

## DATA SHEET - OPERATION MANUAL

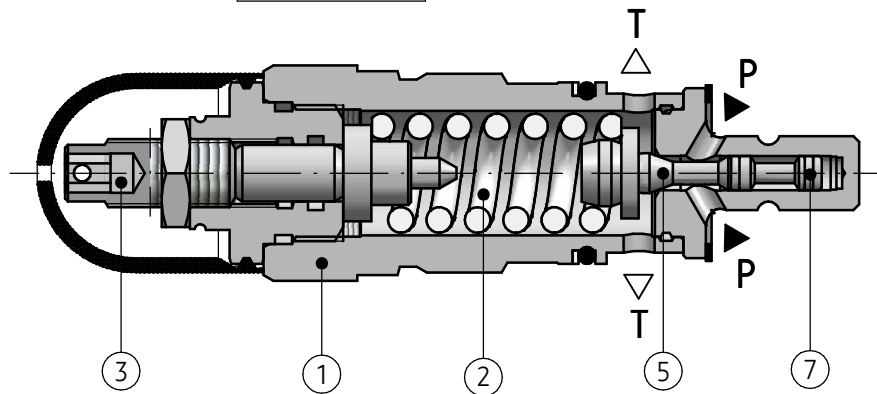
### APPLICATION

A direct operated pressure relief valve type DBD... is designed to limit maximum pressure in the entire hydraulic system or in its part. Depending on the type of mounting in the system, the pressure relief valve type DBD... can be screwed (cartridge version), mounted into threaded connections (version for threaded connection) or mounted to subplate (version for subplate mounting).

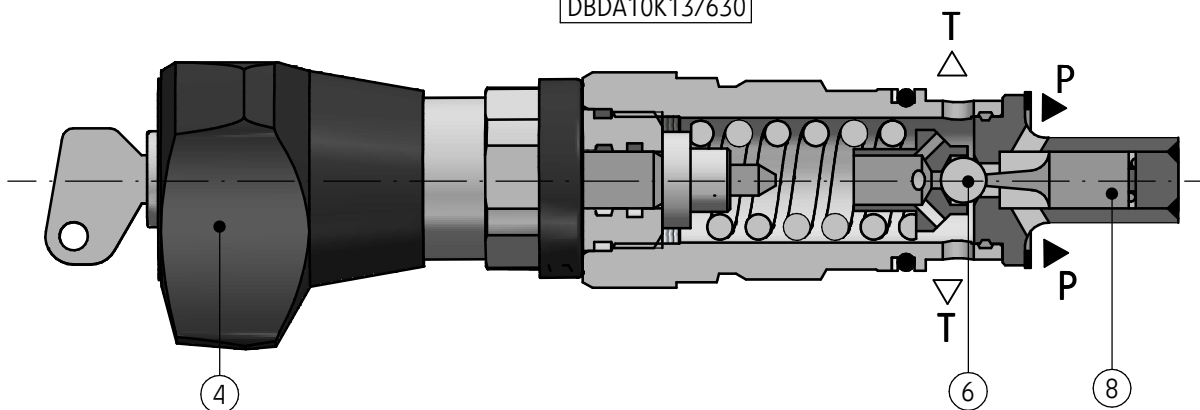


### DESCRIPTION OF OPERATION

DBDS10K13/100



DBDA10K13/630



The pressure relief valve type DBD... mainly consists of body with valve seat (1), spring (2), pressure setting with adjustment element – hexagon socket set screw (3), rotary knob or lockable rotary knob (4), working element – poppet (5) for all versions up to 40 MPa or ball (6) – only for valves NS10 in version up to 63 MPa.

Cracking pressure setting is made by variation of spring tension by means of pressure setting (3) or (4). Various springs (2) (exchangeable) correspond to various ranges of cracking pressure adjustment. A dumping element (7) or (8) is used to eliminate vibrations of the valve.

## TECHNICAL DATA

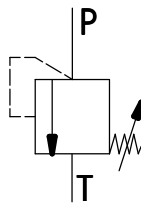
Hydraulic fluid	mineral oil		
Required fluid cleanliness class	ISO 4406 class 20/18/15		
Nominal fluid viscosity	37 mm <sup>2</sup> /s at temperature 55 °C		
Viscosity range	2,8 up to 380 mm <sup>2</sup> /s		
Fluid temperature range (in a tank)	recommended	40 °C up to 55 °C	
	max	-20 °C up to +70 °C	
Ambient temperature range	- 20 °C up to +70 °C		
Maximum operating pressure	NS6	NS10	NS20
	40 MPa	63 MPa	40 MPa
Maximum pressure in T port	31,5 MPa		

## INSTALLATION AND OPERATION REQUIREMENTS

- |   |   |
|---|---|
| <ol style="list-style-type: none"> <li>1. Only fully functional and operational valve must be used.</li> <li>2. During the period of operation must be kept fluid viscosity acc. to requirements defined in this Data Sheet - Operation Manual</li> <li>3. In order to ensure failure free and safe operation the following must be checked: <ul style="list-style-type: none"> <li>• proper working of the valve</li> <li>• cleanliness of the hydraulic fluid</li> </ul> </li> <li>4. Due to heating of valve body to high temp., the valve shall be placed in such way to eliminate the risk of</li> </ol> | <ol style="list-style-type: none"> <li>accidental contact with the body operation or to apply suitable covers acc. to PN - EN ISO 13732 - 1 and PN - EN ISO 4413.</li> <li>5. In order to ensure tightness of the valve block, one should take care of dimension of sealing rings and valve operation parameters given in this Data Sheet - Operation Manual</li> <li>6. A person that operates the valve must be thoroughly familiar with this Data Sheet - Operation Manual.</li> </ol> |
|---|---|

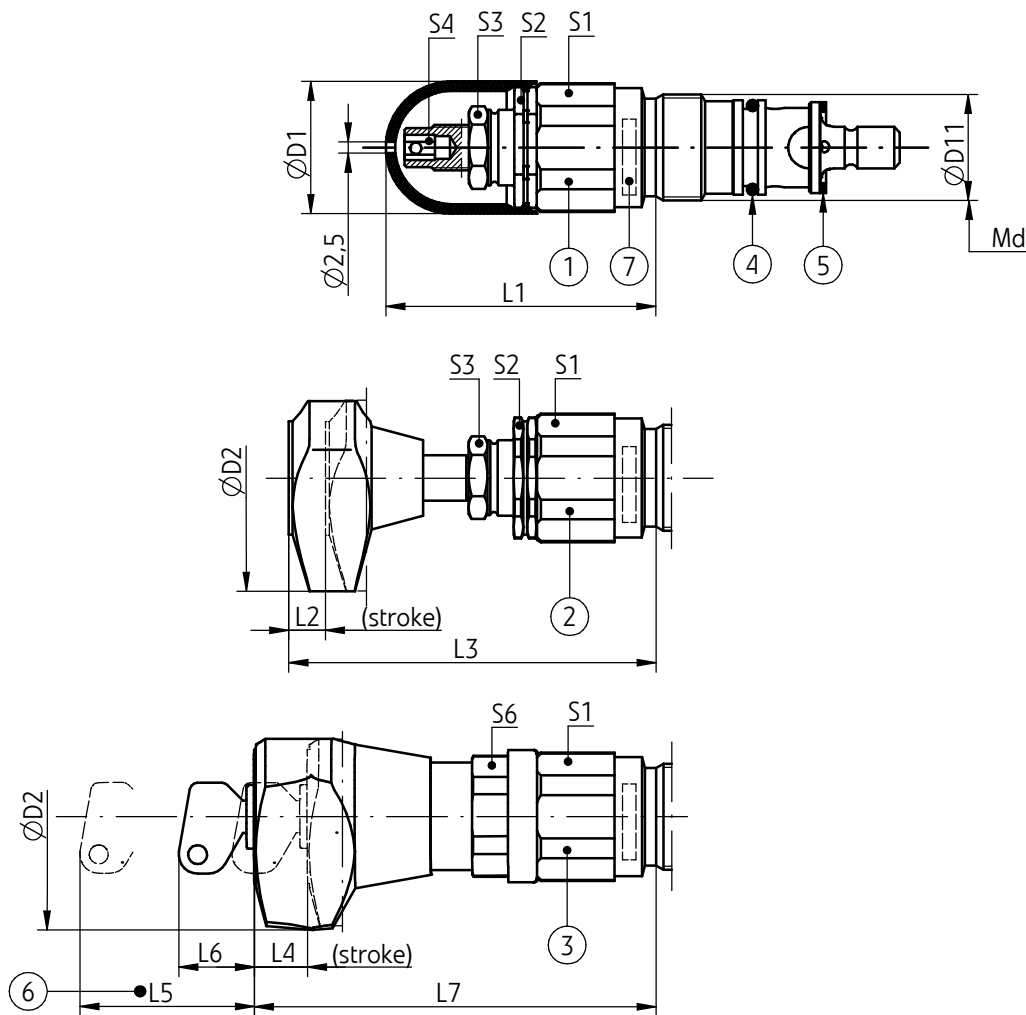
## DIAGRAMS

Graphical symbol of the valve type DBD...



## OVERALL AND CONNECTION DIMENSIONS

versions for cartridge mounting: DBD...6K...; 10K...; 20K...



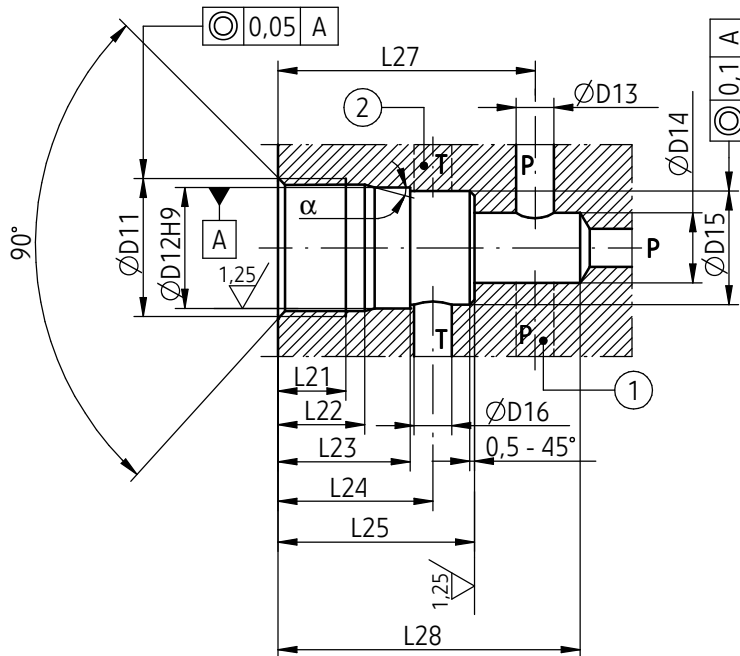
- 1 - Adjustment type *S* (hexagon socket set screw)
- 2 - Adjustment type *H* (rotary knob)
- 3 - Adjustment type *A* (lockable rotary knob)
- 4 - Seal ring **o-ring** - dimensions according to a below table
- 5 - Seal ring - dimensions according to a below table
- 6 - Distance for removing a key from the lock of adjustment *A*
- 7 - Coding for a valve version

valve version	o-ring item 4	ring item 5	ØD1	ØD2	L1	L2	L3	L4
DBD...6 K...	19,2 x 3 - 1pcs/set	17,4 x 24 x 1,5 - 1pcs/set	34	60	72	11	95,5	11
DBD...10 K...	26 x 3 - 1pcs/set	24,7 x 31 x 2 - 1pcs/set	38	60	68	11	91,5	11
DBD...20 K...	34 x 3 - 1pcs/set	31 x 39 x 2 - 1pcs/set	48	60	65	11	87	11

valve version	L5	L6	L7	S1	S2	S3	S4	S6	ØD11	Md [Nm]	weight [kg]
DBD...6 K...	46	18	106,5	32	30	19	6	30	M28 x 1,5	80	0,4
DBD...10 K...	46	18	102,5	36	30	19	6	30	M35 x 1,5	140	0,5
DBD...20 K...	46	18	98	46	36	19	6	30	M45 x 1,5	170	1

## OVERALL AND CONNECTION DIMENSIONS

connection dimensions for valve cavity  
versions: DBD...6K...; 10K...; 20K...

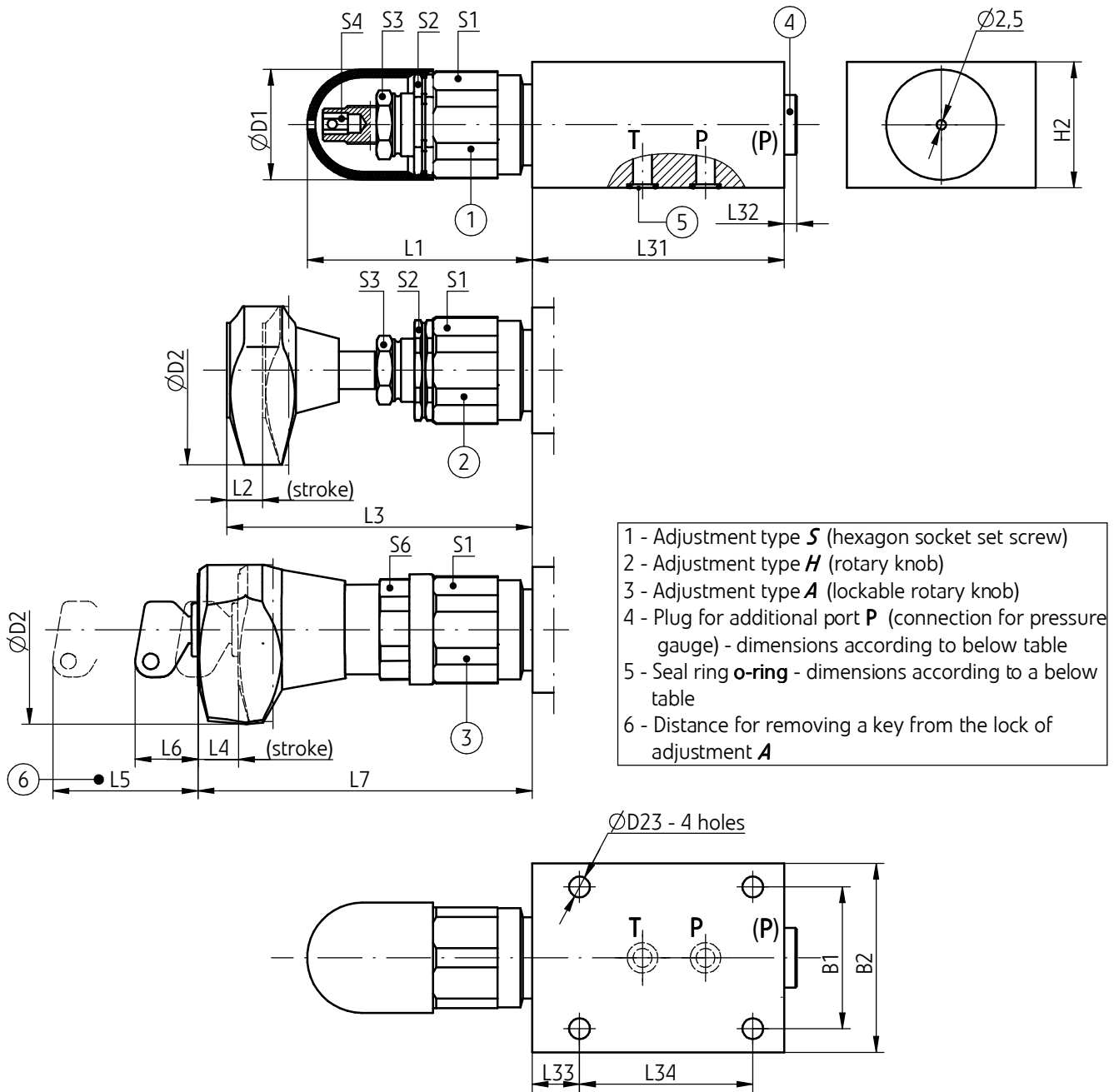


- 1 - Optional location of port P (on circuit  $\phi$  D14)  
2 - Optional location of port T (on circuit  $\phi$  D15)

nominal size of valve cavity (valve version)	$\phi$ D11	$\phi$ D12	$\phi$ D13	$\phi$ D14	$\phi$ D15	$\phi$ D16	L21	L22	L23	L24	L25	L27	L28	$\alpha$
NS6 (DBD...6K...)	M28 x 1,5	25	6	15	24,9	6	15	19	30	35	45	56,5 ± 5	65	15°
NS10 (DBD...10K...)	M35 x 1,5	32	10	18,5	31,9	10	18	23	35	41	52	67,5 ± 7	80	15°
NS20 (DBD...20K...)	M45 x 1,5	40	20	24	39,9	20	21	27	45	54	70	91,5 ± 8	110	20°

# OVERALL AND CONNECTION DIMENSIONS

versions for subplate mounting: DBD...6P...; 10P...; 20P...



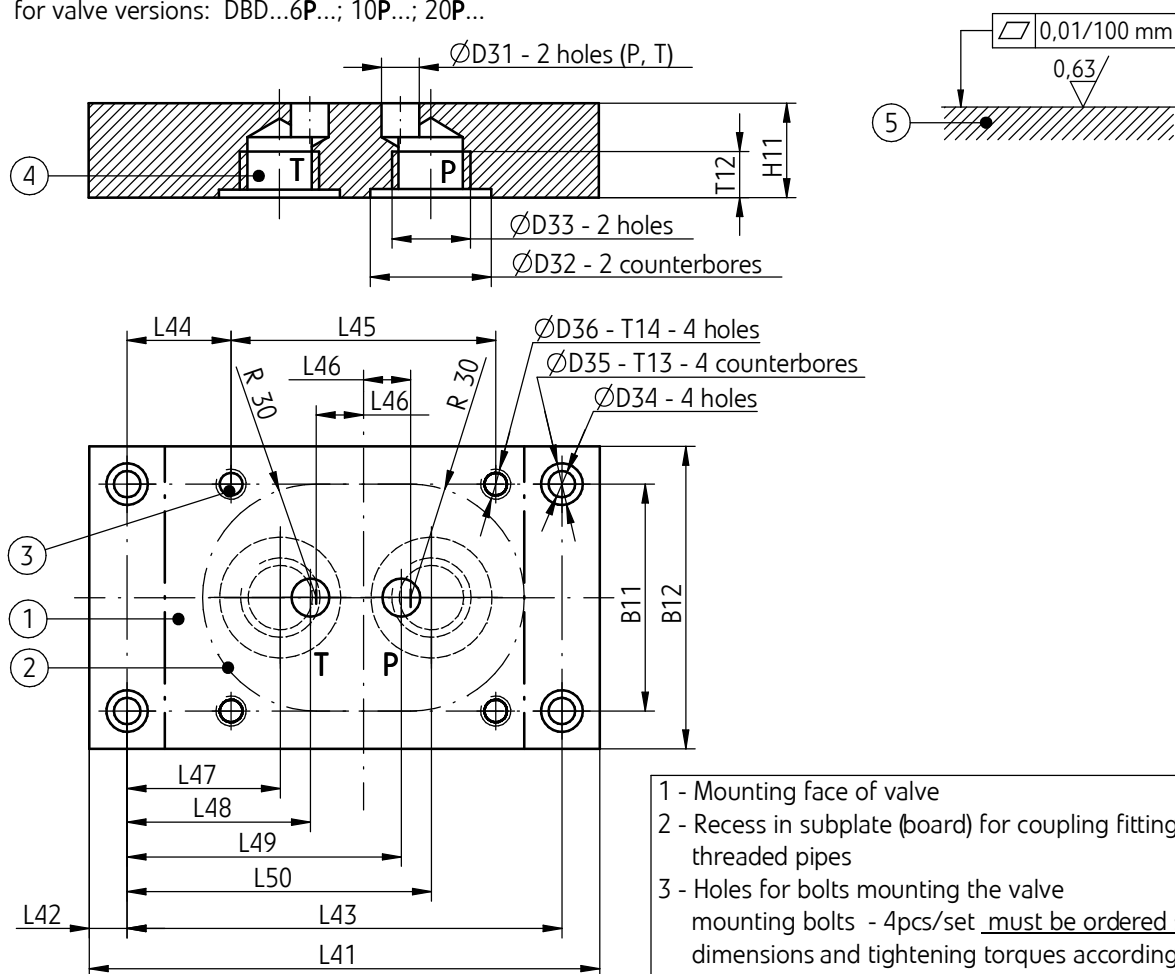
valve version	o-ring pos. 5	B1	B2	φD1	φD2	φD23	H2	L1	L2	L3	L4	L5
DBD...6 P...	7 x 1,5 - 2 pcs/set	45	60	34	60	6,6	40	72	11	95,5	11	46
DBD...10 P...	12,3 x 2,4 - 2 pcs/set	60	80	38	60	9	60	68	11	91,5	11	46
DBD...20 P...	22 x 3 - 2 pcs/set	70	100	48	60	9	70	65	11	87	11	46

valve version	L6	L7	L31	L32	L33	L34	S1	S2	S3	S4	S6	port (P)	weight [kg]
DBD...6 P...	18	106,5	80	4	15	55	32	30	19	6	30	G1/4	1,6
DBD...10 P...	18	102,5	100	4	20	70	36	30	19	6	30	G1/2	3,7
DBD...20 P...	18	98	135	5,5	20	100	46	36	19	6	30	G1	7

## OVERALL AND CONNECTION DIMENSIONS

subplates type **G300/01**; **G302/01**; **G304/01**

for valve versions: DBD...6P...; 10P...; 20P...



- 1 - Mounting face of valve
- 2 - Recess in subplate (board) for coupling fittings for threaded pipes
- 3 - Holes for bolts mounting the valve  
mounting bolts - 4pcs/set must be ordered separately,  
dimensions and tightening torques according to below table
- 4 - Threaded pipe connections
- 5 - Admissible surface roughness and flatness deviation for a subplate face

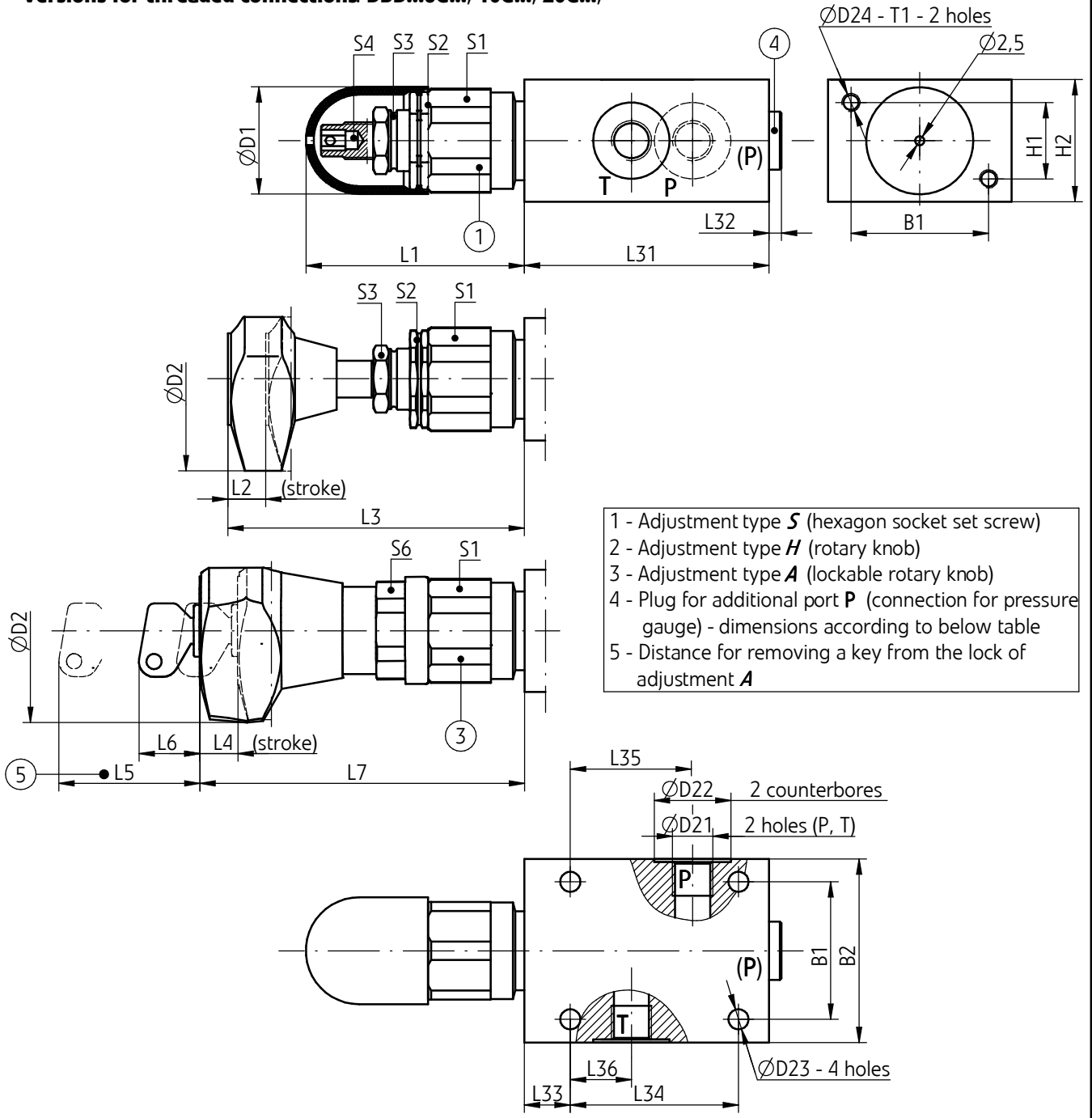
Nominal size (valve version)	subplate	B11	B12	ØD31	ØD32	ØD33	ØD34	ØD35	ØD36	H11	L41	L42	L43	L44
NS6 (DBD...6P...)	G300/01	45	60	6	25	G1/4	7	11	M6	25	110	8	94	22
NS10 (DBD...10P...)	G302/01	60	80	10	34	G1/2	7	11	M8	25	135	10	115	27,5
NS20 (DBD...20P...)	G304/01	70	100	20	47	G1	11,5	17,5	M8	40	170	15	140	20

Nominal size (valve version)	subplate	L45	L46	L47	L48	L49	L50	T11	T12	T13	T14	R1	weight [kg]
NS6 (DBD...6P...)	G300/01	55	10	39	42	62	65	1	15	9	15	25	1,5
NS10 (DBD...10P...)	G302/01	70	12,5	40,5	48,5	72,5	80,5	1	16	9	15	30	2
NS20 (DBD...20P...)	G304/01	100	20	42	54	85	97	1	20	13	22	40	5,5

Nominal size (valve version)	subplate	bolts mounting valve (must be ordered separately)	tightening torque Md [Nm]
NS6 (DBD...6P...)	G300/01	M6 x 50 - 10,9 according to PN -EN ISO 4762 - 4 pcs/set	10
NS10 (DBD...10P...)	G302/01	M8 x 70 - 10,9 according to PN -EN ISO 4762 - 4 pcs/set	25
NS20 (DBD...20P...)	G304/01	M8 x 90 - 10,9 according to PN -EN ISO 4762 - 4 pcs/set	25

# OVERALL AND CONNECTION DIMENSIONS

versions for threaded connections: DBD...6G...; 10G...; 20G...;



- 1 - Adjustment type *S* (hexagon socket set screw)
- 2 - Adjustment type *H* (rotary knob)
- 3 - Adjustment type *A* (lockable rotary knob)
- 4 - Plug for additional port *P* (connection for pressure gauge) - dimensions according to below table
- 5 - Distance for removing a key from the lock of adjustment *A*

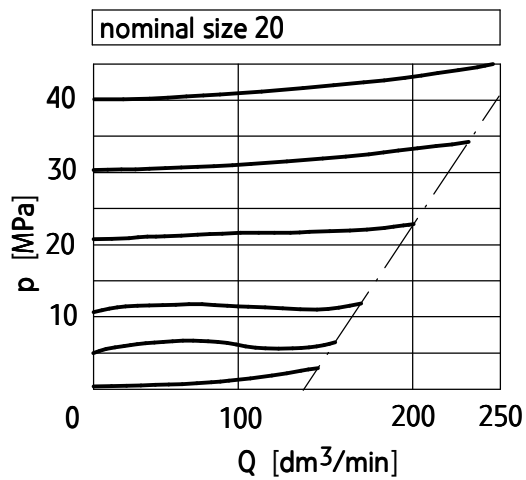
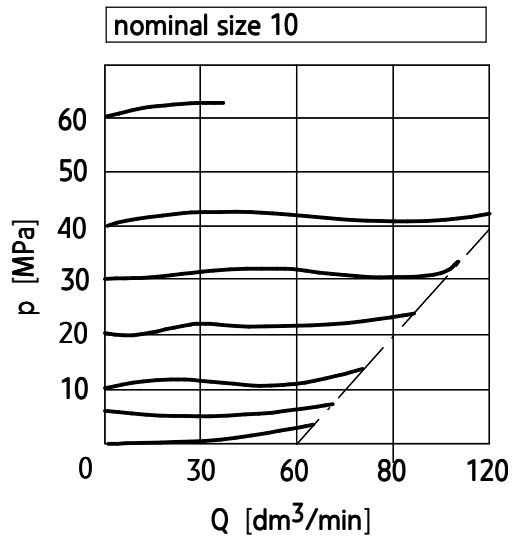
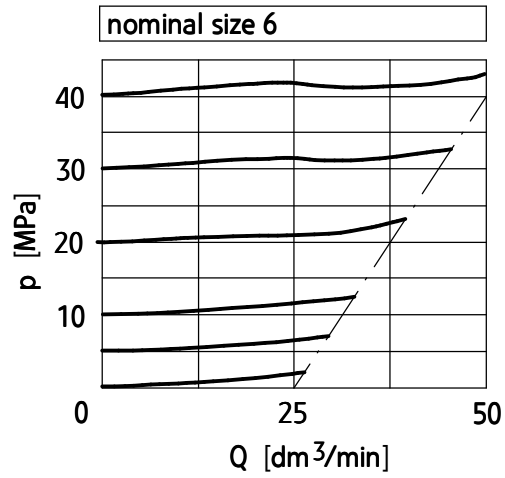
valve version	B1	B2	φD1	φD2	φD21	φD22	φD23	φD24	H1	H2	L1	L2	L3	L4	L5	L6	L7
DBD...6 G...	45	60	34	60	G1/4	25	6,6	M6	25	40	72	11	95,5	11	46	18	106,5
DBD...10 G...	60	80	38	60	G1/2	34	9	M8	40	60	68	11	91,5	11	46	18	102,5
DBD...20 G...	70	100	48	60	G1	47	9	M8	50	70	65	11	87	11	46	18	98

valve version	L31	L32	L33	L34	L35	L36	S1	S2	S3	S4	S6	T1	port (P)	weight [kg]
DBD...6 G...	80	4	15	55	40	20	32	30	19	6	30	10	G1/4	1,6
DBD...10 G...	100	4	20	70	49	21	36	30	19	6	30	15	G1/2	3,7
DBD...20 G...	135	5,5	20	100	65	34	46	36	19	6	30	18	G1	7

# PERFORMANCE CURVES

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

Charakteristics for working pressure during flow





## HOW TO ORDER

<b>DBD</b>				/		*
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### Adjustment element

<b>set screw</b>	= <b>S</b>
rotary knob	= H
lockable rotary knob	= A

### Nominal size (NS)

<b>NS6</b>	= <b>6</b>
<b>NS10</b>	= <b>10</b>
<b>NS20</b>	= <b>20</b>

### Type of connection

<b>cartridge mounting</b>	= <b>K</b>
<b>for threaded connection</b>	= <b>G</b>
<b>for subplate mounting</b>	= <b>P</b>

### Series number

(10-19) - connection and installation dimensions unchanged	= 1X
<b>series 13</b>	= <b>13</b>

### Pressure setting

up to 2,5 MPa	= 25
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>
up to 40 MPa	= 400
up to 63 MPa (available only for valves NS10)	= 630

### Sealing

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

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: DBD S6 K 13/400

**Valves type DBDS... as safety valves DBDS6.../...C and DBDS10.../...C with CE certification in accordance with:**

- **pressure component directive 2014/68/UE**
- **directive 2000/9/EC (relating to carriage)**

**Valves type DBDS20.../...C with CE certification in accordance with:**

- **pressure component directive 2014/68/UE**

**APPLICATION**

Safety valves type DBDS.../...C are used as an end device protecting against excessive pressure in protected system (mostly in hydraulic accumulator).



**DESCRIPTION OF OPERATION**

Safety valves type DBDS.../...C consist of an adjustment set and plumbed at required pressure. The maximum pressure is maintained in protected system by the valve. When the pressure exceeds the maximum then excessive fluid is drained.

Depending on mounting method, safety valves type DBDS.../...C can be produced in the following versions:

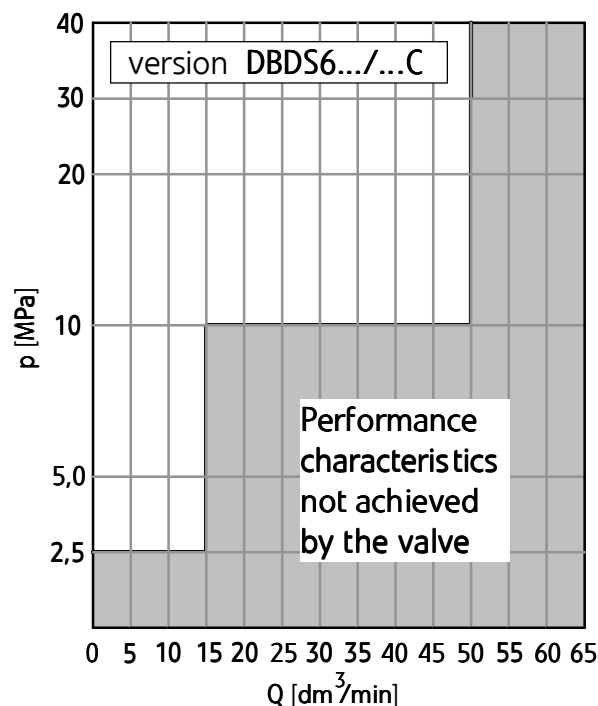
- for cartridge mounting – version DBDS...K/...C
- for subplate connection – version DBDS...P/...C
- for threaded connection – version DBDS...G/...C

**PERFORMANCE CURVES**

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

**Performance characteristics p-Q for valves NS6**

(max discharge capacity of the valve for various pressures of adjustment – operation area of the valve must be within the white area of the diagram)

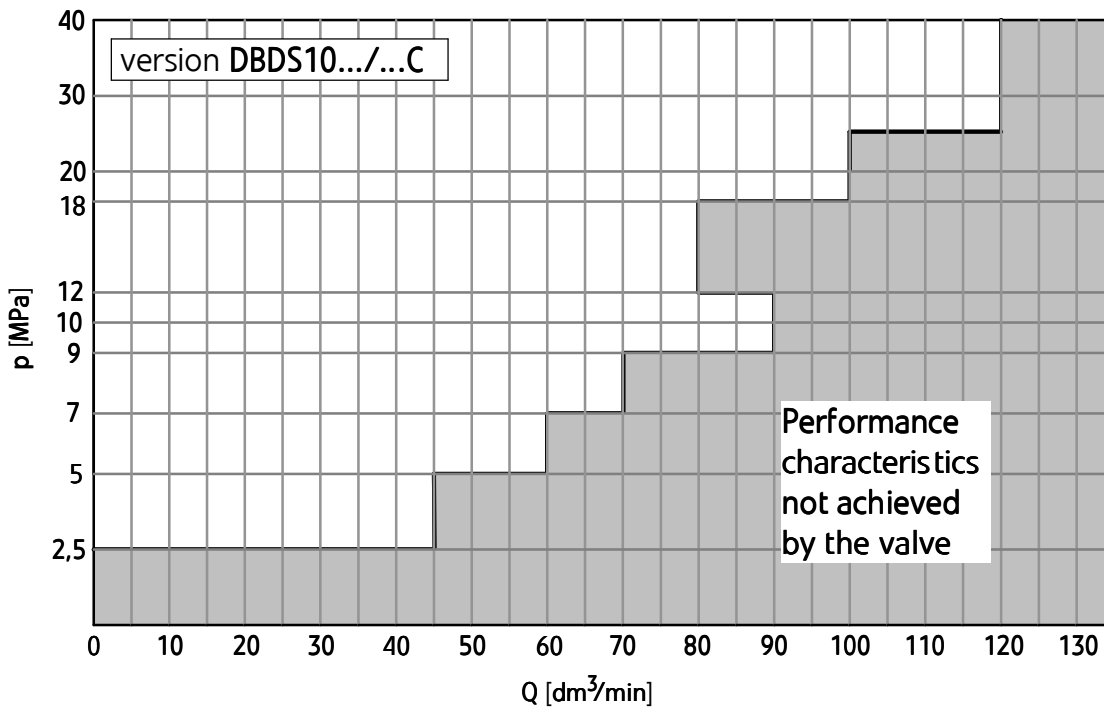


## PERFORMANCE CURVES

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

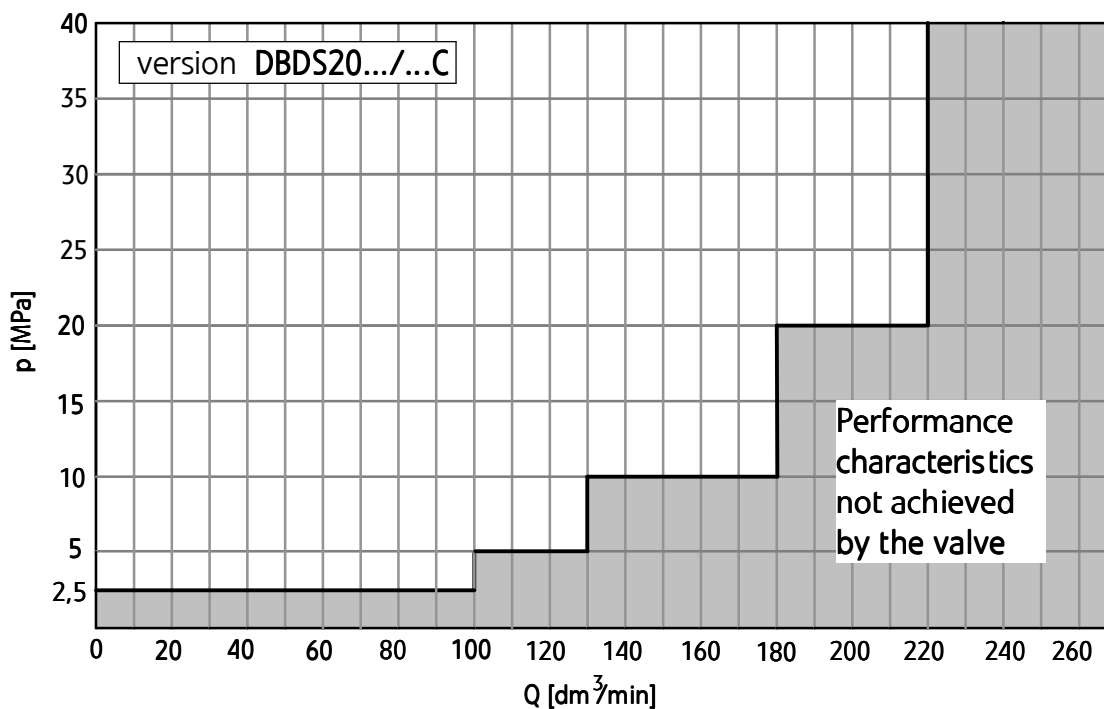
### Performance characteristics p-Q for valves NS10

(max discharge capacity of the valve for various pressures of adjustment – operation area of the valve must be within the white area of the diagram)



### Performance characteristics p-Q for valves NS20

(max discharge capacity of the valve for various pressures of adjustment – operation area of the valve must be within the white area of the diagram)



## HOW TO ORDER

<b>DBD</b>	<b>S</b>			/		<b>C</b>
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**Adjustment element  
set screw**

(adjustment element set and plumbed at required pressure)

= **S**

**Nominal size (NS)**

**NS6**

= **6**

**NS10**

= **10**

**NS20**

= **20**

**Type of connection**

**cartridge mounting**

= **K**

**for threaded connection**

= **G**

**for subplate mounting**

= **P**

**Series number**

(10-19) - connection and installation dimensions unchanged

= **1X**

**series 13**

= **13**

**Pressure setting**

required cracking pressure of the valve should be specified

**Sealing**

**NBR** (for fluids on mineral oil base)

= **no designation**

**FKM** (for fluids on phosphate ester base)

= **V**

**NOTES:**

The valve should be ordered according to the above coding.

• Safety valves type **DBDS.../...C** are designed for hydraulic fluid in the form of mineral oil type HLP40 + HLP60 (50% / 50%) i.e. for fluid in **group 2** in accordance with **article 13** of the **directive 2014/68/UE**.

• **Drain hose must not be charged under pressure (free fluid drain to the tank).**

Coding example: DBD S6 K 13/330 C

## Valves type DBD... as safety valves with unloading DBDPS(PH)...6/...C and DBDPS(PH)...10/...C with CE certification in accordance with pressure directive 2014/68/UE

### APPLICATION

Safety valves type DBDPS(PH).../...C are used as an end device protecting against excessive pressure in protected system (mostly in hydraulic accumulator).



### DESCRIPTION OF OPERATION

Safety valves type DBDPS(PH).../...C consist of an adjustment set and plumbed at required pressure which additionally allows to unload entirely the system (mostly of hydraulic accumulator). It is impossible to increase set pressure. The pressure can be, however, decreased without damaging plumb. Depending on adjustment method, safety valves type...can be produced in the

following versions: with set screw – version DBDPS.../...C or with rotary knob – version DBDPH.../...C. The valves can also have the following type of connection:

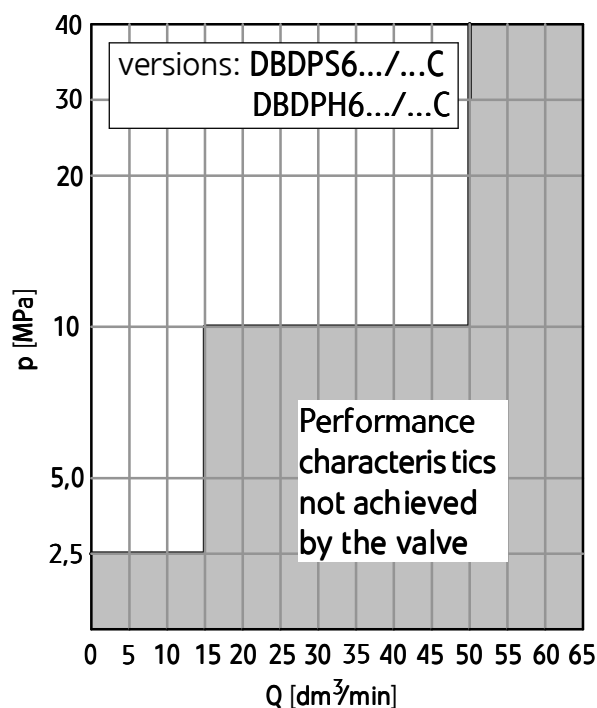
- for cartridge mounting – version DBDPS(PH)...K.../...C
- for subplate mounting – version DBDPS(PH)...P.../...C
- for threaded connections – version DBDPS(PH)...G.../...C

### PERFORMANCE CURVES

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

#### Performance characteristics p-Q for valves NS6

(max discharge capacity of the valve for various pressures of adjustment – operation area of the valve must be within the white area of the diagram)

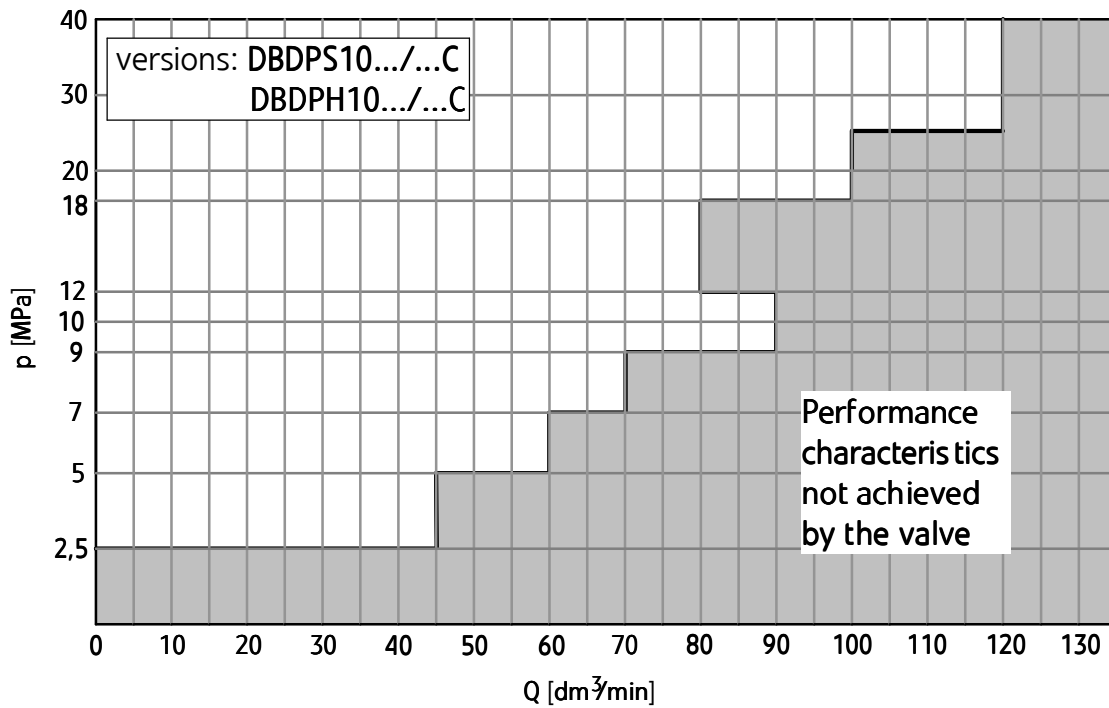


## PERFORMANCE CURVES

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

### Performance characteristics p-Q for valves NS10

(max discharge capacity of the valve for various pressures of adjustment – operation area of the valve must be within the white area of the diagram)



## HOW TO ORDER

<b>DBD</b>				/		<b>C</b>
<b>Adjustment element</b> <b>set screw</b> = <b>PS</b> <b>rotary knob</b> = <b>PH</b>						
<b>Nominal size (NS)</b> <b>NS6</b> = <b>6</b> <b>NS10</b> = <b>10</b>						
<b>Type of connection</b> <b>cartridge mounting</b> = <b>K</b> <b>for threaded connection</b> = <b>G</b> <b>for subplate mounting</b> = <b>P</b>						
<b>Series number</b> (10-19) - connection and installation dimensions unchanged = <b>1X</b> <b>series 13</b> = <b>13</b>						
<b>Pressure setting</b> required cracking pressure of the valve should be specified						
<b>Sealing</b> <b>NBR</b> (for fluids on mineral oil base) = <b>no designation</b> <b>FKM</b> (for fluids on phosphate ester base) = <b>V</b>						

### NOTES:

The valve should be ordered according to the above coding.

- Safety valves type **DBDPS (PH)...**/**...****C** are designed for hydraulic fluid in the form of mineral oil type HLP40 + HLP60 (50% / 50%) i.e. for fluid in **group 2** in accordance with **article 13** of the **directive 2014/68/UE**.
- **Drain hose must not be charged under pressure (free fluid drain to the tank).**

Coding example: DBD PS 6 K 13/330 C

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