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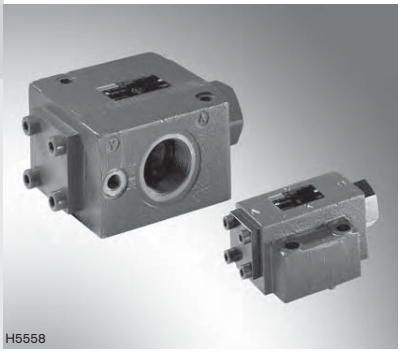


# Check valve hydraulically pilot operated

**RE 21468/07.05** 1/8
Replaces: 02.03

**Types SV and SL**

Nominal sizes 10 to 32
Component series 4X
Maximum operating pressure 315 bar
Maximum flow 550 l/min


H5558

## Overview of contents


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| Function, section | 3 |
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## Features

- For subplate mounting
- Connection location to ISO 5781
- Subplates to data sheet RE 45062 (separate order)
- For threaded connections
- With internal or external pilot oil drain, optional
- With or without decompression feature, optional
- Version with decompression feature for dampened decompression (minimising possible pressure shocks)
- 4 opening pressures, optional

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## Ordering details

| S | | | | | –4X/ | * |
|---|---|---|---|---|---|---|

Internal pilot oil drain = **V**
External pilot oil drain = **L**

| | Type SV | | Type SL | |
|---|---|---|---|---|
| Connection type | G | P | G | P |
| | Ordering details | | | |
| Nom. size 10 | **= 10** | **= 10** | **= 10** | **= 10** |
| Nom. size 16 | **= 15** | – | **= 15** | – |
| Nom. size 20 | **= 20** | **= 20** | **= 20** | **= 20** |
| Nom. size 25 | **= 25** | – | **= 25** | – |
| Nom. size 32 | **= 30** | **= 30** | **= 30** | **= 30** |

For subplate mounting = **P**
For threaded connections = **G**

With decompression feature = **A**
Without decompression feature = **B**

**1 =**
**2 =** See $\Delta p$-$q_V$-characteristic curves
**3 =** A to B,
**4 =** Pages 5 and 6

**Opening pressure**

**4X =** Component series 40 to 49 (40 to 49: unchanged installation and connection dimensions)

**No code =** NBR seals
**V =** FKM seals

**⚠ Attention!**
The compatibility of the seals and pressure fluid used has to be taken into account!

**Seal material**

Further details in clear text

## Preferred types

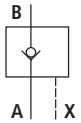
| Type SL | Material No. |
|---|---|
| SL 10 GA1-4X/ | R900483370 |
| SL 10 GB1-4X/ | R900451135 |
| SL 10 PA1-4X/ | R900483371 |
| SL 10 PB1-4X/ | R900443419 |
| SL 15 GA1-4X/ | R900587553 |
| SL 20 PA1-4X/ | R900587559 |
| SL 20 PB1-4X/ | R900599586 |
| SL 25 GA1-4X/ | R900587555 |
| SL 30 GA1-4X/ | R900587556 |
| SL 30 PA1-4X/ | R900587560 |

| Type SV | Material No. |
|---|---|
| SV 10 GA1-4X/ | R900483368 |
| SV 10 GB1-4X/ | R900453511 |
| SV 10 PA1-4X/ | R900483369 |
| SV 10 PB1-4X/ | R900467724 |
| SV 15 GA1-4X/ | R900587549 |
| SV 20 GA1-4X/ | R900587550 |
| SV 20 PA1-4X/ | R900587557 |
| SV 25 GA1-4X/ | R900587551 |
| SV 30 GA1-4X/ | R900587552 |
| SV 30 PA1-4X/ | R900587558 |

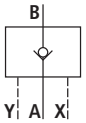
**Further preferred types and standard units can be found within the EPS (Standard Price List).**

## Symbols

**Version SV** (internal pilot oil drain)




**Version SL** (external pilot oil drain)




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## Function, section

The SV and SL valves are hydraulic pilot operated check valves of poppet type design which may be opened to permit flow in the reverse direction.

These valves are used for the isolation of operating circuits which are under pressure, i.e. as a safe guard against the lowering of a load when a line break occurs or against creeping movements of hydraulically locked actuators.

The valve basically comprises of the housing (1), the poppet (2), a compression spring (3), the control spool (4) as well as an optional decompression feature as a ball poppet valve (5).

**Type SV…**

The valve permits free-flow from A to B. In the reverse direction, the poppet (2) is held firmly on to its seat in addition to the spring force by the system pressure.

By applying pressure to connection X, the control spool (4) is moved to the right. This lifts poppet (2) off its seat. Now the valve also permits free-flow from B to A.

In order to ensure that the valve opens due to the pressure applied to the control spool (4), a certain minimum pilot pressure is required (see page 4).

**Types SV..A.. and SL..A..** (with decompression)

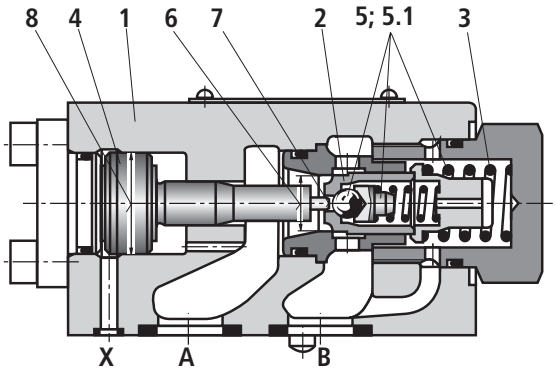
This valve is fitted with an additional decompression feature. When pressure is applied to port X, the control spool (4) is moved to the right. This firstly lifts the ball (5.1) and then the poppet (2) off their seats. The valve now permits flow from B to A.

Because of the decompression feature there is a dampened decompression of the pressurised fluid. Due to this possible pressure shocks are avoided.

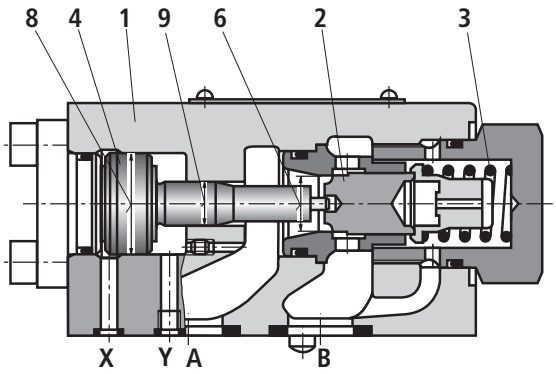
**Type SL...**

The function of this valve corresponds to that of the type SV.

The difference is the external Y connection. Here, the annular area of the control spool (4) is separated from the port A. Pressure present in port A only acts on area $A_4$ (9) of the control spool (4).




**Type SV..PA.-4X/...** (without pilot oil drain, with decompression)




**Type SL..PB.-4X/...** (with pilot oil drain, without decompression)

**6** Area $A_1$
**7** Area $A_2$
**8** Area $A_3$
**9** Area $A_4$

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## **Technical data** (for applications outside these parameters, please consult us!)

### General

| Nominal sizes | | | NS10 | NS16 | NS20 | NS25 | NS32 |
|---|---|---|---|---|---|---|---|
| Weight | – Subplate mounting | kg | 1.8 | | 4.7 | | 7.8 |
| | – Threaded connections | kg | 2.1 | 5.4 | 5.4 | 10 | 10 |
| Installation | | | Optional | | | | |
| Ambient temperature range | | °C | –30 to +80 (NBR seals)<br>–20 to +80 (FKM seals) | | | | |

### Hydraulic

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Maximum operating pressure | | bar | 315 | | | | |
| Maximum flow | | l/min | See characteristic curves, pages 5 and 6 | | | | |
| Control pressure | | bar | 5 to 315 | | | | |
| Pressure fluid | | | Mineral oil (HL, HLP) to DIN 51524 [1]; fast bio-degradable pressure fluids to VDMA 24568 (also see RE 90221); HETG (rape seed oil) [1]; HEPG (polyglycoles) [2]; HEES (synthetic ester) [2]; other pressure fluids on request | | | | |
| Pressure fluid temperature range | | °C | –30 to +80 (NBR seals)<br>–20 to +80 (FKM seals) | | | | |
| Viscosity range | | $mm^2/s$ | 2.8 to 500 | | | | |
| Maximum permissible degree of contamination of the pressure fluid. Cleanliness class ISO 4406 (c) | | | Class 20/18/15 [3] | | | | |
| Flow direction | | | Free-flow from A to B, from B to A when opened | | | | |
| Control volume | – Port X | $cm^3$ | 2.5 | 10.8 | 10.8 | 19.27 | 19.27 |
| | – Port Y (only type SL) | $cm^3$ | 2.0 | 9.6 | 9.6 | 17.5 | 17.5 |
| Control areas (areas according to sectional drawing, see page 3) | – Area $A_1$ | $cm^2$ | 1.33 | 3.46 | 3.46 | 5.72 | 5.72 |
| | – Area $A_2$ | $cm^2$ | 0.33 | 0.7 | 0.7 | 1.33 | 1.33 |
| | – Area $A_3$ | $cm^2$ | 3.8 | 10.17 | 10.17 | 16.61 | 16.61 |
| | – Area $A_4$ | $cm^2$ | 0.79 | 1.13 | 1.13 | 1.54 | 1.54 |

[1] Suitable for NBR and FKM seals

[2] Only suitable for FKM seals

[3] The cleanliness class stated for the components must be adhered too in hydraulic systems. Effective filtration prevents faults from occurring and at the same time increases the component service life.

For the selection of filters see catalogue sheets RE 50070, RE 50076, RE 50081, RE 50086 and RE 50088.

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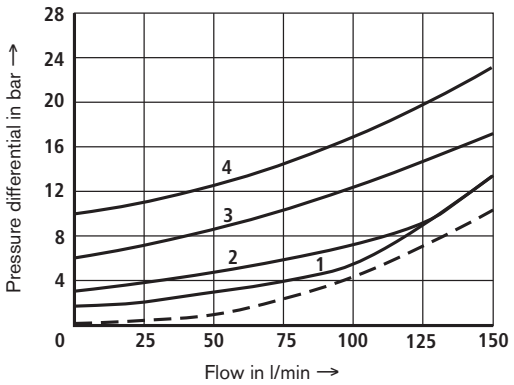
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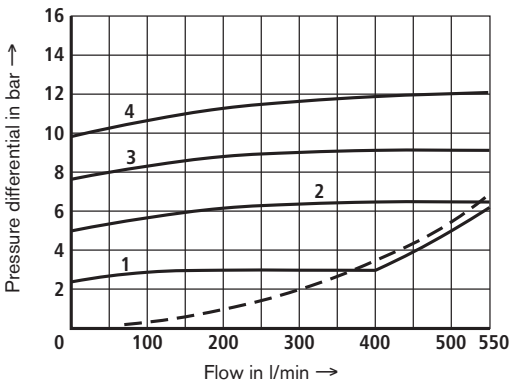
## Characteristic curves: subplate mounting (measured with HLP46, $\vartheta_{oil} = 40\ °C \pm 5\ °C$)

### $\Delta p$-$q_V$-characteristic curves

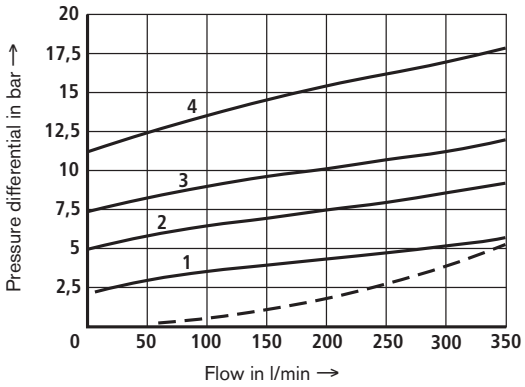
NS10




NS32




NS20



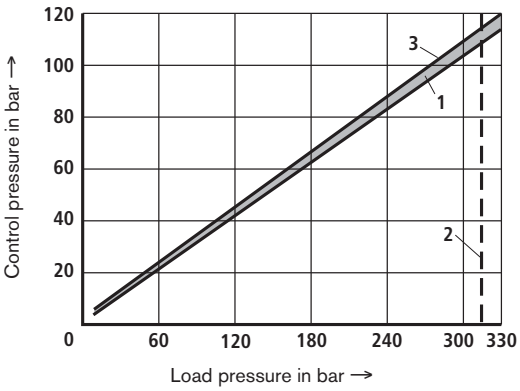

A to B — B to A

Opening pressure in bar

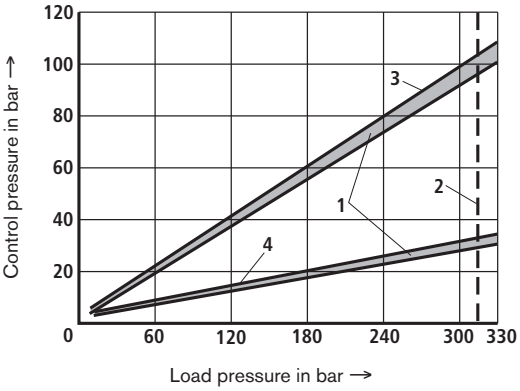
| | NS10 | NS20 | NS32 |
|---|---|---|---|
| 1 | 1.5 | 2.5 | 2.5 |
| 2 | 3 | 5 | 5 |
| 3 | 6 | 7.5 | 8 |
| 4 | 10 | 10 | 10 |

### Control pressure-load pressure-characteristic curves

**Without** decompression




**With** decompression




**1** Scatter range **2** Limiting value **3** Valve poppet **4** Decompression

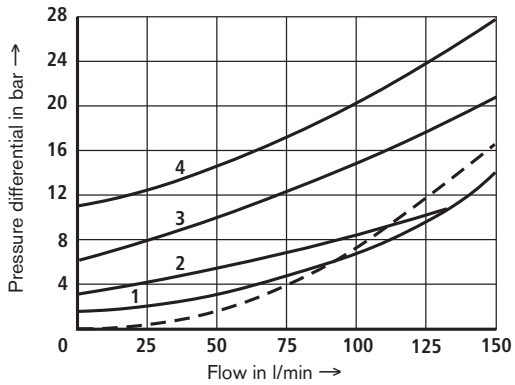
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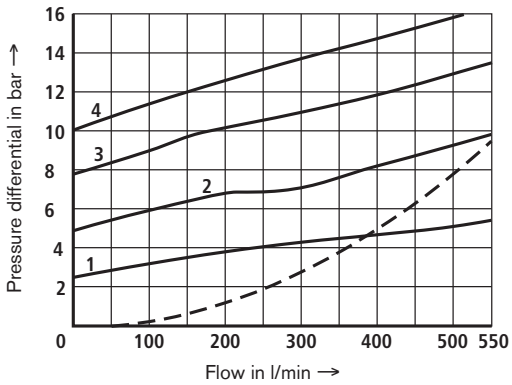
## **Characteristic curves:** threaded connections (measured with HLP46, $\vartheta_{oil} = 40\ °C \pm 5\ °C$)

### $\Delta p$-$q_V$-characteristic curves

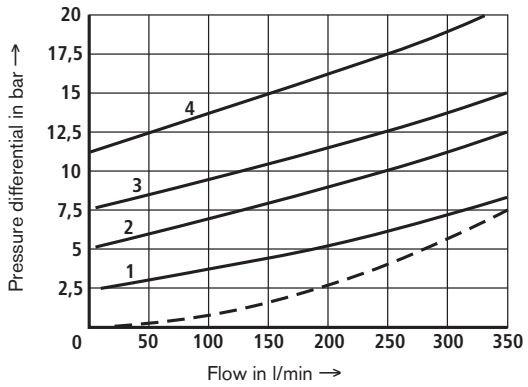
**NS10**




**NS25 and 32**




**NS16 and 20**



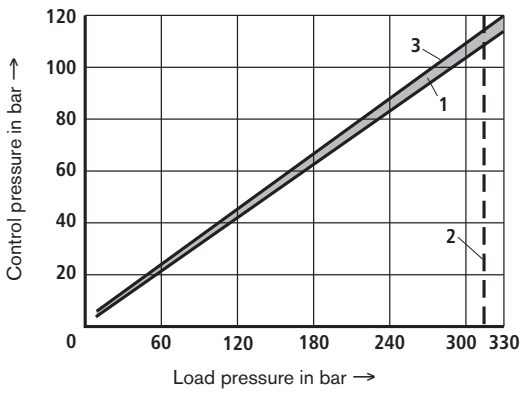

A to B — B to A

Opening pressure in bar

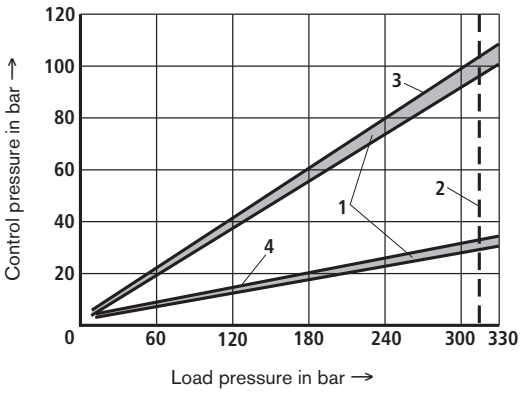
| | NS10 | NS16 and 20 | NS25 and 32 |
|---|---|---|---|
| 1 | 1.5 | 2.5 | 2.5 |
| 2 | 3 | 5 | 5 |
| 3 | 6 | 7.5 | 8 |
| 4 | 10 | 10 | 10 |

### Control pressure-load pressure-characteristic curves

**Without** decompression




**With** decompression

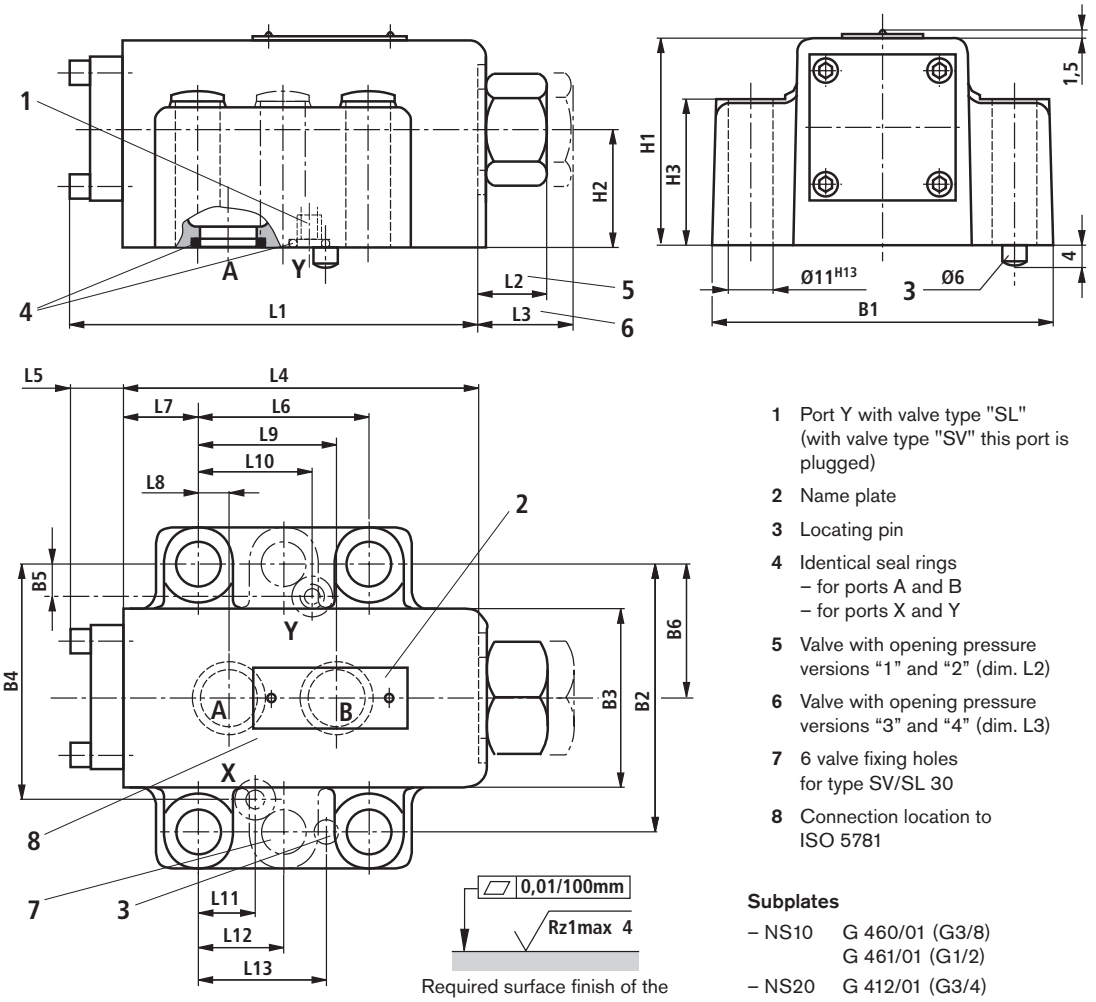



**1** Scatter range **2** Limiting value **3** Valve poppet **4** Decompression

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## Unit dimensions: subplate mounting (nominal dimensions in mm)




Required surface finish of the valve mounting surface

1 Port Y with valve type "SL" (with valve type "SV" this port is plugged)
2 Name plate
3 Locating pin
4 Identical seal rings
– for ports A and B
– for ports X and Y
5 Valve with opening pressure versions "1" and "2" (dim. L2)
6 Valve with opening pressure versions "3" and "4" (dim. L3)
7 6 valve fixing holes for type SV/SL 30
8 Connection location to ISO 5781

| Type | NS | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9 | L10 | L11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SV | 10 | 100,8 | 15,5 | 15,5 | 87,8 | 13 | 42,9 | 18,5 | 7,2 | 35,8 | – | 21,5 |
| | 20 | 135 | 17,7 | 47,7 | 117 | 18 | 60,3 | 27,5 | 11,1 | 49,2 | – | 20,6 |
| | 32 | 156,1 | 36,1 | 46,1 | 134 | 22,1 | 84,2 | 39 | 16,7 | 67,5 | – | 24,6 |
| SL | 10 | 100,8 | 15,5 | 15,5 | 87,8 | 13 | 42,9 | 18,5 | 7,2 | 35,8 | 21,5 | 21,5 |
| | 20 | 135 | 17,7 | 47,7 | 117 | 18 | 60,3 | 27,5 | 11,1 | 49,2 | 39,5 | 20,6 |
| | 32 | 156,1 | 36,1 | 46,1 | 134 | 22,1 | 84,2 | 39 | 16,7 | 67,5 | 59,5 | 24,6 |

| Type | NS | L12 | L13 | B1 | B2 | B3 | B4 | B5 | H1 | H2 | H3 | B6 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SV | 10 | – | 31,8 | 84 | 66,7 | 44 | 58,8 | – | 51 | 29 | 36 | 33,3 |
| | 20 | – | 44,5 | 100 | 79,4 | 61 | 73 | – | 70 | 37 | 55 | 39,7 |
| | 32 | 42,1 | 62,7 | 118 | 96,8 | 75 | 92,8 | – | 85 | 42,5 | 70 | 48,4 |
| SL | 10 | – | 31,8 | 84 | 66,7 | 44 | 58,8 | 7,9 | 51 | 29 | 36 | 33,3 |
| | 20 | – | 44,5 | 100 | 79,4 | 61 | 73 | 6,4 | 70 | 37 | 55 | 39,7 |
| | 32 | 42,1 | 62,7 | 118 | 96,8 | 75 | 92,8 | 3,8 | 85 | 42,5 | 70 | 48,4 |

**Subplates**

– NS10 G 460/01 (G3/8)
G 461/01 (G1/2)
– NS20 G 412/01 (G3/4)
G 413/01 (G1)
– NS32 G 414/01 (G1 1/4)
G 415/01 (G1 1/2)

to data sheet RE 45062 (separate order)

**Valve fixing screws**
(separate order)

– **NS10**
**4 off ISO 4762 - M10 x 50 - 10.9**
– **NS20**
**4 off ISO 4762 - M10 x 70 - 10.9**
– **NS32**
**6 off ISO 4762 - M10 x 85 - 10.9**

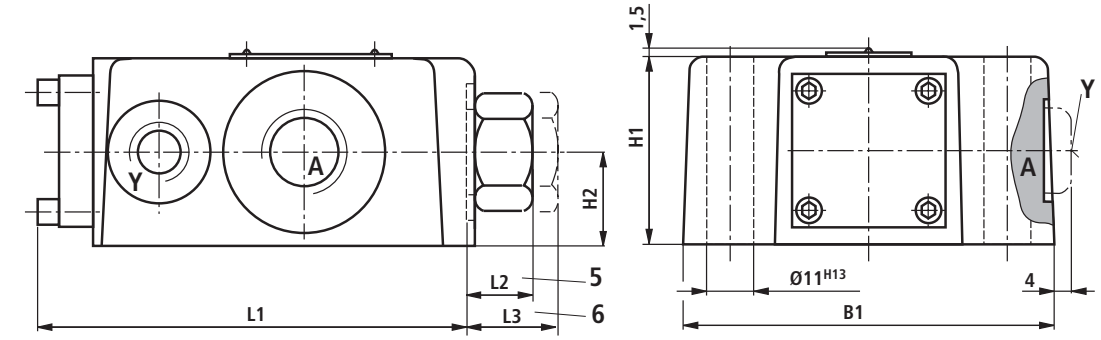
(friction value $\mu_{ges} = 0.14$);
Tightening torque $M_A = 75$ Nm ± 10%
(with changed surfaces please adapt)

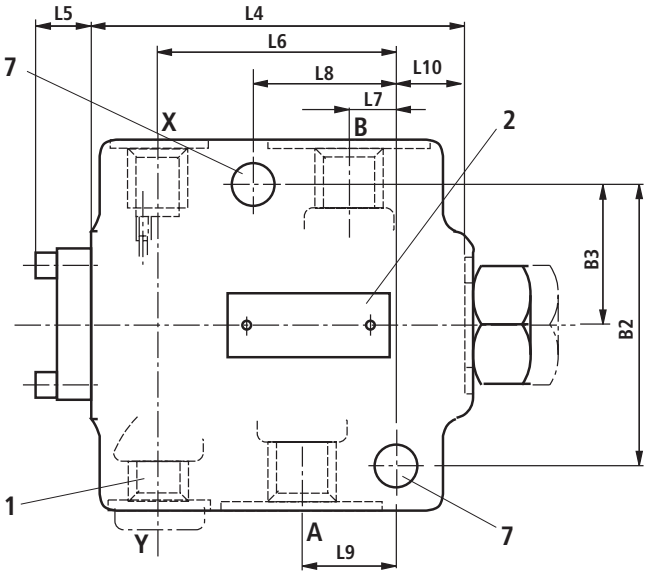
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## **Unit dimensions:** threaded connections (nominal dimensions in mm)




1 Port Y for valve type "SL" (for valve type "SV" this port is plugged)

2 Name plate

5 Valve with opening pressure versions “1” and “2” (dim. L2)

6 Valve with opening pressure versions “3” and “4” (dim. L3)

7 2 valve fixing holes

| Type | Ports NS | A, B | X, Y |
|---|---|---|---|
| SV | 10 | G1/2 | G1/4 |
| | 16 | G3/4 | |
| | 20 | G1 | |
| | 25 | G1 1/4 | |
| | 32 | G1 1/2 | |
| SL | 10 | G1/2 | G1/4 |
| | 16 | G3/4 | |
| | 20 | G1 | |
| | 25 | G1 1/4 | |
| | 32 | G1 1/2 | |

| Type | NS | L1 | L2 | L3 | L4 | L5 | L6 | L7 | L8 | L9 | L10 | B1 | B2 | B3 | H1 | H2 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SV | 10 | 100,8 | 15,5 | 15,5 | 87,8 | 13 | 56,5 | 10,5 | 33,5 | 22,5 | 17,3 | 87 | 66,7 | 33,4 | 44 | 22 |
| | 16, 20 | 133 | 17,7 | 47,7 | 115 | 18 | 74,5 | 17 | 50,5 | 36 | 27 | 105 | 79,4 | 39,7 | 68 | 34 |
| | 25, 32 | 156,1 | 35,7 | 45,7 | 134 | 22,1 | 101 | 24 | 84 | 49 | 18 | 130 | 96,8 | 48,4 | 85 | 42,5 |
| SL | 10 | 100,8 | 15,5 | 15,5 | 87,8 | 13 | 56,5 | 10,5 | 33,5 | 22,5 | 17,3 | 87 | 66,7 | 33,4 | 44 | 22 |
| | 16, 20 | 133 | 17,7 | 47,7 | 115 | 18 | 74,5 | 17 | 50,5 | 36 | 27 | 105 | 79,4 | 39,7 | 68 | 34 |
| | 25, 32 | 156,1 | 35,7 | 45,7 | 134 | 22,1 | 101 | 24 | 84 | 49 | 18 | 130 | 96,8 | 48,4 | 85 | 42,5 |

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