

Spool valve

Flange construction

- ◆ pilot operated
- ◆ 4/2-way impulse execution detented
- ◆ 4/3-way with spring centred mid position
- ◆ 4/2-way with spring reset
- ◆ $Q_{max} = 160 \text{ l/min}$
- ◆ $p_{max} = 350 \text{ bar}$

DESCRIPTION

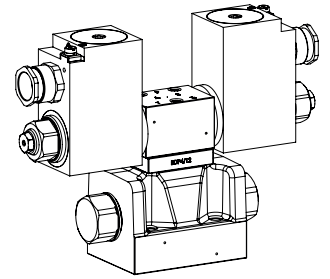
Pilot operated 4-way valve in a 5 chamber system. The control of the pilot valve takes place electrically. Very compact construction with corresponding low weight. The hydraulic control of the pilot valve can be internal or external via an additional connection plate or the mounting interface depending on the type of pilot operation. Spool detented or with spring reset.

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.

NG10

ISO 4401-05

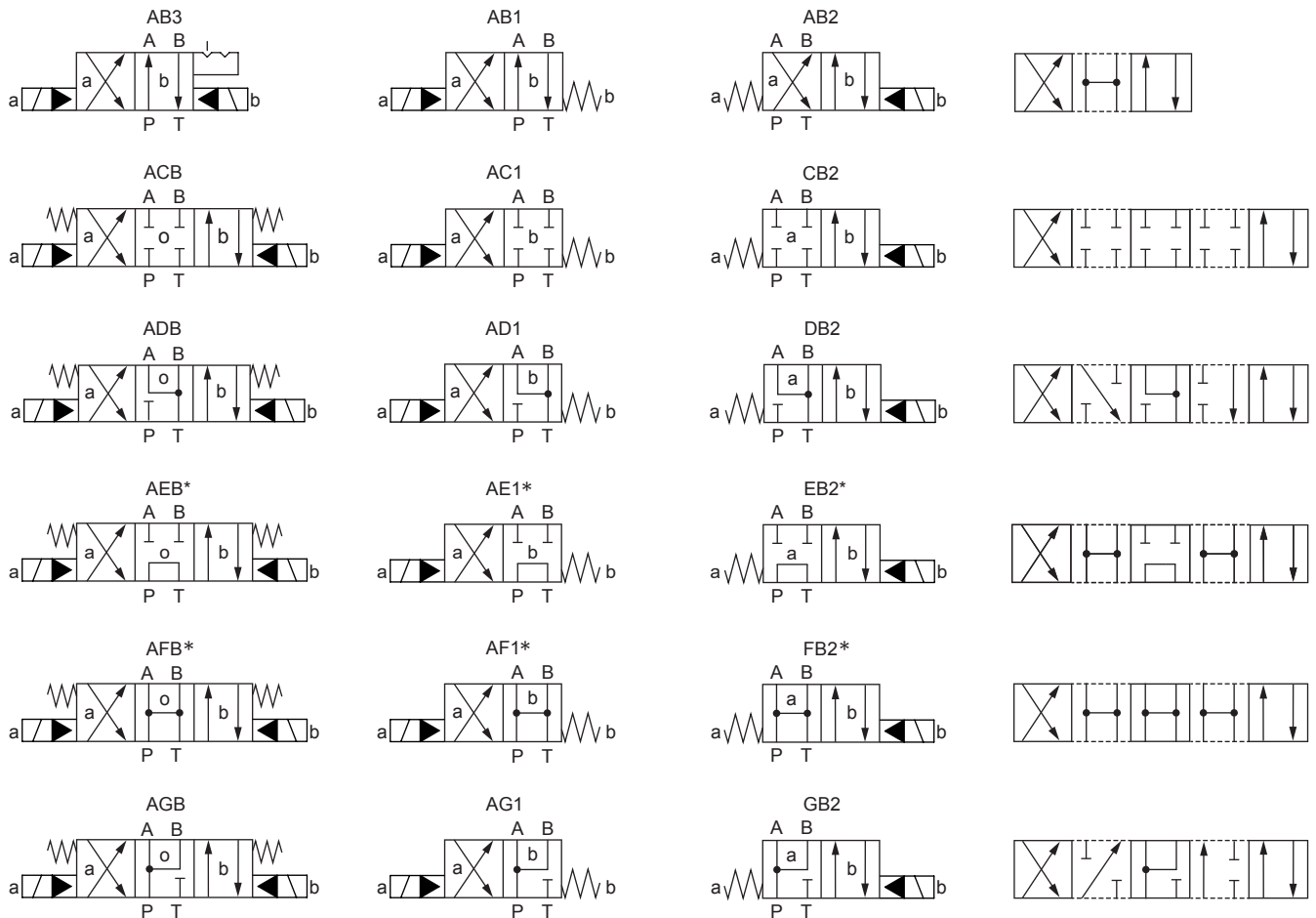
- ⊕ II 2 G Ex db IIC T6, T4
 - ⊕ II 2 D Ex tb III C T80 °C, T130 °C
 - ⊕ I M2 Ex db I Mb
- Class I Division 1
 Class I Zone 1



APPLICATION

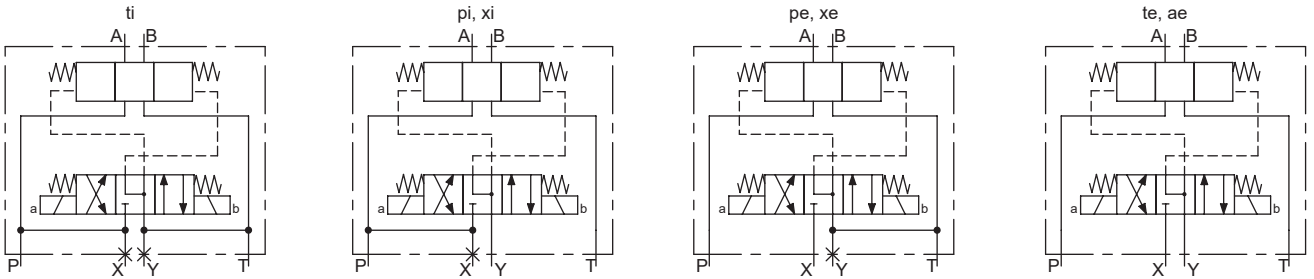
Spool valves are mainly used for controlling direction of movement and stopping of hydraulic cylinders and motors. The direction of movement is determined by the position of the spool and its symbol. Pilot operated valves are used where large volume flows have to be controlled. Switching performance and leakage of the valves must be taken into account when designing the system. Solenoid spool valves are suitable for machine tools and handling systems of any kind.

SYMBOL



* When the connections P and T are connected in the middle position, a back pressure cartridge is built in as standard in the case of internal pilot oil supply (ti/pi). If this back pressure valve is not used (0, according to the type code), it must be ensured that a pilot pressure of minimum 4 bar is present. The pressure difference of this cartridge has to be added to the pressure difference of the main valve (see characteristics) which results in an overall value. Pilot control type xi is not available with a back pressure cartridge.

Types of pilot operation



TYPE CODE

WVY F A10 - - - - / - #

Spool valve, pilot operated, explosion proof

Flange construction

International standard interface ISO NG10

Designation of symbols acc. to table

Back pressure cartridge Standard
only symbols AEB and AFB
without back pressure cartridge see notes
Section symbols

Type of pilot operation:
Control oil Supply (x) and drain (y)
(x) and (y) internally via control plate: ti
(x) and (y) externally: te
(x) internally (y) externally: pi
(x) externally (y) internally: pe
via mounting interface:
(x) and (y) externally: ae
(x) internally (y) externally: xi
(x) externally (y) internally: xe

Nominal voltage U_N 12 VDC G12 115 VAC R115
 24 VDC G24 230 VAC R230

Nominal power P_N 9 W L9 Ambient temperature up to:
 15 W L15 40 °C or 90 °C
 17 W L17 70 °C
 70 °C (only UL / CSA)

Certification ATEX, IECEx, CCC, EAC
 Australia AU UL / CSA UL
 MA MA

Sealing material NBR
 FKM (Viton) D1

Dampening orifices
in control connections A and B without orifice
 orifice Ø 0,5 mm Q 0,5 Provide for control pressure above 100 bar

Design index (subject to change)

1.9-38

GENERAL SPECIFICATIONS

| | |
|---------------------|--|
| Designation | 4/2-, 4/3-spool valve |
| Mounting | Flange construction |
| Nominal size | NG10 according to ISO 4401-05 |
| Actuation | Electrical |
| Ambient temperature | Operation as T6 -25...+40 °C (L9) Operation as T4 -25...+90 °C (L9) -25...+70 °C (L15 / L17) -40...+70 °C (L15 / L17) |
| Weight | 5,1 kg (1 solenoid) 6,8 kg (2 solenoids) 0,3 kg control plate 0,17 kg spacer plate |
| MTTFd | 150 years |

HYDRAULIC SPECIFICATIONS

| | |
|--------------------------|--|
| Working pressure | $p_{max} = 350$ bar |
| Tank pressure | $p_{Tmax} = 160$ bar (type of pilot operation te, pi, ae and xi) $p_{Tmax} = 100$ bar (type of pilot operation ti, pe and xe) |
| Pilot pressure | p_{vmin} : 8...14 bar, see performance limits $p_{vmax} = 350$ bar for connection X (control plate) $p_{vmax} = 200$ bar for connection X (mounting interface) |
| Pressure pilot oil drain | minimum lower by p_{vmin} |
| Maximum volume flow | $Q_{max} = 160$ l/min |
| Leakage oil | See characteristic and pilot valves |
| 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 / L17) FKM -20...+70 °C (L9 or L15 / L17) NBR 872 -40...+70 °C (L15 / L17) |
| Contamination efficiency | Class 20 / 18 / 14 |
| Filtration | Required filtration grade $\beta_{10} \dots 16 \geq 75$, see data sheet 1.0-50 |

ACTUATION

Solenoid spool valve direct operated
 Data sheet 1.3-24
 WDYFA04-AB1 / AB2 for 4/2-way AB1 / AB2
 WDYFA04-AD1 / DB2 for other 4/2-way
 WDYFA04-ADB for 4/3-way with spring centred mid position
 WDYFA04-ADB for 4/2-way impulse execution detented

CERTIFICATES

| | Surface | Mining | Standard -25 °C to... | Z604 -40 °C to... |
|-----------|---------|--------|--------------------------|----------------------|
| ATEX | 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 | |
| UL / CSA | x | | x | x |

The certificates can be found on www.wandfluh.com

INSTALLATION NOTES

| | |
|-------------------|--|
| Mounting type | Flange mounting 4 fixing holes for socket head screws M6 x 40 |
| Mounting position | Any, preferably horizontal |
| Tightening torque | $M_D = 13.5$ Nm \pm 10 %, quality min. 10.9 $M_D = 10.5$ Nm \pm 10 %, quality 8.8: ◆ maximum tank pressure without external connections: 80 bar ◆ maximum tank pressure and maximum pressure external connections: 35 bar |

Note!



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

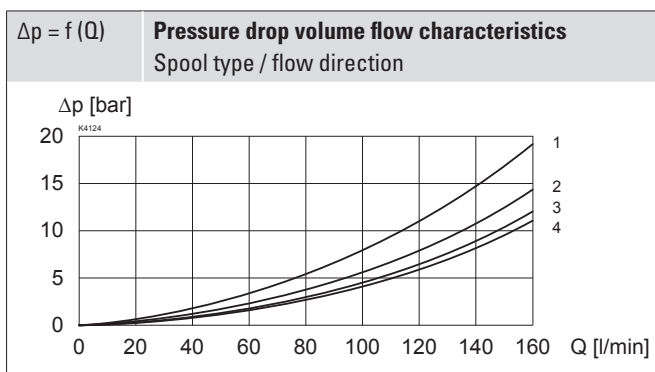
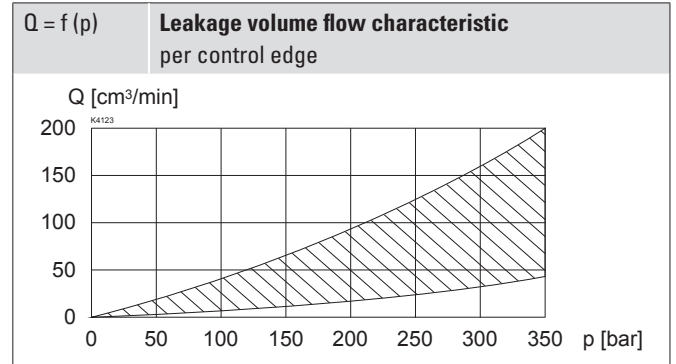
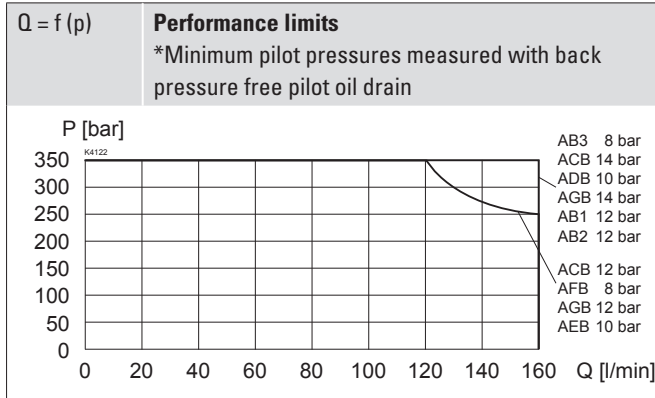
SEALING MATERIAL

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

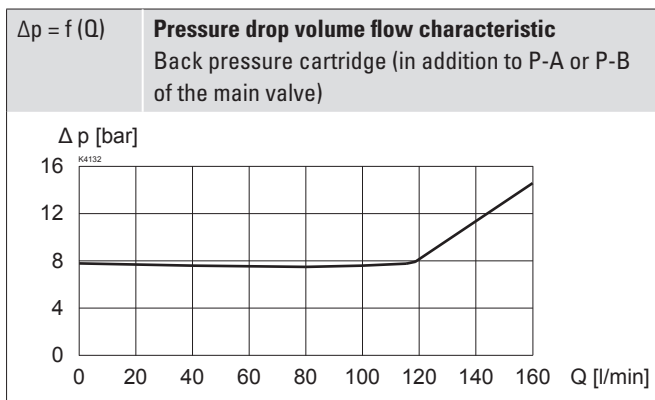
SURFACE TREATMENT

- ◆ The main valve body, the distance plate, the screw plugs, the slip-on coil and the armature tube are zinc-nickel coated
- ◆ The pilot valve body is coated with a two component paint

PERFORMANCE SPECIFICATIONS

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


| Symbol | Volume flow direction | | | | |
|-----------------|-----------------------|-------|-------|-------|-------|
| | P - A | P - B | P - T | A - T | B - T |
| AB1 / AB2 / AB3 | 3 | 3 | - | 2 | 1 |
| ACB / AC1 / CB2 | 3 | 3 | - | 2 | 1 |
| ADB / AD1 / DB2 | 3 | 3 | - | 2 | 1 |
| AEB / AE1 / EB2 | 3 | 3 | 1 | 2 | 1 |
| AFB / AF1 / FB2 | 2 | 2 | 4 | 4 | 2 |
| AGB / AG1 / GB2 | 2 | 2 | - | 2 | 1 |

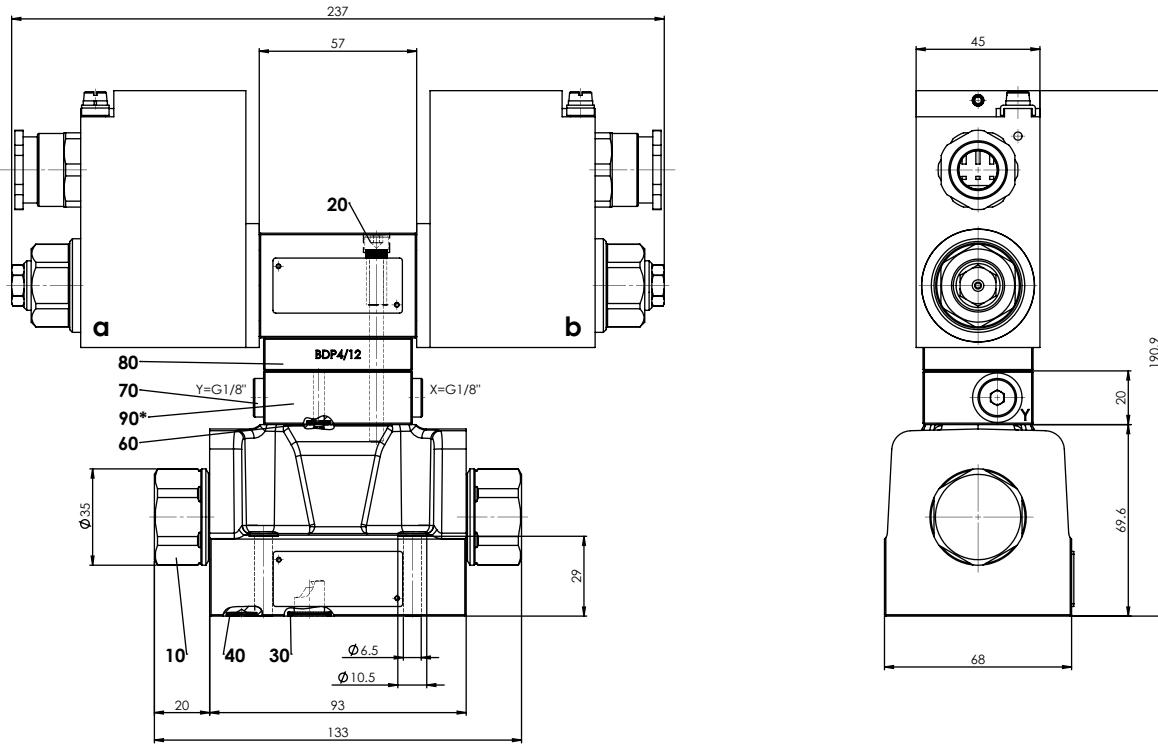

Note!


*Please ensure the minimum pilot pressure. Attention internal pilot connections: valves only switch when the pressure difference in the valve is high enough. Further details on request.

DIMENSIONS

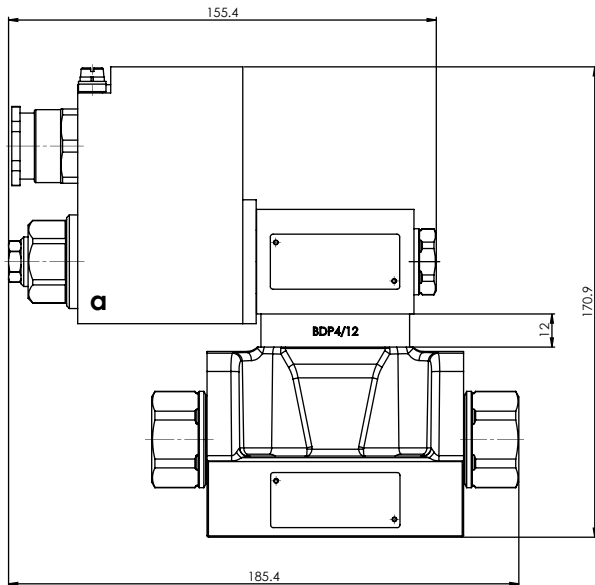
4/3-way spool valve (spring centring)

4/2-way spool valve (impulse)

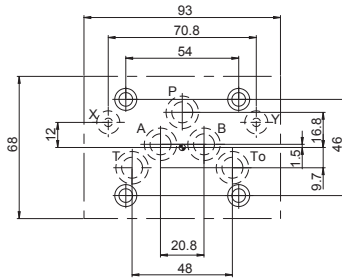


* Pos.90 Control plate with type of pilot operation te, pi, pe only

4/2-way spool valve (spring reset)



HYDRAULIC CONNECTION



ACCESSORIES

| | |
|----------------------------|--------------------|
| Fixing screws | Data sheet 1.0-60 |
| Threaded subplates | Data sheet 2.9-40 |
| Multi-station subplates | Data sheet 2.9-70 |
| Horizontal mounting blocks | Data sheet 2.9-110 |
| Technical explanations | Data sheet 1.0-100 |
| Filtration | Data sheet 1.0-50 |

PARTS LIST

| Position | Article | Description |
|----------|----------|-----------------------------------|
| 10 | 239.7203 | Screw plug |
| 20 | 246.2151 | Socket head screw M5 x 50 DIN 912 |
| | 246.2171 | Socket head screw M5 x 70 DIN 912 |
| 30 | 160.2120 | O-ring ID 12,42 x 1,78 (NBR) |
| | 160.8124 | O-ring ID 12,42 x 1,78 (FKM) |
| 40 | 160.2076 | O-ring ID 7,65 x 1,78 (NBR) |
| | 160.8076 | O-ring ID 7,65 x 1,78 (FKM) |
| 60 | 160.2052 | O-ring ID 5,28 x 1,78 (NBR) |
| | 160.6052 | O-ring ID 5,28 x 1,78 (FKM) |
| 70 | 238.1405 | Screw plug VSTI G1/8"-ED |
| 80 | 173.1400 | Spacer plate NG4 Mini |
| 90 | 173.1500 | Control plate NG4 Mini |

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 | ISO 4401-05 |
| Protection class | EN 60 529 |
| Contamination efficiency | ISO 4406 |