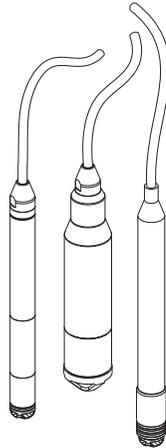


# Brief Operating Instructions

## Waterpilot FMX21

Hydrostatic level measurement  
4 to 20 mA HART

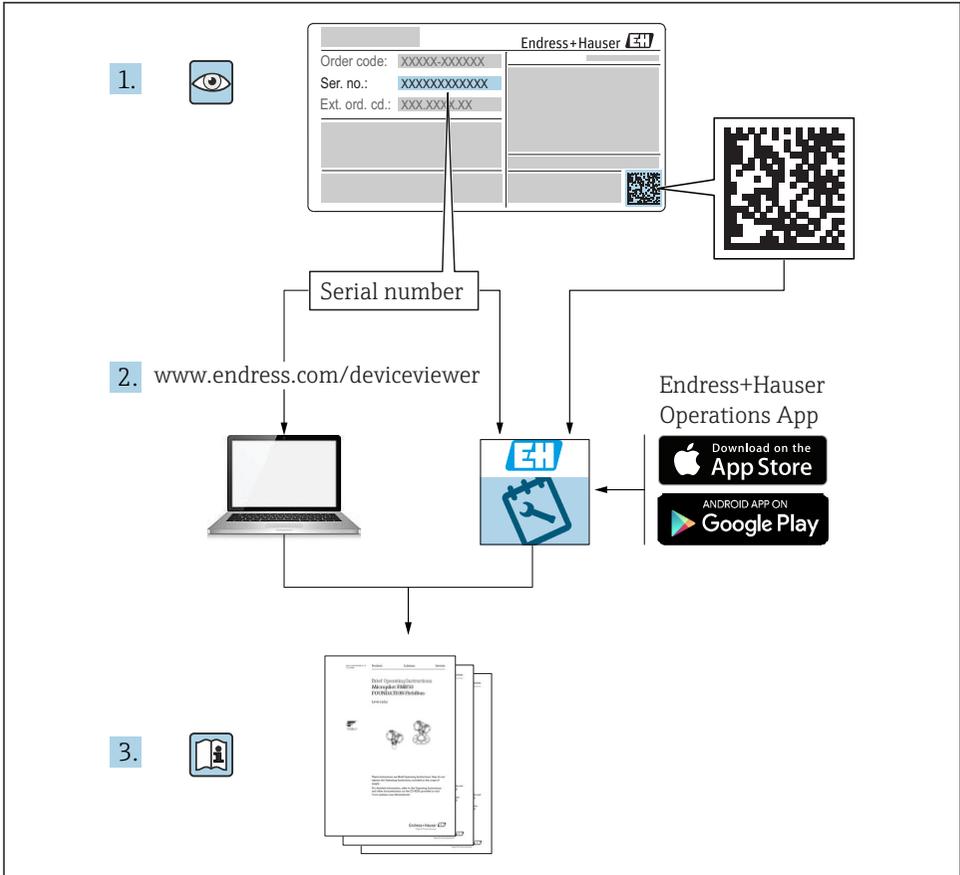


These Instructions are Brief Operating Instructions; they are not a substitute for the Operating Instructions pertaining to the device.

Detailed information about the device can be found in the Operating Instructions and the other documentation:

Available for all device versions via:

- Internet: [www.endress.com/deviceviewer](http://www.endress.com/deviceviewer)
- Smart phone/tablet: *Endress+Hauser Operations App*



A0023555

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# 1 About this document

## 1.1 Document function

The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning.

## 1.2 Symbols used

### 1.2.1 Safety symbols

Symbol	Meaning
	<b>DANGER!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation will result in serious or fatal injury.
	<b>WARNING!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in serious or fatal injury.
	<b>CAUTION!</b> This symbol alerts you to a dangerous situation. Failure to avoid this situation can result in minor or medium injury.
	<b>NOTE!</b> This symbol contains information on procedures and other facts which do not result in personal injury.

### 1.2.2 Electrical symbols

Symbol	Meaning	Symbol	Meaning
	Direct current		Alternating current
	Direct current and alternating current		<b>Ground connection</b> A grounded terminal which, as far as the operator is concerned, is grounded via a grounding system.
	<b>Protective ground connection</b> A terminal which must be connected to ground prior to establishing any other connections.		<b>Equipotential connection</b> A connection that has to be connected to the plant grounding system: This may be a potential equalization line or a star grounding system depending on national or company codes of practice.

### 1.2.3 Tool symbols

Symbol	Meaning
 A0011220	Flat blade screwdriver
 A0011219	Phillips screwdriver
 A0011221	Allen key
 A0011222	Open-ended wrench

### 1.2.4 Symbols for certain types of information

Symbol	Meaning	Symbol	Meaning
	<b>Permitted</b> Procedures, processes or actions that are permitted.		<b>Preferred</b> Procedures, processes or actions that are preferred.
	<b>Forbidden</b> Procedures, processes or actions that are forbidden.		<b>Tip</b> Indicates additional information.
	Reference to documentation		Reference to page

Symbol	Meaning	Symbol	Meaning
	Reference to graphic		Series of steps
	Result of a step		Visual inspection

### 1.2.5 Symbols in graphics

Symbol	Meaning
	Item numbers
	Series of steps
	Views
	Sections

## 1.3 Registered trademarks

### 1.3.1 GORE-TEX®

Trademark of W.L. Gore & Associates, Inc., USA.

### 1.3.2 TEFLON®

Trademark of E.I. Du Pont de Nemours & Co., Wilmington, USA.

### 1.3.3 HART®

Registered trademark of the FieldComm Group, Austin, USA

### 1.3.4 FieldCare®

Trademark of Endress+Hauser Process Solutions AG.

### 1.3.5 DeviceCare®

Trademark of Endress+Hauser Process Solutions AG.

### 1.3.6 iTEMP®

Trademark of Endress+Hauser Wetzer GmbH + Co. KG, Nesselwang, D..

## 1.4 Supplementary documentation



The document types listed are available:

In the Download Area of the Endress+Hauser Internet site: [www.endress.com](http://www.endress.com) → Download

### 1.4.1 Technical Information (TI): planning aid for your device

Waterpilot: TI00431P

RIA15: TI01043K

The document contains all the technical data on the device and provides an overview of the accessories and other products that can be ordered for the device.

### 1.4.2 Operating Instructions (BA): your comprehensive reference

FMX21 4 to 20 mA HART - BA00380P:

RIA15 - BA01170K:

These Operating Instructions contain all the information that is required in various phases of the life cycle of the device: from product identification, incoming acceptance and storage, to mounting, connection, operation and commissioning through to troubleshooting, maintenance and disposal.

### 1.4.3 Safety Instructions (XA)

Depending on the approval, the following Safety Instructions (XA) are supplied with the device. They are an integral part of the Operating Instructions.

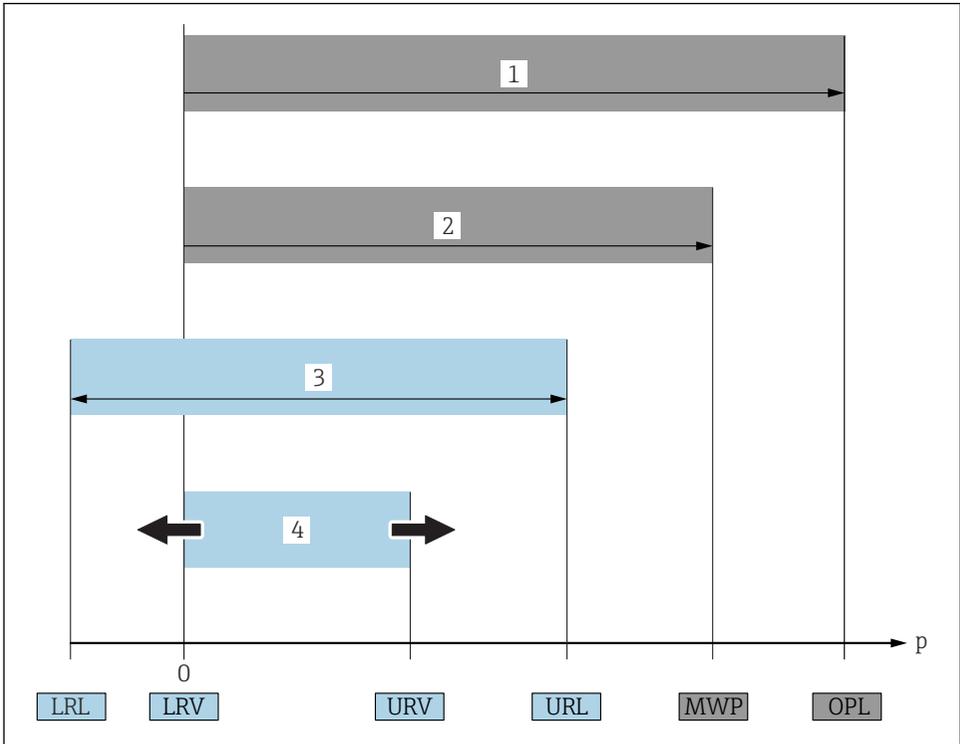
Directive	Type of protection	Category	Documentation	Option <sup>1)</sup>
ATEX	Ex ia IIC	II 2 G	XA00454P	BD
ATEX	Ex nA IIC	II 3 G	XA00485P	BE
IECEX	Ex ia IIC	n/a	XA00455P	IC
CSA C/US	Ex ia IIC	n/a	ZD00232P (960008976)	CE
FM	AEx ia IIC	n/a	ZD00231P (960008975)	FE
NEPSI	Ex ia IIC	n/a	XA00456P	NA
INMETRO	Ex ia IIC	n/a	XA01066P	MA

1) Product Configurator order code for "Approval"



The nameplate indicates the Safety Instructions (XA) that are relevant to the device.

## 1.5 Terms and abbreviations

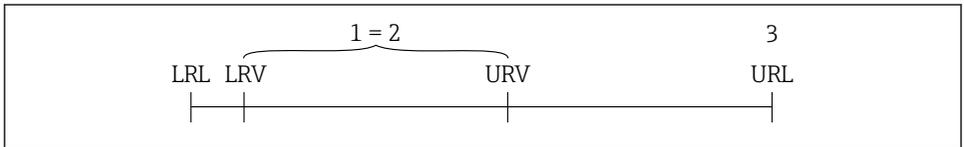


A0029505

Item	Term/abbreviation	Explanation
1	OPL	The OPL (over pressure limit = sensor overload limit) for the measuring device depends on the lowest-rated element, with regard to pressure, of the selected components, i.e. the process connection has to be taken into consideration in addition to the measuring cell. Also observe pressure-temperature dependency. The OPL may only be applied for a limited period of time.
2	MWP	The MWP (maximum working pressure) for the sensors depends on the lowest-rated element, with regard to pressure, of the selected components, i.e. the process connection has to be taken into consideration in addition to the measuring cell. Also observe pressure-temperature dependency. The MWP may be applied at the device for an unlimited period. The MWP can also be found on the nameplate.
3	Maximum sensor measuring range	Span between LRL and URL This sensor measuring range is equivalent to the maximum calibratable/adjustable span.

Item	Term/abbreviation	Explanation
4	Calibrated/adjusted span	Span between LRV and URV Factory setting: 0 to URL Other calibrated spans can be ordered as customized spans.
p	-	Pressure
-	LRL	Lower range limit
-	URL	Upper range limit
-	LRV	Lower range value
-	URV	Upper range value
-	TD (turn down)	Turn down Example - see the following section.
-	PE	Polyethylene
-	FEP	Fluorinated ethylene propylene
-	PUR	Polyurethane

## 1.6 Turn down calculation



A0029545

- 1 Calibrated/adjusted span
- 2 Zero point-based span
- 3 URL sensor

### Example

- Sensor: 10 bar (150 psi)
- Upper range value (URL) = 10 bar (150 psi)
- Calibrated/adjusted span: 0 to 5 bar (0 to 75 psi)
- Lower range value (LRV) = 0 bar (0 psi)
- Upper range value (URV) = 5 bar (75 psi)

Turn down (TD):

$$TD = \frac{URL}{|URV - LRV|}$$

$$TD = \frac{10 \text{ bar (150 psi)}}{|5 \text{ bar (75 psi)} - 0 \text{ bar (0 psi)}|} = 2$$

In this example, the TD is 2:1.

This span is based on the zero point.

## 2 Basic safety instructions

### 2.1 Requirements concerning the staff

The staff must fulfill the following requirements for their tasks:

- ▶ Trained staff: Must have a qualification which corresponds to their function and tasks.
- ▶ Authorized by the plant operator.
- ▶ Familiar with the national regulations.
- ▶ Before starting their work: Must have read and understood all instructions in the operating manual and supplementary documentation as well as the certificate (depending on the application).
- ▶ Must comply with all instructions and the regulatory framework.

### 2.2 Designated use

#### 2.2.1 Application and media

The Waterpilot FMX21 is a hydrostatic pressure sensor for measuring the level of fresh water, wastewater and salt water. The temperature is measured simultaneously in the case of sensor versions with a Pt100 resistance thermometer.

An optional temperature head transmitter converts the Pt100 signal to a 4 to 20 mA signal with superimposed digital communication protocol HART 6.0.

#### 2.2.2 Incorrect use

The manufacturer is not liable for damage caused by improper or non-designated use.

Verification for borderline cases:

- ▶ For special fluids and fluids for cleaning, Endress+Hauser is glad to provide assistance in verifying the corrosion resistance of fluid-wetted materials, but does not accept any warranty or liability.

### 2.3 Workplace safety

For work on and with the device:

- ▶ Wear the required personal protective equipment according to federal/national regulations.
- ▶ Switch off the supply voltage before connecting the device.

### 2.4 Operational safety

Risk of injury!

- ▶ Operate the device in proper technical condition and fail-safe condition only.
- ▶ The operator is responsible for interference-free operation of the device.

#### Modifications to the device

Unauthorized modifications to the device are not permitted and can lead to unforeseeable dangers.

- ▶ If, despite this, modifications are required, consult with Endress+Hauser.

## Repairs

To ensure continued operational safety and reliability,

- ▶ Carry out repairs on the device only if they are expressly permitted.
- ▶ Observe federal/national regulations pertaining to repair of an electrical device.
- ▶ Use original spare parts and accessories from Endress+Hauser only.

## Hazardous area

To eliminate danger to persons or the facility when the device is used in the approval-related area (e.g. explosion protection, pressure vessel safety):

- ▶ Check the nameplate to verify if the device ordered can be put to its intended use in the approval-related area.
- ▶ Observe the specifications in the separate supplementary documentation that is an integral part of these Instructions.

## 2.5 Product safety

This measuring device is designed in accordance with good engineering practice to meet state-of-the-art safety requirements, has been tested, and left the factory in a condition in which it is safe to operate.

It meets general safety standards and legal requirements. It also complies with the EC directives listed in the device-specific EC Declaration of Conformity. Endress+Hauser confirms this by affixing the CE mark to the device.

## 3 Product description

See the Operating Instructions.

## 4 Incoming acceptance and product identification

### 4.1 Incoming acceptance

- Is the order code on the delivery note identical to the order code on the product sticker?
- Are the goods undamaged?
- Do the data on the nameplate correspond to the order specifications and the delivery note?
- Is the documentation available?  
If required (see nameplate): Are the safety instructions (XA) present?



If one of these conditions does not apply, please contact your Endress+Hauser sales office.

## 4.2 Product identification

The following options are available for identification of the measuring device:

- Nameplate specifications
- Order code with breakdown of the device features on the delivery note
- Enter serial number of nameplates in *W@M Device Viewer* ([www.endress.com/deviceviewer](http://www.endress.com/deviceviewer)): All details on the measuring device are displayed.

For an overview of the technical documentation provided, enter the serial number from the nameplates in the *W@M Device Viewer* ([www.endress.com/deviceviewer](http://www.endress.com/deviceviewer))

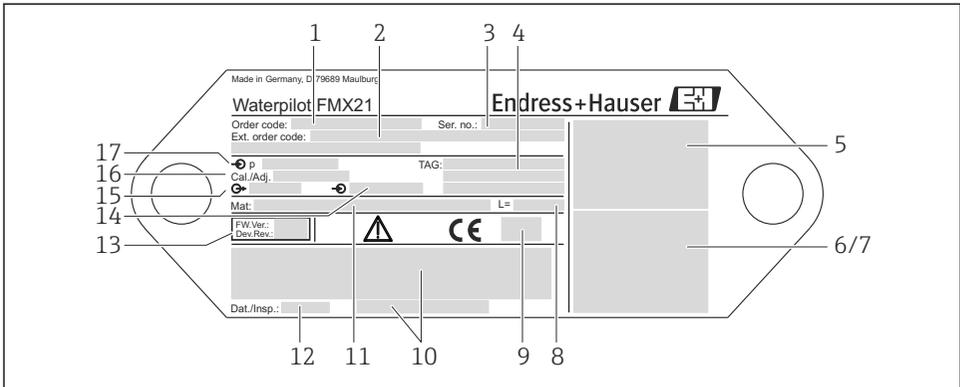
### 4.2.1 Manufacturer address

Endress+Hauser SE+Co. KG  
 Hauptstraße 1  
 79689 Maulburg, Germany

Address of the manufacturing plant: See nameplate.

## 4.3 Nameplates

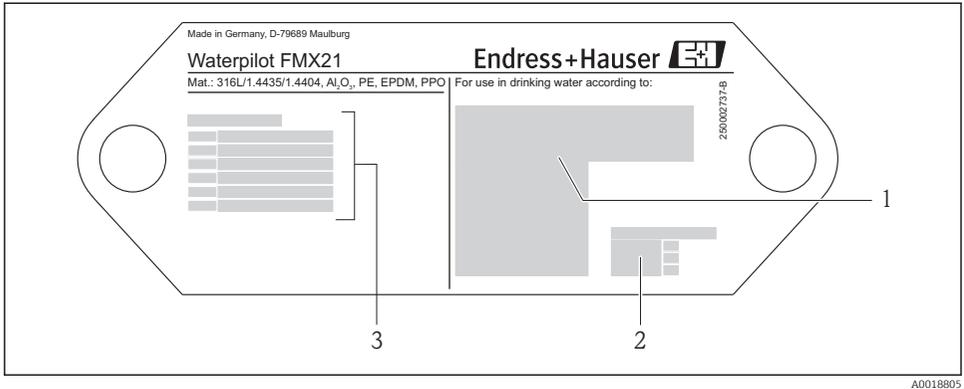
### 4.3.1 Nameplates on extension cable



A0018802

- 1 Order code (shortened for reordering); The meaning of the individual letters and digits is explained in the order confirmation details.
- 2 Extended order number (complete)
- 3 Serial number (for clear identification)
- 4-17 See the Operating Instructions

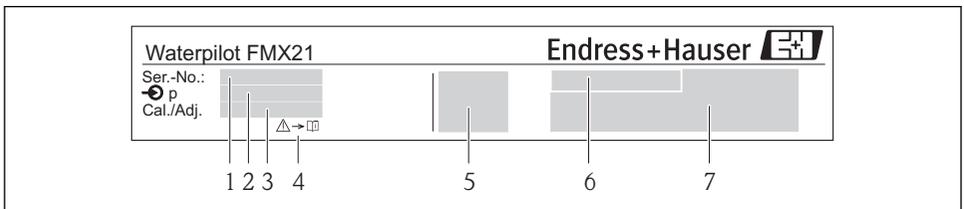
## Additional nameplate for devices with approvals



A0018805

- 1 Approval symbol (drinking water approval)
- 2 Reference to associated documentation
- 3 Approval number (marine approval)

### 4.3.2 Additional nameplate for devices with external diameter 22 mm (0.87 in) and 42 mm (1.65 in)



A0018804

- 1 Serial number
- 2 Nominal measuring range
- 3 Set measuring range
- 4 CE mark or approval symbol
- 5 Certificate number (optional)
- 6 Text for approval (optional)
- 7 Reference to documentation

## 4.4 Identification of sensor type

With gauge pressure or absolute pressure sensors, the "Pos. zero adjust" parameter is displayed in the operating menu. With absolute pressure sensors, the "Calib. offset" parameter is displayed in the operating menu.

## 4.5 Storage and transport

### 4.5.1 Storage conditions

Use original packaging.

Store the measuring device in clean and dry conditions and protect from damage caused by shocks (EN 837-2).

#### Storage temperature range

*FMX21 + Pt100 (optional)*

-40 to +80 °C (-40 to +176 °F)

*Cable*

(when mounted in a fixed position)

- With PE: -30 to +70 °C (-22 to +158 °F)
- With FEP: -30 to +80 °C (-22 to +176 °F)
- With PUR: -40 to +80 °C (-40 to +176 °F)

*Terminal box*

-40 to +80 °C (-40 to +176 °F)

*TMT182 temperature head transmitter (optional) for FMX21 4 to 20 mA HART*

-40 to +100 °C (-40 to +212 °F)

### 4.5.2 Transporting the product to the measuring point

#### **WARNING**

##### **Incorrect transport!**

Device or cable may become damaged, and there is a risk of injury!

- ▶ Transport measuring device in the original packaging.
- ▶ Follow the safety instructions and transport conditions for devices weighing more than 18 kg (39.6 lbs).

## 4.6 Scope of delivery

The scope of delivery comprises:

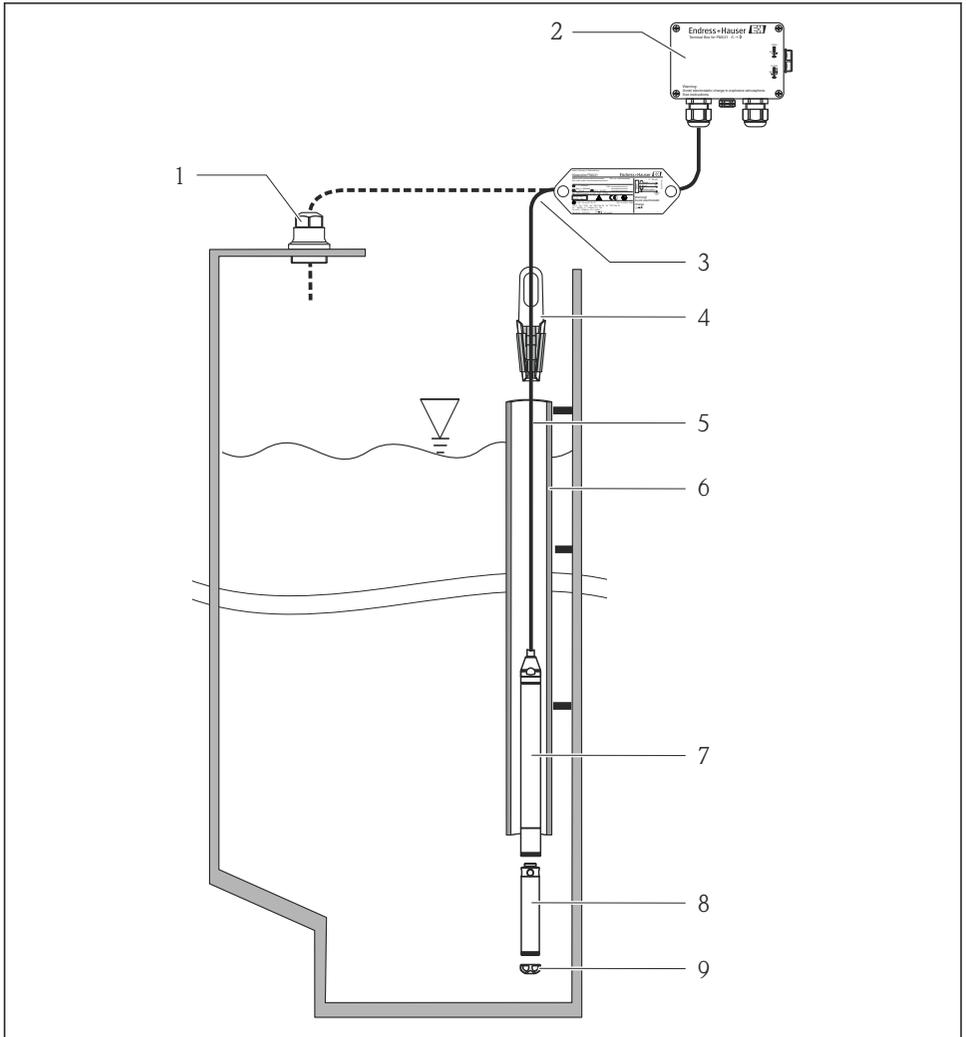
- Waterpilot FMX21, optionally with integrated Pt100 resistance thermometer
- Optional accessories

Documentation supplied:

- The Operating Instructions BA00380P are available on the internet. → see: [www.de.endress.com](http://www.de.endress.com) → Downloads.
- Brief Operating Instructions KA01189P
- Final inspection report
- Drinking water approvals (optional): SD00289P, SD00319P, SD00320P
- Devices that are suitable for use in hazardous areas: Additional documentation e.g. Safety instructions (XA, ZD)

## 5 Installation

### 5.1 Installation conditions



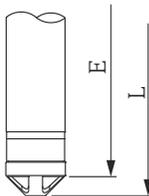
A0018770

- 1 Cable mounting screw (can be ordered as an accessory)
- 2 Terminal box (can be ordered as an accessory)
- 3 Bending radius of extension cable > 120 mm (4.72 in)
- 4 Mounting clamp (can be ordered as an accessory)
- 5 Extension cable
- 6 Guide tube

- 7 *Waterpilot FMX2.1*
- 8 *Additional weight can be ordered as an accessory for the FMX2.1 with external diameter of 22 mm (0.87 in) and 29 mm (1.14 in)*
- 9 *Protection cap*

## 5.2 Additional mounting instructions

- Cable length
  - Customer-specific in meters or feet.
  - Limited cable length when performing installation with freely suspended device with cable mounting screw or mounting clamp, as well as for FM/CSA approval: max. 300 m (984 ft).
- Sideways movement of the level probe can result in measuring errors. For this reason, install the probe at a point free from flow and turbulence, or use a guide tube. The internal diameter of the guide tube should be at least 1 mm (0.04 in) greater than the external diameter of the selected FMX2.1.
- To avoid mechanical damage to the measuring cell, the device is equipped with a protection cap.
- The cable must end in a dry room or a suitable terminal box. The terminal box from Endress+Hauser provides humidity and climatic protection and is suitable for installation outdoors (see the Operating Instructions for additional information).
- Cable length tolerance: < 5 m (16 ft):  $\pm 17.5$  mm (0.69 in); > 5 m (16 ft):  $\pm 0.2$  %
- If the cable is shortened, the filter at the pressure compensation tube must be reattached. Endress+Hauser offers a cable shortening kit for this purpose (see the Operating Instructions for additional information) (documentation SD00552P/00/A6).
- Endress+Hauser recommends using twisted, shielded cable.
- In shipbuilding applications, measures are required to restrict the spread of fire along cable looms.
- The length of the extension cable depends on the intended level zero point. The height of the protection cap must be taken into consideration when designing the layout of the measuring point. The level zero point (E) corresponds to the position of the process isolating diaphragm. Level zero point = E; tip of probe = L (see the following diagram).

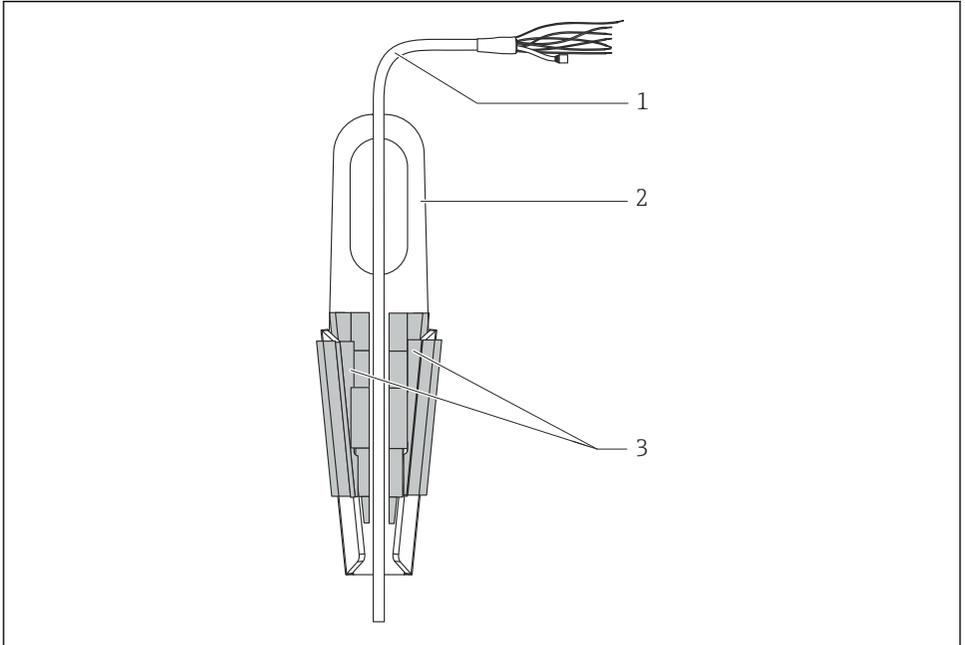


A0026013

## 5.3 Dimensions

For dimensions, please refer to the Technical Information TI00431P/00/EN, "Mechanical construction" section (see also: [www.de.endress.com](http://www.de.endress.com) → Downloads → Media Type: Documentation).

## 5.4 Mounting the Waterpilot with a mounting clamp



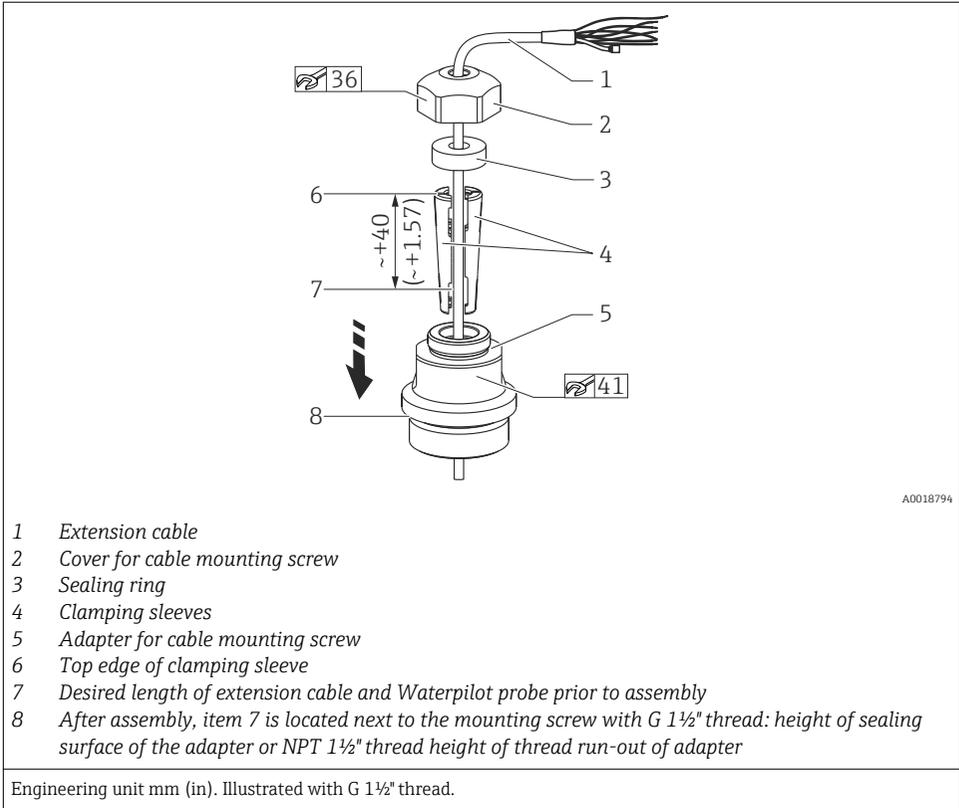
A0018793

- 1 *Extension cable*
- 2 *Suspension clamp*
- 3 *Clamping jaws*

### 5.4.1 Mounting the suspension clamp:

1. Mount the suspension clamp (item 2). Take the weight of the extension cable (item 1) and the device into account when selecting the fastening point.
2. Push up the clamping jaws (item 3). Place the extension cable (item 1) between the clamping jaws as shown in the graphic.
3. Hold the extension cable (item 1) in position and push the clamping jaws (item 3) back down. Tap the clamping jaws gently from above to fix them in place.

## 5.5 Mounting the Waterpilot with a cable mounting screw



A0018794

**i** If you want to lower the level probe to a certain depth, position the top edge of the clamping sleeve 40 mm (4.57 in) higher than the required depth. Then push the extension cable and the clamping sleeve into the adapter as described in Step 6 in the following section.

### 5.5.1 Mounting the cable mounting screw with a G 1½" or NPT 1½" thread:

1. Mark the desired length of extension cable on the extension cable.
2. Insert the probe through the measuring aperture and carefully lower on the extension cable. Fix the extension cable to prevent it from slipping.
3. Slide the adapter (item 5) over the extension cable and screw it tightly into the measuring aperture.
4. Slide the sealing ring (item 3) and cover (item 2) onto the cable from above. Press the sealing ring into the cover.
5. Place the clamping sleeves (item 4) around the extension cable (item 1) at the marked point as illustrated in the graphic.

6. Slide the extension cable with the clamping sleeves (item 4) into the adapter (item 5)
7. Fit the cover (item 2) with the sealing ring (item 3) onto the adapter (item 5) and securely screw together with the adapter.



To remove the cable mounting screw, perform this sequence of steps in reverse.

### **⚠ CAUTION**

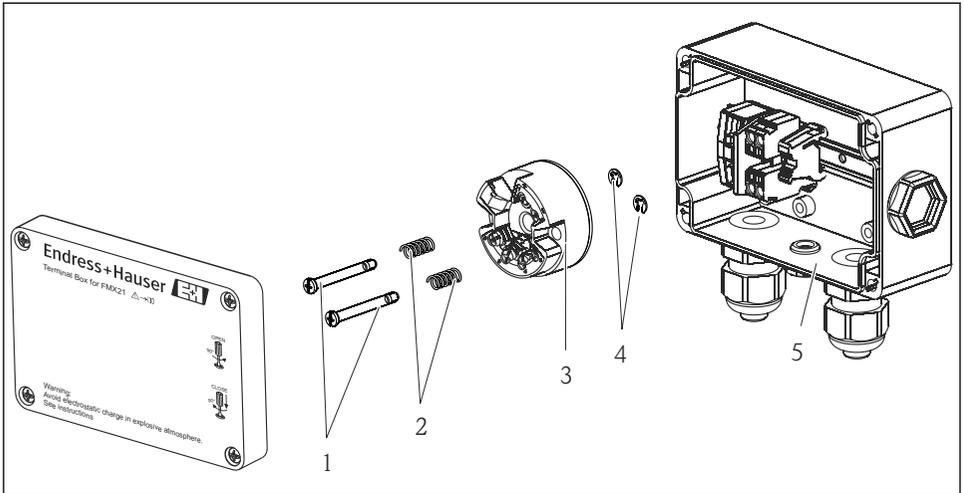
#### **Risk of injury!**

- ▶ Use only in unpressurized vessels.

## 5.6 Mounting the terminal box

The optional terminal box is mounted using four screws (M4). For the dimensions of the terminal box, please see the Technical Information TI00431P/00/ EN, "Mechanical construction" section (see also: [www.de.endress.com](http://www.de.endress.com) → Downloads → Media Type: Documentation).

## 5.7 Mounting the TMT182 temperature head transmitter with terminal box



A0018913

- 1 *Mounting screws*
- 2 *Mounting springs*
- 3 *TMT182 temperature head transmitter*
- 4 *Circlips*
- 5 *Terminal box*



Only open the terminal box with a screwdriver.

**⚠ WARNING****Risk of explosion!**

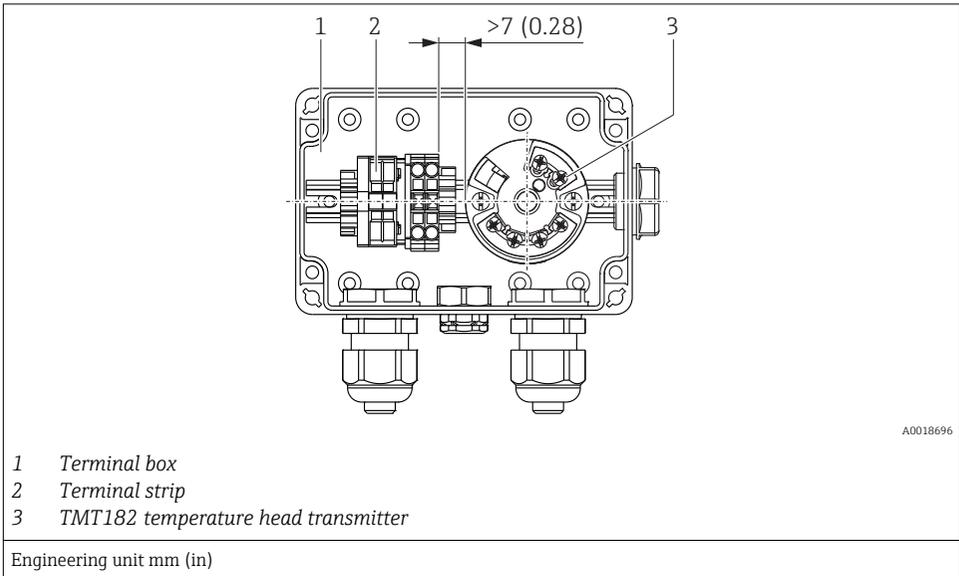
- ▶ The TMT182 is not designed for use in hazardous areas.

**5.7.1 Mounting the temperature head transmitter:**

1. Guide the mounting screws (item 1) with the mounting springs (item 2) through the bore of the temperature head transmitter (item 3)
2. Secure the mounting screws with the circlips (item 4). Circlips, mounting screws and springs are included in the scope of delivery for the temperature head transmitter.
3. Screw the temperature head transmitter into the field housing tightly. (Width of screwdriver blade max. 6 mm (0.24 in))

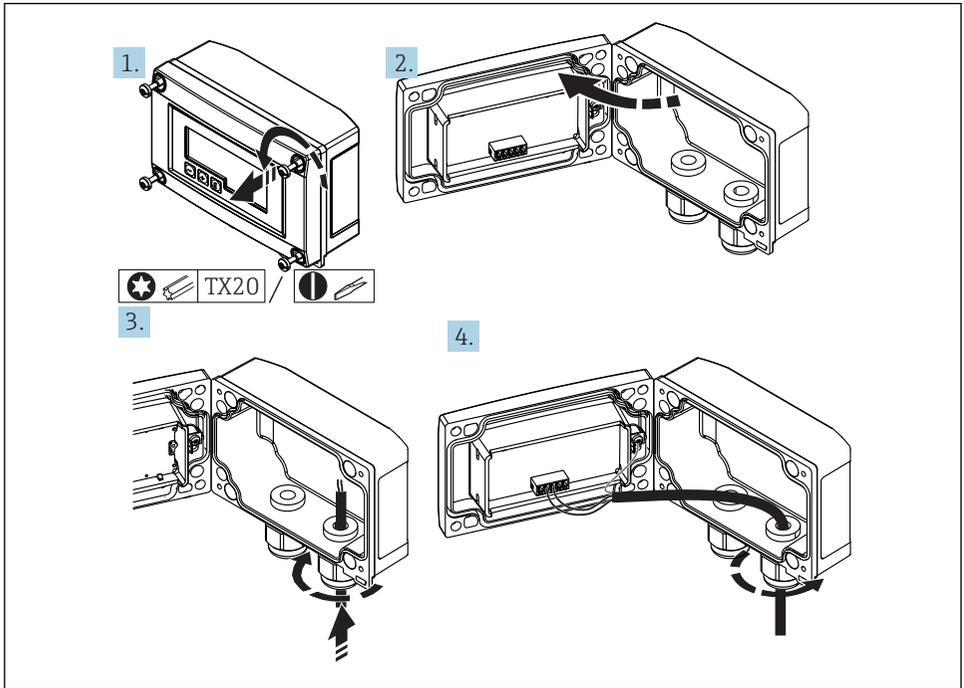
**NOTICE****Avoid damage to the temperature head transmitter.**

- ▶ Do not overtighten the mounting screw.

**NOTICE****Incorrect connection!**

- ▶ A distance of  $>7$  mm ( $> 0.28$ ) must be maintained between the terminal strip and the TMT182 temperature head transmitter.

## 5.8 Inserting the cable into the RIA15 field housing



A0017830

Inserting the cable, field housing, connection without transmitter power supply (example)

1. Release the housing screws
2. Open the housing
3. Open the cable gland (M16) and insert the cable
4. Connect the cable including the functional grounding and close the cable gland

**i** Compensation of the atmospheric pressure must be ensured for the installation. A black, vented cable gland is supplied for this purpose.

If using the communication resistor module in the RIA15, the cable of the FMX21 must be inserted into the right gland when connecting the FMX21 so that the integrated pressure compensation tube is not pinched.

## 5.9 Cable marking



A0030955

- To make installation easier, Endress+Hauser marks the extension cable if a customer-specific length has been ordered.  
Ordering information: Product Configurator order code for "Service", option "IR" or "IS".
- Cable marking tolerance (distance to lower end of level probe):  
Cable length < 5 m (16 ft):  $\pm 17.5$  mm (0.69 in)  
Cable length > 5 m (16 ft):  $\pm 0.2$  %
- Material: PET, stick-on label: acrylic
- Immunity to temperature change:  $-30$  to  $+100$  °C ( $-22$  to  $+212$  °F)

### NOTICE

**The marking is used exclusively for installation purposes.**

- ▶ The mark must be thoroughly removed without trace in the case of devices with drinking water approval. The extension cable must not be damaged in the process.



Not for use of the FMX21 in hazardous areas.

## 5.10 Cable shortening kit

See the Operating Instructions.

## 5.11 Post-installation check

<input type="checkbox"/>	Is the device undamaged (visual inspection)?
<input type="checkbox"/>	Does the device conform to the measuring point specifications? For example: <ul style="list-style-type: none"> <li>▪ Process temperature</li> <li>▪ Process pressure</li> <li>▪ Ambient temperature</li> <li>▪ Measuring range</li> </ul>
<input type="checkbox"/>	Are the measuring point identification and labeling correct (visual inspection)?
<input type="checkbox"/>	Check that all screws are firmly seated.

## 6 Electrical connection

### WARNING

#### Electrical safety is compromised by an incorrect connection!

- ▶ When using the measuring device in a hazardous area, the relevant national standards and guidelines as well as the Safety Instructions (XAs) or installation or control drawings (ZDs) must be adhered to. All data relating to explosion protection can be found in separate documentation which is available on request. This documentation is supplied with the devices as standard →  7

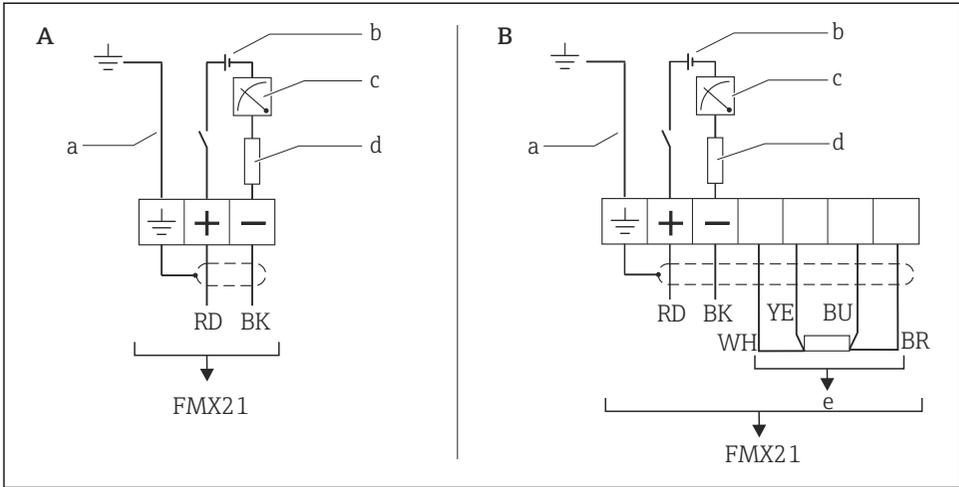
### 6.1 Connecting the device

#### WARNING

#### Electrical safety is compromised by an incorrect connection!

- ▶ The supply voltage must match the supply voltage specified on the nameplate →  12
- ▶ Switch off the supply voltage before connecting the device.
- ▶ The cable must end in a dry room or a suitable terminal box. The IP66/IP67 terminal box with GORE-TEX® filter from Endress+Hauser is suitable for outdoor installation. →  19
- ▶ Connect the device in accordance with the following diagrams. Reverse polarity protection is integrated in the Waterpilot FMX21 and the temperature head transmitter. Changing the polarities will not result in the destruction of the devices.
- ▶ A suitable circuit breaker should be provided for the device in accordance with IEC/EN 61010.

### 6.1.1 Waterpilot with Pt100



A001941

A Waterpilot FMX21

B Waterpilot FMX21 with Pt100 (not for use in hazardous areas); option "NB", Product Configurator order code for "Accessories"

a Not for the FMX21 with external diameter of 29 mm (1.14 in)

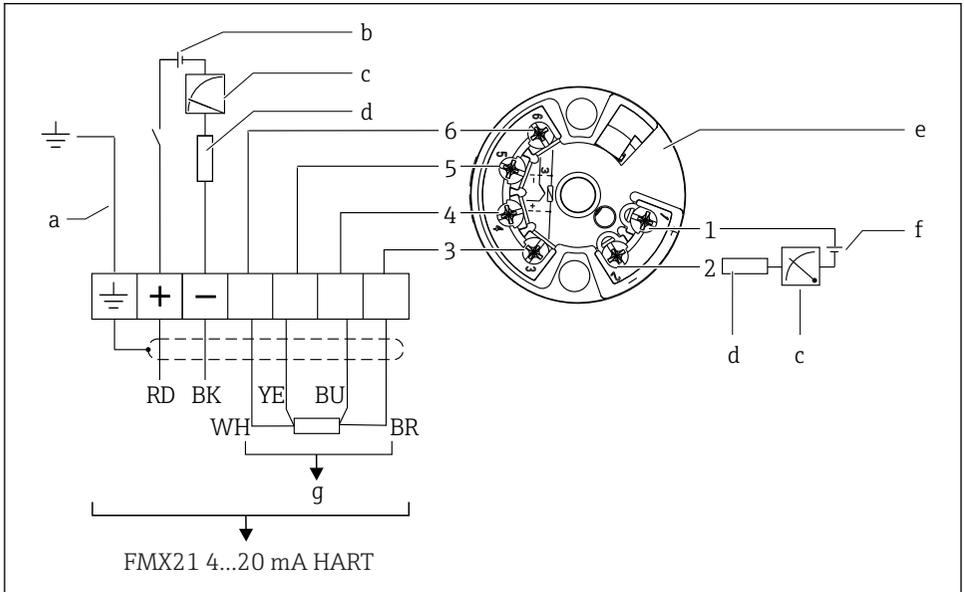
b 10.5 to 30 V DC (hazardous area), 10.5 to 35 V DC

c 4...20 mA

d Resistance ( $R_L$ )

e Pt100

### 6.1.2 Waterpilot with Pt100 and TMT182 temperature head transmitter for FMX21 4 to 20 mA HART



A0018780

- a Not for the FMX21 with external diameter of 29 mm (1.14 in)
  - b 10.5 to 35 V DC
  - c 4...20 mA
  - d Resistance ( $R_t$ )
  - e TMT182 temperature head transmitter (4 to 20 mA) (not for use in hazardous areas)
  - f 11.5 to 35 V DC
  - g Pt100
- 1...6 Pin assignment

Ordering information:

Pt100: Product Configurator order code for "Accessories mounted", option "NB"

TMT182: Product Configurator order code for "Accessories enclosed", option "PT"



### 6.1.4 Waterpilot FMX21, RIA15 with installed HART communication resistor module



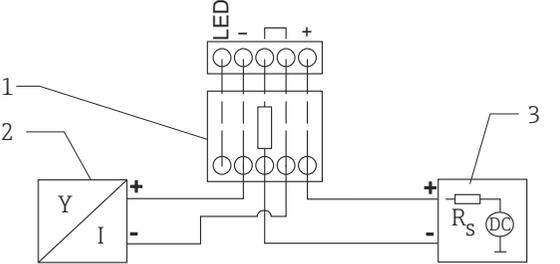
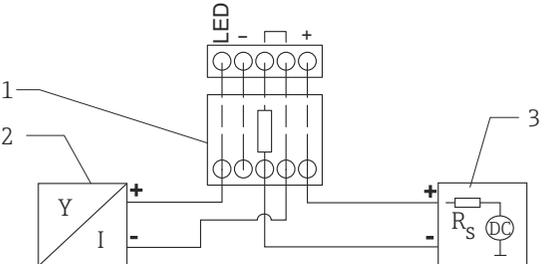
The HART communication module for installation in the RIA15 can be ordered together with the device.

#### Product structure, feature 620 "Accessory enclosed":

- Option R6 "HART communication resistor hazardous / non-hazardous area"
- The **voltage drop** to be taken into account is max. **7 V**



Compensation of the atmospheric pressure must be ensured for the installation. A black, vented cable gland is supplied for this purpose.

	Circuit diagram / Description
<p>Waterpilot FMX21 connection and RIA15 <b>without</b> backlight</p>	 <p style="text-align: right;">A0020839</p> <p>☑ 3 Waterpilot FMX21 block diagram, RIA15 without light, HART communication resistor module</p> <p>1 HART communication resistor module 2 Waterpilot FMX21 3 Power supply</p>
<p>Waterpilot FMX21 connection and RIA15 <b>with</b> backlight</p>	 <p style="text-align: right;">A0020840</p> <p>☑ 4 Waterpilot FMX21 block diagram, RIA15 with light, HART communication resistor module</p> <p>1 HART communication resistor module 2 Waterpilot FMX21 3 Power supply</p>

### 6.1.5 Wire colors

RD = red, BK = black, WH = white, YE = yellow, BU = blue, BR = brown

### 6.1.6 Connection data

Connection classification as per IEC 61010-1:

- Overvoltage category 1
- Pollution level 1

#### Connection data in the hazardous area

See relevant XA.

## 6.2 Supply voltage

### WARNING

#### Supply voltage might be connected!

Risk of electric shock and/or explosion!

- ▶ When using the measuring device in hazardous areas, installation must comply with the corresponding national standards and regulations as well as the Safety Instructions.
- ▶ All explosion protection data are given in separate documentation which is available upon request. The Ex documentation is supplied as standard with all devices approved for use in explosion hazardous areas.

#### 6.2.1 FMX21 + Pt100 (optional)

- 10.5 to 35 V (not hazardous areas)
- 10.5 to 30 V (hazardous areas)

6.2.2 TMT182 temperature head transmitter (optional) for FMX21 4 to 20 mA HART  
11.5 to 35 V DC

## 6.3 Cable specifications

Endress+Hauser recommends using shielded, twisted-pair two-wire cables.

 The probe cables are shielded for device versions with outer diameters of 22 mm (0.87 in) and 42 mm (1.65 in).

#### 6.3.1 FMX21 + Pt100 (optional)

- Commercially available instrument cable
- Terminals, terminal box: 0.08 to 2.5 mm<sup>2</sup> (28 to 14 AWG)

6.3.2 TMT182 temperature head transmitter (optional) for FMX21 4 to 20 mA HART

- Commercially available instrument cable
- Terminals, terminal box: 0.08 to 2.5 mm<sup>2</sup> (28 to 14 AWG)
- Transmitter connection: max. 1.75 mm<sup>2</sup> (15 AWG)

## 6.4 Power consumption

#### 6.4.1 FMX21 + Pt100 (optional)

- ≤ 0.805 W at 35 V DC (non-hazardous area)
- ≤ 0.690 W at 30 V DC (hazardous area)

**6.4.2 TMT182 temperature head transmitter (optional) for FMX21 4 to 20 mA HART**  
≤ 0.805 W at 35 V DC

## **6.5 Current consumption**

### **6.5.1 FMX21 + Pt100 (optional)**

Max. current consumption: ≤ 23 mA

Min. current consumption: ≥ 3.6 mA

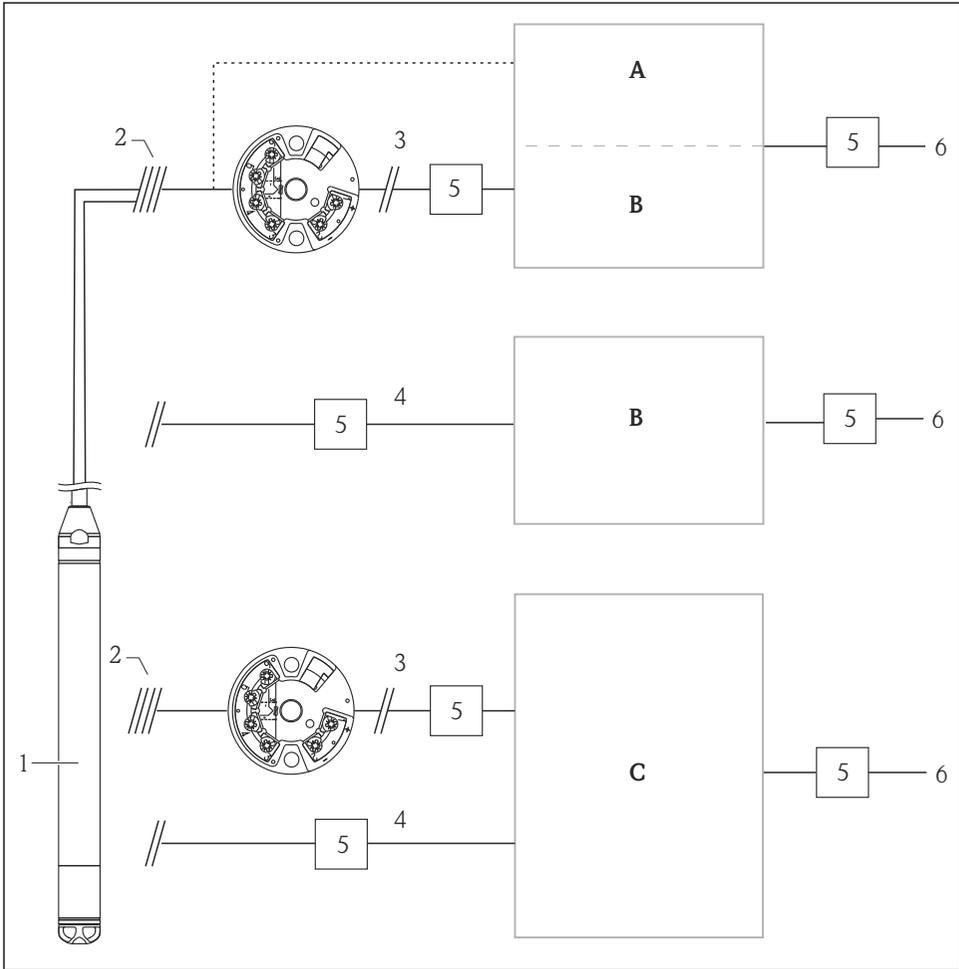
### **6.5.2 TMT182 temperature head transmitter (optional) for FMX21 4 to 20 mA HART**

- Max. current consumption: ≤ 23 mA
- Min. current consumption: ≥ 3.5 mA

## **6.6 Connecting the measuring unit**

### **6.6.1 Overvoltage protection**

To protect the Waterpilot and the TMT182 temperature head transmitter from large interference voltage peaks, Endress+Hauser recommends installing overvoltage protection upstream and downstream of the display and/or evaluation unit as shown in the graphic.



A0018941

- A Power supply, display and evaluation unit with one input for Pt100  
 B Power supply, display and evaluation unit with one input for 4 to 20 mA  
 C Power supply, display and evaluation unit with two inputs for 4 to 20 mA

- 1 Waterpilot FMX21 HART  
 2 Connection for integrated Pt100 in the FMX21  
 3 4 to 20 mA HART (temperature)  
 4 4 to 20 mA HART (level)  
 5 Overvoltage protection, e.g. HAW from Endress+Hauser (not for use in hazardous areas.)  
 6 Power supply

 Further information on the TMT182 temperature head transmitter for HART applications from Endress+Hauser can be found in the Technical Information T100078R/09/EN.

### 6.6.2 Connecting the Commubox FXA195

See the Operating Instructions.

### 6.6.3 Connecting the Field Xpert SFX

See the Operating Instructions.

### 6.6.4 Connecting for air pressure compensation with external measured value

See the Operating Instructions.

### 6.6.5 Connecting an external temperature sensor/temperature head transmitter for density compensation

See the Operating Instructions.

## 6.7 Post-connection check

<input type="checkbox"/>	Is the device or cable undamaged (visual check)?
<input type="checkbox"/>	Do the cables comply with the requirements ?
<input type="checkbox"/>	Do the cables have adequate strain relief?
<input type="checkbox"/>	Are all cable glands installed, securely tightened and leak-tight?
<input type="checkbox"/>	Does the supply voltage match the specifications on the nameplate?
<input type="checkbox"/>	Is the terminal assignment correct ?

## 7 Operation options

Endress+Hauser offers comprehensive measuring point solutions with display and/or evaluation units for the Waterpilot FMX21 HART and TMT182 temperature head transmitter.



Your Endress+Hauser service organization would be glad to be of service if you have any other questions. Contact addresses can be found on the website at [www.endress.com/worldwide](http://www.endress.com/worldwide)

### 7.1 Overview of operating options

#### 7.1.1 Operation using Endress+Hauser operating program

See the Operating Instructions.

#### 7.1.2 Operation via Field Xpert SFX

See the Operating Instructions.

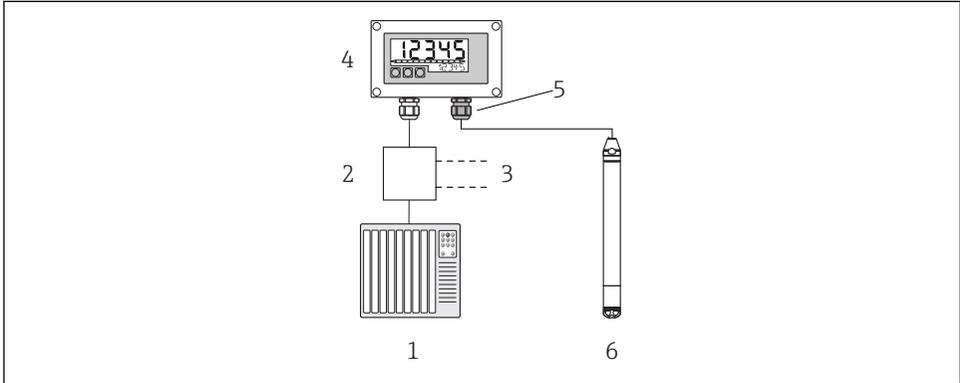
#### 7.1.3 Operation via RIA15

The RIA15 can be used as a local display unit and for the basic configuration of the Waterpilot FMX21 hydrostatic level sensor via HART.

The following parameters can be configured on the FMX2.1 using the 3 operating keys on the front of the RIA15:

- Pressure engineering unit, level, temperature
- Zero adjustment (only for gauge pressure sensors)
- Empty and full pressure adjustment
- Empty and full level adjustment
- Reset to factory defaults

Further information on the operating parameters →  43



A0035931

 5 Remote operation of the Waterpilot FMX2.1 via the RIA15

- 1 PLC
- 2 Transmitter power supply, e.g. RN221N (with communication resistor)
- 3 Connection for Commubox FXA195 and Field Communicator 375, 475
- 4 RIA15 loop-powered process display unit
- 5 Cable gland M16 with pressure compensation membrane
- 6 Waterpilot FMX2.1

## 7.2 Operating concept

Operation with an operating menu is based on an operation concept with "user roles".

User role	Meaning
Operator	Operators are responsible for the devices during normal "operation". This is usually limited to the reading of process values. If the work with the devices goes beyond reading, it concerns simple, application-specific functions that are used in operation. Should an error occur, these users simple forward the information on the errors but do not intervene themselves.
Maintenance	Service engineers usually work with the devices in the phases following device commissioning. They are primarily involved in maintenance and troubleshooting activities for which simple settings have to be made at the device. Technicians work with the devices over the entire life cycle of the product. Thus, commissioning and advanced settings and configurations are some of the tasks they have to carry out.
Expert	Experts work with the devices over the entire life cycle of the device, but, in part, have high requirements on the devices. Individual parameters/functions from the overall functionality of the devices are required for this purpose time and again. In addition to technical, process-oriented tasks, experts can also perform administrative tasks (e.g. user administration). "Experts" can avail of the entire parameter set.

## 7.3 Structure of the operating menu

See the Operating Instructions.

## 7.4 Locking/unlocking operation

See the Operating Instructions.

## 7.5 Resetting to factory settings (reset)

See the Operating Instructions.

# 8 Integrating device via HART® protocol

See Operating Instructions.

## 9 Commissioning

### NOTICE

If a pressure smaller than the minimum permitted pressure or greater than the maximum permitted pressure is present at the device, the following messages are output in succession:

- ▶ "S140 Working range P" or "F140 Working range P" (depending on the setting in the "Alarm behav. P" parameter)
- ▶ "S841 Sensor range" or "F841 Sensor range" (depending on the setting in the "Alarm behav. P" parameter)
- ▶ "S971 Adjustment" (depending on setting in "Alarm behav. P" parameter)

### 9.1 Post-installation check and function check

Before commissioning your measuring point, ensure that the post-installation and post-connection check have been performed.

- "Post-installation check" checklist →  23
- "Post-connection check" checklist →  31

### 9.2 Unlocking/locking configuration

If the device is locked to prevent configuration, it must first be unlocked.

#### 9.2.1 Locking/unlocking software

If the device is locked via the software (device access code), the key symbol appears in the measured value display. If an attempt is made to write to a parameter, a prompt for the device access code appears. To unlock, enter the user-defined device access code.

### 9.3 Commissioning

Commissioning comprises the following steps:

- Function check →  34
- Selection of the measuring mode and pressure unit →  34
- Position adjustment →  36
- Configuring measurement:
  - Pressure measurement →  37
  - Level measurement →  37

### 9.4 Measuring mode selection



The device is configured for the "Pressure" measuring mode as standard. The measuring range and the unit in which the measured value is transmitted correspond to the data on the nameplate.

### WARNING

#### Changing the measuring mode affects the span (URV)

This situation can result in product overflow.

- ▶ If the measuring mode is changed, the setting for the span (URV) must be checked in the "Setup" operating menu and readjusted if necessary.

---

## Measuring mode

---

<b>Navigation</b>	 Setup → Measuring mode
<b>Write permission</b>	Operator/Service engineers/Expert
<b>Description</b>	Select the measuring mode. The operating menu is structured differently depending on the measuring mode selected.
<b>Options</b>	<ul style="list-style-type: none"> <li>▪ Pressure</li> <li>▪ Level</li> </ul>
<b>Factory setting</b>	Level

## 9.5 For selecting the pressure engineering unit

---

### Press. eng. unit

---

<b>Navigation</b>	 Setup → Press. eng. unit
<b>Write permission</b>	Operator/Service engineers/Expert
<b>Description</b>	Select the pressure engineering unit. If a new pressure engineering unit is selected, all pressure-specific parameters are converted and displayed with the new unit.
<b>Options</b>	<ul style="list-style-type: none"> <li>▪ mbar, bar</li> <li>▪ mmH2O, mH2O, inH2O</li> <li>▪ ftH2O</li> <li>▪ Pa, kPa, MPa</li> <li>▪ psi</li> <li>▪ mmHg, inHg</li> <li>▪ kgf/cm<sup>2</sup></li> </ul>
<b>Factory setting</b>	mbar or bar depending on the nominal measuring range of the sensor module, or as per order specifications.

## 9.6 Position adjustment

The pressure resulting from the orientation of the device can be corrected here.

---

### Pos. zero adjust (gauge pressure sensor)

---

<b>Navigation</b>	  Setup → Pos. zero adjust
<b>Write permission</b>	Operator/Service engineers/Expert
<b>Description</b>	Position adjustment – the pressure difference between zero (set point) and the measured pressure need not be known.
<b>Options</b>	<ul style="list-style-type: none"> <li>■ Confirm</li> <li>■ Cancel</li> </ul>
<b>Example</b>	<ul style="list-style-type: none"> <li>■ Measured value = 2.2 mbar (0.033 psi)</li> <li>■ You correct the measured value via the "Pos. zero adjust" parameter with the "Confirm" option. This means that you are assigning the value 0.0 to the pressure present.</li> <li>■ Measured value (after pos. zero adjust) = 0.0 mbar</li> <li>■ The current value is also corrected.</li> </ul>
<b>Factory setting</b>	Cancel

---

### Calib. offset

---

<b>Write permission</b>	Service engineers/Expert
<b>Description</b>	Position adjustment – the pressure difference between the set point and the measured pressure must be known.
<b>Example</b>	<ul style="list-style-type: none"> <li>■ Measured value = 982.2 mbar (14.73 psi)</li> <li>■ You correct the measured value with the value entered (e.g. 2.2 mbar (0.033 psi)) via the "Calib. Offset" parameter. This means that you are assigning the value 980.0 (14.7 psi) to the pressure present.</li> <li>■ Measured value (after pos. zero adjust) = 980.0 mbar (14.7 psi)</li> <li>■ The current value is also corrected.</li> </ul>

**Factory setting** 0.0

## 9.7 Configuring the damping

The output signal follows measured value changes with the delay time. This can be configured via the operating menu.

---

### Damping

---

#### Navigation

 Setup → Damping

#### Write permission

Operator/Service engineers/Expert  
(if the "Damping" DIP switch is set to "on")

#### Description

Enter damping time (time constant  $\tau$ ) ("Damping" DIP switch set to "on")  
Display damping time (time constant  $\tau$ ) ("Damping" DIP switch set to "off").  
The damping affects the speed at which the measured value reacts to changes in pressure.

#### Input range

0.0 to 999.0 s

#### Factory setting

2.0 sec. or according to order specifications

## 9.8 Configuring pressure measurement

See the Operating Instructions.

## 9.9 Configuring level measurement

### 9.9.1 Information on level measurement



**You have a choice of two methods for calculating the level: "In pressure" and "In height". The table in the "Overview of level measurement" section that follows provides you with an overview of these two measuring tasks.**

- The limit values are not checked, i.e. the values entered must be appropriate for the sensor module and the measuring task for the device to be able to measure correctly.
- Customer-specific units are not possible.
- The values entered for "Empty calib./Full calib.", "Empty pressure/Full pressure", "Empty height/Full height" and "Set LRV/Set URV" must be at least 1% apart. The value will be rejected, and a message displayed, if the values are too close together.

## 9.9.2 Overview of level measurement

Measuring task	Level selection	Measured variable options	Description	Measured value display
Calibration is performed by entering two pressure-level value pairs.	"In pressure"	Via the "Output unit" parameter: %, level, volume or mass units	<ul style="list-style-type: none"> <li>Calibration with reference pressure (wet calibration) →  40</li> <li>Calibration without reference pressure (dry calibration) →  38</li> </ul>	The measured value display and the "Level before lin" parameter display the measured value.
Calibration is performed by entering the density and two height-level value pairs.	"In height"		<ul style="list-style-type: none"> <li>Calibration with reference pressure (wet calibration) →  40</li> <li>Calibration without reference pressure (dry calibration) →  40</li> </ul>	

### 9.9.3 "In pressure" level selection Calibration without reference pressure (dry calibration)

#### Example:

In this example, the volume in a tank should be measured in liters. The maximum volume of 1 000 l (264 gal) corresponds to a pressure of 400 mbar (6 psi).

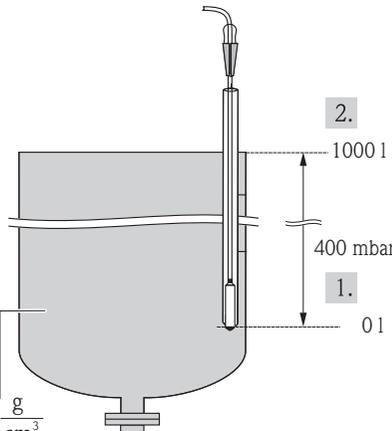
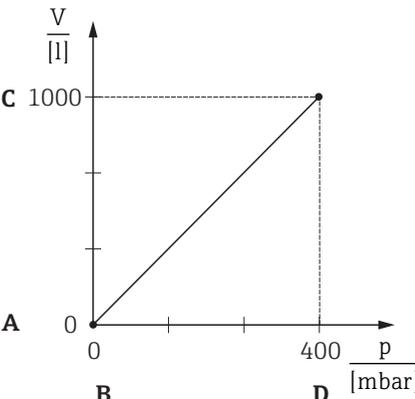
The minimum volume of 0 liters corresponds to a pressure of 0 mbar since the process isolating diaphragm of the probe is at the start of the level measuring range.

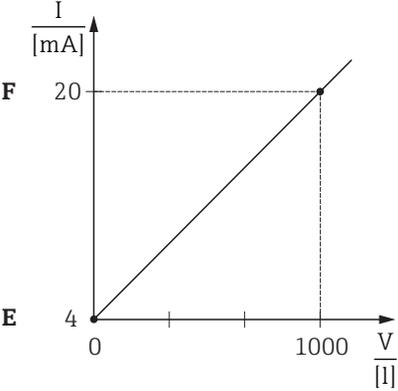
#### Prerequisite:

- The measured variable is in direct proportion to the pressure.
- This is a theoretical calibration i.e. the pressure and volume values for the lower and upper calibration point must be known.



- The values entered for "Empty calib./Full calib.", "Empty pressure/Full pressure" and "Set LRV/Set URV" must be at least 1% apart. The value will be rejected, and a message displayed, if the values are too close together. Further limit values are not checked, i.e. the values entered must be appropriate for the sensor module and the measuring task for the device to be able to measure correctly.
- Due to the orientation of the device, there may be pressure shifts in the measured value, i.e. when the vessel is empty or partly filled, the measured value is not zero. For information on how to perform position adjustment, see →  36.

Description	
<p>1 Select the "Level" measuring mode via the "Measuring mode" parameter. Menu path: Setup → Measuring mode</p> <p><b>⚠ WARNING</b> <b>Changing the measuring mode affects the span (URV)</b> This situation can result in product overflow. ▶ If the measuring mode is changed, the setting for the span (URV) must be checked in the "Setup" operating menu and readjusted if necessary.</p>	 <p><math>\rho = 1 \frac{\text{g}}{\text{cm}^3}</math></p> <p>A0018818</p> <p>1 See table, steps 6 and 7. 2 See table, steps 8 and 9.</p>
<p>2 Select a pressure unit via the "Press eng. unit" parameter, here "mbar" for example. Menu path: Setup → Press. eng. unit</p>	
<p>3 Select the "In pressure" level mode via the "Level selection" parameter. Menu path: Setup → Extended setup → Level → Level selection.</p>	
<p>4 Select a volume unit via the "Output unit" parameter, here "l" (liters) for example. Menu path: Setup → Extended setup → Level → Output unit</p>	
<p>5 Select the "Dry" option via the "Calibration mode" parameter. Menu path: Setup → Extended setup → Level → Calibration mode</p>	 <p>A0017662</p>
<p>6 Enter the volume value for the lower calibration point via the "Empty calib." parameter, here 0 liters for example. Menu path: Setup → Extended setup → Level → Empty calib.</p>	
<p>7 Enter the pressure value for the lower calibration point via the "Empty pressure" parameter, here "0 mbar" for example. Menu path: Setup → Extended setup → Level → Empty pressure</p>	
<p>8 Enter the volume value for the upper calibration point via the "Full calib." parameter, here 1 000 l (264 gal) for example. Menu path: Setup → Extended setup → Level → Full calib.</p>	
<p>9 Enter the pressure value for the upper calibration point via the "Full pressure" parameter, here 400 mbar (6 psi) for example. Menu path: Setup → Extended setup → Level → Full pressure</p>	

	Description		
10	"Adjust density" contains the factory setting 1.0 but can be changed if required. The value pairs subsequently entered must correspond to this density. Menu path: Setup → Extended setup → Level → Adjust density	 <p style="text-align: right; font-size: small;">A0031064</p>	
11	Set the volume value for the lower current value (4 mA) via the "Set LRV" parameter (0 l). Menu path: Setup → Extended setup → Current output → Set LRV		
12	Set the volume value for the upper current value (20 mA) via the "Set URV" parameter (1000 l (264 gal)). Menu path: Setup → Extended setup → Current output → Set URV		
13	If the process uses a medium other than that on which the calibration was based, the new density must be specified in the "Process density" parameter. Menu path: Setup → Extended setup → Current output → Process density.		A See table, step 6. B See table, step 7. C See table, step 8. D See table, step 9. E See table, step 11 F See table, step 12
14	If density correction is required, assign the temperature probe in the "Auto dens. corr." parameter. A density correction is only possible for water. A temperature-density curve that is saved in the device is used. For this reason, the "Adjust density" (step 10) and "Process density" (step 13) parameters are not used here. Menu path: Expert → Application → Level → Auto dens. corr.		
15	Result: The measuring range is configured for 0 to 1000 l (0 to 264 gal).		

 For this level mode, the measured variables %, level, volume and mass are available, see "Output unit" in the Operating Instructions .

**9.9.4 "In pressure" level selection Calibration with reference pressure (wet calibration)**

See the Operating Instructions.

**9.9.5 "In height" level selection Calibration without reference pressure (dry calibration)**

See the Operating Instructions.

**9.9.6 "In height" level selection Calibration with reference pressure (wet calibration)**

See the Operating Instructions.

### 9.9.7 Calibration with partially filled vessel (wet calibration)

See the Operating Instructions.

### 9.9.8 Level measurement with absolute pressure probe and external pressure signal (electrical differential pressure)

See the Operating Instructions.

## 9.10 Automatic density compensation

See the Operating Instructions.

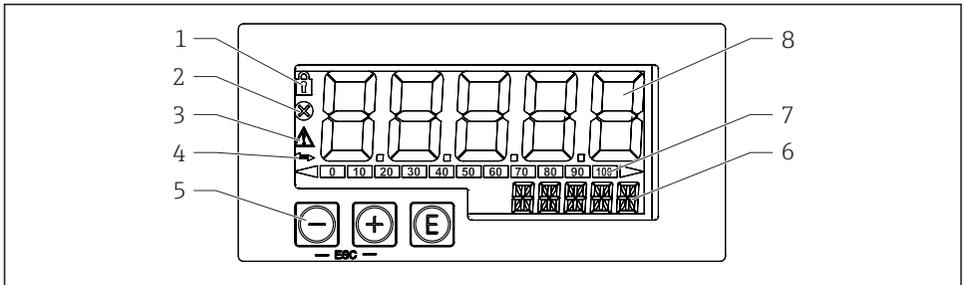
## 9.11 Linearization

See the Operating Instructions.

## 9.12 Backing up or duplicating the device data

See the Operating Instructions.

## 9.13 Operation and settings via RIA15



A0017719

### 6 Display and operating elements of the process display unit

- 1 Symbol: operating menu disabled
- 2 Symbol: error
- 3 Symbol: warning
- 4 Symbol: HART communication active
- 5 Operating keys "-", "+", "E"
- 6 14-segment display for unit/TAG
- 7 Bar graph with indicators for under range and over range
- 8 5-digit 7-segment display for measured value, digit height 17 mm (0.67 in)

The device is operated using three operating keys on the front of the housing. The device setup can be disabled with a 4-digit user code. If the setup is disabled, a padlock symbol appears on the display when an operating parameter is selected.

 A0017716	Enter key; calling up the operating menu, confirming the option/setting parameters in the operating menu
 A0017715	Selecting and setting/changing values in the operating menu; pressing the '-' and '+' keys simultaneously takes the user back up a menu level. The configured value is not saved.
 A0017714	

### 9.13.1 Operating functions

The operating functions of the process display unit are divided into the following menus. The individual parameters and settings are described in the "Commissioning" section.



If the operating menu is disabled by means of a user code, the individual menus and parameters can be displayed but not changed. To change a parameter, the user code must be entered. As the display unit can only display digits in the 7-segment display and not alphanumeric characters, the procedure for number parameters is different to that for text parameters. If the operating position contains only numbers as parameters, the operating position is displayed in the 14-segment display and the configured parameter is displayed in the 7-segment display. To edit, press the 'E'-button followed by the user code. If the operating position contains text parameters, only the operating position is initially displayed in the 14-segment display. If the 'E' button is pressed again, the configured parameter is displayed in the 14-segment display. To edit, press the '+' button followed by the user code.

Setup (SETUP)	Basic device settings
Diagnostics (DIAG)	Device information, display of error messages
Expert (EXPERT)	Expert settings for device setup. The Expert menu is protected from editing by an access code (default 0000).

### 9.13.2 Operating modes

The process display unit can be used in two different operating modes:

- 4 to 20 mA mode:  
In this operating mode, the process display unit is incorporated into the 4 to 20 mA current loop and measures the transmitted current. The variable calculated based on the current value and range limits is displayed in digital form on the 5-digit LCD. In addition, the associated unit and a bar graph can be displayed.
- HART mode:  
The display unit is powered via the current loop.  
The FMX21 can be adjusted under the "Level" menu (see operating matrix). The measured value displayed corresponds to the measured level.  
HART communication operates according to the master/slave principle.

For additional information, see BA01170K.

### 9.13.3 Operating matrix

After power-up:

- ▶ Press the  key twice
  - ↳ The "Level" menu is then available

Using the following operating matrix, a display in percent can be set. To do this, select "Mode" parameter => 4-20 and "Unit" parameter =>%

Setup -> Level (LEVEL) menu				
The LEVEL menu is only visible if the RIA15 has been ordered with the "Level" option and the display unit is operated in the HART mode (MODE = HART). The basic settings for the Waterpilot FMX2.1 level sensor can be made via the RIA15 with this menu.				
RIA15 parameter	Corresponds to parameter of FMX2.1	Values (default=bold)	Visible with	Description
LEVEL <sup>1)</sup>	Level before linearization		Level option MODE = HART FMX2.1 connected	<p>This menu contains the parameters for configuring the pressure measuring device for hydrostatic level measurement, FMX2.1. The basic settings for the FMX2.1 can be made via the RIA15 with this menu.</p> <p> Once the LEVEL menu item is opened, the following parameters are automatically adjusted for easier operation:</p> <ul style="list-style-type: none"> <li>▪ Measuring mode: Level</li> <li>▪ Calibration mode: Dry</li> <li>▪ Level selection: In pressure</li> <li>▪ Lin mode: Linear</li> </ul> <p>It is possible to reset these parameters to the factory default settings by performing a reset.</p>
PUNIT	Press. eng. unit	<b>mbar</b> <sup>2)</sup> <b>bar</b> <sup>2)</sup> kPa PSI		Use this function to select the unit for pressure
LUNIT	Output unit	% m inch feet		Use this function to select the unit for level
TUNIT	Temperature unit	°C °F K		Use this function to select the unit for temperature
ZERO	Pos. zero adjust	<b>NO</b> <b>YES</b>	Gauge pressure sensor	For performing a position adjustment (gauge pressure sensor). The value 0.0 is assigned to the pressure value present. The current value is also corrected.

Setup -> Level (LEVEL) menu				
The LEVEL menu is only visible if the RIA15 has been ordered with the "Level" option and the display unit is operated in the HART mode (MODE = HART). The basic settings for the Waterpilot FMX21 level sensor can be made via the RIA15 with this menu.				
RIA15 parameter	Corresponds to parameter of FMX21	Values (default=bold)	Visible with	Description
P_LRV	Empty pressure	-1999.9 to 9999.9 Default: Gauge pressure sensor: Sensor LRL Absolute pressure sensor: 0		Pressure empty calibration using keys -,+,E More in-depth description / valid value range: any value in the range indicated <sup>1) 3)</sup> Number of decimal places depends on the configured pressure unit.
P_URV	Full pressure	-1999.9 ... 9999.9 Default: Sensor URL		Pressure full calibration using keys -,+,E More in-depth description / valid value range: any value in the range indicated <sup>1) 3)</sup> Number of decimal places depends on the configured pressure unit.
EMPTY	Empty calib.	-1999.9 to 9999.9 Default: 0		Level empty calibration using keys -,+,E More in-depth description / valid value range: any value in the range indicated <sup>1) 3)</sup> Number of decimal places depends on the configured level unit.
FULL	Full calib.	-1999.9 ... 9999.9 Default: 100		Level full calibration using keys -,+,E More in-depth description / valid value range: any value in the range indicated <sup>1) 3)</sup> Number of decimal places depends on the configured level unit.
LEVEL	Level before linearization	Measured value		Displays the measured level Number of decimal places depends on the configured level unit.
RESET	Enter reset code	<b>NO</b> YES		Reset the FMX21 to factory defaults

- 1) If the measured value that is read out is too large, it is displayed as "9999.9", for example. To display a valid measured value, the pressure unit (PUNIT) (or level unit (LUNIT)) must be set to suit the measuring range.
- 2) Default: depends on the sensor nominal range or as per order specifications
- 3) The values entered for "Empty calib./Full calib.", "Empty pressure/Full pressure" and "Set LRV/Set URV" must be at least 1% apart. The value will be rejected, and a message displayed, if the values are too close together. Further

limit values are not checked, i.e. the values entered must be appropriate for the sensor module and the measuring task for the device to be able to measure correctly.



Any additional settings such as linearizations must be made using FieldCare or DeviceCare.



Additional information is available in the RIA15 Operating Instructions BA01170K.





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