Solenoid operated spool valve stainless

**Flange construction**
- 4/2-way impulse valve
- 4/3-way with spring centred mid position
- 4/2-way with spring reset
- $Q_{\text{max}} = 50$ l/min
- $p_{\text{max}} = 350$ bar

**DESCRIPTION**
Direct operated solenoid spool valve with 4 connections in 5 chamber design. With the solenoids deenergised, the spool is held in the center position by the spring (4/3), or switched back to the offset position (4/2). With the impulse spool (4/2), the spool is held in the switching position by the detent. 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.

**APPLICATION**
These valves are suitable for applications in explosion-hazard areas, open cast and also in mines. The stainless execution is especially suitable for the use in wet and salty environment. Spool valves are mainly used for controlling direction of movement and stopping of hydraulic cylinders and motors.

**CERTIFICATES**

<table>
<thead>
<tr>
<th>Surface</th>
<th>Mining</th>
<th>Standard -25°C to…</th>
<th>Z604 -40°C to…</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATEX</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>IECEx</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>CCC</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>EAC</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>Australia</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
<tr>
<td>MA</td>
<td>x</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UL / CSA</td>
<td>x</td>
<td>x</td>
<td>x</td>
</tr>
</tbody>
</table>

The certificates can be found on www.wandfluh.com

**SYMBOL**

**ACTUATION**
Actuation: Switching solenoid, wet pin push type, pressure tight

<table>
<thead>
<tr>
<th>Execution</th>
<th>Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>MKY45 / 18x60 (data sheet 1.1-183)</td>
<td>Cable gland for cable Ø 6,5…14 mm</td>
</tr>
<tr>
<td>MKY45 / 18x60 K9 (data sheet 1.1-183S)</td>
<td></td>
</tr>
<tr>
<td>MKU45 / 18x60 (data sheet 1.1-184)</td>
<td></td>
</tr>
</tbody>
</table>

**Attention!** The UL execution is always supplied without cable gland
### TYPE CODE

Spool valve direct operated
Explosion proof execution Ex d
Flange construction
International standard interface ISO, NG6
Designation of symbols acc. to table

<table>
<thead>
<tr>
<th>Nominal voltage $U_n$</th>
<th>WD</th>
<th>Y</th>
<th>F</th>
<th>A06</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 VDC</td>
<td>012</td>
<td>115 VAC</td>
<td>0115</td>
<td></td>
</tr>
<tr>
<td>24 VDC</td>
<td>024</td>
<td>230 VAC</td>
<td>0226</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nominal power $P_n$</th>
<th>WD</th>
<th>Y</th>
<th>F</th>
<th>A06</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 W</td>
<td>15</td>
<td>L15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 W</td>
<td>15</td>
<td>L15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 W</td>
<td>17</td>
<td>L17</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ambient temperature up to: 40 °C or 90 °C

<table>
<thead>
<tr>
<th>Certification</th>
<th>ATEX, IECEx, CCC, EAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>AU UL / CSA UL MA MA</td>
</tr>
</tbody>
</table>

Sealing material
NBR
FKM (Viton) L11
NBR 872 y-Z604 (only with 15 W)

Stainless
with K8 coil K9
with K9 coil K10 (not for UL execution)

Design index (subject to change)
1.3-34S

### GENERAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Designation</th>
<th>4/2-, 4/3-spool valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction</td>
<td>Direct operated</td>
</tr>
<tr>
<td>Mounting</td>
<td>Flange construction</td>
</tr>
<tr>
<td>Nominal size</td>
<td>NG6 according to ISO 4401-03</td>
</tr>
<tr>
<td>Actuation</td>
<td>Ex-protection switching solenoid</td>
</tr>
</tbody>
</table>

**Ambient temperature**

- Operation as T6
  - -25…+40 °C (L9)
  - -25…+90 °C (L9)
  - -25…+70 °C (L15 / L17)
  - -40…+70 °C (L15 / L17)

- Operation as T4
  - -25…+40 °C (L9)
  - -25…+70 °C (L15 / L17)
  - -40…+70 °C (L15 / L17)

**Weight**

- 2.8 kg (1 solenoid)
- 4.6 kg (2 solenoids)

**MTTFd**

- 150 years

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### HYDRAULIC SPECIFICATIONS

| Working pressure | $p_{\text{max}} = 350$ bar |
| Tank pressure    | $p_{\text{max}} = 200$ bar |
| Maximum volume flow | $Q_{\text{max}} = 50$ l/min, see characteristics |
| Leakage oil      | See characteristics |
| Fluid            | Mineral oil, other fluid on request |
| Viscosity range  | 12 mm²/s…320 mm²/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 $\beta_{10…16} \geq 75$, see data sheet 1.0-50
Solenoid operated spool valve

**ELECTRICAL SPECIFICATIONS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protection class</td>
<td>IP65 / 66 / 67</td>
</tr>
<tr>
<td>Relative duty factor</td>
<td>100 % DF</td>
</tr>
<tr>
<td>Switching frequency</td>
<td>12 000 / h</td>
</tr>
<tr>
<td>Voltage tolerance</td>
<td>± 10 % with regard to nominal voltage</td>
</tr>
<tr>
<td>Standard nominal voltage</td>
<td>AC = 50 to 60 Hz ± 2 %, with built-in two-way rectifier</td>
</tr>
<tr>
<td>Standard nominal power</td>
<td>9 W, 15 W, 17 W</td>
</tr>
<tr>
<td>Temperature class</td>
<td>Nominal power 9 W: T1…T6</td>
</tr>
<tr>
<td></td>
<td>Nominal power 15 W / 17 W: T1…T4</td>
</tr>
</tbody>
</table>

**COMMISSIONING**

**Attention!** 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 can be assumed.

**SURFACE TREATMENT**

- The valve body, the cover and the socket head screws are made of stainless steel.
- The slip-on coil and the armature tube are zinc nickel coated.
- Optionally K10:
  - The coil is made of stainless steel.

**SEALING MATERIAL**

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

**PERFORMANCE SPECIFICATIONS**

**Oil viscosity \( \nu = 30 \text{ mm}^2/\text{s} \)**

**p = f (Q)**

**Performance limits L15 / L17**

- Measured with nominal voltage -10% at 50 °C (steady-state temperature)

**p = f (Q)**

**Performance limits L9**

- Measured with nominal voltage -10% at 40 °C (steady-state temperature)
- Execution L9 90 °C on request

**\( \Delta p = f (Q) \)**

**Pressure drop volume flow characteristic per control edge**

**Q_L = f (Q)**

**Leakage volume flow characteristics P \( \rightarrow \) T**

**Note!**

With the L15 / L17 execution for ambient temperatures up to 70 °C, the performance specifications have been evaluated with an ambient temperature of 50 °C.

**Attention!**

- For valves for the temperature ranges -40 °C to...
- (Z604) the leakage volume flow can be up to eight times higher.

**Note!** Other electrical specifications see data sheet 1.1-183, 1.1-183S and 1.1-184.

**ELECTRICAL SPECIFICATIONS**

- Protection class: IP65 / 66 / 67
- Relative duty factor: 100 % DF
- Switching frequency: 12 000 / h
- Voltage tolerance: ± 10 % with regard to nominal voltage
- Standard nominal voltage: 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

**SEALING MATERIAL**

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

**PERFORMANCE SPECIFICATIONS**

- Oil viscosity \( \nu = 30 \text{ mm}^2/\text{s} \)

**p = f (Q)**

- Performance limits L15 / L17 (50 °C, steady-state temperature)

**p = f (Q)**

- Performance limits L9 (40 °C, steady-state temperature)
- Execution L9 90 °C on request

**\( \Delta p = f (Q) \)**

- Pressure drop volume flow characteristic per control edge

**Q_L = f (Q)**

- Leakage volume flow characteristics P \( \rightarrow \) T

**Note!**

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- Oil viscosity \( \nu = 30 \text{ mm}^2/\text{s} \)

**p = f (Q)**

- Performance limits L15 / L17 (50 °C, steady-state temperature)

**p = f (Q)**

- Performance limits L9 (40 °C, steady-state temperature)
- Execution L9 90 °C on request

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**Note!**

- With the L15 / L17 execution for ambient temperatures up to 70 °C, the performance specifications have been evaluated with an ambient temperature of 50 °C.

**Attention!**

- 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 can be assumed.
**DIMENSIONS**

4/3-way spool valve (spring centring)

4/2-way spool valve (impulse)

Dimensions of the solenoid coil, refer to data sheet 1.1-183, 1.1-183S and 1.1-184

**HYDRAULIC CONNECTION**

**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 4401-03
Protection class | EN 60 529
Contamination efficiency | ISO 4406

**PARTS LIST**

<table>
<thead>
<tr>
<th>Position</th>
<th>Article</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>263.6...</td>
<td>Solenoid coil MK.45 / 18 x 60</td>
</tr>
<tr>
<td>12</td>
<td>154.2201</td>
<td>Knurled nut Ex M18 x 1.5 x 30</td>
</tr>
<tr>
<td>17</td>
<td>160.2251</td>
<td>O-ring ID 25,07 x 2,62 (NBR)</td>
</tr>
<tr>
<td>18</td>
<td>160.2170</td>
<td>O-ring ID 17,17 x 1,78 (NBR)</td>
</tr>
<tr>
<td>40</td>
<td>058.4232</td>
<td>Cover 45 /45 x 17,5 K9</td>
</tr>
<tr>
<td>60</td>
<td>246.2516</td>
<td>Socket head screw M5 x 16 A4 DIN 912</td>
</tr>
<tr>
<td>70</td>
<td>160.2093</td>
<td>O-ring ID 9,25 x 1,78 (NBR) &quot;-25 °C to...&quot;</td>
</tr>
<tr>
<td></td>
<td>160.7092</td>
<td>O-ring ID 9,25 x 1,78 (NBR) &quot;-40 °C to...&quot;</td>
</tr>
<tr>
<td></td>
<td>160.6092</td>
<td>O-ring ID 9,25 x 1,78 (FKM)</td>
</tr>
<tr>
<td>110</td>
<td>111.1080</td>
<td>Cable gland M20 x 1,5</td>
</tr>
</tbody>
</table>

**INSTALLATION NOTES**

Mounting type | Flange mounting
4 fixing holes for socket head screws M5 x 45

Mounting position | Any, preferably horizontal

Tightening torque | Fixing screws M₅ = 5,1 Nm (screw quality A4)
M₆ = 9 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

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