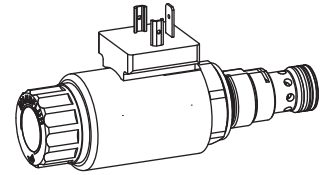


**Proportional pressure relief valve  
 Screw-in cartridge**

- Pilot operated
- $Q_{max} = 100 \text{ l/min}$
- $p_{max} = 400 \text{ bar}$
- $p_{Nmax} = 350 \text{ bar}$

**M22x1,5**  
 ISO 7789

**DESCRIPTION**

Pilot operated proportional pressure relief valve as a screw-in cartridge with a thread M22x1,5 for cavity according to ISO 7789. 7 standard pressure levels are available. The adjustment takes place by means of a Wandfluh proportional solenoid (VDE-standard 0580). The cartridge body made of steel is zinc coated and therefore rust-protected. The solenoid coil is zinc-/nickel-coated.

**FUNCTION**

When the operating pressure set by the proportional solenoid is reached, the main spool opens and connects the protected line with the return line to the tank. The back pressure in T (2) influences the pressure in P (1). This pilot operated proportional pressure relief valve can be adjusted very sensitively and is suitable for large volume flows and high pressures. To control the valve, Wandfluh proportional amplifiers are available (see register 1.13).

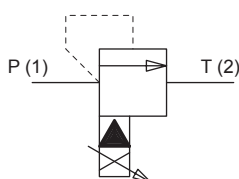
**APPLICATION**

The valve has its application in hydraulic systems, in which the pressure frequently has to be changed. The facility for electric remote controlling of the valve in conjunction with process control systems enables economic problem solutions with repeatable sequences. Installation of the screw-in cartridge in control blocks as well as in the Wandfluh sandwich plates (vertical stacked systems) and flange valves of the NG4-Mini, NG6 and NG10 types. (Please note the separate data sheets in register 2.3). Cavity tools are available for machining the cavities in steel and aluminium (hire or purchase). Please refer to the data sheets in register 2.13.

**TYPE CODE**

|                                       |   | B |                                    | V       |  | P                                |  | PM22- |  | - |  | / |  | - |  | # |  |
|---------------------------------------|---|---|------------------------------------|---------|--|----------------------------------|--|-------|--|---|--|---|--|---|--|---|--|
| Pressure relief valve                 |   |   |                                    |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
| Pilot operated                        |   |   |                                    |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
| Proportional                          |   |   |                                    |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
| Screw-in cartridge M22x1,5            |   |   |                                    |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
| Standard nominal pressure range $p_N$ | 20 bar                                    |   | <input type="text" value="20"/>    | 200 bar |  | <input type="text" value="200"/> |  |       |  |   |  |   |  |   |  |   |  |
|                                       | 63 bar                                    |   | <input type="text" value="63"/>    | 275 bar |  | <input type="text" value="275"/> |  |       |  |   |  |   |  |   |  |   |  |
|                                       | 100 bar                                   |   | <input type="text" value="100"/>   | 350 bar |  | <input type="text" value="350"/> |  |       |  |   |  |   |  |   |  |   |  |
|                                       | 160 bar                                   |   | <input type="text" value="160"/>   |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
|                                       |   |   |                                    |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
| Standard nominal voltage $U_N$        | 12 VDC                                    |   | <input type="text" value="G12"/>   |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
|                                       | 24 VDC                                    |   | <input type="text" value="G24"/>   |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
|                                       | without solenoid coil                     |   | <input type="text" value="X5"/>    |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
| Slip-on coil                          | Metal housing, round                      |   | <input type="text" value="W"/>     |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
|                                       | Metal housing, square                     |   | <input type="text" value="M*"/>    |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
| Electric connection                   | Connector socket EN 175301-803 / ISO 4400 |   | <input type="text" value="D"/>     |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
|                                       | Connector socket AMP Junior-Timer         |   | <input type="text" value="J"/>     |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
|                                       | Connector Deutsch DT04-2P                 |   | <input type="text" value="G"/>     |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
| Sealing material                      | NBR                                       |   | <input type="text"/>               |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
|                                       | FKM (Viton)                               |   | <input type="text" value="D1"/>    |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
| Manual override                       | Armature tube closed (standard)           |   | <input type="text"/>               |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
|                                       | With screwed sealing plug                 |   | <input type="text" value="HB0"/>   |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
|                                       | With manual emergency actuation           |   | <input type="text" value="HB4.5"/> |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |
| Design-Index (Subject to change)      |   |   |                                    |         |  |                                  |  |       |  |   |  |   |  |   |  |   |  |

• Only available in conjunction with other nominal voltages and connection versions. (See data sheet 1.1-174)

**SYMBOLS**

**GENERAL SPECIFICATIONS**

|                     |   |
|---------------------|---|
| Description         | Pilot operated proportional pressure relief valve |
| Construction        | Screw-in cartridge for cavity to ISO 7789         |
| Actuation           | Proportional solenoid                             |
| Mounting            | Screw-in thread M22x1,5                           |
| Ambient temperature | -20...+70 °C                                      |
| Mounting position   | any, preferably horizontal                        |
| Fastening torque    | $M_D = 50 \text{ Nm}$ for screw-in cartridge      |
|                     | $M_D = 5 \text{ Nm}$ for knurled nut              |
| Weight              | $m = 0,5 \text{ kg}$                              |

**ELECTRICAL SPECIFICATIONS**

|                                |  |                |
|--------------------------------|--|----------------|
| Construction                   | Proportional solenoid, wet pin push type, pressure tight       |                |
| Standard-Nominal voltage       | $U_N = 12$ VDC   | $U_N = 24$ VDC |
|                                | $I_G = 1320$ mA  | $I_G = 660$ mA |
| Limiting current               |  |                |
| Relative duty factor           | 100 % DF (see data sheet 1.1-430)                              |                |
| Protection class acc. EN 60529 | Connection version<br>D: IP 65<br>J: IP 66<br>G: IP 67 and 69K |                |

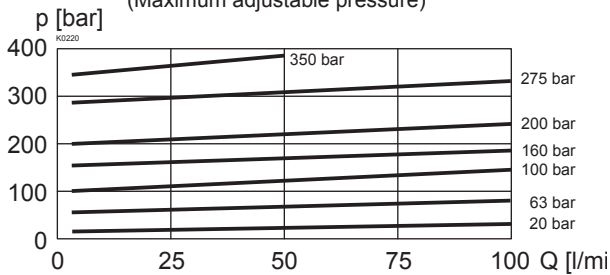
For further electrical specifications see data sheet 1.1-173 (W)  
 1.1-174 (M)

**HYDRAULIC SPECIFICATIONS**

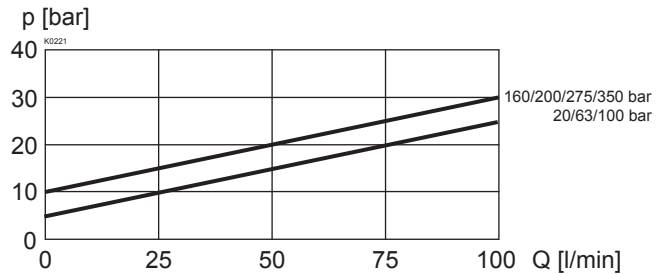
|                          |   |
|--------------------------|---|
| Fluid                    | Mineral oil, other fluid on request   |
| Contamination efficiency | ISO 4406:1999, class 18/16/13<br>(Required filtration grade $\beta_{6...10} \geq 75$ )<br>see data sheet 1.0-50/2 |
| Viscosity range          | 12 mm <sup>2</sup> /s...320 mm <sup>2</sup> /s  |
| Fluid temperature        | -20...+70 °C  |
| Peak pressure            | $p_{max} = 400$ bar<br>$p_{Tmax} = p_p + 20$ bar  |
| Nominal pressure ranges  | $p_N = 20$ bar, 63 bar, 100 bar, 160 bar, 200 bar, 275 bar, 350 bar<br>$Q = 0,3...100$ l/min                      |
| Volume flow              | see characteristics   |
| Leakage volume flow      | see characteristics   |
| Repeatability            | $\leq 3\%$ *  |
| Hysteresis               | $\leq 4\%$ *  |
|                          | * at optimal dither signal  |

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

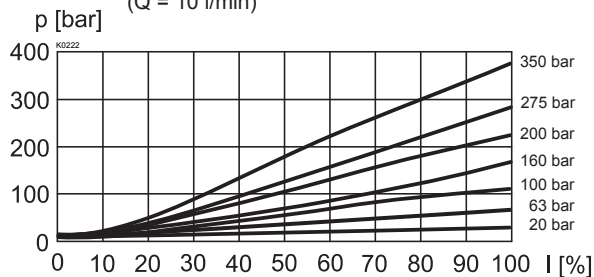
$p = f(Q)$  Pressure volume flow characteristics  
 (Maximum adjustable pressure)



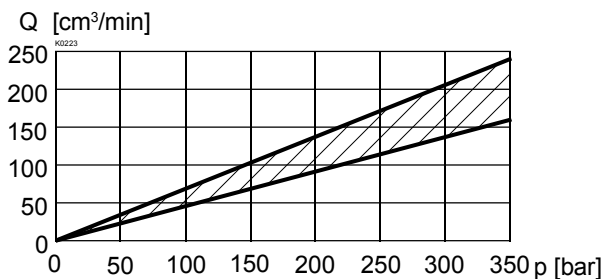
$p = f(Q)$  Pressure volume flow characteristics  
 (Minimum adjustable pressure)

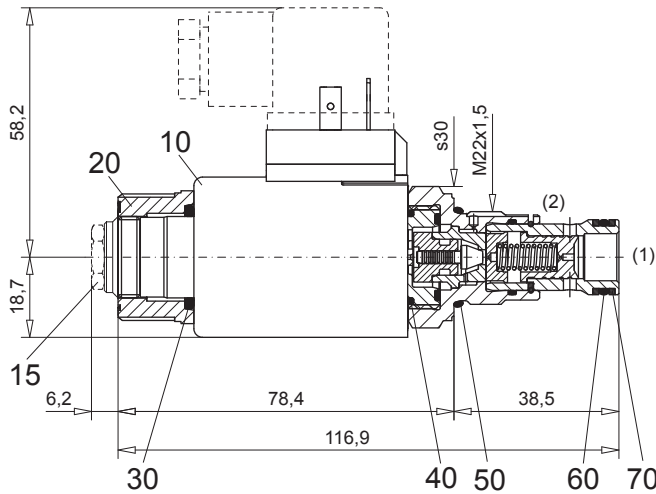


$p = f(I)$  Pressure adjustment characteristics  
 ( $Q = 10$  l/min)

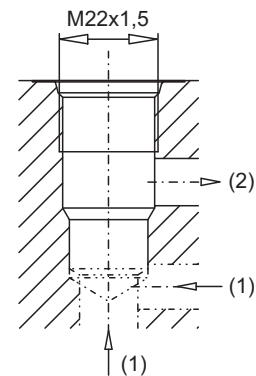


$Q_L = f(p)$  Leakage volume flow characteristics



**DIMENSIONS / SECTIONAL DRAWINGS**


Dimensions of the other connection versions see data sheet 1.1-173

 Cavity drawing according to  
 ISO 7789-22-02-0-98

 For detailed cavity drawing  
 and cavity tools  
 see data sheet 2.13-1003

**PARTS LIST**

| Position | Article  | Description                                  |
|----------|----------|--|
| 10       | 206.2201 | EN 175301<br>Solenoid coil WD37/19x50-G24    |
|          | 206.2200 | Solenoid coil WD37/19x50-G12<br>Junior-Timer |
|          | 206.2203 | Solenoid coil WJ37/19x50-G24                 |
|          | 206.2202 | Solenoid coil WJ37/19x50-G12                 |
|          | 206.2205 | Deutsch<br>Solenoid coil WG37/19x50-G24      |
|          | 206.2204 | Solenoid coil WG37/19x50-G12                 |
| 15       | 253.8000 | HB 4,5 Manual override (data sheet 1.1-300)  |
|          | 239.2033 | HB 0 Plug screw (data sheet 1.1-300)         |
| 20       | 154.2700 | Knurled nut                                  |
| 30       | 160.2187 | O-ring ID 18,72x2,62 (NBR)                   |
|          | 160.6187 | O-ring ID 18,72x2,62 (FKM)                   |
| 40       | 160.2170 | O-ring ID 17,17x1,78 (NBR)                   |
|          | 160.6172 | O-ring ID 17,17x1,78 (FKM)                   |
| 50       | 160.2188 | O-ring ID 18,77x1,78 (NBR)                   |
|          | 160.6188 | O-ring ID 18,77x1,78 (FKM)                   |
| 60       | 160.2140 | O-ring ID 14,00x1,78 (NBR)                   |
|          | 160.6141 | O-ring ID 14,00x1,78 (FKM)                   |
| 70       | 049.3177 | Backup ring RD 14,6x17,5x1,4                 |

**ACCESSORIES**

|                                |                      |
|--------------------------------|----------------------|
| Flange body/sandwich plate     | Register 2.3         |
| Line mount body                | Data sheet 2.9-200   |
| Proportional amplifier         | Register 1.13        |
| Mating connector EN 175301-803 | Article no. 219.2002 |

Technical explanation see data sheet 1.0-100