Solenoid operated spool valve

Flange construction
- 4/2-way impulse execution, detented
- 4/3-way with spring centered mid position
- 4/2-way with spring reset
- \( Q_{\text{max}} = 30 \text{ l/min} \)
- \( p_{\text{max}} = 350 \text{ bar} \)

DESCRIPTION
Direct operated solenoid spool valve with 4 connections in 5 chamber design. Spool detented or with spring reset. 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. Precise spool fit, low leakage, long service life time. Spool made from hardened steel, valve body from high quality hydraulic cast steel. Wide range of standard and special voltages.

APPLICATION
Spool valves are mainly used for controlling direction of movement and stopping of hydraulic cylinders and motors. 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. Miniature valves are used where both, reduced dimensions and weight are important.

SYMBOL

![Symbol diagrams](image-url)
Solenoid operated spool valve

TYPE CODE

Spool valve, direct operated

Slip-on coil, Economy
Slip-on coil, Medium

Flange construction

Mounting interface acc. to Wandfluh standard, NG4-Mini

Designation of symbols acc. to table

Spool specification

Standard
Low Leakage 1/x (only Economy)

Nominal voltage \( U_{N} \)
12 VDC [112]
24 VDC [114]
without coil [X5]

Slip-on coil
Metal housing, round with one-sided collar V
Metal housing, square with one-sided collar N (only Medium)

Connection execution
Connector socket EN 175301-803 / ISO 4400 D
Connector socket AMP Junior-Timer J (only for \( U_{N} \leq 75 \text{ VDC} \))
Connector Deutsch DT04 - 2P G (only for \( U_{N} \leq 75 \text{ VDC} \))

Sealing material
NBR
FKM (Viton) [D1]

Manual override
Integrated
Push-button [HF1]
Spindle [HS1]

Surface protection
Standard
Zinc-nickel [K8]

Design index (subject to change)
1.2-33

GENERAL SPECIFICATIONS

Designation
4/2-, 4/3-spool valve

Construction
Direct operated

Mounting
Flange construction

Nominal size
NG4-Mini according to Wandfluh standard

Actuation
Switching solenoid

Ambient temperature
\(-25\ldots +70 \, ^{\circ}\) C
if \( > +50 \, ^{\circ}\) C, then no undervoltage is admissible

Weight
0.83 kg (1 solenoid Economy)
0.90 kg (1 solenoid Medium)
1.12 kg (2 solenoids Economy)
1.24 kg (2 solenoids Medium)

MTTFd
150 years

ELECTRICAL SPECIFICATIONS

Protection class
Connection execution D: IP65
Connection execution J: IP66
Connection execution G: IP67 and IP69K

Relative duty factor
100 \% DF

Switching frequency
15 000 / h

Service life time
10\(^7\) (number of switching cycles, theoretically)

Voltage tolerance
\( \pm 10 \, \% \) with regard to nominal voltage

Standard nominal voltage
12 VDC, 24VDC, 115 VAC, 230 VAC
AC = 50 to 60 Hz, rectifier integrated in the connector socket

Note!
Other electrical specifications see data sheet 1.1-168 (slip-on coil V) and 1.1-175 (slip-on coil N)
**HYDRAULIC SPECIFICATIONS**

- **Working pressure**
  - $p_{\text{max}} = 350 \text{ bar (} P_{T} < 20 \text{ bar)}$
  - $p_{\text{max}} = 315 \text{ bar (} P_{T} > 20 \text{ bar)}$

- **Tank pressure**
  - $p_{\text{max}} = 100 \text{ bar}$

- **Maximum volume flow**
  - $Q_{\text{max}} = 30 \text{ l/min, see characteristics}$

- **Leakage oil**
  - See characteristics

- **Fluid**
  - Mineral oil, other fluid on request

- **Viscosity range**
  - $12 \text{ mm}^2/\text{s} \ldots 320 \text{ mm}^2/\text{s}$

- **Temperature range**
  - Fluid: $-25 \ldots +70 \, ^{\circ}\text{C (NBR)}$
  - Fluid: $-20 \ldots +70 \, ^{\circ}\text{C (FKM)}$

- **Contamination efficiency**
  - Class $20 / 18 / 14$

- **Filtration**
  - Required filtration grade $ß 10 \ldots 16 \geq 75$, see data sheet 1.0-50

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**PERFORMANCE SPECIFICATIONS**

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

**Economy**
- $p = f (Q)$
- Performance limits: Measured with nominal voltage -10 %
- Low Leakage

**Medium**
- $p = f (Q)$
- Performance limits: Measured with nominal voltage -10 %

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**ACTUATION**

- **Actuation**
  - Switching solenoid, wet pin push type, pressure tight

- **Execution**
  - Economy: V.E37 / 19 x 40 (Data sheet 1.1-168)
  - Medium: V.E37 / 19 x 50 (Data sheet 1.1-168)
  - N.S35 / 19 x 50 (Data sheet 1.1-175)

- **Connection**
  - Connector socket EN 175301 – 803
  - Connector socket AMP Junior-Timer
  - Connector Deutsch DT04 – 2P

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**Pressure drop volume flow characteristics**

**Economy / Medium**
- $\Delta p = f (Q)$
- Volume flow direction

**Summary**

- Economy
  - AB1 / AB2 / AB3: 2 / 2 / 2
  - A - T: - / - / 1
  - B - T: - / - / 1

- Medium
  - AB1 / AB2 / AB3: 2 / 2 / 2
  - A - T: - / - / 1
  - B - T: - / - / 1

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www.wandfluh.com  Illustrations are not binding  Data subject to change  3/5  Edition: 20 05  1.2-33E
Performance Specifications

Pressure drop volume flow characteristics

\[ \Delta p = f(Q) \]

Leakage volume flow characteristics

\[ Q_L = f(Q) \]

Standards

Mounting interface: Wandfluh standard
Solenoids: DIN VDE 0580
Connection execution D: EN 175301 – 803
Protection class: EN 60 529
Contamination efficiency: ISO 4406

Sealing Material

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

Surface Treatment

Standard:
- The valve body is painted with a two component paint
- The armature tube, the slip-on coil and the plug screw are zinc-nickel coated

Optionally (K8):
- All external parts are zinc-nickel coated
ISO 9227 (800 h) salt spray test

Installation Notes

Mounting type: Flange mounting
3 fixing holes for socket head screws M5 x 40
Mounting position: Any, preferably horizontal

Note:
The length of the fixing screw depends on the base material of the connection element.
**DIMENSIONS**

4/3-way valve (spring centred)

4/2-way valve (impulse)

4/2-way valve (spring reset)

**HYDRAULIC CONNECTION**

- Integrated (–) Actuation pin integrated in the armature tube. Actuation by pressing the pin
- Push-button (HF1) Integrated in the knurled nut. Actuation by pressing the push-button
- Spindle (HS1) Integrated in the knurled nut. Actuation by turning the spindle (continuously variable valve actuation)

Attention! The actuation of the manual override is possible up to a tank pressure of:

- 40 bar Integrated (–)
- 40 bar Push-button (HF1)
- 100 bar Spindle (HS1)

**PARTS LIST**

<table>
<thead>
<tr>
<th>Position</th>
<th>Article</th>
<th>Description</th>
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<tbody>
<tr>
<td>10</td>
<td>206.2...</td>
<td>V.E37 / 19 x 40</td>
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<td>260.5...</td>
<td>V.E37 / 19 x 50</td>
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<td>160.2052</td>
<td>O-ring ID 5,28 x 1,78 (NBR)</td>
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<td>Knurled nut</td>
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<td>80</td>
<td>253.7001</td>
<td>Push-button</td>
</tr>
<tr>
<td>90</td>
<td>253.7000</td>
<td>Spindle</td>
</tr>
</tbody>
</table>

**ACCESSORIES**

- Mating connector grey (A) Article no. 219.2001
- Mating connector black (B) Article no. 219.2002
- Mounting screws Data sheet 1.0-60
- Threaded subplates Data sheet 2.9-10
- Multi-station subplates Data sheet 2.9-50
- Horizontal mounting blocks Data sheet 2.9-90
- Technical explanations Data sheet 1.0-100
- Filtration Data sheet 1.1-50
- Relative duty factor Data sheet 1.1-430

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