Process transmitter, model UPT-2x

GB

Process transmitter, model UPT-20

WIKA

Part of your business

Prior to starting any work, read the operating instructions!
Keep for later use!

Vor Beginn aller Arbeiten Betriebsanleitung lesen!
Zum späteren Gebrauch aufbewahren!

Contents

Contents

Declartations of conformity can be found online at www.wika.com

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1. General information

- The process transmitter described in the operating instructions has been designed and manufactured using state-of-the-art technology. All components are subject to stringent quality and environmental criteria during production. Our management systems are certified to ISO 9001 and ISO 14001.

- These operating instructions contain important information on handling the instrument. Working safely requires that all safety instructions and work instructions are observed.

- Observe the relevant local accident prevention regulations and general safety regulations for the instrument's range of use.

- The operating instructions are part of the product and must be kept in the immediate vicinity of the instrument and readily accessible to skilled personnel at any time.

- Skilled personnel must have carefully read and understood the operating instructions prior to beginning any work.

- The manufacturer's liability is void in the case of any damage caused by using the product contrary to its intended use, non-compliance with these operating instructions, assignment of insufficiently qualified skilled personnel or unauthorised modifications to the instrument.

- The general terms and conditions contained in the sales documentation shall apply.

- Subject to technical modifications.

- Further information:
  - Internet address: www.wika.de / www.wika.com
  - Relevant data sheet: PE 86.05
  - Application consultant: Tel.: +49 9372 132-0
                          Fax: +49 9372 132-406
                          info@wika.com

Explanation of symbols

WARNING!
... indicates a potentially dangerous situation that can result in serious injury or death, if not avoided.

WIKA operating instructions process transmitter, model UPT-2x

CAUTION!
... indicates a potentially dangerous situation that can result in light injuries or damage to equipment or the environment, if not avoided.

Information
... points out useful tips, recommendations and information for efficient and trouble-free operation.

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2. Safety

WARNING!
Before installation, commissioning and operation, ensure that the appropriate instrument has been selected in terms of measuring range, design and specific measuring conditions.
Non-observance can result in serious injury and/or damage to the equipment.

Further important safety instructions can be found in the individual chapters of these operating instructions.

2.1 Intended use

The process transmitter measures gauge pressure, absolute pressure and vacuum. The physical quantity pressure is converted into an electrical signal.

The process transmitter has been designed exclusively for industrial applications in internal and external locations. Its scope of application is defined by its technical performance limits and its materials. Improper use is defined as any application that exceeds the technical performance limits or is not compatible with the materials. Checking against improper use is the responsibility of the operator.

The instrument has been designed and built solely for the intended use described here, and may only be used accordingly.

The technical specifications contained in these operating instructions must be observed. Improper handling or operation of the instrument outside of its technical specifications requires the instrument to be taken out of service immediately and inspected by an authorised WIKA service engineer.

The manufacturer shall not be liable for claims of any type based on operation contrary to the intended use.

2.2 Personnel qualification

WARNING!
Risk of injury should qualification be insufficient!
Improper handling can result in considerable injury and damage to equipment.
The activities described in these operating instructions may only be carried out by skilled personnel who have the qualifications described below.

Skilled personnel
Skilled personnel are understood to be personnel who, based on their technical training, knowledge of measurement and control technology and on their experience and knowledge of country-specific regulations, current standards and directives, are capable of carrying out the work described and independently recognising potential hazards.

Special operating conditions require further appropriate knowledge, e.g. of aggressive media, compatibility of materials.

2.3 Personal protective equipment
The personal protective equipment is designed to protect the skilled personnel from hazards that could impair their safety or health during work. When carrying out different work on and with the instrument, personal protective equipment must be worn.

Follow the instructions displayed in the work area regarding personal protective equipment!

The requisite personal protective equipment must be provided by the operating company.

2.4 Special hazards

WARNING!
For hazardous media such as oxygen, acetylene, flammable or toxic gases or liquids, and refrigeration plants, compressors, etc., in addition to all standard regulations, the appropriate existing codes or regulations must also be followed.

WARNING!
Residual media in the dismounted process transmitter can result in a risk to personnel, the environment and equipment.
Take sufficient precautionary measures.

2.5 Labelling, safety marks

Product label
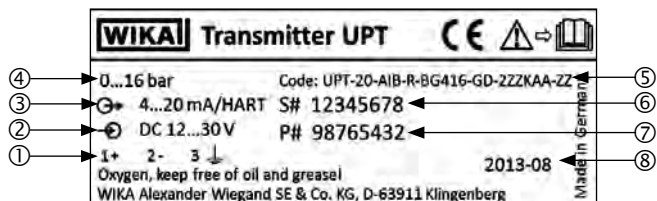
④	Pin assignment	⑤	Model code
②	Power supply	⑥	S# Serial no.
③	Output signal	⑦	P# Product no.
④	Measuring range	⑧	Date of manufacture YYYY-MM

Explanation of symbols

Before mounting and commissioning the instrument, ensure you read the operating instructions!

CE, Communauté Européenne
Instruments bearing this mark comply with the relevant European directives.

Output signal

Power supply

Ground (GND)

3. Specifications

3.1 Measuring range (see product label)

Gauge pressure				
bar	0 ... 0.4	0 ... 1.6	0 ... 6	0 ... 16	0 ... 40
	0 ... 100	0 ... 250	0 ... 600	0 ... 1,000	
psi	0 ... 10	0 ... 15	0 ... 30	0 ... 100	0 ... 300
	0 ... 500	0 ... 1,500	0 ... 5,000	0 ... 10,000	

Absolute pressure				
bar	0 ... 0.4	0 ... 1.6	0 ... 6	0 ... 16	0 ... 40
psi	0 ... 30	0 ... 100	0 ... 300	0 ... 500	

Vacuum and +/- measuring ranges				
bar	-0.4 ... 0	-0.2 ... +0.2	-1 ... +0.6	-1 ... +5	-1 ... +15
	-1 ... +40				
psi	-14.5 ... 0	-14.5 ... +15	-14.5 ... +100	-14.5 ... +300	-14.5 ... +600

Vacuum tightness
Vacuum resistance is provided, except for instruments for oxygen applications.

Overpressure limit

Measuring range	Overpressure limit
≤ 16 bar/300 psi	3 times
> 16 bar/300 psi	2 times

3.2 Accuracy data

Accuracy at reference conditions
Including non-linearity, hysteresis, zero offset and end value deviation (corresponds to measured error per IEC 61298-2).

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Accuracy	
Standard	0.15 % of span
Option 1	0.10 % of span
Option 2	0.20 % of span

Mounting correction
-20 ... +20 %

Non-repeatability
≤ 0.15 % of span

Behaviour with turndown (with accuracy 0.15 %)
Turndown = basic measuring range : scaled measuring range

- 1:1 ... 5:1   No change in accuracy
- > 5:1   < 0.03 % x turndown

Long-term stability
≤ (0.1 % x turndown)/year

Thermal change zero point/span (reference temperature 20 °C)

In compensated range 10 ... 70 °C:
< 0.05 % / 10 K x turndown

Outside compensated range:
Typical < 0.1 % / 10 K x turndown

Thermal change of the current output (reference temperature 20 °C)
< 0.05 % / 10 K, max. 0.15 %

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3.3 Operating conditions

The process pressure transmitter is suitable for internal and external operation.
Direct exposure to sunlight is permitted.

Humidity
≤ 93 % r. h.

Ambient temperature
Instrument with display: -20 ... +60 °C
Instrument without display: -40 ... +80 °C [1]

1) Instrument with angular connector or circular connector: -30 ... +80 °C

Storage temperature
-40 ... +80 °C

Medium temperature
Oxygen application: -20 ... +60 °C

Model UPT-20: -40 ... +85 °C
-40 ... +105 °C at max. 40 °C ambient temperature
-40 ... +120 °C at max. 30 °C ambient temperature

Model UPT-21: Depending on sealing, cooling element and ambient temperature

UPT-21 without cooling element:
85 °C at max. 80 °C ambient temperature
105 °C at max. 40 °C ambient temperature
120 °C at max. 30 °C ambient temperature

UPT-21 with cooling element:
85 °C at max. 80 °C ambient temperature
120 °C at max. 50 °C ambient temperature
150 °C at max. 40 °C ambient temperature

Sealing	
Material	Medium temperature
NBR	-20 ... +105 °C
FKM	-20 ... +105 °C
FKM	-20 ... +150 °C [2]
EPDM [1]	-40 ... +105 °C
EPDM [1]	-40 ... +150 °C [2]

1) EPDM only with hygienic process connection
2) Process connection with cooling element

3. Specifications

Vibration resistance
4 g (5 ... 100 Hz) per GL characteristic curve 2

Shock resistance
150 g (3.2 ms) per IEC 60068-2-27

Ingress protection
IP 66/67
IP 65 for versions with circular connector, angular connector or overvoltage protection

Ingress protection only applies with closed case head and closed cable glands.

3.4 Materials

Wetted parts
- Model UPT-20, measuring range ≤ 40 bar: Stainless steel 1.4404

- Model UPT-20, measuring range > 40 bar: Stainless steel 1.4404 and stainless steel 2.4711

- Model UPT-21: Stainless steel 1.4435

Sealing material
See table "medium temperature" under chapter 3.3 "Operating conditions"

Case head
Plastic (PBT) with conductive surface per EN 60079-0:2012
Colour: night blue RAL5022

Pressure transmission medium

Model	Medium
Model UPT-20	Measuring range ≤ 40 bar: Synthetic oil, halocarbon oil
	Measuring range > 40 bar: Dry measuring cell
Model UPT-21	Synthetic oil, halocarbon oil

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3.5 Display and operating unit (option)

Refresh rate
200 ms

Main display
4 ½-digit

Additional display
Selectable via menu, three-line scale range

Bargraph display
20 segments, radial, pressure gauge simulation

Colours
Background: light grey, digits: black

Operating state
Display via symbols

3.6 Output signal (see product label)

Signal
4 ... 20 mA
4 ... 20 mA with HART® signal

Load in Ω
$(U_B - U_{Bmin})$ / 0.023 A

U_B = applied power supply (see "Power supply")
U_{Bmin} = minimum permissible power supply (see "Power supply")

Damping
0 ... 99.9 s, adjustable

After the set damping time the instrument outputs 63 % of the applied pressure as output signal.

Settling time t_{90}
60 ms without HART®
80 ms with HART®

Refresh rate
20 ms without HART®
50 ms with HART®

3.7 Voltage supply

Power supply U_B
DC 12 ... 36 V

3.8 Electrical connections

Available connections	Ingress protection	Wire cross-section
Cable gland M20 x 1.5 and spring-loaded terminals	IP 66/67	max. 2.5 mm^2 (AWG 14)
Angular connector DIN 175301-803A with mating connector	IP 65	max. 1.5 mm^2
Circular connector M12 x 1 (4-pin) without mating connector	IP 65	-

The stated ingress protection only applies when plugged in using mating connectors that have the appropriate ingress protection.

3.9 Reference conditions (per IEC 61298-1)

Temperature
23 °C ± 2 °C

Power supply
DC 23...25 V

Atmospheric pressure
860 ... 1,060 mbar (86 ... 106 kPa, 12.5 ... 15.4 psig)

Humidity
35 ... 93 % r. h.

Characteristic curve determination
Terminal method per IEC 61298-2

Curve characteristics
Linear

Reference mounting position
Vertical, diaphragm points downward

3.10 CE conformity

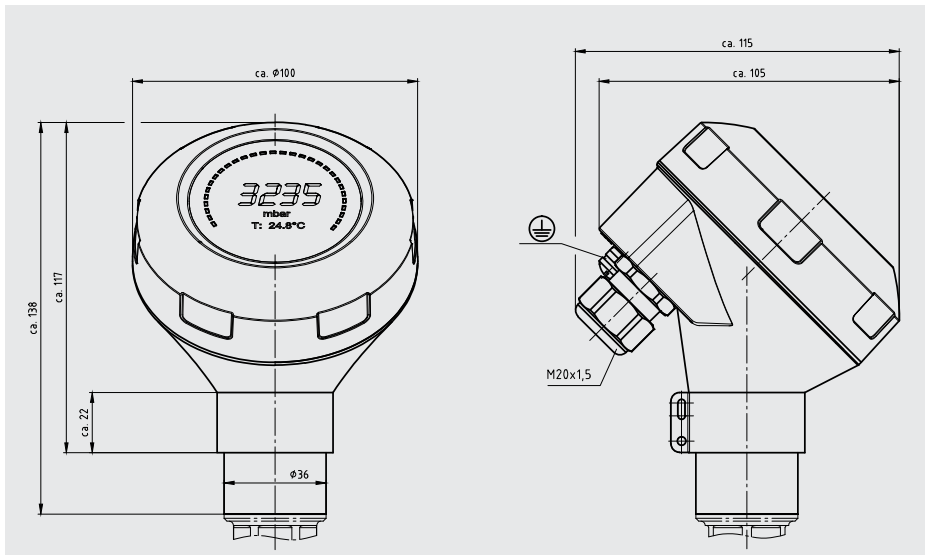**Pressure equipment directive**
97/23/EC

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EMC directive
2004/108/EG interference emission (group 1, class B) and immunity per
EN 61326-1:2013 (industrial application), EN 61326-2-3:2013 and per
NAMUR NE 21:2011

> During interference, increased measuring deviations of up to 0.15 % can occur.

3.11 Dimensions in mm

Process transmitter, models UPT-20 and UPT-21

3. Specifications

Process connections for model UPT-20
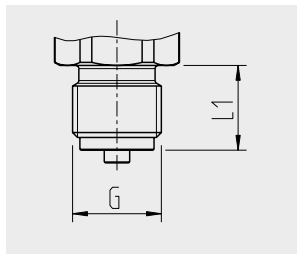
G	L1
G ⅜ B	16
G ½ B	20
M20 x 1.5	20

Hexagon dimension: 12 mm
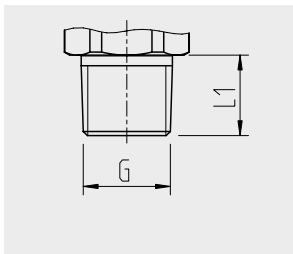
G	L1
¼ NPT	13
½ NPT	19

Hexagon dimension: 12 mm
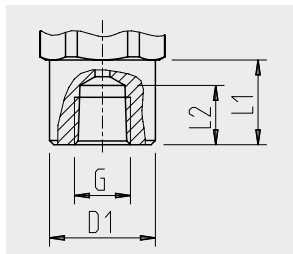
G	L1	L2	D1
½ NPT, female	20	19	26.5

Hexagon dimension: 12 mm

Process connections for model UPT-21
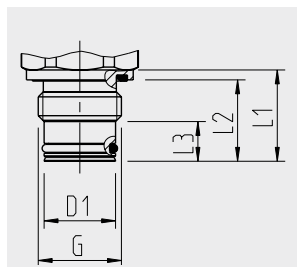
G	L1	L2	L3	D1
G ½ B	23	20.5	10	18

Hexagon dimension: 12 mm
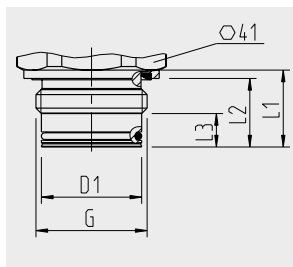
G	L1	L2	L3	D1
G 1 B	23	20.5	10	30

Hexagon dimension: 13 mm
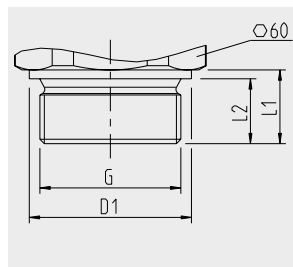
G	L1	L2	D1
G 1 ½ B	25	22	55

Hexagon dimension: 14 mm

Hygienic
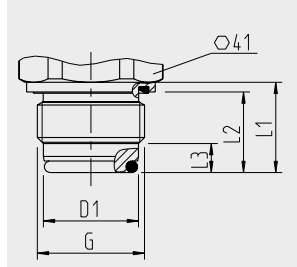
G	L1	L2	L3	D1
G 1 B	28	25	9	29.5

Hexagon dimension: 13 mm

Hygienic
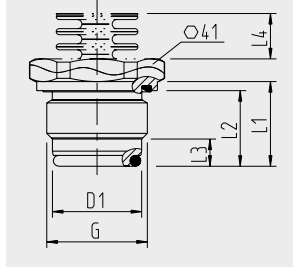
G	L1	L2	L3	L4	D1
G 1 B	28	25	9	15.5	29.5

Hexagon dimension: 13 mm

4. Design and function

4.1 Design

① Process connection, thread

② Process connection, spanner flats

③ Sensor housing

④ Ex-relevant data

⑤ Case head

⑥ Push-on cap

⑦ Product label

⑧ Ground screw, outside

⑨ Electrical connection, cable gland

⑩ Second bore for cable gland (delivered sealed with blind plug)

4.2 Description
The process transmitter processes the prevailing pressure and converts it into a current signal. This current signal can be used for the evaluation, control and monitoring of the process.

HART® (option)
The instrument version with HART® can communicate with a controller (master).

Measuring range scaling (turndown)
The start and end of the measuring range can be set within defined ranges.

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Display and operating unit (accessory)
The display and operating unit model DI-PT-U has a main and an additional display.

The main display and the additional display are able to be set in almost any way. In the factory setting, the main display shows the pressure value of the output signal.

The process transmitter is configured via the display and operating unit.

Adaptable to mounting position
The process transmitter is fitted with a case head which can be turned through 330°.

The display and operating unit can be attached in 90° steps. Thus the measured value can be read irrespective of the mounting position.

Rotatable case head

330°

Displaceable display and operating unit

4.3 Scope of delivery

■ Pre-assembled process transmitter
■ Ordered accessories
■ Operating instructions
■ Measured value protocol

Cross-check scope of delivery with delivery note.

5. Transport, packaging and storage

5.1 Transport
Check the process transmitter for any damage that may have been caused by transport. Obvious damage must be reported immediately.

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5.2 Packaging
Do not remove packaging until just before mounting.
Keep the packaging as it will provide optimum protection during transport (e.g. change in installation site, return for calibration).

5.3 Storage

Permissible conditions at the place of storage:
- Storage temperature: -40 ... +80 °C
- Humidity: 35 ... 93 % relative humidity (no condensation)

Avoid exposure to the following factors:
- Proximity to hot objects, when permissible storage temperature is exceeded by radiation
- Mechanical vibration, mechanical shock (putting it down hard), when the permissible values are exceeded, see chapter 3 "specifications"
- Soot, vapour, dust and corrosive gases
- Hazardous areas and flammable atmospheres where the instruments are not suitable for installation in or mounting to equipment in explosive atmospheres.

Store the process transmitter in its original packaging in a location that fulfils the conditions listed above. If the original packaging is not available, then store the instrument in a container that is similar to the original packaging, so that the instrument can't be scratched and is protected against damage if dropped.

> **WARNING!**
> Before storing the instrument (following operation), remove any residual media. This is of particular importance if the medium is hazardous to health, e.g. caustic, toxic, carcinogenic, radioactive, etc.

6. Commissioning, operation

The process transmitter should only be commissioned and operated by skilled personnel.

6.1 Mechanical mounting

6.1.1 Selecting the installation site
The space required is dependent on the design variant of the process transmitter. The case head is rotatable through 330° and the display and operating unit can be inserted and oriented in 90° steps. Thus the process transmitter can be adjusted to the installation site (see figures under chapter 4.1 "Description").

Select an installation site that has sufficient space for:
■ Carrying out a safe electrical mounting.
■ Being able to use the operating elements following the mounting.

6.1.2 Mounting the process transmitter

CAUTION!
Defective components.
Physical injury and damage to property.
- Only use original parts.

For information on tapped holes and welding sockets, see Technical information IN 00.14 at www.wika.com.

1. Clean the sealing faces and threads. Check these for damage.
   Rectify any damage before mounting.

2. Seal the process connection as follows and screw in by hand.
   Do not cross the threads.

Parallel threads Seal the sealing face ① with flat gaskets, sealing rings or WIKA profile sealings.	per EN 837	per DIN 3852-E
Tapered threads Wrap threads with sealing material, e.g. PTFE tape.	NPT, R and PT	
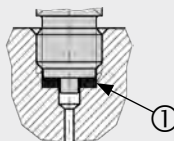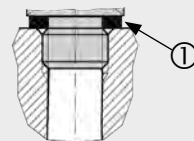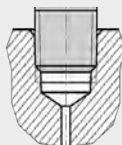
3.

⚠️ **CAUTION!**
Improper mounting
Process transmitter is damaged.
- Tighten the process transmitter using the spanner flats.
- Do not tighten using the sensor housing or the case head.
- Use a suitable open-ended spanner.

Tighten the process transmitter using the spanner flats.
The correct torque depends on the dimensions of the process connection and the gasket used (form/material).

① Spanner flats
② Sensor housing
③ Case head

6.2 Electrical mounting

6.2.1 Requirements for connection cable

■ Use a cable with suitable characteristics for the particular operating conditions (e.g. heat-resistant).

■ Where there is electromagnetic radiation above the test values per EN 61326, a shielded connection cable must be used. Connect the connection cable to the process transmitter's internal ground terminal.

■ Cable diameter: 7 ... 12 mm
For cable diameters outside of 7 ... 12 mm, change the seal and cable gland.

When using angular connector DIN 175301-803 A: 6 ... 8 mm

■ Wire cross-section:
  - Single wire: 0.13 ... 2.5 mm^2
  - End splices: 0.13 ... 1.5 mm^2
  - Ground screw, inside: 0.13 ... 2.5 mm^2
  - Ground screw, outside: 0.13 ... 4 mm^2
  - When using DIN 175301-803 A angular connector 1.5 mm^2 (only via end splices)

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■ When using an M12 x 1 (4-pin) circular connector, the mating connector is supplied by the customer. It is important to ensure the matching design from the connector manufacturer.

6.2.2 Making the electrical connection

⚠ **CAUTION!**
Ingress of moisture.
Moisture can destroy the process transmitter.
- Protect the opened process transmitter against moisture.

1. Screw off the case head cover by hand and pull out the display and operating unit or push-on cap.

2. Pass the connection cable through the cable gland and connect it.
   - For pin assignment see chapter 6.2.3 "pin assignments".
   - Ground the process transmitter via the process connection or connect with the equipotential bonding via the external grounding screw.

3. Tighten the cable gland.
   - Recommended tightening torque 1.5 Nm
   - Check that the seals are correctly seated in order to guarantee the ingress protection.
   - Ensure that no moisture can enter at the cable end.

4. Attach the push-on cap or display and operating unit and screw the case head cover tight down to the stop.
   - Ensure that the case head is tightly closed.

5. Perform a mounting correction.
   - Without display, see chapter 8.1 "Performing a mounting correction (offset)"
   - Via HART®, see chapter 8.2 "Configuring the HART® interface"
   - With display, see chapter 9.5 "Mounting correction (offset)"

6.2.3 Pin assignments

Spring-loaded terminal

Outlet for connection cable   **Pin assignment**

With shielded connection cable, connect the cable shield to the internal grounding screw.

① Cable gland
② Process connection
③ Positive power supply terminal +
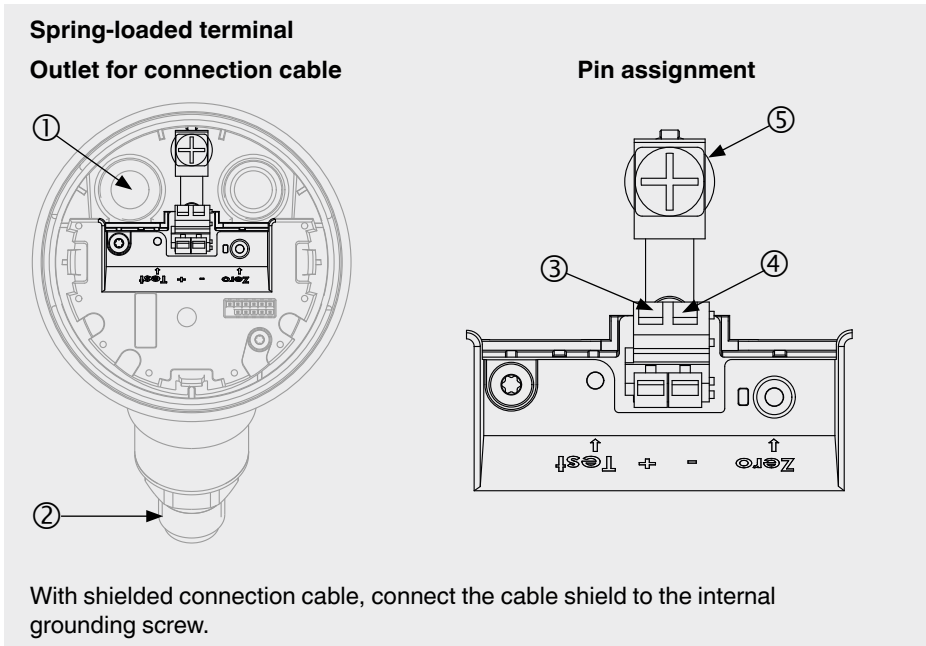
④ Negative power supply terminal −
⑤ Ground screw, inside (GND)

Angular connector DIN 175301-803 A		
+	1	
−	2	
Shield	GND ⏚	

Circular connector M12 x 1 (4-pin)		
+	1	
−	3	
Shield	4	

7. Display and operating unit, model DI-PT-U

7.1 Design and description

The display and operating unit model DI-PT-U is available as an accessory.
It can be plugged into the instrument electronics at 90° increments. Thus the display can be read, whether the process transmitter is mounted laterally or upside down.

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Description

① Direction key [▲]
② Escape key [ESC]
③ Additional display
④ Unit
⑤ Main display
⑥ Trend indication
⑦ Bargraph with over/under limit arrows
⑧ Enter key [↵]
⑨ Direction key [▼]

7.2 Accessing/exiting the operating menu

Accessing: Press [↵].
Exiting: Press [ESC] repeatedly until the menu has been exited.

If after 3 min. no entry is made, the menu will automatically be exited and the last set display mode will be activated.
If there is an invalid entry, the message "Input error" will show in the display for 2 seconds, and the previous menu will be accessed.

7.3 Installation/Removal

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CAUTION!
Ingress of moisture.
Moisture can destroy the process transmitter.
- Protect the opened process transmitter against moisture.
- Close the case head tightly.

1. Screw off the case head cover by hand.

2. **Installation:**
   Pull out the push-on cap and attach the display and operating unit into any of the locking positions (0°, 90°, 180°, 270°).

   Removal:
   Pull out the display and operating unit and attach the push-on cap.

3. Screw on the case head cover.
   - Ensure that the case head is tightly closed.
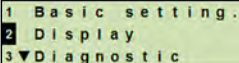
7.4 Setting the main display

The main display can indicate the following values:
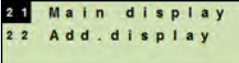
- **Pressure**   Applied pressure is indicated.

- **Level**   Level is indicated.

- **Current**   Output signal is indicated.

- **PV percent**   Output signal is indicated as a percentage.

- **Sensor temperature** Temperature at the sensor is indicated.

- **PV (primary value)** The value corresponding to the mode will be indicated.
                          If the mode is changed, then the main display will change.

1. Open the operating menu with [↵].
   Select "Display" and confirm with [↵].
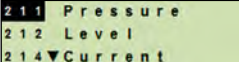
   ```
   1  Basic  setting.
   2  Display
   3▼Diagnostic
   ```

2. Select "Main display" and confirm with [↵].

   ```
   21  Main  display
   22  Add.display
   ```

3. Select value and confirm with [↵].
   Main display indicates the selected value.

   ```
   211  Pressure
   212  Level
   214▼Current
   ```

7.5 Setting the additional display
The additional display can indicate the following values:

Measured values

- Pressure
- Level
- Current
- PV percent
- Sensor temperature
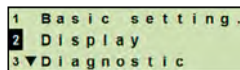
Drag pointer values
- P_{min} / P_{max}
- PV_{min} / PV_{max}
- T_{min} / T_{max}
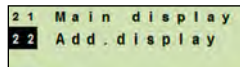
Further data
- TAG short (max. 8 capital letters and figures)
- TAG long (max. 32 alphanumeric characters)
- Blank (disables the additional display)

1. Open the operating menu with [↵].
   Select "Display" and confirm with [↵].
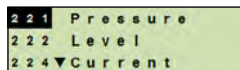
1	Basic setting.
2	**Display**
3▼	Diagnostic

2. Select "Add. display" and confirm with [↵].

21	Main display
22	**Add.display**

3. Select value and confirm with [↵].
   Additional display indicates the selected value.

221	**Pressure**
222	Level
224▼	Current

8. Configuration without display and operating unit

8.1 Performing a mounting correction (offset)

The mounting correction corrects a zero offset in the output signal by defining a new zero point. The zero offset is caused by the mounting position.

GB

Correction range: ±20 % of maximum measuring range
Required tool: Multimeter (ammeter)

1. Screw off the case head cover and pull out the push-on cap.

2. Press [Zero] for approx. 2 s (e.g. with measuring tip of a multimeter).

   Mounting correction successful: Control diode lights up for 2 s.
   Mounting correction unsuccessful: Control diode blinks 5 times.

① Control diode
② Mounting correction, [Zero] key
③ Test contact
④ Positive power supply terminal +
⑤ Negative power supply terminal −
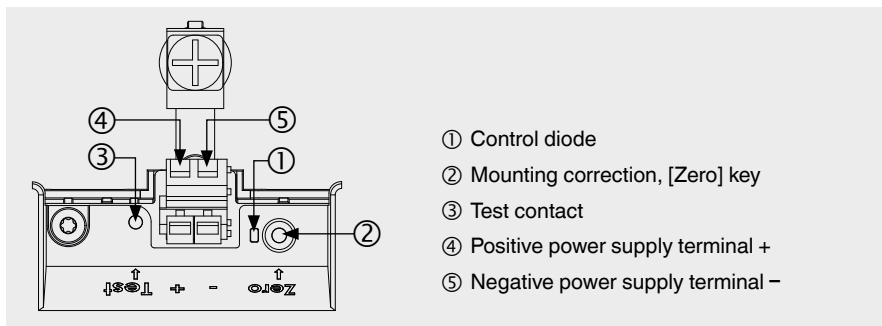
3. Check the output signal as follows.

> ⚠ **CAUTION!**
> **Incorrect connection.**
> A short circuit will destroy the process transmitter.
> - Ensure that the multimeter does not come into contact with the positive power supply terminal.

■ Set the multimeter to current measurement.
■ Connect the positive measuring line of the multimeter to the test contact.
■ Connect the negative measuring line of the multimeter to the negative power supply terminal.

8. Configuration without display and operating unit

8.2 Configuring over HART® interface
HART®-compatible process transmitters can be set with operating software
(e.g. Pactware™).

The operation of the respective menus is described in the associated online help.

The generic device drivers are available for download from www.wika.com.

Connecting process transmitter to PC (HART®)

1. Connect HART® modem to process transmitter.
2. Connect HART® modem to PC.
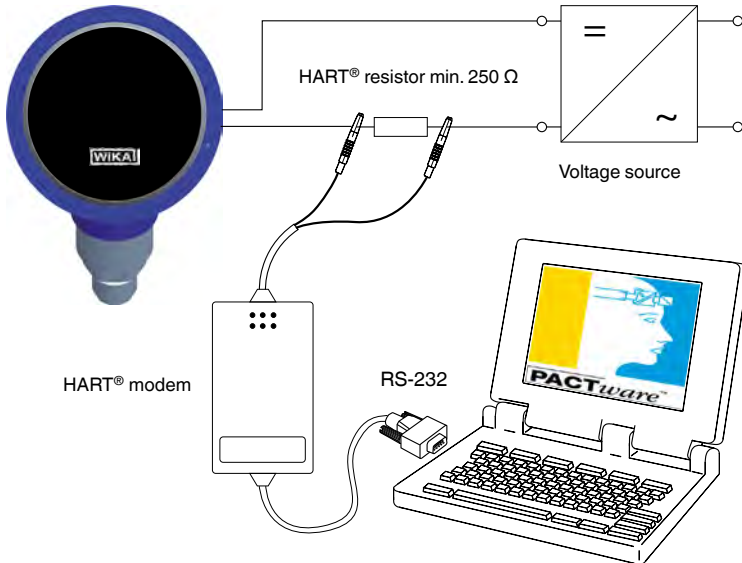
9. Configuration via display and operating unit

9.1 Configuring the measuring task

9.1.1 Configuring pressure measurement

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

   ```
   1 Basic setting
   2 Display
   3▼Diagnostic
   ```

2. Select "Application" and confirm with [↵].

   ```
   11  Scale setting
   12  Application
   13▼Damping value
   ```

3. Select "Pressure" and confirm with [↵].

   ```
   121  Pressure
   122  Level
   124▼Mode
   ```

4. Select "Unit" and confirm with [↵].

   ```
    Unit
    Mounting corr.
   ```

5. Select pressure unit and confirm with [↵].
   Pressure unit is set.

   ```
    bar
    mbar
   ▼psi
   ```

6. Go back one menu level using [ESC].
   Select "Mode" and confirm with [↵].

   ```
   122▲Level
   124  Mode
   125  Sensor temp.
   ```

7. Select "Pressure" and confirm with [↵].
   Mode is set.

   ```
    Pressure
    Level
   ```

8. Scale the measuring range.
   See chapter 9.3 "Scaling the measuring range".

9. Perform a mounting correction.
   See chapter 9.5 "Mounting correction (offset)".

9. Configuration via display and operating unit

9.1.2 Configuring level measurement

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

   ```
   1  Basic  setting
   2  Display
   3▼Diagnostic
   ```

2. Select "Application" and confirm with [↵].

   ```
   11  Scale  setting
   12  Application
   13▼Damping  value
   ```

3. Select "Level" and confirm with [↵].

   ```
   121  Pressure
   122  Level
   124▼Mode
   ```

4. Select "Unit" and confirm with [↵].

   ```
   █  Unit
      Density
      Offset
   ```

5. Select length unit and confirm with [↵].
   Length unit is set.

   ```
   █  m
      cm
   ▼mm
   ```

6. Select "Density" and confirm with [↵].

   ```
      Unit
   █  Density
      Offset
   ```

7. Select "Density unit" and confirm with [↵].

   ```
   █  Density  unit
      Density  value
   ```

8. Select density unit and confirm with [↵].
   Density unit is set.

   ```
   █  kg/dm³
      lb/f³
   ```

9. Select "Density value" and confirm with [↵].

   ```
      Density  unit
   █  Density  value
   ```

10. Set digit using [▲] [▼] and confirm with [↵]. The cursor moves to the next digit. Repeat for each digit.
    Density value is set.

    ```
    Density  value
    █1.045        kg/dm³
    ```

11. Go back two menu levels using [ESC].
    Select "Mode" and confirm with [↵].

    ```
    122▲Level
    124  Mode
    125  Sensor  temp.
    ```

12. Select "Level" and confirm with [↵].
    Mode is set.

    ```
       Pressure
    █  Level
    ```

13. Perform a mounting correction.
    See chapter 9.5 "Mounting correction (offset)".

9.2 Setting the units

9.2.1 Setting the pressure unit

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

   | **1** Basic setting |
   | 2 Display |
   | 3 ▼Diagnostic |

2. Select "Application" and confirm with [↵].

   | 11 Scale setting |
   | **12** Application |
   | 13 ▼Damping value |

3. Select "Pressure" and confirm with [↵].

   | **121** Pressure |
   | 122 Level |
   | 124 ▼Mode |

4. Select "Unit" and confirm with [↵].

   | ■ Unit |
   | Mounting corr. |

5. Select pressure unit and confirm with [↵].
   Pressure unit is set.

   | ■ bar |
   | mbar |
   | ▼psi |
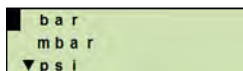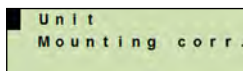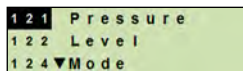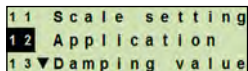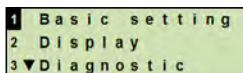
9.2.2 Set length unit (for level measurement)
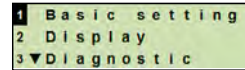
1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

   | **1** Basic setting |
   | 2 Display |
   | 3 ▼Diagnostic |

2. Select "Application" and confirm with [↵].

   | 11 Scale setting |
   | **12** Application |
   | 13 ▼Damping value |

3. Select "Level" and confirm with [↵].

   | 121 Pressure |
   | **122** Level |
   | 124 ▼Mode |

4. Select "Unit" and confirm with [↵].

   | ■ Unit |
   | Density |
   | Offset |

5. Select length unit and confirm with [↵].
   Length unit is set.

   | ■ m |
   | cm |
   | ▼mm |
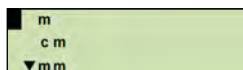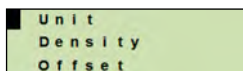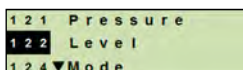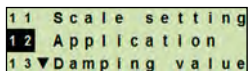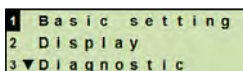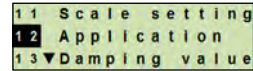
9.2.3 Setting the density unit

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].
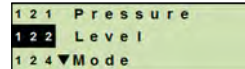
1	Basic setting
2	Display
3 ▼Diagnostic

2. Select "Application" and confirm with [↵].
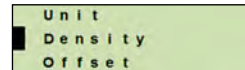
1 1	Scale setting
1 2	Application
1 3 ▼Damping value

3. Select "Level" and confirm with [↵].
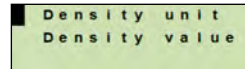
1 2 1	Pressure
1 2 2	Level
1 2 4 ▼Mode

4. Select "Density" and confirm with [↵].
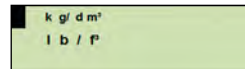
Unit
Density
Offset

5. Select "Density unit" and confirm with [↵].
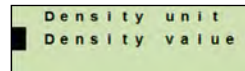
Density unit
Density value

6. Select unit and confirm with [↵].
   Density unit is set.
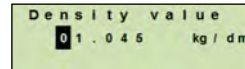
k g/ d m³
l b / f³

7. Select "Density value" and confirm with [↵].

Density unit
Density value

8. Set digit using [▲] [▼] and confirm with [↵]. The
   cursor moves to the next digit. Repeat for each digit.
   Density value is set.
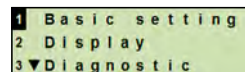
 | Density value |
   |---|
   | 0 1 . 0 4 5   kg / d m³ |

9.2.4 Setting the temperature unit
Temperature unit °C and °F selectable.
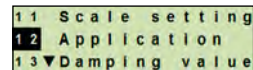
1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

1	Basic setting
2	Display
3 ▼Diagnostic

2. Select "Application" and confirm with [↵].

1 1	Scale setting
1 2	Application
1 3 ▼Damping value

2. Select "Sensor temp." and confirm with [↵].

1 2 2 ▲Level
1 2 4	Mode
1 2 5	Sensor temp.

3. Select temperature unit and confirm with [↵].

° C
° F

9.3 Scaling the measuring range
"Scale setting" defines the start and end of the measuring range.

9.3.1 Performing a wet adjustment
For the start of the measuring range and end of the measuring range, the values will be taken from the running measurement. The respective output signal can be adjusted.

GB

Requirement   Measurement must be running.

Setting range   Start of measuring range: -10 ... +110 % of measuring range
End of measuring range: 1 ... 120 % of measuring range
Max. turndown: 100 : 1 (recommended max. 20 : 1)

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

1	Basic setting
2	Display
3▼	Diagnostic

2. Select "Scale setting" and confirm with [↵].
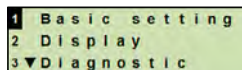
11	Scale setting
12	Application
13▼	Damping value
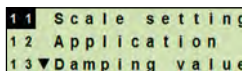
3. Select "Wet adjustm." and confirm with [↵].

111	Dry adjustm.
112	Wet adjustm.
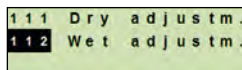
4. Define the current measured value as start of measuring range or end of measuring range:

■	min. adjustm.
	max. adjustm.
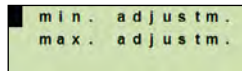
   To define as start of measuring range:
   Confirm "min. adjustm." with [↵].

	min. adjustm.
■	max. adjustm.
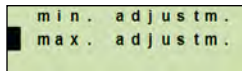
   To define as end of measuring range:
   Confirm "max. adjustm." with [↵].

5. Change digit using [▲] [▼] and confirm with [↵]. The cursor moves to the next digit. Repeat for each digit. When the last digit is exited, the menu moves back to step 2.

min. adjustm.	
01.123	mbar
04.0	mA

max. adjustm.	
1004.3	mbar
20.0	mA
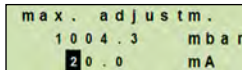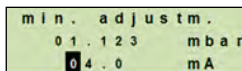
   ℹ   With the input of current values that are not either 4 mA or 20 mA, the pressure value is converted into the standardised current signals as soon as the current value entered is accepted.

9.3.2 Performing a dry adjustment

Via the dry adjustment, the values for the start of the measuring range and the end of the measuring range are entered manually. The respective output signal can be adjusted.

Requirement   No measurement is running. If there is a running measurement, the output signal can alter abruptly.

Setting range   Start of measuring range: -10 ... +110 % of measuring range
End of measuring range: 1 ... 120 % of measuring range
Max. turndown: 100 : 1 (recommended max. 20 : 1)

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

   ```
   1 Basic setting
   2 Display
   3▼Diagnostic
   ```

2. Select "Scale setting" and confirm with [↵].

   ```
   11 Scale setting
   12 Application
   13▼Damping value
   ```

3. Select "Dry adjustm." and confirm with [↵].

   ```
   111 Dry adjustm.
   112 Wet adjustm.
   ```

4. Define the start of measuring range or end of measuring range:

   ```
   ■ min. adjustm.
     max. adjustm.
   ```

   To define start of measuring range:
   Confirm "min. adjustm." with [↵].

   ```
     min. adjustm.
   ■ max. adjustm.
   ```

   To define end of measuring range:
   Confirm "max. adjustm." with [↵].

5. Change digit using [▲] [▼] and confirm with [↵]. The cursor moves to the next digit. Repeat for each digit. When the last digit is exited, the cursor moves to the output signal (step 6).
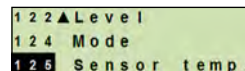
   ```
   min. adjustm.
    ░1.123    mbar
   ▼  04.0     mA
   ```

   ```
   max. adjustm.
   ▲ ░009.3   mbar
     20.0     mA
   ```

6. Change digit using [▲] [▼] and confirm with [↵]. The cursor moves to the next digit. Repeat for each digit. When the last digit is exited, the menu moves back to step 2.

   ```
   min. adjustm.
    01.123    mbar
    ░4.0      mA
   ```

   ```
   max. adjustm.
    1004.3    mbar
    ░0.0      mA
   ```

   ⓘ   With the input of current values that are not either 4 mA or 20 mA the pressure value is converted into the standardised current signals as soon as the current value entered is accepted.

9.4 Setting the mode

The mode defines which measurement parameter will be transmitted via the current output (pressure, level)

> **i** If the PV (primary value) is indicated on the main display, the indicated value will change according to the mode. This means that the main display indicates the pressure or the level, depending on the mode.

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

```
1 Basic setting
2 Display
3▼Diagnostic
```

2. Select "Application" and confirm with [↵].

```
11  Scale setting
12  Application
13▼Damping value
```

3. Select "Mode" and confirm with [↵].

```
122▲Level
124  Mode
125  Sensor temp.
```

4. Select measurement parameter and confirm with [↵].
   Mode is set.

```
  Pressure
  Level
```

9.5 Mounting correction (offset)

9.5.1 Performing a wet adjustment
Zero point will be taken from measurement in operation.

GB

Requirement ■ Deviation ≤ 20 % of the measuring range.
■ Absolute vacuum with absolute pressure measuring instruments.
Not to be carried out without suitable equipment.

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

1 Basic setting
2 Display
3 ▼Diagnostic

2. Select "Application" and confirm with [↵].

11 Scale setting
12 Application
13 ▼Damping value

3. Select "Pressure" and confirm with [↵].

121 Pressure
122 Level
124 ▼Mode

4. Select "Mounting corr." and confirm with [↵].

Unit
▮ Mounting corr.

5. Select "apply" and confirm with [↵].
   Current measured value will be used as the new zero point.

change
▮ apply

Mounting corr.
new 1004.1 mbar
old 0000.0 mbar

9.5.2 Performing a dry adjustment
The mounting correction is registered manually via the dry adjustment. For all future measurements, the mounting correction will be subtracted.

Requirement Deviation ≤ 20 % of the measuring range.

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

1 Basic setting
2 Display
3 ▼Diagnostic

2. Select "Application" and confirm with [↵].

11 Scale setting
12 Application
13 ▼Damping value

3. Select "Pressure" and confirm with [↵].

121 Pressure
122 Level
124 ▼Mode

4. Select "Mounting corr." and confirm with [↵].

```
U n i t
■ M o u n t i n g   c o r r .
```

5. Select "change" and confirm with [↵].

```
■ c h a n g e
  a p p l y
```

6. Change digit using [▲] [▼] and confirm with [↵]. The cursor moves to the next digit. Repeat for each digit.

```
M o u n t i n g   c o r r .
n e w  0 0 0 0 . 0    m b a r
o l d  0 0 0 0 . 0    m b a r
```

Entered value will be used as the new zero point.

9.6 Setting the damping

The damping prevents the fluctuation of the output signal when there are short-term fluctuations in the measured value.

> **ℹ** Pressure spikes will still be registered, e.g. as P_{max} in the menu point "Diagnostics".

Setting range: 0 ... 99.9 s

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

```
1  B a s i c   s e t t i n g
2  D i s p l a y
3 ▼D i a g n o s t i c
```

2. Select "Damping value" and confirm with [↵].

```
1 2 ▲A p p l i c a t i o n
1 3  D a m p i n g   v a l u e
1 4  W r i t e   p r o t e c t
```

3. Change digit using [▲] [▼] and confirm with [↵]. The cursor moves to the next digit. Repeat for each digit.

```
D a m p i n g   v a l u e
0 0 . 0   s e c
```

Damping is set.

9.7 Write protection

An active write protection locks the settings so that these cannot be changed via the display and operating module nor via HART®. A key icon above the main display signals that the write protection is active.

GB

Activation/deactivation of the write protection and changing the PIN is also possible via HART®.

9.7.1 Activating/deactivating the write protection

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

   ```
   1 Basic setting
   2 Display
   3 ▼Diagnostic
   ```

2. Select "Write protection" and confirm with [↵].

   ```
   12▲Application
   13 Damping value
   14 Write protect
   ```

3. Select "on/off" and confirm with [↵].

   ```
   141 on/off
   142 Change PIN
   ```

4. **Activate write protection:**
   Select "on" and confirm with [↵].

   ```
   on
   off
   ```

   Deactivate write protection:
   Select "off" and confirm with [↵].
   Enter PIN and confirm with [↵].

   Write protection is activated/deactivated.

9.7.2 Changing PIN

Factory setting: 0000

1. Open the operating menu with [↵].
   Select "Basic setting" and confirm with [↵].

   ```
   1 Basic setting
   2 Display
   3 ▼Diagnostic
   ```

2. Select "Write protection" and confirm with [↵].

   ```
   12▲Application
   13 Damping value
   14 Write protect
   ```

3. Select "Change PIN" and confirm with [↵].

   ```
   141 on/off
   142 Change PIN
   ```

4. Change digit using [▲] [▼] and confirm with [↵]. The cursor moves to the next digit. Repeat for each digit.

   Pin is changed.

   ```
   Change PIN
   0 0 0 0
   ```

10. Diagnostic functions

Requirement: Display and operating unit fitted.

10.1 Simulations

10.1.1 Performing a pressure simulation
A pressure value within the measuring range must be entered and is converted into a current value and output.

1. Open the operating menu with [↵].
   Select "Diagnostic" and confirm with [↵].

   ```
   2▲Display
   3  Diagnostic
   4▼Detail setup
   ```

2. Select "Simulation" and confirm with [↵].

   ```
   31  Simulation
   32  Drag pointer
   33  Operat.time
   ```
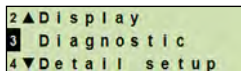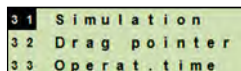
3. Select "Press. simu." and confirm with [↵].
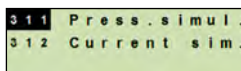
   ```
   311  Press.simul.
   312  Current sim.
   ```

4. Change digit using [▲] [▼] and confirm with [↵]. The cursor moves to the next digit. Repeat for each digit.

   ```
   Press.simul.
       0123.0    mbar
   ```

5. Simulation is active.
   Ending the simulation. Press [ESC] to do this.

   ```
   Press.simul.
       0123.0    mbar
   active
   ```
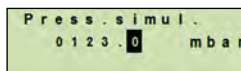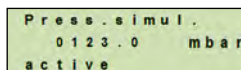
10.1.2 Performing a current simulation
The selected or entered current value will be simulated and output as the PV (primary value).

1. Open the operating menu with [↵].
   Select "Diagnostic" and confirm with [↵].

   ```
   2▲Display
   3  Diagnostic
   4▼Detail setup
   ```

2. Select "Simulation" and confirm with [↵].

   ```
   31  Simulation
   32  Drag pointer
   33  Operat.time
   ```
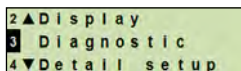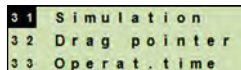
3. Select "Current sim." and confirm with [↵].

   ```
   311  Press.simul.
   312  Current sim.
   ```
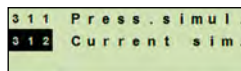
4. Select the current value or define via "Input".
   Change digit using [▲] [▼] and confirm with [↵]. The cursor moves to the next digit. Repeat for each digit.

   ```
   ■  4  mA
      20  mA
   Input
   ```

5. Simulation is active.
   Ending the simulation. Press [ESC] to do this.

   ```
   Current simul.
          04.0  mA
   active
   ```

10.2 Indicating/ressetting drag pointer

The drag pointer function indicates the limit values reached since the last reset. These limit values can be queried and reset.

10.2.1 Drag pointer P_{min} / P_{max}

Indicates the minimum and maximum pressure that has occurred since the last reset.

Indicating

1. Open the operating menu with [↵].
   Select "Diagnostic" and confirm with [↵].

```
2 ▲ D i s p l a y
3   D i a g n o s t i c
4 ▼ D e t a i l   s e t u p
```

2. Select "Drag pointer" and confirm with [↵].

```
3 1   S i m u l a t i o n
3 2   D r a g   p o i n t e r
3 3   O p e r a t . t i m e
```

3. Select "P min/max" and confirm with [↵].

```
3 2 1   P   m i n / m a x
3 2 2   P V   m i n / m a x
3 2 3   T   m i n / m a x
```

4. Select "display" and confirm with [↵].

```
■   d i s p l a y
    r e s e t
```

5. Limit values are indicated.
   $P_▼ = P_{min}$
   $P_▲ = P_{max}$

```
P   m i n / m a x
P ▼        6 . 2      m b a r
P ▲    1 0 1 8 . 0    m b a r
```

Resetting

1. Open the operating menu with [↵].
   Select "Diagnosis" and confirm with [↵].

```
2 ▲ D i s p l a y
3   D i a g n o s t i c
4 ▼ D e t a i l   s e t u p
```

2. Select "Drag pointer" and confirm with [↵].

```
3 1   S i m u l a t i o n
3 2   D r a g   p o i n t e r
3 3   O p e r a t . t i m e
```

3. Select "P min/max" and confirm with [↵].

```
3 2 1   P   m i n / m a x
3 2 2   P V   m i n / m a x
3 2 3   T   m i n / m a x
```

4. Select "reset" and confirm with [↵].

```
    d i s p l a y
■   r e s e t
```

5. Select limit value and confirm with [↵].
   $P_▼ = P_{min}$
   $P_▲ = P_{max}$

   Limit value is reset.

```
P   m i n / m a x
P ▼   - - - - - - -   m b a r
P ▲    1 0 1 8 . 0    m b a r
```

10.2.2 Drag pointer PV$_{min}$ / PV$_{max}$

Indicates the minimum and maximum value of the primary value since the last reset.

For indicate and reset see chapter 10.2.1 "Drag Pointer P$_{min}$ / P$_{max}$"

10.2.3 Drag pointer T$_{min}$ / T$_{max}$

Indicates the minimum and maximum temperature of the temperature sensor, measured since the last reset.

For indicate and reset see chapter 10.2.1 "Drag Pointer P$_{min}$ / P$_{max}$"

GB

10.3 Indicating/resetting operating time

Indicates the operating time since the last reset.

Indicating

1. Open the operating menu with [↵].
    Select "Diagnostic" and confirm with [↵].

    ```
    2 ▲ D i s p l a y
    3   D i a g n o s t i c
    4 ▼ D e t a i l   s e t u p
    ```

2. Select "Operat. time" and confirm with [↵].

    ```
    3 1   S i m u l a t i o n
    3 2   D r a g   p o i n t e r
    3 3   O p e r a t . t i m e
    ```

3. Select "display" and confirm with [↵].

    ```
    3 3 1   d i s p l a y
    3 3 2   r e s e t
    ```

4. Operating time is indicated.

    ```
    O p e r a t i n g   t i m e
        0 y 1 6 d   3 h
    ```

Resetting

1. Open the operating menu with [↵].
    Select "Diagnostic" and confirm with [↵].

    ```
    2 ▲ D i s p l a y
    3   D i a g n o s t i c
    4 ▼ D e t a i l   s e t u p
    ```

2. Select "Operat. time" and confirm with [↵].

    ```
    3 1   S i m u l a t i o n
    3 2   D r a g   p o i n t e r
    3 3   O p e r a t . t i m e
    ```

3. Select "reset" and confirm with [↵].

    ```
    3 3 1   a n z e i g e n
    3 3 2   r ü c k s e t z e n
    ```

4. Confirm operating time with [↵].

    ```
    O p e r a t i n g   t i m e
        0 y 1 6 d   3 h
    r e s e t
    ```

5. Operating time is reset.

    ```
    O p e r a t i n g   t i m e
        0 y   0 d   0 h
    r e s e t
    ```

11. Detail setup
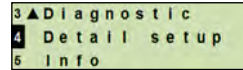
Requirement: Display and operating unit fitted.
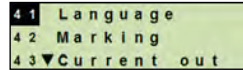
11.1 Setting the language
Available languages: German, English, French, Spanish

1. Open the operating menu with [↵].
   Select "Detail setup" and confirm with [↵].

```
3▲Diagnostic
4  Detail setup
5  Info
```
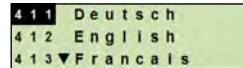
2. Select "Language" and confirm with [↵].

```
41  Language
42  Marking
43▼Current out
```

3. Select language and confirm with [↵].
   Language is set.
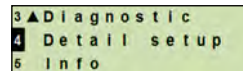
```
411  Deutsch
412  English
413▼Francais
```

11.2 Marking the measuring point (TAG)
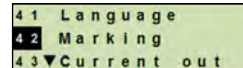
11.2.1 Setting the TAG short
TAG short enables 8 figures with a limited character set (numbers and capital letters).
TAG short can be indicated in the additional display.

1. Open the operating menu with [↵].
   Select "Detail setup" and confirm with [↵].

```
3▲Diagnostic
4  Detail setup
5  Info
```
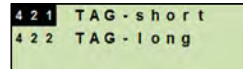
2. Select "Marking" and confirm with [↵].

```
41  Language
42  Marking
43▼Current out
```

3. Select "TAG short" and confirm with [↵].

```
421  TAG-short
422  TAG-long
```

4. Change figure using [▲] [▼] and confirm with [↵].
   The cursor moves to the next figure. Repeat for each
   figure.

```
Input
■
```

   TAG short is set.

11.2.2 Setting the TAG long
TAG long enables 32 figures with alphanumeric characters (all characters in accordance with HART® revision 7). TAG long can be indicated in the additional display.

Setting is made as described in chapter 11.2.1 "TAG short".

11.3 Setting the alarm signal

Alarm signal downscale (3.5 mA)
In the event of a failure in the process transmitter, the output signal changes itself to 3.5 mA.

Alarm signal upscale (21.5 mA)
In the event of a failure in the process transmitter, the output signal changes itself to 21.5 mA.

1. Open the operating menu with [⏎].
   Select "Detail setup" and confirm with [⏎].

   ```
   3 ▲ D i a g n o s t i c
   4   D e t a i l   s e t u p
   5   I n f o
   ```

2. Select "Current out" and confirm with [⏎].

   ```
   4 2 ▲ M a r k i n g
   4 3   C u r r e n t   o u t
   4 4 ▼ C o n t r a s t
   ```

3. Select "Alarm signal" and confirm with [⏎].

   ```
   4 3 1   A l a r m   s i g n a l
   4 3 2   L i m i t s
   ```

4. Select alarm signal and confirm with [⏎].
   3.5 mA = alarm signal downscale
   21.5 mA = alarm signal upscale

   ```
   ■   3 . 5   m A
       2 1 . 5   m A
   ```
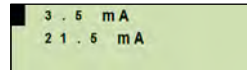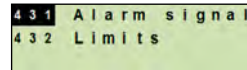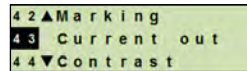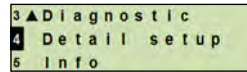
   Alarm signal is set.

11.4 Setting the signal limits
The signal limits define the current range within which the output signal can be. Above or below the signal limits are the preset limits for the output signal.

Setting range: 3.8 ... 20.5 mA or 4.0 ... 20.0 mA
                   (NAMUR recommendation for process instruments is 3.8 ... 20.5 mA)

1. Open the operating menu with [⏎].
   Select "Detail setup" and confirm with [⏎].

   ```
   3 ▲ D i a g n o s t i c
   4   D e t a i l   s e t u p
   5   I n f o
   ```

2. Select "Current out" and confirm with [⏎].

   ```
   4 2 ▲ M a r k i n g
   4 3   C u r r e n t   o u t
   4 4 ▼ C o n t r a s t
   ```

3. Select "Limits" and confirm with [⏎].

   ```
   4 3 1   A l a r m   s i g n a l
   4 3 2   L i m i t s
   ```

3. Select signal limits and confirm with [⏎].
   Signal limits are set.

   ```
   ■   3 . 8   . .   2 0 . 5   m A
       4 . 0   . .   2 0 . 0   m A
   ```
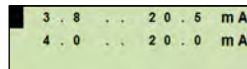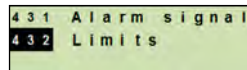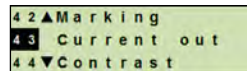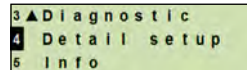
11.5 Setting the contrast of the LC display

Setting range: 1 ... 9 (in steps of 1)

1. Open the operating menu with [↵].
   Select "Detail setup" and confirm with [↵].

   ```
   3▲Diagnostic
   4  Detail setup
   5  Info
   ```

2. Select "Contrast" and confirm with [↵].

   ```
   43▲Current out
   44  Contrast
   45▼Reset
   ```

3. Change figure using [▲] [▼] and confirm with [↵].
   Contrast is set.

   ```
   Input
     5
   ```

11.6 Restoring factory setting

1. Open the operating menu with [↵].
   Select "Detail setup" and confirm with [↵].

   ```
   3▲Diagnostic
   4  Detail setup
   5  Info
   ```

2. Select "Reset" and confirm with [↵].

   ```
   44▲Contrast
   45  Reset
   46▼HART
   ```

3. Select the settings that are to be reset and confirm
   with [↵].

   ```
   451  Instru.spec.
   452  Drag pointer
   ```

   Instru. spec.:
   Instrument settings will be reset to their as-delivered
   settings.

   Drag pointer:
   The drag pointer values are reset.

4. Confirm reset with [↵].
   The settings are reset.

   ```
   Instru.spec.
   reset
   ```

11. Detail setup

11.7 Setting the HART®communication

11.7.1 Setting the short address (multidrop mode)

Setting range: 0 ... 63

1. Open the operating menu with [↵].
   Select "Detail setup" and confirm with [↵].

   ```
   3 ▲ D i a g n o s t i c
   4   D e t a i l   s e t u p
   5   I n f o
   ```

2. Select "HART" and confirm with [↵].

   ```
   4 4 ▲ C o n t r a s t
   4 5   R e s e t
   4 6   H A R T
   ```

3. Select "Short addr." and confirm with [↵].

   ```
   4 6 1   S h o r t   a d d r .
   4 6 2   C o n s . c u r r e n t
   ```

4. Change digit using [▲] [▼] and confirm with [↵]. The cursor moves to the next digit. Repeat for each digit.

   ```
   S h o r t   a d d r e s s
   0 0
   ```

   Short address is set.

11.7.2 Activating/deactivating constant current

The constant current affects the output of current values, e.g. in the additional display

1. Open the operating menu with [↵].
   Select "Detail setup" and confirm with [↵].

   ```
   3 ▲ D i a g n o s t i c
   4   D e t a i l   s e t u p
   5   I n f o
   ```

2. Select "HART" and confirm with [↵].

   ```
   4 4 ▲ C o n t r a s t
   4 5   R e s e t
   4 6   H A R T
   ```

3. Select "Cons. current" and confirm with [↵].

   ```
   4 6 1   S h o r t   a d d r .
   4 6 2   C o n s . c u r r e n t
   ```

4. Activate/deactivate constant current.
   Select "on" or "off" and confirm with [↵].

   ```
   o n
   o f f
   ```

   Constant current is activated/deactivated.

12. Instrument information

12.1 Indicating measuring range

1. Open the operating menu with [↵].
   Select "Info" and confirm with [↵].

```
3 ▲ D i a g n o s t i c
4   D e t a i l   s e t u p
5   I n f o
```

2. Select "Measur. range" and confirm with [↵].

```
5 1   M e a s u r . r a n g e
5 3   D a t e   m a n u f a c .
5 4 ▼ V e r s i o n
```

3. Measuring range is indicated.

```
M e a s u r . r a n g e
0 . 0   -     1 . 6   b a r
```

12.2 Indicating date of manufacture

1. Open the operating menu with [↵].
   Select "Info" and confirm with [↵].

```
3 ▲ D i a g n o s t i c
4   D e t a i l   s e t u p
5   I n f o
```

2. Select "Date manufact." and confirm with [↵].

```
5 1   M e a s u r . r a n g e
5 3   D a t e   m a n u f a c .
5 4 ▼ V e r s i o n
```

3. Date of manufacture is indicated.

```
D a t e   m a n u f a c t .
0 3 - 0 4 - 2 0 1 4
```

12.3 Indicating firmware version

1. Open the operating menu with [↵].
   Select "Info" and confirm with [↵].

```
3 ▲ D i a g n o s t i c
4   D e t a i l   s e t u p
5   I n f o
```

2. Select "Version" and confirm with [↵].

```
5 3 ▲ D a t e   m a n u f a c .
5 4   V e r s i o n
5 5   S e r i a l   n u m b e r
```

3. Firmware version is indicated.
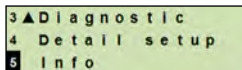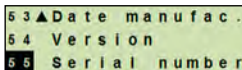
```
V e r s i o n
F W :   0 1 . 0 1 . 0 0 1
```

GB

12.4 Indicating serial number

1. Open the operating menu with [⏎].
   Select "Info" and confirm with [⏎].

```
3▲Diagnostic
4  Detail setup
5  Info
```
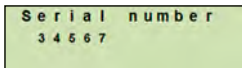
2. Select "Serial number" and confirm with [⏎].

```
53▲Date manufac.
54  Version
55  Serial number
```

3. Serial number is indicated.

```
Serial  number
34567
```

13. Maintenance and cleaning

13.1 Maintenance
Repairs must only be carried out by the manufacturer.

13.2 Cleaning

CAUTION!
- The exterior should only be cleaned when the instrument is closed and sealed. This applies to the case head cover and all openings, e.g. the cable glands.
- Use a cloth moistened with soapy water or isopropanol.
- Electrical connections must not come into contact with moisture.
- Wash or clean the dismounted instrument before returning it, in order to protect persons and the environment from exposure to residual media.
- Residual media in the dismounted process transmitter can result in a risk to personnel, the environment and equipment. Take sufficient precautionary measures.

For information on returning the instrument see chapter 15.2 "Return".

13.3 Recalibration

DKD/DAkkS certificate - official certificates:
We recommend that the process transmitter is regularly recalibrated by the manufacturer, with time intervals of approx. 12 months.

14. Faults

In the event of any faults, first check whether the process transmitter is mounted correctly, mechanically and electrically. For instruments with display and operating units, the error code with error text will be displayed in the event of a failure.

GB

Faults	Causes	Measures
Display does not indicate anything	Instrument is not mounted correctly	Install the electrical connection and/or the display and operating unit correctly

Error code	Error text	Causes	Measures
E001	Hardware fault	Lack of communication	Restart the instrument. Return the instrument.
E002	Sensor missing	Communication to the sensor faulty	Restart the instrument. Return the instrument.
E003	Sensor faulty	Pressure status sensor faulty	Restart the instrument. Return the instrument.
E004	Characteristic curve error	Overflow in calculation chain	Restart the instrument. Switch to a linear characteristic curve. Check the inputs. Return the instrument.
E005	Temperature sensor	Temperature sensor faulty	Restart the instrument Return the instrument
E006 [1]	Overpressure sensor	Overload pressure sensor	Restart the instrument Depressurise the instrument (ambient pressure) and restart Return the instrument
E007	Sensor temperature	Temperature exceeded at the pressure sensor, limit monitoring in the electronics	Return the instrument

1) Error message can also appear when the pressure is greater than the nominal pressure range.

⚠ **CAUTION!**
If faults cannot be eliminated by means of the measures listed above, shut down the process transmitter immediately, and ensure that pressure and/or signal are no longer present, and secure the instrument from being put back into operation inadvertently.
In this case, contact the manufacturer.
If a return is needed, please follow the instructions given in chapter 15.2 "Return".

15. Dismounting, return and disposal

⚠ **WARNING!**
Residual media in the dismounted process transmitter can result in a risk to personnel, the environment and equipment.
Take sufficient precautionary measures.

15.1 Dismounting
Only disconnect the pressure gauge once the system has been depressurised!

15.2 Return

⚠ **WARNING!**
Strictly observe the following when shipping the instrument:
All instruments delivered to WIKA must be free from any kind of hazardous substances (acids, bases, solutions, etc.).

When returning the instrument, use the original packaging or a suitable transport packaging.

To avoid damage:
1. Place the protection cap onto the process connection.
2. Wrap the instrument in an antistatic plastic film.
3. Place the instrument, along with the shock-absorbent material, in the packaging.
   Place shock-absorbent material evenly on all sides of the transport packaging.
4. If possible, place a bag containing a desiccant inside the packaging.
5. Label the shipment as carriage of a highly sensitive measuring instrument.

GB

Information on returns can be found under the heading "Service" on our local website.

15.3 Disposal

Incorrect disposal can put the environment at risk.

Dispose of instrument components and packaging materials in an environmentally compatible way and in accordance with the country-specific waste disposal regulations.

16. Accessories

Description	Order no.
Welding socket	
■ for process connection G ½ flush	1192299
■ for process connection G 1 flush	1192264
■ for process connection G ½ flush	2158982
■ for process connection G 1 hygienic flush	2166011
Instrument mounting bracket for wall or pipe mounting, stainless steel	14058660
Overvoltage protection for transmitter, 4 ... 20 mA, M20 x 1.5	14002489
HART® modem with USB interface	11077336
Overvoltage protection Ex d with flameproof enclosure	12140503
Display and operating unit, model DI-PT-U The display and operating unit can be attached in 90° steps. The display and operating unit features a main display and an additional display. The main display indicates the set main value, e.g. the pressure value. The additional display shows different values, at the same time as the main display – these values can be selected by the user. The process transmitter can be configured via the display and operating unit.	13315277

WIKA

EG-Konformitätserklärung	EC Declaration of Conformity
Dokument Nr.:	Document No.:
14105369.01	14105369.01

Wir erklären in alleiniger Verantwortung, dass die mit CE gekennzeichneten Produkte

We declare under our sole responsibility that the CE marked products

Typ:

Model:

UPT-20-Z, UPT-21-Z

UPT-20-Z, UPT-21-Z

Beschreibung:

Description:

Prozesstransmitter

Process Transmitter

gemäß gültigem Datenblatt:

according to the valid data sheet:

PE 86.05

PE 86.05

die grundlegenden Schutzanforderungen der folgenden Richtlinie(n) erfüllen:

are in conformity with the essential protection requirements of the directive(s)

97/23/EG (DGRL)[1]
2004/108/EG (EMV)

97/23/EC (PED)[1]
2004/108/EC (EMC)

Die Geräte wurden entsprechend den folgenden Normen geprüft:

The devices have been tested according to the following standards:

EN 61326-1:2013
EN 61326-2-3:2013

EN 61326-1:2013
EN 61326-2-3:2013

(1) PS > 200 bar: Modul A, druckhaltendes Ausrüstungsteil

(1) PS > 200 bar; Module A, pressure accessory

Unterzeichnet für und im Namen von / Signed for and on behalf of

WIKA Alexander Wiegand SE & Co. KG

Klingenberg, 2014-05-09

Geschäftsbereich / Company division: ETM

Qualitätsmanagement / Quality management: CQL

Stefan Heidinger

Thomas Gerling

Unterschrift, autorisiert durch das Unternehmen / Signature authorized by the company

Appendix 2: Menu tree, basic setting

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6

GB

```
Basic
setting      1
  │
  └─ Scale
     setting   1 1
        │
        ├─ Dry
        │  adjustment  1 1 1
        │     ├─ Min. adjustment
        │     └─ Max. adjustment
        │
        └─ Wet
           adjustment  1 1 2
              ├─ Min. adjustment
              └─ Max. adjustment

  └─ Application   1 2
        │
        ├─ Pressure   1 2 1
        │     ├─ Unit ──────── bar, mbar ...
        │     └─ Mounting
        │        correction
        │           ├─ change
        │           └─ apply
        │
        ├─ Level   1 2 2
        │     ├─ Unit ──────── m, cm ...
        │     ├─ Density
        │     │     ├─ Density unit ── kg/dm³, lb/ft³
        │     │     └─ Density value
        │     └─ Offset
        │           ├─ change
        │           └─ apply
        │
        └─ Mode   1 2 4
              ├─ Pressure
              └─ Level
```

Level 1   Level 2   Level 3   Level 4   Level 5   Level 6

```
                       ┌──────────────┐   ┌──────────────┐
                       │ Sensor       │   │ °C, °F       │
                       │ tempera-     │───│              │
                       │ ture    1 2 5│   │              │
                       └──────────────┘   └──────────────┘

        ┌──────────────┐
        │ Damping      │
        │          1 3 │
        └──────────────┘

        ┌──────────────┐   ┌──────────────┐   ┌──────────────┐
        │ Write        │   │ on/off       │   │ on           │
        │ protection 1 4│──│              │───│              │
        └──────────────┘   └──────────────┘   └──────────────┘
                                              ┌──────────────┐
                                              │ off          │
                                              │              │
                                              └──────────────┘
                           ┌──────────────┐
                           │ Change PIN   │
                           │              │
                           └──────────────┘
```

Appendix 3: Menu tree, display

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6

Display	Main display	Pressure
2	2 1	2 1 1

		Level
		2 1 2

		Current
		2 1 4

		PV percent
		2 1 5

		Sensor temperature
		2 1 6

		PV
		2 1 7

	Additional display	Pressure
	2 2	2 2 1

		Level
		2 2 2

		Current
		2 2 4

		PV percent
		2 2 5

		Sensor temperature
		2 2 6

		Pmin, Pmax
		2 2 7

		PVmin, PVmax
		2 2 8

		Tmin, Tmax
		2 2 9

		TAG short
		2 2 A

		TAG long
		2 2 B

		Blank
		2 2 C

Appendix 4: Menu tree, diagnostic

Level 1   Level 2   Level 3   Level 4   Level 5   Level 6

```
Diagnostic          Simulation          Press. simul.
           3                      31                      311

                                        Current sim.        4 mA
                                                    312

                                                            20 mA

                                                            Enter


                    Drag                Pmin,               display
                    pointer    32       Pmax       321

                                                            reset


                                        PVmin,              display
                                        PVmax      322

                                                            reset


                                        Tmin, Tmax          display
                                                    323

                                                            reset


                    Operat. time        display
                               33                   331

                                        reset
                                                    332
```

Appendix 5: Menu tree, detail setup

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6

GB

Detail setup — 4

- Language — 4 1
  - German — 4 1 1
  - English — 4 1 2
  - Francais — 4 1 3
  - Espanol — 4 1 4
- Marking — 4 2
  - TAG short — 4 2 1
  - TAG long — 4 2 2
- Current out — 4 3
  - Alarm signal — 4 3 1
    - 3.5 mA
    - 21.5 mA
  - Limits — 4 3 2
    - 3.8 ... 20.5 mA
    - 4.0 ... 20.0 mA
- Contrast — 4 4
- Reset — 4 5
  - Instru. spec. — 4 5 1
  - Drag pointer — 4 5 2

Appendix 5: Menu tree, detail setup

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6

HART
4 6

Short addr.
4 6 1

Cons. current
4 6 2

on

Appendix 6: Menu tree, info

Level 1	Level 2	Level 3	Level 4	Level 5	Level 6

Info 5

Measur. range 5 1

Date manufac. 5 3

Version 5 4

Serial number 5 5

GB

WIKA operating instructions process transmitter, model UPT-2x
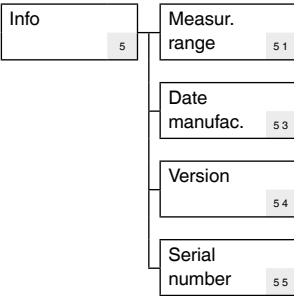
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