

4/3 proportional directional valves direct-acting with Onboard Electronic and transducer **P4WERE 06**

DESCRIPTION

HYDAC proportional directional valves of the P4WERE series combines directional control with speed control of the consumer.

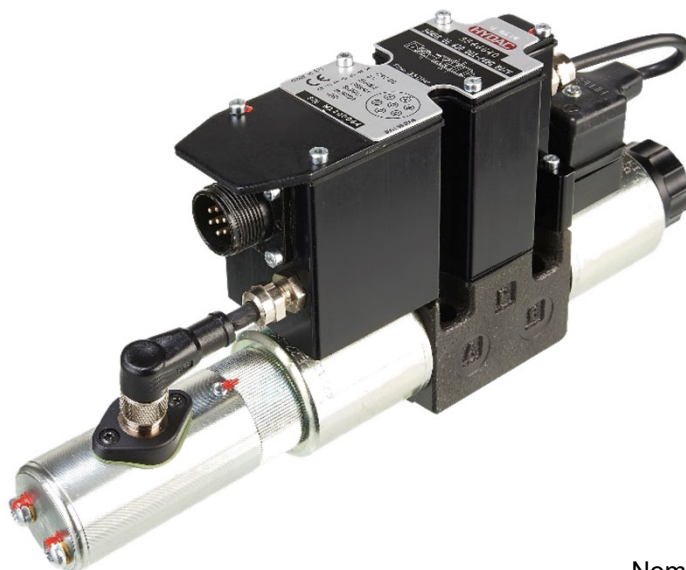
The controlled volume flow is proportional to the electrical input signal on valve electronics.

The integrated digital electronics in combination with the transducer allows improved performance and function due to

- regulation of size and direction of a volume flow
- short response times
- low hysteresis
- high repeatability

FEATURES

- High flow capacity due to optimized, cast casing
- Low hysteresis due to precision machining of moving parts
- With integrated Onboard Electronic and transducer
- Easy interchangeability due to internationally standardised interface according to ISO 4401



Nominal size 6
up to 80 l/min
up to 350 bar

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MODEL CODE

P4WERE 06 E 12 D01 – 24 PG E0 A /V

Type

Proportional directional valve
with Onboard Electronic (OBE) and transducer

Nominal size

6

Symbol

see page 2

Nominal flow (at $\Delta p = 10 \text{ bar}$, $P \rightarrow T$)

- 01 = 1 l/min
- 04 = 4 l/min
- 12 = 12 l/min
- 18 = 18 l/min (E spool only)
- 30 = 30 l/min
- 30/15 = 30 l/min ($P \rightarrow A$)/ 15 l/min ($P \rightarrow B$)

Series

D01 = standard with manual override

Power supply

24 = 24 VDC

Coil Type

PG = DIN connector to EN175301-803

Input signal

- E0 = $\pm 10 \text{ V}$
- E1 = 4 – 20 mA

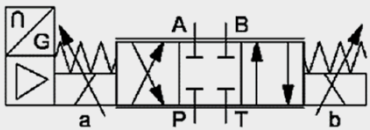
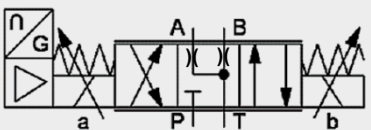
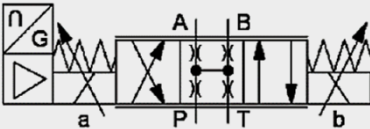
Pin C Function

see „Diagramms Pin C Function“ on page 7

Sealing material

- V = FKM (standard)
- N = NBR

SPOOL TYPES / SYMBOLS

Type	Basic symbol	Type	Basic symbol
E		Q	
Z			

FUNCTION

The proportional valves of the P4WERE series are direct-acting valves with integrated Onboard Electronic.

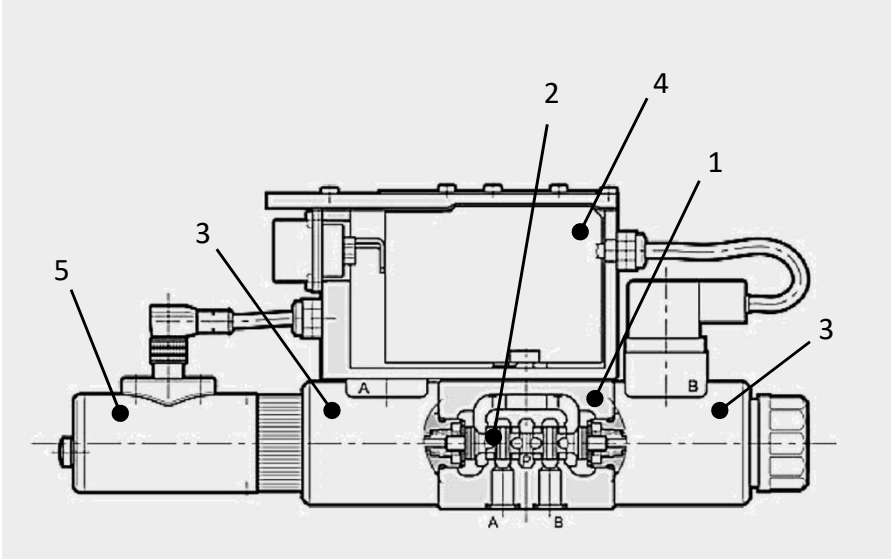
The volume flow is controlled continuously (proportionally) to the electrical input signal at the solenoid coil.

The valve consists of a valve casing (1), a control piston (2), as well as a transducer (5) and two proportional solenoids (3).

The proportional solenoid coils are controlled via the integrated Onboard electronic (OBE) (4).

According to the input signal, the solenoid generates a force and shifts the piston against a spring. This releases cross-sections, which define the size of the volume flow, depending on the pressure difference at the relevant control element.

SECTION VIEW



ACCESSORIES

	Designation	Part no.
Seal kits (4-part set)	9,25 x 1,78 90 Sh FKM	3524413
	9,25 x 1,78 90 Sh NBR	3524355
Mounting screws	ISO 4762 M5 x 30 (4 pcs)	3524313
Main connector	6+PE EN175201 Part 804	6080324
Electronics	Lin-Bus Interface	3648934

TECHNICAL DATA ¹

General specifications			
MTTF _d		150 - 1200 years, 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	[°C]	-20 to +60	
Installation position		No orientation restrictions	
Weight	[kg]	2,7 one solenoid;	
Material		Valve casing:	Cast iron
		Name plate:	Aluminium
Surface coating		Valve casing:	Phosphate coated
Hydraulic specifications			
Operating pressure	[bar]	Port P, A, B:	p _{max} = 350
		Port T:	p _{max} = 210
Flow rate (bei Δp A → B min. 10 bar)	[bar]	see performance curves on page 4	
Operating fluid		Hydraulic oil to DIN 51524 part 1, 2 and 3	
Media operating temperature range	[°C]	-20 to +80	
Viscosity range	[mm²/s]	10 to 400	
Permitted contamination level of operating fluid		class 18/16/13 according to ISO 4406	
Hysteresis	[%]	< 0,2 of Q _{max}	
Repeatability	[%]	< 0,2 of Q _{max}	
Sealing material		FKM, NBR (standard),	
Electrical specifications			
Switching time (0 → 100%): (0 → 100%):	[ms]	see Performance on page 4	
Type of voltage		DC	
Rated voltage	[V]	24	
Protection class to DIN EN 60529		with electrical connection "G" IP65 ² with electrical connection "N" IP65 ²	

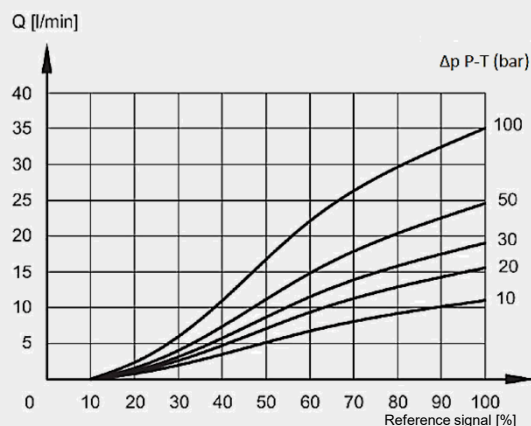
PERFORMANCE

measured at $T_{oil} = 50^\circ\text{C}$ and $36\text{ mm}^2/\text{s}$, $p = 140\text{ bar}$

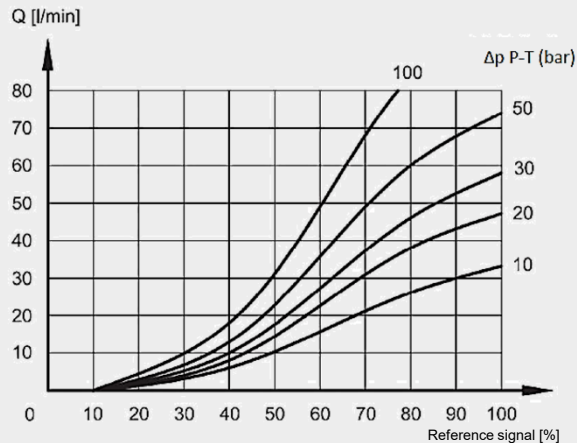
The performance represent typical curves for the various available valve pistons, at a constant Δp , depending on the current supplied by the solenoid coil.

The total valve pressure drop (Δp) was measured between port P and T of the valve.

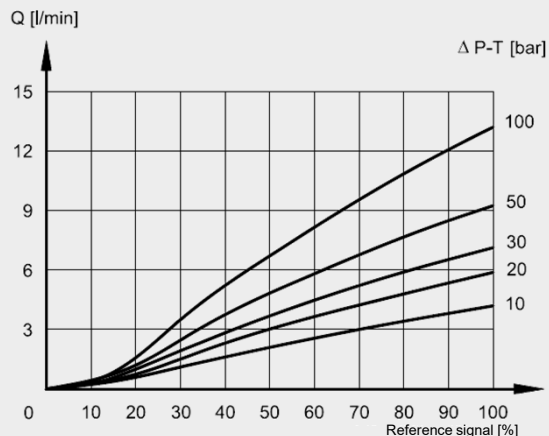
E / Q 12 spool



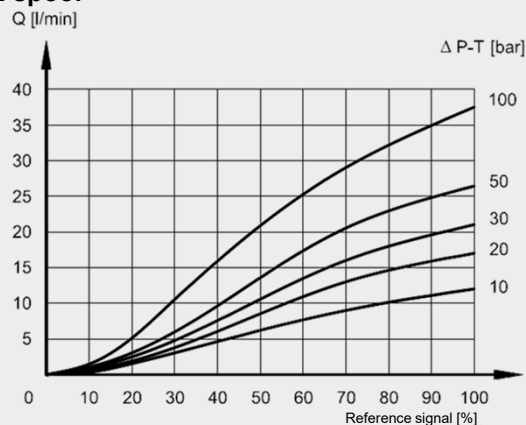
E / Q 30 spool



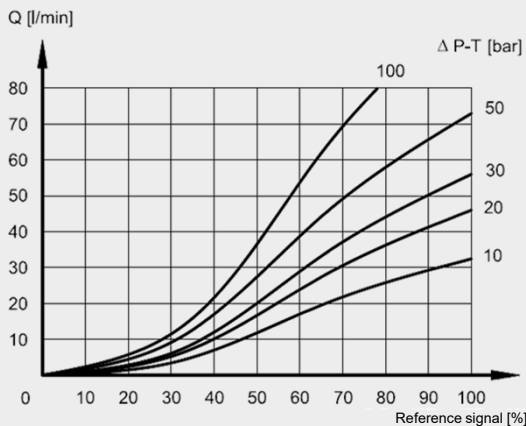
Z 04 spool



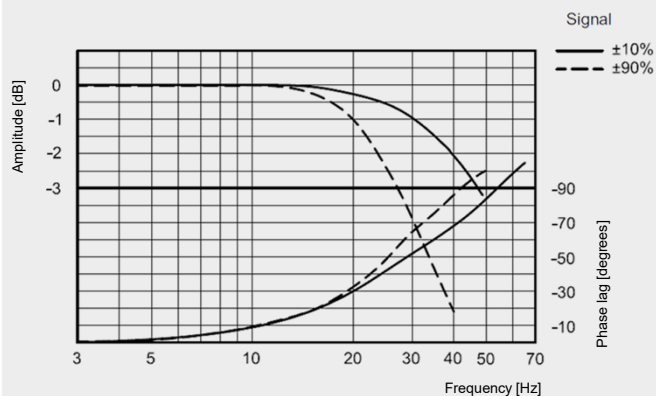
Z 12 spool



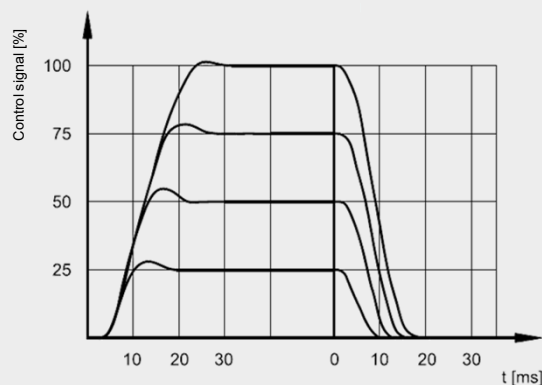
Z 30 spool



Frequency response Z spool

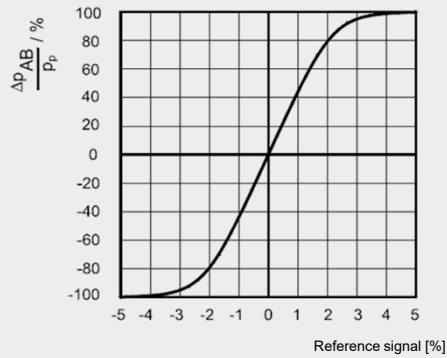


Switching time



PERFORMANCE

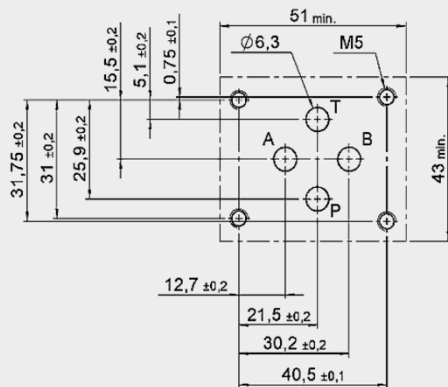
Pressure gain Z spool



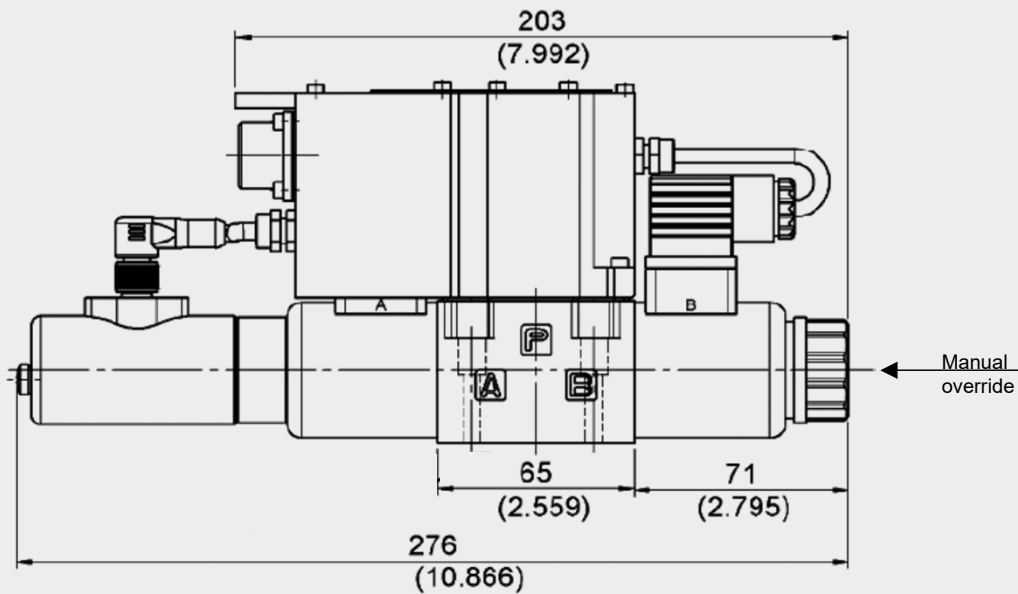
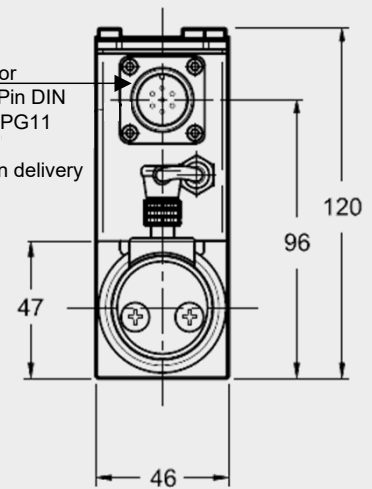
DIMENSIONS

INTERFACE

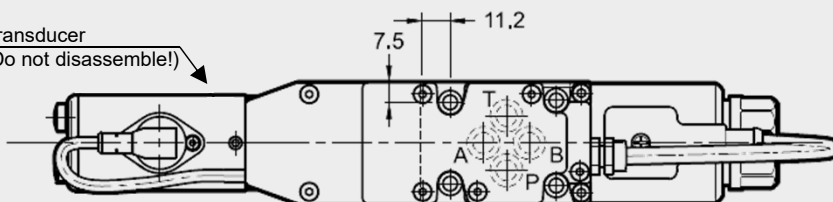
ISO 4401-03-02-0-05



Main connector
(connector 7 Pin DIN
43563 - IP65 PG11
EX7S/L/10)
not included in delivery

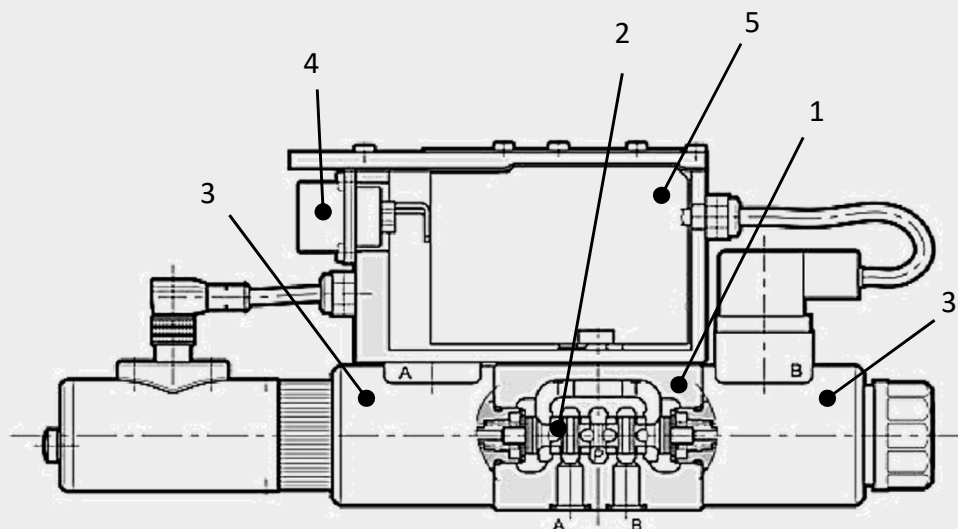


Transducer
(Do not disassemble!)



Mounting screws (ISO 4762): 4 pcs M5 x 30 A10.9 (not included in delivery)
Torque: 5 Nm

INTEGRATED ELECTRONIC



Parameterisable only via LIN bus

- 1) Valve with proportional solenoids
- 2) Valve piston
- 3) Proportional solenoid
- 4) Main connector
- 5) Electronic housing

General specifications

Power consumption:	25 W
Current consumption:	max. 1,88 A
Rated voltage:	24 V DC (19 – 30 V DC, ripple max. 3 Vpp)
Duty cycle:	100% ED (continuous)
Control signal E0:	Voltage signal ± 10 VDC
Control signal E1:	Current signal 4 – 20 mA
Alert signale:	Overload and overheating of electronics
Communication:	LIN-Bus ISO 11898 LIN-Bus Interface
Electronical connection:	7-pin MIL-C-5015-G (DIN-EN 175201-804)
LIN-Bus connection:	M12-IEC 60947-5-2
EMC EN61000-6-4:	According to 2014/30/EU standard
EMC EN61000-6-2:	According to 2014/30/EU standard
Type of protection:	IP65 / IP67 (CEI EN 60529 standard)

ELEKTRONIC

Standard version with reference signal voltage E0

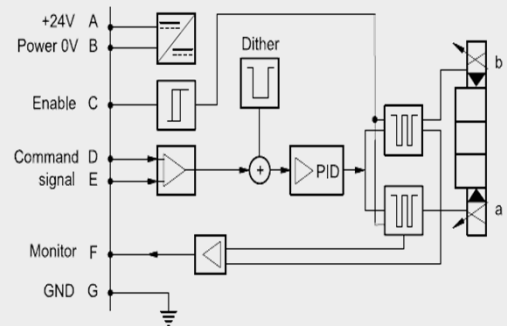
PIN	Value	Version A	Version B	Version C
A	24 V DC	Supply voltage		
B	0 V			
C		release 24 V DC	unoccupied	PIN F reference 0 V
D	+/- 10 V	control (differential input)		
E	0 V	PIN D reference		
F	+/- 10 V	monitor (0V reference PIN B)		monitor
PE	GND	earth (mass)		

Standard version with reference signal current E1

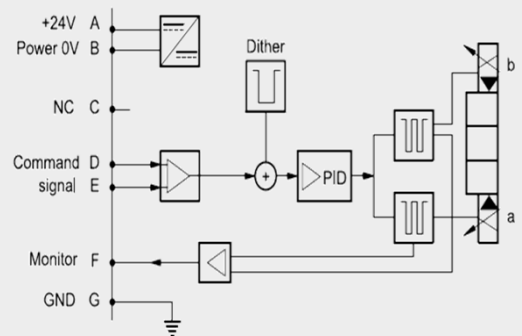
PIN	Value	Version A	Version B	Version C
A	24 V DC	Supply voltage		
B	0 V			
C		release 24 V DC	unoccupied	PIN F reference 0 V
D	4 - 20 mA	control		
E	0 V	PIN D reference		
F	4 - 20 mA	monitor (feedback) (0V reference PIN B)		monitor (feedback)
PE	GND	earth (mass)		

Diagramms PIN C Function

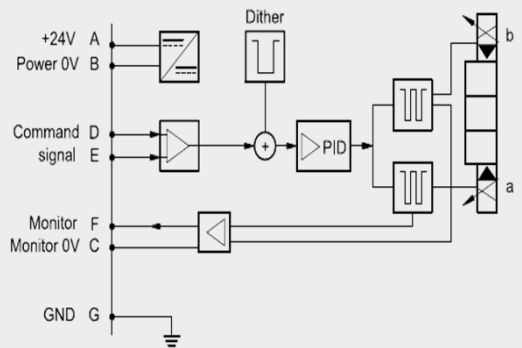
Version A: External release (on request)



Version B: Internal release (standard)



Version C: 0V Monitor (on request)



Hint 1

- Voltage signal (0V centring position)
 - -10V to 0 V: flow direction P – B and A – T
 - 0V to +10V: flow direction P – A und B – T
- Current signal (12 mA centring position)
 - 4 mA to 12 mA: flow direction P – B and A – T
 - 12 mA to 20 mA: flow direction P – A and B – T

Pin D and Pin E must always be contacted.

Hint 2

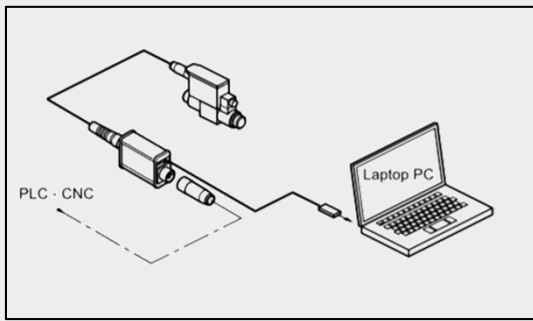
PIN C function A and B: Nominal input value measured between pin F and pin B.

Hint 3

We recommend to provide an external protection at pin A (24 V DC) for protection of the electronics: 5A/50V fast fuse.

LIN-BUS INTERFACE

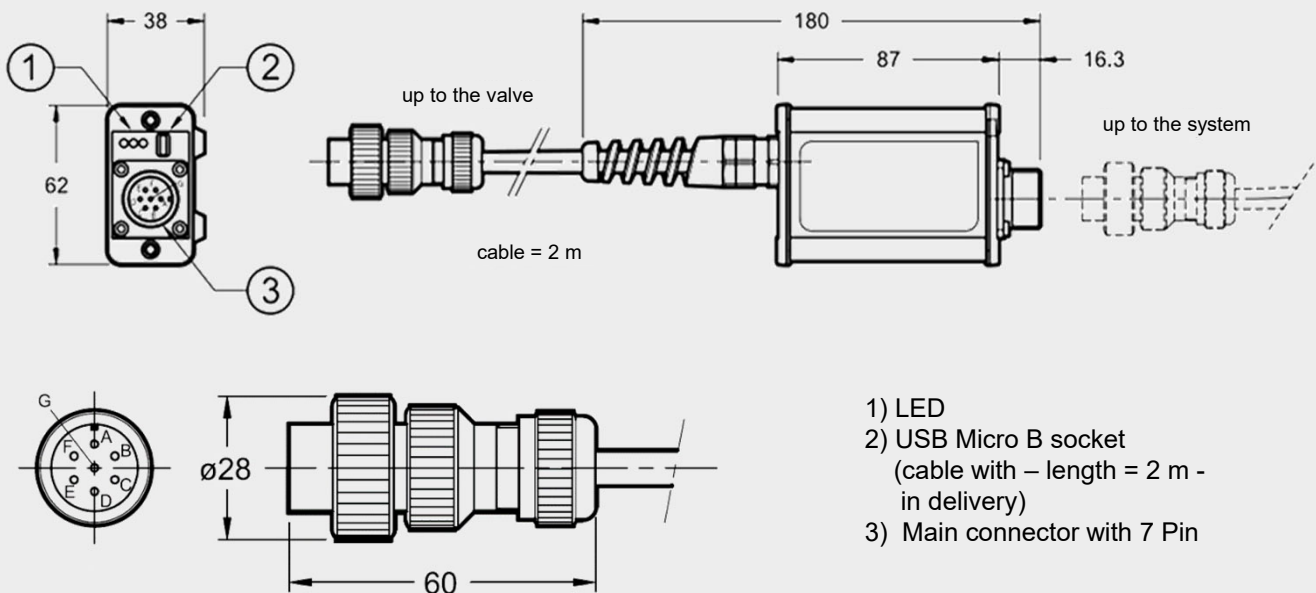
Is also required for parameterisation of Onboard electronic



Content*: Parameterize-software, adapter and PC connection cable

* On request (not included in delivery)

- The kit contains a test device with embedded connection cable 7 pin and a USB cable for connection to the PC. The dedicated software are available for download from our website.
- The device is suitable for troubleshooting and functional testing of HYDAC proportional valves with LIN-bus interface.
- The software allow the check of settings, display the diagnostic and permit to make changes on the standard parameter setting made in factory, adapting it to your system.
- No additional power supply is required: the device uses the supply source from the 7 PIN system cable.



- 1) LED
- 2) USB Micro B socket
(cable with – length = 2 m - in delivery)
- 3) Main connector with 7 Pin

In the casing of electronics, a 7-pole port for connecting with external devices is integrated.

The cable diameter for the main connector (cable and connector are not included in delivery) has to be min. 8 mm and should be max. 10 mm.

Hint

We recommend the use of a metal connector to ensure electromagnetic compatibility (EMC) and to avoid electromagnetic disturbances.

Note

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

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