

Pilot operated pressure reducing valve type DR

NS 10, 20, 30 | p_{max} 35 MPa | Q_{max} 400 dm³/min | WK 420 310



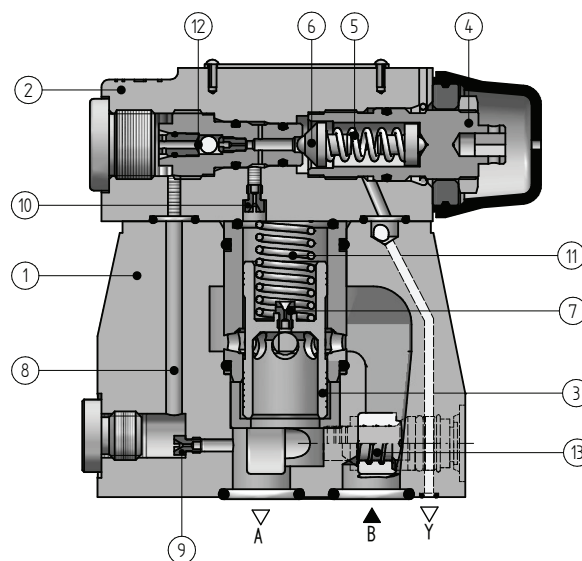
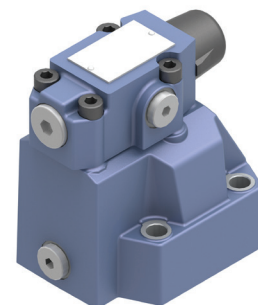
DATA SHEET - OPERATION MANUAL

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 initial 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 orifice **7** affects the upper side of the spool loaded with spring **11**. Via the orifice **10** pressure affects the poppet **6**. Pressure from line **A** also affects the poppet **6** of the pilot valve and the upper side of the spool **3** of the main valve **1** via the control line **8** with the orifice **9** and the check valve **12**. 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 **2** opens and control stream is drained to line **Y**. Pressures difference is lifting the spool **3** in direction of shutting off the flow and is fixing balance between pressure in line **A** and pressure set by means of adjustment element that causes pressure drop in line **A**. Pressure reducing valve type DR... can be equipped with a check valve **13** which allows free flow from line **A** to **B**.



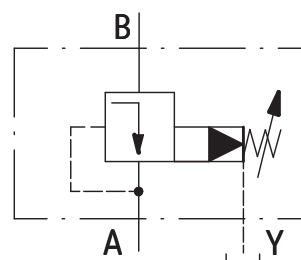
TECHNICAL DATA

hydraulic fluid	mineral oil				
oil cleanliness class	ISO 4406 class 20/18/15				
nominal fluid viscosity	37 mm ² /s at temperature 55°C				
viscosity range	2,8 ÷ 380 mm ² /s				
fluid temperature range (in tank)	recommended: 40 ÷ 55°C; max. -20 ÷ +70°C				
ambient temperature range	-20 ÷ 70°C				
max. operating pressure					
max. pressure in line B	35 MPa				
max. pressure in line Y					
max. setting pressure	35 MPa				
max. output pressure	WN10: 0,3 ÷ 35MPa	WN20; WN30 1 ÷ 35 MPa			
max. flow	WN10: 150 dm ³ /min	WN20: 300 dm ³ /min	WN30: 400 dm ³ /min		
weight [kg]		DR...	DR...G...	DRC...	DRC30...
	WN10	3,8	50,0	-	-
	WN20	5,7	4,8	1,6	-
WN30	8,4	5,5	-	1,6	-

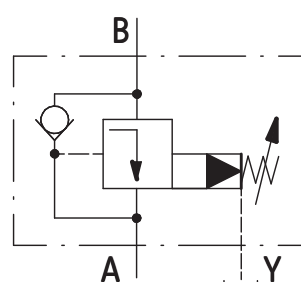
assembly and operation requirements at:
www.operating-conditions.ponar.pl

HYDRAULIC DIAGRAM

version without check valve DR.../...YM...
 DR10...; 20...; 30.../...YM... (subplate mounting)
 DR10...; 20...; 30...G.../...YM... (threaded mounting)
 DRC.../...Y... (pilot valve without the main spool)
 DRC30.../...Y... (pilot valve with the main spool)

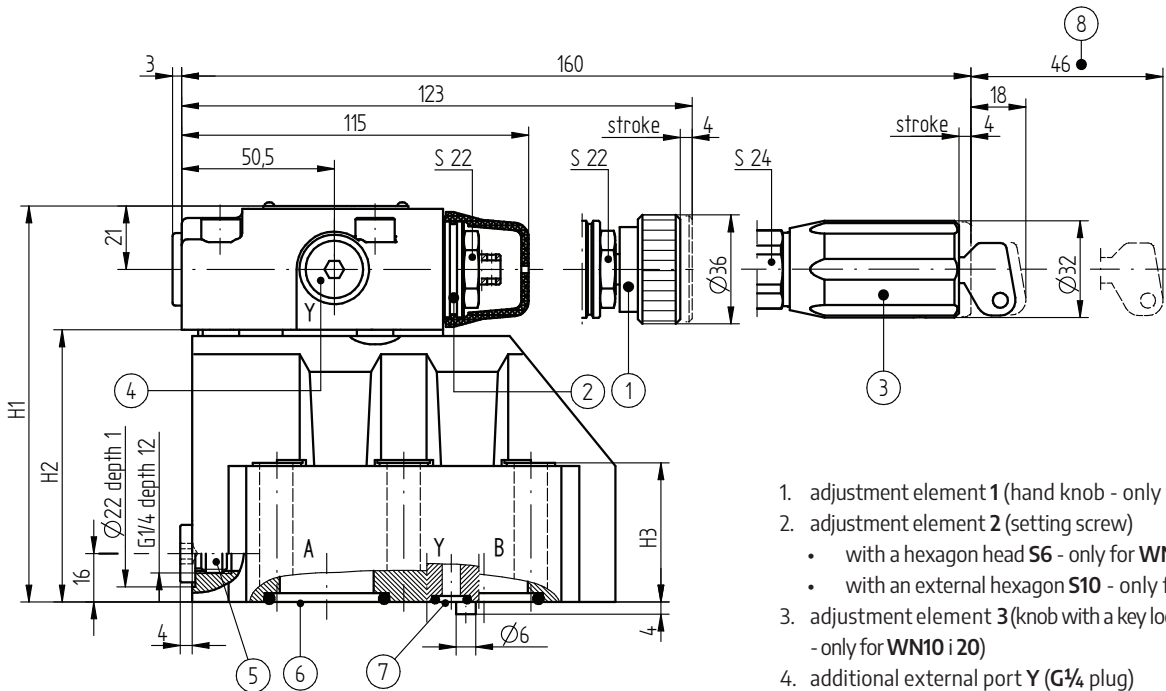


version with check valve DR.../...Y...
 DR10...; 20...; 30.../...Y... (subplate mounting)

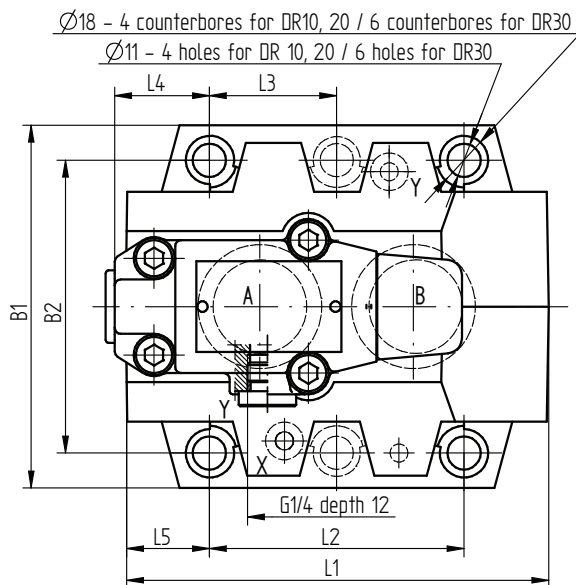


OVERALL AND CONNECTION DIMENSIONS

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



1. adjustment element 1 (hand knob - only for WN10 i 20)
2. adjustment element 2 (setting screw)
 - with a hexagon head S6 - only for WN10 i 20
 - with an external hexagon S10 - only for WN30
3. adjustment element 3 (knob with a key lock - only for WN10 i 20)
4. additional external port Y (G $\frac{1}{4}$ plug)
5. pressure gauge connection (G $\frac{1}{4}$ plug)
6. o-ring 2 pcs./set (A, B) - according to the table
7. o-ring 2 pcs./set (X, Y) - according to the table
8. space required to remove the key from the lock of the adjustment element 3



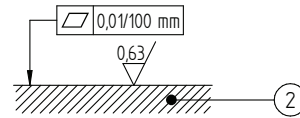
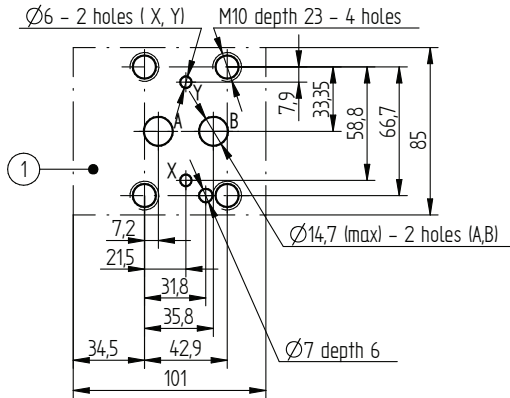
version	DR10	DR20	DR30
o-ring pos. 6	17,1 x 2,6	28,2 x 3,5	34,5 x 3,5
o-ring pos. 7	9,2 x 1,8	9,2 x 1,8	9,2 x 1,8
B1	85	102	120
B2	66,7	79,4	96,8
H1	113	123	131
H2	72	82	90
H3	28	38	46
L1	96	112	140
L2	42,9	60,3	84,2
L3	-	-	42
L4	34,6	36,9	31,3
L5	35,6	33,5	28

OVERALL AND CONNECTION DIMENSIONS

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

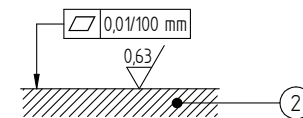
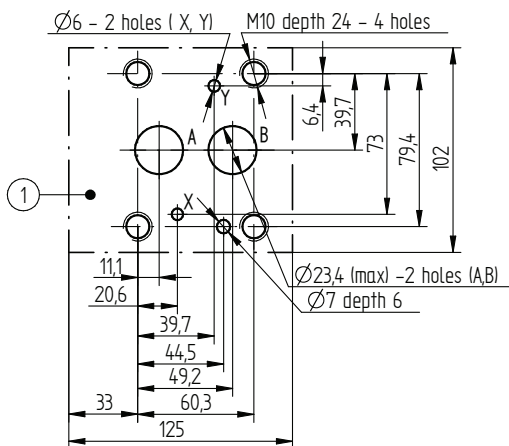
porting pattern on subplate

DR10



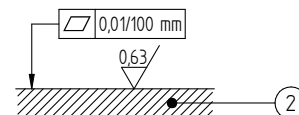
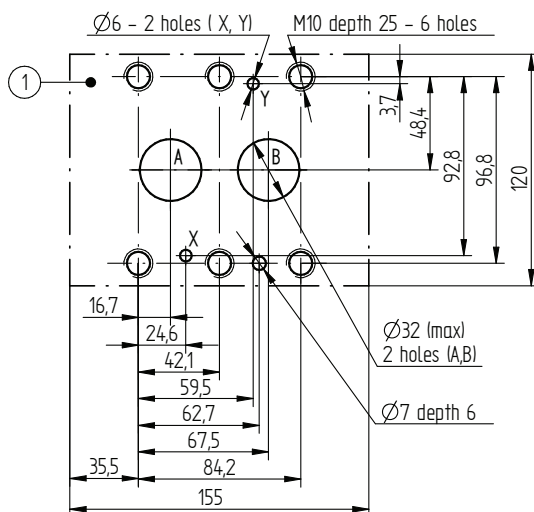
- porting pattern on subplate according to:
 - CETOP- RP 121H identified by CETOP- 4.4.5-2-06 nominal size CETOP 06
 - PN - ISO 5781
 - mounting screws M10 × 50 - 10.9 - 4 pcs/set in accordance with PN -EN ISO 4762
 - tightening torque $M_d = 73 \text{ Nm}$
- required surface quality of the valve contact surface

DR20



- 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 screws M10 x 60 - 10.9 - 4 pcs/set in accordance with PN -EN ISO 4762
 - tightening torque $M_d = 73 \text{ Nm}$
- required surface quality of the valve contact surface

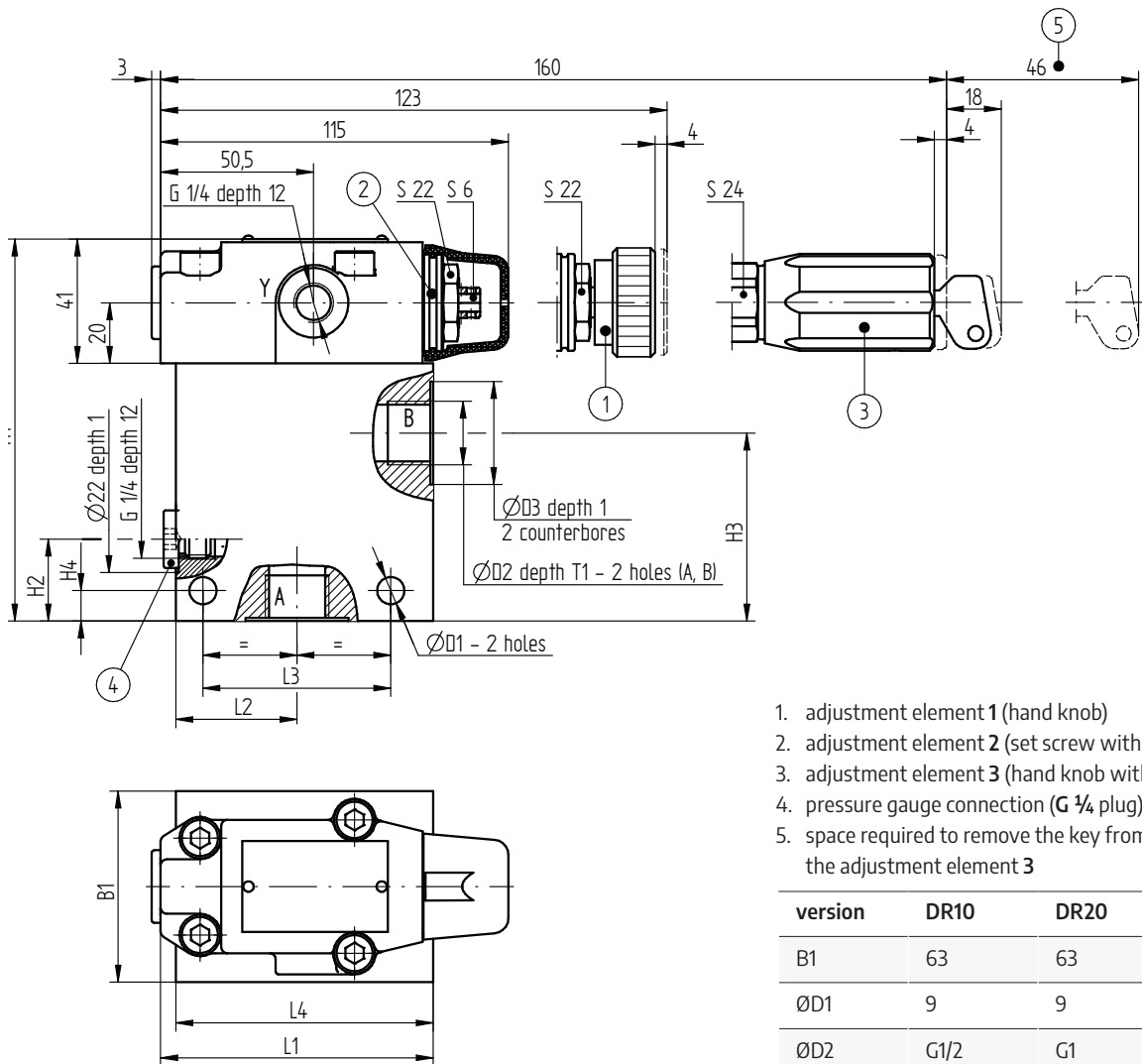
DR30



- porting pattern on subplate according to:
 - CETOP- RP 121H
 - PN - ISO 5781
 - mounting screws M10 × 70 - 10.9 - 6 pcs/set in accordance with PN -EN ISO 4762
 - tightening torque $M_d = 73 \text{ Nm}$
- required surface quality of the valve contact surface

OVERALL AND CONNECTION DIMENSIONS

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



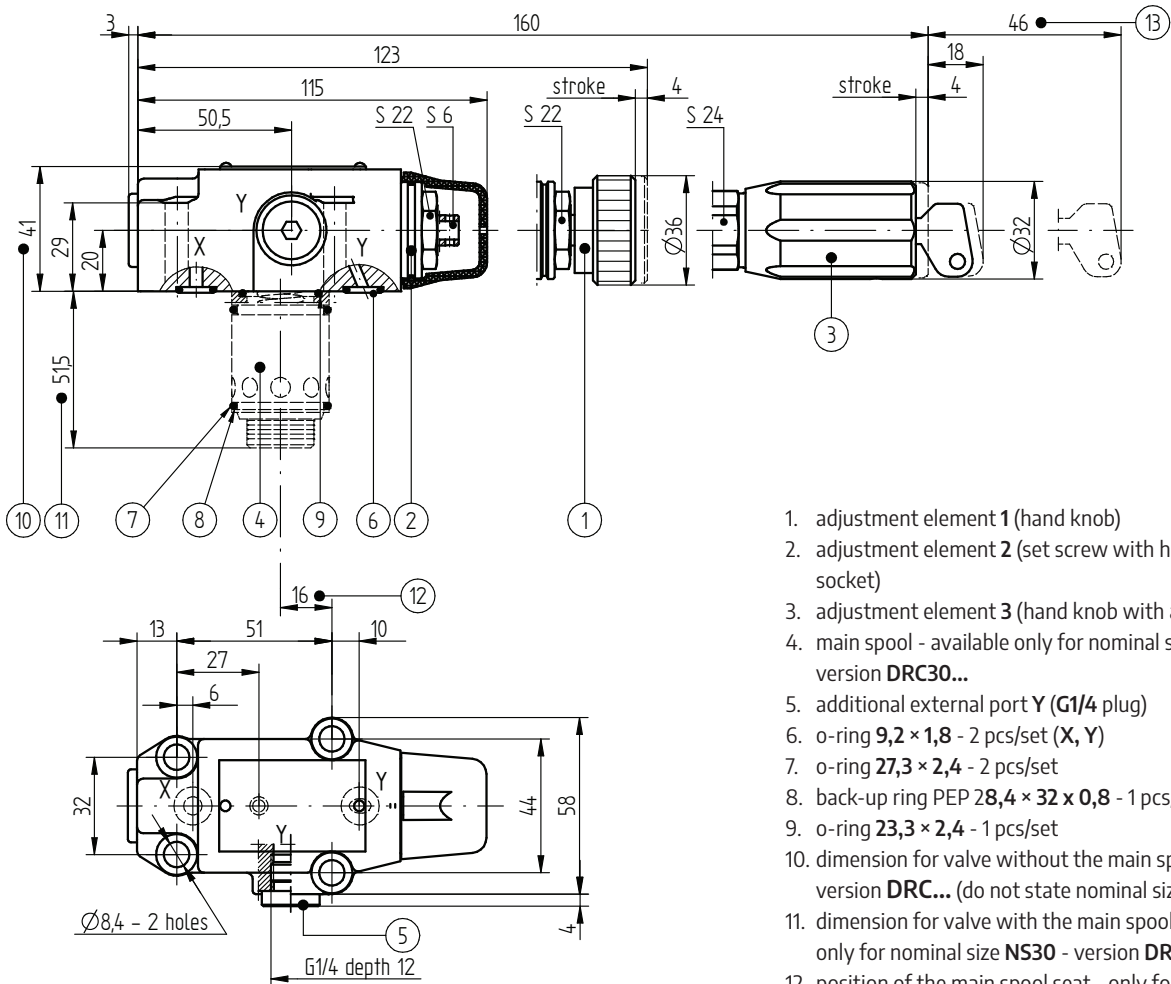
1. adjustment element 1 (hand knob)
2. adjustment element 2 (set screw with hexagon socket)
3. adjustment element 3 (hand knob with a key lock)
4. pressure gauge connection (G 1/4 plug)
5. space required to remove the key from the lock of the adjustment element 3

version	DR10	DR20	DR30
B1	63	63	70
ØD1	9	9	11
ØD2	G1/2	G1	G1 1/2
T1	14	18	22
ØD3	34	47	61
H1	126	126	139
H2	27	27	42
H3	47	47	51
H4	10	10	13
L1	90	90	99
L2	40	40	46
L3	62	62	72
L4	85	85	100

OVERALL AND CONNECTION DIMENSIONS

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

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

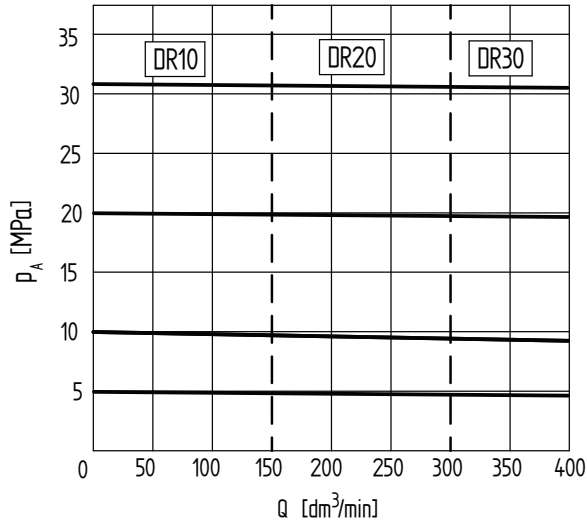


1. adjustment element 1 (hand knob)
2. adjustment element 2 (set screw with hexagon socket)
3. adjustment element 3 (hand knob with a lock)
4. main spool - available only for nominal size **NS30** version **DRC30...**
5. additional external port Y (**G1/4** plug)
6. o-ring **9,2 × 1,8** - 2 pcs/set (X, Y)
7. o-ring **27,3 × 2,4** - 2 pcs/set
8. back-up ring PEP **28,4 × 32 × 0,8** - 1 pcs/set
9. o-ring **23,3 × 2,4** - 1 pcs/set
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 the main spool seat - only for versions mentioned above
13. space required to remove the key from the lock of adjustment element 3

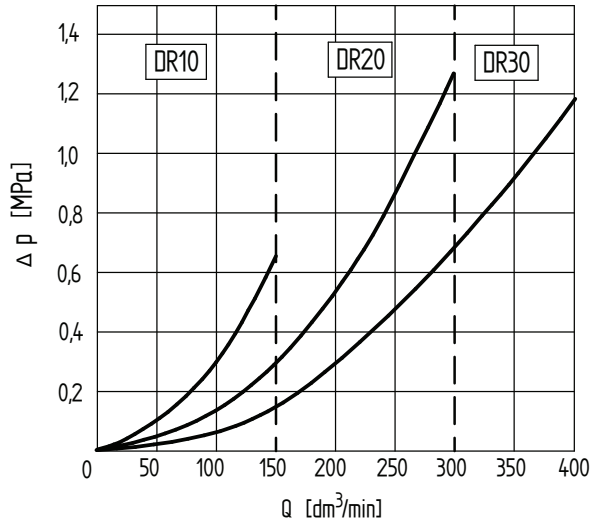
CHARACTERISTICS

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

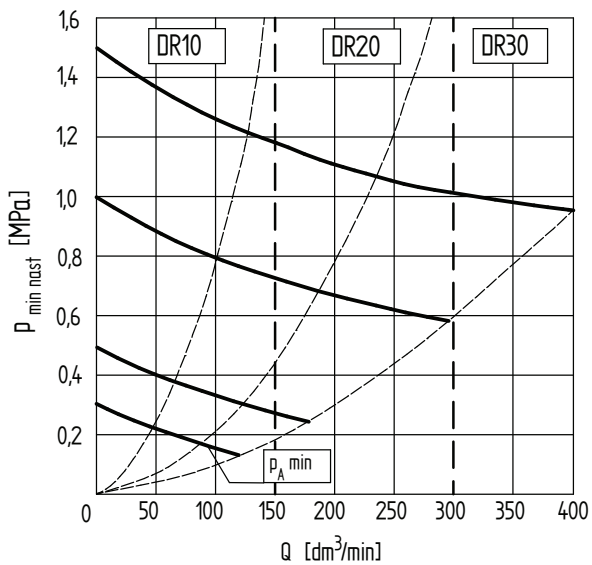
outlet pressure p_A in relation to the flow Q ;
flow direction $B \rightarrow A$



minimum settable pressure difference Δp in
relation to the flow Q ; flow direction $B \rightarrow A$

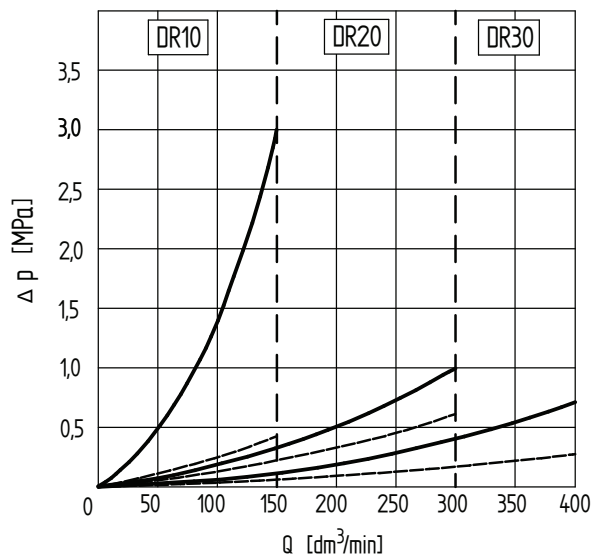


Minimum settable pressure p_{min} in relation to the flow Q at
minimal reduced outlet pressure $p_{A\text{min}}$; flow direction $B \rightarrow A$



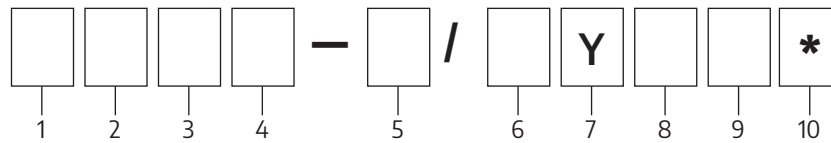
Pressure resistance $\Delta p(Q)$ across the check valve;
flow direction $A \rightarrow B$

— main valve closed
- - - main valve fully opened



HOW TO ORDER

DR



1 design version

complete valve = \emptyset
 pilot valve with the main spool
 (state a nominal size) = C...
 pilot valve without the main spool
 (do not state nominal size in
 the next step) C

2 nominal size (NS)

NS10 = 10
 NS20 = 20
 NS30 = 30

3 connection type*

subplate mounting = \emptyset
 threaded connection = G

* applies only to a complete valve

4 type of adjustment element

hand knob* = 1
 setting screw = 2
 hand knob with a key lock* = 3
 *not available for NS30 in subplate version

5 series number

series 52 = 52
 series 22* = 22
 * only for NS30 in subplate version

6 pressure setting range

up to 5 MPa = 50
 up to 10 MPa = 100
 up to 20 MPa = 200
 up to 35 MPa = 350

7 pilot oil supply and pilot oil drain

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

8 sealing

NBR (for fluids on mineral oil base) = \emptyset
 FKM (for fluids on phosphate ester base) = V

9 check valve (A → B)*

with a check valve (only for subplate
 connection) = \emptyset
 without check valve = M

* applies only to subplate and threaded version

10 further requirements = *

(to be agreed upon with the Manufacturer)

\emptyset indicates that the box should be left blank.

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

Coding example: **DR10G2-52/100YM**

SUBPLATES AND MOUNTING SCREWS

Subplates for particular versions of valve should be ordered according to subplate type, taking into the account the size of threaded connections given in the table below. Subplates and mounting screws **must be ordered separately**.

valve type	subplate type data sheet	threaded connections of the subplate	mounting screws
DR10...	G461/01 WK 450 798	A, B - G 1/2 X, Y - G 1/4	M10 x 50 - 10.9 PN - EN ISO 4762 (PN/M-82302)
DR20...	G413/01 WK 450 799	A, B - G 1 X, Y - G 1/4	M10 x 60 - 10.9 PN - EN ISO 4762 (PN/M-82302)
DR30...	G415/01 WK 470 471	A, B - G 1 1/2 X, Y - G 1/4	M10 x 70 - 10.9 PN - EN ISO 4762 (PN/M-82302)

CONTACT

PONAR Wadowice S.A.
 ul. Wojska Polskiego 29
 34-100 Wadowice

tel. +48 33 488 21 00
 www.ponar-wadowice.pl