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Technical Information
RIA16

Field indicator



Loop-powered field indicator for looping into the 4 to 20 mA current circuit

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

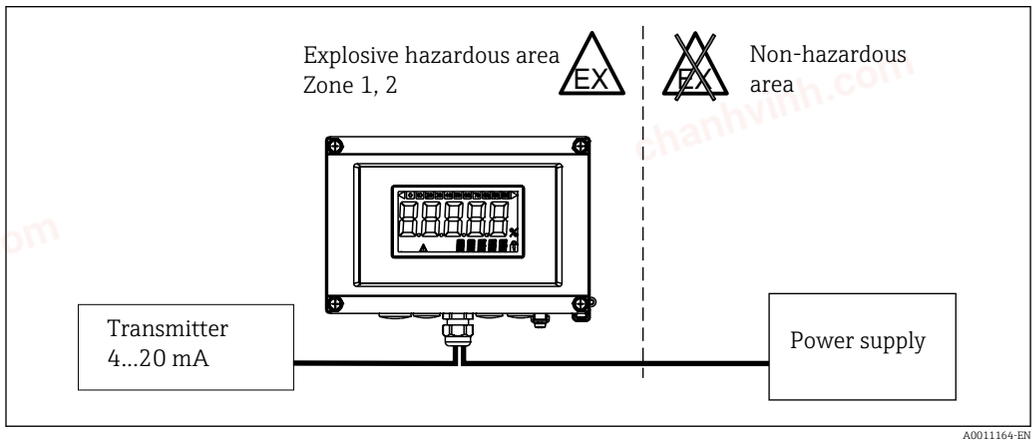
- Loop-powered indicator
- 5-digit LC display, character height 26 mm (1.02 in)
- Trend bargraph in increments of 10%
- Measuring range display from -19999 to 99999
- Digital limit switch
- Freely programmable units
- 3-key operation
- Approvals: ATEX, FM, CSA, GL
- Configuration with FieldCare PC software
- Configuration without power supply using setup box

Endress+Hauser
People for Process Automation

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Function and system design

Measuring principle



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 digitally and as a bargraph with limit value violation signalling. The indicator is looped into the 4 to 20 mA circuit and obtains 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
- $U_{low/max} \leq$ 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.

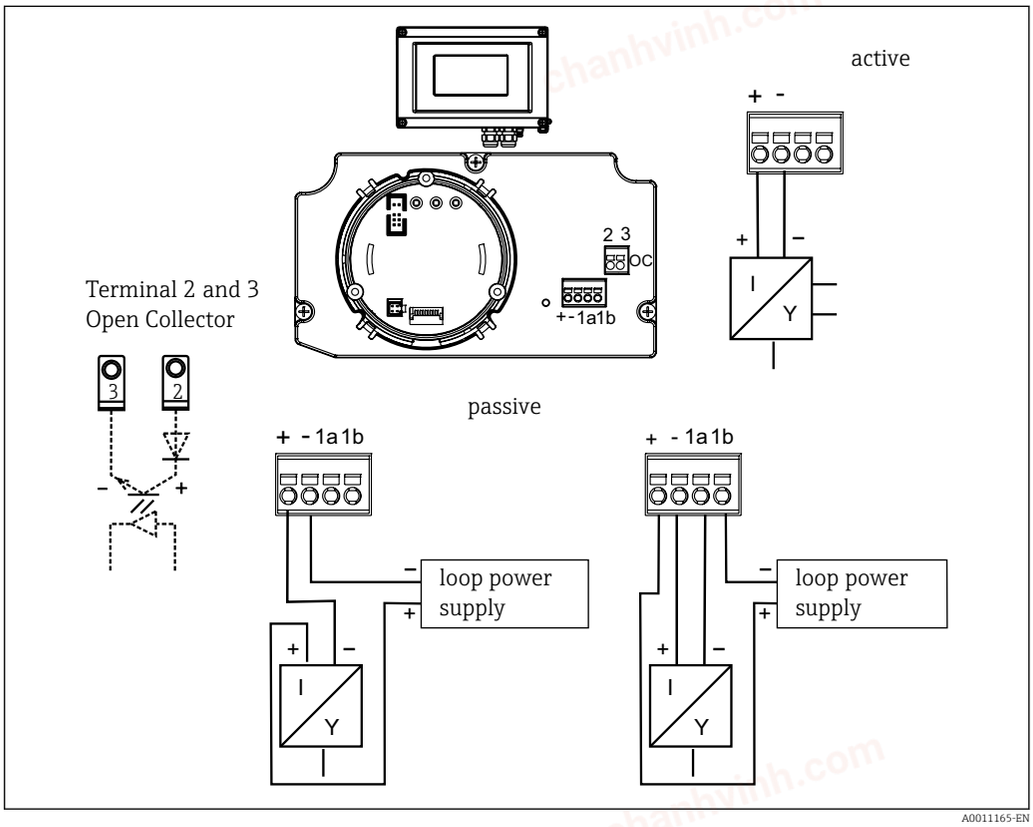
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Power supply

Supply voltage

Supply by means of the 4 to 20 mA current loop.

Electrical connection



2 *Terminal assignment of 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 instrumentation	Support terminal
2	Digital limit switch (collector)	Switch output
3	Digital limit switch (emitter)	Switch output

Cable entry

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

The plastic housing provides up to 5 cable entries. Ex works, 3 of them remain closed. You can open the cable entries using a suitable tool.

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

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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%

Installation

Mounting location	Wall or pipe mounting (see 'Accessories')
Orientation	No restrictions, the orientation is determined by the readability of the display.

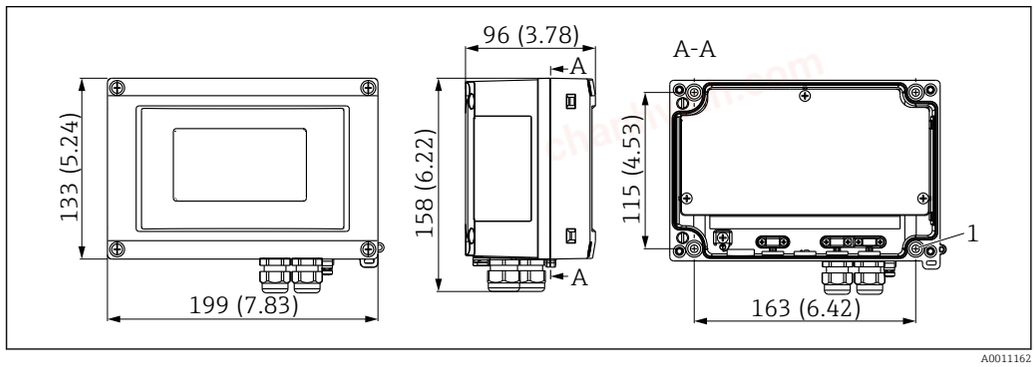
Environment

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 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 evaluated by UL)
Shock and vibration resistance	3g / 2 to 150 Hz as per IEC 60 068-2-6
Condensation	Permitted
Installation category	1 as per IEC 61010
Pollution degree	2 as per IEC 61010
Electromagnetic compatibility (EMC)	**CE compliance** 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 EU Declaration of Conformity. Maximum measured error < 0.2% of measuring range. Interference immunity as per IEC/EN 61326 series, industrial requirements. Interference emission as per IEC/EN 61326 series, Class B equipment.

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Mechanical constructions

Design, dimensions



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3 *Dimensions in mm (in)*

1 *Bore hole for mounting directly to the the wall or on the optional mounting plate with 4 screws Ø5 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

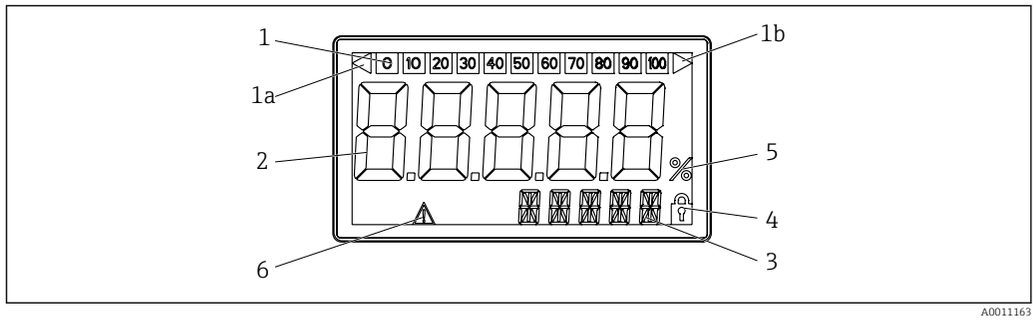
Cables / wires up to 2.5 mm^2 (14 AWG) plus ferrule

Operability

Operating concept

3-key operation (-/+/E) integrated in device, access with housing open

Local operation



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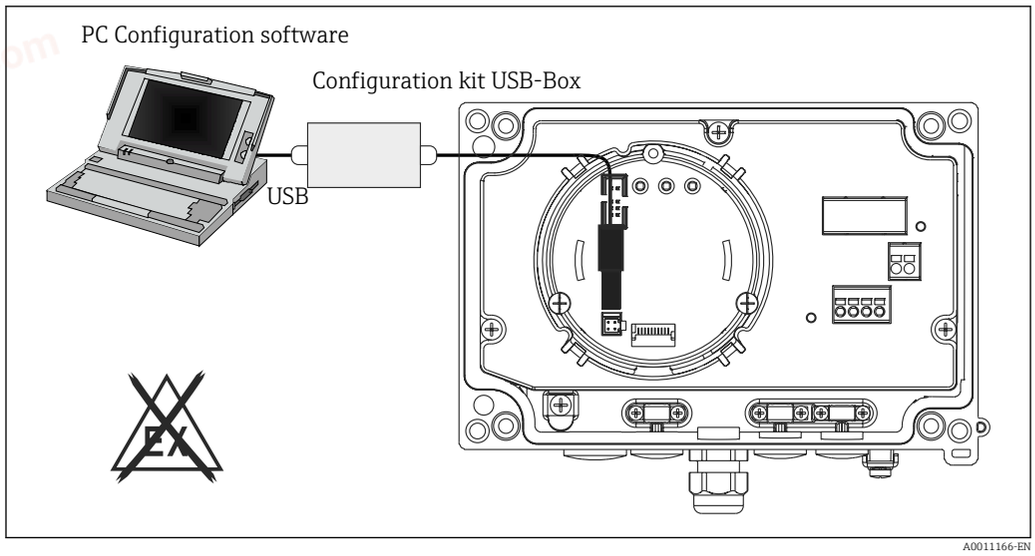
4 *LC display of the field indicator*

1 *bargraph display in increments of 10% with indicators for measuring range undershoot (item 1a)/overshoot (item 1b)*
2 *measured value display, character height 26 mm (1.02 in)*
3 *14-segment display for units and information messages*
4 *symbol "programming disabled"*
5 *unit "%"*
6 *warning symbol "failure"*

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- Display range
  -19999 to 99999
- Offset
  -19999 to 99999
- Signalling
  Measuring range overshoot/undershoot
- Limit value violation
  Lower/upper limit value exceeded

Remote operation



5 *Configuration with PC operating software*

Configuration

The device is configured with the FieldCare PC operating software. FieldCare Device Setup forms part of the scope of supply of Commubox FXA291 or TXU10-AC (see "Accessories") or can be downloaded free of charge from the Internet at www.endress.com.

Schnittstelle

Configuration interface at device; connection to PC via configuration cable (see "Accessories")

Configurable device parameters (selection)

Measuring dimension, measuring ranges (linear/square), setup block using user code, failsafe mode, digital filter (damping), offset, limit value (min/max/alarm), alarm limit values freely adjustable.

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Certificates and approvals

CE mark	The measuring system meets the legal requirements of the applicable EC guidelines. These are listed in the corresponding EC Declaration of Conformity together with the standards applied. Endress +Hauser confirms successful testing of the device by affixing to it the CE mark.
EAC mark	The product meets the legal requirements of the EEU guidelines. The manufacturer confirms the successful testing of the product by affixing the EAC mark.
Hazardous area approvals	Information about currently available Ex versions (ATEX, FM, CSA, etc.) can be supplied by your E+H Sales Center on request. All explosion protection data are given in a separate documentation which is available upon request.
Marine approval	Germanischer Lloyd (GL)
UL approval	UL recognized component (see www.ul.com/database, search for Keyword "E225237")
CSA GP	CSA General Purpose

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Ordering information

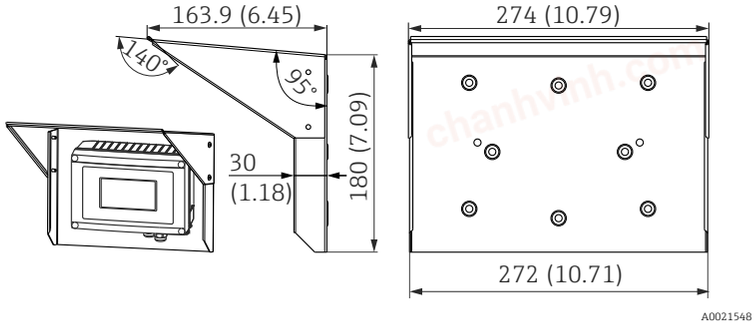
Detailed ordering information is available from the following sources:
- In the Product Configurator on the Endress+Hauser website: www.endress.com -> Click "Corporate" -> Select your country -> Click "Products" -> Select the product using the filters and search field -> Open product page -> The "Configure" button to the right of the product image opens the Product Configurator.
- From your Endress+Hauser Sales Center: www.addresses.endress.com

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

Various accessories, which can be ordered with the device or subsequently from Endress+Hauser, are available for the device. Detailed information on the order code in question is available from your local Endress+Hauser sales center or on the product page of the Endress+Hauser website: www.endress.com.

Device-specific accessories

Designation	Description
Mounting set wall/pipe (for pipes Ø1-5 inches)	
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

Documentation

- System components and data manager - solutions to complete your measuring point: FA00016K/09
- Operating isntructions process indicator RIA16: BA00280R/09
- Supplementary Ex-documentation: ATEX II2(1)G Ex ib[ia] IIC T6/T5/T4: XA00088R/09

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