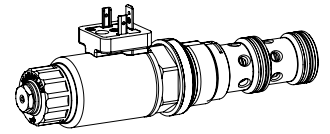


## Proportional pressure reducing cartridge

- ◆ pilot operated
- ◆  $Q_{\max} = 160 \text{ l/min}$
- ◆  $p_{\max} = 400 \text{ bar}$
- ◆  $p_{N \text{ red max}} = 350 \text{ bar}$

**M33 x 2**  
**ISO 7789**



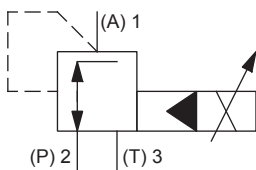
## DESCRIPTION

Pilot operated proportional pressure reducing valve in screw-in cartridge construction for cavity according to ISO 7789. Proportionally to the solenoid current, the solenoid force and the pressure in port A (1) rise. The valve functions practically independently of the pressure in port P (2). Pressure increase in the consumer port A (1) to above the adjusted value, e.g. through an active consumer, is avoided by discharging excess oil to the tank T (3). With the solenoid deenergised, the oil flows freely from port P (2) to consumer port A (1). For the control, Wandfluh proportional amplifiers are available (see register 1.13).

## APPLICATION

The electrical remote control in conjunction with process controls allows economical solutions with repeatable processes. The screw-in cartridge is perfectly suitable for installation in control blocks. For machining the cartridge cavity in steel and aluminum blocks, cavity tools are available (hire or purchase). Please refer to the data sheets in register 2.13.

## SYMBOL



## ACTUATION

|            |  |
|------------|--|
| Actuation  | Proportional solenoid, wet pin push type, pressure tight   |
| Execution  | W.S37 / 19 x 50 (Data sheet 1.1-173)<br>M.S35 / 19 x 50 (Data sheet 1.1-174)                         |
| Connection | Connector socket EN 175301 – 803<br>Connector socket AMP Junior-Timer<br>Connector Deutsch DT04 – 2P |

## STANDARDS

|                          |                 |
|--------------------------|-----------------|
| Cartridge cavity         | ISO 7789        |
| Solenoids                | DIN VDE 0580    |
| Connection execution D   | EN 175301 – 803 |
| Protection class         | EN 60 529       |
| Contamination efficiency | ISO 4406        |

## INSTALLATION NOTES

|                   |  |
|-------------------|--|
| Mounting type     | Screw-in cartridge M33 x 2   |
| Mounting position | Any, preferably horizontal   |
| Tightening torque | $M_D = 80 \text{ Nm}$ Screw-in cartridge<br>$M_D = 5 \text{ Nm}$ knurled nut |

**TYPE CODE**

|  |   |   |                                    |                                  |  |
|--|---|---|------------------------------------|----------------------------------|--|
|  |   | M V P PM33 - <input type="text"/> - <input type="text"/> / <input type="text"/> <input type="text"/> - <input type="text"/> <input type="text"/> # <input type="text"/> |                                    |                                  |  |
| Pressure reducing valve                  |   |   |                                    |                                  |  |
| Pilot operated                           |   |   |                                    |                                  |  |
| Proportional                             |   |   |                                    |                                  |  |
| Screw-in cartridge M33 x 2               |   |   |                                    |                                  |  |
| Nominal pressure range $p_{N\text{red}}$ | 100 bar                                   | <input type="text" value="100"/>  | 200 bar                            | <input type="text" value="200"/> |  |
|  | 275 bar                                   | <input type="text" value="275"/>  | 350 bar                            | <input type="text" value="350"/> |  |
| Nominal voltage $U_N$                    | 12 VDC                                    | <input type="text" value="G12"/>  |                                    |                                  |  |
|  | 24 VDC                                    | <input type="text" value="G24"/>  |                                    |                                  |  |
|  | without 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"/>     |                                  |  |
| Connection execution                     | 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                          | Manual override                           |   | <input type="text" value="HB4,5"/> |                                  |  |
|  | Screw plug                                |   | <input type="text" value="HB0"/>   |                                  |  |
| Design index (subject to change)         |   |   |                                    |                                  |  |

2.3-649

**GENERAL SPECIFICATIONS**

|                     |                                      |
|---------------------|--------------------------------------|
| Designation         | Proportional pressure reducing valve |
| Construction        | Pilot operated                       |
| Mounting            | Screw-in cartridge construction      |
| Nominal size        | M33 x 2 according to ISO 7789        |
| Actuation           | Proportional solenoid                |
| Ambient temperature | -25...+70 °C                         |
| Weight              | 0,75 kg                              |
| MTTFd               | 150 years                            |

**ELECTRICAL SPECIFICATIONS**

|                           |  |
|---------------------------|--|
| Protection class          | Connection execution D: IP65<br>Connection execution J: IP66<br>Connection execution G: IP67 and IP69K |
| Relative duty factor      | 100 % DF   |
| Standard nominal voltage  | 12 VDC, 24 VDC   |
| Limiting current at 50 °C | $I_G = 1320 \text{ mA } (U_N = 12\text{VDC})$<br>$I_G = 660 \text{ mA } (U_N = 24\text{VDC})$          |

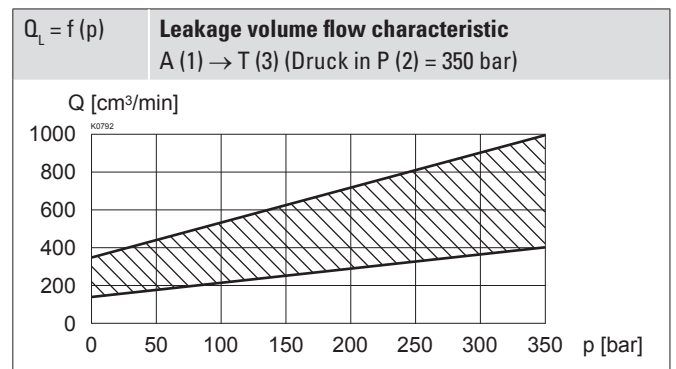
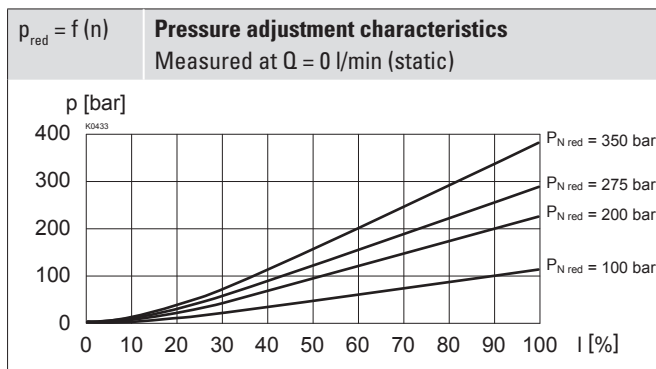
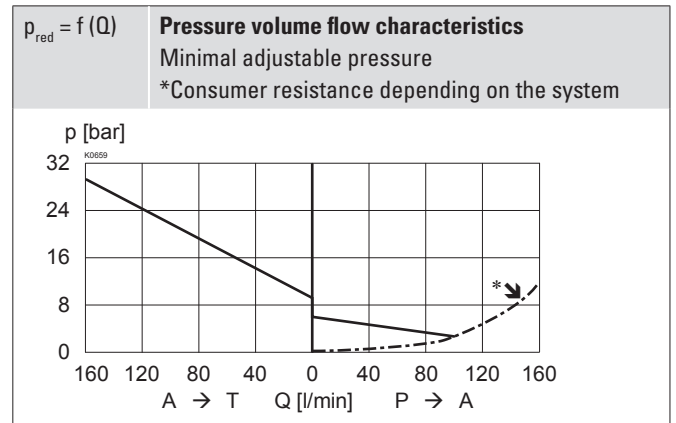
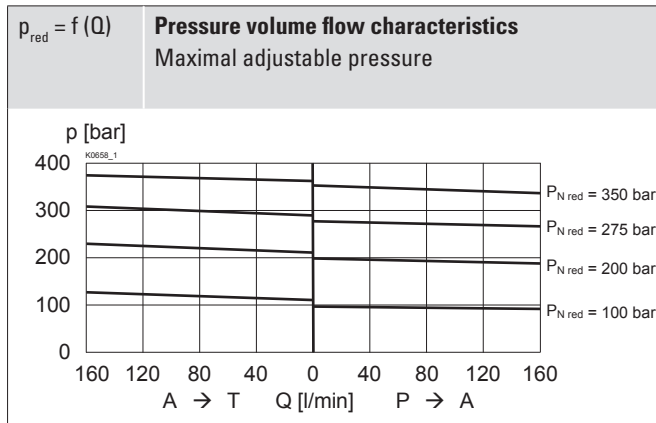
**Note!**


Other electrical specifications see data sheet 1.1-173 (slip-on coil W) and 1.1-174 (slip-on coil M)

**HYDRAULIC SPECIFICATIONS**

|                          |   |
|--------------------------|---|
| Working pressure         | $p_{\text{max}} = 400 \text{ bar}$  |
| Nominal pressure range   | $P_{N\text{red}} = 100 \text{ bar, } 200 \text{ bar, } 275 \text{ bar, } 350 \text{ bar}$ |
| Volume flow range        | $Q = 0 \dots 160 \text{ l/min}$   |
| Leakage oil              | See characteristics   |
| Hysteresis               | $\leq 4 \%$ at optimal dither signal  |
| Repeatability            | $\leq 2 \%$ at optimal dither signal  |
| Fluid                    | Mineral oil, other fluid on request   |
| Viscosity range          | $12 \text{ mm}^2/\text{s} \dots 320 \text{ mm}^2/\text{s}$                                |
| Temperature range fluid  | -25...+70 °C (NBR)<br>-20...+70 °C (FKM)  |
| Contamination efficiency | Class 18 / 16 / 13  |
| Filtration               | Required filtration grade $\beta_{6 \dots 10} \geq 75$ , see data sheet 1.0-50            |

**PERFORMANCE SPECIFICATIONS**

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

**ACCESSORIES**

|                         |                      |
|-------------------------|----------------------|
| Proportional amplifier  | Register 1.13        |
| Electric plug B (black) | Article no. 219.2002 |
| Threaded body           | Data sheet 2.9-210   |
| Technical explanations  | Data sheet 1.0-100   |
| Filtration              | Data sheet 1.0-50    |

**SURFACE TREATMENT**

- ◆ The cartridge body, the slip-on coil and the armature tube are zinc-nickel coated

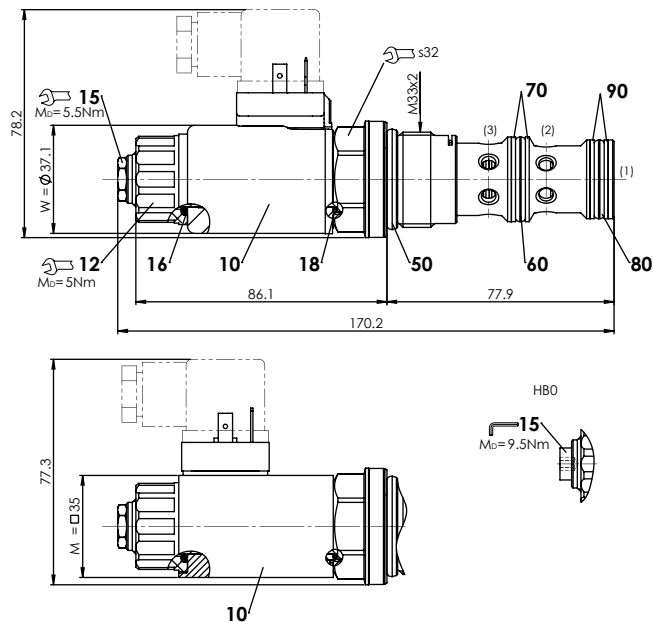
**MANUAL OVERRIDE**

Standard: HB4,5  
 Optionally: Screw plug (HB0), no actuation possible.

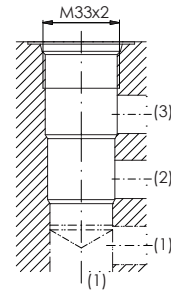
**Attention!** If the manual override is actuated, the nominal pressure level may be exceeded.


**SEALING MATERIAL**

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

**DIMENSIONS**

**HYDRAULIC CONNECTION**

Cavity drawing according to ISO 7789-33-04-0-98


**Note!**


For detailed cavity drawing and cavity tools see data sheet 2.13-1040

**PARTS LIST**

| Position                       | Article    | Description             |
|--------------------------------|------------|-------------------------|
| 10                             | 206.2...   | W.S37 / 19 x 50         |
|                                | 260.5...   | M.S35 / 19 x 50         |
| 12                             | 154.2700   | Knurled nut             |
| 15                             | 253.8000   | HB4,5 manual override   |
|                                | 239.2033   | HB0 Screw plug          |
|                                | 251.5908   | Seal kit MVPPM33        |
| <b>Seal kit consisting of:</b> |            |                         |
| 16                             | O-ring     | ID 18,72 x 2,62         |
| 18                             | O-ring     | ID 17,17 x 1,78         |
| 50                             | O-ring     | ID 29,82 x 2,62         |
| 60                             | O-ring     | ID 23,47 x 2,62         |
| 70                             | Back. ring | PTFE rd 24,5 x 29 x 1,4 |
| 80                             | O-ring     | ID 21,89 x 2,62         |
| 90                             | Back. ring | PTFE rd 22,5 x 27 x 1,4 |