



Level



Pressure



Flow



Temperature



Liquid
Analysis



Registration



Systems
Components



Services



Solutions

Operating Instructions

Ceraphant T PTC31, PTP31, PTP35

Pressure switch

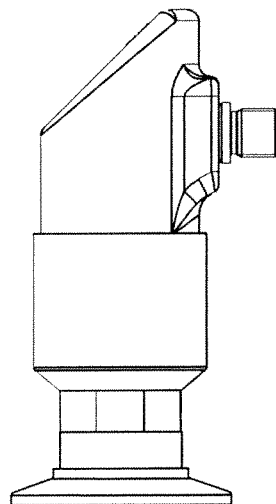
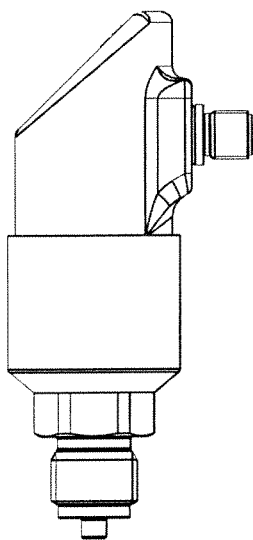


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1 Safety instructions

1.1 Designated use

The Ceraphant T is a pressure switch for measuring and monitoring absolute and gauge pressures. The device has been safely built with state-of-the-art technology and meets the applicable requirements and EC Directives. It can, however, be a source of danger if used incorrectly or for anything other than the designated use.

1.2 Installation, commissioning and operation

Installation, electrical connection, commissioning, operation and maintenance of the measuring system must be carried out by trained, qualified specialists authorised to perform such work by the facility's owner-operator. The specialist must have read and understood these Operating Instructions and must follow the instructions they contain. The device may only be modified and repair work carried out if this is explicitly permitted in the Operating Instructions. Damaged devices which could be a source of danger may not be commissioned and must be labelled and identified as defective.

1.3 Operational safety

Explosion-hazardous areas:

The Ceraphant T is not approved for use in Ex-areas.

1.4 Return

The following procedures must be carried out before a device is returned to Endress+Hauser:

- Always enclose a fully completed "Declaration of Contamination" form with the device. Only then can Endress+Hauser transport and examine a returned device. A copy of the "Declaration of Contamination" can be found on the second last page of these Operating Instructions.
- Remove all fluid residues. This is particularly important if the fluid is hazardous to health, e.g. flammable, toxic, caustic, carcinogenic, etc.



Warning!

Do not return a measuring device if you are not absolutely certain that all traces of hazardous substances have been removed, e.g. substances which have penetrated crevices or diffused through plastic.

2 Device identification

2.1 Nameplate

To identify your device, compare the complete order code and the version information on the delivery papers with the data on the nameplate.

The nameplate is divided into several sections. On the left, the Endress+Hauser logo and 'Ceraphant T' are displayed. Below this, it states 'Made in Germany D-79689 Maulburg'. The main body contains fields for identification: Order Code (1), Ser.-No. (2), TAG (3), Rel. (5), and a warning symbol with a document icon. Below these are fields for degree of protection (6, 7), sensor range (8), and max. operating pressure (MWP, 9). The 'Mat:' section includes wetted materials (10), electronics (11), current output (12), and supply voltage (U: 13). On the right, there are CE and UL approval marks, a triangle with the number 3 (74-02), and a box with the number 15. At the bottom right, a connection diagram shows a circular component with terminals 1, 2, 3, and 4, connected to L+, L-, and a common line. A box with the number 14 is next to the diagram.

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Fig. 1: Explanation of the nameplate – see Table below

| | | | | | |
|---|-----------------------------------|----|-------------------------|----|--------------------|
| 1 | Order code | 6 | Degree of protection | 11 | Electronics |
| 2 | Serial number | 7 | Degree of protection | 12 | Current output |
| 3 | TAG number | 8 | Sensor range | 13 | Supply voltage |
| 4 | TAG number | 9 | Max. operating pressure | 14 | Connection diagram |
| 5 | Release number (change status) | 10 | Wetted materials | 15 | Approvals |

Notes:

- The release number indicates the change status of the device. A change in the last two figures does not have any effect on the compatibility – see also section 7.
- The MWP (maximum working pressure) is specified on the nameplate. This value refers to a reference temperature of +20 °C and may be applied to the device for an unlimited time. The test pressure (Over Pressure Limit OPL) corresponds to 1.5 times the MWP and may be applied for a limited time only in order to avoid lasting damage.

3 Installation

3.1 Incoming acceptance, storage

- Incoming acceptance:
Check the packaging and the device for damage. Check that the goods delivered are complete and nothing is missing.
- Storage:
Storage temperature $-40...+85\text{ }^{\circ}\text{C}$

3.2 Dimensions

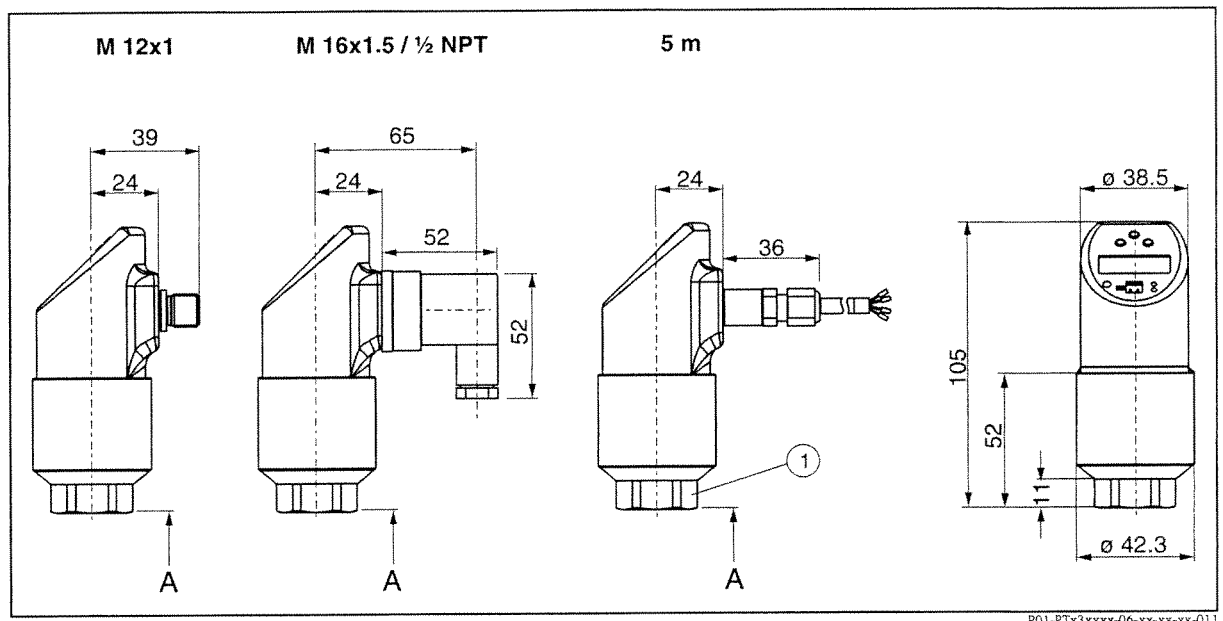


Fig. 2: Dimensions

M12x1 connector as per IEC 60947-5-2

M16x1.5 or 1/2 NPT valve plug as per DIN 43650A/ISO 4400

Cable 5 m long, cable outer diameter 7.7 mm; cores 4 x 0.2 mm², PE 0.75 mm²
reference pressure hose with outer diameter 2.5 mm

① Across flats AF 27 (for 400 bar sensor AF 32)

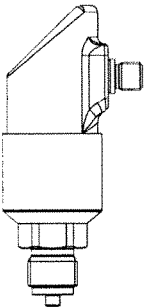
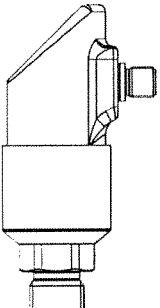
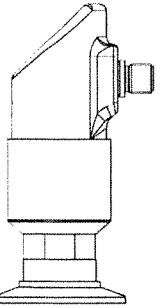
A = process connections – see next section

All dimensions in mm

3.3 Process connection

The following table illustrates the versions of Ceraphant T

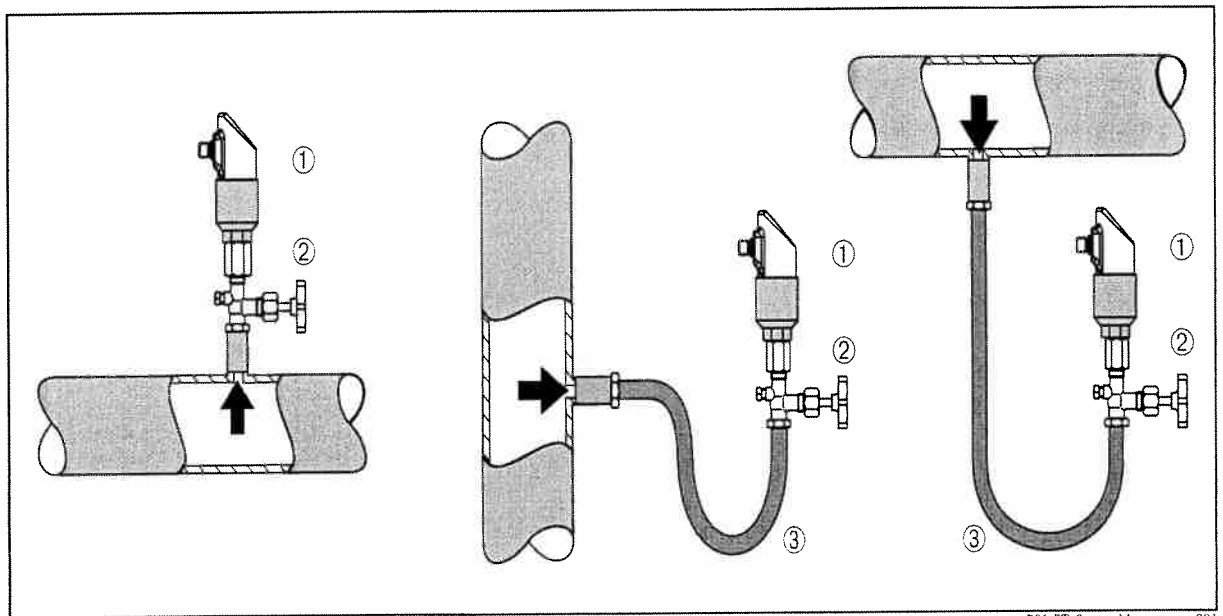
A detailed overview of the process connections and their dimensions can be found in the Technical Information TI 384P.

| Ceraphant product family | PTC 31 | PTP 31 | PTP 35 |
|--------------------------|---|---|---|
| |  P01-PTC31xxx-14-xx-xx-xx-001 |  P01-PTP31xxx-14-xx-xx-xx-001 |  P01-PTP35xxx-14-xx-xx-xx-001 |
| Measuring cell | With capacitive measuring cell and ceramic measuring diaphragm (Ceraphire®) | With piezoresistive measuring cell and metallic measuring diaphragm | With piezoresistive measuring cell and metallic measuring diaphragm for hygienic applications |
| Field of application | Measurement and monitoring of absolute and gauge pressures | Measurement and monitoring of absolute and gauge pressures | Measurement and monitoring of absolute and gauge pressures in hygienic processes |
| Process connection | Thread – G ¼ female – G ¼A and G ½A – G ½A, bore 11 mm – M 12x1.5 – 7/16-20 UNF – ¼ FNPT and ½ MNPT | Thread – G ¼ female – G ¼A and G ½A – G ½A, bore 11 mm – M 12x1.5 – 7/16-20 UNF – ¼ FNPT and ½ MNPT | Hygiene – Clamp ½"- 2" – G 1A – Varivent F, N – DIN 11851 – APV inline – SMS 1½" |
| Measuring range | 0...0.1 bar/1.5 psi to 0...40 bar/600 psi | 0...1 bar/15 psi to 0...400 bar/6000 psi | 0...1 bar/15 psi to 0...40 bar/600 psi |
| Process temperature | –40 °C...+100 °C | –40 °C...+100 °C | –40 °C...+100 °C (135 °C max. 1 hour) |

3.4 Installation instructions

For typical possibilities for installing the Ceraphant T – see the diagram below:

- Pressure measurement in gases (left)
Mount Ceraphant T with shut-off assembly above the sampling nozzle so that any condensate can drain off into the process.
- Pressure measurement in steam (centre)
Mount Ceraphant T with U-pipe below the sampling nozzle. Fill the U-pipe with fill fluid before commissioning.
- Pressure measurement in liquids (right)
Mount Ceraphant T below or at the same level as the sampling nozzle.



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Fig. 3: Possibilities for installing to measure pressure in gases, steam and liquids.

- ① Ceraphant T
- ② Shut-off assembly
- ③ U-pipe

Mounting instructions:

- Do not mount the device in the product flow or at a point where it could be affected by pressure pulses.
- Calibration and functional testing are easier if the device is mounted downstream of a shut-off assembly.
- The orientation of the Ceraphant T can result in zero point shift, i.e. in an unpressurised state, the measured value does not display zero. This zero point shift can be corrected – see "Operation" section.
- The on-site display can be rotated electronically 180° – see "Operation" section.
- The housing can be rotated up to 310°.

4 Wiring

4.1 DC voltage version with M12 connector

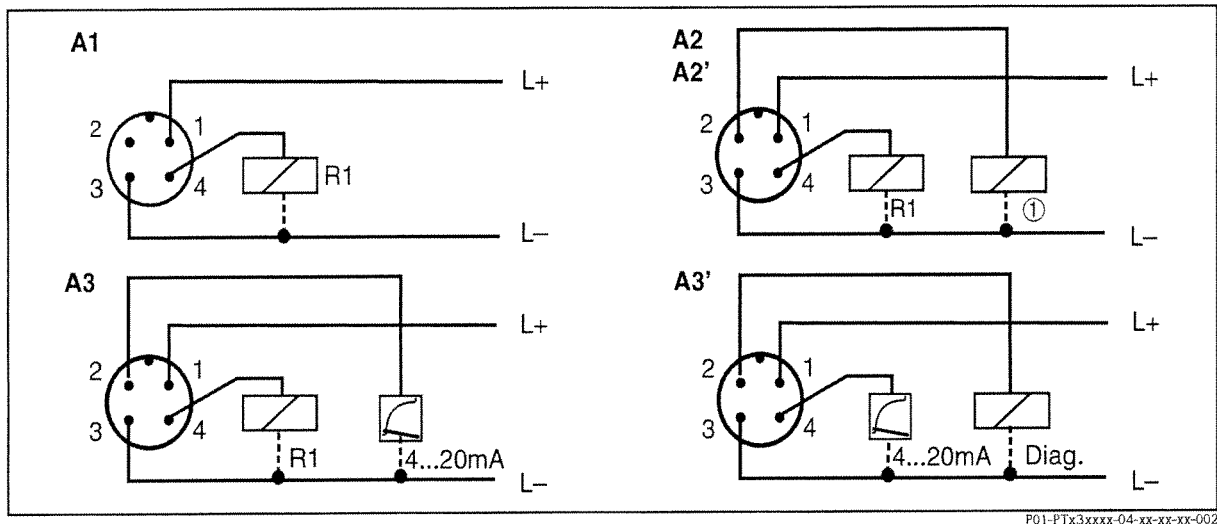


Fig. 4: Ceraphant T with M12x1 connector

A1: 1x PNP switch output

A2: 2x PNP switch outputs R1 and R2

A2': 2x PNP switch outputs R1 and R2 (diagnosis/break contact with adjustment "DESINA")

A3: PNP switch output with additional analog output

A3': PNP switch output with additional analog output (PIN assignment with "DESINA" setting)



Caution!

To avoid the analog input damaging of a PLC, do not connect the a active PNP switch output of the device to the 4...20 mA input of a PLC.



Note!

DESINA (see chapter 5.1.3 Basic settings):

R2 = Diagnosis/break contact (more informations about DESINA see www.desina.de)

4.2 DC voltage version with valve connector

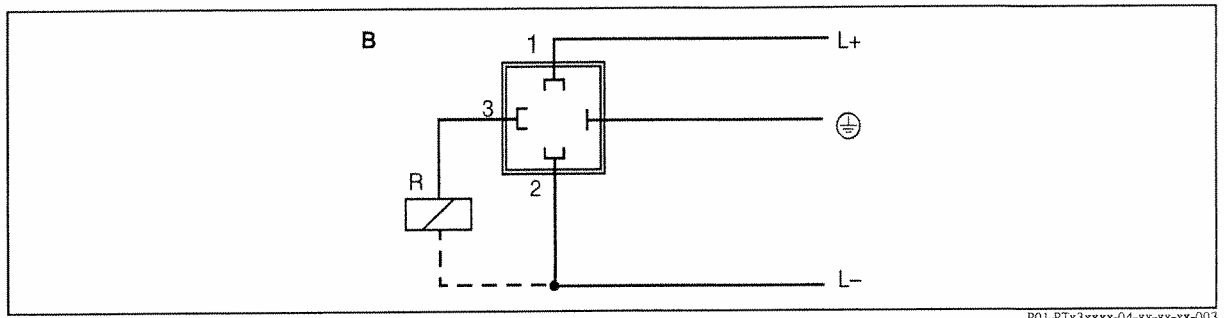


Fig. 5: Ceraphant T with valve connector

B: 1x PNP switch output

4.3 DC voltage version with cable

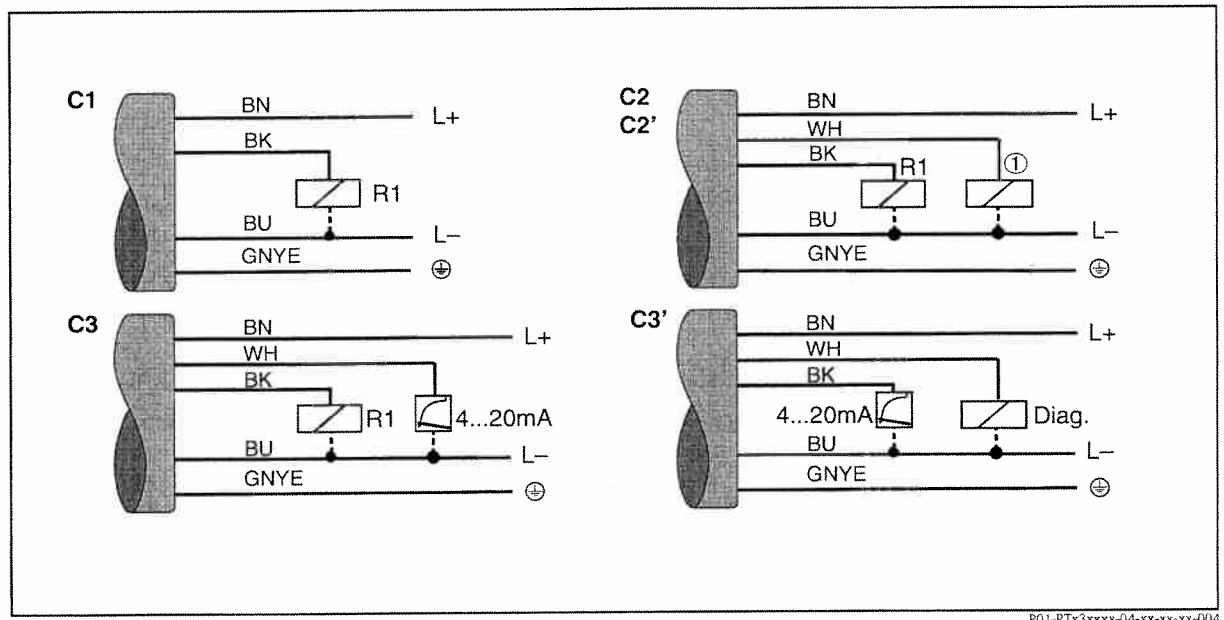


Fig. 6: Ceraphant T with cable connection

C1: 1x PNP switch output

C2: PNP switch outputs R1 and ① (R2)

C2': PNP switch outputs R1 and ① (diagnosis/break contact with adjustment "DESINA")

C3: PNP switch output with additional analog output

C3': PNP switch output with additional analog output (assignment with "DESINA" setting)

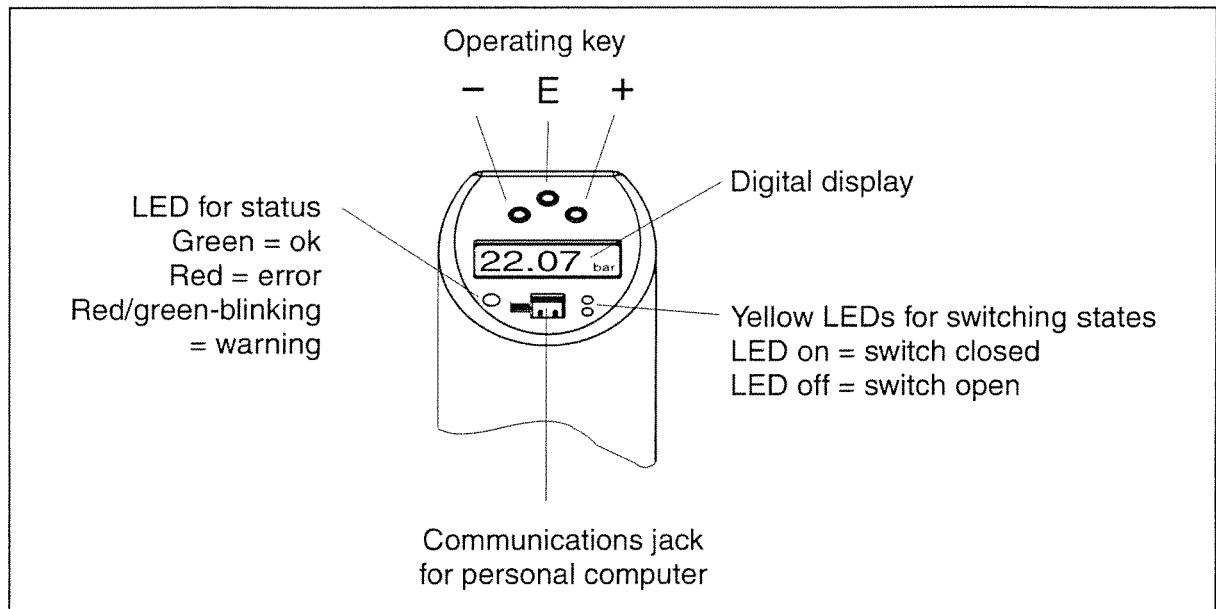
Cable specification: all three versions 5-core (4 x 0.2 mm², PE 0.75 mm²)

– Core colours: BN = brown, BK = black, WH = white, BU = blue, GNYE = green/yellow

5 Operation

5.1 On-site operation

The Ceraphant T is operated by means of three keys. The digital display and the light emitting diodes (LED) support navigation in the operating menu.



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Fig. 7: Position of operating elements and possibilities for display

Background illumination of the digital display:

- White = OK status
- Red = error status

5.1.1 Navigating in the operating menu

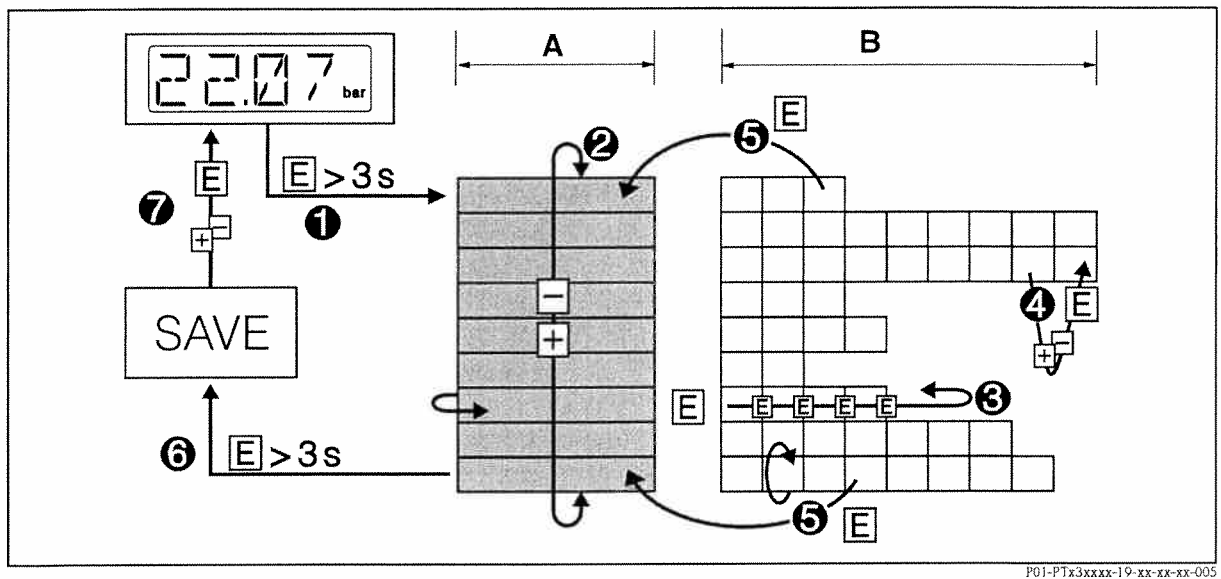


Fig. 8: Navigating in the operating menu

A Function group selection

B Function selection

- ① Enter the operating menu
 - Press the E key for longer than 3 s
- ② Select the "Function group" with the + or – key
- ③ Select the "Function" with the E key
- ④ Enter or change parameters with the + or – key
 - Then return to "Function" with the E key *Note: If software locking is enabled, it must be disabled before making entries or changes by entering the code selected*
- ⑤ Press the E key several times to return to the "Function group"
- ⑥ Jump back to the measuring position (Home position)
 - Press the E key for longer than 3 s
- ⑦ Query to save data (select "YES" or "NO" with the + or – key)
 - Confirm with the E key

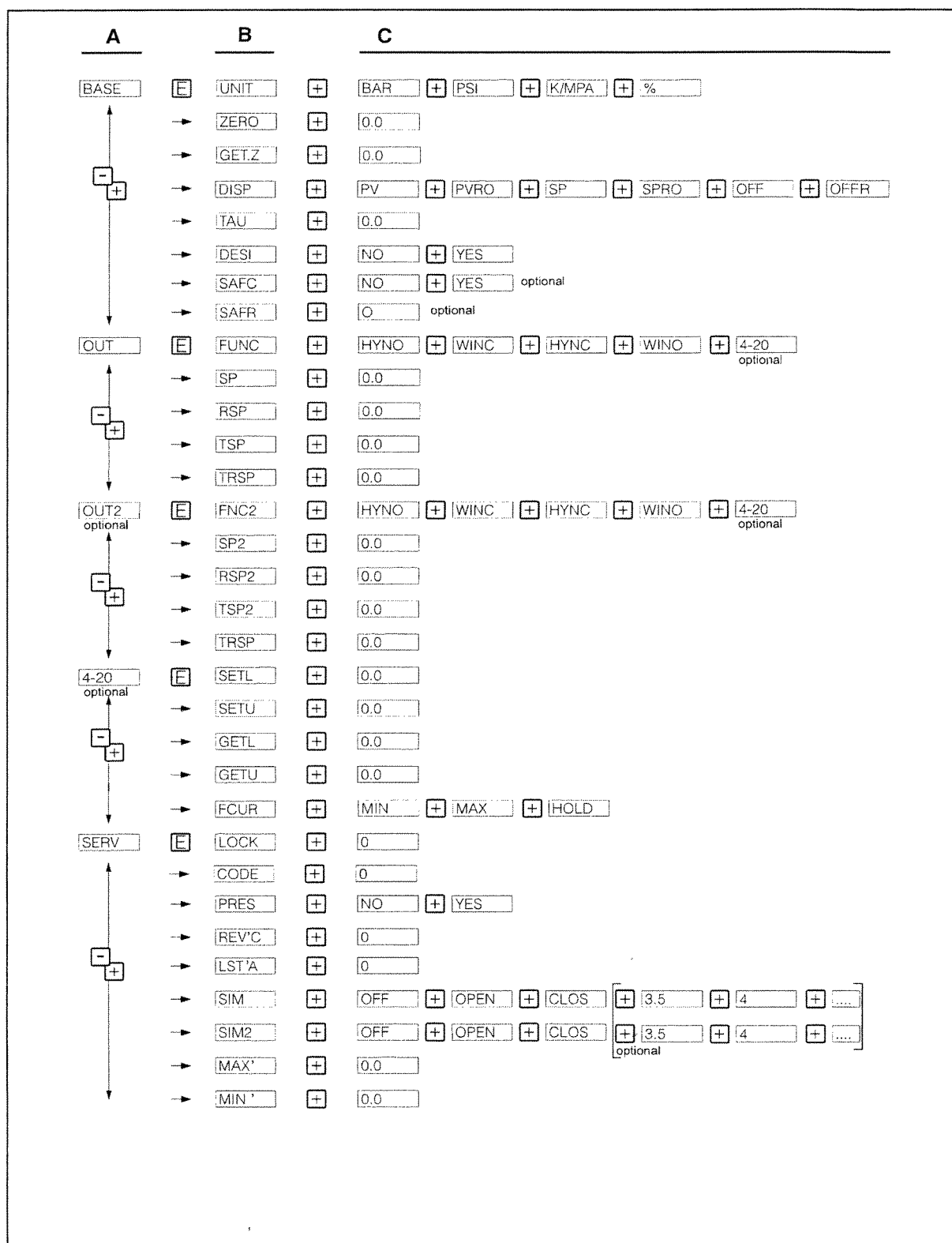


Note!

Changes to the parameter settings only become effective if you choose ⑦ "YES" when asked to save data.

5.1.2 Structure of the operating menu

The structure below shows all the possible fields of the operating menu.



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Fig. 9: Operating menu: A function groups, B functions, C settings

5.1.3 Basic settings

| Base | Basic settings | | | |
|------|---|---------------------------------------|---|--|
| BASE | UNIT | Technical unit | BAR PSI KPA 1/1 | Select technical unit: bar psi kPa/MPa % |
| | ZERO | Configure zero point | 0.0 | Offset: ±20 % URL |
| | GET.Z | Accept zero point | 0.0 | Current value as zero point (Offset max. ±20 % URL) |
| | DISP | Display | PV PVRO SP SPRO OFF OFFR | PV: measured value display PVRO: measured value display rotated 180° SP: set switch point display SPRO: set switch point display rotated 180° OFF: display off OFFR: display off rotated 180° |
| | TAU | Damping: display value, output signal | 0.0 | 0...40 s in increments of 0.1 s |
| | DESI | DESINA | NO YES | Connection in accordance with DESINA guidelines (see Section 4) |
| Note | The percentage specification applies to the upper range limit | | | |

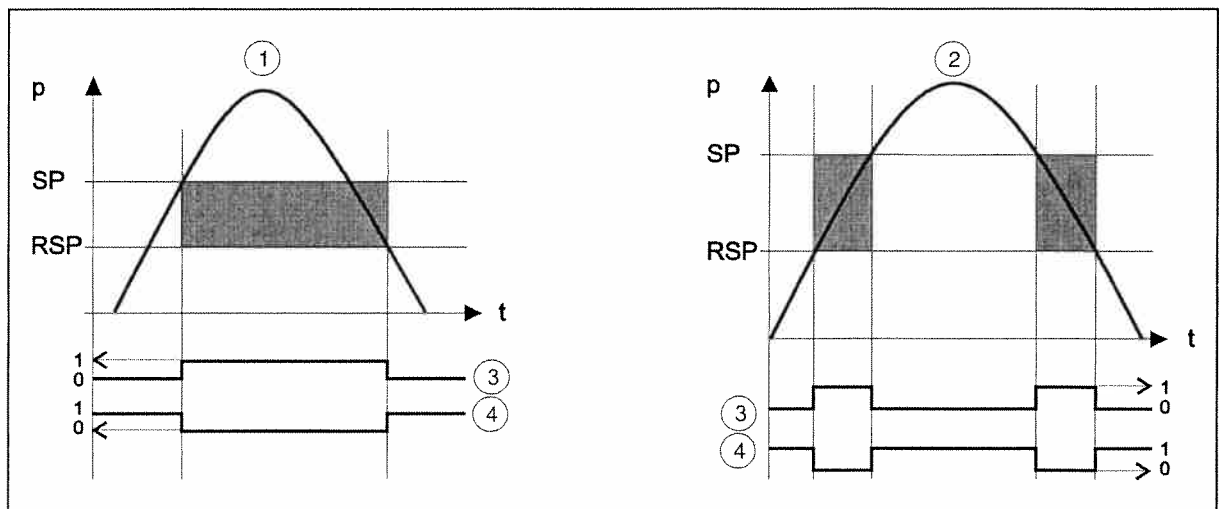
5.1.4 Output setting

- Hysteresis function: The hysteresis function enables two-point control via a hysteresis. Depending on the pressure p , the hysteresis can be set via the switch point SP and the switch-back point RSP.

- Window function: Enables the monitoring of a process pressure range.

The hysteresis of the switch points SP and RSP is less than 0.1 % URL. Under rough EMC-conditions quick switching is possible if the measured value is near to SP or RSP. Setting a damping of 0.1 s will avoid this effect.

- NO contact or NC contact: This switch function is freely selectable.
- Factory setting (if no customer-specific settings have been ordered):
Switch point SP 1: 45 %; Switch-back point RSP 1: 44.5 %
Switch point SP 2: 55 %; Switch-back point RSP 2: 54.5 %
Analog output: LRV 0 %; URV 100 %
- Range of adjustment: LRL = Lower Range Limit; URL = Upper Range Limit;
LRV = Lower Range Value; URV = Upper Range Value



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Fig. 10: ① Hysteresis function, ② Window function, ③ Switch status NO contact, ④ Switch status NC contact, SP switch point; RSP switch-back point

| OUT/OUT2 | Output/output 2 | | | |
|--|----------------------------------|--------------------------|--|---|
| <div>OUT</div> <div>OUT2</div> | <div>FUNC</div> <div>FNC2</div> | Switching characteristic | <div>HYNO</div> <div>HYNC</div> <div>WINO</div> <div>WINC</div> <div>4--20</div> | HYNO: Hysteresis/NO contact HYNC: Hysteresis/NC contact WINO: Window/NO contact WINC: Window/NC contact 4...20 mA: Analog output (only if available) |
| | <div>SP</div> <div>SP2</div> | Switch point value | <div>0.0</div> | Switch point 0.5...100 % URL in increments of 0.1 % of selected unit (min. 0.001 bar) |
| | <div>RSP</div> <div>RSP2</div> | Switch-back point value | <div>0.0</div> | Switch-back point 0...99.5 % URL in increments of 0.1 % of selected unit (min. 0.001 bar) |
| | <div>TSP</div> <div>TSP2</div> | Switch point delay | <div>0.0</div> | Delay time 0...99 s in increments of 0.1 s |
| | <div>TRSP</div> <div>TRSP2</div> | Switch-back point delay | <div>0.0</div> | Delay time 0...99 s in increments of 0.1 s |
| Min. distance between SP and RSP: 0.5% URL | | | | |

| 4 - 20 | Analog output | | | |
|--|---------------|----------------------------------|----------------------|--|
| 4 -- 20 | SETL | Value for 4 mA (LRV) | 0.0 | Enter lower range value in increments of 0.1 % of selected unit |
| | SETU | Value for 20 mA (URV) | 0.0 | Enter upper range value in increments of 0.1 % of selected unit |
| | GETL | Pressure applied for 4 mA (LRV) | 0.0 | Take pressure value as lower range value |
| | GETU | Pressure applied for 20 mA (URV) | 0.0 | Take pressure value as upper range value |
| | FCUR | Error current | MIN' MAX' HOLD | Current value in event of error: MIN = ≤ 3.6 mA MAX = ≥ 21.0 mA HOLD = last value |
| Turndown up to 4:1, LRV must be lower than URV | | | | |

5.1.5 Service function setting

■ Locking code

A locking code already assigned can only be changed by first entering the old code for enabling the device.

| SERV | Service functions | | | |
|------|-------------------|--------------------------|-------------------------------------|---|
| SERV | LOCK | Security locking | <input checked="" type="checkbox"/> | Locking against undesired configuration |
| | CODE | Locking code | <input checked="" type="checkbox"/> | Freely selectable code 1...9999 0 = no locking |
| | PRES | Reset | NO YES | Reset all entries to the factory setting |
| | REV'C | Revision counter | <input checked="" type="checkbox"/> | Increases by 1 with each configuration |
| | LST'A | Last device status | <input checked="" type="checkbox"/> | Displays the last device status to occur ≠0 |
| | SIM SIM2 | Simulation output 1 or 2 | OFF OPEN CLOS 3.5 | OFF: No simulation OPEN: Switch output open CLOS: Switch output closed 3.5: Simulation values for analog output in mA (3.5/4.0/8.0/12.0/16.0/20.0/21.7) |
| | MAX' | Max. indicator | <input checked="" type="checkbox"/> | Display of max. measured process value |
| | MIN' | Min. indicator | <input checked="" type="checkbox"/> | Display of min. measured process value |

5.2 Operation with personal computer and ReadWin 2000

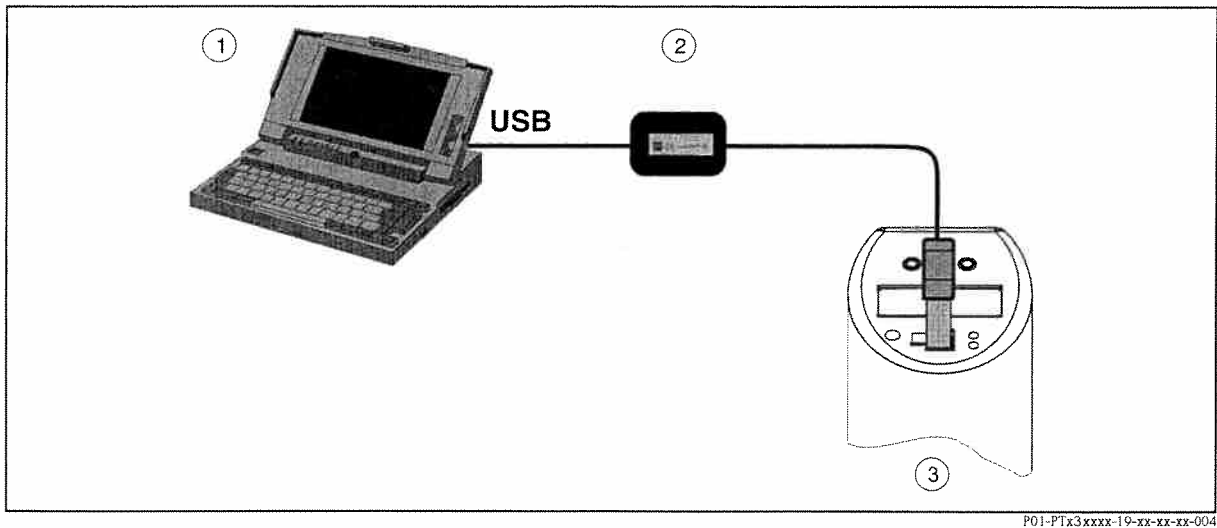


Fig. 11: Operation with PC

- ① Personal computer with ReadWin configuration software
- ② Configuration kit (USB interface)
- ③ Ceraphant T with communication jack

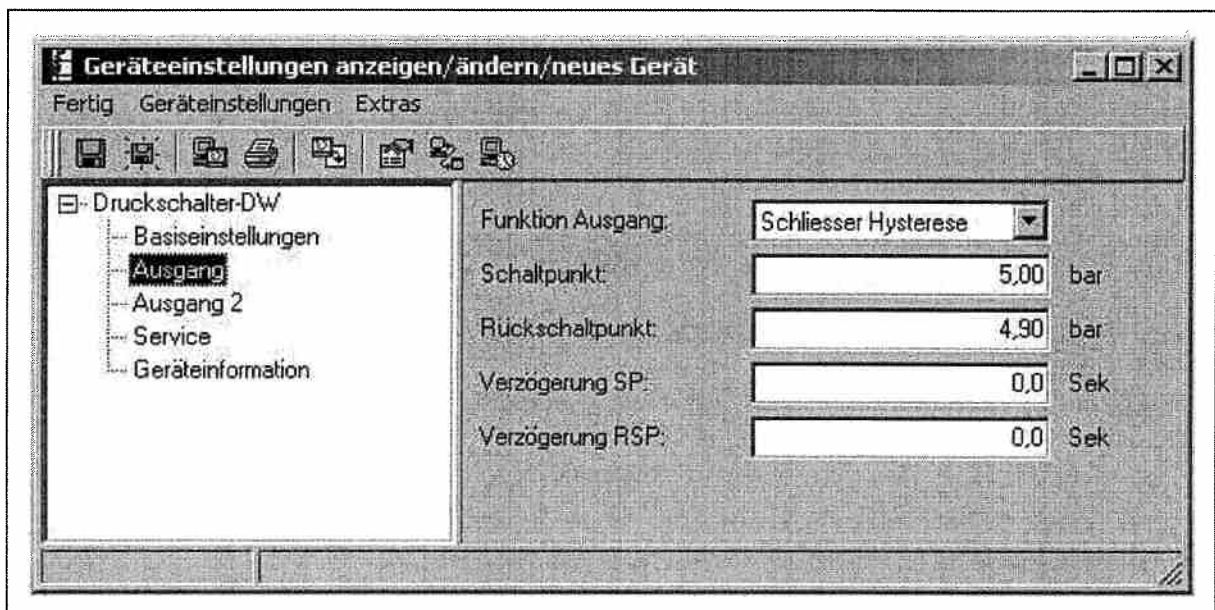


Fig. 12: Device configuration with ReadWin

5.2.1 Additional operating options

In addition to the operating options listed in the previous "On-site operation" section, the ReadWin configuration software provides further information on the Ceraphant T:

| Function group | Description |
|----------------|---------------------------------------|
| SERV | Number of switch changes for output 1 |
| | Number of switch changes for output 2 |
| | Device status |
| | Last error to occur |
| INFO | Tag number |
| | Order code |
| | Limit switch serial number |
| | Sensor serial number |
| | Electronics serial number |
| | Device release (change status) |
| | Hardware version |
| | Software version |

5.2.2 Operating Instructions for ReadWin

Comprehensive information on the ReadWin configuration software may be found in the Operating Instructions BA 137R/09/en (refer to www.readwin2000.com).

6 Accessories

6.1 Process connection

- Ceraphant T PTC31:
The sensor module and the process connection are connected together and cannot be separated.
- Ceraphant T PTP31, PTP35:
The process connection is an adapter and the sensor module has an adapter thread. As a result, the process connection can easily be changed at a later stage.
Exceptions: process connection Clamp $\frac{1}{2}$ and G 1A and 400 bar sensors.

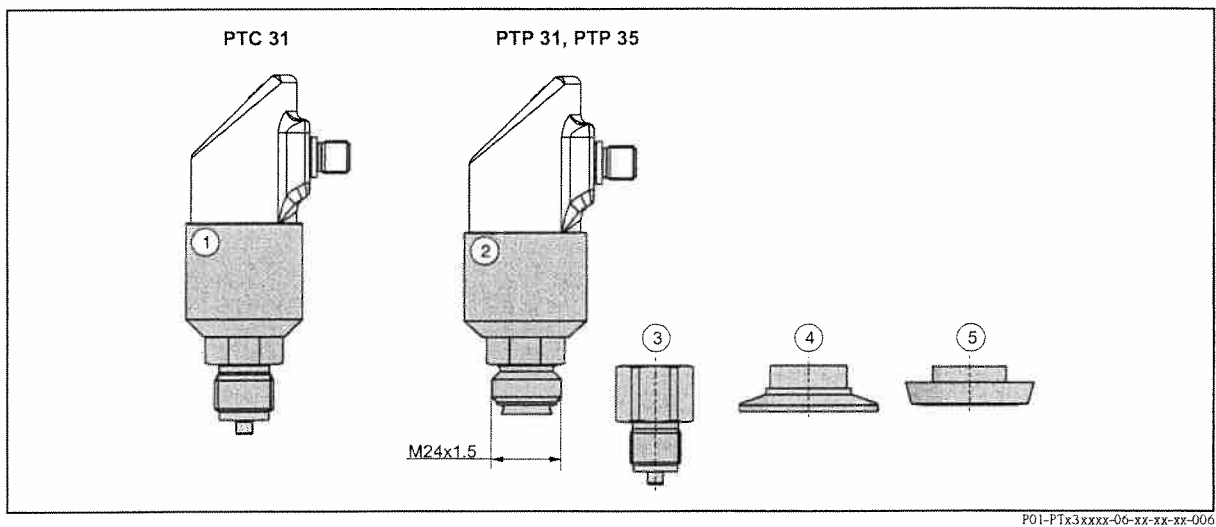
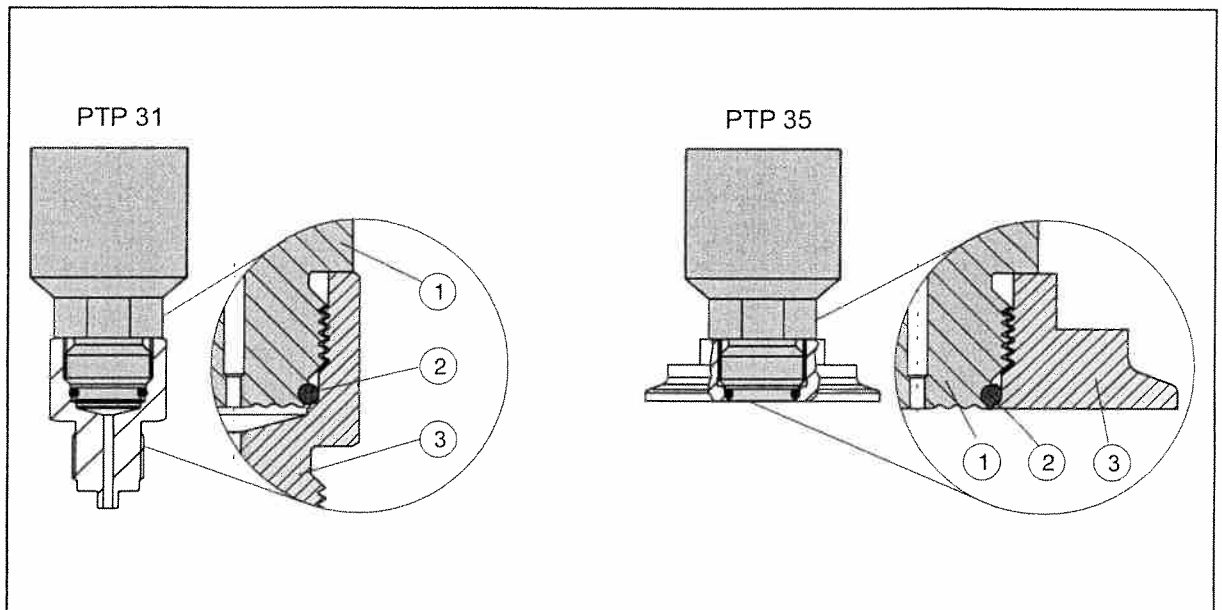


Fig. 13: Process connection

- ① Sensor module PTC31
- ② Sensor module PTP31 and PTP35
- ③ Adapter with threaded connection
- ④ Adapter with Clamp connection (apart from Clamp $\frac{1}{2}$ ")
- ⑤ Adapter with hygiene connection (apart from G 1A)

6.1.1 Adapter change

The adapter can be changed on PTP31 and PTP35.



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Fig. 14: Changing the adapter

- ① Sensor module with adapter thread
- ② Standard O-ring
- ③ Adapter

Please note the following when changing the adapter:

- Use a new O-ring. Diameter 15.54 x 2.62 mm.
With either EPDM 70 Shore FDA or FKM 70 Shore material.
- The device (sensor module) can be fixed in place with an open-ended wrench AF 27.
- The adapter can be screwed on with an open-ended wrench AF 28 or AF 32 (depending on the process connection).
The maximum torque is 80Nm. The thread can become loose if exposed to severe strain through pressure and temperature. For this reason, the air-tightness must be checked regularly and the thread tightened if necessary. We recommend using Teflon tape as an additional thread seal.
- When changing the adapter, make sure that the measuring diaphragm of the sensor is not damaged.



Note! O-ring change

We recommend to change the O-ring in the same time frame as of all other sealings in your process.

6.1.2 Adapter versions

- PTP 31: order numbers for thread adapter versions.

Version AC: order no. 52023980

Version AD: order no. 52023981

Version AE: order no. 52023982

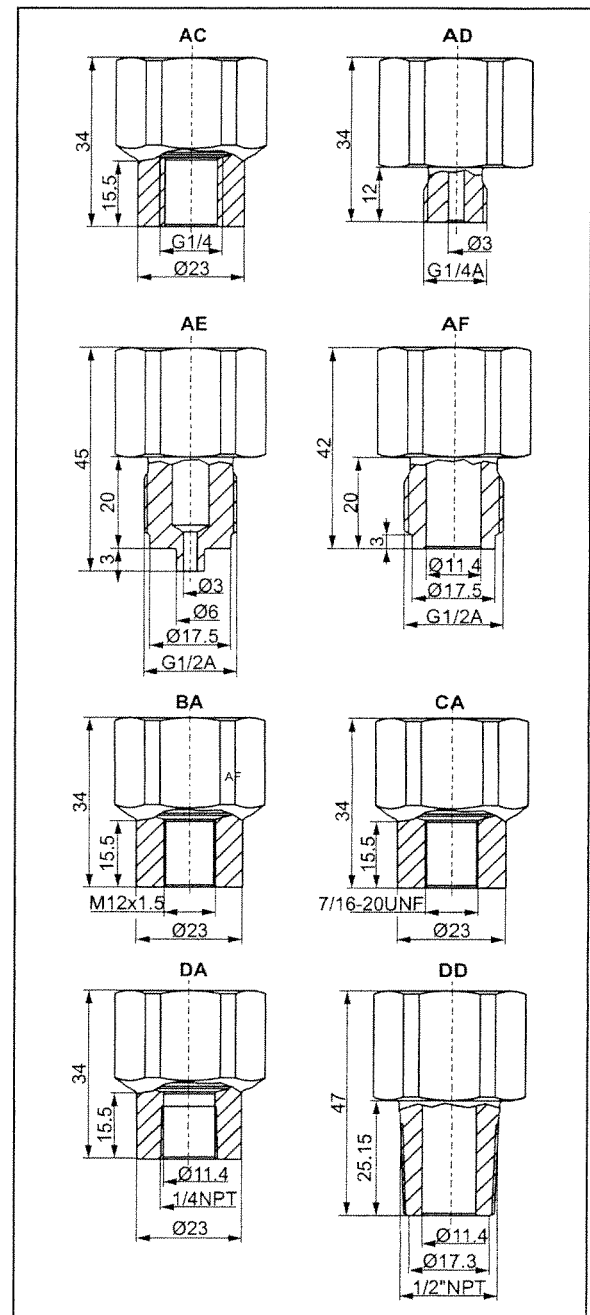
Version AF: order no. 52023983

Version BA: order no. 52023984

Version CA: order no. 52023985

Version DA: order no. 52023986

Version DD: order no. 52023987



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- PTP 35: order numbers for Clamp adapter versions.

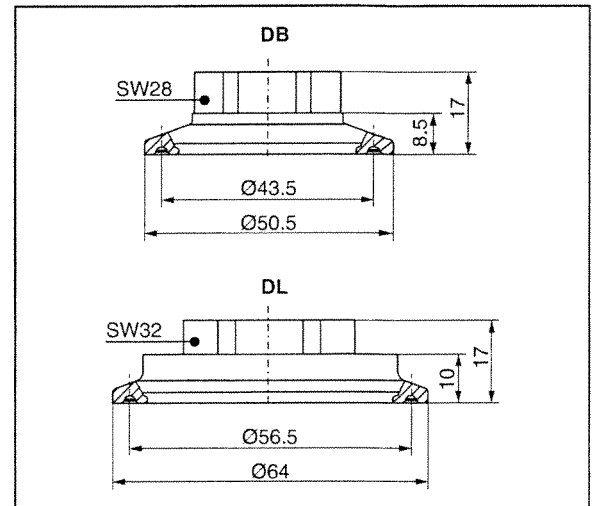
Version DB: order no. 52023994

Version DL: order no. 52023995

Optional with inspection certificate 3.1:

Version DB: order no. 52024001

Version DL: order no. 52024002



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- PTP 35: order numbers for hygiene adapter versions.

Version LB: order no. 52023996

Version LL: order no. 52023997

Version PH: order no. 52023999

Version PL: order no. 52023998

Version HL: order no. 52024000

Version KL: order no. 52026997

Optional with inspection certificate 3.1:

Version LB: order no. 52024003

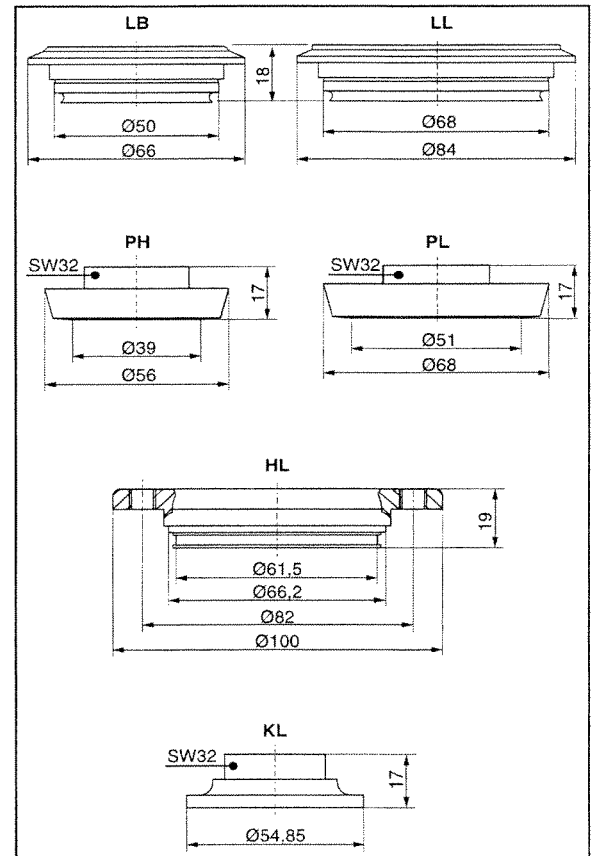
Version LL: order no. 52024004

Version PH: order no. 52024006

Version PL: order no. 52024005

Version HL: order no. 52024007

Version KL: order no. 52026999



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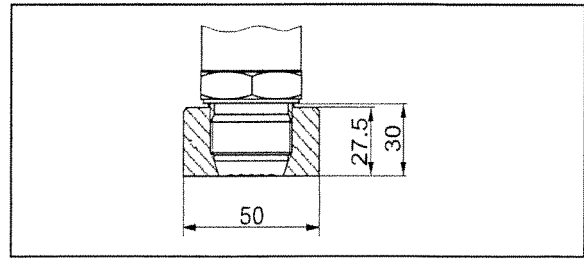
6.1.3 O-ring for adapter change

- O-ring 15.54 x 2.62 mm, EPDM 70 Shore FDA, order number 52024267
- O-ring 15.54 x 2.62 mm, FKM 70 Shore, order number 52024268

6.2 Welding bosses

6.2.1 Welding boss with sealing taper

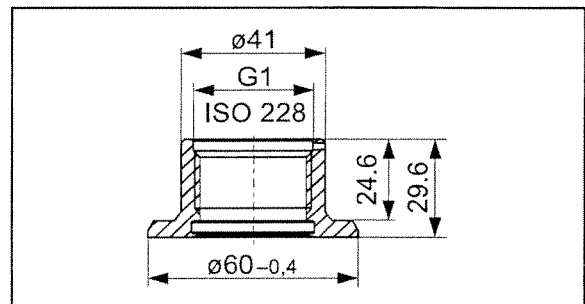
- Welding boss for flush mounting process connection G1A with metallic sealing taper (version BA for PTP 35)
Material: AISI 316L
Order number: 52005087
- Optional with inspection certificate 3.1
Order number: 52010171
- Welding aid (Dummy) for welding the welding boss without any problems, order number 52005087 or 52010171
Material: brass
Order number: 52005272



P01-Pxxxxxxx-00-xx-00-xx-001

6.2.2 Welding boss with sealing surface

- Welding boss for flush mounting process connection G1 A with sealing surface (version BB for PTP 35)
Material: AISI 316L
Seal (enclosed): silicone O-ring
Order number: 52001051
- Optional with inspection certificate 3.1
Order number: 52011896

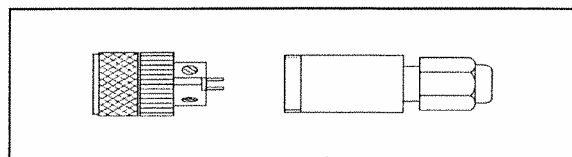


P01-PMP13xxx-00-xx-00-xx-002

6.3 Electrical connection

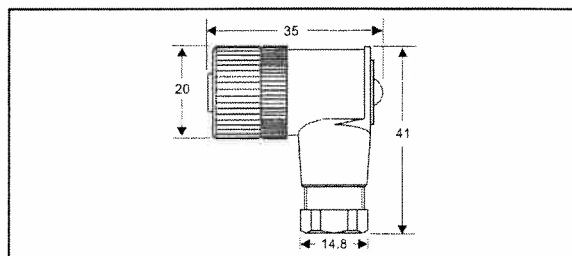
6.3.1 Plug-in jack, connecting cable

- M 12x1 plug-in jack
Connection to M 12x1 housing connector
Materials: Body PA, coupling nut Cu Zn, brass, nickeled
Protection: IP 67 (fully locked)
Order number: 52006263



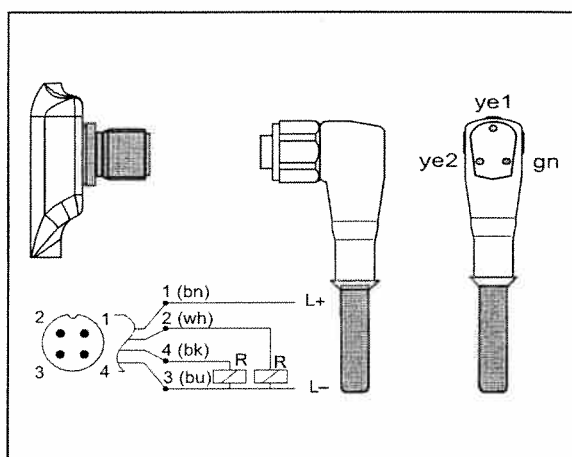
P01-PMP13xxx-00-xx-00-xx-003

- M 12x1 plug-in jack, elbowed
Connection to M 12x1 housing connector
Materials: Body PBT/PA, coupling nut GD-Zn, brass, nickeled
Protection: IP 67 (fully locked)
Order number: 52006327



P01-PTxxxxxx-00-xx-00-xx-002

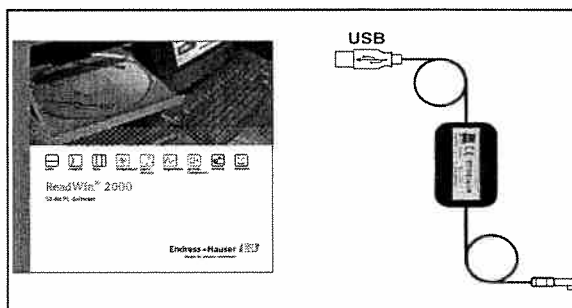
- Cable, 4 x 0.34 mm² with M 12 socket, elbowed, screw plug, length 5 m
Materials: Body PUR; coupling nut Cu Zn/Ni, brass, nickeled; cable: PVC
Protection: IP 67 (fully locked)
Order number: 52010285
- Cable, 4 x 0.34 mm² with M 12 socket, with LED, elbowed, screw plug, PVC cable. For devices with switch output only
Materials: Body PVC, coupling nut 316L, Protection: IP 69K (fully locked)
Order number: 52018763



P01-PTx3xxxx-07-xx-xx-xx-001

6.4 Operation with ReadWin

- Configuration kit
For PC-programmable transmitters. Setup program and interface cable for PCs with USB port. Adapter for transmitters with 4-pin post connector.
Order code: TXU10-AA
- ReadWin® 2000: Supplied with the configuration kit or downloaded from internet: www.readwin2000.com



P01-PTxx3xxx-00-xx-00-xx-001

7 Trouble-shooting

7.1 Errors and warnings

If an error in the device occurs, the colour of the status LED changes from green to red and the background illumination of the digital display changes from white to red. The display shows:

- E-code for errors. In the event of an error message, the measured value is uncertain.
- W-code for warnings. In the event of a warning, the measured value is reliable.

| Code | Explanation |
|------|--|
| E011 | Device configuration faulty |
| E012 | Error in measurement or underreach/overreach |
| E015 | Error in EEPROM |
| E019 | Power supply has undervoltage/overvoltage |
| E020 | Error in flash |
| E021 | Error in RAM |
| E022 | USB supply voltage |
| E025 | Switching contact 1 is not open although it should be |
| E026 | Switching contact 2 is not open although it should be |
| E040 | VCC (controller voltage) is out of working area |
| E042 | Output current cannot be generated. Possible cause: analog output not connected |
| E044 | Output current drifts too much (± 0.5 mA) |

| Code | Explanation |
|------|-----------------------------------|
| W107 | Simulation active |
| W202 | Pressure outside the sensor range |

| Code | Explanation |
|------|---|
| W209 | Device starts |
| W210 | Configuration modified |
| W212 | Sensor signal outside the permitted range |
| W250 | Number of switch cycles exceeded |
| W270 | Short-circuit and overload at output 1 |
| W280 | Short-circuit and overload at output 2 |

7.2 Repair

A repair is not planned.

7.3 Disposal

When disposing, ensure that the materials of the device components are separated and processed accordingly.

7.4 Change status (release)

The release number on the nameplate and in the Operating Instructions indicates the change status of the device: X.YY. (example 1.02.).

| | |
|----|--|
| X | Change in the main version. Compatibility no longer provided. Device and Operating Instructions change. |
| YY | Compatibility provided. Operating Instructions change. |

7.5 Change status - history

| Release no. device | Changes |
|--------------------|------------------------------|
| 1.00 | |
| 1.01 | New analog electronics |
| 1.02 | Modification sensor units |
| 1.03 | Internal device modification |

8 Most important technical data

8.1 Power supply

Supply voltage

- DC voltage version
12...30 V DC

Current consumption

- Without load < 60 mA, with reverse polarity protection

Power supply failure

- Behaviour in case of overvoltage
The device works continuously without any damage up to 34 V DC.
If the supply voltage is exceeded, the properties specified are no longer guaranteed.
- Behaviour in case of undervoltage
If the supply voltage drops below the minimum value, the device switches off (status as if not supplied with power = switch open)

8.2 Output

Switching capacity

- Switch status ON: $I_a \leq 250 \text{ mA}$
- Switch status OFF: $I_a \leq 1 \text{ mA}$
- Switching cycles: > 10,000,000
- Voltage drop PNP: $\leq 2 \text{ V}$
- Overload resistance
Automatic load check of switching current; output is switched off in case of overcurrent, the switching current is tested again every 0.4 s;
max. capacitance load: 14 μF at max. supply voltage (without resistive load)
max. period length: 0.5 s; min. t_{on} : 40 μs

Load (analog output)

- Max. $(V_{\text{supply}} - 6.5 \text{ V})/0.022 \text{ A}$

Signal on alarm

- Analog output
 $\leq 3,6 \text{ mA}$ / last current value / $\geq 21,0 \text{ mA}$ adjustable
(if setting $\geq 21.0 \text{ mA}$ the output is $\geq 21.5 \text{ mA}$)
- Switch outputs
In safe state (switch normally open)

8.3 Operating conditions

- Any orientation
- Any position-dependent zero shift can be corrected
Offset: $\pm 20\%$ URL

Operating conditions: Environment

- Ambient temperature range
–40...+85 °C (briefly up to +100 °C)
- Storage temperature
–40...+85 °C

Operating conditions: Process

– Medium temperature ranges

- PTC 31: –40...+100 °C
- PTP 31: –40...+100 °C
- PTP 35: –40...+100 °C (+135 °C for max. 1 hour)


Please also note the temperature limits of the seal used.

- Seals:
FKM: Viton® (temperature range –20...+100 °C)
EPDM: FDA number 21-CFR 177.2600, Class II 3A Sanitary Standard 18, USP Class VI
(temperature range –40...+100 °C)
FKM: Viton® for O₂ applications (70C3 CO2-70-0041V), temperature range –10...+60 °C

Limiting medium pressure range

- For overload resistance, see nameplate (section 2)
- Vacuum resistance
For ceramic sensor with nominal value >100 mbar: 0 mbar_{abs}
For ceramic sensor 100 mbar: 700 mbar_{abs}
For metal sensor: 10 mbar_{abs}

9 Dangerous Goods sheet

Endress+Hauser 

People for Process Automation

Declaration of Hazardous Material and De-Contamination Erklärung zur Kontamination und Reinigung

RA No.

Please reference the Return Authorization Number (RA#), obtained from Endress+Hauser, on all paperwork and mark the RA# clearly on the outside of the box. If this procedure is not followed, it may result in the refusal of the package at our facility.
Bitte geben Sie die von E+H mitgeteilte Rücklieferungsnummer (RA#) auf allen Lieferpapieren an und vermerken Sie diese auch außen auf der Verpackung. Nichtbeachtung dieser Anweisung führt zur Ablehnung ihrer Lieferung.

Because of legal regulations and for the safety of our employees and operating equipment, we need the "Declaration of Hazardous Material and De-Contamination", with your signature, before your order can be handled. Please make absolutely sure to attach it to the outside of the packaging.

Aufgrund der gesetzlichen Vorschriften und zum Schutz unserer Mitarbeiter und Betriebseinrichtungen, benötigen wir die unterschriebene "Erklärung zur Kontamination und Reinigung", bevor Ihr Auftrag bearbeitet werden kann. Bringen Sie diese unbedingt außen an der Verpackung an.







Type of instrument / sensor
Geräte-/Sensortyp _____

Serial number
Seriennummer _____

☐ **Used as SIL device in a Safety Instrumented System / Einsatz als SIL Gerät in Schutzanlagen**
Process data / Prozessdaten

 Temperature / Temperatur _____ [°F] _____ [°C] Pressure / Druck _____ [psi] _____ [Pa]
 Conductivity / Leitfähigkeit _____ [µS/cm] Viscosity / Viskosität _____ [cp] _____ [mm²/s]

Medium and warnings
Warnhinweise zum Medium

| | Medium /concentration Medium /Konzentration | Identification CAS No. |  flammable entzündlich |  toxic giftig |  corrosive ätzend |  harmful/ irritant gesundheitsschädlich/ reizend |  other * sonstiges * |  harmless unbedenklich |
|--|--|---------------------------|--|---|--|--|--|--|
| Process medium Medium im Prozess | | | | | | | | |
| Medium for process cleaning Medium zur Prozessreinigung | | | | | | | | |
| Returned part cleaned with Medium zur Endreinigung | | | | | | | | |

* explosive; oxidising; dangerous for the environment; biological risk; radioactive

* explosiv; brandfördernd; umweltgefährlich; biogefährlich; radioaktiv

Please tick should one of the above be applicable, include safety data sheet and, if necessary, special handling instructions.

Zutreffendes ankreuzen; trifft einer der Warnhinweise zu, Sicherheitsdatenblatt und ggf. spezielle Handhabungsvorschriften beilegen.

Description of failure / Fehlerbeschreibung _____

Company data / Angaben zum Absender

| | |
|-------------------------|---|
| Company / Firma _____ | Phone number of contact person / Telefon-Nr. Ansprechpartner: _____ |
| Address / Adresse _____ | Fax / E-Mail _____ |
| _____ | Your order No. / Ihre Auftragsnr. _____ |

"We hereby certify that this declaration is filled out truthfully and completely to the best of our knowledge. We further certify that the returned parts have been carefully cleaned. To the best of our knowledge they are free of any residues in dangerous quantities."

"Wir bestätigen, die vorliegende Erklärung nach unserem besten Wissen wahrheitsgetreu und vollständig ausgefüllt zu haben. Wir bestätigen weiter, dass die zurückgesandten Teile sorgfältig gereinigt wurden und nach unserem besten Wissen frei von Rückständen in gefährlichen Mengen sind."

PIST/Modula XV

(place, date / Ort, Datum) _____

Name, dept./ Abt. (please print / bitte Druckschrift) _____

Signature / Unterschrift _____

www.endress.com/worldwide

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