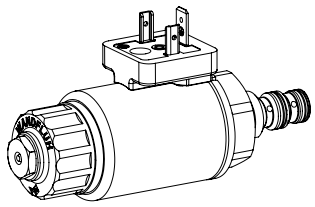
Proportional pressure reducing cartridge

- direct operated
- Q_{max} = 6 l/min
- p_{max} = 210 bar (350 bar)
- $p_{N\ red\ max}$ = 40 bar

M16 x 1,5
Wandfluh standard



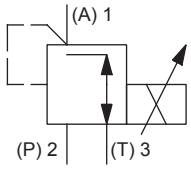
DESCRIPTION

Direct operated proportional pressure reducing valve in screw-in cartridge construction for cavity according to Wandfluh standard. 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 consumer port A (1) to port T (3). For the control, Wandfluh proportional amplifiers are available (see register 1.13).

APPLICATION

These valves are used in hydraulic systems where the pressure has to be changed frequently. The electrical remote control in conjunction with process controls allows economical solutions with repeatable processes. 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) M.S35 / 19 x 50 (Data sheet 1.1-174)
Connection	Connector socket EN 175301 – 803 Connector socket AMP Junior-Timer Connector Deutsch DT04 – 2P

STANDARDS

Cartridge cavity	Wandfluh standard
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 type M16 x 1,5
Mounting position	Any, preferably horizontal
Tightening torque	M_D = 30 Nm Screw-in cartridge M_D = 5 Nm knurled nut M_D = 9,5 Nm HB0 M_D = 5,5 Nm HB4,5

TYPE CODE

M D P PM16 - [ ] - [ ] / [ ] [ ] - [ ] [ ] [ ] # [ ]

Pressure reducing valve			
Direct operated			
Proportional			
Screw-in cartridge M16 x 1,5			
Nominal pressure range $p_{N\,red}$	25 bar	25	
	40 bar	40	
Nominal voltage U_N	12 VDC	G12	
	24 VDC	G24	
	without coil	X5	
Slip-on coil	Metal housing round		W
	Metal housing square		M
Connection execution	Connector socket EN 175301-803 / ISO 4400		D
	Connector socket AMP Junior - Timer		J
	Connector Deutsch DT04 - 2P		G
Sealing material	NBR		
	FKM (Viton)	D1	
Manual override	Manual override		HB4,5
	Screw plug		HB0
	System pressure max. 210 bar		
	System pressure max. 350 bar		Z406
Design index (subject to change)			

2.3-605

GENERAL SPECIFICATIONS

Designation	Proportional pressure reducing valve
Construction	Direct operated
Mounting	Screw-in cartridge construction
Nominal size	M16 x 1,5 according to Wandfluh standard
Actuation	Proportional solenoid
Ambient temperature	-25…+70 °C
Weight	0,45 kg
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
Standard nominal voltage	12 VDC, 24 VDC
Limiting current at 50 °C	I_G = 1360 mA (U_N = 12VDC) I_G = 680 mA (U_N = 24VDC)

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

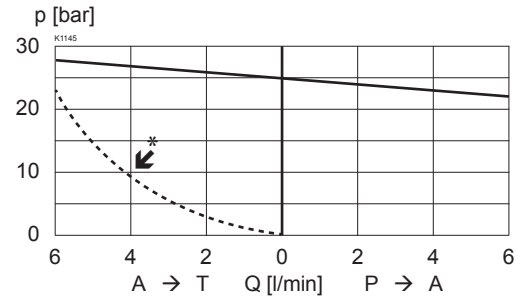
HYDRAULIC SPECIFICATIONS

Working pressure	p_{max} = 210 bar (350 bar)
Nominal pressure range	$P_{N\,red}$ = 25 bar, 40 bar
Minimum adjustable pressure	< 0,5 bar
Volume flow range	Q = 0…6 l/min
Leakage oil	**25 bar execution at p_{sys} = 210 bar** p_{red} = 0 bar: < 10 ml/min p_{red} = 25 bar: < 50 ml/min **40 bar execution at p_{sys} = 210 bar** p_{red} = 0 bar: < 10 ml/min p_{red} = 45 bar: < 40 ml/min
Hysteresis	≤ 4 % at optimal dither signal
Repeatability	≤ 1 % at optimal dither signal
Fluid	Mineral oil, other fluid on request
Viscosity range	12 mm²/s…320 mm²/s
Temperature range fluid	-25…+70 °C (NBR) -20…+70 °C (FKM)
Contamination efficiency	Class 18 / 16 / 13
Filtration	Required filtration grade ß 6…10 ≥ 75, see data sheet 1.0-50

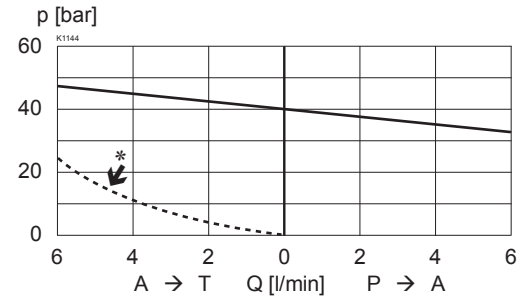
PERFORMANCE SPECIFICATIONS

Oil viscosity υ = 30 mm²/s

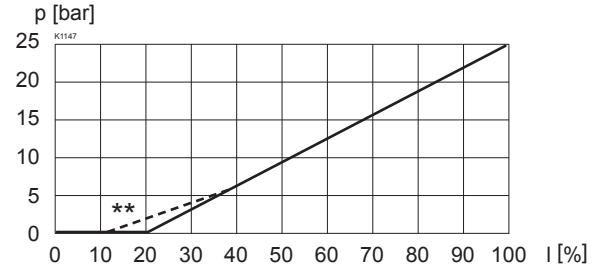
p_{red} = f (Q) **Pressure volume flow characteristics**
Maximal adjustable pressure
25 bar execution
*Limit of the operating range



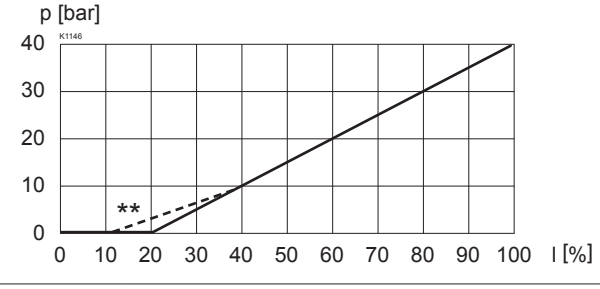
p_{red} = f (Q) **Pressure volume flow characteristics**
Maximal adjustable pressure
40 bar execution
*Limit of the operating range



p_{red} = f (n) **Pressure adjustment characteristics**
Measured at Q = 0 l/min (static)
25 bar execution
**Slightly increased hysteresis



p_{red} = f (n) **Pressure adjustment characteristics**
Measured at Q = 0 l/min (static)
40 bar execution
**Slightly increased hysteresis



ACCESSORIES

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

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.

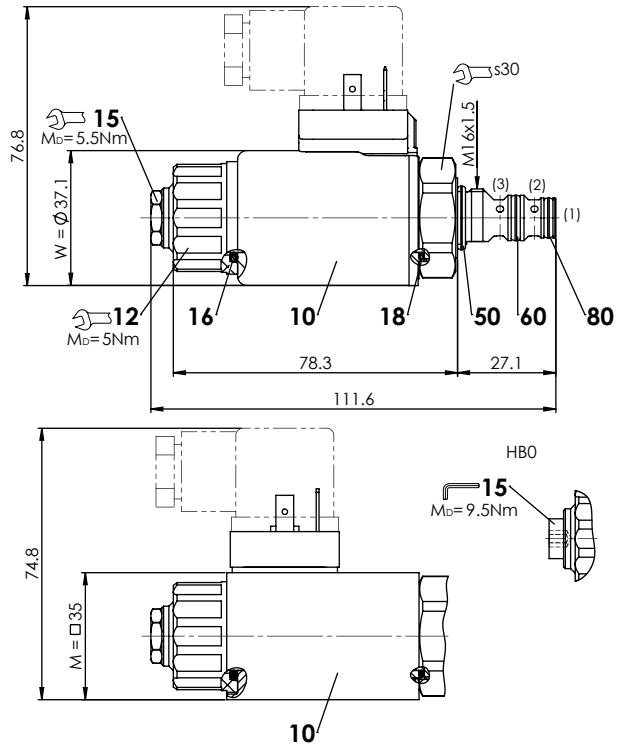
SURFACE TREATMENT

- The cartridge body is gas-nitro carburised
- The slip-on coil and the armature tube are zinc nickel coated

SEALING MATERIAL

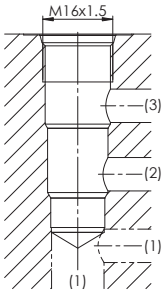
NBR or FKM (Viton) as standard, choice in the type code

DIMENSIONS



HYDRAULIC CONNECTION

Cavity drawing according to Wandfluh standard



Attention! For detailed cavity drawing and cavity tools see data sheet 2.13-1051

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
	251.1008	Seal kit MDPPM16, MDBPM16

Seal kit consisting of:

16	O-ring	ID 18,72 x 2,62
18	O-ring	ID 17,17 x 1,78
50	O-ring	ID 14,00 x 1,78
60	O-ring	ID 9,25 x 1,78
80	O-ring	ID 7,65 x 1,78