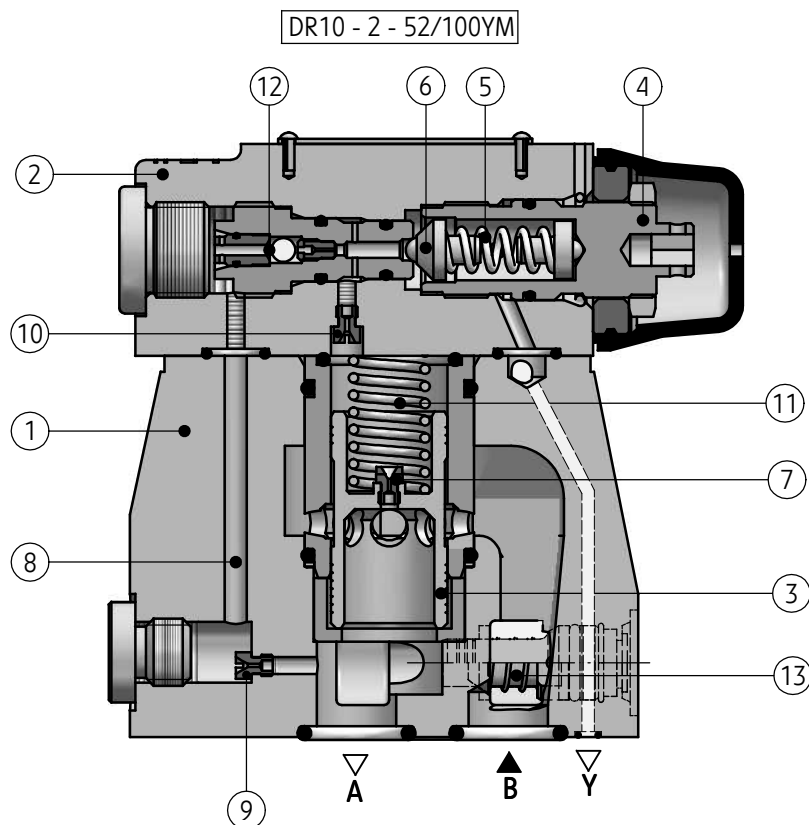


### APPLICATION

Pilot operated pressure reducing valve type DR... is used to reduce pressure in hydraulic systems with large flows.

### DESCRIPTION OF OPERATION



Pilot operated pressure reducing valve type DR... comprises of the main valve (1) and the pilot valve type DRC... (2). There is a spool (3) in the main valve (1) which allows free flow from line B to A in starting position. Demanded output pressure is set by means of adjustment element (4) that allows to change tension of spring (5) of the pilot valve (2). Pressure in line A affects the lower side of the spool (3) in direction of shutting off the flow. At the same time pressure via the jet (7) affects the upper spring (11) loaded side of the spool. Via the jet (10) pressure affects the poppet (6). Pressure from line A also affects via the control line (8) with the jet (9) and the check valve (12) the poppet (6) of the pilot valve and the

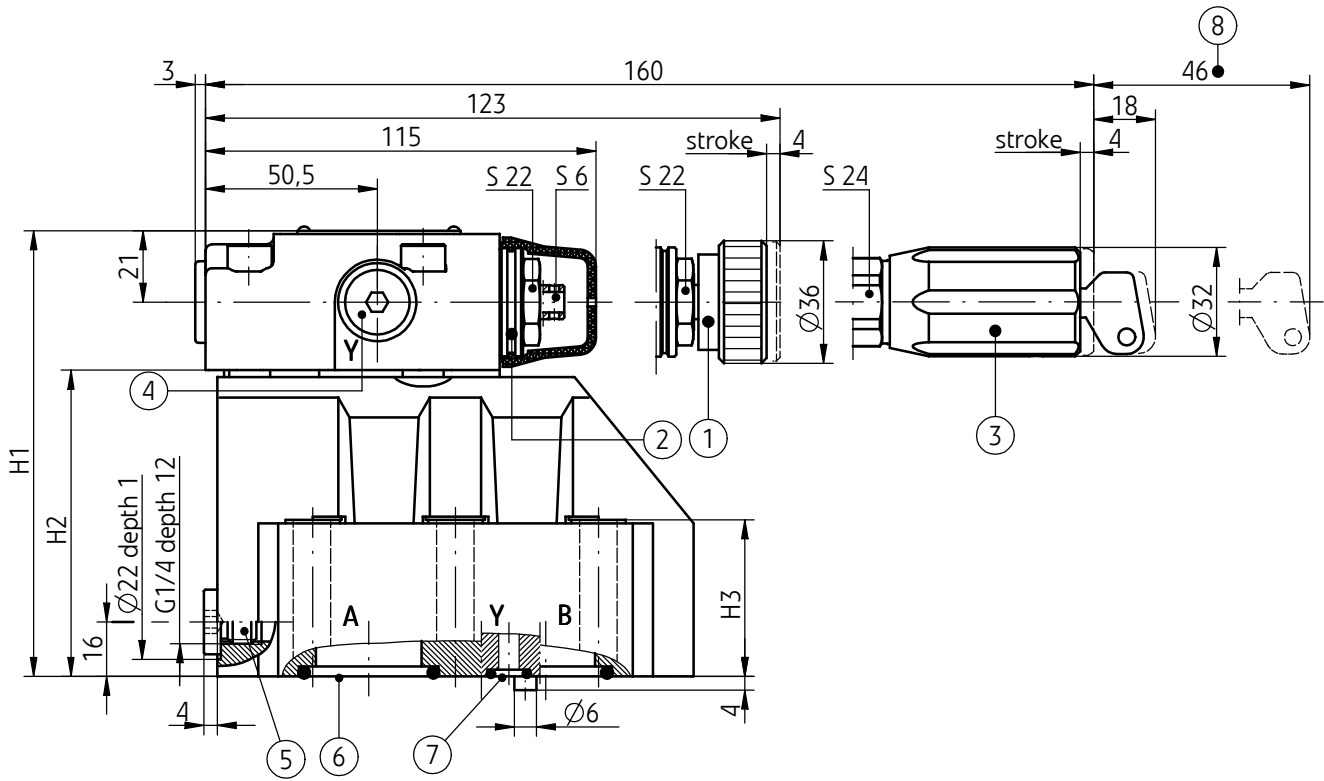
upper side of the spool (3) of the main valve (1). As long as output pressure is lower than set pressure the spool (3) is kept in open position by spring (11). If pressure in line A reaches the set pressure the pilot valve opens and control stream is drained to line Y. As an effect of flow through jets combination a pressure drop occurs, what allows the spool (3) to move upwards, in direction of shutting off the flow and fixing balance between pressure in line A and pressure set by means of adjustment element (4), that causes an effect of pressure reducing in line A. Pressure reducing valve type DR... can be equipped with the check valve (13) which allows free flow from line A to B.

## TECHNICAL DATA

Hydraulic fluid	mineral oil				
<b>Required filtration</b>	<b>up to 16 µm</b>				
Recommended filtration	up to 10 µm				
Nominal fluid viscosity	37 mm <sup>2</sup> /s at temperature 55 °C				
Viscosity range	2,8 up to 380 mm <sup>2</sup> /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 +70°C				
<b>Maximum operating pressure</b>	<b>31,5 MPa</b>				
<b>Inlet pressure (in line B)</b>	<b>do 31,5 MPa</b>				
<b>Output pressure (in line A)</b>	nominal size	NS10	0,3 - 31,5 MPa		
		NS20	1 - 31,5 MPa		
		NS30			
<b>Maximum backpressure (in line Y)</b>	<b>31,5 MPa</b>				
<b>Maximum setting pressure</b>	<b>31,5 MPa</b>				
<b>Maximum flow rate</b>	nominal size	NS10	150 dm <sup>3</sup> / min		
		NS20	300 dm <sup>3</sup> / min		
		NS30	400 dm <sup>3</sup> / min		
Weight	nominal size	version			
		DR...	DR...G...	DRC...	DRC30...
	NS10	3,8 kg	5,0 kg	1,6 kg	does not occur
	NS20	5,7 kg	4,8 kg		does not occur
	NS30	8,4 kg	5,5 kg		1,6 kg

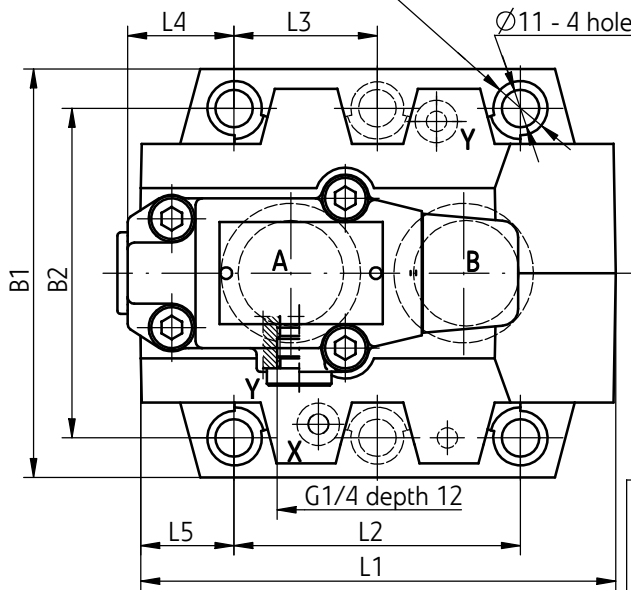
# OVERALL AND CONNECTION DIMENSIONS

versions for subplate mounting: DR10...; 20...; 30...



Ø18 - 4 spotfaces for DR10, 20  
6 spotfaces for DR30

Ø11 - 4 holes for DR 10, 20/6 holes for DR30



- 1 - Adjustment 1 (handknob)
- 2 - Adjustment 2 (set screw with hexagon socket)
- 3 - Adjustment 3 (lockable handknob)
- 4 - Additional external port Y (G 1/4 plug)
- 5 - Pressure gauge connection (G 1/4 plug)
- 6 - Sealing ring o-ring -2 pcs/kit (A, B)- according to table
- 7 - Sealing ring o-ring -2 pcs/kit (X, Y)- according to table
- 8 - Space required to remove the key from the lock of the adjustment item 3

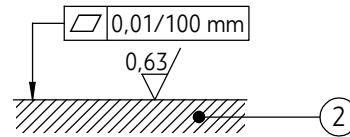
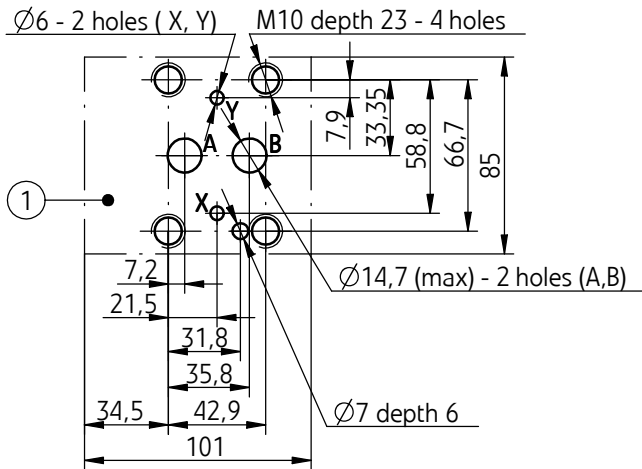
version	o-ring item 6	o-ring item 7	B1	B2	H1	H2	H3	L1	L2	L3	L4	L5
DR10...	17,1 x 2,6	9,2 x 1,8	85	66,7	113	72	28	96	42,9	-	34,6	35,6
DR20...	28,2 x 3,5		102	79,4	123	82	38	112	60,3	-	36,9	33,5
DR30...	34,5 x 3,5		120	96,8	131	90	46	140	84,2	42,1	31,3	28

## OVERALL AND CONNECTION DIMENSIONS

versions for subplate mounting: DR10...; 20...; 30...

porting pattern on subplate

### version DR10...

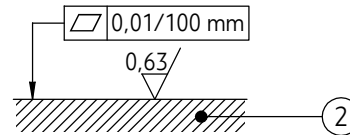
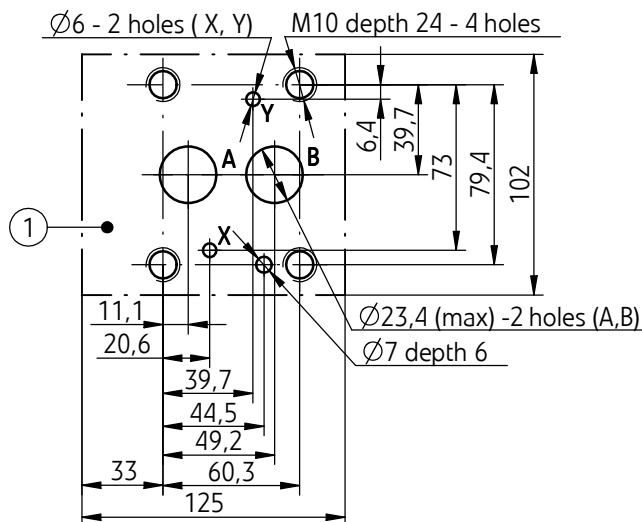


1 - Porting pattern on subplate according to:

- CETOP- RP 121H  
identified by CETOP- 4.4.5-2-06  
nominal size CETOP 06
- PN - ISO 5781  
mounting bolts **M10 x 50 - 10.9** - 4 pcs/kit  
in accordance with PN -EN ISO 4762  
tightening torque **Md = 73 Nm**

2 - Subplate surface required

### version DR20...

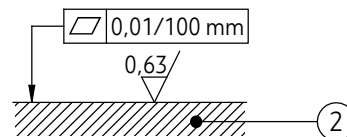
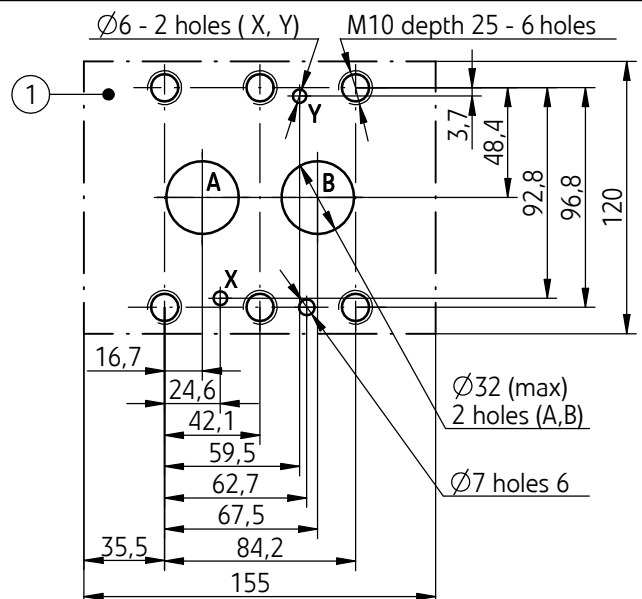


1 - Porting pattern on subplate according to:

- CETOP- RP 121H  
identified by CETOP- 4.4.5-2-08  
nominal size CETOP 08
- PN - ISO 5781  
mounting bolts **M10 x 60 - 10.9** - 4 pcs/kit  
in accordance with PN -EN ISO 4762  
tightening torque **Md = 73 Nm**

2 - Subplate surface required

### version DR30...



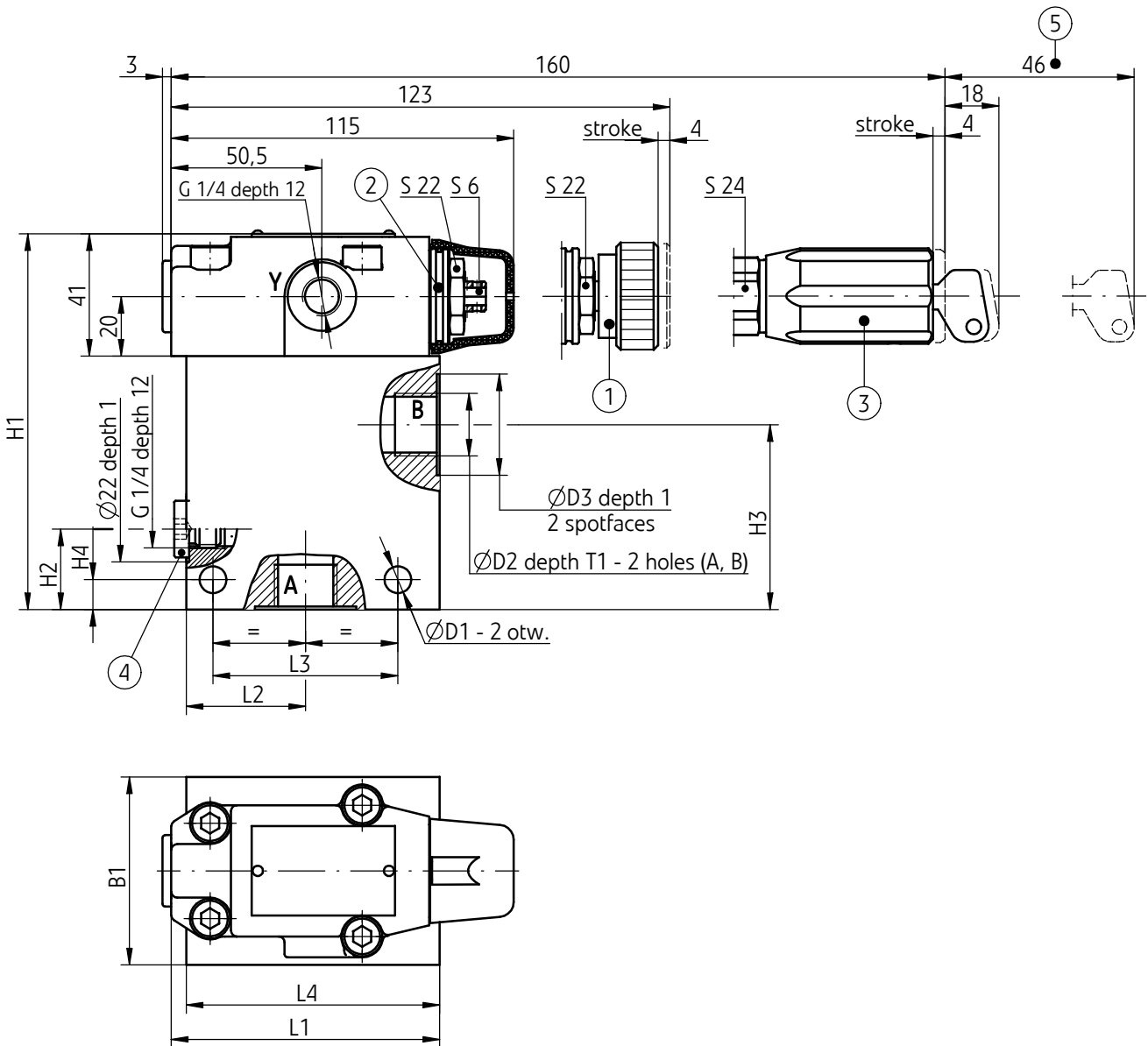
1 - Porting pattern on subplate according to:

- CETOP- RP 121H
- PN - ISO 5781  
mounting bolts **M10 x 70 - 10.9** - 6 pcs/kit  
in accordance with PN -EN ISO 4762  
tightening torque **Md = 73 Nm**

2 - Subplate surface required

# OVERALL AND CONNECTION DIMENSIONS

versions for threaded connection: DR10...G...; 20...G...; 30...G...



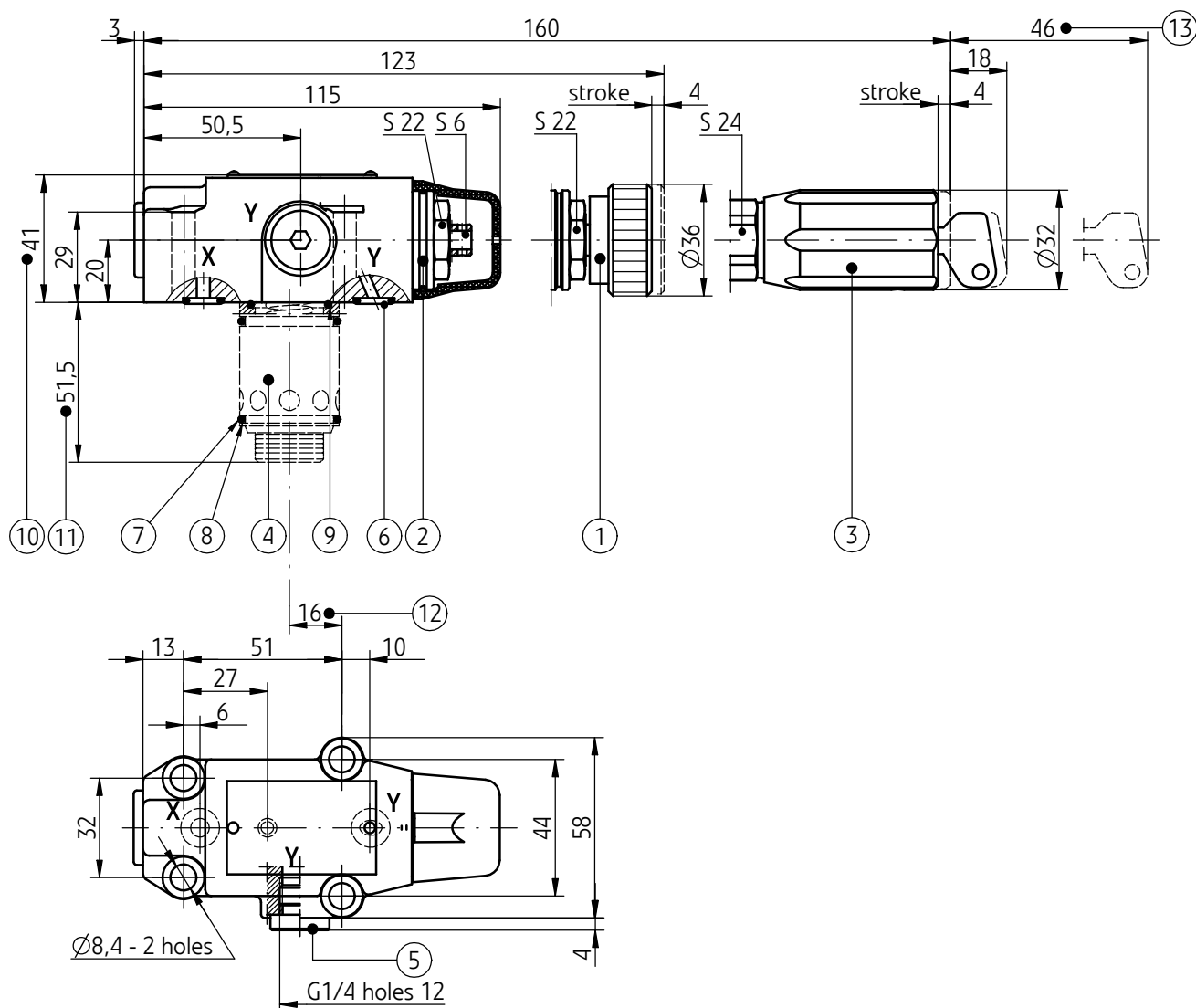
- 1 - Adjustment **1** (handknob)
- 2 - Adjustment **2** (set screw with hexagon socket)
- 3 - Adjustment **3** (lockable handknob)
- 4 - Pressure gauge connection (G 1/4 plug)
- 5 - Space required to remove the key from the lock of the adjustment item 3

version	B1	φ D1	φ D2	T1	φ D3	H1	H2	H3	H4	L1	L2	L3	L4
DR10...G...	63	9	G 1/2	14	34	126	27	47	10	90	40	62	85
DR20...G...	63	9	G 1	18	47	126	27	47	10	90	40	62	85
DR30...G...	70	11	G 1 1/2	22	61	139	42	51	13	99	46	72	100

## OVERALL AND CONNECTION DIMENSIONS

**pilot valve without the main spool - version DRC...**

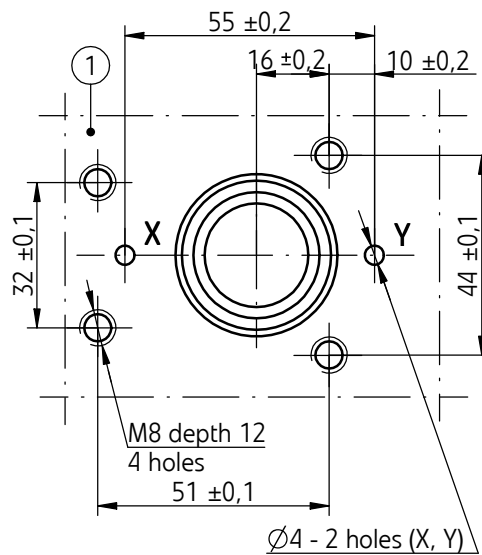
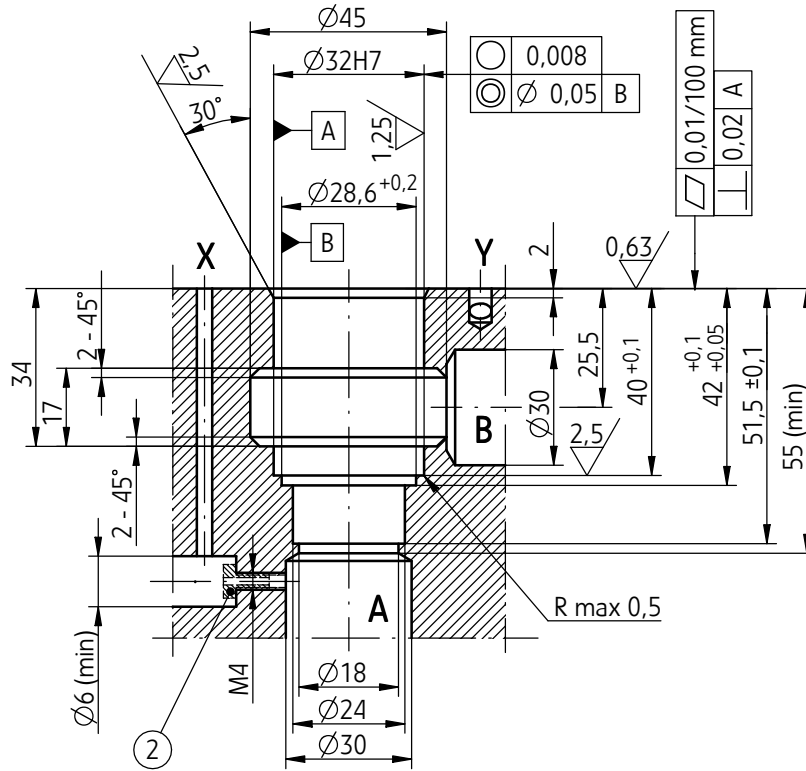
**pilot valve with the main spool - version DRC30...**



- 1 - Adjustment **1** (handknob)
- 2 - Adjustment **2** (set screw with hexagon socket)
- 3 - Adjustment **3** (lockable handknob)
- 4 - The main spool - available only for nominal size NS30 version DRC30...
- 5 - Additional external port **Y** (G1/4 plug)
- 6 - Sealing ring **O-ring 9,2 x 1,8** - 2 pcs/kit (X, Y)
- 7 - Sealing ring **O-ring 27,3 x 2,4** - 2 pcs/kit
- 8 - Back-up ring **PEP 28,4 x 32 x 0,8** - 1 pcs/kit
- 9 - Sealing ring **O-ring 23,3 x 2,4** - 1 pcs/kit
- 10 - Dimension for valve **without the main spool** version DRC... (do not state nominal size)
- 11 - Dimension for valve **with the main spool** available only for nominal size NS30 - version DRC30...
- 12 - Position of socket of the main spool - only for version mentioned above
- 13 - Space required to remove the key from the lock of the adjustment item 3

# OVERALL AND CONNECTION DIMENSIONS

pilot valve with the main spool  
 version DRC30...  
 dimensions of the valve cavity

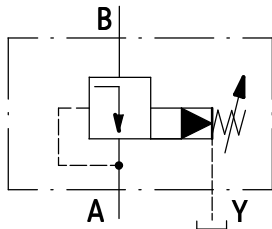


- 1 - Porting pattern on end face of the valve seat  
 mounting bolts **M8 x 40 -10.9** - 4 pcs/kit  
 in accordance with **PN - EN ISO 4762**  
 tightening torque **Md = 37 Nm**
- 2 - Jet

## SCHEMES

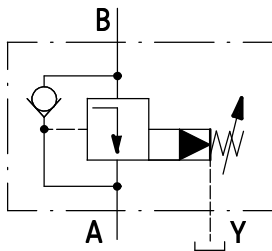
Graphic symbol of valve - version without check valve DR.../...YM...

versions: DR10...; 20...; 30.../...YM... (for subplate mounting)  
DR10...; 20...; 30...G.../...YM... (for threaded connections)  
DRC.../...YM... (pilot valve without the main spool)  
DRC30.../...YM... (pilot valve with the main spool)



Graphic symbol of valve - version with check valve DR.../...Y...

versions: DR10...; 20...; 30.../...Y... (for subplate mounting)

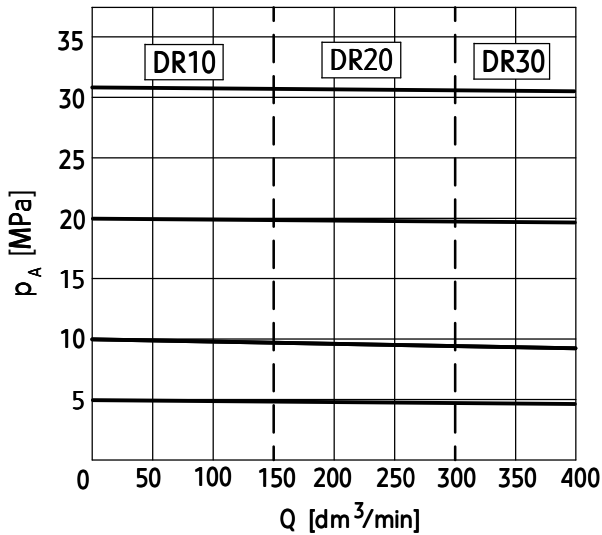




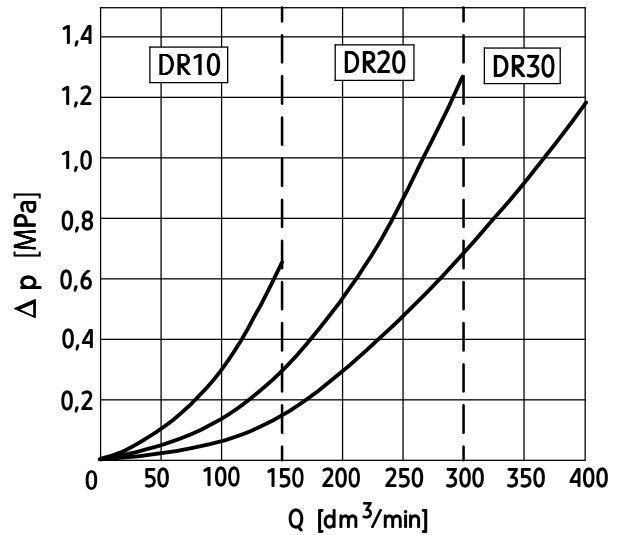
## PERFORMANCE CURVES

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

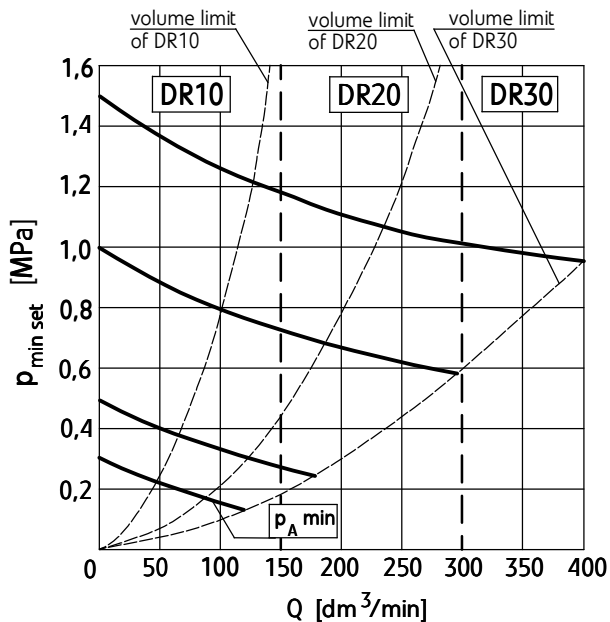
Outlet pressure  $p_A$  in relation to the flow  $Q$   
flow direction  $B \rightarrow A$



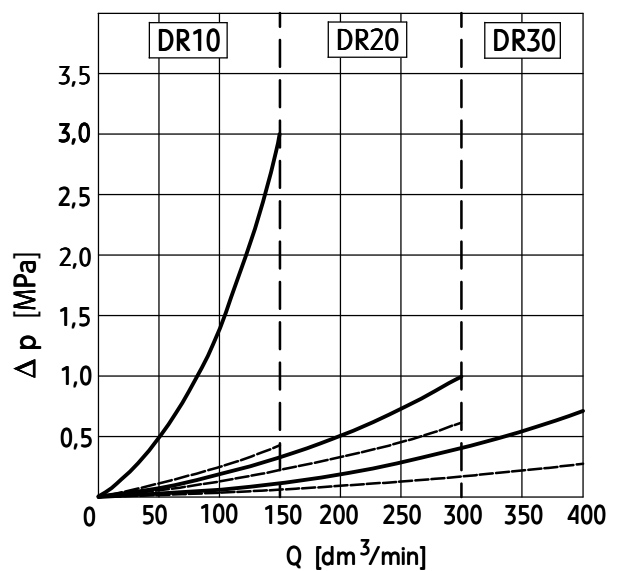
Minimum settable pressure difference  $\Delta p$  in relation to the flow  $Q$   
flow direction  $B \rightarrow A$



Minimum settable pressure  $p_{\min \text{ set}}$  in relation to the flow  $Q$  at minimal reduced outlet pressure  $p_{A \text{ min}}$   
flow direction  $B \rightarrow A$



Pressure resistance  $\Delta p(Q)$  across the check valve przy przepływie przez zawór zwrotny  
flow direction  $A \rightarrow B$   
— main valve closed  
- - - main valve fully opened



## HOW TO ORDER

<b>DR</b>					+	/	<b>Y</b>			★
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**Design version**  
**complete valve** = no designation

**pilot valve with the main spool** = **C ...**  
state nominal size NS30 in the next step

**pilot valve without the main spool** = **C**  
do not state nominal size in the next step

**Nominal size (NS)**

<b>NS10</b>	= <b>10</b>
<b>NS20</b>	= <b>20</b>
<b>NS30</b>	= <b>30</b>

**Mounting method**

<b>subplate mounting</b>	= no designation
<b>threaded connection</b>	= <b>G</b>

**Type of adjustment element**

handknob	= 1
<b>set screw with hexagon socket</b>	= <b>2</b>
lockable handknob	= 3

**Series number**

(50-59) - connection and installation dimensions unchanged	= 5X
<b>series 52</b>	= <b>52</b>

**Settable pressure range**

up to 5 MPa	= 50
<b>up to 10 MPa</b>	= <b>100</b>
up to 20 MPa	= 200
<b>up to 31,5 MPa</b>	= <b>315</b>

**Pilot oil supply and pilot oil drain**  
**internal pilot oil supply, external pilot oil drain** (for all versions of the valve) = **Y**

**Sealing**

<b>NBR</b> (for fluids on mineral oil base)	= no designation
<b>FKM</b> (for fluids on phosphate ester base)	= V

**Check valve** (free flow direction: **A** to **B**)

<b>with check valve</b> (only for versions for subplate mounting)	= no designation
without check valve	= M

Further requirements in clear 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 in short delivery time.  
Coding example: DR10G2 - 52/100YM

## SUBPLATES AND MOUNTING BOLTS

Subplates for particular versions of valve should be ordered according to subplate type, taking into the account the size of thread connections given in the table below.

Subplates and mounting bolts must be ordered separately.

**NOTE:**

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

Valve type	Subplate type	Thread connections of the subplate	Mounting bolts
DR10...	G460/01	A, B - G 3/8 X, Y - G 1/4	<b>M10 x 50 - 10.9</b> - 4 pcs/kit in accordance with PN - EN ISO 4762 tightening torque <b>Md = 73 Nm</b> .
	<b>G461/01</b>	<b>A, B - G 1/2</b> <b>X, Y - G 1/4</b>	
DR20...	G412/01	A, B - G 3/4 X, Y - G 1/4	<b>M10 x 60 - 10.9</b> - 4 pcs/kit in accordance with PN - EN ISO 4762 tightening torque <b>Md = 73 Nm</b> .
	<b>G413/01</b>	<b>A, B - G 1</b> <b>X, Y - G 1/4</b>	
DR30...	G414/01	A, B - G 1 1/4 X, Y - G 1/4	<b>M10 x 70 - 10.9</b> - 6 pcs/kit in accordance with PN - EN ISO 4762 tightening torque <b>Md = 73 Nm</b> .
	<b>G415/01</b>	<b>A, B - G 1 1/2</b> <b>X, Y - G 1/4</b>	
DRC...	G51/01	X, Y - G 1/4	<b>M8 x 40 - 10.9</b> - 4 pcs/kit in accordance with PN - EN ISO 4762 tightening torque <b>Md = 37 Nm</b> .

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](http://www.ponar-wadowice.pl)

