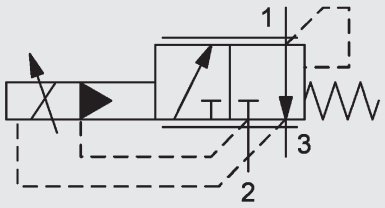
HYDAC INTERNATIONAL

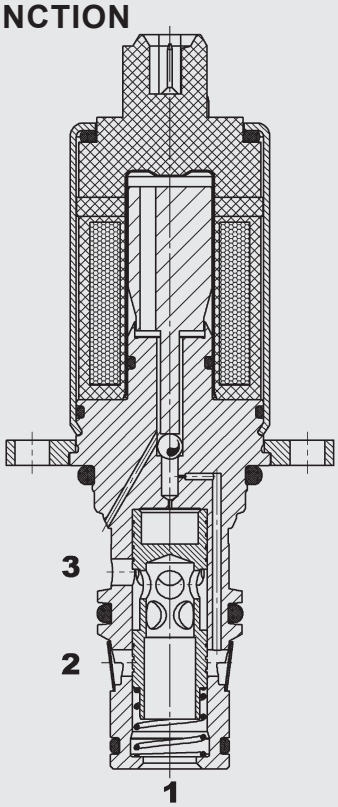


up to 100 l/min
up to 60 bar

3-Way Proportional Pressure Reducing Valve Spool Type, Pilot-Operated Compact valve – 60 bar

PDMC12S30P

FUNCTION



The proportional pressure reducing valve is a pilot-operated, 3-way spool-type valve. When de-energised, port 1 (consumer) is unloaded/ released via tank port 3.

When the inlet pressure and volume required fluctuates, it provides an almost constant outlet pressure which is proportional to the solenoid current.

When the control current increases, the coil solenoid exerts a force via the pilot line on the control piston and thereby connects pump port 2 with port 1 (consumer).

When a load causes the pressure to build at port 1, this acts on the control piston and produces a counter force to the solenoid force, which in turn moves the control piston back again. This causes the flow from pump port 2 and port 1 (consumer) to be restricted until the pressure equals the target value.

If, as a result of external factors, the pressure at port 1 rises above the preset pressure, the valve opens from port 1 (consumer) to tank port 3.

Any pressure at tank port 3 is additive to the control pressure.

The valves have been developed specifically for high dynamic performance and low pressure drops.

FEATURES

- Compact design
- Excellent dynamic performance
- Control pressure reduction is possible right down to 0 bar
- Excellent curve characteristics, even with undersupplied primary pressure (the max. control pressure is approx. 1.3 bar below the primary pressure)
- Coil seals protect the solenoid system
- Application example: clutch control
- Screen filter protects the pilot from contamination
- Version 15 with reduced leakage due to minimised pilot oil leakage in the de-energised state < 50 ml
- Optional: version with screen
- External surfaces with extended corrosion protection

SPECIFICATIONS*

Primary pressure at port 2:	max. 60 bar
Control pressure at port 1:	max. 45 bar
Tank pressure at port 3:	max. 10 bar dynamic (should be piped separately to tank, i.e. not connected to the working hydraulics)
Nominal flow:	max. 100 l/min
Pressure ranges:	0 – 27 bar, 0 – 45 bar
Pressure drop:	approx. 15 bar at 100 l/min (from 3 → 2) approx. 15 bar at 100 l/min (from 2 → 1)
Leakage incl. pilot oil flow:	Energised: < 1 l/min De-energised: < 50 ml/min → version 15 (at 60 bar pump pressure)
Temperature range of operating fluid:	min. -30 °C to max. +100 °C
Ambient temperature range:	min. -30 °C to max. 80 °C *(see note on thermal load capacity of the coil)
Operating fluid:	hydraulic oil to DIN 51524 Part 1, 2 and 3
Viscosity range:	min. 7 mm²/s to max. 2000 mm²/s
Filtration:	Class 19/17/14 according to ISO 4406 or cleaner
$MTTF_d$:	150 – 1200 years, according to DIN EN ISO 13849-1
Materials:	Valve body: steel Spool: hardened and ground steel Seals: NBR (standard) FKM (optional, media temperature range -20 °C to +120 °C)
Cavity:	12S30
Weight:	0.325 kg
Electronics	
Coil duty rating:	100 % duty cycle in continuous operation * (see note on thermal load capacity of the coil)
Control currents:	0 - 950 mA, 10.5 Ω / 0 - 750 mA, 21.2 Ω (24 V) 0 - 2.000 mA, 2.65 Ω / 0 - 1500 mA, 5.2 Ω (12 V)
Dither frequency:	300 Hz recommended (100 – 300 Hz)
Hysteresis with dither:	2 % of the max. control current
Repeatability:	≤ 1 % of max. pressure range
Hysteresis error:	≤ 1 % of max. control current
Response sensitivity:	≤ 1 % of max. control current
Insulation material class:	H to VDE0580, 180 °C

*see "Conditions and Instructions for Valves" in brochure 53.000

MODEL CODE

PDMC12S30 P – 01 – C – N – 45 – 12 PU – 10.5

Basic model
Proportional pressure reducing valve, compact

Cavity
12S30 = compact cavity

Design
P = pilot-operated

Version
01 = standard
03 = screen at port 2
15 = minimised leakage (pilot oil cut-off) with a de-energised valve

Type of connection
C = slip-in only

Sealing material
N = NBR (standard)
V = FKM

Pressure range
27 = 0 to 30 bar
45 = 0 to 45 bar

Coil voltage
12 = 12 Volt
24 = 24 Volt

Coil connectors
PN = Deutsch connector DT04, 2-pole, axial
PU = AMP Junior Timer, 2-pole, axial

Coil resistance
2.65 =2.65 Ω (12 V)
5.2 = 5.2 Ω (12 V)
10.5 =10.5 Ω (24 V)
21.2 =21.2 Ω (24 V)

Standard models

Model code	Part no.
PDMC12S30P-01-C-N-27-12PN-5.2	3544646
PDMC12S30P-01-C-N-27-24PN-21,2	3710158
PDMC12S30P-01-C-N-45-12PN-5.2	3677472
PDMC12S30P-15-C-V-45-24PN-10,5	3707325

Other models on request

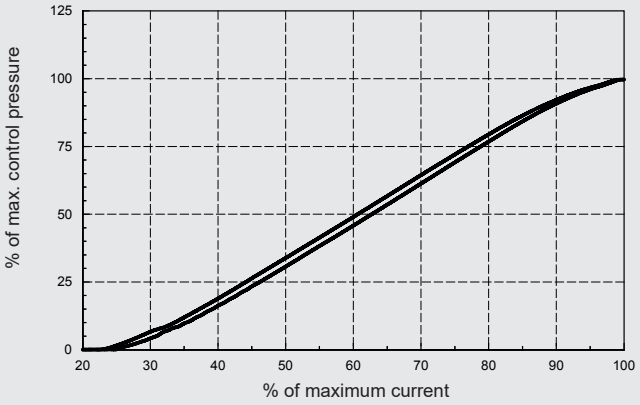
Inline connection housing

Designation	Part no.	Material	Ports	Pressure
R12S30-010-01	3545849	steel	G3/8”	60 bar

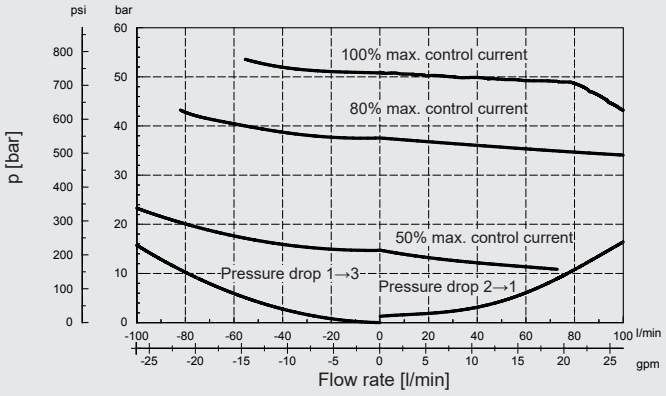
TYPICAL PERFORMANCE

Measured at
ν = 34 mm²/s
T_{oil} = 46 °C

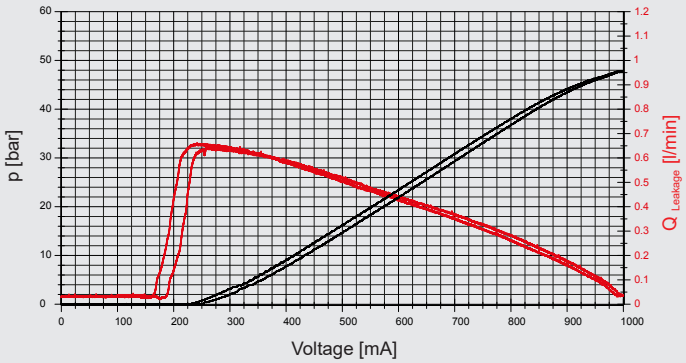
p/I



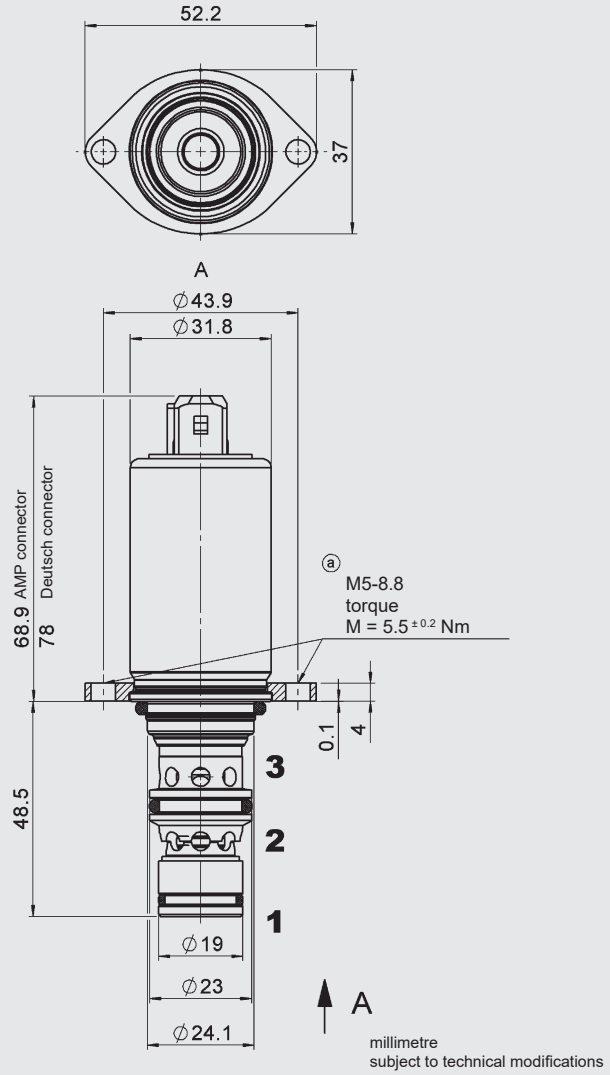
Δp/Q



Pilot oil volume with version 15



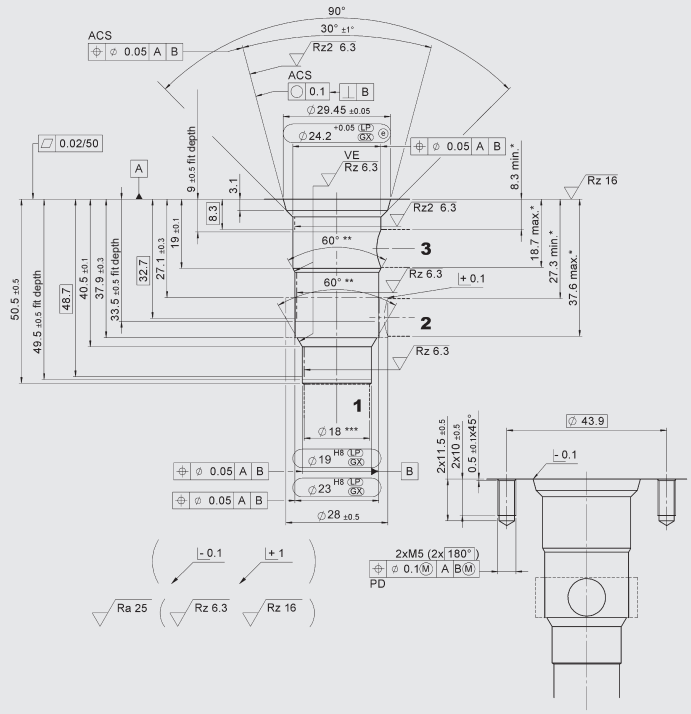
DIMENSIONS



millimetre
subject to technical modifications

CAVITY

3-Way 12S30



VE = visual examination
--- optional!
* authorised boring zone (for block design)
** Sharp edges should be avoided with a radius of 0.1 mm to 0.2 mm.
*** largest pre-drilling diameter (nominal tool diameter)

Form tools

Tool	Part no.
Countersink	In preparation
Reamer	In preparation

millimetre
subject to technical modifications

ENVIRONMENTAL TESTS

NOTICE:
These tests are performed to ensure the correct functioning throughout the service life. The selected pressure and temperature ranges in particular do not represent normal operating conditions!

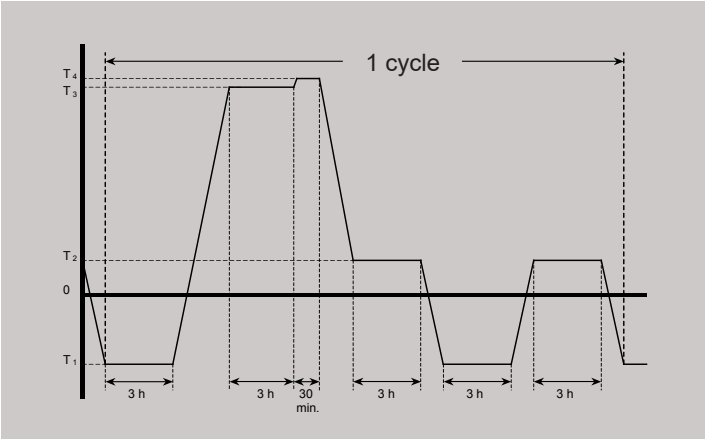
Long-term function test:
Actuation: I = 0 mA - I_{max}
Number of load changes: 2 x 10^6

Salt spray test:
according to ISO 9227, no red rust formation after 1000 hours

High temperature test:
Valve is continuously supplied with current 50 %I_{nom} without applying pressure for 96 h at T_{air}= 120 °C
Followed by a function test at T_{air}= 120 °C.

Low temperature test:
Valve is continuously supplied with current 25 %I_{nom} without applying pressure for 96 h at T_{air}= -30 °C
Followed by a function test at T_{air}= -30 °C.

Temperature cycle test:
T_1= -40 °C; T_2= 20 C°; T_3= 120 °C; T_4= 125 °C
Temperature change < 4 °C/min; 10 cycles (approx.169 h), function test during the last cycle at T_2.



Temperature shock test:
100 cycles; change in temperature ≥ 50 °C/min.
T_{min}: -60 °C; T_{max}: +90 °C
Followed by a function test at T_{air}=20 °C.

Thermal load capacity of the coil:
100% duty cycle at $T_{A,max}$ = 80 °C
Please note:
The data is based on the complete valve, mounted in a line body (block temperature 105 °C, aluminium or steel; dimensions 40 x 60 x 56 mm), flanged to a base block (block temperature 105 °C, steel, dimensions 200 x 150 x 100 mm). The air in the climatic test cabinet is circulated by the cabinet ventilator.

Mechanical shock test:
according to DIN EN 60068-2-29
Valve pressurised p_2 = 60 bar and continuously supplied with current
I = 50 %I_{nom}
Load: in each of the 3 main axes;
100 impacts (a = 400 m/s²; t = 6 ms)

VIBRATION TESTS

Broadband noise:
according to IEC 60068-2-64
Valve pressurised p_2 = 60 bar and continuously supplied with current
I = 50 % I_{nom}
Load: in each of the 3 main axes; noise in accordance with specified frequency spectrum, duration: 24h. Followed by a functional test at T_{air} = 20 °C.

Resonance frequency measurement:
according to DIN EN 60068-2-6
Frequency sweep: 10 Hz – 2000 Hz
10 Hz, frequency change 1 octave/min; a = 40m/s².
Followed by a function test at T_{air} = 20 °C.

Note
The information in this brochure relates to the operating conditions and fields of application described. For applications not described, please contact the relevant technical department.
All technical details are subject to change without notice.

HYDAC Fluidtechnik GmbH
Justus-von-Liebig-Str.
D-66280 Sulzbach/Saar
Tel.: 0 68 97 /509-01
Fax: 0 68 97 /509-598
E-mail: valves@hydac.com