

DATA SHEET - OPERATION MANUAL

APPLICATION

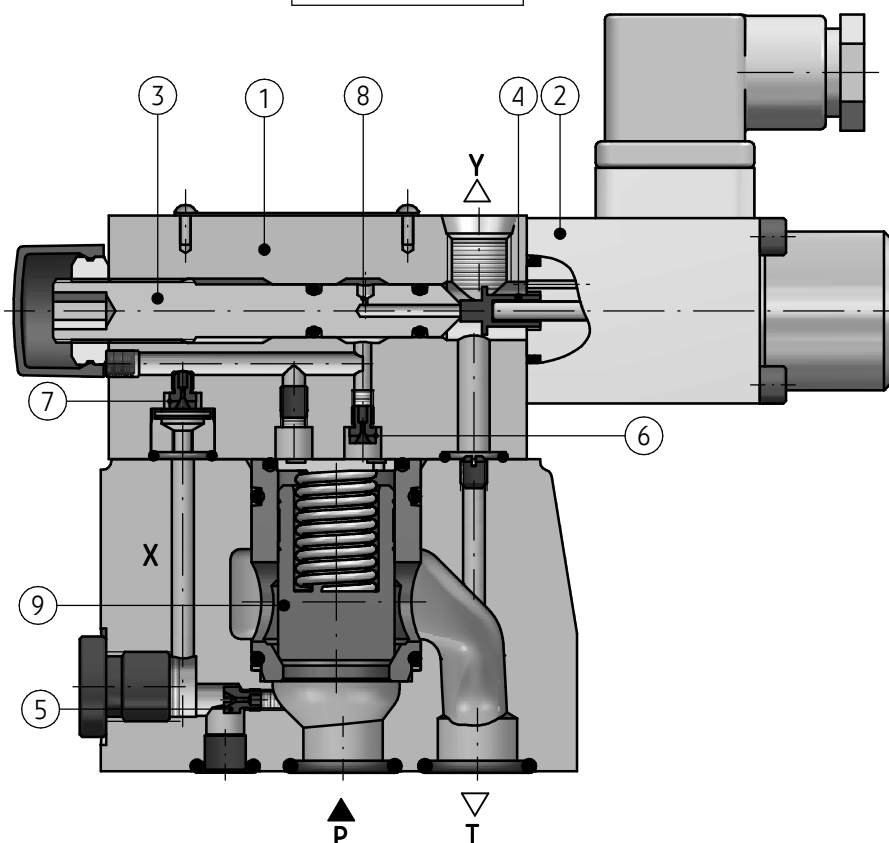
Proportional pressure relief valve electrically operated type **WZPPE...** is used to control pressure in hydraulic system. Regulated pressure in hydraulic system is related to the solenoid current of proportional pressure relief valve. Electronic regulators or other electronic systems according to list on page 3 can be used to supply the valve type **WZPPE...**



DESCRIPTION OF OPERATION

version WZPPE...

WZPPE10 - 12/200Y



Pressure relief valves type **WZPPE...** consist basically of the pilot unit housing (1) type **WZEP...**, proportional solenoid (2) adjusting jet (3) and blind (4). Pressure at port **P** acts through the system of jets (5), (6), (7), (8) on the bottom and top side of the spool valve (6) and the blind (4) connected with solenoid core. Push force of the blind (4) to the jet (3) is proportional to the strength of current flowing through the solenoid (2). If pressure applied at the blind (4) is higher than the setting, the blind (4) is withdrawn and the

pressure at the top of the poppet drops. Thus the poppet (9) lifts and flow opening from port **P** to **T**. Flow control **X** is internally supplied.

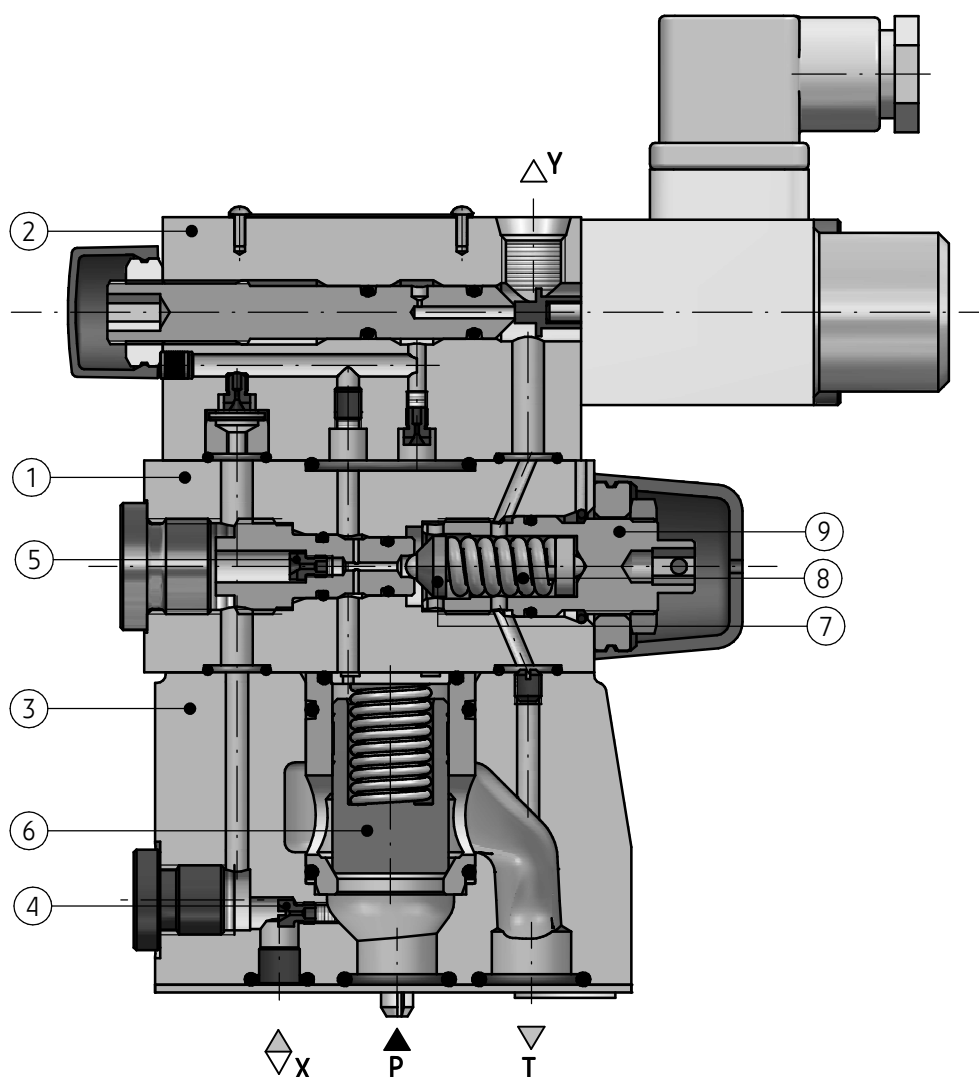
NOTE:

Adjusting jet (3) is adjusted at the factory and it is not allowed to change its setting (that may damage the valve).

DESCRIPTION OF OPERATION

version WZPPE.../...M...

WZPPE10 - 12/200YM2



Pressure relief valve type **WZPPE...** is also with mechanical pressure reduction (version **WZPPE...M...**). Housing of pressure reduction valve (1) - version **UZAC...**, is seated between pilot unit housing (2) and body of main unit housing (3). Pressure at port **P** acts on the bottom side of main spool (6) as well as through the system of jets (4) and (5) on the top side of spool (6) and on poppet (7) pushed by spring (8) force of pressure reducing valve. At rest the pressure on both sides of the poppet is the same. Ports **P** and **T** are separated. If the pressure in the system reaches the value of the setting (9) and spring tension (8) of the valve reducing

pressure (1), thus the poppet (7) is withdrawn and the pressure at the top of the poppet (6) drops. Thus the spool (6) lifts and flow opening from port **P** to **T**.

NOTE:

Regulated pressure (port P) in hydraulic system is related to the solenoid current of proportional pressure relief valve type (2) only to the pressure set on pressure reducing valve (1). So as to set the pressure in valve (1) the max. current is to be given on valve solenoid (2) and by setting element (9) max. or other required working pressure is to 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	-20°C up to +50°C			
Maximum operating pressure	ports P, T	31,5 MPa		
	port Y	without oil outlet drain		
Maximum flow	nominal valve size	NS10	NS20	NS30
		200 dm ³ / min	400 dm ³ / min	600 dm ³ / min
Weight	valve version	nominal valve size		
		NS10	NS20	NS30
	WZPPE...	3,9 kg	5,1 kg	6,1 kg
	WZPPE.../...M...	4,7 kg	5,6 kg	6,5 kg
	WZPGE...	4,9 kg	4,7 kg	5,4 kg
	WZPGE.../...M...	6,5 kg	6,3 kg	7,0 kg
	WZPSE	1,3 kg	–	1,3 kg
	WZPSE.../...M...	1,7 kg	–	1,7 kg
	WZEP...	1,2 kg		
Hysteresis	2,5% of max pressure			
Repetition accuracy	2%			
Control current	0 to 0,68 A			
Working position	optional			
Rated resistance of solenoid coil	24,2 Ω			
Electronic regulator	20 RE 10 - acc. to data sheet WK 495 771			
	20 RE 10 D - acc. to data sheet WK 420 810			
	20 RE 10 E - acc. to data sheet WK 420 820			

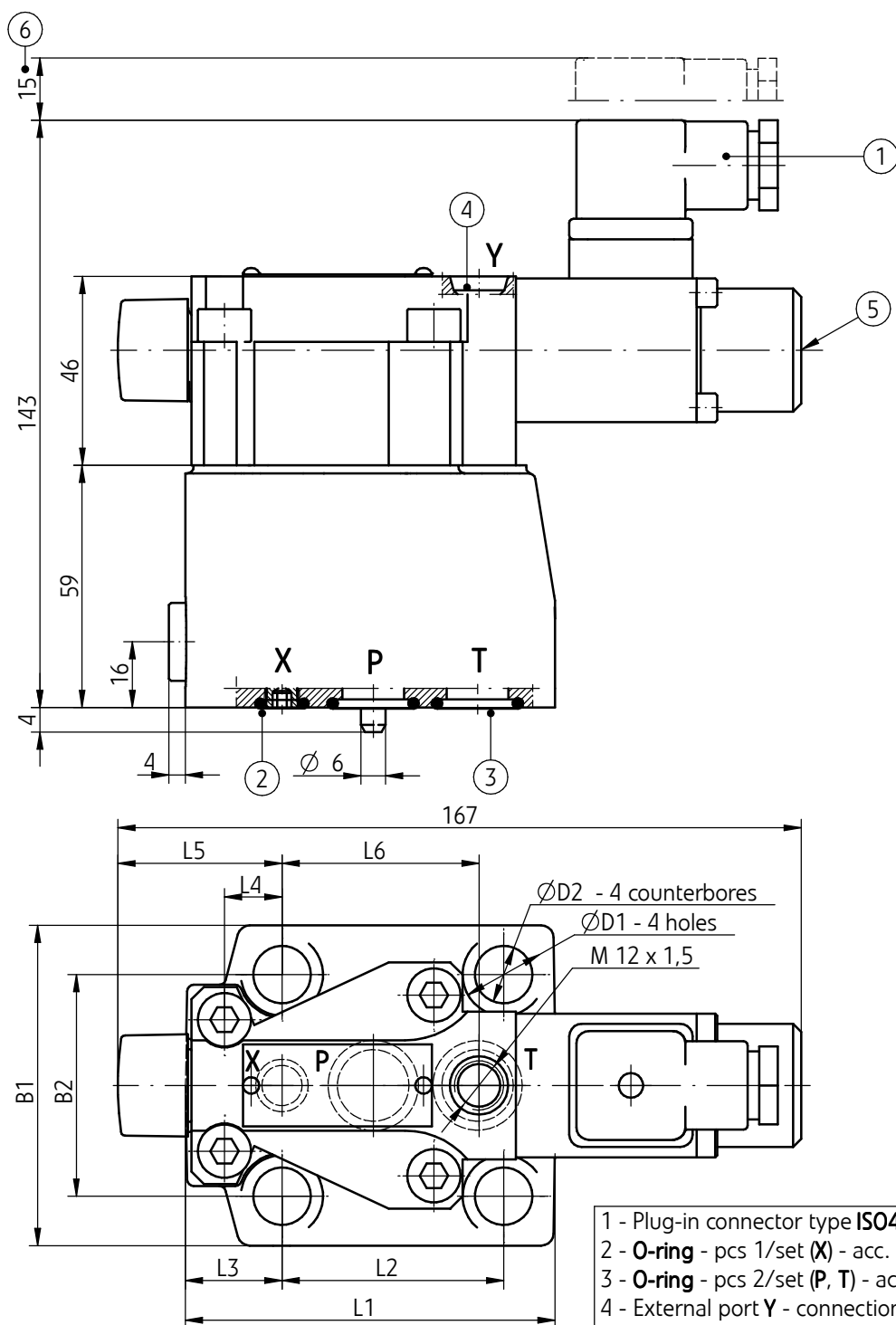
DIAGRAMS

Hydraulic diagrams of valves - versions:
WZPPE...; WZPSE...; WZPGE...

detailed diagram	simplified diagram
versions: WZPPE.../...Y..., WZPSE.../...Y..., WZPGE.../...Y...	
versions: WZPPE.../...YM..., WZPSE.../...YM..., WZPGE.../...YM...	
version WZEP...	

OVERALL AND CONNECTION DIMENSIONS

versions for subplate mounting: WZPPE10...; ...20...; ...30...



1 - Plug-in connector type **ISO4401** (DIN 43650 - A)

2 - **O-ring** - pcs 1/set (**X**) - acc. to table

3 - **O-ring** - pcs 2/set (**P, T**) - acc. to table

4 - External port **Y** - connection **M12 x 1,5** acc. to **PN/M-73101 (o-ring 9,3 x 2,4 - pcs 1/set must be ordered separately)**

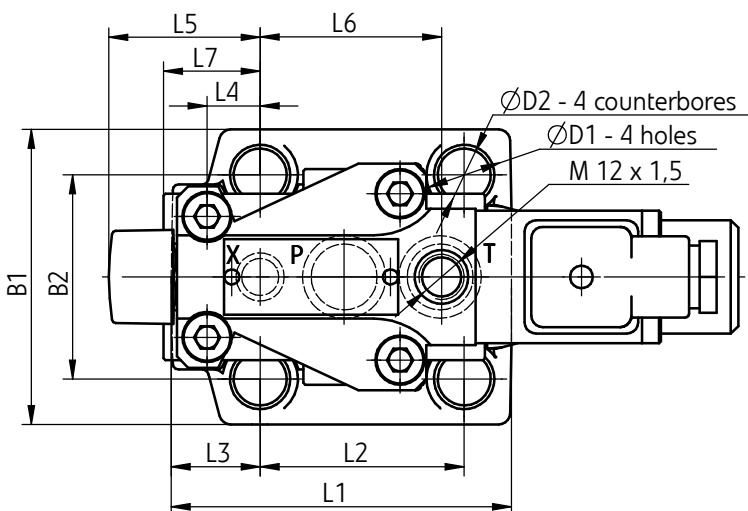
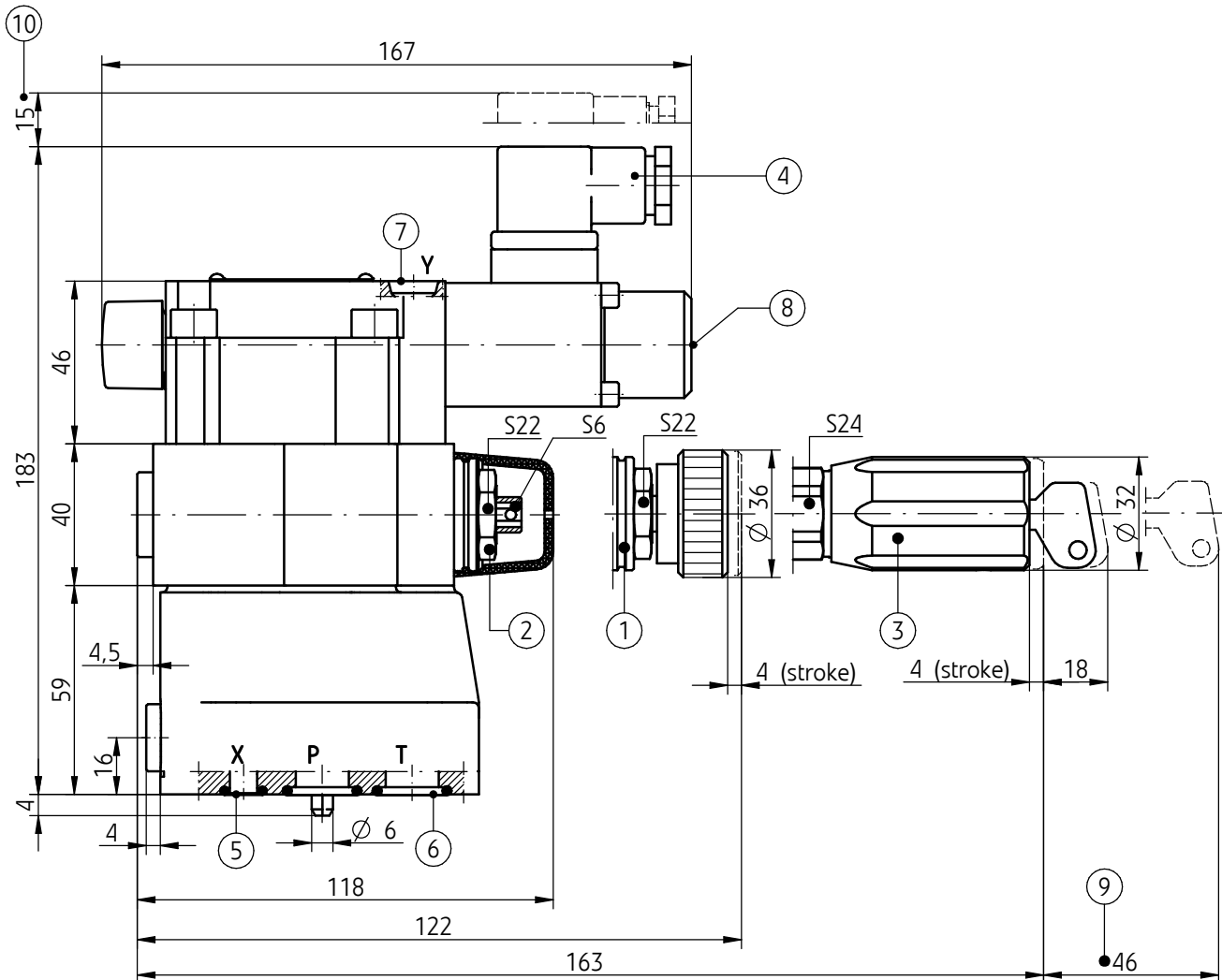
5 - Manual override

6 - Space for disassembly of plug-in connector - item 1

valve version	o-ring - item 2	o-ring - item 3	B1	B2	D1	D2	L1	L2	L3	L4	L5	L6
WZPPE10...	8,3 x 2,4	17,1 x 2,6	78	54	20	14	90	54	23,5	14	40	48
WZPPE20...	8,3 x 2,4	28,2 x 3,5	100	70	26	18	117	67	34	11	37	51
WZPPE30...	8,3 x 2,4	34,5 x 3,5	115	82,5	29	20	148	89	41,6	8,6	34,6	53,4

OVERALL AND CONNECTION DIMENSIONS

versions for subplate mounting: WZPPE10.../...M; ...20.../...M; ...30.../...M



- 1 - Setting **1** (handknob)
- 2 - Setting **2** (set screw with hexagon socket)
- 3 - Setting **3** (lockable handknob)
- 4 - Plug-in connector type **ISO4401** (DIN 43650 - A)
- 5 - **O-ring** - pcs 1/set (**X**) - acc. to table
- 6 - **O-ring** - pcs 2/set (**P, T**) - acc. to table
- 7 - External port **Y** - connection **M12 x 1,5** acc. to **PN/M-73101** (**o-ring 9.3 x 2.4** - pcs 1/set must be ordered separately)
- 8 - Manual override
- 9 - Space for key withdrawal from lock of setting - item 3
- 10 - Space for disassembly of plug-in connector - item 4

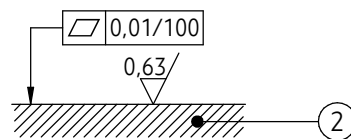
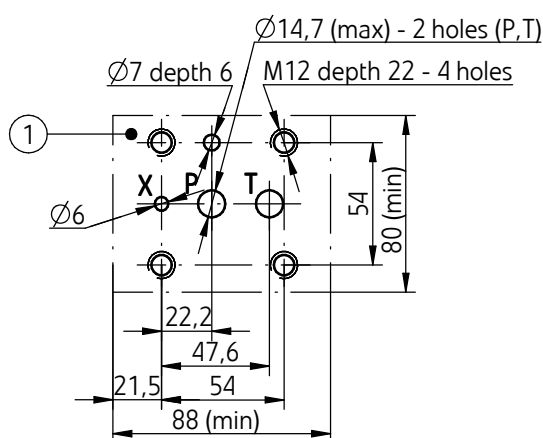
valve version	o-ring - item 5	o-ring - item 6	B1	B2	D1	D2	L1	L2	L3	L4	L5	L6	L7
WZPPE10...	8,3 x 2,4	17,1 x 2,6	78	54	20	14	90	54	23,5	14	40	48	25,5
WZPPE20...	8,3 x 2,4	28,2 x 3,5	100	70	26	18	117	67	34	11	37	51	22,8
WZPPE30...	8,3 x 2,4	34,5 x 3,5	115	82,5	29	20	148	89	41,5	8,6	34,6	53,4	20,1

OVERALL AND CONNECTION DIMENSIONS

versions for subplate mounting: WZPPE10.../...M; ...20.../...M; ...30.../...M

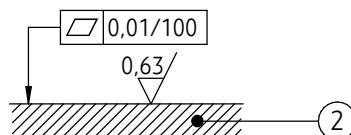
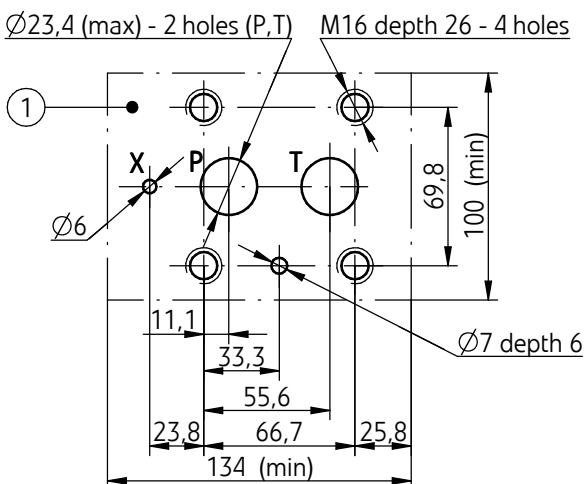
porting pattern of the subplate surface

versions: WZPPE10...; WZPPE10.../...M



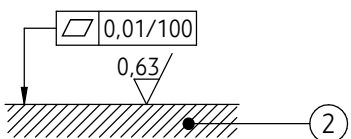
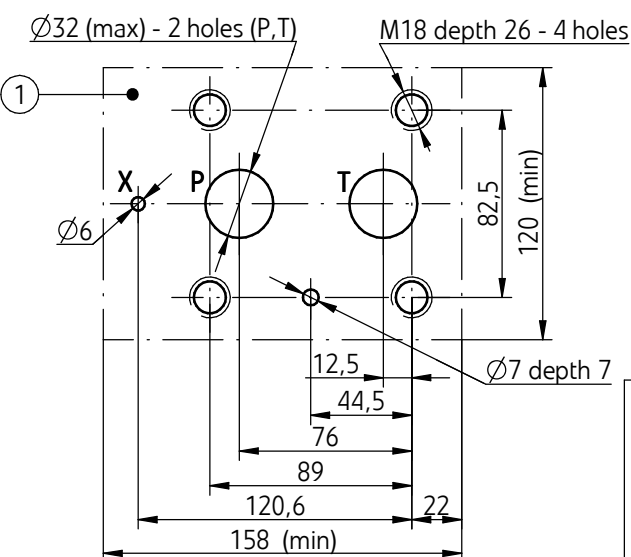
- 1 - Porting pattern of the subplate surface compliant with **PN - ISO 6264** standard
designation **ISO 6264 -06-09-1-97** (CETOP R06)
fixing screws **M12 x 50 - 10.9** acc. to **PN - EN ISO 4762**
pcs 4/set; tightening torque **Md = 120 Nm**
- 2 - Subplate surface required

versions: WZPPE20...; WZPPE20.../...M



- 1 - Porting pattern of the subplate surface compliant with **PN - ISO 6264** standard
designation **ISO 6264 -08-13-1-97** (CETOP R06)
fixing screws **M16 x 50 - 10.9** acc. to **PN - EN ISO 4762**
pcs 4/set; tightening torque **Md = 310 Nm**
- 2 - Subplate surface required

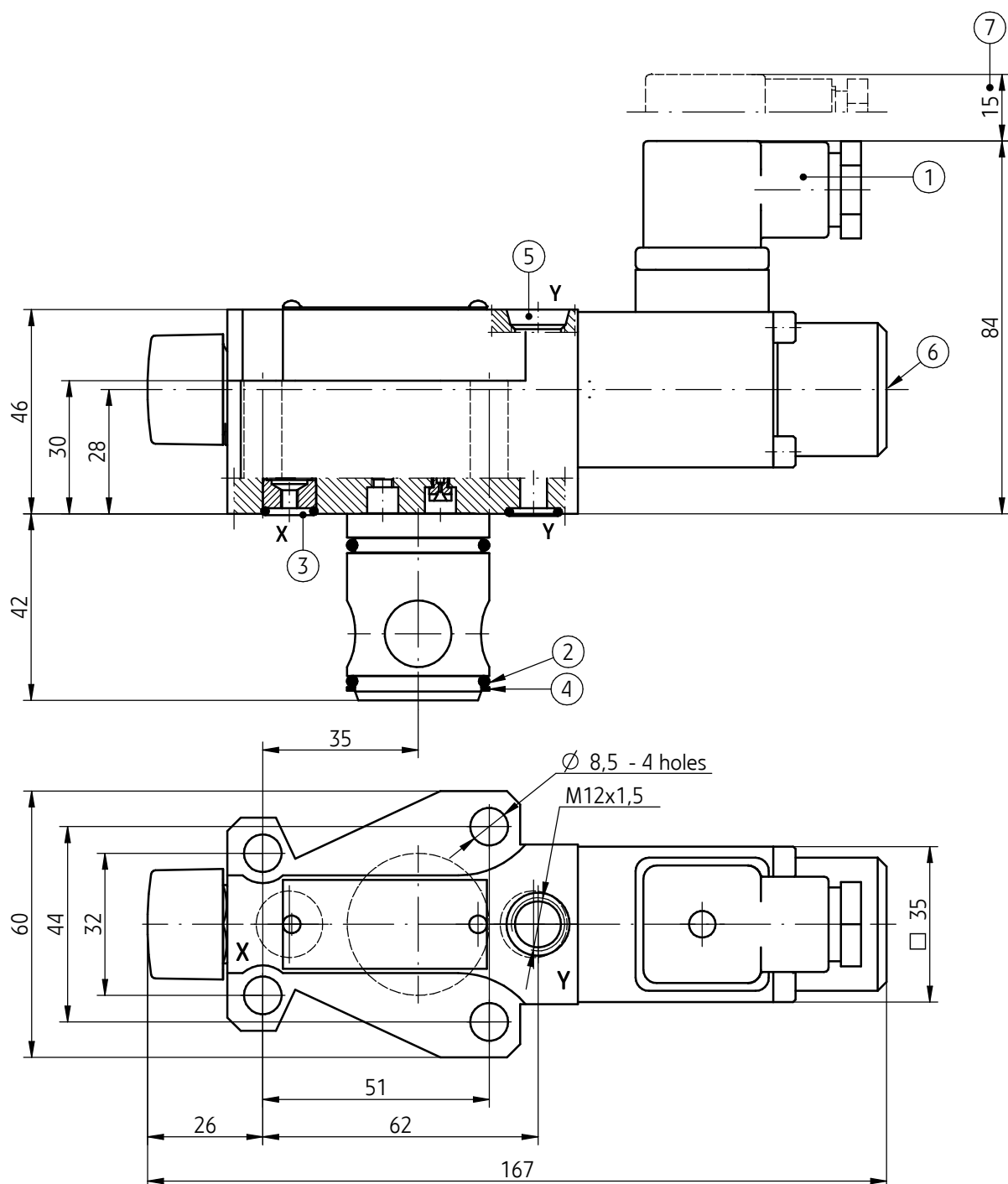
versions: WZPPE30...; WZPPE30.../...M



- 1 - Porting pattern of the subplate surface compliant with **PN - ISO 6264** standard
designation **ISO 6264 -10-17-1-97** (CETOP R06)
fixing screws **M18 x 50 - 10.9** acc. to **PN - EN ISO 4762**
pcs 4/set; tightening torque **Md = 430 Nm**
- 2 - Subplate surface required

OVERALL AND CONNECTION DIMENSIONS

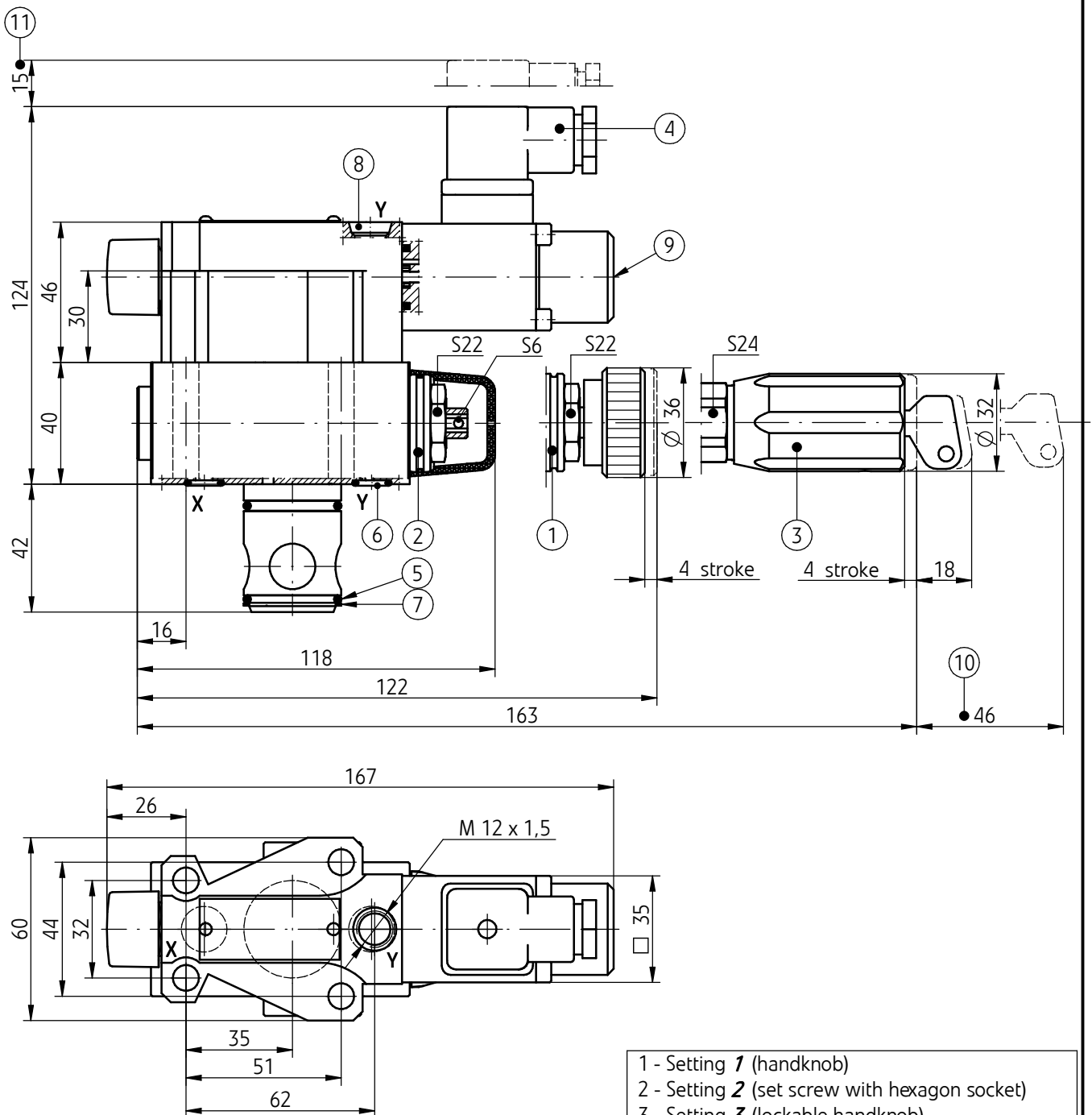
versions for cartridge mounting: WZPSE10...; ...30...



- 1 - Plug-in connector type **ISO4401** (DIN 43650 - A)
- 2 - **O-ring 27,3 x 2,4** - pcs 2/set
- 3 - **O-ring 9,2 x 1,8** - pcs 2/set (X, Y)
- 4 - Back-up ring **PEP 28,4 x 32 x 0,8** - pcs 1/set
- 5 - External port Y - connection **M12 x 1,5** acc. to **PN/M-73101** (**o-ring 9,3 x 2,4** - pcs 1/ set must be ordered separately)
- 6 - Manual override
- 7 - Space for disassembly of plug-in connector - item 1

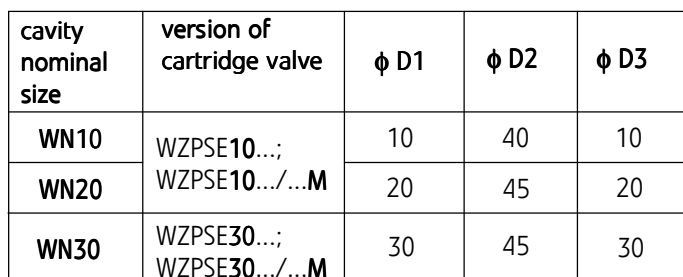
OVERALL AND CONNECTION DIMENSIONS

versions for cartridge mounting: WZPSE10.../...M; ...30.../...M



- 1 - Setting **1** (handknob)
- 2 - Setting **2** (set screw with hexagon socket)
- 3 - Setting **3** (lockable handknob)
- 4 - Plug-in connector type **ISO4401** (DIN 43650 - A)
- 5 - **O-ring 27,3 x 2,4** - pcs 2/set
- 6 - **O-ring 9,2 x 1,8** - pcs 2/set (X, Y)
- 7 - Back-up ring **PEP 28,4 x 32 x 0,8** - pcs 1/set
- 8 - External port Y - connection **M12 x 1,5** acc. to **PN/M-73101** (**o-ring 9,3 x 2,4** - pcs 1/set must be ordered separately)
- 9 - Manual override
- 10 - Space for key withdrawal from lock of setting - item 4
- 11 - Space for disassembly of plug-in connector - item 4

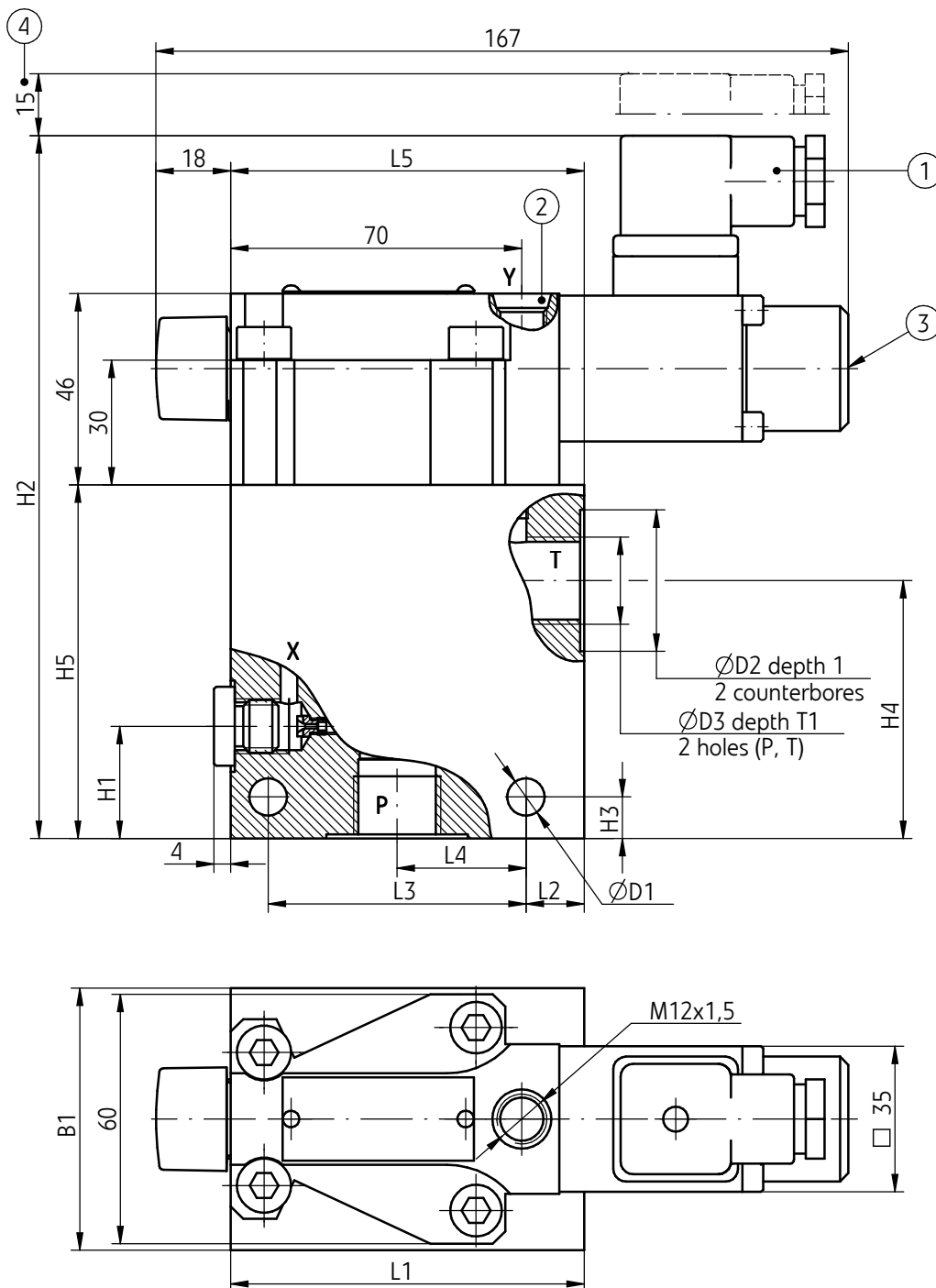
versions for cartridge mounting: WZPSE10...; ...30...; WZPSE10.../...M; ...30.../...M
cavity



2 - Jet ϕ_1

OVERALL AND CONNECTION DIMENSIONS

versions for threaded mounting: WZPGE10...; ...20...; ...30...

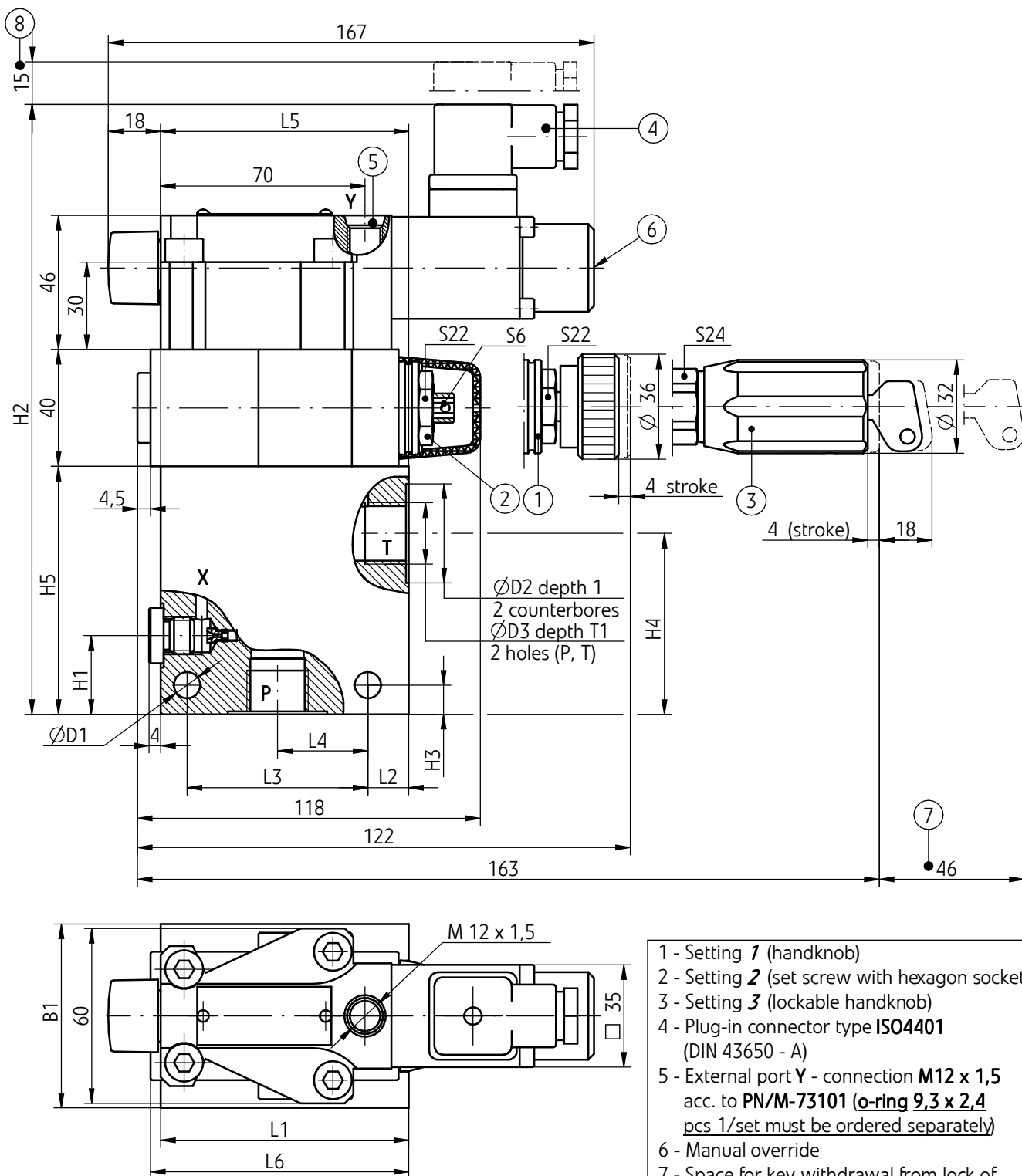


- 1 - Plug-in connector type ISO4401 (DIN 43650 - A)
- 2 - External port Y - connection M12 x 1,5 acc. to PN/M-73101 (o-ring 9.3 x 2.4 - pcs 1/set must be ordered separately)
- 3 - Manual override
- 4 - Spacefor disassembly of plug-in connector - item 1

valve version	B1	$\varnothing D1$	$\varnothing D2$	$\varnothing D3$	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	T1
WZPGE10...	63	9	34	G 1/2	27	169	10	62	85	85	14	62	31	85	14
WZPGE20...	63	9	47	G 1	27	169	10	62	85	85	14	62	31	85	18
WZPGE30...	70	11	61	G 1 1/2	42	182	13	64	98	100	18	72	36	94	22

OVERALL AND CONNECTION DIMENSIONS

versions for threaded mounting: WZPGE10.../...M; ...20.../...M; ...30.../...M

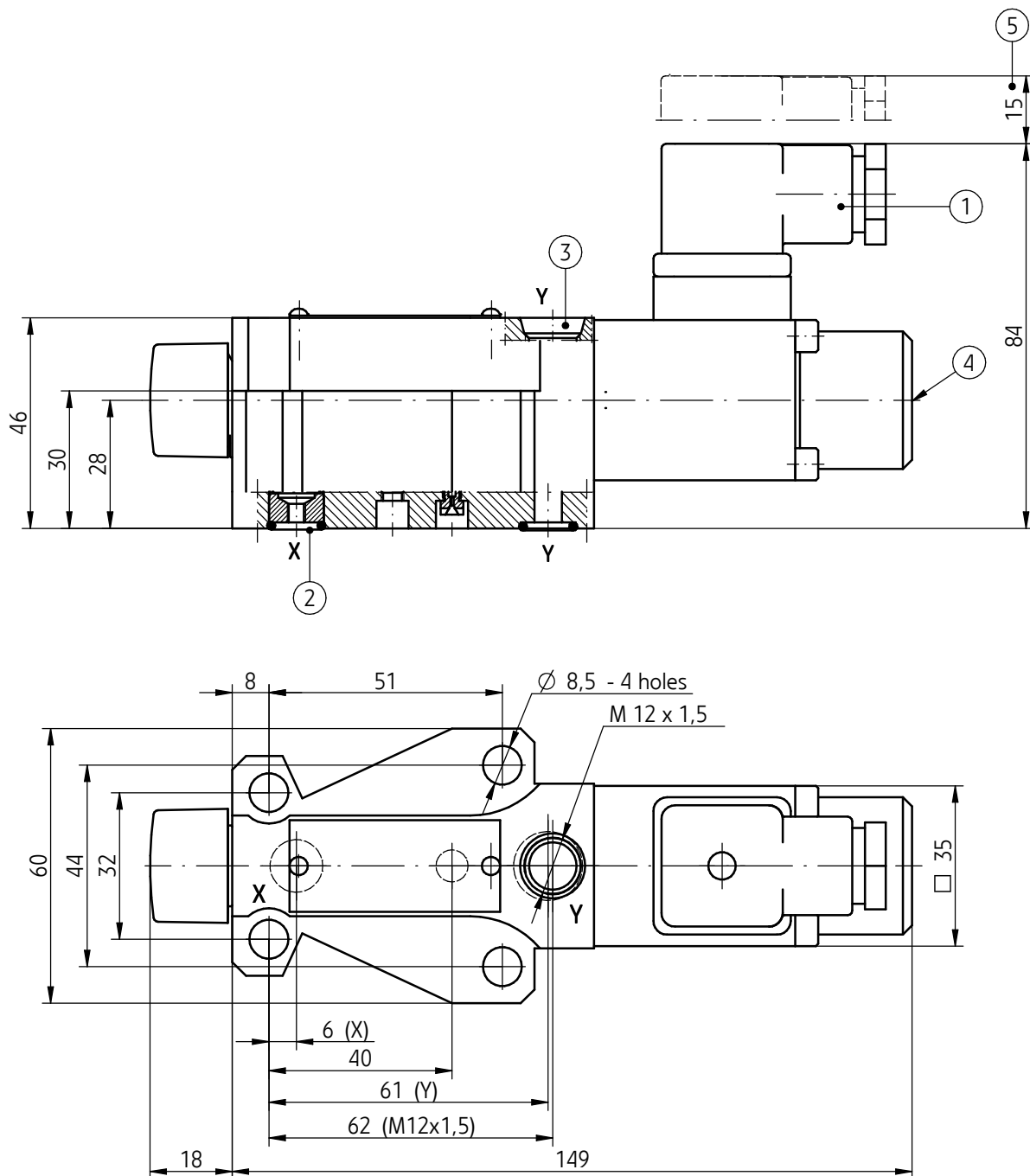


- 1 - Setting 1 (handknob)
- 2 - Setting 2 (set screw with hexagon socket)
- 3 - Setting 3 (lockable handknob)
- 4 - Plug-in connector type ISO4401 (DIN 43650 - A)
- 5 - External port Y - connection M12 x 1,5 acc. to PN/M-73101 (o-ring 9,3 x 2,4 pcs 1/set must be ordered separately)
- 6 - Manual override
- 7 - Space for key withdrawal from lock of setting - item 3
- 8 - Space for disassembly of plug-in connector item 4

valve version	B1	φ D1	φ D2	φ D3	H1	H2	H3	H4	H5	L1	L2	L3	L4	L5	L5	T1
WZPGE10.../...M	63	9	34	G 1/2	27	210	10	62	85	85	14	62	31	85	88,5	14
WZPGE20.../...M	63	9	47	G 1	27	210	10	62	85	85	14	62	31	85	88,5	18
WZPGE30.../...M	70	11	61	G 1 1/2	42	225	13	64	98	100	18	72	36	94	97,5	22

OVERALL AND CONNECTION DIMENSIONS

pilot valve - version WZEP...

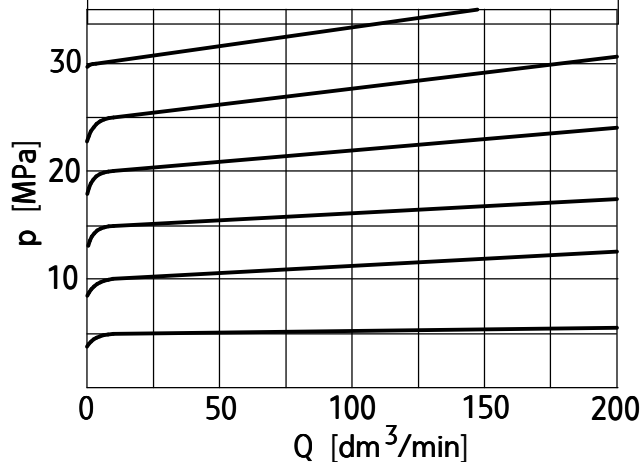


- 1 - Plug-in connector type **ISO4401** (DIN 43650 - A)
- 2 - **O-ring 9,2 x 1,8** - pcs 2/set (X, Y)
- 3 - External port **Y** - connection **M12 x 1,5**
acc. to **PN/M-73101** (**o-ring 9,3 x 2,4**
pcs 1/set must be ordered separately)
- 4 - Manual override
- 5 - Spacefor disassembly of plug-in connector - item 1

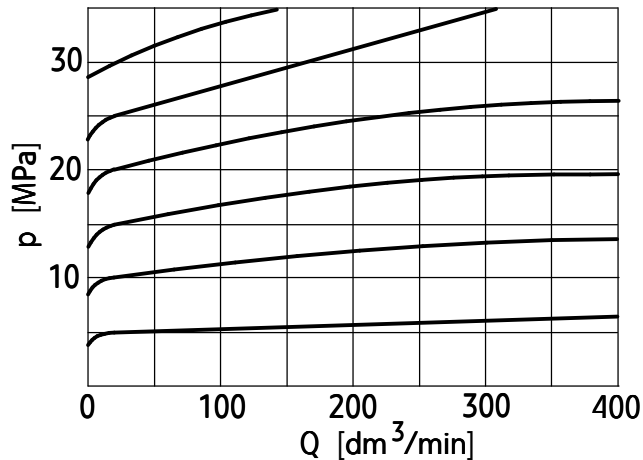
PERFORMANCE CURVES

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

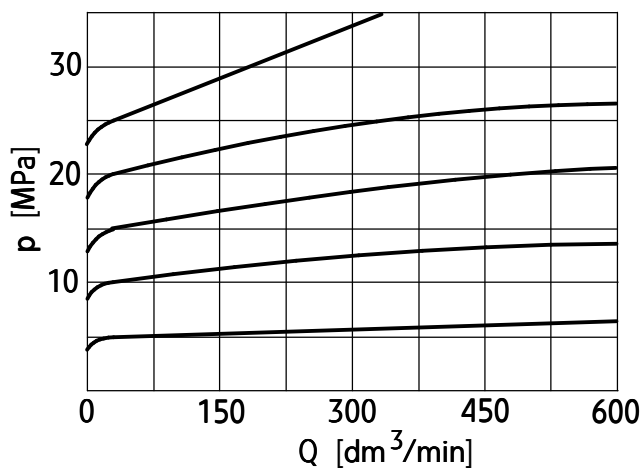
Operating pressure p in relation to flow rate Q
for valves **NS10**



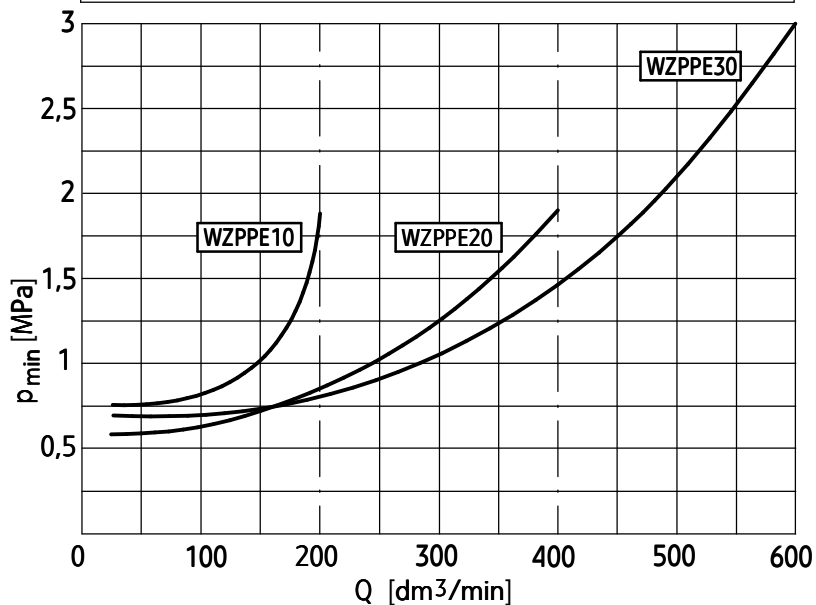
Operating pressure p in relation to flow rate Q
for valves **NS20**



Operating pressure p in relation to flow rate Q
for valves **NS30**



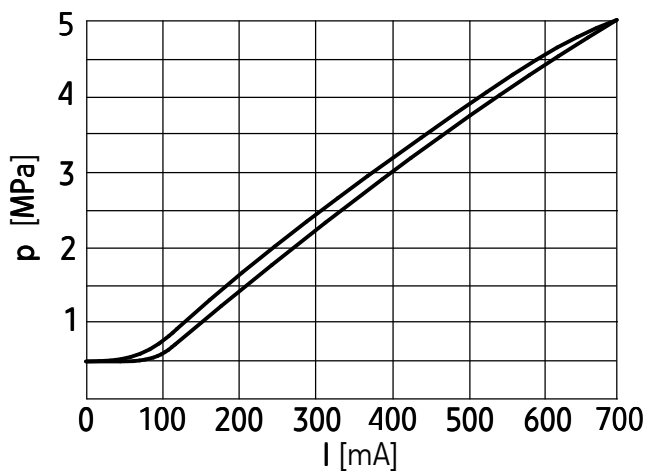
Minimal set pressure $p_{\min}$ in relation to flow rate Q



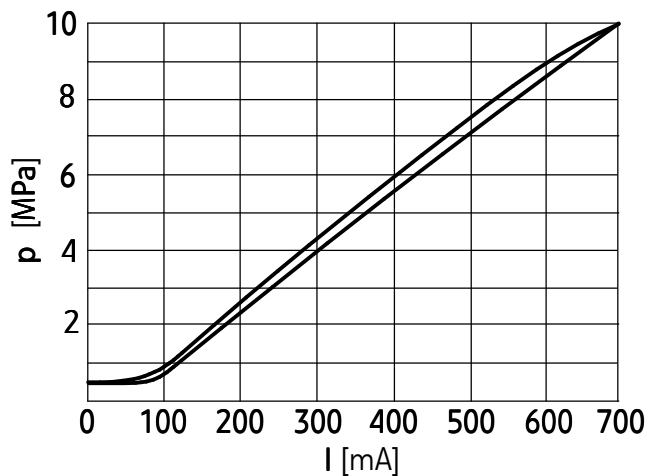
PERFORMANCE CURVES

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

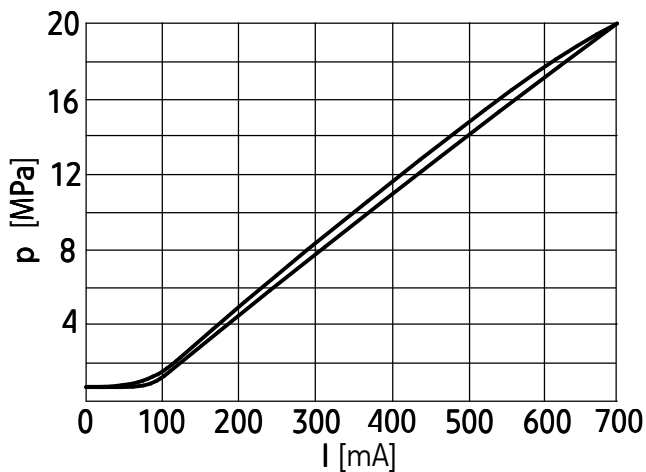
Operating pressure **p** in relation to current control **I**
for valve version WZEP.../50



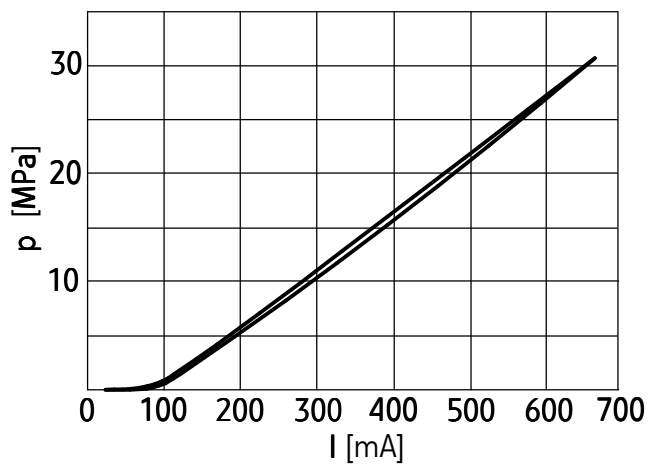
Operating pressure **p** in relation to current control **I**
for valve version WZEP.../100



Operating pressure **p** in relation to current control **I**
for valve version WZEP.../200



Operating pressure **p** in relation to current control **I**
for valve version WZEP.../320



HOW TO ORDER

	+	/	Y				*
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Design version

valve for subplate mounting = **WZPPE**

valve for threaded mounting = **WZPGE**

valve for cartridge mounting

state nominal size NS10 or NS30

in next space

= **WZPSE**

pilot valve

do not state nominal size in next space = **WZEP**

Nominal size (NS)

NS10 = **10**

NS20 = **20**

NS30 = **30**

Series number

complete valves (versions: WZPPE..., WZPGE..., WZPSE...)

(12 - 19) - connection and installation dimensions unchanged = 1X

series 12 = **12**

pilot valve (version WZEP...)

(22 - 29) - connection and installation dimensions unchanged = 2X

series 23 = **23**

Settable pressure range

up to 5 MPa = 50

up to 10 MPa = 100

up to 20 MPa = **200**

up to 31,5 MPa = 320

Type of flow control

flow with external port Y = **Y**

Sealing

NBR (for fluids on mineral oil base) = **no designation**

FKM (for fluids on phosphate ester base) = **V**

Type of mechanical pressure reduction

without pressure reducing valve = **no designation**

with pressure reducing valve (type UZAC...) = **M**

Type of setting of pressure valve (only versions WZPPE.../...M)

handknob = 1

set screw with hexagon socket = **2**

lockable handknob = 3

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 preferred versions available in short delivery time.

Coding example: WZPPE10 - 12/200 Y 2

SUBPLATES AND FIXING SCREWS

Subplates should be ordered acc. to subplate designation with regard to dimensions of threaded connections specified in the table.

Detailed data concerning subplates are given in suitable data sheets.

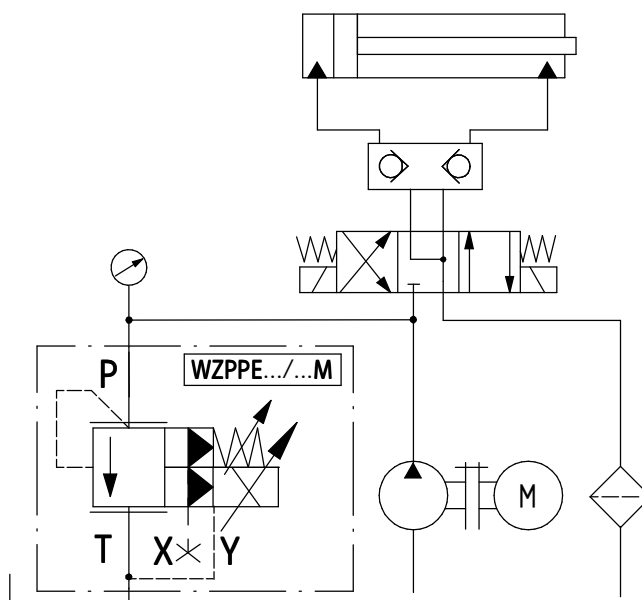
Subplates and fixing screws are delivered on separate order.

NOTE:

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

Valve version	Subplate type data sheet number	Threaded connections	Fixing screws
WZPPE10...; WZPPE10.../...M	G406/01 WK 470 013	P, T - G 3/8 X - G 1/4	M12 x 50 - 10.9 acc. to PN - EN ISO 4762 pcs 4/set tightening torque Md = 120 Nm
	G407/01 WK 470 013	P, T - G 1/2 X - G 1/4	
WZPPE20...; WZPPE20.../...M	G408/01 WK 450 797	P, T - G 3/4 X - G 1/4	M16 x 50 - 10.9 acc. to PN - EN ISO 4762 pcs 4/set tightening torque Md = 310 Nm
	G409/01 WK 450 797	P, T - G 1 X - G 1/4	
WZPPE30...; WZPPE30.../...M	G410/01 WK 470 473	P, T - G 1 1/4 X - G 1/4	M18 x 50 - 10.9 acc. to PN - EN ISO 4762 pcs 4/set tightening torque Md = 430 Nm
	G411/01 WK 470 473	P, T - G 1 1/2 X - G 1/4	

EXAMPLE OF APPLICATION IN HYDRAULIC SYSTEM



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