# Technical Information
# RIA16
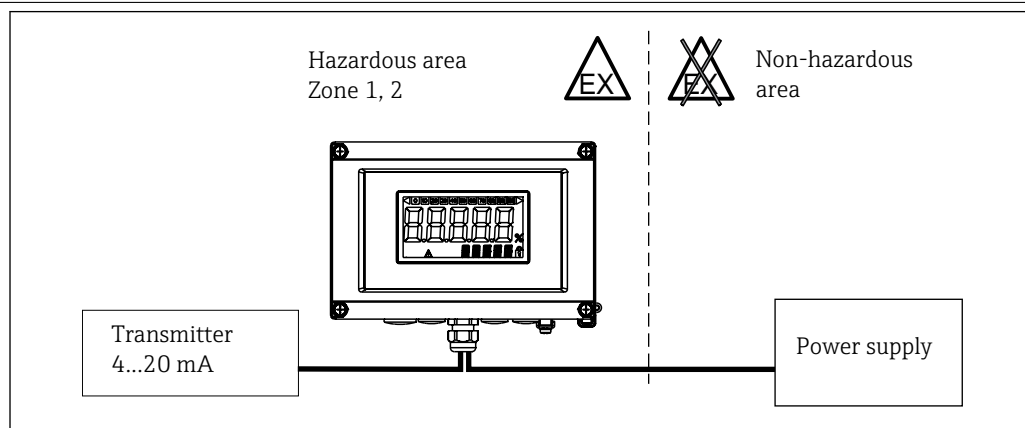
## Loop-powered field indicator



## Application

- Oil & gas
- Petrochemical industry
- System and apparatus engineering
- Outdoor applications
- Laboratory facilities
- Process data acquisition and monitoring
- Optional: aluminum housing for Ex application

## Your benefits

- Loop-powered indicator
- 5-digit LC display, character height 26 mm (1.02 in)
- Trend bar graph in increments of 10%
- Measuring range display from -19999 to 99999
- Digital limit switch
- Freely programmable units
- 3-key operation
- Approvals: ATEX, FM, CSA, IECEx, NEPSI, UK CA, DNV GL
- Parameter configuration via interface using PC Software
- Parameter configuration without power connection using setup box

Endress+Hauser

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# Function and system design

**Measuring principle**



Hazardous area
Zone 1, 2

Non-hazardous area

Transmitter
4...20 mA

Power supply

*A0052354*

🖾 *1    Example of an application of the field indicator*

The indicator records an analog measuring signal and shows this on the display. The LC display shows the current measured value in digital form and as a bar graph indicating a limit value violation. The indicator is looped into the 4 to 20 mA circuit and gets the required energy from there.

**Measuring system**

Microcontroller-controlled indicator in single-chamber field housing with illuminated LC display. The measuring range, decimal point and offset of the indicator can be configured comfortably by means of three keys in the device with the housing open or by means of a PC with the FieldCare PC software.

# Input

**Measured variable**

Current

**Measuring range**

4 to 20 mA (reverse polarity protection)

**Input signal**

- Line voltage drop < 4 V at 3 to 22 mA
- Maximum line voltage drop < 6 V at maximum short-circuit current 200 mA

# Output

**Output signal**

**Switching output**

Digital limit switch

Passive, open collector:
- $I_{max}$ = 200 mA
- $U_{max}$ = 35 V
- $U_{low/max}$ ≤ 2 V at 200 mA
- Maximum reaction time to limit value = 250 ms
- Temperature range: –20 to +80 °C (–4 to +176 °F)
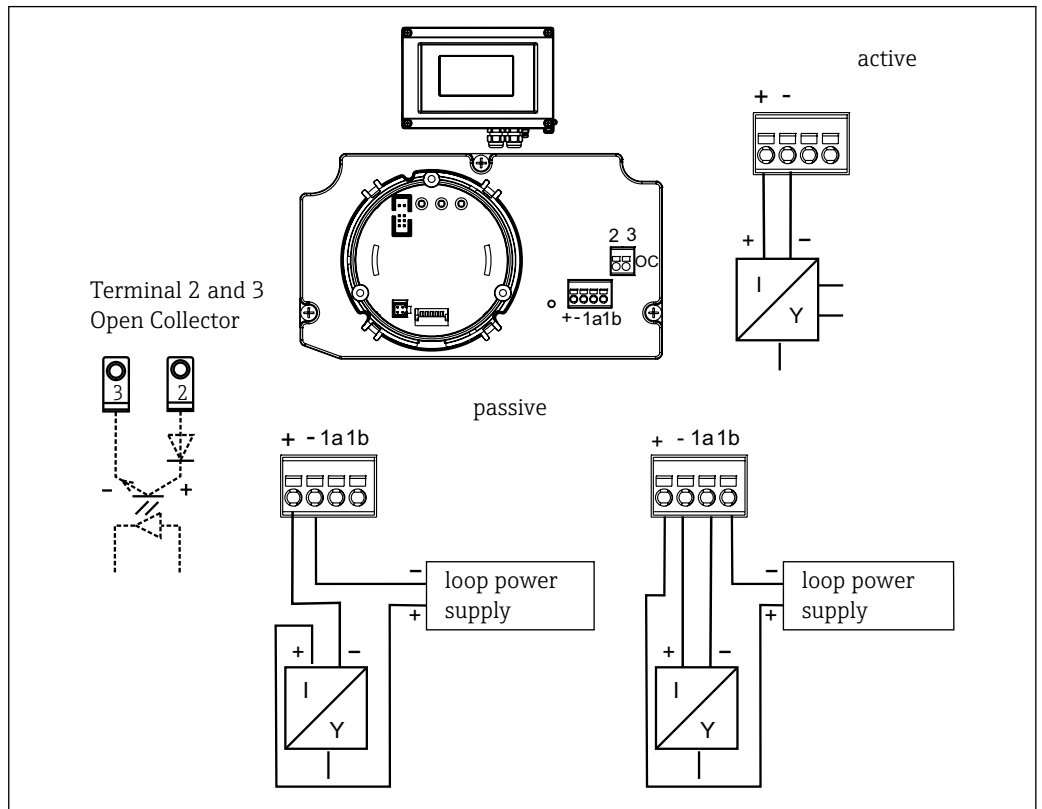
**Signal on alarm**

- No measured value visible on the LC display, no background illumination.
- Open Collector inactive.

**Transmission behavior**

The indicator allows the HART® transmission protocol to pass unimpeded.

# Power supply

**Terminal assignment**



*☒ 2    Field indicator terminal assignment*

| Terminal | Terminal assignment | Input and output |
|----------|---------------------|------------------|
| + | Measuring signal (+) 4 to 20 mA | Signal input |
| - | Measuring signal (-) 4 to 20 mA | Signal input |
| 1a, 1b | Terminal for further instrumentation | Support terminal |
| 2 | Digital limit switch (collector) | Switch output |
| 3 | Digital limit switch (emitter) | Switch output |

**Supply voltage**    Power is supplied via the 4 to 20 mA current loop.

**Cable entries**    The following cable entries are available:
- 2x thread NPT1/2
- 2x thread M16

The plastic housing includes up to 5 cable entries. In the housing as supplied to the customer, 3 of these remain closed. If necessary, you can open these using a suitable tool.

The aluminum housing also includes 5 cable entries, 3 of which are closed with blind plugs.

# Performance characteristics

| | |
|---|---|
| **Reference operating conditions** | T = 25 °C (77 °F) |
| **Maximum measured error** | < 0.1% of scaled display range |
| **Influence of ambient temperature (temperature drift)** | Effect on the accuracy when ambient temperature changes by 1 K (1.8 °F): 0.01% |

# Mounting

| | |
|---|---|
| **Mounting location** | Wall or pipe mounting (see 'Accessories') |
| **Orientation** | No restrictions: The device orientation is determined by the readability of the display. |
| **Operating altitude** | Up to 2 000 m (6 561.7 ft) above sea level |

# Environment

| | |
|---|---|
| **Ambient temperature range** | −40 to +80 °C (−40 to +176 °F) |
| | −20 to +80 °C (−4 to +176 °F) when the Open Collector output is used |
| | ℹ️ The display can react slowly for temperatures < −20 °C (−4 °F). |
| | Readability of the display cannot be guaranteed at temperatures < −30 °C (−22 °F). |
| **Storage temperature** | −40 to +80 °C (−40 to +176 °F) |
| **Electrical safety** | As per IEC 61010-1, |
| | UL61010-1, |
| | CSA C22.2 No. 1010.1-92 |
| **Climate class** | As per IEC 60654-1, Class C |
| **Degree of protection** | IP 67, NEMA 4X (not UL rated) |
| **Shock resistance** | 3g/2 to 150 Hz as per IEC 60068-2-6 |
| **Condensation** | Permitted |
| **Installation category** | 1 according to IEC 61010 |
| **Pollution degree** | 2 |
| **Overvoltage category** | II |
| **Electromagnetic compatibility (EMC)** | **CE conformity** |
| | Electromagnetic compatibility in accordance with all the relevant requirements of the IEC/EN 61326 series and NAMUR Recommendation EMC (NE21). For details, refer to the Declaration of Conformity. |

Maximum measured error <1% of measuring range.

Interference immunity as per IEC/EN 61326 series, industrial requirements

Interference emission as per IEC/EN 61326 series, Class B equipment

ℹ️ Connection of the functional grounding may be needed for functional purposes. Compliance with the electrical codes of individual countries is mandatory.

# Mechanical construction

**Design, dimensions**
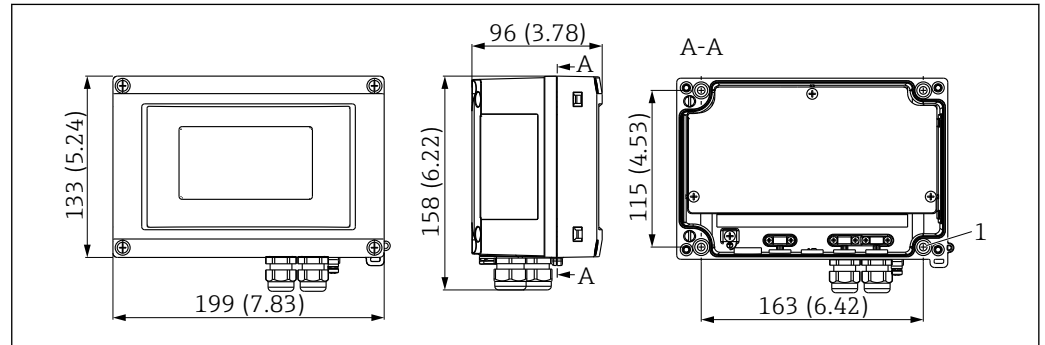


🖼 *3    Dimensions in mm (in)*

*1    Bore hole for mounting directly to wall or optional mounting plate with 4 screws Ø 5 mm (0.2 in)*

**Weight**
- Plastic housing: approximately 500 g (1.1 lb)
- Aluminum housing: approximately 1.7 kg (3.75 lb)

**Materials**

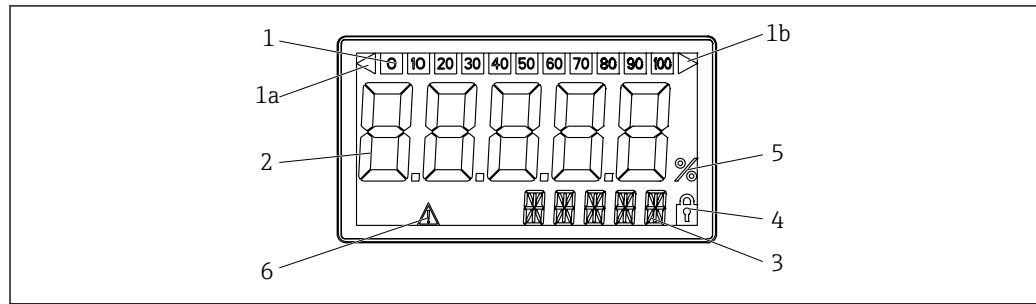| Housing | Nameplate |
|---|---|
| Fiber-glass reinforced plastic PBT-GF30 | Laser marking |
| Optional: Aluminum (AlSi12, AC-44100 or AlSi10Mg(Fe), AC-43400) | Laser-writable foil, polyester |

**Terminals**    Cables / wires up to 2.5 mm$^2$ (14 AWG) plus ferrule

# Human interface

**Operating concept**    3-key operation (-/+/E) integrated in device; access when housing is open

**On-site operation**



A0011163

🔲 4    *LC display of the field indicator*

*1    Bar graph display in increments of 10% with indicators for measurement range undershoot (item 1a) and overshoot (item 1b)*
*2    Measured value display, digit height 26 mm (1.02 in)*
*3    14-segment display for units and messages*
*4    "Programming disabled" symbol*
*5    Unit "%"*
*6    "Failure" warning symbol*

- Display range
  -19999 to 99999
- Offset
  -19999 to 99999
- Signalization
  Measuring range overshoot/undershoot
- Limit value violation
  Limit value overshoot/undershoot

**Remote operation**

**Parameter configuration**

The device can be configured with the FieldCare PC software. FieldCare Device Setup is included in the Commubox FXA291 and TXU10-AC scope of delivery (see 'Accessories') or can be downloaded free of charge at www.endress.com.

**Interface**

Configuration interface on the device; connection to the PC via interface cable (see 'Accessories').

**Configurable device parameters (selection)**

Measuring dimension, measuring ranges (linear/squared), setup lock with user code, failure mode, digital filter (damping), offset, limit value (min/max/alarm), user-configurable alarm limit values
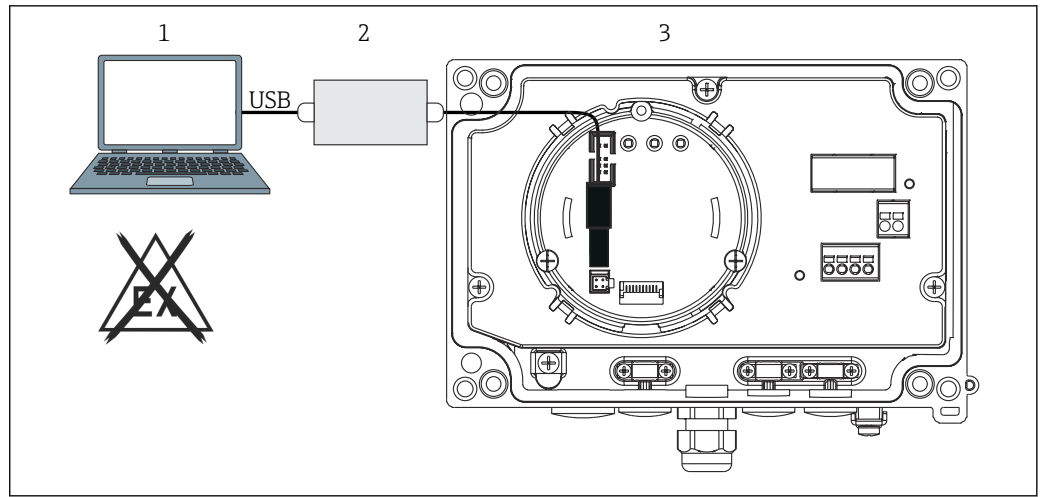
*⊠ 5      Configuring the field indicator using an interface adapter*

*1      PC configuration software*
*2      Configuration kit USB box*
*3      Field indicator*

# Certificates and approvals

Current certificates and approvals for the product are available at www.endress.com on the relevant product page:

1. Select the product using the filters and search field.
2. Open the product page.
3. Select **Downloads**.

**UL approval**       More information under UL Product iq™, search for keyword "E225237")

# Ordering information

Detailed ordering information is available from your nearest sales organization www.addresses.endress.com or in the Product Configurator at www.endress.com:

1. Select the product using the filters and search field.
2. Open the product page.
3. Select **Configuration**.

> **Product Configurator - the tool for individual product configuration**
> - Up-to-the-minute configuration data
> - Depending on the device: Direct input of measuring point-specific information such as measuring range or operating language
> - Automatic verification of exclusion criteria
> - Automatic creation of the order code and its breakdown in PDF or Excel output format
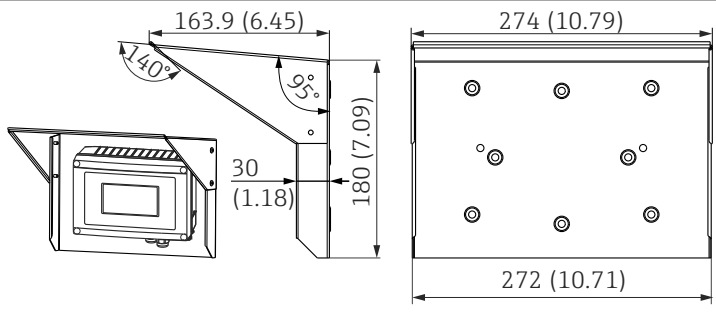> - Ability to order directly in the Endress+Hauser Online Shop

# Accessories

Accessories currently available for the product can be selected via the Product Configurator at www.endress.com:

1. Select the product using the filters and search field.
2. Open the product page.

3. Select **Spare parts & Accessories**.

**Device-specific accessories**

| Designation | Description |
|---|---|
| Wall/pipe mounting kit | For pipes Ø1-5", different variants for plastic and aluminum housings |
| Weather protection cover |  |

🖼 *6    Dimensions in mm (in)*

**Communication-specific accessories**

| Designation | |
|---|---|
| Interface cable | Commubox TXU10 incl. FieldCare Device Setup and DTM Library |
| | Commubox FXA291 incl. FieldCare Device Setup and DTM Library |

# Supplementary documentation

The following types of documentation are available on the product pages and in the Download Area of the Endress+Hauser website (www.endress.com/downloads) (depending on the selected device version):

| Document | Purpose and content of the document |
|---|---|
| Technical Information (TI) | **Planning aid for your device**<br>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. |
| Brief Operating Instructions (KA) | **Guide that takes you quickly to the 1st measured value**<br>The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning. |
| Operating Instructions (BA) | **Your reference document**<br>The 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. |
| Description of Device Parameters (GP) | **Reference for your parameters**<br>The document provides a detailed explanation of each individual parameter. The description is aimed at those who work with the device over the entire life cycle and perform specific configurations. |
| Safety Instructions (XA) | Depending on the approval, Safety Instructions (XA) are supplied with the device. The Safety Instructions are an integral part of the Operating Instructions.<br><br>ℹ Information on the Safety Instructions (XA) that are relevant for the device is provided on the nameplate. |
| Supplementary device-dependent documentation (SD/FY) | Always comply strictly with the instructions in the relevant supplementary documentation. The supplementary documentation is an integral part of the device documentation. |

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