

## Technical information

### Field display

# RIA 261

Digital loop-powered field display  
for 4 to 20 mA current loops



#### Features and benefits

- Loop-powered display, no additional power supply cable required
- 5 digit LC display, 26 mm height
- Trend bargraph in 10% steps
- Rear illumination without additional power supply
- Measurement range displayed from -19999 to 99999
- Flexible measurement range set up using three push buttons
- Certification
  - ATEX
  - FM
  - CSA
- GL Germanischer Lloyd Marine approval
- Two cable entries for wiring the measurement circuit
- Space for installing additional measurement electronics, e.g. temperature head transmitters
- Housing can be lead sealed
- Protection class IP66/NEMA 4X
- GORE-TEX® membrane for pressure compensation

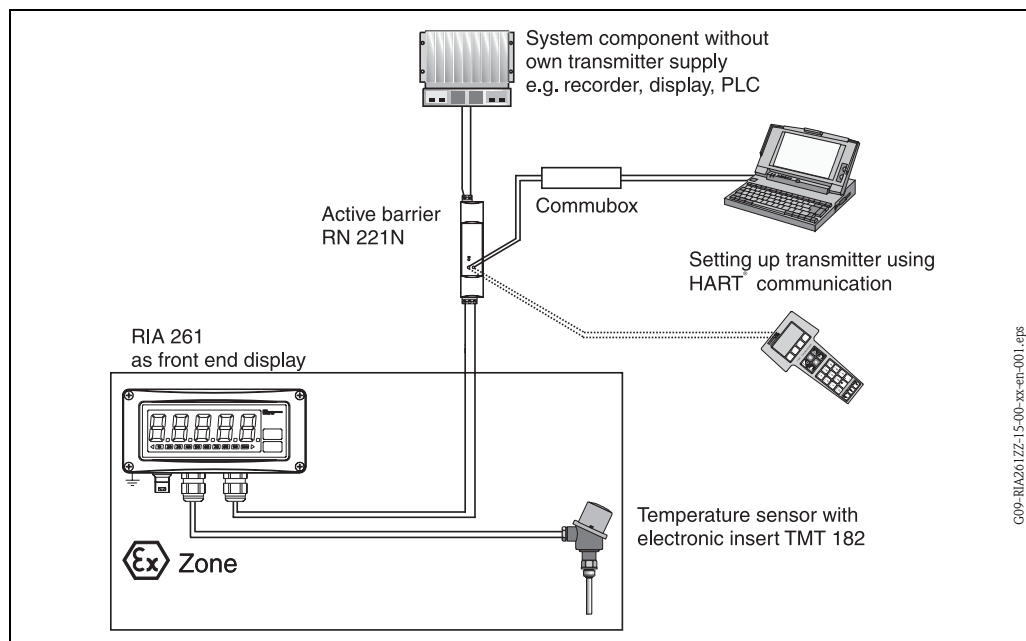
#### Application

- Plant and machine construction
- Field mounted applications
- Laboratory fittings
- Process display, monitoring
- Suitable for Ex application



## Function and system design

### Measuring principle



Example for field display application area

The display measures an analogue measurement signal and indicates this on the display. The display is connected in a 4 to 20 mA current loop and also derives its supply from the loop. The volt drop is almost negligible (< 2.5 V). The dynamic internal resistance (load) makes sure that independently from the loop current, the maximum volt drop is never exceeded. The analogue signal at the input is digitised, analysed and shown in the rear illuminated display.

### Equipment architecture

Micro-controller controlled field mounted display with illuminated LC display. Setting up measurement range, decimal point and offset of the display is easily done on an open unit using the three operational push buttons fitted. Setting up during operation is possible. The rear illuminated display is always active and needs no further wiring for its energy requirement.

## Input

#### Measured variable

Current

#### Measuring range

4 to 20 mA (polarity protected)

#### Electrical specifications

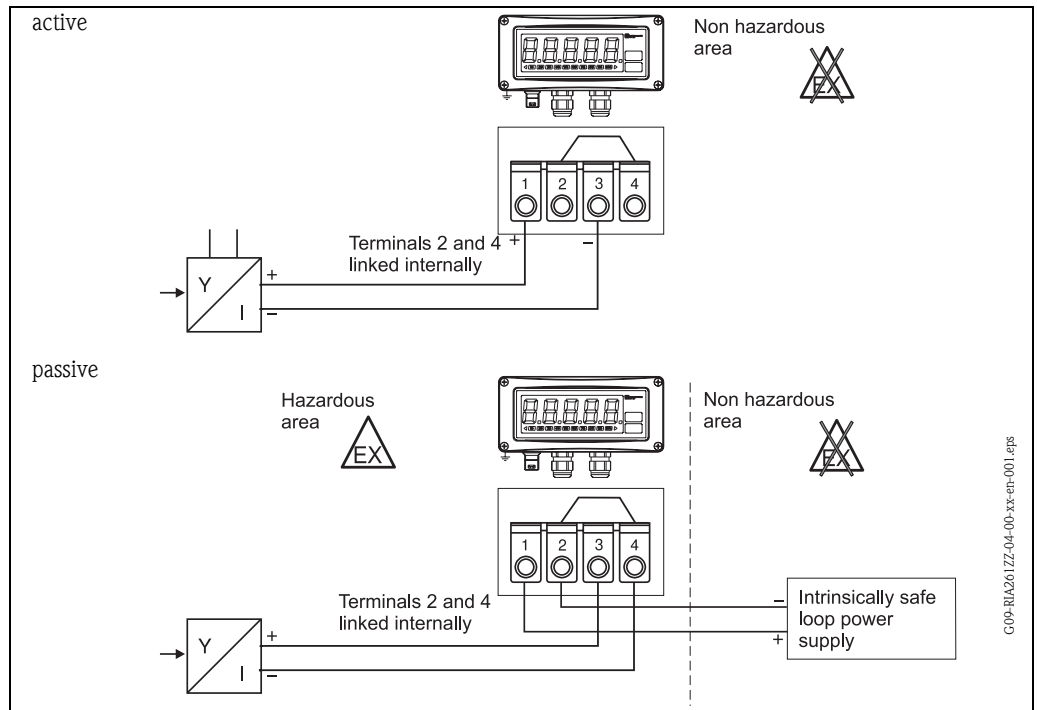
- Volt drop (load)  
< 2.5 V
- Max. input current (short circuit current)  
200 mA

## Output

<b>Output signal</b>	The analogue input signal (4 to 20 mA) is not converted. The input signal is digitised, analysed and shown in the LC display.
<b>Signal on alarm</b>	No measured value seen in the LC display, no rear illumination.
<b>Transmission behaviour</b>	The display allows transmission of the HART® transmission protocol.

## Auxiliary energy

### Electrical connection



Field mounted display terminal layout

	Terminal	In- and outputs
1	Measurement signal (+) 4 to 20 mA	Signal input
2	Connection terminal for further instrumentation	Terminal
3	Measurement signal (-) 4 to 20 mA	Signal input
4	Connection terminal for further instrumentation	Terminal

<b>Supply voltage</b>	The power supply is done using the 4 to 20 mA current loop power. Volt drop: < 2.5 V
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<b>Cable entry</b>	2 x M20 cable entries  Alternative: 2 x 1/2" NPT cable entries
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## Performance characteristics

<b>Reference conditions</b>	T = 25 °C
<b>Maximum measured error</b>	< 0.1% of scaled analogue range
<b>Non-repeatability</b>	Not specified
<b>Influence of ambient temperature</b>	Temperature drift = 0.01%/K ambient temperature

## Operating conditions

<b>Installation instructions</b>	<ul style="list-style-type: none"> <li>■ Installation area: Wall or pipe mounting (see Accessories)</li> <li>■ Installation angle: No limitations</li> </ul>
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## Environment

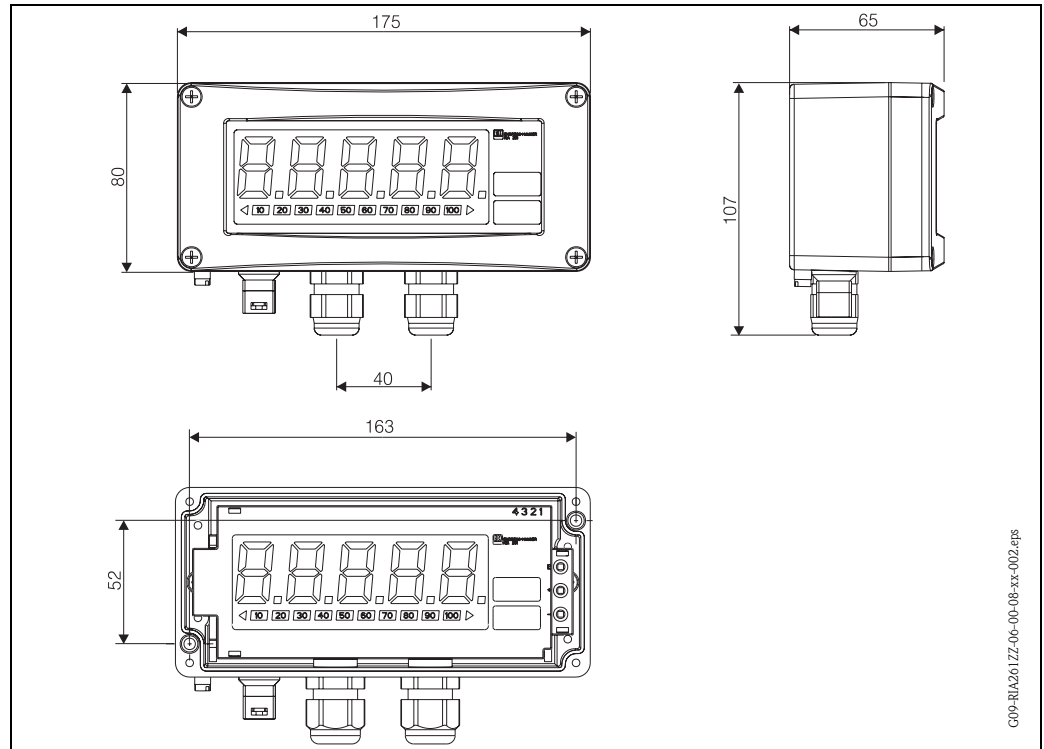
<b>Ambient temperature range</b>	-20 to +60 °C (for Ex areas, see Ex certificate)
<b>Ambient temperature limits</b>	See ambient temperature range
<b>Storage temperature</b>	-25 to +70 °C
<b>Climate class</b>	To IEC 60654-1, Class D1
<b>Degree of protection</b>	IP66, NEMA 4X
<b>Shock resistance</b>	7 Nm housing, 4 Nm glass to IEC 60079-0
<b>Vibration resistance</b>	Not specified
<b>Electromagnetic compatibility</b>	<p><b>RF protection</b> To EN 55011 Group 1, Class B</p>

### Interference safety

- ESD to IEC 61000-4-2, 6 kV/ 8 kV
- Electromagnetic fields to IEC 61000-4-3, 10 V/m
- Burst (power supply) to IEC 61000-4-4, 4 kV
- Surge to IEC 61000-4-5, 1 kV
- Cable high frequency to IEC 61000-4-6, 10 V

## Mechanical construction

### Design, dimensions



Unit dimensions in mm

Dimensions for wall mounting holes (lower picture) in mm

- There is room available behind the hinged electronics for additional electronics e.g. temperature head transmitter. **Take note of manufacturers installation instructions!**  
Internal dimensions: H = 60 mm, W = 140 mm, D = 30 mm
- Housing can be lead sealed
- GORE-TEX® membrane used as pressure compensation fitted to the left of the cable entries

### Weight

Approx. 800 g

### Material

#### Housing

Die cast aluminium epoxy coated with glass insert

#### Wall/stand pipe mounting kit and tensioning tape

1.4301 stainless steel

### Terminals

- Plug in screw terminals inside the housing in order enable loop current connection:  
Plug on screw terminals, terminal size 1.5 mm<sup>2</sup> solid core, 1.0 mm<sup>2</sup> stranded with ferrule
- Earth (ground) connection on housing exterior: Terminal range 2.5 mm<sup>2</sup>

## Human interface

### Display elements

- Display  
5 digit LC display, 26 mm character height, rear illuminated  
Bargraph display in 10% steps, markers for over/under range display
- Display range  
-19999 to +99999
- Offset  
-19999 to +32767
- Operation  
Three push button operation (-/+/E) integrated in the unit, access when unit is opened
- Signals  
Measurement range over/under value
- Rear illumination  
Illumination brightness increases with an increase in loop current

## Certificates and approvals



The measurement system fulfils the legal requirements laid out within the EU regulations 89/336/EWG. Endress+Hauser acknowledges successful testing of the unit by adding the CE mark.

### Ex approval

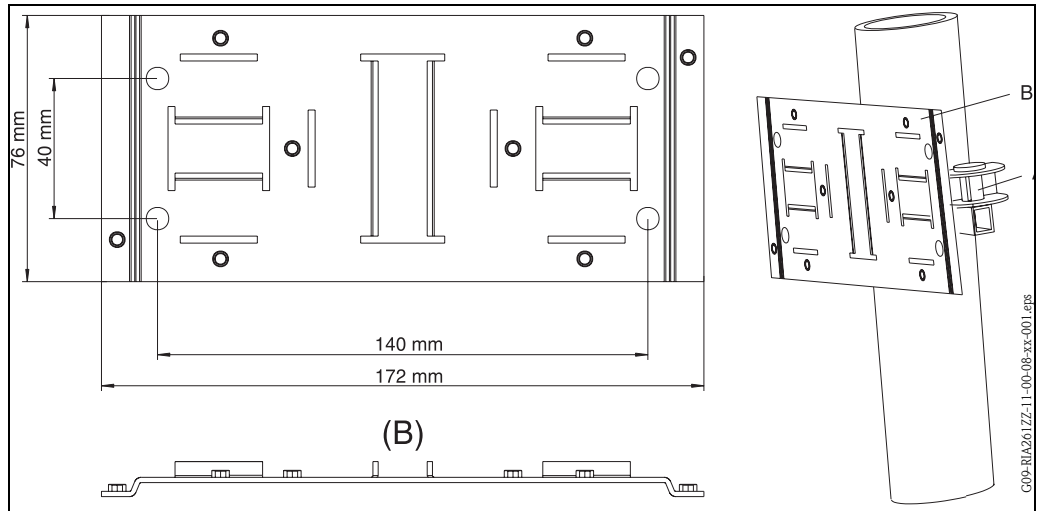
Details regarding the availability of the Ex versions (ATEX, FM, CSA, etc.) can be obtained from your local E+H sales organisation. All relevant data for Ex protection can be found in separate Ex documentation, which can be requested separately.

## Ordering information

### Product structure

<b>Process Display RIA261, Field</b>	
Electronic indicator. Loop powered. 1 channel, presettable scale. Display LC, 5 digit, char. height 26mm. Bargraph -10...110%. Approval: GL (German Lloyd) Marine. Rear-illuminated display.	
<b>Approval:</b>	
A	Non-hazardous area
B	ATEX II2(1)G EEx ia IIC T6
C	FM IS, NI Cl.I / 1,2 Gr.ABCD T6
D	CSA Cl.I, Div 1,2 Gr. ABCD T6
E	ATEX II3G EEx nA IIC T6
<b>Housing; Cable entry:</b>	
1	Alu IP66 NEMA4x; gland M20
2	Alu IP66 NEMA4x; thread NPT 1/2
<b>Additional option:</b>	
1	Basic version
2	Mounting bracket, wall / pipe
3	Works calib. certif.
4	Mounting bracket, wall / pipe + WCC=Works calib. certif.
RIA261-	← Order code

## Accessories



Wall and stand pipe mounting kit, pos. B (with tension tape installation, pos. A)  
Order number 51003502

## Further documentation

- Operating manual process display RIA 261 (BA111R/09/)
- Ex additional documentation: ATEX (XA007R/09/a3) FM, CSA, etc.
- Brochure "System Components" (FA016K/09/en)

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Subject to modification

#### International Head Quarter

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