TI00143R/09/EN/05.23-00
71615258
2023-01-30

Technical Information
RIA14

Loop-powered field indicator



Application

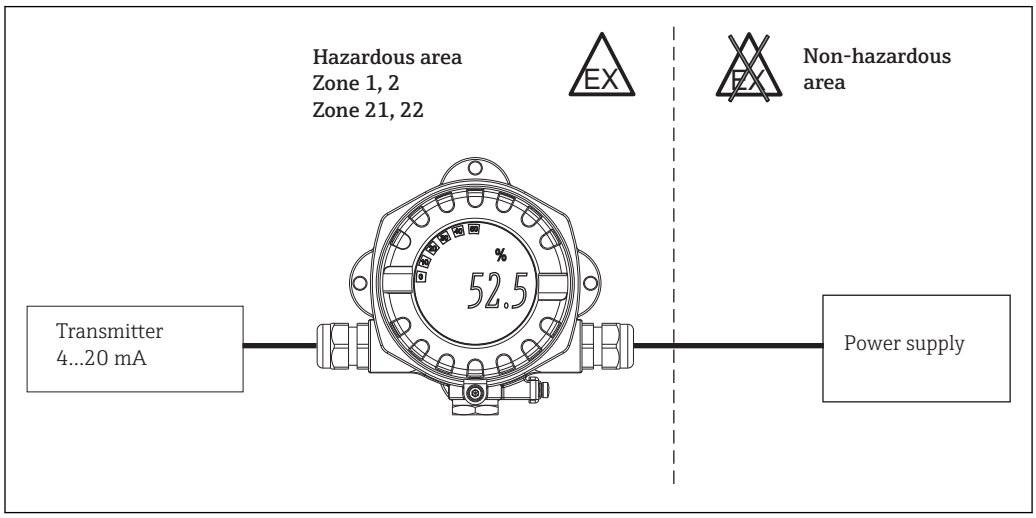
- Oil & gas
- Petrochemicals
- Plant and apparatus engineering
- Free-space applications
- Laboratory equipment
- Process recording and monitoring
- Optional: Stainless steel housing

Your benefits

- Loop-powered indicator in single-compartment housing
- 5-digit LC display, digit height 20.5 mm (0.8 in)
- Backlit display, pluggable in 90 ° steps
- Trend bar graph in increments of 10 %
- Measuring range display from −19 999 to 99 999
- Digital limit switch
- Freely programmable units
- 3-key operation
- International approvals
  ATEX, IECEx, FM, CSA, TIIS, UK CA, UL listed, BV and marine approvals
- 3 cable entries
- Configuration via interface with FieldCare PC software
- Configuration without power supply using setup box

Function and system design

Measuring principle



1 Example of an application of the field indicator

The indicator captures an analog measuring signal and presents it 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-compartment field housing with backlit LC display. Configuration of the measuring range, decimal point and offset of the display can be conveniently performed via three keys in the device with the housing open or via a PC with the FieldCare PC software.

Input

Measured variable

Current

Measuring range

4 to 20 mA Reverse polarity protection

Input signal

- Voltage drop < 4 V at 3 to 22 mA
- Max. voltage drop < 6 V at max. short-circuit current 200 mA

Output

Output signal

Digital limit switch

Passive, open collector:

I_{max}	200 mA

U_{max}	35 V

$U_{low/max}$	< 2 V at 200 mA

Max. reaction time to limit value	250 ms

Temperature range	−20 to +80 °C (−4 to +176 °F)

Signal on alarm

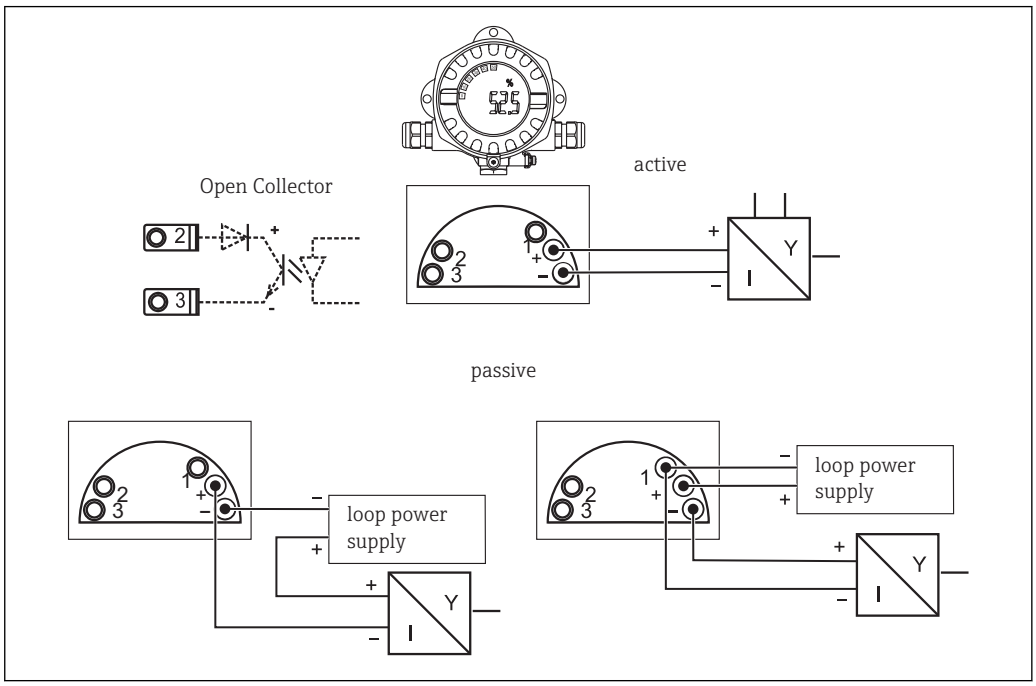
- No measured value visible in the LC display, no background illumination.
- Open collector inactive.

Transmission behavior

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

Power supply

Terminal assignment



2 *Terminal assignment of the field indicator*

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 instruments	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.

The device may only be powered by a power unit with an energy-limited circuit in accordance with UL/EN/IEC 61010-1, Section 9.4 and the requirements of Table 18.

Voltage drop

Voltage drop	< 3.6 V at 3 to 22 mA
Max. voltage drop	< 6 V at max. short-circuit current 200 mA

Terminals

Cables up to 2.5 mm² (14 AWG) max. plus ferrule

Cable entries

The following cable entries are available:
- NPT 1/2 thread
- M20 thread
- G1/2 thread
- 2x NPT1/2 gland + 1x dummy plug
- 2x M20 gland + 1x dummy plug

Performance characteristics

Reference conditions

T	25 °C (77 °F)

Maximum measured error

< 0.1 % of scaled display range

Influence of ambient temperature

Impact on 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 orientation is determined by the legibility of the display.

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 using the open collector output

The display may react slowly at temperatures < −20 °C (−4 °F).

At temperatures < −30 °C (−22 °F) the readability of the display can no longer be guaranteed.

Storage temperature

−40 to 80 °C (−40 to 176 °F)

Electrical safety

As per IEC 61010-1,

UL 61010-1,

CSA C22.2 No. 1010.1-92

Climate class

As per IEC 60654-1, Class C

Degree of protection

IP 66/IP67, Type 4X (not assessed by UL)

Vibration resistance

3g at 2 to 150 Hz as per IEC 60068-2-6

Condensation

Permitted

Installation category

1 as per 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.

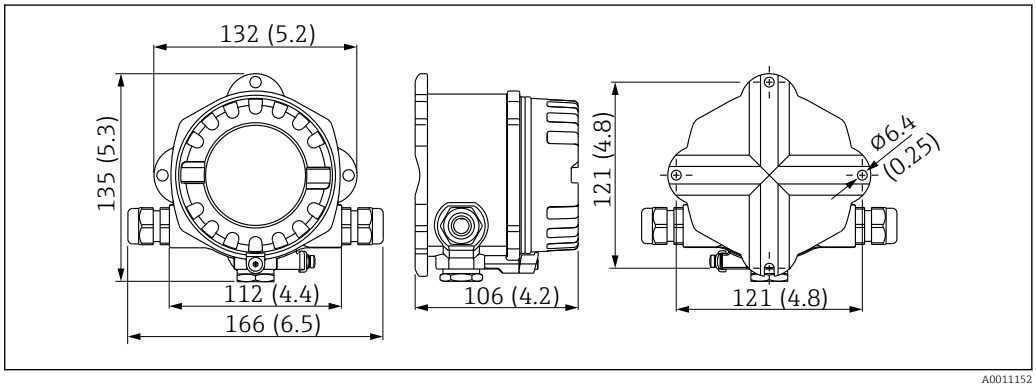
Interference immunity as per IEC/EN 61326 series, industrial requirements

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

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 Die-cast aluminum housing for general applications, or optional stainless steel housing



3 Dimensions in mm (in)

- Aluminum housing for general applications or, optional stainless steel housing
- Electronics compartment and connection compartment in single-chamber housing
- Display can be fitted in steps of 90 °

Weight

Aluminum housing	Approx. 1.6 kg (3.5 lb)
Stainless steel housing	Approx. 4.2 kg (3.5 lb)

Materials

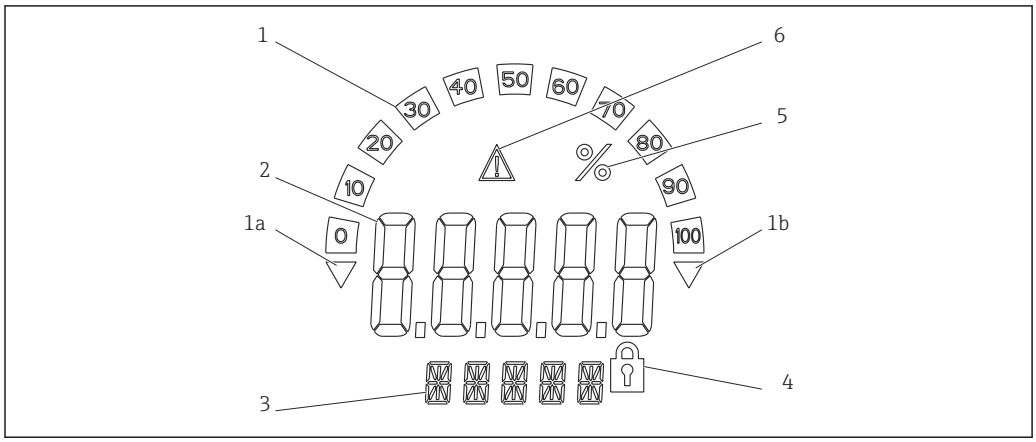
Housing	Nameplate
Die-cast aluminum AlSi10Mg/ALSi12Mg with powder coating on polyester base	Aluminum AlMgl, anodized in black
Stainless steel CF3M (316L)	Stainless steel 1.4404 (AiSi 316L)

Terminals Cables up to 2.5 mm^2 (14 AWG) max. plus ferrule

Human interface

Operation concept 3-key operation (-/+/E) integrated in the device, access when housing is open

Local operation



4 *LC display of the field indicator (backlit, fitted in steps of 90 °)*

1 Bar graph display
1a Mark for underranging
1b Mark for overranging
2 Measured value display, digit height 20.5 mm (0.8 in)
3 14-segment display for units and messages
4 "Programming locked" symbol
5 Unit "%"
6 "Fault" warning icon

- Display area
  −19 999 to +99 999
- Offset
  −19 999 to +99 999
- Signalization
  Overranging/underranging
- Limit value over/under cut
  Limit value overranging/underranging

Remote operation

Configuration

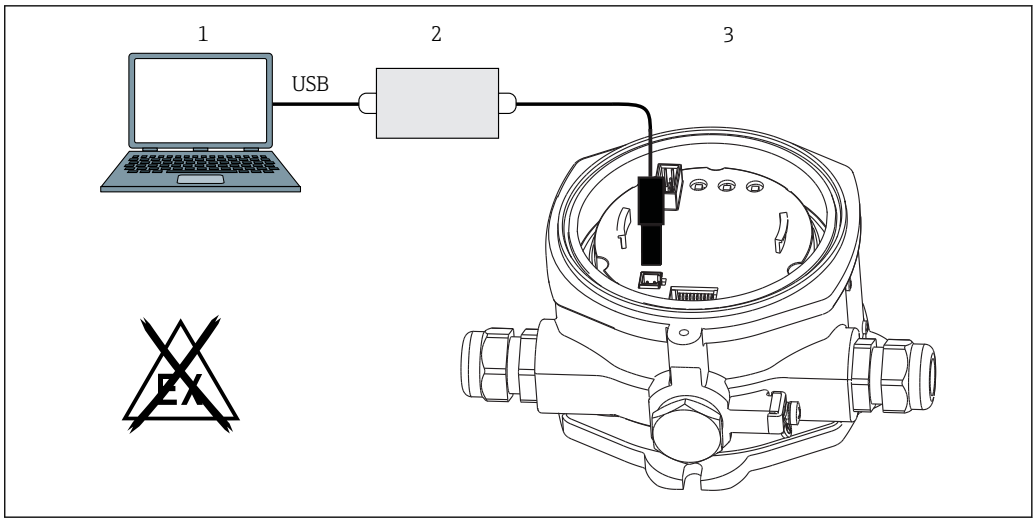
The device can be configured with the FieldCare PC software. FieldCare Device Setup is included in the scope of delivery of the Commubox FXA291 and TXU10-AC (see 'Accessories') or can be downloaded free of charge via www.endress.com.

Interface

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

Configurable device parameters (selection)

Measuring dimension, measuring ranges (linear/quadratic), setup lock via operator code, failsafe mode, digital filter (damping), offset, limit value (min/max/alarm), alarm limit values can be configured by the user



5 *Configuration via PC configuration software*

1 *PC configuration software*
2 *USB box configuration kit*
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**.

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** 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** The Brief Operating Instructions contain all the essential information from incoming acceptance to initial commissioning.
Operating Instructions (BA)	**Your reference document** 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** 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. 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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