

DATA SHEET - OPERATION MANUAL

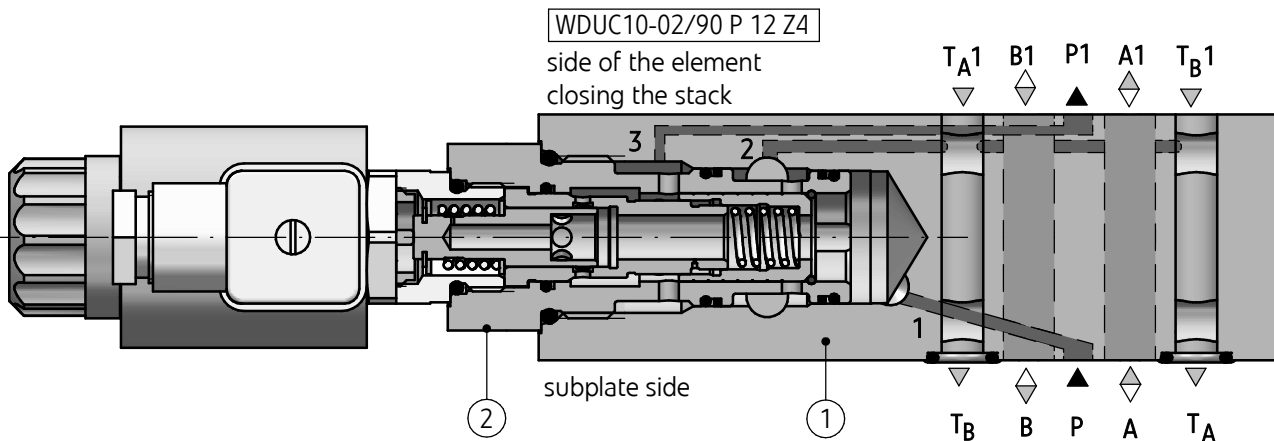
APPLICATION

3-way, electrically operated, proportional flow control valve, sandwich plate type WDUC10... is used for independent from the pressure at the supply (pump) controlling of flow rate of oil in a hydraulic system. It allows for controlling the speed of the receiver - usually a piston rod of a cylinder or a shaft of a hydraulic motor. The supply stream is divided into the priority stream, connected depending on the housing type to ports **P**, **A** or **B** and a residual stream. Flow control valve type WDUC10... is intended for sandwich mounting in hydraulic blocks.

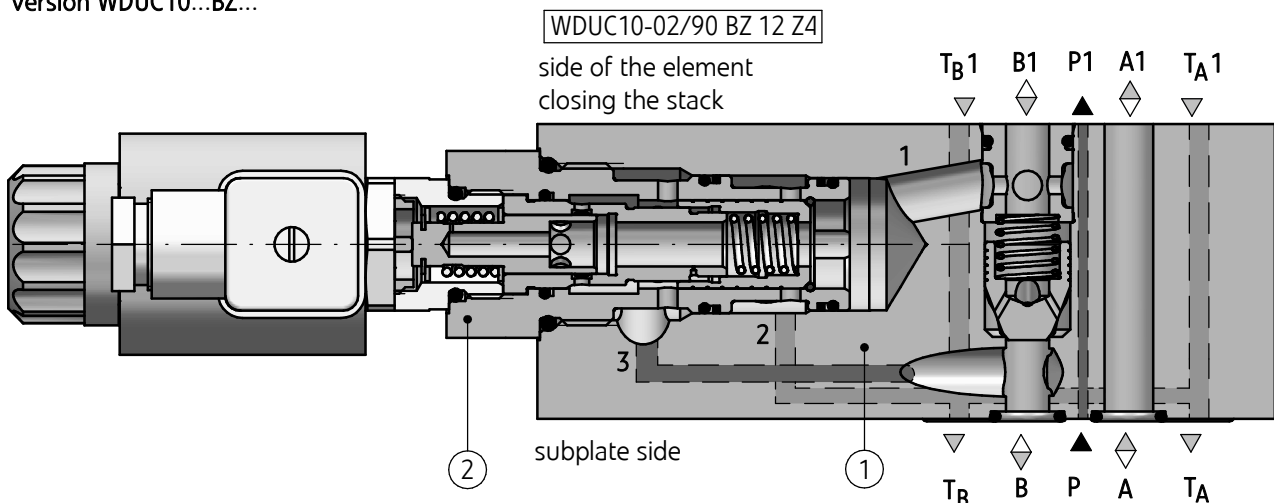


DESCRIPTION OF OPERATION

version WDUC10...P...



version WDUC10...BZ...

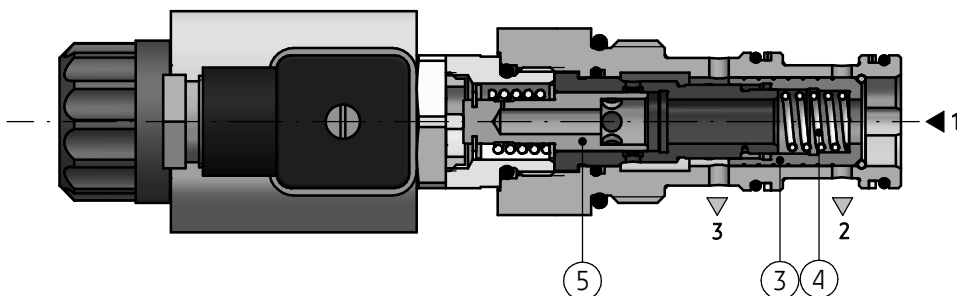


The 3-way flow control valve type WDUC10... consists of the valve (2) type WDUD10... - description of operation at page 2 and the housing (1). It is suitable for sandwich mounting, usually under a directional control valve. Regulation of stream is possible at ports **A**, **B** or **P**, and

the residual stream is directed to the port **T**. Versions ...AZ... and ...BZ... are additionally equipped in check valves, placed in the housing (1), at the supply port, allowing free flow of the fluid in the opposite direction.

DESCRIPTION OF OPERATION

valve - item 2 acc. to drawing at page 1
(type WDUC10 acc. to data sheet WK 420 270)



Hydraulic fluid flowing through the valve from port 1 to 3 causes a pressure drop at the throttle (5), which depends from the setting and the current value of flow through the throttle (5). The difference of pressures in front of and behind the throttle (5) affects the spool (3) and after overcoming the initial tension of the spring (4) causes the opening of flow from port 1 to 2 allowing flow of residual stream. At the same time, the spool (3) by the controlling

edge - from the opposite side - causes throttling of flowing oil stream to the port 3. The spool (3) will be in a balance at the moment when the pressure drop at the measuring throttle (5) will conform to the initial tension of the spring (4). T means that the flow rate through the port 3 will be independent from the pressure at the supply (port 1), and will depend only from the position of the throttle (5).

DANE TECHNICZNE

Hydraulic fluid	mineral oil		
Required fluid cleanliness class	ISO 4406 class 20/18/15		
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 +70 °C	
Ambient temperature range	- 20 °C up to +50 °C		
Max working pressure	25 MPa		
Min working pressure for flow control function	1,8 MPa		
Max flow rate	valve version (flow range)	flow rate	
		port 1	port 3
	WDUC10.../25...	60 dm ³ /min	25 dm ³ /min
	WDUC10.../50...	90 dm ³ /min	50 dm ³ /min
Hysteresis	WDUC10.../90...	150 dm ³ /min	90 dm ³ /min
	WDUC10.../25...	10 %	
	WDUC10.../50...	8 %	
Max solenoid current I _{max}	1,5 A		
	Solenoid coil resistance at temperature 20 °C	5,4 Ω	
Electronic regulator (delivered on separate order)	type 20RE10 E acc. to data sheet WK 420 820 type 20RC10 E acc. to data sheet WK 427 790 (when powering with a stabilised voltage 12 to 24V DC set maximum value of current I _{max})		
	type 21RE10 D acc. to data sheet WK 421 810		
Valve weight	5 kg		

INSTALLATION AND OPERATION REQUIREMENTS

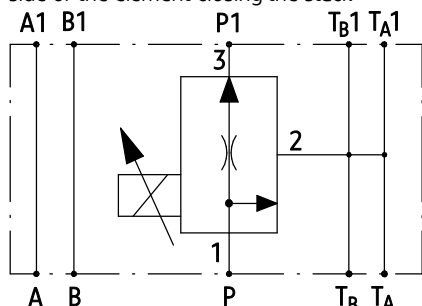
1. Only fully functional and operational valve, properly connected to electrical installation must be used.
2. During the period of operation must be kept fluid viscosity acc. to requirements defined in this Data Sheet - Operation Manual
3. In order to ensure failure free and safe operation the following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

DIAGRAMS

Hydraulic diagrams of proportional flow control valve type WDUC10...

version WDUC10...P...

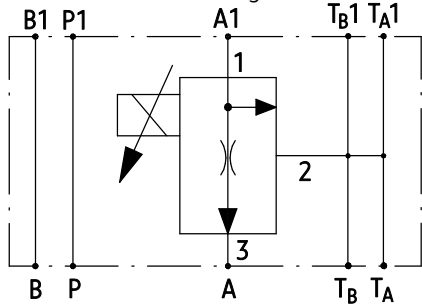
side of the element closing the stack



subplate side

version WDUC10...A...

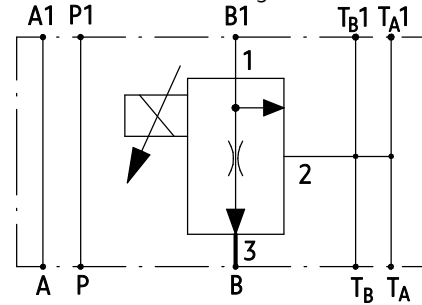
side of the element closing the stack



subplate side

version WDUC10...B...

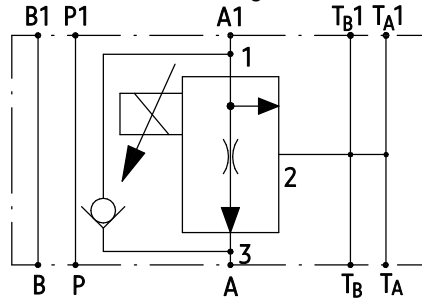
side of the element closing the stack



subplate side

version WDUC10...AZ...

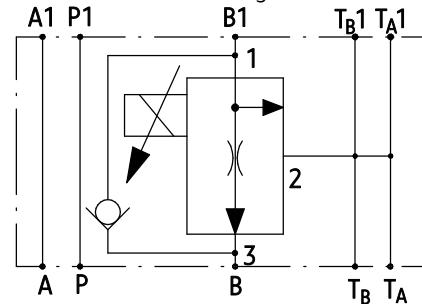
side of the element closing the stack



subplate side

version WDUC10...BZ...

side of the element closing the stack



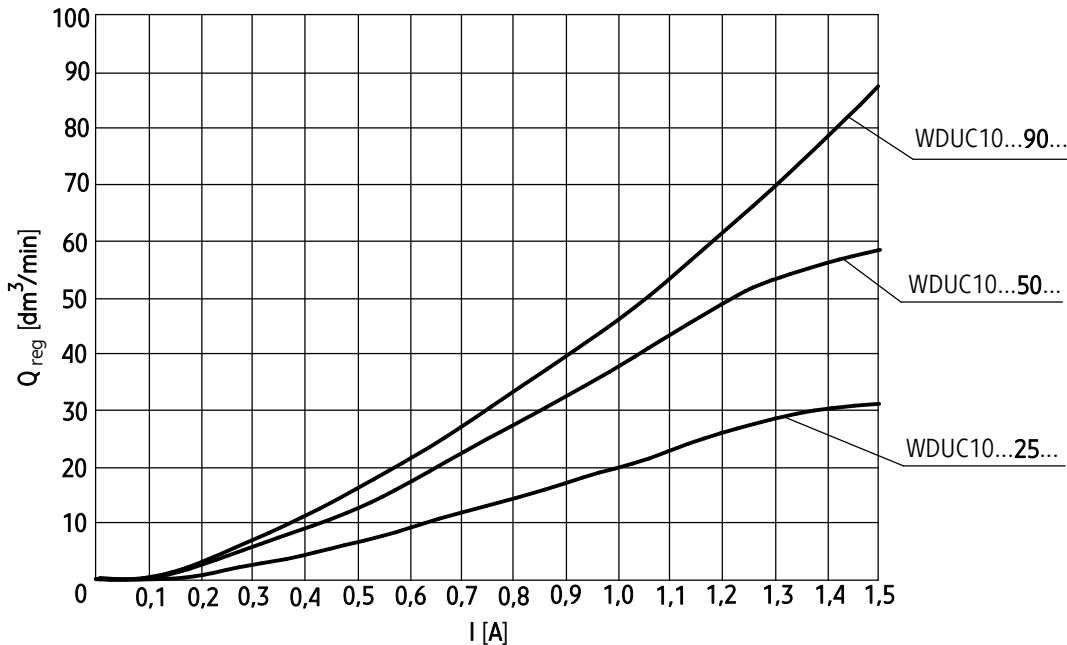
subplate side

PERFORMANCE CURVES

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

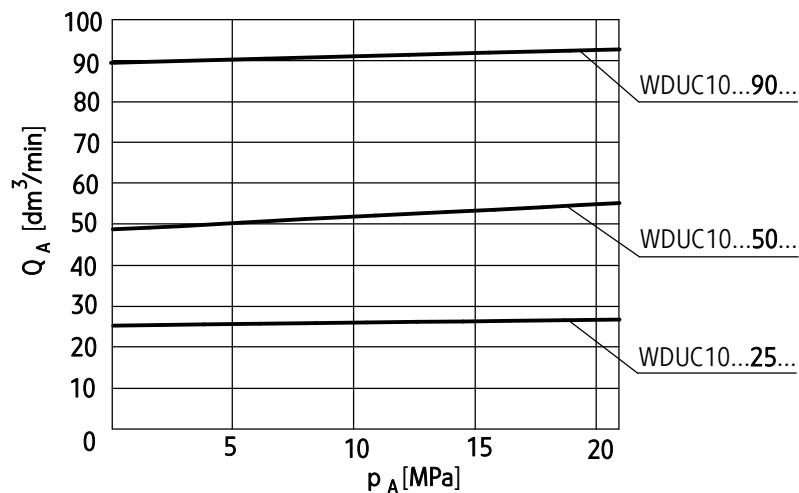
Performance curves for flow rate depending on the supply current of the solenoid

performance curves for regulated flow Q_{reg} depending on the supply current of the solenoid I for valves type **WDUC10...** in versions with various flow ranges



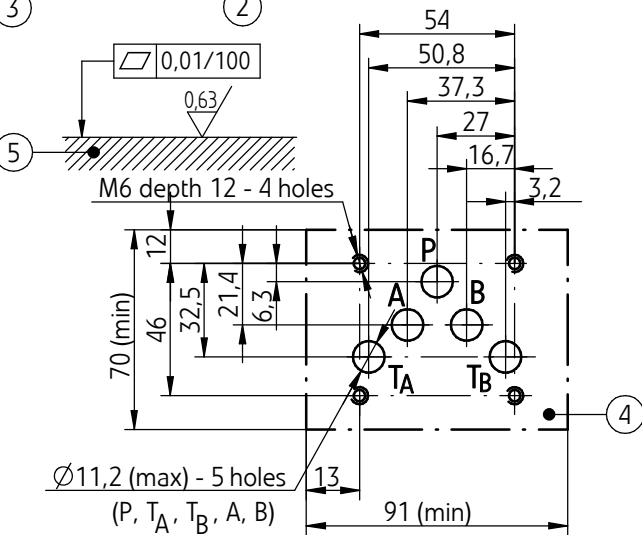
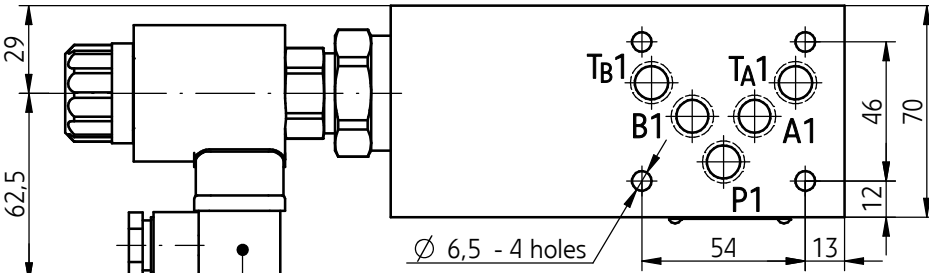
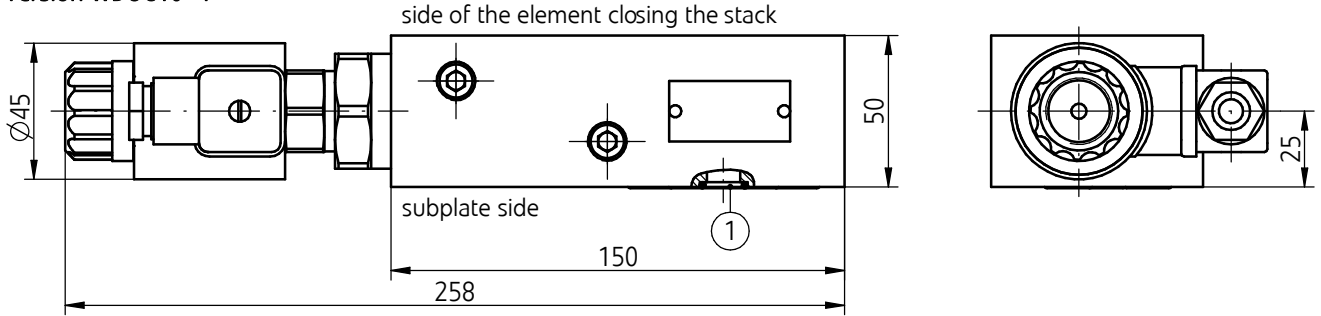
Performance diagrams of stable flow rate

performance curves of flow Q_A depending on pressure p_A for valves type **WDUC10...** in versions with various flow ranges



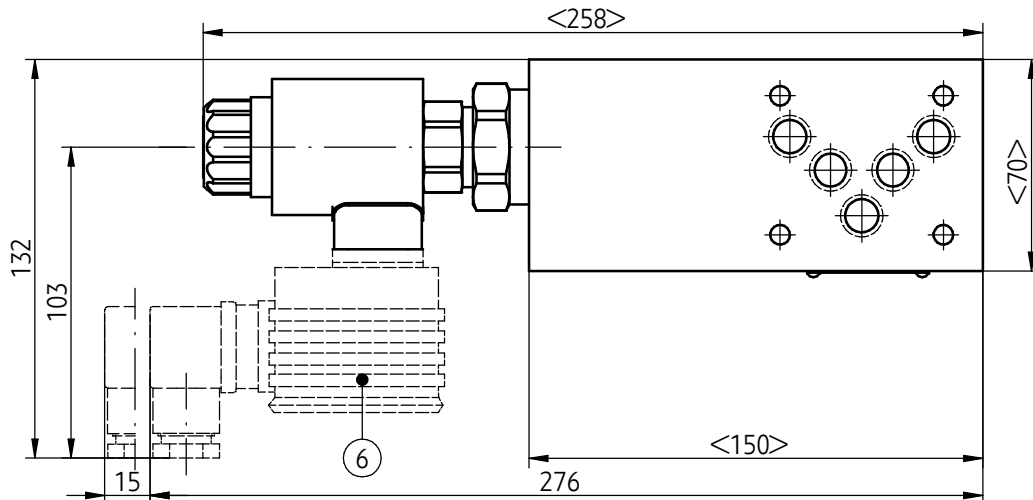
OVERALL AND CONNECTION DIMENSIONS

version WDU10...P...



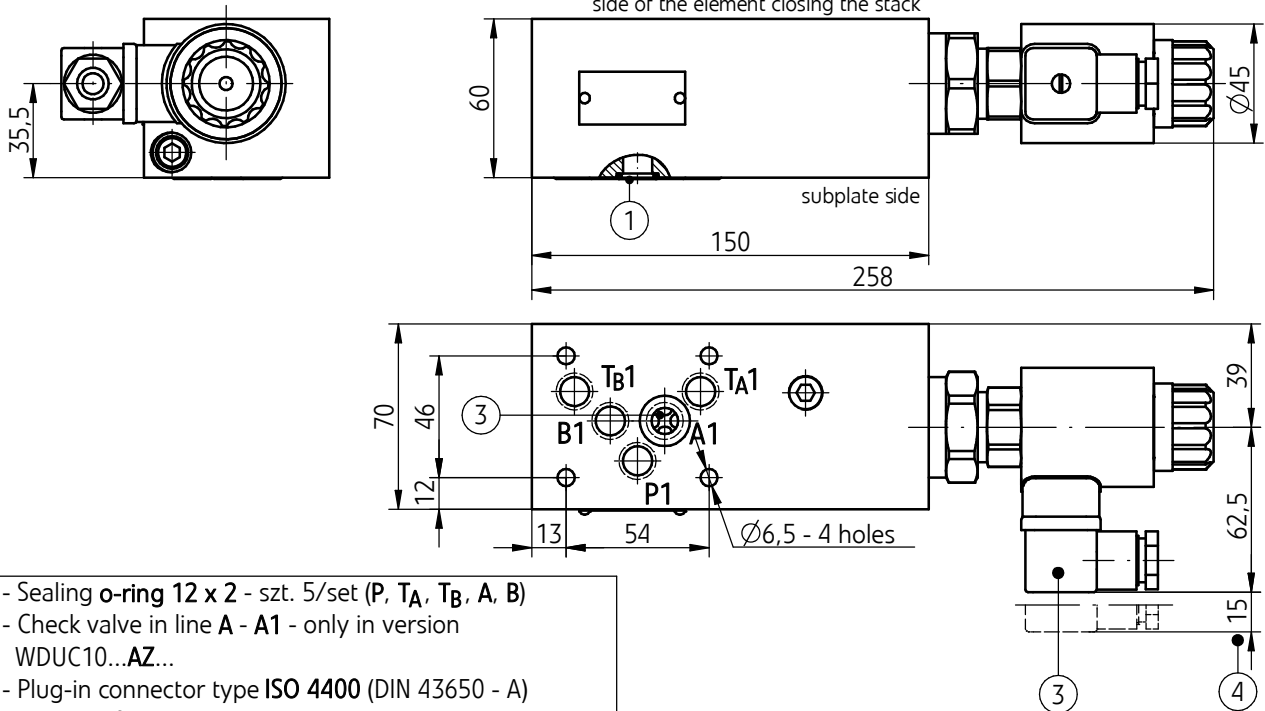
- 1 - Sealing o-ring 12 x 2 - szt. 5/set (P, T_A, T_B, A, B)
 - 2 - Plug-in connector type ISO 4400 (DIN 43650 - A)
 - 3 - Distance for disassembling the plug-in connector - item 2
 - 4 - Porting pattern - configuration of connection holes of subplate surface and the valve body surface from the side of the element closing the stack compliant with the standard ISO 4401; designation ISO 4401-05-04-0-94 (CETOP 05) fixing screws M6 x L* -10.9 acc. to PN - EN ISO 4762 pcs. 4/set delivered on separate order; tightening torque Md = 15 Nm
 - 5 - Subplate surface required
 - 6 - Electronic regulator type 20RE10E with a plug-in connector type ISO 4400 (DIN 43650-A) in accordance with data sheet WK 420 820 delivered on separate order
- NOTE:**
(*) - Required length of the screws L is related to type and the number of hydraulic components sandwich fitted

overall dimensions of version WDU10...P... with fitted electronic regulator type 20RE10E

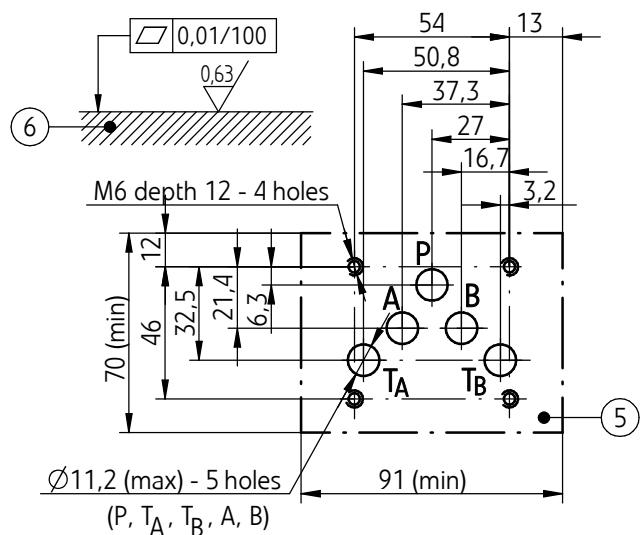


OVERALL AND CONNECTION DIMENSIONS

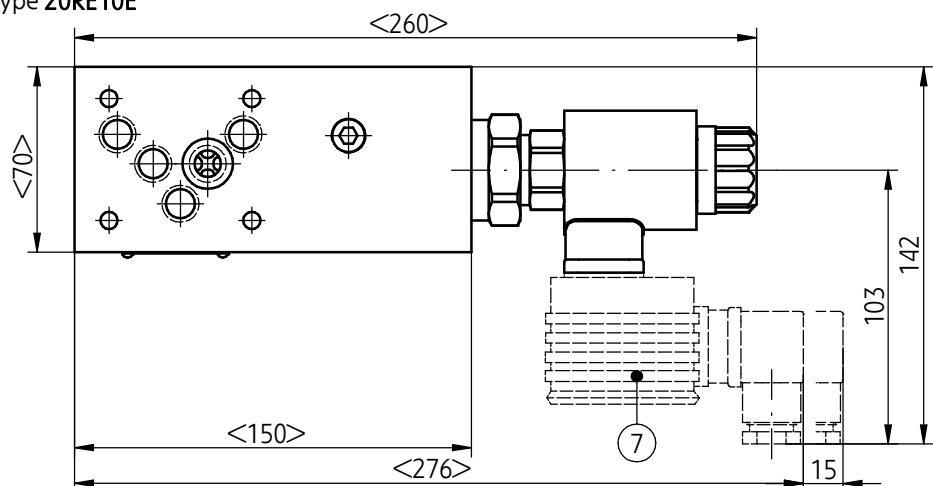
versions: WDUC10...A...; ...AZ...



- 1 - Sealing o-ring 12 x 2 - szt. 5/set (P, T_A, T_B, A, B)
 - 2 - Check valve in line A - A1 - only in version WDUC10...AZ...
 - 3 - Plug-in connector type ISO 4400 (DIN 43650 - A)
 - 4 - Distance for disassembling the plug-in connector - item 3
 - 5 - Porting pattern - configuration of connection holes of subplate surface and the valve body surface from the side of the element closing the stack compliant with the standard ISO 4401; designation ISO 4401-05-04-0-94 (CETOP 05) fixing screws M6 x L* -10.9 acc. to PN - EN ISO 4762 pcs. 4/set delivered on separate order; tightening torque Md = 15 Nm
 - 6 - Subplate surface required
 - 7 - Electronic regulator type 20RE10E with a plug-in connector type ISO 4400 (DIN 43650-A) in accordance with data sheet WK 420 820 delivered on separate order
- NOTE:**
(*) - Required length of the screws L is related to type and the number of hydraulic components sandwich fitted

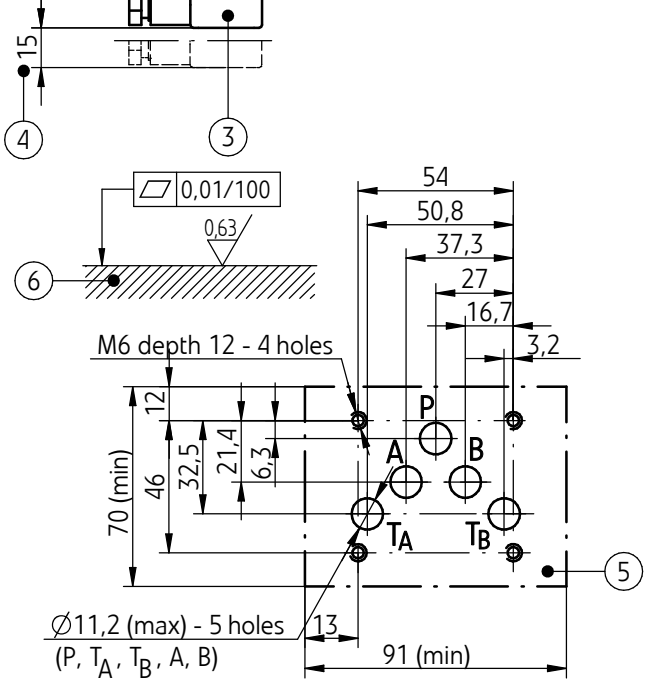
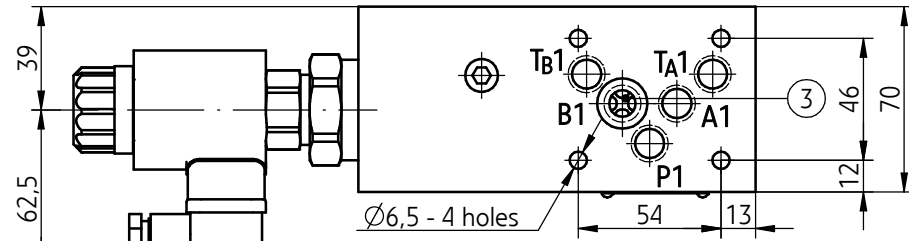
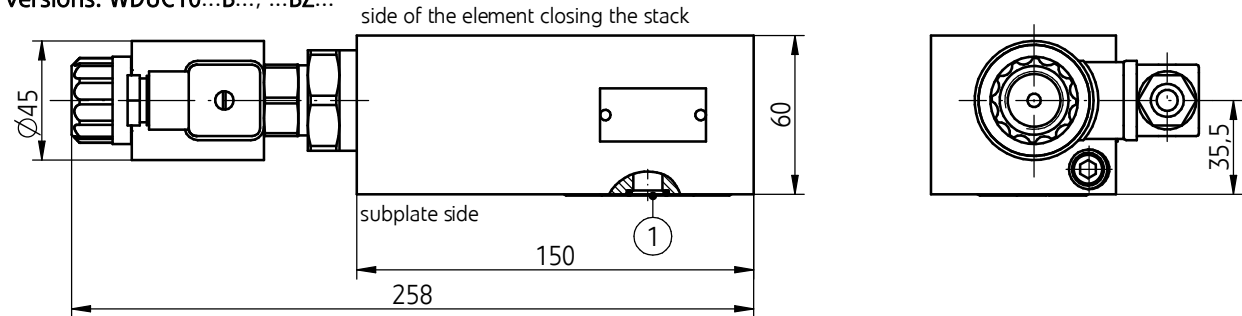


overall dimensions of versions: WDUC10...A...; ...AZ...
with fitted electronic regulator type 20RE10E



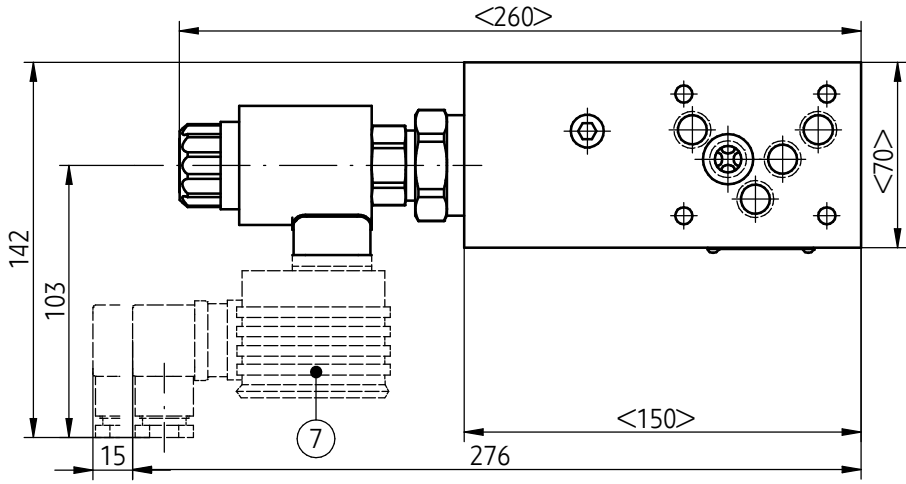
OVERALL AND CONNECTION DIMENSIONS

versions: WDUC10...B...; ...BZ...



- 1 - Sealing o-ring 12 x 2 - szt. 5/set (P, T_A, T_B, A, B)
 - 2 - Check valve in line B - B1 - only in version WDUC10...BZ...
 - 3 - Plug-in connector type ISO 4400 (DIN 43650 - A)
 - 4 - Distance for disassembling the plug-in connector - item 3
 - 5 - Porting pattern - configuration of connection holes of subplate surface and the valve body surface from the side of the element closing the stack compliant with the standard ISO 4401; designation ISO 4401-05-04-0-94 (CETOP 05) fixing screws M6 x L* -10.9 acc. to PN - EN ISO 4762 pcs. 4/set delivered on separate order; tightening torque Md = 15 Nm
 - 6 - Subplate surface required
 - 7 - Electronic regulator type 20RE10E with a plug-in connector type ISO 4400 (DIN 43650-A) in accordance with data sheet WK 420 820 delivered on separate order
- NOTE:**
(*) - Required length of the screws L is related to type and the number of hydraulic components sandwich fitted

overall dimensions of versions: WDUC10...B...; ...BZ... with fitted electronic regulator type 20RE10E



HOW TO ORDER

WDUC	10	+	/						*
-------------	-----------	----------	----------	--	--	--	--	--	----------

Nominal size (NS) NS10 = 10									
Series number (00-09) - connection and installation dimensions unchanged = 0X series 02 = 02									
Flow range up to 25 dm³/min = 25 up to 50 dm³/min = 50 up to 90 dm³/min = 90									
Flow control at ports P to P1 = P A1 to A = A B1 to B = B A1 to A with a check valve = AZ B1 to B with a check valve = BZ									
Solenoid coil coil for max current I max = 1,5 A = 12									
Electrical connection plug-in connector type ISO 4400 without LED (DIN 43650 - A) = Z4									
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:

The flow control valve should be ordered according to the above coding.

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

Coding example: WDUC10 - 02/90 P 12 Z4

SUBPLATES AND FIXING SCREWS

Subplates must be ordered according to data sheet

WK 496 520. Subplate symbols:

G 66/01 - threaded connections G 3/8

G 67/01 - threaded connections **G 1/2**

G 89/01 - threaded connections G 1/4

G 67/02 - threaded connections M22 x 1,5

G 534/01 - threaded connections G 3/4

NOTE:

The subplate symbol in bold is the preferred version available in short delivery time.

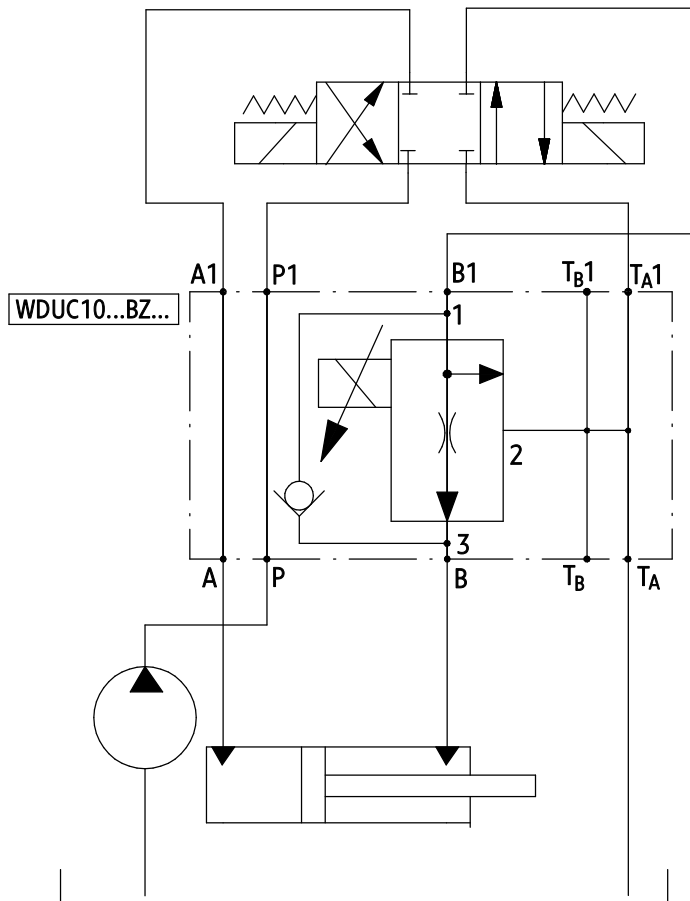
Subplates and fixing screws **M6 x L*** - 10,9 - acc. to

PN - EN ISO 4762 - pcs. 4/set are delivered on separate order; tightening torque **Md = 15 Nm**.

NOTE:

(*) - required length of the screws L is related to type and the number of hydraulic components sandwich fitted

EXAMPLE OF APPLICATION IN A HYDRAULIC SYSTEM



PONAR Wadowice S.A.
ul. Wojska Polskiego 29
34-100 Wadowice
tel. +48 33 488 21 00
fax. +48 33 488 21 03
www.ponar-wadowice.pl

