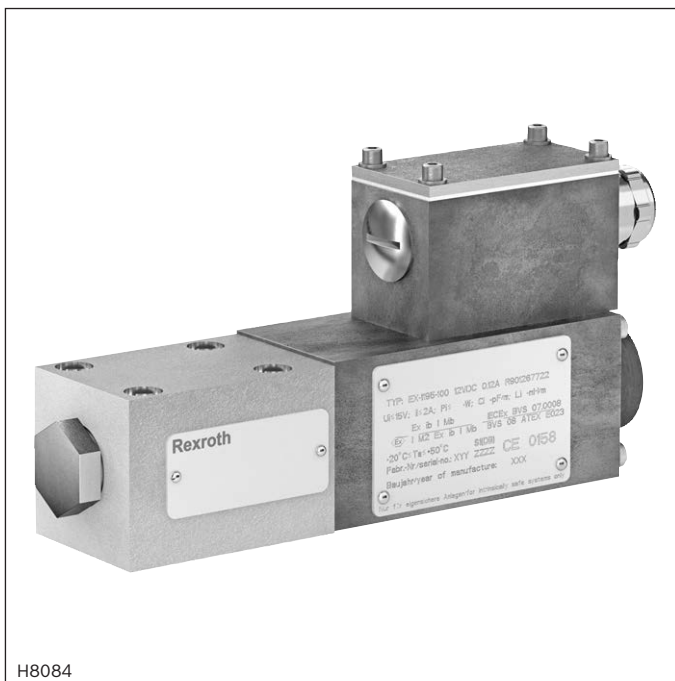


## Directional seat valves, direct operated, with solenoid actuation

## Type SE ...XH and SE ...XM



H8084

- ▶ Size 6
- ▶ Component series 6X
- ▶ Maximum operating pressure 420 bar
- ▶ Maximum flow 4 l/min



## ATEX units

### For potentially explosive atmospheres



**Information on explosion protection:**

- ▶ Area of application in accordance with the Explosion Protection Directive 2014/34/EU:  
**I M2 (XM); II 2G (XH)**
- ▶ Type of protection of valve:
  - Ex h I Mb X according to EN 80079-38 (XM)
  - Ex h IIC T6 Gb X according to EN 80079-36 (XH)
- ▶ Type of protection of valve solenoid:  
Ex ib I Mb / Ex ib IIC T6 Gb according to EN 60079-11
- ▶ Valve solenoid certified according to IECEx

## Features

- ▶ 3/2 or 4/2-way version
- ▶ For intended use in potentially explosive atmosphere
- ▶ Porting pattern according to ISO 4401-03-02-0-05 (however, without locating hole)
- ▶ Blocked connection tight
- ▶ Wet-pin DC solenoid
- ▶ Safe switching also with longer standstill periods under pressure
- ▶ Electrical connection as individual connection with cable gland or connector (depending on the valve type)
- ▶ With manual override

## Contents

|                            |           |
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| Ordering code              | 2, 3      |
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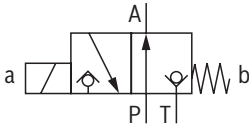
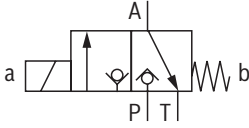
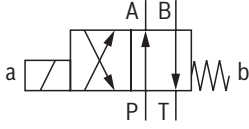
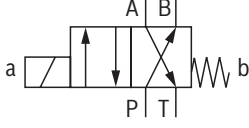
 **Notice:** The documentation version with which the product was supplied is valid.

## Ordering code

|    |    |    |    |    |    |    |    |     |    |    |    |    |    |
|----|----|----|----|----|----|----|----|-----|----|----|----|----|----|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09  | 10 | 11 | 12 | 13 | 14 |
|    | -  |    | SE | 6  |    | 6X | /  | 420 | B  |    | N  |    | V  |

|    |                       |    |
|----|-----------------------|----|
| 01 | Oil-in-water emulsion | E  |
|    | Water                 | W  |
| 02 | 3 main ports          | 3  |
|    | 4 main ports          | 4  |
| 03 | Seat valve            | SE |
| 04 | Size 6                | 6  |

## Symbols

|    |                                                                                     |   |   |   |
|----|-------------------------------------------------------------------------------------|---|---|---|
| 05 | Main ports                                                                          | 3 | 4 |   |
|    |    | ✓ | - | U |
|    |    | ✓ | - | C |
|    |   | - | ✓ | D |
|    |  | - | ✓ | Y |

|    |                                                                                          |     |
|----|------------------------------------------------------------------------------------------|-----|
| 06 | Component series 60 ... 69 (60 ... 69: unchanged installation and connection dimensions) | 6X  |
| 07 | Operating pressure 420 bar                                                               | 420 |
| 08 | High-power solenoid (wet-pin)                                                            | B   |

## Voltage (direct voltage 12 V)

|    |                                                    |        |
|----|----------------------------------------------------|--------|
| 09 | Nominal power supply 120 mA (for version "E" only) | G12-12 |
|    | Nominal power supply 190 mA (for version "W" only) | G12-19 |
| 10 | With manual override                               | N      |

## Explosion protection

|    |                                                                  |    |
|----|------------------------------------------------------------------|----|
| 11 | "Intrinsically safe" for device group II (only with version "E") | XH |
|    | "Intrinsically safe" for device group I                          | XM |
|    | For details, see information on the explosion protection page 7  |    |

## Electrical connection

|    |                                                                         |       |
|----|-------------------------------------------------------------------------|-------|
| 12 | Solenoid with terminal box and cable gland (for version "E" only)       | Z2    |
|    | Solenoid with connector facing the valve housing (for version "W" only) | K20ZL |
|    | For details on electrical connections see page 15                       |       |

Ordering code

|    |    |    |    |    |    |    |    |     |    |    |    |    |    |  |   |
|----|----|----|----|----|----|----|----|-----|----|----|----|----|----|--|---|
| 01 | 02 | 03 | 04 | 05 | 06 | 07 | 08 | 09  | 10 | 11 | 12 | 13 | 14 |  |   |
|    | -  |    | SE | 6  |    | 6X | /  | 420 | B  |    | N  |    | /  |  | V |

|    |                                                     |         |
|----|-----------------------------------------------------|---------|
| 13 | Without check valve insert, without throttle insert | no code |
|    | With check valve insert                             | P       |
|    | Throttle Ø 1.2 mm                                   | B12     |
|    | Throttle Ø 1.5 mm                                   | B15     |
|    | Throttle Ø 1.8 mm                                   | B18     |
|    | Throttle Ø 2.0 mm                                   | B20     |

Seal material (Observe compatibility of seals with hydraulic fluid used)

|    |           |   |
|----|-----------|---|
| 14 | FKM seals | V |
|----|-----------|---|



Notes:

- Representation of the symbols according to DIN ISO 1219-1.
- The manual override cannot be assigned a safety function.

Function, section, symbols: 3/2 directional seat valve

General

Type SE directional seat valves are direct operated directional valves with solenoid actuation. They control start, stop and direction of flow.

The directional valves basically comprise a housing (1), the solenoid (2), the hardened valve system (3) and the balls (4.1 and 4.2) as closing element.

**For unobjectionable functioning, the hydraulic system has to be bled properly.**

**Basic principle**

In the initial position, the ball (4.1) is pressed onto the seat by the spring (7), in spool position, the ball (4.2) is pressed onto the seat by the solenoid (2). The force of solenoid (2) acts via the ball (5) on the actuating plunger (6) that is sealed on two sides. The chamber between the two sealing elements is connected to port P. Thus, the valve system (3) is pressure-compensated in relation to the actuating forces (solenoid or return spring). Thus, the valves can be used up to 420 bar.

Notes:

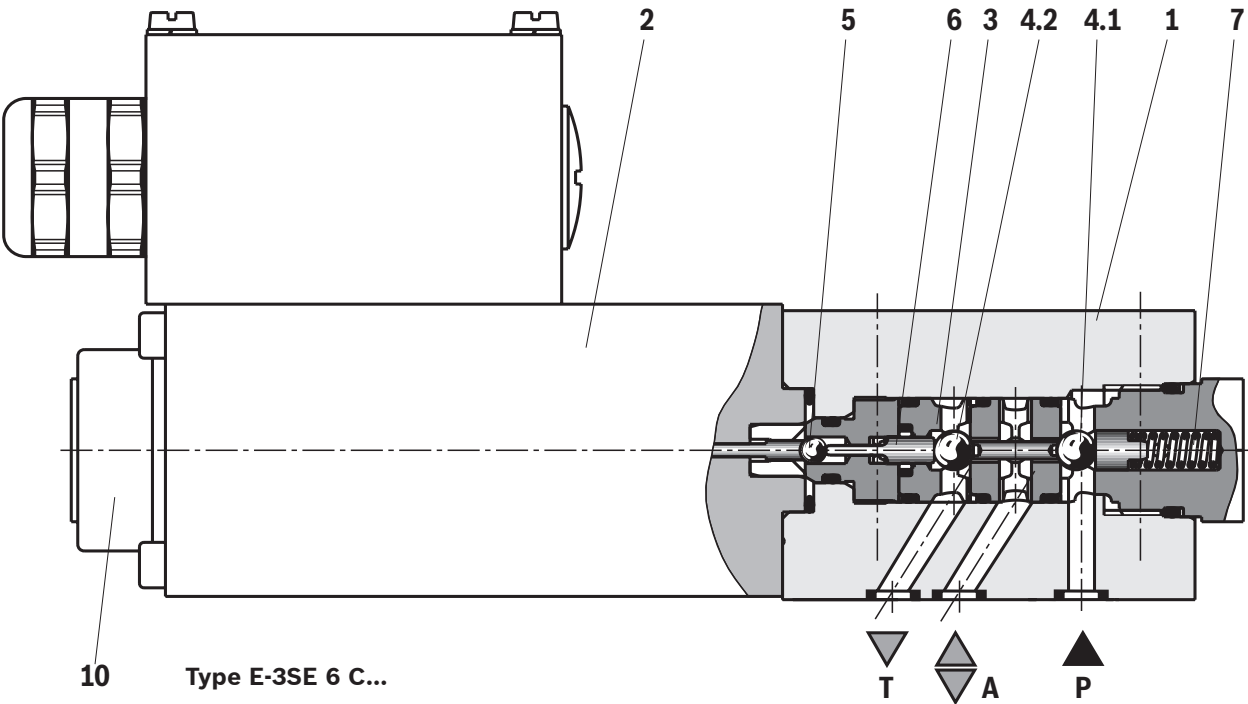
- The 3/2 directional seat valves have a "negative spool overlap". Therefore, port T must always be connected. That means that during the switching process – from the starting of the opening of one valve seat to the closing of the other valve seat – ports P–A–T are connected with each other. However, this process takes place within such a short time that it is irrelevant in nearly all applications.

- The manual override (10) allows for the switching of the valve without solenoid energization.
- Make sure that the specified maximum flow is not exceeded. A throttle insert must be used for flow limitation, if necessary (see page 14).
- In order to switch the valve safely or maintain it in its spool position, the pressure situation at the relevant ports must be as follows:  $P \geq A \geq T$ .
- Ports P, A, B and T are clearly specified according to their tasks. They must not be exchanged or closed. The flow is only admissible in the direction of arrow.

The seat arrangement offers the following options:

Symbols

|                  | U                            | C                            |
|------------------|------------------------------|------------------------------|
|                  |                              |                              |
| Initial position | P and A connected, T blocked | P blocked, A and T connected |
| Spool position   | P blocked, A and T connected | P and A connected, T blocked |



## Function, section, symbols: 4/2 directional seat valve

With a sandwich plate, the **Plus-1 subplate**, under the 3/2 directional seat valve, the function of a 4/2 directional seat valve is achieved.

### Function of the Plus-1 subplate

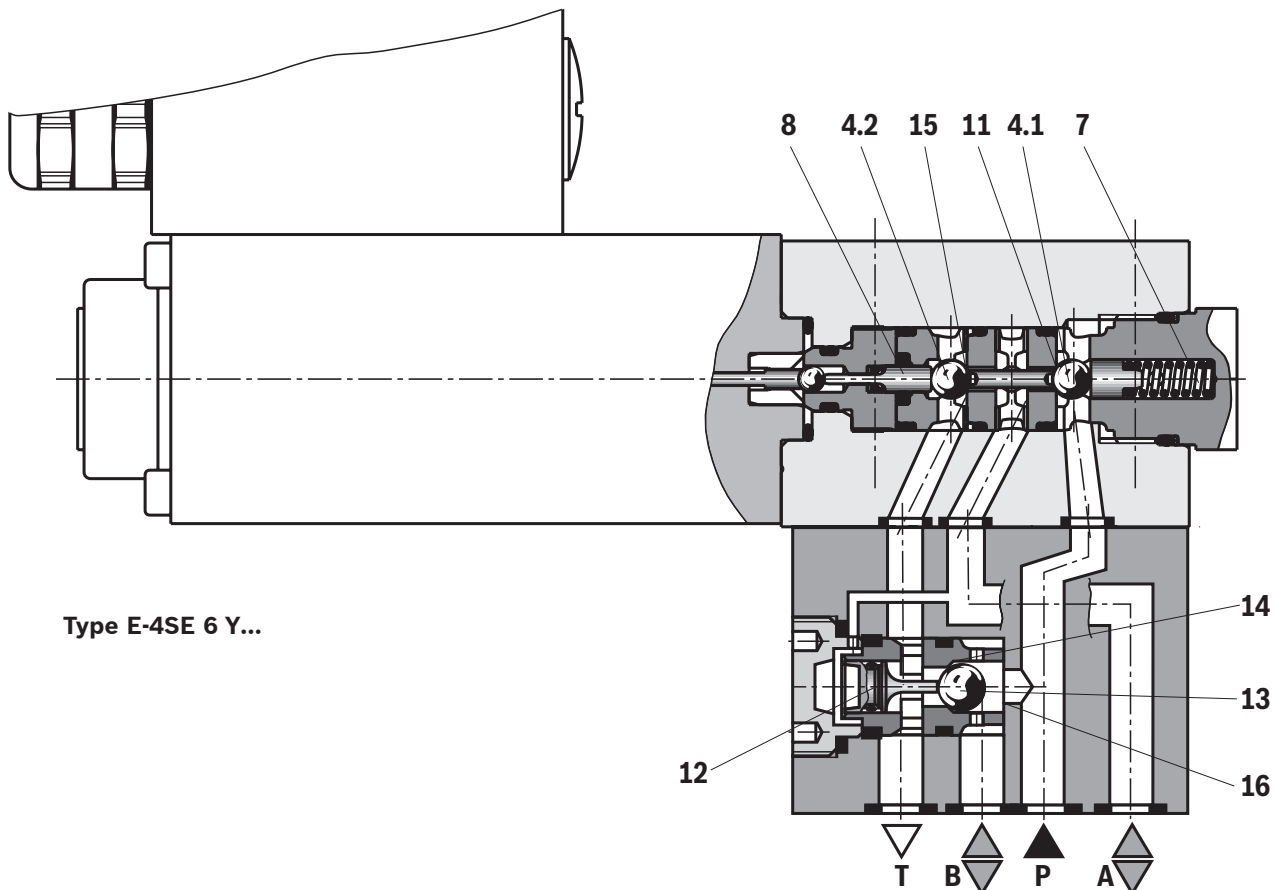
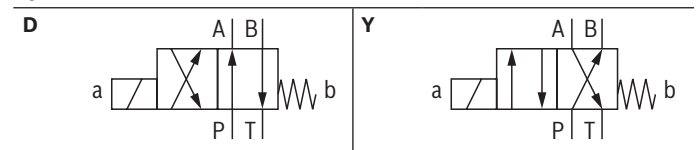
- **Initial position**  
The main valve is not actuated. The spring (7) holds the ball (4.1) on the seat (11). Port P is blocked and A is connected to T. Apart from that, one control line is connected from A to the large area of the control spool (12), which is thus unloaded to the tank.  
The pressure applied via P now pushes the ball (13) onto the seat (14). Now, P is connected to B, and A to T.
- **Transition position**  
When the main valve is actuated, the control spool (8) is shifted against the spring (7) and the ball (4.2) is pressed onto the seat (15). During this, port T is blocked, P, A, and B are briefly connected to each other.
- **Spool position**  
P is connected to A. As the pump pressure acts via A on the large area of the control spool (12), the ball (13) is pressed onto the seat (16). Thus, B is connected to T, and P to A. The ball (13) in the Plus-1 subplate has a "positive spool overlap".

### Notes:

- When operating 4/2 directional seat valves to control differential cylinders, the annulus area of the cylinder must only be connected with connection A of the valve. Otherwise, pressure peaks can be created while switching, which will exceed the maximum operating pressure.
- When operating 4/2 directional seat valves, the minimum pressure must be 8 bar and the minimum flow must be 3 l/min.
- In order to switch the valve safely or maintain it in its spool position, the pressure situation at the relevant ports must be as follows:  $P \geq A \geq B \geq T$ .
- Ports P, A, B and T are clearly specified according to their tasks. They must not be exchanged or closed. The flow is only admissible in the direction of arrow.

The use of the Plus-1 subplate and the seat arrangement offer the following options:

### Symbols



**Technical data**

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

| General                                    |                              |       |                                                 |
|--------------------------------------------|------------------------------|-------|-------------------------------------------------|
| Weight                                     | ▶ 3/2 directional seat valve | kg    | 2,6                                             |
|                                            | ▶ 4/2 directional seat valve | kg    | 3,4                                             |
| Installation position                      |                              |       | any                                             |
| Ambient temperature range                  |                              | °C    | -20 ... +50                                     |
| Storage temperature range                  |                              | °C    | +5 ... +40                                      |
| Maximum storage time                       |                              | Years | 1                                               |
| Maximum admissible acceleration $a_{\max}$ |                              | g     | 10                                              |
| Surface protection                         | ▶ Valve body                 |       |                                                 |
|                                            | – Version "E"                |       | galvanized                                      |
|                                            | – Version "W"                |       | Stainless steel                                 |
|                                            | ▶ Solenoid                   |       | galvanized                                      |
| Maximum surface temperature                |                              | °C    | See information on explosion protection, page 7 |

| Hydraulics                                                        |                |                    |                                                                                     |
|-------------------------------------------------------------------|----------------|--------------------|-------------------------------------------------------------------------------------|
| Maximum operating pressure                                        | ▶ Port P, A, B | bar                | 420                                                                                 |
|                                                                   | ▶ Port T       | bar                | 40                                                                                  |
| Maximum flow                                                      |                | l/min              | 4                                                                                   |
| Hydraulic fluid                                                   |                |                    | see table below                                                                     |
| Hydraulic fluid temperature range                                 |                | °C                 | +5 ... +50                                                                          |
| Viscosity range                                                   |                | mm <sup>2</sup> /s | 1 ... 380                                                                           |
| Maximum admissible degree of contamination of the hydraulic fluid |                |                    | Class 20/18/15 <sup>1)</sup>                                                        |
| Cleanliness class according to ISO 4406 (c)                       |                |                    | (For hydraulic fluids containing water, a comparable cleanliness is to be ensured.) |

| Hydraulic fluid              | Classification     | Suitable sealing materials    | Standards | Data sheet |
|------------------------------|--------------------|-------------------------------|-----------|------------|
| Mineral oils                 | HL, HLP, HLPD      | FKM                           | DIN 51524 | 90220      |
| Flame-resistant ▶ Water-free | HFDU (glycol base) | FKM                           | ISO 12922 | 90222      |
|                              | HFDE (ester base)  | FKM                           |           |            |
|                              | HFDR               | FKM                           |           |            |
|                              | ▶ Containing water | HFA, HFB, water <sup>2)</sup> | 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 increased cavitation tendency with HFA, HFB hydraulic fluids and water, 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.

<sup>1)</sup> 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.

<sup>2)</sup> Only version "W"

**Technical data**

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

| <b>Electric</b>                                             |    |                                                        |          |
|-------------------------------------------------------------|----|--------------------------------------------------------|----------|
| Nominal voltage                                             | V  | 12                                                     |          |
| Voltage type                                                |    | Direct voltage                                         |          |
| Voltage tolerance                                           | %  | ±10                                                    |          |
| Admissible residual ripple                                  | %  | < 5                                                    |          |
| Duty cycle / operating mode according to VDE 0580           |    | S1 (continuous operation)                              |          |
| Ordering code for voltage                                   |    | "G12-12"                                               | "G12-19" |
| Rated current                                               | mA | 120                                                    | 190      |
| Coil resistance with solenoid temperature 20 °C             | Ω  | 89                                                     | 59       |
| Minimum current for achieving the hydraulic switching power | mA | 88                                                     | 143      |
| Switching times according to ISO 6403                       | ms | See table page 8                                       |          |
| Maximum switch-off voltage peaks solenoid <sup>2)</sup>     | V  | -3                                                     |          |
| Protection class according to EN 60529                      |    | IP 65 (with correctly installed electrical connection) |          |

- <sup>2)</sup> Switching off the valve solenoid results in a voltage peak due to the inductive effect. The valve solenoid already contains an interference protection circuit dampening this voltage peak. However, additional external switching measures have to be taken, if required, in order to avoid connected electric circuits being influenced by the residual voltage peak.

| <b>Information on explosion protection</b>                                      |    |                   |                  |
|---------------------------------------------------------------------------------|----|-------------------|------------------|
| Ordering code for voltage                                                       |    | "G12-12"          | "G12-19"         |
| Ordering code for explosion protection                                          |    | "XM"              | "XH"             |
| Area of application according to Directive 2014/34/EU                           |    | I M2              | II 2G            |
| Type of protection valve according to EN 80079-36 and EN 80079-38 <sup>3)</sup> |    | Ex h I Mb X       | Ex h IIC T6 Gb X |
| Type of protection valve solenoid according to EN 60079-0                       |    | Ex ib I Mb        | Ex ib IIC T6 Gb  |
| Maximum surface temperature <sup>4)</sup>                                       | °C | 80                | 88               |
| Temperature class                                                               |    | -                 | T6               |
| Type examination certificate Solenoid                                           |    | BVS 08 ATEX E 023 |                  |
| "IECEx Certificate of Conformity" solenoid                                      |    | IECEx BVS 07.0008 |                  |

 **Special application conditions for safe application:**

- Connection lines must be installed in a strain-relieved way. The first mounting point must be within 150 mm of the valve solenoid.
- The maximum temperature of the surface of the valve jacket is 80 °C. This has to be considered when selecting the connection cable and/or contact of the connection cable with the surface of the jacket is to be prevented.

**Technical data**

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

**Safety-related maximum values of the solenoids dependent on the device group and the type of electrical connection**

| Device group                                      |     | I           |             | II          |
|---------------------------------------------------|-----|-------------|-------------|-------------|
| Ordering code for explosion protection            |     | "XM"        |             | "XH"        |
| Ordering code for voltage                         |     | "G12-12"    | "G12-19"    | "G12-12"    |
| Electrical connection "Z2"                        |     |             |             |             |
| ▶ Maximum voltage $U_i$                           | VDC | 15          | –           | 27          |
| ▶ Maximum current $I_i$                           | A   | 2           | –           | 2           |
| ▶ Maximum input power $P$                         | W   | –           | –           | 3           |
| ▶ Effective inner inductivity $L_i$ <sup>5)</sup> | nH  | neglectable | –           | neglectable |
| ▶ Effective inner capacity $C_i$ <sup>5)</sup>    | pF  | neglectable | –           | neglectable |
| ▶ Ambient temperature range                       | °C  | –20 ... +50 | –           | –20 ... +50 |
| Electrical connection "K20ZL"                     |     |             |             |             |
| ▶ Maximum voltage $U_i$                           | VDC | –           | 15          | –           |
| ▶ Maximum current $I_i$                           | A   | –           | 2           | –           |
| ▶ Effective inner inductivity $L_i$               | nH  | –           | neglectable | –           |
| ▶ Effective inner capacity $C_i$                  | pF  | –           | neglectable | –           |
| ▶ Ambient temperature range                       | °C  | –           | –20 ... +50 | –           |

3) Ex h: structural safety c according to EN 80079-37.

4) Surface temperature &gt; 50 °C, provide contact protection.

5) Per meter of cable length

**Switching times** (installation position: solenoid horizontal)

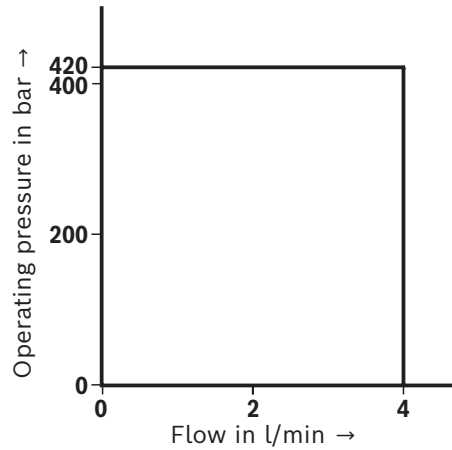
| Pressure $p$<br>in bar | Flow $q_v$<br>in l/min | Switching times $t$<br>in ms     |     |     |     |           |     |     |     |                                  |     |     |     |           |     |     |     |
|------------------------|------------------------|----------------------------------|-----|-----|-----|-----------|-----|-----|-----|----------------------------------|-----|-----|-----|-----------|-----|-----|-----|
|                        |                        | "G12-12"                         |     |     |     |           |     |     |     | "G12-19"                         |     |     |     |           |     |     |     |
|                        |                        | $t_{ON}$ (without tank pressure) |     |     |     | $t_{OFF}$ |     |     |     | $t_{ON}$ (without tank pressure) |     |     |     | $t_{OFF}$ |     |     |     |
|                        |                        | C                                | U   | Y   | D   | C         | U   | Y   | D   | C                                | U   | Y   | D   | C         | U   | Y   | D   |
| 70                     | 4                      | 220                              | 265 | 230 | 275 | 95        | 85  | 105 | 95  | 140                              | 160 | 150 | 170 | 110       | 100 | 120 | 110 |
| 140                    | 4                      | 260                              | 265 | 270 | 275 | 100       | 90  | 110 | 100 | 150                              | 165 | 160 | 175 | 120       | 110 | 130 | 120 |
| 280                    | 4                      | 320                              | 260 | 330 | 270 | 115       | 110 | 125 | 120 | 170                              | 170 | 180 | 180 | 125       | 135 | 135 | 145 |
| 320                    | 4                      | 350                              | 260 | 360 | 270 | 120       | 115 | 130 | 125 | 175                              | 170 | 185 | 180 | 130       | 140 | 140 | 150 |
| 420                    | 4                      | 360                              | 260 | 370 | 270 | 120       | 130 | 130 | 140 | 185                              | 170 | 195 | 180 | 135       | 145 | 145 | 155 |

**Notice:**

The switching times were determined at a hydraulic fluid temperature of 40 °C and a viscosity of 46 cSt. Deviating hydraulic fluid temperatures can result in different switching times. Switching times change dependent on operating time and application conditions.

## Performance limits

(measured with HLP46,  $\vartheta_{\text{oil}} = 40 \pm 5 \text{ }^{\circ}\text{C}$ )



### Notice:

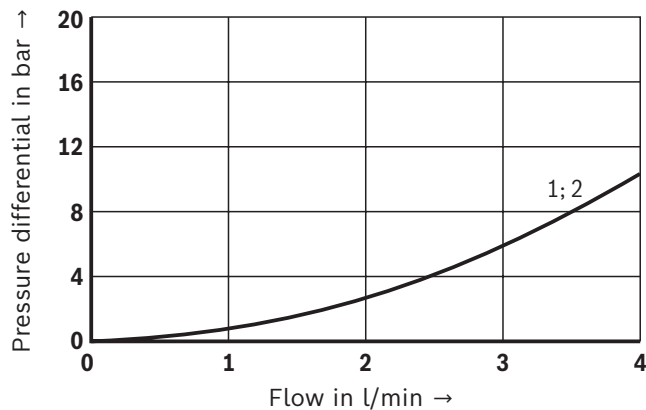
The performance limits were determined when the solenoids were at operating temperature, at 10% undervoltage and without tank preloading.

## Characteristic curves

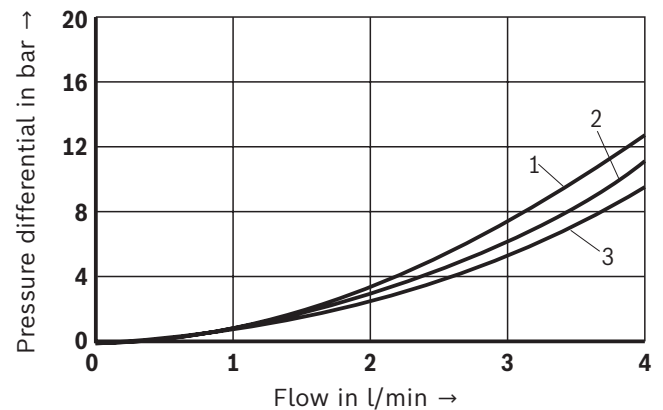
(measured with HLP46,  $\vartheta_{\text{oil}} = 40 \pm 5^{\circ}\text{C}$  and  $p = 100 \text{ bar}$ )

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

3/2 directional seat valve

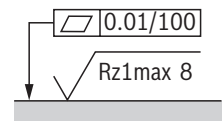
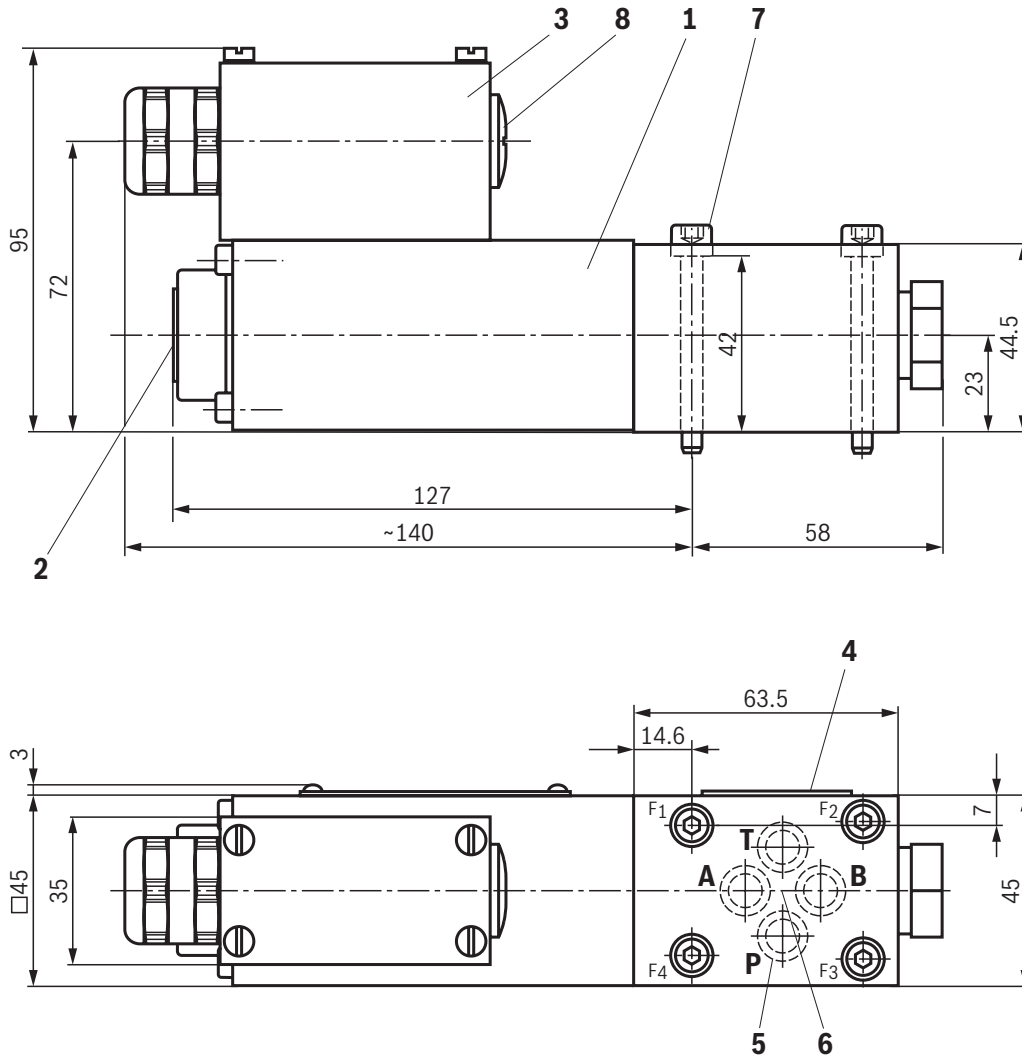


4/2 directional seat valve



- 1 A→T
- 2 P→A
- 3 B→T, P→B

**Dimensions:** Version "E-3...G12-12..Z2..."  
(dimensions in mm)



Required surface quality of the valve contact surface

- 1 Valve solenoid
- 2 Manual override "N"
- 3 Terminal box
- 4 Name plate
- 5 Identical seal rings for ports A, B, T, seal ring for port P
- 6 Porting pattern according to ISO 4401-03-02-0-05 (however, without locating hole)
- 7 **Valve mounting screws** (included in the scope of delivery)  
Only use valve mounting screws with the subsequently listed thread diameters and strength properties:  
**4 hexagon socket head cap screws**  
**ISO 4762 - M5 x 50 - 10.9**  
(friction coefficient  $\mu_{\text{total}} = 0.09 \dots 0.14$ );  
Tightening torque  $M_A = 7 \text{ Nm} \pm 10\%$ ,  
Material no. **R913043758**
- 8 Plug screw

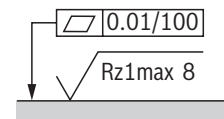
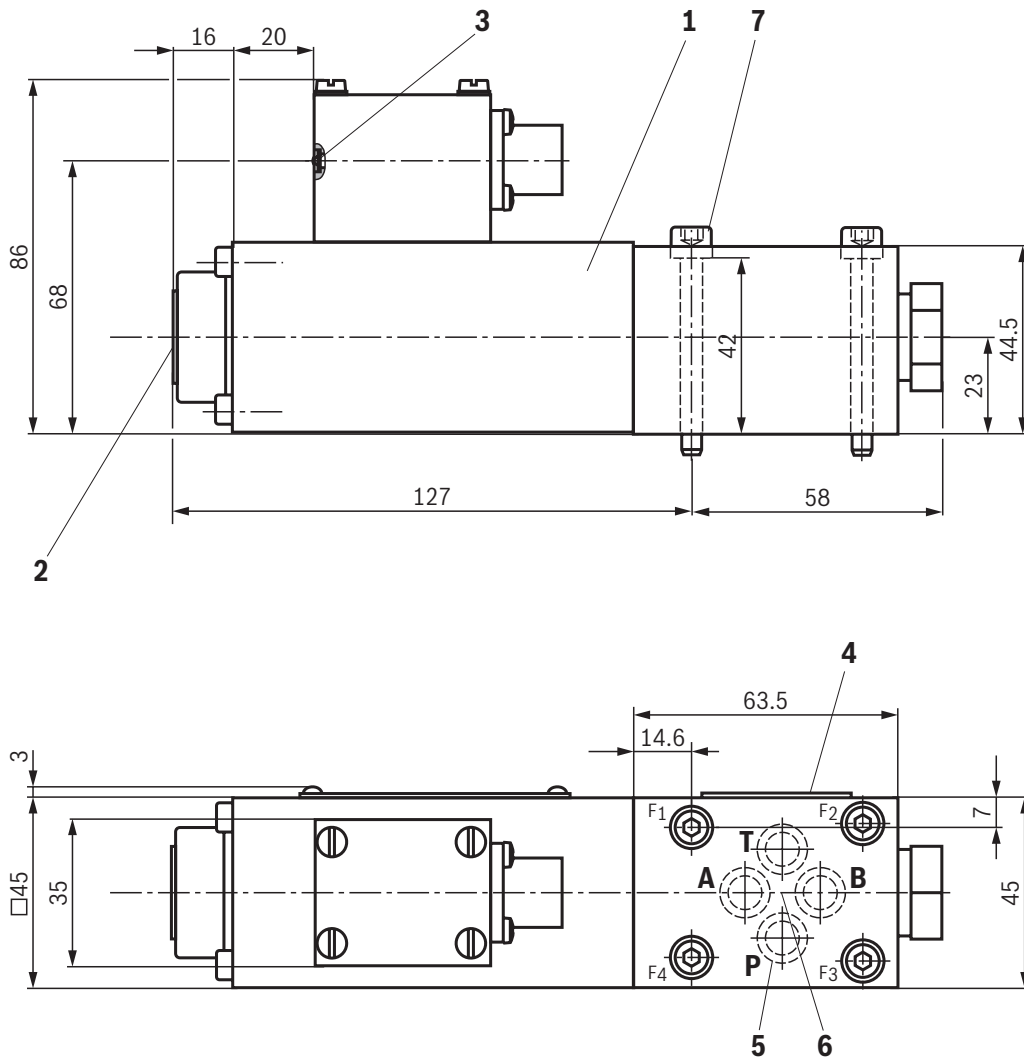
**Subplates** (separate order) with porting pattern according to ISO 4401-03-02-0-05, see data sheet 45100.



**Notes:**

- ▶ Subplates are no components in the sense of Directive 2014/34/EU and can be used after the manufacturer of the overall system has conducted an assessment of the risk of ignition. The "G...J3" versions are free from aluminum and/or free from magnesium and galvanized.
- ▶ The dimensions are nominal dimensions which are subject to tolerances.

**Dimensions:** Version "W-3...G12-19..K20ZL..."  
(dimensions in mm)



Required surface quality of the valve contact surface

- 1 Valve solenoid
- 2 Manual override "N"
- 3 Red LED for displaying the operating state
- 4 Name plate
- 5 Identical seal rings for ports A, B, T, seal ring for port P
- 6 Porting pattern according to ISO 4401-03-02-0-05 (however, without locating hole)
- 7 **Valve mounting screws** (included in the scope of delivery)  
Only use valve mounting screws with the subsequently listed thread diameters and strength properties:  
**4 hexagon socket head cap screws**  
**ISO 4762 - M5 x 50 - 10.9**  
(friction coefficient  $\mu_{\text{total}} = 0.09 \dots 0.14$ );  
Tightening torque  $M_A = 7 \text{ Nm} \pm 10\%$ ,  
Material no. **R913043758**

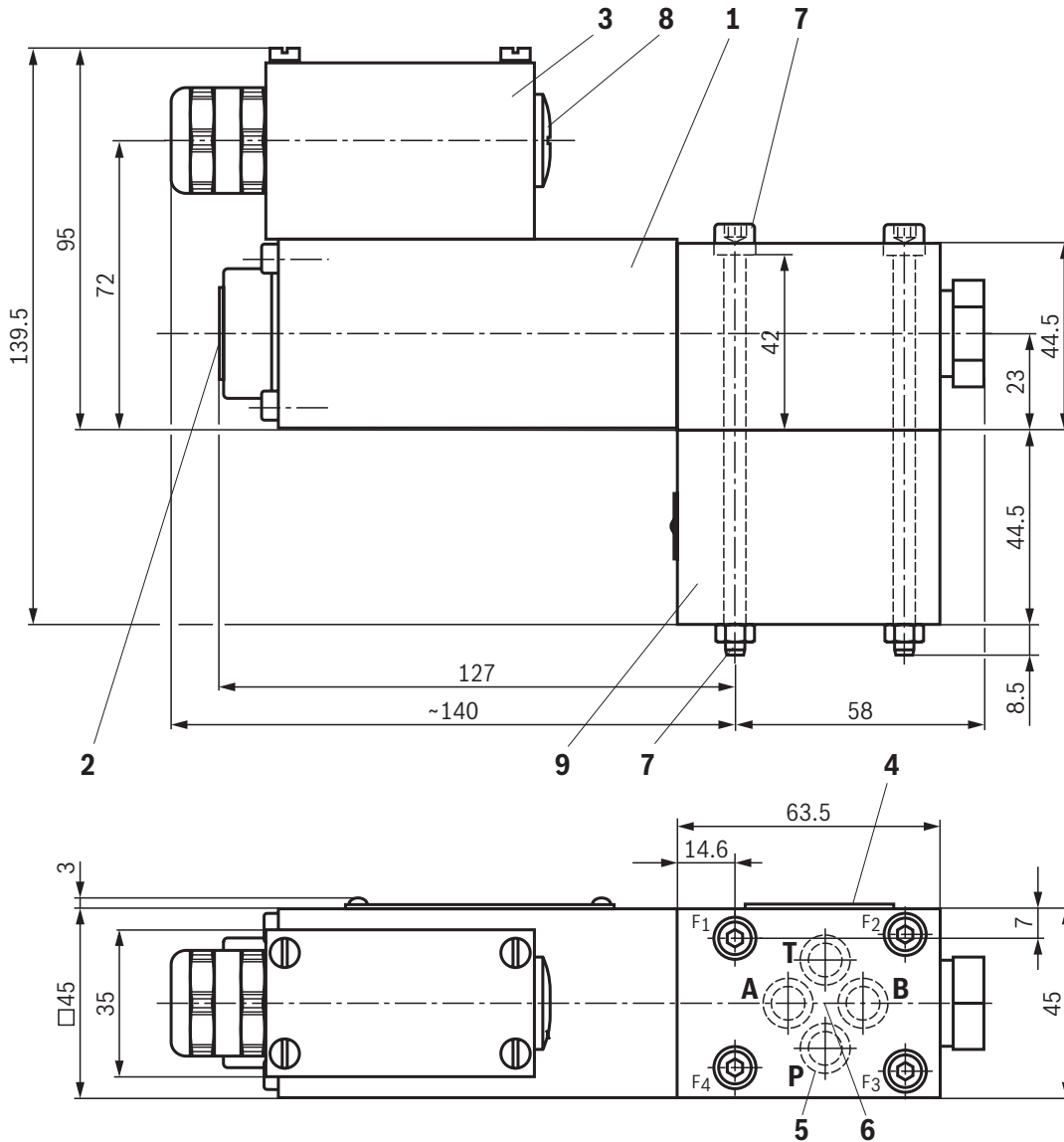
**Subplates** (separate order) with porting pattern according to ISO 4401-03-02-0-05, see data sheet 45100.



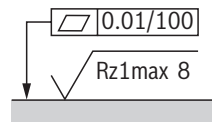
**Notes:**

- Subplates are no components in the sense of Directive 2014/34/EU and can be used after the manufacturer of the overall system has conducted an assessment of the risk of ignition. The "G...J3" versions are free from aluminum and/or free from magnesium and galvanized.
- The dimensions are nominal dimensions which are subject to tolerances.

**Dimensions:** Version "E-4...G12-12..Z2..."  
(dimensions in mm)



- 1 Valve solenoid
- 2 Manual override "N"
- 3 Terminal box
- 4 Name plate
- 5 Identical seal rings for ports A, B, T, seal ring for port P
- 6 Porting pattern according to ISO 4401-03-02-0-05 (however, without locating hole)
- 7 **Valve mounting screws** (included in the scope of delivery)  
Only use valve mounting screws with the subsequently listed thread diameters and strength properties:  
**4 hexagon socket head cap screws**  
**ISO 4762 - M5 x 95 - 10.9**  
(friction coefficient  $\mu_{\text{total}} = 0.09 \dots 0.14$ );  
Tightening torque  $M_A = 7 \text{ Nm} \pm 10\%$ ,  
Material no. **R913051579**
- 8 Plug screw
- 9 Plus-1 subplate



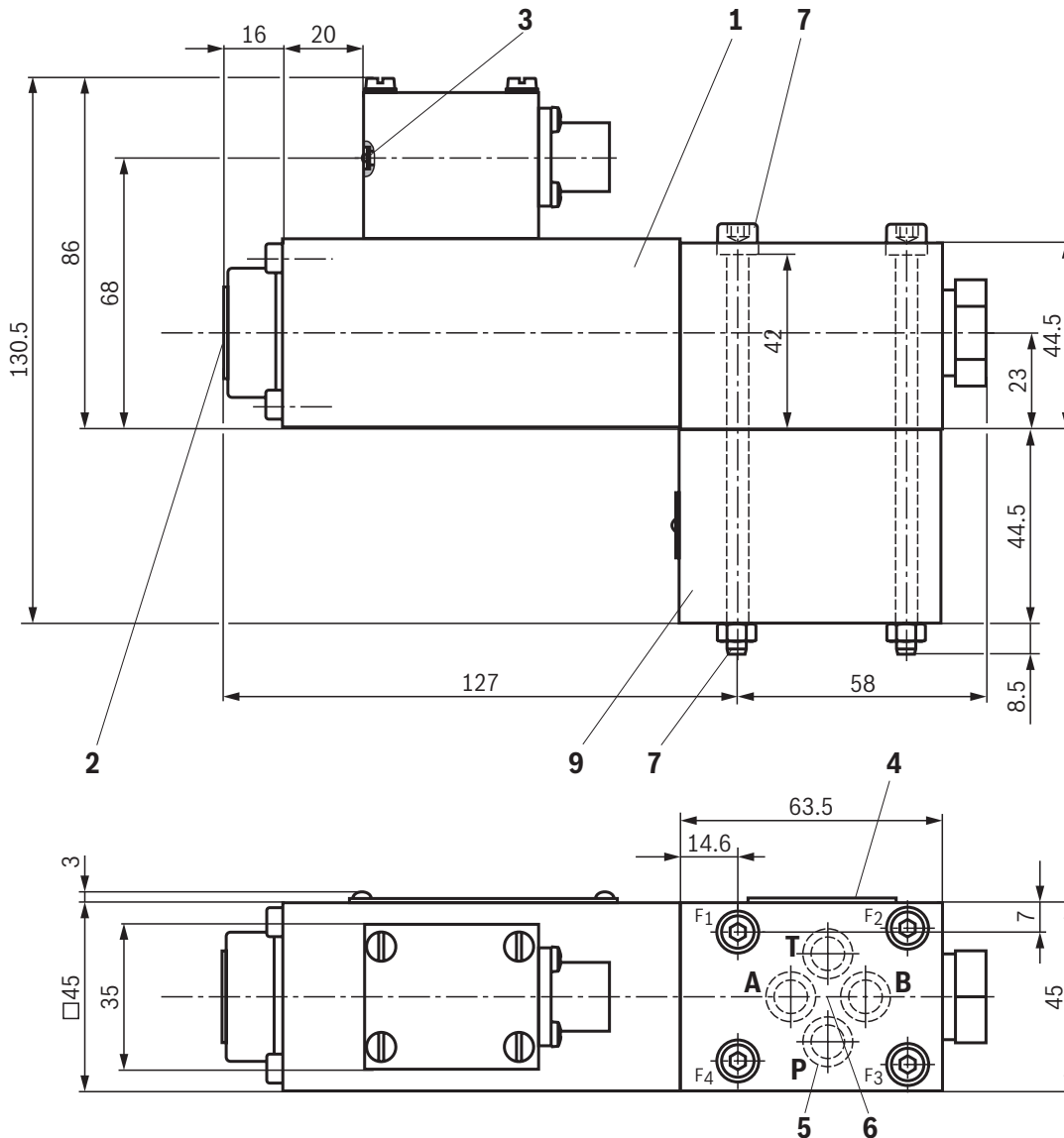
Required surface quality of the valve contact surface

**Subplates** (separate order) with porting pattern according to ISO 4401-03-02-0-05, see data sheet 45100.

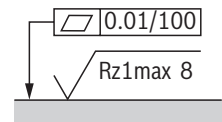
**Notes:**

- Subplates are no components in the sense of Directive 2014/34/EU and can be used after the manufacturer of the overall system has conducted an assessment of the risk of ignition. The "G...J3" versions are free from aluminum and/or free from magnesium and galvanized.
- The dimensions are nominal dimensions which are subject to tolerances.

**Dimensions:** Version "W-4...G12-19..K20ZL..."  
(dimensions in mm)



- 1 Valve solenoid
- 2 Manual override "N"
- 3 Red LED for displaying the operating state
- 4 Name plate
- 5 Identical seal rings for ports A, B, T, seal ring for port P
- 6 Porting pattern according to ISO 4401-03-02-0-05 (however, without locating hole)
- 7 **Valve mounting screws** (included in the scope of delivery)  
Only use valve mounting screws with the subsequently listed thread diameters and strength properties:  
**4 hexagon socket head cap screws**  
**ISO 4762 - M5 x 95 - 10.9**  
(friction coefficient  $\mu_{\text{total}} = 0.09 \dots 0.14$ );  
Tightening torque  $M_A = 7 \text{ Nm} \pm 10\%$ ,  
Material no. **R913051579**
- 9 Plus-1 subplate



Required surface quality of the valve contact surface

**Subplates** (separate order) with porting pattern according to ISO 4401-03-02-0-05, see data sheet 45100.

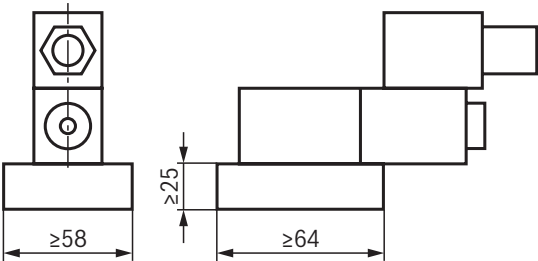
**Notes:**

- Subplates are no components in the sense of Directive 2014/34/EU and can be used after the manufacturer of the overall system has conducted an assessment of the risk of ignition. The "G...J3" versions are free from aluminum and/or free from magnesium and galvanized.
- The dimensions are nominal dimensions which are subject to tolerances.

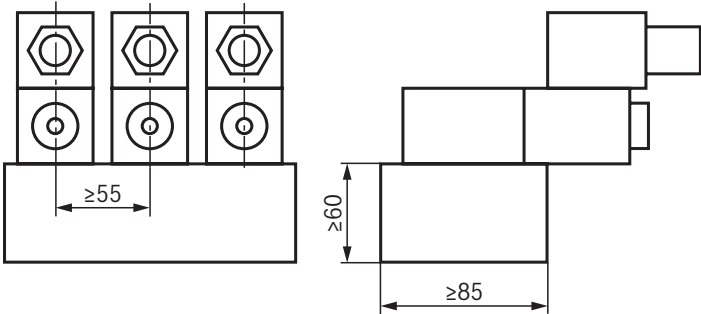
**Installation conditions**  
(dimensions in mm)

|                                                      | Individual assembly                                        | Bank assembly                                    |
|------------------------------------------------------|------------------------------------------------------------|--------------------------------------------------|
| Subplate dimensions                                  | Minimum dimensions<br>Length ≥ 64, width ≥ 58, height ≥ 25 | Minimum cross-section<br>height ≥ 60, width ≥ 85 |
| Thermal conductivity of the subplate                 | ≥ 36.2 W/mK                                                |                                                  |
| Minimum distance between the longitudinal valve axes | ≥ 55                                                       |                                                  |

Individual assembly



Bank assembly



**Notice:**

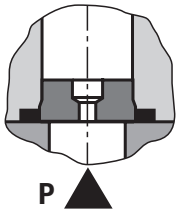
Observe the "Special application conditions for safe application" on page 7.

**Throttle insert**

The use of a throttle insert is required when, due to prevailing operating conditions, flows can occur during the switching processes, which exceed the performance limit of the valve.

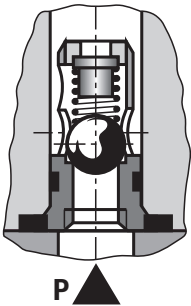
Examples:

- Accumulator operation,
- Use as pilot control valve with internal pilot fluid tapping.



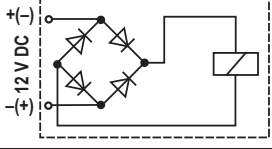
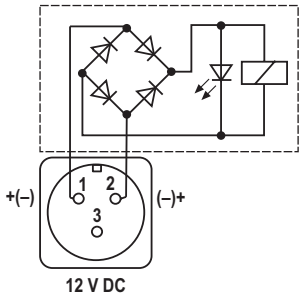
**Check valve insert**

The check valve insert allows a free flow from P to A and closes A to P.



## Electrical connection

The type-examination tested valve solenoid is equipped with an electrical connection according to the following table. The electrical connection of the solenoid is polarity-independent.

| Ordering code electrical connection | Type of connection, description                                                                                                                                                                                                                                                  | Circuit diagram                                                                     | Ordering code solenoid, availability |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------|
| <b>Z2</b><br>(version "E" only)     | <ul style="list-style-type: none"> <li>▶ Electrical connection via 2-pole terminal in terminal box</li> <li>▶ With cable gland</li> <li>▶ Without operating display</li> </ul>                                                                                                   |   | <b>G12-12</b> (120 mA)               |
|                                     | Cable gland                                                                                                                                                                                                                                                                      |                                                                                     |                                      |
|                                     | <ul style="list-style-type: none"> <li>▶ Threaded connection</li> </ul>                                                                                                                                                                                                          | M20 x 1.5                                                                           |                                      |
|                                     | <ul style="list-style-type: none"> <li>▶ Line diameter</li> </ul>                                                                                                                                                                                                                | mm 6.5 ... 9.5                                                                      |                                      |
|                                     | <ul style="list-style-type: none"> <li>▶ Sealing</li> </ul>                                                                                                                                                                                                                      | Outer sheath sealing                                                                |                                      |
| <b>K20ZL</b><br>(version "W" only)  | Cable                                                                                                                                                                                                                                                                            |                                                                                     | <b>G12-19</b> (190 mA)               |
|                                     | <ul style="list-style-type: none"> <li>▶ Temperature rating</li> </ul>                                                                                                                                                                                                           | °C ≤-20 ... ≥+80                                                                    |                                      |
|                                     | Connection terminal of solenoid                                                                                                                                                                                                                                                  |                                                                                     |                                      |
|                                     | <ul style="list-style-type: none"> <li>▶ Line cross-section</li> </ul>                                                                                                                                                                                                           | mm <sup>2</sup> 0.75 ... 1.5                                                        |                                      |
| <b>K20ZL</b><br>(version "W" only)  | <ul style="list-style-type: none"> <li>▶ Electrical connection via connector, 3-pole with pin contacts Type 845-11-1125-001</li> <li>▶ Operating display via light emitting diode (LED), red</li> <li>▶ Suitable mating connector, type 845-11-8522-001 <sup>1)</sup></li> </ul> |  | <b>G12-19</b> (190 mA)               |
|                                     | Cable                                                                                                                                                                                                                                                                            |                                                                                     |                                      |
|                                     | <ul style="list-style-type: none"> <li>▶ Temperature rating</li> </ul>                                                                                                                                                                                                           | °C ≤-20 ... ≥+80                                                                    |                                      |

<sup>1)</sup> Separate order, Souriau company



### Notice:

Only use finely stranded conductors with pressed-on wire end ferrules.

## Further information

- |                                                                                 |                                                                        |
|---------------------------------------------------------------------------------|------------------------------------------------------------------------|
| ► Subplates                                                                     | Data sheet 45100                                                       |
| ► Use of non-electrical hydraulic components in an explosive environment (ATEX) | Data sheet 07011                                                       |
| ► Hydraulic fluids on mineral oil basis                                         | Data sheet 90220                                                       |
| ► Flame-resistant, water-free hydraulic fluids                                  | Data sheet 90222                                                       |
| ► Flame-resistant hydraulic fluids – containing water                           | Data sheet 90223                                                       |
| ► Directional seat valves, direct operated, with solenoid actuation             | Operating instructions 22047-XH                                        |
| ► Information on available spare parts                                          | <a href="http://www.boschrexroth.com/spc">www.boschrexroth.com/spc</a> |

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