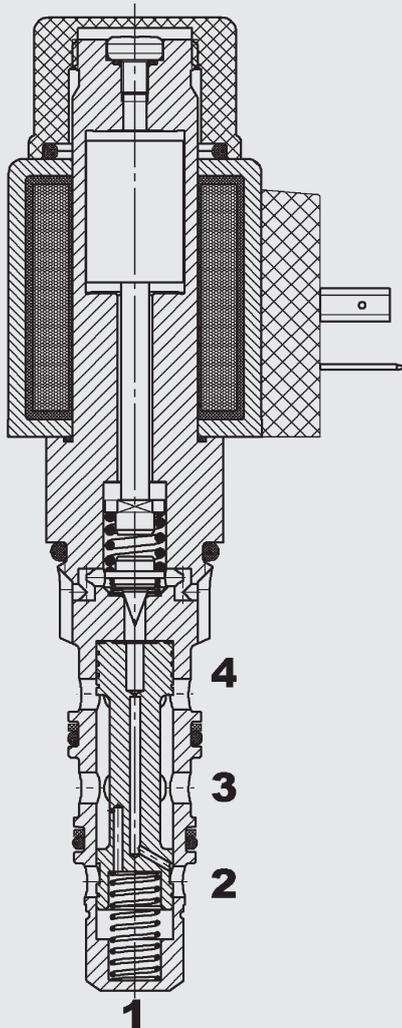


up to 60 l/min  
up to 250 bar

## 3-Way Proportional Pressure Reducing Valve **PDR10P-10**

spool design, pilot operated  
Cartridge Valve UNF – 250 bar

### FUNCTION



### PRODUCT ADVANTAGES

- Control range starts at 0 bar due to the pilot technology used
- Excellent stability throughout the entire flow range
- Very good dynamic performance
- Coil seals protect the solenoid system
- Wide variety of connectors available
- External surfaces with advanced corrosion protection due to Zn-Ni coating (1,000 h salt spray test)

### FUNCTION DESCRIPTION

The 3-way proportional pressure reducing valve is a pilot-operated spool-type valve. Port 2 (pump) is internally connected to the back of the main spool.

When de-energized, there is no pressure as the pilot stage opens and relieves to port 4 (tank). The main stage spool thus remains in the starting position. Port 3 (consumer) is connected to port 4 and therefore relieved to tank.

When the valve is energized, a proportional pressure can build up in the space below the pilot stage. This causes the main stage spool to move downwards, opening the connection from port 2 to port 3 and causing oil to flow to the consumer. Pressure then builds up at port 3.

This consumer pressure is internally forwarded to the bottom of the main stage spool, moving the main stage spool upwards against the pilot pressure. The control edge of the main stage spool throttles the connection between port 2 and port 3 until there is a balance between the pilot pressure and the resulting control pressure at port 3.

The pilot pressure and thus the control pressure of the valve can be varied steplessly by energizing the solenoid coil.

In addition, the valve has a pressure protection on the outlet side.

If the pressure at port 3 (consumer) exceeds the specified control pressure, it is relieved to port 4 (tank).

Caution: Port 1 is not used.

#### Notice

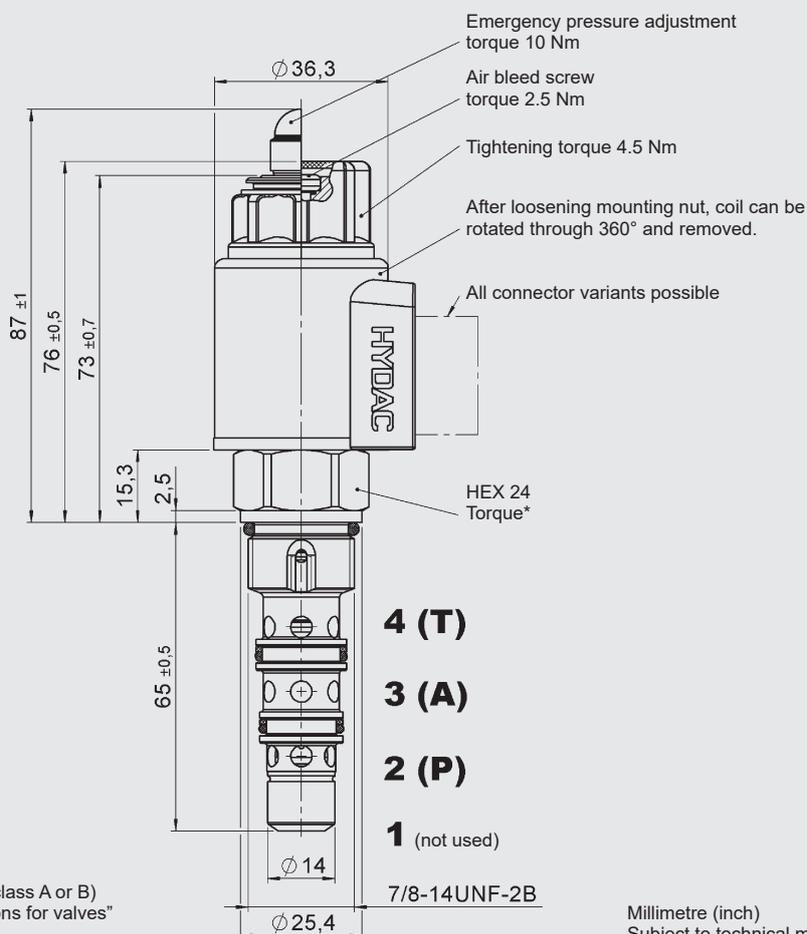
In order to achieve optimal function, any trapped air should be vented using the air bleed screw located on the pole tube (not for the version with manual override).

## TECHNICAL DATA\*

Operating pressure	max. 250 bar	
Pressure setting ranges	0 to 20 bar 0 to 40 bar 0 to 60 bar 0 to 100 bar 0 to 200 bar	
Flow rate	max. 60 l/min	
Internal leakage	max. 1.2 l/min at $v = 46 \text{ mm}^2/\text{s}$ and 250 bar	
Temperature range of operating fluid	NBR: min. -20 °C to max. +100 °C FKM: min. -20 °C to max. +120 °C	
Ambient temperature range	NBR: min. -20 °C to max. + 60 °C FKM: min. -20 °C to max. + 60 °C	
Operating fluid	Hydraulic oil to DIN 51524 Part 1, 2 and 3	
Viscosity range	min. 10 $\text{mm}^2/\text{s}$ to max. 420 $\text{mm}^2/\text{s}$	
Filtration (to ISO 4406)	$\leq 210 \text{ bar}$ : min. class 17/15/12 $> 210 \text{ bar}$ : min. class 16/14/11	
MTTF <sub>d</sub>	150–1200 years, measurement according to DIN EN ISO 13849-1	
Installation position	No orientation restrictions	
Materials	Valve body	High tensile steel
	Piston	Hardened and polished steel
	Seals	NBR (standard) FKM (optional)
	Back-up rings	PTFE
	Solenoid coil	Steel/polyamide
Cavity	FC10-4	
Weight	Valve assembly	0.46 kg
	Coil only	0.20 kg
<b>Electronics</b>		
Control currents	1050 mA; 8.8 ohm (24 volt) 2100 mA; 2.2 ohm (12 volt)	
Dither frequency	120 - 200 Hz	
Hysteresis with dither	2 - 4 % of $I_{\text{nom}}$	
Repeatability	$\leq 1.5 \%$ of $p_{\text{nom}}$	
Reversal error	$\leq 2 \%$ of $I_{\text{nom}}$	
Response sensitivity	$\leq 1 \%$ of $I_{\text{nom}}$	
Coil type	Coil...-40-1836	

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

## DIMENSIONS

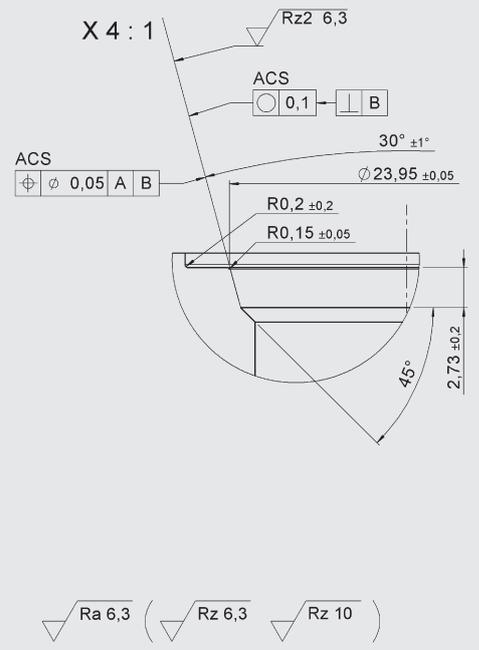
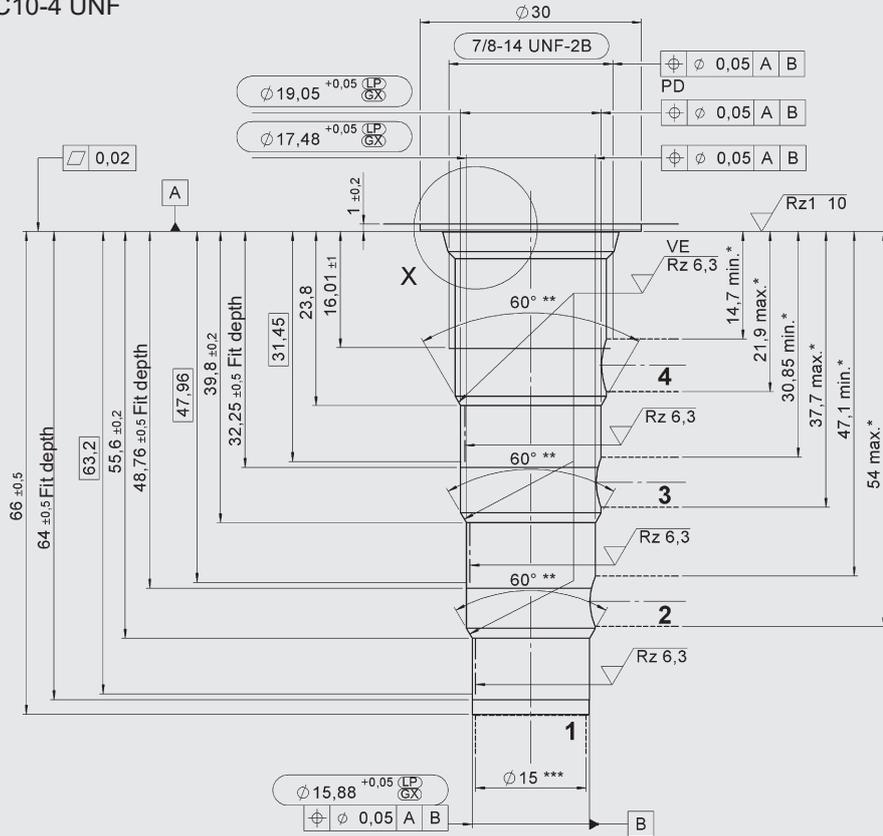


\*Torque:  
Steel housing (burst strength  $> 360 \text{ N/mm}^2$ ): 45 Nm  
Aluminium housing (burst strength  $> 330 \text{ N/mm}^2$ ): 35 Nm  
(With torque tool according to DIN EN ISO 6789, tool type II class A or B)  
For more information see "Operating conditions and instructions for valves" in brochure 53.000

Millimetre (inch)  
Subject to technical modifications

# CAVITY

FC10-4 UNF



- VE = visual examination
- \* Allowed drilling zone (for manifold design)
- \*\* Sharp edges should be avoided by rounding to a radius of 0.1 mm to 0.2 mm
- \*\*\* Largest pre-drilling diameter (nominal tool diameter)

Millimetre (inch)  
Subject to technical modifications

## MODEL CODE

**PDR10P - 10 - C - N - 030 - 24 - PG - 2.2**

### Basic model

Proportional pressure reducing valve, pilot operated

### Type

10 = control pressure can be relieved down to atmospheric pressure

### Body and ports

C = cartridge only

### Sealing material

N = NBR (standard)

V = FKM

### Pressure range

030 = 300 PSI (20 bar)

060 = 600 PSI (40 bar)

090 = 900 PSI (60 bar)

140 = 1400 PSI (100 bar)

290 = 2900 PSI (200 bar)

Other pressures on request

### Nominal voltage

DC: 12 = 12 V DC

24 = 24 V DC

### Coil type (40-1836)\*

DC: PG = DIN connector type A to EN175301-803

PT = AMP Junior Timer, 2-pole, radial

PL = connector with two free strands, 457mm long

PN = Deutsch connector DT04-2P, 2-pole, axial

\*see "Solenoid Coils for Proportional Valves" in brochure 5.215

### Coil resistance

8.8 = 8.8 ohm (1050 mA)

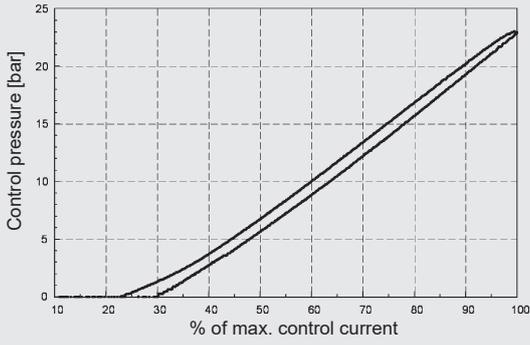
2.2 = 2.2 ohm (2100 mA)

# TYPICAL PERFORMANCE

measured at  $v = 46 \text{ mm}^2/\text{s}$ ,  $T_{\text{oil}} = 40 \text{ }^\circ\text{C}$

## p-I Performance

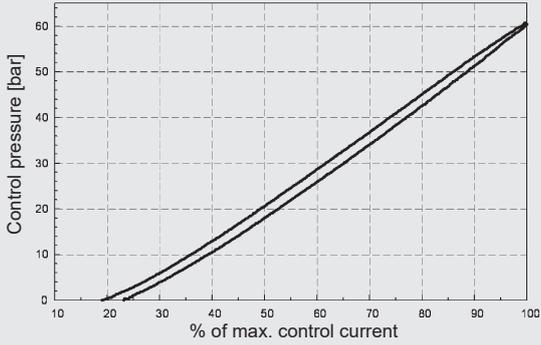
20 bar



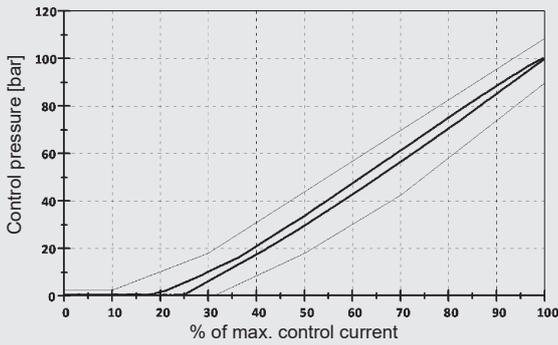
40 bar



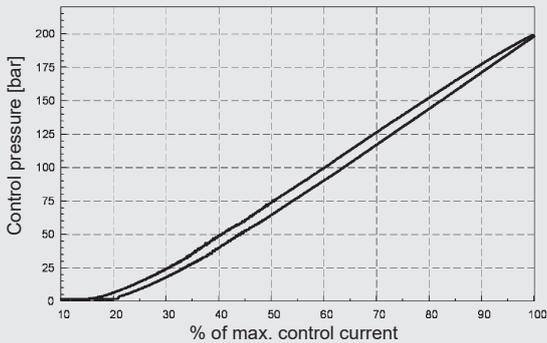
60 bar



100 bar

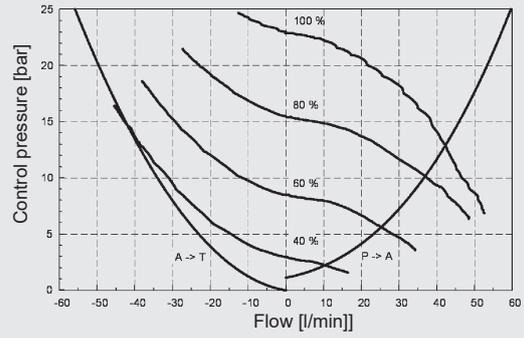


200 bar

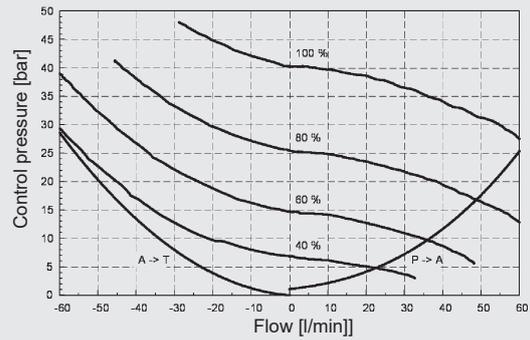


## p-Q Performance

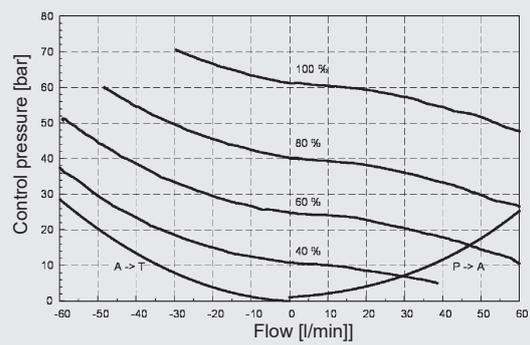
20 bar



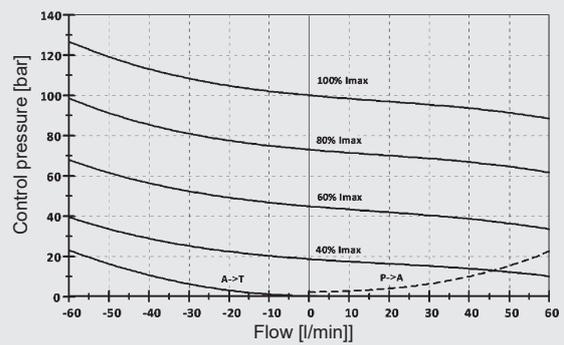
40 bar



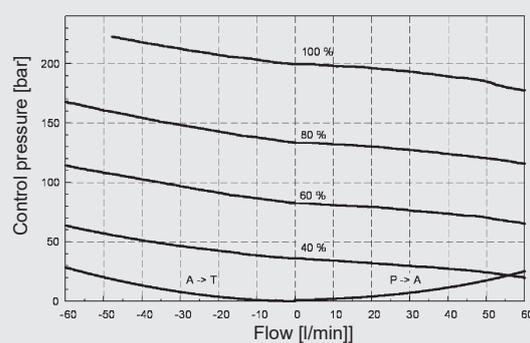
60 bar



100 bar



200 bar



## MATERIAL OVERVIEW

### Standard models

Model code	Part no.
PDR10P-10-C-N-030-24PN-8.8	3711809
PDR10P-10-C-N-060-24PN-8.8	3924090
PDR10P-10-C-N-090-24PN-8.8	3711810

Other versions on request

### Accessories, standard in-line bodies

Code	Material	Ports	Pressure	Part no.
FH104-SB4	Steel, zinc-plated	G1/2"	250 bar	3037784
FH104-AB4	Aluminium, anodised	G1/2"	210 bar	3038097

Other housing upon request

### Accessories, form tools for cavity

Tool	Part no.
Countersink	176174
Reamer	176175

### Spare parts, seal kits

Code	Material	Part no.
FS UNF 10/N	NBR	3651557
FS UNF 10/V	FKM	3651559

## NOTE

The information in this brochure relates to the operating conditions and applications described.

For applications not described, please contact the relevant technical department.

Technical modifications are reserved.

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