

4/3 proportional directional valves direct-acting with Onboard Electronic P4WEE 10

DESCRIPTION

HYDAC proportional valves of the P4WEE series are pilot stages for pilot operated proportional directional valves with Onboard Electronic, which combines directional control with speed control of the consumer.

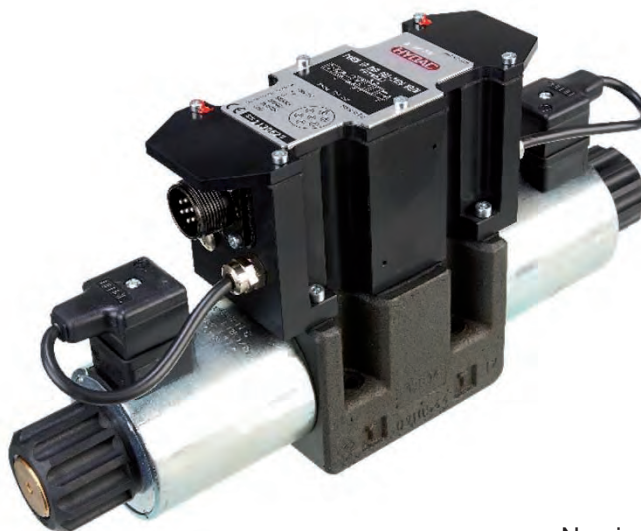
The controlled volume flow is proportional to the electrical input signal on the solenoid.

The integrated digital electronics allows improved performance and function due to

- shorter response times
- reduced hysteresis
- better repeatability

FEATURES

- High flow capacity due to optimized, cast casing
- Low hysteresis due to precision machining of moving parts
- Integrated digital electronics
- Easy interchangeability due to internationally standardised interface according to ISO 4401



Nominal size 10
up to 90 l/min
up to 320 bar

CONTENT

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MODEL CODE

P4WEE 10 E 30 D01 – 24 PG E0 A /V

Type

Proportional directional valve
With integrated Onboard Electronic (OBE)

Nominal size (NG)

10

Symbol

see chapter „Spool types / Symbols“

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

30 = 30 l/min

60 = 60 l/min

Series

D01 = standard with manual override

Power supply

24 = 24 VDC

Coil type

PG = DIN Stecker nach EN175301-803

Input signal

E0 = $\pm 10 \text{ V}$

E1 = 4 – 20 mA

Pin C Function

see „Diagramms Pin C Function“ in chapter „Electronic“

Sealing material

V = FKM (standard)

N = NBR

SPOOL TYPES / SYMBOLS

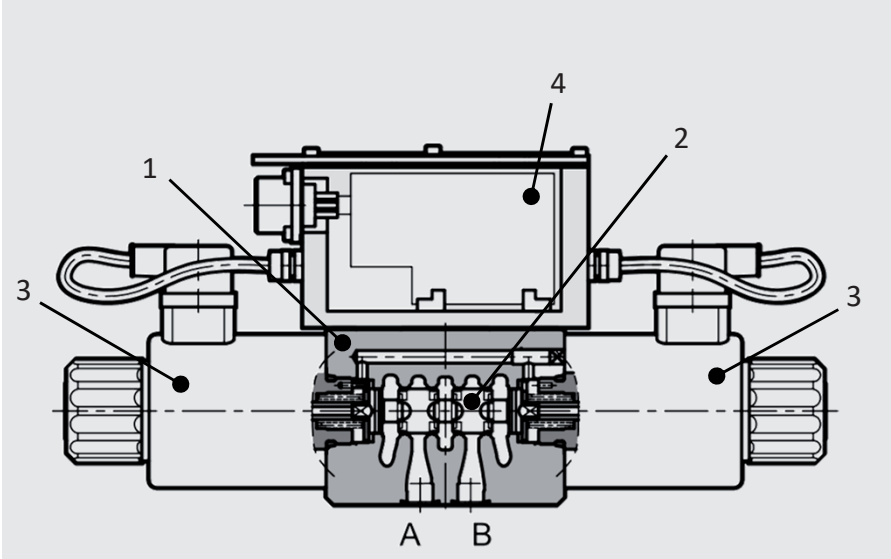
Type	Basic symbol	Type	Basic symbol
E		Q	
EA			

FUNCTION

The proportional valves of the P4WEE 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) and two proportional solenoids (3). The proportional solenoid coils are controlled via the integrated Onboard electronic (4).

According to the input signal, the solenoid generates a force and shifts the piston against a spring. This releases cross-sections P-B-A-T or P-A-B-T, 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)	12,45 x 1,78 90 Sh FKM	3524439
	12,45 x 1,78 90 Sh NBR	3524438
Mounting screws	ISO 4762 M6 x 40 (4 pcs)	3524314
Main connector	6+PE EN175201 Part 804	6080324
Electronic	Lin-Bus Interface	3648934

TECHNICAL DATA 1

General specifications			
MTTF _d :		To EN ISO 13849-1:2015 chart C1 & C2	
Ambient temperature:		[°C]	-20 to +60
Installation position:		No orientation restrictions	
Weight:		[kg]	6,6
Material:		Valve casing:	Cast iron
		Name plate:	Aluminium
Surface coating:		Valve casing:	Phosphate
Hydraulic specifications			
Operating pressure:		[bar]	Port P, A, B: p _{max} = 320 Port T: p _{max} = 140
Flow: (Δp = 10 bar, P→T)		[l/min]	30, 60
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 – 400
Permitted contamination level of operating fluid:		class 18/16/13 to ISO 4406	
Sealing material:		NBR, FKM (standard)	
Electrical specifications			
Switching time (0 → 100%):		[ms]	See chapter „Performance“
Switching time (100% → 0):		[ms]	
Type of voltage:		[V]	DC
Rated voltage:		[A]	24
Hysteresis:		[%]	< 3,0 of Q _{max}
Repeatability:		[%]	< ±1,0 of Q _{max}
Protection class to DIN EN 60529:		with electrical connection “G “ IP65²/IP67²	

1 see „Conditions and Instructions for Valves“ in brochure 53.000

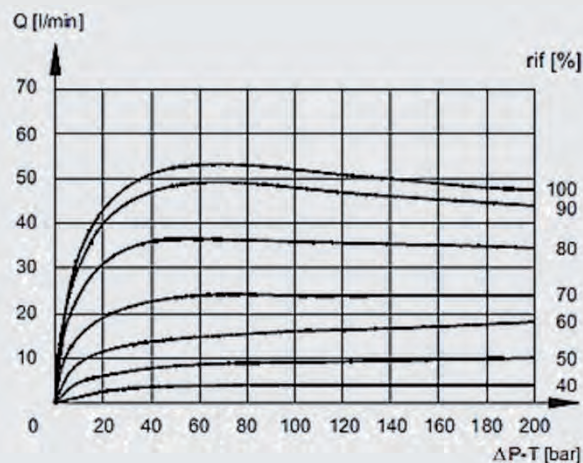
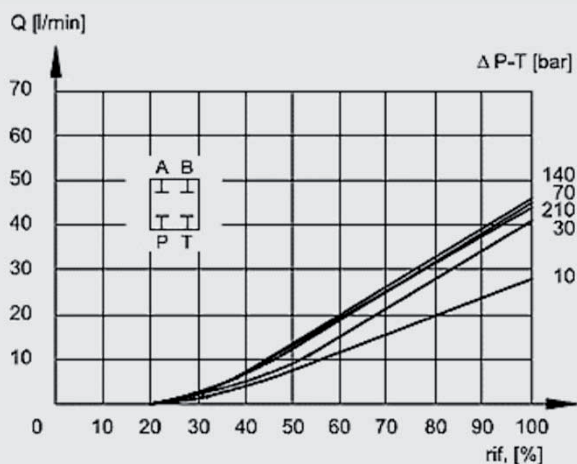
2 if installed correctly

PERFORMANCE

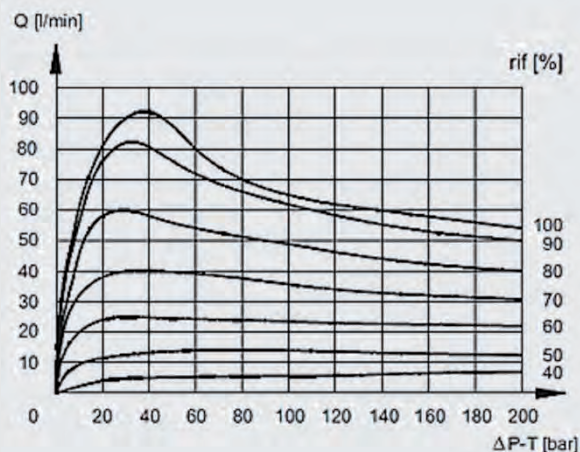
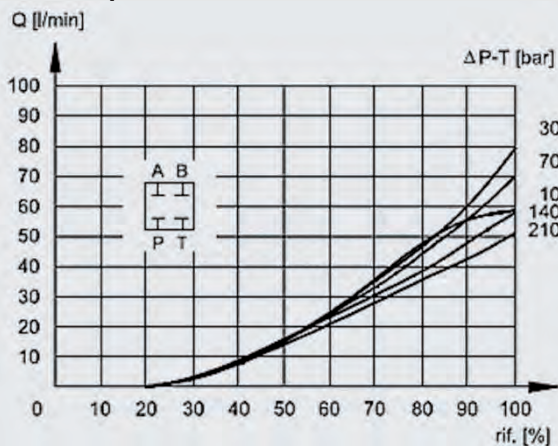
measured at $T_{oil} = 50^{\circ}\text{C}$ and $36 \text{ mm}^2/\text{s}$

The performance curves represent typical flow curves for different valve pistons. The first curve shows the flow value at constant Δp , depending on the solenoid current. The second curve describes the dependency of flow value and Δp at constant solenoid current. The total valve pressure drop (Δp) was measured between port P and T of the valve.

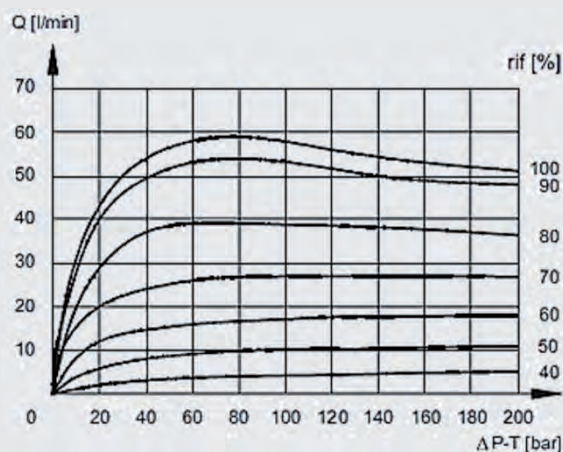
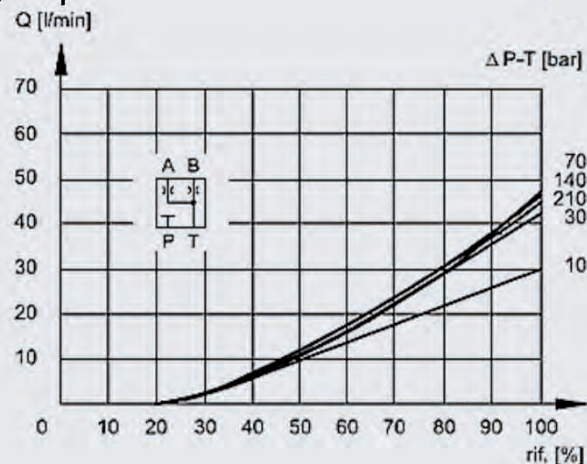
E / EA 30 spool



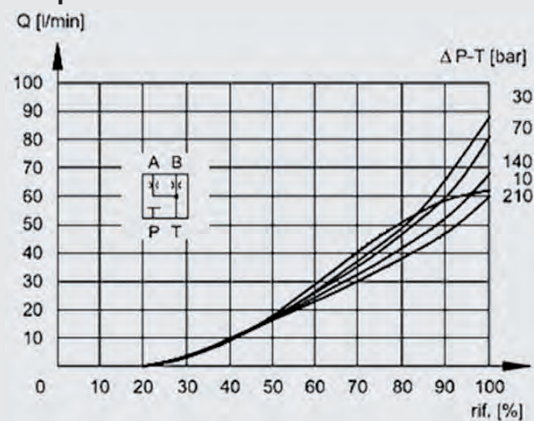
E / EA 60 spool



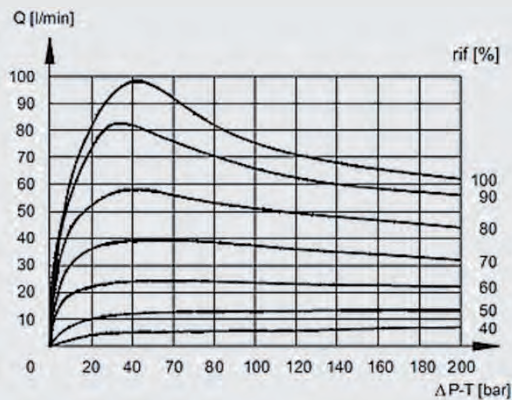
Q 30 spool



Q 60 spool

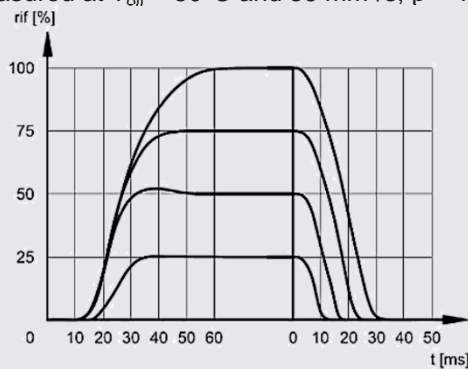


PERFORMANCE



Switching time

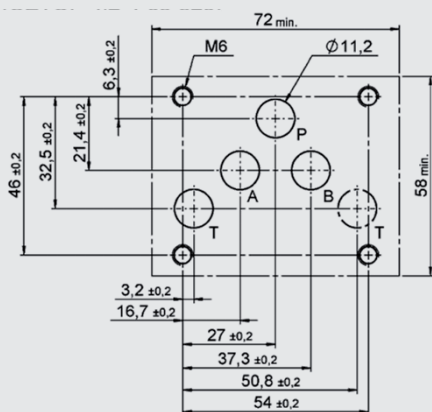
measured at $T_{oil} = 50^\circ\text{C}$ and $36 \text{ mm}^2/\text{s}$, $p = 140 \text{ bar}$



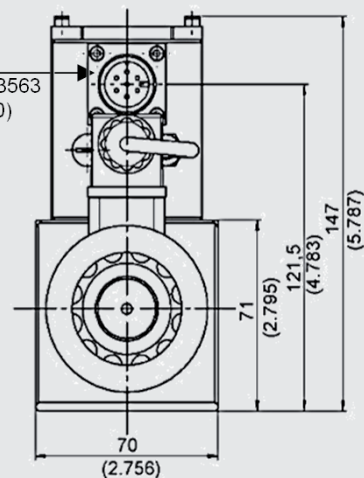
DIMENSIONS

INTERFACE

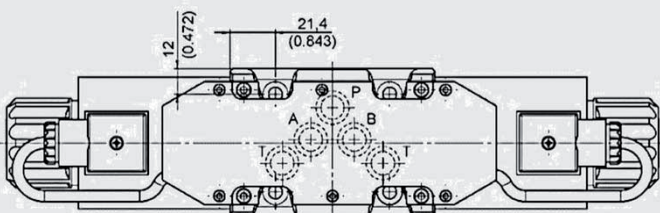
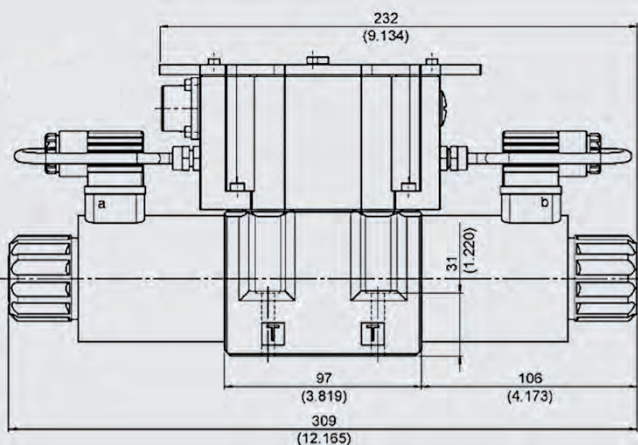
ISO 4401-05-04-0-05



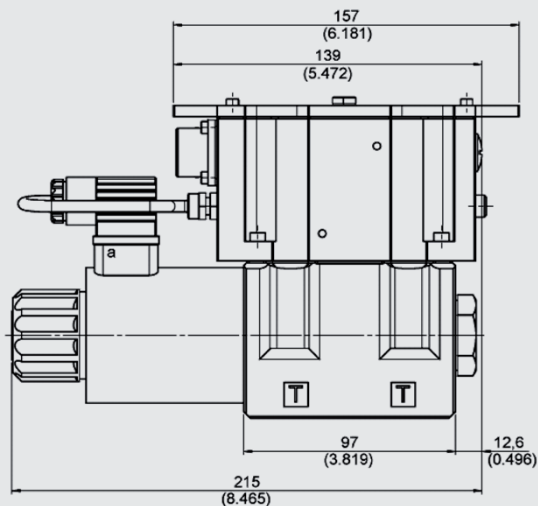
Main connector
(connector 7 Pin DIN 43563
- IP65 PG11 EX7S/L/10)
not included in delivery



With two solenoids



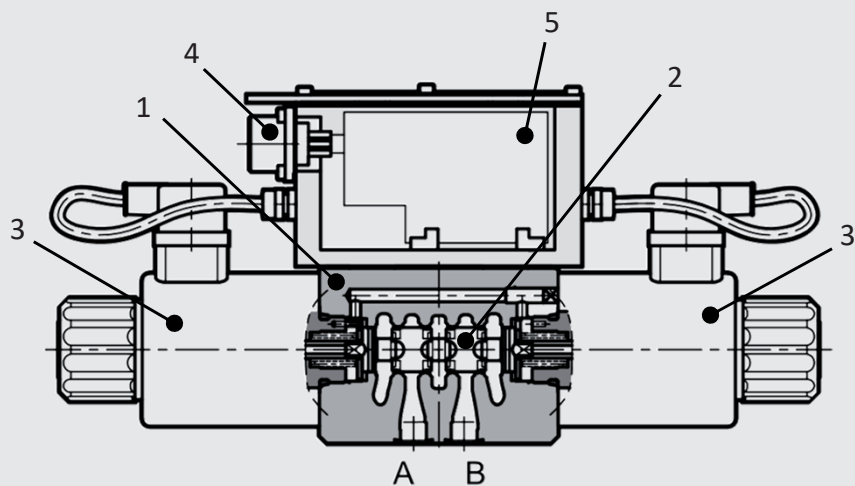
With one solenoid



Standard
Nothand

Mounting screws (ISO 4762): 4 pcs M6 x 40 A10.9 (not included in delivery)
Torque: 8 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:	40 W
Current consumption:	max. 2,8 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 signal:	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

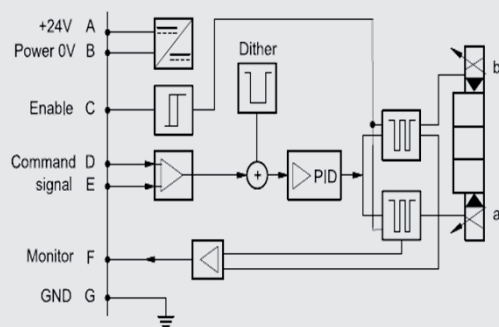
PIN	Value	Version A	Version B	Version C
A	24 V DC	Supply voltage		
B	0 V			
C		release 24 V DC	unoccupied	PIN F reference 0 V
D	+/- 10 V	control (differential input)		
E	0 V	PIN D reference		
F	+/- 10 V	monitor (0V reference PIN B)		monitor
PE	GND	earth (mass)		

Standard version with reference signal current E1

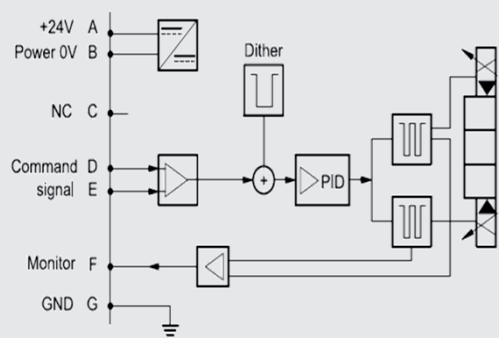
PIN	Value	Version A	Version B	Version C
A	24 V DC	Supply voltage		
B	0 V			
C		release 24 V DC	unoccupied	PIN F reference 0 V
D	4 - 20 mA	control		
E	0 V	PIN D reference		
F	4 - 20 mA	monitor (meedback) (0V reference PIN B)		monitor (meedback)
PE	GND	earth (mass)		

Diagramms PIN C Function

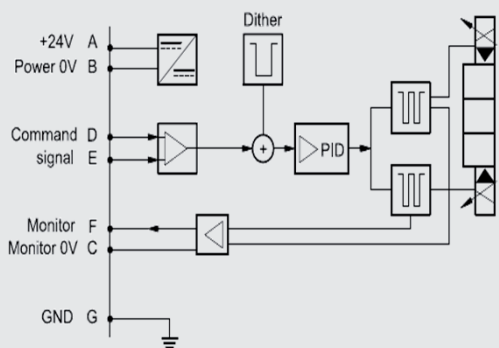
Version A: External release (on request)



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
- With one solenoid (type EA)
 - 4 mA to 20 mA: flow direction P – B and A – T
 - 0V to +10V: flow direction P – B and A – T

Pin D and Pin E must always be contacted.

Hint 2

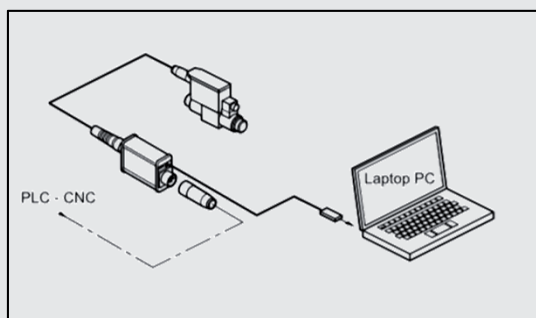
PIN C function A and B: Nominal input value measured between pin F and pin B.

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

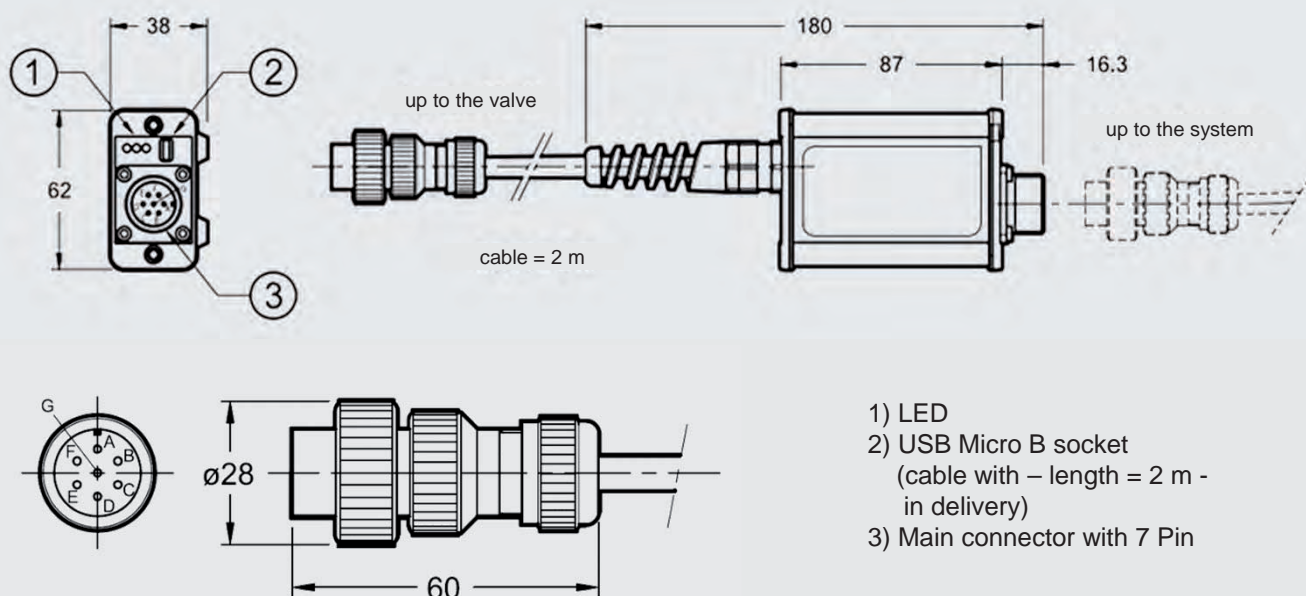
Is also required for parameterisation of Onboard electronic



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

- 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.

* On request (not included in delivery)



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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