HYDAC INTERNATIONAL

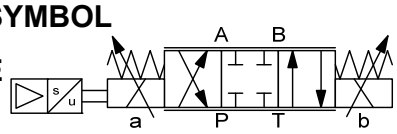

# 4/3-Proportional Solenoid Valve direct acting, with integrated Electronics and transducer

Subplate to ISO4401

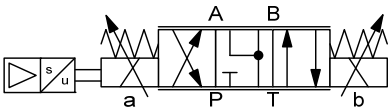
**P4WRE 06**

## SYMBOL

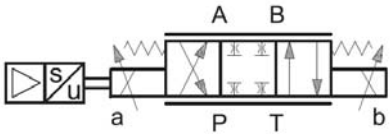
E




J

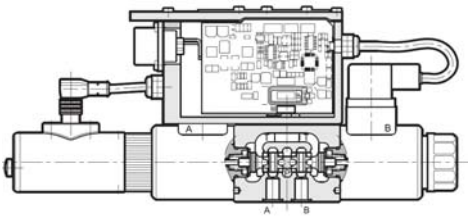



Z




**Up to 80 l/min**
**Up to 350 bar**

## FUNCTION



The P4WRE 06 is a direct acting solenoid valve which combines the directional control with the velocity control of the consumer.
The controlled nominal flow is proportional to the electrical input signal at the coil.
Analogue to his size the coil creates a force and moves the piston against the spring. Herewith the corresponding cross section diameters are opened which determines the flow rate in dependence of the pressure differential.
The integrated digital electronics permits a better performance of the valve and function by
- shortened response times
- reduced hysteresis
- better repeat accuracy

## FEATURES

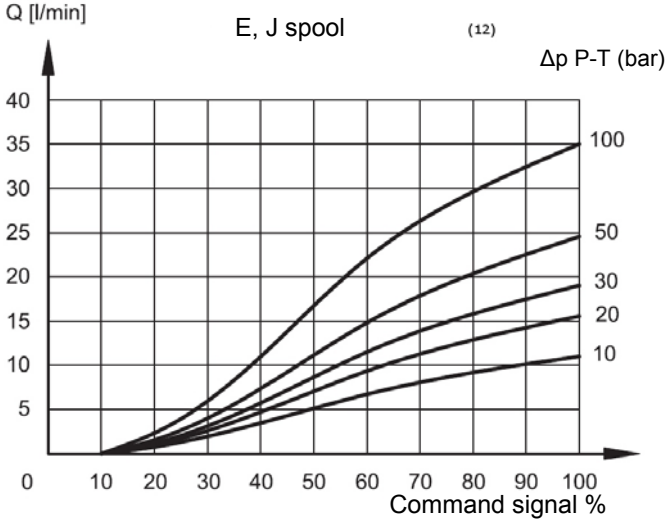
- High flow rate due to optimized casted housing
- Small hysteresis by super finish of moving parts
- Long life cycle times by armature switching under oil
- Minimal wear by hardened and ground valve piston
- Simple exchangeability by international standardized hole pattern to ISO 4401
- Integrated digital amplifier and position transducer

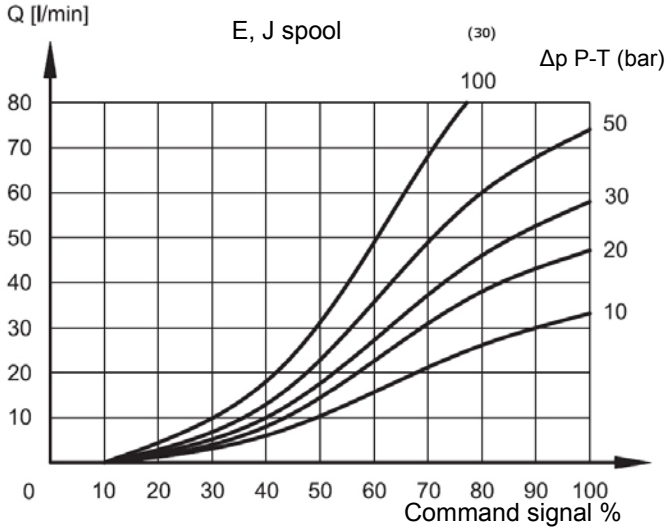
## SPECIFICATIONS

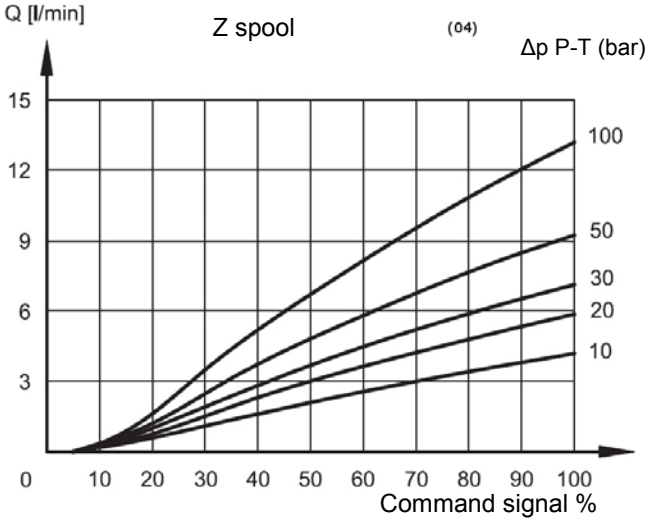
| | |
|---|---|
| Operating pressure: | ports P,A,B max. 350 bar<br>port T max. 210 bar |
| Nominal flow: | max. 80 l/min |
| Hysteresis: | (in % of Qmax) < 0,2 % |
| Repeat accuracy: (in % of Qmax) | < +/- 0,2 % |
| Media operating temp.range: | -20°C up to +80°C |
| Ambient temperature range: | -20°C up to +50°C |
| Hydraulic fluid: | Hydraulic fluid to DIN 51524 part 1 / 2 |
| Viscosity range: | 10 $mm^2/s$ up to 400 $mm^2/s$ |
| Filtration: | Class 18/16/13 up to 19/17/14 according to ISO4406 |
| Coil duty rating: | 100% (continuous) |
| Supply voltage: | DC |
| Nominal current: | 0,86 A at 24V DC |
| Resistance at 20°C: | 17,6 Ohm at 24V DC |
| Electromagnetic compatibility: (EMC) | Emissions to EN 50081-1<br>compatibility to EN 50082-2<br>to Norm 89/336 CEE |
| IP rating: | IP65 |
| Installation: | no orientation restrictions |
| Hint: | Vent system and valve before setting in motion |
| Hole pattern: | ISO4401-03-02-0-05 |
| Weight: | 2,7 kg |

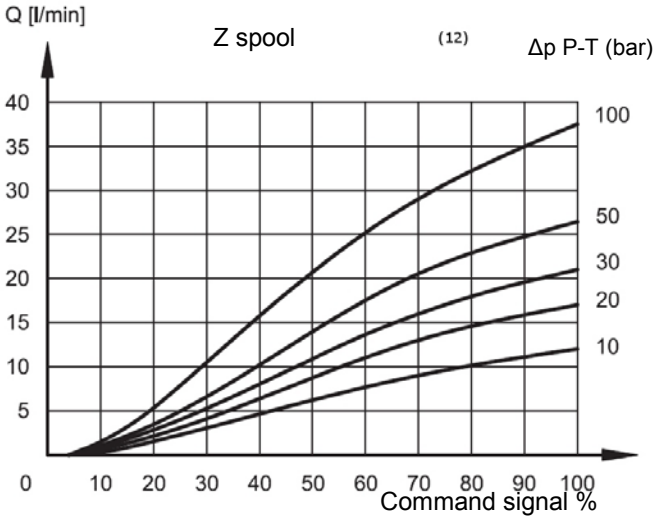
## PERFORMANCE

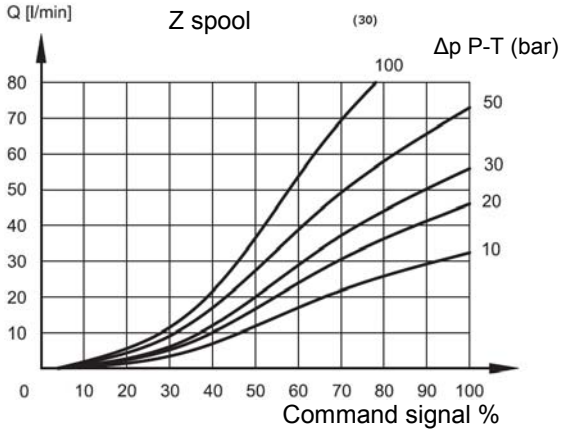
measured at $\nu$= 33 mm²/s and $T_{oil}$ = 46° C (The related Δp is measured between lines P and T of the valve)

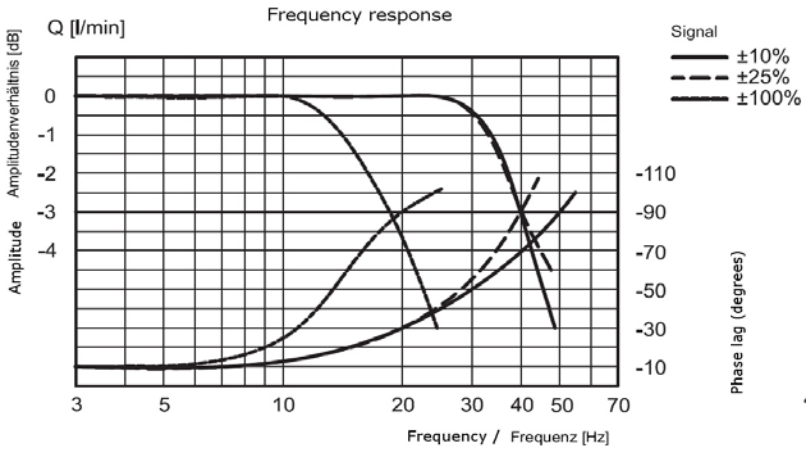


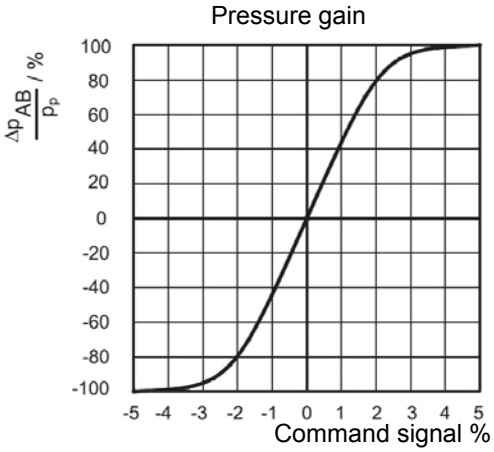



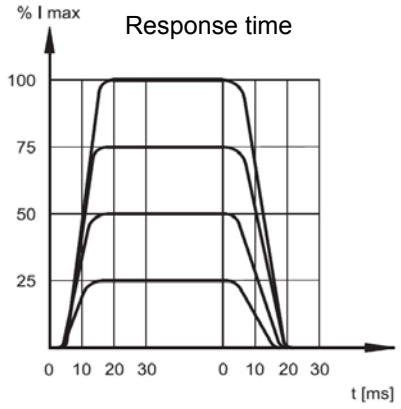



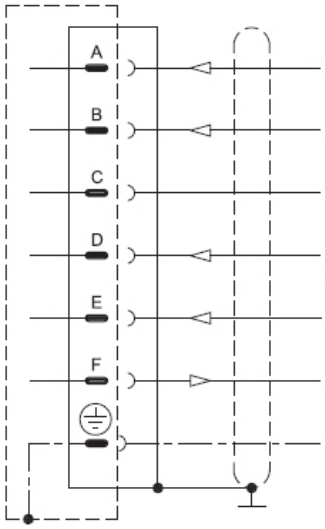



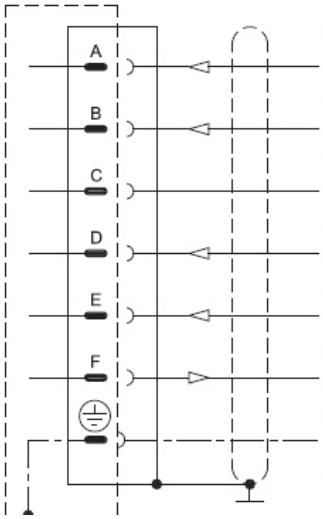

Curve taken at 50% flow and (ΔP 10 bar P->T)

## Input signal E0 voltage signal




| Pin | Value | Function | Details |
|---|---|---|---|
| A | 24 V DC | Voltage | 19 35 V CC (ripple max 3 Vpp) see note 1 |
| B | 0 V | Sypply (Zero) | 0 V |
| C | 24 V DC | Release | see Note 2 |
| D | ± 10 V | Differential input | Impedanz $R_i$ > 50 kΩ see note 3 |
| E | 0 V | Differential Input | --- |
| F | 6 - 10V o<br>2 - 6 -10V | Monitor Feedback or. Comm.Lin | Signal WA see note 4 |
| PE | GND | Protective earth conductor | --- |

## Input signal E1 current signal



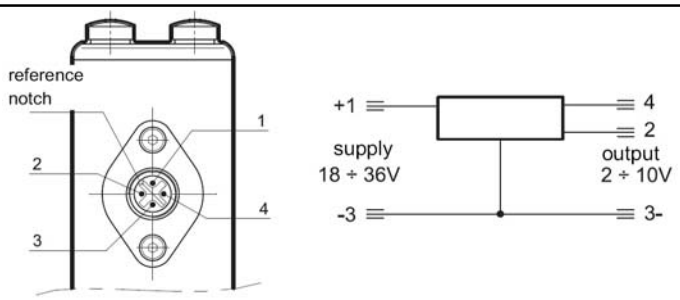

| Pin | Value | Function | Details |
|---|---|---|---|
| A | 24 V DC | Voltage | 19 bis 35 V CC (ripple max 3 Vpp) see Note 1 |
| B | 0 V | Supply (Zero) | 0 V |
| C | 24 V DC | Release | see Note 2 |
| D | 4 ÷ 20 mA | Signal input | Impedanz $R_i$ > 500 kΩ |
| E | 0 V | Zero point reference | --- |
| F | 6 - 10V o<br>2 - 6 -10V | Monitor Feedback or Comm. Lin | Signal WA see Note 4 |
| PE | GND | Protective earth Conductor | --- |

**NOTE 1**: preview on the Pin A (24 VDC) an external fuse for protecting electronics. Fuse characteristics: 5A/50V type fast.
**NOTE 2:** preview 24V DC on the PIN C to activate the card power stage.
**NOTE 3**: The input signal is differential type on E0 version only. For double solenoid valves, with positive reference signal connected to pin D, the valve opening is P - A and B - T. With zero reference signal the valve is in central position. For “SA” single solenoid valves, with positive reference to pin D, the valve opening is P-B and A-T. The spool stroke is proportional to UD - UE. If only one input signal (single-end) is available, the pin B (0V power supply) and the pin E (0V reference signal) must be connected through a jumper and both connected to GND, electric panel side.
**NOTE 4**: This value changes, as shown in the table below. When MONITOR function is enabled and the card is enabled, read the test point pin F in relation to pin B (0V). When detect a failure or error of the sensor LVDT, the drive bring the valve back in central position and locks it. In this condition the pin F, referring to the pin B, indicates 0V DC output. To reset the fault, the card must be disabled and re-enable. When the card is disabled, the pin F referred to the pin B shows 2.7V DC output: this value is given by the voltage of the LIN bus communication and not by the MONITOR value.

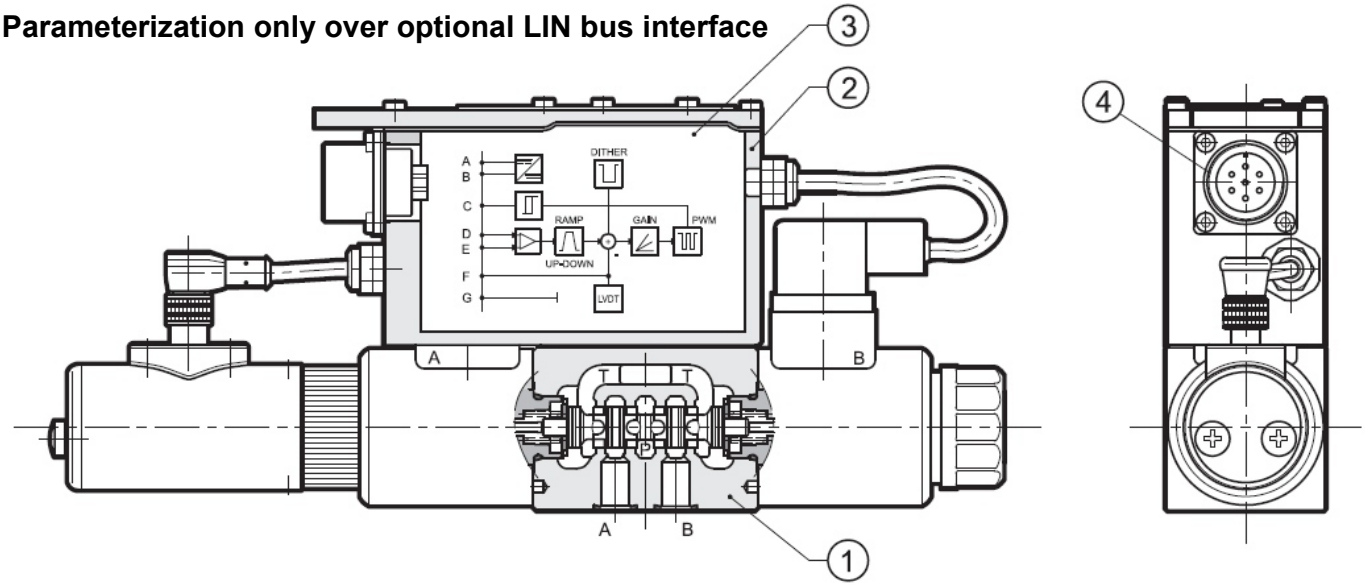
## ELECTRONICS

**Position encoder – Electrical connection**

| | | |
|---|---|---|
| Pin 1 | supply 18 ÷ 36 V | Pin 8c |
| Pin 2 | Output ÷ 10 V | Pin 24a |
| Pin 3 | 0 V | Pin 22c |
| Pin 4 | NC | NC |



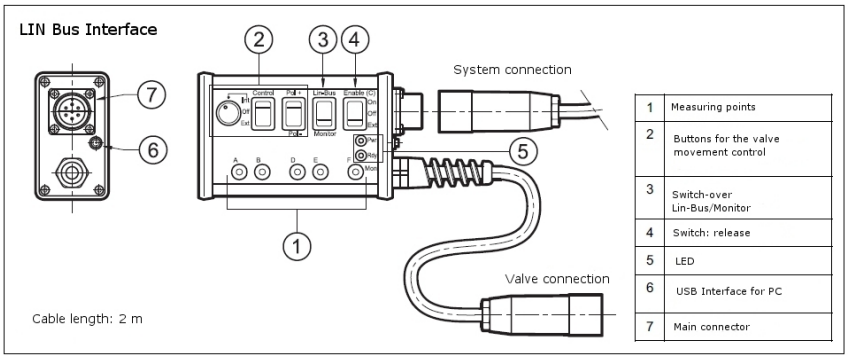

**Parameterization only over optional LIN bus interface**




| | | | |
|---|---|---|---|
| 1 | Valve with proportional coils | 3 | Digital amplifier |
| 2 | Housing for Electronics | 4 | Main connector |

| | |
|---|---|
| Power input: | 70 W |
| Current draw: | 2,6 A max. |
| Nominal voltage: | 24 VDC (19-35VDC, ripple max.3Vpp) |
| Coil duty rating: | 100% (continuous) |
| Input signal E0: | voltage signal +/-10VDC (Impedance Ri >50 kOhm) |
| Input signal E1: | current signal 4-20mA (Impedance Ri =500 Ohm) |
| Alert signals: | Overload and overheating of Electronics, LVDT sensor failure, cable break, power failure <4mA |
| Communication: | LIN Bus Interface (optional on request) |
| Electronics port: | 7-pin MIL-C-5015-G (DIN43563) |
| EMC EN61000-6-4: | Corresponding 2004/108 CE Standard |
| EMC EN61000-6-4: | Corresponding 2004/108 CE Standard |
| IP rating: | IP65 (CEI EN 60529 Standard) |

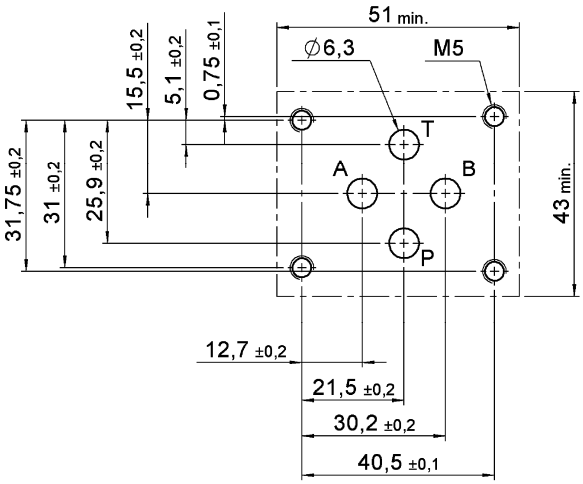
Attention: to parameterize the OBE a LIN bus interface is necessary
(not in the standard scope of delivery)
Price on request



| Standard models | Part No. |
|---|---|
| P4WRE 06 E12 D01-24PG E0/V | 3565232 |
| P4WRE 06 E30 D01-24PG E0/V | 3565233 |
| P4WRE 06 J12 D01-24PG E0/V | 3565246 |
| P4WRE 06 J30 D01-24PG E0/V | 3565247 |

Other types on request

## Hole pattern to ISO 4401-03-02-05




## MODEL CODE

**P4WRE 06 E 12 D01- 24PG E0 /V**

**Name**
Proportional solenoid valve subplate with integr. Electronics

**Nominal size**
6

**Symbol**
E, J, Z

**Nominal flow**
4 = 4 l/min (only Z symbol)
12 = 12 l/min (At Δp=10 bar P-T)
30 = 30 l/min

**Type**
D01 = Standard type with manual override

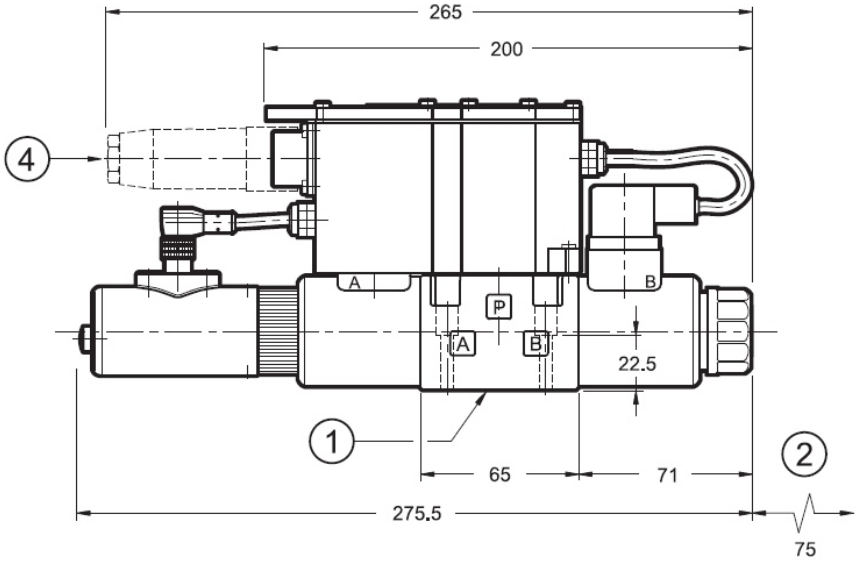
**Nominal voltage**
12= 12 V DC

**Coil connector**
PG= DIN plug to EN175301-803 (for coil)

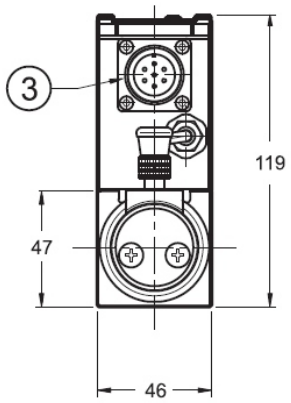
**Input signal**
E0= +/-10 V
E1= 4-20 mA

**Seal material**
V= FPM (Standard)
N= NBR (optional)

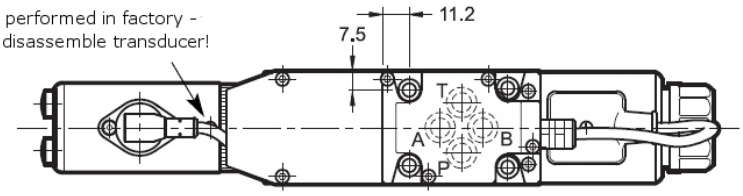
## DIMENSIONS




Dimensions




Sealing performed in factory - do not disassemble transducer!




1) Mounting plate with O-rings 4x 9.25 x 1.78 NBR 90 Shore
2) Free space for mounting the coil
4) Main plug
2) Plug 7 pin DIN 43563 – IP65 PG11 EX7/L/10
(not included in delivery Mat. 6080324)
Fastening screws: 4x M5 x 30 10.9, Torque 5 Nm +o,5 Nm
All dimensions in mm. Fastening elements are not in the scope of delivery.

Annotation
The technical information in this brochure are relating to the operating conditions and applications.
At deviant applications and/or operating conditions please contact the technical dept.
Technical information are subject to technical modifications.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