

## 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.

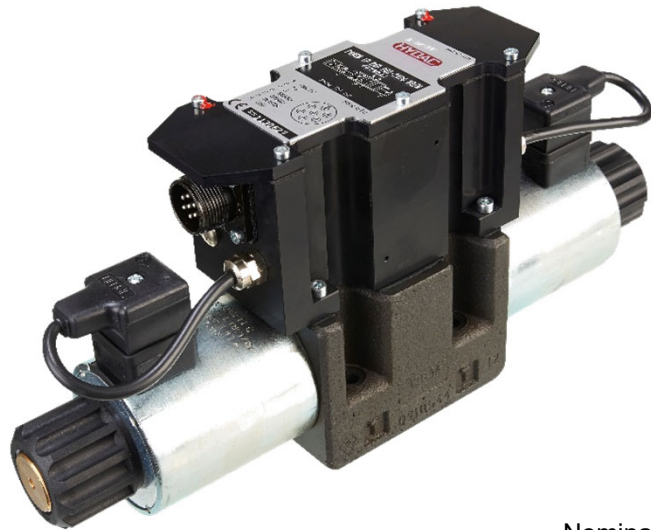
The controlled volume flow is proportional to the electrical input signal on the solenoid.

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

Description	1
Features	1
Model code	2
Spool types / Symbols	2
Technical Data	3
Function	3
Section view	3
Accessories	3
Performance	4
Dimensions	5
Electronic	6

## 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 page 2

### 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

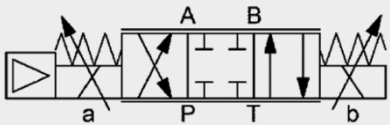
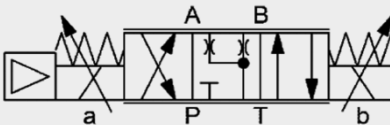
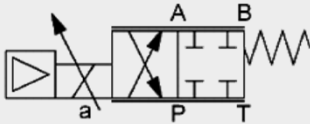
see „Diagramms Pin C Function“ on page 7

### 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.

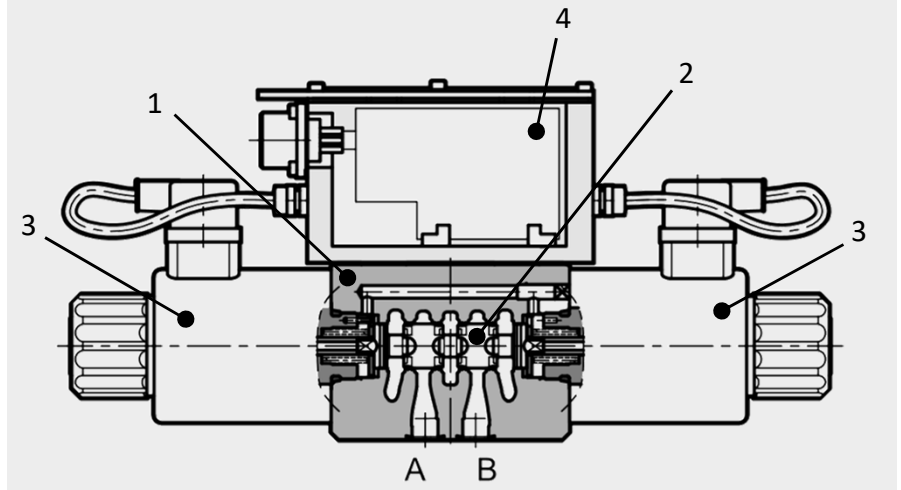
The volume flow is controlled continuously (proportionally) to the electrical input signal at the solenoid coil.

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	12,45 x 1,78 90 Sh FKM	3524439
(4-part set)	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 <sup>1</sup>

### General specifications

MTTF <sub>d</sub> :	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]	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: ( $\Delta p = 10 \text{ bar}$ , 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:	[mm <sup>2</sup> /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 „Performance“ on page 5	
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" IP65 <sup>2</sup> /IP67 <sup>2</sup>		

<sup>1</sup> see „Conditions and Instructions for Valves“ in brochure 53.000

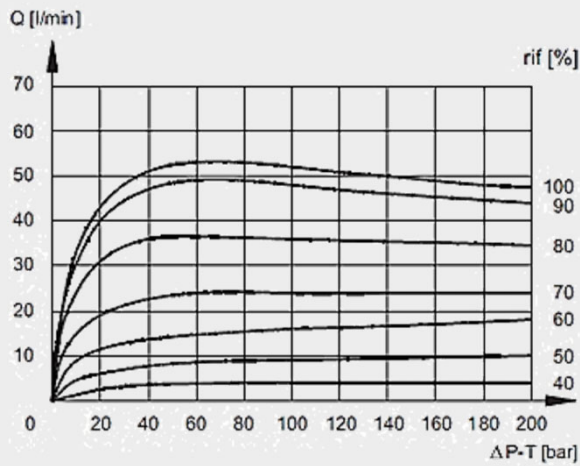
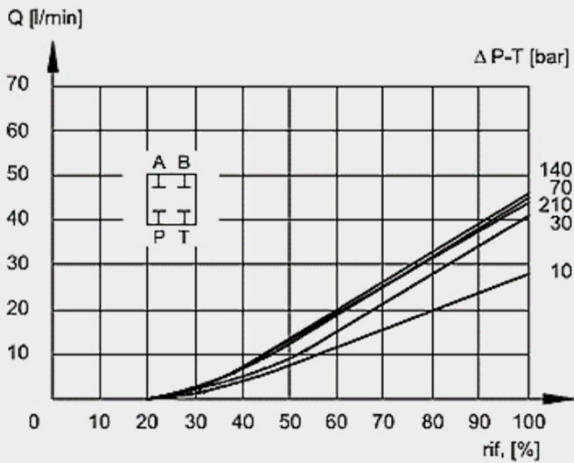
<sup>2</sup> if installed correctly

## PERFORMANCE

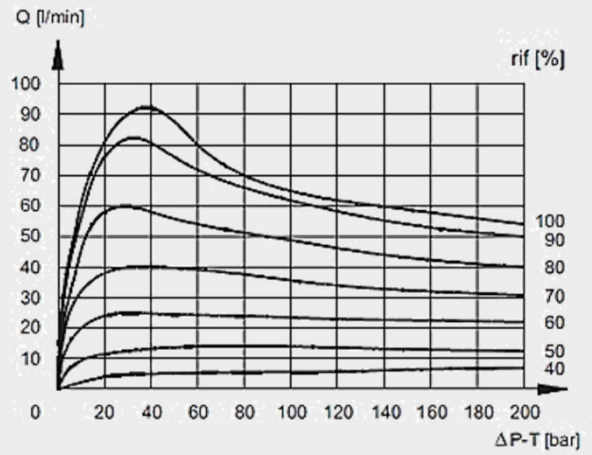
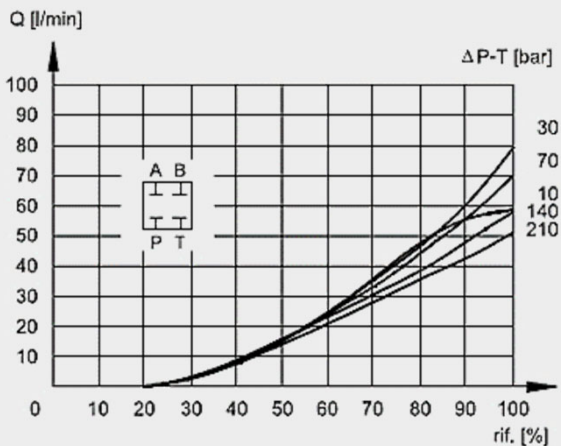
measured at  $T_{oil} = 50^{\circ}\text{C}$  and  $36 \text{ mm}^2/\text{s}$

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

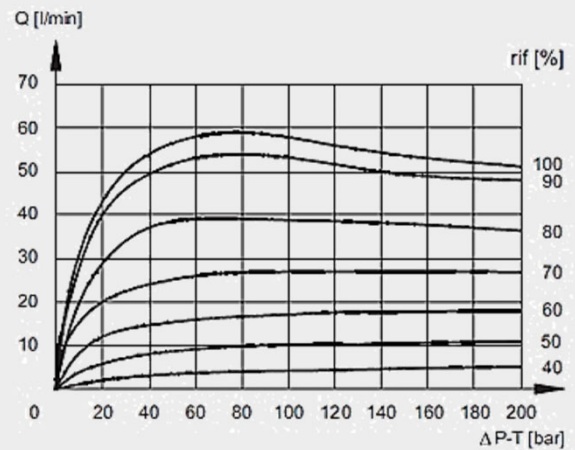
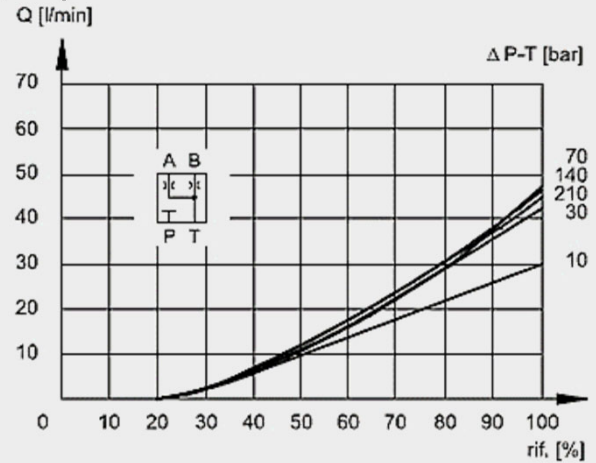
### E / EA 30 spool



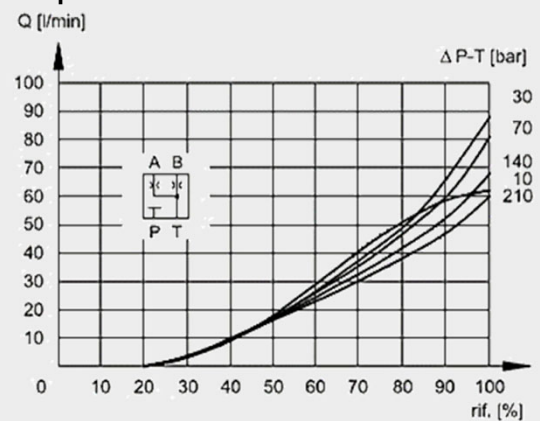
### E / EA 60 spool



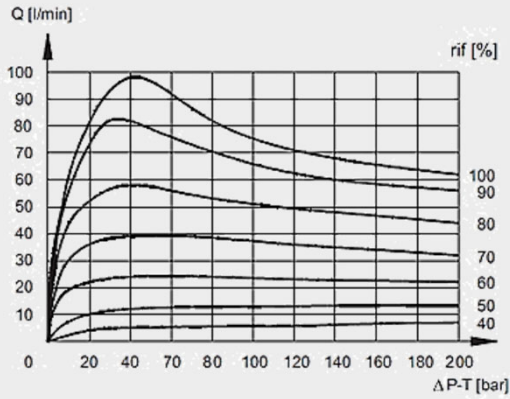
### Q 30 spool



### Q 60 spool

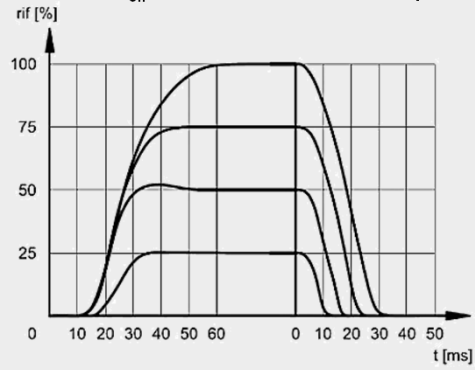


## PERFORMANCE



## Switching time

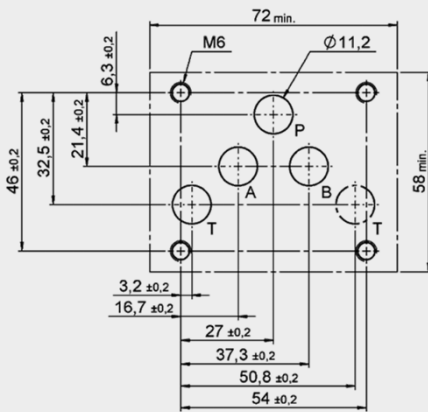
measured at  $T_{oil} = 50^\circ C$  and  $36 \text{ mm}^2/s$ ,  $p = 140 \text{ bar}$



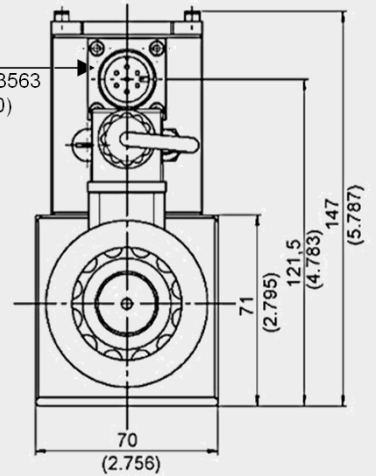
## DIMENSIONS

### INTERFACE

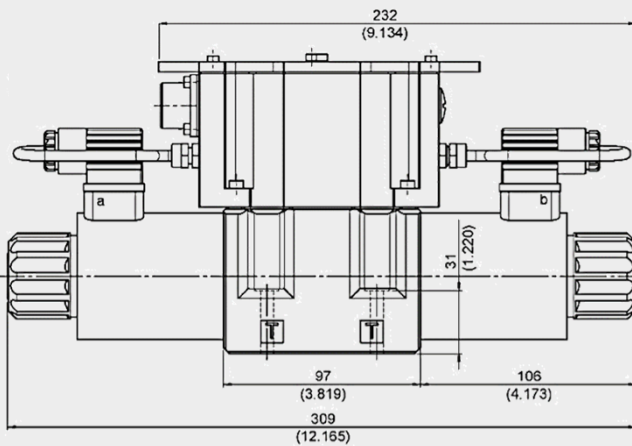
ISO 4401-05-04-0-05



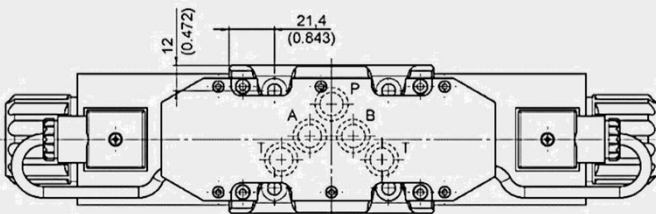
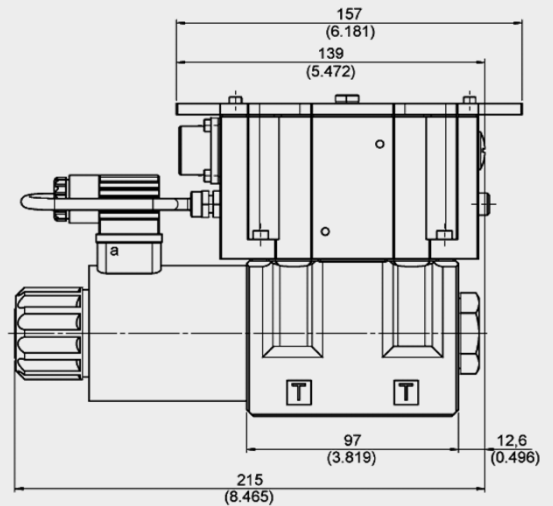
Main connector  
(connector 7 Pin DIN 43563  
- IP65 PG11 EX7S/L/10)  
not included in delivery



### With two solenoids

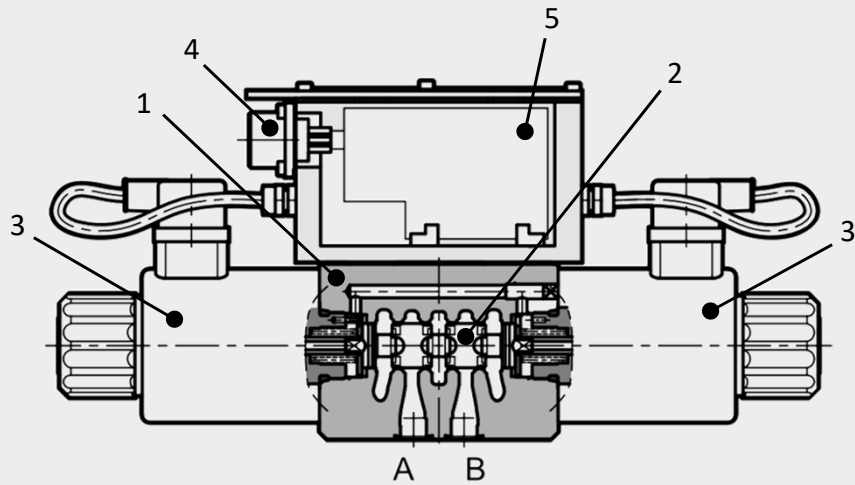


### With one solenoid



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 $\pm 10$ VDC
Control signal E1:	Current signal 4 – 20 mA
Alert signal:	Overload and overheating of electronics
Communication:	LIN-Bus ISO 11898 LIN-Bus Interface
Electrical 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

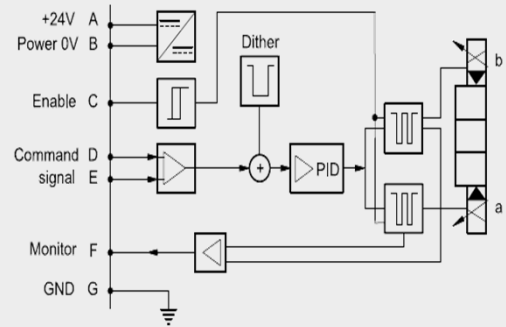
PIN	Value	Version A	Version B	Version C
A	24 V DC	Supply voltage		
B	0 V			
C		release 24 V DC	unoccupied	PIN F reference 0 V
D	+/- 10 V	control (differential input)		
E	0 V	PIN D reference		
F	+/- 10 V	monitor (0V reference PIN B)		monitor
PE	GND	earth (mass)		

## Standard version with reference signal current E1

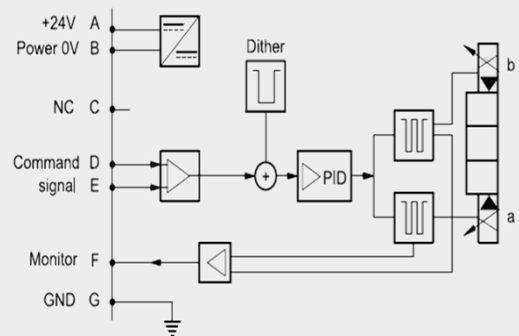
PIN	Value	Version A	Version B	Version C
A	24 V DC	Supply voltage		
B	0 V			
C		release 24 V DC	unoccupied	PIN F reference 0 V
D	4 - 20 mA	control		
E	0 V	PIN D reference		
F	4 - 20 mA	monitor (meedback) (0V reference PIN B)		monitor (meedback)
PE	GND	earth (mass)		

## Diagramms PIN C Function

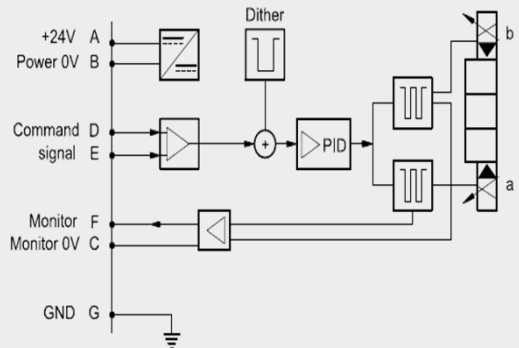
### Version A: External release (on request)



### 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

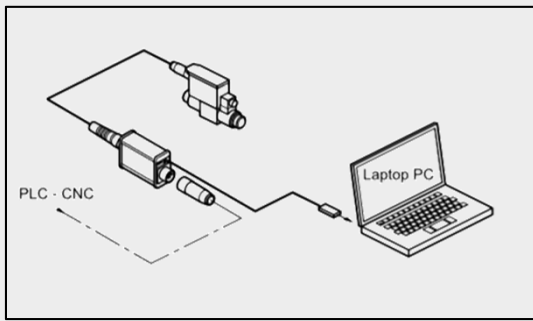
PIN C function A and B: Nominal input value measured between pin F and pin B.

### 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

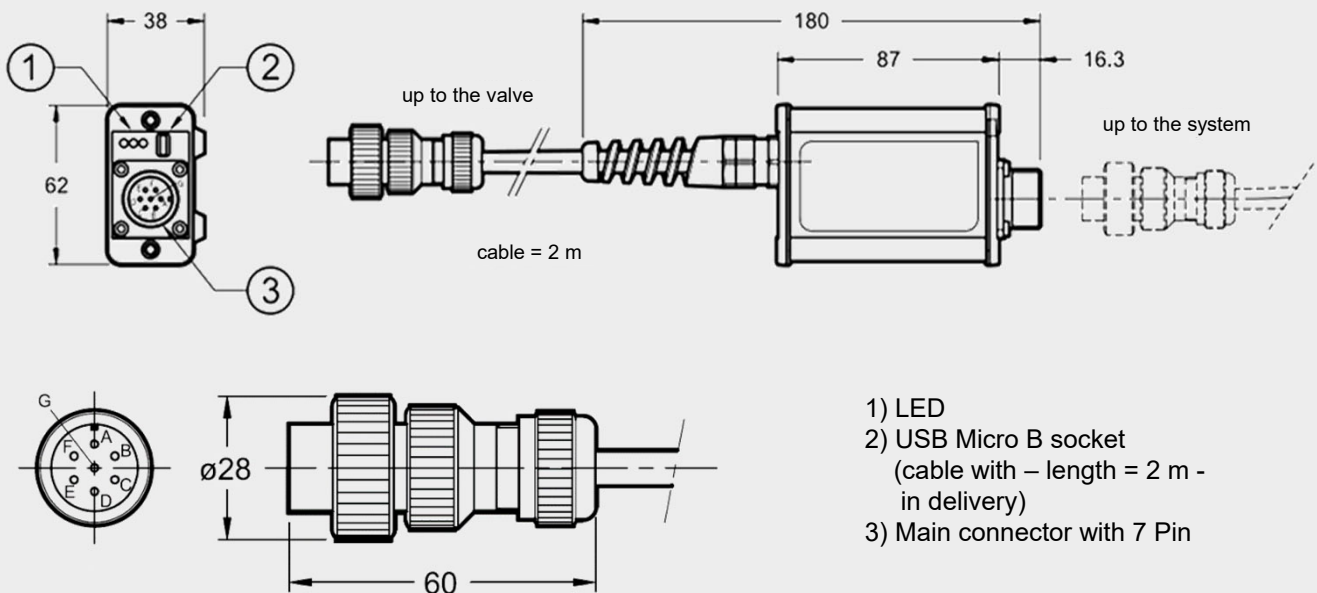
Is also required for parameterisation of Onboard electronic



- 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.

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