

CATALOGUE SHEET - SERVICE MANUAL

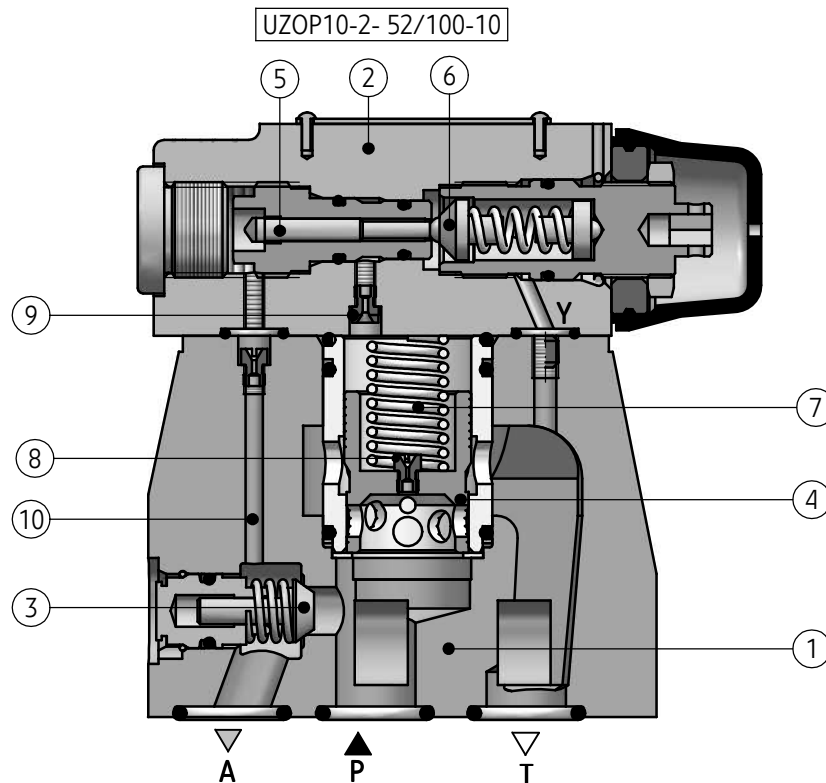
APPLICATION

The pressure shut-off valve type UZOP... is used in hydraulic systems to work with a pump and an accumulator (or the second pump). The valve is used to unload the pump flow (to a drain line) when the pressure in the accumulator reaches fixed setting at the valve. When pressure in accumulator drops (by relative theoretical value **10%** or **17%**) the valve connects the pump to resupply the accumulator.

The product has been designed and manufactured meeting the requirements stated in Directive 2006/95/WE for voltages:

- 50 - 250 V AC
- 75 - 250 V DC

DESCRIPTION OF OPERATION

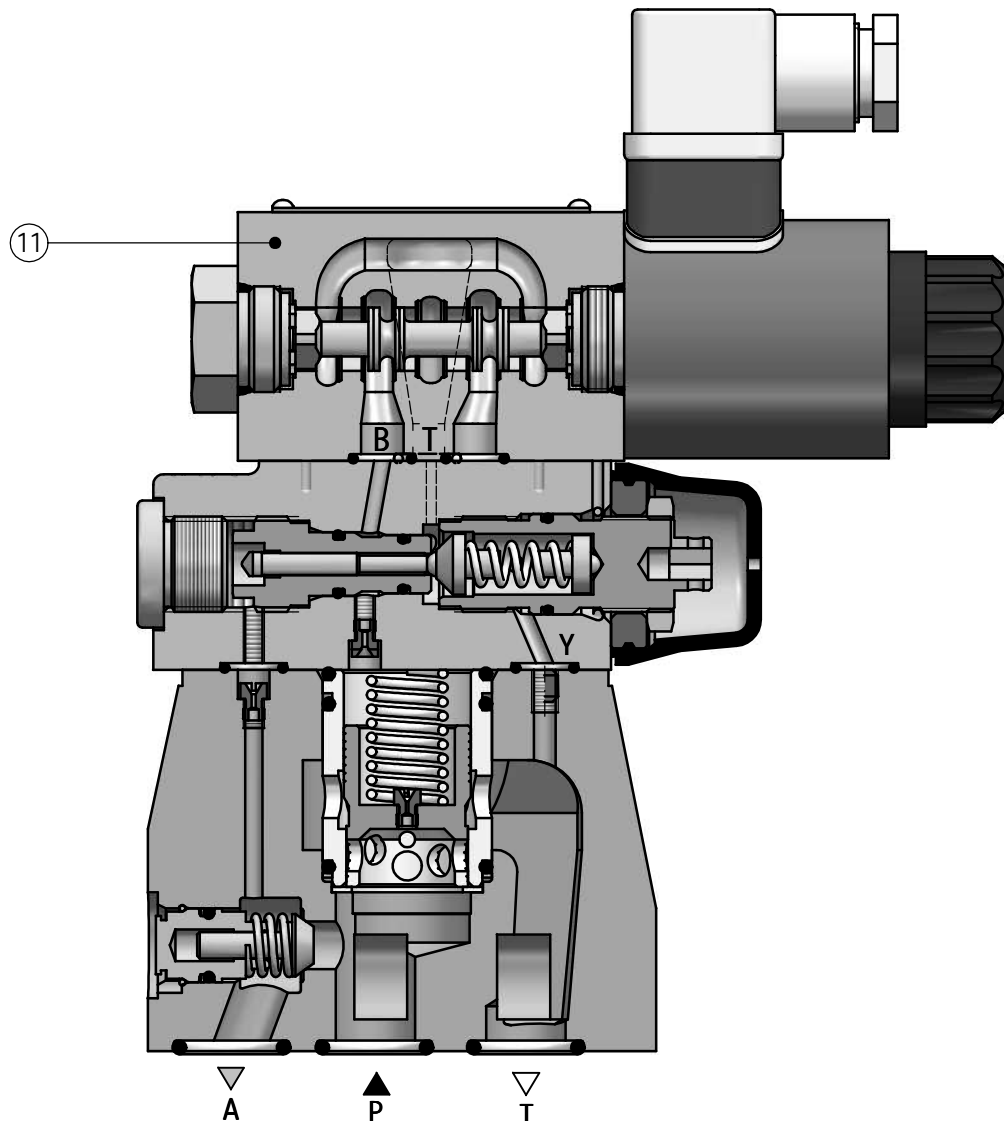


Hydraulic fluid flows from port **P** through the check valve (3) into port **A** (hydraulic accumulator supply). When the pressure set at pilot valve (2) is reached, then the poppet (6) goes up and the fluid flows from port **P** through a cascade of the orifices (8) and (9) to the pilot oil drain **T** (or **Y**). As a result of pressure drop acting on the spool (4) of the main valve (1), the spool (4) lifts off its seat against the spring tension (7) and opens the connection from **P** to **T**. Now the check valve (3) closes the connection from **A** to **T** and pressure in port **A** is not relieved to port **T**. As soon as the pilot valve (2) is

opened, pressure in port **A** via pilot line (10) acting on the tappet (5) supports the poppet (6) of a pilot valve (2). In consequence after opening the main valve (1) and relieving port **P** the poppet (6) is held in the open position. The pilot valve (2) is reclosed just after the pressure in port **A** drops by the fixed percentage value (**10%** or **17%**). In consequence pilot oil flow through a cascade of the orifices (8) and (9) is broken and main spool (4) closes flow to the drain **T**. As a result the valve reaches the initial position to enable flow from **P** to **A** (resupply the accumulator).

DESCRIPTION OF OPERATION

UZOPW10-A2-52/100 -10G24NZ4



The pressure shut-off valve **type UZOP...** can also be made with built-on electrically operated directional valve - version **UZOPW...**. The directional valve (11) enables pilot flow directly to the drain **T** (or **Y**) side from pressure valve.

In relation to valve version port **P** can be unloaded in energised position - version **UZOPW... A...** or energised position - version **UZOPW... B...** of directional valve (11).

ASSEMBLY AND APPLICATION REQUIREMENTS

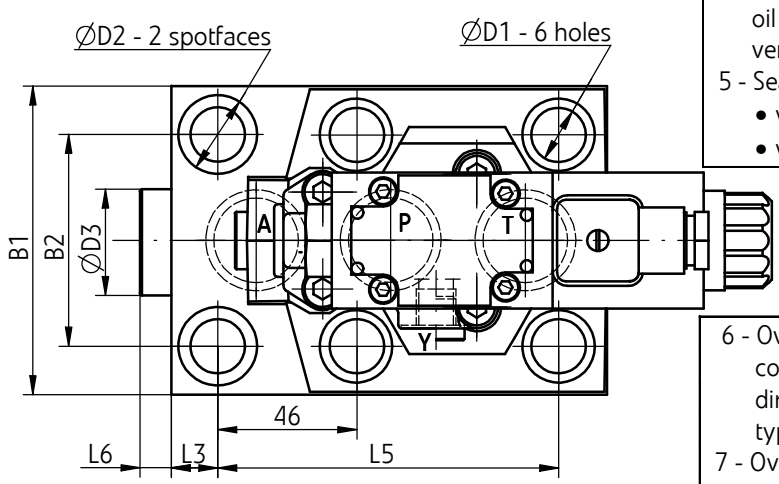
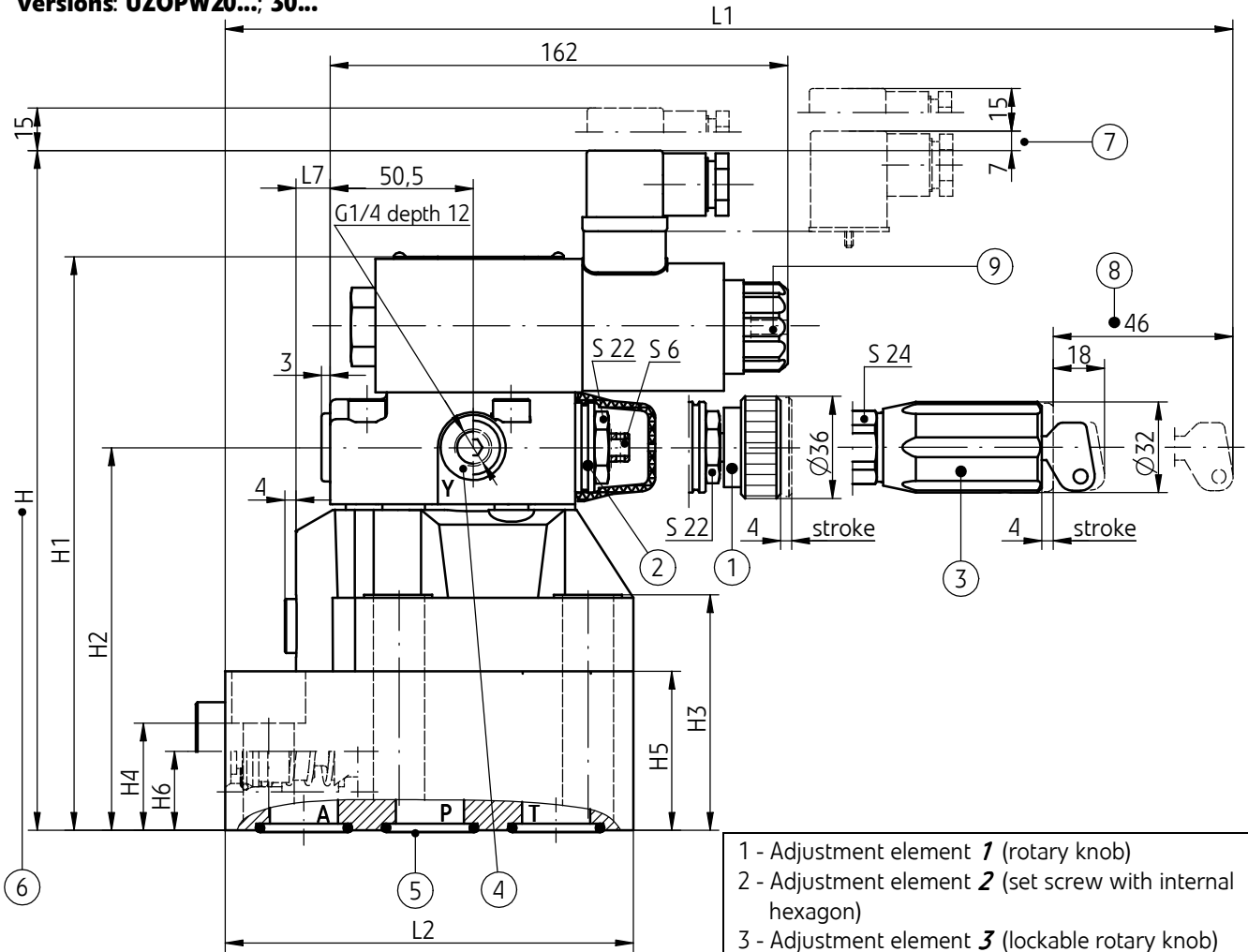
1. The pressure shut-off valve with built-on directional valve electrically operated can be used only working properly and suitably connected to an electric system. Only skilled workers are allowed to connect and disconnect the valve to an electric system.
2. Ground connection (\perp) must be connected with protective earth wire (PE \perp) in a supply system according to appropriate instructions.
3. It is forbidden to apply a pressure shut-off valve with built-on directional valve electrically operated if the supply cable in the gland of plug-in connector is not properly tightened.
4. It is forbidden to apply a pressure shut-off valve if the plug-in-connector is not properly tightened to the solenoid socket and is not secured by fixing screw tightly.
5. Due to heating a solenoid coil, pressure shut-off valves with built-on directional valve electrically operated 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).

TECHNICAL DATA

Hydraulic fluid	mineral oil				
Required filtration	up to 16 µm				
Recommended filtration	up to 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 +70°C			
Ambient temperature range	version UZOP...	-20°C up to +70°C			
	version UZOPW...	-20°C up to +50°C			
Maximum operating pressure	31,5 MPa				
Maximum pressure at port Y	version UZOP...	31,5 MPa			
	version UZOPW...	21 MPa			
Minimum set pressure	0,5 MPa				
Maximum set pressure	31,5 MPa				
Maximum flow	nominal size	valve version			
		UZOP...-10...	UZOP...-17...		
	NS10	40 dm³/min	60 dm³/min		
	NS20	80 dm³/min	120 dm³/min		
	NS30	120 dm³/min	240 dm³/min		
Switching hysteresis	version UZOP...-10...	10 %			
	version UZOP...-17...	17 %			
Switching hysteresis range (related to set pressure range)	version UZOP...-10...	5 % do 20 %			
	version UZOP...-17...	11 % do 28 %			
Weight	nominal size	valve version			
		UZOP...	UZOPW...	UZOPC...	UZOPWC...
	NS10	3,7 kg	5,4 kg	1,5 kg	3,1 kg
	NS20	6,9 kg	8,5 kg	1,5 kg	3,1 kg
	NS30	13,1 kg	14,7 kg	1,5 kg	3,1 kg
Directional valve type (applied to version UZOPW... only)	WE6... according to catalogue sheet WK 499 502				
Nominal supply voltage for solenoid	DC			AC (plug-in connector with rectifier)	
	12V	24V	110V	230V - 50Hz	110V - 50Hz
Supply voltage tolerance	±10%				
Power requirement (DC)	30 W				
Insulation	IP 65				
Solenoid coil temperature	max 150 °C				

OVERALL AND CONNECTION DIMENSIONS

versions: UZOPW20...; 30...



- 1 - Adjustment element **1** (rotary knob)
- 2 - Adjustment element **2** (set screw with internal hexagon)
- 3 - Adjustment element **3** (lockable rotary knob)
- 4 - External port **Y** - for version with external pilot oil drain UZOP...Y... only (plug G1/4 for other versions)
- 5 - Seal o-ring - 3 pcs/kit (A, P, T)
 - version UZOP20... - seal o-ring 28,17 x 2,62
 - version UZOP30... - seal o-ring 34,5 x 3,5

- 6 - Overall dimension for the valve with electrical connection **12V, 24V, 110V DC** (built-on directional valve with plug-in connector type **DIN 43650 / ISO 4400**)
- 7 - Overall dimension for the valve with electrical connection **110V, 230V AC** (built-on directional valve with plug-in connector type **DIN 43650 / ISO 4400** with rectifier)
- 8 - Space required to remove the key from the lock
- 9 - Manual override

valve version	L1	L2	L3	L4	L5	L6	L7	B1	B2	H	H1	H2	H3	H4	H5	H6	φD1	φD2	φD3
UZOPW20...	197	144	15,3	46	112,7	-	12	102	70	240	204	135	83	38	56	28	18	26	-
UZOPW30...	239	205	49,3	50,8	139,7	16,5	20	115	82,5	260	224	155	103	56	76	38	20	30	55

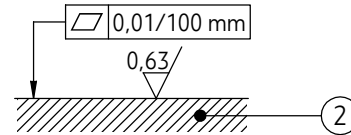
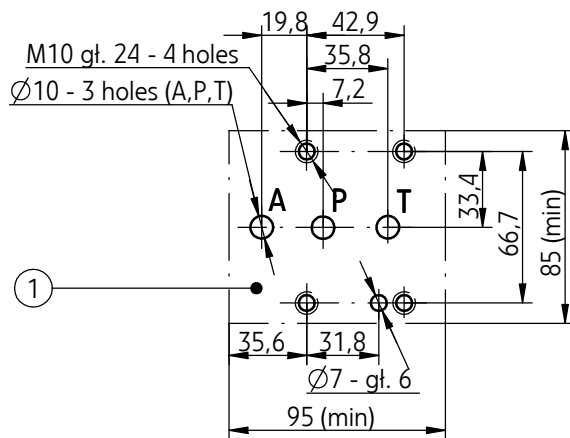
OVERALL AND CONNECTION DIMENSIONS

versions for subplate mounting: **UZOP10...; 20...; 30...**

UZOPW10... 20... 30...

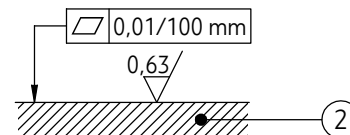
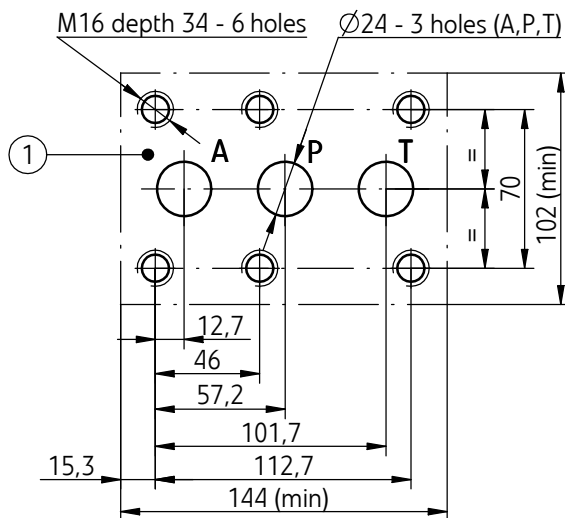
mounting holes configuration of subplates

versions: UZOP10...; UZOPW10...



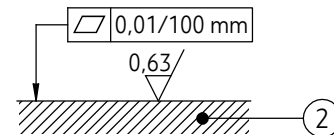
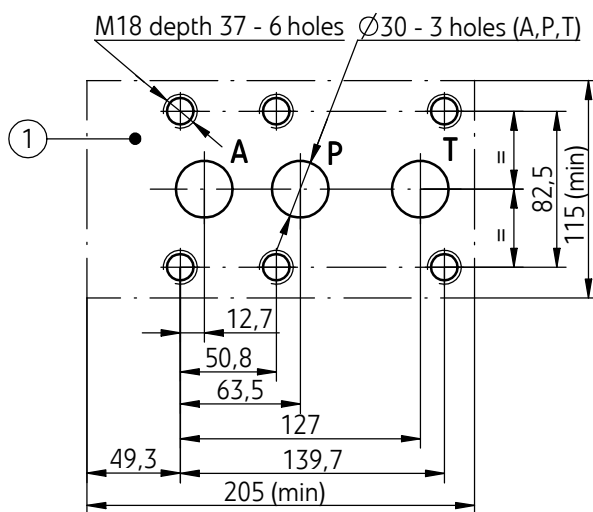
- 1 - Mounting holes configuration on a subplate fixing screws **M10 x 50 - 10.9** according to **PN - EN ISO 4762** - 4 pcs / kit tightening torque **Md = 75 Nm**
- 2 - Required surface finish of a subplate

versions: UZOP20...; UZOPW20...



- 1 - Mounting holes configuration on a subplate fixing screws according to **PN - EN ISO 4762**:
- **M16 x 100 - 10.9** - 4 pcs / kit tightening torque **Md = 310 Nm.**
 - **M16 x 60 - 10.9** - 2 pcs / kit tightening torque **Md = 310 Nm**
- 2 - Required surface finish of a subplate

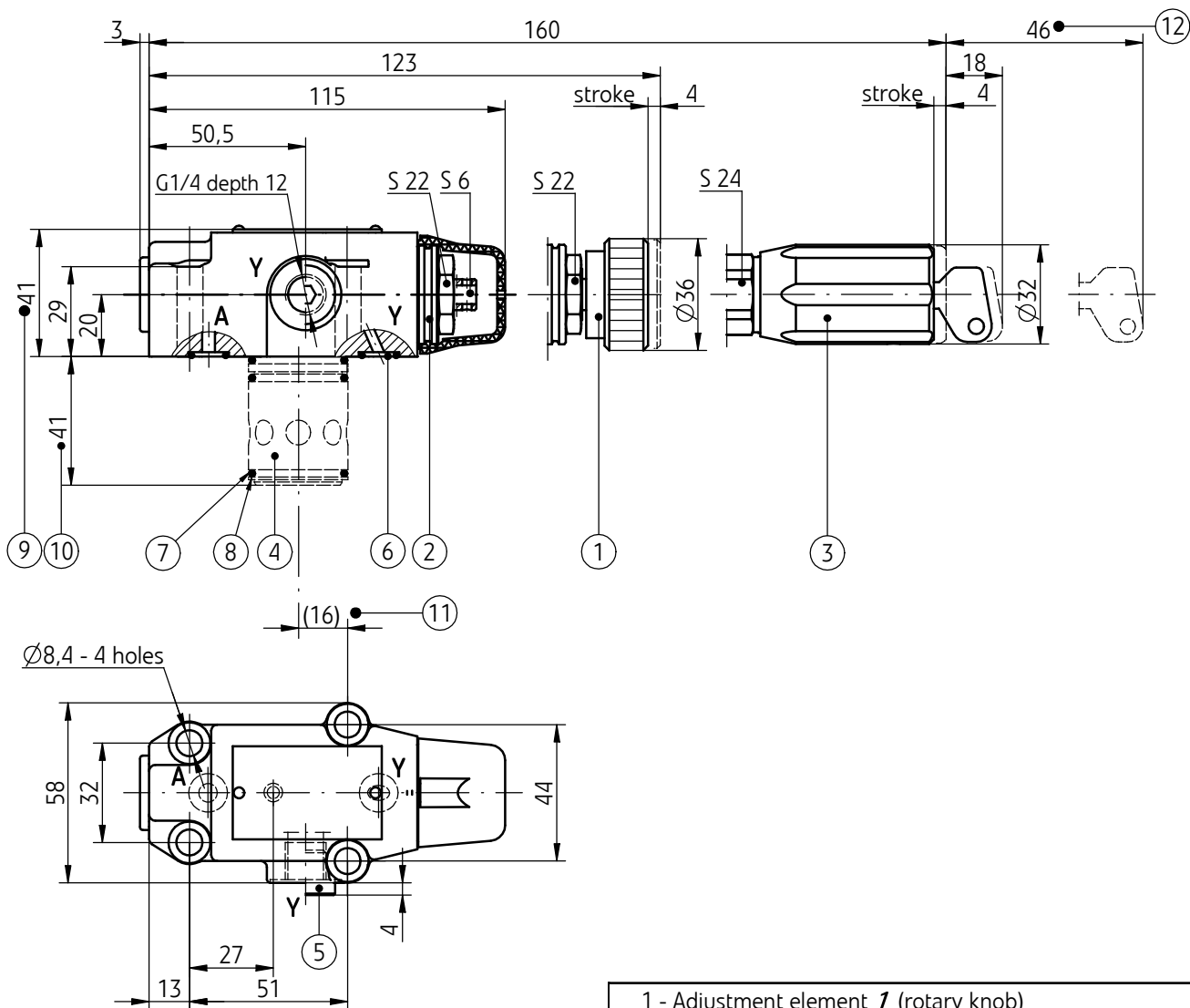
versions: UZOP30...; UZOPW30...



- 1 - Mounting holes configuration on a subplate fixing screws according to **PN - EN ISO 4762**:
- **M18 x 120 - 10.9** - 4 pcs / kit tightening torque **Md = 430 Nm.**
 - **M18 x 80 - 10.9** - 2 pcs / kit tightening torque **Md = 430 Nm**
- 2 - Required surface finish of a subplate

OVERALL AND CONNECTION DIMENSIONS

pilot valve without main spool - version UZOPC...
 pilot valve with main spool - version UZOPC30...

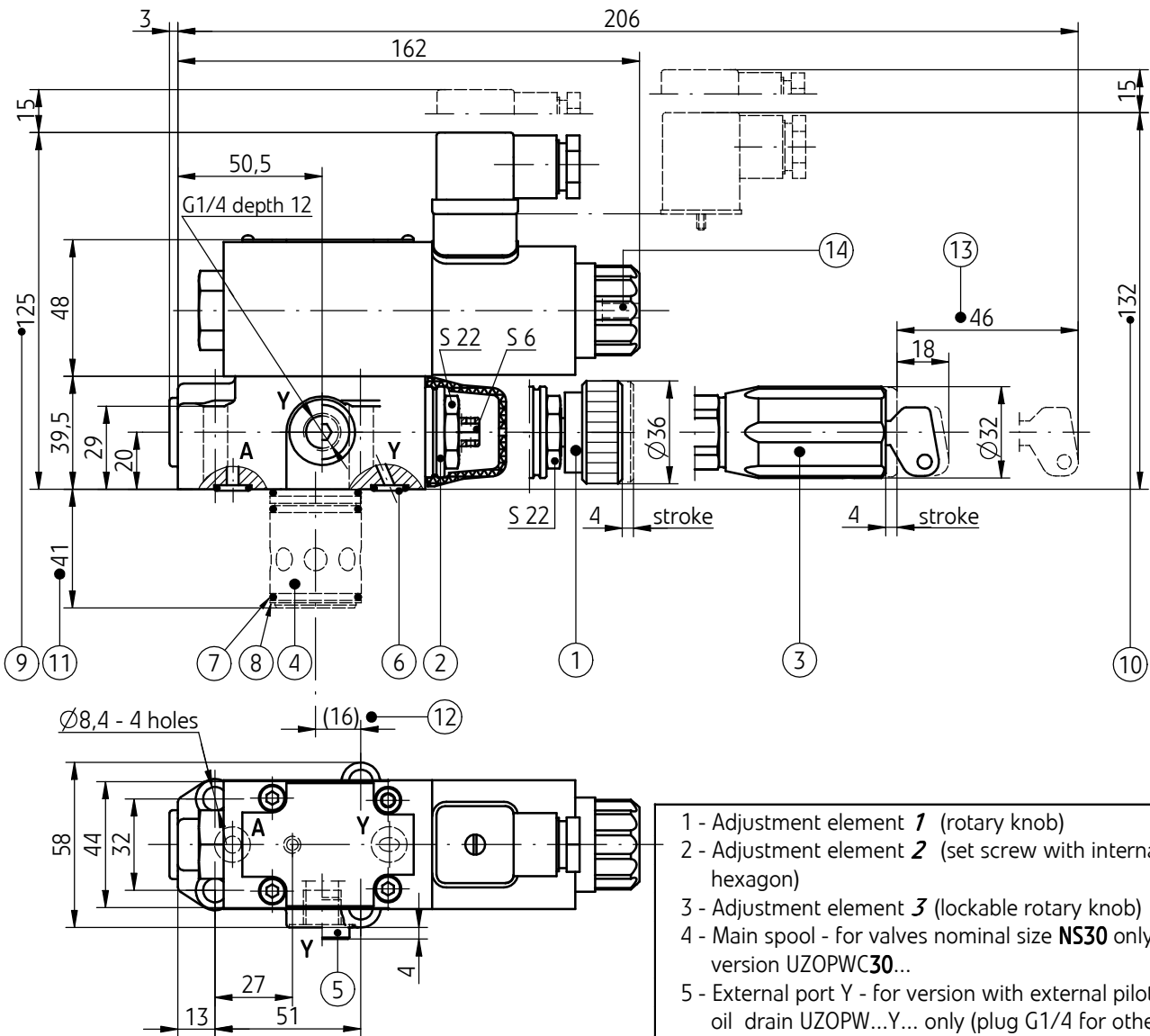


- 1 - Adjustment element 1 (rotary knob)
- 2 - Adjustment element 2 (set screw with internal hexagon)
- 3 - Adjustment element 3 (lockable rotary knob)
- 4 - Main spool - for valves nominal size NS30 only - version UZOPC30...
- 5 - External port Y - for version with external pilot oil drain UZOPW...Y... only (plug G1/4 for other versions)
- 6 - Seal o-ring 9,25 x 1,78 - 2 pcs/kit (A, Y)
- 7 - Seal o-ring 27,3 x 2,4 - 3 pcs/kit
- 8 - Back-up ring PEP 28,4 x 32 x 0,8 - 1 pc/kit
- 9 - Overall dimension for the valve without main spool - version UZOPC... (nominal size is not stated)
- 10 - Overall dimension for the valve with main spool - applied to valves nominal size NS30 only - version UZOPC30...
- 11 - Main spool bore position - applied to valve version like item 10 only
- 12 - Space required to remove the key from the lock

OVERALL AND CONNECTION DIMENSIONS

pilot valve without main spool - version UZOPWC...

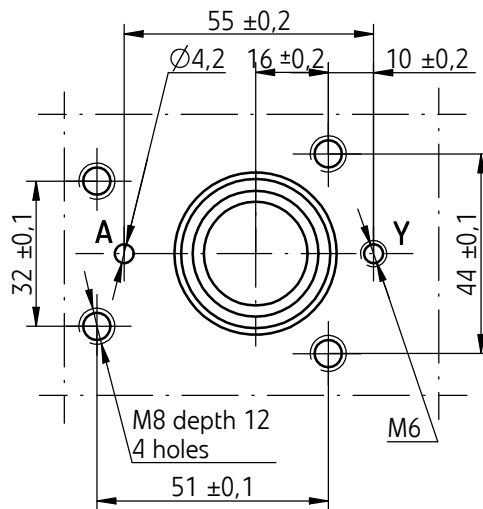
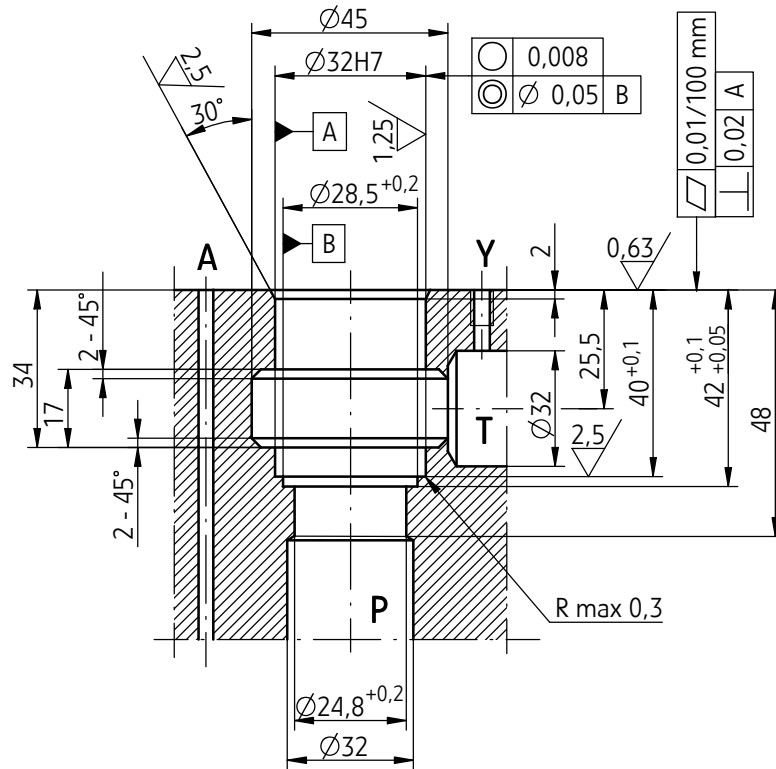
pilot valve with main spool - version UZOPWC30...



- 1 - Adjustment element **1** (rotary knob)
- 2 - Adjustment element **2** (set screw with internal hexagon)
- 3 - Adjustment element **3** (lockable rotary knob)
- 4 - Main spool - for valves nominal size **NS30** only version UZOPWC30...
- 5 - External port Y - for version with external pilot oil drain UZOPW...Y... only (plug G1/4 for other versions)
- 6 - Seal o-ring **9,25 x 1,78** - 2 pcs/kit (A, Y)
- 7 - Seal o-ring **27,3 x 2,4** - 3 pcs/kit
- 8 - Back-up ring PEP **28,4 x 32 x 0,8** - 1 pc/kit
- 9 - Overall dimension for the valve without main spool - version UZOPWC... (nominal size is not stated) with electrical connection **12V, 24V, 110V DC** (built-on directional valve with plug-in connector type **DIN 43650/ISO 4400**)
- 10 - Overall dimension for the valve like item 9 with electrical connection **110V, 230 V AC** (built-on directional valve with plug-in connector type **DIN 43650/ ISO 4400** with rectifier)
- 11 - Overall dimension for the valve with main spool - applied to valves nominal size **NS30** only - version UZOPWC30...
- 12 - Main spool bore position - applied to valve version like item 11 only
- 13 - Space required to remove the key from the lock
- 14 - Manual override

OVERALL AND CONNECTION DIMENSIONS

pilot valve with main spool
 versions: UZOPC30...; UZOPWC30...
 dimensions of installation cavity



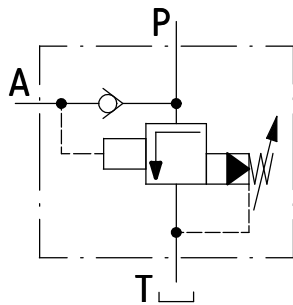
NOTE:

Mounting holes configuration on the face of cavity
 fixing screws **M8 x 40 -10.9** - 4 pcs/kit
 according to **PN - EN ISO 4762**
 tightening torque **Md = 37 Nm**

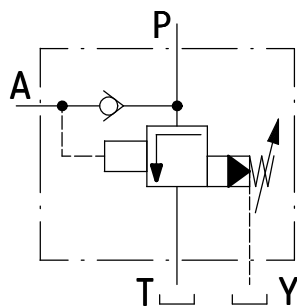
SCHEMES

Hydraulic schemes of complete valves
versions: UZOP...; UZOPW...

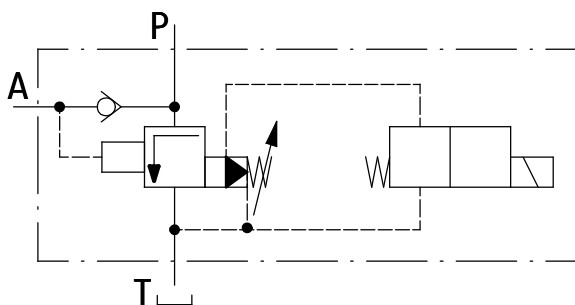
version UZOP...



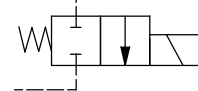
version UZOP...Y...



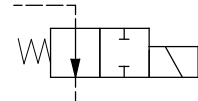
version UZOPW...



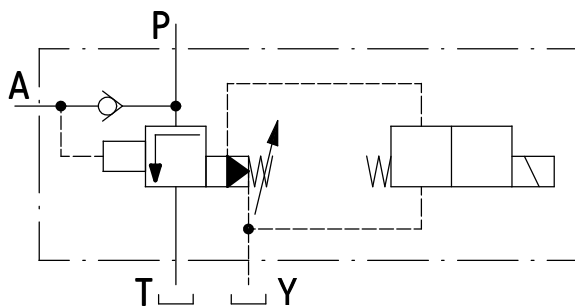
UZOPW...A...
(normally closed)



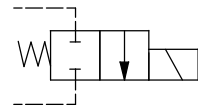
UZOPW...B...
(normally open)



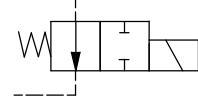
version UZOPW...Y...



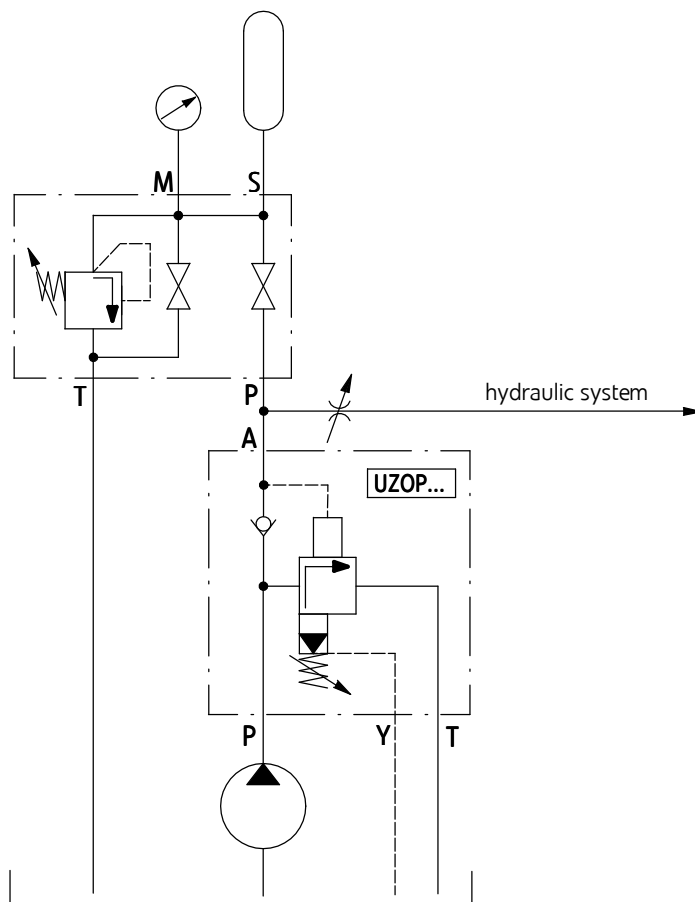
UZOPW...A.../...Y...
(normally closed)



UZOPW...B.../...Y...
(normally open)



EXAMPLE OF APPLICATION IN HYDRAULIC SYSTEM



NOTE:

The connection between the valve type **UZOP...** and the hydraulic accumulator should be as short as possible and with low pressure drop.

HOW TO ORDER

UZOP				+	+	/	+		
-------------	--	--	--	---	---	---	---	--	--

Design version
without unloading
with unloading

= no code
 = **W**

Valve version

complete valve

= no code

pilot valve with main spool

= **C ...**

state nominalsize NS30 only in the next step

pilot valve without main spool

= **C**

do not state nominalsize in the next step

Nominal size (NS)

NS10

= **10**

NS20

= **20**

NS30

= **30**

Unloading method (applied to version UZOPW... only)

directional valve in de-energized position closed

= **A**

directional valve in de-energized position open

= **B**

Adjustment element

rotary knob

= **1**

set screw with internal hexagon

= **2**

lockable rotary knob

= **3**

Series number

(51-59) - connection and installation dimensions unchanged

= **5X**

series 52

= **52**

Settable pressure range

up to 5 MPa

= **50**

up to 10 MPa

= **100**

up to 20 MPa

= **200**

up to 31,5 MPa

= **315**

Percentage difference in switching off and switching on pressure

10% (for this version state the option ...Y... in next space of code)

= **10**

17%

= **17**

Pilot oil drain

internal pilot oil drain to port T

= no code

external pilot oil drain via port Y

= **Y**

HOW TO ORDER

				★
--	--	--	--	---

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

Sealing

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

Electrical connection (only for version UZOPW...)

Plug-in connector type DIN 43650-A/ISO 4400 without LED = **Z4**
Plug-in connector type DIN 43650-A/ISO 4400 with LED = Z4L

Manual override for solenoid (only for version UZOPW...)

solenoid without manual override = no code
solenoid with manual override = **N**

Supply voltage for solenoid (only for version UZOPW...)

12V DC = G12
24V DC = **G24**
110V DC = G110
110V AC 50Hz (plug-in connector with rectifier) = W110R
230V AC 50Hz (plug-in connector with rectifier) = **W230R**

NOTES:

The valve should be ordered according to the above coding.

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

Coding example: UZOPW 20 - A 2 - 52/100 - 17 W230R N Z4

SUBPLATES AND FIXING BOLTS

Subplate types for different valve versions, threaded connections dimensions for pipes and fixing screws are listed in the table below. In order, the subplate symbol according to the table must be stated.

Subplates and fixing screws must be ordered separately.

valve version	subplate type	threaded connections	fixing screws
UZOP10... UZOPW10...	G468/01	A, P, T - G 1/2	M10 x 50 - 10.9 according to PN - EN ISO 4762 4 pcs/kit; tightening torque Md = 75 Nm
UZOP20... UZOPW20...	G470/01	A, P, T - G 1	M16 x 100 - 10.9 according to PN - EN ISO 4762 4 pcs/kit; tightening torque Md = 310 Nm M16 x 60 - 10.9 according to PN - EN ISO 4762 2 pcs/kit; tightening torque Md = 310 Nm
UZOP30... UZOPW30...	G472/01	A, P, T - G 1 1/2	M18 x 120 - 10.9 according to PN - EN ISO 4762 4 pcs/kit; tightening torque Md = 430 Nm M18 x 80 - 10.9 according to PN - EN ISO 4762 2 pcs/kit; tightening torque Md = 430 Nm

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

