override		8 further requirements = *
3 spool symbol		without manual override =	Ø	(agreed upon with the Manufacturer)
spool diagrams -	see page 2	with manual override =	N	

Ø indicates that the box should be left blank.

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

Coding example: **USAB10-3X/E-16**

SUBPLATES AND MOUNTING SCREWS

Subplates must be ordered according to data sheet WK 496 520:

G 67/01 - threaded connections G 1/2

G 534/01 - threaded connections G 3/4

Mounting screws for the directional spool valve:

M6 × 50 - 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 = 15 Nm**

CONTACT

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KONTAKT

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