

Solenoid operated poppet valve

Flange construction

- ◆ 2/2-, 3/2- und 3/4-way
- ◆ normally open and normally closed
- ◆ $Q_{max} = 15 \text{ l/min}$
- ◆ $P_{max} = 350 \text{ bar}$

DESCRIPTION

Direct operated 2/2-, 3/2 and 3/4-way solenoid poppet valve in sandwich construction. By means of the pressure tight switching solenoid, the poppet valve spool is opened or closed acting against the spring. Due to the poppet spool construction with pressure compensation on both sides, the flow through the valve is possible in both directions. The metallic sealing seat closes the valve virtually leak free. The pressure tight encapsulated Ex-protection solenoid coil prevents an explosion on the inside penetrating to the outside as well as an ignitable surface temperature.

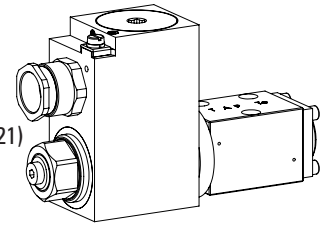
CERTIFICATES

| | Surface | Mining | Standard -25 °C to... | Z604 -40 °C to... |
|--------------|---------|--------|--------------------------|----------------------|
| ATEX / UKEX | x | x | x | x |
| IECEx | x | x | x | x |
| CCC | x | x | x | x |
| EAC | x | x | x | x |
| Australia | x | x | x | x |
| MA | | x | x | |
| USA / Canada | x | | x | x |
| PESO | x | | x | x |

The certificates can be found on www.wandfluh.com

NG4-Mini Wandfluh standard

Ex db IIC T6, T4 Gb (Zone 1)
 Ex tb III C T80 °C, T130 °C Db (Zone 21)
 Ex db I Mb
 ⓧ II 2 G Ex db IIC T6, T4
 ⓧ II 2 D Ex tb III C T80 °C, T130 °C
 ⓧ I M2 Ex db I Mb
 Class I, Division 1, Group A, B, C, D T4
 Class II & III, Division I, Group E, F, G T4



APPLICATION

These valves are suitable for applications in explosion-hazard areas, open cast and also in mines. Poppet valves are used where tight closing functions of the valve are essential like leakage-free load holding, clamping or gripping. Miniature valves are used where both, reduced dimensions and weight are important.

ACTUATION

| | |
|------------|---|
| Actuation | Switching solenoid, wet pin push type, pressure tight |
| Execution | MKY45 / 18x60 (data sheet 1.1-183) |
| Connection | Cable gland for cable Ø 6,5... 14 mm |

Attention! The UC execution is always supplied without cable gland

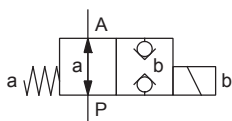


STANDARDS

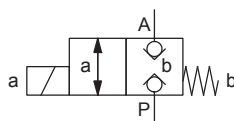
| | |
|--------------------------|---------------------------------|
| Explosion protection | Directive 2014 / 34 / EU (ATEX) |
| Flameproof enclosure | EN / IEC / UL 60079-1, 31 |
| Cable entry | EN 60079-0, 1, 7, 15, 31 |
| Mounting interface | Wandfluh standard |
| Protection class | EN 60 529 |
| Contamination efficiency | ISO 4406 |

SYMBOL

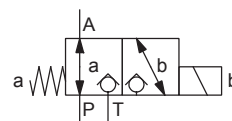
B.22040b



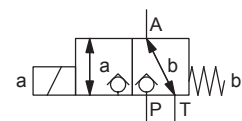
B.22041a



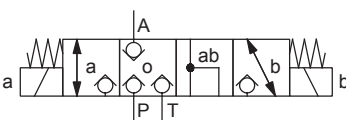
B.32040b



B.32041a



B.3404



TYPE CODE

| | | | | |
|---|-----------------------------|-------------------------------|---------------------------------|---|
| 2/2 or 3/2 way execution | | B Exd | <input type="checkbox"/> 2 04 | <input type="checkbox"/> - <input type="checkbox"/> / <input type="checkbox"/> / <input type="checkbox"/> - <input type="checkbox"/> # <input type="checkbox"/> |
| 3/4 way execution | | B Exd | <input type="checkbox"/> 3 4 04 | <input type="checkbox"/> - <input type="checkbox"/> / <input type="checkbox"/> / <input type="checkbox"/> - <input type="checkbox"/> # <input type="checkbox"/> |
| Mounting interface according to Wandfluh standard | | | | |
| Explosion-proof execution, Ex d | | | | |
| 2 way (connections) | <input type="checkbox"/> 2 | | | |
| 3 way (connections) | <input type="checkbox"/> 3 | | | |
| 2 switching positions | | | | |
| 4 switching positions | | | | |
| Nominal size 4-Mini | | | | |
| Normally closed | Solenoid on A-side | <input type="checkbox"/> 1a | | |
| Normally open | Solenoid on B-side | <input type="checkbox"/> 0b | | |
| Nominal voltage U _N | 12 VDC | <input type="checkbox"/> G12 | 115 VAC | <input type="checkbox"/> R115 |
| | 24 VDC | <input type="checkbox"/> G24 | 230 VAC | <input type="checkbox"/> R230 |
| Nominal power P _N | 9 W | <input type="checkbox"/> L9 | Ambient temperature up to: | |
| | 15 W | <input type="checkbox"/> L15 | 40 °C or 90 °C | |
| | | | 70 °C | |
| Certification | ATEX, UKEX, IECEx, EAC, CCC | <input type="checkbox"/> | USA / Canada | <input type="checkbox"/> UC-M187 |
| | Australia | <input type="checkbox"/> AU | India | <input type="checkbox"/> PE |
| | MA | <input type="checkbox"/> MA | | |
| Sealing material | NBR | <input type="checkbox"/> | | |
| | FKM (Viton) | <input type="checkbox"/> D1 | | |
| | NBR -40° C | <input type="checkbox"/> Z604 | (only with 15 W) | |

Design index (subject to change)

1.11-3132

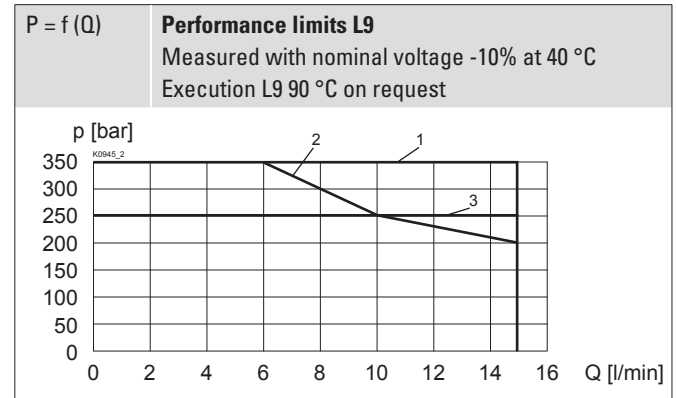
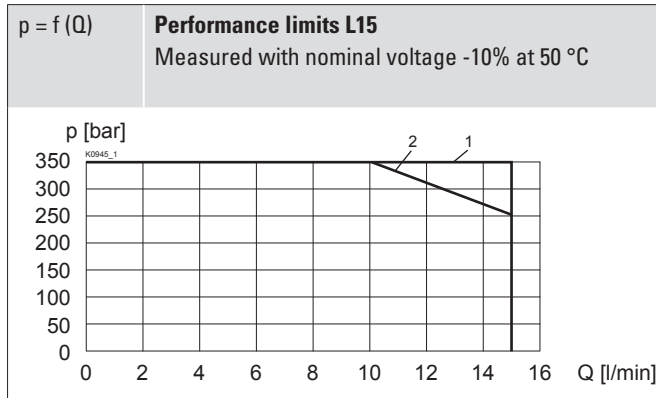
GENERAL SPECIFICATIONS

| | |
|---------------------|--|
| Designation | 2/2-, 3/2- and 3/4-way poppet valve |
| Construction | Direct operated |
| Mounting | Flange construction |
| Nominal size | NG4-Mini according to Wandfluh standard |
| Actuation | Ex-protection switching solenoid |
| Ambient temperature | Operation as T6 -25...+40 °C (L9) Operation as T4 -25...+90 °C (L9) -25...+70 °C (L15) -40...+70 °C (L15) |
| Weight | 3,2 kg (2/2- and 3/2-way) 5,0 kg (3/4-way) |
| MTTFd | 150 years |

HYDRAULIC SPECIFICATIONS

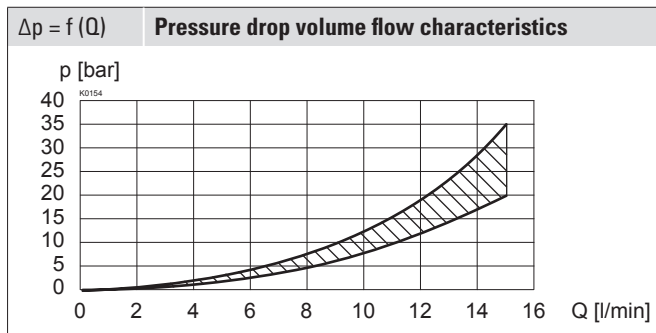
| | |
|--------------------------|--|
| Working pressure | p _{max} = 350 bar |
| Maximum volume flow | Q _{max} = 15 l/min, see characteristic |
| Volume flow direction | Any (see characteristic) |
| Leakage oil | Poppet type, max. 0,05 ml / min (approx. 1 drop / min) at 30 cSt |
| Fluid | Mineral oil, other fluid on request |
| Viscosity range | 12 mm ² /s...320 mm ² /s |
| Temperature range fluid | Operation as T6 NBR -25...+40 °C (L9) FKM -20...+40 °C (L9) Operation as T4 NBR -25...+70 °C (L9 or L15) FKM -20...+70 °C (L9 or L15) NBR 872 -40...+70 °C (L15) |
| Contamination efficiency | Class 20 / 18 / 14 |
| Filtration | Required filtration grade β 10...16 ≥ 75, see data sheet 1.0-50 |


PERFORMANCE SPECIFICATIONS


 Oil viscosity $\nu = 30 \text{ mm}^2/\text{s}$


| Type | Flow direction | | | |
|------------|----------------|-------|-------|-------|
| | P - A | A - T | A - P | T - A |
| BEXd22041a | 1 | - | 1 | - |
| BEXd22040b | 1 | - | 1 | - |
| BEXd32041a | 1 | 1 | 2 | 1 |
| BEXd32040b | 1 | 1 | 1 | 1 |
| BEXd3404 | 1 | 1 | 1 | 1 |

| Type | Flow direction | | | |
|------------|----------------|-------|-------|-------|
| | P - A | A - T | A - P | T - A |
| BEXd22041a | 1 | - | 1 | - |
| BEXd22040b | 1 | - | 2 | - |
| BEXd32041a | 1 | 2 | 1 | 1 |
| BEXd32040b | 1 | 1 | 3 | 1 |
| BEXd3404 | 1 | 1 | 1 | 1 |



Note!  With the L15 execution for ambient temperatures up to 70 °C, the performance specifications have been evaluated with an ambient temperature of 50 °C

Attention!  Long periods of non-actuation can reduce the switching performance

SURFACE TREATMENT

- ◆ The valve body is painted with a two component paint
- ◆ The cover, the slip-on coil and the armature tube are zinc-nickel coated

VALVES INSTALLED

The central functioning element is the poppet valve cartridge NG4, data sheet 1.11-2020.

ELECTRICAL SPECIFICATIONS

| | |
|--------------------------|--|
| Protection class | IP67 |
| Relative duty factor | 100 % DF |
| Switching frequency | 12'000 / h |
| Voltage tolerance | ± 10 % with regard to nominal voltage |
| Standard nominal voltage | 12 VDC, 24VDC, 115 VAC, 230 VAC AC = 50 to 60 Hz ± 2 %, with built-in two-way rectifier |
| Standard nominal power | 9 W, 15 W, 17 W |
| Temperature class | Nominal power 9 W: T1...T6 Nominal power 15 W / 17 W: T1...T4 |

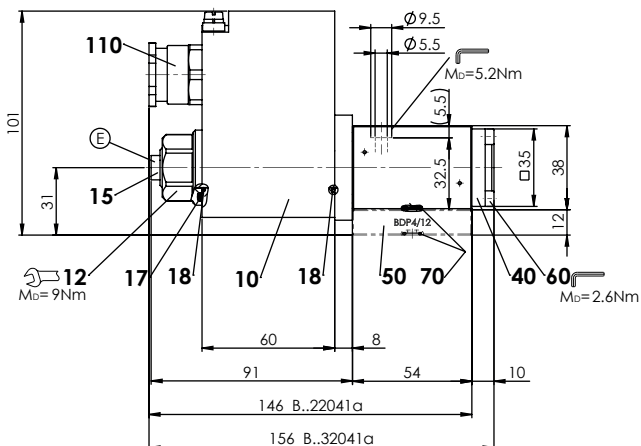
Note!  Other electrical specifications see data sheet 1.1-183

SEALING MATERIAL

NBR or FKM (Viton) as standard, choice in the type code

DIMENSIONS

3/2-; 2/2-way

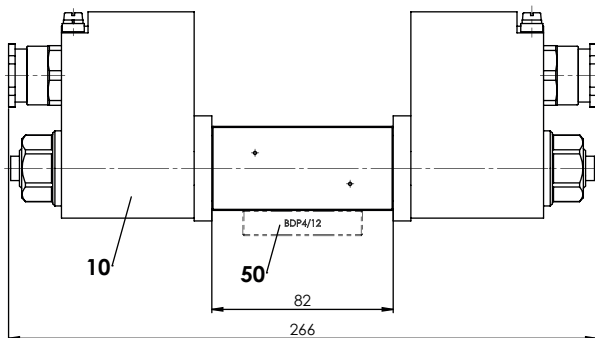


E = Air bleed screw

Dimensions of the solenoid coil see data sheet 1.1-183

The distance plate BDP4/12 has to be ordered separately

3/4-way


PARTS LIST

| Position | Article | Description |
|----------|----------|-----------------------------------|
| 10 | 263.6... | Solenoid coil MKY45 / 18 x 60 |
| 12 | 154.2603 | Knurled nut Ex M18 x 1,5 x 18 |
| 15 | 239.2033 | Screw plug HB0 (incl. seal) |
| 17 | 160.2251 | O-ring ID 25,07 x 2,62 (NBR) |
| 18 | 160.2170 | O-ring ID 17,17 x 1,78 (NBR) |
| 40 | 057.4201 | Cover |
| 50 | 173.1450 | Distance plate BDP4 / 12 |
| 60 | 246.1113 | Socket head screw M4 x 12 DIN 912 |
| 70 | 160.2052 | O-ring ID 5,28 x 1,78 (NBR) |
| | 160.6052 | O-ring ID 5,28 x 1,78 (FKM) |
| 110 | 111.1080 | Cable gland M20 x 1,5 |

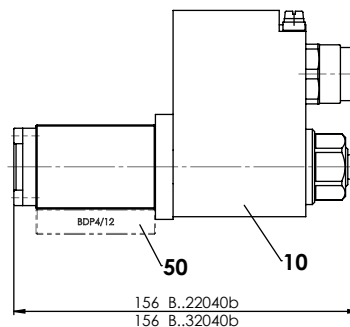
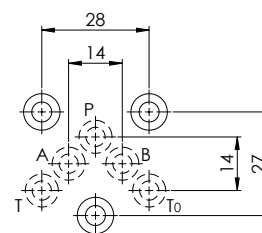
COMMISSIONING

Attention! When commissioning, the valve must be vented under pressure (max. two rotations of screw E).



The solenoid coil must only be put into operation, if the requirements of the operating instructions supplied are observed to their full extent. In case of non-observance, no liability is assumed.

3/2-; 2/2-way


HYDRAULIC CONNECTION

MANUAL OVERRIDE

Screw plug (HB0), no actuation possible

Optionally: HB4,5, HN(K) or HG(K)

→ See data sheet 1.1-311

ACCESSORIES

| | |
|----------------------------|--------------------|
| Fixing screws | Data sheet 1.0-60 |
| Threaded subplates | Data sheet 2.9-05 |
| Multi-station subplates | Data sheet 2.9-45 |
| Horizontal mounting blocks | Data sheet 2.9-85 |
| Technical explanations | Data sheet 1.0-100 |
| Hydraulic fluids | Data sheet 1.0-50 |
| Filtration | Data sheet 1.0-50 |
| Relative duty factor | Data sheet 1.1-430 |

INSTALLATION NOTES

| | |
|-------------------|---|
| Mounting type | Flange mounting 3 fixing holes for socket head screws M5 x 40 or M5 x 50 (with distance plate BDP4/12) |
| Mounting position | Any, preferably horizontal |
| Tightening torque | Fixing screws $M_0 = 5,2 \text{ Nm}$ (screw quality 8.8, zinc coated) $M_0 = 5 \text{ Nm}$ knurled nut |

Note!


The length of the fixing screw depends on the base material of the connection element.

Attention!


For stack assembly please observe the remarks in the operating instructions