

PILOT OPERATED PRESSURE REDUCING VALVE TYPE DR



Q-HYDRAULIKA

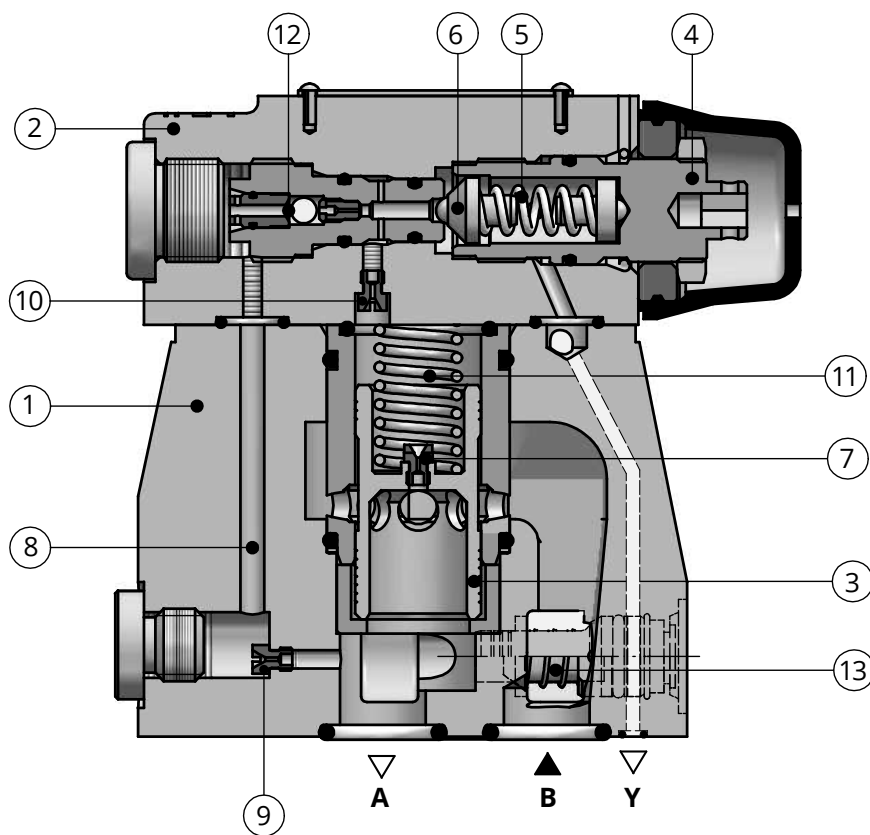
NS10, 20, 30 | up to 31,5 MPa | up to 400 dm³/min

WK 420 310

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

DESCRIPTION OF OPERATION

DR10-2-52/100YM



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

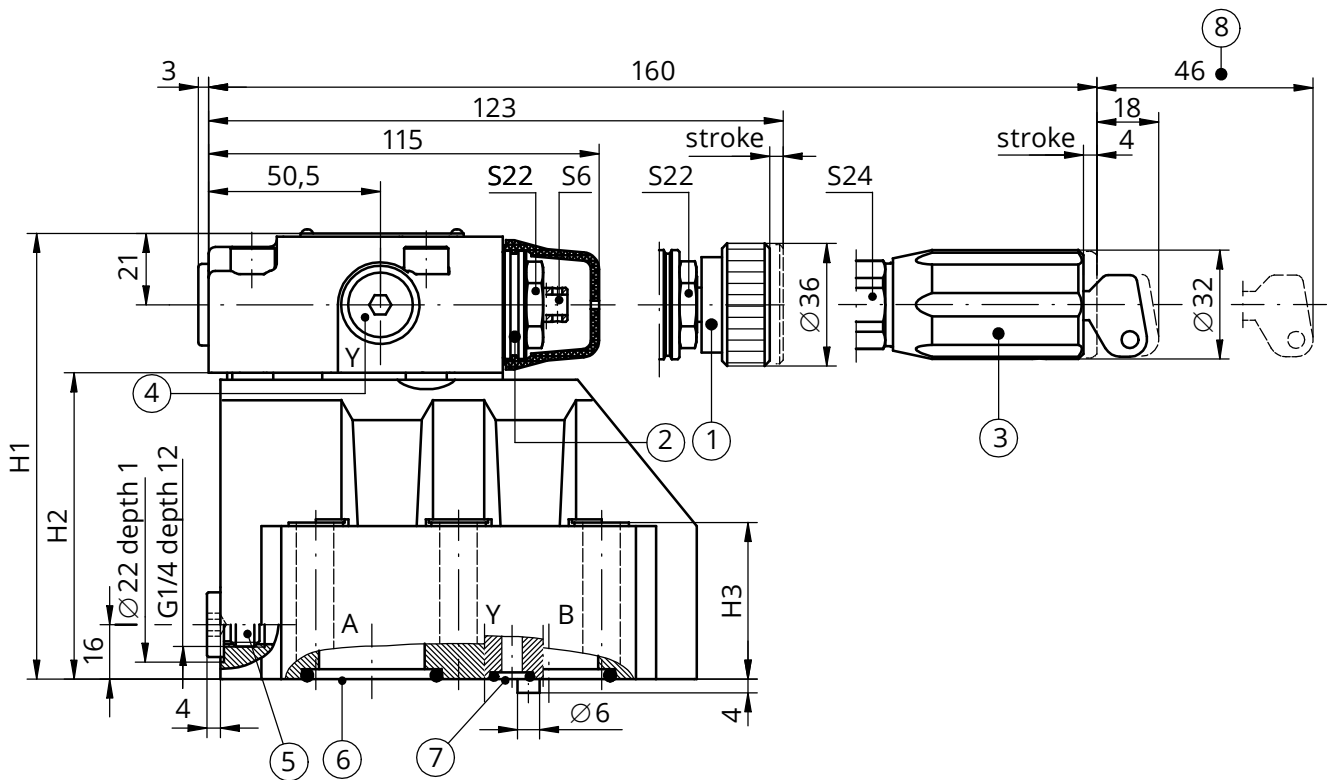
valve and the upper side of the spool (3) of the main valve (1). As long as output pressure is lower than set pressure the spool (3) is kept in open position by spring (11). If pressure in line **A** reaches the set pressure the pilot valve opens and control stream is drained to line **Y**. As an effect 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

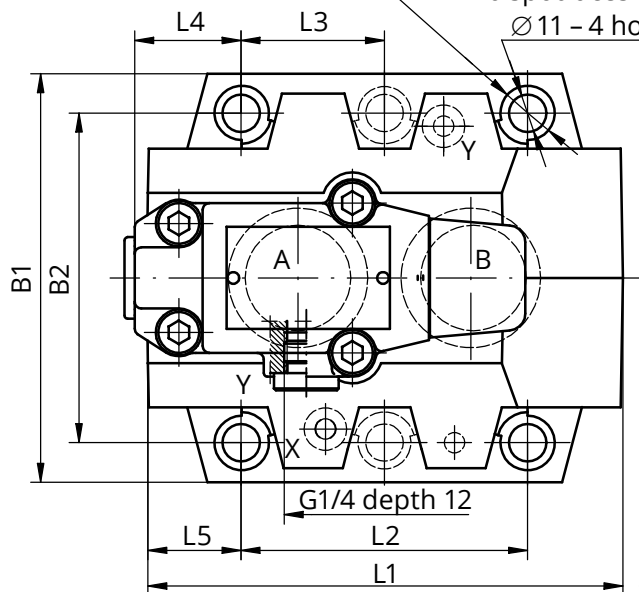
Hydraulic fluid	mineral oil				
Required filtration	up to 16 μm				
Recommended filtration	up to 10 μm				
Nominal fluid viscosity	37 mm ² /s at temperature 55°C				
Viscosity range	2,8 up to 380 mm ² /s				
Fluid temperature range (in a tank)	recommended	40° C up to 55° C			
	max.	-20° C up to +70° C			
Ambient temperature range	-20° C up to +70° C				
Max operating pressure	31,5 MPa				
Inlet pressure (in line B)	do 31,5 MPa				
Output pressure (in line A)	nominal size	NS10	0,3 – 31,5 Mpa		
		NS20	1 – 31,5 Mpa		
		NS30			
Maximum backpressure (in line Y)	31,5 MPa				
Maximum setting pressure	31,5 MPa				
Maximum flow rate	nominal size	NS10	150 dm ³ /min.		
		NS20	300 dm ³ /min.		
		NS30	400 dm ³ /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 DR10, 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

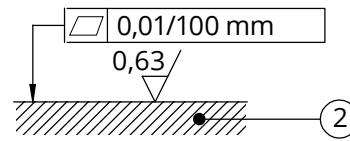
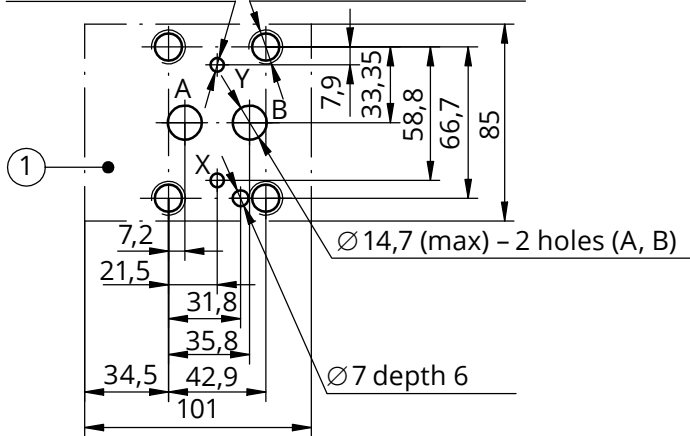
version	o-ring item 6	o-ring item 7	B1	B2	H1	H2	H3	L1	L2	L3	L4	L5
DR10...	17,1 × 2,6	9,2 × 1,8	85	66,7	113	72	28	96	42,9	-	34,6	35,6
DR20...	28,2 × 3,5		102	79,4	123	82	38	112	60,3	-	36,9	33,5
DR30...	34,5 × 3,5		120	96,8	131	90	46	140	84,2	42,1	31,3	28

OVERALL AND CONNECTION DIMENSIONS

versions for subplate mounting: DR10...; 20...; 30...
porting pattern on subplate

version DR10...

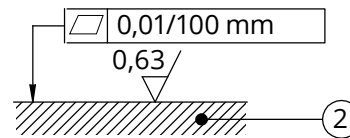
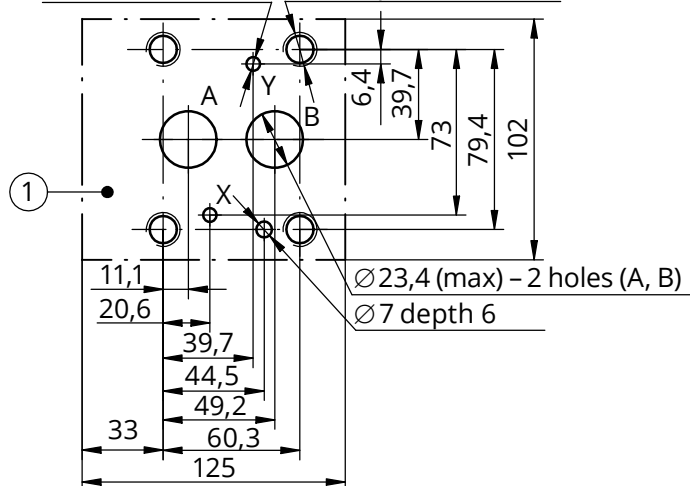
Ø6 - 2 holes (X, Y) M10 depth 23 - 4 holes



- 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 × 50 - 10.9** - 4 pcs/kit in accordance with **PN - EN ISO 4762** tightening torque **Md = 73 Nm**
- 2 - Subplate surface required

version DR10...

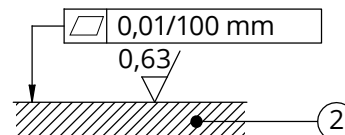
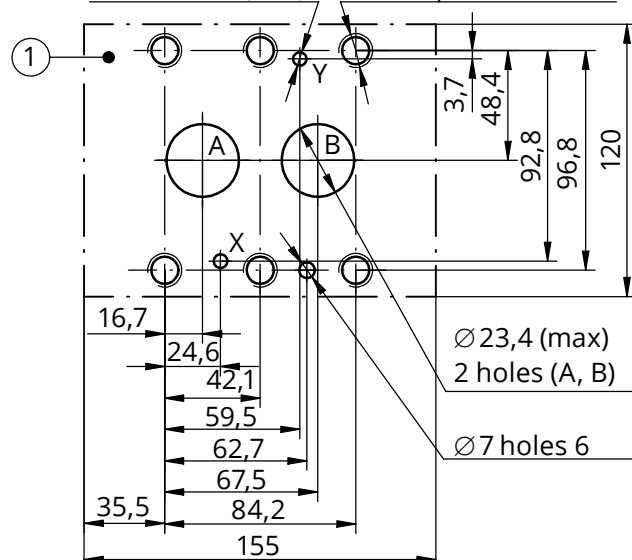
Ø6 - 2 holes (X, Y) M10 depth 24 - 4 holes



- 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 × 60 - 10.9** - 4 pcs/kit in accordance with **PN - EN ISO 4762** tightening torque **Md = 73 Nm**
- 2 - Subplate surface required

version DR10...

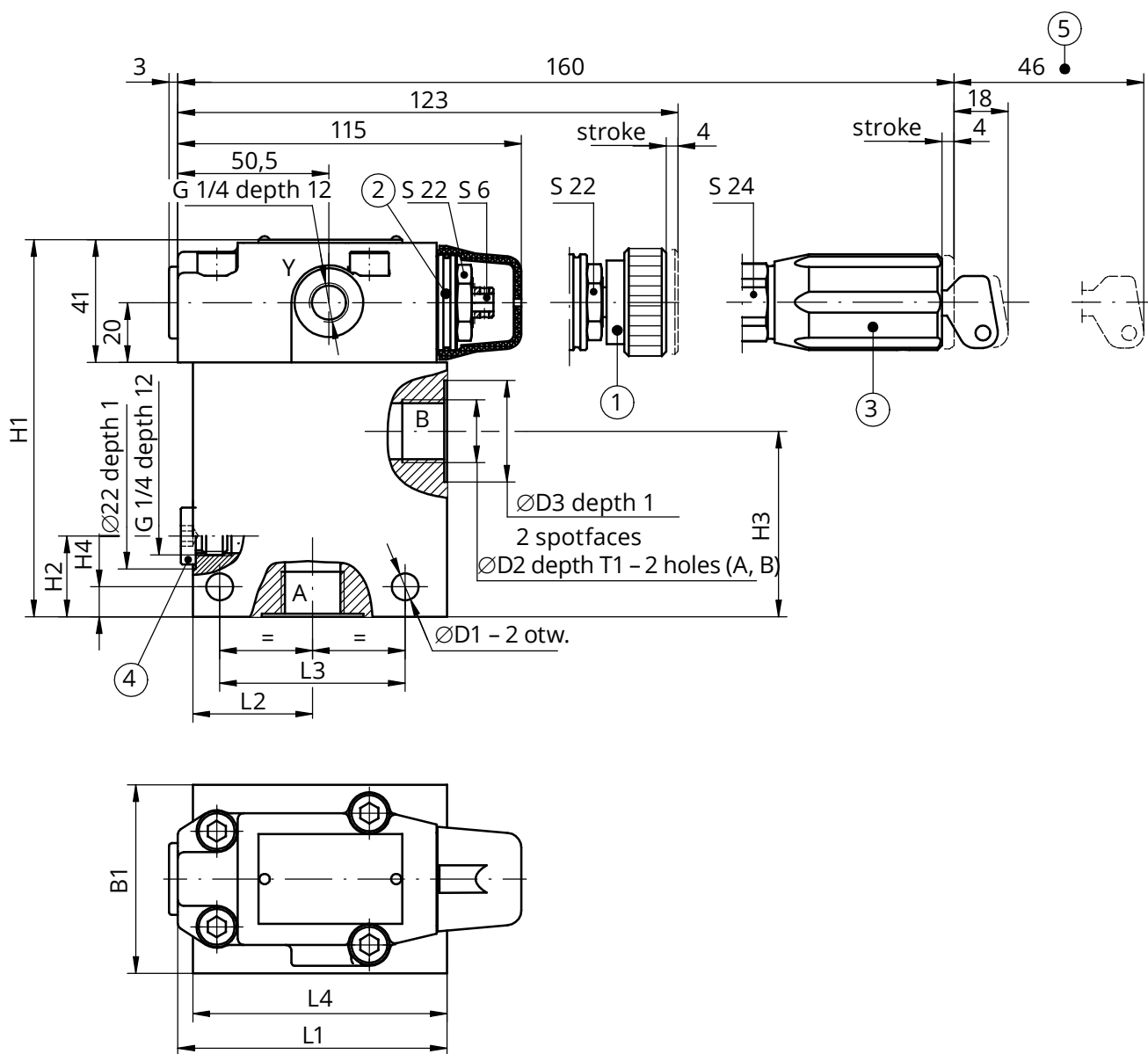
Ø6 - 2 holes (X, Y) M10 depth 25 - 6 holes



- 1 - Porting pattern on subplate according to:
 - **CETOP - RP 121H**
 - **PN - ISO 5781** mounting bolts **M10 × 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...



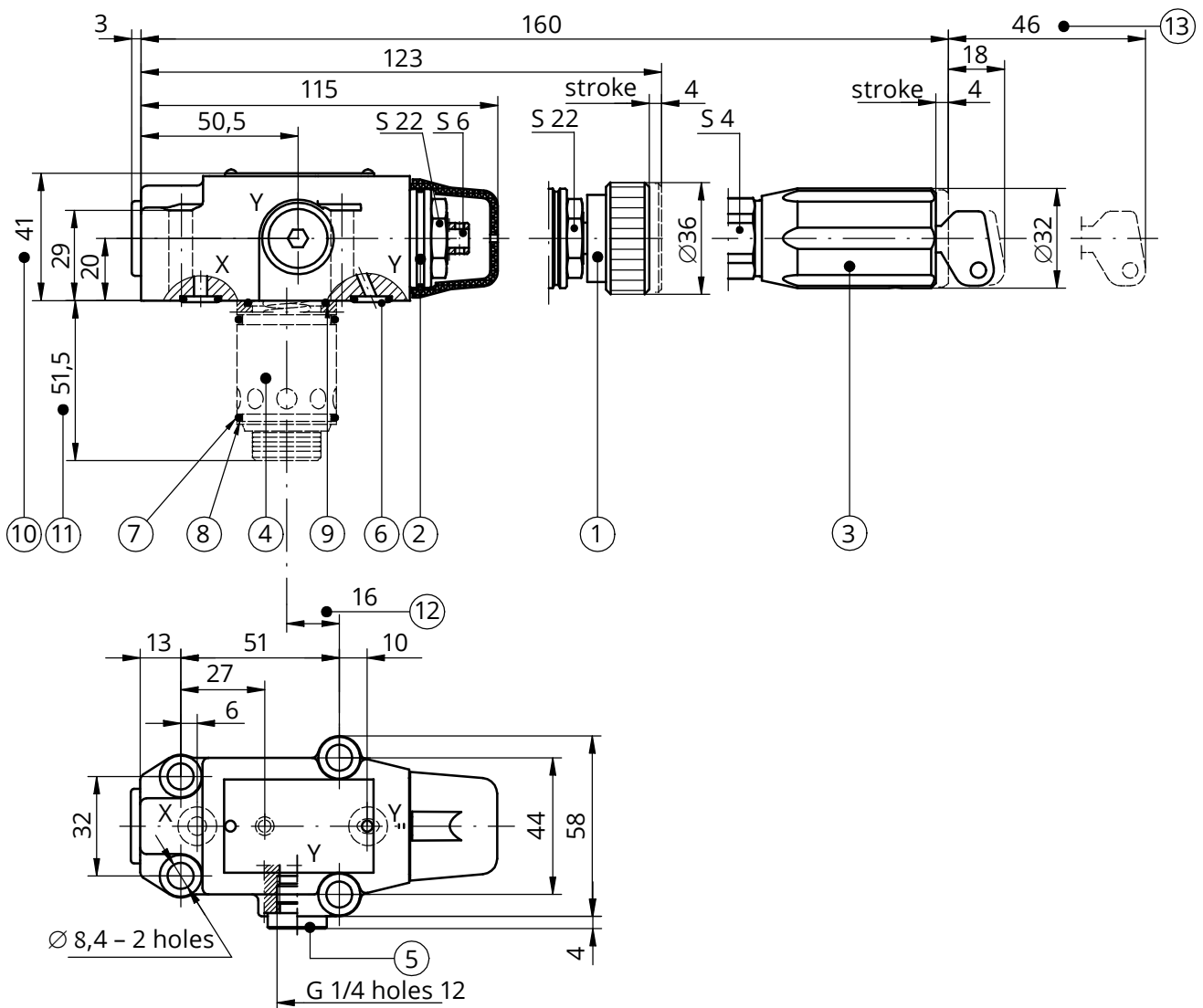
- 1 - Adjustment1 (handknob)
- 2 - Adjustment2 (set screw with hexagon socket)
- 3 - Adjustment3 (lockable handknob)
- 4 - Pressure gauge connection (**G 1/4** plug)
- 5 - Space required to remove the key from the lock of the adjustment item 3

version	B1	∅ D1	∅ D2	T1	∅ 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...

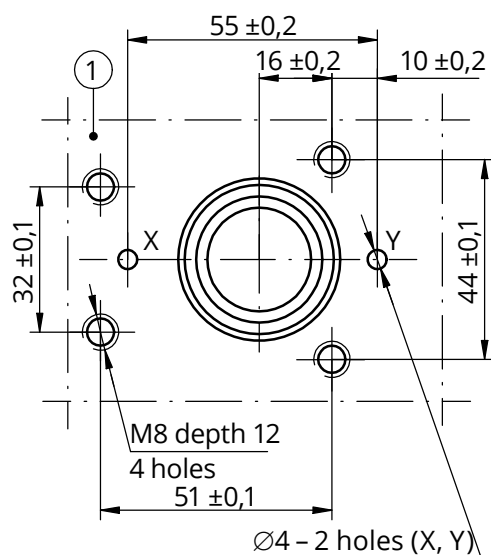
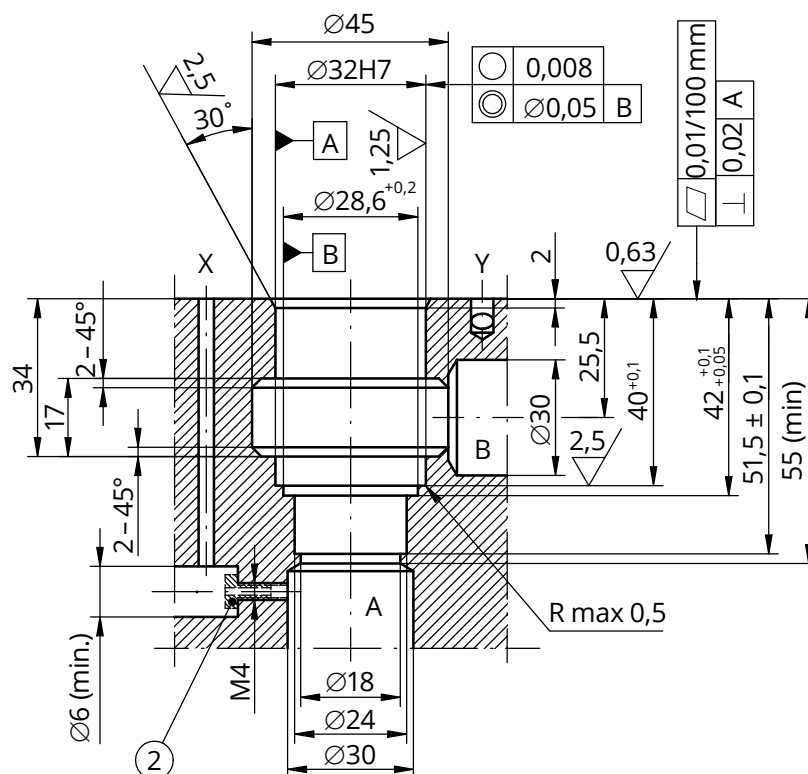
pilot valve with the main spool - version DRC30...



- 1 - Adjustment1 (handknob)
- 2 - Adjustment2 (set screw with hexagon socket)
- 3 - Adjustment3 (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 × 1,8** - 2 pcs/kit (X, Y)
- 7 - Sealing ring **o-ring 27,3 × 2,4** - 2 pcs/kit
- 8 - Back-up ring **PEP 28,4 × 32 × 0,8** - 1 pcs/kit
- 9 - Sealing ring **o-ring 23,3 × 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

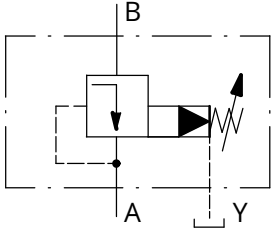


- 1 - Porting pattern on end face of the valve seat
mounting bolts **M8 × 40 - 10.9** - 4 pcs/kit in
accordance with **PN - EN ISO 4762** tightening torque
Md = 37 Nm
- 2 - Jet

SCHEMES

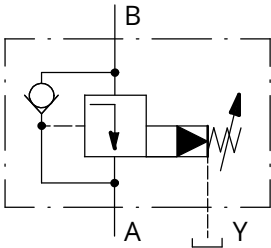
Graphic symbol of valve – version without check valve DR.../...YM...

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



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

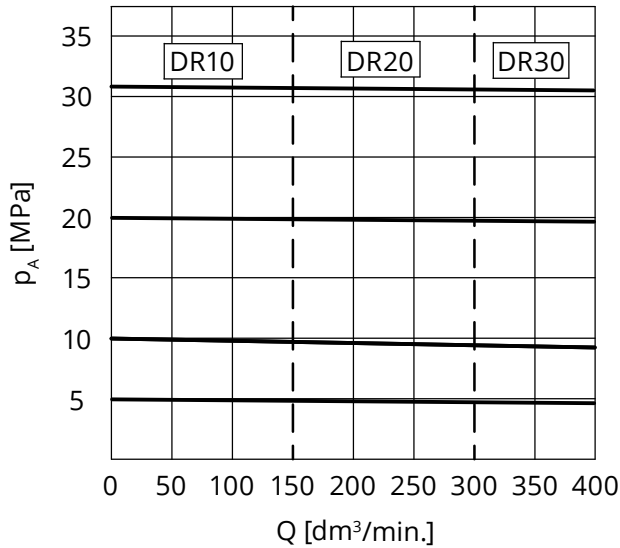
versions: DR10...; 20...; 30.../...Y... (for subplate mounting)



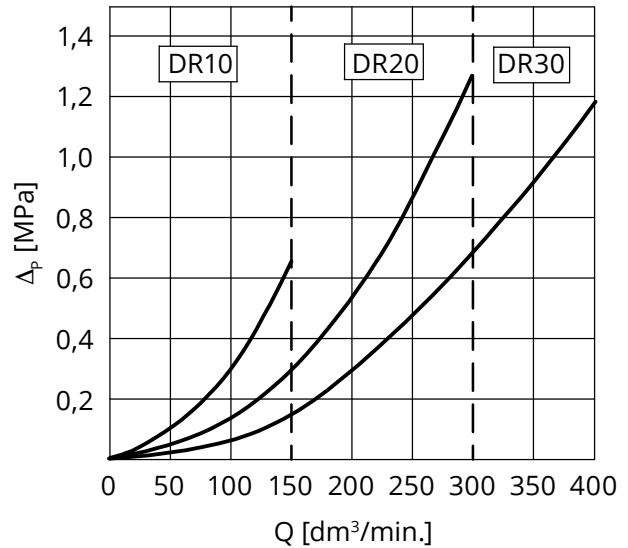
PERFORMANCE CURVES

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

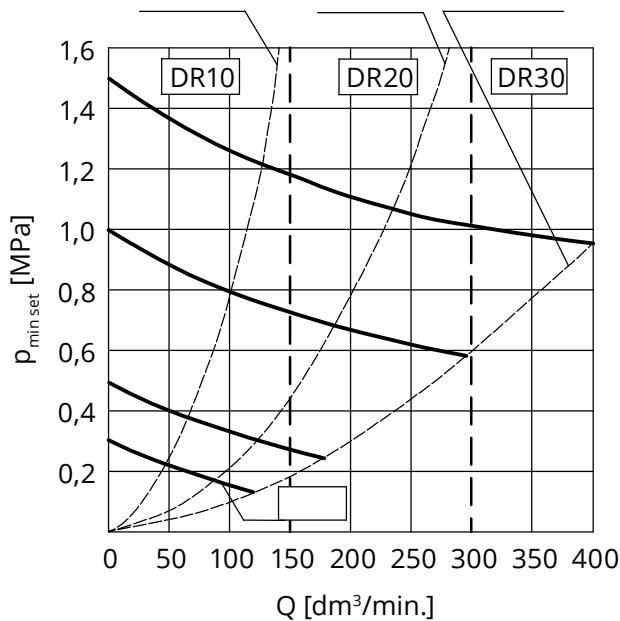
Outlet pressure p_A in relation to the flow Q
flow direction **B→A**



Minimum settable pressure difference Δp in relation to the flow Q
flow direction **B→A**

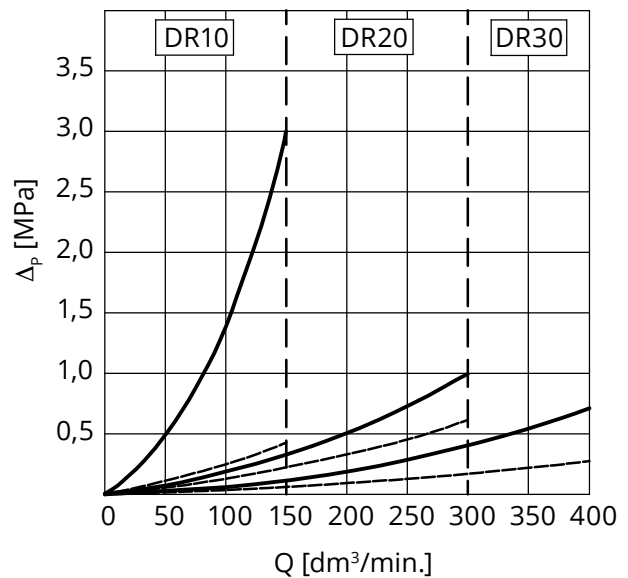


Minimum settable pressure $p_{\text{min set}}$ in relation to the flow Q at minimal reduced outlet pressure $p_A \text{ min}$
flow direction **B→A**



Pressure resistance $\Delta p(Q)$ across the check valve
przy przepływie przez zawór zwrotny
flow direction **B→A**

- main valve closed
- - - main valve fully opened



HOW TO ORDER



<p>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</p>	←	DR	[]	[]	[]	-	/	Y	[]	[]	[]	*
<p>Nominal size (NS) NS10 = 10 NS20 = 20 NS30 = 30</p>	←											
<p>Mounting method subplate mounting = no designation threaded connection = G</p>	←											
<p>Type of adjustment element handknob = 1 set screw with hexagon socket = 2 lockable handknob = 3</p>	←											
<p>Series number (50 - 59) - connection and installation dimensions unchanged = 5X series 52 = 52</p>	←											
<p>Settable pressure range up to 5 MPa = 50 up to 10 MPa = 100 up to 20 MPa = 200 up to 31,5 MPa = 315</p>	←											
<p>Pilot oil supply and pilot oil drain internal pilot oil supply, external pilot oil drain (for all versions of the valve) = Y</p>	←											
<p>Sealing NBR (for fluids on mineral oil base) = no designation FKM (for fluids on phosphate ester base) = V</p>	←											
<p>Check valve (free flow direction: A to B) with check valve (only for versions for subplate mounting) = no designation without check valve = M</p>	←											
<p>Further requirements in clear text (to be agreed with the manufacturer)</p>	←											

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