

## Pressure relief valve, direct operated

### Type DBD



- ▶ Size 6 ... 30
- ▶ Component series 1X
- ▶ Maximum operating pressure 630bar [9150 psi]
- ▶ Maximum flow 330 l/min [87 US gpm]

### Features

- ▶ As screw-in cartridge valve (cartridge)
- ▶ For threaded connection
- ▶ For subplate mounting
- ▶ Adjustment types for pressure adjustment, optionally:
  - Bushing with hexagon and protective cap
  - Rotary knob
  - Hand wheel
  - Lockable rotary knob

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## Ordering code

01	02	03	04	05	06	07	08	09	10
DBD				1X	/				*

01	Pressure relief valve, direct operated	DBD
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## Adjustment type for pressure adjustment

02		NG6	NG8	NG10	NG15	NG20	NG25	NG30	
	Bushing with hexagon and protective cap	✓	✓	✓	✓	✓	✓	✓	S
	Rotary knob <sup>1)</sup>	✓	✓	✓	✓	✓	-	-	H
	Hand wheel <sup>2)</sup>	-	-	-	-	-	✓	✓	H
	Lockable rotary knob <sup>1; 3; 4)</sup>	✓	✓	✓	✓	✓	-	-	A

03		
	Size 6 (port G1/4)	6
	Size 8 (port G3/8)	8
	Size 10 (port G1/2)	10
	Size 15 (port G3/4)	15
	Size 20 (port G1)	20
	Size 25 (port G1 1/4)	25
	Size 30 (port G1 1/2)	30

## Type of connection

04		NG6	NG8	NG10	NG15	NG20	NG25	NG30	
	As screw-in cartridge valve (cartridge)	✓	-	✓	-	✓	-	✓	K
	For threaded connection <sup>5)</sup>	✓	✓	✓	✓	✓	✓	✓	G
	For subplate mounting	✓	-	✓	-	✓	-	✓	P

05	Component series 10 ... 1Z (10 ... 1Z: unchanged installation and connection dimensions)	1X
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Pressure rating <sup>6)</sup>

06		NG6	NG8	NG10	NG15	NG20	NG25	NG30	
	Set pressure up to 25 bar [362 psi]	✓	✓	✓	✓	✓	✓	✓	25
	Set pressure up to 50 bar [725 psi]	✓	✓	✓	✓	✓	✓	✓	50
	Set pressure up to 100 bar [1450 psi]	✓	✓	✓	✓	✓	✓	✓	100
	Set pressure up to 200 bar [2900 psi]	✓	✓	✓	✓	✓	✓	✓	200
	Set pressure up to 315 bar [4568 psi]	✓	✓	✓	✓	✓	✓	✓	315
	Set pressure up to 400 bar [5800 psi]	✓	✓	✓	✓	✓	-	-	400
	Set pressure up to 630 bar [9150 psi] <sup>7)</sup>	-	-	✓	-	-	-	-	630

## Seal material

07		
	NBR seals	no code
	FKM seals	V
	Observe compatibility of seals with hydraulic fluid used! (Other seals upon request)	

## Line connection


08		
	Pipe thread according to ISO 228/1	no code
	SAE thread	12

## Equipment Directive

09		
	Without type-examination procedure	no code
	Type-examination tested safety valve according to PED 2014/68/EU <sup>8)</sup>	E

10	For further information, see the plain text	
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Explanation of the footnotes see page 3.

 **Notice:** Preferred types and standard units are contained in the EPS (standard price list).

## Ordering code

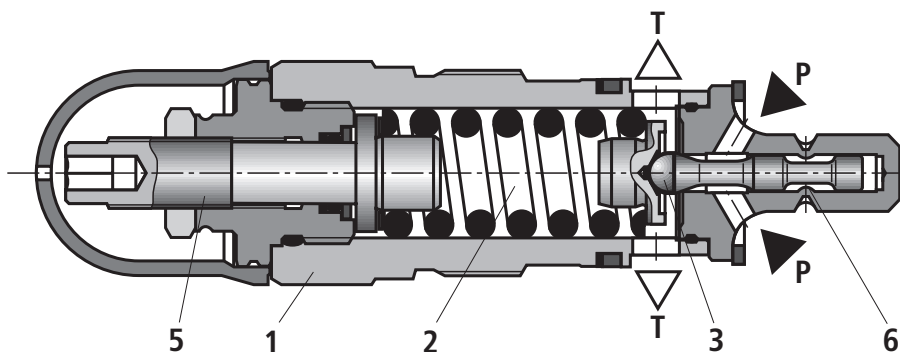
- 1) With size 20, only available for the pressure ratings 25, 50 or 100 bar.
- 2) Only available for the pressure ratings 25, 50 or 100 bar.
- 3) Key with material no. **R900008158** is included in the scope of delivery.
- 4) Not available for type-examination tested safety valves.
- 5) Not available for type-examination tested safety valves of size 8, 15 and 25.
- 6) When selecting the pressure rating, please observe the characteristic curves and notes on page 5.
- 7) With version "G" and "P", only available as "SO292", see page 6 and 9.
- 8) See ordering code on page 11.

## Function, section, symbol

Pressure relief valves of type DBD are direct operated seat valves. They are used for limiting a system pressure. The valves basically consist of sleeve (1), spring (2), poppet with damping piston (3) (pressure rating 25 ... 400 bar) or ball (4) (pressure rating 630 bar) and adjustment type (5). The system pressure can be set steplessly via the adjustment type (5). The spring (2) pushes the poppet (3) or the ball (4) onto the seat. Channel P is connected to the system. The pressure existing in the system acts on the poppet surface (or the ball).

If the pressure in channel P exceeds the value set at the spring (2), the poppet (3) or the ball (4) opens against the spring (2). Now, hydraulic fluid from channel P flows into channel T. The stroke of the poppet (3) is limited by the embossing (6).

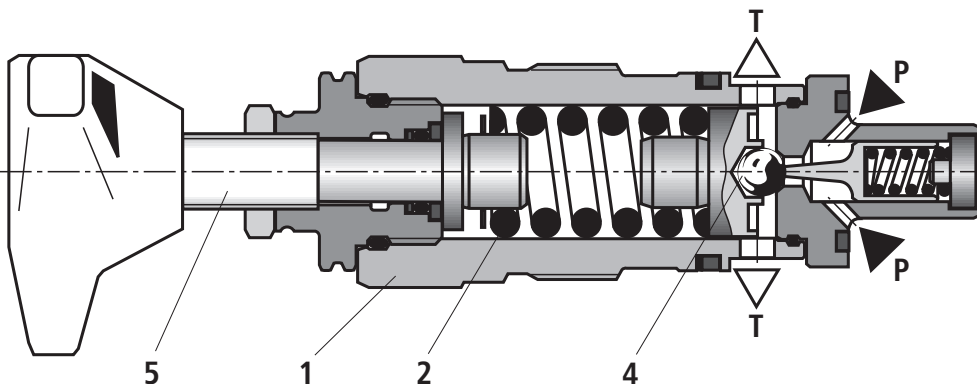
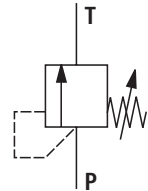
In order to achieve good pressure adjustment over the entire pressure range, the entire pressure range has been divided into 7 pressure ratings. One pressure rating corresponds to a certain spring for a maximum operating pressure that can be set by means of that spring.



### Type DBDS..K1X/...

Version pressure rating 25 ... 400 bar (poppet seat valve)

### Symbol



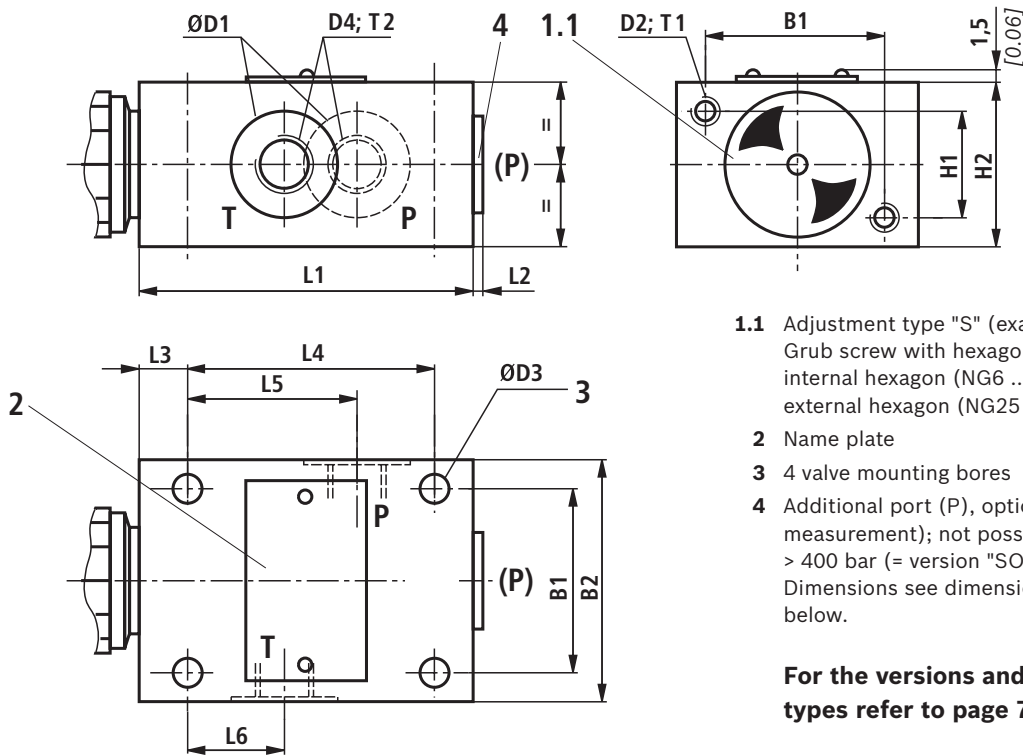
### Type DBDH 10 K1X/...

Version pressure rating 630 bar (ball seat valve, only NG10)

#### Notes:

- The adjustment type (5) is constructed so that it cannot be lost. Due to the gimbal-mounting, the adjustment element remains loose (movable) in the adjustment type (5) in case of complete unloading.
- Pressure rating "25": If despite completely unloaded adjustment type, the minimum pressure does not settle, the adjustment element has to be "pulled back" to the stop due to the low spring and/or restoring force.
- For pressure adjustment / increase, the adjustment element can then be screwed in again.

**Dimensions:** Threaded connection  
(dimensions in mm [inch])



- 1.1** Adjustment type "S" (example)  
Grub screw with hexagon and protective cap;  
internal hexagon (NG6 ... NG20)  
external hexagon (NG25 and 30)
- 2** Name plate
- 3** 4 valve mounting bores
- 4** Additional port (P), optional (e.g. for pressure measurement); not possible for NG10 and pressure rating > 400 bar (= version "SO292").  
Dimensions see dimensions D4, tightening torque see table below.

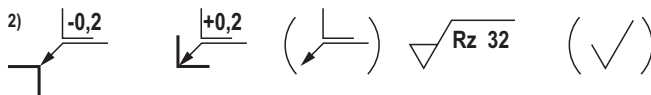
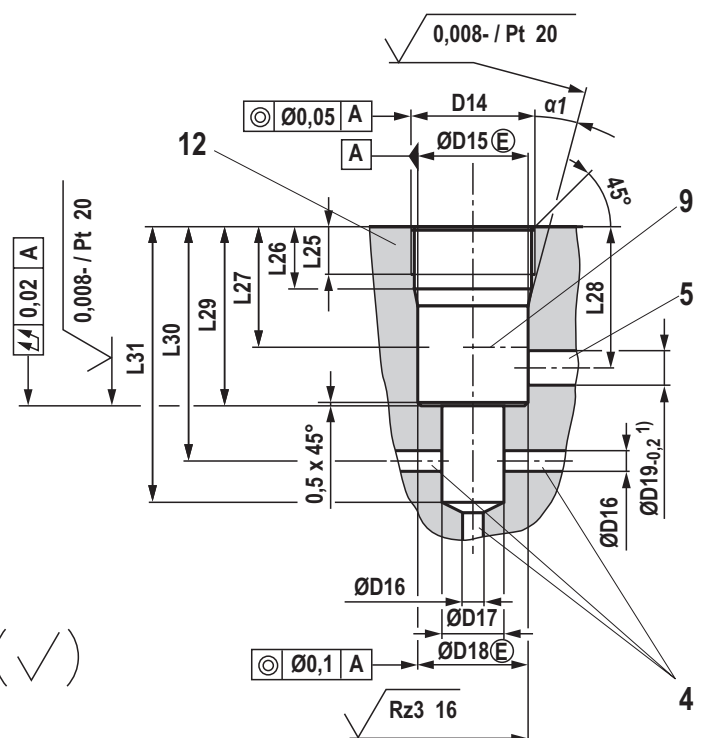
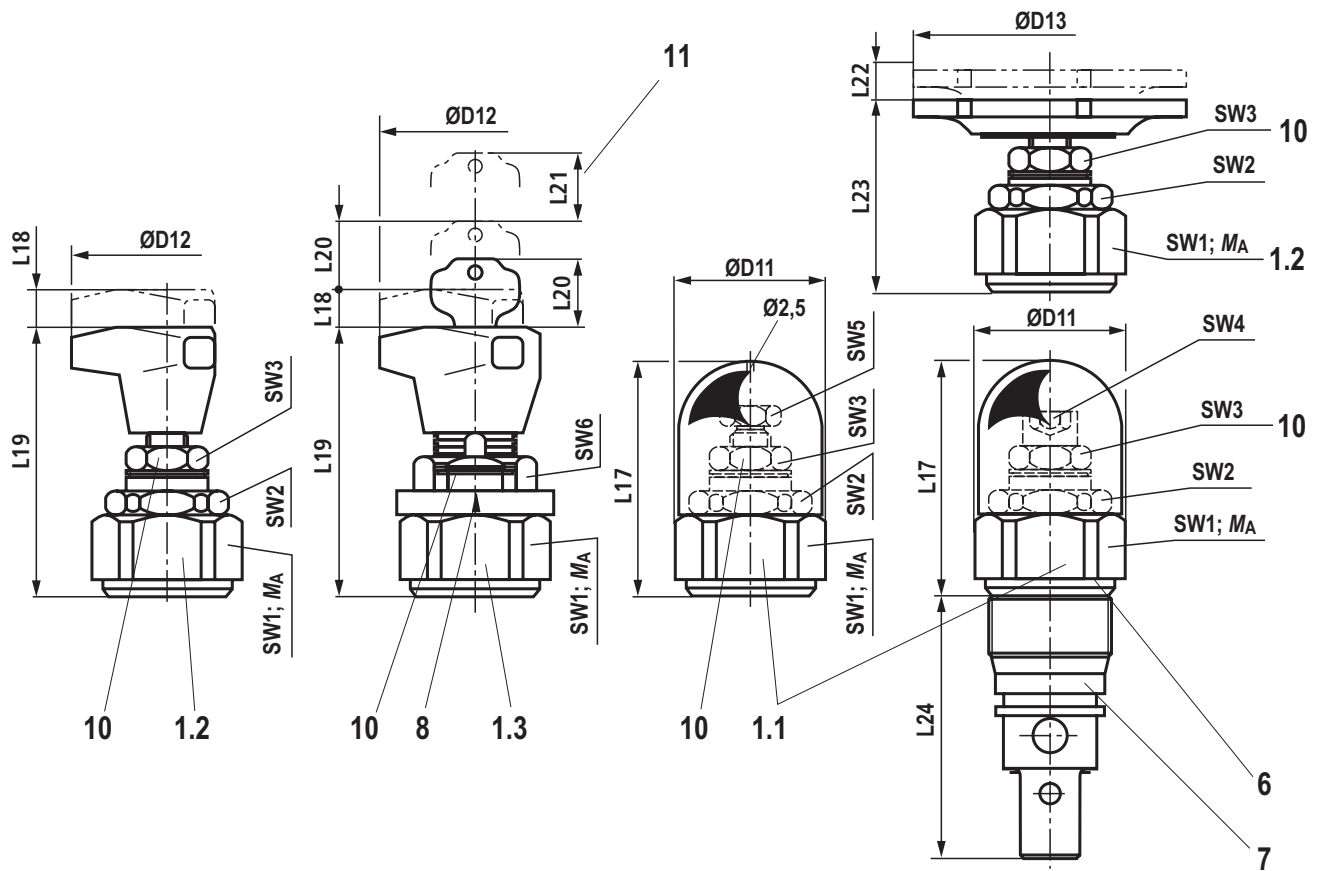
**For the versions and dimensions of the adjustment types refer to page 7 and 8.**

NG	B1	B2	ØD1	D2	ØD3	D4	Tightening torques $M_A$ in Nm [ft-lbs] for fittings <sup>1)</sup>	
							Plug screw (4)	Pipe fittings
6	45 [1.77]	60 [2.36]	25 [0.98]	M6	6.6 [0.26]	G1/4	30 [22]	60 [44]
8	60 [2.36]	80 [3.15]	28 [1.10]	M8	9 [0.35]	G3/8	40 [29]	90 [66]
10	60 [2.36]	80 [3.15]	34 [1.34]	M8	9 [0.35]	G1/2	60 [44]	130 [95]
15	70 [2.76]	100 [3.94]	42 [1.65]	M8	9 [0.35]	G3/4	80 [59]	200 [147]
20	70 [2.76]	100 [3.94]	47 [1.85]	M8	9 [0.35]	G1	135 [99]	380 [280]
25	100 [3.94]	130 [5.12]	56 [2.21]	M10	11 [0.43]	G1 1/4	480 [354]	500 [368]
30	100 [3.94]	130 [5.12]	65 [2.56]	M10	11 [0.43]	G1 1/2	560 [413]	600 [442]

NG	H1	H2	L1	L2	L3	L4	L5	L6	T1	T2	Weight, approx. in kg [lbs]
6	25 [0.98]	40 [1.57]	80 [3.15]	4 [0.16]	15 [0.59]	55 [2.17]	40 [1.57]	20 [0.79]	10 [0.39]	12 [0.47]	1.5 [3.3]
8	40 [1.57]	60 [2.36]	100 [3.94]	4 [0.16]	20 [0.79]	70 [2.76]	48 [1.89]	21 [0.83]	15 [0.59]	12 [0.47]	3.7 [8.2]
10	40 [1.57]	60 [2.36]	100 [3.94]	4 [0.16]	20 [0.79]	70 [2.76]	48 [1.89]	21 [0.83]	15 [0.59]	14 [0.55]	3.7 [8.2]
15	50 [1.97]	70 [2.76]	135 [5.32]	4 [0.16]	20 [0.79]	100 [3.94]	65 [2.56]	34 [1.34]	18 [0.71]	16 [0.63]	6.4 [14.1]
20	50 [1.97]	70 [2.76]	135 [5.32]	5.5 [0.22]	20 [0.79]	100 [3.94]	65 [2.56]	34 [1.34]	18 [0.71]	18 [0.71]	6.4 [14.1]
25	60 [2.36]	90 [3.54]	180 [7.09]	5.5 [0.22]	25 [0.98]	130 [5.12]	85 [3.35]	35 [1.38]	20 [0.79]	20 [0.79]	13.9 [30.6]
30	60 [2.36]	90 [3.54]	180 [7.09]	5.5 [0.22]	25 [0.98]	130 [5.12]	85 [3.35]	35 [1.38]	20 [0.79]	22 [0.87]	13.9 [30.6]

<sup>1)</sup> The tightening torques are guidelines, referring to the maximum operating pressure and when using a manual torque wrench (tolerance ±10%).

**Dimensions:** Screw-in cartridge valve  
(dimensions in mm [inch])



1) Maximum dimension  
2) All seal ring insertion faces are rounded and free of burrs  
Tolerance for all angles  $\pm 0,5^\circ$

Dimensional tables and item explanations see page 8.

## Dimensions: Screw-in cartridge valve (dimensions in mm [inch])

### Screw-in cartridge valve

NG	ØD11	ØD12	ØD13	L17	L18	L19	L20	L21	L22	L23	L24
6	34 [1.34]	60 [2.36]	–	72 [2.83]	11 [0.43]	83 [3.26]	28 [1.10]	20 [0.79]	–	–	64.5 [2.54]
10	38 [1.50]	60 [2.36]	–	68 [2.68]	11 [0.43]	79 [3.11]	28 [1.10]	20 [0.79]	–	–	77 [3.03]
20	48 [1.89]	60 [2.36]	–	65 [2.56]	11 [0.43]	77 [3.03]	28 [1.10]	20 [0.79]	–	–	106 [4.17]
30	63 [2.48]	–	80 [3.15]	83 [3.26]	–	–	–	–	11 [0.43]	56 [2.21]	131 [5.16]

NG	SW1	SW2	SW3	SW4	SW5	SW6	Tightening torques $M_A$ in Nm [ft-lbs] for screw-in cartridge valves <sup>2)</sup>			Weight, approx. in kg [lbs]
							Pressure rating in bar [psi]			
							up to 200 [2900]	up to 400 [5800]	up to 630 [9150]	
6	32	30	19	6	–	30	50±5 [37±3.7]	80±5 [59±4]	–	0.4 [0.88]
10	36	30	19	6	–	30	100±5 [74±3.5]	150±10 [110±3.5]	200±10 [148±7.5]	0.5 [1.10]
20	46	36	19	6	–	30	150±10 [111±7.5]	300±15 [221±11]	–	1 [2.21]
30	60	46	19	–	13	–	350±20 [258±19.5]	500±30 [369±22]	–	2.2 [4.85]

<sup>2)</sup> The tightening torques are guidelines with a friction coefficient  $\mu_{\text{total}} = 0.12$  and when using a manual torque wrench.

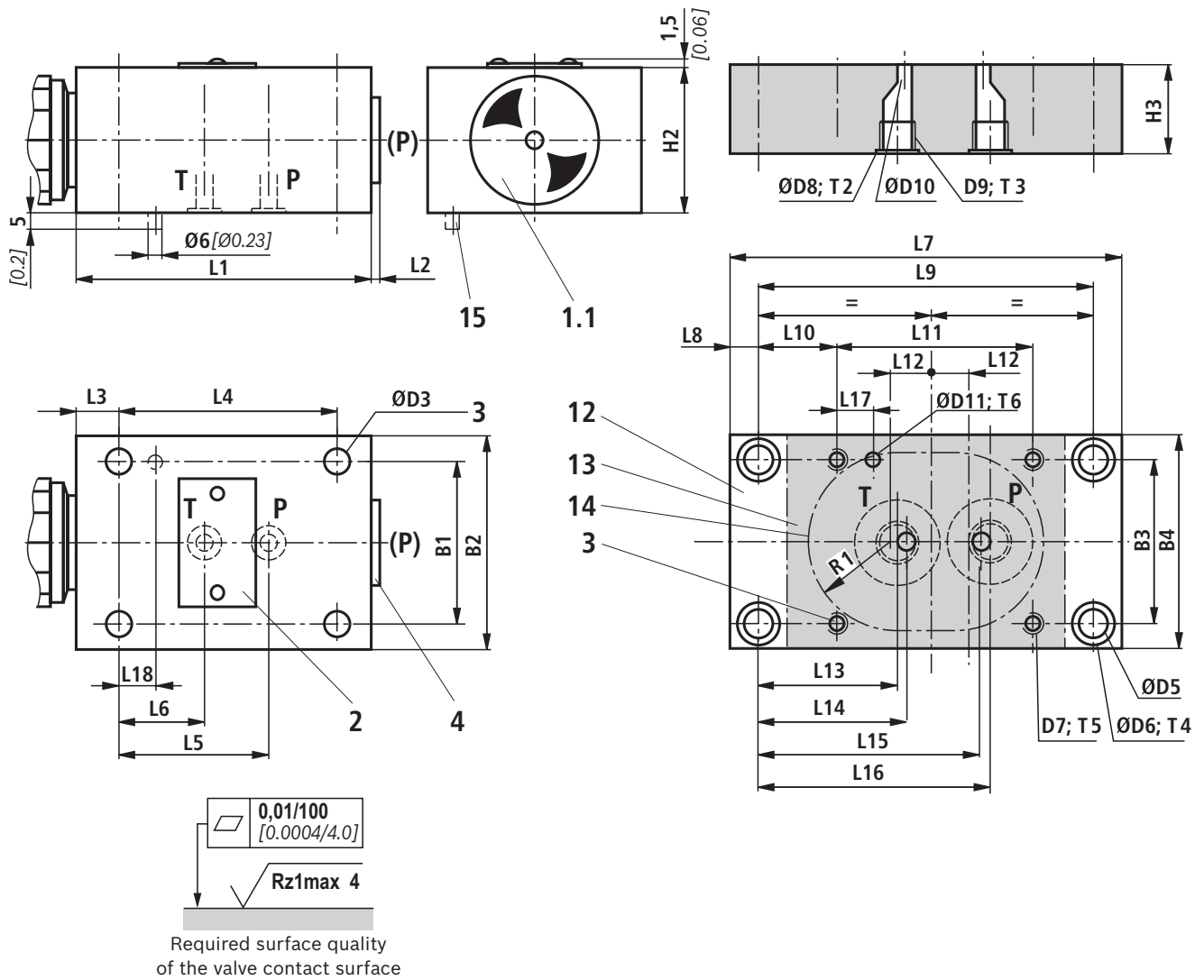
### Mounting cavity

NG	D14	ØD15	ØD16	ØD17	ØD18		ØD19
6	M28 x 1.5	25H9 [0.9843+0.002]	6 [0.24]	15 [0.59]	24.9 <sup>+0.152</sup> –0.2	[0.9803] <sup>[+0.006]</sup> [0.00786]	12 [0.47]
10	M35 x 1.5	32H9 [1.2598+0.0024]	10 [0.39]	18.5 [0.73]	31.9 <sup>+0.162</sup> –0.2	[1.2559] <sup>[+0.0064]</sup> [–0.0079]	15 [0.59]
20	M45 x 1.5	40H9 [1.5748+0.0024]	20 [0.79]	24 [0.95]	39.9 <sup>+0.162</sup> –0.2	[1.5709] <sup>[+0.0063]</sup> [–0.0079]	22 [0.87]
30	M60 x 2	55H9 [2.1654+0.0029]	30 [1.18]	38.75 [1.53]	54.9 <sup>+0.174</sup> –0.2	[2.1614] <sup>[+0.0069]</sup> [–0.0079]	34 [1.34]

NG	L25	L26	L27	L28	L29	L30	L31	α1
6	15 [0.59]	19 [0.75]	30 [1.18]	36 [1.42]	45 [1.77]	56,5±5,5 [2.22±0.217]	65 [2.56]	15°
10	18 [0.71]	23 [0.91]	35 [1.38]	41.5 [1.63]	52 [2.05]	67.5±7.5 [2.66±0.295]	80 [3.15]	15°
20	21 [0.83]	27 [1.06]	45 [1.77]	55 [2.17]	70 [2.76]	91.5±8.5 [3.60±0.335]	110 [4.33]	20°
30	23 [0.91]	29 [1.14]	45 [1.77]	63 [2.48]	84 [3.31]	113.5±11.5 [4.47±0.453]	140 [5.51]	20°

- |   |   |
|---|---|
| <p><b>1.1</b> Adjustment type "S" – Grub screw with hexagon and protective cap; internal hexagon (NG6 ... NG20), external hexagon (NG30)</p> <p><b>1.2</b> Adjustment type "H" – rotary knob (NG6 ... NG20), hand wheel (NG30)</p> <p><b>1.3</b> Adjustment type "A" – lockable rotary knob NG6 ... NG10 (NG20 up to 100 bar [1450 psi])</p> <p><b>4</b> Port P, at any place at the circumference or at the front side</p> <p><b>5</b> Port T, at any place at the circumference</p> <p><b>6</b> Type designation</p> <p><b>7</b> Pressure rating (stamped in)</p> | <p><b>8</b> Marking (adjustment of the zero position after the valve has been screwed in; then fixing of the ring by horizontal shifting until it engages on the plug screw SW6).</p> <p><b>9</b> Depth of fit</p> <p><b>10</b> Lock nut, tightening torque <math>M_A = 10^{+5}</math> Nm [7.4<sup>+3.7</sup> ft-lbs]</p> <p><b>11</b> Space required to remove the key</p> <p><b>12</b> Minimum stability of the housing materials, see Technical data page 4.</p> |
|---|---|

**Dimensions:** Subplate mounting  
(dimensions in mm [inch])



- 1.1 Adjustment type "S" (example)  
Grub screw with hexagon and protective cap;  
internal hexagon (NG6 ... NG20), external hexagon (NG30)
- 2 Name plate
- 3 4 valve mounting bores
- 4 Additional port (P), optional (e.g. for pressure measurement); not possible for NG10 and pressure rating > 400 bar (= version "SO292"). Tightening torques see dimensional table on page 6)
- 12 Subplate (type designation see table on page 10)
- 13 Valve contact surface
- 14 Front panel break-through
- 15 Locking pin (only with type-examination tested safety valves)

**For reasons of stability, exclusively the following valve mounting screws may be used** (separate order):  
**4 hexagon socket head cap screws ISO 4762 - f1Zn-240h-L<sup>1)</sup>**  
 (friction coefficient  $\mu_{total} = 0.09 \dots 0.14$ )

NG	Dimension	Property class	$M_A$ in Nm [ft-lbs] <sup>2)</sup>	Material number
6	M6 x 50	10.9	12.5 [9.2]	R913000151
10	M8 x 70	10.9	28 [20.7]	R913000149
20	M8 x 90	12.9	28 [20.7]	R913000150
30	M10 x 110	12.9	56 [41.3]	R913000148

**4 hexagon socket head cap screws UNC** upon request

<sup>1)</sup> As replacement, you can also use specified screws according to DIN 912.

<sup>2)</sup> For tightening, use a manual torque wrench with a tolerance  $\leq 10\%$ .

**For the versions and dimensions of the adjustment types refer to page 7 and 8.**

## Dimensions: Subplate mounting (dimensions in mm [inch])

### Pressure relief valve

NG	B1	B2	ØD3	H2	L1	L2	L3
6	45 [1.77]	60 [2.36]	6.6 [0.26]	40 [1.57]	80 [3.15]	4 [0.16]	15 [0.59]
10	60 [2.36]	80 [3.15]	9 [0.35]	60 [2.36]	100 [3.94]	4 [0.16]	20 [0.79]
20	70 [2.76]	100 [3.94]	9 [0.35]	70 [2.76]	135 [5.32]	5.5 [0.22]	20 [0.79]
30	100 [3.94]	130 [5.12]	11 [0.43]	90 [3.54]	180 [7.09]	5.5 [0.22]	25 [0.98]

NG	L4	L5	L6	L18	Port P	Weight, approx. in kg [lbs]
6	55 [2.17]	40 [1.57]	20 [0.79]	15 [0.59]	G1/4	1.5 [3.3]
10	70 [2.76]	45 [1.77]	21 [0.83]	15 [0.59]	G1/2	3.7 [8.2]
20	100 [3.94]	65 [2.56]	34 [1.34]	15 [0.59]	G3/4	6.4 [14.1]
30	130 [5.12]	85 [3.35]	35 [1.37]	15 [0.59]	G1 1/4	13.9 [30.6]

### Subplates

NG	Type	B3	B4	ØD5	ØD6	D7	ØD8	D9
6	G300/01 [G300/12]	45 [1.77]	60 [2.36]	6.6 [0.26]	11 [0.43]	M6 [1/4-20 UNC]	25 [0.98]	G1/4 [SAE 4; 7/16-20]
10	G661//01	60 [2.36]	80 [3.15]	6.6 [0.26]	11 [0.43]	M8	25 [0.98]	G3/8
	G662/01	60 [2.36]	80 [3.15]	6.6 [0.26]	11 [0.43]	M8	34 [1.34]	G1/2
20	G303/01	70 [2.76]	100 [3.94]	11 [0.43]	18 [0.71]	M8	42 [1.65]	G3/4
	G304/01	70 [2.76]	100 [3.94]	11 [0.43]	18 [0.71]	M8	47 [1.85]	G1
30	G305/01	100 [3.94]	130 [5.12]	11 [0.43]	18 [0.71]	M10	56 [2.20]	G1 1/4
	G306/01	100 [3.94]	130 [5.12]	11 [0.43]	18 [0.71]	M10	65 [2.56]	G1 1/2

NG	ØD10	ØD11	H3	L7	L8	L9	L10	L11	L12
6	6 [0.24]	8 [0.32]	25 [0.98]	110 [4.33]	8 [0.32]	94 [3.70]	22 [0.87]	55 [2.17]	10 [0.39]
10	10 [0.39]	8 [0.32]	25 [0.98]	135 [5.32]	10 [0.39]	115 [4.53]	27.5 [1.08]	70 [2.76]	12.5 [0.49]
	10 [0.39]	8 [0.32]	25 [0.98]	135 [5.32]	10 [0.39]	115 [4.53]	27.5 [1.08]	70 [2.76]	12.5 [0.49]
20	15 [0.59]	8 [0.32]	40 [1.57]	170 [6.69]	15 [0.59]	140 [5.51]	20 [0.79]	100 [3.94]	20 [0.79]
	20 [0.79]	8 [0.32]	40 [1.57]	170 [6.69]	15 [0.59]	140 [5.51]	20 [0.79]	100 [3.94]	20 [0.79]
30	30 [1.18]	8 [0.32]	40 [1.57]	190 [7.48]	12.5 [0.49]	165 [6.50]	17.5 [0.67]	130 [5.12]	22.5 [0.89]

NG	L13	L14	L15	L16	L17	T2	T3	T4	T5
6	39 [1.54]	42 [1.65]	62 [2.44]	65 [2.56]	15 [0.59]	1 [0.039]	15 [0.59]	9 [0.35]	15 [0.59]
10	40.5 [1.59]	48.5 [1.91]	72.5 [2.85]	80.5 [3.17]	15 [0.59]	1 [0.039]	15 [0.59]	9 [0.35]	12 [0.47]
	40.5 [1.59]	48.5 [1.91]	72.5 [2.85]	80.5 [3.17]	15 [0.59]	1 [0.039]	16 [0.63]	9 [0.35]	15 [0.59]
20	45 [1.77]	54 [2.13]	85 [3.35]	94 [3.70]	15 [0.59]	1 [0.039]	20 [0.79]	13 [0.51]	22 [0.87]
	42 [1.65]	54 [2.13]	85 [3.35]	97 [3.82]	15 [0.59]	1 [0.039]	20 [0.79]	13 [0.51]	22 [0.87]
30	42 [1.65]	52.5 [2.07]	102.5 [4.04]	113 [4.45]	15 [0.59]	1 [0.039]	24 [0.95]	11.5 [0.45]	22 [0.87]

NG	T6	R1	Weight, approx. in kg [lbs]
6	6 [0.24]	25 <sup>+2</sup> [0.98 <sup>+0.079</sup> ]	1.5 [3.3]
10	6 [0.24]	30 <sup>+5</sup> [1.18 <sup>+0.197</sup> ]	2 [4.4]
20	6 [0.24]	40 <sup>+3</sup> [1.57 <sup>+0.118</sup> ]	5.5 [12.1]
30	6 [0.24]	55 <sup>+4</sup> [2.16 <sup>+0.157</sup> ]	8 [17.6]

#### Notice:

The specified subplates are **not** approved for use with type-examination tested safety valve according to Pressure Equipment Directive 2014/68/EU!