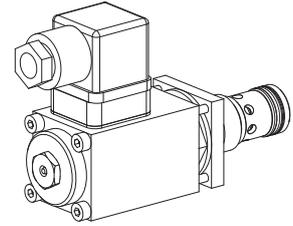


**Proportional 2-way flow control valve  
Screw-in cartridge**

- Direct operated, pressure compensated
- $Q_{max} = 25 \text{ l/min}$ ,  $p_{max} = 350 \text{ bar}$
- $Q_{Nmax} = 25 \text{ l/min}$

**M22x1,5**  
 ISO 7789

**DESCRIPTION**

Direct operated, pressure compensated proportional flow control valve, as a screw-in cartridge with a thread M22 x 1,5 for cavity acc. to ISO 7789. Four flow ranges are available. The volume flow is adjusted by a Wandfluh proportional solenoid (VDE standard 0580). The cartridge body made of steel is special surface coated for corrosion rust protection and low friction of control- and throttle spools. The solenoid is zinc coated.

**FUNCTION**

The 2-way flow control valve is designed to keep the oil flow to any actuator constant irrespective of the load. The force controlled proportional solenoid running in the fluid acts directly on the restrictor spool which opens the throttling notches in the cartridge body. The throttle opening, and therefore the flow volume changes proportionally to the current absorption of the proportional solenoid. If pressure in the system changes the pressure compensator will change the area of the oil passage to an extent as to keep the pressure drop over the restrictor constant. When the solenoid is with-out current, the restrictor spool is held in the closed position by a spring. To control the valve Wandfluh proportional amplifiers are available (see register 1.13).

**APPLICATION**

Proportional flow control valves are suitable for precise feed control system where the supply volume flow needs to be kept constant even when the load fluctuates. The screw-in cartridge is very suitable for mounting in control blocks, flange bodys and sandwich. Stepped tools are available for making the receptacle bores in steel and aluminium (hire or purchase). Please refer to the data sheets in register 2.13.

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**TYPE CODE**

|                                   |           |   |   |   |      |   |  |   |  |   |  |
|-----------------------------------|-----------|---|---|---|------|---|--|---|--|---|--|
|                                   |           | Q | N | P | PM22 | - |  | - |  | # |  |
| Flow control valve                |           |   |   |   |      |   |  |   |  |   |  |
| Normally closed                   |           |   |   |   |      |   |  |   |  |   |  |
| Proportional                      |           |   |   |   |      |   |  |   |  |   |  |
| Screw-in cartridge M22x1,5        |           |   |   |   |      |   |  |   |  |   |  |
| Nominal volume flow rates $Q_N$ : | 3,2 l/min |   |   |   |      |   |  |   |  |   |  |
|                                   | 8 l/min   |   |   |   |      |   |  |   |  |   |  |
|                                   | 18 l/min  |   |   |   |      |   |  |   |  |   |  |
|                                   | 25 l/min  |   |   |   |      |   |  |   |  |   |  |
| Standard nominal voltage $U_N$ :  | 12 VDC    |   |   |   |      |   |  |   |  |   |  |
|                                   | 24 VDC    |   |   |   |      |   |  |   |  |   |  |
| Design-Index (Subject to change)  |           |   |   |   |      |   |  |   |  |   |  |

**GENERAL SPECIFICATIONS**

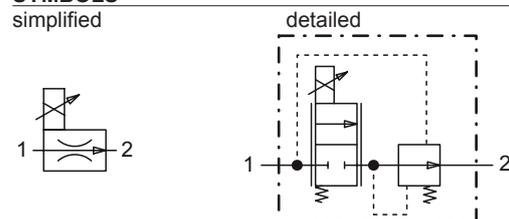
|                     |                                                                                                        |
|---------------------|--------------------------------------------------------------------------------------------------------|
| Description         | 2-way proportional flow control valve                                                                  |
| Construction        | Screw-in cartridge for cavity acc. to ISO 7789                                                         |
| Operations          | Proportional solenoid                                                                                  |
| Mounting            | Screw-in thread M22x1,5                                                                                |
| Ambient temperature | -20...50 °C                                                                                            |
| Mounting position   | any                                                                                                    |
| Fastening torque    | $M_D = 50 \text{ Nm}$ for screw-in cartridge<br>$M_D = 2,8 \text{ Nm}$ (Qual. 8.8) for solenoid screws |
| Weight              | $m = 0,64 \text{ kg}$                                                                                  |
| Flow direction      | 1 → 2                                                                                                  |

**HYDRAULIC SPECIFICATIONS**

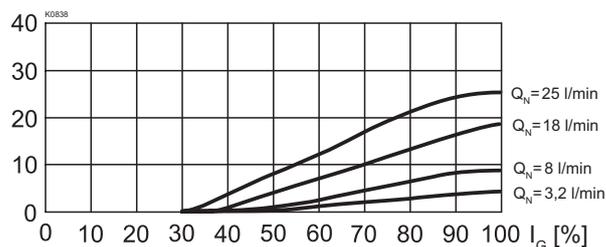
|                          |                                                                                                                    |
|--------------------------|--------------------------------------------------------------------------------------------------------------------|
| Fluid                    | Mineral oil, other fluid on request                                                                                |
| Contamination efficiency | ISO 4406:1999, class 18/16/13<br>Required filtration grade ( $\beta_{6...10} \geq 75$ )<br>(see data sheet 1.0-50) |
| Viscosity range          | 12 mm <sup>2</sup> /s...320 mm <sup>2</sup> /s                                                                     |
| Fluid temperature        | -20...+70 °C                                                                                                       |
| Peak pressure            | $p_{max} = 350 \text{ bar}$                                                                                        |
| Nominal volume flow      | $Q_N = 3,2/8/18/25 \text{ l/min}$                                                                                  |
| Max. Volume flow         | $Q_{max} = 25 \text{ l/min}$                                                                                       |
| Min. Volume flow         | $Q_{min} = 0,1 \text{ l/min}$                                                                                      |
| Leakage volume flow      | see characteristics                                                                                                |
| Repeatability            | ≤ 2 %*                                                                                                             |
| Hysteresis               | ≤ 5 %*                                                                                                             |
|                          | * at optimal dither signal                                                                                         |

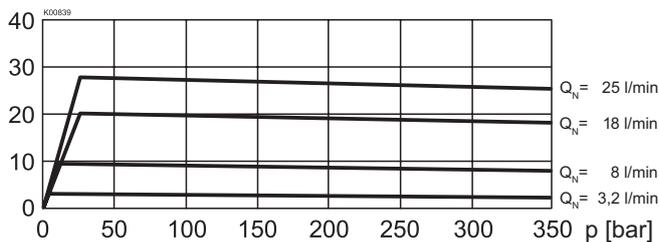
**ELECTRICAL SPECIFICATIONS**

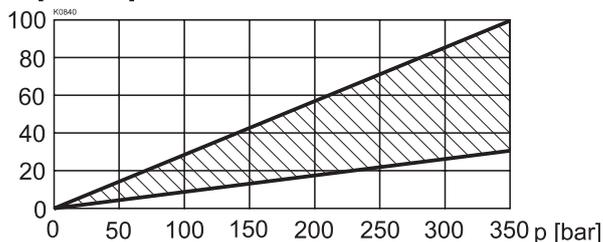
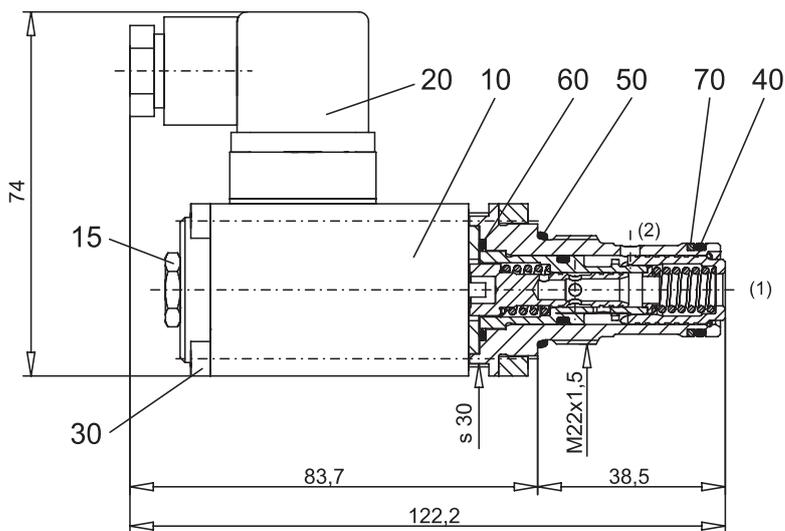
|                                 |                                                          |                        |
|---------------------------------|----------------------------------------------------------|------------------------|
| Construction                    | Proportional solenoid, wet pin push type, pressure tight |                        |
| Standard nominal voltage        | U = 12 VDC                                               | U = 24 VDC             |
| Limiting current                | $I_G = 1250 \text{ mA}$                                  | $I_G = 680 \text{ mA}$ |
| Relative duty factor            | 100% ED (see data sheet 1.1-430)                         |                        |
| Protection class                | IP 65 acc. to EN 60 529                                  |                        |
| Connection/                     | Over device plug connection acc. to                      |                        |
| Power supply                    | ISO 4400 / DIN 43650 (2P+E)                              |                        |
| Other electrical specifications | see data sheet 1.1-117 (PI35V)                           |                        |

**SYMBOLS**


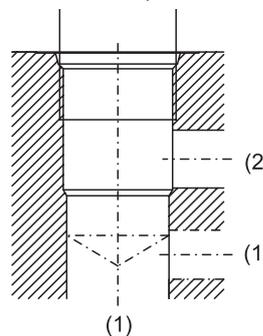
**CHARACTERISTICS** Oil viscosity  $\nu = 30 \text{ mm}^2/\text{s}$ 
 $Q = f(I)$  Volume flow adjustment characteristics

 $Q$  [l/min]

 $Q = f(p)$  Volume flow pressure characteristics

 $Q$  [l/min]

 $Q = f(p)$  Leakage volume flow characteristics

 $Q$  [cm<sup>3</sup>/min]

**DIMENSIONS / SECTIONAL DRAWINGS**

 Cavity drawing acc. to  
 ISO 7789-22-01-0-98

M22x1,5


 For detailed cavity drawing  
 and cavity tools see data  
 sheet 2.13-1008

**PARTS LIST**

| Position | Article              | Description                                                        |
|----------|----------------------|--------------------------------------------------------------------|
| 10       | 256.3454<br>256.3426 | Proportional solenoid PI35V-G24<br>Proportional solenoid PI35V-G12 |
| 15       | 253.8000             | Plug with integrated manual override<br>HB4,5                      |
| 20       | 219.2002             | Plug (black)                                                       |
| 30       | 246.1166             | Cyl. screw M4x65 DIN 912                                           |
| 40       | 160.2156             | O-ring ID 15,60x1,78                                               |
| 50       | 160.2188             | O-ring ID 18,77x1,78                                               |
| 60       | 160.2170             | O-ring ID 17,17x1,78                                               |
| 70       | 049.3191             | Back-up ring RD 16,1x19x1,4                                        |

**ACCESSORIES**

Proportional amplifier

Register 1.13

Technical explanation see data sheet 1.0-100D