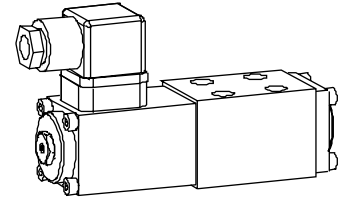


**Solenoid operated spool valve**

- 4/2-way impulse valve
- 4/3-way with spring centred mid position
- 4/2-way with spring reset
- $Q_{max} = 20$  l/min,  $p_{max} = 350$  bar

**NG4  
ISO 4401-02**

**DESCRIPTION**

Direct solenoid operated spool valve with a 5 annular chamber body design. Solenoid wet pin oil immersed armature type. Precision honed spool for low leakage. Low pressure drop due to the body design and spool profiling. Spool is of hardened steel, body is of high grade hydraulic cast iron for long service life. The valve is of flange-type design for direct mounting onto threaded subplates or more complex manifolds.

**FUNCTION**

- 4/2-way detent spool valve:  
4 ports directional control valve with 2 position detented spool. With the solenoids deenergised the spool remains in the last switched position.
- 4/2-way spool valve:  
4 ports 2 position spool valve, spring offset. With the solenoid deenergised the spool returns to the offset position.
- 4/3-way spool valve:  
4 ports 3 position spool valve, spring centered. With the solenoids deenergised the spool returns to the center position.

**APPLICATION**

These solenoid operated directional control valves are mainly used for diverting and preventing fluids flows in hydraulic systems. There are now many more applications that can be catered for due to the high flow characteristics and low pressure drop of this new directional control valve.

**CONTENT**

|                                       |                      |
|---------------------------------------|----------------------|
| GENERAL SPECIFICATIONS                | 1.2-51/1             |
| HYDRAULIC SPECIFICATIONS              | 1.2-51/1             |
| ELECTRICAL SPECIFICATIONS             | 1.2-51/2             |
| SOLENOID DESCRIPTION                  | 1.2-51/2             |
| TYPE LIST/<br>DESIGNATIONS OF SYMBOLS | 1.2-51/2             |
| CHARACTERISTICS                       | 1.2-51/2<br>1.2-51/3 |
| DIMENSIONS                            | 1.2-51/3             |
| SECTIONAL DRAWING                     | 1.2-51/3             |
| PARTS LIST                            | 1.2-51/3             |
| ACCESSORIES                           | 1.2-51/3             |

**TYPE CODE**

|  |                          |                          |      |     |   |                          |   |                          |   |                          |
|--|--------------------------|--------------------------|------|-----|---|--------------------------|---|--------------------------|---|--------------------------|
| Spool valve direct operated                          | WD                       | <input type="checkbox"/> | F    | B04 | - | <input type="checkbox"/> | - | <input type="checkbox"/> | # | <input type="checkbox"/> |
| Economy-solenoid                                     | <input type="checkbox"/> | E                        |      |     |   |                          |   |                          |   |                          |
| Medium-solenoid                                      | <input type="checkbox"/> | M                        |      |     |   |                          |   |                          |   |                          |
| Flange type  |                          |                          |      |     |   |                          |   |                          |   |                          |
| International standard interface ISO nominal size 04 |                          |                          |      |     |   |                          |   |                          |   |                          |
| Description of symbol refer to table 1.2-51/2        |                          |                          |      |     |   |                          |   |                          |   |                          |
| Standard-Nominal voltage $U_N$                       | 12VDC                    | <input type="checkbox"/> | G12  |     |   |                          |   |                          |   |                          |
|  | 24VDC                    | <input type="checkbox"/> | G24  |     |   |                          |   |                          |   |                          |
|  | 110VAC                   | <input type="checkbox"/> | R110 |     |   |                          |   |                          |   |                          |
|  | 115VAC                   | <input type="checkbox"/> | R115 |     |   |                          |   |                          |   |                          |
|  | 230VAC                   | <input type="checkbox"/> | R230 |     |   |                          |   |                          |   |                          |
| Design-Index (Subject to change)                     |                          |                          |      |     |   |                          |   |                          |   |                          |

**GENERAL SPECIFICATIONS**

|                     |  |
|---------------------|--|
| Designation         | 4/2-, 4/3-way directional control valve                      |
| Nominal size        | 4 according to ISO 4401-02                                   |
| Type                | Direct operated spool valve                                  |
| Operations          | Solenoid   |
| Type of mounting    | Flange<br>4 fixing holes for<br>socket head cap screws M5x40 |
| Connections         | Screw fitting connection plates                              |
| Ambient temperature | -20...+50° C   |
| Mounting position   | any, preferably horizontal                                   |
| Fastening torque    | $M_D = 5,5$ Nm (quality 8.8)                                 |

| Weight              | Economy     | Medium      |
|---------------------|-------------|-------------|
| 4/2-way impulse     | m = 1,2 kg  | m = 1,4 kg  |
| 4/3-way             | m = 1,2 kg  | m = 1,4 kg  |
| 4/2-way(1 solenoid) | m = 0,83 kg | m = 0,93 kg |

**HYDRAULIC SPECIFICATIONS**

|                                    |  |
|------------------------------------|--|
| Fluid                              | Mineral oil, other fluid on request  |
| Contamination efficiency           | ISO 4406, classe 18/14<br>(Required filtration grade $\beta_{10...16} \geq 75$ )<br>refer to data sheet 1.0-50/2 |
| Viscosity range                    | 12 mm <sup>2</sup> /s...320 mm <sup>2</sup> /s   |
| Fluid temperature                  | -20...+70° C   |
| Operating pressure in port P, A, B | Economy: $p_{max} = 250$ bar<br>Medium: $p_{max} = 350$ bar  |
| Tank pressure in port T            | $p_{max} = 100$ bar  |
| Max. volume flow                   | $Q_{max} = 20$ l/min   |
| Leakage volume flow                | see characteristics  |

**ELECTRICAL SPECIFICATIONS**

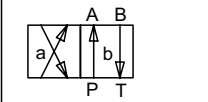
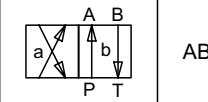
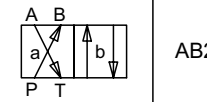
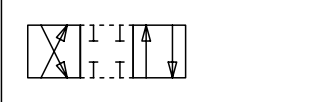
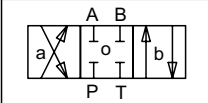
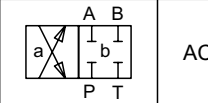
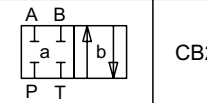
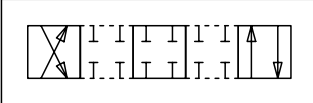
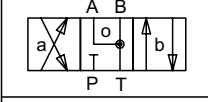
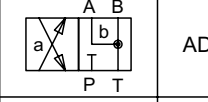
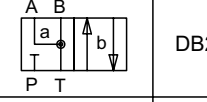
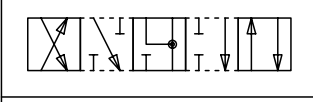
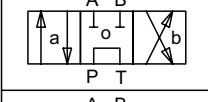
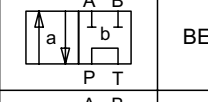
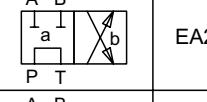
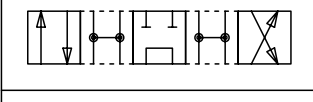
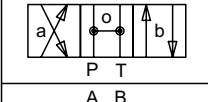
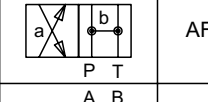
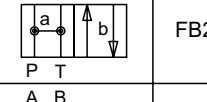
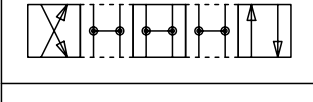
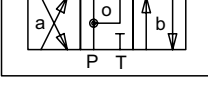
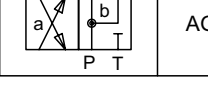
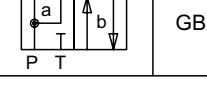
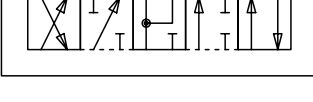
|   |   |
|---|---|
| Construction                                | Solenoid, wet pin push type, pressure tight   |
| Standard-Nominal voltage                    | $U_N = 12$ VDC<br>$U_N = 24$ VDC<br>$U_N = 110$ VAC*<br>$U_N = 115$ VAC*<br>$U_N = 230$ VAC*<br>AC = 50 to 60 Hz<br>* Rectifier integrated in the plug,<br>other nominal voltages and nominal<br>performances on request. |
| Voltage tolerance                           | ±10% of nominal voltage   |
| Protection class                            | IP 65 to DIN 40050  |
| Relative duty factor                        | 100% DF (see data sheet 1.1-430)  |
| Switching cycles                            | 15'000/h  |
| Operating life (number of switching cycles) | 10 <sup>7</sup>   |
| Connection/Power supply                     | Over device plug connection to ISO 4400/<br>DIN 43650, (2P+E),<br>other connections on request  |

**SOLENOID DESCRIPTION**

With respect to the selection of the solenoid, the following statements are important:

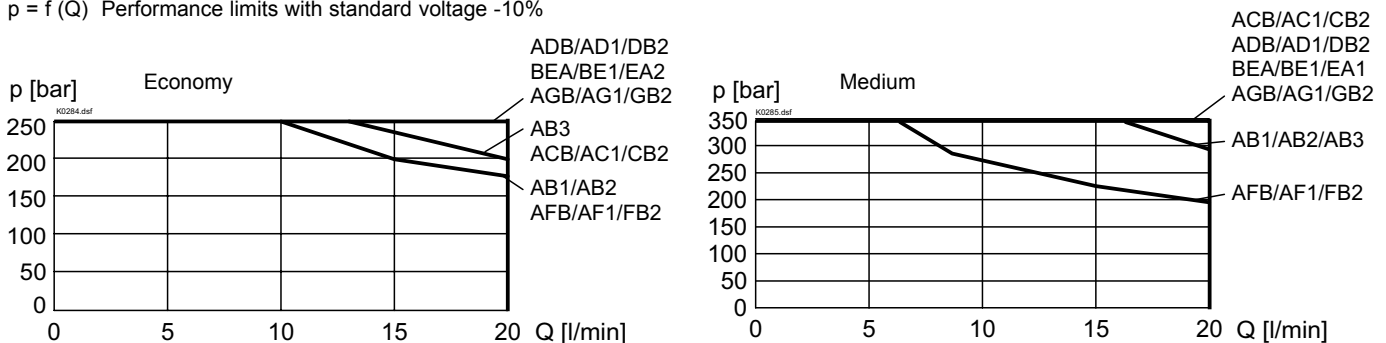
- The solenoid is the most expensive component of the solenoid spool valve.
- For this reason, it is not economical to use the same solenoid for all applications.
- Depending on the application, sales area, and customer, the requirements for solenoid spool valves and solenoids differ very considerably.
- In order to be able to offer the customer an optimum, we can supply our solenoid spool valves NG4 in 2 different versions  
 Solenoid:
  - Economy BEIIV (data sheet 1.1-100)
  - Medium SIN35V (data sheet 1.1-105)

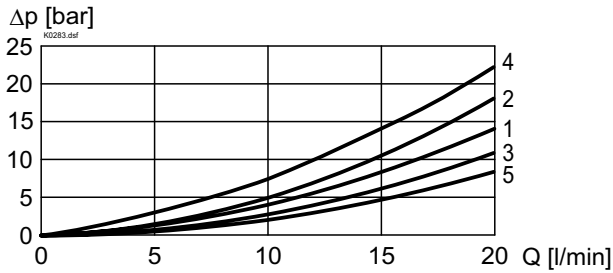
**TYPE LIST / DESIGNATION OF SYMBOLS**

|  |   |   |   |
|--|---|---|---|
| 4/2-way valve impulse  | 4/2-way valve with spring reset operation A-side  | operation B-side  | Transitional functions  |
|  AB3   |  AB1   |  AB2   |    |
| 4/3-way valve spring centered  |   |   |   |
|  ACB |  AC1 |  CB2 |  |
|  ADB |  AD1 |  DB2 |  |
|  BEA |  BE1 |  EA2 |  |
|  AFB |  AF1 |  FB2 |  |
|  AGB |  AG1 |  GB2 |  |

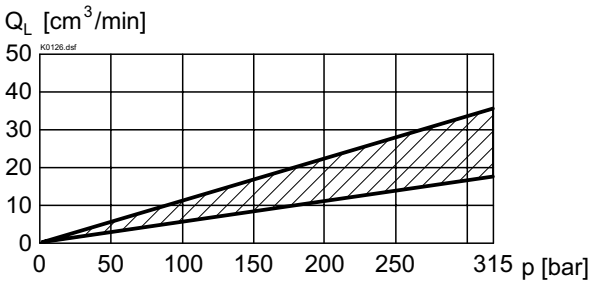

**CHARACTERISTICS** Oilviscosity  $\nu = 30$  mm<sup>2</sup>/s

$p = f(Q)$  Performance limits with standard voltage -10%

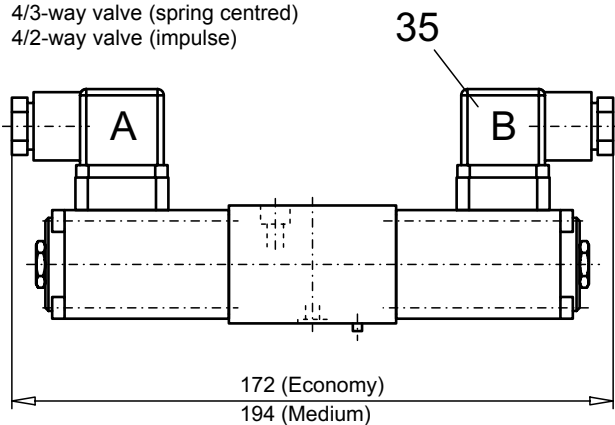


$\Delta p = f(Q)$  Pressure drop volume flow characteristics


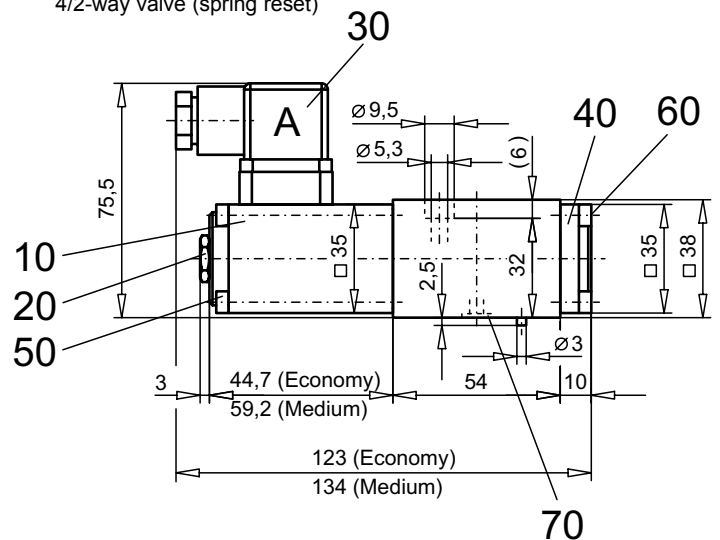
| Pressure drop<br>Curve no.<br>Symbol | Volume flow direction |       |       |       |       |
|--------------------------------------|-----------------------|-------|-------|-------|-------|
|                                      | P - A                 | P - B | P - T | A - T | B - T |
| AB1/AB2/AB3                          | 1                     | 1     | -     | 2     | 2     |
| ACB/AC1/CB2                          | 1                     | 1     | -     | 2     | 2     |
| ADB/AD1/DB2                          | 1                     | 1     | -     | 2     | 2     |
| BEA/BE1/EA2                          | 3                     | 3     | 4     | 2     | 2     |
| AFB/AF1/FB2                          | 3                     | 3     | 5     | 2     | 2     |
| AGB/AG1/GB2                          | 3                     | 3     | -     | 2     | 2     |

 $Q_L = f(p)$  Leakage volume flow characteristics per control edge

 Leakage envelope AB3/AB1/ACB/ADB/AFB/AGB

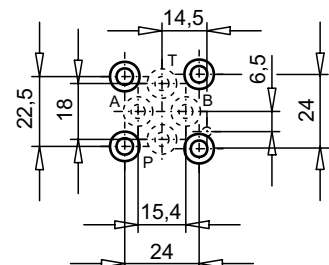
**DIMENSIONS**

 4/3-way valve (spring centred)  
 4/2-way valve (impulse)


4/2-way valve (spring reset)


**PARTS LIST**

| Position | Article              | Description   |
|----------|----------------------|---|
| 10       | 260.1...<br>260.4... | Economy-solenoid BEIIV<br>Medium-solenoid SIN35V                            |
| 20       | 253.8000             | Plug with integrated manual override<br>HB4,5                               |
| 30       | 219.2001             | Electric plug A (grey)  |
| 35       | 219.2002             | Electric plug B (black)   |
| 40       | 057.4202             | Cover   |
| 50       | 246.1145<br>246.1160 | Socket head cap screw M4x45 (BEIIV)<br>Socket head cap screw M4x60 (SIN35V) |
| 60       | 246.1112             | Socket head cap screw M4x12 DIN 912   |
| 70       | 160.2060             | O-ring ID 6,07x1,78   |


**ACCESSORIES**

Threaded connecting plates

see Reg. 2.9

Technical explanation see data sheet 1.0-100E