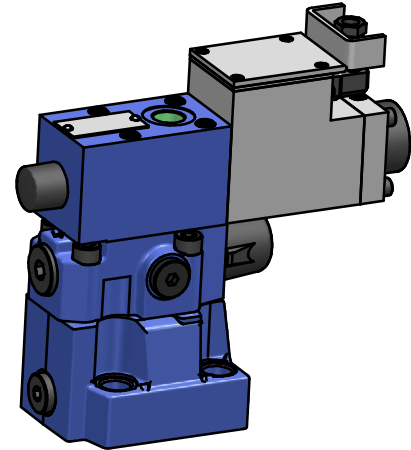


DATA SHEET - OPERATION MANUAL

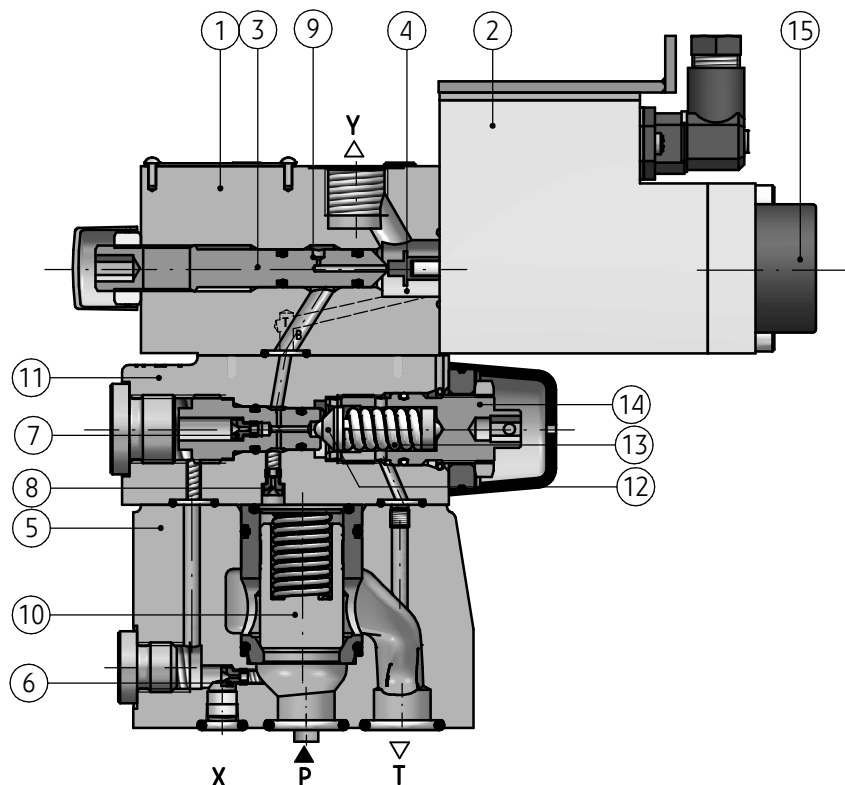
APPLICATION

Intrinsically safe, proportional, pressure-relief valves type **IWZP(P, S, G)E10**... are used for controlling pressure in a hydraulic system. Control pressure in the system is a function of the current supplied to the coil of the proportional solenoid. The valves are intended to work in an explosive atmosphere in underground mining pits (group I) and in machines working near flammable substances in the form of gases, vapours, mists (group II). The **IWZP(P, S, G)E10**... valves have certificates of intrinsic safety: $\langle \text{Ex} \rangle \text{IM1 Ex ia I Ma}$; $\langle \text{Ex} \rangle \text{II 2G Ex ia IIA T3 Gb}$. They can work with an output intrinsically safe circuit „ia” or „ib” of max. parameters: $U_i = 15 \text{ V}$, $I_i = 2 \text{ A}$, $C_i = 0$, $L_i = 0$.



DESCRIPTION OF OPERATION

IWZPPE10 - 02/200 -12NY



Intrinsically safe, proportional, pressure-relief valves type **IWZP(P, S, G)E10** consist of **the intrinsically safe pilot valve** type **IWZEP6**... - the main elements are: body (1) intrinsically safe proportional solenoid (2) and control nozzle (3) and diaphragm (4); **main valve** - with main elements: body (5), spool (10), nozzle (6); **pressure relief valve** - with main elements: body (11), nozzle (7), poppet (12), spring (13), adjustment element (14). The pressure from port **P** acts on the bottom side of the spool (10) of the main valve, and also through the nozzles system (6), (7), (8), (9) on the top side of the spool (10) of

the main valve, and on poppet (12) loaded by the spring (13) pressure of pressure reducing valve and on diaphragm (4) connected with the solenoid core (2). The strength of diaphragm (4) to the control nozzle (3) is proportional to the current intensity flowing through the solenoid (2). If the pressure acting on the diaphragm (4) is higher than set, the diaphragm (4) is moved and the pressure in the top part of the spool (10) drops. It results in spool (10) lift and opening of the flow from port **P** to **T**. The control stream **X** is **supplied internally**.

DESCRIPTION OF OPERATION

At standstill the pressure is equal on both sides of the spool (10). Ports **P** and **T** are separated from each other. If pressure in a system reaches the value determined by the position of the adjustment element (14) and spring (13) tension of the pressure reducing valve, then the poppet is moved (12) and the pressure in the top part of the spool (10) drops. It results in spool (10) lift and opening of the flow from port **P** to **T**. In case of power disconnection the switching of the solenoid (2) is enabled by the manual override (15).

NOTES:



The control nozzle (3) is factory set and its setting shall not be changed (it can cause damage of the valve or system, where the valve operates).

Control pressure (in port **P**) is the function of the current intensity applied on the proportional solenoid coil (2), only till pressure value set at the pressure reducing valve. In order to set the pressure at the pressure reducing valve the maximum current shall be applied on the solenoid (2) and by means of the adjustment element (14) the maximum or other requested working pressure shall be set.

TECHNICAL DATA

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 T _a	- 20 °C up to +60 °C			
Maximum operating pressure	ports P, T	30 MPa		
	port Y	direct drain to the tank by hose with internal diameter min. φ8		
Maximum flow	200 dm ³ / min			
Weight	valve version			
	IWZPPE10...	IWZPGE10...	IWZPSE10...	IWZEP6...
	5,3 kg	6,9 kg	3,4 kg	2,2 kg
Control method	PWM 150 Hz signal			
Hysteresis	< 7% max pressure			
Maximum current of solenoid coil I max	0, 3 A			
Resistance of solenoid coil winding at the temperature 20 °C (without semiconductors)	20,2 Ω			
Degree of protection	IP 65			
Operating position	optional			

COMPLIANCE WITH THE DIRECTIVE 94/9/WE

Quality assurance certificate	CE 1026 FTZU	No. FTZ U 05 ATEX Q 013
Certificate of examination type	KOMAG 14ATEX0057X	
Intrinsic safety feature	 I M 1 Ex ia I Ma	 II 2G Ex ia IIA T3 Gb

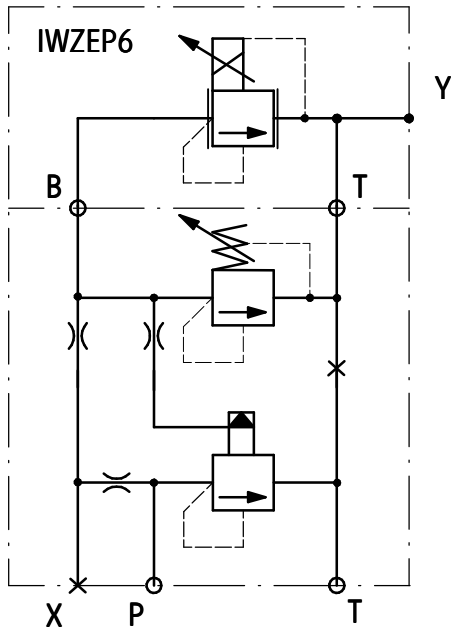
INSTALLATION AND OPERATION REQUIREMENTS

1. Electric connection of the valve must be made according to electric diagram placed on page no. 4 !
2. Electric conductors for valve connection shall meet requirements applied in the mining machinery.
3. Only skilled workers can connect or disconnect the valve to / from an electrical system.
4. During the operation one must maintain the recommended fluid viscosity and required filtration acc. to requirements defined in this Data Sheet - Operation Manual.
5. In order to ensure safe and failure-free operation of the valve, the following must be checked on regular basis:
 - condition of the electrical connection
 - operation of the valve
 - cleanliness of the hydraulic fluid
6. Solenoid plug shall precisely adhere to socket and shall be secured with thread bolt screwed securely in a place. The tightness and suitable clamp of cable in the plug gland shall be ensured.
7. In order to provide tightness of the valve connection to the hydraulic system, one should keep the dimensions of the cavity, sealing rings, tightening torques and valve operation parameters specified in this Data Sheet - Operation Manual.
8. Any valve repair in mining condition is forbidden. A damaged valve must be returned to the producer for repair. The address of service is mentioned on last page of this Data Sheet - Operation Manual.
9. A person that operates the intrinsically safe valve must be thoroughly familiar with this Data Sheet - Operation Manual.

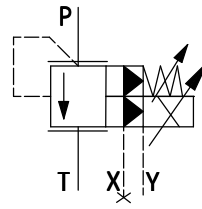
DIAGRAMS

Hydraulic diagrams of valve type IWZP(P, S, G)E10...

detailed diagram



simplified diagram

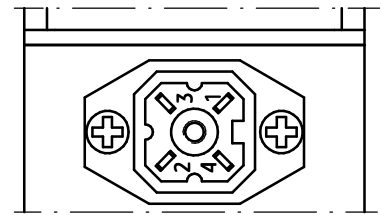
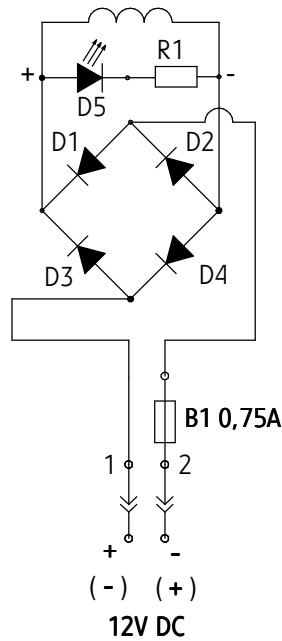
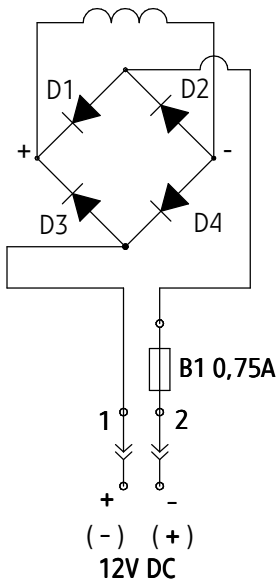


Electric diagrams of valves type IWZP(P, S, G)E10..., IWZEP6...

versions without LED signalling
 IWZPPE10 ...N...; IWZPSE10...N...;
 IWZPGE... N...; IWZEP6...N...

versions with LED signalling
 IWZPPE10 ...NL...; IWZPSE10...NL...;
 IWZPGE... NL...; IWZEP6...NL...

plan of solenoid coil electrical connection

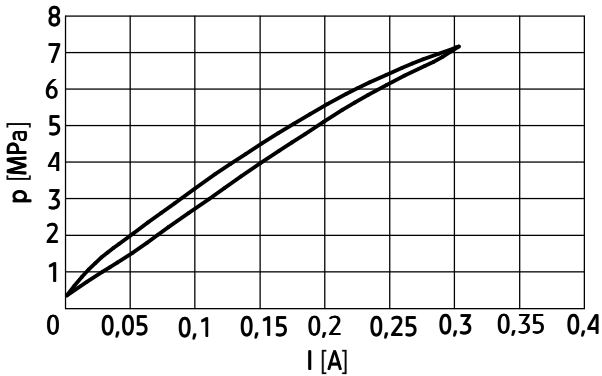


PERFORMANCE CURVES

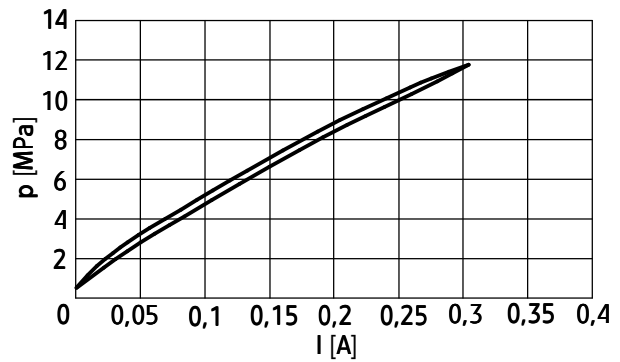
measured at viscosity $\nu = 41 \text{ mm}^2/\text{s}$ and temperature $t = 50^\circ\text{C}$

Characteristic curves of control pressure in relation to current intensity controlling solenoid

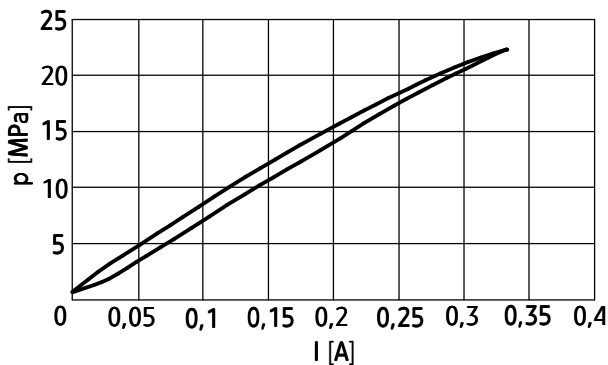
characteristic curve of control pressure in relation to current intensity $p(I)$ for version IWZPPE10...50... by flow rate $Q = 10 \text{ dm}^3/\text{min}$



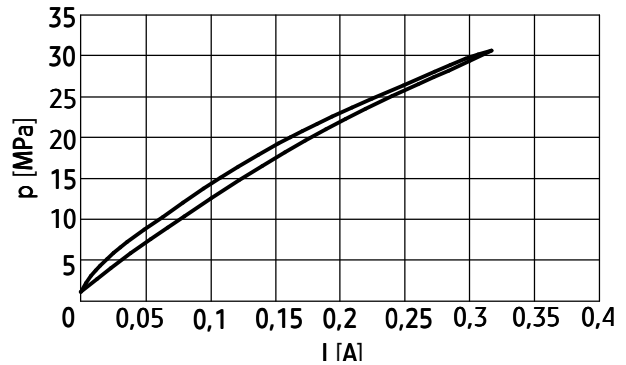
characteristic curve of control pressure in relation to current intensity $p(I)$ for version IWZPPE10...100... by flow rate $Q = 10 \text{ dm}^3/\text{min}$



characteristic curve of control pressure in relation to current intensity $p(I)$ for version IWZPPE10...200... by flow rate $Q = 10 \text{ dm}^3/\text{min}$

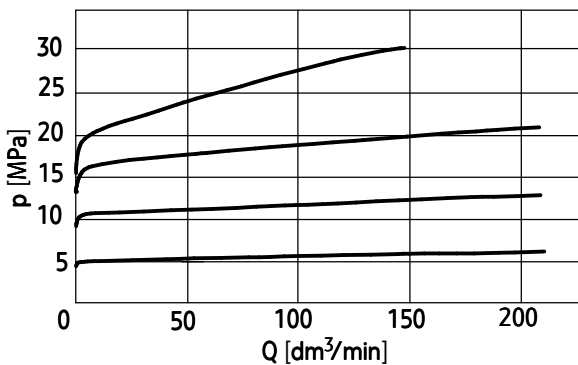


characteristic curve of control pressure in relation to current intensity $p(I)$ for version IWZPPE10...300... by flow rate $Q = 10 \text{ dm}^3/\text{min}$

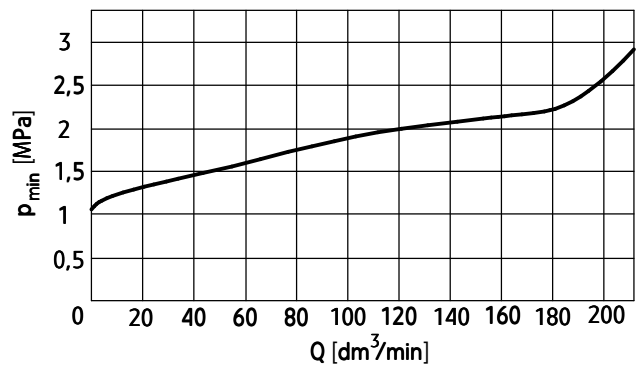


Characteristic curves of operating pressure in relation to flow rate

characteristic curves of operating pressure in relation to flow rate $p(Q)$

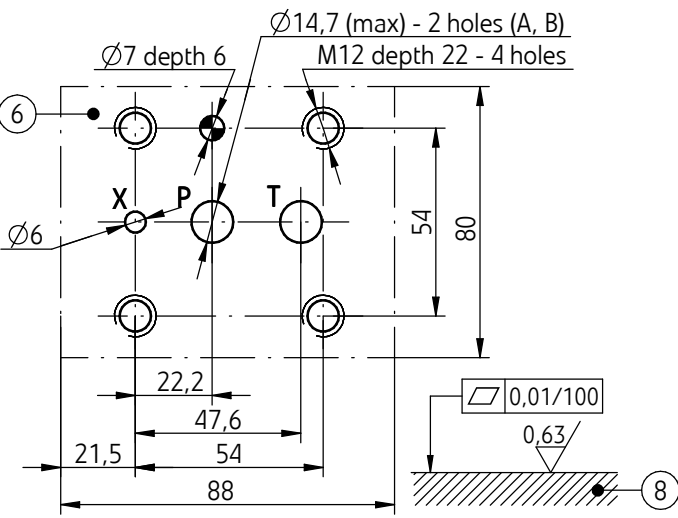
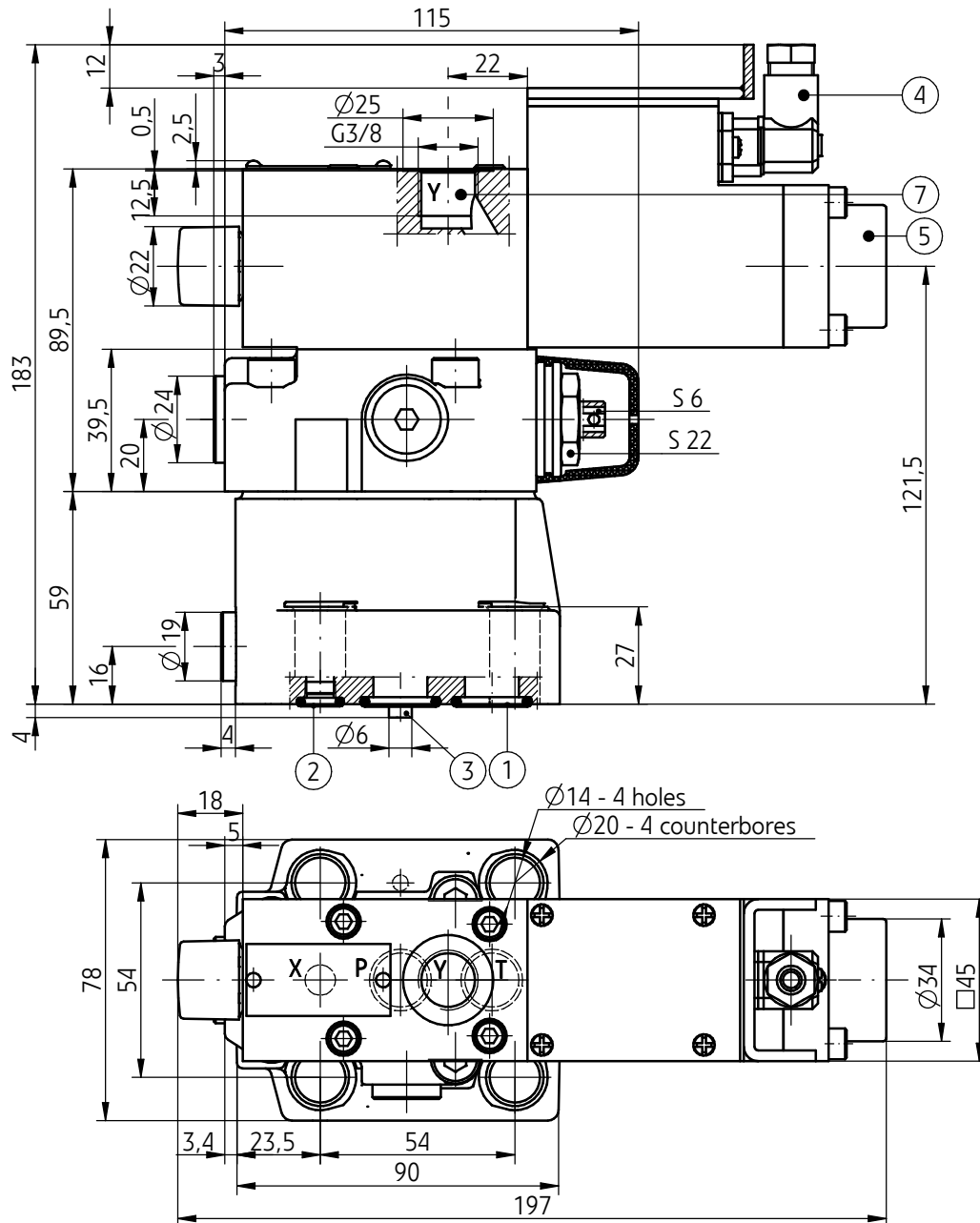


minimal set pressure p_{\min} in relation to flow rate Q



OVERALL AND CONNECTION DIMENSIONS

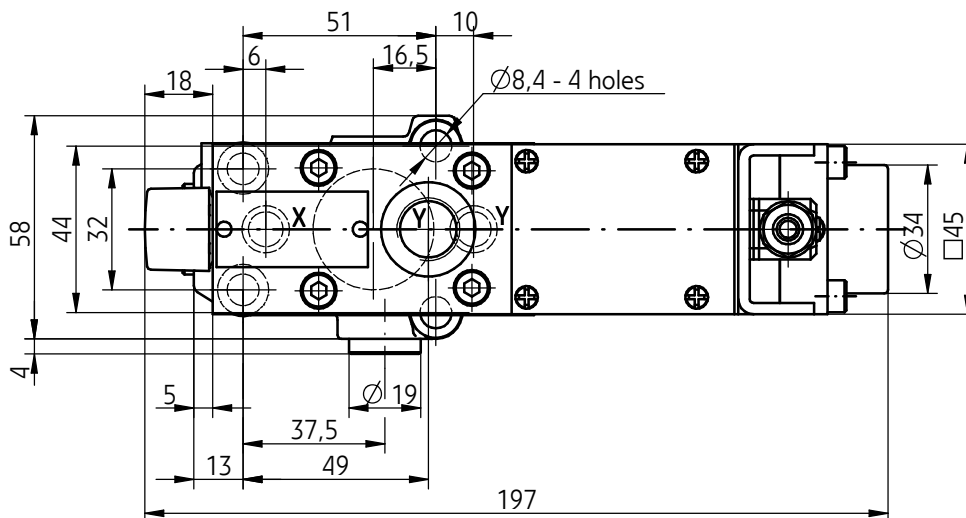
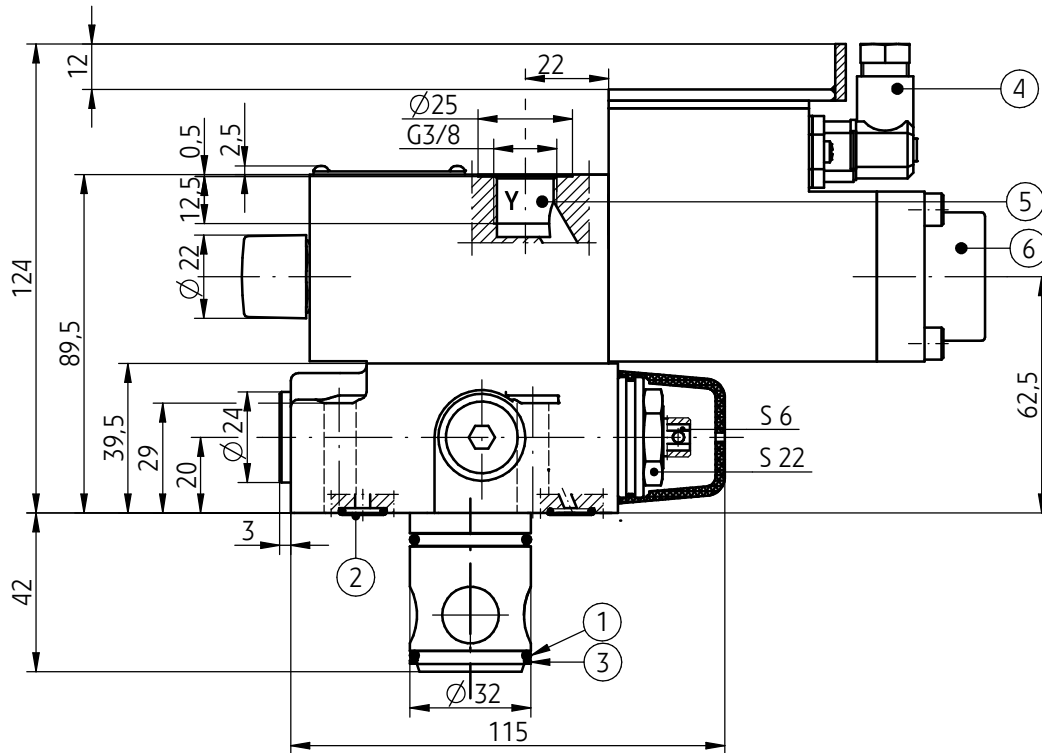
version for subplate mounting IWZPE10...



- 1 - Sealing ring **o-ring 17,12 x 2,62** - pcs 2/set (P, T)
 - 2 - Sealing ring **o-ring 8,3 x 2,4** - pcs 1/set (X)
 - 3 - Locating pin
 - 4 - Plug **Hirschmann G4 KW 1F** type
 - 5 - Manual override
 - 6 - Porting pattern of the subplate surface compliant with PN - ISO 6264 standard; designation PN - ISO 6264 -06-09-1-97 (CETOP R06); fixing screws **M12 x 50 -10.9** acc. to PN - EN ISO 4762; pcs 4/set; tightening torque **Md = 120 Nm**
 - 7 - Leakage drain port **Y***
 - 8 - Subplate surface required
- NOTE:**
 (*) - Port Y shall be directly connected to tank with a hose with internal diameter min. $\phi 8$ in depressurized condition

OVERALL AND CONNECTION DIMENSIONS

version for cartridge mounting IWZPSE10...



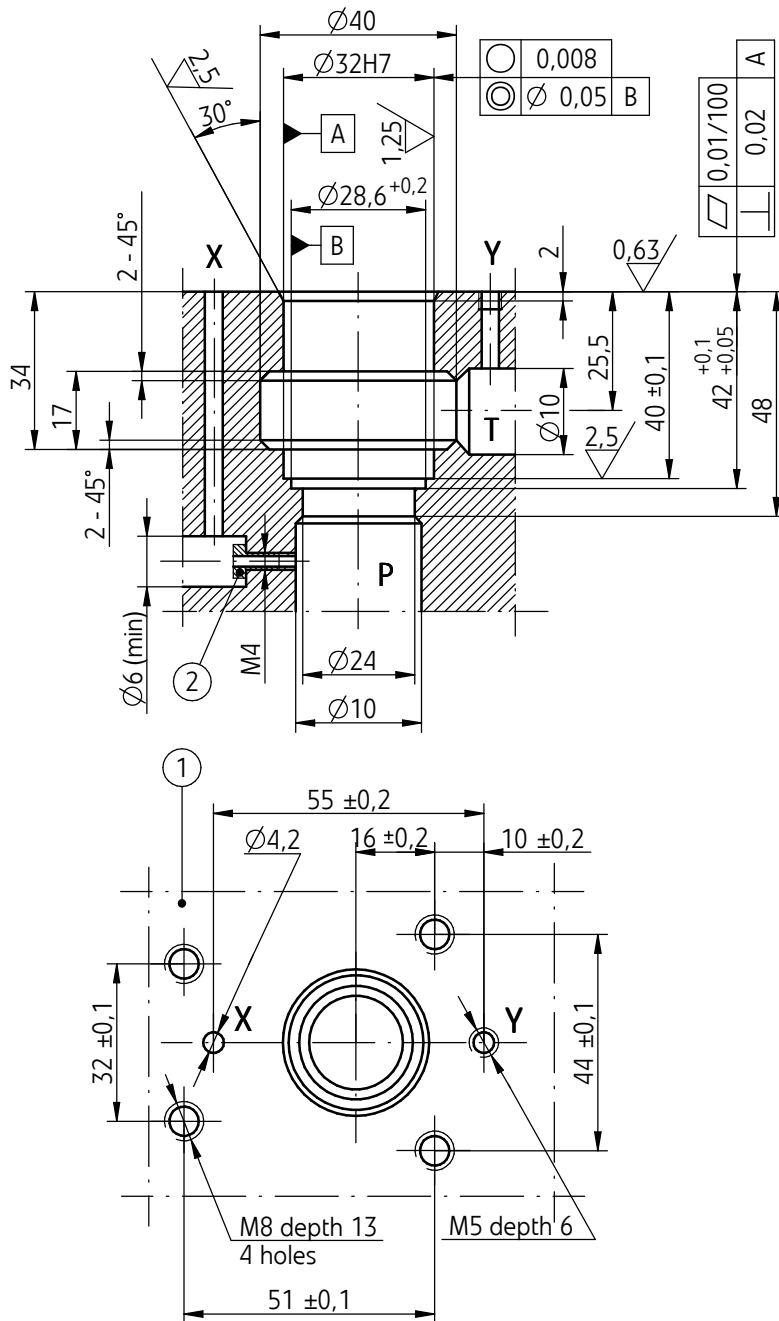
- 1 - Sealing ring o-ring 27,3 x 2,4 - pcs 2/set
- 2 - Sealing ring o-ring 9,25 x 1,78 - pcs 2/set (X, Y)
- 3 - Back-up ring PEP 28,4 x 32 x 0,8
- 4 - Plug Hirschmann G4 KW 1F type
- 5 - Leakage drain port Y *
- 6 - Manual override

NOTE:

(*) - Port Y shall be directly connected to tank with a hose with internal diameter min. $\varnothing 8$ in depressurized condition

OVERALL AND CONNECTION DIMENSIONS

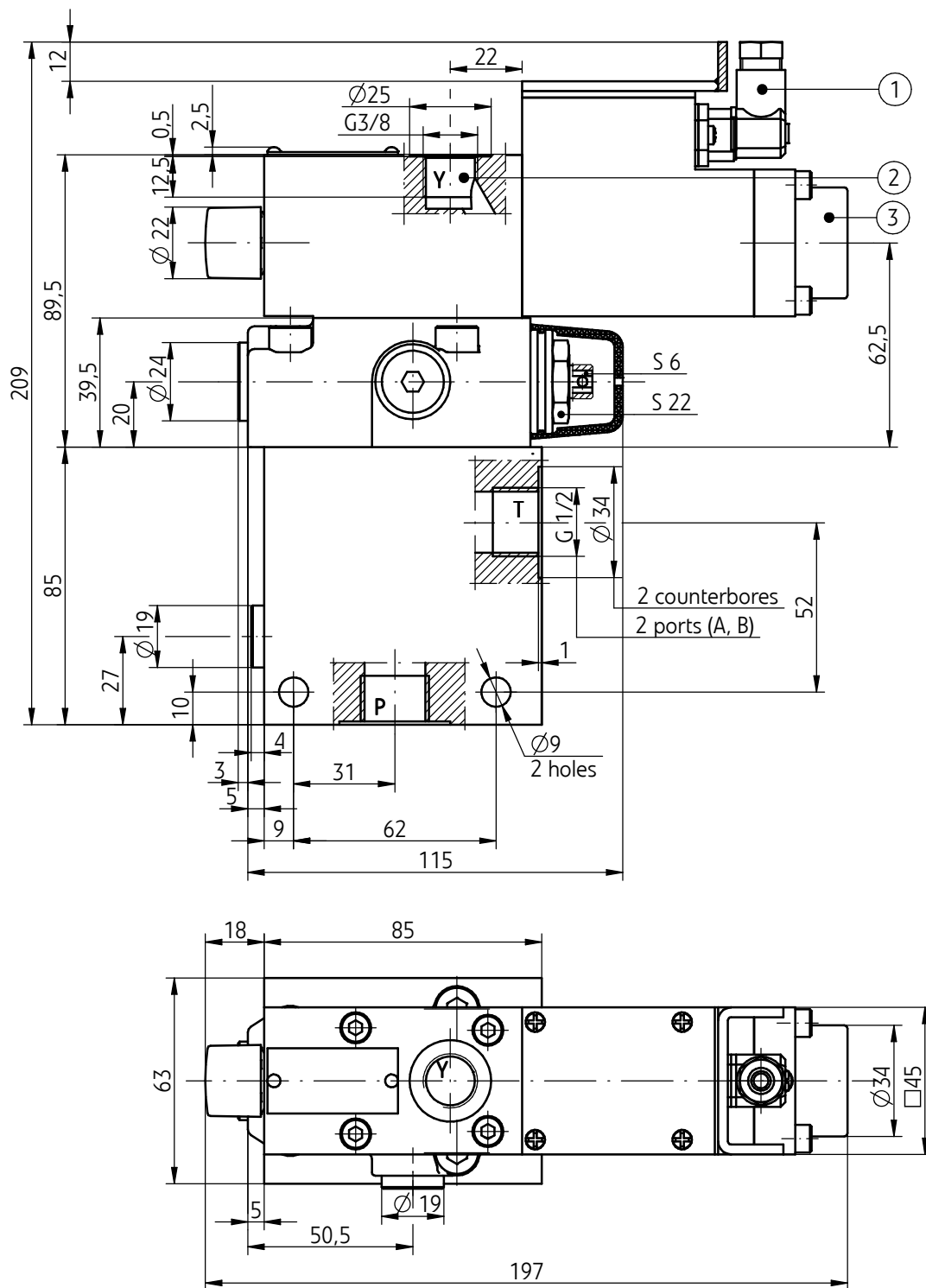
version for cartridge mounting IWZPSE10...
cavity



- 1 - Mounting holes configuration of cavity face surface;
fixing screws **M8 x 40 - 10.9**
acc. to **PN - EN ISO 4762** - pcs 4 /set
tightening torque **Md = 37 Nm**
- 2 - Nozzle $\varnothing 0,6$

OVERALL AND CONNECTION DIMENSIONS

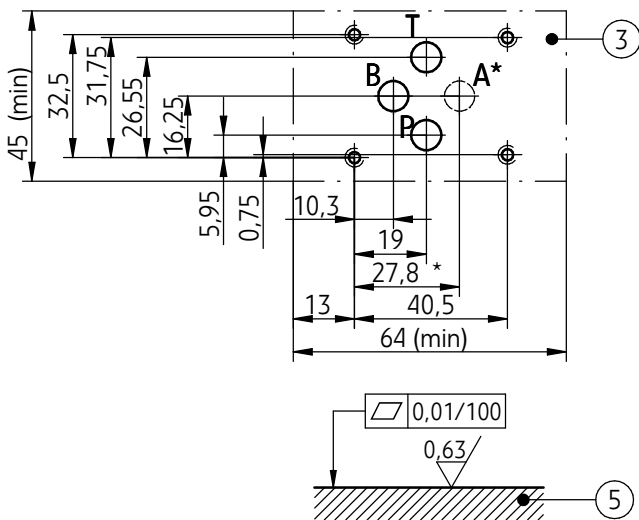
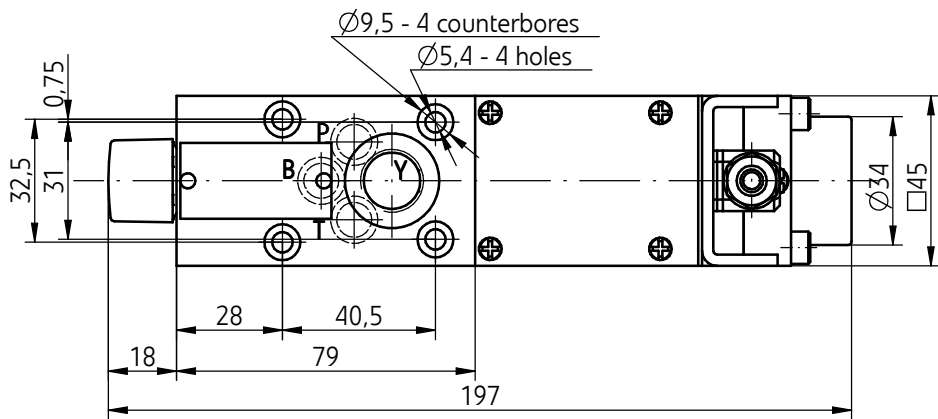
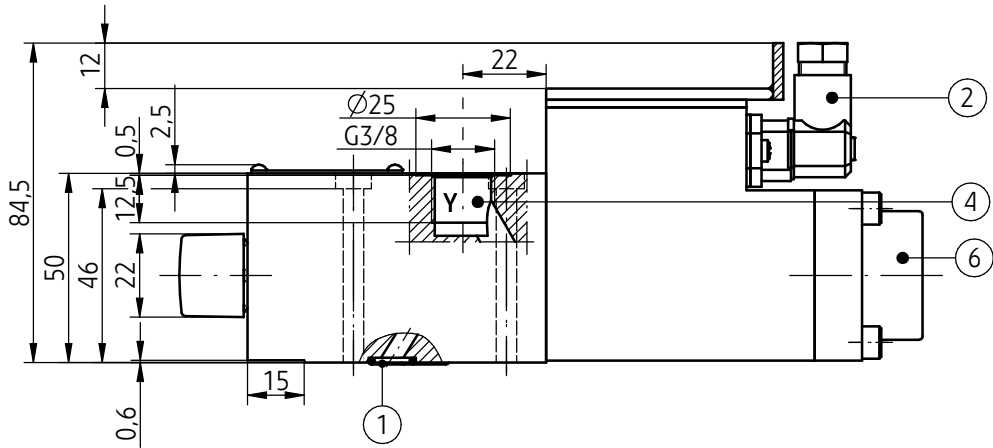
version for threaded mounting IWZPGE10...



- 1 - Plug Hirschmann G4 KW 1F type
 - 2 - Leakage drain port Y *
 - 3 - Manual override
- NOTE:**
 (*) - Port Y shall be directly connected to tank with a hose with internal diameter min. $\phi 8$ in depressurized condition

OVERALL AND CONNECTION DIMENSIONS

pilot valve - version IWZEP6...



- 1 - Sealing ring o-ring 9,25 x 1,78 - pcs 3/set (P, A*, B, T)
 - 2 - Plug Hirschmann G4 KW 1F type
 - 3 - Porting pattern of the subplate surface compliant with ISO 4401-03 standard; designation ISO 4401-03-02-0-94 (CETOP 03); fixing screws M5 x 50 -10.9 acc. to PN - EN ISO 4762; pcs 4/set; tightening torque Md = 9 Nm
 - 4 - Leakage drain port Y **
 - 5 - Subplate surface required
 - 6 - Manual override
- NOTES:**
- (*) - Connection element not used by pilot valve - IWZEP6 version
 - (**) - Port Y shall be directly connected to tank with a hose with internal diameter min. $\phi 8$ in depressurized condition

HOW TO ORDER

	+	/	+						*
--	---	---	---	--	--	--	--	--	---

Valve version
valve for subplate mounting = IWZPPE
valve for threaded mounting = IWZPGE
valve for cartridge mounting = IWZPSE
pilot valve = IWZEP

Nominal size (NS)
complete valve - NS10 = 10
pilot valve - NS6 = 6

Series number
 (02 - 09) - connection and installation dimensions unchanged = 0X
series 02 = 02

Settable pressure range
 up to 5 MPa = 50
 up to 10 MPa = 100
up to 20 MPa = 200
 up to 30 MPa = 300

Solenoid coil
coil for supply voltage U = 12V DC; current I max = 0,3 A = 12

Manual override
solenoid with manual override = N

Solenoid supply signalling
without LED indicator = no designation
 with LED indicator = L

Pilot oil drain
drain via independent port Y = Y

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

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

NOTES:

The valve should be ordered according to the above coding.

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

Coding example: IWZPPE10 - 02/200 - 12 NY

SUBPLATES AND FIXING SCREWS

Subplates for version **IWZPPE10...** must be ordered according to data sheet **WK 470 013**.

Subplate symbols:

G406/01 - threaded connections A, B - G 3/8; X - G1/4

G407/01 - threaded connections A, B - **G1/2**; X - **G1/4**

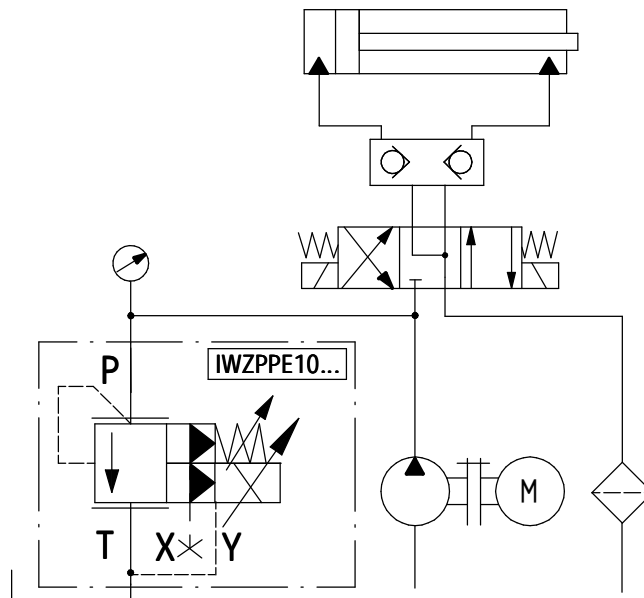
NOTE:

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

Subplate and fixing screws **M12 x 50 - 10,9** according to **PN - EN ISO 4762** - pcs 4/set must be ordered separately.

Tightening torque **Md = 120 Nm**

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

 **PONAR**[®]
wadowice