

Technical Information

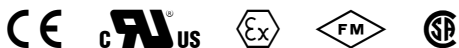
RIA16

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

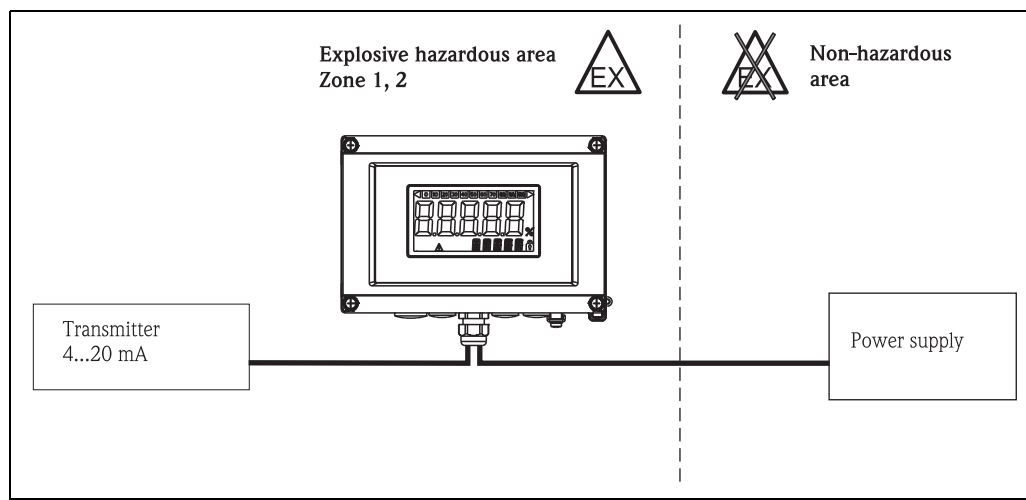


Your benefits

- Loop-powered indicator
- 5-digit LC display, character height 26 mm (1.02")
- 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
- Configuration with FieldCare PC software
- Configuration without power supply using setup box

Function and system design

Measuring principle



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

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

Output

Output

Digital limit switch
 Passive, open collector:
 $I_{\max} = 200 \text{ mA}$
 $U_{\max} = 35 \text{ V}$
 $U_{\text{low/max}} = < 2 \text{ V at } 200 \text{ mA}$
 Max. reaction time to limit value = 250 ms

Signal on alarm

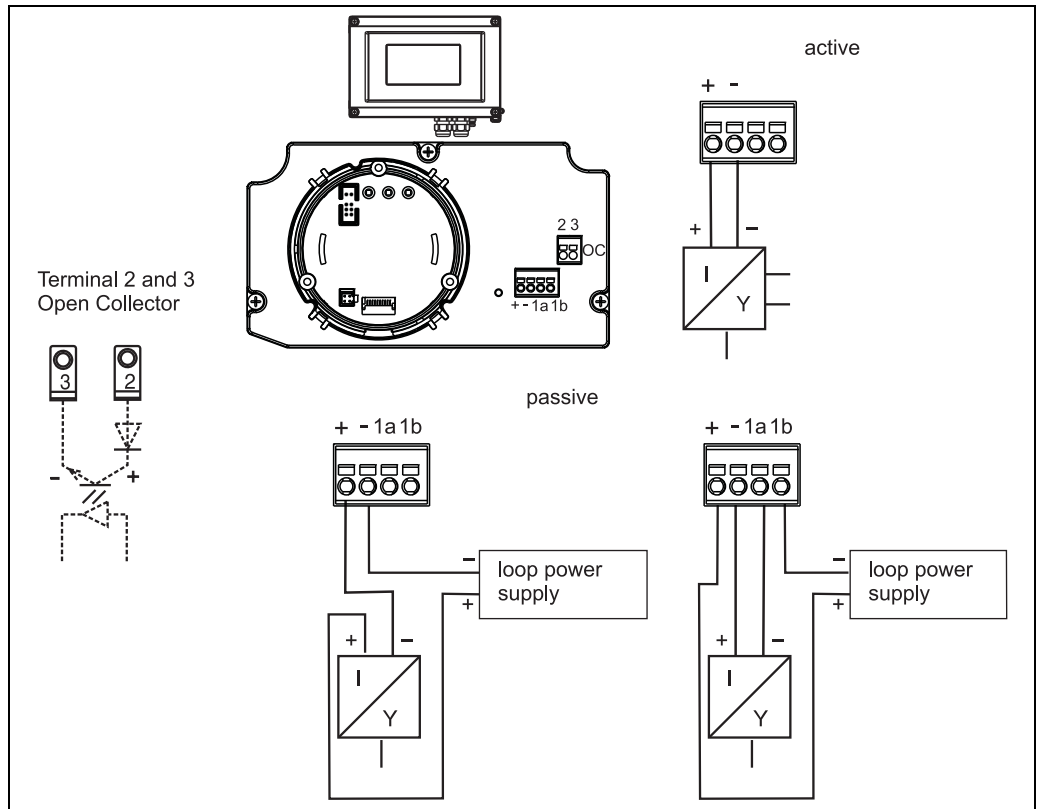
- No measured value visible on the LC display, no background illumination.
- Open Collector inactive.

Transmission behavior

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

Power supply

Electrical connection



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

Supply voltage

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

Cable entry

The following cable entries are available:

- 2x thread NPT1/2
- 2x thread M16



Note!

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.


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

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

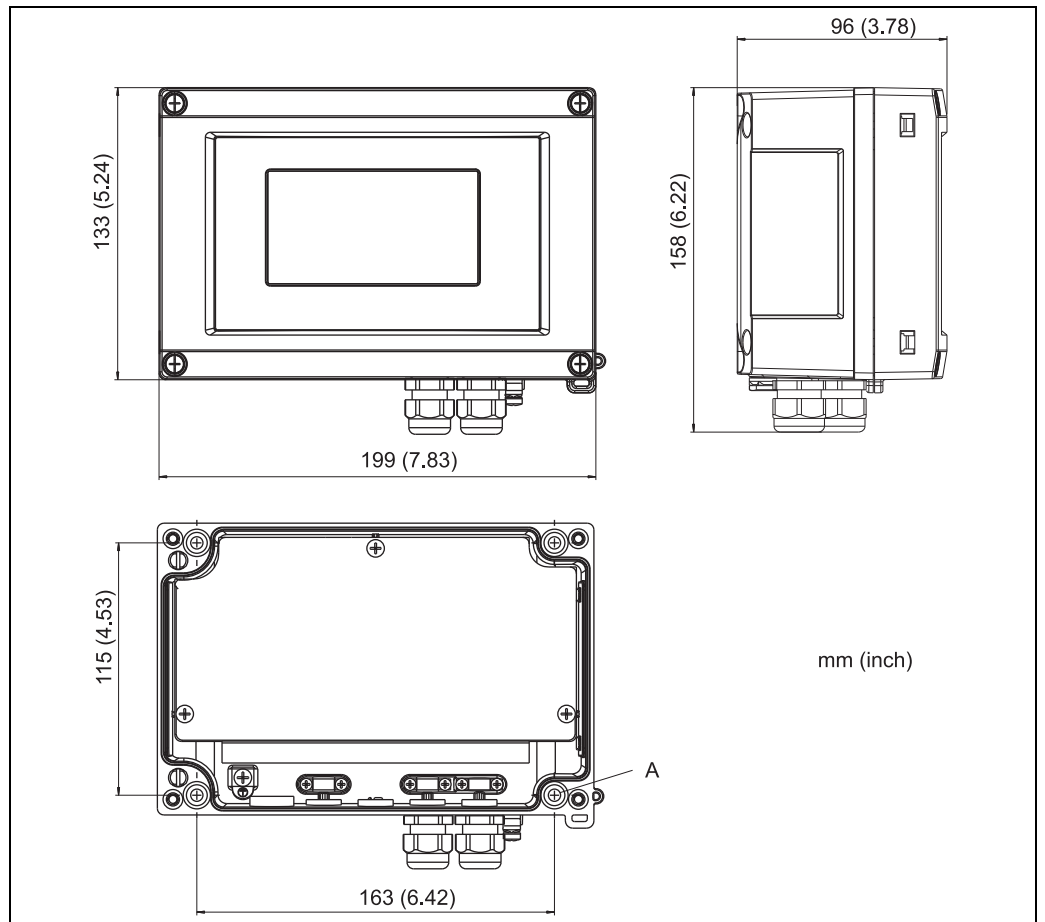
Environment

Ambient temperature limits	-40 to +80 °C (-40 to +176 °F)
	Note! 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 60 654-1, 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 to IEC 61010
Pollution degree	2 to IEC 61010
Electromagnetic compatibility (EMC)	<ul style="list-style-type: none"> ■ EN 61326 (IEC 61326): Electromagnetic compatibility (EMC requirements) ■ NAMUR (NE21): Association for Standards for Control and Regulation in the Chemical Industry ■ Maximum deviation: < 0.2 % of span

Mechanical construction

Design, dimensions

Fiber-glass reinforced plastic housing for general purpose or, as an option, aluminum housing



Data in mm (data in inches in brackets)

Weight

- Approx. 500 g (1.1 lb) (plastic housing)
- Approx. 1.7 kg (3.75 lb) (aluminum housing)

Material

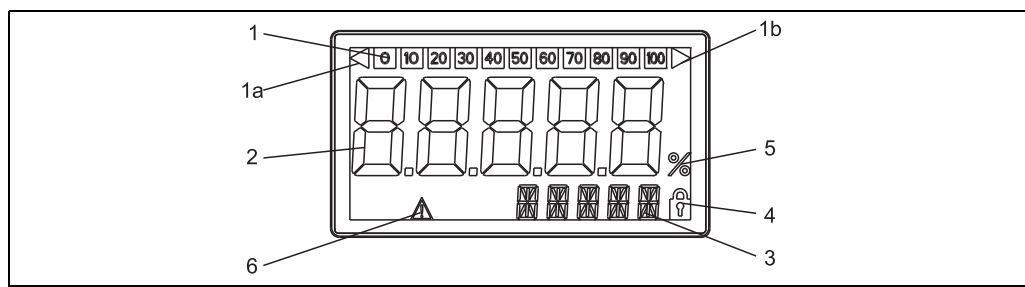
Housing	Nameplate
Fiber-glass reinforced plastic PBT-GF30	Laser marking
Aluminum AlSi12 (as an option)	Aluminum AlMg1, anodized in black

Terminals

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

Human interface

Display elements



LC display of the field indicator

Item 1: bargraph display in increments of 10% with indicators for measuring range undershoot (item 1a)/overshoot (item 1b)

Item 2: measured value display, character height 26 mm (1.02")

Item 3: 14-segment display for units and information messages

Item 4: symbol "programming disabled"

Item 5: unit "%"

Item 6: warning symbol "failure"

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

Operating elements

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

Remote operation

Configuration

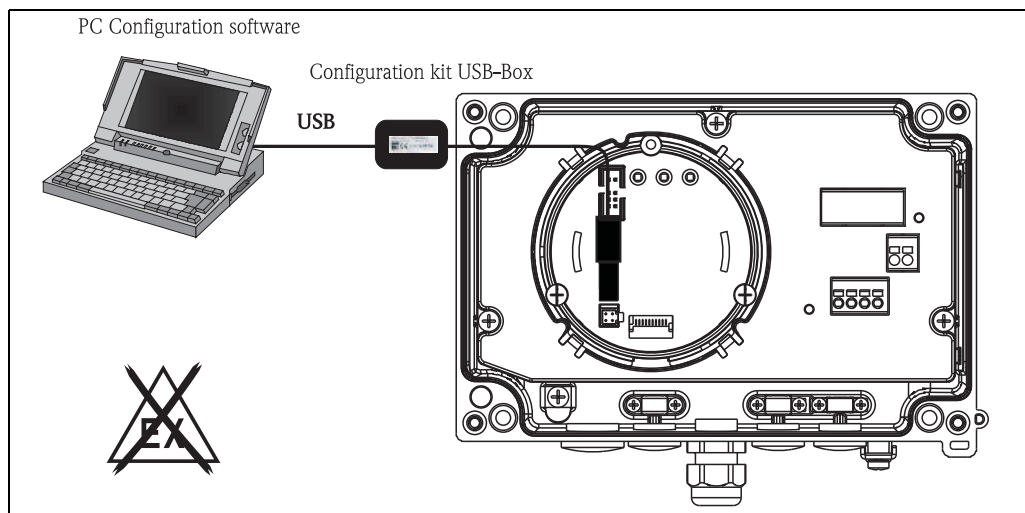
The device is configured with the FieldCare PC operating software. FieldCare Device Setup forms part of the scope of supply of Commubox FXA291 or TXU10-AC (see 'Accessories') or can be downloaded free of charge from the Internet at www.endress.com.

Interface

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.



Configuration with PC operating software.

Certificates and approvals

CE mark	The device complies with the legal requirements of the EC directives. Endress+Hauser confirms that the device has been successfully tested by affixing to it the CE 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.
Other standards and guidelines	<ul style="list-style-type: none">■ IEC 60529: Degree of protection by housing (IP-Code)■ IEC 61010-1: Safety requirements for electrical measurement, control and laboratory instrumentation.■ EN 61326: Electrical equipment for measurement, control and laboratory use - EMC requirements.■ NAMUR: User association of automation technology in process industries (www.namur.de)■ NEMA: Standardization association for the electrical industry in North America.
UL	Recognized component to UL 3111-1
CSA GP	CSA General Purpose

Ordering information

Product structure

RIA16	Field indicator 1 channel, scalable; loop powered. 5-digit LC display, character height 26 mm (1.02") Bargraph resolution 10%, over-/underrange, unit display. Internal 3-key operation; Open Collector. NEMA 4x, IP67. Field housing.
Approval:	
AA	Non-hazardous area
BA	ATEX II2(1)G Ex ib[ia] IIC T6
BN	ATEX II3G Ex nA II T4/T5/T6
CA	CSA General purpose
C1	CSA IS, NI/1/2/ABCDEFG/T6
F1	FM IS, NI/1/2/ABCDEFG/T6
IB	IECEX Ex ib[ia] IIC T6
Housing:	
1	Plastics, glass fiber reinforced
2	Aluminum
Cable entry:	
A	M16
B	NPT1/2
RIA16-	← Order code (part 1; 1 attribute per category must be selected.)
Additional selection (as option - no selection or multiple selection is possible)	
Accessories, mounted:	
EA	2x adapter M16 to M20 + 2x M20 cable gland
E1	2x cable gland M16
E6	2x adapter M16 to NPT1/2
E8	2x adapter M16 to M20
Calibration:	
F1	Works calibration certificate
Service:	
G1	Pre-configured as per customer specification
G9	Special version, TSP-no. to be spec.
Further approvals:	
H2	UL listed
Accessories:	
I1	Blind plug
I2	Mounting kit wall/tube
I3	Configuration kit TXU10
I4	Weather protection cover
Identification:	
Z1	Measuring point (TAG), metal
Z2	Measuring point (TAG), on device
Z3	Mounting marker, paper
Z6	Measuring point (TAG), as specified by customer
RIA16-	+ ← Order code (complete)

Accessories

Accessories

Order No.	Name
FXA291	Commubox FXA291 incl. FieldCare Device Setup and DTM library
TXU10-AC	Commubox TXU10 incl. FieldCare Device Setup and DTM library
71091611	Pipe mounting kit with steel mounting plate (for pipes with Ø1-5 inches)
71089844	Pipe mounting kit with plastic mounting plate (for pipes with Ø1-5 inches)

Documentation

- Overview brochure: System components: FA016K/09
- Operating Instructions for 'RIA16 field indicator': BA280R/09
- Supplementary Ex documentation:
ATEX II2(1)G EX ib[ia] IIC T6/T5/T4: XA088R/09/a3

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