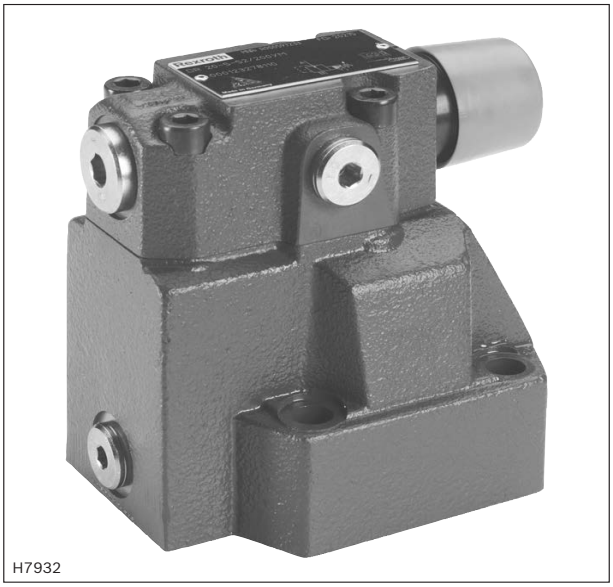
RE 26892
Edition: 2019-09
Replaces: 2019-01

rexroth
A Bosch Company

Pressure reducing valve, pilot-operated

Type DR



- Size 10 ... 32
- Component series 5X
- Maximum operating pressure 350 bar
- Maximum flow 400 l/min

Features

- For subplate mounting
- Porting pattern according to ISO 5781
- For threaded connection
- As cartridge valve
- 4 adjustment types, optionally:
  - Rotary knob
  - Sleeve with hexagon and protective cap
  - Lockable rotary knob with scale
  - Rotary knob with scale
- 5 pressure ratings
- Check valve, optional (only subplate mounting)
- Corrosion-protected design

Contents

Ordering code

01	02	03	04	05		06		07	08	09	10	11	12
DR					**–**	**5X**	**/**		**Y**				*****

01	Pressure reducing valve, pilot-operated	**DR**

02	Valve complete (subplate mounting or threaded connection)	**no code**
	Pilot control valve **without** main spool insert (cartridge valve; do **not** enter any size)	**C**
	Pilot control valve **with** main spool insert (cartridge valve)	**C30**

03		Subplate mounting "–"	Threaded connection "G"	
	Size 10	✓	✓ (G1/2)	**10**
	Size 16	–	✓ (G3/4)	**15** [1]
	Size 25	✓	✓ (G1)	**20**
	Size 25	–	✓ (G1 1/4)	**25** [1]
	Size 32	✓	✓ (G1 1/2)	**30**

04	As cartridge valve (version "C", **without** main spool insert)	**no code**
	As cartridge valve (version "C30", **with** main spool insert)	**–**
	For subplate mounting	**–**
	For threaded connection	**G**

Adjustment type

05	Rotary knob	**4**
	Sleeve with hexagon and protective cap ("J3" version without protective cap; always with maximum pressure adjustment)	**5**
	Lockable rotary knob with scale	**6** [2]
	Rotary knob with scale	**7**

06	Component series 50 ... 59 (50 ... 59: unchanged installation and connection dimensions)	**5X**

Set pressure

07	Up to 50 bar	**50**
	Up to 100 bar	**100**
	Up to 200 bar	**200**
	Up to 315 bar	**315**
	Up to 350 bar (only version "M")	**350**

Pilot oil supply

08	Internal pilot oil supply, external pilot oil return	**Y**

09	**With** check valve (for subplate mounting only)	**no code** [1]
	Without check valve	**M**

Corrosion resistance

10	None	**no code**
	Improved corrosion protection (240 h salt spray test according to EN ISO 9227); (only version "5")	**J3**

Seal material (observe compatibility of seals with hydraulic fluid used, see page 5)

11	NBR seals	**no code**
	FKM seals	**V**

12	Further details in the plain text	

[1] Not for version "J3"

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

☞ **Notes:**
- For valve types for use in potentially explosive areas, refer to data sheet 07011.
- Preferred types and standard units are contained in the EPS (standard price list).

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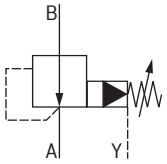
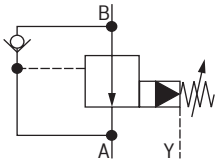
Symbols

Without check valve **"M"**

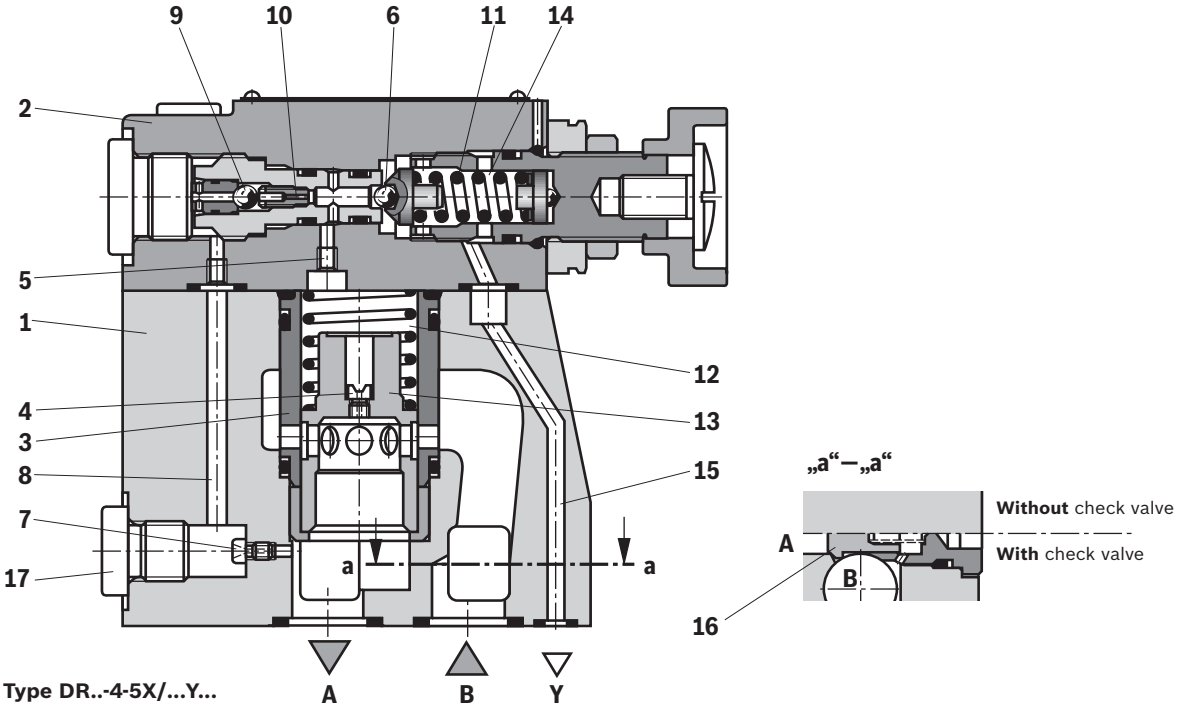


With check valve **"no code"**



Function, section

Pressure valves of type DR are pilot-operated pressure reducing valves controlled from the secondary circuit.
The pressure reducing valves basically consist of the main valve (1) with main spool insert (3) and pilot control valve (2) with adjustment type.
In the rest position the valves are open. Hydraulic fluid flows from channel B via the main spool insert (3) to channel A without restrictions. The pressure applied to channel A acts on the lower main spool side. At the same time, pressure is applied to the spring-loaded side of the main spool (3) via the nozzle (4) and to the ball (6) in the pilot control valve (2) via the channel (5). It also acts via the nozzle (7), control line (8), check valve (9) and nozzle (10) on the ball (6). Depending on the setting of the spring (11), a pressure builds up in front of the ball (6), in the channel (5) and in the spring chamber (12) holding the control spool (13) in the opened position. The hydraulic fluid in channel B can flow via the main spool insert (3) to channel A without restrictions until a pressure builds up in channel A which exceeds the value set at the spring (11) and opens the ball (6). The control spool (13) moves into closing direction.
The desired reduced pressure is achieved when there is a state of equilibrium between the pressure in channel A and the pressure set at the spring (11).
The pilot oil return from the spring chamber (14) is always realized externally via the control line (15) into the tank.
For the free flow back from channel A to channel B, a check valve (16) can optionally be installed.
A pressure gauge connection (17) allows for the control of the reduced pressure in channel A.



Type DR..-4-5X/...Y...

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Technical data

(For applications outside the stated values, please ask us!)

general								
Size				10	16	25 (version "20")	25 (version "25")	32
Weight	Subplate mounting	▶ Version "DR . –"	kg	3.4	–	5.3	–	8.0
	Cartridge valve	▶ Version "DRC"	kg	1.2				
		▶ Version "DRC30"	kg	1.5				
	Threaded connection	▶ Version "DR ." G"	kg	5.3	5.2	5.1	5.0	4.8
Installation position				any				
Ambient temperature range			°C	–30 ... +50 (NBR seals) –20 ... +50 (FKM seals)				

hydraulic								
Maximum operating pressure	▶ Port B		bar	350 [1]				
Maximum inlet pressure	▶ Port B		bar	350 [1]				
Maximum outlet pressure	▶ Connection ...		bar	350 [1]				
Operating pressure range	▶ Port A		bar	10 ... 350 [1]				
Maximum counter pressure	▶ Port Y		bar	350 [1]				
Minimum set pressure			bar	flow-dependent (see characteristic curves page 6)				
Maximum set pressure			bar	50; 100; 200; 315; 350 [1]				
Maximum flow	▶ Subplate mounting		l/min	150	–	300	–	400
	▶ Threaded connection		l/min	150	300	300	400	400
Hydraulic fluid				see table page 5				
Hydraulic fluid temperature range			°C	–30 ... +80 (NBR seals) –20 ... +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]				

[1] Only version "M"

[2] The cleanliness classes specified for the components must be adhered to in hydraulic systems. Effective filtration prevents faults and simultaneously increases the life cycle of the components.
For the selection of filters, see www.boschrexroth.com/filter.

Technical data

(For applications outside the stated values, please ask us!)

Hydraulic fluid		Classification	Suitable sealing materials	Standards	Data sheet
Mineral oils		HL, HLP, HLPD, HVLP, HVLPD	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, Fuchs 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 sywstem 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 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 specific to the installation - to back up the return flow pressure in ports T to approx. 20% of the pressure differential at the component.

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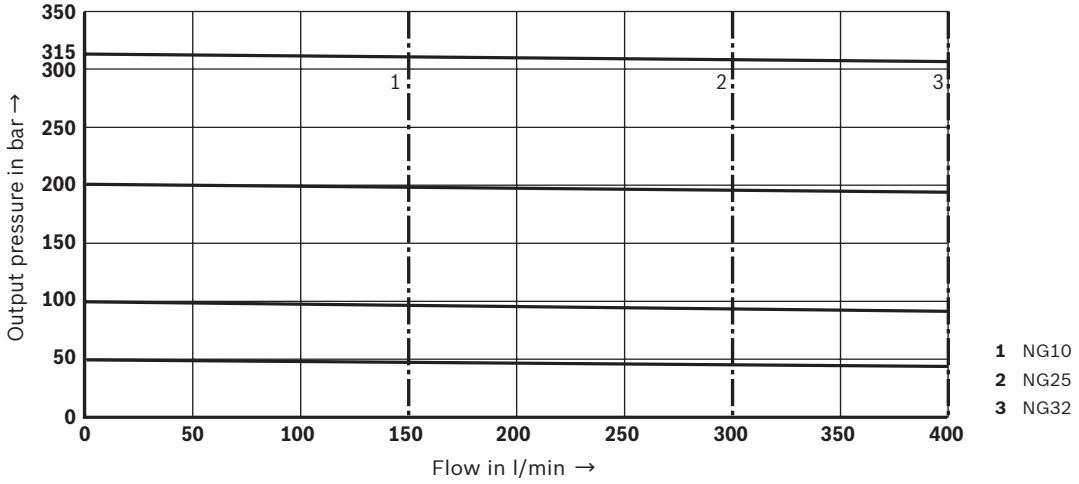
Characteristic curves

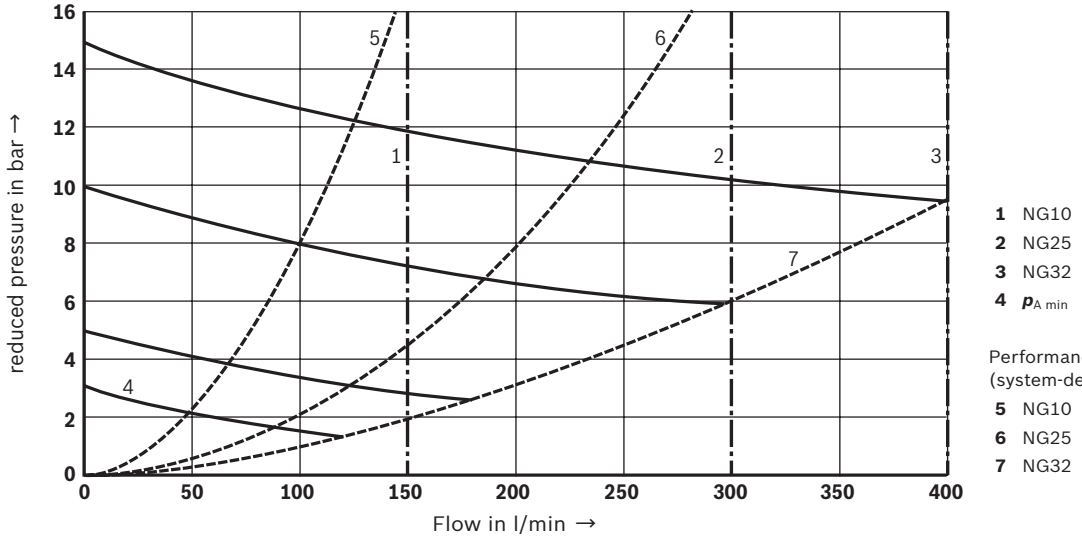
(measured with HLP46, ϑ_{oil} = 40 ±5 °C)

Output pressure p_A dependent on the flow q_V (B to A)



1 NG10
2 NG25
3 NG32

Minimum set pressure with $p_{A\ min}$ dependent on the flow q_V (B to A)



1 NG10
2 NG25
3 NG32
4 $p_{A\ min}$

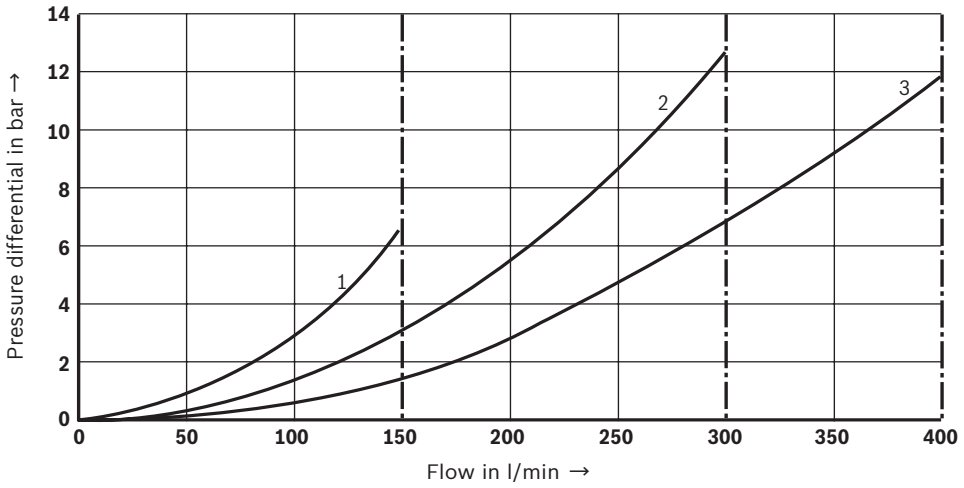
Performance limit
(system-dependent)
5 NG10
6 NG25
7 NG32

Notes:
- The characteristic curves apply to the pressure at the valve output p = 0 bar across the entire flow range.
- Valve body and hydraulic fluid temperature-compensated; large temperature differences may lead to differing values.

Characteristic curves

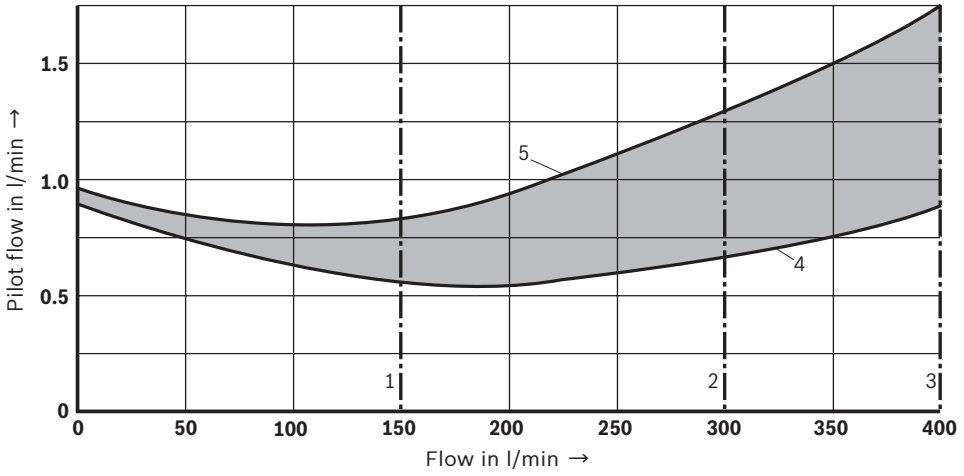
(measured with HLP46, ϑ_{oil} = 40 ±5°C)

***Δp-q*V characteristic curve** (B to A; lowest adjustable pressure differential)



1 NG10
2 NG25
3 NG32

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

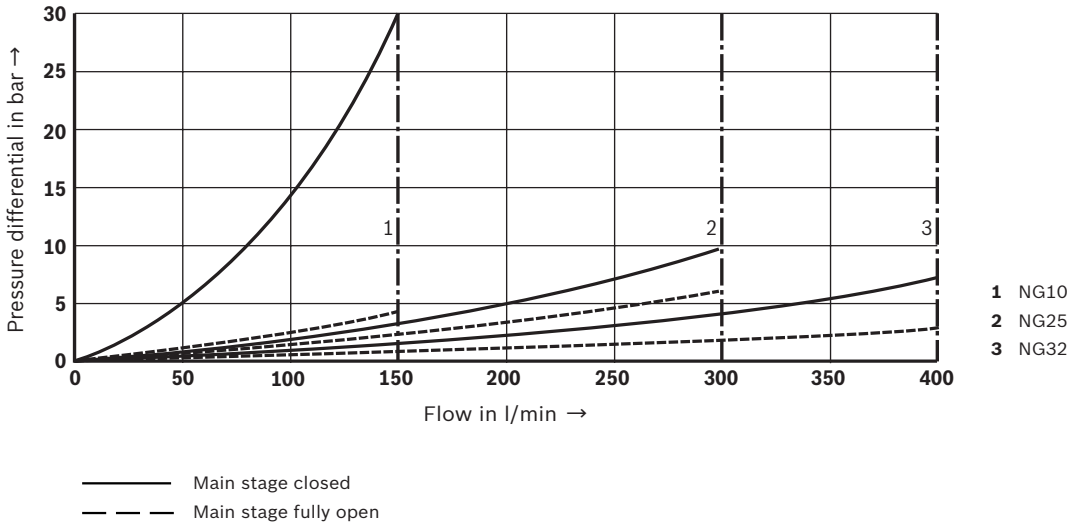


1 NG10
2 NG25
3 NG32
4 *Δp* = 50 bar
5 *Δp* = 200 bar

☞ **Notes:**
- The characteristic curves apply to the pressure at the valve output ***p*** = 0 bar across the entire flow range.
- Valve body and hydraulic fluid temperature-compensated; large temperature differences may lead to differing values.

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

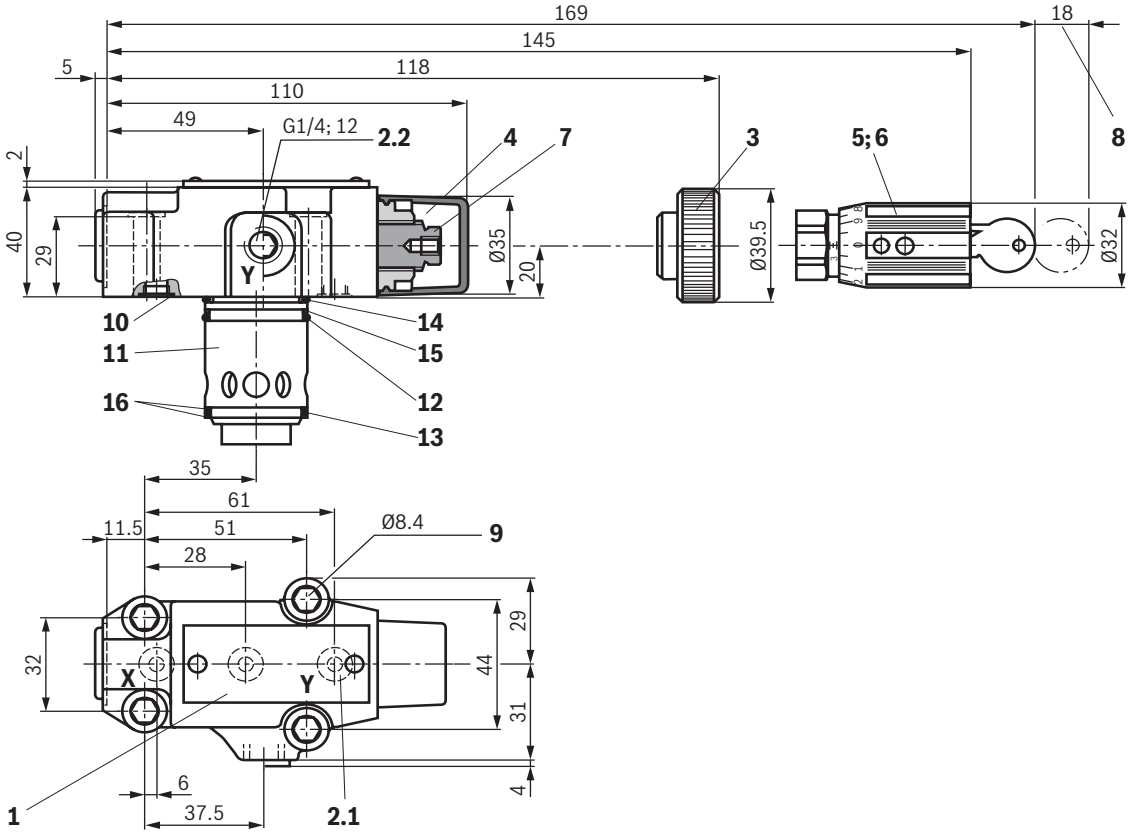
***Δp-q*V characteristic curve via the check valve** (A to B)



1 NG10
2 NG25
3 NG32

Notes:
- The characteristic curves apply to the pressure at the valve output ***p*** = 0 bar across the entire flow range.
- Valve body and hydraulic fluid temperature-compensated; large temperature differences may lead to differing values.

Dimensions: Cartridge valve
(dimensions in mm)



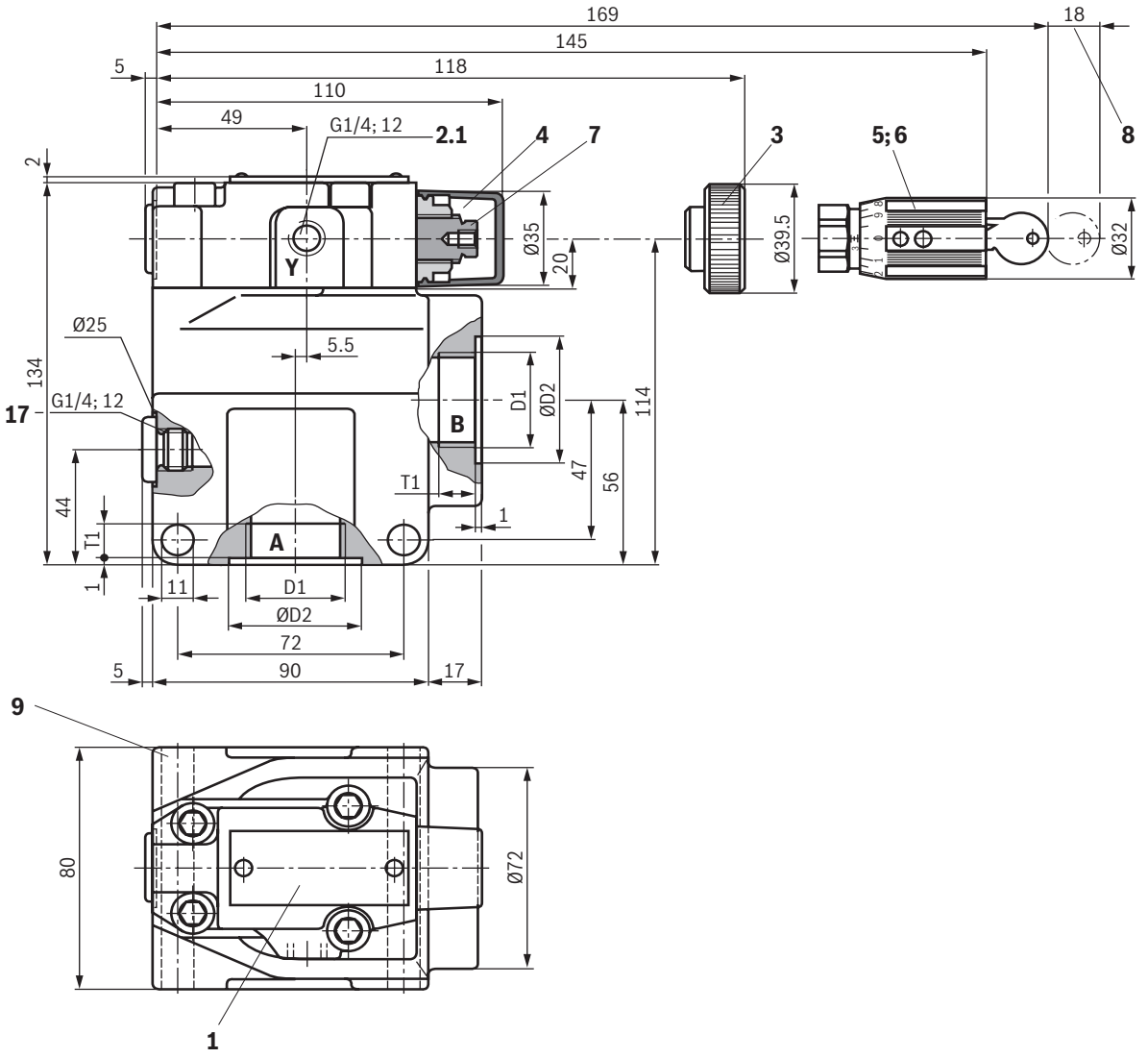
1 Name plate
2.1 Port Y for external pilot oil return
2.2 Port Y optional for external pilot oil return
3 Adjustment type "4"
4 Adjustment type "5"
5 Adjustment type "6"
6 Adjustment type "7"
7 Hexagon, wrench size 10
8 Space required to remove the key
9 Valve mounting bores
10 Seal rings
11 Main spool insert
12 Seal ring
13 Seal ring
14 Seal ring
15 Support ring
16 Support ring

Valve mounting screws (separate order)
4 hexagon socket head cap screws
ISO 4762 - M8 x 40 - 10.9-flzn/nc/480h/C
friction coefficient μ_{total} = 0.09 ... 0.14,
tightening torque M_A = 31 Nm ±10%,
material no. **R913015798**

Installation bore see page 13.

Notice:
The dimensions are nominal dimensions which are subject to tolerances.

Dimensions: Threaded connection
(dimensions in mm)



1	Name plate
2.1	Port Y for external pilot oil return
3	Adjustment type "4"
4	Adjustment type "5"
5	Adjustment type "6"
6	Adjustment type "7"
7	Hexagon, wrench size 10
8	Space required to remove the key
9	Valve mounting bores
17	Pressure gauge connection

NG	D1	ØD2	T1
10	G1/2	34	14
16 ("DR 15 G...")	G3/4	42	16
25 ("DR 20 G...")	G1	47	18
25 ("DR 25 G...")	G1 1/4	58	20
32 ("DR 30 G...")	G1 1/2	65	22

☞ **Notice:**
The dimensions are nominal dimensions which are subject to tolerances.

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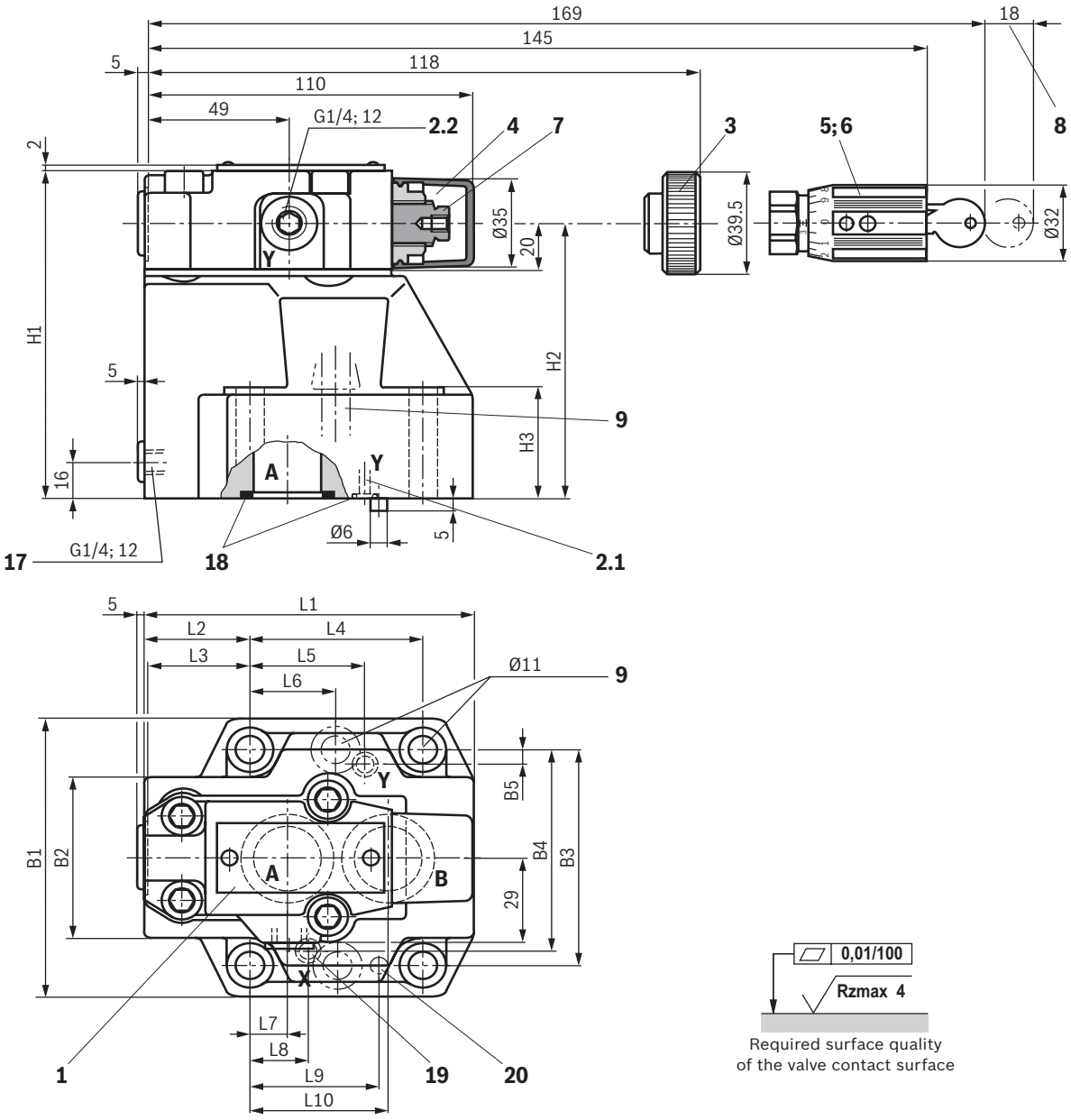
Dimensions: Subplate mounting
(dimensions in mm)



Required surface quality
of the valve contact surface

NG	B1	B2	B3	B4	B5	H1	H2	H3	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10
10	85	50	66.7	58.8	7.9	112	92	28	96	35.5	33	42.9	21.5	–	7.2	21.5	31.8	35.8
25	102	59.5	79.4	73	6.4	122	102	37	116	37.5	35.4	60.3	39.7	–	11.1	20.6	44.5	49.2
32	120	76	96.8	92.8	3.8	130	110	46	145	33	29.8	84.2	59.5	42.1	16.7	24.6	62.7	67.5

Item explanations, subplates and **valve mounting screws** see page 12.

Notice:
The dimensions are nominal dimensions which are subject to tolerances.

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Dimensions: Subplate mounting "P"

1 Name plate
2.1 Port Y for external pilot oil return
2.2 Port Y optional for external pilot oil return
3 Adjustment type "4"
4 Adjustment type "5"
5 Adjustment type "6"
6 Adjustment type "7"
7 Hexagon, wrench size 10
8 Space required to remove the key
9 Valve mounting bore
17 Pressure gauge connection
18 Identical seal rings for ports A and B;
Identical seal rings for ports X and Y
19 Port X without function (blind bore)
20 Locking pin

Valve mounting screws (separate order)

Size	Quantity	Hexagon socket head cap screws	Material number
10	4	**ISO 4762 - M10 x 50 - 10.9-flzn/nc/480h/C** friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 60 Nm ±10%	**R913015580**
25 "20"	4	**ISO 4762 - M10 x 60 - 10.9-flzn/nc/480h/C** friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 60 Nm ±10%	**R913014770**
32 "30"	6	**ISO 4762 - M10 x 70 - 10.9-flzn/nc/480h/C** friction coefficient μ_{total} = 0.09 ... 0.14; tightening torque M_A = 60 Nm ±10%	**R913014772**

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

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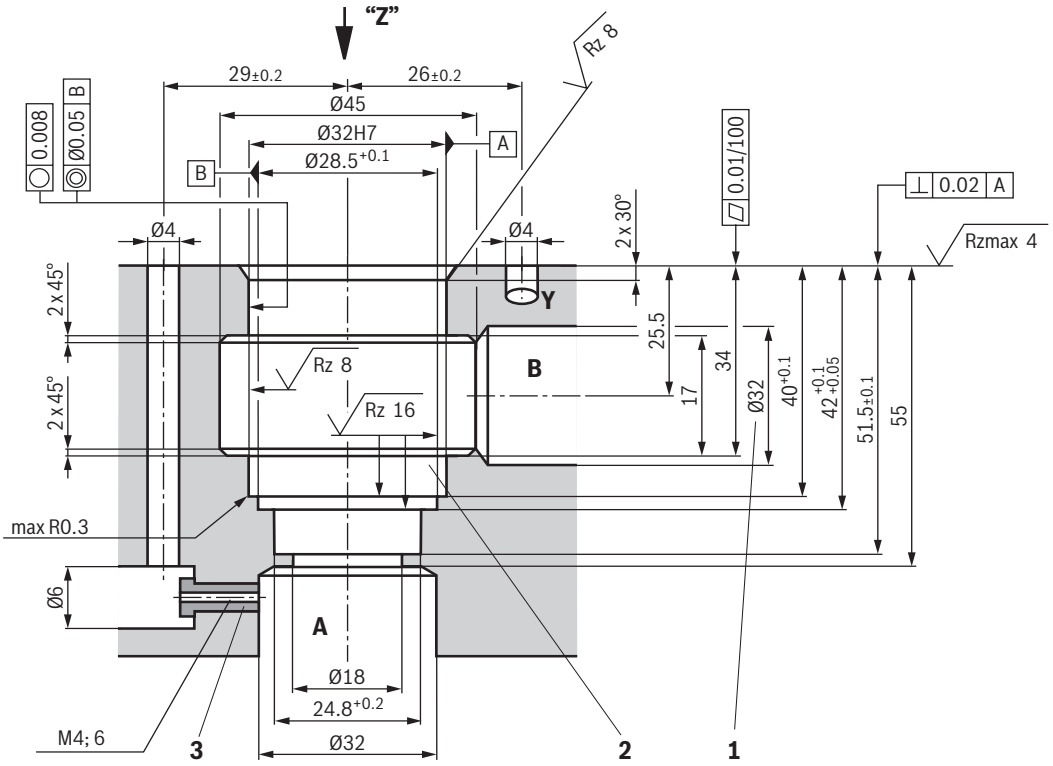
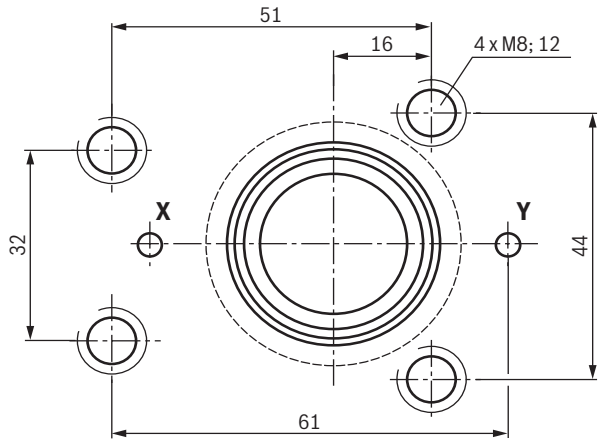
Installation bore
(dimensions in mm)



View "Z"



1 **Notice:**
Bore Ø32 may intersect Ø45 at any point. However, it must be observed that the connection bore and the valve mounting bore are not damaged!

2 Support ring and seal rings are to be inserted before the assembly of the main spool into this bore

3 Nozzle, separate order

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Accessories (separate order)

Denomination	Material number
Protective cap	**R900135501**

Further information

▶ Hydraulic valves for industrial applications	Operating instructions 07600-B
▶ 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 (HFAE, HFAS, HFB, HFC)	Data sheet 90223
▶ Use of non-electrical hydraulic components in an explosive environment (ATEX)	Data sheet 07011
▶ Selection of filters	
▶ Information on available spare parts	

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