PRODUCT CATALOG
VALVE TECHNOLOGY

WEBER-HYDRAULIK ValveTech GmbH

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Proportional Directional Valves

**Subplate Mounting Valves**

**W4_E-5PS03**
- Direct operated, solenoid operated
- Operating pressure max. 315 bar
- Volume flow max. 5 l/min
- Size NG 3

**W4_E-1AS06**
- Direct operated, solenoid operated
- Operating pressure max. 350 bar
- Volume flow max. 25 l/min
- Size NG 6, DIN 24340 A06

**Screw-in Valves**

**S22E-1V08**
- Pilot operated, solenoid operated
- Operating pressure max. 250 bar
- Nominal flow 25 l/min
- Cavity SAE08
Proportional directional valve W42E-5PS03 and W43E-5PS03

Characteristics

- proportional directional valve in spool design
- miniature edition
- minimum oil leakage
- spring centred spool
- maintenance-free
- available with various volume flows
### Technical data

#### Hydraulic
- Operating pressure max.: 315 bar
  - port T: 75 bar
  - summated pressure A, B: 350 bar
- Flow rate: 1, 3, 5 l/min at Δp = 7 bar
- Flow direction: see symbols in type code
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999)
  - 18/16/13, filter with β 5(c) > 200
- Repeatability: < 3% with optimized PMW-signal*
- Hysteresis: < 5% with optimized PMW-signal*
* at 20% to 100% of the nominal valve current

#### Mechanics
- Design: spool type, direct operated
- Size: NG 3 (company standard)
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any, preferably horizontal
- Maximum acceleration: 5 g
- Weight: 4/2-way-design: 0.42 kg
  - 4/3-way-design: 0.58 kg
- Material:
  - valve parts: steel
  - seals: NBR, Viton optional
- Surface protection:
  - coil: zinc coated
  - body: nitrocarburized

#### Electric
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 1.3 A (12 V), 0.63 A (24 V)
- Nominal resistance (R20): 5.9 Ω (12 V), 24.0 Ω (24 V)
- Power consumption: 9.6 W at nominal valve current
- Shifting time: 100% ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape B, unterminated wire
- Electronic controllers: see chapter 6 "electronics and sensor technology" as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
**Performance**

Flow rate diagram (Q/I) W4_E-5PS03 at Δp = 7 bar

Pressure drop diagram (Δp/Q) W4_E-5PS03 at I_N

**NOTE**
Maximum tolerance of flow rate ±10% at symmetric flow. Maximum pressure drop at control edge Δp: 20 bar.

**Test conditions**
Oil: HLP 32, temperature: 40 °C (~32 cSt)
**Dimensions**

- **Electric plug acc. to DIN EN 175301-803**
  (formerly DIN 43650)
  shape B

- **O-rings 4.48 x 1.78**

- **Port pattern NG 3**
  (company standard)

**NOTE**

The valve must be mounted with fitting screws according to DIN EN ISO 4762 M4 x 30 - 12.9. Installation torque: 2.2 ± 0.2 Nm, screw-in depth min. 7 mm.

**NOTE**

For the appropriate mounting plates, see our „accessories“ in the appendix or contact us.

**NOTE**

For a detailed drawing of the port pattern please see chapter 11 „general information“ under the category „port patterns“ or our online catalogue at www.weber-hydraulik.com.
## Accessories and additional information

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<td>Socket connector DIN EN 175301-803*, shape B, black</td>
<td>149.0005</td>
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<tr>
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<td>Socket connector DIN EN 175301-803*, shape B, grey</td>
<td>149.0004</td>
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<td>Adapter plug DIN EN 175301-803*, shape B to shape A</td>
<td>109.0006</td>
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<td></td>
<td>Seal kit W43.5PS03 (NBR)</td>
<td>405.0066</td>
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<td></td>
<td>Seal kit W43.5PS03 (Viton)</td>
<td>405.0067</td>
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<td></td>
<td>Adapter plate NG 6 to NG 3, including seals and screws</td>
<td>203.0153</td>
</tr>
<tr>
<td></td>
<td>Mounting plate NG 3, ports sidewise</td>
<td>151.0171</td>
</tr>
</tbody>
</table>

**NOTE**
For the appropriate electronic controllers, see chapter 6 „*electronics and sensors*“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual**
Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „*general operating manual*“ or will be provided upon request.
Proportional directional valve W42E-1AS06 and W43E-1AS06

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</tbody>
</table>

Characteristics

- proportional directional spool valve
- spring centred spool
- controls volume and direction of flow rate
- maintenance-free
- rotatable and replaceable coils
Technical data

Hydraulic
- Operating pressure: port P, A, B: 350 bar
  port T: 210 bar
- Flow rate: 8, 16, 24 l/min
- Flow direction: see symbols in type code
- Hydraulic fluid: mineral oil according to DIN 51524,
  other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999)
  18/16/13, filter with β 5(c) > 200
- Repeatability: < 3 % with optimized PMW-signal*
- Hysteresis: < 5 % with optimized PMW-signal*
  * at 20 % to 100 % of the nominal valve current

Mechanic
- Design: spool type, direct operated
- Size: NG 6 (DIN 24340 A06, ISO 4401-03, CETOP 3)
- Fluid temperature: -20 °C to +65 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Maximum acceleration: 5 g
- Weight: 4/2-way-design: 1,6 kg
  4/3-way-design: 2,1 kg
- Material: valve parts: steel
  seals: NBR, Viton optional
- Surface protection: coil: zinc-nickel
  body: comparable

Electric
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 1,8 A (12 V), 0,9 A (24 V)
- Nominal resistance (R20): 2,7 Ω (12 V), 12,6 Ω (24 V)
- Power consumption: 21,6 W (at nominal valve current)
- Shifting time: 100 % ED
- Control command: PWM-signal
- PWM-frequency: typically 85 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, respectively AMP Junior Timer
- Electronic controllers: see chapter 6 "electronics and sensors" as well as our online catalogue at www.weber-hydraulik.com.
Performance

Flow rate diagram (Q/I) W4_E-1AS06 at Δp = 10 bar

Pressure drop diagram (Δp/Q) W4_E-1AS06 at I_n

**NOTE**
Maximum tolerance of flow rate ±10% at symmetric flow. Maximum pressure drop at control edge Δp: 20 bar.

**Test conditions**
Oil: HLP 32, temperature: 40 °C (~32 cSt).
Proportional directional valve

Dimensions

Electric plug acc. to DIN EN 175301-803 (formerly DIN 43650) shape A

Solenoid, rotatable 360°

O-rings 9.25 x 1.78

Port pattern NG 6
DIN 24340 A06, ISO 4401-03, CETOP 3

NOTE The valve must be mounted with fitting screws according to DIN EN ISO 4762 M5 x 30 - 12.9. Installation torque: 5.7 Nm, screw-in depth min. 8 mm.

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.
ValveTech | 010130_W4_E-1AS06_e

Proportional directional valve

**Type code**

- 1 AS06
- 01

**Model**

- W42E 4/2-way-design
- W43E 4/3-way-design

**Series**

AS06

**Revision**

H401

**Electric termination**

- DIN D
- Deutsch (on request) C
- AMP Junior Timer J

**Nominal voltage**

- 12 V DC 12
- 24 V DC 24

**Nominal flow**

- 08 l/min 08
- 16 l/min 16
- 24 l/min 24

**Seals**

- NBR
- Viton V

**Manual override**

- without
- manual override (push pin) H401

**Mounting interface**

Mounting plate ISO 4401 (steel), size 06

**Spool type**

- D
- DA
- DB
- N
- NA
- NB

**Nominal voltage**

12 V DC 12

24 V DC 24
## Accessories and additional information

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<td>Socket connector DIN EN 175301-803*, shape A, black</td>
<td>149.0007</td>
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<td>Socket connector DIN EN 175301-803*, shape A, grey</td>
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<td>Screw M5 x 30 DIN EN ISO 4762 (formerly DIN 912), 8.8, zinc plated</td>
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<td>Seal kit W4_E-1AS06 (Viton)</td>
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<td>Coil 12 V DIN EN 175301-803*, shape A</td>
<td>147.0011</td>
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<tr>
<td></td>
<td>Coil 24 V DIN EN 175301-803*, shape A</td>
<td>147.0009</td>
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<td>Coil 12 V, AMP Junior Timer</td>
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<td></td>
<td>Coil 24 V, AMP Junior Timer</td>
<td>147.0010</td>
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* (formerly DIN 43650)

### NOTE

For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

### Manual

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
Proportional 2/2-way poppet valve S22E-1V08

Characteristics

- proportional poppet valve
- compact design
- leakage free closing
- volume flow control
- maintenance-free
- rotatable and replaceable solenoid coils
### Technical data

#### Hydraulic
- **Operating pressure max.:** 250 bar
- **Nominal flow:** 25 l/min
- **Flow direction:** 1 to 2 check valve function, 2 to 1 proportional throttle
- **Hydraulic fluid:** mineral oil according to DIN 51524, other hydraulic fluids upon request
- **Viscosity range:** 7.4 - 420 cSt
- **Filtration:** oil cleanliness according to ISO 4406 (1999) 20/18/15
- **Hysteresis:** ± 25 mA at 400 mA testing flow

#### Mechanic
- **Design:** screw-in poppet valve, pilot operated
- **Size:** SAE08
- **Fluid temperature:** -30 °C to +110 °C
- **Ambient temperature:** -20 °C to +50 °C
- **Storage temperature:** -30 °C to +60 °C (non-condensing)
- **Installation position:** any
- **Weight:** 0.39 kg
- **Material:** valve parts: steel
  - seals: NBR, Viton optional
- **Surface protection:** exterior parts: zinc coated

#### Electric
- **Nominal voltage:** 12 V DC, 24 V DC
- **Nominal valve current:** 1.4 A (12 V), 0.72 A (24 V)
- **Nominal resistance (R20):** 6 Ω (12 V), 22 Ω (24 V)
- **Power consumption max.:** 17.3 W at nominal valve current (coil temperature 20 °C)
- **Shifting time:** 100% ED
- **Control command:** PWM-signal
- **PWM-frequency:** typically 140 Hz (depending on application)
- **Protection class:** IP65 with correctly mounted and locked mating connector
- **Electric termination:** electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, Deutsch connector
- **Electronic controllers:** see chapter 6 “electronics and sensors” as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com)
**Performance**

Flow rate diagram (Q/I) S22E-1V08 at Δp = 75 bar

![Flow rate diagram](image)

**Test conditions**

Oil: HLP 32, temperature: 40 °C (~32 cSt)

Higher viscosity changes the performance diagrams.

**Dimensions**

*Screw-in valve S22E-1V08*

- Electric plug according to DIN EN 175301-803 (formerly DIN 43650), shape A
- Solenoid coil, rotatable 360°
- Locating shoulder SAE08
- Installation torque 40-45 Nm
  
  SW 24

**Cavity SAE08**

NOTE For a detailed drawing of the port pattern please see chapter 11 “general information” under the category “port patterns” or our online catalogue at www.weber-hydraulik.com.

NOTE Please contact us for appropriate manifolds.
Type code

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<th>Nominal flow</th>
<th>Electric termination</th>
<th>Nominal voltage</th>
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<td>DIN</td>
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<td>Deutsch</td>
<td>24 V DC</td>
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<td>AMP Junior Timer</td>
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Series Mounting interface Revision Seals
V08 size 08 - X - V
NBR Viton

Accessories and additional information

Accessories/spare parts

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<th>Material number:</th>
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<td>Socket connector DIN EN 175301-803, shape A, black</td>
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<tr>
<td>Coil 24 V, DIN EN 175301-803, shape A</td>
<td>146.0020</td>
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<td>Coil 12 V, Deutsch connector</td>
<td>1091887</td>
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<td>Aluminium housing 3/8&quot;</td>
<td>093.0024</td>
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<td>Steel housing 3/8&quot;</td>
<td>153.0139</td>
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<td>Seal kit (NBR)</td>
<td>1096036</td>
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NOTE For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
**Proportional Pressure Relief Valves**

**direct operated types**

**DBE-1RS10**
- Direct operated, solenoid operated
- Operating pressure max. 500 bar
- Volume flow max. 4.5 l/min
- In-line body G 1/4"

**EEPDBDS 02**
- Direct operated, solenoid operated
- Operating pressure max. 315 bar
- Volume flow max. 2 l/min
- Cavity T-8A

**EPDBD 03**
- Direct operated, solenoid operated
- Operating pressure max. 315 bar
- Volume flow max. 3 l/min
- Cavity EPDBD 03

**EPDBD 05**
- Direct operated, solenoid operated
- Operating pressure max. 315 bar
- Volume flow max. 12 l/min
- Various cavities, degressive version available

**EPDBD 05-EX acc. to ATEX-directive**
- Direct operated, solenoid operated
- Operating pressure max. 250 bar
- Volume flow max. 12 l/min
- Cavity EPDBD 05

**pilot operated types**

**EPDB 08**
- Pilot operated, solenoid operated
- Operating pressure max. 315 bar
- Volume flow max. 80 l/min
- Various cavities, degressive version available

**EPDBS 10**
- Pilot operated, solenoid operated
- Operating pressure max. 315 bar
- Volume flow max. 150 l/min
- Cavity T-3A, degressive version available

**Proportional Valves with large nominal size**
- Pilot operated, solenoid operated
- Operating pressure max. 315 bar
- Volume flow max. 760 l/min
- Different versions available, suitable in-line bodies and subplates up to NG 25
pilot operated types

EPDZA-06

pilot operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 40 l/min
mounting plate NG 6
Proportional pressure relief valve DBE-1RS10

direct operated, solenoid operated
operating pressure max. 500 bar
volume flow max. 4,5 l/min
in-line body G 1/4"

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Characteristics

- proportional pressure relief valve in spool design
- high-pressure valve up to 500 bar
- minimum oil leakage
- maintenance-free
- rotatable and replaceable coil
Technical data

**Hydraulic**
- Operating pressure max.: 500 bar (dynamic, with free return flow in port T)
- Operating pressure min.: 10 bar
- Flow rate: 4.5 l/min at differential pressure control Δp = 10 bar
- Flow direction: 1 (P) to 2 (T) (2 to 1 not allowed)
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
- Repeatability: < 3 % with optimized PMW-signal*
- Hysteresis: < 5 % with optimized PMW-signal*

* at 20 % to 100 % of the nominal valve current

**NOTE**
The pressure on port 2 (T) adds directly to the set pressure. The total pressure of ports 1 (P) and 2 (T) must not exceed the maximum operating pressure.

**Mechanic**
- Design: spool valve in in-line body, direct operated by solenoid
- Size: G 1/4"
- Fluid temperature: -20 °C to +65 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any, preferably horizontal
- Weight: 3.7 kg
- Material: steel
- Surface protection: coil: zinc coated steel
  in-line body: steel

**Electric**
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 2.8 A (12 V), 1.4 A (24 V)
- Nominal resistance (R20): 3.2 Ω (12 V), 12.8 Ω (24 V)
- Power consumption: 35 W at nominal valve current
- Shifting time: 100% ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A
- Electronic controllers: see chapter 6 "electronics and sensors" as well as our online catalogue at www.weber-hydraulik.com.
**Performance**

Pressure drop diagram (p/I) DBE-1RS10 at Q = 1,5 l/min

Pressure drop diagram (Δp/Q) DBE-1RS10 at I = 0 mA (currentless)

*Test conditions*  
Oil: HLP 32, temperature: 40 °C (~32 cSt)

**Dimensions**

- installation torque: 4 Nm
- installation torque: max: 0,5 Nm
- electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A
- solenoid coil, rotatable 360°
Type code

<table>
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<tr>
<th>Model</th>
<th>Size</th>
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<th>Electric termination</th>
<th>Nominal voltage</th>
<th>Seals</th>
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<td>DBE</td>
<td></td>
<td>500 bar</td>
<td>DIN</td>
<td>12 V</td>
<td>NBR</td>
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<td></td>
<td></td>
<td></td>
<td>D</td>
<td>24 V</td>
<td>Viton</td>
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Mounting interface

RS10 in-line body (steel)

Manual override

H402 manual override with push pin

Accessories and additional information

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<td></td>
<td>Coil 12 V, DIN EN 175301-803*, shape A</td>
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<td>Coil 24 V, DIN EN 175301-803*, shape A</td>
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* (formerly DIN 43650)

NOTE For the appropriate electronic controllers, see chapter 6 "electronics and sensors" as well as our online catalogue at www.weber-hydraulik.com.

Manual Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category "general operating manual" or will be provided upon request.
Proportional pressure relief valve EEPDBDS 02

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 2 l/min
cavity T-8A

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<td>Type code</td>
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<tr>
<td>Appendix</td>
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</tr>
</tbody>
</table>

Characteristics

- screw-in valve for cavity T-8A
- miniature edition (edge length of solenoid: 25 mm)
- suitable as pilot valve
- low vibration
- maintenance-free
**Technical data**

**Hydraulic**
- Operating pressure max.: 315 bar (with free return flow in port 2)
- Flow rate: see pressure drop diagram
- Flow rate min.: 0.2 l/min
- Pressure setting range: see type code
- Flow direction: 1 to 2 (2 to 1 not allowed)
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
- Repeatability: < 3 % with optimized PWM-signal*
- Hysteresis: < 5 % with optimized PWM-signal*

* at 20 % to 100 % of the nominal valve current

**NOTE**
- The pressure on port 2 adds directly to the set pressure. The total pressure of port 1 and 2 must not exceed the maximum operating pressure.

---

**Mechanic**
- Design: screw-in valve, direct operated by solenoid
- Size: T-8A cavity
- Fluid temperature: -10 °C to +65 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0.24 kg
- Material: valve parts: steel, seals: NBR, Viton optional
- Surface protection: exterior parts: zinc coated steel, partially burnished

**Electric**
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 1.2 A (12 V), 0.63 A (24 V)
- Nominal resistance (R20): 6 Ω (12 V), 24 Ω (24 V)
- Power consumption max.: 9.6 W at nominal valve current
- Shifting time: 100% ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape B, unterminated wire
- Electronic controllers: see chapter 6 “electronics and sensors” as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com)
Performance

Pressure drop diagram (p/I) EEPDBDS 02 at Q = 0.5 l/min

Pressure drop diagram (p/Q) EEPDBDS 02 at I

Pressure drop diagram (Δp/Q) EEPDBDS 02 at I = 0 mA (currentless)

Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.

* The maximum operating pressure of 315 bar is not to be exceeded.
**Dimensions**

**Screw-in valve**  
EEPDBS 02

- Installation torque: 1,1 ± 0,1 Nm  
  SW 2,5

- Solenoid rotatable

- Electric plug according to  
  DIN EN 175301-803  
  (formerly DIN 43650) shape B

- Installation torque: 35 Nm  
  SW 19

- Locating shoulder T-8A

---

**Cavity T-8A**

---

**NOTE**  
For a detailed drawing of the cavity please see chapter 11 "general information" or our online catalogue at www.weber-hydraulik.com.

**NOTE**  
We also provide a variety of suitable manifolds for T-8A. Please contact us for further assistance.
Proportional pressure relief valve

**Type code**

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure setting range</th>
<th>Magnet options</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEPDBDS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>25 bar</td>
<td>12V-NH</td>
</tr>
<tr>
<td></td>
<td>105 bar</td>
<td>24V-NH</td>
</tr>
<tr>
<td></td>
<td>160 bar</td>
<td>24V-K</td>
</tr>
<tr>
<td></td>
<td>210 bar</td>
<td></td>
</tr>
<tr>
<td></td>
<td>315 bar</td>
<td></td>
</tr>
</tbody>
</table>

**Seals**

- NBR
- Viton

**Appendix**

### Accessories/spare parts

- Socket connector DIN EN 175301-803*, shape B, black
- Seal kit EEPDBDS 02 (NBR)
- Seal kit EEPDBDS 02 (Viton)

* (formerly DIN 43650)

**NOTE**

For the appropriate electronic controllers, see chapter 6 “electronics and sensors” as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual**

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 “general information” under the category “general operating manual” or will be provided upon request.
Proportional pressure relief valve EPDBD 03

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 3 l/min
cavity EPDBD 03

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<tr>
<td>Dimensions</td>
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<tr>
<td>Type code</td>
<td>6</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>6</td>
</tr>
</tbody>
</table>

Characteristics

- slip-in valve for cavity EPDBD 03
- miniature edition (edge length of solenoid: 25 mm)
- suitable as pilot valve
- low vibration
- maintenance-free
Technical data

**Hydraulic**
- Operating pressure max.: 250 bar (dynamic)
  315 bar (with free return flow in port 2)
  with aluminium in-line body max. 250 bar
- Flow rate: 2.6 l/min at $\Delta p$ according to pressure drop diagrams
- Pressure setting range: see type code
- Flow direction: 1 (P) to 2 (T) (2 to 1 not allowed)
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999)
  18/16/13, filter with $\beta S(c) > 200$
- Repeatability: $< 3 \%$ with optimized PMW-signal*
- Hysteresis: $< 5 \%$ with optimized PMW-signal*

* at 20% to 100% of the nominal valve current and approximately 10 to 63 cSt

**NOTE**
The pressure on port 2 (T) adds directly to the set pressure. The total pressure of ports 1 (P) and 2 (T) must not exceed the maximum operating pressure.

**Mechanic**
- Design: EEPROMB slip-in valve, EPDBDR in in-line body, direct operated by solenoid
- Size: 03
- Fluid temperature: -20 °C to +65 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any, preferably with solenoid facing down
- Weight: EEPROMB 03: 0.24 kg
  EPDBDR 03: 0.34 kg
- Material: valve parts: steel, in-line body: aluminium
  seals: NBR, Viton optional
- Surface protection: exterior parts: zinc coated steel, partially burnished
  in-line body: anodized aluminium

**Electric**
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 1.2 A (12 V), 0.63 A (24 V)
- Nominal resistance (R20): 6 Ω (12 V), 24 Ω (24 V)
- Power consumption: 9.6 W at nominal valve current
- Shifting time: 100% ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape B, unterminated wire
- Electronic controllers: see chapter 6 "electronics and sensors" as well as our online catalogue at www.weber-hydraulik.com.
**Performance**

Pressure drop diagram (p/I) EEPDBD 03 at Q = 1.0 l/min

Pressure drop diagram (p/Q) EEPDBD 03 at I_n

Pressure drop diagram (∆p/Q) EEPDBD 03 at I = 0 mA (currentless)

**Test conditions**

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the performance curves.
**Dimensions**

*Slip-in valve*

**EEPDBD 03**

installation torque: 1 Nm

SW 2,5

installation torque: max. 0,5 Nm

electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape B

**Cavity EPDBD 03**

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.
**Dimensions**

*Slip-in valve in*

*in-line body G 1/4”*

*EPDBDR 03*

installation torque: max. 0.5 Nm

installation torque: 1 Nm

SW 2,5

electric plug according to

DIN EN 175301-803

(formerly DIN 43650) shape B

**Proportional pressure relief valve**

**Slip-in valve in**

**in-line body G 1/4”**

**EPDBDR 03**
## Proportional pressure relief valve

### Type code

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Size</th>
<th>Revision</th>
<th>Nominal voltage</th>
<th>Electric termination and manual override</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPDBD</td>
<td>slip-in pressure relief valve</td>
<td></td>
<td></td>
<td>12V, 24V DC</td>
<td>DIN with manual override (push pin)**</td>
</tr>
<tr>
<td>EPDBDR</td>
<td>pressure relief valve in in-line body*</td>
<td></td>
<td></td>
<td></td>
<td>Unterminated wire 300 mm without manual override</td>
</tr>
</tbody>
</table>

### Accessories and additional information

<table>
<thead>
<tr>
<th>Accessories/ spare parts</th>
<th>Part:</th>
<th>Article number:</th>
</tr>
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<tr>
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<td>149.0005</td>
<td></td>
</tr>
<tr>
<td>Seal kit EEPDBD 03 (NBR)</td>
<td>405.0076</td>
<td></td>
</tr>
<tr>
<td>Seal kit EEPDBD 03 (Viton)</td>
<td>405.0077</td>
<td></td>
</tr>
</tbody>
</table>

*In-line body up to max. 210 bar operating pressure available

**Manual override up to max. 210 bar operating pressure available

### Pressure setting range

<table>
<thead>
<tr>
<th>Pressure setting range</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>30 bar</td>
<td>30</td>
</tr>
<tr>
<td>70 bar</td>
<td>70</td>
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<tr>
<td>115 bar</td>
<td>115</td>
</tr>
<tr>
<td>210 bar</td>
<td>210</td>
</tr>
<tr>
<td>315 bar</td>
<td>315</td>
</tr>
</tbody>
</table>

### Electric termination and manual override

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>12V DC</td>
<td></td>
</tr>
<tr>
<td>24V DC</td>
<td></td>
</tr>
</tbody>
</table>

### Seals

<table>
<thead>
<tr>
<th>Seals</th>
<th>Value</th>
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<td>NBR</td>
<td></td>
</tr>
<tr>
<td>Viton</td>
<td></td>
</tr>
</tbody>
</table>

### Manual

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.

### NOTE

For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
Proportional pressure relief valve EPDBD 05

---

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 12 l/min
cavity EPDBD 05 or
cavity T-10A or C-10-2

---

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<tr>
<td>Type code</td>
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<td>Appendix</td>
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</tbody>
</table>

---

**Characteristics**

- proportional pressure relief valve in spool design
- slip-in valve for cavity EEPDBD 05
- or screw-in valve for cavity T-10A
- or screw-in valve for cavity C-10-2
- suitable as pilot valve
- low vibration
- maintenance-free
- degressive versions available
- versions according to the ATEX-directive for the use in potentially explosive atmospheres available (see datasheet 020141_EPDBD_05_EX_e)
### Technical Data

#### Hydraulic
- **Operating pressure max.:** 315 bar (with free return flow in port T), for aluminium manifolds: 210 bar
- **Max. pressure at port T:** 35 bar
- **Flow rate:**
  - Pressure range 25-115 bar: 12 l/min
  - Pressure range 175-315 bar: 8 l/min at Δp = 10 bar
- **Pressure setting range:** see type code
- **Flow direction:** P to T (T to P not allowed)
- **Hydraulic fluid:** mineral oil according to DIN 51524, other hydraulic fluids upon request
- **Viscosity range:** 10 - 350 cSt
- **Filtration:** oil cleanliness according to ISO 4406 (1999)
- **Repeatability:** < 3 % with optimized PMW-signal*
- **Hysteresis:** < 5 % with optimized PMW-signal*

* at 20 % to 100 % of the nominal valve current.

**NOTE**
The pressure at port T adds directly to set pressure.

#### Mechanic
- **Design:** EEPDBD slip-in valve, EPDBDR in in-line body, ZEPDBD in sandwich body NG 6, EPDBDA in mounting plate NG 6, EEPBDBS screw-in valve T-10A, EEPDBDM screw-in valve C-10-2, direct operated
- **Size:** 05
- **Fluid temperature:** -25 °C to +70 °C
- **Ambient temperature:** -25 °C to +50 °C
- **Storage temperature:** -30 °C to +60 °C (non-condensing)
- **Installation position:** any
- **Weight:** EEPDBD 05: 0,7 kg, EPDBDR 05: 1,13 kg, ZEPDBD(05/06): 1,05 kg, EPDBDA (05/06): 0,99 kg, EEPBDBS 05: 0,74 kg, EEPDBDM: 0,73 kg
- **Material:** valve parts and in-line body: steel, sandwich body and mounting plate: aluminium; seals: NBR, optional Viton
- **Surface protection:** exterior parts and in-line body: zinc coated steel, partially burnished, sandwich body and mounting plate: anodized aluminium

#### Electric
- **Nominal voltage:** 12 V DC, 24 V DC
- **Nominal valve current:** 1,7 A (12 V), 0,7 A (24 V)
- **Nominal resistance (R20):** 4 Ω (12 V), 25 Ω (24 V)
- **Power consumption:** 16 W at nominal valve current
- **Shifting time:** 100 % ED
- **Control command:** PWM-signal
- **PWM-frequency:** typically 140 Hz (depending on application)
- **Protection class:** IP65 with correctly mounted and locked mating connector
- **Electric termination:** Electric plug according to DIN EN 175301-803 shape A, AMP Junior Timer, unterminated wire
- **Electronic controllers:** see chapter 6 “electronics and sensor technology” as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com)
Performance

Pressure drop diagram (p/l) EPDBD 05 at Q = 0.8 l/min

Pressure drop diagram (p/l) EPDBD 05 degressive version at Q = 0.8 l/min

Pressure drop diagram (p/Q) EPDBD 05 at IN

Pressure drop diagram (p/Q) EPDBD 05 degressive version at IN

Pressure drop diagram (∆p/Q) EPDBD 05 at I = 0 mA (currentless)

Pressure drop diagram (∆p/Q) EPDBD 05 degressive version at I = 100% (full current)

Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)

Higher volume flow and viscosity lead to higher pressure at port P. The higher the pressure setting range, the stronger this effect will be.
### Dimensions

*Slip-in valve*

**EEPDBD 05**

- Installation torque 4 Nm
- SW 3
- Electric plug according to DIN EN 175301-803 shape A
- Solenoid 4 x 90° rotatable

### Cavity

**EEPDBD 05**

---

**NOTE** For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE** The valve is also available as EPDBDR 05 in in-line body, as ZEPDBD (05/06) in a sandwich body NG 6 and as EPDBDA (05/06) in a mounting plate NG 6. Dimension sheets are available upon request.
Dimensions

**Screw-in valve**

**EEPDBDS 05**

- **installation torque 4 Nm**
  - SW 3
- **electric plug according to DIN EN 175301-803 shape A**
- **solenoid 4 x 90° rotatable**
- **locating shoulder T-10A**
- **installation torque 45 Nm**
  - SW 22

**Cavity T-10A**

**NOTE**

- For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE**

- For appropriate manifolds see chapter 10 „manifolds“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE**

- The valve is also available as degressive version.
Dimensions

*Screw-in valve*  
EEPDBDM 05

- **Installation torque**: 4 Nm  
  SW 3
- **Electric plug**: According to DIN EN 175301-803 shape A
- **Solenoid**: 4 x 90° rotatable
- **Locating shoulder**: C-10-2
- **Installation torque**: 45 Nm  
  SW 22

*Cavity C-10-2*

**NOTE**  
For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at www.weber-hydraulik.com.

**NOTE**  
We also provide a variety of suitable manifolds for C-10-2. Please contact us for further assistance.

**NOTE**  
The valve is also available as degressive version.
Dimensions

*Slip-in valve*

EEPDBD 05
degressive

installation torque 4 Nm
SW 3

electric plug according to DIN EN 175301-803 shape A

solenoid 4 x 90° rotatable

_Cavity EEPDBD 05_

**NOTE** For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at www.weber-hydraulik.com.

**NOTE** The degressive version of the valve is also available as EEPDBDS 05 (with cavity T-10A) or as EEPDBDM 05 (with cavity C-10-2).
The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure relief function of the valve. Be aware that the valve can not fulfil its pressure relief function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system! The application as a pressure relief valve with extended throttle function is dangerous and not suggested. All liability for doing so lies with the operator!

**NOTE FOR FNH**

---

### Type code

<table>
<thead>
<tr>
<th>Design</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEPROMD 05</td>
<td>Slip-in valve</td>
</tr>
<tr>
<td>EPPDR 05</td>
<td>Slip-in valve in in-line body</td>
</tr>
<tr>
<td>ZEPBD (05/06)</td>
<td>Slip-in valve in sandwich body NG 6**</td>
</tr>
<tr>
<td>EPBDDBA (05/06)</td>
<td>Slip-in valve in mounting plate NG 6**</td>
</tr>
<tr>
<td>EPPDBS 05</td>
<td>Screw-in valve T-10A</td>
</tr>
<tr>
<td>EPPDBM 05</td>
<td>Screw-in valve C-10-2</td>
</tr>
</tbody>
</table>

### Manual override*

- **without**
- **FNH** (see note) lockable manual override with hexagon socket and lock nut
- **DNH** manual override with push knob

### Pressure setting range

<table>
<thead>
<tr>
<th>Setting</th>
<th>Range (bar)</th>
</tr>
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<tbody>
<tr>
<td>25</td>
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<tr>
<td>45</td>
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<td>70</td>
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<tr>
<td>115</td>
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</tr>
<tr>
<td>275</td>
<td>275</td>
</tr>
<tr>
<td>315</td>
<td>315</td>
</tr>
</tbody>
</table>

### Electric termination

- **DIN**
- **AMP** AMP Junior Timer (only 24 V version)
- **K** unterminated wire 500 mm (only 24 V version)

---

* for degressive versions no additional manual override selectable

** aluminium manifolds are approved for max. operating pressure of 210 bar
Appendix

Accessories/spare parts

<table>
<thead>
<tr>
<th>Article:</th>
<th>Article number:</th>
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<tbody>
<tr>
<td>Socket connector DIN EN 175301-803, shape A, black</td>
<td>149.0007</td>
</tr>
<tr>
<td>Seal kit EEPDBD 05 (NBR)</td>
<td>405.0050</td>
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<tr>
<td>Seal kit EEPDBD 05 (Viton)</td>
<td>405.0051</td>
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<tr>
<td>Seal kit T-10A (NBR)</td>
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<td>Seal kit T-10A (Viton)</td>
<td>405.0037</td>
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<tr>
<td>Seal kit C-10-2 (NBR)</td>
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<tr>
<td>Seal kit C-10-2 (Viton)</td>
<td>405.0080</td>
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</table>

Note

For appropriate electronic controllers, see chapter 6 „electronics and sensor technology“ as well as our online catalogue at www.weber-hydraulik.com.

Manual

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category „general operating manual“ or will be provided upon request.
Proportional pressure relief valve EPDBD 05 acc. to ATEX-directive

Characteristics

- proportional pressure relief valve in spool design
- according to the ATEX-directive for the use in potentially explosive atmospheres
- slip-in valve for cavity EEPDBD 05
- suitable as pilot valve
- low vibration
- maintenance-free

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<tr>
<td>Set-up</td>
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</tbody>
</table>
Technical Data

**Hydraulic**
- Operating pressure max.: 250 bar (with free return flow in port 2),
  Tank pressure max.: 35 bar
- Flow rate: pressure range 20-80 bar: 12 l/min
  pressure range 120-220 bar: 8 l/min at Δp = 10 bar
- Pressure setting range: see type code
- Flow direction: 1 (P) to 2 (T) (2 to 1 not allowed)
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
- Repeatability: < 3 % with optimized PWM-signal*
- Hysteresis: < 5 % with optimized PWM-signal*
  * at 20 % to 100 % of the nominal valve current

**NOTE**
The pressure at port 2 adds directly to the set pressure.

**Mechanic**
- Design: EEPDBD slip-in valve, EPDBDR in in-line body, ZEPDBD in sandwich body NG 6, EPDBDA in mounting plate NG 6, direct operated
- Size: 05
- Fluid temperature: -30 °C to +50 °C
- Ambient temperature: -30 °C to +50 °C
- Storage temperature: -30 °C to +50 °C (non-condensing)
- Installation position: any
- Weight: EEPDBD 05: 2,7 kg, EPDBDR 05: 3,1 kg, ZEPDBD(05/06) and EPDBDA (05/06): 3,0 kg
- Material: valve parts and in-line body: steel, sandwich body and mounting plate: aluminium; seals: NBR, optional Viton
- Surface protection: exterior parts and in-line body: zinc coated steel, partially burnished, sandwich body and mounting plate: anodized aluminium

**Electric**
- Nominal voltage: 24 V DC
- Nominal valve current: 0,6 A
- Nominal resistance (R20): 23,1 Ω
- Power consumption: 15,6 W at nominal valve current
- Shifting time: 100 % ED
- Control command: PWM-signal
- PWM-frequency: typically 85 Hz (depending on application)
- Protection system: IP67 according to IEC/EN 60529, IP69K according to DIN 40050-9 with intended assembling
- Protection class: III according to DIN VDE 0580
Technical Data

**Electric**
- EC Type Examination Cert.: IBExU 13 ATEX 1040 X, IECEx IBE 13.00117X
- Electronic controllers: see chapter 6 “electronics and sensor technology” as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
- Electronics that are used in explosion protected areas must be Ex-certified!

Performance
- Performance graphs upon request.

Dimensions

**Slip-in valve EEPDBD 05 EX**
- installation torque 5 Nm SW 26
- earth connection
- solenoid 360° rotatable*
- connecting cable 15 m
- installation torque 3 Nm SW 3

* with EC Type Examination Certificate IBExU 13 ATEX 1040 X, IECEx IBE 13.00117X

**Cavity EEPDBD 05 EX**
- For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE**
- The valve is also available as EPDBDR 05 in in-line body, as ZEPDBD (05/06) in a sandwich body NG 6 and as EPDBDA (05/06) in a mounting plate NG 6. Dimension sheets are available upon request.
Type code

Design
- EEPDBD 05 Slip-in valve
- EPDBDR 05 Slip-in valve in in-line body
- ZEPDBD (05/06) Slip-in valve in sandwich body NG 6*
- EPDBDA (05/06) Slip-in valve in mounting plate NG 6*

Pressure setting range
- 20 20 bar
- 30 30 bar
- 50 50 bar
- 80 80 bar
- 120 120 bar
- 145 145 bar
- 190 190 bar
- 220 220 bar

Seals
- NBR
- Viton V

NOTE
* aluminium manifolds are approved for max. operating pressure of 210 bar

Appendix

Accessories/ spare parts

<table>
<thead>
<tr>
<th>Article:</th>
<th>Article number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal kit EEPDBD 05 (NBR)</td>
<td>405.0050</td>
</tr>
<tr>
<td>Seal kit EEPDBD 05 (Viton)</td>
<td>405.0051</td>
</tr>
</tbody>
</table>

NOTE
For the appropriate electronic controllers, see chapter 6 „electronics and sensor technology“ as well as our online catalogue at www.weber-hydraulik.com.
Please consider whether the electronic controller will be located inside or outside of the explosion protected area. Electronics that are used in explosion protected areas must be certified according to the ATEX-directive!
Set-up

The solenoid coil may only be operated when installed on the appropriate valve. Further information can be found in the provided operation manual of the solenoid. When operating the valve, information contained in the provided operation manual of the solenoid, as well as our general operating manual, must be followed precisely!

Single or multiple mounting of the valve in single operation must have a minimum size of 46 x 46 x 66 mm and a base plate ≥ 46 x 30 x 66 mm. The material must be Fe or material with the same or better thermal conductivity.

The installation of these electrical components must be carried out by an electrician with adequate qualifications.

Each solenoid must be short-circuit fuse protected suitable to its nominal valve current (max. 3 x Iₚ, according to IEC/EN 60127-2). This could, for example, be a motor protecting switch with thermal quick release and short-circuit protection (adjusted to the rated current).

The installed fuse must have a voltage rating equal or larger than the rated voltage of the solenoid, and the fuse should be installed in the associated power supply. If this is not possible, the fuse can be installed separately if the appropriate safety instructions are carefully considered.

When connecting the fuse to the circuit, it is of utmost importance to consider whether the fuse will be located inside, or outside of the explosion protected area. If the fuse will be connected to the circuit inside of the explosion protected area, then it must be mounted in an Ex-certificated terminal box.

For equipotential bonding, a ground terminal is provided on the outside of the solenoid.

Manual

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category “general operating manual” or will be provided upon request.
Proportional pressure relief valve EPDB 08

pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 80 l/min
cavity T-10A or C-10-2

Characteristics
- proportional pressure relief valve in spool design
- screw-in valve for cavity T-10A
- or slip-in valve for cavity C-10-2
- low vibration
- maintenance-free
- degressive version available

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<td>Type code</td>
<td>7</td>
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</tbody>
</table>
**Technical data**

_Hydraulic_

- Operating pressure max.: 315 bar (with free return flow in port 2) with aluminium manifolds 210 bar max. pressure at port 2: 35 bar
- Flow rate: 80 l/min
- Pressure setting range: see type code
- Flow direction: 1 (P) to 2 (T) (2 to 1 not allowed)
- Hydraulic fluid: mineral oil according to DIN 51524, others upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(0) > 200
- Repeatability: < 3 % with optimized PWM-signal*
- Hysteresis: < 5 % with optimized PWM-signal*

* at 20 % to 100 % of the nominal valve current

**NOTE**
The pressure on port 2 (T) adds directly to the set pressure. The total pressure of ports 1 (P) and 2 (T) must not exceed the maximum operating pressure.

_Mechanic_

- Design: EEPDBS screw-in valve T-10A or EEPDBM screw-in valve C-10-2, EPDBSA screw-in valve in mounting plate NG 6, pilot operated
- Size: 08
- Fluid temperature: -25 °C to +70 °C
- Ambient temperature: -25 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: EEPDBS 08 and EEPDBM 08: 0,7 kg, EPDBSA 08: 1,1 kg
- Material: valve parts: steel, seals: NBR, Viton optional
- Surface protection: exterior parts: zinc coated steel, partially burnished

_Electric_

- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 1,7 A (12 V), 0,7 A (24 V)
- Nominal resistance (R20): 4 Ω (12 V), 25 Ω (24 V)
- Power consumption: 16 W at nominal valve current
- Shifting time: 100 % ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, unterminated wire
- Electronic controllers: see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com
Performance

Pressure drop diagram (p/I) EEPDB 08 at Q = 20 l/min

Pressure drop diagram (Δp/Q) EEPDB 08 at I = 0 mA (currentless)

Pressure drop diagram (Δp/Q) EEPDB 08 degressive version at I = 100 % (full current)

Test conditions
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the performance curves.
Dimensions

*Screw-in valve*  
EEPDBS 08

installation torque 3 Nm  
SW 3

installation torque:  
max. 0.5 Nm

electric plug acc. to  
DIN EN 175301-803  
(formerly DIN 43650) shape A

installation torque 45 Nm  
SW 22

locating shoulder T-10A

*Cavity T-10A*

NOTE  
For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE  
For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

NOTE  
The valve is also available as EPDBSA (08/06) in a mounting plate NG 6. Please contact us for further information.
Dimensions

**Slip-in valve**

*EEPDBM 08*

- Installation torque 3 Nm
  - SW 3
- Installation torque:
  - Max. 0.5 Nm
- Electric plug acc. to
  - DIN EN 175301-803 (formerly DIN 43650) shape A
- Installation torque 45 Nm
  - SW 22
- Locating shoulder C-10-2

**Cavity C-10-2**

*NOTE* For a detailed drawing of the cavity please see chapter 11 *“general information”* or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

*NOTE* We also provide a variety of suitable manifolds for C-10-2. Please contact us for further assistance.
Dimensions

Screw-in valve
EEPDBS 08 degressive

Do not adjust!

installation torque 3 Nm
SW 3

installation torque: max. 0.5 Nm

electric plug acc. to
DIN EN 175301-803
(formerly DIN 43650) shape A

installation torque 45 Nm
SW 22

locating shoulder T-10A

Cavity T-10A

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.
NOTE FOR FNH

The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure relief function of the valve. Be aware that the valve can not fulfil its pressure relief function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system! The application as a pressure relief valve with extended throttle function is dangerous and not suggested. All liability for doing so lies with the operator! In case the manual override FNH is screwed in to achieve a throttle function (even though this is not suggested), the reduction of the nominal valve current has to be taken into consideration.
### Accessories and additional information

<table>
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<th>Accessories/ spare parts</th>
<th>Part:</th>
<th>Article number:</th>
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<tr>
<td></td>
<td>Socket connector DIN EN 175301-803, shape A, black</td>
<td>149.0007</td>
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<td>Seal kit T-10A (NBR)</td>
<td>405.0013</td>
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<td>Seal kit T-10A (Viton)</td>
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<td>Seal kit C-10-2 (NBR)</td>
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<td>Seal kit C-10-2 (Viton)</td>
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**NOTE**

For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual**

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
Proportional pressure relief valve EPDBS 10

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<td>Type code</td>
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<tr>
<td>Accessories and additional information</td>
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Characteristics

- proportional pressure relief valve in spool design
- screw-in valve for cavity T-3A
- low vibration
- maintenance-free
- degressive version available
### Technical data

#### Hydraulic
- **Operating pressure max.:** 315 bar (with free return flow in port 2)
- **Flow rate:** 150 l/min
- **Pressure setting range:** see type code
- **Flow direction:** 1 (P) to 2 (T) (2 to 1 not allowed)
- **Hydraulic fluid:** mineral oil according to DIN 51524, others upon request
- **Viscosity range:** 10 - 350 cSt
- **Filtration:** oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
- **Repeatability:** < 3 % with optimized PWM-signal*
- **Hysteresis:** < 5 % with optimized PWM-signal*

* at 20 % to 100 % of the nominal valve current

**NOTE**
The pressure on port 2 (T) adds directly to the set pressure. The total pressure of ports 1 (P) and 2 (T) must not exceed the maximum operating pressure.

#### Mechanic
- **Design:** EEPDBS screw-in valve T-3A, EPDBSA screw-in valve in mounting plate NG 10, pilot operated
- **Size:** 10
- **Fluid temperature:** -25 °C to +70 °C
- **Ambient temperature:** -25 °C to +50 °C
- **Storage temperature:** -30 °C to +60 °C (non-condensing)
- **Installation position:** any
- **Weight:** EEPDBS 10: 0.84 kg, EPDSA 10: 1.78 kg
- **Material:** valve parts: steel
- **Seals:** NBR, Viton optional
- **Surface protection:** exterior parts: zinc coated steel, partially burnished

#### Electric
- **Nominal voltage:** 12 V DC, 24 V DC
- **Nominal valve current:** 1.7 A (12 V), 0.7 A (24 V)
- **Nominal resistance (R20):** 4 Ω (12 V), 25 Ω (24 V)
- **Power consumption:** 16 W at nominal valve current
- **Shifting time:** 100 % ED
- **Control command:** PWM-signal
- **PWM-frequency:** typically 140 Hz (depending on application)
- **Protection class:** IP65 with correctly mounted and locked mating connector
- **Electric termination:** Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, unterminated wire
- **Electronic controllers:** see chapter 6 "electronics and sensors" as well as our online catalogue at www.weber-hydraulik.com.
Performance

Pressure drop diagram (p/I) EPDBS 10 at Q = 35 l/min

Pressure drop diagram (p/Q) EPDBS 10 at \( I_N \)

Pressure drop diagram (\( \Delta p/Q \)) EPDBS 10 at \( I = 0 \) mA (currentless)

Pressure drop diagram (\( \Delta p/Q \)) EPDBS 10 degressive version at \( I = 100 \% \) (full current)

Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the performance curves.
**Dimensions**

*Screw-in valve*

*EEPDBS 10*

Installation torque: 3 Nm
SW 3

Installation torque 3 Nm
SW 3

Electric plug acc. to DIN EN 175301-803
(formerly DIN 43650) shape A

Installation torque: 65 Nm
SW 24

Locating shoulder T-3A

---

**Cavity T-3A**

---

**NOTE**
For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE**
For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE**
The valve is also available as EPDBSA 10 in a mounting plate NG 10. Dimension sheets are available upon request.
**Dimensions**

* Screw-in valve  
  EEPDBS 10  
  degressive version

---

**Do not adjust!**

- Installation torque: 3 Nm  
  SW 3
- Installation torque:  
  max. 0.5 Nm
- Electric plug acc. to  
  DIN EN 175301-803  
  (formerly DIN 43650) shape A
- Installation torque: 65 Nm  
  SW 24
- Locating shoulder T-3A

---

**Cavity T-3A**

---

**NOTE**  
For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE**  
For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
### Type code

<table>
<thead>
<tr>
<th>Design</th>
<th>Pressure setting range</th>
<th>Nominal voltage</th>
<th>Special design</th>
<th>Seals</th>
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<td>EEPDBS</td>
<td>Screw-in valve T-3A</td>
<td>25 bar</td>
<td>12V</td>
<td>without</td>
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<td>45 bar</td>
<td>12V DC</td>
<td>NBR</td>
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<td>70 bar</td>
<td>24V</td>
<td>Viton</td>
</tr>
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<td></td>
<td></td>
<td>115 bar</td>
<td>24V DC</td>
<td>V</td>
</tr>
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<td></td>
<td>175 bar</td>
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<td>210 bar</td>
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<td>275 bar</td>
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<tr>
<td></td>
<td></td>
<td>315 bar</td>
<td></td>
<td></td>
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<tr>
<td>EPDBSA</td>
<td>Screw-in valve in mounting plate NG 10*</td>
<td>25 bar</td>
<td>12V</td>
<td>without</td>
</tr>
<tr>
<td></td>
<td></td>
<td>45 bar</td>
<td>12V DC</td>
<td>NBR</td>
</tr>
<tr>
<td></td>
<td></td>
<td>70 bar</td>
<td>24V</td>
<td>Viton</td>
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<tr>
<td></td>
<td></td>
<td>115 bar</td>
<td>24V DC</td>
<td>V</td>
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<td>275 bar</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>315 bar</td>
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</tr>
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</table>

* aluminium manifolds are only approved for max. operating pressure of 210 bar
** for degressive version no additional manual override selectable

### NOTE FOR FNH

The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure relief function of the valve. Be aware that the valve can not fulfill its pressure relief function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system! The application as a pressure relief valve with extended throttle function is dangerous and not suggested. All liability for doing so lies with the operator!

In case the manual override FNH is screwed in to achieve a throttle function (even though this is not suggested), the reduction of the nominal valve current has to be taken into consideration.

### Accessories and additional information

<table>
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<tr>
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<th>Article number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socket connector DIN EN 175301-803*, shape A, black</td>
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<td>Seal kit T-3A (NBR)</td>
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<td>Seal kit T-3A (Viton)</td>
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<td>405.0041</td>
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</table>

* formerly DIN 43650

### NOTE

For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at www.weber-hydraulik.com.

### Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Pilot-operated proportional valves with large nominal size

- Pilot-operated proportional pressure relief valves or pressure control valves with large nominal size
- Modular set-up out of proportional pilot valves and mechanical cartridge valves with cavities up to T-19A
- Pressure relief valves up to 760 l/min
- Pressure control valves up to 320 l/min
- Suitable in-line bodies and subplates up to NG 25
- Varied combinations with different technical characteristics possible

- We would be happy to develop with you the ideal solution for your project.
The proportional sequence valve EPDZA is used for the more exact setting of consumer or system pressures, since it is independent of pressure fluctuations of the flowing oil.

For clamping and brake functions, in order to guarantee that a certain pressure is given before the oil flows to further consumers.

The proportional sequence valve EPDZA lets the oil of P flow after A, starting from a proportionally adjustable opening pressure. If the pressure drops again, the valve closes with small hysteresis. Contrary to standard pressure relief valves the actual opening pressure remains constantly, independent of pressure fluctuations in channel A. The EPDZA consists of a mechanical pressure relief valve, which is pilot-controlled by a proportional pressure relief valve. The spring chamber of the mechanical valve is separately relieved over channel T. If the pressure fluctuations are negligible in the T-channel, the pilot flow can be led also after T (plug 1, see symbol ). Otherwise it must flow off after channel B (plug 2). The valve has a mechanical maximum pressure setting. Below this setting the valve works proportionally.

**Technical Data**

<table>
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<tr>
<th>Hydraulic</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Pressure:</td>
<td>max. 350 bar</td>
</tr>
<tr>
<td>Rated Flow:</td>
<td>max. 40 l/min</td>
</tr>
<tr>
<td>Pressure Ranges:</td>
<td>see model code</td>
</tr>
<tr>
<td>Minimum Pressure:</td>
<td>see model code. Flow rate and viscosity dependently. Pressure at port T adds directly to the setting.</td>
</tr>
<tr>
<td>Fluids:</td>
<td>oils as per DIN 51524, others upon request</td>
</tr>
<tr>
<td>Viscosity Range:</td>
<td>10 – 350 cSt</td>
</tr>
<tr>
<td>Filtration:</td>
<td>class 18/16/13, filter β 6...10 ≥ 75</td>
</tr>
<tr>
<td>Pilot Flow (from P to B):</td>
<td>appr. 0.15 – 0.20 l/min</td>
</tr>
<tr>
<td>Leakage (from P to T):</td>
<td>max. 50 ccm/min/ 100 bar/ 32 cSt</td>
</tr>
<tr>
<td>Repeatability:</td>
<td>&lt; X% *</td>
</tr>
<tr>
<td>Hysteresis:</td>
<td>&lt; X% *</td>
</tr>
<tr>
<td>Linearity:</td>
<td>* at optimum dither signal between the 20% and 100% values of the pressure range</td>
</tr>
</tbody>
</table>

| Mechanical                    |               |
| Design:                       | piston-sleeve style pilot operated |
| Ambient Temperature:          | -20 °C – +50 °C |
| Fluid Temperature:            | -20 °C – +80 °C |

| Electrical                    |               |
| Nominal Voltage:              | 24 V DC; 12 V DC |
| Rated Current:                | 700 mA (24 V); 1700 mA (12 V) |
| Nominal Resistance (R₀):      | 25 Ω (24 V); 4 Ω (12 V) |
| Wattage:                      | max. 20 W     |
| Cyclic Duration Factor:       | 100 %         |
| Control Command:              | PWM (Pulse-Width-Modulated DC) |
| Dither Frequency:             | preferably 140 Hz |
| Environmental Protection:     | IP 65         |
| Electrical Termination:       | plug as per DIN 43650 form A, incl. square connector Pg9 |
| Control Devices:              | see chapter 6 'Electronic Amplifiers' |

| Installation:                 | no restrictions |
| Weight:                       | 1.33 kg         |
| Materials:                    | valve parts: steel body: aluminium seals: NBR, Viton backup rings: Teflon, PU |
| Surface Protection:           | solenoid: zinc plated ext. valve parts: zinc plated, burnished body: anodised |

**Cover Plate CETOP/ISO 3 • max. 350 bar • max. 40 l/min**
Performance

Oil: HLVP 32, temperature: 40 °C (≈ 32 cSt), I= 100 %= 700 mA (24 V) or 1700 mA (12 V).
Higher oil flows and higher viscosities will cause higher pressures at port P.

Pressure vs. Current (Δp/I) at Q=
Pressure vs. Flow (Δp/Q) at max. setting

Pressure vs. Flow (Δp/Q) no current (I= 0 mA)
Leakage from P to T (Q/Δp) below setting

Model Code

| EPDZA 06 | 350 | 0 | * | 24V | *
<table>
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<tr>
<td>Proportional Sequence Valve, Pilot Operated, Size 06</td>
<td>Pressure Range</td>
<td>Pilot Flow Plug</td>
<td>Design (intern)</td>
<td>Nominal Voltage</td>
<td>Special Executions</td>
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<tr>
<td>350 = X - 350 bar</td>
<td>0 = to B and T (no plug)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = to T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 = to B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dimensions [mm]

[Diagram of the valve with dimensions]
Proportional Pressure Control Valves

**direct operated types**

**EPDRD3-04**
direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 4 l/min
cavity EPDRD3-04, mounting plates NG 4 and NG 6

**EPDRD3-04 acc. to ATEX-directive**
direct operated, solenoid operated
operating pressure max. 250 bar
volume flow max. 4 l/min
cavity EPDRD3-04, mounting plates NG 4 and NG 6

**EPDRD3-05**
direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 12 l/min
cavity T-11A or C-10-3, various housings

**pilot operated types**

**EPDR3-06**
pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 30 l/min
sandwich body or mounting plate NG 6

**EPDR3-08**
pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 40 l/min
cavity T-11A or C-10-3, various housings

**EPDRS3-10**
pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 80 l/min
cavity T-2A, various housings

**Proportional Valves with large nominal size**
pilot operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 320 l/min
suitable in-line bodies and subplates up to NG 25

**Accessories**

**Pressure Sequence Body ZRV-06**
pressure control from 0 bar
operating pressure max. 250 bar
volume flow max. 30 l/min
pressure sequence body NG 6
Proportional pressure control valve EPDRD3-04

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</table>

Characteristics

- 3-way proportional pressure control valve in spool design
- slip-in valve for cavity EPDRD3-04
- suitable as pilot valve
- compact design
- minimum oil leakage
- low vibration
- maintenance-free
- degressive version available
- versions according to the ATEX-directive for the use in potentially explosive atmospheres available (see datasheet 030111_EPDRD3_04_EX_e)
- also usable as 2-way proportional pressure reducing valve (after consultation with WEBER-HYDRAULIK ValveTech)
Technical Data

Hydraulic

- Operating pressure max.: port 2 (P): 315 bar, with aluminium manifolds: 210 bar
  port 1 (A): 45 bar, pressure port 3 (T) < pressure port 1 (A)
- Flow rate: 4 l/min
- Pressure setting range: see type code
- Flow direction: see symbol
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999)
  18/16/13, filter with β 5(c) > 200
- Repeatability: < 3 % with optimized PWM-signal*
- Hysteresis: < 5 % with optimized PWM-signal*

* at 20 % to 100 % of the nominal valve current.

NOTE

The pressure on port 3 (T) adds directly to the set pressure. The total pressure of ports A and T must not exceed the maximum operating pressure.

Mechanic

- Design: EEPDRD slip-in valve, EPDRDR in in-line body,
  EPDRDA in mounting plate NG 4 or NG 6,
  direct operated
- Size: 04
- Fluid temperature: -25 °C to +70 °C
- Ambient temperature: -25 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any, preferably horizontal
- Maximum acceleration: 5 g, crossways
- Weight: EEPDRD3-04: 0,7 kg, EPDRDR3-04: 0,96 kg,
  DEPDRDR3-04: 1,86 kg, EPDRDA3-04/04: 0,92 kg,
  DEPDRDA3-04/06: 0,98 kg, DEPDRDA3-04/06: 1,82 kg
- Material: valve parts: steel, in-line body and mounting plate:
  aluminium; seals: NBR, optional Viton
- Surface protection: solenoid: zinc coated steel
  in-line body and mounting plate: anodized aluminium

Electric

- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 1,7 A (12 V), 0,7 A (24 V)
- Nominal resistance (R20): 4 Ω (12 V), 25 Ω (24 V)
- Power consumption: 16 W at nominal valve current
- Shifting time: 100 % ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 shape A,
  AMP Junior Timer, unterminated wire
- Electronic controllers: see chapter 6 "electronics and sensors" as well as our online catalogue at www.weber-hydraulik.com
Performance

Pressure drop diagram \((p/I)\) EPDRD3-04 at \(Q = 0\) l/min (static)

Pressure drop diagram \((p/I)\) EPDRD3-04 degressive version at \(Q = 0\) l/min (static)

Pressure drop diagram \((p/Q)\) EPDRD3-04 with 15 bar spool at various currents

Pressure drop diagram \((p/Q)\) EPDRD3-04 degressive version with 15 bar spool at various currents

Pressure drop diagram \((\Delta p/Q)\) EPDRD3-04 at \(I = 0\) mA (currentless)

Pressure drop diagram \((\Delta p/Q)\) EPDRD3-04 degressive version at \(I = 100\%\) (full current)

Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the characteristic curves.
**Dimensions**

*Slip-in valve*

**EEPDRD3-04**

- **Installation torque**: 3 Nm
  - SW 3
- **Installation torque**: max. 0.5 Nm
- **Electric plug according to**
  - DIN EN 175301-803
  - Shape A

**Cavity EPDRD3-04**

- **4 x M4**
  - 28
- **∅16**
  - 32

**NOTE** For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE** The valve is also available as EPDRDA3-04/04 in a mounting plate NG 4 or as EPDRDA3-04/06 in a mounting plate NG 6. Dimension sheets are available upon request.

**NOTE** The valve is also available as degressive version.
Dimensions

Slip-in valve in
in-line body G 1/4"
EPDRDR3-04

installation torque 3 Nm
SW 3

installation torque:
max. 0.5 Nm

electric plug according to
DIN EN 175301-803
shape A

- **Dimensions**
  - Slip-in valve in in-line body G 1/4"
  - **EPDRDR3-04**
  - Installation torque: 3 Nm
  - SW 3
  - Electric plug according to DIN EN 175301-803
  - Shape A

- **Weights and Materials**
  - Weight: approx. 0.020 kg
  - Materials: DERIVATE FROM MATERIAL V22

- **Revision**
  - Format: A3
  - Date: 2016.08.30
  - Drawing No.: SAA
  - Scale: 1:1.35

- **Marks and Certifications**
  - Made in Germany
  - Patent.

- **Design**
  - Material: Derivate from Material V22
  - Weight: approx. 0.020 kg
  - Certification: Conformity. All rights reserved in the event of a patent.

- **Technical Details**
  - ISO 2768 - EN ISO 1302
  - ISO 13715
Dimensions

*Two slip-in valves in double-in-line body G 14" DEPDR3-04*

- **Installation torque**: 3 Nm
  - SW 3

- **Installation torque**: max. 0.5 Nm

- **Electric plug according to DIN EN 175301-803 shape A**
The valve is also available as EPDRDR3-04 in an in-line body, and as EPDRDA3-04/04 in a mounting plate NG 4 or as EPDRDA3-04/06 in a mounting plate NG 6. Dimension sheets are available upon request.
### Type code

<table>
<thead>
<tr>
<th>Design</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>EEPDRD3-04</td>
<td>Slip-in valve</td>
</tr>
<tr>
<td>EPDRDR3-04</td>
<td>Pressure control valve in in-line body*</td>
</tr>
<tr>
<td>DEPDRDR3-04</td>
<td>2 pressure control valves in double-in-line body*</td>
</tr>
<tr>
<td>EPDRDA3-04/04</td>
<td>Pressure control valve in mounting plate NG 4*</td>
</tr>
<tr>
<td>EPDRDA3-04/06</td>
<td>Pressure control valve in mounting plate NG 6*</td>
</tr>
<tr>
<td>DEPDRDA3-04/06</td>
<td>2 pressure control valves in double-mounting plate NG 6*</td>
</tr>
</tbody>
</table>

* aluminium manifolds are approved for max. operating pressure of 210 bar
** for degressive versions no additional manual override selectable
*** DEUTSCH plug on request

### Pressure setting range

<table>
<thead>
<tr>
<th></th>
<th>10 bar</th>
<th>15 bar</th>
<th>30 bar</th>
<th>45 bar</th>
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<tbody>
<tr>
<td><strong>Design</strong></td>
<td>10</td>
<td>15</td>
<td>30</td>
<td>45</td>
</tr>
<tr>
<td><strong>Nominal voltage</strong></td>
<td>12V DC</td>
<td>24V DC</td>
<td></td>
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</table>

### Electric termination***

<table>
<thead>
<tr>
<th></th>
<th>DIN</th>
<th>AMP</th>
<th>K</th>
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<tr>
<td><strong>Design</strong></td>
<td>DIN</td>
<td>AMP</td>
<td>K unterminated wire 500 mm</td>
</tr>
</tbody>
</table>

### Manual override**

<table>
<thead>
<tr>
<th></th>
<th>without</th>
<th>FNH</th>
<th>DNH</th>
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</thead>
<tbody>
<tr>
<td><strong>Design</strong></td>
<td>without</td>
<td>lockable manual override with hexagon socket and lock nut</td>
<td>manual override with push knob</td>
</tr>
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</table>

### Seals

<table>
<thead>
<tr>
<th></th>
<th>NBR</th>
<th>Viton V</th>
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</table>

---

**NOTE FOR FNH**

The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure control function of the valve. Be aware that the valve can not fulfil its pressure control function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system!
Accessories and additional information

<table>
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<tr>
<th>Accessories/ spare parts</th>
<th>Article:</th>
<th>Article number:</th>
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<tr>
<td></td>
<td>Socket connector DIN EN 175301-803, shape A, black</td>
<td>149.0007</td>
</tr>
<tr>
<td></td>
<td>Seal kit EEPRD3-04 (NBR)</td>
<td>405.0060</td>
</tr>
<tr>
<td></td>
<td>Seal kit EEPRD3-04 (Viton)</td>
<td>405.0097</td>
</tr>
</tbody>
</table>

**NOTE**  For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual**  Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Proportional pressure control valve EPDRD3-04 acc. to ATEX-directive

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<tr>
<td>Set-up</td>
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Characteristics

- 3-way proportional pressure control valve in spool design
- according to the ATEX-directive for the use in potentially explosive atmospheres
- slip-in valve for cavity EPDRD3-04
- suitable as pilot valve
- compact design
- minimum oil leakage
- low vibration
- maintenance-free
- also usable as 2-way proportional pressure reducing valve (after consultation with WEBER-HYDRAULIK ValveTech)
# Technical Data

## Hydraulic
- Operating pressure max.: port 2 (P): 250 bar, with aluminium manifolds: 210 bar, port 1 (A): 45 bar, pressure port 3 (T) < pressure port 1 (A)
- Flow rate: 4 l/min
- Pressure setting range: see type code
- Flow direction: see symbol
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
- Repeatability: < 3% with optimized PWM-signal*
- Hysteresis: < 5% with optimized PWM-signal*

* at 20% to 100% of the nominal valve current

**NOTE** The pressure on port 3 (T) adds directly to the set pressure. The total pressure of ports A and T must not exceed the maximum operating pressure.

## Mechanic
- Design: EEPDRD slip-in valve, EPDRDR in in-line body, EPDRDA in mounting plate NG 4 or NG 6, direct operated
- Size: 04
- Fluid temperature: -30 °C to +50 °C
- Ambient temperature: -30 °C to +50 °C
- Storage temperature: -30 °C to +50 °C (non-condensing)
- Installation position: any, preferably horizontal
- Maximum acceleration: 5 g, crossways
- Weight:
  - EEPDRD3-04: 2,7 kg, EPDRDR3-04: 2,96 kg,
  - DEPDRD3-04: 3,86 kg, EPDRDA3-04/04: 1,92 kg,
  - EPDRDA3-04/06: 1,98 kg, DEPDRDA3-04/06: 3,82 kg
- Material:
  - valve parts: steel, in-line body and mounting plate: aluminium;
  - seals: NBR, optional Viton
- Surface protection: solenoid: zinc coated steel, partially burnished, in-line body and mounting plate: anodized aluminium

## Electric
- Nominal voltage: 24 V DC
- Nominal valve current: 0,6 A
- Nominal resistance (R20): 23,1 Ω
- Power consumption: 15,6 W at nominal valve current
- Shifting time: 100% ED
- Control command: PWM-signal
- PWM-frequency: typically 85 Hz (depending on application)
- Protection system: IP67 according to IEC/EN 60529, IP69K according to DIN 40050-9 with intended assembling
- Protection class: III according to DIN VDE 0580
- Electric termination: 15 meter connecting cable FL4G11Y 2x1,5 mm² with explosive protection acc. to the ATEX-directive IECEx/ATEX CE 0637, Ex II 2G Ex mb IIC T4 Gb, II 2D Ex mb IIIC T130° Db in acc. with EN 60079-0:2012/ IEC 60079-0:2011, EN 60079-18:2009/ IEC 60079-18:2009
Technical Data

Electric

EC Type Examination Cert.: IBExU 13 ATEX 1040 X, IECEx IBE 13.00117X

Electronic controllers: see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com.

Electronics that are used in explosion protected areas must be Ex-certified!

Performance

Performance graphs upon request.

Dimensions

Slip-in valve
EEPDRD3-04 EX

Installation torque 5 Nm
SW 26

Solenoid 360° rotatable*

Earth connection

Connecting cable 15 m

Installation torque 3 Nm
SW 3

* with EC Type Examination Certificate
IBExU 13 ATEX 1040 X, IECEx IBE 13.00117X

Cavity
EEPDRD3-04

For a detailed drawing of the cavity please see chapter 11 "general information" or our online catalogue at www.weber-hydraulik.com.

NOTE

The valve is also available as EPDRDR3-04 in an in-line body, and as EPDRDA3-04/04 in a mounting plate NG 4 or as EPDRDA3-04/06 in a mounting plate NG 6. Dimension sheets are available upon request.
### Type code

<table>
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<th>Type code</th>
<th>Description</th>
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<tr>
<td>EEPDRD3-04</td>
<td>Slip-in valve</td>
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<td>Pressure control valve in in-line body*</td>
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<tr>
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<td>2 pressure control valves in double-in-line body*</td>
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<td>2 pressure control valves in double-mounting plate NG 6*</td>
</tr>
</tbody>
</table>

* aluminium manifolds are approved for max. operating pressure of 210 bar

### Pressure setting range

- **Nominal voltage:** 24V
- **Connecting cable:** 15 m with explosive protection
- **Seals:**
  - NBR
  - Viton

### Accessories and additional information

<table>
<thead>
<tr>
<th>Accessories/ spare parts</th>
<th>Article: Seal kit EEPDRD3-04 (NBR)</th>
<th>Article number: 405.0060</th>
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<tr>
<td>Article: Seal kit EEPDRD3-04 (Viton)</td>
<td>Article number: 405.0097</td>
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**NOTE**

For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

Please consider whether the electronic controller will be located inside or outside of the explosion protected area. Electronics that are used in explosion protected areas must be certified according to the ATEX-directive!
Set-up

The solenoid coil may only be operated when installed on the appropriate valve. Further information can be found in the provided operation manual of the solenoid. When operating the valve, information contained in the provided operation manual of the solenoid, as well as our general operating manual, must be followed precisely!

Single or multiple mounting of the valve in single operation must have a minimum size of 46 x 46 x 66 mm and a base plate ≥ 46 x 30 x 66 mm. The material must be Fe or material with the same or better thermal conductivity.

The installation of these electrical components must be carried out by an electrician with adequate qualifications.

Each solenoid must be short-circuit fuse protected suitable to its nominal valve current (max. 3 x \(I_{\text{N}}\) according to IEC/EN 60127-2). This could, for example, be a motor protecting switch with thermal quick release and short-circuit protection (adjusted to the rated current).

The installed fuse must have a voltage rating equal or larger than the rated voltage of the solenoid, and the fuse should be installed in the associated power supply. If this is not possible, the fuse can be installed separately if the appropriate safety instructions are carefully considered.

When connecting the fuse to the circuit, it is of utmost importance to consider whether the fuse will be located inside, or outside of the explosion protected area. If the fuse will be connected to the circuit inside of the explosion protected area, then it must be mounted in an Ex-certificated terminal box.

For equipotential bonding, a ground terminal is provided on the outside of the solenoid.

Manual

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
Proportional pressure control valve EPDRD3-05

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 12 l/min
cavity T-11A or C-10-3

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<td>Type code</td>
<td>7</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>8</td>
</tr>
</tbody>
</table>

Characteristics

- 3-way proportional pressure control valve in spool design
- screw-in valve for cavity T-11A or
- screw-in valve for cavity C-10-3
- minimum oil leakage
- low vibration
- maintenance-free
- degressive version available
- also usable as 2-way proportional pressure reducing valve (after consultation with WEBER-HYDRAULIK ValveTech)
Technical Data

**Hydraulic**
- Operating pressure max.: 315 bar, with aluminium manifolds: 210 bar
- Pressure at port 3 (T) < pressure at port 1 (A)
- Flow rate: 12 l/min
- Pressure setting range: see type code
- Flow direction: see symbol
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
- Repeatability: < 3 % with optimized PWM-signal*
- Hysteresis: < 5 % with optimized PWM-signal*
* at 20 % to 100 % of the nominal valve current.

**Mechanic**
- Design: EEPDRDS screw-in valve T-11A, EEPDRDM screw-in valve C-10-3, or EPDRDSA screw-in valve in mounting plate NG 6, direct operated
- Size: 05
- Fluid temperature: -25 °C to +70 °C
- Ambient temperature: -25 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any, preferably horizontal
- Maximum acceleration: 5 g, crossways
- Weight: EEPDRDS3-05: 0,76 kg, EEPDRDM3-05: 0,86 kg, EPDRDSA3-05/06: 1,07 kg
- Material: valve parts: steel, mounting plate: aluminium, seals: NBR, optional Viton
- Surface protection: exterior parts: zinc coated steel, partially burnished mounting plate: anodized aluminium

**Electric**
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 1,7 A (12 V), 0,7 A (24 V)
- Nominal resistance (R20): 4 Ω (12 V), 25 Ω (24 V)
- Power consumption: 16 W at nominal valve current
- Shifting time: 100 % ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 shape A, AMP Junior Timer, unterminated wire
- Electronic controllers: see chapter 6 "electronics and sensors" as well as our online catalogue at www.weber-hydraulik.com
**Performance**

**Pressure drop diagram (p/l) EPDRD3-05 at Q = 0 l/min (static)**

- For I = 0 mA (currentless),\( p \approx 80\% \)\( \Rightarrow \)\( 100\% \)
- For I = 100\% (full current),\( p \approx 45\% \)

**Pressure drop diagram (p/Q) EPDRD3-05 with 115 bar spool at various currents**

- \( p \approx 100\% \)
- \( p \approx 80\% \)
- \( p \approx 45\% \)

**Pressure drop diagram (Δp/Q) EPDRD3-05 at I = 0 mA (currentless)**

**Pressure drop diagram (Δp/Q) EPDRD3-05 degressive version at I = 100\% (full current)**

---

**Test conditions**

Oil: HLP 32, temperature: 40 °C (~32 cSt)

Higher viscosities change the characteristic curves.
Dimensions

Screw-in valve
EEPDRDS3-05

installation torque 3 Nm
SW 3

installation torque:
max. 0,5 Nm

electric plug according to
DIN EN 175301-803 shape A

installation torque 45 Nm
SW 22

locating shoulder T-11A

Cavity T-11A

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

NOTE The valve is also available as degressive version.
**Dimensions**

*Screw-in valve*  
**EEPDRDM3-05**

- **Installation torque:**  
  3 Nm  
  **SW 3**

- **Installation torque:**  
  max. 0.5 Nm

- **Electric plug according to DIN EN 175301-803 shape A**

- **Installation torque:**  
  45 Nm  
  **SW 22**

- **Locating shoulder C-10-3**

---

**Cavity C-10-3**

For a detailed drawing of the cavity please see chapter 11. *general information* or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE**  
We also provide a variety of suitable manifolds for C-10-3. Please contact us for further assistance.

**NOTE**  
The valve is also available as degressive version.
Dimensions

Screw-in valve

EEPDRDS3-05
degressive

Installation torque: 3 Nm
SW 3

Electric plug according to
DIN EN 175301-803 shape A

Installation torque: max. 0.5 Nm

Locating shoulder T-11A

Cavity T-11A

NOTE: For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE: For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

NOTE: The degressive version of the valve is also available as EEPROMD3-05 (with cavity C-10-3).
The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure control function of the valve. Be aware that the valve can not fulfil its pressure control function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system!
**Accessories and additional information**

<table>
<thead>
<tr>
<th>Accessories/ spare parts</th>
<th>Article:</th>
<th>Article number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-10-3 (NBR)</td>
<td>Seal kit</td>
<td>405.0063</td>
</tr>
<tr>
<td>C-10-3 (Viton)</td>
<td>Seal kit</td>
<td>405.0096</td>
</tr>
<tr>
<td>T-11-A (NBR)</td>
<td>Seal kit</td>
<td>405.0038</td>
</tr>
<tr>
<td>T-11-A (Viton)</td>
<td>Seal kit</td>
<td>405.0039</td>
</tr>
<tr>
<td>EN 175301-803, shape A, black</td>
<td>Socket connector</td>
<td>149.0007</td>
</tr>
</tbody>
</table>

**NOTE**
For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at www.weber-hydraulik.com.

**Manual**
Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Characteristics

- 3-way proportional pressure control valve in spool design
- screw-in valve for cavity T-11A or
- screw-in valve for cavity C-10-3
- low vibration
- maintenance-free
- degressive version available
- also usable as 2-way proportional pressure reducing valve (after consultation with WEBER-HYDRAULIK ValveTech)

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<td>Type code</td>
<td>7</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>8</td>
</tr>
</tbody>
</table>
## Technical data

**Hydraulic**
- Operating pressure max.: 315 bar, with aluminium manifolds: 210 bar
- Flow rate: 40 l/min
- Pressure setting range: see type code
- Flow direction: see hydraulic symbol
- Hydraulic fluid: mineral oil according to DIN 51524, others upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
- Repeatability: < 3 % with optimized PWM-signal*
- Hysteresis: < 5 % with optimized PWM-signal*
- * at 20 % to 100 % of the nominal valve current

**NOTE**
The pressure on port 3 (T) adds directly to the set pressure. The total pressure of ports A and T must not exceed the maximum operating pressure.

**Mechanic**
- Design: EEPDRS screw-in valve T-11A or EEPDRM screw-in valve C-10-3, EPDRSA screw-in valve in mounting plate NG 6, pilot operated
- Size: 08
- Fluid temperature: -25 °C to +70 °C
- Ambient temperature: -25 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any, preferably horizontal
- Maximum acceleration: 5 g, crossways
- Weight: EEPDRS3-08: 0,76 kg, EEPDRM3-08: 0,79 kg, EPDRSA3-08/06: 1,01 kg
- Material: valve parts: steel, mounting plate: aluminium seals: NBR, Viton optional
- Surface protection: exterior parts: zinc coated steel, mounting plate: anodized aluminium

**Electric**
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 1,7 A (12 V), 0,7 A (24 V)
- Nominal resistance (R20): 4 Ω (12 V), 25 Ω (24 V)
- Power consumption: 16 W at nominal valve current
- Shifting time: 100 % ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, unterminated wire
- Electronic controllers: see chapter 6 "electronics and sensors" as well as our online catalogue at www.weber-hydraulik.com
**Performance**

Pressure drop diagram (p/I) EPDR3-08 at Q = 1,0 l/min

Pressure drop diagram (p/I) EPDR3-08 degressive version at Q = 1,0 l/min

Pressure drop diagram (p/Q) EPDR3-08 with 315 bar spool at various currents

Pressure drop diagram (p/Q) EPDR3-08 degressive version with 315 bar spool at various currents

Pressure drop diagram (Δp/Q) EPDR3-08 at I = 0 mA (currentless)

Pressure drop diagram (Δp/Q) EPDR3-08 degressive version at I = 100% (full current)

**Test conditions**

Oil: HLP 32, temperature: 40 °C (~32 cSt)

Higher viscosities change the characteristic curves.
Dimensions

*Screw-in valve*

**EEPDRS3-08**

installation torque: 3 Nm
SW 3

installation torque:
max. 0,5 Nm

electric plug acc. to

DIN EN 175301-803
(formerly DIN 43650) shape A

installation torque 45 Nm
SW 22

locating shoulder T-11A

### Cavity T-11A

*NOTE* For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

*NOTE* For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

*NOTE* The valve is also available as EPDRSA3 08/06 in a mounting plate NG 6. Dimension sheets are available upon request.

*NOTE* The valve is also available as degressive version.
Dimensions

*Screw-in valve EEPDRM3-08*

- **Installation torque:** 3 Nm
  - **SW 3**
- **Installation torque:**
  - **Max. 0.5 Nm**
- **Electric plug acc. to DIN EN 175301-803**
  - (formerly DIN 43650) shape A
- **Installation torque 45 Nm**
  - **SW 22**
- **Locating shoulder C-10-3**

**Cavity C-10-3**

**NOTE** For a detailed drawing of the cavity please see chapter 11 *general information* or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE** We also provide a variety of suitable manifolds for C-10-3. Please contact us for further assistance.

**NOTE** The valve is also available as degressive version.
Dimensions

*Screw-in valve
EEPDRS3 08
degressive

Do not adjust!

installation torque: 3 Nm
SW 3

installation torque:
max: 0,5 Nm

electric plug acc. to
DIN EN 175301-803
(formerly DIN 43650) shape A

installation torque 45 Nm
SW 22

locating shoulder T-11A

*Cavity T-11A

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

NOTE The degressive version of the valve is also available as EEPDRM3-08 (with cavity C-10-3).
**Type code**

- - - X - - - -

- Revision
- Nominal voltage
  - 12V
  - 12V DC
  - 24V
  - 24V DC

- Special design
  - without
  - degressive**
  - DEG

**Design**

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<th>Type code</th>
<th>Description</th>
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<td>EEPDRS3-08</td>
<td>Screw-in pressure control valve T-11A</td>
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<tr>
<td>EEPDRM3-08</td>
<td>Screw-in pressure control valve C-10-3</td>
</tr>
<tr>
<td>EPDRSA3-08/06</td>
<td>Pressure control valve in mounting plate NG 6*</td>
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**Pressure setting range**

<table>
<thead>
<tr>
<th>Model</th>
<th>Pressure Setting (bar)</th>
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</thead>
<tbody>
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<td>315</td>
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**Nominal voltage**

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<tr>
<th>Design</th>
<th>Voltage (V)</th>
<th>DC</th>
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<tr>
<td>12V</td>
<td>12V</td>
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<tr>
<td>24V</td>
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**Electric termination***

<table>
<thead>
<tr>
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<th>Termination</th>
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<tbody>
<tr>
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<td>(only 24V version)</td>
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<tr>
<td>AMP</td>
<td>unterminated wire</td>
</tr>
<tr>
<td></td>
<td>500 mm</td>
</tr>
<tr>
<td></td>
<td>(only 24V version)</td>
</tr>
<tr>
<td>K</td>
<td>unterminated</td>
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<tr>
<td></td>
<td>wire 500 mm</td>
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<td>(only 24V version)</td>
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**Manual override**

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<tr>
<th>Design</th>
<th>Override</th>
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<tr>
<td>FNH</td>
<td>lockable manual</td>
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<tr>
<td></td>
<td>override with</td>
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<tr>
<td></td>
<td>hexagon socket</td>
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<td></td>
<td>and lock nut</td>
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<tr>
<td>DNH</td>
<td>manual override</td>
</tr>
<tr>
<td></td>
<td>with push knob</td>
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</tbody>
</table>

**Seals**

<table>
<thead>
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<th>Design</th>
<th>Seals</th>
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<tr>
<td></td>
<td>NBR</td>
</tr>
<tr>
<td></td>
<td>Viton V</td>
</tr>
</tbody>
</table>

* aluminium manifolds are approved for max. operating pressure of 210 bar
** for degressive versions no additional manual override selectable
*** DEUTSCH plug on request

**NOTE FOR FNH**

The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure control function of the valve. Be aware that the valve can not fulfil its pressure control function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system!
## Accessories and additional information

<table>
<thead>
<tr>
<th>Accessories/ spare parts</th>
<th>Article:</th>
<th>Article number:</th>
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<tbody>
<tr>
<td>Socket connector DIN EN 175301-803, shape A, black</td>
<td></td>
<td>149.0007</td>
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<tr>
<td>Seal kit T-11A (NBR)</td>
<td></td>
<td>405.0038</td>
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<tr>
<td>Seal kit T-11A (Viton)</td>
<td></td>
<td>405.0039</td>
</tr>
<tr>
<td>Seal kit C-10-3 (NBR)</td>
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<tr>
<td>Seal kit C-10-3 (Viton)</td>
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</table>

**NOTE**
For the appropriate electronic controllers, see chapter 6, „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual**
Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Proportional pressure control valve EPDRS3-10

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<td>Performance</td>
<td>3</td>
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<td>Dimensions</td>
<td>4</td>
</tr>
<tr>
<td>Type code</td>
<td>6</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>7</td>
</tr>
</tbody>
</table>

Characteristics

- 3-way proportional pressure control valve in spool design
- screw-in valve for cavity T-2A
- low vibration
- maintenance-free
- degressive version available
- also usable as 2-way proportional pressure reducing valve (after consultation with WEBER-HYDRAULIK ValveTech)
Technical data

**Hydraulic**
- Operating pressure max.: 315 bar, with aluminium manifolds: 210 bar
- Flow rate: 80 l/min
- Pressure setting range: see type code
- Flow direction: see hydraulic symbol
- Hydraulic fluid: mineral oil according to DIN 51524, others upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
- Repeatability: < 3% with optimized PWM-signal*
- Hysteresis: < 5% with optimized PWM-signal*

* at 20% to 100% of the nominal valve current

**NOTE**
The pressure on port 3 (T) adds directly to the set pressure. The total pressure of ports A and T must not exceed the maximum operating pressure.

**Mechanic**
- Design: EEPDRS screw-in valve T-2A, EPDRSA screw-in valve in mounting plate NG 10, pilot operated
- Size: 10
- Fluid temperature: -25 °C to +70 °C
- Ambient temperature: -25 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any, preferably horizontal
- Maximum acceleration: 5 g, crossways
- Weight: EEPDRS3-10: 0,86 kg, EPDRSA3-10: 1,69 kg
- Material: valve parts: steel, mounting plate: aluminium seals: NBR, Viton optional
- Surface protection: exterior parts: zinc coated steel, mounting plate: anodized aluminium

**Electric**
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 1,7 A (12 V), 0,7 A (24 V)
- Nominal resistance (R20): 4 Ω (12 V), 25 Ω (24 V)
- Power consumption: 16 W at nominal valve current
- Shifting time: 100% ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, unterminated wire
- Electronic controllers: see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com
Performance

Pressure drop diagram (p/I) EPDRS3-10 at Q = 1,0 l/min

Pressure drop diagram (p/Q) EPDRS3-10 with 25 bar spool at various currents

Pressure drop diagram (Δp/Q) EPDRS3-10 at I = 0 mA (currentless)

Pressure drop diagram (Δp/Q) EPDRS3-10 degressive version at I = 100% (full current)

Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the characteristic curves.
Dimensions

**Screw-in valve**
**EEPDRS3-10**

- Installation torque 3 Nm
  SW 3

- Electric plug acc. to
  DIN EN 175301-803
  (formerly DIN 43650) shape A

- Installation torque 65 Nm
  SW 24

- Locating shoulder T-2A

**Cavity T-2A**

**NOTE** For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE** For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE** The valve is also available as EPDRA3-10 in a mounting plate NG 10. Dimension sheets are available upon request.

**NOTE** The valve is also available as degressive version.
**Dimensions**

*Screw-in valve  
EEPDRS3-10  
degressive*

Do not adjust!

- **Installation torque 3 Nm**  
  SW 3

- **Electric plug acc. to**  
  DIN EN 175301-803  
  (formerly DIN 43650) shape A

- **Installation torque 65 Nm**  
  SW 22

- **Locating shoulder T-2A**

**NOTE**  
For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE**  
For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
### Type code

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<thead>
<tr>
<th>Design</th>
<th>Screw-in pressure control valve T-2A</th>
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<tbody>
<tr>
<td>EEPDRS3-10</td>
<td>Pressure control valve in mounting plate NG 10*</td>
</tr>
<tr>
<td>EPDRSA3-10</td>
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</tbody>
</table>

#### Pressure setting range

<table>
<thead>
<tr>
<th>Setting</th>
<th>Bar</th>
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</thead>
<tbody>
<tr>
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<tr>
<td>45</td>
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<td>275</td>
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<tr>
<td>315</td>
<td>315</td>
</tr>
</tbody>
</table>

#### Nominal voltage

- **12V DC**
- **24V DC**

#### Electric termination***

- **DIN**
- **AMP**
  - AMP Junior Timer (only 24 V version)
- **K**
  - Unterminated wire 500 mm (only 24 V version)

#### Manual override**

<table>
<thead>
<tr>
<th>Override</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNH</td>
<td>Lockable manual override with hexagon socket and lock nut</td>
</tr>
<tr>
<td>DNH</td>
<td>Manual override with push knob</td>
</tr>
</tbody>
</table>

#### Seals

- **NBR**
- **Viton V**

---

* Aluminium manifolds are approved for max. operating pressure of 210 bar
** For degressive versions no additional manual override selectable
*** DEUTSCH plug on request

---

### NOTE FOR FNH

The lockable manual override with hexagon socket and lock nut (FNH) could be used to override the pressure control function of the valve. Be aware that the valve can not fulfil its pressure control function if the FNH is screwed in and locked. This can lead to excessive pressure and cause breakage or failure of the components if no parallel pressure relief protection is present.

The FNH should never be screwed in and locked when used in conjunction with a running system!
## Accessories and additional information

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<tr>
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<th>Article:</th>
<th>Article number:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Socket connector DIN EN 175301-803, shape A, black</td>
<td>149.0007</td>
</tr>
<tr>
<td></td>
<td>Seal kit T-2A (NBR)</td>
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<td>Seal kit T-2A (Viton)</td>
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**NOTE**
For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual**
Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
Pilot-operated proportional valves with large nominal size

- Pilot-operated proportional pressure relief valves or pressure control valves with large nominal size
- Modular set-up out of proportional pilot valves and mechanical cartridge valves with cavities up to T-19A
- Pressure relief valves up to 760 l/min
- Pressure control valves up to 320 l/min
- Suitable in-line bodies and subplates up to NG 25
- Varied combinations with different technical characteristics possible

We would be happy to develop with you the ideal solution for your project.
The proportional pressure reducing/relieving valve size 06 is a pilot operated valve. It reduces a higher input pressure into a lower consumer pressure. The consumer pressure can be set proportionally to the solenoid current. If the adjusted pressure on the consumers side is exceeded, the pressure relief function of the valve is used (3 way function). It flows so long oil from the consumer after T, until the adjusted pressure is again reached.

The valve is applicable also as a pure pressure-reducing valve (2-way-function). The third port (T) may not be closed however. All internal parts are hardened and ground/honed. In order to achieve an optimal resolution, numerous pressure ranges are available. The valve has a precise and good-natured responding mode.

Note: if the difference between input pressure and consumer pressure is very high, the oil should be very clean (filtration up to 3 µm is necessary).

The valve is available in a sandwich body CETOP/ISO 3 (DIN 24340 A06, NG 6).

**Technical Data**

**Hydraulic**
- Rated Pressure: port P and A: max. 315 bar
  port T: not higher than port A pressure
- Rated Flow: max. 30 l/min
- Pressure Ranges: see model code
- Minimum Pressure: appr. 6 bar
- Fluids: oils as per DIN 51524, others upon request
- Viscosity Range: 10 – 350 cSt
- Pilot Flow: appr. 0,15 – 0,20 l/min/ 32 cSt
- Filtration: class 18/16/13, filter β 6...10 ≥ 75

**Mechanical**
- Ambient Temperature: -20 °C – +50 °C
- Fluid Temperature: -20 °C – +80 °C
- Installation: no restrictions
- Weight: 1,51 kg
- Materials:
  - valve parts: steel
  - seals: NBR
  - backup rings: Teflon, PU
- Surface Protection:
  - solenoid: zinc plated
  - body: anodised
  - ext. valve parts: burnished

**Electrical**
- Nominal Voltage: 24 V DC; 12 V DC
- Rated Current: 700 mA (24 V); 1700 mA (12 V)
- Nominal Resistance ($R_0$): 25 Ω (24 V); 4 Ω (12 V)
- Power Consumption: 17 W (24 V); 20 W (12 V)
- Cyclic Duration Factor: 100 %
- Control Command: PWM (Pulse-Width-Modulated DC)
- Dither Frequency: preferably 140 Hz
- Environmental Protection: IP 65
- Electrical Termination: plug as per DIN 43650 form A, incl. square connector Pg9
- Control Devices: see chapter 6 'Electronic Amplifiers'

**Designs Symbol**

**Electrical Terminations**

- for terms and definitions see chapter 12

WEBER-Hydraulik ValveTech GmbH
D-78467 Konstanz  Felix-Wankel-Str. 4
Fon: +49/7531/9748-0  www.weber-hydraulik.com
Fax: +49/7531/9748-44  info.de-k@weber-hydraulik.com

© WEBER-HYDRAULIK ValveTech GmbH
Model Code

| ZEPDR3-06 | - 175 - * - 24V | / | *
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3-Way Proportional Pressure Reducing Valve, pilot operated, size 06</td>
<td>Pressure Range</td>
<td>Design</td>
<td>Nominal Voltage</td>
</tr>
<tr>
<td>deliverable executions:</td>
<td>25 = 25 bar</td>
<td>(intern)</td>
<td>12V = 12 V DC</td>
</tr>
<tr>
<td>Sandwich body: ZEPDR3-06 = CETOP/ISO 03 (NG 6) function in P</td>
<td>45 = 45 bar</td>
<td></td>
<td>24V = 24 V DC</td>
</tr>
<tr>
<td></td>
<td>70 = 70 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>115 = 115 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>175 = 175 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>210 = 210 bar</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>315 = 315 bar</td>
<td></td>
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</tr>
</tbody>
</table>

Dimensions (mm)

---

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EPDR3-06-E  Date: 02/04  Page 2 of 2  Subject to change.  © WEBER-HYDRAULIK ValveTech GmbH
Pressure sequence body ZRV06

- enables pressure control from 0 bar, with pilot operated proportional pressure control valves
- available with nozzle or plug

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<tr>
<td>Type code</td>
<td>4</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>4</td>
</tr>
</tbody>
</table>

Pressure control from 0 bar
operating pressure max. 250 bar
volume flow max. 30 l/min
pressure sequence body NG 6

030310_ZRV06_e
07.2018
Technical data

Hydraulic
- Operating pressure max.: 250 bar
- Flow rate max.: 30 l/min
- Flow direction: from A to T, from P to A
- Hydraulic fluid: mineral oil according to DIN 51524, others upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999)
  18/16/13, filter with β 5(c) > 200
- Opening pressure: to A (pre-load pressure): 6 bar
  from A (check valve): 2 bar

NOTE: The use of the pressure sequence body ZRV reduces the max. pressure control-range of the proportional pressure control valve to approximately 2 bar respectively 6 bar.

NOTE: The pressure control range can not be below tank pressure.

Mechanic
- Design: pressure sequence body ZRV for pressure control valves
- Size: 06
- Fluid temperature: -20 °C to +70 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any, preferably horizontal
- Weight: 0,47 kg
- Material: valve parts: steel, pressure sequence body: aluminium, seals: NBR
- Surface protection: pressure sequence body: anodized aluminium

Performance
- Performance graphs upon request.
NOTE For a detailed drawing of the port pattern please see chapter 11 "general information" under the category "port patterns" or our online catalogue at www.weber-hydraulik.com.

NOTE The valve must be mounted with fitting screws according to DIN EN ISO 4762 M5 x 50 - 9.8. Installation torque: 4.5 Nm, screw-in depth min. 10 mm.

Symbol

Example with pressure control valve

static: plug
dynamic: nozzle
**Type code**

<table>
<thead>
<tr>
<th>ZRV06</th>
<th>-</th>
<th>-</th>
<th>X</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure sequence body NG 6</td>
<td>Pre-load pressure</td>
<td>Nozzle</td>
<td>Revision</td>
</tr>
<tr>
<td>2 bar</td>
<td>2 bar</td>
<td>5 bar</td>
<td>6 bar</td>
</tr>
<tr>
<td>401.0128</td>
<td>B with nozzle (0.5 mm)</td>
<td>X with plug</td>
<td></td>
</tr>
</tbody>
</table>

**Accessories and additional information**

<table>
<thead>
<tr>
<th>Accessories/ spare parts</th>
<th>Article:</th>
<th>Article number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 x o-ring 9.25 x 1.78 (NBR)</td>
<td>401.0128</td>
<td></td>
</tr>
</tbody>
</table>

**Manual**

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category "general operating manual" or will be provided upon request.
Proportional Throttle Valves

PVDE2-11
- Direct operated, solenoid operated
- Operating pressure max. 350 bar
- Volume flow max. 25 l/min
- Cavity PVDE2-11 or T-13A

PVDE2-11 acc. to ATEX-directive
- Direct operated, solenoid operated
- Operating pressure max. 250 bar
- Volume flow max. 20 l/min
- Cavity PVDE2-11

PVDES2-14
- Direct operated, solenoid operated
- Operating pressure max. 350 bar
- Volume flow max. 80 l/min
- Cavity T-5A

PVDES2-18
- Direct operated, solenoid operated
- Operating pressure max. 315 bar
- Volume flow max. 195 l/min
- Cavity T-16A
Proportional throttle valve PVDE_2-11

- direct operated, solenoid operated
- operating pressure max. 350 bar
- volume flow max. 25 l/min
- cavity PVDE2-11 or T-13A

Characteristics

- proportional 2/2-way throttle valve
- normally open or normally closed models
- slip-in valve for cavity PVDE2-11
- or screw-in valve for cavity T-13A
- maintenance-free
- also available with EX-plug according to the ATEX-directive for the use in potentially explosive atmospheres (see datasheet 040111_PVDE_2-11_EX_e)
Technical data

Hydraulic
- **Operating pressure max.**: 350 bar, differential pressure control $\Delta p$ max. 25 bar
- **Flow rate**: 3, 7, 11, 17 l/min, 21 l/min (only SO), 25 l/min (only SG) at differential pressure control $\Delta p = 10$ bar
- **Performance limit**: max. nominal flow rate also at a higher differential pressure control $\Delta p$
- **Flow direction**: 1 to 2 (2 to 1 not allowed)
- **Hydraulic fluid**: mineral oil according to DIN 51524, other hydraulic fluids upon request
- **Viscosity range**: 10 - 350 cSt
- **Filtration**: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta_{5(c)} > 200$
- **Repeatability**: < 3 % with optimized PMW-signal*
- **Hysteresis**: < 5 % with optimized PMW-signal*
* at 20 % to 100 % of the nominal valve current

Mechanic
- **Design**: PVDE slip-in design, PVDR in in-line body or PVDES screw-in design, direct operated
- **Size**: 11
- **Fluid temperature**: -20 °C to +65 °C
- **Ambient temperature**: -20 °C to +50 °C
- **Storage temperature**: -30 °C to +60 °C (non-condensing)
- **Installation position**: any
- **Maximum acceleration**: 3 g
- **Weight**: PVDE2-11: 0,61 kg, PVDR2-11: 1,27 kg, PVDES2-11: 0,72 kg
- **Material**: valve parts and manifold: steel, seals: NBR, Viton optional
- **Surface protection**: exterior parts: zinc coated steel

Electric
- **Nominal voltage**: 12 V DC, 24 V DC
- **Nominal valve current**: 1,7 A (12 V), 0,7 A (24 V)
- **Nominal resistance (R20)**: 4,0 Ω (12 V), 25,0 Ω (24 V)
- **Power consumption**: 16 W at nominal valve current
- **Shifting time**: 100 % ED
- **Control command**: PWM-signal
- **PWM-frequency**: typically 140 Hz (depending on application)
- **Protection class**: IP65 with correctly mounted and locked mating connector
- **Electric termination**: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer or unterminated wire
- **Electronic controllers**: see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com.
**Performance**

Flow rate diagram (Q/I) PVDE2-11 at Δp = 10 bar

*Test conditions*  
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Dimensions

_Slip-in valve
PVDE2-11_

installation torque: 3 Nm
SW 3

installation torque:
max. 0.5 Nm

electric plug according to
DIN EN 175301-803
(formerly DIN 43650) shape A

_Cavity PVDE2-11_

4 x M4

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.
ValveTech | 040110_PVDE_2-11_e

Proportional throttle valve

Dimensions

_Slip-in valve in_ in-line body G3/8"
_PVDR2-11_

installation torque: max. 0,5 Nm

measuring port G1/4"

installation torque: 3 Nm
SW 3

electric plug according to
DIN EN 175301-803
(formerly DIN 43650) shape A

Maßstab 1/1,35

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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<tr>
<td>71</td>
<td>7,5</td>
<td>25</td>
<td>45</td>
<td>45,3</td>
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<td>60</td>
<td>(\varnothing 36)</td>
<td>40</td>
<td>G3/8</td>
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Maßstab 1/1,35

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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<td>7,5</td>
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<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dimensions

Screw-in valve
PVDES2-11

installation torque: 3 Nm
SW 3

installation torque:
max. 0.5 Nm

electric plug according to
DIN EN 175301-803
(formerly DIN 43650) shape A

installation torque: 45 Nm
SW 22

locating shoulder T-13A

Cavity T-13A

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE We also provide a variety of suitable manifolds for T-13A. Please contact us for further assistance.
ValveTech | 040110_PVDE_2-11_e

Proportional throttle valve

Type code

<table>
<thead>
<tr>
<th>Type code</th>
<th>11 / x -</th>
<th>Size</th>
<th>Nominal voltage</th>
<th>Manual override</th>
<th>Spool type</th>
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<tbody>
<tr>
<td>PVD</td>
<td>2</td>
<td></td>
<td>12V 12 V DC</td>
<td>without</td>
<td>SG</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>24V 24 V DC</td>
<td>spring loaded manual override (push knob)</td>
<td>normally closed</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>lockable manual override with hexagon socket and lock nut</td>
<td>SO</td>
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<tr>
<td>Model</td>
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<td></td>
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<td>lockable manual override with hand wheel and lock nut</td>
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</tr>
<tr>
<td>E</td>
<td>slip-in valve</td>
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<tr>
<td>R</td>
<td>in-line body</td>
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<tr>
<td>ES</td>
<td>screw-in valve</td>
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<tr>
<td>Nominal flow at Δp = 10 bar</td>
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<tr>
<td>1 x 1</td>
<td>3 l/min</td>
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<tr>
<td>2 x 2</td>
<td>11 l/min</td>
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<tr>
<td>4 x 1,5</td>
<td>17 l/min</td>
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<tr>
<td>6 x 2 (only SG)</td>
<td>25 l/min</td>
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<tr>
<td>4 x 3 (only SO)</td>
<td>21 l/min</td>
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<tr>
<td>Electric Termination</td>
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<td>DIN</td>
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<tr>
<td>AMP Junior Timer (only for 24 V model)</td>
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<td>K</td>
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</tr>
<tr>
<td>Seals</td>
<td>NBR</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Viton</td>
<td>V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Model:
- E: slip-in valve
- R: in-line body
- ES: screw-in valve

Spool type:
- SG: normally closed
- SO: normally open
## Accessories and additional information

### Accessories/spare parts

<table>
<thead>
<tr>
<th>Part:</th>
<th>Article number:</th>
</tr>
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<tbody>
<tr>
<td>Socket connector DIN EN 175301-803*, shape A, black</td>
<td>149.0007</td>
</tr>
<tr>
<td>Socket connector DIN EN 175301-803*, shape A, grey</td>
<td>149.0008</td>
</tr>
<tr>
<td>Seal kit PVDE2-11 (NBR)</td>
<td>405.0020</td>
</tr>
<tr>
<td>Seal kit PVDE2-11 (Viton)</td>
<td>405.0068</td>
</tr>
<tr>
<td>Seal kit T-13A (NBR)</td>
<td>405.0013</td>
</tr>
<tr>
<td>Seal kit T-13A (Viton)</td>
<td>405.0037</td>
</tr>
</tbody>
</table>

* (formerly DIN 43650)

A variety of alternative solenoids with manual overrides are available on request.

### NOTE

For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

### Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Proportional throttle valve PVDE_2-11-EX according to ATEX-directive

direct operated, solenoid operated operating pressure max. 250 bar volume flow max. 20 l/min cavity PVDE2-11

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<td>Performance</td>
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<tr>
<td>Dimensions</td>
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<tr>
<td>Type code</td>
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<tr>
<td>Accessories and additional information</td>
<td>5</td>
</tr>
<tr>
<td>Set-up</td>
<td>6</td>
</tr>
</tbody>
</table>

Characteristics

- proportional 2/2-way throttle valve in spool design
- according to the ATEX-directive for the use in potentially explosive atmospheres
- normally open or normally closed models
- slip-in valve for cavity PVDE2-11
- maintenance-free
## Technical data

### Hydraulic
- **Operating pressure max.:** 250 bar, differential pressure control Δp max. 25 bar
- **Flow rate:** 2,4, 5,6, 8,8, 13,6 l/min; 16,8 l/min (only SO), 20 l/min (only SG) at differential pressure control Δp = 10 bar
- **Performance limit:** max. nominal flow rate also at a higher differential pressure control Δp
- **Flow direction:** 1 to 2, (2 to 1 not allowed)
- **Hydraulic fluid:** mineral oil according to DIN 51524, other hydraulic fluids upon request
- **Viscosity range:** 10 - 350 cSt
- **Filtration:** oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200
- **Repeatability:** < 3 % with optimized PWM-signal*
- **Hysteresis:** < 5 % with optimized PWM-signal*
- * at 20 % to 100 % of the nominal valve current

### Mechanic
- **Design:** PVDE slip-in design or PVDR in in-line body, direct operated by solenoids
- **Size:** 11
- **Fluid temperature:** -30 °C to +50 °C
- **Ambient temperature:** -30 °C to +50 °C
- **Storage temperature:** -30 °C to +50 °C (non-condensing)
- **Installation position:** any
- **Maximum acceleration:** 3 g crossways
- **Weight:** PVDE2-11: 2,6 kg, PVDR2-11: 3,27 kg
- **Material:** valve parts and manifold: steel, seals: NBR, Viton optional
- **Surface protection:** exterior parts: zinc coated steel

### Electric
- **Nominal voltage:** 24 V DC
- **Nominal valve current:** 0,6 A
- **Nominal resistance (R20):** 23,1 Ω
- **Power consumption:** 15,6 W at nominal valve current
- **Shifting time:** 100% ED
- **Control command:** PWM-signal
- **PWM-frequency:** typically 85 Hz (depending on application)
- **Protection system:** IP67 according to IEC/EN 60529, IP69K according to DIN 40050-9 with intended assembling
- **Protection class:** III according to DIN VDE 0580
- **Electric termination:** 15 meter connecting cable FL4G11Y 2x1,5 mm² with explosive protection acc. to the ATEX-directive IECEx/ATEX 0637.00 Ex IIC T4 + Db, II 2G Ex mb IIC T30° Db in acc. with EN 60079-0:2012 + A11:2013 / IEC 60079-0:2011 + Cor.:2012 + Cor.:2013, EN 60079-18:2015 / IEC 60079-18:2014
**Technical Data**

*Electric*

EC Type Examination Cert.: IBExU 13 ATEX 1040 X, IECEx IBE 13.0017X

Electronic controllers: see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com.

Electronics that are used in explosion protected areas must be Ex-certified!

**Performance**

Performance graphs upon request

**Dimensions**

*Slip-in valve PVDE2-11-EX*

- Installation torque 5-1 Nm
  - SW 26
- Solenoid 360° rotatable*
- Earth connection
- Connecting cable 15 m
- Installation torque 3 Nm
  - SW 3

* with EC Type Examination Certificate
IBExU 13 ATEX 1040 X, IECEx IBE 13.0017X

**Cavity PVDE2-11**

*NOTE* For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.
**Dimensions**

*Slip-in valve in in-line body G 3/8” PVDR2-11_EX*

- **Installation torque**: 3 Nm, SW 3
- **Measuring port**: G 1/4”
- **Connecting cable**: 15 m
- **Earth connection**: with EC Type Examination Certificate

*Solenoid 360° rotatable*

*with EC Type Examination Certificate*
IBExU 13 ATEX 1040 X, IECEx IBE 13.0017X
Type code

PVD throttle valve, model
E  slip-in valve
R  in in-line body

Nominal flow at Δp = 10 bar

<table>
<thead>
<tr>
<th>Spool type</th>
<th>SG</th>
<th>normally closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>SO</td>
<td>normally open</td>
<td></td>
</tr>
</tbody>
</table>

| Revision | 1 |

| Nominal voltage | 24V |

| connecting cable 15 m with explosive protection |

Seals
NBR
Viton V

Accessories and additional information

| Accessories/ | Article: | Material number: |
| spare parts  | Seal kit PVDE2-11 (NBR) | 405.0020 |
|             | Seal kit PVDE2-11 (Viton) | 405.0068 |

NOTE
For the appropriate electronic controllers, see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com.
Please consider whether the electronic controller will be located inside or outside of the explosion protected area. Electronics that are used in explosion protected areas must be certified according to the ATEX-directive!
Set-up

The solenoid coil may only be operated when installed on the appropriate valve. Further information can be found in the provided operation manual of the solenoid. When operating the valve, information contained in the provided operation manual of the solenoid, as well as our general operating manual, must be followed precisely!

Single or multiple mounting of the valve in single operation must have a minimum size of 46 x 46 x 66 mm and a base plate ≥ 46 x 30 x 66 mm. The material must be Fe or material with the same or better thermal conductivity.

The installation of these electrical components must be carried out by an electrician with adequate qualifications.

Each solenoid must be short-circuit fuse protected suitable to its nominal valve current (max. $3 \times I_{\text{N}}$ according to IEC/EN 60127-2). This could, for example, be a motor protecting switch with thermal quick release and short-circuit protection (adjusted to the rated current).

The installed fuse must have a voltage rating equal or larger than the rated voltage of the solenoid, and the fuse should be installed in the associated power supply. If this is not possible, the fuse can be installed separately if the appropriate safety instructions are carefully considered.

When connecting the fuse to the circuit, it is of utmost importance to consider whether the fuse will be located inside, or outside of the explosion protected area. If the fuse will be connected to the circuit inside of the explosion protected area, then it must be mounted in an Ex-certificated terminal box.

For equipotential bonding, a ground terminal is provided on the outside of the solenoid.

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
**Proportional throttle valve PVDES2-14**

- Direct operated, solenoid operated
- Operating pressure max. 350 bar
- Volume flow max. 80 l/min
- Cavity T-5A

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<td>Type code</td>
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<tr>
<td>Accessories and additional information</td>
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</tbody>
</table>

**Characteristics**

- Proportional 2/2-way throttle valve in spool design
- Normally open or normally closed models
- Screw-in valve for cavity T-5A
- Maintenance-free
- Rotatable and replaceable solenoid coil
**Technical data**

**Hydraulic**
- Operating pressure max.: 350 bar, differential pressure control $\Delta p$ max. 25 bar
- Flow rate: see type code at differential pressure control $\Delta p = 10$ bar
- Performance limit: max. nominal flow rate also at a higher differential pressure control $\Delta p$
- Flow direction: 1 to 2 (2 to 1 not allowed)
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
- Repeatability: < 3% with optimized PMW-signal*
- Hysteresis: < 5% with optimized PMW-signal*
* at 20% to 100% of the nominal valve current

**Mechanic**
- Design: PVDES screw-in valve or PVDR in in-line body, direct operated
- Size: 14
- Fluid temperature: -20 °C to +65 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Maximum acceleration: 5 g
- Weight: PVDES: 0,7 kg, PVDR: 2,1 kg
- Material: valve parts and manifolds: steel
  seals: NBR, Viton optional
- Surface protection: exterior parts: zinc coated steel

**Electric**
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 12 V: DIN and AMP 2,3 A, Deutsch 2,0 A
  24 V: DIN and AMP 1,1 A
- Nominal resistance (R20): 12 V: DIN and AMP 2,7 $\Omega$, Deutsch 3,85 $\Omega$
  24 V: DIN and AMP 12,6 $\Omega$
- Power consumption: 23 W at nominal valve current
- Shifting time: 100% ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, Deutsch connector
- Electronic controllers: see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com.
ValveTech | 040120_PVDES2-14_e

Performance
Flow rate diagram (Q/I) PVDES2-14 at Δp = 10 bar, normally closed

Flow rate diagram (Q/I) PVDES2-14 at Δp = 10 bar, normally open

Test conditions
Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions
Screw-in valve
PVDES2-14
installation torque: 4 Nm
solenoid coil, rotatable 360°
installation torque: max. 0.5 Nm
electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A
locating shoulder T-5A
installation torque: 60 to 65 Nm
SW 24

Cavity T-5A

NOTE For a detailed drawing of the cavity please see chapter 11 “general information” or our online catalogue at www.weber-hydraulik.com.
Proportional throttle valve

Dimensions

*Screw-in valve in in-line body G1/2“ PVDR2-14*

Solenoid coil, rotatable 360°

Measuring port G1/4“

Installation torque: 4 Nm

Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A

Maßstab 1:2,1
Type code

- 14 / x - 11 - - H402 - -

<table>
<thead>
<tr>
<th>Size</th>
<th>Revision</th>
<th>Seals</th>
<th>Electric termination</th>
<th>Manual override</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-</td>
<td>NBR</td>
<td>DIN</td>
<td>H402</td>
</tr>
<tr>
<td>2</td>
<td>SO</td>
<td>Viton</td>
<td>AMP Junior Timer</td>
<td>manual override with push pin</td>
</tr>
<tr>
<td>3</td>
<td>SO</td>
<td></td>
<td>Deutsch (only for 12 V)</td>
<td>lockable manual override with lock nut</td>
</tr>
<tr>
<td>4</td>
<td>SO</td>
<td></td>
<td></td>
<td>lockable manual override with hand-wheel</td>
</tr>
</tbody>
</table>

Spool type

- SG: normally closed
- SO: normally open

Nominal flow
at Δp = 10 bar

| 15 l/min | only SG | 2 x 1,3 |
| 27 l/min | only SG | 4 x 1,5 |
| 36 l/min |        | 5 x 1,5 |
| 51 l/min |        | 7 x 1,5 |
| 66 l/min |        | 9 x 1,6 |
| 80 l/min |        | 8 x 3,0 |
| 10 l/min | only SO | 2 x 1,8 |
| 25 l/min |        | 5 x 1,8 |
| 36 l/min |        | 7 x 1,8 |

Nominal voltage

- 12 V DC
- 24 V DC

Accessories and additional information

Accessories/spare parts

<table>
<thead>
<tr>
<th>Part:</th>
<th>Article number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socket connector DIN EN 175301-803*, shape A, black</td>
<td>149.0007</td>
</tr>
<tr>
<td>Socket connector DIN EN 175301-803*, shape A, grey</td>
<td>149.0008</td>
</tr>
<tr>
<td>Seal kit T-5A (NBR)</td>
<td>405.0040</td>
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<tr>
<td>Seal kit T-5A (Viton)</td>
<td>405.0041</td>
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<tr>
<td>Coil 12 V, DIN EN 175301-803*, shape A</td>
<td>147.0011</td>
</tr>
<tr>
<td>Coil 24 V, DIN EN 175301-803*, shape A</td>
<td>147.0009</td>
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<tr>
<td>Coil 12 V, AMP Junior Timer</td>
<td>147.0007</td>
</tr>
<tr>
<td>Coil 24 V, AMP Junior Timer</td>
<td>147.0010</td>
</tr>
<tr>
<td>Coil 12 V, Deutsch connector</td>
<td>147.0012</td>
</tr>
</tbody>
</table>

* (formerly DIN 43650)

NOTE

For the appropriate electronic controllers, see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com.

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 “general information” under the category “general operating manual” or will be provided upon request.

WEWEBER-HYDRAULIK ValveTech GmbH  www.weber-hydraulik.com
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Phone: +49 7531 9748-0  Fax: +49 7531 9748-44  All rights reserved
Proportional throttle valve PVDES2-18

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 195 l/min
cavity T-16A

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<td>Dimensions</td>
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<tr>
<td>Type code</td>
<td>4</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>5</td>
</tr>
</tbody>
</table>

Characteristics

- proportional 2/2-way throttle valve in spool design
- normally open or normally closed models
- screw-in valve for cavity T-16A
- high flow rate
- maintenance-free
- rotatable and replaceable solenoid coil
**Technical data**

### Hydraulic
- Operating pressure max.: 315 bar (dynamic) differential pressure control $\Delta p$ max. 25 bar
- Flow rate: 95, 130, 195 l/min at differential pressure control $\Delta p = 10$ bar
- Performance limit: max. nominal flow rate also at a higher differential pressure control $\Delta p$
- Flow direction: 1 to 2 (2 to 1 not allowed)
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(\text{c}) > 200$
- Repeatability: < 3% with optimized PMW-signal*
- Hysteresis: < 5% with optimized PMW-signal*
- * at 20% to 100% of the nominal valve current

### Mechanic
- Design: screw-in valve, direct operated
- Size: 18
- Fluid temperature: -20 °C to +65 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Maximum acceleration: 3 g
- Weight: 1.9 kg including coil
- Material: valve parts: steel, seals: NBR, Viton optional
- Surface protection: exterior parts: zinc coated steel

### Electric
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 2.28 A (12 V), 1.1 A (24 V)
- Nominal resistance (R20): 3.9 Ω (12 V), 16.5 Ω (24 V)
- Power consumption (P20): 20.3 W (12 V), 20 W (24 V)
- Power consumption max.: 30.6 W (12 V), 30.1 W (24 V)
- Shifting time: 100% ED
- Control command: PWM-signal
- PWM-frequency: typically 85 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803, shape A
- Electronic controllers: see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com)
Performance

Flow rate diagram (Q/I) PVDES2-18 at Δp = 10 bar, normally closed

Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)

Higher viscosity changes the performance diagrams.

Flow rate diagram (Q/I) PVDES2-18 at Δp = 10 bar, normally open

Dimensions

Screw-in valve PVDES2-18

Installation torque 4 Nm

Solenoid coil, rotatable 360°

Installation torque max. 0.5 Nm

Electric plug according to DIN EN 175301-803, shape A

Locating shoulder T-16A

Installation torque 200 to 215 Nm

SW 36
Dimensions

*Cavity T-16A*

**NOTE** For a detailed drawing of the cavity please see chapter 11 "general information" or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE** For appropriate manifolds see chapter 10 "connecting plates and manifolds" as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

### Type code

<table>
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<th>-</th>
<th>Seals</th>
<th>NBR</th>
<th>Viton</th>
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<tbody>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>V</td>
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</table>

**Nominal flow at Δp = 10 bar**

<table>
<thead>
<tr>
<th>Size</th>
<th>Nominal flow</th>
<th>95 l/min</th>
<th>130 l/min</th>
<th>195 l/min</th>
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<tbody>
<tr>
<td>95</td>
<td>95 l/min</td>
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<tr>
<td>130</td>
<td>130 l/min</td>
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<td></td>
</tr>
<tr>
<td>195</td>
<td>195 l/min</td>
<td></td>
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</tr>
</tbody>
</table>

**Spool type**

- **SG**: normaly closed
  - **SO**: normaly open

**Manual override**

- **H402**: manual override (push pin)
- **H301**: lockable override with hexagon socket and lock nut
- **H302**: lockable override with hand wheel and lock nut

**Nominal voltage**

<table>
<thead>
<tr>
<th>Revision</th>
<th>Nominal voltage</th>
<th>12V</th>
<th>24V</th>
</tr>
</thead>
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<tr>
<td>11</td>
<td>12 V DC</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>24 V DC</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Dimensions**

- **Model**: PVDES2
- **Type code**: PVDES2-18
- **Size**: 18

**Seals**

- **NBR**
- **Viton V**

**Manual override**

- **H402**: manual override (push pin)
- **H301**: lockable override with hexagon socket and lock nut
- **H302**: lockable override with hand wheel and lock nut

**Nominal voltage**

- **12V**: 12 V DC
- **24V**: 24 V DC
Accessories and additional information

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<tr>
<td>Accessory</td>
<td>Socket connector DIN EN 175301-803, shape A, black</td>
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<tr>
<td>Seal kit T-16A (NBR)</td>
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<td>Seal kit T-16A (Viton)</td>
<td>Coil 24 V, DIN EN 175301-803, shape A</td>
<td>147.0019</td>
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NOTE For the appropriate electronic controllers, see chapter 6 “electronics and sensors” as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

Manual Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 “general information” under the category “general operating manual” or will be provided upon request.
Proportional Flow Control Valves

EPSR2-11 and EPSR3-11
- direct operated, solenoid operated
- operating pressure max. 350 bar
- volume flow max. 20 l/min
- in-line body, sandwich body or mounting plate NG 6

EPSR2-14 and EPSR3-14
- direct operated, solenoid operated
- operating pressure max. 350 bar
- volume flow max. 70 l/min
- in-line body or sandwich body NG 6 or NG 10
Proportional flow control valve EPSR2-11 and EPSR3-11

direct operated, solenoid operated
operating pressure max. 350 bar
volume flow max. 20 l/min
in in-line body, sandwich body NG 6
or mounting plate NG 6

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</tbody>
</table>

Characteristics

- 2- or 3-way proportional flow control valve in in-line body, in sandwich body NG 6 or in mounting plate NG 6
- normally open or normally closed models
- available with or without check valve
- maintenance-free
**Technical data**

**Hydraulic**
- Operating pressure max.: 350 bar
- Flow rate: see type code, at differential pressure control $\Delta p = 7$ bar
- Flow direction: see symbol
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(c) > 200$
- Repeatability: $< 3\%$ with optimized PWM-signal*
- Hysteresis: $< 5\%$ with optimized PWM-signal*
- * at 20\% to 100\% of the nominal valve current

**Mechanic**
- Design: Slip-in valve in in-line body or in sandwich-body or mounting plate NG 6
- Size: 11
- Fluid temperature: $-20^\circ$ C to $+65^\circ$ C
- Ambient temperature: $-20^\circ$ C to $+50^\circ$ C
- Storage temperature: $-30^\circ$ C to $+60^\circ$ C (non-condensing)
- Installation position: any
- Maximum acceleration: 3 g, crossways
- Weight: EPSR: 2.39 kg, EPSRV: 1.63 kg, ZEPSR: 2.41 kg, EPSRA: 1.84 kg
- Material: valve parts and manifolds: steel, seals: NBR, Viton optional
- Surface protection: exterior parts: zinc coated steel

**Electric**
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 1.7 A (12 V), 0.7 A (24 V)
- Nominal resistance (R20): 4 $\Omega$ (12 V), 25 $\Omega$ (24 V)
- Power consumption: 16 W at nominal valve current
- Shifting time: 100\% ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, unterminated wire
- Electronic controllers: see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com.
Performance

Flow rate diagram (Q/I) EPSR2-11

Pressure drop diagram (p/Q) EPSR2-11

Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions

Proportional flow control valve in in-line body EPSR 11

installation torque 3 Nm

SW 3

electric plug according to DIN EN 175301-803
(formerly DIN 43650) shape A

NOTE

The valve is also available as EPSRA-06-11 in a mounting plate NG 6. Dimension sheets are available upon request.
Proportional flow control valve

in in-line body

with check valve

EPSRV 11

Dimensions

Proportional flow control valve in in-line body with check valve EPSRV 11

electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A

installation torque 3 Nm

SW 3

HM3/90 46 03
**Dimensions**

*Proportional flow control valve in sandwich body NG 6 ZEPSR 06-11*

- **4 x o-rings 9.25 x 1.78**
- **Installation torque: 3 Nm**
- **SW 3**

**port pattern NG 6 (DIN 24340 A06)**

**electric plug according to DIN EN 175301-803 (formerly DIN 43650)**

**shape A**

**NOTE** For a detailed drawing of the port pattern please see chapter 11 „general information“ under the category „port patterns“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE** The valve must be mounted with fitting screws according to DIN EN ISO 4762 M5 x 60 - 12.9. Installation torque: 6 Nm, screw-in depth min. 8 mm.
Proportional flow control valve

**Type code**

<table>
<thead>
<tr>
<th>Size*</th>
<th>Revision</th>
<th>Steel manifold</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>

**Seals**

- NBR
- Viton V

**Nominal voltage**

- 12V 12 V DC
- 24V 24 V DC

**Manual override**

- without
- spring loaded manual override (push knob) DNH
- lockable manual override with hexagon socket and lock nut FNH
- lockable manual override with hand wheel and lock nut HNH

**Design**

- EPSR Flow control valve in in-line body
- EPSRV Flow control valve in in-line body with check valve
- ZEPSR Flow control valve in sandwich body NG 6
- EPSRA Flow control valve in mounting plate NG 6

**Nominal flow**

(at Δp = 7 bar)

<table>
<thead>
<tr>
<th>Model</th>
<th>Spool type</th>
<th>Nominal flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>SG</td>
<td>2 l/min</td>
</tr>
<tr>
<td>2</td>
<td>SO</td>
<td>5 l/min</td>
</tr>
<tr>
<td>3</td>
<td>SG</td>
<td>10 l/min</td>
</tr>
<tr>
<td>3</td>
<td>SO</td>
<td>15 l/min</td>
</tr>
<tr>
<td>2</td>
<td>SG</td>
<td>20 l/min (Δp = 10 bar)</td>
</tr>
</tbody>
</table>

**Electric termination**

- DIN
- AMP Junior Timer (only 24 V version) AMP
- unterminated wire 500 mm (only 24 V version) K

* with sandwich body (ZEPSR) and mounting plate (EPSRA): size „06-11“
** DEUTSCH plug on request
Accessories and additional information

<table>
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<th>Accessories / spare parts</th>
<th>Article:</th>
<th>Article number:</th>
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<tbody>
<tr>
<td></td>
<td>Socket connector DIN EN 175301-803, shape A, black</td>
<td>149.0007</td>
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<tr>
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<td>4 x o-ring 9,25 x 1,78 (NBR)</td>
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<td>4 x o-ring 9,25 x 1,78 (Viton)</td>
<td>401.0147</td>
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</table>

A variety of alternative electric terminations and manual overrides are available on request.

**NOTE**

For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual**

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
Proportional flow control valve EPSR2-14 and EPSR3-14

Characteristics

- 2- or 3-way proportional flow control valve in in-line body or in sandwich body NG 6 or NG 10
- normally open or normally closed models
- versions available where surplus flow can be pressurised
- maintenance-free
- rotatable and replaceable coils

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Technical data

**Hydraulic**

- Operating pressure max.: \(350\) bar
- Flow rate: see type code, at differential pressure control \(\Delta p = 7\) bar
- Flow direction: 2-way: 1 to A, 3-way: 2 to A (1 = tank)
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: \(10 - 350\) cSt
- Filtration: oil cleanliness according to ISO 4406 (1999)
  18/16/13, filter with \(\beta(5) > 200\)
- Repeatability: < 3% with optimized PWM-signal*
- Hysteresis: < 5% with optimized PWM-signal*
  * at 20% to 100% of the nominal valve current

**Mechanic**

- Design: Screw-in valve in in-line body or in sandwich-body
  NG 6 or NG 10
- Size: 14
- Fluid temperature: \(-20\) °C to \(+65\) °C
- Ambient temperature: \(-20\) °C to \(+50\) °C
- Storage temperature: \(-30\) °C to \(+60\) °C (non-condensing)
- Installation position: any
- Maximum acceleration: 5 g, crossways
- Weight: EPSR: 4,30 kg, ZEPSR2-06: 3,88 kg, ZEPSR3-06: 2,69 kg
  ZEPSR3-10: 5,65 kg
- Material: valve parts and manifolds: steel,
  seals: NBR, Viton optional
- Surface protection: exterior parts: zinc coated steel

**Electric**

- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 12 V: DIN and AMP 2,3 A, DEUTSCH 2,0 A
  24 V: DIN and AMP 1,1 A
- Nominal resistance (R20): 12 V: DIN and AMP 2,7Ω, DEUTSCH 3,85Ω
  24 V: DIN and AMP 12,6Ω
- Power consumption: 23,0 W at nominal valve current
- Shifting time: 100% ED
- Control command: PWM-signal
- PWM-frequency: typically 140 Hz (depending on application)
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 (formerly
  DIN 43650) shape A, AMP Junior Timer, DEUTSCH
- Electronic controllers: see chapter 6 “electronics and sensors” as well as our
  online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
Performance

Flow rate diagram (Q/I) EPSR2-14 at $\Delta p = 7$ bar, normally closed

Flow rate diagram (Q/I) EPSR2-14 at $\Delta p = 7$ bar, normally open

Test conditions
Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions

Proportional flow control valve in in-line body EPSR 14

NOTE
The valve is also available as EPSRR, where the surplus flow can be pressurised and can therefore be supplied to a second actuator. Please contact us for further information.
Dimensions

**Proportional flow control valve in sandwich body NG 6 ZEPSR-06-14**

- solenoid coil 360° rotatable
- 4 x o-rings 9.25 x 1.78
- port pattern NG 6 (DIN 24340 A06)
- electric plug according to DIN EN 175301-803 shape A installation torque 4 Nm

**NOTE**
The valve must be mounted with fitting screws according to DIN EN ISO 4762 M5 x 60 - 12.9. Installation torque: 6,3±0,3 Nm, screw-in depth min. 8 mm.

**Proportional flow control valve in sandwich body NG 10 ZEPSR-10-14**

- solenoid coil 360° rotatable
- 5 x o-rings 14.00 x 1.78
- port pattern NG 10 (DIN 24340 A10)
- electric plug according to DIN EN 175301-803 shape A installation torque 4 Nm

**NOTE**
Operating pressure max.: P, A, B: 350 bar; TA, TB: 10 bar.

**NOTE**
The valve is also available as EPSRA2-10-14 in a mounting plate NG 10. Dimension sheets are available upon request.

**NOTE**
The valve must be mounted with fitting screws according to DIN EN ISO 4762 M6 x 30 - 12.9. Installation torque: 10±0,5 Nm, screw-in depth min. 8 mm.

**NOTE**
For a detailed drawing of the port pattern please see chapter 11 „general information“ under the category „port patterns“ or our online catalogue at www.weber-hydraulik.com.
### Type code

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<td></td>
<td></td>
<td>NBR</td>
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<td></td>
<td></td>
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<td>Viton</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>V</td>
</tr>
</tbody>
</table>

### Model

- **Model**: EPSR, ZEPSR
- **Design**: Flow control valve in in-line body, Flow control valve in sandwich body

<table>
<thead>
<tr>
<th>Design</th>
<th>Nominal flow (at Δp = 7 bar)</th>
<th>Manual override</th>
</tr>
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<td>EPSR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ZEPSR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NG 6 or NG 10*</td>
<td>30 l/min</td>
<td>manual override with push pin: H402</td>
</tr>
<tr>
<td></td>
<td>40 l/min</td>
<td>lockable manual override with hexagon socket and lock nut: H301</td>
</tr>
<tr>
<td></td>
<td>60 l/min (only SO)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>70 l/min (only SO)</td>
<td></td>
</tr>
</tbody>
</table>

### Electric termination

- **Termination**: DIN, AMP, DEU (DEUTSCH (only 12 V))

### Seals
- **Seals**: NBR, Viton, V

### Nominal voltage

- **Nominal voltage**: 12V, 24V
  - 12V DC
  - 24V DC

### Manual override

- **Manual override**: without, manual override with push pin, lockable manual override with hexagon socket and lock nut, lockable manual override with hand wheel

### Design notes

- * with sandwich body:
  - NG 6: ZEPSR2-06-14 respectively ZEPSR3-06-14
  - NG 10: ZEPSR3-10-14 (only available as 3-way-version)

### NOTE

The valve is also available as EPSRR where the surplus flow can be pressurised and can therefore be supplied to a second actuator. Please contact us for further information.
## Accessories and additional information

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<td>149.0007</td>
<td></td>
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<tr>
<td>Socket connector DIN EN 175301-803, shape A, grey</td>
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<td>Coil 12 V, DIN EN 175301-803, shape A</td>
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<td>Coil 24 V, DIN EN 175301-803, shape A</td>
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<tr>
<td>Coil 12 V, AMP Junior Timer</td>
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<tr>
<td>Coil 24 V, AMP Junior Timer</td>
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<td>Coil 12 V, DEUTSCH connector</td>
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<td>Seal kit EPSR(3)-14 (NBR)</td>
<td>405.0116</td>
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<tr>
<td>Seal kit EPSR(3)-14 (Viton)</td>
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<td>Seal kit ZEPSR-06-14 (NBR)</td>
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<tr>
<td>Seal kit ZEPSR(3)-10-14 (Viton)</td>
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**NOTE**

For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual**

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
Electronics and Sensors

Chapter 6

Proportional Chopper Amplifier

SC-/ ESC-/ DSC-2000
electric amplifier for proportional valves
operating voltage 8-35 V DC
maximum current 2.6 A

VB-3A
electric amplifier for proportional valves
maximum current 1600 mA
input signal 0-5 V and 0-10 V or
input signal 0-20 mA and 4-20 mA

Accessories
Pressure Transmitter MODS
compact and robust universal pressure transmitter
shock and vibration resistant
nominal voltage 12-32 V DC
measuring range 6-600 bar
Proportional Chopper Amplifier SC-/ESC-/DSC-2000

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Characteristics

- compact design
- compensating the temperature-dependent magnetoresistance of the proportional solenoid
- multi-course potentiometers for adjusting $I_{ref}$, $I_{max}$ and time ramp
- LED signaling
- fuse-protected output 2 A or 3 A
- external voltage or current control
Technical data

Mechanic

Design: amplifier module, amplifier for installation onto mounting rails, double amplifier for 2 prop. solenoids for installation onto mounting rails

Ambient temperature: -20 °C to +60 °C
Installation position: any
Weight: SC-2000: 0,32 kg
ESC-2000: 0,08 kg
DSC-2000: 0,14 kg
Maximum acceleration: 2 G

Electric

Operating voltage: 8 to 35 V DC
Nominal voltage (solenoid): 12 V DC, 24 V DC
Nominal resistance (solenoid): 2.5 to 60 Ω
Maximum current: 0 to 2,6 A adjustable
Minimum current: 0 to 0,6 A adjustable
Dither frequency: 140 Hz, 85 Hz, 300 Hz
Stand-by current consumption: 0,016 A
Ramp generator: 0 to 5 s adjustable
Protection class: IP65
Fuse: Wickmann microfuse 2 A (max. 3 A)
Shifting time: 100 % ED
Input signal: 0 to 10 V (0 to 5 V)
0 to 20 mA (external load resistor)
4 to 20 mA (special version)
Deviation: 0,6 % / Ω for temperature fluctuations of the solenoid
0,3 % / V for voltage fluctuations
Electromagnetic compatibility: CE conform to EMV standard 2004/108/EG
Transient emissions EMA: EN 55 011-1B
Stability EMB: EN 50 082-2
NOTE  For the double amplifier DSC-2000-U a second board will be integrated. The dimensions stay the same.
Operational elements

<table>
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<td>Amplifier for mounting rails</td>
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<tr>
<td>DSC</td>
<td>Double amplifier for mounting rails</td>
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</table>

Potentiometer $I_{\text{max}}$
Potentiometer $I_{\text{min}}$
Potentiometer Ramp

Fuse
Wickmann 2 A / 3 A

LED
Voltage supply and fuse

LED initial state

Type code

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<th>Design</th>
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<th>Amplifier</th>
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<td>Amplifier for mounting rails</td>
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<tr>
<td>DSC</td>
<td></td>
<td>Double amplifier for mounting rails</td>
</tr>
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</table>

**Dither frequency**
- 140 Hz
- 300 Hz
- 85 Hz

**Ramp time**
- 0-5 s
- 0-60 s*
- 60 s

**Cable length**
- 1.5 m
- 5 m
- 10 m

* only partially available
** only option for SC-2000U

Accessories and additional information

**Accessories/spare parts**

<table>
<thead>
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<th>Part</th>
<th>Article number</th>
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<tr>
<td>Adapter plug DIN EN 175301-803 shape B to shape A</td>
<td>109.0006</td>
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<tr>
<td>Replacement fuse 2 A</td>
<td>109.0003</td>
</tr>
<tr>
<td>Replacement fuse 3,15 A</td>
<td>109.0004</td>
</tr>
</tbody>
</table>
Set up

**NOTE**  The chopper amplifier has to be adjusted on-load (with connected prop. solenoid). Never disconnect the solenoid while the operating current is connected.

To get optimal results and to avoid defects on the chopper amplifier and the valves, adjust the chopper amplifier with the following instructions:

Adjust minimum current \( I_{\text{min}} \) always before maximum current \( I_{\text{max}} \).

1. Connect supply voltage (see figure).
2. Connect external potentiometer (see figure).
3. Switch on hydraulic supply.
4. Observe the function of the valve.
5. Set external potentiometer to minimum value.
6. Adjust the \( I_{\text{min}} \) potentiometer so that there is no hydraulic outlet (pressure or volume flow).
7. Set external potentiometer to maximum value.
8. Adjust the \( I_{\text{max}} \) potentiometer so that the desired max. pressure or volume flow is reached.
9. The chopper amplifier is adjusted. The desired adjustment range is between the minimum value and the maximum value.
10. If there is still a dead range, repeat the basic adjustments \( I_{\text{min}} \) and \( I_{\text{max}} \).
11. Adjust the ramp potentiometer to the desired value (0-5s).

**Two-point control**

1. Connect supply voltage (see figure).
2. Connect selector switch (min./max. value, see figure).
3. Adjust selector switch to minimum value (1 to 4 connected).
4. Switch on hydraulic supply.
5. Observe the function of the valve.
6. Adjust the \( I_{\text{min}} \) potentiometer so that there is no hydraulic outlet (pressure or volume flow).
Set up

**Two-point control**
- Adjust selector switch to maximum value (1 to 3 connected).
- Adjust the \( I_{\text{min}} \) potentiometer so that the desired max. pressure or volume flow is reached.
- The chopper amplifier is adjusted. The desired adjustment range is between the minimum value and the maximum value.
- If there is still a dead range, repeat the basic adjustments (\( I_{\text{min}} \) and \( I_{\text{max}} \)).
- Adjust the ramp potentiometer to the desired value (0-5s).

**External current control 0 - 20 mA**
- Connect load resistor (250 \( \Omega \), see figure).
- Connect supply voltage (see figure).
- Connect external current control (see figure).

- Switch on hydraulic supply.
- Observe the function of the valve.
- Adjust external current to approx. 0,05 mA.
- Adjust the \( I_{\text{max}} \) potentiometer so that there is no hydraulic outlet (pressure or volume flow).
- Adjust external current to 20 mA.
- Adjust the \( I_{\text{max}} \) potentiometer so that the desired max. pressure or volume flow is reached.
- The chopper amplifier is adjusted. The desired adjustment range is between the minimum value and the maximum value.
- If there is still a dead range, repeat the basic adjustments (\( I_{\text{min}} \) and \( I_{\text{max}} \)).
- Adjust the ramp potentiometer to the desired value (0-5s).
Set up

*External voltage control*

- Connect supply voltage (see figure).
- Connect external voltage control (5/10 V, see figure).

- Switch on hydraulic supply.
- Observe the function of the valve.
- Adjust external voltage to approx. 0.005 V.
- Adjust the \( I_{\text{min}} \) potentiometer so that there is no hydraulic outlet (pressure or volume flow).
- Adjust external voltage to accumulated value (5/10 V).
- Adjust the \( I_{\text{max}} \) potentiometer so that the desired max. pressure or volume flow is reached.
- The chopper amplifier is adjusted. The desired adjustment range is between the minimum value and the maximum value.
- If there is still a dead range, repeat the basic adjustments (\( I_{\text{min}} \) and \( I_{\text{max}} \)).
- Adjust the ramp potentiometer to the desired value (0-5s).
Proportional Chopper Amplifier VB-3A

- electric amplifier for proportional valves
- maximum current 1600 mA
- input signal 0-5 V and 0-10 V or input signal 0-20 mA and 4-20 mA

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Characteristics

- compensating the temperature-dependent magnetoresistance of the proportional solenoid
- multi-course potentiometers for adjusting \( I_{\text{min}} \) \( I_{\text{max}} \) and time ramp
- 2 ramp functions
- dither frequency adjustable between 100 Hz and 500 Hz
- LED signaling
- external enable function
- for installation onto mounting rails according to DIN EN50022 or 50035
Technical data

**Mechanic**

- Design: chopper amplifier for installation onto mounting rails
- Ambient temperature: -20 °C to +60 °C
- Installation position: any
- Weight: 0,10 kg
- Maximum acceleration: 2 G

**Electric**

- Operating voltage: 12 V DC to 36 V DC
- Nominal voltage (solenoid): 12 V DC, 24 V DC
- Auxiliary voltage: 10 V DC (max. 20 mA current consumption)
- Maximum current Out: 300 mA to 1600 mA adjustable
- Minimum current Out: 10 mA to 500 mA adjustable
- Stand-by current consumption: 40 mA
- Dither frequency: 100 Hz to 500 Hz adjustable
- Ramp generator: up and down ramp separately adjustable up to 80 mA/s
- Protection class: IP20
- Shifting time: 100% ED
- Input signal: 0-5 V, 0-10 V, optional 0-20 mA, 4-20 mA
- Output: short-circuit-proof
- Electric termination: screw terminals up to 1,5 qmm

Dimensions

**Chopper amplifier**

**VB-3A**

![Dimensions Diagram]

- 22,5 mm
- 75 mm
- 90 mm
- 101 mm

---

**Technical data**

**Mechanic**

- Design: chopper amplifier for installation onto mounting rails
- Ambient temperature: -20 °C to +60 °C
- Installation position: any
- Weight: 0,10 kg
- Maximum acceleration: 2 G

**Electric**

- Operating voltage: 12 V DC to 36 V DC
- Nominal voltage (solenoid): 12 V DC, 24 V DC
- Auxiliary voltage: 10 V DC (max. 20 mA current consumption)
- Maximum current Out: 300 mA to 1600 mA adjustable
- Minimum current Out: 10 mA to 500 mA adjustable
- Stand-by current consumption: 40 mA
- Dither frequency: 100 Hz to 500 Hz adjustable
- Ramp generator: up and down ramp separately adjustable up to 80 mA/s
- Protection class: IP20
- Shifting time: 100% ED
- Input signal: 0-5 V, 0-10 V, optional 0-20 mA, 4-20 mA
- Output: short-circuit-proof
- Electric termination: screw terminals up to 1,5 qmm

**Dimensions**

**Chopper amplifier**

**VB-3A**

![Dimensions Diagram]
Front panel

LED red: enable off
LED green: enable on

Ramp up
Ramp down

I_{max}
I_{min}

Dither frequency

Connections

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<th>Description</th>
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<td>3</td>
<td>I_{min}</td>
</tr>
<tr>
<td>4</td>
<td>I_{max}</td>
</tr>
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<td>5</td>
<td>ramp up</td>
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<td>6</td>
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<tr>
<td>A, C</td>
<td>connection solenoid</td>
</tr>
<tr>
<td>M</td>
<td>0 V</td>
</tr>
<tr>
<td>K</td>
<td>10 V</td>
</tr>
<tr>
<td>D</td>
<td>12-36 V DC</td>
</tr>
<tr>
<td>F, E</td>
<td>0 V</td>
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<tr>
<td>J</td>
<td>enable</td>
</tr>
<tr>
<td>G, H</td>
<td>input</td>
</tr>
</tbody>
</table>
NOTE
The chopper amplifier has to be adjusted on-load (with connected proportional solenoid). Never disconnect the solenoid while the operating current is connected.

To get optimal results and to avoid defects on the chopper amplifier and the valves, adjust the chopper amplifier with the following instructions.

Adjust minimum current ($I_{\text{min}}$) always before maximum current ($I_{\text{max}}$).

**Basic adjustment**
- Connect supply voltage (+ to D, - to F).
- To activate the amplifier, connect the enable supply to terminal J.
- Connect solenoid to terminal A and C.
- Connect input signal:
  - **External voltage control (SPS)**:
    - Connect external voltage control to terminals H (5/10 V+) and G (-/GND).
  - **Potentiometer control**:
    - Bridge terminal M to terminal G.
    - Connect external potentiometer to terminals K (10 V+), M (0 V) and H (center tap).
  - **External current control (VB-3A-I)**:
    - Connect external current control to terminals H (+) and E (-).
- Switch on operating voltage and hydraulic supply.
- Observe the function of the valve.
- Set input signal to minimum value.
- Adjust the $I_{\text{min}}$ potentiometer so that there is no hydraulic outlet (pressure or volume flow).
- Set input signal to maximum value.
- Adjust the $I_{\text{max}}$ potentiometer so that the desired max. pressure or volume flow is reached.
- The chopper amplifier is adjusted. The desired adjustment range is between the minimum value and the maximum value.
- If there is still a dead range, repeat the basic adjustments ($I_{\text{min}}$ and $I_{\text{max}}$).
Set up

**Basic adjustment for ramp time and dither frequency**

- The ramp-up time can be adjusted with the ramp potentiometer. To extend the ramp time, turn potentiometer to the left.

The basic adjustment of the dither frequency (125 Hz) is suitable for most applications. The frequency has to be changed if:

- large valves are pilot operated with small proportional valves (lower frequency)
- or
- the frequency should be less audible (higher frequency). Though the hysteresis can decline.

**Enable**

By switching the enable voltage, the ramps are bypassed.

Enable voltage:

- < 1 V: enable off
- > 4 V to 36 V: enable on
Pressure Transmitter MODS

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Characteristics

- robust
- compact
- pressure peak resistant
- overload protected
- with reverse voltage protection
- limitation of power loss
- electronic calibration
- stainless steel
- fully welded, “dry” measuring cell, therefore no internal transmission media
- applicable with all standard signals for industry, hydraulics and pneumatics
- various signal-, thread- and connecting options available
- Certifications: German Lloyd (GL) for marine applications
  CE-Directive 2014/30/EU
  CE-Directive 2014/68/EU
  Railway applications (DIN EN 50155)
Technical data

**Hydraulic**
- Measuring range: see type code
- Pressure type: relative pressure
- Overload pressure: 2 x full scale*
- Burst pressure: 3 x full scale*

**Mechanic**
- Design: screw-in pressure transmitter
- Fluid temperature: -40 °C to +125 °C
- Ambient temperature: -40 °C to +105 °C
- Installation position: any
- Weight: 0,1 kg
- Material: stainless steel
- Measuring principle: piezoresistive
- Shock resistance: 1000 g according to DIN EN 60068-2-32
- Vibration resistance: 20 g according to DIN EN 60068-2-6
- Damping: ø0,6 mm at hydraulic connector, integrated in sensor

**Electric**
- Nominal voltage: 12 - 32 V DC or 5 V DC ±10 %
- Protection class: IP67 (according to plug-system, if correctly mounted)
- Response time: ≤ 2 ms
- Output signal: see type code
- Electric termination: Electric plug M12x1, 4-pin
  Electric plug DIN EN 175301-803, shape A, 3-pin + PE
- Electromagnetic compatibility:
  - Temperature coefficient in compensated temperature range: ≤ 0,15 % / 10 K
  - Radiation: < 30 BμV/m (according to DIN 61000-4-3)
  - Accuracy @ RT: ≤ 0,50 % of the range
  - Stability/Year: ≤ 0,15 % of the range
  - Non-linearity: ≤ 0,15 % of the range

**NOTE**
Due to electronic calibration the pressure transmitter has a total error of 2 % of full scale*. Customised versions with better accuracy are available on request.

* integral linearity error
**Dimensions**

MODS

**Pin assignment**

*electric plug*

*M12x1, 4-pin*

View on MODS-sensor

<table>
<thead>
<tr>
<th>Output signal</th>
<th>Pin 1</th>
<th>Pin 2</th>
<th>Pin 3</th>
<th>Pin 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>supply voltage + (12 - 32 V DC)</td>
<td>n.c.</td>
<td>output signal 4 - 20 mA</td>
<td>n.c.</td>
</tr>
<tr>
<td>B</td>
<td>supply voltage + (12 - 32 V DC)</td>
<td>n.c.</td>
<td>GND</td>
<td>output signal 0 - 20 mA</td>
</tr>
<tr>
<td>C</td>
<td>supply voltage + (12 - 32 V DC)</td>
<td>n.c.</td>
<td>GND</td>
<td>output signal 0 - 10 V DC</td>
</tr>
<tr>
<td>D</td>
<td>supply voltage + (5 V DC ±10%)</td>
<td>n.c.</td>
<td>GND</td>
<td>output signal 0,5 - 4,5 V DC ratiometric</td>
</tr>
<tr>
<td>E</td>
<td>supply voltage + (12 - 32 V DC)</td>
<td>output signal 4 - 20 mA</td>
<td>GND</td>
<td>n.c.</td>
</tr>
</tbody>
</table>

n.c. = not connected

**electric plug**

*DIN EN 175301-803 shape A, 3-pin + PE*

View on MODS-sensor

<table>
<thead>
<tr>
<th>Output signal</th>
<th>Pin 1</th>
<th>Pin 2</th>
<th>Pin 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>supply voltage + (12 - 32 V DC)</td>
<td>GND</td>
<td>output signal 0 - 10 V DC</td>
</tr>
</tbody>
</table>
**Type code**

| MODS | - | G 1/4 | - | - | - |
| Pressure transmitter | Measuring range | Connection thread (DIN 3852) | Output signal | Electric plug |
| 6 | -1 - 6 bar | 4 - 20 mA | M12x1 |
| 60 | 0 - 60 bar | 0 - 20 mA | M12 |
| 160 | 0 - 160 bar | 0 - 10 V DC | DIN EN 175301-803 |
| 250 | 0 - 250 bar | 0,5 - 4,5 V DC | shape A, 3-pin + PE |
| 400 | 0 - 400 bar | 4 - 20 mA | N |
| 600 | 0 - 600 bar | (3-wire) | |

**Accessories and additional information**

| Accessories/ spare parts | Article: | Material number: |
| Seal ring (Viton) | 1095335 |
**Special Valves**

**Pressure Valves**
- **Accumulator Charging Valve SLV**
  - Pilot operated
  - Operating pressure max. 315 bar
  - Volume flow max. 60 l/min
  - Mounting plate NG 6, NG 10

- **Hydraulic Accumulator Safety Block HSB-06**
  - Direct operated, manuell or solenoid operated
  - Operating pressure max. 350 bar
  - Volume flow max. 40 l/min
  - Mounting plate NG6

**Flow Valves/Throttle Valves**
- **Rapid Traverse/Creep Valve ZMSR**
  - Operating pressure max. 250 bar
  - Volume flow max. 30 l/min
  - Sandwich body NG 6

**On/Off Valves**
- **Pressure Discharge Valve ZMSVD2**
  - Operating pressure max. 315 bar
  - Volume flow max. 30 l/min
  - Sandwich body NG 6, NG 10, NG 16
  - Discharge from A and B to T

**Check Valves**
- **Hydraulic Motor Anti Cavitation Valve HNV**
  - Cavitation protection for orbital engines
  - With hollow bolts G3/8"
The FLUID TEAM accumulator load valve SLV is a shift valve with a pressure-dependent shifting point. The shift pressure is measured in port B. If the shift pressure is reached, the valve opens the connection of port P after T, the pump is in pressure-free circulation. As soon as the pressure sank in port B on the reset point, the valve closes the connection of P after T, the accumulator will be loaded again. The reset pressure lies approx. 15% below adjusted shift pressure (= reset hysteresis). The SLV is available as a cover plate CETOP/ISO 3 (SLV 6) and CETOP/ISO 5 (SLV 10). The setting of the shift pressure can be done in the factory. If the accumulator is fitted directly to the cover plate, devices with integrated check valve are available.

### Technical Data

**Hydraulic**
- Rated pressure: max. 315 bar
- Switching pressure: see model code
- Hysteresis: see model code
- Rated flow: SLV 6: max. 30 l/min; SLV 10: max. 60 l/min
- Fluids: Oils as per DIN 51524; Others upon request
- Viscosity: 3 – 400 cSt
- Filtration: min. 25 µm

**Design:** pilot operated
**Operation temperature:** -20 ºC – +80 ºC
**Installation:** no restrictions
**Weight:** SLV 6: 1.3 kg; SLV 10: 1.9 kg
**Materials:** valve parts: steel; body: aluminium; seals: NBR (Viton available)
**Surface protection:** back up rings: Teflon; PU; valve zinc plated; body anodised

**Mechanic**
- **Symbols**

**Model Code**

<table>
<thead>
<tr>
<th>SLV 6</th>
<th>210</th>
<th>15</th>
<th>3</th>
<th>RV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accumulator Load Valve Surface Mount Body</td>
<td>Shift Pressure Range</td>
<td>Hysteresis</td>
<td>Design</td>
<td>Check Valve „P“ to „B“</td>
</tr>
<tr>
<td>NG 6 SLV 6</td>
<td>55 = 18 – 55 bar</td>
<td>15 = 15%</td>
<td>internal</td>
<td>0 = without check valve</td>
</tr>
<tr>
<td>NG 10 SLV 10</td>
<td>105 = 28 – 105 bar</td>
<td>On request:</td>
<td></td>
<td>RV = with check valve</td>
</tr>
<tr>
<td></td>
<td>210 = 70 – 210 bar</td>
<td>20 = 20%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>350 = 140 – 315 bar</td>
<td>30 = 30%</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>50 = 50%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Dimensions [mm]

**SLV 6 with / without Check Valve**

![Diagram of SLV 6 with Check Valve](image1)

![Diagram of SLV 6 without Check Valve](image2)

**SLV 10**

![Diagram of SLV 10](image3)
Accumulator Safety Valve HSB-06

cover plate CETOP 3 • pressure relief valve as per 97/23/EC • max. 40 l/min

Description

The hydraulic accumulator safety valve HSB-06 is used for the prescribed security and discharge of hydraulic systems with accumulators. By the execution as CETOP/ISO 3 (NG 6) cover plate is an assembly without pipework in sandwich body packs possible. Additional functions, e.g. (restrictor-) check valves, are simple with standard bodies to add. By the internal connection of the channels A, B and P there are additional connection possibilities, e.g. for the accumulator, for consumers, measuring etc.

The direct operated pressure relief valve is according to 97/23/EC, and can be supplied preset. Various options stand to the selection: pressure discharge manually (with screw) or electrically (over 2/2 poppet valve) as well as a Minimess® measure coupling in P.

Technical Data

<table>
<thead>
<tr>
<th>Hydraulic</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated Pressure:</td>
<td>with manual discharge: 350 bar</td>
</tr>
<tr>
<td></td>
<td>with electrical discharge: 250 bar</td>
</tr>
<tr>
<td>Flow Rate:</td>
<td>max. 40 l/min</td>
</tr>
<tr>
<td>Adjustment Range:</td>
<td>see diagram at page 2</td>
</tr>
<tr>
<td>Fluids:</td>
<td>oils as per DIN 51524, others on request</td>
</tr>
<tr>
<td>Viscosity Range:</td>
<td>12 – 230 cSt</td>
</tr>
<tr>
<td>Filter:</td>
<td>class 18/16/13, filter ß 6...10 ≥ 75</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mechanic</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ambient Temperature:</td>
<td>manual discharge: -20 °C – +60 ºC</td>
</tr>
<tr>
<td></td>
<td>electrical discharge: -20 °C – +50 ºC</td>
</tr>
<tr>
<td>Fluid Temperature:</td>
<td>-20 °C – +60 ºC</td>
</tr>
<tr>
<td>Installation:</td>
<td>no restrictions</td>
</tr>
<tr>
<td>Materials:</td>
<td>valve parts, body: steel, seals: NBR, back up rings: Teflon, PU</td>
</tr>
<tr>
<td>Surface Protection:</td>
<td>valves: zinc plated, phosphated body: zinc plated</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Electrical</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal Voltage:</td>
<td>24 V DC ± 10%</td>
</tr>
<tr>
<td>Power Consumption:</td>
<td>22 W</td>
</tr>
<tr>
<td>Nominal Resistance (R₀):</td>
<td>26 Ω</td>
</tr>
<tr>
<td>Cyclic Duration Factor:</td>
<td>100 %</td>
</tr>
<tr>
<td>Environmental Protection:</td>
<td>IP 65</td>
</tr>
<tr>
<td>Electrical Termination:</td>
<td>plug as per DIN 43650 form A, incl. square connector Pg9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Symbols / Assembling Examples</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>HSB-06 – E – M – 210</td>
<td></td>
</tr>
<tr>
<td>Accumulator Safety Valve CETOP 3</td>
<td>Pressure Discharge</td>
</tr>
<tr>
<td>A = manual (screw)</td>
<td>O = plugged</td>
</tr>
<tr>
<td>E = electrical, 24 V DC, normally open</td>
<td>M = Minimess coupling M16x2</td>
</tr>
<tr>
<td>setting [bar]</td>
<td>special executions</td>
</tr>
</tbody>
</table>

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**Safety Regulations** for presetted Pressure Relief Valves after Pressure Equipment Directive 97/23/EC

After 97/23/EC the increase of the system pressure due to the oil flow may not be larger than 10% of the adjusted pressure setting. **Note!** The system pressure increases due to the increasing flow rate by the back pressure in the blow-off line (port T). Before the order of a presetted valve it must be considered that the existing flow rate of the application is less than the maximum flow rate in the diagram at the right side. This diagram shows the maximally permissible flow rate related to the setting pressure. The indicated maximally permissible flow rate $q_{V_{\text{max}}}$ may not be exceeded. Blow-off (T) lines of relief valves must out-flow safely.

Absolutely consider the operation notes!

- In the work the indicated pressure is set with a flow rate by 2 l/min.
- The indicated maximally permissible flow rate applies to applications without back-pressure in the blow-off line (port T).
- With removing the valve's sealing the permission after DGRL is no longer valid!
- Always consider the ‘pressure equipment directive 97/23/EC’-guidelines!
Dimensions (mm)

**HSB-06-A-O-... manual discharge**

Abb. Meßanschuß verschlossen

**HSB-06-E-M-... electrical discharge**

fig. with Minimess® coupling
High/low flow rate shift valve ZMSRP2, ZMSRT2

sandwich body CETOP/ISO 3 ● in P or T ● max. 30 l/min

Description
With the FLUID TEAM high/low flow rate shift valve ZMSR*2 it is possible to shift between two flow rate values. If the 2/2 poppet valve is open, the entire approaching oil can flow through the sandwich body. If it is closed, the flow control valve comes to function. Here it can be chosen between a pressure compensated 2-way flow control valve and a restrictor (needle) valve. Because of the sharp-edged orifice these valves are very insensitive to viscosity. Due to the balanced needle these valves are easily adjustable even with high pressures. For the 2/2 poppet valve you can chose between the version 'normally closed' and 'normally open'. The ZMSRP2 limits the approaching oil flow in P, the ZMSRT2 limits the oil flow running off to T.

Technical Data

Hydraulic
Rated Pressure: max. 250 bar
Rated Flow: max. 30 l/min (through poppet valve)
Fluids: oils as per DIN 51524, others upon request
Viscosity Range: 10 – 350 cSt
Filtration: class 10/16/13, filter € 6...10 ± 75

Mechanical
Ambient Temperature: -20 °C – +50 °C
Fluid Temperature: -20 °C – +80 °C
Installation: no restrictions
Weight: 0.9 kg
Materials: valve parts: steel, body: aluminium, seals: NBR, back up rings: Teflon, PU
Surface Protection: valve: zinc plated, body: anodised

Note: for further technical data see data sheet MSVT (chapter 8).

Electrical
Nominal Voltage: 24V DC, 12V DC, 205V DC; ± 10 %
Nominal Resistance (R20°): 24V: 22 Ω; 12V: 5.8 Ω; 205V: 1.6 kΩ
Power Consumption: 27 W
Cyclic Duration Factor: 100 %
Environmental Protection: IP 65
Electrical Termination: plug as per DIN 43650 form A, incl. coupler socket Pg9

Symbols

fig. with flow control valve (FDBA) and 2/2 poppet valve normally open (MSVT-07)

Model Code

<table>
<thead>
<tr>
<th>ZMSRP2-06</th>
<th>–</th>
<th>FDBA</th>
<th>–</th>
<th>L</th>
<th>A</th>
<th>N</th>
<th>–</th>
<th>MSVT3</th>
<th>–</th>
<th>24V</th>
</tr>
</thead>
<tbody>
<tr>
<td>High/Low Flow Rate Shift Valve</td>
<td>deliverable executions:</td>
<td>Flow Control Valve</td>
<td>Poppet Valve</td>
<td>Voltage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function in P</td>
<td>ZMSRP2-06</td>
<td>FDBA = pressure compensated</td>
<td>A = for FDBA: 1 – 23 l/min</td>
<td>MSVT-03</td>
<td>12V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Function in T</td>
<td>ZMSRT2-06</td>
<td>NCCB = needle valve</td>
<td>– for NCCB: orifice Ø 0 – 4.8 mm</td>
<td></td>
<td>24V DC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

| 12V DC | 205V DC |

Note: Alternations Reserved.
ZMSRP2-06-...

Function in P

Turn screw clockwise to decrease flow.
Complete adjustment range in 5 turns.
Leakage at shutoff: < 0.4 l/min/315 bar/32 cSt.

ZMSRT2-06-...

Function in T

notes for flow control valve: see above
Pressure Discharge Valve ZMSVD2

Sandwich Body CETOP/ISO 3, 5, 7 • opens A and B to T

Description
With the pressure discharge valve ZMSVD2 is simple eliminating of residual pressures in the A and B channels of sandwich packages possible. The channels A and B are dischargeable thereby separately over two 2/2-way poppet valves to the tank (T channel). By the use of compact valves increase in altitude is small.

Symbol
![Symbol](image)

Application
The ZMSVD2 finds particularly in tooling machines use. Example: core strain discharge of injection moulding machines (before tool changes).

Technical Data

<table>
<thead>
<tr>
<th>Hydraulic</th>
<th>CETOP/ISO 3, 5: max. 30 l/min</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluids:</td>
<td>oils as per DIN 51524, others upon request</td>
</tr>
<tr>
<td>Viscosity Range:</td>
<td>10 – 350 cSt</td>
</tr>
<tr>
<td>Filtration:</td>
<td>class 20/18/14, filter Ø 10...16 ≥ 75</td>
</tr>
<tr>
<td>Leakage:</td>
<td>max. 5 drops/ min.</td>
</tr>
</tbody>
</table>

| Rated Pressure: | max. 315 bar |
| Rated Flow over poppet valve: | CETOP/ISO 3, 5: max. 30 l/min |
| Fluids: | oils as per DIN 51524, others upon request |
| Viscosity Range: | 10 – 350 cSt |
| Filtration: | class 20/18/14, filter Ø 10...16 ≥ 75 |
| Leakage: | max. 5 drops/ min. |

| Materials: | valve parts: steel |
| body: Aluminium |
| seals: NBR |
| back up rings: Teflon, PU |
| Surface Protection: | valve: zinc plated, burnished |
| body: anodised |

Electrical

Nominal Voltage: 24 V DC, 12 V DC, ± 10%

Nominal Resistance (R0):
- CETOP/ISO 3, 5: 24V: 26 Ω, 12V: 8Ω
- CETOP/ISO 7: 24V: XX Ω, 12V: X Ω

Wattage: 22 W

Cyclic Duration Factor: 100%

Environmental Protection: IP 65

Electrical Termination:
- CETOP/ISO 3, 5: plug as per DIN 43650 form A, incl. square connector Pg9
- CETOP/ISO 7: plug as per DIN 43650 form B, incl. square connector Pg7

Model Code

<table>
<thead>
<tr>
<th>ZMSVD2</th>
<th>A/T−B/T</th>
<th>1</th>
<th>24V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure Discharge Valve, Sandwich Body</td>
<td>Function</td>
<td>Design</td>
<td>Voltage</td>
</tr>
<tr>
<td>deliverable executions:</td>
<td>A/T−B/T = discharge from A and B to T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CETOP/ISO 3 (NG 6)</td>
<td>ZHD/ND-06</td>
<td></td>
<td>24V DC</td>
</tr>
<tr>
<td>CETOP/ISO 5 (NG 10)</td>
<td>ZHD/ND-10</td>
<td></td>
<td>12V DC</td>
</tr>
<tr>
<td>CETOP/ISO 5 (with X + Y)</td>
<td>ZHD/ND-10Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CETOP/ISO 7 (NG 16)</td>
<td>ZHD/ND-16</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
*) fig. shows interface with X- and Y-channel. The other dimensions are identic.
Bypass anti cavitation valve HNV

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<th>Contents</th>
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</tr>
</thead>
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<td>Technical data</td>
<td>2</td>
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<tr>
<td>Dimensions</td>
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</tr>
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<td>3</td>
</tr>
<tr>
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<td>3</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>3</td>
</tr>
</tbody>
</table>

Characteristics

- hydraulic motor bypass valve
- cavitation protection for Danfoss OMM and similar motors
- the check valve ensures a backflow of oil in case of motor overrun
- space-saving installation possible
- maintenance-free
**Technical data**

*Hydraulic*
- Operating pressure max.: 210 bar
- Flow rate max.: 10 l/min
- Opening pressure at check valve: 0,3 bar
- Hydraulic fluid: mineral oil according to DIN 51524, others upon request
- Viscosity range: 7,4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999), 18/16/13, filter with β 5(c) > 200

*Mechanic*
- Design: bypass anti cavitation valve
- Size: G 3/8
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -20 °C to +80 °C
- Storage temperature: -20 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0,23 kg
- Material: body: aluminium
- Surface protection: hollow bolts and steel sealing rings: steel
  - aluminium: anodized, steel: zinc coated

**Dimensions**

*Bypass anti cavitation valve HNV*

![Diagram of the bypass anti cavitation valve HNV](image-url)
Bypass anti cavitation valve

Type code

<table>
<thead>
<tr>
<th>Article description</th>
<th>Article number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bypass anti cavitation valve HNV including G 3/8&quot; hollow bolts</td>
<td>203.0029</td>
</tr>
</tbody>
</table>

Set-up

The installation torque values of port P and R are maximum values which are not to be exceeded (Nm, counter material steel), otherwise this might lead to damage at the steel sealing ring. The correct installation torque must be guaranteed by using the necessary tools (torque wrench) and procedure.

If leakage occurs at the steel sealing ring despite the correct installation torque, the system must never be tightened with a higher torque, but it might be necessary to replace the bypass anti cavitation valve and/or its counterpart, as well as the steel sealing ring.

The system is designed to absorb hydraulic forces. If there are any mechanic forces, e.g. applied through hydraulic tubing, this may lead to failure.

Any hydraulic tubing must be mounted with the system being turned off and stress-relieved.

Accessories and additional information

<table>
<thead>
<tr>
<th>Accessories/ spare parts</th>
<th>Article:</th>
<th>Article number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>hollow bolt G 3/8&quot;</td>
<td></td>
<td>805.0001</td>
</tr>
<tr>
<td>steel sealing ring R 3/8&quot;</td>
<td></td>
<td>809.0011</td>
</tr>
</tbody>
</table>

Manual

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category "general operating manual" or will be provided upon request.
On-Off Directional Valves

2/2-way Poppet Valves

2/2-way Poppet Valve MSVT
- direct operated or pilot operated
- normally open or normally closed
- operating pressure max. 350 bar
- volume flow max. 40 l/min

Sandwich Body 2/2-double Poppet Valve ZMSV2
- pilot operated, normally closed
- operating pressure max. 315 bar
- volume flow max. 80 l/min
- sandwich body NG 6, NG 10

3/2-way Poppet Valves

3/2-way Compact Poppet Valve MSV3/2
- direct operated, solenoid operated
- operating pressure max. 315 bar
- volume flow max. 20 l/min
- cavity MSV3/2

3/2-way Poppet Valve S32S-A1X34
- direct operated, solenoid operated
- operating pressure max. 350 bar
- volume flow max. 30 l/min
- cavity S32S-X34

Spool Valves

4/2, 4/3 Directional Valve W4_S-5PS03
- direct operated, solenoid operated
- operating pressure max. 315 bar
- volume flow max. 8 l/min
- size NG 3

4/2, 4/3 Directional Valve W4_S-A1AS06
- direct operated, solenoid operated
- operating pressure max. 350 bar
- volume flow max. 80 l/min
- size NG 6, DIN 24340 A06

4/2, 4/3 Directional Valve W4_S-A2AS06
- direct operated, solenoid operated
- operating pressure max. 250 bar
- volume flow max. 50 l/min
- size NG 6, DIN 24340 A06
2/2-way poppet valve MSVT

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<td>3</td>
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<td>Type code</td>
<td>4</td>
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<tr>
<td>Accessories and additional information</td>
<td>5</td>
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</tbody>
</table>

Characteristics

- screw-in poppet valve
- pilot operated or direct operated available
- normally open or normally closed models available
- maintenance-free
### Technical Data

**Hydraulic**
- **Operating pressure max.**: 350 bar (MSVT 20 and MSVT 21: 250 bar, flow from 1 to 2: 150 bar)
- **Flow rate**: 40 l/min (MSVT 20: 15 l/min, MSVT 21: 30 l/min)
- **Flow direction**: from 2 to 1 (1 to 2)
- **Hydraulic fluid**: mineral oil according to DIN 51524, others upon request
- **Viscosity range**: 3 - 400 cSt
- **Filtration**: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with ß 5(c) > 200

**Mechanic**
- **Design**: Screw-in valve
- **Fluid temperature**: -10 °C to +80 °C
- **Ambient temperature**: -20 °C to +50 °C
- **Storage temperature**: -30 °C to +60 °C (non-condensing)
- **Installation position**: any
- **Weight**: 0,31 kg
- **Material**: valve parts: steel, coil: plastic, seals: NBR
- **Surface protection**: burnished/zinc coated

**Electric**
- **Nominal voltage**: 12 V DC, 24 V DC
- **Nominal resistance (R20)**: 8 Ω (12 V), 26 Ω (24 V)
- **max. power consumption**: 18 W (12 V), 22 W (24 V)
- **Shifting-time**: 100% ED
- **Protection class**: IP65 correctly mounted and locked mating connector
- **Electric termination**: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A

**Performance**

**Pressure drop diagram (Δp/Q) MSVT-03 and MSVT-04**

![Pressure drop diagram Δp/Q MSVT-03 and MSVT-04](image)

**Pressure drop diagram (Δp/Q) MSVT-07**

![Pressure drop diagram Δp/Q MSVT-07](image)
Performance
Pressure drop diagram (Δp/Q) MSVT-20 and MSVT-21

Test conditions
Oil: HLP 32, temperature: 40 °C (~32 cSt)

Dimensions
Screw-in valve
MSVT

solenoid rotatable 360°
installation torque
max. 0.5 Nm
electric plug acc. to
DIN EN 175301-803
shape A
installation torque 45 Nm SW 24
locating shoulder
Dimension

Cavity MSVT

NOTE For a detailed drawing of the cavity please see chapter 11 “general information” or our online catalogue at www.weber-hydraulik.com.

Type code

2/2-way poppet valve

<table>
<thead>
<tr>
<th>Model</th>
<th>Nominal voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>03</td>
<td>12 V 12 V DC</td>
</tr>
<tr>
<td>04</td>
<td>24 V 24 V DC</td>
</tr>
<tr>
<td>07</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td></td>
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<td>22</td>
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</tr>
</tbody>
</table>
## Accessories and additional information

<table>
<thead>
<tr>
<th>Accessories / spare parts</th>
<th>Article:</th>
<th>Article number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socket connector DIN EN 175301-803, shape A, black</td>
<td>149.0007</td>
<td></td>
</tr>
<tr>
<td>Socket connector DIN EN 175301-803, shape A, grey</td>
<td>149.0008</td>
<td></td>
</tr>
<tr>
<td>Aluminium housing 3/8&quot;</td>
<td>093.0024</td>
<td></td>
</tr>
<tr>
<td>Steel housing 3/8&quot;</td>
<td>153.0139</td>
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</tr>
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</table>

**Manual**

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
**Description**

The ZMSV2 includes two hydraulically controlled 2/2-way-poppet valves. They are both operated by a pilot valve. Therefore channel A and B can be shut off tight, regardless of the load pressure. The switching process is slightly damped, to avoid negative effects of sudden decompression. The minimum switching pressure (pressure difference between channel P and T) should be at least 20 bar. The sandwich bodies are available in size NG 6 or NG 10 (also with X- and Y-channel).

**Symbol**

![Symbol](image)

**Technical Data**

<table>
<thead>
<tr>
<th>Hydraulic</th>
<th></th>
<th></th>
<th>Mechanic</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Rated pressure</td>
<td>max. 315 bar</td>
<td></td>
<td>Ambient temperature:</td>
<td>-20 °C – +40 °C</td>
</tr>
<tr>
<td>Rated flow NG 6</td>
<td>max. 40 l/min</td>
<td></td>
<td>Fluid temperature:</td>
<td>-20 °C – +80 °C</td>
</tr>
<tr>
<td>Minimum pressure</td>
<td>20 bar (P-T)</td>
<td></td>
<td>Installation position:</td>
<td>any</td>
</tr>
<tr>
<td>Fluids:</td>
<td>hydraulic fluids acc. to DIN 51524, others upon request</td>
<td></td>
<td>Weight:</td>
<td>NG 6: 1.76 kg; NG 10: 3.10 kg</td>
</tr>
<tr>
<td>Viscosity Range</td>
<td>10 – 300 cSt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Filtration</td>
<td>min. 25 µm, optimally 15 µm</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leakage</td>
<td>max. 5 drops/min.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Materials:</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>valve parts:</td>
<td>steel</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>body:</td>
<td>aluminium</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seals:</td>
<td>NBR, Viton optional</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Surface protection:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>body: anodized</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ext. valve parts:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>zinc plated, burnished</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal voltage:</td>
<td>24 V DC ± 10 %</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal resistance (R&lt;sub&gt;20&lt;/sub&gt;):</td>
<td>29 Ω</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power consumption:</td>
<td>max. 20 W</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shifting time:</td>
<td>100 % ED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protection class:</td>
<td>IP 65</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electric termination:</td>
<td>electric plug acc. to DIN 43650</td>
<td></td>
<td>shape B, incl. female connector Pg7</td>
<td></td>
</tr>
</tbody>
</table>
Type code

<table>
<thead>
<tr>
<th>Type code</th>
<th>Function</th>
<th>Revision</th>
<th>Nominal Voltage</th>
<th>Special designs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZMSV2–06–A/B</td>
<td>SGV = normally closed, pilot operated</td>
<td>(in-house)</td>
<td>24 V DC</td>
<td></td>
</tr>
</tbody>
</table>

Available models:

- **NG 6** (DIN 24340 A06) ZMSV2–06–A/B
- **NG 10** (DIN 24340 A10) ZMSV2–10–A/B
- **NG 10** (DIN 24340 A10 with X and Y) ZMSV2–10Y–A/B

Dimensions

**NG 6**

**NG 10**

- Fig. shows model with X and Y channel

H3-934301

H3-954407
3/2-way poppet valve MSV32

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Accessories and additional information | 4

Characteristics

- screw-in poppet valve
- with manual override
- also available in in-line body or mounting plate NG 6
- maintenance-free
## Technical Data

**Hydraulic**
- Operating pressure max.: 315 bar
- Flow rate: 20 l/min
- Flow direction: see symbol
- Hydraulic fluid: mineral oil according to DIN 51524, others upon request
- Viscosity range: 3 - 400 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**Mechanic**
- Design: screw-in poppet valve
- Size: MSV3/2
- Fluid temperature: -10 °C to +80 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0.42 kg
- Material: valve parts: steel, seals: NBR, backup rings: PU, Teflon
- Surface protection: zinc coated steel

**Electric**
- Nominal voltage: 12 V DC, 24 V DC
- Nominal resistance (R20): 5.8 Ω (12 V), 22 Ω (24 V)
- Max. power consumption: 27 W
- Shifting time: 100% ED
- Protection class: IP65 correctly mounted and locked mating connector
- Electric termination: Electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer
- Electronic controllers: see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com

## Performance

### Pressure drop diagram (Δp/Q) at I_n

<table>
<thead>
<tr>
<th>Δp [bar]</th>
<th>Q [l/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
</tr>
</tbody>
</table>

### Switching power diagram (p/Q) at I_n

<table>
<thead>
<tr>
<th>p [bar]</th>
<th>Q [l/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>80</td>
<td>4</td>
</tr>
<tr>
<td>120</td>
<td>6</td>
</tr>
<tr>
<td>160</td>
<td>8</td>
</tr>
<tr>
<td>200</td>
<td>10</td>
</tr>
<tr>
<td>240</td>
<td>12</td>
</tr>
<tr>
<td>280</td>
<td>14</td>
</tr>
<tr>
<td>320</td>
<td>16</td>
</tr>
<tr>
<td>360</td>
<td>18</td>
</tr>
<tr>
<td>400</td>
<td>20</td>
</tr>
</tbody>
</table>

| 0       | 2         |
| 4       | 4         |
| 6       | 6         |
| 8       | 8         |
| 10      | 10        |
| 12      | 12        |
| 14      | 14        |
| 16      | 16        |
| 18      | 18        |
| 20      | 20        |
Dimensions

Screw-in valve

**MSV3/2**

- Solenoid 360° rotatable
- Installation torque: max. 0.5 Nm
- Electric termination:
  - DIN EN 175301-803
  - Shape A
- Installation torque 45 Nm SW 24
- Locating shoulder

**Cavity MSV3/2**

**NOTE** For a detailed drawing of the cavity please see chapter 11 “general information” or our online catalogue at www.weber-hydraulik.com.

**NOTE** The valve is also available as LMSVA-06 in a mounting plate NG 6. Dimension sheets are available upon request.
Type code

<table>
<thead>
<tr>
<th>Nominal voltage</th>
<th>lockable manual override</th>
<th>Electric Termination</th>
<th>Body</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 V DC</td>
<td></td>
<td>DIN</td>
<td></td>
</tr>
<tr>
<td>24 V DC</td>
<td></td>
<td>AMP Junior Timer</td>
<td></td>
</tr>
<tr>
<td>90°</td>
<td></td>
<td>AMP</td>
<td></td>
</tr>
<tr>
<td>G3/8</td>
<td></td>
<td>in-line body G3/8</td>
<td></td>
</tr>
</tbody>
</table>

3/2-way poppet valve
- MSV3/2 screw-in valve
- LMSVA-06-321 in mounting plate NG 6, 0-position P closed
- LMSVA-06-322 in mounting plate NG 6, 0-position P open

Accessories and additional information

**Accessories / spare parts**

<table>
<thead>
<tr>
<th>Article</th>
<th>Article number</th>
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<tbody>
<tr>
<td>Socket connector DIN EN 175301-803, shape A, black</td>
<td>149.0007</td>
</tr>
<tr>
<td>Socket connector DIN EN 175301-803, shape A, grey</td>
<td>149.0008</td>
</tr>
<tr>
<td>Sealing kit MSV32 (NBR)</td>
<td>405.0006</td>
</tr>
</tbody>
</table>

**NOTE**
For the appropriate electronic controllers, see chapter 6, *electronics and sensors* as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual**
Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11, *general information*, under the category *general operating manual* or will be provided upon request.

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Felix-Wankel-Str. 4, 78467 Konstanz
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Fax: +49 7531 9748-44

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3/2-way poppet valve S32S-A1X34

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<tr>
<td>Performance</td>
<td>2</td>
</tr>
<tr>
<td>Dimensions</td>
<td>3</td>
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<tr>
<td>Type code</td>
<td>4</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>4</td>
</tr>
</tbody>
</table>

Characteristics

- 3/2-way- screw-in poppet valve
- leak-free
- for on-off bi-directional control of flow to actuators with leak-free closing in both directions
- all ports can be fully pressurized
- maintenance-free
- rotatable and replaceable coil
### Technical Data

#### Hydraulic
- **Operating pressure max.:** 350 bar
- **Flow rate:** 30 l/min
- **Flow direction:** see symbol
- **Hydraulic fluid:** mineral oil according to DIN 51524, others upon request
- **Viscosity range:** 3 - 400 cSt
- **Filtration:** oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with ß 5(c) > 200

#### Mechanic
- **Design:** screw-in poppet valve
- **Size:** 34
- **Fluid temperature:** -20 °C to +80 °C
- **Ambient temperature:** -20 °C to +80 °C
- **Storage temperature:** -30 °C to +60 °C (non-condensing)
- **Installation position:** any
- **Weight:** 0.43 kg
- **Material:** valve parts: steel, seals: NBR, Viton optional
- **Surface protection:** exterior parts: zinc coated steel (240 h salt spray test acc. to ISO 9227)

#### Electric
- **Nominal voltage:** 12 V DC, 24 V DC
- **Nominal valve current:** 2.0 A (12 V), 0.93 A (24 V)
- **Nominal resistance (R20):** 6 Ω (12 V), 26 Ω (24 V)
- **Shifting time:** 100% ED
- **Protection class:** IP65 correctly mounted and locked mating connector
- **Electric termination:** Electric plug according to DIN EN 175301-803, shape A

### Performance

#### Pressure drop diagram (Δp/Q)

![Pressure drop diagram](image)

#### Switching power diagram (p/Q)

![Switching power diagram](image)

#### Test conditions
- Oil: HLP 32, temperature: 40 °C (~32 cSt)
**Dimensions**

*Screw-in valve S32S-A1X34*

- Installation torque 3 + 1 Nm
- SW 30
- Solenoid coil 360° rotatable
- Installation torque:
  - Max. 0.5 Nm
- Electric termination
- DIN EN 175301-803 shape A
- Installation torque 30 + 2 Nm
- SW 24
- Locating shoulder

**Cavity S32S-X34**

**NOTE** For a detailed drawing of the cavity please see chapter 11 “general information” or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
**Type code**

<table>
<thead>
<tr>
<th>S32S</th>
<th>A1X34</th>
<th>SO</th>
<th>01</th>
<th>D</th>
<th>H407</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model</td>
<td>3/2-way poppet valve</td>
<td>Mounting interface</td>
<td>Revision</td>
<td>Nominal voltage</td>
<td>Seals</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>DIN</td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td>12</td>
<td>24</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>12 V DC</td>
<td>24 V DC</td>
</tr>
</tbody>
</table>

**Accessories and additional information**

**Accessories / spare parts**

Appropriate manifolds, different electric terminations and various kinds of manual overrides are available upon request. Please contact us for further information.

**Manual**

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 "general information" under the category "general operating manual" or will be provided upon request.
On/off directional valve W42S-5PS03 and W43S-5PS03

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 8 l/min
size NG 3 (company standard)

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 Characteristics

- on/off directional spool valve
- miniature edition
- 2-way- or 3-way-version available
- spring centred spool
- maintenance-free
## Technical data

### Hydraulic
- Operating pressure max.: 315 bar, port T: 75 bar
- Summated pressure A, B: 350 bar
- Flow rate: 8 l/min at Δp = 7 bar
- Flow direction: see symbols in type code
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

### Mechanic
- Design: spool type, direct operated
- Size: NG 3 (company standard)
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any, preferably horizontal
- Maximum acceleration: 5 g
- Weight: 4/2-way-design: 0,42 kg, 4/3-way-design: 0,62 kg
- Material: valve parts: steel, seals: NBR, Viton optional
- Surface protection: coil: zinc coated, body: nitrocarburized

### Electric
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 2 A (12 V), 1 A (24 V)
- Nominal resistance (R20): 5,9 Ω (12 V), 24,0 Ω (24 V)
- Power consumption: 24 W at nominal valve current
- Shifting time: 100% ED
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape B, unterminated wire
**Performance**

Pressure drop diagram ($\Delta p/Q$) W4_S-5PS03

---

**Test conditions**  
Oil: HLP 32, temperature: 40 °C (~32 cSt)  
Higher viscosity changes the performance diagrams.
Dimensions

Electric plug acc. to DIN EN 175301-803
(formerly DIN 43650)
shape B

O-rings 4,48 x 1,78

Port pattern NG 3
(company standard)

NOTE The valve must be mounted with fitting screws according to DIN EN ISO 4762 M4 x 30 - 12.9. Installation torque: 2,2 ± 0,2 Nm, screw-in depth min. 7 mm. The mounting surface of the valve must have a flatness better than 0.01 mm.

NOTE For the appropriate mounting plates, see our „accessories“ or contact us.

NOTE For a detailed drawing of the port pattern please see chapter 11 „general information“ under the category „port patterns“ or our online catalogue at www.weber-hydraulik.com.
Type code

Model
- W42S 4/2-way-design (on/off)
- W43S 4/3-way-design (on/off)

Mounting interface
Mounting plate FT (steel), size 03 PS03

Spool type*

D

DA

DB

N

NA

NB

Seals
NBR
Viton

*Other spool types are available upon request.

Series
- 5 PS03 -

Revision
- 01 -

Electric termination
DIN unterminated wire D L

Nominal voltage
12 12 V DC
24 24 V DC
## Accessories and additional information

### Accessories/spare parts

<table>
<thead>
<tr>
<th>Article:</th>
<th>Material number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Socket connector DIN EN 175301-803*, shape B, black</td>
<td>149.0005</td>
</tr>
<tr>
<td>Adapter plug DIN EN 175301-803*, shape B to shape A</td>
<td>109.0006</td>
</tr>
<tr>
<td>Seal kit W43_-5PS03 (NBR)</td>
<td>405.0066</td>
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<tr>
<td>Seal kit W43_-5PS03 (Viton)</td>
<td>405.0067</td>
</tr>
<tr>
<td>Adapter plate NG 6 to NG 3, including seals and screws</td>
<td>203.0153</td>
</tr>
<tr>
<td>Mounting plate NG 3, ports sidewise</td>
<td>151.0171</td>
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</tbody>
</table>

### Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 “general information” under the category “general operating manual” or will be provided upon request.
3/2-way Compact Spool Valve MV3/2

direct operated, solenoid operated
operating pressure max. 315 bar
volume flow max. 20 l/min

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<tr>
<td>Type code</td>
<td>4</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>4</td>
</tr>
</tbody>
</table>

Characteristics

- screw-in spool valve
- with manual override
- also available in in-line body or mounting plate NG 6
- maintenance-free

080320_MV32_e
09.2018
Technical data

Hydraulic

- Operating pressure max.: 315 bar
- Flow rate: 20 l/min
- Flow direction: see symbol
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 3 - 400 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

Mechanic

- Design: screw-in valve
- Size: MV3/2
- Fluid temperature: -10 °C to +80 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0.5 kg
- Material: valve parts: steel, seals: NBR, backup rings: PU, Teflon
- Surface protection: zinc coated

Electric

- Nominal voltage: 12 V DC, 24 V DC
- Nominal resistance (R20): 5.8 Ω (12 V), 22 Ω (24 V)
- Max. power consumption: 27 W
- Shifting time: 100% ED
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer

Performance

Pressure drop diagram (Δp/Q) at I_N
**Dimensions**

Screw-in valve  
**MV3/2**

- Solenoid 360° rotatable
- Installation torque: max. 0.5 Nm
- Electric termination
- DIN EN 175301-803 shape A
- Installation torque 45 Nm SW 24
- Locating shoulder

*Cavity MV3/2*

**NOTE** For a detailed drawing of the cavity please see chapter 11 “general information” or our online catalogue at www.weber-hydraulik.com.

**NOTE** The valve is also available as LMVA-06 in a mounting plate NG 6. Dimension sheets are available upon request.
Type code

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3/2-way compact spool valve

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Accessories and additional information

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Manual

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
On/off directional valve W42S-A1AS06 and W43S-A1AS06

Direct operated, solenoid operated operating pressure max. 350 bar volume flow max. 80 l/min size NG 6, DIN 24340 A06

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<td>Performance</td>
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<td>Dimensions</td>
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<td>Type code</td>
<td>5</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>6</td>
</tr>
</tbody>
</table>

Characteristics

- on/off directional spool valve
- 2-way- or 3-way-version available
- spring centred spool
- maintenance-free
- rotatable and replaceable coils
Technical Data

Hydraulic
- Operating pressure max.: port P, A, B: 350 bar
  port T: 210 bar
- Flow rate max.: 80 l/min
- Flow direction: see symbols in type code
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 20 - 400 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 21/18/15, filter with β 5(c) > 200

Mechanic
- Design: spool type, direct operated by solenoids
- Size: NG 6 (DIN 24340 A06, ISO 4401-03, CETOP 3)
- Fluid temperature: -30 °C to +80 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Maximum acceleration: 5 g
- Weight: 4/2-way-design: 1.6 kg
  4/3-way-design: 2.2 kg
- Material: valve parts: steel
  seals: NBR, Viton optional
- Surface protection: solenoid: zinc coated
  body: phosphatised

Electric
- Nominal voltage: 12 V DC, 24 V DC
- Nominal valve current: 2.7 A (12 V), 1.3 A (24 V)
- Nominal resistance (R20): 4.41 Ω (12 V), 18.6 Ω (24 V)
- Power consumption max.: 32.6 W (12 V), 31 W (24 V)
- Shifting time: 100 % ED
- Protection class: IP65 with correctly mounted and locked mating connector
- Electric termination: electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, DEUTSCH
- Electronic controllers: see chapter 6 “electronics and sensors” as well as our online catalogue at www.weber-hydraulik.com
Performance

Pressure drop diagram (Δp/Q) W4_S-A1AS06 at IN

Switching power diagram (p/Q) W4_S-A1AS06 at I_N

Test conditions
Oil: HLP 32, temperature: 40 °C (~32 cSt)

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<td>R11</td>
</tr>
<tr>
<td>R21</td>
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</table>

* The different spool types are pictured in the type code on page 5.
Dimensions

- **electric plug acc. to DIN EN 175301-803 shape A**
- **solenoid coil 360° rotatable**
- **port pattern NG 6**
- **DIN 24340 A06, CETOP 3**

**NOTE**
- The valve must be mounted with four fitting screws according to DIN EN ISO 4762 M5 x 45 - 10.9. Installation torque: 8.9 Nm.

**NOTE**
- For a detailed drawing of the port pattern please see chapter 11 „general information“ under the category „port patterns“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

---

*NBR: Quad-ring 9.25 x 1.68 (4 pcs.)*

*Viton: O-ring 9.25 x 1.78 (4 pcs.)*

*port pattern NG 6*

*HM3/15 34 06*
### Type code

**Design**
- W42S: 4/2-way-design (on/off)
- W43S: 4/3-way-design (on/off)

**Mounting interface**
- Mounting plate
  - ISO 4401 (steel), size 06
  - AS06

### Electric termination
- DIN
  - D
- AMP Junior Timer
  - J
- DEUTSCH
  - C

### Nominal voltage
- 12 V DC
- 24 V DC

### Spool type

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<td>R21</td>
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</table>

### Manual override
- Manual override (push pin)
  - H407

### Seals
- NBR
- Viton V
## Accessories and additional information

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<th>Article number:</th>
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<td>Socket connector DIN EN 175301-803, shape A, black</td>
<td>149.0007</td>
</tr>
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<td>Socket connector DIN EN 175301-803, shape A, grey</td>
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<td>Srew DIN EN ISO 4762 M5 x 45 - 10.9</td>
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<td>Coil 24 V, AMP Junior Timer</td>
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**NOTE** For the appropriate electronic controllers, see chapter 6 „electronics and sensors“ as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual** Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
On/off directional valve W42S-A2AS06 and W43S-A2AS06

direct operated, solenoid operated
operating pressure max. 250 bar
volume flow max. 50 l/min
size NG 6, DIN 24340 A06

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<td>5</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>6</td>
</tr>
</tbody>
</table>

Characteristics

- on/off directional spool valve
- 2-way- or 3-way-version available
- spring centred spool
- maintenance-free
- rotatable and replaceable coils
## Technical Data

### Hydraulic
- **Operating pressure max.**:
  - port P, A, B: 250 bar
  - port T: 100 bar
- **Flow rate max.**: 50 l/min
- **Flow direction**: see symbols in type code
- **Hydraulic fluid**: mineral oil according to DIN 51524, other hydraulic fluids upon request
- **Viscosity range**: 20 - 400 cSt
- **Filtration**: oil cleanliness according to ISO 4406 (1999)
  - 21/18/15, filter with $\beta_5(c) > 200$

### Mechanic
- **Design**: spool type, directly operated by solenoids
- **Size**: NG 6 (DIN 24340 A06, ISO 4401-03, CETOP 3)
- **Fluid temperature**: -20 °C to +80 °C
- **Ambient temperature**: -20 °C to +50 °C
- **Storage temperature**: -30 °C to +60 °C (non-condensing)
- **Installation position**: any
- **Maximum acceleration**: 5 g
- **Weight**:
  - 4/2-way-design: 1.4 kg
  - 4/3-way-design: 1.6 kg
- **Material**:
  - valve parts: steel
  - seals: NBR, Viton optional
- **Surface protection**:
  - solenoid: zinc coated
  - body: phosphatised

### Electric
- **Nominal voltage**: 12 V DC, 24 V DC
- **Nominal valve current**: 2.41 A (12 V), 1.16 A (24 V)
- **Nominal resistance (R20)**: 4.9 Ω (12 V), 19 Ω (24 V)
- **Power consumption max.**: 28.9 W (12 V), 31 W (24 V)
- **Shifting time**: 100% ED
- **Protection class**: IP65 with correctly mounted and locked mating connector
- **Electric termination**: electric plug according to DIN EN 175301-803 (formerly DIN 43650) shape A, AMP Junior Timer, Deutsch DT04-2P
- **Electronic controllers**: see chapter 6 "electronics and sensors" as well as our online catalogue at www.weber-hydraulik.com
Performance

Pressure drop diagram (\(\Delta p/Q\)) W4_S-A1AS06

Switching power diagram (\(p/Q\)) W4_S-A1AS06 at \(I_N\)

Test conditions

Oil: HLP 32, temperature: 40 °C (~32 cSt)

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* The different spool types are pictured in the type code on page 5.
On/off directional valve

Dimensions

Electric plug acc. to DIN EN 175301-803 shape A

Port pattern NG 6
DIN 24340 A06, CETOP 3

Solenoid coil 360° rotatable

NBR: Quad-ring 9,25 x 1,68 (4 pcs.)
Viton: O-ring 9,25 x 1,78 (4 pcs.)

**NOTE**
The valve must be mounted with fitting screws according to DIN EN ISO 4762 M5 x 45 - 10.9. Installation torque: 8,9 Nm.

**NOTE**
For a detailed drawing of the port pattern please see chapter 11 „general information“ under the category „port patterns“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
**Type code**

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<td>DEUTSCH C</td>
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**Seals**
- NBR
- Viton V

**Mounting interface**
- Mounting plate ISO 4401 (steel), size 06 AS06

**Manual override**
- Manual override (push pin) H407

**Spool type**

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**Nominal voltage**
- 12 V DC
- 24 V DC

**Design**
- W42S: 4/2-way-design (on/off)
- W43S: 4/3-way-design (on/off)
### Accessories and additional information

<table>
<thead>
<tr>
<th>Accessories/spare parts</th>
<th>Part:</th>
<th>Article number:</th>
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<td>Socket connector DIN EN 175301-803, shape A, grey</td>
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**NOTE**

For the appropriate electronic controllers, see chapter 6, "electronics and sensors" as well as our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Manual**

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category "general operating manual" or will be provided upon request.
Cartridges

Pressure Relief Valves

Pressure Relief Valve DBT
- direct operated
- operating pressure max. 350 bar
- volume flow max. 50 l/min
- cavity T-13A

Pressure Relief Valve EDB
- direct operated, with anti-cavitation/check function
- operating pressure max. 420 bar
- volume flow max. 60 l/min
- cavity EDB, T-10A or T-13A

Pressure Relief Valve DBG1
- direct operated
- operating pressure max. 365 bar
- volume flow max. 15 l/min
- cavity DBG1

Pressure Relief Valve DBG4
- direct operated
- operating pressure max. 350 bar
- volume flow max. 30 l/min
- cavity DBG4

Pressure Relief Valve DB12-FT
- direct operated
- operating pressure max. 350 bar
- volume flow max. 100 l/min
- available with CE type examination

Check Valves

Double Check Valve DRV
- direct operated
- pre-load function
- operating pressure max. 350 bar
- volume flow max. 50 l/min

Check Valve RKR
- operating pressure max. 350 bar
- volume flow max. 80 l/min

Check Valve RHR
- operating pressure max. 350 bar
- volume flow max. 120 l/min

Check Valve RBR
- operating pressure max. 350 bar
- volume flow max. 80 l/min
Cartridges

Chapter 09

**Shuttle Valves**

- **Shuttle Valve FTRW**
  - Operating pressure max. 350 bar
  - Volume flow max. 15 l/min

**Flow Valves/Throttle Valves**

- **Hose Burst Valve RBS1**
  - Operating pressure max. 315 bar
  - Volume flow max. 150 l/min

- **Flow Control Valve VCD**
  - Operating pressure max. 315 bar
  - Volume flow max. 150 l/min

- **Flow Control Valve VCL**
  - Operating pressure max. 210 bar
  - Volume flow max. 40 l/min

- **Flow Control Valve VCM**
  - Operating pressure max. 315 bar
  - Volume flow max. 9 l/min

- **Throttle Valve STO**
  - Operating pressure max. 315 bar
  - Screw-in valve for cavity STO

- **Throttle Valve STE**
  - Operating pressure max. 315 bar
  - Screw-in valve for cavity STE

- **Throttle Valve STD**
  - Operating pressure max. 350 bar
  - Screw-in valve for cavity STD
Component Coupling Check Valves
Component Coupling Check Valve KK-M14 x 1,5
operating pressure max. 315 bar
volume flow max. 20 l/min

Directional Valves
Hot Oil Shuttle W33H-1X06
operating pressure max. 420 bar
volume flow max. 40 l/min
screw-in valve for cavity NC506/4
Pressure relief valve DBT

direct operated
operating pressure max. 350 bar
volume flow max. 50 l/min

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Dimensions | 3
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Accessories and additional information | 7

Characteristics

- screw-in pressure relief valve
- also available in in-line body or sandwich body
- compact design
- maintenance-free
Technical Data

**Hydraulic**
- Operating pressure max.: 350 bar
- Tank pressure max.: DBT1: 350 bar, DBT2 and DBT3: 70 bar
- Flow rate: see type code
- Flow direction: 1 (P) to 2 (T)
- Pressure setting range: see type code
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 7,4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**NOTE**
The pressure on port 2 (T) adds directly to the set pressure. The total pressure of port 1 (P) and 2 (T) must not exceed the maximum operating pressure.

**Mechanic**
- Design: screw-in valve
- Fluid temperature: -30 °C to +80 °C
- Ambient temperature: -30 °C to +80 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: DBT1, DBT3: 0,14 kg, DBT2: 0,10 kg
- Material: valve parts: steel, seals: NBR, backup rings: PU, teflon
- Surface protection: zinc coated

Performance

**Pressure diagram (p/Q) DBT1 and DBT3**

**Pressure diagram (p/Q) DBT2**

**Test conditions**
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosities change the performance curves.
Dimensions

*Screw-in valve DBT1*

**NOTE**
For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE**
The valve is also available in an in-line body. Dimension sheets are available upon request.
**Dimensions**

*Screw-in valve DBT2*

---

**Cavity DBT2 (STO)**

*NOTE*  For a detailed drawing of the cavity please see chapter 11 „*general information*“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

*NOTE*  The valve is also available in an in-line body. Dimension sheets are available upon request.
**Dimensions**

*Screw-in valve DBT3*

![Diagram of Screw-in valve DBT3](image)

- **Installation torque**: 18 - 22 Nm (SW 19)
- **Installation torque**: 55 - 65 Nm (SW 27)

**Cavity DBT3**

*(C-10-2)*

![Diagram of Cavity DBT3](image)

**NOTE**

For a detailed drawing of the cavity please see chapter 11 “general information” or our online catalogue at www.weber-hydraulik.com.

**NOTE**

The valve is also available in an in-line body or in a sandwich body. Dimension sheets are available upon request.
**Type code**

**DBT1**
- Pressure relief valve
  - max. 25 l/min
  - Setting screw with lock nut
  - Seal NBR
  - Pressure setting range
    - 20-130 bar: B
    - 40-180 bar: A
    - 180-350 bar: W

**DBT2**
- Pressure relief valve
  - max. 10 l/min
  - Setting screw with lock nut
  - Seal NBR
  - Pressure setting range
    - 10-60 bar: D
    - 40-270 bar: A

**DBT3**
- Pressure relief valve
  - max. 50 l/min
  - Setting screw with lock nut
  - Seal NBR
  - Pressure setting range
    - 40-200 bar: A
    - 180-350 bar: W

**Symbol Body**
- without
- in-line body G 3/8

**NOTE** Special pressure settings are available on request. Please contact our customer service: anfrage.dekw@weber-hydraulik.com.
### Accessories and additional information

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<th>Accessories / Spare parts</th>
<th>Article:</th>
<th>Material number:</th>
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<td></td>
<td>Seal kit DBT1 (NBR)</td>
<td>407.0003</td>
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<tr>
<td></td>
<td>Seal kit DBT3 (NBR)</td>
<td>407.0007</td>
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**Manual**

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11, "general information" under the category "general operating manual" or will be provided upon request.
Pressure relief valve EDB

- direct operated with anti-caviation/check function
- max. operating pressure 420 bar
- max. volume flow 60 l/min
- cavity EDB, T-10A or T-13A

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<td>Type code</td>
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<tr>
<td>Accessories and additional information</td>
<td>7</td>
</tr>
</tbody>
</table>

Characteristics

- pressure relief valve with anti-caviation/check function
- slip-in valve for cavity EDB or
- screw-in valve T-10A or T-13A
- also available in in-line body or as double slip-in valve in in-line body
- compact design
- minimum oil leakage
- maintenance-free
Technical data

Hydraulic
- Operating pressure max.: EDB: 420 bar
  EDB38, DEDB, EDB10, EDB13: 350 bar
- Flow rate max.: EDB: 60 l/min
  EDB38, DEDB, EDB10, EDB13: 50 l/min
- Pressure setting range: see type code
- Opening pressure anti-cavitation valve: <0,5 bar
- Hydraulic fluid: mineral oil according to DIN 51524,
  other hydraulic fluids upon request
- Viscosity range: 7,4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999)
  18/16/13, filter with β S(c) > 200
- Hysteresis: 10 %

Mechanic
- Design: EDB: slip-in valve, EDB38: slip-in valve in in-line body,
  DEDB: double valve in in-line body, EDB10/EDB13: cartridge valve T-10A/T-13A
- Fluid temperature: -30 °C to +80 °C
- Ambient temperature: -30 °C to +80 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: EDB: 0,015 kg, EDB38: 0,3 kg, DEDB: 1,15 kg,
  EDB10/EDB13: 0,06 kg
- Material: valve parts: steel
  seals: NBR, Viton optional
- Surface protection: exterior parts: zinc coated steel

Performance

Pressure diagram (p/Q) EDB from 2 to 1

Pressure drop diagram (Δp/Q) anti-cavitation/check valve from 1 to 2

Test conditions
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Higher viscosity changes the performance diagrams.
Factory pressure settings established at Q = 10 l/min.

NOTE
With manifolds the performance may vary.
**Dimensions**

*Slip-in valve EDB*

For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
Dimensions

Cartridge valve

EB10

Cavity T-10A

Installation torque 35 - 40 Nm

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

NOTE For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.
Dimensions

Cartridge valve  
EDB13

Installation torque 35 - 40 Nm

Cavity T-13A

NOTE  For a detailed drawing of the cavity please see chapter 11 “general information” or our online catalogue at www.weber-hydraulik.com.

NOTE  For appropriate manifolds see chapter 10 “connecting plates and manifolds” as well as our online catalogue at www.weber-hydraulik.com.
Dimensions

*Slip-in valve in in-line body EDB38*

*double slip-in valve in in-line body DEDB*
**Type code**

<table>
<thead>
<tr>
<th>Design</th>
<th>Pressure setting range*</th>
<th>Locking screw</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDB</td>
<td>20-70 bar</td>
<td>with locking screw, with CV*** spring</td>
</tr>
<tr>
<td>EDB38</td>
<td>71-130 bar</td>
<td>without locking screw, with CV spring</td>
</tr>
<tr>
<td></td>
<td>131-210 bar</td>
<td>without locking screw, without CV spring</td>
</tr>
<tr>
<td>DEDB</td>
<td>211-280 bar</td>
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</tr>
<tr>
<td></td>
<td>281-350 bar</td>
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<tr>
<td></td>
<td>351-420 bar**</td>
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</table>

* Please select pre-adjusted pressure setting according to your needs. Once set, the pressure setting is permanent and can not be changed afterwards.

**Exception**: The EDB is available with or without a fixed pressure setting.

***CV = check valve

**NOTE** Factory pressure settings are established at Q = 10 l/min.

**Accessories and additional information**

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<th>Accessories/ spare parts</th>
<th>Article:</th>
<th>Material number:</th>
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<tr>
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<td>Seal kit T-10A / T-13A (Viton)</td>
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**NOTE** For appropriate manifolds see chapter 10 „connecting plates and manifolds“ as well as our online catalogue at www.weber-hydraulik.com.

**Manual** Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Pressure relief valve DBG1

direct operated
max. operating pressure 365 bar
max. volume flow 15 l/min

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<td>Type code</td>
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<tr>
<td>Accessories and additional information</td>
<td>3</td>
</tr>
</tbody>
</table>

Characteristics

- screw-in pressure relief valve
- compact design
- maintenance-free
Technical Data

*Hydraulic*
- Operating pressure max.: 365 bar
- Tank pressure max.: 100 bar
- Flow rate: 15 l/min
- Flow direction: 1 (P) to 2 (T)
- Pressure setting range: see type code
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 12 - 400 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 20/18/15, filter with β 5(c) > 200

*Mechanic*
- Design: screw-in valve
- Fluid temperature: -30 °C to +80 °C
- Ambient temperature: -40 °C to +80 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0,067 kg
- Material: valve parts: steel, seal: NBR, PTFE
- Surface protection: exterior parts: zinc coated steel

Performance

Pressure drop diagram (p/Q) DBG1

*Test conditions* Oil: HLP 32, temperature: 40 °C (~32 cSt)
Dimensions

Screw-in valve
DBG1

installation torque 35 - 40 Nm
SW 21
locating shoulder

Cavity DBG1

NOTE
For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code

DBG1
Pressure relief valve
max. 15 l/min

X
Setting screw with
lock nut

P
Seal PTFE

Set pressure

Pressure setting range

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Accessories and additional information

Manual
Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
Pressure relief valve DBG4

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Characteristics:
- screw-in pressure relief valve
- compact design
- low leakage
- maintenance-free
Technical Data

**Hydraulic**
- Operating pressure max.: 350 bar
- Tank pressure max.: 100 bar
- Flow rate: 30 l/min
- Flow direction: 1 (P) to 2 (T)
- Pressure setting range: 175 bar respectively 320 bar ±3 %
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 7,4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999), 18/16/13, filter with β 5(c) > 200

**NOTE**
The pressure at port 2 (T) adds directly to the set pressure.

**Mechanic**
- Design: screw-in valve
- Fluid temperature: -30 °C to +80 °C
- Ambient temperature: -40 °C to +80 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0,215 kg
- Material: valve parts: steel, seals: NBR
- Surface protection: exterior parts: zinc coated steel

Performance

Pressure drop diagram (p/Q) DBG4

**Test conditions**
Oil: HLP 32, temperature: 40 °C (~32 cSt)
**Dimensions**

*Screw-in valve DBG4*

Installation torque 25 +5 Nm
SW 24

**Cavity DBG4**

NOTE: For a detailed drawing of the cavity please see chapter 11 "general information" or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Type code**

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<td>XWP-320</td>
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Revision /X
Accessories and additional information

**Accessories / Spare parts**

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**Manual**

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category “general operating manual” or will be provided upon request.
Pressure relief valve DB12-FT

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<tr>
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</tbody>
</table>

Characteristics

- Screw-in pressure relief valve
- Available with CE type examination
- Low-vibration
- Maintenance-free
Technical Data

**Hydraulic**
- Operating pressure max.: 350 bar
- Flow rate: 100 l/min
- Pressure setting range: 10 - 350 bar
- Flow direction: 1 (P) to 2 (T) pressure relief function
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**Mechanic**
- Fluid temperature: -30 °C to +85 °C
- Ambient temperature: -30 °C to +80 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0.45 kg
- Material: valve parts: steel, seals: NBR, PTFE
- Surface protection: exterior parts: zinc coated steel
- CE type examination: 01 202 111-B-2054 acc. to 97/23/EG (for DB12-FT-XWN)

Performance

**Pressure drop diagram (p/Q) DB12-FT**

*Test conditions*  
Oil: HLP 32, temperature: 40 °C (~32 cSt)
Dimensions

*Screw-in valve*  
*DB12-FT*

**Seal (only XWN)**

**Installation torque:** 120 Nm  
**SW 32**

**Locating shoulder**

**Cavity DB12-FT**

**NOTE** For a detailed drawing of the cavity please see chapter 11 *general information* or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**NOTE** Suitable manifolds are available upon request.
Pressure relief valve

**Type code**

<table>
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<table>
<thead>
<tr>
<th>Pressure relief valve</th>
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</table>

**Design**

- screw-in valve, adjustable 10 - 350 bar (LWN)
- screw-in valve CE type examination, plumbed, set pressure (XWN)

**Pressure setting range XWN**

| 250 - 330 bar selectable |

**Accessories and additional information**

**Accessories / spare parts**

| Article: Seal kit DB12-FT (NBR) | Article number: 405.0084 |

**Manual**

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
Double check valve DRV

Characteristics

- double check valve with pre-load function
- also available in in-line body
- compact design
- maintenance-free

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Technical Data

**Hydraulic**
- Operating pressure max.: 350 bar
- Flow rate: max. 50 l/min
- Flow direction: from 1 to 2: sequence pressure from 2 to 1: bypass
- Pressure setting range: see type code
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 7,4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta_5(c) > 200$

**Mechanic**
- Design: Screw-in valve
- Size: G 1/2"
- Fluid temperature: -30 °C to +80 °C
- Ambient temperature: -30 °C to +80 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0,06 kg
- Material: valve parts: steel seals: NBR

Performance

Pressure drop diagram ($\Delta p/Q$) DRV

**Test conditions**
- Oil: HLP 32, temperature: 40 °C (~32 cSt)
Dimensions

Double check valve

DRV

DRV in body G3

NOTE  For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at www.weber-hydraulik.com.
Double check valve

**Type code**

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<td>10 bar</td>
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<tr>
<td></td>
<td></td>
<td>15 bar *</td>
</tr>
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</table>

* max. volume flow 20 l/min
** for assembling from side 1, a screw-in tool (10.8 mm x 3.0 mm) is required

**Appendix**

**Accessories / spare parts**

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<th>Part:</th>
<th>Article number:</th>
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<tbody>
<tr>
<td>Screw-in tool</td>
<td>139.0002</td>
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</table>

**Manual**

Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category „general operating manual“ or will be provided upon request.
Check valve RKR

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Technical Data                                     2
Performance                                        2
Dimensions                                         3
Type code                                          3
Accessories and additional information            3

Characteristics

- screw-in check valve
- reciprocally mountable
- various sizes available
- compact design
- maintenance-free

operating pressure max. 350 bar
volume flow max. 80 l/min
Technical Data

**Hydraulic**
- Operating pressure max.: 350 bar
- Flow rate max.: 80 l/min
- Flow direction: from 1 to 2
- Pressure setting range: see type code
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 7,4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**Mechanic**
- Design: screw-in valve
- Fluid temperature: -30 ºC to +100 ºC
- Ambient temperature: -30 ºC to +100 ºC
- Storage temperature: -3W0 ºC to +80 ºC (non-condensing)
- Installation position: any
- Weight: see table
- Material: valve parts: steel, seals: NBR

**NOTE**
The pressure at port 2 adds directly to the crack pressure.

Performance

**Pressure drop diagram (Δp/Q) RKR**

Test conditions
- Oil: HLP 32, temperature: 40 ºC (~32 cSt)
- Higher viscosity changes the performance diagrams.
### Dimensions

*Check valve RKR*

<table>
<thead>
<tr>
<th>Size G</th>
<th>A [mm]</th>
<th>B [mm]</th>
<th>C [mm]</th>
<th>E [mm]</th>
<th>SW 1</th>
<th>SW 2</th>
<th>Weight [kg]</th>
<th>Installation torque [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>G 1/4&quot;</td>
<td>17,0</td>
<td>5,5</td>
<td>6,0</td>
<td>11,3</td>
<td>3</td>
<td>3</td>
<td>0,02</td>
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</tr>
<tr>
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<td>18,5</td>
<td>5,5</td>
<td>7,5</td>
<td>14,8</td>
<td>4</td>
<td>3</td>
<td>0,03</td>
<td>6</td>
</tr>
<tr>
<td>G 1/2&quot;</td>
<td>22,5</td>
<td>6,5</td>
<td>9,5</td>
<td>18,5</td>
<td>6</td>
<td>5</td>
<td>0,04</td>
<td>10</td>
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<td>7,0</td>
<td>14,5</td>
<td>24,1</td>
<td>8</td>
<td>8</td>
<td>0,07</td>
<td>20</td>
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</tbody>
</table>

**NOTE** For a detailed drawing of the cavity please see chapter 12 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

### Type code

*Check valve RKR*

**Type Code**

| RKR | - | - | - |

*Screw-in check valve*

### Accessories and additional information

*Manual*

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Check valve RHR

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<tr>
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<tr>
<td>Dimensions</td>
<td>3</td>
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<tr>
<td>Type code</td>
<td>3</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>3</td>
</tr>
</tbody>
</table>

Characteristics

- screw-in check valve
- various sizes available
- compact design
- maintenance-free

operating pressure max. 350 bar
volume flow max. 120 l/min
Technical Data

**Hydraulic**
- Operating pressure max.: 350 bar, for RHR-34: 500 bar
- Flow rate: max. 120 l/min
- Flow direction: from 1 to 2
- Pressure setting range: see type code
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 7.4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with $\beta 5(\gamma) > 200$

**NOTE** The pressure at port 2 adds directly to the crack pressure.

**Mechanic**
- Design: screw-in valve
- Fluid temperature: -25 °C to +80 °C
- Ambient temperature: -30 °C to +80 °C
- Storage temperature: -30 °C to +80 °C (non-condensing)
- Installation position: any
- Weight: see table at dimensions
- Material: valve parts: steel
  seals: NBR

Performance

Pressure drop diagram ($\Delta p/Q$) RHR

![Pressure drop diagram](attachment:image.png)

**Test conditions**
- Oil: HLP 32, temperature: 40 °C (~32 cSt)
- Higher viscosities change the performance curves.
Dimensions

Check valve RHR

<table>
<thead>
<tr>
<th>Size G</th>
<th>A Ø [mm]</th>
<th>B [mm]</th>
<th>C [mm]</th>
<th>E Ø [mm]</th>
<th>Weight [g]</th>
<th>Inst. torque [Nm]</th>
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</thead>
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<tr>
<td>G 1/4&quot;</td>
<td>8,5</td>
<td>8,8</td>
<td>4,4</td>
<td>2,2</td>
<td>5</td>
<td>15</td>
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<tr>
<td>G 3/8&quot;</td>
<td>10,8</td>
<td>12</td>
<td>7</td>
<td>3</td>
<td>15</td>
<td>20</td>
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<td>G 1/2&quot;</td>
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<td>14,7</td>
<td>8</td>
<td>3,8</td>
<td>19</td>
<td>30</td>
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<tr>
<td>G 3/4&quot;</td>
<td>18,5</td>
<td>17,5</td>
<td>10</td>
<td>4,6</td>
<td>45</td>
<td>80</td>
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NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code

RHR

Screw-in check valve

<table>
<thead>
<tr>
<th>Size</th>
<th>Volume flow max. [l/min]</th>
<th>Crack pressure [bar]</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>G 1/4&quot;</td>
<td>20</td>
</tr>
<tr>
<td>38</td>
<td>G 3/8&quot;</td>
<td>50</td>
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<tr>
<td>12</td>
<td>G 1/2&quot;</td>
<td>80</td>
</tr>
<tr>
<td>34</td>
<td>G 3/4&quot;</td>
<td>120</td>
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Accessories and additional information

Accessories / spare parts

<table>
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<tr>
<th>Article:</th>
<th>Material number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting tool W1 for RHR-14</td>
<td>139.0001</td>
</tr>
<tr>
<td>Mounting tool W2 for RHR-38</td>
<td>139.0002</td>
</tr>
<tr>
<td>Mounting tool W5 for RHR-12</td>
<td>139.0005</td>
</tr>
<tr>
<td>Mounting tool W7 for RHR-34</td>
<td>139.0020</td>
</tr>
</tbody>
</table>

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.

WEBER-HYDRAULIK ValveTech GmbH
Felix-Wankel-Str. 4, 78467 Konstanz
Phone: +49 7531 9748-0
Fax: +49 7531 9748-44

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Check valve RBR

Characteristics

- screw-in ball-type check valve
- various sizes available
- compact design
- maintenance-free

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<td>Performance</td>
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<td>Dimensions</td>
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<tr>
<td>Type code</td>
<td>3</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>3</td>
</tr>
</tbody>
</table>
**Technical Data**

*Hydraulic*
- Operating pressure max.: 350 bar
- Flow rate max.: 80 l/min
- Flow direction: from 2 to 1
- Pressure setting range: see type code
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 5 - 800 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

*NOTE* The pressure at port 1 adds directly to the crack pressure.

*Mechanic*
- Design: ball-type screw-in valve
- Size: see type code
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -20 °C to +80 °C
- Storage temperature: -20 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: see table
- Material: valve parts: steel, seals: NBR

**Performance**

*Pressure drop diagram (Δp/Q) RBR*

---

*Test conditions*
- Oil: HLP 32, temperature: 40 °C (~32 cSt)
- Higher viscosity changes the performance diagrams.
**Dimensions**

*Check valve RBR*

<table>
<thead>
<tr>
<th>Size G</th>
<th>A [mm]</th>
<th>B [mm]</th>
<th>E Ø [mm]</th>
<th>SW</th>
<th>Weight [kg]</th>
<th>Installation torque [Nm]</th>
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</thead>
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<tr>
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<td>10</td>
<td>5,5</td>
<td>11,5</td>
<td>6</td>
<td>0,005</td>
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<td>11,2</td>
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<td>14,95</td>
<td>6</td>
<td>0,015</td>
<td>20</td>
</tr>
<tr>
<td>G 1/2&quot;</td>
<td>13,2</td>
<td>8</td>
<td>18,7</td>
<td>8</td>
<td>0,020</td>
<td>30</td>
</tr>
</tbody>
</table>

**NOTE** For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Type code**

- **Screw-in check valve**

<table>
<thead>
<tr>
<th>Size</th>
<th>Volume flow max. [l/min]</th>
<th>Crack pressure [bar]</th>
</tr>
</thead>
<tbody>
<tr>
<td>G 1/4&quot;</td>
<td>20</td>
<td>0,3</td>
</tr>
<tr>
<td>G 3/8&quot;</td>
<td>50</td>
<td>0,3</td>
</tr>
<tr>
<td>G 1/2&quot;</td>
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<td>0,3</td>
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**Accessories and additional information**

*Manual* Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Shuttle valve FTRW

- screw-in shuttle valve
- sizes G1/8" or G1/4" available
- compact design
- maintenance-free

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<td>Technical Data</td>
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<tr>
<td>Dimensions</td>
<td>2</td>
</tr>
<tr>
<td>Type code</td>
<td>3</td>
</tr>
</tbody>
</table>
Technical Data

**Hydraulic**
- Operating pressure max.: FTRW-2,5: 315 bar, FTRW-5: 350 bar
- Flow rate: FTRW-2,5: 8 l/min, FTRW-5: 15 l/min
- Flow direction: from 1 or 3 to 2
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 7.4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**Mechanic**
- Design: screw-in valve
- Size: G1/8" or G1/4"
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -20 °C to +80 °C
- Storage temperature: -20 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: FTRW-2,5: 0.005 kg, FTRW-5: 0.012 kg
- Material: valve parts: steel, seals: NBR

Dimensions

**Shuttle valve**

- **FTRW-2,5**

**Cavity FTRW-2,5**
**Dimensions**

*Shuttle valve*

*FTRW-5*

![Drawing of Shuttle valve FTRW-5](image)

*Cavity FTRW-5*

![Drawing of Cavity FTRW-5](image)

**NOTE** For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Type code**

<table>
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<tr>
<th>FTRW</th>
<th>-</th>
<th>-</th>
<th>N</th>
</tr>
</thead>
</table>

**Seal NBR**

**Size**

| 2.5 | G 1/8" |
| 5   | G 1/4" |

**Manual** Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 11 under the category „general operating manual“ or will be provided upon request.
Hose burst valve RBS1

operating pressure max. 315 bar
volume flow max. 150 l/min

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</tr>
<tr>
<td>Performance</td>
<td>2</td>
</tr>
<tr>
<td>Type code</td>
<td>4</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>4</td>
</tr>
</tbody>
</table>

Characteristics

- screw-in hose burst valve
- to prevent sudden pressure loss due to tubing or hose breaks
- various sizes available
- easy to install
- compact design
- maintenance-free
Technical Data

**Hydraulic**
- Operating pressure max.: 315 bar
- Flow rate max.: see type code
- Flow direction: 1 to 2: without function
  2 to 1: working direction
- Hydraulic fluid: mineral oil according to DIN 51524,
  other hydraulic fluids upon request
- Viscosity range: 7.4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999)
  18/16/13, filter with β 5(c) > 200

**Mechanic**
- Design: screw-in valve
- Size: G 1/4”, G 3/8”, G 1/2”, G 3/4”, M18 x 1,5
- Fluid temperature: -30 °C to +100 °C
- Ambient temperature: -30 °C to +100 °C
- Storage temperature: -30 °C to +80 °C (non-condensing)
- Installation position: any
- Weight: see table at dimensions
- Material: steel

Performance

**Adjusting diagram clearance (S/Q) G 1/4” and G 3/8”, M18 x 1,5**

**Pressure drop diagram (Δp/Q) from 1 to 2 RBS1-14**

**Adjusting diagram clearance (S/Q) G 1/2”, G 3/4”**

**Pressure drop diagram (Δp/Q) from 1 to 2 RBS1-38, RBS1-M18**
## Performance

### Pressure drop diagram (Δp/Q) from 1 to 2

**RBS1-12**

![Pressure drop diagram for RBS1-12](image)

**RBS1-34**

![Pressure drop diagram for RBS1-34](image)

**Test conditions**

Oil: HLP 32, temperature: 40 °C (~32 cSt)

Higher viscosity changes the performance diagrams.

## Dimensions

**Hose burst valve**

**RBS1**

![Diagram of RBS1](image)

<table>
<thead>
<tr>
<th>Size G</th>
<th>A Ø [mm]</th>
<th>B [mm]</th>
<th>C [mm]</th>
<th>D Ø [mm]</th>
<th>E Ø [mm]</th>
<th>F Ø [mm]</th>
<th>Weight [g]</th>
<th>SW</th>
</tr>
</thead>
<tbody>
<tr>
<td>G 1/4&quot;</td>
<td>8</td>
<td>17,5</td>
<td>8</td>
<td>9,5</td>
<td>2,4</td>
<td>0,6...2</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>G 3/8&quot;</td>
<td>10,5</td>
<td>23</td>
<td>10,5</td>
<td>12,5</td>
<td>3,5</td>
<td>0,6...2</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>G 1/2&quot;</td>
<td>13</td>
<td>25</td>
<td>12</td>
<td>15</td>
<td>4,5</td>
<td>0,6...2</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>G 3/4&quot;</td>
<td>16</td>
<td>30,5</td>
<td>17</td>
<td>18,5</td>
<td>6</td>
<td>0,6...2</td>
<td>42</td>
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<tr>
<td>M18 x 1,5</td>
<td>10,5</td>
<td>23</td>
<td>10,5</td>
<td>12,5</td>
<td>3,5</td>
<td>0,6...2</td>
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<td>3,5</td>
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</table>

**NOTE**

For a detailed drawing of the cavity please see chapter 11 **‘general information’** or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
Hose burst valve

**Type code**

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<th>Material number:</th>
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<td>138.0009</td>
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<td>Mounting tool W3 for RBS1-38 and RBS1-M18</td>
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<td>Mounting tool W4 for RBS1-12</td>
<td>139.0004</td>
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<td>Mounting tool W6 for RBS1-34</td>
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**Accessories and additional information**

**Accessories / spare parts**

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<tr>
<td>Mounting tool W6 for RBS1-34</td>
<td>139.0006</td>
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</tbody>
</table>

**NOTE**

Other manifolds are available upon request.

**Manual**

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Flow control valve VCD

Characteristics

- screw-in flow control valve
- also available as meter-out or meter-in control valve in a sandwich body NG 6
- various sizes available
- compact design
- maintenance-free

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<tr>
<td>Performance</td>
<td>2</td>
</tr>
<tr>
<td>Dimensions</td>
<td>4</td>
</tr>
<tr>
<td>Type code</td>
<td>5</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>5</td>
</tr>
</tbody>
</table>
Technical Data

Hydraulic
- Operating pressure max.: 315 bar
- Flow rate max.: see type code
- Flow direction: 1 to 2: flow control
  2 to 1: without function
- Hydraulic fluid: mineral oil according to DIN 51524,
  other hydraulic fluids upon request
- Viscosity range: 7.4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999)
  18/16/13, filter with β 5(c) > 200

Mechanic
- Design: screw-in valve
- Fluid temperature: -30 °C to +100 °C
- Ambient temperature: -30 °C to +100 °C
- Storage temperature: -30 °C to +80 °C (non-condensing)
- Installation position: any
- Weight: see table in dimensions
- Material: steel

Performance

Volume flow setting range

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<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>G 1/4&quot;</td>
<td>1-1.6</td>
<td>1.6-2.5</td>
<td>2.5-4</td>
<td>4-6.3</td>
<td>6.3-10</td>
</tr>
<tr>
<td>G 3/8&quot;</td>
<td>2.5-4</td>
<td>4-6.3</td>
<td>6.3-10</td>
<td>10-16</td>
<td>16-25</td>
</tr>
<tr>
<td>G 1/2&quot;</td>
<td>16-21</td>
<td>21-28</td>
<td>28-37</td>
<td>37-50</td>
<td>50-67</td>
</tr>
<tr>
<td>G 3/4&quot;</td>
<td>37-50</td>
<td>50-67</td>
<td>67-90</td>
<td>90-120</td>
<td>120-150</td>
</tr>
</tbody>
</table>

NOTE: The spring length flow diagrams represent the obtained flow range related to orifices A to E with a nominal pressure Δp of 50 bar.
**Performance**

Adjustment diagram spring length (R/Q) G 3/8"

<table>
<thead>
<tr>
<th>R [mm]</th>
<th>15</th>
<th>14</th>
<th>13</th>
<th>12</th>
<th>11</th>
<th>10</th>
<th>9</th>
<th>8</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q [l/min]</td>
<td>30</td>
<td>25</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adjustment diagram spring length (R/Q) G 3/4"

<table>
<thead>
<tr>
<th>R [mm]</th>
<th>23</th>
<th>22</th>
<th>21</th>
<th>20</th>
<th>19</th>
<th>18</th>
<th>17</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q [l/min]</td>
<td>150</td>
<td>130</td>
<td>110</td>
<td>90</td>
<td>70</td>
<td>50</td>
<td>30</td>
</tr>
</tbody>
</table>

Pressure drop diagram (Δp/Q) VCD

<table>
<thead>
<tr>
<th>Δp [bar]</th>
<th>12</th>
<th>10</th>
<th>8</th>
<th>6</th>
<th>4</th>
<th>2</th>
<th>0</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q [l/min]</td>
<td>140</td>
<td>120</td>
<td>100</td>
<td>80</td>
<td>60</td>
<td>40</td>
<td>20</td>
</tr>
</tbody>
</table>

Test conditions

- Oil: HLP 32, temperature: 40 °C (~32 cSt)
- Higher viscosity changes the performance diagrams.
Flow control valve

Dimensions

Flow control valve

VCD

NOTE

For a detailed drawing of the cavity please see chapter 11 “general information” or our online catalogue at www.weber-hydraulik.com.

<table>
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<tr>
<th></th>
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<tbody>
<tr>
<td>G 1/4&quot;</td>
<td>39</td>
<td>12,5</td>
<td>7</td>
<td>10</td>
<td>4</td>
<td>10,3</td>
<td>22</td>
<td>0,012</td>
<td>5,5</td>
<td>4,5</td>
<td>6</td>
<td>10</td>
</tr>
<tr>
<td>G 3/8&quot;</td>
<td>43</td>
<td>13,5</td>
<td>7</td>
<td>11,5</td>
<td>4</td>
<td>14</td>
<td>23</td>
<td>0,022</td>
<td>7</td>
<td>6</td>
<td>8</td>
<td>11,5</td>
</tr>
<tr>
<td>G 1/2&quot;</td>
<td>49</td>
<td>16</td>
<td>8</td>
<td>15</td>
<td>6</td>
<td>18,2</td>
<td>27</td>
<td>0,036</td>
<td>7</td>
<td>6</td>
<td>12</td>
<td>15</td>
</tr>
<tr>
<td>G 3/4&quot;</td>
<td>60</td>
<td>21</td>
<td>10</td>
<td>20</td>
<td>6</td>
<td>23</td>
<td>31</td>
<td>0,072</td>
<td>7</td>
<td>6</td>
<td>15</td>
<td>20</td>
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</table>

NOTE
**Type code**

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</thead>
<tbody>
<tr>
<td>Flow control valve</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Size** | **Volume flow setting range [l/min]** | **Presetting [l/min] (optional)** |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>14 G 1/4&quot;</td>
<td>A 1-1.6, B 1.6-2.5, C 2.5-4, D 4-6.3, E 6.3-10</td>
<td>fixed volume flow presetting, selectable according to setting range</td>
</tr>
<tr>
<td>38 G 3/8&quot; *</td>
<td>A 2.5-4, B 4-6.3, C 6.3-10, D 10-16, E 16-25</td>
<td></td>
</tr>
<tr>
<td>12 G 1/2&quot;</td>
<td>A 16-21, B 21-28, C 28-37, D 37-50, E 50-67</td>
<td></td>
</tr>
</tbody>
</table>

*NOTE* The valve VCD-38 is also available as **meter-out or meter-in control valve** in a sandwich body NG 6. Dimension sheets are available upon request.

**Accessories and additional information**

**Accessories / Spare parts**
- Article: In-line body G 1/4" Material number: 138.0008
- Article: In-line body G 3/8" Material number: 138.0009
- Article: In-line body G 1/2" Material number: 138.0010
- Article: In-line body G 3/4" Material number: 138.0011
- Article: In-line body with sealing lip G 1/4" Material number: 138.0013

**Manual**
Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11, **general information** under the category **general operating manual** or will be provided upon request.

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Fax: +49 7531 9748-44
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Flow control valve VCL

max. operating pressure 210 bar
max. volume flow 35 l/min

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<tr>
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<td>3</td>
</tr>
</tbody>
</table>

Characteristics

- screw-in flow control valve
- various sizes available
- compact design
- maintenance-free
Technical Data

**Hydraulic**
- Operating pressure max.: 210 bar
- Flow rate: see type code
- Flow direction:
  - 1 to 2: flow control
  - 2 to 1: free through orifice
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 7.4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**Mechanic**
- Design: screw-in valve
- Size: G1/2", G1/4", G3/8"
- Fluid temperature: -30 °C to +100 °C
- Ambient temperature: -30 °C to +100 °C
- Storage temperature: -20 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: see table
- Material: steel

Dimensions

*Flow control valve VCL*

For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
Dimensions

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>G 1/4&quot;</td>
<td>25,5</td>
<td>13,5</td>
<td>8,5</td>
<td>3</td>
<td>8</td>
<td>10</td>
<td>5</td>
<td>1,5</td>
<td>11</td>
<td>0,012</td>
</tr>
<tr>
<td>G 3/8&quot;</td>
<td>28</td>
<td>15</td>
<td>10,5</td>
<td>2</td>
<td>11</td>
<td>14</td>
<td>5</td>
<td>1,5</td>
<td>14,5</td>
<td>0,024</td>
</tr>
<tr>
<td>G 1/2&quot;</td>
<td>35</td>
<td>19,5</td>
<td>13</td>
<td>2</td>
<td>14</td>
<td>17,5</td>
<td>5</td>
<td>1,5</td>
<td>17,5</td>
<td>0,048</td>
</tr>
</tbody>
</table>

NOTE The valve ist also available as double flow control valve DVCL in inline body G 1/4" for flow control in both directions. Dimension sheets are available up on request.

Type code

- Design
  - VCL: Flow control valve
  - DVCL: Double flow control valve (only G 1/4")

<table>
<thead>
<tr>
<th>Size</th>
<th>max. volume flow [l/min]</th>
<th>Presetting [l/min]</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>G 1/4“</td>
<td>10</td>
</tr>
<tr>
<td>38</td>
<td>G 3/8“</td>
<td>20</td>
</tr>
<tr>
<td>12</td>
<td>G 1/2“</td>
<td>35</td>
</tr>
</tbody>
</table>

Appendix

- **Accessories / Spare parts**
  - Article: n-line body G 1/2“ Article number: 138.0010
  - In-line body G 3/8“ Article number: 138.0009
  - In-line body G 1/4“ Article number: 138.0008

- **Manual**
  Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category „general operating manual“ or will be provided upon request.
Flow control valve VCM

Characteristics

- screw-in flow control valve
- various volume flows available
- compact design
- maintenance-free

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Technical Data 2
Dimensions 2
Type code 3
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Dimensions 2
Type code 3
Appendix 3
Technical Data

**Hydraulic**
- Operating pressure max.: 315 bar
- Flow rate: see type code at differential pressure control
  \( \Delta p = 5.3 \) bar
- Flow direction: 1 to 2: flow control
  2 to 1: without function
- Hydraulic fluid: mineral oil according to DIN 51524,
  other hydraulic fluids upon request
- Viscosity range: 7.4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999)
  18/16/13, filter with \( \beta 5(\circ) > 200 \)

**Mechanic**
- Design: screw-in valve
- Size: 08
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -30 °C to +80 °C
- Storage temperature: -20 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0.06 kg
- Material: valve parts: steel, seals: NBR
- Surface protection: zinc coated steel

Dimensions

**Flow control valve**
- **VCM**
  - installation torque 27±3 Nm
  - SW 22

![Diagram of Flow control valve VCM](image-url)
NOTE
For a detailed drawing of the cavity please see chapter 12 „general information“ under the category „valve cavities and port patterns“ or our online catalogue at www.weber-hydraulik.com.

Type code

Flow control valve

<table>
<thead>
<tr>
<th>Nominal flow at Δp = 5,3 bar</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,85 0,85 l/min*</td>
</tr>
<tr>
<td>1,5  1,5 l/min**</td>
</tr>
<tr>
<td>2,5  2,5 l/min**</td>
</tr>
<tr>
<td>3,0  3,0 l/min**</td>
</tr>
<tr>
<td>4,2  4,2 l/min**</td>
</tr>
<tr>
<td>6,0  6,0 l/min*</td>
</tr>
<tr>
<td>7,5  7,5 l/min*</td>
</tr>
<tr>
<td>9,0  9,0 l/min*</td>
</tr>
</tbody>
</table>

* tolerance ±10% l/min of nominal flow
** tolerance +20% l/min of nominal flow

Appendix

Accessories / Spare parts
Seal kit VCM-08 (NBR)  Article:  Article number: 405.0113

Manual
Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category „general operating manual“ or will be provided upon request.
Throttle valve STO

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<td>Performance</td>
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<td>Type code</td>
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<tr>
<td>Accessories and additional information</td>
<td>4</td>
</tr>
</tbody>
</table>

Characteristics

- screw-in throttle valve
- for manual limitation of volume flows
- compact design
- maintenance-free
**Technical Data**

**Hydraulic**
- Operating pressure max.: 315 bar
- Flow direction: throttling in both directions, the pressure at port 1 should be the higher pressure
- Nominal width: Ø 3 mm
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 7.4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**Mechanic**
- Design: screw-in valve
- Adjusting method: with spindle-setting screw, optionally hand wheel
- Adjusting range: approx. 4 turns
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -20 °C to +80 °C
- Storage temperature: -20 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0.08 kg
- Material: valve parts: steel, O-rings: NBR, backup ring: teflon

**Performance**

**Pressure drop diagram Δp/Q STO fully opened**

![Pressure drop diagram](image)

**Test conditions**
- Oil: HLP 32, temperature: 40 °C (~32 cSt)
Dimensions

*Throttle valve STO*

installation torque 35 - 40 Nm

SW 21

NOTE

For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
Type code

STO

NOTE  The valve is also available with hand wheel.

Accessories and additional information

<table>
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<tr>
<th>Accessories / spare parts</th>
<th>Article:</th>
<th>Article number:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manifold straight 3/8&quot;</td>
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Manual  Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 “general information” under the category “general operating manual” or will be provided upon request.
Throttle valve STE

max. operating pressure 315 bar
screw-in valve for cavity STE

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<td>Performance</td>
<td>2</td>
</tr>
<tr>
<td>Dimensions</td>
<td>3</td>
</tr>
<tr>
<td>Type code</td>
<td>3</td>
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<tr>
<td>Accessories and additional information</td>
<td>3</td>
</tr>
</tbody>
</table>

Characteristics

- screw-in throttle valve
- for manual limitation of volume flows
- compact design
- maintenance-free
Technical data

**Hydraulic**
- Operating pressure max.: 315 bar
- Flow direction: throttling in both directions
- Nominal width: Ø 7...9 mm
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 7.4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**Mechanic**
- Design: screw-in valve
- Adjusting method: with spindle-setting screw
- Adjusting range: approx. 9 turns
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -20 °C to +80 °C
- Storage temperature: -20 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0.03 kg
- Material: valve parts: steel, O-ring: NBR, backup ring: teflon

Performance

Pressure drop diagram Δp/Q STE fully opened

![Pressure drop diagram](image)

**Test conditions**
- Oil: HLP 32, temperature: 40 °C (~32 cSt)
Dimensions

Throttle valve STE

Installation torque 25 - 30 Nm
SW 19

Cavity STE

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at www.weber-hydraulik.com.

Type code

STE
Throttle valve

Accessories and additional information

<table>
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<tr>
<th>Accessories / spare parts</th>
<th>Article:</th>
<th>Article number:</th>
</tr>
</thead>
<tbody>
<tr>
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<td></td>
<td>405.0030</td>
</tr>
</tbody>
</table>

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.

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Throttle valve STD

max. operating pressure 350 bar
screw-in valve for cavity STD

090470_STD_e
04.2018

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<tr>
<td>Performance</td>
<td>2</td>
</tr>
<tr>
<td>Dimensions</td>
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</tr>
<tr>
<td>Type code</td>
<td>3</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>3</td>
</tr>
</tbody>
</table>

Characteristics

- screw-in throttle valve
- for manual limitation of volume flows
- compact design
- maintenance-free
Technical data

**Hydraulic**
- Operating pressure max.: 350 bar
- Flow direction: throttling in both directions
- Nominal width: Ø 3,5 mm
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 7,4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**Mechanic**
- Design: screw-in valve
- Adjusting method: with spindle-setting screw
- Adjusting range: approx. 7 turns
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -20 °C to +80 °C
- Storage temperature: -20 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0,0094 kg
- Material: valve parts: steel, O-ring: NBR, backup ring: teflon

Performance

Pressure drop diagram Δp/Q STD fully opened

Test conditions
- Oil: HLP 32, temperature: 40 °C (~46 cSt)
**Dimensions**

*Throttle valve STD*

installation torque 7.6 - 8.4 Nm

**Cavity STD**

**NOTE** For a detailed drawing of the cavity please see chapter 12 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

**Type code**

| STD |
| Throttle valve |

**Accessories and additional information**

*Manual* Information regarding installation, set-up and maintenance can be found in our catalogue in chapter 12 under the category „general operating manual“ or will be provided upon request.
Component coupling check valve KK-M14x1.5

operating pressure max. 315 bar
volume flow max. 20 l/min

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<td>Performance</td>
<td>2</td>
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<tr>
<td>Dimensions</td>
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</tbody>
</table>

Characteristics

- for use in jig manufacturing and others
- blocks oil cannel of components when sepperated
- compact design
- flow direction from either side
- hardened and honed parts
- minimum oil leakage
- maintenance-free
Technical data

**Hydraulic**
- Operating pressure max.: 315 bar
- Flow rate max.: 20 l/min
- Flow direction: any
- Hydraulic fluid: mineral oil according to DIN 51524, others upon request
- Viscosity range: 7,4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**Mechanic**
- Design: Screw-in coupling
- Size: M14 x 1,5
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -20 °C to +80 °C
- Storage temperature: -20 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: 0,01 kg
- Material: steel
- Seals: NBR
- Surface protection: burnished steel

Performance

**Pressure drop diagram (Δp/Q) KK-M14x1,5**

![Pressure drop diagram](image)

**Test conditions**
- Oil: HLP 32, temperature: 40 °C (~32 cSt).
- Higher viscosity changes the performance diagrams.

Dimensions

**Component coupling**

**KK-M14x1,5 with short pin**

![Component coupling diagram](image)

actuating path max. 1,5 mm
Dimensions

Component coupling

*KK-M14x1,5 with long pin*

actuating path max. 1,5 mm

Cavity *KK-M14x1,5*

NOTE For a detailed drawing of the cavity please see chapter 11 „general information“ or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).

Mounted couplings

*KK-M14x1,5*

NOTE Place corresponding o-ring in the right position of the respective cavity before mounting the couplings (see mounting instructions).

NOTE The component couplings must be mounted as pairs (one coupling with long pin combined with one coupling with short pin). Two component couplings of the same kind (long/long or short/short) are not compatible.

NOTES • For external tightness the counterbore must to be 2,1 mm (for o-rings with Ø 2,62 mm).
• The pins may not be exposed to radial forces.
• The actuation path of the pin must not exceed 1,5 mm.
• Coupling and decoupling only when system is depressurized.
• When decoupled, the (long) pin of the valve (Art.-No. 131.0005) exceeds the surface about 3,5 mm.
Type code

<table>
<thead>
<tr>
<th>Component coupling</th>
<th>Model</th>
<th>Article number</th>
</tr>
</thead>
<tbody>
<tr>
<td>KK-M14x1,5</td>
<td>long pin</td>
<td>131.0005</td>
</tr>
<tr>
<td>KK-M14x1,5</td>
<td>short pin</td>
<td>131.0006</td>
</tr>
</tbody>
</table>

**NOTE**
The component coupling check valves are sold in 10 pieces per unit.

Mounting instruction

**NOTE**
The mounting instruction is also enclosed with the shipping notes of every delivery.

**KK-M14x1,5 with o-ring 11 x 1**
for standard cavity according to datasheet

Step 1:
carefully place o-ring 11 x 1 on the bottom of the standard cavity before screwing in the valve

Step 2:
screw valve (without o-ring) in the standard cavity

3. Result:
Mounted component coupling check valve with o-ring 11 x 1

**KK-M14x1,5 with o-ring 9 x 1**
for customer specific cavity

Step 1:
carefully mount o-ring 9 x 1 on valve

Step 2:
screw valve (with mounted o-ring) in the customer specific cavity

3. Result:
Mounted component coupling check valve with o-ring 9 x 1

Accessories and additional information

<table>
<thead>
<tr>
<th>Accessories/spare parts</th>
<th>Article:</th>
<th>Material number:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Screw-in tool AVA1C for KK M14x1,5</td>
<td>139.0007</td>
</tr>
<tr>
<td></td>
<td>O-ring 9,0 x 1,0</td>
<td>401.0028</td>
</tr>
<tr>
<td></td>
<td>O-ring 11,0 x 1,0</td>
<td>401.0101</td>
</tr>
</tbody>
</table>

Manual

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Hot oil shuttle W33H-1X06

direct operated
operating pressure max. 420 bar
volume flow max. 40 l/min

cavity NCS06/4

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<tr>
<td>Performance</td>
<td>2</td>
</tr>
<tr>
<td>Dimensions</td>
<td>3</td>
</tr>
<tr>
<td>Type code</td>
<td>5</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>5</td>
</tr>
</tbody>
</table>

Characteristics

- directional flush valve in spool design
- screw-in valve for cavity NCS06/4
- used e.g. for cooling in closed circuits
- also available in in-line body G3/8” or mounting plate NG 10
- robust and durable
- minimum oil leakage
- maintenance-free
**Technical data**

*Hydraulic*
- Operating pressure max.: 420 bar
- Flow rate max.: 40 l/min
- Switching pressure: 10 bar
- Hydraulic fluid: mineral oil according to DIN 51524, other hydraulic fluids upon request
- Viscosity range: 10 - 350 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 20/18/15, filter with $\beta$ 5(c) > 200

*Mechanic*
- Design: W33H spool type screw-in valve, cavity NCS06/4 or in in-line body G3/8"
- Fluid temperature: -20 °C to +90 °C
- Ambient temperature: -20 °C to +50 °C
- Storage temperature: -30 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: valve: 0,17 kg, valve in in-line body: 0,97 kg
- Material: valve parts: steel, seals: NBR / PUR, Viton optional
- Surface protection: zinc coated

**Performance**

*Pressure drop diagramm ($\Delta p/Q$) W33H-1X06 from 1 to 2*

*Pressure drop diagramm ($\Delta p/Q$) W33H-1X06 from 3 to 2*

**Test conditions**
- Oil: HLP 32, temperature: 40 °C (~32 cSt)
- Higher viscosity changes the performance diagrams.
**Dimensions**

*Screw-in valve*  
**W33H-1X06**

installation torque 65 ± 5 Nm
SW 27
locating shoulder NCS06/4

**Cavity NCS06/4**

NOTE For a detailed drawing of the cavity please see chapter 11 “general information” or our online catalogue at [www.weber-hydraulik.com](http://www.weber-hydraulik.com).
NOTE The valve is also available in a mounting plate NG 10. Dimension sheets are available upon request.
**Type code**

<table>
<thead>
<tr>
<th>W33H</th>
<th>1X06</th>
<th>10</th>
<th>01</th>
<th>Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot oil shuttle</td>
<td>Model</td>
<td>Switching pressure 10 bar</td>
<td>Revision</td>
<td>Hot oil shuttle in in-line body G3/8*</td>
</tr>
</tbody>
</table>

**NOTE**

On request the valve is also available in a mounting plate NG 10 as W33H-1X06-10-01-NG10.

**Accessories and additional information**

**Accessories / spare parts**

| Article: Seal kit NCS06/4 (NBR) for W33H-1X06-10-01 | Material number: 1097614 |

**Manual**

Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information“ under the category „general operating manual“ or will be provided upon request.
Connecting Plates and Manifolds

Chapter 1

Connecting Plates and Manifolds
Hollow Bolt Body HSS
for counterbalance valves or pilot to open check valves
cavity T-11A or T-2A

Connecting Plates and Manifolds
suitable for various cavities

Line Mount Bodies, Tools
Line Mount Bodies, Tools
operating pressure max. 350 bar
Hollow bolt body HSS

for counterbalance valves or pilot to open check valves with cavity T-11A or T-2A

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<tr>
<td>Dimensions</td>
<td>2</td>
</tr>
<tr>
<td>Table of dimensions</td>
<td>3</td>
</tr>
<tr>
<td>Type code</td>
<td>3</td>
</tr>
<tr>
<td>Set-up</td>
<td>4</td>
</tr>
<tr>
<td>Accessories and additional information</td>
<td>4</td>
</tr>
</tbody>
</table>

Characteristics

- hollow bolt body for counterbalance valves or pilot to open check valves
- space-saving installation possible
- dead space is minimized
- available in many variations
- available with already mounted valves
- turnable
- hollow bolt can be mounted from both sides
- maintenance-free
Technical data

**Hydraulic**
- Operating pressure max.: 315 bar
- Flow rate: depending on valve
- Hydraulic fluid: mineral oil according to DIN 51524, others upon request
- Viscosity range: 7,4 - 420 cSt
- Filtration: oil cleanliness according to ISO 4406 (1999) 18/16/13, filter with β 5(c) > 200

**Mechanic**
- Design: Hollow bolt body
- Fluid temperature: -20 °C to +80 °C
- Ambient temperature: -20 °C to +80 °C
- Storage temperature: -20 °C to +60 °C (non-condensing)
- Installation position: any
- Weight: without valves, see *table of dimensions*
- Material: steel
- Surface protection: seal at Usit-ring: NBR

Dimensions

**Hollow bolt body HSS**

for installation torque and width across flats (SW) see *table of dimensions*
Table of dimensions

<table>
<thead>
<tr>
<th></th>
<th>G 1/4&quot;</th>
<th>G 3/8&quot;</th>
<th>G 1/2&quot;</th>
<th>G 3/4&quot;</th>
<th>M18 x 1,5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cavity</td>
<td>T-11A</td>
<td>T-11A</td>
<td>T-11A</td>
<td>T-2A</td>
<td>T-11A</td>
</tr>
<tr>
<td>1</td>
<td>G 1/4&quot;</td>
<td>G 3/8&quot;</td>
<td>G 1/2&quot;</td>
<td>G 3/4&quot;</td>
<td>G 1/2&quot;</td>
</tr>
<tr>
<td>2 and 4</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
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<tr>
<td>A [mm]</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>40</td>
<td>30</td>
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<tr>
<td>B [mm]</td>
<td>60</td>
<td>55</td>
<td>65</td>
<td>80</td>
<td>65</td>
</tr>
<tr>
<td>C [mm]</td>
<td>75</td>
<td>80</td>
<td>85</td>
<td>100</td>
<td>80</td>
</tr>
<tr>
<td>D [mm]*</td>
<td>33</td>
<td>33</td>
<td>33</td>
<td>55</td>
<td>33</td>
</tr>
<tr>
<td>E [mm]**</td>
<td>13</td>
<td>13</td>
<td>13</td>
<td>17</td>
<td>13</td>
</tr>
<tr>
<td>F [mm]</td>
<td>27</td>
<td>27</td>
<td>30</td>
<td>38</td>
<td>27</td>
</tr>
<tr>
<td>G [mm]</td>
<td>51</td>
<td>51</td>
<td>54</td>
<td>61</td>
<td>51</td>
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<tr>
<td>H [mm]</td>
<td>63</td>
<td>63</td>
<td>66</td>
<td>75</td>
<td>63</td>
</tr>
<tr>
<td>I [mm]</td>
<td>12</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>J [mm]</td>
<td>41</td>
<td>39</td>
<td>48</td>
<td>57</td>
<td>48</td>
</tr>
<tr>
<td>SW</td>
<td>19</td>
<td>22</td>
<td>27</td>
<td>41</td>
<td>24</td>
</tr>
<tr>
<td>Installation torque [Nm]</td>
<td>22 ± 1,1</td>
<td>40 ± 2</td>
<td>65 ± 3,3</td>
<td>180 ± 9</td>
<td>50 ± 2,3</td>
</tr>
<tr>
<td>Weight [kg] ***</td>
<td>0,85</td>
<td>0,85</td>
<td>1,0</td>
<td>2,0</td>
<td>1,0</td>
</tr>
<tr>
<td>Article number</td>
<td>203.0144</td>
<td>203.0003</td>
<td>203.0005</td>
<td>203.0006</td>
<td>203.0012</td>
</tr>
</tbody>
</table>

* Dimension „D“ applies to counterbalance valves with L-control (e.g. CBCA-LAN)
** Dimension „E“ applies to pilot to open check valves without manual load release (e.g. CKCB-XCN)
*** Weight of hollow bolt body without any valves

**NOTE**
The installation torque values of the hollow bolt are maximum values which are not be exceeded (Nm, couter material steel). This must be guaranteed by using the necessary tools (torque wrench) and procedure.

**NOTE**
The steel sealing ring may not be replaced by any other sealing! It has a functional purpose in absorbing forces. Other sealing rings (e.g. copper, or USIT-rings) are not permitted!

### Type code

- **HSS**
- **Cavity**
  - R 1/4"
  - R 3/8"
  - R 1/2"
  - R 3/4"
  - M18 x 1,5

**NOTE**
The hollow bolt bodies HSS are available with a variety of counterbalance valves and pilot to open check valves. They can also be provided with a Minimess® test-point. Please contact us for more information.
Set-up

The hollow bolt body HSS must be fitted completely before mounting on the cylinder. Through inappropriate mounting of the hollow bolt body to the cylinder, it is possible that additional forces lead to leaking due to loosened parts. If mounted inappropriately, it is possible that the steel sealing ring damages the cylinder and/or the hollow bolt body. If leakage occurs at the steel sealing ring despite the correct installation torque, the system must never be tightened with a higher torque, but it might be necessary to replace the cylinder and/or the hollow bolt body, as well as the steel sealing ring. The system is designed to absorb hydraulic forces. If there are any mechanic forces, e.g. applied through hydraulic tubing, this may lead to failure. Any hydraulic tubing must be mounted to the hollow bolt body with the system being turned off and stress-relieved.

Accessories and additional information

Accessories/spare parts
Please contact us for fitting steel sealing rings, locking screws or valves as spare parts for the hollow bolt body HSS.

Manual
Information regarding installation, set-up and maintenance can be found in our product catalogue in chapter 11 „general information” under the category „general operating manual” or will be provided upon request.
Connecting Plates and Manifolds

suitable for various cavities

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<td>Cavity T-3A</td>
<td>4</td>
</tr>
<tr>
<td>Cavity T-5A</td>
<td>5</td>
</tr>
<tr>
<td>Cavity T-8A</td>
<td>6</td>
</tr>
<tr>
<td>Cavity T-10A</td>
<td>7</td>
</tr>
<tr>
<td>Cavity T-11A</td>
<td>11</td>
</tr>
<tr>
<td>Cavity T-13A</td>
<td>14</td>
</tr>
<tr>
<td>Cavity T-16A</td>
<td>16</td>
</tr>
</tbody>
</table>

NOTE All aluminium manifolds are approved for a maximum operating pressure of 210 bar.
Cavity T-2A

Manifold 90°
BAV, BAW

<table>
<thead>
<tr>
<th>Type</th>
<th>Ports</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAV</td>
<td>G 1/2&quot;</td>
<td>0,49 (Alu)</td>
</tr>
<tr>
<td>BAV/S</td>
<td></td>
<td>1,30 (Steel)</td>
</tr>
<tr>
<td>BAW</td>
<td>G 3/4&quot;, Port 3: G 1/2&quot;</td>
<td>0,27 (Alu)</td>
</tr>
<tr>
<td>BAW/S</td>
<td></td>
<td>0,70 (Steel)</td>
</tr>
</tbody>
</table>

Sandwich body
NG 10 in B
BB2

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>BB2</td>
<td>1,11 (Alu)</td>
</tr>
</tbody>
</table>
## Cavity T-2A

**Sandwich body**
**NG 10 in P**
**BBP**

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>BBP</td>
<td>0.72 (Alu)</td>
</tr>
<tr>
<td>BBP/S</td>
<td>1.88 (Steel)</td>
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</tbody>
</table>

**Sandwich body**
**NG 10 in A**
**BBA**

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
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<tbody>
<tr>
<td>BBA</td>
<td>0.57 (Alu)</td>
</tr>
<tr>
<td>BBA/S</td>
<td>1.47 (Steel)</td>
</tr>
</tbody>
</table>
Cavity T-3A

*Manifold 90°*

*G 1/2”*

*CAV, CAW*

<table>
<thead>
<tr>
<th>Type</th>
<th>Ports</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAV</td>
<td>G 1/2&quot;</td>
<td>0,29 (Alu)</td>
</tr>
<tr>
<td>CAV/S</td>
<td>G 1/2&quot;</td>
<td>0,76 (Steel)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Ports</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAV</td>
<td>G 3/4&quot;</td>
<td>0,27 (Alu)</td>
</tr>
<tr>
<td>CAV/S</td>
<td>G 3/4&quot;</td>
<td>0,70 (Steel)</td>
</tr>
</tbody>
</table>

Manifold 90°

*CEV, CEW*

*Type Ports Weight [kg]*

<table>
<thead>
<tr>
<th>Type</th>
<th>Ports</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEV</td>
<td>G 1/2&quot;</td>
<td>0,45 (Alu)</td>
</tr>
<tr>
<td>CAV/S</td>
<td>G 1/2&quot;</td>
<td>1,17 (Steel)</td>
</tr>
<tr>
<td>CEW</td>
<td>G 3/4&quot;</td>
<td>0,41 (Alu)</td>
</tr>
<tr>
<td>CEW/S</td>
<td>G 3/4&quot;</td>
<td>1,08 (Steel)</td>
</tr>
</tbody>
</table>
**Cavity T-3A**

*Sandwich body*

NG 10 P → T CBP

![Diagram of Cavity T-3A](image)

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBP</td>
<td>0,71 (Alu)</td>
</tr>
<tr>
<td>CBP/S</td>
<td>1,85 (Steel)</td>
</tr>
</tbody>
</table>

**Cavity T-5A**

*Manifold 90°*  

G 1/2" DAV

![Diagram of Cavity T-5A](image)

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>DAV</td>
<td>0,25 (Alu)</td>
</tr>
<tr>
<td>DAV/S</td>
<td>0,66 (Steel)</td>
</tr>
</tbody>
</table>

**NOTE**  
Other manifolds and sandwich bodies are available upon request.
Cavity T-8A

*Manifold 90°
G 1/4”
WFP*

**NOTE** Other manifolds and sandwich bodies are available upon request.
### Cavity T-10A

*In-line body*  
**FAU, FAV, FAW**

<table>
<thead>
<tr>
<th>Type</th>
<th>Ports</th>
<th>A [mm]</th>
<th>B [mm]</th>
<th>C [mm]</th>
<th>D [mm]</th>
<th>E [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAU</td>
<td>G 3/8&quot;</td>
<td>63,5</td>
<td>41,1</td>
<td>31,8</td>
<td>25,4</td>
<td>26,2</td>
<td>0,20 (Alu)</td>
</tr>
<tr>
<td>FAU/S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0,48 (Steel)</td>
</tr>
<tr>
<td>FAV</td>
<td>G 1/2&quot;</td>
<td>76,2</td>
<td>57,2</td>
<td>38,1</td>
<td>36,3</td>
<td>36,3</td>
<td>0,38 (Alu)</td>
</tr>
<tr>
<td>FAV/S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0,96 (Steel)</td>
</tr>
<tr>
<td>FAW</td>
<td>G 3/4&quot;</td>
<td>76,2</td>
<td>57,2</td>
<td>38,1</td>
<td>36,3</td>
<td>36,3</td>
<td>0,36 (Alu)</td>
</tr>
<tr>
<td>FAW/S</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0,92 (Steel)</td>
</tr>
</tbody>
</table>
**Cavity T-10A**

*In-line body*
1 open
FEU, FEV

**Manifold straight**
G 3/8"
FCU

---

<table>
<thead>
<tr>
<th>Type</th>
<th>Ports</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEU</td>
<td>G 3/8&quot;</td>
<td>0,32 (Alu)</td>
</tr>
<tr>
<td>FEU/S</td>
<td>G 3/8&quot;</td>
<td>0,84 (Steel)</td>
</tr>
<tr>
<td>FEV</td>
<td>G 1/2&quot;</td>
<td>0,30 (Alu)</td>
</tr>
<tr>
<td>FEV/S</td>
<td>G 1/2&quot;</td>
<td>0,80 (Steel)</td>
</tr>
</tbody>
</table>

---

**Manifold straight**
G 3/8"
FCU

**Type**
**Weight [kg]**
FCU 0,26 (Alu)
FCU/S 0,67 (Steel)
Cavity T-10A

Manifold 90°
G 3/8"
FNU

NOTE The sandwich body is available with unloading port at A or at B.

Sandwich body NG 6
FB4

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FNU</td>
<td>0.42 (Alu)</td>
</tr>
<tr>
<td>FNU/S</td>
<td>0.92 (Steel)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FB4</td>
<td>0.44 (Alu)</td>
</tr>
<tr>
<td>FB4/S</td>
<td>0.97 (Steel)</td>
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</tbody>
</table>
**Cavity T-10A**

*Sandwich body NG 6 FBA, FBP, FBT*

---

**Sandwich body NG 10, P→T CBE**

---

<table>
<thead>
<tr>
<th>Type</th>
<th>Ports</th>
<th>Design</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBA/M</td>
<td>metric</td>
<td>A→T or</td>
<td>0,30 (Alu)</td>
</tr>
<tr>
<td>FBA/T</td>
<td></td>
<td>B→T</td>
<td>0,70 (Steel)</td>
</tr>
<tr>
<td>FBP/M</td>
<td>metric</td>
<td>P→T</td>
<td>0,30 (Alu)</td>
</tr>
<tr>
<td>FBP/T</td>
<td></td>
<td></td>
<td>0,70 (Steel)</td>
</tr>
<tr>
<td>FBT/M</td>
<td>metric</td>
<td>from T</td>
<td>0,30 (Alu)</td>
</tr>
<tr>
<td>FBT/T</td>
<td></td>
<td></td>
<td>0,70 (Steel)</td>
</tr>
</tbody>
</table>
Cavity T-11A

*Manifold 90°*  
EAV, ECV, ECT, EAU, ECU

<table>
<thead>
<tr>
<th>Type</th>
<th>Port 1</th>
<th>Port 2</th>
<th>Port 3</th>
<th>A [mm]</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>EAV</td>
<td>G 1/2&quot;</td>
<td>G 1/2&quot;</td>
<td>G 3/8&quot;</td>
<td>61,7</td>
<td>0,32 (Alu)</td>
</tr>
<tr>
<td>EAV/S</td>
<td>G 1/2&quot;</td>
<td>G 1/2&quot;</td>
<td>G 1/4&quot;</td>
<td>64,3</td>
<td>0,32 (Alu)</td>
</tr>
<tr>
<td>ECV</td>
<td>G 1/2&quot;</td>
<td>G 1/2&quot;</td>
<td>G 1/4&quot;</td>
<td>64,3</td>
<td>0,34 (Alu)</td>
</tr>
<tr>
<td>ECV/S</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
<td>64,3</td>
<td>0,89 (Steel)</td>
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<tr>
<td>ECT</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
<td>64,3</td>
<td>0,33 (Alu)</td>
</tr>
<tr>
<td>ECT/S</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
<td>G 1/4&quot;</td>
<td>64,3</td>
<td>0,86 (Steel)</td>
</tr>
<tr>
<td>EAU</td>
<td>G 3/8&quot;</td>
<td>G 3/8&quot;</td>
<td>G 3/8&quot;</td>
<td>61,7</td>
<td>0,33 (Alu)</td>
</tr>
<tr>
<td>EAU/S</td>
<td>G 3/8&quot;</td>
<td>G 3/8&quot;</td>
<td>G 1/4&quot;</td>
<td>64,3</td>
<td>0,87 (Steel)</td>
</tr>
<tr>
<td>ECU</td>
<td>G 3/8&quot;</td>
<td>G 3/8&quot;</td>
<td>G 1/4&quot;</td>
<td>64,3</td>
<td>0,33 (Alu)</td>
</tr>
<tr>
<td>ECU/S</td>
<td>G 3/8&quot;</td>
<td>G 3/8&quot;</td>
<td>G 1/4&quot;</td>
<td>64,3</td>
<td>0,87 (Steel)</td>
</tr>
</tbody>
</table>

Sandwich body NG 6  
EBY

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBY</td>
<td>0,48 (Alu)</td>
</tr>
<tr>
<td>EBY/S</td>
<td>1,22 (Steel)</td>
</tr>
</tbody>
</table>
**Cavity T-11A**

*Manifold 90°  
YEV, YEU*

---

**Manifold straight**

*XEU*

---

<table>
<thead>
<tr>
<th>Type</th>
<th>Ports</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>YEV</td>
<td>G 1/2&quot;</td>
<td>0,49 (Alu)</td>
</tr>
<tr>
<td>YEV/S</td>
<td>G 1/2&quot;</td>
<td>1,29 (Steel)</td>
</tr>
<tr>
<td>YEU</td>
<td>G 3/8&quot;</td>
<td>0,52 (Alu)</td>
</tr>
<tr>
<td>YEU/S</td>
<td>G 3/8&quot;</td>
<td>1,36 (Steel)</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>XEU</td>
<td>0,65 (Alu)</td>
</tr>
<tr>
<td>XEU/S</td>
<td>1,71 (Steel)</td>
</tr>
</tbody>
</table>
Cavity T-11A

*Sandwich body NG 6 EB2*

![Diagram of Cavity T-11A]

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>EB2</td>
<td>0.56 (Alu)</td>
</tr>
<tr>
<td>EB2/S</td>
<td>1.24 (Steel)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>EBP/M</td>
<td>0.32 (Alu)</td>
</tr>
<tr>
<td>EBP/T</td>
<td>0.77 (Steel)</td>
</tr>
</tbody>
</table>

---

Sandwich body NG 6 EBP

![Diagram of Sandwich body NG 6 EBP]

---
Cavity T-13A

Manifold 90°
G 3/8"
GAU

Type Ports Weight [kg]
GCT G 1/4" 0,15 (Alu)
GCT/S 1,39 (Steel)
GCU G 3/8" 0,14 (Alu)
GCU/S 0,37 (Steel)

Manifold straight
GCT, GCU

Type Weight [kg]
GAU 0,15 (Alu)
GAU/S 0,28 (Steel)
Cavity T-13A

**Sandwich body NG 6 GBA**<br>in A or B

**Sandwich body NG 6 Z6S**<br>in P

### Type | Weight [kg]
--- | ---
GBA | 0.3 (Alu)
GBA/S | 0.76 (Steel)
Z6S | 0.23 (Alu)
Z6S/S | 0.61 (Steel)

**NOTE**  Other manifolds and sandwich bodies are available upon request.
Cavity T-16A

**Manifold straight**

ICX

Manifold 90°

**G 1 1/4"**

IAY, IAX

---

<table>
<thead>
<tr>
<th>Type</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICX</td>
<td>0.96 (Alu)</td>
</tr>
<tr>
<td>ICX/S</td>
<td>2.51 (Steel)</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Type</th>
<th>Ports</th>
<th>Weight [kg]</th>
</tr>
</thead>
<tbody>
<tr>
<td>IAY</td>
<td>G 1 1/4&quot;</td>
<td>0.8 (Alu)</td>
</tr>
<tr>
<td>IAY/S</td>
<td></td>
<td>2.09 (Steel)</td>
</tr>
<tr>
<td>IAX</td>
<td>G 1&quot;</td>
<td>0.88 (Alu)</td>
</tr>
<tr>
<td>IAX/S</td>
<td></td>
<td>2.31 (Steel)</td>
</tr>
</tbody>
</table>
**Line Mount Bodies, Tools**

for small screw in valves ● steel zinc plated ● max. 350 bar

**Description**
Suitably for the FLUID TEAM small screw in valve program. The zinc plating ensures a good corrosion protection. The housings are rated for 350 bar.

**Deliverable Executions**

- **female-female**
  - type G2, G3  

- **female-male with sealing shoulder**
  - type G5, G5B, G6

**Type** | **Size G** | **A** | **B** | **C** | **Ø D** | **SW (Hex.)** | **Weight [kg]** | **Torque [Nm]** | **Art.-No.**
---|---|---|---|---|---|---|---|---|---
G2 | suitable for VCD, VCL, RBS1  
BSPP 1/4 | 66 | 13 | - | 19 | 0,09 | – | 138.0008  
BSPP 3/8 | 70 | 37 | 13 | - | 22 | 0,12 | – | 138.0009  
BSPP 1/2 | 80 | 42 | 15 | - | 27 | 0,20 | – | 138.0010  
BSPP 3/4 | 100 | 51 | 17 | - | 32 | 0,29 | – | 138.0011

G3 | suitable for DRV, RKR, RHR  
BSPP 1/2 | 90 | 65 *) | 15 | - | 27 | 0,23 | – | 138.0012

G5 | suitable for RBS1  
BSPP 1/4 | 50 | 23 | 12 | 6 | 19 | 0,06 | 30 | 138.0003  
BSPP 3/8 | 60 | 25 | 12 | 9 | 22 | 0,10 | 50 | 138.0004  
BSPP 1/2 | 73 | 32 | 14 | 12 | 27 | 0,17 | 65 | 138.0005  
BSPP 3/4 | 110 | 55 | 16 | 16 | 32 | 0,32 | 180 | 138.0006

G5B | suitable for VCL, RHR, RKR  
BSPP 3/8 | 60 | 43 | 12 | 9 | 22 | 0,10 | 50 | 138.0007

G6 | suitable for VCD, VCL, RBS1  
M12x1,5 / BSPP 1/4 | 72 | 42 | 12 | 6 | 19 | 0,10 | 30 | 138.0013

*) body with 118° drilling angle for O-ring sealing
### Screw-In Tool

![Diagram of Screw-In Tool]

<table>
<thead>
<tr>
<th>For Valve</th>
<th>Type</th>
<th>Art.- No.</th>
<th>L</th>
<th>L1</th>
<th>L2</th>
<th>ØF</th>
<th>Hole Circle x Pin-Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>RBS1 G 1/4</td>
<td>W1</td>
<td>139.0001</td>
<td>120</td>
<td>110</td>
<td>60</td>
<td>11,3</td>
<td>8,5 x 2,0</td>
</tr>
<tr>
<td>RHR G 1/4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RHR G 3/8</td>
<td>W2</td>
<td>139.0002</td>
<td>120</td>
<td>110</td>
<td>60</td>
<td>15,0</td>
<td>10,8 x 2,4</td>
</tr>
<tr>
<td>RBS1 G 3/8</td>
<td>W3</td>
<td>139.0003</td>
<td>120</td>
<td>110</td>
<td>60</td>
<td>15,0</td>
<td>10,5 x 3,0</td>
</tr>
<tr>
<td>RBS1 G 1/2</td>
<td>W4</td>
<td>139.0004</td>
<td>120</td>
<td>110</td>
<td>60</td>
<td>18,8</td>
<td>13,0 x 3,9</td>
</tr>
<tr>
<td>RHR G 1/2</td>
<td>W5</td>
<td>139.0005</td>
<td>120</td>
<td>110</td>
<td>60</td>
<td>18,8</td>
<td>14,2 x 3,4</td>
</tr>
<tr>
<td>RBS1 G 3/4</td>
<td>W6</td>
<td>139.0006</td>
<td>120</td>
<td>110</td>
<td>60</td>
<td>24,0</td>
<td>16,0 x 5,5</td>
</tr>
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</table>
Appendix: General Information

Valve Cavities and Port Patterns

Port Patterns
NG 3 to NG 25

Valve Cavities
2-way designs

Valve Cavities
3-way designs

Manual Overrides and Electrical Connectors

Manual Overrides
designs

Electrical Connectors
designs

Test Conditions
Test Conditions and Standards
applied standards
GENERAL TERMS AND CONDITIONS OF SALE
AND DELIVERY
(“TERMS OF SALE”) OF THE WEBER-HYDRAULIK GROUP

Version 19.2

The following General Terms and Conditions of Sale and Delivery of the WEBER-HYDRAULIK Group shall apply to all companies of the WEBER-HYDRAULIK Group with seat in Germany or Austria. These companies are listed on the website www.weber-hydraulik.com. To the extent that the words “we”, “us” or “our” are used in the following General Terms and Conditions of Sale and Delivery (hereinafter referred to as “Terms of Sale”), such shall refer to the respective company of the WEBER-HYDRAULIK Group to which the contract was awarded by the Ordering Party.

Section 1 General Provisions, Scope

1. Our Terms of Sale shall apply only to entrepreneurs as well as to legal entities under public law or special assets under public law in accordance with Section 310 [1] BGB [German Civil Code].

2. Our Terms of Sale shall apply exclusively; we do not acknowledge any terms to the contrary or any deviating terms used by the Ordering Party (hereinafter also referred to as the “Customer”), unless such have been expressly approved by us in writing.

Our silence regarding such deviating provisions shall in particular not be interpreted as acknowledgement or approval thereof, neither with respect to future contracts.

Our Terms of Sale shall apply in lieu of any general terms and conditions used by the Ordering Party, even if we accept the order of the Ordering Party without reservation although we are aware that terms of the Ordering Party contrary to or deviating from our Terms of Sale exist, or if we effect delivery although the Ordering Party has pointed out that his general terms and conditions apply - unless we have expressly waived the application of our Terms of Sale.

The exclusion of the general terms and conditions of the Ordering Party shall also apply if these Terms of Sale do not include any special stipulations for individual aspects requiring regulation.

By accepting our acknowledgement of order, the Ordering Party expressly acknowledges that he waives any demurrer that may be derived from his general terms and conditions.
3. Our Terms of Sale shall also apply to all future orders, without requiring express agreement on their incorporation in each specific case; they shall also apply if we effect delivery to the Ordering Party without reservation although we are aware that the Ordering Party uses terms and conditions contrary to or deviating from our Terms of Sale.

4. All and any agreements entered into between us and the Customer for the execution of the contract shall be made in writing.

5. Our Terms of Sale shall apply in particular to contracts governing the sale and/or delivery of movable property (hereinafter referred to as “goods”), irrespective of whether we manufacture the goods ourselves or purchase them from our suppliers (Sections 433, 651 BGB). Unless otherwise agreed, the present Terms of Sale shall apply as a framework agreement also for similar future contracts in the version applicable at the time the order was placed by the Ordering Party and/or in the text form last communicated (“text form” as defined under § 126b BGB - German Civil Code-) to the Ordering Party, without any requirement on our part to refer to them in each individual case.

6. Any individual agreements entered into with the Ordering Party in individual cases (including collateral agreements, supplements and changes) shall in any event have priority over these Terms of Sale. Subject to proof to the contrary, the contents of such agreements shall be governed by a written contract and/or our written acknowledgement.

7. Our employees shall not be entitled to add to the contractual content or deviate from such content. Such shall not apply to our responsible bodies or persons vested with general commercial power of representation [German “Prokura”) or to persons specifically authorized by the latter to this effect.

8. Legally relevant declarations and notifications from the Ordering Party relating to the contract (e.g. setting deadlines, dunning letters, withdrawal) must be given in writing, i.e. in written or text form (e.g. letter, email, fax). Legal formal requirements and additional supporting evidence, in particular in cases of doubt relating to the lawful entitlement of the declaring party shall remain unaffected hereby.

9. Any reference to the application of statutory provisions shall be for the purpose of clarification only. The statutory provisions shall also apply without such clarification, unless they are directly modified or explicitly excluded by these Terms of Sale.

Section 2 Offer, Conclusion of Contract, Tender Documents, Changes, Quotes

1. Our offers are without obligation and non-binding. Such shall not apply if a written offer has been explicitly stipulated as legally binding.
2. The order of the goods or the order placed by the Customer shall be deemed a binding contract offer. We can accept orders or commissions within 14 days of their receipt.

3. Within the framework of order placement, the Customer must provide us with all customer-specific requirements and documentation necessary for the execution of the order, including but not limited to technical drawings, test instructions, raw material analyses etc. The Customer must in particular notify us of the tolerances and standards which must be observed. The Customer shall be liable for ensuring that all the documentation and information are correct. We shall not be liable for any defects resulting from any errors in this documentation or information.

4. Acceptance can be declared either in writing (e.g. by way of acknowledgement of order) or by delivering the goods to the Customer.

5. Each order shall be governed by our written acknowledgement of order. If the Customer has any objections as to the contents of the acknowledgement of order, he must oppose such acknowledgement of order without delay. Otherwise the contract shall take effect in accordance with the acknowledgement of order. In the event of any deviations in the content of drawings the specifications in the acknowledgement of order shall be authoritative.

6. We shall be entitled to make structural modifications to the products delivered by us insofar as such modifications are the result of enhancements of the respective series product and if the modified products are at least commercially and technically equivalent to the products ordered by the Customer and can be used by the Customer the same way as the products originally to be delivered.

7. If our scope of services needs to be modified due to missing or incorrect information provided by the Customer, we shall be entitled to effect such modifications; any costs or damage incurred thereby must be reimbursed to us by the Customer.

8. Any information provided by us relating to the subject-matter of the delivery or service (e.g. weights, dimensions, values in use, capacity, tolerances and technical specifications) as well as any depictions thereof provided by us (e.g. drawings and images) shall only be deemed approximately authoritative unless the usability of such information for the contractually intended purpose requires precise conformity. These shall not constitute guaranteed characteristics but are descriptions or designations of the delivery or service. Deviations customary in the trade and deviations which are the result of legal provisions or which represent technical improvements as well as the replacement of components by equivalent parts shall be permissible insofar as they do not adversely affect the usability for the contractually intended purpose.

9. We reserve title and copyrights to all and any images, drawings, calculations and other documents of companies of the WEBER-HYDRAULIK Group. Irrespective of whether such records are protected by law they constitute valuable company knowhow. Therefore, disclosure to any third party or commercial use by the Ordering Party beyond the purpose of the respective delivery contract shall
require our express consent. Such shall not apply to documents or records that are generally known and in the public domain.

Section 3 Prices, Terms of Payment

1. Unless otherwise provided for in the acknowledgement of order our prices shall be “ex works”, exclusive of value-added tax, packaging, transportation and insurance. Any customs duties, fees, taxes and other public dues shall be borne by the Customer.

2. Our prices are exclusive of the statutory value-added tax; it will be indicated separately at the statutory rate on the date of the invoice and must be paid separately by the Ordering Party.

3. In the case of sale by dispatch (item 7.1 hereof) the Customer shall bear the transportation costs ex warehouse as well as the costs of any transport insurance that the Customer may require. If we do not charge the transport costs actually incurred in the individual case, a flat-rate transport fee shall be deemed agreed (exclusive of transport insurance) at a rate of 3% of the net value of the goods. Any customs duties, fees, taxes and other public dues shall be borne by the Customer.

4. Deduction of discounts shall only be permissible if such has been specifically agreed in writing.

5. Unless otherwise provided for in the acknowledgement of order the purchase price shall be due for payment net (without deduction) within 14 days of the date of the invoice. However, even within the scope of an ongoing business relationship we shall be entitled at any time to effect delivery, in whole or in part, only with advance payment. The respective reservation will be made with the acknowledgement of order at the latest.

6. Upon expiration of the aforesaid term of payment the Customer will be in default of payment. During default the purchase price shall bear interest at the statutory rate of default interest applicable at the time. We reserve the right to assert further damages caused by the delay. With respect to merchants our claim for payment of the commercial default interest (Section 353 HGB [German Commercial Code]) shall be unaffected. Payment shall be deemed effected in due time if it is received on our account within the deadline.

7. The Customer may only offset counterclaims that are undisputed, recognized by us and recognized by non-appealable judgment or that are in reciprocity to our claims. Furthermore, the Customer may only enforce a right of retention if his counterclaim is based on the same contractual relationship. If the delivery is defective the counterclaims of the buyer shall remain unaffected, in particular in accordance with item 9.4 of these Terms of Sale.

8. If, after conclusion of the contract it becomes apparent that our claim to the purchase price is at risk due to the Customer’s inability to perform (e.g. filing of application for the initiation of insolvency
proceedings), based on statutory provisions we shall be entitled to refuse performance and – after setting a deadline, if applicable, to withdraw from the contract (Section 321 BGB). In the case of contracts on the production of non-fungible goods (custom-made items) we shall have the right to withdraw from the contract immediately; the statutory provisions on the waiver of deadlines shall remain unaffected.

9. If it has been agreed that delivery shall be effected more than 4 months after conclusion of the respective delivery contract we reserve the right to reasonably adjust the delivery prices if and to the extent that such is necessary on account of an increase in material or energy costs and/or a general wage increase in the metal industry affecting our company. If such results in a price increase of more than 10% the Ordering Party shall be entitled to withdraw from the contract.

Section 4 Sampling/Approval

1. Unless otherwise agreed, sampling will be carried out before the commencement of serial production of the products to be delivered by us. After sampling an initial sample test report will be prepared.

2. Upon delivery of the initial samples and the initial sample test report the Customer must review the same and, if no defects are found, declare his approval within a reasonable period of time. Approval may also be provided by the Customer by placing an order for serial production of the parts to be delivered by us after receipt of the initial sample test report. The order placement shall then be deemed the declaration of approval.

Section 5 Duty of Information of the Customer

1. If the respective specifications are not provided in the documentation indicated under item 2.3 hereof, the Customer must provide us with all necessary information required for proper and correct production of the products to be delivered by us by commencement of serial production at the latest. This shall include but not be limited to detailed information on the handling of the parts.

2. The Customer undertakes to inform us if usage of the products to be delivered by us is associated with specific risks. Such applies in particular to use of the products to be delivered by us in safety-relevant areas, such as the automotive sector, medical engineering, aerospace and armaments.

Section 6 Delivery, Time of Delivery, Delay in Delivery

1. Any binding periods and dates for delivery must be expressly agreed in writing. In case of non-binding or approximate (approx., around, about etc.) delivery periods or dates we shall use our best efforts to comply with these periods or dates. If a specific calendar week has been agreed as time of delivery,
we shall have the right to effect delivery or performance up until and including the Sunday of such calendar week.

2. The delivery time results from the agreements concluded in accordance with the acknowledgement of order. Compliance with such shall require that all and any commercial and technical issues have been clarified and the Customer has fulfilled all of his obligations and, in particular, has provided a sufficient amount of any transport boxes or containers that may be required. If this is not the case, the time period for delivery will be reasonably extended. Such shall not apply if and to the extent that we are responsible for the delay.

3. The delivery time shall be deemed met if the delivery item has left our premises by the time the delivery period expires or if readiness for dispatch has been notified. If dispatch and/or acceptance of the delivery item is delayed for reasons for which the Customer is responsible we will charge him for the costs incurred by such delay, commencing one month after notification of readiness for dispatch and/or acceptance.

4. A delivery period or date agreed with the Ordering Party shall be deemed adequately extended if after placement of an order technical problems arise or technical issues require clarification for reasons for which we are not responsible.

5. If our Customer is in default of acceptance or otherwise culpably breaches duties of cooperation, we shall have the right to claim compensation for the damage incurred by us in this respect, including any additional expenses which may have been incurred. The right to assert any further claims shall be reserved. If the aforesaid condition is met the risk of accidental loss or accidental deterioration of the delivery item shall pass to our Customer at the point in time the Customer is in default of acceptance or in debtor’s delay.

6. Whenever goods cannot be delivered for reasons for which we are not responsible, any costs incurred by us must be reimbursed. Our Customer shall be entitled to claim delivery of the delivery item manufactured inclusive of ancillary services, unless he is responsible for the non-delivery.

7. Upon expiration of an additional time period set by the Ordering Party in accordance with Section 323 BGB we shall have the right to ask the Ordering Party to declare within a time period of 10 days whether he insists that the contract be executed or whether he avails himself of his right to withdraw from the contract. If no such declaration is made by the Ordering Party within this time period we shall be entitled to withdraw from the contract.

8. We shall only be entitled to effect partial deliveries and partial services if

- the partial delivery can be used by the Customer within the framework of the contractually intended purpose,
- delivery of the remaining goods ordered is ensured.
9. If we are in default of delivery, the Customer must first grant us a reasonable grace period of at least 30 days – provided that this period is not unreasonable – in order to render performance. If this time period elapses without result, any claims for damages for breach of duty – irrespective of the reason thereof – shall apply only subject to the provisions of item 6.10 below.

10. If the Customer incurs any damage on account of our delayed delivery, he shall have the right – to the exclusion of any further claims – to claim compensation for the delay. Such compensation shall amount to 0.25% of the net payment for each commencing week that the delivery of the goods and/or service as a whole is in default, however not exceeding 2.5% of the net remuneration of the total delivery and/or total service which, due to the delay, cannot be delivered and/or provided by us in time or in accordance with the contract. Any further compensation paid by us for the damage caused by the delay shall be excluded. Such shall not apply if we have acted on intent, with gross negligence or maliciously, in the case of claims for injury to life, limb or health, in the case of default and if a fixed date of delivery within the meaning of the law has been agreed and a performance guarantee has been given or a procurement risk has been assumed in accordance with Section 276 BGB and in the case of compulsory statutory liability. We reserve the right to prove that no damage occurred at all or that the damage was considerably less.

Section 7 Passing of Risk, Packaging, Acceptance, Default in Acceptance

1. Unless otherwise specified in the acknowledgement of order, delivery shall be effected “ex works” (Incoterms 2010), which shall also be the place of performance for delivery and supplementary performance (if applicable). Upon request of the Customer and at his expense the goods will also be shipped to another point of destination (sale by dispatch). Unless otherwise agreed, we shall have the right to determine the respective type of shipment (in particular select the shipping company, dispatch route, packaging) ourselves.

2. Transport packaging as well as all other packaging in accordance with the Packaging Ordinance will not be taken back, with the exclusion of pallets. The Ordering Party undertakes to arrange for the disposal of the packaging at his own expense.

3. The risk of accidental loss and accidental deterioration shall pass to the Ordering Party as soon as the goods have left our premises, an external warehouse or, in the case of direct delivery of goods not manufactured by us, the warehouse of the sub-supplier. However, in the case of sales by dispatch the risk of accidental loss and accidental deterioration of the goods as well as the risk of delay shall already pass with delivery of the goods to the carrier, forwarding agent or other person or entity charged with the shipping of the goods. If acceptance has been agreed, such acceptance shall be authoritative for the passing of risk. In other respects, the statutory provisions of the law on contracts for work and services [German “Werkvertragsrecht”] shall also apply mutatis mutandis if acceptance has been agreed. Default in acceptance by the buyer shall be equivalent to delivery or acceptance. The
risk of accidental loss and accidental deterioration shall pass to the Customer with delivery at the latest.

4. If dispatch or collection of the goods is delayed as a consequence of circumstances for which the Ordering Party is responsible, risk shall pass to the Ordering Party with receipt of the notification of readiness for dispatch. In this case, after setting a reasonable time period that has however expired without results, we are entitled to otherwise dispose of the delivery items and to provide delivery to the Ordering Party with a reasonably extended term of delivery.

5. Warehouse costs incurred after the passing of risk shall be borne by the Customer. If the goods are stored in our warehouse, warehouse costs shall amount to 0.25% of the invoice amount of the stored delivery items for each completed week of storage. Assertion and proof of further storage costs shall be reserved.

6. If acceptance needs to be performed, the purchase item shall be deemed accepted, if and when

- delivery and – if installation is also owed by us – installation is/are completed,
- we have informed the Customer thereof pointing out the assumed acceptance as per this item 7 6. and have asked him to accept the goods,
- 6 working days have passed since delivery or installation or if the Customer has started using the purchase item (e.g. has put the equipment delivered into operation) and if, in this case, 6 working days have passed since delivery or installation and
- the Customer has failed to effect acceptance within this time period for a reason other than a defect notified to us that renders impossible or significantly impairs the use of the purchase item.

Section 8 Provision of Goods / Incoming Goods Inspection

1. The Customer must deliver the goods in such a way as to ensure that article name, quantity and weight are clearly visible and unambiguous identification is possible.

2. Upon receipt, we shall only inspect the goods of the Customer for external damage of packaging, boxes and the goods themselves. We will inform the Customer of any defects which may have been detected within 10 working days.

3. If damage occurs to the material provided by the Customer during the manufacturing process as a result of a breach of the obligations stipulated in items 5.1 or 5.2 hereof, we shall not be liable for this. If any damage or loss is incurred by us on account of this the Customer shall be obliged to provide compensation thereof.
Section 9 Liability for Defects

1. Unless otherwise provided for in the following, the provisions laid down by law shall apply to the rights of the buyer in the case of material defects and defects of title (including incorrect delivery and short delivery as well as improper assembly or faulty assembly instructions). The special provisions laid down by law relating to end delivery of unprocessed goods to a consumer, even if the latter has processed the goods, shall remain unaffected (supplier recourse as per Section 478 BGB). Claims from supplier recourse shall be excluded if the defective goods were further processed either by the buyer or another entrepreneur, e.g. by incorporation into another product.

2. The claims for defects asserted by the Customer require that he has observed his statutory obligations regarding inspection and reporting (Section 377, 381 HGB). If a defect is detected upon delivery, during inspection or at any later point in time we must be notified hereof in writing without delay. In any case, apparent defects must be reported in writing within 7 working days from delivery and any defects that were not apparent during inspection must be notified in writing within the same time period after detection. If the buyer fails to duly inspect the goods and/or fails to notify the defect, our liability shall be excluded for the defect that was not notified and/or not notified in time or not notified in the proper form or manner in accordance with the legal provisions. We shall have the right to set up adequate guidelines specifying how the products delivered by us shall be inspected immediately upon receipt.

3. If the purchase item is defective, we shall, at our discretion, be entitled to effect supplementary performance by either remedying the defect or by delivering a new item free from defect in replacement. Our right to refuse supplementary performance if the respective conditions under statutory law are met shall be unaffected hereby. In the event of remedy of defect, we shall be under the obligation to bear all expenses required to remedy the defect, including but not limited to transport, travel, labour and material costs insofar as these costs are not increased by taking the purchase item to a place other than the place of delivery.

4. We shall have the right to make the supplementary performance owing conditional on the buyer paying the due purchase price. However, the buyer shall have the right to retain a part of the purchase price proportionate to the defect.

5. The buyer must grant us the necessary time and opportunity for the supplementary performance owed by us and must, in particular, provide us with the rejected goods for inspection or verification purposes. In the case of replacement delivery, the buyer must return the defective goods to us in accordance with the provisions laid down by law. If we were not originally under the obligation to incorporate the goods, supplementary performance shall include neither the disassembly of the defective item nor its re-incorporation.
6. We shall be entitled to refuse supplementary performance if the total expenditure required for this amount to more than 20% of the purchase price. The right of the buyer in such case to either reduce the purchase price or to withdraw from the contract, provided the respective statutory provisions are met, shall be unaffected hereby; the following item 11 hereof shall apply with respect to the respective claims for damages.

7. Item 11 hereof shall apply to claims for damages the buyer may have on account of defects in the products delivered by us and/or for compensation of wasted efforts.

8. The expenditure required for inspection and supplementary performance, including but not limited to transport, travel, labour and material costs as well as costs of assembly and disassembly, if applicable, shall be borne or refunded by us in accordance with the statutory provisions, if a defect actually exists. If products delivered by us are inspected by us as a consequence of a notification of defect by the Customer and the notification of defect turns out to be unfounded, the Customer shall bear the costs incurred hereby (in particular inspection and transport costs), which will be charged to him in accordance with our standard rates for maintenance and service work, unless the lack of defectiveness was not discernible for the buyer.

9. In the case of defects in components from other manufacturers which cannot be remedied by us for licencing or factual reasons we will, at our discretion, assert our warranty claims against the manufacturers and suppliers for the account of the Customer or will assign such claims to the Customer. In case of such defects, warranty claims can only be asserted against us if the respective other conditions are met and in accordance with the stipulations in these Conditions for Sale if legal enforcement of the aforesaid claims against the manufacturer and supplier was not successful or is futile, e.g. due to insolvency.

10. All and any liability on our part for products delivered by us shall become extinct if the products delivered by us are modified by the Customer, unless the Customer provides proof that such modifications are not the cause of the notified defect. Likewise, all and any liability on our part for defects of the products delivered shall become extinct if the products have not been maintained, cared for and used in accordance with our instructions and guidelines, unless the Customer is able to prove that deviating from our instructions and guidelines was not the cause of the defect notified by the Customer. The Customer undertakes to comply with our instructions and guidelines for maintenance, care and use of the products delivered and to document compliance in suitable form. Upon request, proof of the compliance with such instructions and guidelines must be provided to us. The warranty shall not be applicable if the Customer modifies the delivery item either himself or has it changed by a third party without the consent of the seller, rendering remedy of defect either impossible or only possible with an unreasonable amount of effort. In each case the Customer shall bear the additional costs of the remedy of the defect incurred by such modification.

11. In urgent cases, e.g. where the safety of operations is compromised or disproportionate damage needs to be prevented, the Customer shall be entitled to remedy the defect himself and claim from
us reimbursement of the expenditure necessary from an objective point of view. In such case, if the Customer remedies the defect himself, we must be notified thereof without delay - beforehand, if possible. The right of the Customer to take action himself shall not apply if we are entitled to refuse the respective supplementary performance in accordance with the provisions laid down by law.

12. If supplementary performance has failed despite two attempts or if a reasonable time period to be set by the buyer has expired without result or can be waived in accordance with the statutory provisions, the Customer shall be entitled to withdraw from the contract or to reduce the purchase price. In the event of a minor defect the right of withdrawal shall not apply.

13. In case of defects, any claims of the buyer for damages and/or compensation for expenses incurred to no avail shall only apply as stipulated under item 11 hereof and shall be excluded in all other respects.

Section 10 Liability for Software Defects

1. Following the respective notification of defects by the Ordering Party we shall remedy defects in the software supplied (software programmes and the corresponding documentation and circuits and other records) within a limitation period of 12 months from delivery. At our discretion, remedy will be effected by rectifying the defect, delivering software free from such defect or demonstrating ways to prevent the effects of the defect. At least three attempts at supplementary performance must be accepted in the event of a defect. An equivalent new software version or the equivalent previous software version without the defect must be accepted by the Ordering Party if such can be expected of him. The limitation period shall not commence anew on account of the supplementary performance. If we refuse to carry out the supplementary performance, if the supplementary performance fails or cannot be expected of the Ordering Party, the Ordering Party shall be entitled to assert additional claims and may in particular demand a reduction of the purchase price or withdraw from the contract.

2. The software shall have the agreed properties and characteristics and shall be suited for the contractually intended use – in the absence of an agreement it shall be suited for its customary use. It shall meet the criteria of practical suitability and shall be of the quality customary for this kind of software; it is not possible to completely exclude software defects. Functional impairment of the software as a result of hardware defects, environmental conditions, operating errors or the like does not constitute a defect. A negligible reduction in quality shall not be taken into account.

3. The Ordering Party shall assist us in error analysis and remedy of defect in particular by providing a substantiated description of the problems that arise, providing comprehensive information and by granting us the time and opportunity necessary for remedying the defect. At our discretion, defects
may be remedied on site or at our business premises. Services can also be performed remotely. The Ordering Party must, at his own expense, arrange for the necessary technical requirements and must provide us electronic access to the software upon prior notification.

4. We shall be entitled to charge additional costs if the software was modified, used outside its prescribed environment or was handled incorrectly. We shall be entitled to charge compensation for expenses incurred if no defect is detected and if negligence was involved when the Ordering Party notified the defect. The burden of proof shall be with the Ordering Party. Section 254 BGB shall apply mutatis mutandis.

5. Our liability shall be excluded if the minimum requirements regarding the Ordering Party’s hardware and software facilities as stated in the agreed specifications are not met, if the software is installed at the Ordering Party on different hardware to the hardware quoted in the agreed specifications without our consent, which must be provided in text form, if different software to the software disclosed to us when agreement was made on the specifications has been installed on the same hardware or connected hardware of the Customer on which the software is installed and the customer does not provide us with evidence that such different software has not caused any disruptions in the use of the delivery item and/or the software, if the Customer has modified the software without our previous consent in text form or if the Ordering Party has not used the software in accordance with its intended use.

6. Unless otherwise stipulated herein we shall not be liable for any damage that did not originate in the delivered software itself; we shall in particular not be liable for loss of data or other consequential damage. In other respects, item 11 hereof shall apply to claims for damages and claims for compensation of wasted efforts.

7. The provisions of item 9 hereof shall apply mutatis mutandis.

**Section 11 Liability and Claims for Damages**

1. Any claims for damages asserted by the Ordering Party against us shall be excluded insofar as neither the corporate bodies, executives, employees or other ancillary agents of WEBER-HYDRAULIK GMBH can be charged with intent or gross negligence.

2. The present limitation of liability shall not apply if obligations are breached, the fulfilment of which are essential for the proper execution of the contract and the observance of which der Customer may regularly rely on (so-called “cardinal obligations” [= fundamental obligations going to the root of the contract]). However, even if such essential obligations are breached – unless there is no intent or gross negligence on the part of WEBER-HYDRAULIK GMBH – the damage to be compensated in such case shall be limited to the purchase price of the respective delivery order; furthermore, the amount of the maximum damage shall be limited to the common and foreseeable damage.
3. Furthermore, the aforesaid limitation of liability shall not apply in the case of injury to life, limb or health.

4. The aforesaid limitation of liability shall apply to claims for damages of whatever kind asserted by the Ordering Party and arising out of the contractual relationship, including but not limited to damages caused by delay, damages for non-performance, damages for defects of the products delivered or for a breach of the consultation and information obligations. The aforesaid limitation of liability shall also apply to the costs for recall actions implemented by the Ordering Party as a consequence of a defect of the products delivered by us, irrespective of the fact whether the claim for compensation of costs of the Ordering Party is based on damage claims relating to tort or contractually based damage claims or on management without mandate ("negotiorum gestio").

5. If products delivered by us are delivered to places outside the territory of the Federal Republic of Germany, we cannot assume any liability that the products do not infringe any industrial property rights of any third party. It shall always be the responsibility of the Customer to check and ensure whether the products delivered by us might infringe any industrial property rights of any third party in countries outside the Federal Republic of Germany. In this respect, the Customer undertakes to indemnify and hold us harmless from and against all and any claims asserted by any third party based on the infringement of industrial property rights. It shall always be the responsibility of the Customer to verify whether products delivered by us comply with the statutory and official rules and regulations in countries outside the Federal Republic of Germany and are compliant with the standards applicable there – unless their conformity with such statutory or official rules and regulations or standards is confirmed by us in writing.

**Section 12 Retention of Title**

1. We retain title to the purchase item until all payment due from the delivery contract has been received in full. If the Ordering Party acts in breach of the contract, in particular if the Ordering Party is in default of payment, we shall have the right to take back the purchase item. If we take back the purchase item such shall not constitute a withdrawal from the contract, unless such withdrawal has been expressly declared by us in writing. If we seize the purchase item such shall always constitute a withdrawal from the contract. We shall have the right to utilize the purchase item we have taken back, the proceeds resulting from such utilization shall then be offset against the amounts owed to us by the Ordering Party, less appropriate costs for utilization.

2. The Ordering Party undertakes to handle the purchase item with due care and must, in particular, adequately insure it at its replacement value at his own expense against theft and fire and water damage. If maintenance or inspection work is required the Ordering Party must carry out such work at his own expense in due time. As early as with the present, in order to secure the payment claims to which we are entitled, the Ordering Party shall assign to us all and any claims to which he may be
entitled against any third party or against the insurer due to the destruction or damage of the goods subject to retention of title. The Ordering Party undertakes to notify respective defects without delay; furthermore, upon our first request, he shall be under the obligation to disclose the assignment to the third parties or the insurer.

3. If the goods subject to retention of title are seized by third parties or in the event of other third-party interventions, the Ordering Party must inform us immediately thereof in writing so that we can file a court action in accordance with Section 771 ZPO [German Code of Civil Procedure].

4. The Ordering Party shall be entitled to sell the purchase item in the ordinary course of business. However, as early as with the present he shall assign to us all and any claims from such resale against his customers or third parties up to the sum total of the invoice (including VAT) of our claim, irrespective of whether the purchase item was resold without or after processing. The Ordering Party shall remain entitled to collect the claim even after assignment. Our entitlement to collect the claim ourselves shall remain unaffected hereby. However, we undertake not to collect the claim ourselves for as long as the Ordering Party meets his payment obligations using the proceeds from the resale, is not in default of payment and if, in particular, no application for the initiation of insolvency proceedings has been filed or if the Ordering Party has not discontinued his payments. However, if such is the case, we shall be entitled to demand that the Ordering Party discloses to us both the assigned claims and the respective debtors, provides all information necessary for collection, hands over the respective documentation and informs the debtors (third party) of the assignment.

5. Processing or transformation of the purchase item by the Ordering Party shall always be undertaken on our behalf. If the purchase item is processed with other products which do not belong to us, we shall acquire co-ownership of the new product in proportion to the value of the purchase item (sum total of the invoice inclusive of VAT) and the value of the other processed products at the time of processing. The same shall apply to the product created by such processing as for the purchase item delivered under retention of title.

6. If the purchase item is inseparably mixed or combined with other products not belonging to us, we shall acquire co-ownership of the new product in proportion to the value of the purchase item (sum total of the invoice inclusive of VAT) and the value of the other mixed or combined products at the time of such mixing or combining. If the purchase item is mixed or combined in such a way that the product of the Ordering Party is to be considered as the principal thing, it shall be deemed agreed that the Ordering Party shall assign to us co-ownership of this product on a pro rata basis. The Ordering Party shall store and safeguard for us the sole ownership or co-ownership thus generated.

7. The Ordering Party shall also assign to us any claims to secure the claims we have against him that may accrue against a third party by combining the purchase item with a piece of real estate.
8. Upon request of the Ordering Party, we undertake to release, at our option, the securities to which we are entitled, insofar as their realisable value exceeds the value of the claims to be secured by more than 10%.

9. If the products delivered by us are delivered to a country outside the Federal Republic of Germany that does not acknowledge the aforesaid retention of title, the Customer undertakes, upon first request, to obtain for us the respective liens and/or other security rights equivalent to the aforesaid retention of title and to take all measures that are necessary and useful in this respect. The Customer undertakes, if required, to advise us of the necessity of such liens or other security rights.

Section 13 Supply by our own Suppliers, Force Majeure

1. We shall be exempted from our obligation to effect delivery if such delivery is prevented by an event of Force Majeure. Events of Force Majeure shall include but not be limited to war, earthquake, flood and other disasters, strike, destruction of production facilities by fire or explosion – to the extent that we are not responsible for the impediment that hinders delivery, either at our site or at the site of our supplier. If the impediment continues for a duration of more than four weeks we shall, in such cases, be entitled to withdraw from the contract.

2. We shall not be liable for a delay in the delivery time if such delay is due to the fact that we are not supplied, or not supplied on time, with raw materials, components or semi-finished products by our own suppliers even though the respective cover transaction has been concluded and we are not responsible for the missing, delayed or defective delivery by the supplier and the supplier was selected by us with the customary care. In such case, we undertake to seek a replacement for the failed delivery without delay, if such replacement delivery by another supplier can be expected of us. A replacement delivery can only be expected of us if it is equivalent in price and quality to the delivery originally agreed. We undertake to inform the Ordering Party of the reasons for such delays in delivery immediately. If the delivery is delayed by more than two months as a consequence of such circumstances both we and the Ordering Party have the right to withdraw from the contract. Any payments or goods/services already received must be returned, any further claims shall be excluded.

Section 14 Software

1. If software and the related documentation are part of the deliveries and services the Ordering Party shall be granted the non-exclusive, non-transferrable, not sub-licensable and revocable right of use for internal use by the Ordering Party together with the products for which the software has been delivered. Use of the software on more than one system shall not be permitted.

Unless a specific license agreement has been concluded with us in writing, any other use of the
software and the related documentation, e.g. together with the Ordering Party’s own hardware or the hardware of any third party, shall be expressly excluded.

2. We and/or the software supplier retain all and any other rights to the software and the documentation and circuits including any copies and subsequent supplements thereto. The award of sub-licenses shall not be permitted.

The Ordering Party must ensure that such software and documentation are not disclosed to any third party without our prior written consent.

3. The Ordering Party shall only be entitled to duplicate, rework, translate or convert the software from object code to source code within the scope permitted by law (Sections 69 a et. seq. German Copyright Act). Provision of source programmes shall require special written agreement. If the originals bear a copyright notice such notice must also be added to the copies by the Ordering Party.

4. Unless otherwise agreed, the right of use shall in each case be deemed granted with the acknowledgement of order and delivery of the software, the related documentation and any subsequent additions.

Section 15 Statute of Limitation

1. In derogation from Section 438 [1], number 3, BGB, the general limitation period for claims for material defects and defects of title shall be one year from delivery. If acceptance has been agreed, the limitation period shall commence with acceptance.

2. However, if the goods are a building or an object that, in conformity with its customary manner of utilization, has been used for a building and has caused its defectiveness (building material), claims will become statute-barred in five years from delivery in accordance with the statutory provision (Section 438 [1], no. 2, BGB). Any additional special provisions on limitation periods laid down by law shall remain unaffected (in particular Section 438 [1], no. 1, [3], Sections 444, 445b BGB).

3. The aforesaid limitation periods stipulated by sales law shall also apply to contractual and non-contractual claims for damages by the buyer based on a defect of the goods – unless the standard statutory limitation periods (Sections 195, 199 BGB) would, in an individual case, result in shorter limitation periods. However, claims for damages of the Customer in accordance with items 11.2. and 11.3 above as well as claims under the Product Liability Act shall become statute-barred in accordance with the statutory limitation periods exclusively.
Section 16 Confidentiality

Both parties undertake not to use any trade secrets of the other party of which they gain knowledge in the course of the collaboration or delivery for their own economic purposes beyond the purpose of the respective delivery contract or to pass them on to any third party. Obligation to confidentiality shall not apply if such trade secrets have become part of the public domain without the fault of the other party. Furthermore, obligation to confidentiality shall become extinct 5 years after the termination of the cooperation. Trade secrets shall be deemed industrial secrets within the meaning of Section 17 UWG [German Act against unfair Competition].

Section 17 Export Control, Import Regulations

1. In the absence of any derogating contractual agreements concluded with the Ordering Party the products delivered are intended to be placed on the market within the Federal Republic of Germany for the first time, or, in case of delivery outside the Federal Republic of Germany to the agreed country of first delivery (country of first delivery).

2. The export of specific goods by the Ordering Party from there may be subject to official authorisation – e.g. on account of their nature or intended use or final destination. If the Ordering Party exports the products delivered by us or has them exported by any third party, the Ordering Party undertakes to check this out himself and to strictly comply with the relevant export regulations and embargoes, in particular those of the European Union (EU), of Germany and/or other EU member states as well as those of the United States of America or Asian or Arab countries, if applicable, and of all third countries affected.

In addition to this, the Ordering Party is under the obligation to ensure that the required national product approvals or product registrations are obtained and that the stipulations under national law of the respective country for provision of user information in the local language as well as all import regulations are met before the Ordering Party delivers the products delivered by us to a country other than the country of first delivery agreed with us.

3. The Ordering Party will in particular check and ensure – and, upon request, provide us with proof -that
- the products provided are not intended for military, nuclear or armaments use;
- no deliveries of goods of US origin, of US software or US technology are made to companies and persons included in the US Denied Persons List (DPL); that without official authorisation no deliveries of goods of US origin are made to companies and persons included in the US Warning List, US Entity List or US Specially Designated Nationals and Blocked Persons List;
− no deliveries are made to companies and persons included in the List of Specially Designated Terrorists, of Foreign Terrorist Organizations, Specially Designated Global Terrorists or the EU Terrorist List or other relevant negative lists for export control;
− no deliveries of the products supplied by us are made to military recipients;
− no deliveries are made to recipients that have breached other provisions under export control regulations, in particular regulations of the EU or of the ASEAN countries;
− all early warnings from the competent German authorities or the national authorities of the respective country of origin of the consignment are observed.

4. Access to and use of products delivered by us shall only be permitted if the aforesaid checks and assurances have been made by the Ordering Party; otherwise, the Customer shall refrain from the intended export and we shall be under no obligation to perform.

5. If the products delivered by us are passed on to any third party, the Ordering Party undertakes to bind such third party in the same way as stipulated in items 17.1 – 17.4 above and to inform the third party that compliance with such legal provisions is imperative.

6. If delivery outside the Federal Republic of Germany has been agreed, the Ordering Party shall ensure at his own expense that all national import regulations of the country of first delivery have been complied with regarding the products that are to be delivered by us.

7. The Ordering Party shall indemnify and hold us harmless from and against all damage and expenditure resulting from the culpable breach of the aforesaid obligations stipulated in items 17.1 – 17.6.

**Section 18 Choice of Law, Place of Jurisdiction, Place of Performance**

1. All and any contracts concluded between us and the Supplier shall be governed by the substantive law of the Federal Republic of Germany, excluding the provisions of international private law and the UN Convention on Contracts for the International Sale of Goods (CISG).

2. If the Ordering Party is a registered trader with seat in the European Union, Switzerland, Norway or Iceland when the proceedings are initiated exclusive place of jurisdiction for all and any disputes arising out of or in connection with the business relationship between us and the Ordering Party shall be the place of business of our company that has been awarded the order. In derogation herefrom we shall however be entitled to bring an action at any other general or special legal venue before the court that has local jurisdiction at the respective place of business of the supplier.

3. To the extent that item 2 hereof shall not be applicable, all and any disputes arising in connection with the respective supply contract or its validity shall be settled by final and binding decision in accordance with the Rules of Arbitration of the German Arbitration Institute (Deutsche Institution für
Schiedsgerichtsbarkeit e.V. (DIS)) excluding the jurisdiction of the courts. Place of arbitration shall be Heilbronn. The language of the arbitration proceedings shall be German.

4. Place of performance for all obligations arising out of the business relationship shall be the place of business of our company to which the Customer has awarded the order.

5. Place of performance for delivery and payment including law suits concerning cheques and bills shall be the place of business of our company to which the Customer has awarded the order. We shall be entitled to also bring an action against the Ordering Party at his place of residence or place of business.

6. Should any of the provisions of the present General Terms and Conditions of Sale and Delivery be ineffective or void such shall not affect the effectiveness of the remaining provisions.
The following General Terms and Conditions of Purchase of the WEBER-HYDRAULIK Group shall apply to all companies of the WEBER-HYDRAULIK Group with seat in Germany or Austria. These companies are listed on the website www.weber-hydraulik.com. To the extent that the words “we”, “us” or “our” are used in the following General Terms and Conditions of Purchase (hereinafter referred to as “Terms of Purchase”), such shall refer to the respective company of the WEBER-HYDRAULIK Group that placed the order with the Supplier.

Section 1 General Provisions, Scope

1. Our Terms of Purchase shall apply only to companies as per Section 310 [4] of the BGB [German Civil Code] as well as to public law entities and special assets under public law.

2. Our Terms of Purchase shall apply exclusively; we do not acknowledge any terms to the contrary or any deviating terms used by the Supplier, unless such have been expressly approved by us in writing. Our silence regarding such deviating provisions shall in particular not be interpreted as acknowledgement or approval thereof, neither with respect to future contracts.

Our Terms of Purchase shall apply in lieu of any general terms and conditions used by the Supplier, even if we accept the delivery from the Supplier without reservation although we are aware that terms of the Supplier contrary to or deviating from our Terms of Purchase exist, or if we place an order although the Supplier has pointed out that his general terms and conditions apply - unless we have expressly waived the application of our Terms of Purchase.

The exclusion of the general terms and conditions of the Supplier shall also apply if these Terms of Purchase do not include any special stipulations for individual aspects requiring regulation.

By accepting our order confirmation the Supplier expressly acknowledges that he waives any demurrer that may be derived from the Supplier’s general terms and conditions.

3. All and any agreements entered into between us and the Supplier for the execution of the contract must be in writing to be effective.

4. Our Terms of Purchase shall also apply to future business, even if in specific cases we make no reference to the same.
5. Any individual agreements entered into with the Supplier on an individual basis (including collateral agreements, supplements and changes) shall in any event have priority over these Terms of Purchase. Subject to proof to the contrary, the contents of such agreements shall be governed by a written contract and/or our written confirmation.

6. Legally relevant declarations and notifications from the Supplier relating to the contract (e.g. setting deadlines, dunning letters, withdrawal from contract) must be given in writing, i.e. in written or text form (“text form” as defined under Section 126b BGB) (e.g. letter, email, fax). Legal formal requirements and additional supporting evidence, in particular in cases of doubt relating to the lawful entitlement of the declaring party shall remain unaffected hereby.

7. Our employees shall not be entitled to add to the contractual content or deviate from such content. Such shall not apply to our corporate bodies or persons vested with general commercial power of representation [German “Prokura”] or to persons specifically authorized by the latter to this effect.

8. Any reference to the application of statutory provisions shall be for the purpose of clarification only. Therefore, the statutory provisions shall also apply without clarification, unless the statutory provisions are directly changed or explicitly excluded by these Terms of Purchase.

Section 2 Offer, Tender Documents

1. Our order shall be deemed binding at the earliest when placed or confirmed in writing. Any obvious errors (e.g. typing errors, calculation errors) and incomplete data within the order, including the order documents, must be pointed out to us by the Supplier, so that we can correct and/or supplement the order before acceptance; otherwise, the contract shall be deemed as not concluded.

2. The Supplier shall be under the obligation to acknowledge our order in writing within a time period of 7 working days or to execute the order unconditionally, in particular by sending the goods (acceptance).

3. We shall have the right to change the time and place of delivery as well as the type of packaging at any time by way of written information communicated at least 10 working days before the agreed date of delivery. The same shall apply to changes to product specifications, insofar as such changes can be implemented within the ordinary production process of the Supplier without considerable extra effort – whereby in such cases the notification period in accordance with the preceding sentence shall be at least 20 working days. We will reimburse the extra costs incurred by the Supplier as a result of the modification, whereby such costs must be substantiated and reasonable. If such modifications entail delays in delivery which cannot be prevented with reasonable efforts in the ordinary production and business operation of the Supplier, the originally agreed date of delivery will be extended accordingly. In good time before the date of delivery, however no later than within 10 working days after receipt of our notification as per sentence 1 hereof, the Supplier will inform us in writing of the extra costs or delays in delivery anticipated on the basis of his careful assessment.
4. We shall have the right to terminate the contract at any time by way of written notice, specifying the reason thereof, if we can no longer use the products ordered in our business operations due to circumstances that have arisen after the conclusion of the contract. In such case, the partial performance rendered by the Supplier will be remunerated by us.

5. We shall retain ownership rights and copyrights with respect to our images, drawings, calculations and other documents; these must not be disclosed or made available to any third party without our express written consent. They shall only be used for production by virtue of our order; once the order has been completed they must be returned to us without further request, including all and any copies which may have been made thereof. They must be kept secret vis-à-vis any third party – in this respect the provisions of item 12 [4] hereof shall additionally apply.

Section 3 Prices, Terms of Payment

1. The price stated in the order shall be binding. Unless otherwise agreed in writing the price shall include delivery “free domicile” including packaging. If packaging is to be returned such shall require special agreement.

2. All prices shall include the statutory sales tax unless such tax is declared separately. The statutory value-added-tax shall not be included in the price. Unless otherwise agreed in an individual case, the price shall include all services and ancillary services provided by the Supplier (e.g. assembly, installation) as well as all incidental costs (e.g. proper packaging, transportation costs including transport insurance and third-party liability insurance, if applicable).

3. Invoices can only be processed by us if they include the order number specified in our order; the Supplier shall be liable for all and any consequences that result from his failure to comply with this obligation, unless he can substantiate that he is not responsible for these consequences.

4. Unless otherwise agreed in writing, we shall pay the purchase price within a time period of 14 days, calculated from complete delivery and performance (including acceptance, if such has been agreed) and receipt of a proper invoice, with a discount of 3 %, or net within 60 days after receipt of the invoice. In the case of a bank transfer, payment shall be deemed made on time if the remittance order is received by our bank before expiration of the payment term; we shall not be responsible for any delays caused by the banks involved in the payment process.

5. We shall not owe interest on maturity. If our payment is delayed we shall owe default interest at a rate of five percentage points above the basic rate of interest in accordance with Section 247 BGB.

6. We shall be entitled to set-off and retention rights as well as to the plea of non-performance of the contract within the scope laid down by law. We shall in particular be entitled to withhold payments
due for as long as we are still entitled to assert claims against the Supplier arising from incomplete or defective performance.

7. The Supplier may only offset claims for payment or exercise retention rights with counterclaims that are recognized by non-appealable judgement or are undisputed.

Section 4 Time of Delivery, Delay in Delivery

1. The time of delivery stated in the order shall be binding. Premature deliveries shall not be permitted.

2. The Supplier undertakes to inform us in writing and without delay of all and any non-compliance with a delivery date that is impending or has arisen, the cause thereof and the expected duration of the delay. The onset of default shall be unaffected thereby.

3. If the Supplier does not perform or does not perform within the agreed delivery period, or if the Supplier is in default, our rights - especially our rights to withdraw from the contract and to assert claims for damages - shall be governed by the statutory provisions. We shall in particular have the right to claim damages in lieu of performance after we have granted a reasonable time period which has however expired without results. If we claim damages the Supplier shall have the right to provide proof that he is not responsible for the breach of duty. The stipulations of item 4 hereof shall remain unaffected.

4. In case of delayed delivery we shall have the right - in addition to any further legal claims - to claim a contractual penalty of 0.5% of the order value (minus sales tax) for each commencing week the delivery is delayed, however not exceeding 5% of the total order value (minus sales tax). The contractual penalty can be asserted in addition to performance. Any claims for damages in lieu of and in addition to the performance as well as the right to withdraw from the contract shall remain unaffected. However, the contractual penalty is to be credited against any damage or loss caused by the delay that may be claimed by us. If the supply obligations are met we shall have the right to declare our reservation to assert contractual penalties up until the final payment becomes mature.

Section 5 Performance, Delivery, Passing of Risk, Default in Acceptance

1. Without our prior written consent the Supplier shall not be entitled to have the performance owed by him performed by any third party (e.g. subcontractors). Unless otherwise agreed in an individual case, the Supplier shall bear the procurement risk for the services or performance to be provided by him (e.g. restriction to inventory).

2. Delivery shall be effected “free domicile” to the place designated in the order. If the place of destination is not indicated and unless otherwise agreed, delivery shall be made to our place of business. The respective place of destination shall also be place of performance for the delivery, also for supplementary performance, should such apply (“obligation to be performed at the creditor’s
place of business”). The Supplier undertakes to take out adequate transport insurance. With the discontinuance of the SVS / RVS forwarding insurance on 30 June 1998 any declarations which may have been made on prohibition customers / partial prohibitions may no longer be valid. Since 01 July 1998 we are deemed “waiver customers” in the forwarding agreement.

3. The delivery shall be accompanied by a delivery note indicating date (date of issuance and shipment), contents of the delivery (item number and quantity) as well as our order identification (date and number). If the delivery note is missing or is incomplete we shall not be liable for any delays in processing and payment resulting therefrom. The corresponding dispatch note for the same content shall be sent to us separately, (i.e. not together with the delivery note).

4. The risk of accidental loss and accidental deterioration of the delivery item shall pass to us after delivery is taken at the place of performance. If acceptance has been agreed such acceptance shall be authoritative for the passing of risk. Also in other respects, the statutory provisions on contracts for work and services [German “Werkvertragsrecht”) shall apply mutatis mutandis for acceptance. Default in acceptance by us shall be equivalent to delivery or acceptance.

5. The statutory provisions shall apply as regards the commencement of our being in default of acceptance. However, the Supplier must also explicitly offer us his performance if a specific or assignable calendar date has been agreed for an action or contribution on our part (e.g. provision of material). If we are in default of acceptance the Supplier shall be entitled to claim compensation for his extra expenses in accordance with the statutory provisions (Section 304 BGB). If the contract concerns a non-fungible item to be produced by the Supplier (custom-made item), the Supplier shall only be entitled to additional rights if we have undertaken to contribute and are responsible for not providing such assistance.

6. Without our prior written consent the Supplier shall not be entitled to effect partial deliveries.

7. Even if shipment has been agreed the risk shall not pass to us until the goods are delivered to the agreed place of destination.

Section 6 Quality, Documentation

1. The Supplier shall comply with the recognised rules of engineering, the safety regulations and the agreed technical specifications. The Supplier guarantees that the respective “Agreement on Quality Assurance for Suppliers of WEBER-HYDRAULIK GMBH” that will be provided to him free of charge at any time upon request, is complied with.

2. In the case of subcontracted goods the Supplier must document in suitable form compliance with our “Agreement on Quality Assurance for Suppliers of WEBER-HYDRAULIK GMBH” and indicate the measures taken in this respect. Upon written advance notification our authorized representatives
shall have the right to verify compliance with these guidelines at the premises of the Supplier during ordinary working hours.

Section 7 Inspection of Defects, Warranty

1. Unless otherwise defined in the following, the provisions laid down by law shall apply to our rights relating to material defects and defects of title of the goods (including incorrect delivery and short delivery as well as incorrect assembly, inadequate assembly or operating instructions or instructions for use) as well as to other breaches of duty by the Supplier.

2. According to the statutory provisions the Supplier shall in particular be liable for ensuring that the goods have the agreed properties and quality when the risk passes to us. Agreement on properties and quality shall be deemed to be those product specifications that – in particular by being named or referenced in our order – are the subject-matter of the respective contract or that have been incorporated into the contract the same way as the present Terms of Purchase. Here, it makes no difference whether the product specification originates from us, the Supplier or the manufacturer.

3. By accepting or approving samples or prototypes submitted to us this does not mean that we waive our warranty claims.

4. In derogation from Section 442 [1], sentence 2, BGB, we shall also be entitled to unrestricted claims for defects even if the defect remained unknown to us upon the conclusion of the contract due to gross negligence.

5. The statutory provisions shall apply as regards the commercial duty to inspect and to report defects (Sections 377, 381 HGB [German Commercial Code]) with the following proviso: Our inspection duty shall be limited to defects that become clearly manifest during external examination, including delivery documents, in our incoming goods inspection (e.g. transport damage, incorrect or short delivery) or become apparent in random checks during our quality controls. If acceptance has been agreed there is no obligation to inspect the delivery items. In all other respects it depends on whether an inspection in the ordinary course of business is feasible when the circumstances of the particular case are taken into account. Our obligation to report defects if such defects are detected at a later date shall remain unaffected. Without prejudice to our inspection duty, however, our complaint (notification of defect) shall be deemed made without delay and in good time if it is sent within 7 working days starting from the date of detection or – in case of apparent defects – from the date of delivery.

6. If we detect a defect in the delivered products we shall have the right to charge a one-off fee of € 100.00 plus value-added tax for the inspection of the product and preparation of an inspection report. Such shall not exclude the assertion of higher costs for testing and examination of defective goods delivered in terms of claims for damages.
7. Supplementary performance shall also include disassembly of defective goods and reassembly, if the goods, in accordance with their type or nature and their intended use, were incorporated into another object or attached to another object. Our statutory claim for compensation of the respective costs shall remain unaffected. The expenses required for inspection and supplementary performance shall also be borne by the Supplier should it transpire that there was actually no defect at all. Our liability for damages in the case of unjustified requests for a remedy of defect shall remain unaffected; in such case, however, we shall only be liable if we have discerned or have not discerned due to gross negligence that there was no defect.

8. Without prejudice to our rights laid down by law and the stipulations under item 6 [?] hereof the following shall apply: If the Supplier fails to meet his obligations for supplementary performance – at our discretion either by remedy of the defect (repair) or by delivery of a defect-free item (replacement) – within a reasonable time period set by us we shall have the right to remedy the defect ourselves and claim compensation for the expenses thus incurred and/or can request a corresponding advance payment. If the supplementary performance by the Supplier has failed or cannot be expected of us (e.g. due to special urgency, threat to operational safety or imminent occurrence of damage of a disproportionate nature) a deadline does not need to be set; we will inform the Supplier without delay, beforehand if possible, of such circumstances.

9. In addition to this, in the case of material defects or defects of title we shall be entitled to reduce the purchase price or withdraw from the contract in accordance with the statutory provisions. In accordance with the provisions laid down by law we shall also be entitled to claim damages and reimbursement of expenses.

10. Upon receipt of our written notification of defect by the Supplier, the statute of limitation for warranty claims shall be suspended until the Supplier rejects our claims or declares that the defect has been remedied or otherwise refuses to continue negotiations with regard to our claims. In the case of replacement deliveries and remedy of defects the warranty period for repaired parts and replacement parts will start anew unless, based on the conduct of the Supplier, we must assume that the latter did not feel that he was obliged to implement the measure but only provided the replacement or remedied the defect as a gesture of goodwill or for similar reasons.

Section 8 Product Liability, Indemnity, Third-party Insurance

1. If any third party asserts claims for damages based on product liability against us, the Supplier undertakes, upon first request, to indemnify us and hold us harmless from and against such third-party claims, if and to the extent that the cause thereof is within his field of control and organization and he is liable himself vis-à-vis third parties. This applies in particular, if the cause of the existing or alleged defect lies in the products delivered by the Supplier or if the Supplier failed to point out potential risks to us associated with the use and incorporation of the products delivered by the Supplier. The applicability of Section 254 BGB shall not be excluded hereby. This obligation to
indemnity shall not apply if the claim is based on a breach of duty on account of gross negligence or intent on our part.

2. Within the scope of his indemnity obligation the Supplier must reimburse expenses in accordance with Sections 683, 670 BGB arising out of or in connection with claims asserted against us by any third party, including any recall actions implemented by us. To the extent possible and reasonable, we will inform the Supplier on the content and scope of recall measures and will give him the opportunity to comment on the same. Any further statutory claims shall remain unaffected. The application of Section 254 BGB shall not be excluded.

3. The Supplier undertakes to maintain product liability insurance with a lump-sum coverage of € 10 million per personal injury / property damage; should we be entitled to additional damage claims such shall remain unaffected.

Section 9 Intellectual Property Rights of Third Parties

1. The Supplier shall be responsible for ensuring that the products delivered by him do not infringe any third-party intellectual property rights in European Union or other countries where he manufactures the products or has them manufactured.

2. If claims are asserted against us by any third party on account of this the Supplier undertakes to indemnify us and hold us harmless from and against such claims upon first written request; without the consent of the Supplier we shall not be entitled to enter into agreements concerning this matter with such third party, in particular not to reach settlements.

3. The indemnity obligation of the Supplier shall apply to all expenses necessarily incurred by us out of or in connection with the claim asserted by a third party.

4. Our additional statutory claims for defects of title in the products delivered to us shall remain unaffected. Claims for defects of title shall become statute-barred 36 months from the passing of risk.

5. Section 254 BGB shall apply.

Section 10 Recourse against the Supplier

1. In addition to claims for defects we shall be entitled to assert in full, without any restrictions, claims in recourse within the supply chain as laid down by law (recourse against the supplier as per Sections 445a, 445b, 478 BGB). We shall in particular have the right to require the Supplier to provide the exact type of supplementary performance (remedy of defects or replacement) owed by us to our customer in each individual case. Our legal option (Section 439 [1] BGB) shall not be restricted by this.
2. Before we acknowledge or comply with a claim for defects asserted by one of our customers (including reimbursement of expenses as per Sections 445a [1], 439 [2] and [3] BGB) we will notify the Supplier by providing him with a brief account of the facts and invite him to provide his comments in writing. If he fails to submit a substantiated account within a reasonable period of time and if an amicable solution is not achieved, the claim for defect in effect granted by us shall be deemed as owed to our customer. In such case, it shall be incumbent upon the Supplier to provide evidence to the contrary.

3. Our claims for recourse against the Supplier shall also apply if the defective goods have been processed either by us or by another entrepreneur, e.g. by way of incorporation into another product.

Section 11 Statute of Limitation

1. Unless otherwise specified in the following, the mutual claims of the contracting parties shall become statute-barred in accordance with the provisions laid down by law.

2. In derogation from Section 438 [1], number 3, BGB, the general limitation period for claims for defects shall be 3 years from the passing of risk. If acceptance has been agreed, the limitation period shall commence upon acceptance. The 3-year limitation period shall apply to claims for defects of title mutatis mutandis, whereby the statutory limitation period for the claim of a third party for return in rem (Section 438 [1], number 1, BGB) shall remain unaffected; furthermore, claims for defects of title shall not become statute-barred for as long as the third party is still in the position to assert the claim against us – in particular because it is not yet statute-barred.

3. The limitation periods under the law governing the sale of goods, inclusive of the aforesaid extension, shall apply to all contractual claims for defects, to the extent permitted by law. If and to the extent that we are also entitled to non-contractual claims for damages based on a defect the standard limitation period laid down by law shall apply (Sections 195, 199 BGB), unless, in an individual case, application of the limitation periods stipulated under the law governing the sale of goods results in a longer limitation period.

Section 12 Replacement Parts

1. The Supplier undertakes to have replacement parts for the products supplied to us available for a time period of at least 15 years from delivery onwards.

2. If the Supplier intends to discontinue the production of replacement parts for the products supplied to us he will inform us of his decision to discontinue production without delay. Subject to paragraph 1 hereof the decision must be made at least 12 months before production is discontinued.
Section 12 Retention of Title, Provision of Parts, Tools, Confidentiality

1. Insofar as we provide the Supplier with parts we shall retain title to these parts. Processing and transformation by the Supplier shall be undertaken on behalf of us. If our goods subject to retention of title [German “Vorbehaltsware”] are processed with other objects that do not belong to us, we shall acquire co-ownership of the new product in proportion to the value of our goods (purchase price plus VAT) and the value of the other processed goods at the time of processing.

2. If the goods provided by us are inseparably mixed or combined with other goods that do not belong to us, we shall acquire co-ownership of the new product in proportion to the value of the goods subject to retention of title (purchase price plus VAT) and the value of the other mixed or combined goods at the time of such mixing or combining. If the goods provided by us are mixed or combined in such a way that the product of the Supplier is to be considered as the principal thing, it shall be deemed as agreed that the Supplier shall assign to us co-ownership of this product on a pro rata basis; the Supplier shall safeguard the sole ownership or co-ownership for us.

3. We reserve title to tools; the Supplier undertakes to use the tools only in order to manufacture the goods ordered by us. The Supplier undertakes to insure the tools owned by us at his own expense and at their replacement value against theft, fire and water damage. At the same time, as early as with the present, the Supplier shall assign to us all and any claims for compensation arising out of this insurance; we hereby accept the assignment. The Supplier undertakes to carry out the necessary maintenance and inspection work as well as all maintenance and repair work relating to our tools at his own expense and in a timely manner. Any incidents or malfunctions must be reported to us immediately; if the Supplier culpably fails to do so, claims for damages shall remain unaffected. The Supplier undertakes to return the tools owned by us to us upon first request. In relation to us, the Supplier shall be deemed to be a custodian without any personal title claim to our tools. Any rights of retention of the Supplier relating to such tools shall be excluded, irrespective of the legal grounds on which such claim may be based.

4. The Supplier undertakes to treat as strictly confidential all and any images, drawings, calculations and other documents and information. Such may only be disclosed to any third party with our express consent. The obligation to confidentiality shall continue after termination of this contract; it shall become extinct if and when the manufacturing know-how contained in the images, drawings, calculations and other documents provided by us has become part of the public domain.

5. Upon request of the Suppliers, we undertake to release the security rights, at our option, insofar as the security rights to which we are entitled to per paragraph 1 and/or 2 hereof exceed the purchase price of the total of our unpaid goods subject to retention of title by more than 10%.
Section 14 Compliance with Statutory Provisions

1. In the context of each delivery item or every service provided, the Supplier must ensure that all legal provisions, regulations and other rules or regulations, in particular all safety and environment-related provisions, are complied with. The provisions of the European Directives must, in particular, be complied with for all deliveries.

2. The Supplier undertakes to comply in every respect with the requirements and obligations relating to the prohibition of certain substances in accordance with the legal provisions and regulations for each single delivery item. This shall apply in particular to requirements and obligations of the REACH regulation (EC) no. 1907/2006, the RoHS directive 2011/65 EC, as amended, including the respective amendments and supplements, and their transposition into national law by the EU member states. Upon our request, the Supplier will provide us with written, product-specific declarations of conformity which shall also be valid vis-à-vis our customers and which we may pass on to our customers.

3. The Supplier undertakes to comply with the relevant export restrictions and inform us in writing and without delay at the time of the order of any official authorization requirements which may be applicable to the (re)export of his goods in accordance with German, European and US export and customs regulations and the export and customs regulations of the country of origin of his goods. The Supplier will reimburse us for all and any extra costs and other damages incurred by us as a consequence of incomplete or false information, to the extent that the Supplier is responsible thereof.

Section 15 Export Control, Import Regulations

1. If it is intended that information, products, goods, materials, services or technology (hereinafter referred to as “goods”) are to be provided to us, of which the Supplier has knowledge – or, after careful review, has reason to assume – that these are subject to restrictions under German, US or other applicable regulations (e.g. authorisation requirements, person-related or country-specific sanctions) the Supplier acknowledges and undertakes to inform us without delay and before the export, re-export, transfer, disclosure or provision of the goods subject to export control (hereinafter referred to as “controlled goods”) about such restrictions. To the extent such is known to the Supplier, the Supplier shall inform us where these are listed (e.g. on the US Commerce Control List) and which restrictions apply to the export, re-export, transfer, disclosure or provision of the controlled goods under the respective applicable regulations.

2. The Supplier shall, at his own expense, obtain and secure all and any official permits, approvals, certifications, applications, permissions or licences that the Supplier requires for export, re-export, transfer, disclosure or provision of goods under this agreement.
3. The Supplier further accepts to cooperate with us by providing us, upon request, with information and other assistance required for export qualification, export documentation and the issuance of export licences (if required) of the controlled goods.

4. In any event the Supplier shall ensure that controlled goods are not exported, re-exported, transferred, disclosed or provided without our express prior written declaration of consent.

Section 16 Assignment

The Supplier shall not be entitled to assign his claims arising out of the contractual relationship to any third party. This shall not apply to monetary claims.

Section 17 Applicable Law, Place of Jurisdiction, Place of Performance, Severability

1. All and any contracts concluded between us and the Supplier shall be governed by the substantive law of the Federal Republic of Germany, excluding the provisions of international private law and the UN Convention on Contracts for the International Sale of Goods (CISG).

2. If the Supplier discontinues his payments, a preliminary administrator is appointed or insolvency proceedings are initiated against the assets of the Supplier, we shall have the right to withdraw from the contract, either in whole or in part, or to terminate the contract. In such case, in order to continue operations, we shall be entitled to use the existing facilities or deliveries and services hitherto provided by the Supplier against payment of a reasonable remuneration.

3. If the Supplier is a registered trader with seat in the European Union, Switzerland, Norway or Iceland at the time proceedings are initiated, exclusive place of jurisdiction for all and any disputes arising out of or in connection with the business relationship between us and the Supplier shall be the place of business of our company that has placed the order. In derogation herefrom we shall however be entitled to bring an action at any other general or special legal venue.

4. To the extent that item 3 hereof is not applicable, all and any disputes arising in connection with the respective supply contract or its validity shall be settled by final and binding decision in accordance with the Rules of Arbitration of the German Arbitration Institute (Deutsche Institution für Schiedsgerichtsbarkeit e.V. (DIS)) excluding the jurisdiction of the courts. Place of arbitration shall be Heilbronn. The language of the arbitration proceedings shall be German.

5. Place of performance for all obligations arising out of the business relationship shall be the place of business of our company that placed the order.

6. Should any of the provisions of this contract be or become ineffective/void or not enforceable based on the laws on General Terms and Conditions as per Sections 305 to 310 BGB, either in whole or in part, the statutory provisions shall apply.
Should a present or future provision of the contract be or become ineffective/void or not enforceable for reasons other than the provisions relating to the laws on General Terms and Conditions as per Sections 305 to 310 BGB, either in whole or in part, such shall not affect the validity of the remaining provisions of this contract, unless the execution of the contract – also taking into consideration the following provisions – would constitute an unreasonable hardship for one of the parties. The same shall apply if a gap in need of supplementation should be found after conclusion of the contract.

Contrary to a possible principle based upon which a severability clause shall on principle only reverse the burden of proof, the effectiveness and validity of the remaining contractual provisions shall in all circumstances be maintained, i.e. Section 139 BGB shall be waived in its entirety.

The parties shall replace provisions that are ineffective/void or unenforceable or gaps in need of supplementation for reasons other than the provisions on the law on General Terms and Conditions as per Sections 305 to 310 BGB by an effective provision which in its legal and economic content corresponds to the ineffective/void or unenforceable provision as well as the overall purpose of the contract. Section 139 BGB (partial invalidity) shall be expressly excluded. If the invalidity of a provision is due to a specified measure of the performance or time (term or deadline) the provision shall be redefined using a measure that is legally permitted and that approaches the originally intended measure as closely as possible.
**General operating manual**  
for assembly, commissioning and maintenance of valves and hydraulic manifolds

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Important information

Range of validity of the operating manual
The present general operating manual exclusively refers to hydraulic components (in particular valves, manifolds, pressure sensors etc; referred to as valves in the following; but also analogously applies to electronic components) from WEBER-HYDRAULIK ValveTech GmbH. The following operating manual is aimed at the operator of the valves and the installation manufacturer and user. Among other things, it contains important safety information that should be known by the operator of the valves.

The indications of this general operating manual are to be inserted in the operating manual of the superordinate complete system. This operating manual should be kept accessible and always close to the valve or the superordinate machine installation.

Liability declaration
The declarations on liability for defects and claims for damages are listed in the general terms and conditions of WEBER-HYDRAULIK ValveTech GmbH. These are available to the customer at the latest since the conclusion of the contract.

Liability exclusion
The general terms and conditions apply. Among others, warranty and liability claims for personal and property damages are excluded if they can be traced back to one or more of the following causes:
- inappropriate use of the valve
- inadequate assembly, disassembly, commissioning and maintenance of the valve
- disregarding the operating manual
- disregarding the technical specifications of the valve
- unauthorized constructive modifications of the valve
- inappropriately conducted repairs
- action of foreign objects and acts of God

WEBER-HYDRAULIK ValveTech does not accept liability for incorrect, incomplete or missing information. We reserve the right to modifications.

Intended use
The commissioning, application and use of the valves may only occur as described in this operating manual. The valves may only be operated as components of a superordinate complete system, e.g. a machine installation and only in industrial domains as per the DIN EN ISO 4413 standard (Fluidics - General rules and safety-technical requirements towards hydraulic installations and their components).

The valves are not approved for the use in any of the following applications without the explicit written consent of WEBER-HYDRAULIK ValveTech:
- nuclear facility applications
- ordnance equipment
- aircraft or aerospace applications
- steering or braking systems for vehicles
**Intended use**

- amusement rides (e.g. rollercoaster)
- in explosive or hazardous environments, unless it is explicitly allowed by an indication of ATEX conformity

The valves are only planned for the use with hydraulic oils based on mineral oil under observation of the filtering requirements and the respective max. operating pressures, volumetric flows and temperatures (see respective data sheet of the valves). The use with other fluids is subject to the agreement of WEBER-HYDRAULIK ValveTech. Any use beyond this is not admissible.

The type label may not be removed or painted over.

All valves are checked by WEBER-HYDRAULIK ValveTech before delivery. Non-verified valves may not be installed.

**Responsibility of the operator**

The operator and user of the valves is responsible for the correct use. Indications in this operating manual pertaining to use, commissioning, storage and maintenance of the valves are thereby to be respected. The manufacturer and operator of the superordinate complete system, e.g. a machine installation, is responsible for the compliance with the applicable national and international safety and accident prevention measures for the specific application.

**Selection and qualification of personnel**

All works with or on the valves must be performed by trained and instructed persons with the required knowledge and experience.

Works on electrical connections and electronic components may only be performed by an authorized expert electrician.

**Explanation of symbols**

Safety indications in this operating manual are marked with a symbol. The individual indications are introduced by signal words that express the extent of the danger. Indications on avoidance of dangers follow.

**DANGER**

Indicates the immediate risk of death and serious bodily harm.

**WARNING**

Indicates the risk of serious injury.

**CAUTION**

Indicates the risk of slight injury or material damages.
Important safety instructions

Following the safety indications and the applicable national and international safety directives helps in avoiding accidents, faults and errors.

When designing machines and using valves, the application-specific safety and accident prevention directives are to be respected, such as e.g. DIN EN ISO 12100 (Safety of machines general design guidelines, risk assessment and risk reduction) or DIN EN ISO 4413 (Fluidics - General rules and safety-technical requirements towards hydraulic installations and their components).

DANGER
Risk of death or injury due to squirting hydraulic oil under high pressure.

- Before working on valves, release pressure from hydraulic installation.
- Check pipes, tubes and screw connections of the hydraulic installation regularly.
- Immediately remedy leaks.
- Do not modify valves.

WARNING
Health hazard through skin contact with or swallowing of hydraulic oils.

- Before working on valves, drain reservoirs which are located on a higher level.
- If hydraulic oil was swallowed or has entered the bloodstream, immediately contact a physician. Do not induce vomiting. If necessary, bind limbs.

WARNING
Health hazard due to inhalation of oil mist.

- Do not directly inhale oil mists, carry respiratory protection if necessary.

CAUTION
Danger of contamination of water and soil by leaking hydraulic oil.

- Use collection containers.
- Dispose hydraulic oil adequately.
- Immediately remedy leaks.

CAUTION
Damages to the valve due to immersion in liquids.

- Do not plunge valves in liquids.

NOTE
When manipulating hydraulic oils, the respective safety regulations applicable for the product must be observed.
Transportation and storage

Packaging and transportation
- Carefully pack and unpack the valves.
- Immediately notify any transportation damages to the transporter and WEBER-HYDRAULIK ValveTech in writing.
- Keep the original packaging.
- Only transport valves in adequate closed original packaging.
- Always transport valves with dust protection.

Storage conditions
- Storing the valves:
  - at low air humidity (<65%)
  - at temperatures from -10 to +60°C
  - without direct heat sources or sunlight
  - without exposure to ozone or ionizing radiation
  - only in adequate closed original packaging
  - always with dust protection

WEBER-HYDRAULIK ValveTech valves are usually checked with hydraulic oil in the factory and thereby protected against corrosion. If the valves were stored for more than 1 year, check for damages before assembly. If necessary, the valves can be sent to WEBER-HYDRAULIK ValveTech for inspection at added costs.
- Store seals (NBR) for max. 7 years.

NOTE
Oil residues can lead to resinification on the valves due to longer storage times.
- Remove any resinification before use.

Assembly and commissioning
The commissioning, application and use of the valves may only occur as described in this operating manual.

DANGER
Serious injury, burns or fires due to squirting hydraulic oil.

Before all works on the valves:
- Turn off the machine.
- Protect the machine against switching back on:
  - Lock main command installation and pull out key.
  - Append warning sign on the main switch.
- Switch off voltage to all lines in the hydraulic circuit.
- Release pressure from all pressure pipes and accumulators in the hydraulic circuit.
NOTE

For correct bleeding of the hydraulic installation, observe the respective operating manual of the machine installation.

CAUTION

Risk of burns due to very hot valves and hydraulic connection tubes.
- Carry adequate work protection equipments (work gloves, protective goggles).
- Let all components cool off before beginning work.

Assembly conditions

- Ensure that valves or valve components remain undamaged.
  - Do not install damaged valves or valve components!
- Ensure that all seals are available and undamaged.
  - Do not install damaged seals!
- Do not directly assemble valves onto machine parts that are exposed to strong vibrations or shocks.
- Do not install valves on units that move in a jerky fashion and that do not correspond to the direction of movement of the piston.
- Assemble the valve so that no thermal overheating may occur.

Assembly

- Thoroughly clean the assembly surface/screw holes.
- Remove dust protection from the hydraulic connection.
- Assemble seals.
- Attach valve.
- Observe installation torques in the data sheet of the respective valve.
- **Slip-in valve**: tighten assembly screws in a non-distorted manner. Tighten screws crosswise.
- **Cartridge-valve**: tighten the valve at the screwing hexagon.
- Determine switch position of the valve.

NOTE

When installing valves with electrical connections or electronic components, observe the applicable directive (VDE directives or similar).
The valves are components of a superordinate complete system.

**Operation**
- In order to operate this system or the superordinate machine installation, observe the corresponding operating manual.

**Decommissioning/disassembly**
- Ensure that the hydraulic installation is pressure-less and at zero potential. If necessary, observe available pressure accumulators.
- Ensure that no components come loose or may move when letting off hydraulic oil.
- Disconnect connection lines.
- Collect exiting hydraulic oil with a container.
- Secure components that are to be held in position by the valves.
- Unscrew assembly screws of the valve.
- Remove valve and seals.

**Maintenance and repairs**
Replacement components and sealing kits may be obtained from WEBER-HYDRAULIK ValveTech. Only use the sealing kits indicated on the data sheet of the valve.

**Exchange seals**
- Disassemble valves.
- Remove all seals and dispose them adequately.
- If necessary, clean valve.
- Carefully insert new seals and ensure fitting accuracy.
- Re-attach valve. Thereby ensure that no seal slips out of place.
- Observe installation torques in the data sheet of the respective valve.
- Tighten assembly screws in a non-distorted manner crosswise or tighten the valve at the screwing hexagon.
- Determine switch position of the valve.

**Damages/Faults**
- Immediately notify the responsible person in case of damages or faults on valves or on the machine installation.
- If necessary, switch off the machine installation and secure it.

Repairs and modifications or retrofit of valves are to be exclusively performed by WEBER-HYDRAULIK ValveTech.

**Disposal**
- Disassemble valves.
- Drain valve until no more hydraulic oil drips out.
- Collect hydraulic oil and dispose it adequately.
- Dispose the seals appropriately.
- Dispose the valve as metal waste.
- Dispose electronic components adequately as per the applicable regulations.
Errors and troubleshooting

Leaks
☐ If leaks occur, stop the machine.
☐ Check the causes of the leaks by trained expert personnel.
☐ If the valve is leaky, exchange the seals or the complete valve.
☐ Do not operate the machine further with faulty valves!

Other
☐ Contact customer service.

Technical Data
☐ The technical data may be found in the corresponding data sheets/dimension sheets of the valves.
Port patterns
NG 3 to NG 25

NOTE
- Screw-in depth of mounting screws:
  steel: approximately 1,0 - 1,3 x d
  cast: approximately 1,3 - 1,5 x d
  aluminium: approximately 1,5 - 2,0 x d
  (d = diameter of thread)
- surface roughness at sealing area: Rz = 6,3

NG 3
(company standard)

NOTE
Most sandwich- and top-mount bodies have a second T-port (bottom right), unlike most subplates, which usually just have one T-port.
NG 3 compact

HE2/13 17 12

NG 4 compact

HE2/13 44 01
NG 4
ISO 4401-02-01*

* Deviation from norm: without drilling G

HE4/14 09 02

NG 6
DIN 24340 A06
ISO 4401-03-02*
CETOP 3*

* Deviation from norm: without drilling G
** Deviation from CETOP 3

HE4/14 09 03
**NOTE** Most sandwich- and top-mount bodies have a second T-port (bottom right), unlike most subplates, which usually just have one T-port.

---

**NG 16**

*DIN 24340 A16*  
*ISO 4401-07-07*  
*CETOP 7*

* Deviation from DIN 24340 A16 and ISO 4401-07-07: without drilling L

** Deviation from DIN 24340 A16 and ISO 4401-07-07

*** Deviation from CETOP 7
NG 25

DIN 24340 A25*
ISO 4401-08-08*
CETOP 8

* Deviation from DIN 24340 A25 and ISO 4401-08-08: without drilling L

** Deviation from DIN 24340 A25 and CETOP 8

*** Deviation from CETOP 8

HE4/14 09 06
Valve cavities
2-way designs

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<tr>
<td>Cavity T-16A</td>
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</table>

NOTE:
PT = reaming depth
AS = locating shoulder
\[ a / \sqrt{Rz,3} \]

General tolerances to DIN ISO 2768-1 f; H
Cavity EPDBD 03

Y (2:1)

Z (2:1)

Cavity EPDBD 05

Y (2:1)

Z (2:1)
Cavity PVDE2-11

Cavity SMSVP

HE4/14 11 04

HE4/14 10 03
Cavity MSVT

Y (2:1)

Z (2:1)

Cavity DBT

X (2:1)

Y (2:1)

Z (2:1)
Cavity EDB

X (2:1)

Y (2:1)

Z (2:1)

Cavity DBG1

Y (2:1)

Z (2:1)
Cavity DBG4

Y (2:1)

Z (2:1)

Cavity DB12-FT

X (2:1)

Y (2:1)

Z (2:1)
Cavity DRV

Cavity RKR

Cavity RHR
Cavity RBR

Z (2:1)

![Diagram of Cavity RBR]

<table>
<thead>
<tr>
<th>size G</th>
<th>Ø D max.</th>
<th>Ø F (+0,1)</th>
<th>H max.</th>
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</thead>
<tbody>
<tr>
<td>G 1/4“</td>
<td>7 mm</td>
<td>11,6 mm</td>
<td>3 mm</td>
</tr>
<tr>
<td>G 3/8“</td>
<td>9 mm</td>
<td>15,1 mm</td>
<td>3 mm</td>
</tr>
<tr>
<td>G 1/2“</td>
<td>12 mm</td>
<td>18,8 mm</td>
<td>3 mm</td>
</tr>
</tbody>
</table>

Cavity RBS1

Z (2:1)

![Diagram of Cavity RBS1]

<table>
<thead>
<tr>
<th>size G</th>
<th>H min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G 1/4“</td>
<td>11 mm</td>
</tr>
<tr>
<td>G 3/8“</td>
<td>11 mm</td>
</tr>
<tr>
<td>G 1/2“</td>
<td>15 mm</td>
</tr>
<tr>
<td>G 3/4“</td>
<td>16 mm</td>
</tr>
<tr>
<td>M 18 x 1,5</td>
<td>11 mm</td>
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</table>

Cavity VCD

![Diagram of Cavity VCD]

<table>
<thead>
<tr>
<th>size G</th>
<th>H min.</th>
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<tbody>
<tr>
<td>G 1/4“</td>
<td>22 mm</td>
</tr>
<tr>
<td>G 3/8“</td>
<td>23 mm</td>
</tr>
<tr>
<td>G 1/2“</td>
<td>27 mm</td>
</tr>
<tr>
<td>G 3/4“</td>
<td>31 mm</td>
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</table>
Cavity VCL

<table>
<thead>
<tr>
<th>Size G</th>
<th>Ø D min.</th>
<th>H min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>G 1/4&quot;</td>
<td>8 mm</td>
<td>5 mm</td>
</tr>
<tr>
<td>G 3/8&quot;</td>
<td>11 mm</td>
<td>5 mm</td>
</tr>
<tr>
<td>G 1/2&quot;</td>
<td>14 mm</td>
<td>5 mm</td>
</tr>
</tbody>
</table>

H64/14 21 02

Cavity VCM

HE4/10 08 02
Cavity STO/DBT2

Cavity STE
Cavity STD

Y (2:1)

\( \phi 11,1^{\circ} 5^\circ \)

Z (2:1)

\( \phi 11,1^{\circ} 5^\circ \)

Cavity KK-M14

Cavity KK-M14 x 1.5 K
for couplings with short pin

Cavity KK-M14 x 1.5 L
for couplings with long pin

HE4/09 18 08

HE4/07 22 01
Cavity C-10-2

X (2:1)

Y (2:1)

Z (2:1)

Cavity T-3A

X (2:1)

Y (2:1)

Z (2:1)

HE4/14 10 04

HE4/14 09 12
Cavity T-5A

X (2:1)

Y (2:1)

Z (2:1)

HE4/14 09 13
Cavity T-8A

X (2:1)

Y (2:1)

Z (2:1)

Cavity T-10A

X (2:1)

Y (2:1)

Z (2:1)
**Cavity T-13A**

X (2:1)

- 0.03
- 0.02
- 0.02
- 0.02
- 0.25max

Y (2:1)

- 0.02
- 0.02
- 0.25max

Z (2:1)

- 0.02
- 0.02
- 0.25max

---

**ValveTech | 110420_cavities2_e**

Valve cavities

---

**HE4/14 09 20**
Cavity T-16A

X (2:1)

Y (2:1)

Z (2:1)

HE4/14 10 01

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Valve cavities
3-way designs

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<td>4</td>
</tr>
<tr>
<td>Cavity T-2A</td>
<td>5</td>
</tr>
</tbody>
</table>

**NOTE**

\( a = \sqrt{Rz6.3} \)

PT = reaming depth

Cavity FTRW-2,5

NOTE: 

- \( a = \sqrt{Rz6.3} \)
- PT = reaming depth
Valve cavities

Cavity FTRW-5

Z (2:1)

30°

R0.4

Cavity EEPROMD3-04

Z (2:1)

30°

R0.5

M4x9/13

HE4/14 31 16

HE4/14 10 06

GEAEND.
Cavity SMSV6

X (2:1)

Y (2:1)

Z (2:1)

Cavity M(S)V3/2

X (2:1)

Y (2:1)

Z (2:1)
Cavity T-2A

X (2:1)

Y (2:1)

Z (2:1)

R0.8

R0.8

777.0017

HE4/14 09 08

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Manual overrides
Designs

**Characteristics**
- manual override works directly on the solenoid
- available as lockable or not lockable versions
- lockable versions for mechanical standard settings of the valve
- for cases of disturbance or implementing

**NOTE**
You can check the available manual overrides for the particular valves in the type code on the datasheet of each valve.

**NOTE**
The pictures exemplify the designs of the manual overrides. The connections to the solenoid may vary according to the different sizes of the valves.

**Manual override with push pin**
*NH (H402)*
- not lockable
- for operation the internal pin has to be pushed with a pointed object
- when releasing the pin, it switches back into the basic position
- not for continuous operation

---

HE4/124818
Manual overrides

*Manual override with push knob*
*DNH (H405)*

- not lockable
- for operation the knob has to be pushed
- when releasing the knob, it switches back into the basic position
- not for continuous operation

*Manual override with lock nut*
*FNH (H301)*

- lockable with screw
- suitable for mechanical standard settings
Manual override with lock nut and hand-wheel

- lockable with hand-wheel
- suitable for mechanical standard settings

Manual override with lock nut and hand-wheel

H302
**Electrical connectors**

**Designs**

*NOTE* You can check the available connectors for the particular valves in the type code on the datasheet of each valve.

**Connector DIN 43650 shape A and B**

For round solenoid bodies.

**Connector AMP Junior Timer**

For round solenoid bodies.
Connector AMP
Junior Timer

For rectangular solenoid bodies.

Connector Deutsch
DT04-2P

Only available for rectangular solenoid bodies.

Uterminated wire
300 mm
Test conditions and standards
valid for WEBER-HYDRAULIK ValveTech valves

Test conditions

- unless otherwise noted, all tests are made with hydraulic oil after DIN 51524 type HLP 32 or HLVP 32
- Oil temperature 40°C ± 3°C
- Viscosity 32 cSt
- Purity level (DIN EN ISO 4406) 16/14/11 or better

Applied standards

- Fluid technology: DIN EN ISO 4413
- Hydraulic oil: DIN 51524
- Filtration: ISO 4406
- Protection classes (IP...): EN 60529