Pilot operated pressure sequence valve type UZK

NS 10, 20, 30 | p_{max} 35 MPa | Q_{max} 450 dm³/min | WK 420 360

PONAR wadowice

DATA SHEET - OPERATION MANUAL

APPLICATION

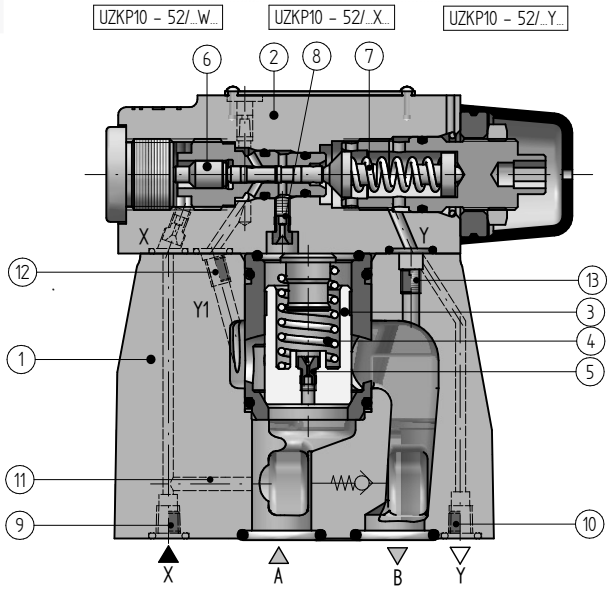
Pressure sequence valve type **UZK...** is designated for sequence switching of parts of a hydraulic system (connecting circuits when set pressure is reached). Version **UZK...W...** of the valve is mainly used as counterbalance valve. In version **UZK...Y...** is used as sequence valve (line B does not affect the setting). Versions **UZK...Z...** and **UZK...X...** can be supplied with control pressure from other circuit. Because of this these versions can be used for unloading function.

The valve is compliant with the directive 2014/35/UE.

DESCRIPTION OF OPERATION

versions: UZK.../...W...; UZK.../...X...; UZK.../...Y...

Pilot operated pressure sequence valve type **UZK...** comprises of the main valve **1** and the pilot valve **2**. Pressure in line **A** acts both sides of the main spool **3** via hole in the main spool **3** and the jet **5**. The spring **4** holds the main spool and closes flow from line **A** to **B**. Simultaneously pressure via line **X** affects the pilot spool **6**, the spring **7** tensioned according to pressure setting holds the pilot spool in closed position. When set pressure is exceeded, the pilot spool **6** moves towards the pressure adjustment. When using the valve as pilot or sequence valve it allows fluid to drain from spring chamber of the main spool **3** via jet and control line **8**, line Y1 to line B. Fluid flow via the jet **5** causes pressure difference between the lower and the upper side of the main spool **3**. The main spool **3** moves upward. Connection from **A** to **B** is open and system pressure remains unchanged. The function of the valve in a system depends on the way of connection of control pressure. **(cont. on page 2)**



TECHNICAL DATA

hydraulic fluid		mineral oil	
required oil cleanliness class		ISO 4406 class 20/18/15	
nominal fluid viscosity		37 mm²/s w at temperature 55 °C	
viscosity range		2,8 ÷ 380 mm²/s	
fluid temperature range (in tank)		rec.: 40÷ 55°C; max.: -20 ÷ +70°C	
ambient temperature range		**UZK...**:-20 ÷ +70°C; **UZK...E...:** -20 ÷ +50°C	
max. working, inlet pressuure (ports A, X)		up to 35 MPa	
max. pressure	at the outlet (port B)	UZK...	35 MPa
		UZK...E...	21,5 MPa
	backpressure (port Y)	UZK...	35 MPa
		UZK...E...	21,5 MPa
max. flow		WN10	150 dm³/min
		WN20	300 dm³/min
		WN30	450 dm³/min

Nominal supply voltage for solenoid		DC 12V; 24V; 110V		AC with rectifier 230V-50Hz; 220V-50Hz; 110V-50Hz		AC - direct supply 230V-50Hz	
supply voltage tolerance		± 10%					
power consumption (DC)		30 W				-	
hold-on power (AC)		-				50 VA	
switch-on power (AC)		-				300 VA	
weight		UZKP...	UZKP...E	UZKS..	UZKS...E	UZKB	UZKB...E
	WN10	3,8 kg	5,3 kg	-	-	1,6 kg	3,1 kg
	WN20	5,7 kg	7,2 kg	-	-		
	WN20	8,4 kg	9,9 kg	1,6 kg	3,1 kg		
valve type		WE6 wg WK 499 502 (tylko dla wersji UZK...E...)					
insulation		IP 65					
coil temperatorue		max 150°C					

assembly and operation requirements at:

DESCRIPTION OF OPERATION cont.

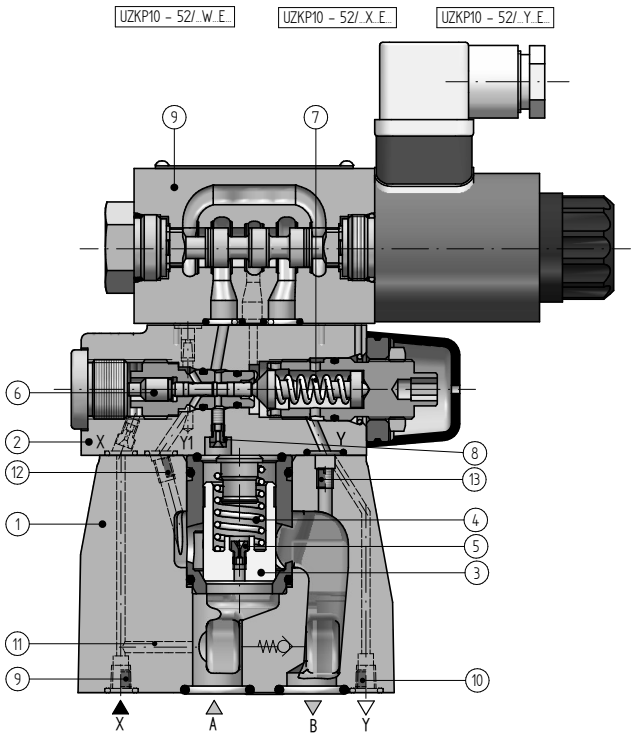
versions: UZK.../...W...; UZK.../...X...; UZK.../...Y...

In version UZK.../...**W...** with internal pilot supply and internal pilot drain lines **11**, **12**, **13** are open; lines **9**, **10** are plugged – the valve has function of counterbalance valve in a system because pressure in line **B** affects the adjustment and the other side of pilot spool.

In version UZK.../...**X...** with external pilot supply and internal pilot drain to line **B** lines **9**, **11**, **12**, **13** are open; line **10** is plugged. In version UZK.../...**Y...** pilot valve is supplied internally, leakage is drained without pressure via separated line Y, supply oil is drained via line **12** to line **B**. Lines **10**, **11**, **12**, **13** are open; line **9** is plugged – valve has function of sequence valve in a system.

versions: UZK.../...W...E... UZK.../...X...E... UZK.../...Y...E...

The pressure sequence valve type **UZK...** is also available in version with electrical pressure unloading. Directional valve **9** in neutral position shuts off the drain line before the pilot spool. The valve functions as described before. After switching directional valve **9**the chamber of the spring of the main spool **3** is connected with a tank. The main spool **3** unloaded form the top side moves opening connection from line A to B. The valve is available in two versions: opened and closed in deenergized position.

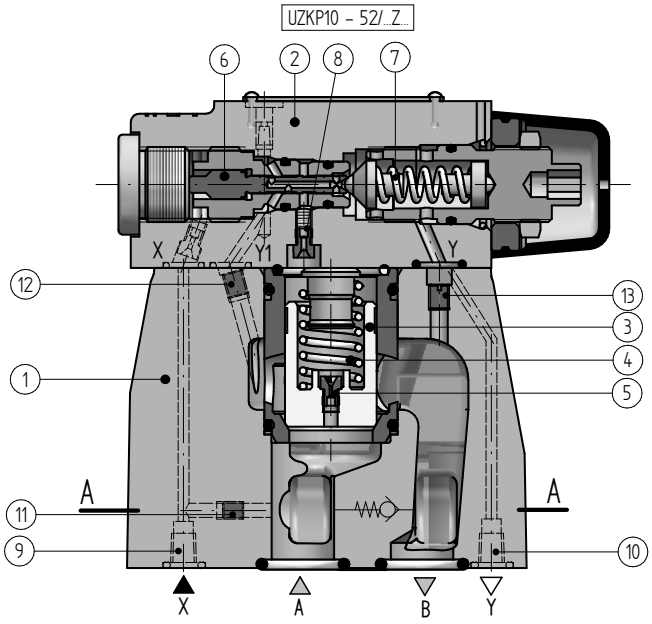


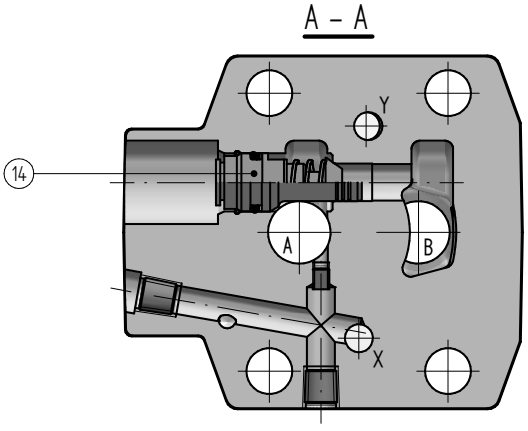
versions: UZK.../...Z...

In version **UZK.../...Z...** the pilot valve is supplied via separated line X, leakage is drained without pressure via separated line **Y** - lines **9**, **10** are open; lines **11**, **12**, **13** are plugged. Control pressure is supplied to chamber of the pilot spool **6** via separated line **X** (**9**). Simultaneously pressure in line **A** acts via the jet **5** on the side of the main spool **3** loaded by spring **4**.

When pressure set by adjustment of the pilot valve **2** is exceeded in line **X** (**9**), the pilot spool **6** moves rightward against the spring **7**. As a result of this oil flows from the side of the main spool **3** loaded by spring **4**, via the jet **8** and a hole in the pilot spool **6** to the chamber of the spring **7** in the pilot valve **2**.

Fluid flow via the jet **5** causes pressure difference between the lower and the upper side of the main spool **3**. The main spool **3** moves upward. Connection from **A** to **B** is open. This allows flow of the main stream from line **A** to **B** with minimum pressure difference. Control pressure is drained without pressure to the tank via separated line **Y** **10**. The valve has function of unloading valve in a system. To allow free flow from line **B** to **A** the check valve **14** can be installed optionally.

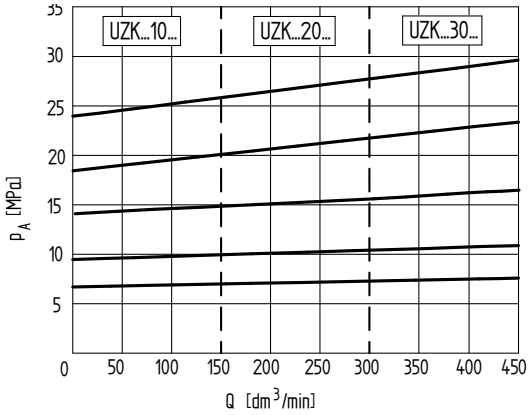




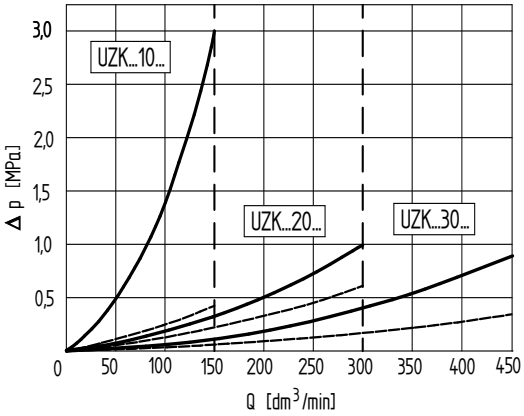
PERFORMANCE CURVES

measured at viscosity of hydraulic fluid ν = 41 mm^2 /s and temperature t = 50°C)

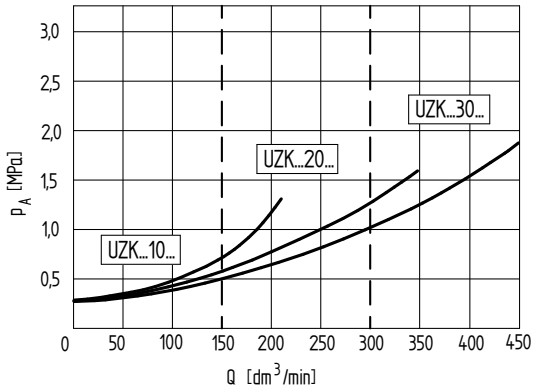
inlet pressure p_A in relation to flow Q, direction A → B



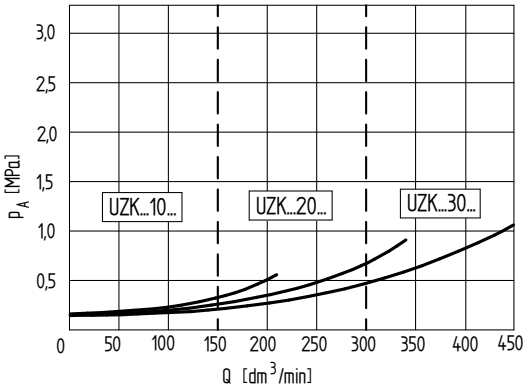
pressure resistance Δp (Q) across the check valve, flow A → B
main valve closed main valve fully open



minimum settable pressure p_A in relation to flow Q, direction A → B, outlet pressure p_B=0; versions UZK...W...; UZK...X...;UZK...Y...



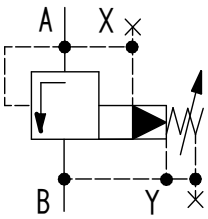
minimum settable pressure p_A in relation to flow Q, direction A → B, outlet pressure p_B=0; versions UZK...Z



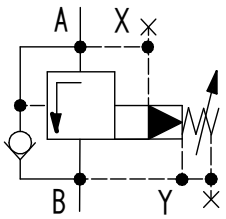
HYDRAULIC DIAGRAMS - VERSIONS UZK...

version UZK...W...

UZK...W...

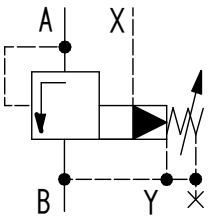


UZK...W...Z...

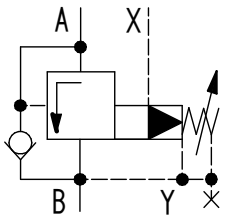


version UZK...X...

UZK...X...

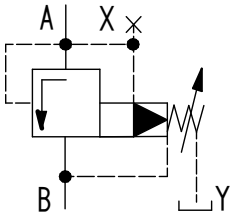


UZK...X...Z...

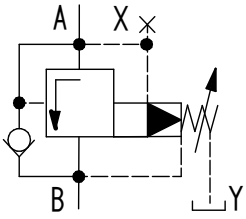


version UZK...Y...

UZK...Y...

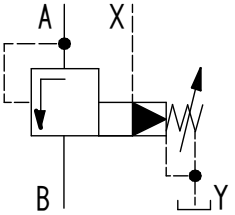


UZK...Y...Z...

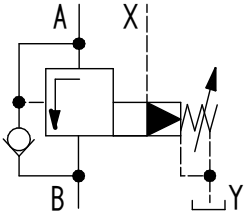


version UZK...Z...

UZK...Z...

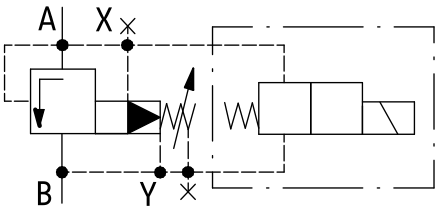


UZK...Z...Z...

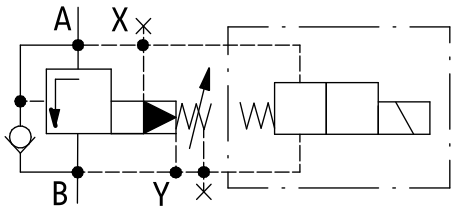


HYDRAULIC DIAGRAMS - VERSIONS UZK...E...

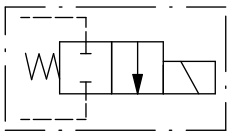
UZK...W...E...



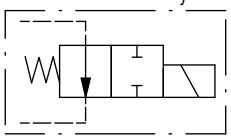
UZK...W...Z...E...



UZK...W...AE...
(normalnie zamknięty)

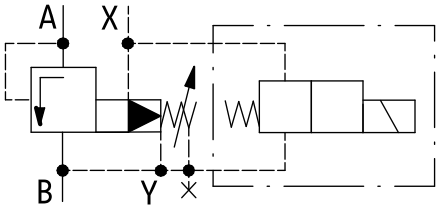


UZK...W...BE...
(normalnie otwarty)

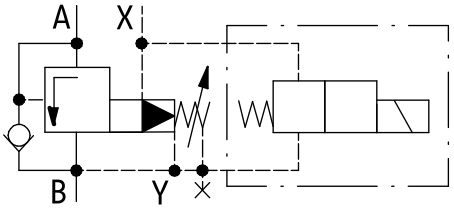


version UZK...X...E...

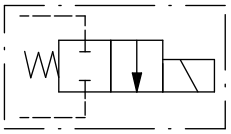
UZK...X...E...



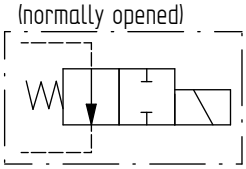
UZK...X...Z...E...



UZK...X...AE...
(normally closed)

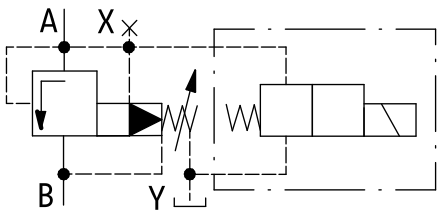


UZK...X...BE...
(normally opened)

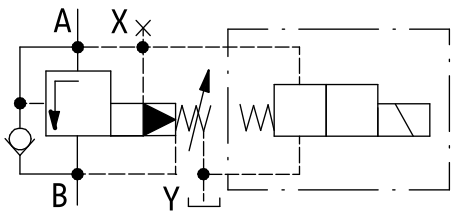


version UZK...Y...E...

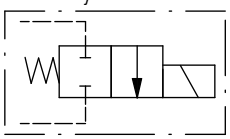
UZK...Y...E...



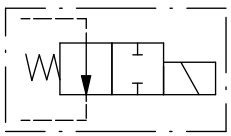
UZK...Y...Z...E...



UZK...Y...AE...
(normally closed)

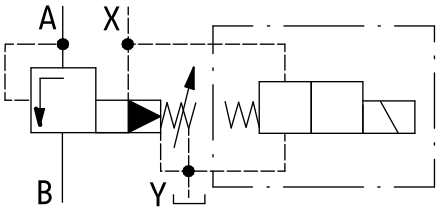


UZK...Y...BE...
(normally opened)

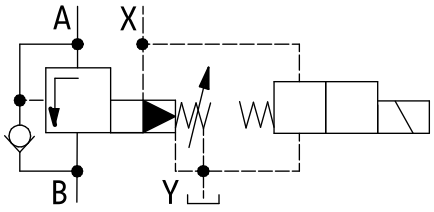


version UZK...Z...E...

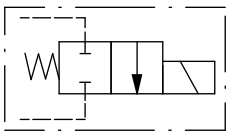
UZK...Z...E...



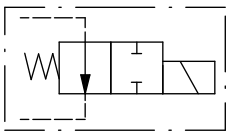
UZK...Z...Z...E...



UZK...Z...AE...
(normally closed)



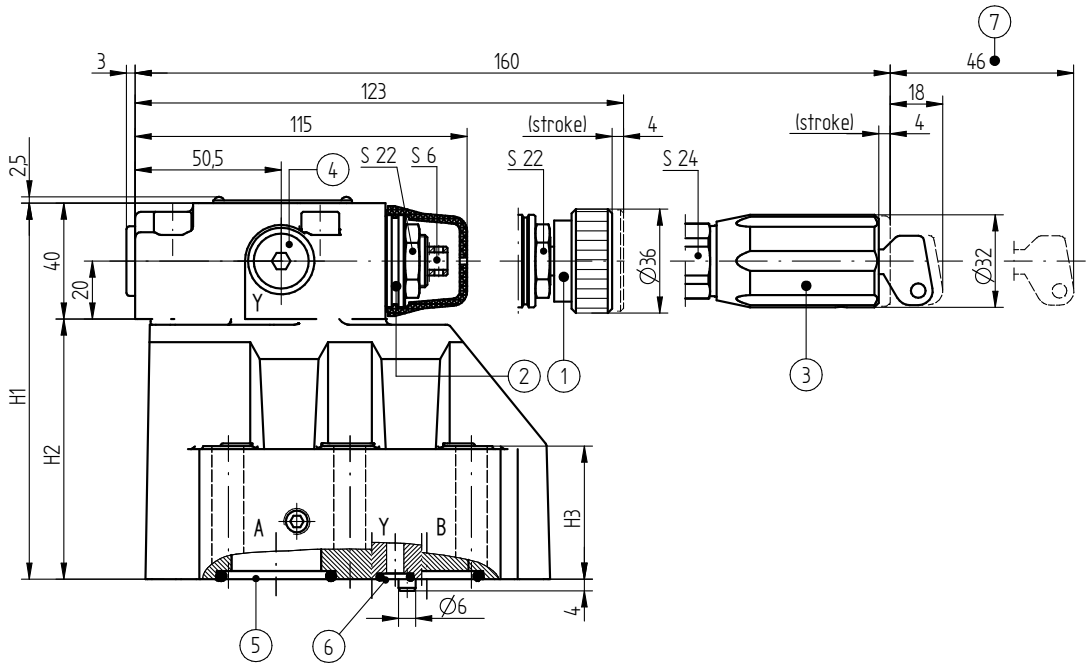
UZK...Z...BE...
(normally opened)

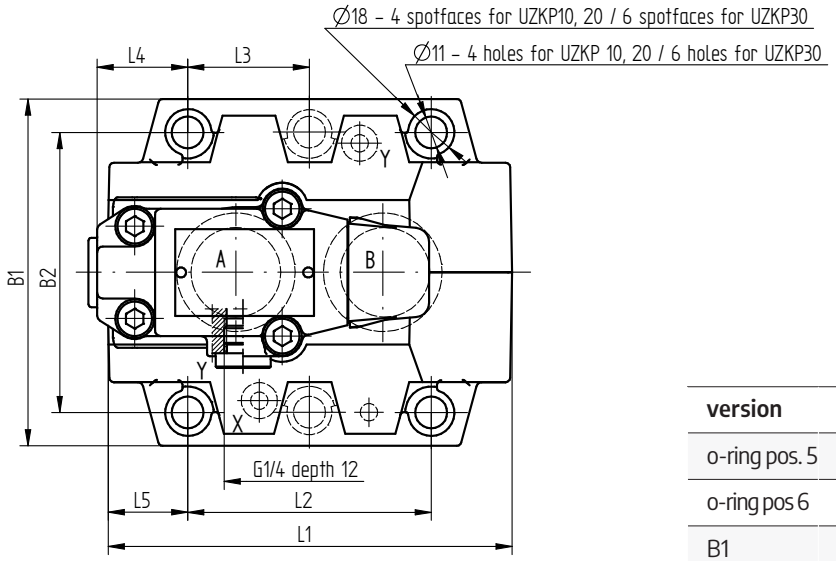


OVERALL AND CONNECTION DIMENSIONS

complete valve - versions for subplate mounting:

UZKP10...; ...20...; ...30...





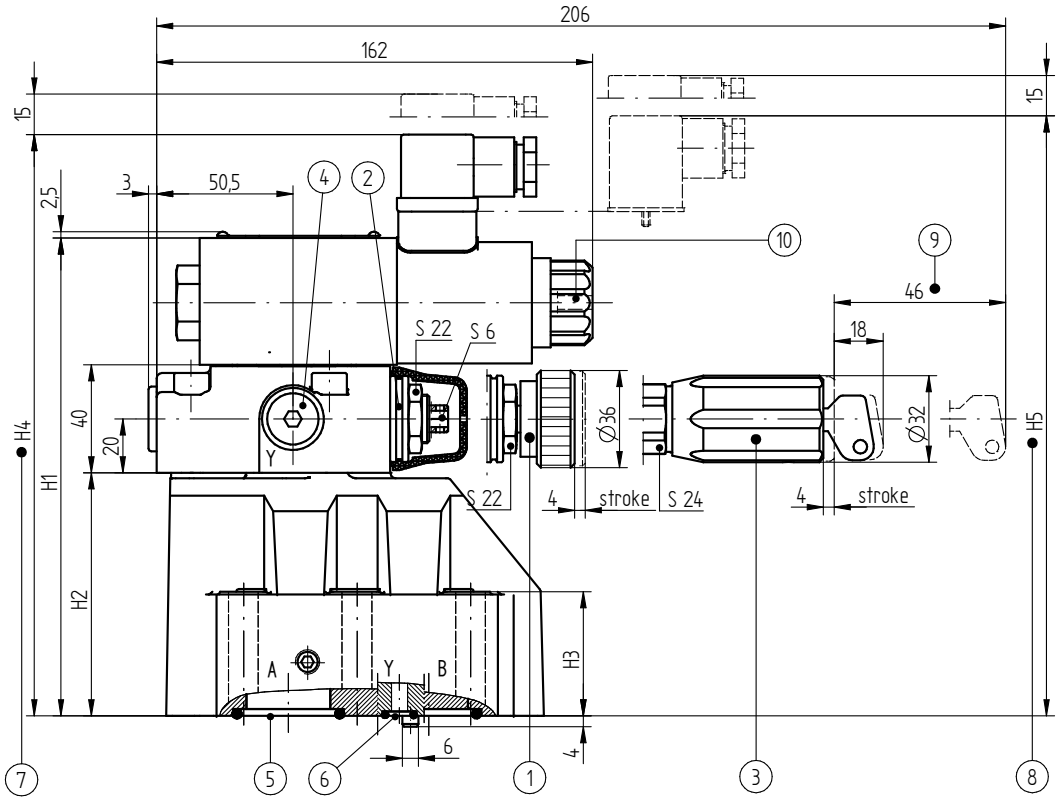
1. setting element **1** (rotary knob)
2. setting element **2** (setting screw with a hexagon head **S6**)
3. setting element **3** (rotary knob with a key lock)
4. additional external port **Y** (plug **G¼**)
5. o-ring 2 pcs/set (**A, B**) - see the table
6. o-ring 2 pcs/set (**X, Y**) - see the table
7. space required to remove the key from the lock of setting element pos. 3

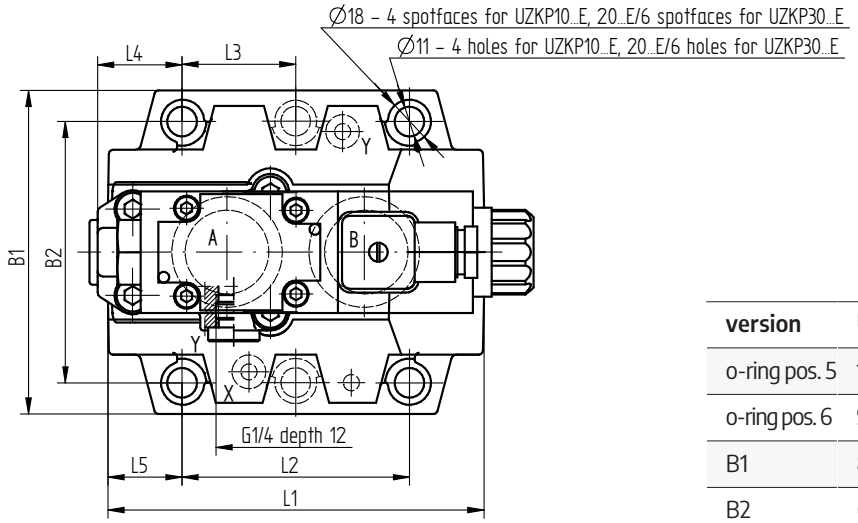
version	UZKP10	UZKP20	UZKP30
o-ring pos. 5	17,1 x 2,6	28,2 x 3,5	34,5 x 3,5
o-ring pos 6	9,2 x 1,8	9,2 x 1,8	9,2 x 1,8
B1	85	102	120
B2	66,7	79,4	96,8
H1	112	122	130
H2	72	82	90
H3	28	38	46
L1	96	112	140
L2	42,9	60,3	84,2
L3	-	-	42,1
L4	34,6	36,9	31,3
L5	35,6	33,5	28

OVERALL AND CONNECTION DIMENSIONS

complete valve - versions for subplate mounting:

UZKP10...E...; ...20...E...; ...30...E...





1. setting element **1** (rotary knob)
2. setting element **2** (setting screw with a hexagon head **S6**)
3. setting element **3** (rotary knob with a key lock)
4. additional external port **Y** (plug **G¼**)
5. o-ring 2 pcs/set (**A, B**) - see the table
6. o-ring 2 pcs/set (**X, Y**) - see the table
7. dimension for the valve with electrical connection of a directional valve **12V**, **24V**, **110V DC** plug type **ISO 4400** (**DIN 43650 - A**)
8. dimension for the valve with electrical connection of a directional valve **110V**, **230V AC** plug type **ISO 4400** (**DIN 43650 - A**) with a rectifier
9. space required to remove the key from the lock of setting element pos. 3
10. manual override

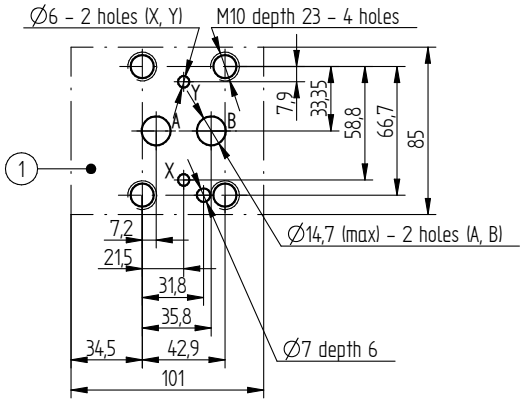
version	UZKP10	UZKP20	UZKP30
o-ring pos. 5	17,1 x 2,6	28,2 x 3,5	34,5 x 3,5
o-ring pos. 6	9,2 x 1,8	9,2 x 1,8	9,2 x 1,8
B1	85	102	120
B2	66,7	79,4	96,8
H1	161	171	179
H2	72	82	90
H3	28	38	46
H4	198	208	216
H5	205	215	223
L1	96	112	140
L2	42,9	60,3	84,2
L3	-	-	42,1
L4	34,6	36,9	31,3
L5	35,6	33,5	28

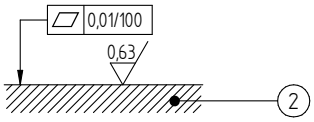
OVERALL AND CONNECTION DIMENSIONS

versions for subplate mounting UZKP10...; ...20...; ...30...; UZKP10...E...; ...20...E...; ...30...E...

porting pattern of the subplate

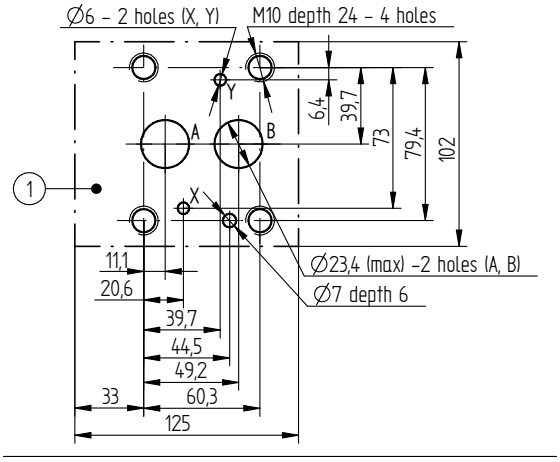
UZKP10...; UZKP10...E...

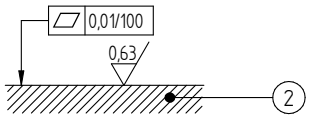




1. porting pattern of the subplate compliant with **PN - ISO 5781** designation **PN-ISO 5781-06-07 (CETOP 06)** mounting screws **M10 × 50 - 10.9** acc. to **PN - EN ISO 4762** (PN/M-82302) - pcs/set
   tightening torque M_d **= 73 Nm**
2. required surface quality of the valve contact surface

UZKP20...; UZKP20...E...

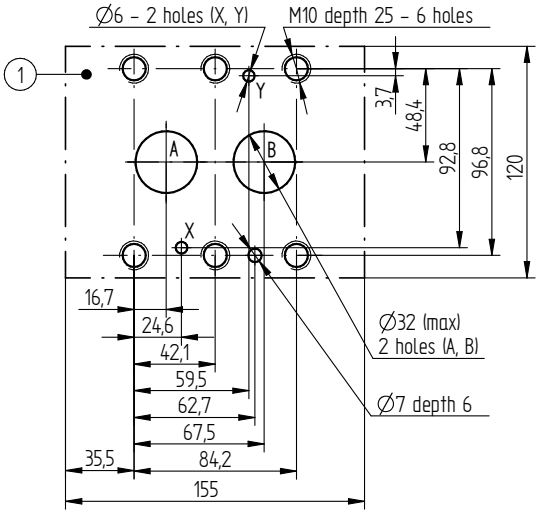


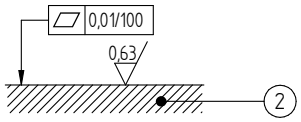


porting pattern of the subplate compliant with **PN - ISO 5781** designation **PN-ISO-5781-08-10 (CETOP 08)** mounting screws **M10 × 60 - 10.9** acc. to **PN - EN ISO 4762** (PN/M-82302) - 4 pcs/set
tightening torque M_d **= 73 Nm**

3. required surface quality of the valve contact surface

UZKP30...; UZKP30...E...





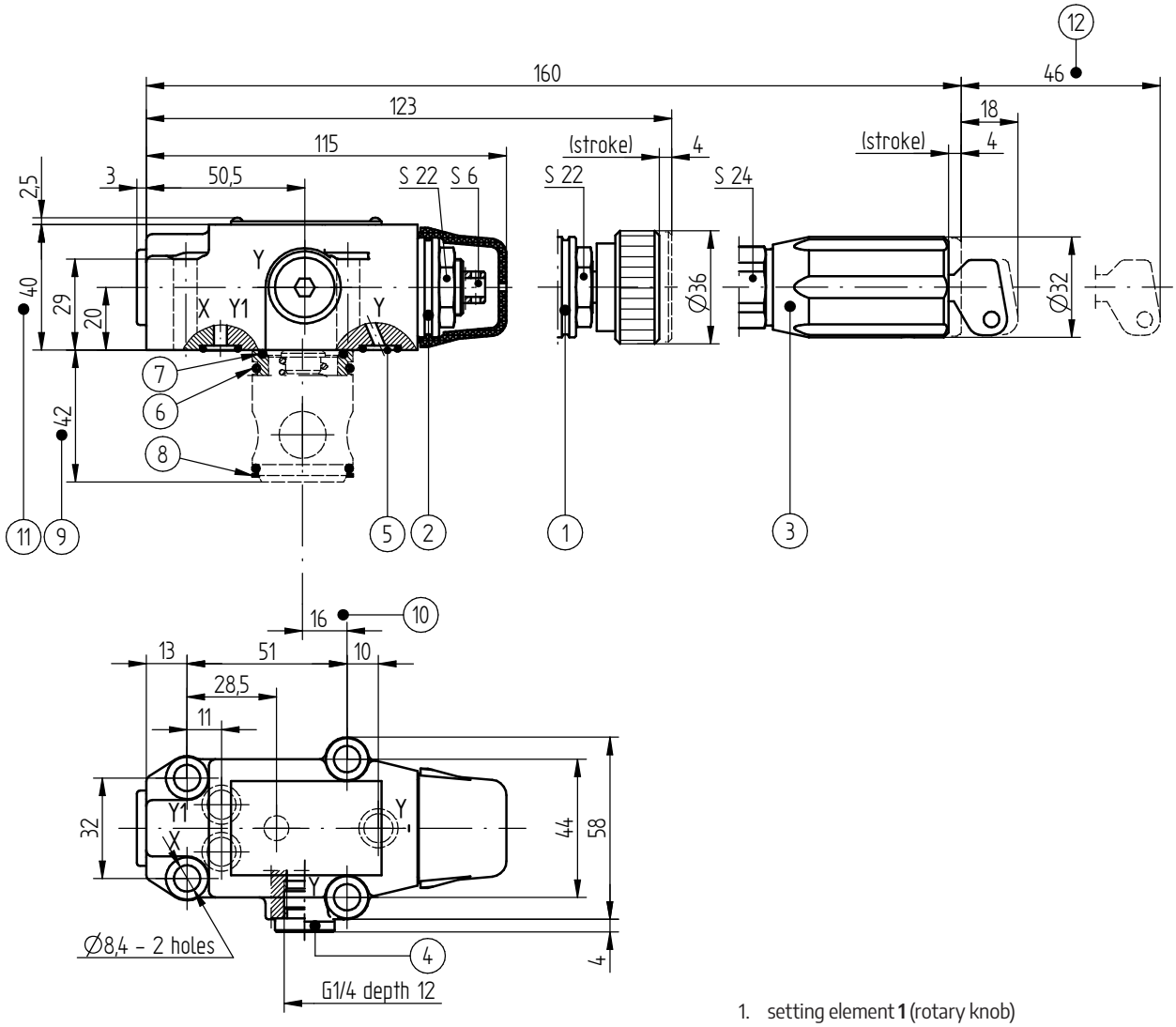
1. porting pattern of the subplate compliant with **PN - ISO 5781** designation **PN-ISO 5781-08-13** mounting screws **M10 × 70 - 10.9** acc. to **PN - EN ISO 4762** (PN/M-82302) - 6 pcs/set
   tightening torque M_d **= 73 Nm**
2. required surface quality of the valve contact surface

OVERALL AND CONNECTION DIMENSIONS

pilot valve with the main spool - version UZKS30...

for manifold block mounting

pilot valve without the main spool - version UZKB...



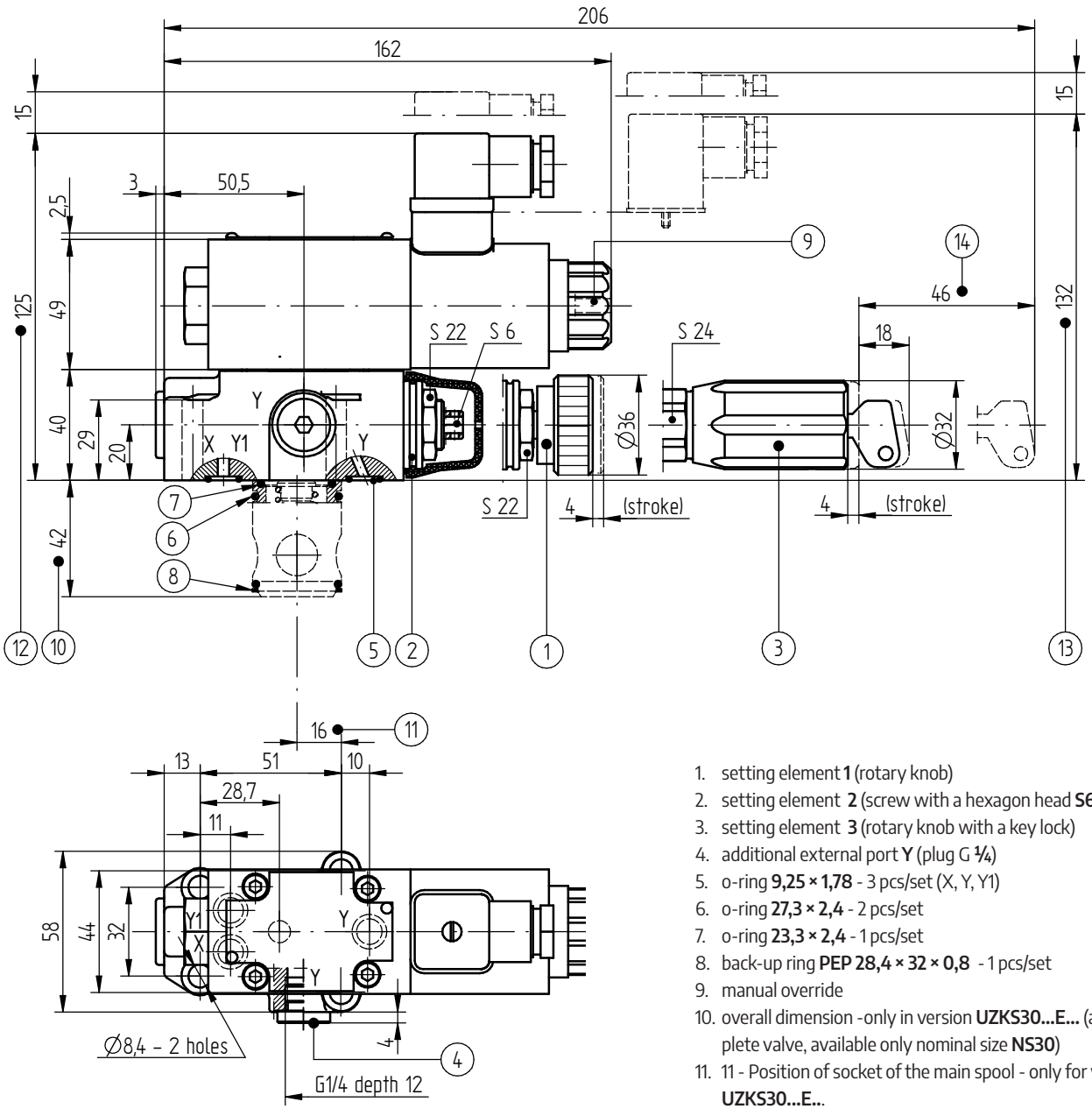
1. setting element **1** (rotary knob)
2. setting element **2** (screw with a hexagon head **S6**)
3. setting element **3** (rotary knob with a key lock)
4. additional external port **Y** (plug G **¼**)
5. o-ring **9,25 × 1,78** - 3 pcs/set (X, Y, Y1)
6. o-ring **27,3 × 2,4** - 2 pcs/set
7. o-ring **23,3 × 2,4** - 1 pcs/set
8. back-up ring **PEP 28,4 × 32× 0,8** - 1 pcs/set
9. overall dimension - only in version **UZKS30...**(a complete valve - available only nominal size **NS30**)
10. Position of socket of the main spool - only in version **UZKS30...**
11. overall dimension for version **UZKB...** (pilot valve without the main spool - do not state nominal size)
12. space required to remove the key from the lock of setting element pos. 3

OVERALL AND CONNECTION DIMENSIONS

pilot valve with the main spool - version UZKS30...E...

for manifold block mounting

pilot valve without the main spool - version UZKB...E...



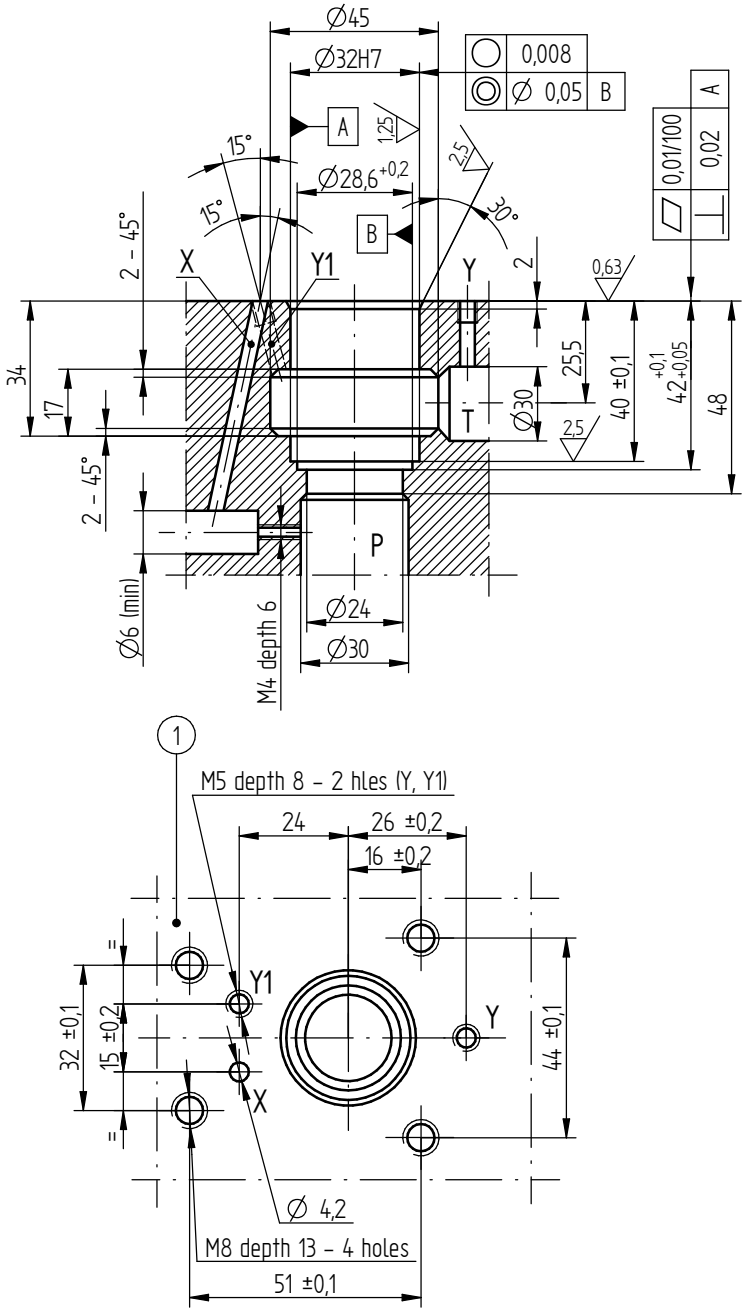
1. setting element **1** (rotary knob)
2. setting element **2** (screw with a hexagon head **S6**)
3. setting element **3** (rotary knob with a key lock)
4. additional external port **Y** (plug G **¼**)
5. o-ring **9,25 × 1,78** - 3 pcs/set (X, Y, Y1)
6. o-ring **27,3 × 2,4** - 2 pcs/set
7. o-ring **23,3 × 2,4** - 1 pcs/set
8. back-up ring **PEP 28,4 × 32 × 0,8** - 1 pcs/set
9. manual override
10. overall dimension -only in version **UZKS30...E...** (a complete valve, available only nominal size **NS30**)
11. 11 - Position of socket of the main spool - only for version **UZKS30...E...**
12. overall dimension -only in versions: **UZKB...E...; UZKS30...E...** with electrical connection **12V, 24V, 110V DC** - connector type **ISO 4400 (DIN 43650 - A)**
13. overall dimension of the valve for versions: **UZKB...E...; UZKS30...E...** with electrical connection **110V, 230V AC** - connector type **ISO 4400 (DIN 43650 - A)** with rectifier
14. space required to remove the key from the lock of setting element pos. 3

OVERALL AND CONNECTION DIMENSIONS

pilot valve with the main spool - versions for manifold

block mounting: UZKS30... ; UZKS30...E...

valve cavity



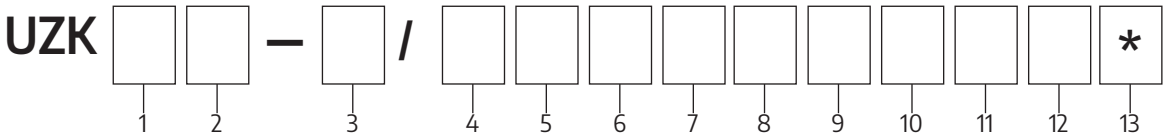
1. porting pattern of the front surface of the connection port, mounting screws **M8 × 40 -10.9** acc to **PN - EN ISO 4762 (PN/M-82302)** - 4 pcs/set
tightening torque M_d = 37 Nm

SUBPLATES AND MOUNTING SCREWS

valve version	plate type data sheet number	threaded connections of the plate	screws for mounting the valve to the plate
UZKP10... UZKP10...E...	G461/01 WK 450 798	A, B - G ½ X, Y - G **¼**	M10 x 50 - 10.9 wg PN - EN ISO 4762 (PN/M-82302) 4 pcs/set tightening torque M_d = 73 Nm
UZKP20... UZKP20...E...	G413/01 WK 450 799	A, B - G 1 X, Y - G **¼**	M10 x 60 - 10.9 wg PN - EN ISO 4762 (PN/M-82302) 4 pcs/set tightening torque M_d = 73 Nm
UZKP30... UZKP30...E...	G415/01 WK 470 471	A, B - G 1 ½ X, Y - G **¼**	M10 x 70 - 10.9 wg PN - EN ISO 4762 (PN/M-82302) 6 pcs/set tightening torque M_d = 73 Nm

Subplates and mounting screws are delivered **on separate order.**

HOW TO ORDER



1 design type

complete valve =	**P**
pilot valve with the main spool = (in the next step, choose nominal size NS30)	**S**
pilot valve without the main spool = (skip the nominal size in the next step)	**B**

2 nominal size (NS)

NS10 =	**10**
NS20 =	**20**
NS30 =	**30**

3 series number

series 52 =	**52**

(50 ÷ 59) - connection and installation dimensions unchanged

4 settable pressure range

up to 10 MPa =	**100**
up to 20 MPa =	**200**
up to 35 MPa =	**350**

5 pilot oil supply and pilot oil drain

pilot oil supply from line A ;pilot oil and leakage drained together to line B =	W
pilot oil supply from separatedline X; pilot oil and leakage drained together to line =	X
pilot oil supply from line A; pilot oil and lakage drained to line B, leakage drained to separated line Y =	Y
pilot oil supply from separated line X pilot oil and leakage drained together to line Y =	Z

6 setting element

rotary knob =	1
screw with a hexagon head =	**2**
rotary knob with a key lock=	3

7 check valve

without a check valve =	**Ø**
with a check valve=	Z

8 unloading method

without unloading =	Ø
spool valve in de-energized position closed =	AE
directional valve in de-energized position open =	BE

9 Supply voltage for solenoid *

12V DC =	G12
24V DC =	**G24**
110V DC =	G110
110V AC50 Hz (connector with rectifier) =	W110R
230V AC 50 Hz (wtyczka z prostownikiem) =	**W230R**
230V AC 50 Hz (direct supply with alternating current) =	W230-50

***** only for version UZK...E...

10 manual override

with a manual override =	**N**
without a manual override =	Ø

***** only for version UZK...E...

11 electrical connection type *

connectory type ISO 4400 (DIN 43650 - A) without LED =	**Z4**
connector type ISO 4400 (DIN 43650 - A) with LED =	Z4L

***** only for versions UZK...E...

12 sealing

NBR (for fluids on mineral oil base) =	**Ø**
FKM (for fluids on phosphate ester base) =	V

13 further requirements = *

(agreed upon with the Manufacturer)

Ø indicates that the box should be left blank.
The **symbols in bold** are the preferred versions available in short delivery time.

Coding example: Coding example: **UZKP10-52/200 W 2**

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