HYDAC INTERNATIONAL

Proportional pressure control valve with on-board electronics (OBE) and integrated pressure sensor

P3DRSERE 6

Solenoid-operated, direct-acting – 350 bar

DESCRIPTION

HYDAC pressure control valves in the P3DRSERE 6 series are direct-acting, electrically actuated poppet valves.

The valve is operated by an oil-immersed switching solenoid. The solenoid force acts directly on the spools of two poppet valves, which enable a pressure control valve function when used in combination.

The control pressure is set continuously, independently of the pilot flow rate.
A nominal value signal at the input of the on-board electronics specifies the desired pressure value. The integrated pressure sensor measures the current pressure value and the controller integrated into the on-board electronics controls the two poppet valves. This means that oil can flow to or away from the consumer, so the pressure value corresponding to the nominal value signal is applied to the valve.

More information can be found in the following operating instructions 5.136.BA “P3DRSERE6 Proportional Pressure Control Valve operating instructions”.

FEATURES

- Application for pressure control
- Easy to use thanks to a plug-and-play design or specific adjustment to suit more complex applications
- Operating parameters of the on-board electronics can be adjusted via the OBE Service Tool software
- Highly dynamic and very good response behaviour
- Hole pattern according to ISO 4401-03; DIN 24340 Form A6

Nominal size 6
up to 20 l/min
up to 350 bar

CONTENTS

MODEL CODE

P3DRSERE 6 A 350 / 200 A40 – 24 X1 / E1 B / V

Designation
Leak-tight proportional pressure control valve
with on-board electronics and integrated pressure sensor, direct-acting

Nominal size
6

Symbol
A = closed-loop pressure control in port A

Max. control pressure
350 = up to 350 bar

Default setting, control pressure
As above = default setting corresponds to max. control pressure (standard)
200 = default setting up to 200 bar (example), custom setting

Series
A40 = improved corrosion protection (standard)

Supply voltage, on-board electronics
24 = 24 V DC

Main connector
X1 = M12x1, 8 pin, A-coded (standard)
X2 = MIL-C-5015-G, 7 pin, DIN EN 175201-804

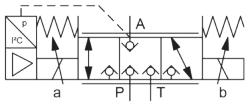
Default setting, nominal value signal / monitor signal
E1 = current 4 – 20 mA
E2 = voltage 0 – 10 V

Pin 4/C function (see section 2.5)
A = external enable
B = internal enable (standard)
C = monitor output reference potential (only with connector X2)
D = external override (P to A)

Sealing material
V = FKM (standard)
N = NBR

SPOOL TYPE / SYMBOLS

3/3 directional spool valve

Type	Basic symbol
A	

FUNCTION

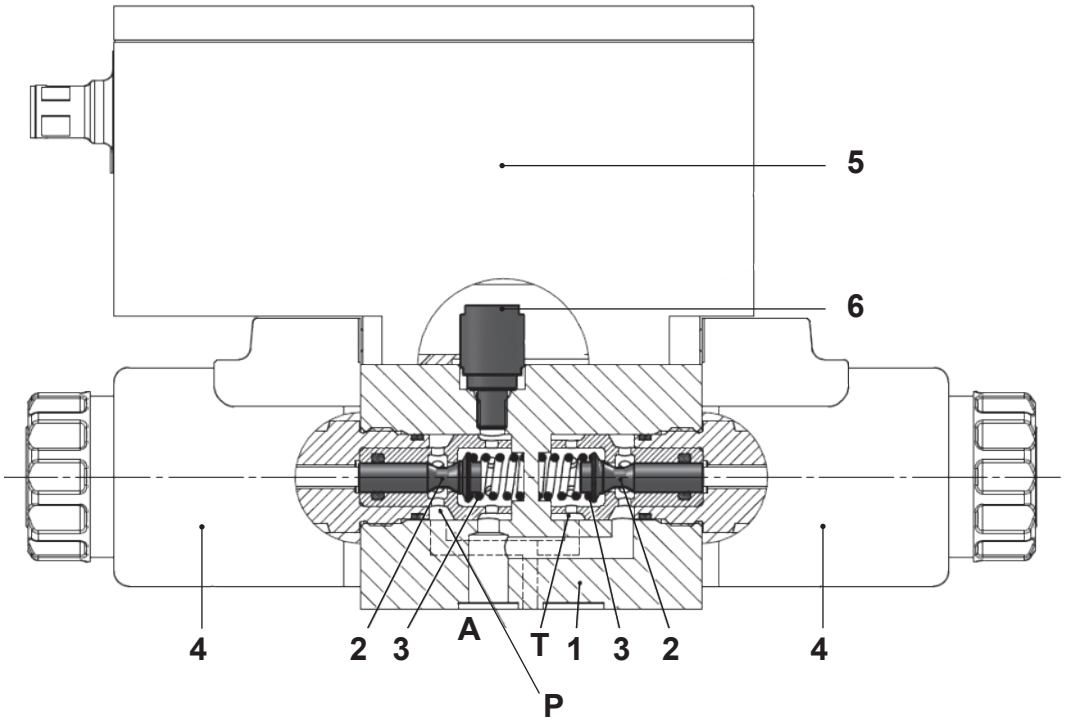
The valve is made up of a valve casing (1) with two corresponding poppet valve elements (2). These elements each have a return spring (3) and are equipped with two solenoids (4) and on-board electronics (5). An integrated pressure sensor (6) measures the current value of the output pressure.

The on-board electronics implements an analogue nominal value signal in such a way that through targeted opening and closing of two control edges of the poppet valves, a corresponding proportional pressure at the consumer is generated. The combination of the two poppet valves, the on-board electronics with a controller and the integrated pressure sensor enables a precise pressure control function.

If there is no current supply at the valve, the return springs set the valve spools to the closed position and disconnect the consumer from the pump and tank with no leakage.

Notice:
The valve's port B is not used.
Pressure must not be applied to port B.
Mount O-rings at all connections, including port B.
The control pressure at port A must never be lower than the pressure at port T.
In a de-energised state (e.g. loss of voltage supply), the previously controlled pressure at port A is locked in.

SECTION VIEW



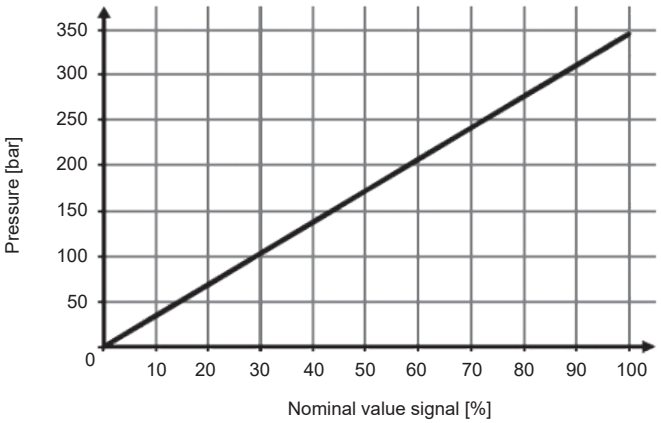
TECHNICAL DATA [1)]

General specifications		
$MTTF_D$	150 – 1200 years, assessment according to DIN EN ISO 13849-1:2016; Table C.1, Confirmation of ISO 13849-2:2013; Tables C.1 and C.2	
Ambient temperature	-20 °C to +60 °C	
Installation	No orientation restrictions	
Weight	2.6 kg with two solenoids and OBE	
Material	Valve casing:	Steel
	Electronics housing:	Aluminium
	Coil housing:	Steel
	Type label:	Aluminium
Surface coating	Valve casing:	Zinc-nickel plated
	Pole tube: coil housing:	Zinc-plated Zinc-nickel plated
Hydraulic specifications		
Operating pressure	Port P, A, T: p_{max} = 350 bar	
Control pressure (port A)	0 – 350 bar (standard), adjustable in OBE Service Tool, custom default setting possible	
Flow rate	up to 20 l/min (dependent on control pressure, see p/Q curve)	
Operating fluid	Hydraulic oil to DIN 51524 Part 1, 2 and 3	
Media operating temperature range	-20 °C to +80 °C	
Viscosity range	15 to max. 400 mm²/s	
Permitted contamination level of operating fluid	Class 18/16/13 according to ISO 4406 or cleaner	
Hysteresis	<3 % of p_{nom}	
Max. switching frequency	±3600 1/h	
Sealing material	FKM (standard), NBR	
Electrics		
Main connector	X1: M12x1, 8-pole, A-coded, DIN EN 61076-2-101 (standard) X2: MIL-C-5015-G, 7-pole, DIN EN 175201-804	
Supply voltage	24 V DC (18 – 36 DC, residual ripple 5 %)	
Duty cycle	100 % duty cycle	
Max. power consumption	32 W	
Default setting, monitor output can be altered in the OBE Service Tool	E1: 4 – 20 mA or E2: 0 – 10 V	
Default setting, nominal value input can be altered in the OBE Service Tool	E1: 4 – 20 mA (max. resistance 500 kΩ) or E2: 0 – 10 V (min. resistance 2 Ω)	
Pin 4/C external override	In variant D, switching pin 4/C causes the valve to fully open the connection from P to A. Switch off pin 4/C to return the valve to pressure control mode.	
Step response time (0 – 100 %)	50 – 100 ms (depending on the enclosed oil volume, flow rate and controller parameters)	
EMC	● DIN EN 61000-4 part 2 to 6 ● DIN EN 61000-6 part 2 to 3 ● DIN EN 55016	
Protection class according to DIN EN 60529	IP65 [2)]	
Specifications		
The software can be used to monitor and alter the corresponding parameters. Download from www.hydac.com		

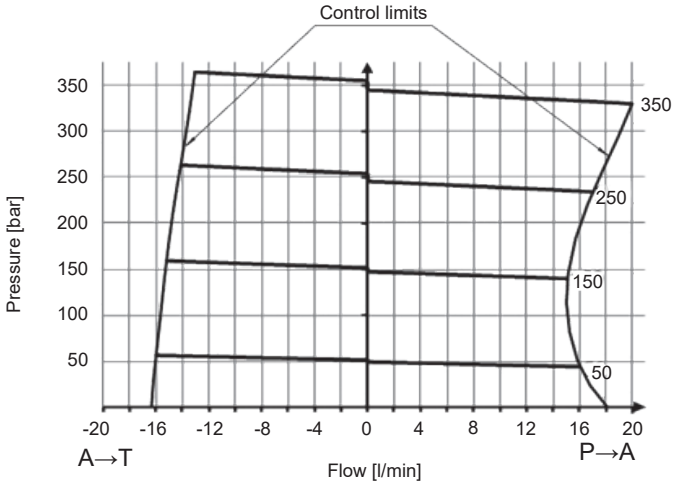
1) see “Conditions and instructions for valves” in brochure 53.000
2) if installed correctly

TYPICAL PERFORMANCE

p/nominal value curve measured at T_{oil} = 45 °C and 42 mm²/s

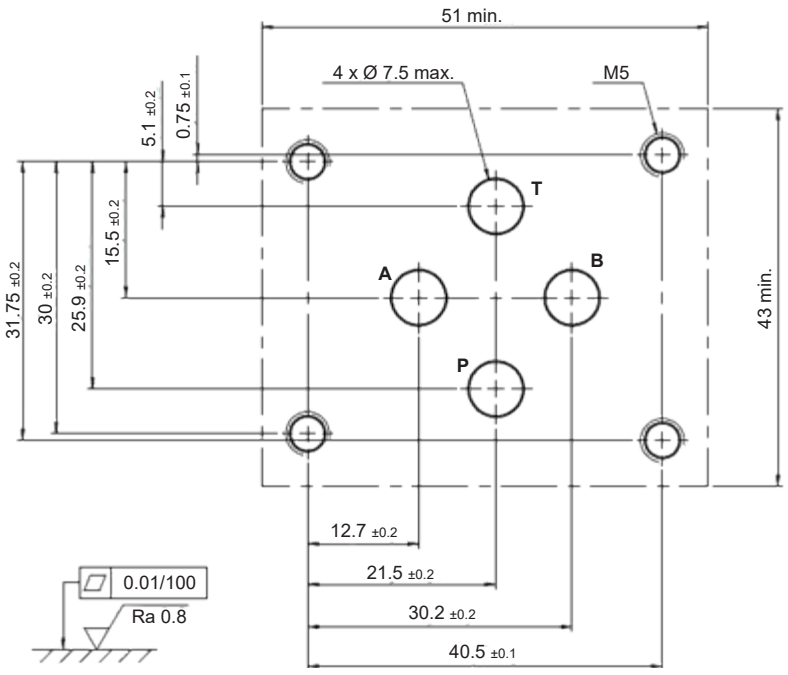


p/Q curve with performance limit

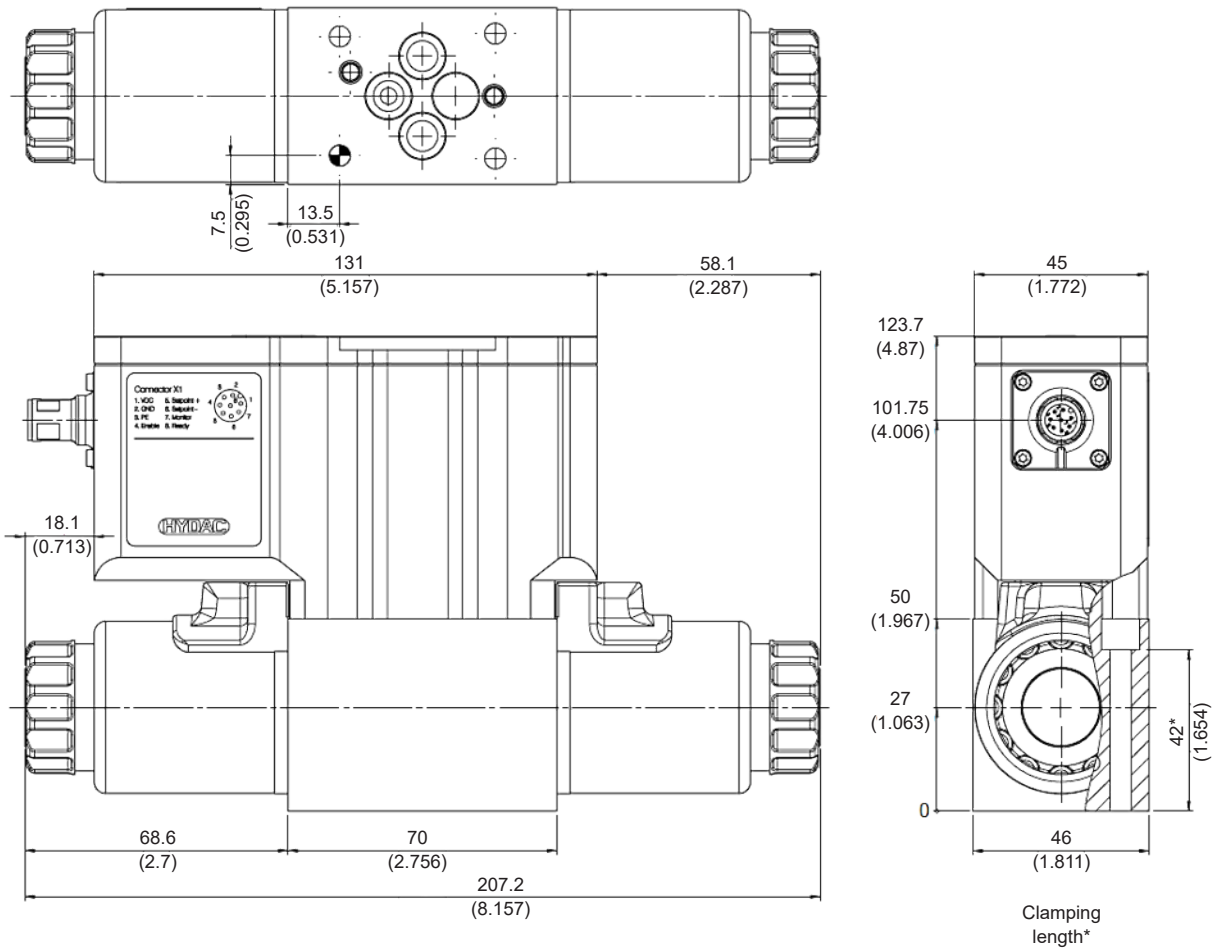


DIMENSIONS

Hole pattern to ISO 4401-03-02-0-05 (CETOP 3)



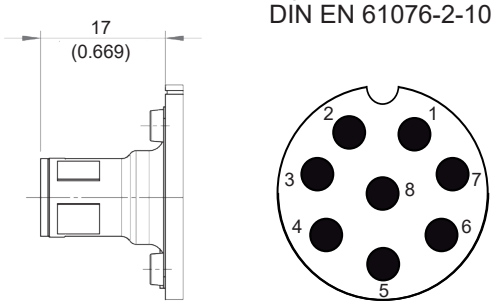
Mounting screws:
(not included in delivery)
DIN EN ISO 4762 – M5x50 – 10.9
Tightening torque: 7 Nm
Torque acc. to DIN EN ISO 6789,
tool type II class A or B



MAIN CONNECTOR AND PIN ASSIGNMENT

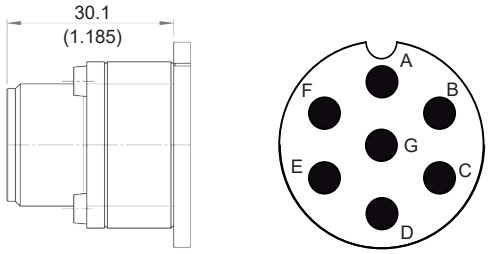
X1: M12x1

8-pole, A-coded
DIN EN 61076-2-101



X2: MIL-C-5015-G

7-pole
DIN EN 175201-804



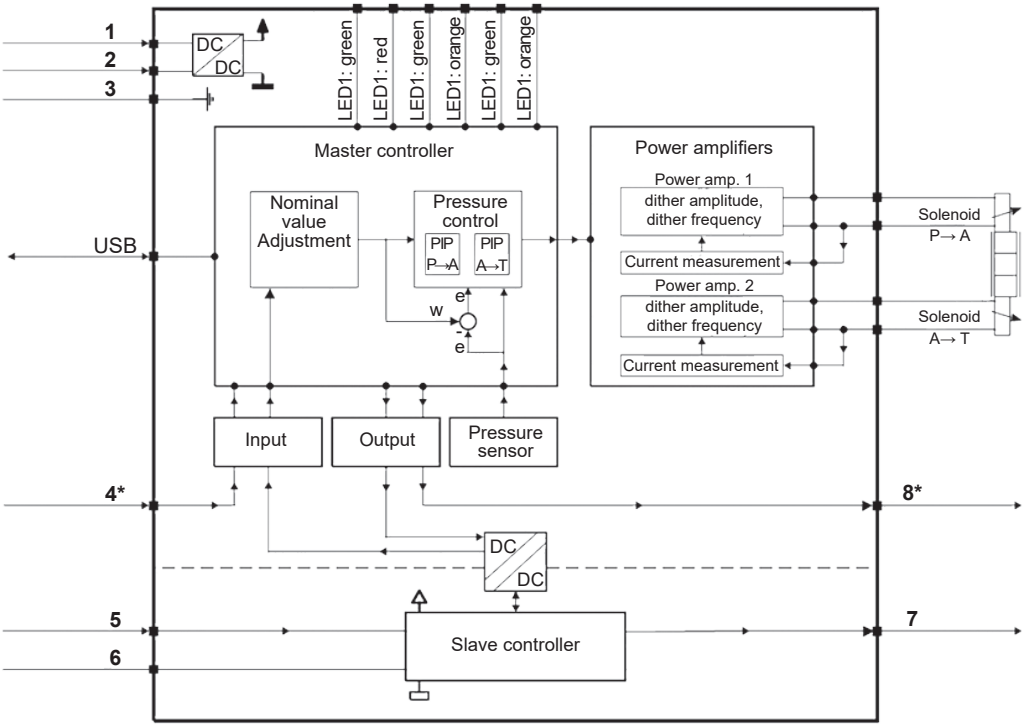
M12x1

Pin	Pin block diagram	Function			Description
		Version A	Version B	Version D	
1	1	+24 V DC			Positive operating voltage
2	2	0 V			Operating voltage, reference potential
3	3	PE			Protective conductor
4	4	+24 V DC	Not used	+24 V DC	Enable
5	5	0 – 10 V or 4 – 20 mA			Nominal value, input
6	6	0 V			Nominal value / monitor reference potential
7	7	0 – 10 V or 4 – 20 mA			Monitor output
8	8	+24 V DC			Output – operational readiness signal

MIL-C-5015-G

Pin	Pin block diagram	Function				Description
		Version A	Version B	Version C	Version D	
A	1	+24 V DC				Positive operating voltage
B	2	0 V				Operating voltage, reference potential
G	3	PE				Protective conductor
C	4	+24 V DC	Not used	0 V	+24 V DC	**Version A:** Enable **Version C:** Monitor reference potential
D	5	0 – 10 V or 4 – 20 mA				Nominal value, input
E	6	0 V				**Versions A, B and D:** Nominal value / monitor reference potential **Version C:** nominal value reference potential
F	7	0 – 10 V or 4 – 20 mA				Monitor output

BLOCK DIAGRAM



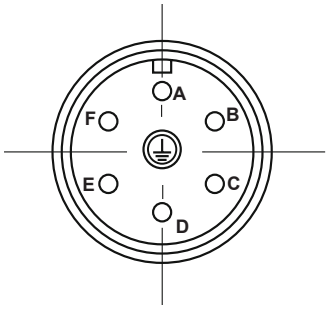
* for additional information, see pin assignment table

CONNECTOR FOR MIL CONNECTOR

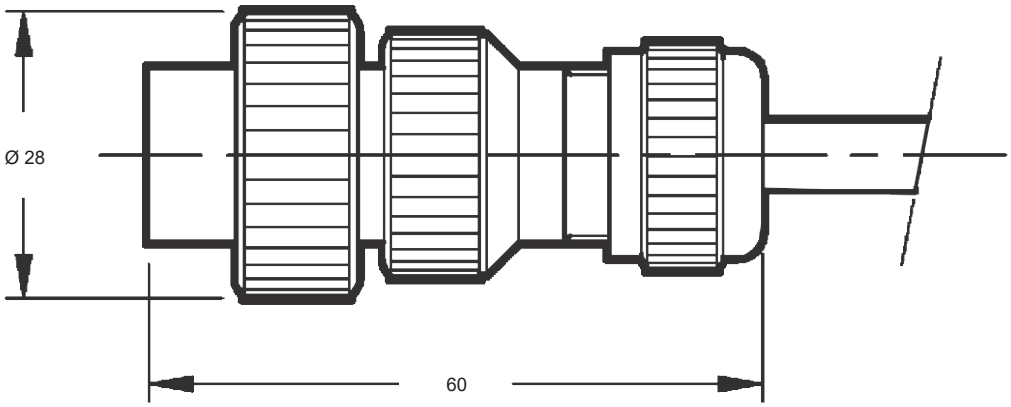
The external diameter of the cable sheath for the connector (cable and plug connector are not part of the scope of delivery) must be min. 8 mm and can be max. 10 mm.

Note:
For the M12 connector, a standard M12x1, 8-pin, A-coded connector can be used.

Pin assignment



Metal connector



ACCESSORIES

Designation	Material	Code	Part no.
Seal kit (set of 4 pcs.)	NBR	Seal kit 4WE 6	3492432
Seal kit	FKM	Seal kit 4WE 6	3120269
Mounting screws, 4 pcs.		SO 4762 M5 x 50 – 10.9	4312231
Main connector for on-board electronics		Connector 6+PE EN175201 Part 804	6080324

NOTE

The information in this brochure relates to the operating conditions and applications described. For applications not described, please contact the relevant technical department.

Subject to technical modifications.

Documents are only valid if they have been obtained via the website and are up-to-date.

HYDAC Fluidtechnik GmbH
Justus-von-Liebig-Str.
66280 Sulzbach/Saar
Germany
Tel.: +49 68 97 / 509-01
Fax: +49 68 97 / 509-598
E-mail: valves@hydac.com