RE 26893
Edition: 2024-03
Replaces: 2013-01

rexroth
A Bosch Company

Pressure reducing valve, pilot-operated

Type DR

H7928

- Sizes 10 and 25
- Component series 1X; 4X
- Maximum operating pressure 315 bar
- Maximum flow 160 l/min

Features

- For subplate mounting
- Porting pattern according to ISO 5781
- For threaded connection
- As screw-in cartridge valve
- 4 adjustment types, optionally:
  - Rotary knob
  - Bushing with hexagon and protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale
- 4 pressure ratings

Contents

Ordering code

01	02	03		04		05		06	07	08	09	10
DR			**–**		**–**		**/**		**Y**			

01	Pressure reducing valve	**DR**	
02	**– Size 10**		
	Subplate mounting "no code"	**10**	◇
	Threaded connection "G" (G1/2)	**10**	◇
	– Size 25		
	Subplate mounting "no code"	**20**	◇
	Threaded connection "G" (G3/4)	**15**	
	Threaded connection "G" (G1)	**20**	◇
	Screw-in cartridge valve "K"	**20**	◇

Type of connection

03	Subplate mounting	**No code**	◇
	Threaded connection	**G**	◇
	Screw-in cartridge valve	**K**	◇

Adjustment type

04	Rotary knob	**4**	
	Bushing with hexagon and protective cap	**5**	◇
	Lockable rotary knob with scale	**6** [1]	
	Rotary knob with scale	**7**	
05	Component series 10 ... 19 (10 ... 19: unchanged installation and connection dimensions); (03 = "K")	**1X**	◇
	Component series 40 ... 49 (40 ... 49: unchanged installation and connection dimensions); (03 = "no code" and "G")	**4X**	◇

Pressure rating

06	Set pressure up to 50 bar	**50**	
	Set pressure up to 100 bar	**100**	◇
	Set pressure up to 200 bar	**200**	◇
	Set pressure up to 315 bar	**315**	◇
07	Pilot oil supply internal, pilot oil return external	**Y**	
08	With check valve (subplate mounting only)	**No code**	
	Without spring return	**M**	◇

Seal material (observe compatibility of seals with hydraulic fluid used, see page 6)

09	NBR seals	**No code**	◇
	FKM seals	**V**	

Line connection

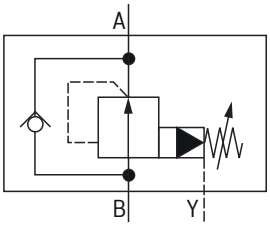
10	Pipe thread according to ISO 228/1	**No code**	◇
	SAE thread (threaded connection "G")	**/12**	

[1] H-key with material no. **R900008158** is included in the scope of delivery

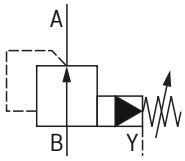
☞ **Notice:** ◇ = Preferred type

Symbols

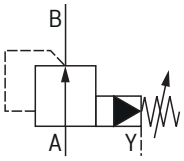
Subplate mounting
"DR...Y"



Subplate mounting; screw-in cartridge valve
"DR...YM"; "DR . K...YM"



Threaded connection
"DR . G...YM"



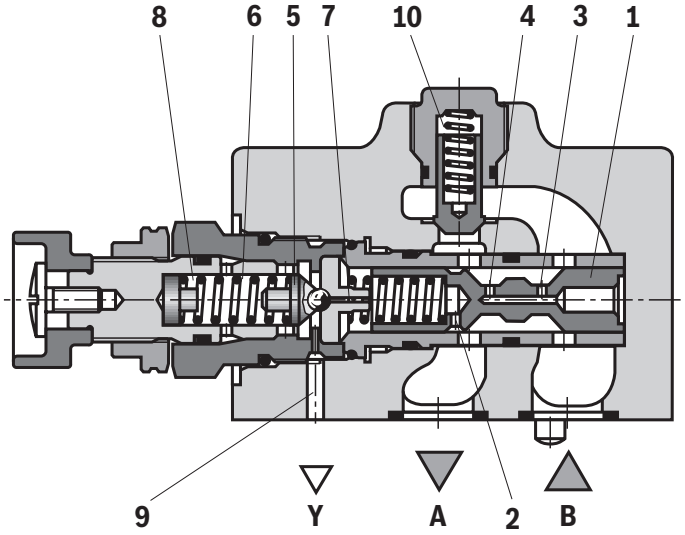
Function, section

The pressure valve type DR is a pilot-operated pressure reducing valve. It is used to reduce the system pressure. It mainly consists of a screw-in cartridge valve (cartridge) and housing, optionally with or without check valve (subplate mounting only).

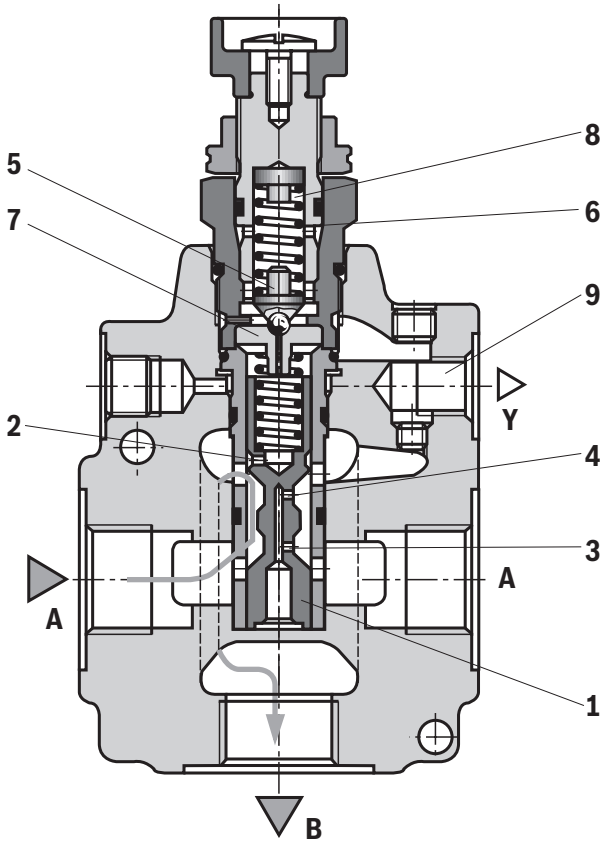
In the rest position the valve is open. The hydraulic fluid is able to flow freely from the input channel via the main control spool (1) to the output channel. The pressure in the output channel is applied to the spring-loaded side of the main control spool (1) via the bore (2). At the same time, the pressure acts upon the side of the main control spool (1) that is opposite to the spring via the bores (3) and (4).

If the pressure in the output channel exceeds the value set at the spring (6), the pilot poppet (5) opens. Hydraulic fluid flows from the spring-loaded side of the main control spool (1) via the nozzle (7) and the pilot poppet (5) into the spring chamber (8).
The main control spool (1) assumes its control position and keeps the value in the output channel set at the spring (6) constant. The pilot oil return from the spring chamber (8) is always realized externally via the Y port (9).
In subplate mounting version "P", a check valve (10) can be optionally installed for free flow back from channel A→B.

☞ **Notice:**
The pressure in port Y is added 1:1 to the set reduced pressure.



Type DR 10 -4-4X/...



Type DR 20 G-4-4X/...

Technical data
(for applications outside these values, please consult us!)

General				
Size		NG	**10**	**25**
Type of connection			Subplate mounting; threaded connection; screw-in cartridge valve	
Porting pattern			ISO 5781	
Weight	▶ Subplate mounting	kg	3.2	3.5
	▶ Threaded connection	kg	3.6	3.3
	▶ Screw-in cartridge valve	kg	2.5	2.8
Installation position			Any	
Ambient temperature range		°C	–20 ... +80 (NBR seals) –15 ... +80 (FKM seals)	
Conformity	▶ RoHS Directive		2015/65/EU [1]	

Hydraulic				
Nominal pressure		bar	315	
Maximum operating pressure	▶ Input	bar	315	
Hydraulic fluid			See table below	
Hydraulic fluid temperature range		°C	–20 ... +80 (NBR seals) –15 ... +80 (FKM seals)	
Viscosity range		mm^2/s	10 ... 800	
Maximum admissible degree of contamination of the hydraulic fluid, cleanliness class according to ISO 4406 (c)			Class 20/18/15 [2]	
Maximum flow	▶ Subplate mounting	l/min	80	160
	▶ Threaded connection	l/min	80	160
Minimum set pressure		bar	Flow-dependent (see characteristic curves page 7)	
Maximum set pressure		bar	50; 100; 200; 315	
Maximum secondary pressure	▶ Output	bar	50; 100; 200; 315	
Maximum counter pressure	▶ Port Y	bar	250	

[1] The product fulfills the substance requirements of the RoHS Directive 2015/65/EU.

[2] The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and at the same time increases the life cycle of the components.

Technical data
(for applications outside these values, please consult us!)

Hydraulic fluid		Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils		HL, HLP	NBR, FKM	DIN 51524	90220
Bio-degradable	▶ Insoluble in water	HETG	FKM	ISO 15380	90221
		HEES	FKM		
	▶ Soluble in water	HEPG	FKM	ISO 15380	
Flame-resistant	▶ Water-free	HFDU (glycol base)	FKM	ISO 12922	90222
		HFDU (ester base)	FKM		
		HFDR	FKM		
	▶ Containing water	HFC (Fuchs: Hydrotherm 46M, Renosafe 500; Petrofer: Ultra Safe 620; Houghton: Safe 620; Union: Carbide HP5046)	NBR	ISO 12922	90223

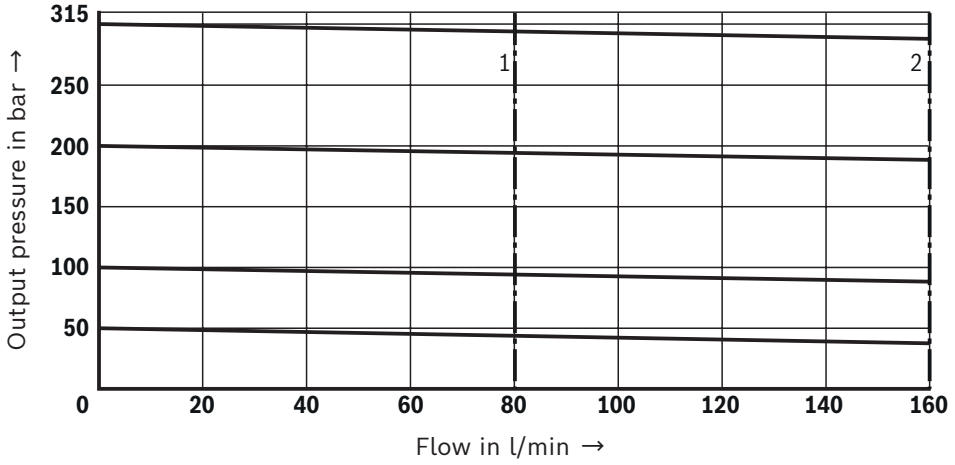
☞ **Important information on hydraulic fluids:**

- ▶ For further information and data on the use of other hydraulic fluids, please refer to the data sheets above or contact us.
- ▶ There may be limitations regarding the technical valve data (temperature, pressure range, life cycle, maintenance intervals, etc.).
- ▶ The ignition temperature of the hydraulic fluid used must be 50 K higher than the maximum surface temperature.
- ▶ **Bio-degradable and flame-resistant – containing water:** If components with galvanic zinc coating (e.g. version "J3" or "J5") or parts containing zinc are used, small amounts of dissolved zinc may get into the hydraulic system and cause accelerated aging of the hydraulic fluid. Zinc soap may form as a chemical reaction product, which may clog filters, nozzles and solenoid valves – particularly in connection with local heat input.
- ▶ **Flame-resistant – containing water**: Due to the increased cavitation tendency with HFC hydraulic fluids, the life cycle of the component may be reduced by up to 30% as compared to the use with mineral oil HLP. In order to reduce the cavitation effect, it is recommended – if possible considering conditions specific to the installation – to back up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.

Characteristic curves

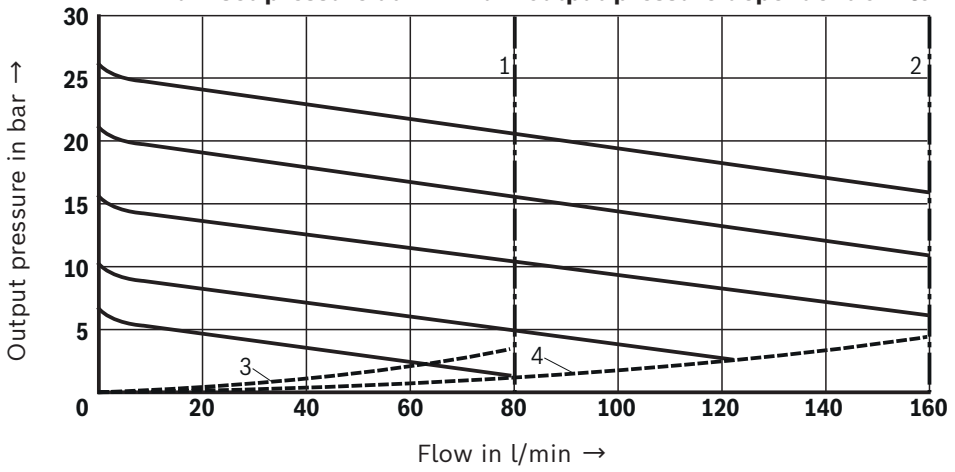
(measured with HLP46, ϑ_{oil} = 40±5 °C)

Output pressure dependent on flow (B→A)



1 NG10
2 NG25

Minimum set pressure at minimum output pressure dependent on flow (B→A)



1 NG10
2 NG25

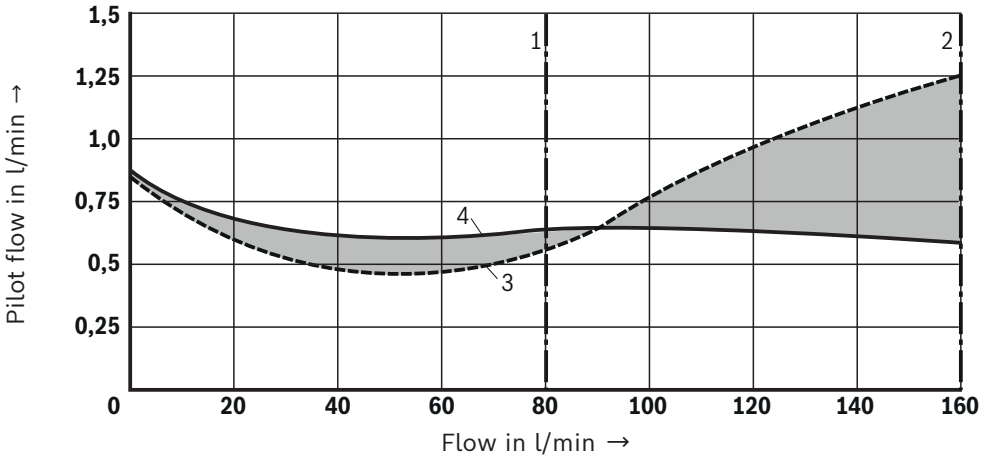
Performance limit
(system-dependent):

3 NG10
4 NG25

☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

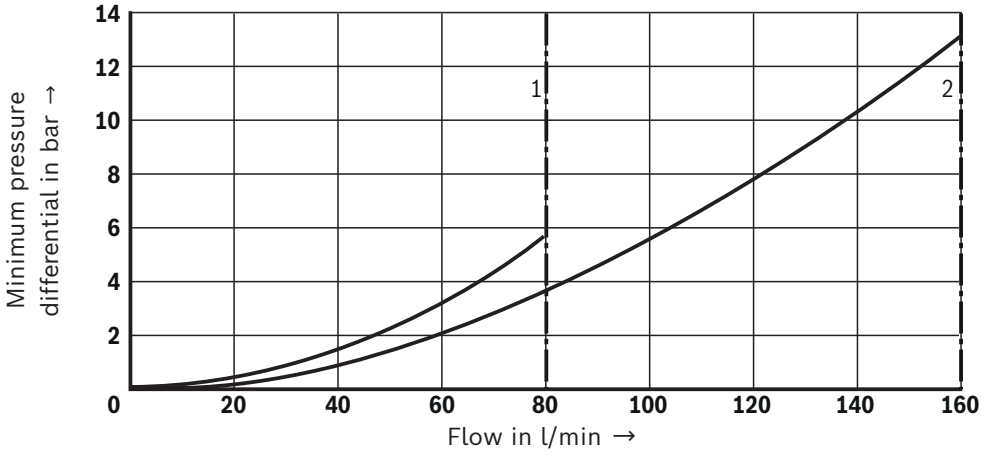
Characteristic curves
(measured with HLP46, ϑ_{oil} = 40±5 °C)

Pilot flow dependent on the flow (B→A) **and pressure differential**



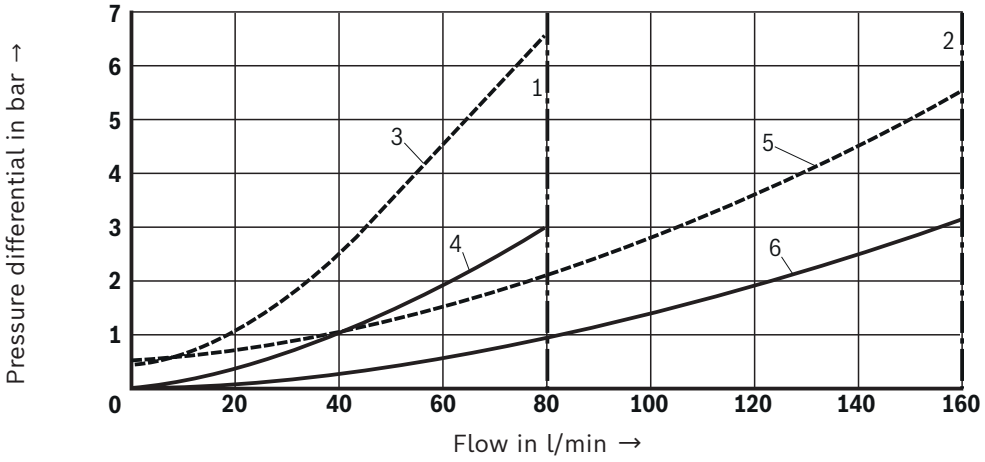
1 NG10
2 NG25
3 ***Δp*** = 250 bar
4 ***Δp*** = 50 bar

Δp_{min}-q_V characteristic curve (B→A)



1 NG10
2 NG25

Δp-q_V characteristic curve via check valve (A→B)

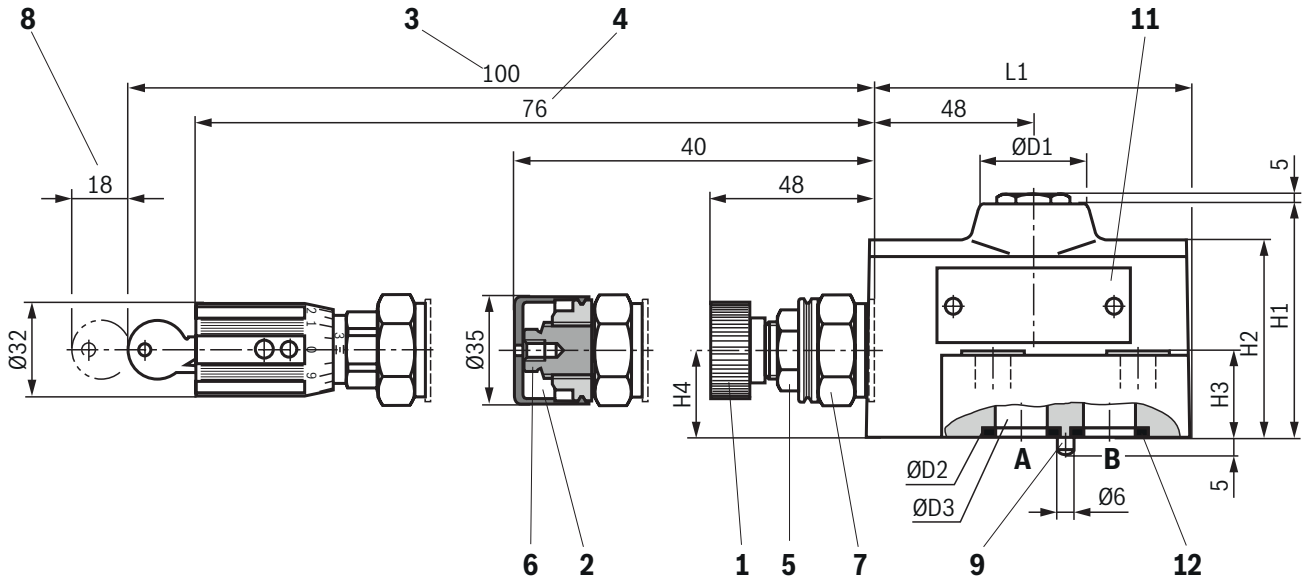


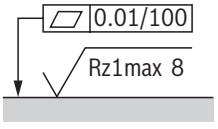
1 NG10
2 NG25

Main stage
3, 5 Closed
4, 6 Fully open

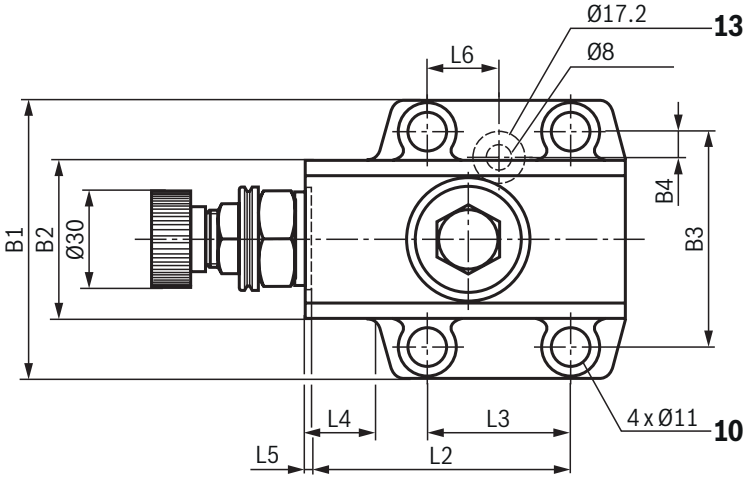
☞ **Notice:**
Typical characteristic curves which are subject to tolerance variations.

Dimensions: Subplate mounting
(dimensions in mm)





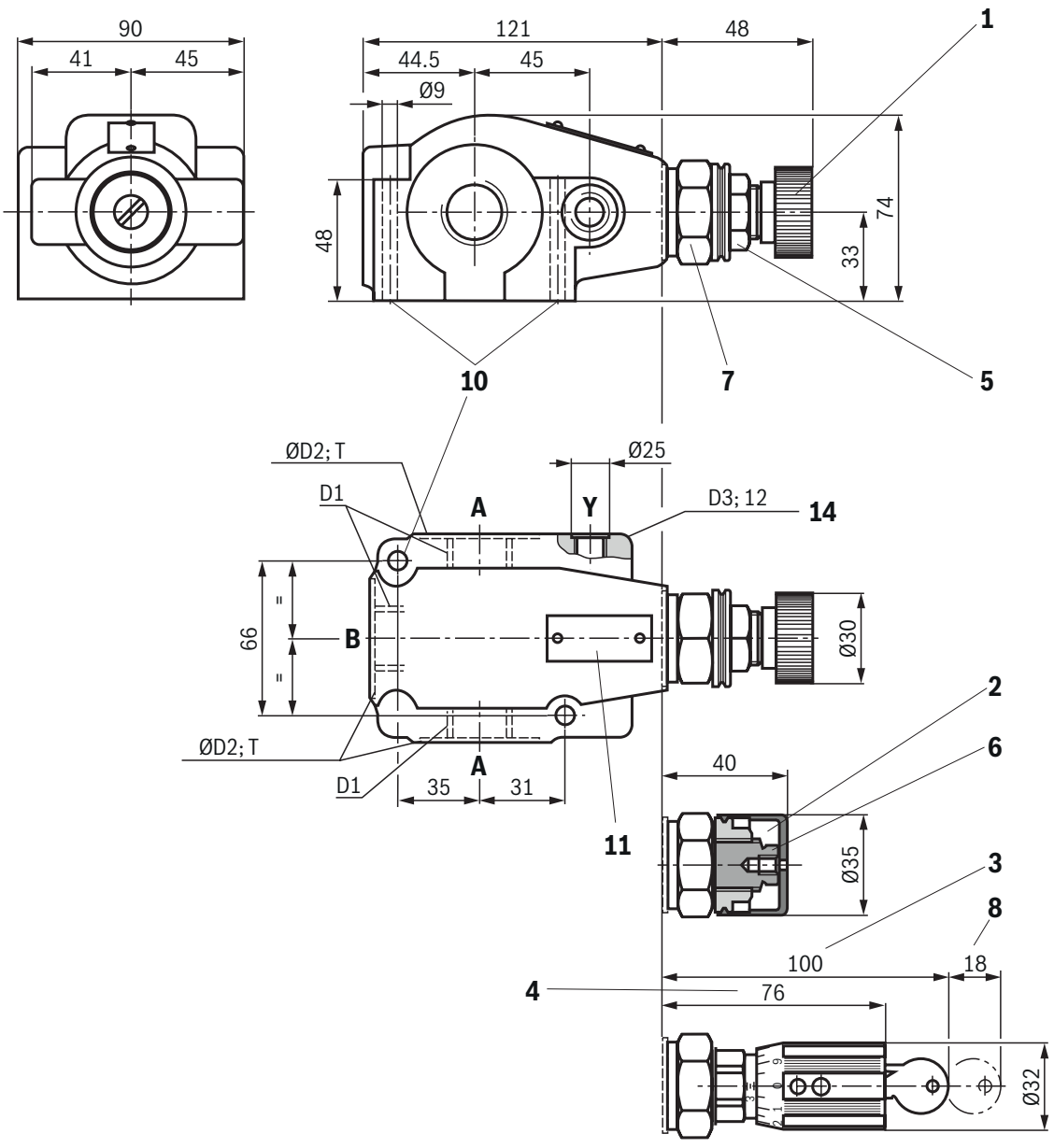
Required surface quality
of the valve contact surface



Version	L1	L2	L3	L4	L5	L6	B1	B2	B3	B4	H1	H2	H3	H4	ØD1	ØD2	ØD3
"DR 10"	95.5	79	42.9	23	2.5	21.5	85	49	66.7	7.9	71	60	26	26	35.5	21.8	15
"DR 20"	96	79.5	60.3	7	4	39.7	100	58	79.4	6.4	96	78	26	40	41	34.8	25

Item explanations, subplates, and **valve mounting screws** see page 13.

Dimensions: Threaded connection "G"
(dimensions in mm)



Version	D1 [1]	ØD2 [1]	D3 [1]	T [1]
"DR 10 G"	G1/2	34	G1/4	0.3
"DR 15 G"	G3/4	42	G1/4	0.3
"DR 20 G"	G1	47	G1/4	0.3

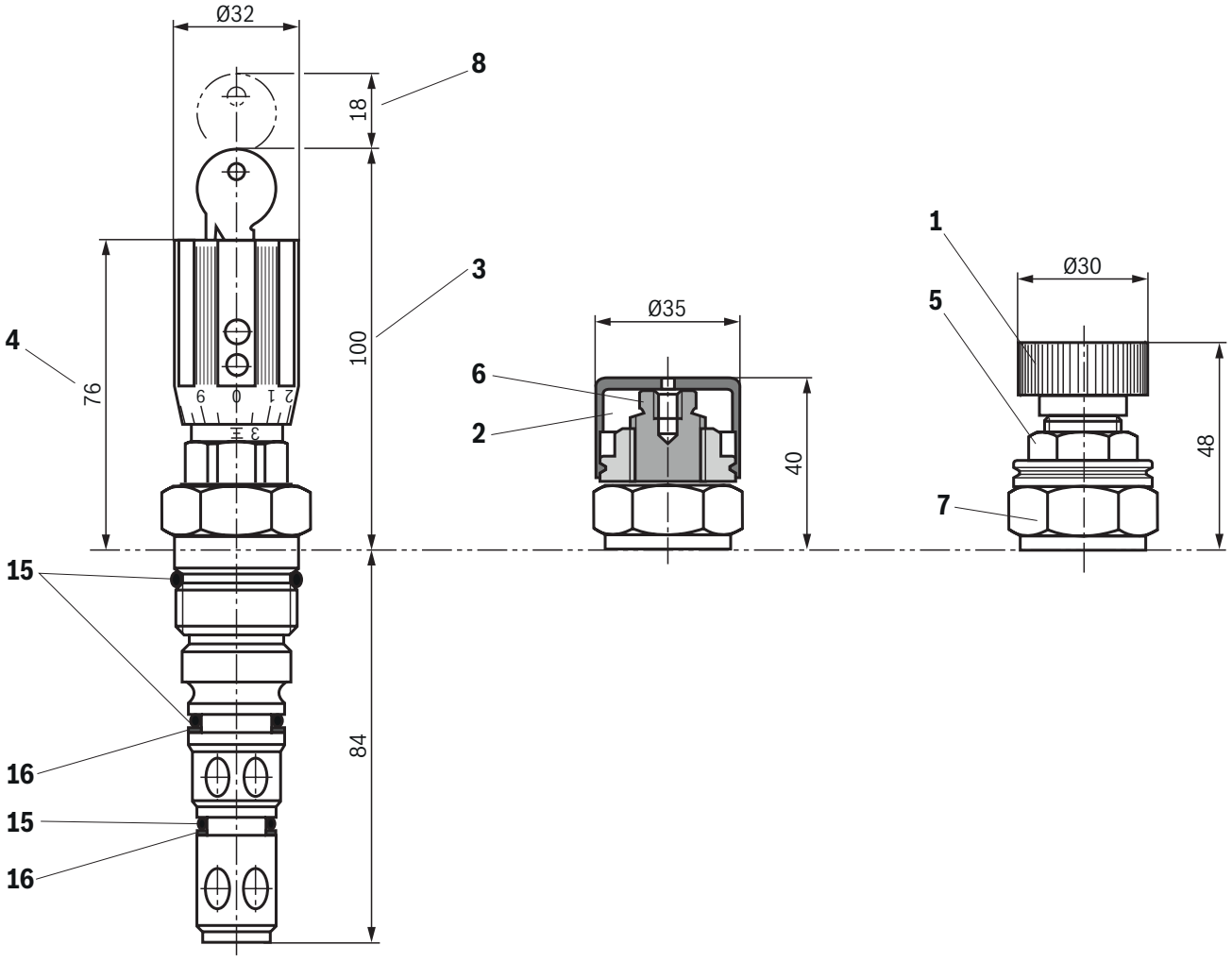
Notice:
In this valve version, **no** check valve for free return flow is installed in the valve.

[1] Deviating dimensions for version "/12"

Version	D1	ØD2	D3	T
"DR 10 G"	3/4-16 UNF	30	7/16-20 UNF	1
"DR 15 G"	1 1/16-12 UN	41	7/16-20 UNF	1
"DR 20 G"	1 5/16-12 UN	49	7/16-20 UNF	1

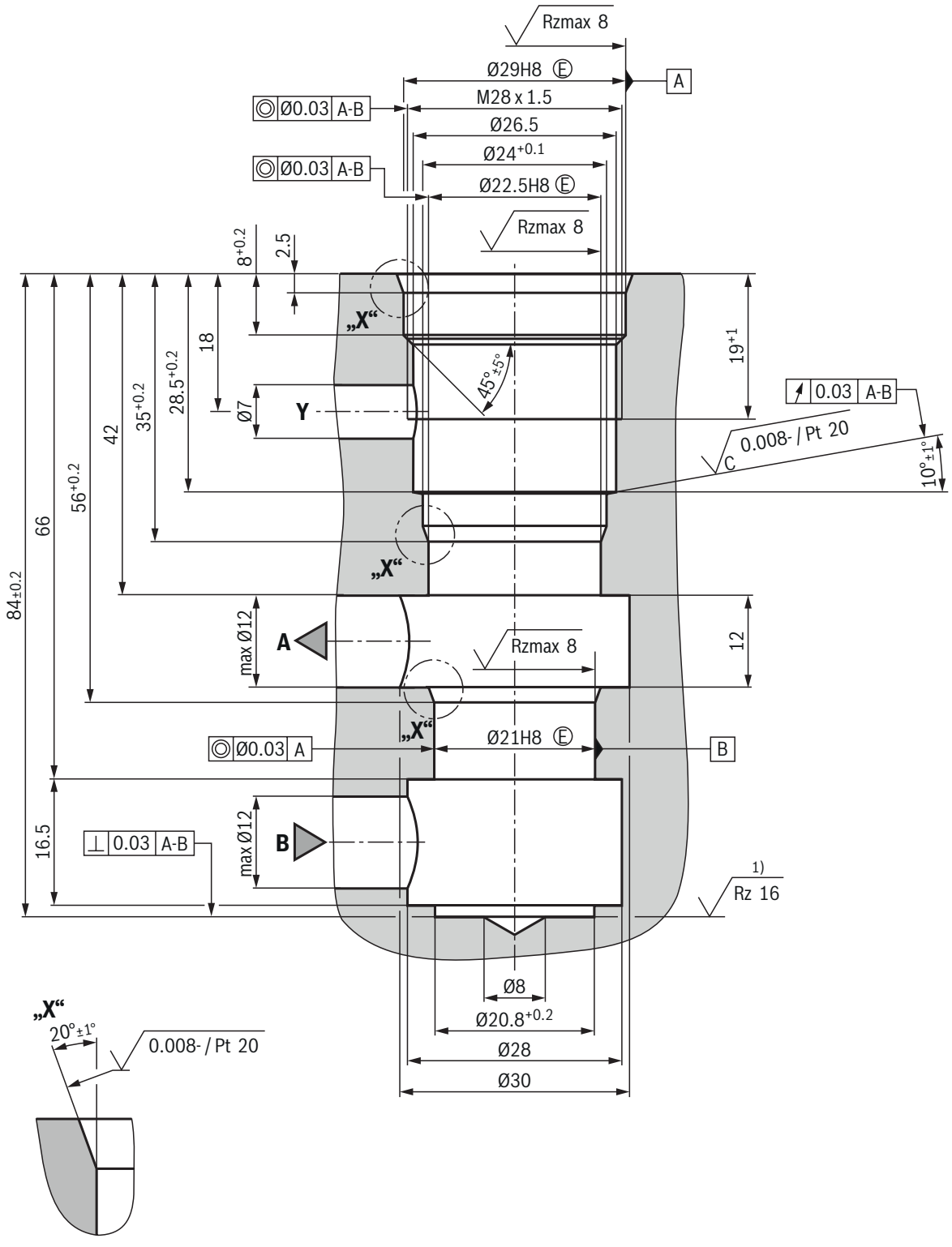
Item explanations, subplates, and **valve mounting screws** see page 13.

Dimensions: Screw-in cartridge valve "K"
(dimensions in mm)



1 Adjustment type "4"
2 Adjustment type "5"
3 Adjustment type "6"
4 Adjustment type "7"
5 Lock nut SW22
6 Hexagon SW10
7 Hexagon SW30, screw-in tightening torque M_A = 50 Nm
8 Space required to remove the key
15 Seal ring
16 Support ring

Mounting cavity
(dimensions in mm)



☞ **Notice:**
Optionally, the connection bores A, B and Y can be applied at the circumference.

1) Visual inspection

Dimensions

1 Adjustment type "4"
2 Adjustment type "5"
3 Adjustment type "6"
4 Adjustment type "7"
5 Lock nut SW22
6 Hexagon SW10
7 Hexagon SW30, screw-in tightening torque M_A = 50 Nm
8 Space required to remove the key
9 Locking pin
10 Valve mounting bores
11 Name plate
12 Identical seal rings for ports A and B
13 Seal ring for port Y
14 Port Y for pilot oil return

Valve mounting screws (separate order)

Size	Quantity	Hexagon socket head cap screws	Material number
10	4	**ISO 4762 - M10 x 40 - 10.9** Friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 75 Nm ±10%	**R913014559**
25	4	**SO 4762 - M10 x 50 - 10.9** Friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 75 Nm ±10%	**R913015580**

☞ **Notice:**
The tightening torques stated are guidelines when using screws with the specified friction coefficients and when using a manual torque wrench (tolerance ± 10%).

Subplates (separate order) with porting pattern according to ISO 5781 see data sheet 45100.

Further information

▶ Subplates	Data sheet 45100
▶ Hydraulic fluids on mineral oil basis	Data sheet 90220
▶ Environmentally compatible hydraulic fluids	Data sheet 90221
▶ Flame-resistant, water-free hydraulic fluids	Data sheet 90222
▶ Flame-resistant hydraulic fluids – containing water	Data sheet 90223
▶ Reliability characteristics according to EN ISO 13849	Data sheet 08012
▶ Hydraulic valves for industrial applications	Operating instructions 07600-B
▶ Information on available spare parts	