

## Input

<b>Measured variables</b>	Conductivity, resistivity, temperature	
<b>Measuring range</b>	Conductivity (conductive): Conductivity (inductive): Resistivity: Concentration: Temperature:	0 to 600 mS/cm (uncompensated) 0 to 2000 mS/cm (uncompensated) 0 to 200 M $\Omega$ -cm 0 to 9999 (% , ppm, mg/l, TDS) -35 to +250 °C (-31 to +482 °F)
<b>Cable specification</b>	Cable length (conductive):  Cable length (inductive): Cable resistance CYK71:	conductivity: max. 100 m (328.1 ft) (CYK71) resistivity: max 15 m (49.22 ft) (CYK71) max 55 m (180.46 ft) (CLK5) 165 $\Omega$ /km (conductivity measurement)
<b>Cell constant</b>	Adjustable cell constant:	k = 0.0025 to 99.99 cm <sup>-1</sup>
<b>Temperature sensors</b>	Pt 100, Pt 1000, NTC 30K	
<b>Measuring frequency</b>	Conductivity, resistivity (conductive): Conductivity (inductive):	170 Hz to 2 kHz 2 kHz
<b>Binary inputs</b>	Voltage: Power consumption:	10 to 50 V max. 10 mA
<b>Current input</b>	4 to 20 mA, galvanically separated Load: 260 $\Omega$ at 20 mA (voltage drop 5.2 V)	

## Output

**Output signal** 0/4 to 20 mA, galvanically separated, active

<b>HART</b>	
Signalkodierung	Frequency Shift Keying (FSK) + 0,5 mA über Stromausgangssignal
Datenübertragungsrate	1200 Baud
Galvanische Trennung	ja

<b>PROFIBUS PA</b>	
Signalkodierung	Manchester Bus Powered (MBP)
Datenübertragungsrate	31,25 kBit/s, Spannungsmodus
Galvanische Trennung	ja (IO-Module)

<b>PROFIBUS DP</b>	
Signalkodierung	RS485
Datenübertragungsrate	9,6 kBd, 19,2 kBd, 93,75 kBd, 187,5 kBd, 500 kBd, 1,5 MBd
Galvanische Trennung	ja (IO-Module)

<b>Signal on alarm</b>	2.4 or 22 mA in case of an error	
<b>Load</b>	maximum 500 $\Omega$	
<b>Linearization transmission behaviour</b>	Conductivity:	adjustable
	Resistivity:	adjustable
	Concentration:	adjustable
	Actuating variable:	adjustable
	Temperature:	adjustable
<b>Resolution</b>	max. 700 digits/mA	
<b>Min. distance for 0 / 4 to 20 mA signal</b>	Conductivity:	
	Measured value 0 to 1.999 $\mu\text{S/cm}$	0.2 $\mu\text{S/cm}$
	Measured value 0 to 19.99 $\mu\text{S/cm}$	2 $\mu\text{S/cm}$
	Measured value 20 to 199.9 $\mu\text{S/cm}$	20 $\mu\text{S/cm}$
	Measured value 200 to 1999 $\mu\text{S/cm}$	200 $\mu\text{S/cm}$
	Measured value 2 to 19.99 mS/cm	2 mS/cm
	Measured value 20 to 2000 mS/cm	20 mS/cm
	Resistivity	
	Measured value 0 to 199.9 k $\Omega\cdot\text{cm}$	20 k $\Omega\cdot\text{cm}$
	Measured value 200 to 1999 k $\Omega\cdot\text{cm}$	200 k $\Omega\cdot\text{cm}$
	Measured value 2 to 19.99 M $\Omega\cdot\text{cm}$	2.0 M $\Omega\cdot\text{cm}$
	Measured value 20 to 200 M $\Omega\cdot\text{cm}$	20 M $\Omega\cdot\text{cm}$
	Concentration	no minimum distance
	Temperature	15 $^{\circ}\text{C}$
<b>Isolation voltage</b>	max. 350 V <sub>RMS</sub> /500 V DC	
<b>Overvoltage protection</b>	according to EN 61000-4-5	
<b>Auxiliary voltage output</b>	Output voltage:	15 V $\pm$ 0.6
	Output current:	max. 10 mA
<b>Contact outputs</b>	Switching current with ohmic load (cos $\varphi$ = 1):	max. 2 A
	Switching current with inductive load (cos $\varphi$ = 0.4):	max. 2 A
	Switching voltage:	max. 250 V AC, 30 V DC
	Switching power with ohmic load (cos $\varphi$ = 1):	max. 500 VA AC, 60 W DC
	Switching power with inductive load (cos $\varphi$ = 0.4):	max. 500 VA AC, 60 W DC
<b>Limit contactor</b>	Pickup/dropout delay:	0 to 2000 s
<b>Controller</b>	Function (adjustable):	pulse length/pulse frequency controller
	Controller response:	PID
	Control gain K <sub>p</sub> :	0.01 to 20.00
	Integral action time T <sub>n</sub> :	0.0 to 999.9 min
	Derivative action time T <sub>v</sub> :	0.0 to 999.9 min
	Period for pulse length controller:	0.5 to 999.9 s
	Frequency for pulse frequency controller:	60 to 180 min <sup>-1</sup>
	Basic load:	0 to 40% of max. set value
<b>Alarm</b>	Function (selectable):	Latching/momentary contact
	Alarm threshold adjustment range:	Conductivity, resistivity, concentration, temperature, USP, EP: complete measuring range
	Alarm delay:	0 to 2000 s (min)

**Protocol specific data**

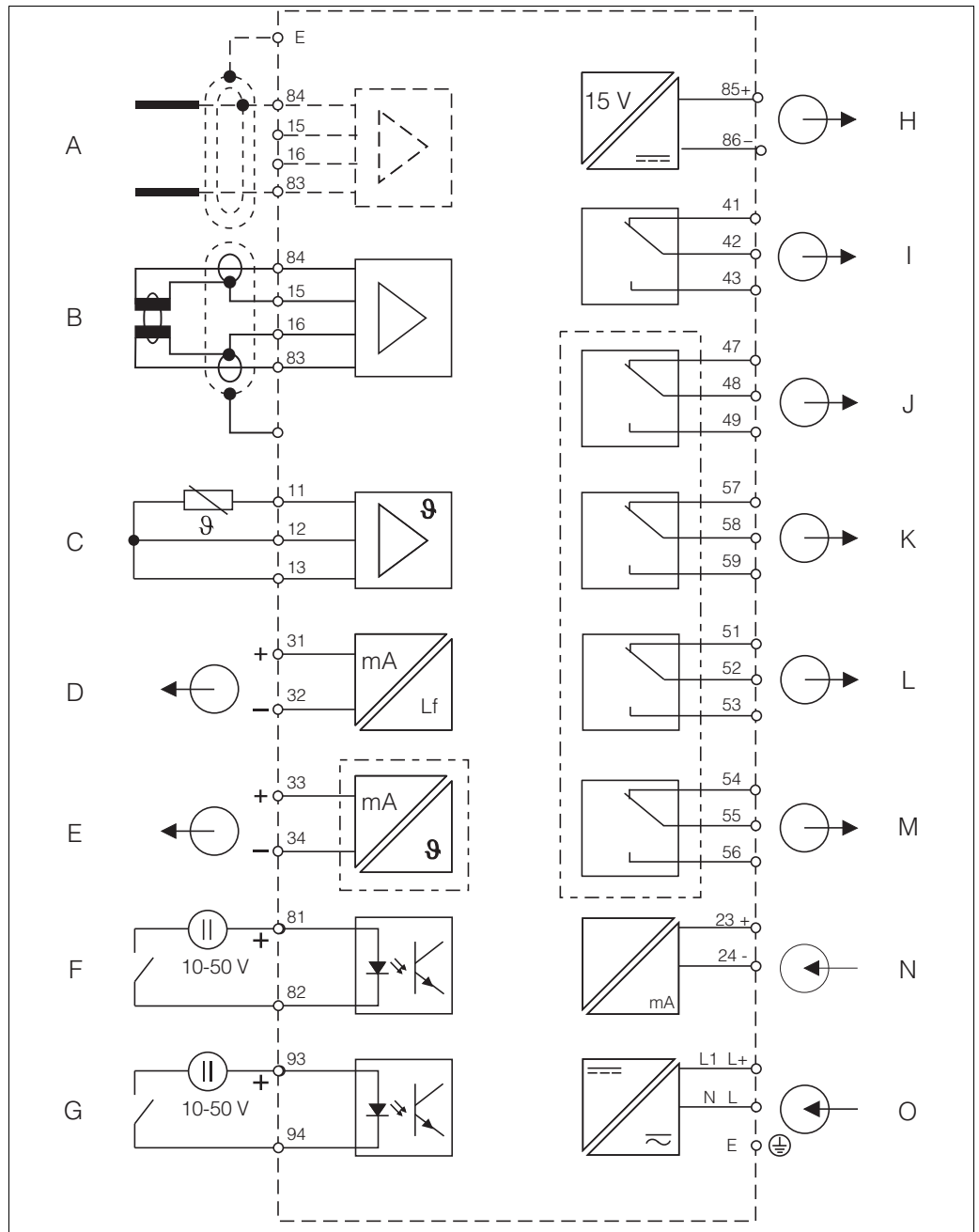
<b>HART</b>	
Manufacturer ID	11 <sub>h</sub>
Device type code	0092 <sub>h</sub> (ind. measured), 0093 <sub>h</sub> (cond. measured)
Transmitter specific revision	0001 <sub>h</sub>
HART specification	5.0
DD files	<a href="http://www.products.endress.com/profibus">www.products.endress.com/profibus</a>
Load HART	250 Ω
Device variables	None (dynamic variables PV, SV, only)
Features supported	-

<b>PROFIBUS PA</b>	
Manufacturer ID	11 <sub>h</sub>
Ident number	1515 <sub>h</sub>
Device revision	11 <sub>h</sub>
Profile version	2.0
GSD files	<a href="http://www.products.endress.com/profibus">www.products.endress.com/profibus</a>
GSD file version	
Output values	Main value, temperature value
Input values	Display value of PLC
Features supported	Device locking: The device can be locked by hardware or software.

<b>PROFIBUS DP</b>	
Manufacturer ID	11 <sub>h</sub>
Ident number	1521 <sub>h</sub>
Profile version	2.0
GSD files	<a href="http://www.products.endress.com/profibus">www.products.endress.com/profibus</a>
GSD file version	
Output values	Main value, temperature value
Input values	Display value of PLC
Features supported	Device locking: The device can be locked by hardware or software.

# Power supply

## Electrical connection



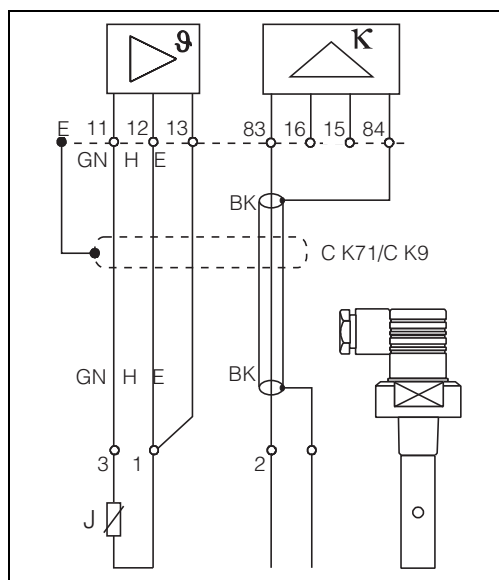
Electrical connection of the transmitter

- |   |                              |   |   |
|---|------------------------------|---|---|
| A | Sensor (conductive)          | I | Alarm (current-free contact position)   |
| B | Sensor (inductive)           | J | Relay 1 (current-free contact position) |
| C | Temperature sensor           | K | Relay 2 (current-free contact position) |
| D | Signal output 1 conductivity | L | Relay 3 (current-free contact position) |
| E | Signal output 2 variable     | M | Relay 4 (current-free contact position) |
| F | Binary input 1 (Hold)        | N | Current input 4 ... 20 mA               |
| G | Binary input 2 (Chemoclean)  | O | Power supply                            |
| H | Aux. voltage output          |   |   |

The instrument has protection class II and is generally operated without protective earth connection. To ensure the measuring stability and the function for conductive sensors you have to connect the outer screen of the sensor cable to the PE terminal.

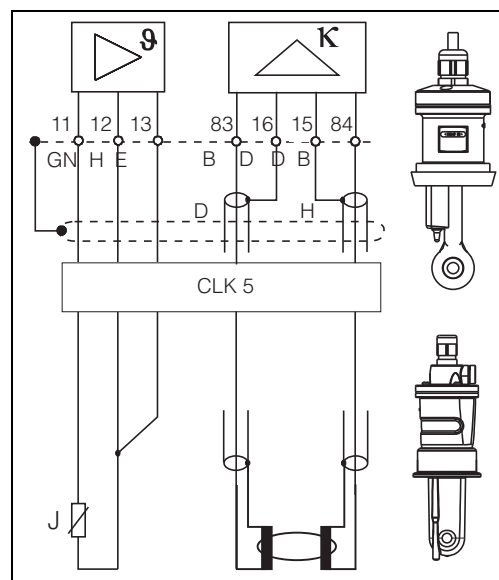
**Sensor connection**

You require screened special measuring cables to connect conductivity sensors to the transmitter. To extend the measuring cable, use junction box and extension cable (see accessories).



C07-CLM2x3xx-04-06-00-xx-007.eps

Connection of conductive sensors



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Connection of inductive sensors

**Supply voltage**

Depending on ordered version:  
100/115/230 V AC +10/-15 %, 48 to 62 Hz  
24 V AC/DC +20/-15 %

**Fieldbus connection**

<b>HART</b>	
Supply voltage	n/a, active current outputs
Integrated reverse voltage protection	n/a, active current outputs

<b>PROFIBUS PA</b>	
Supply voltage	9 V to 32 V, max. 35 V
Polarity sensitive	no
FISCO/FNICO compliant acc. to IEC 60079-27	no

<b>PROFIBUS DP</b>	
Supply voltage	9 V to 32 V, max. 35 V
Polarity sensitive	n/a
FISCO/FNICO compliant acc. to IEC 60079-27	no

**Power consumption**

max. 7.5 VA

**Mains protection**

Fine-wire fuse, medium-slow blow 250 V/3.15 A

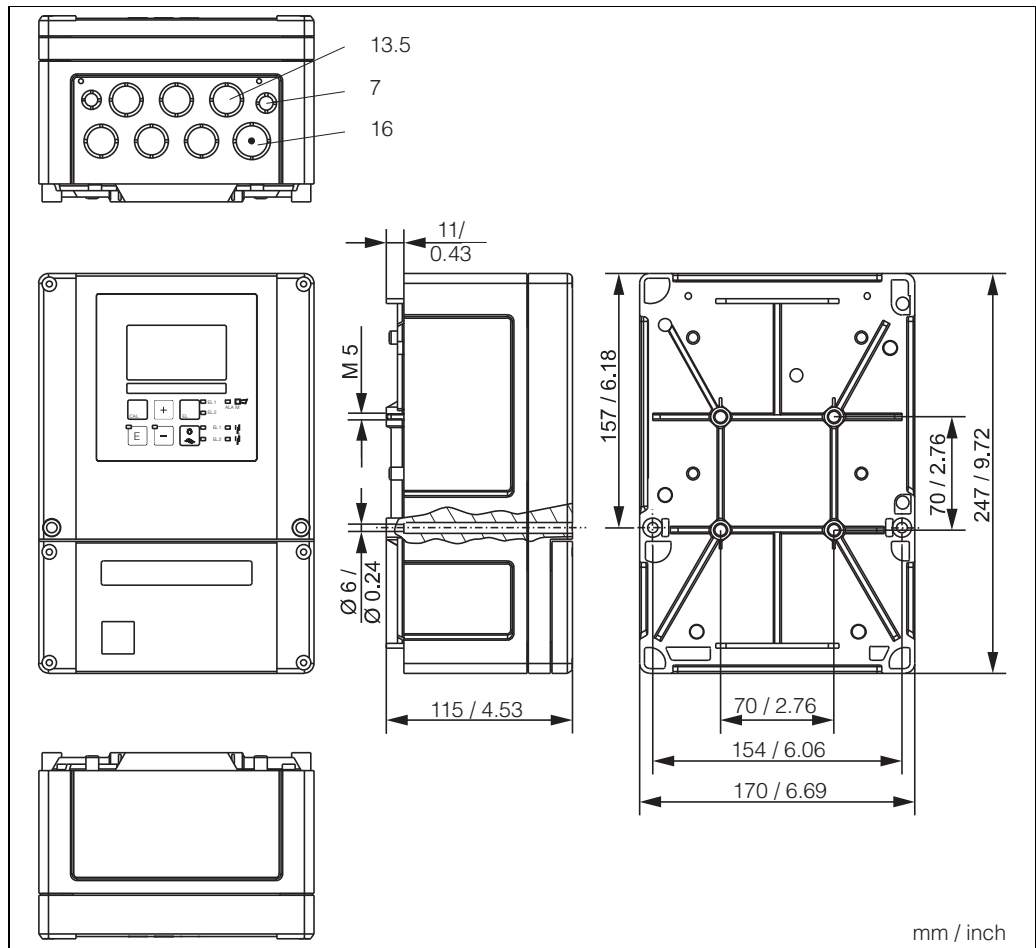
## Performance characteristics

<b>Reference temperature</b>	25 °C (77 °F); adjustable for the compensation of the medium temperature	
<b>Resolution</b>	Conductivity:	depending on the measuring range: 0.001 µS/cm to 1.999 µS/cm and $k \leq 0.5 \text{ cm}^{-1}$
	Temperature:	0.1 °C
<b>Maximum measured error<sup>1)</sup></b>	Conductivity:	
	Display:	max. 0.5 % of measured value ± 4 digits
	Conductivity signal output:	max. 0.75 % of current output range
	Resistivity:	
	Display:	max. 0.5 % of measured value ± 4 digits
	Resistivity signal output:	max. 0.75 % of current output range
	Temperature:	
	Display:	max. 1.0 % of measuring range
	Temperature signal output:	max. 1.25 % of current output range
<b>Repeatability<sup>1)</sup></b>	Conductivity:	max. 0.2 % of measured value ± 2 digits
	Resistivity:	max. 0.2 % of measured value ± 2 digits
<b>Temperature compensation</b>	Range:	-35 to +250 °C (-31 to +482 °F)
	Types of compensation:	uncompensated, linear, NaCl, table; conductive only: ultrapure water NaCl, ultrapure water HCl
<b>Temperature offset</b>	±5 °C; for the adjustment of the temperature display	

1) acc. to IEC 746-1, for nominal operating conditions

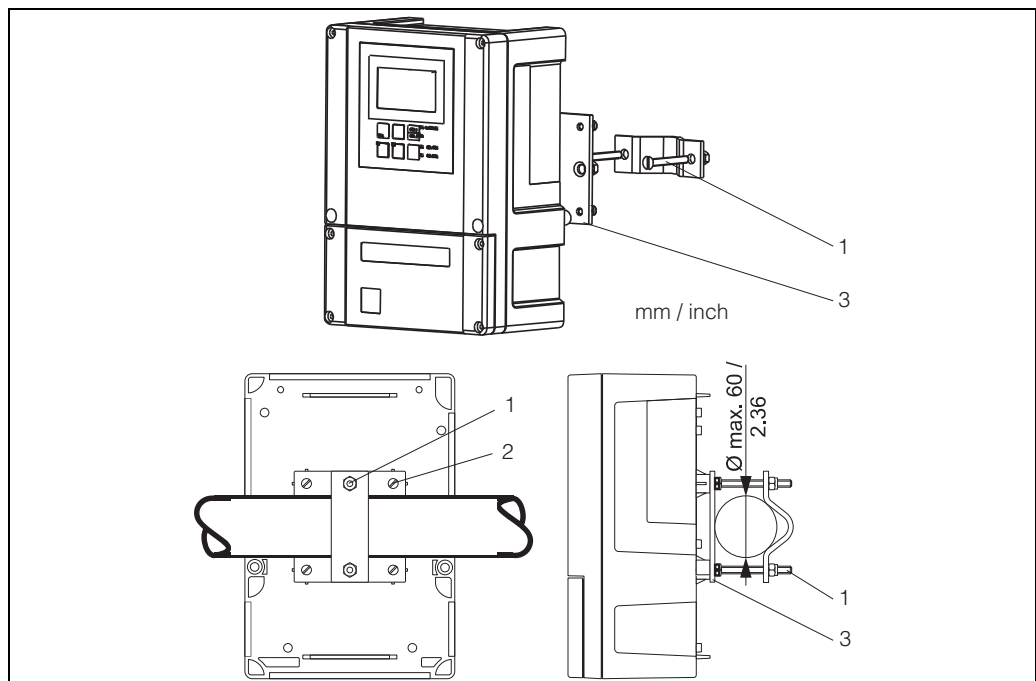
# Installation

## Installation instructions



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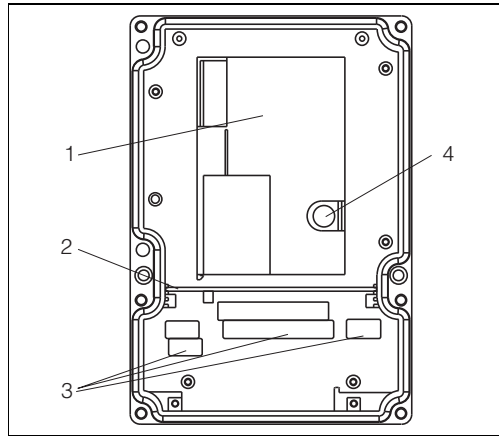
Field instrument



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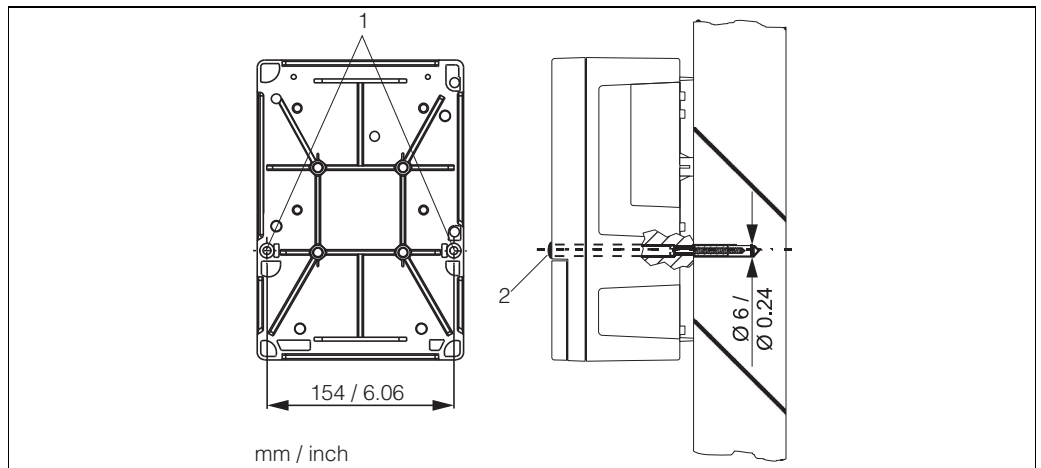
Mounting on pipes

1 - 3 Mounting screws and mounting plate



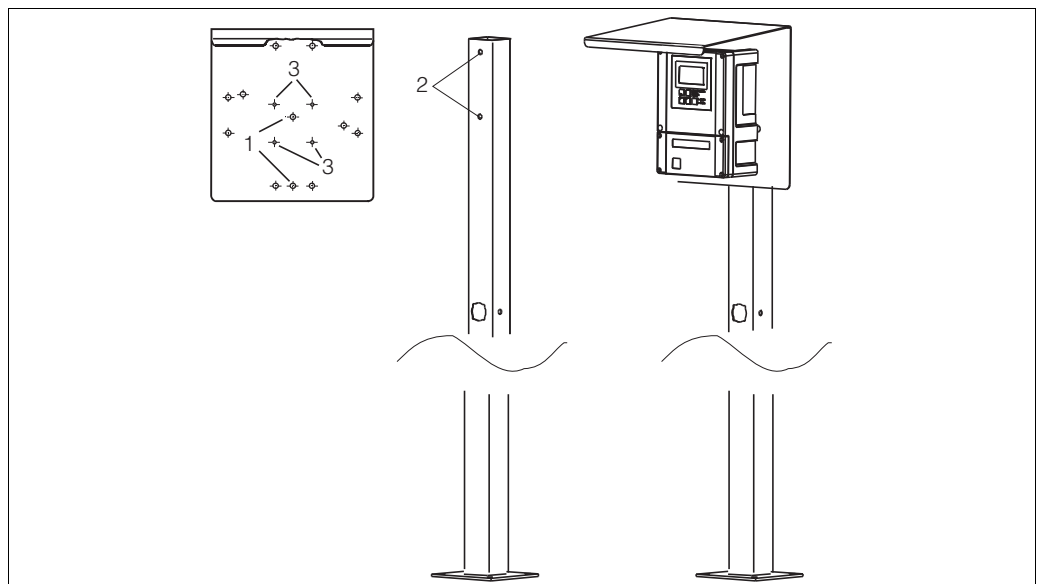
- 1 Removable electronics box
- 2 Partition plate
- 3 Terminal blocks
- 4 Fuse

View into the field instrument



Wall mounting of the field instrument

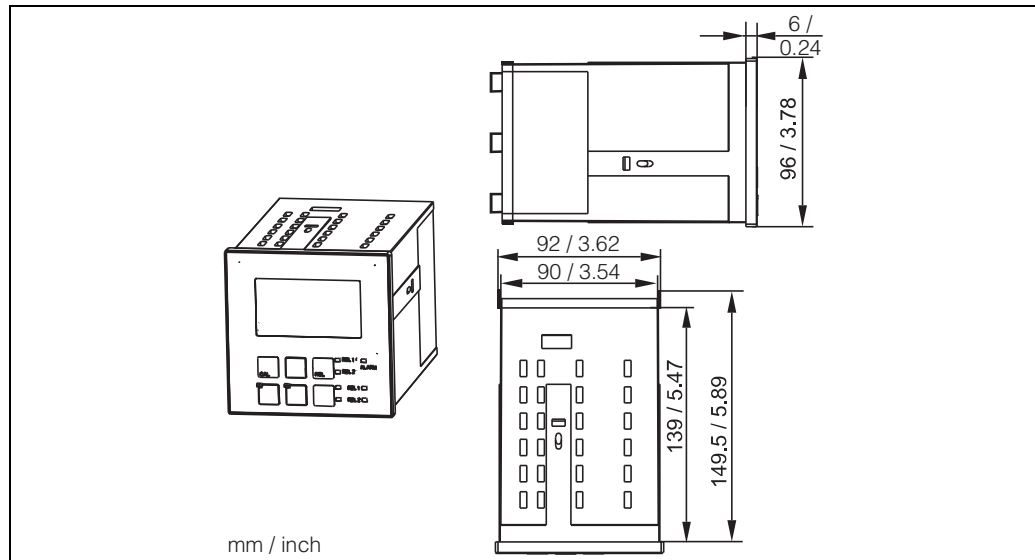
- 1 Mounting holes
- 2 Protecting cap



Mounting of the field instrument with mounting post and weather protection cover

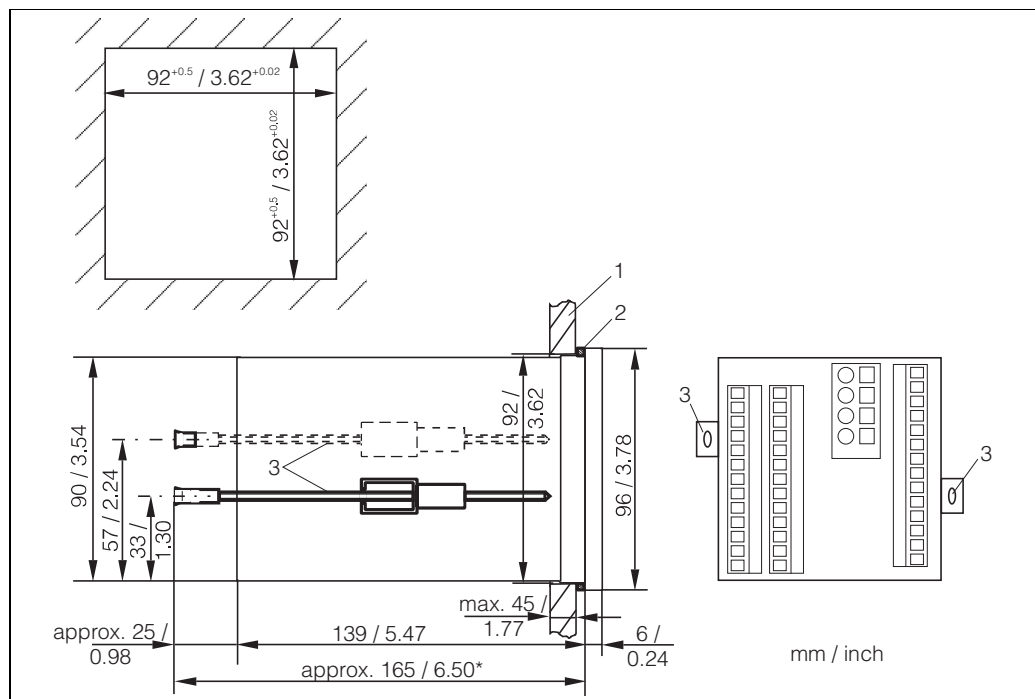
- 1 - 3 Mounting holes





Dimensions panel-mounted instrument

4005735



Installation of the panel-mounted instrument

- 1 Wall of control cabinet
- 2 Gasket
- 3 Tensioning screws
- \* Required installation depth

4005739

## Environment

<b>Ambient temperature</b>	-10 to +55 °C (+14 to +131 °F)	
<b>Storage temperature</b>	-25 to +65 °C (-13 to +149 °F)	
<b>Electromagnetic compatibility</b>	Interference emission and interference immunity as per EN 61326-1:2006, EN 61326-2-3:2006	
<b>Ingress protection</b>	Panel mounted instrument: Field instrument:	IP 54 (front), IP 30 (housing) IP 65 / tightness acc. to NEMA 4X
<b>Electrical safety</b>	according EN/IEC 61010-1:2001, Installation Category II, for use up to 2000 m above sea level	
<b>CSA</b>	Apparatus with CSA General Purpose Approval are certified for indoor use.	
<b>Relative humidity</b>	10 to 95%, non-condensing	
<b>Pollution degree</b>	The product is suitable for pollution degree 2.	

## Mechanical construction

<b>Dimensions</b>	Panel mounted instrument: Field instrument:	96 x 96 x 145 mm (3.78 x 3.78 x 5.71 inches) Installation depth: approx. 165 mm (6.50") 247 x 170 x 115 mm (9.72 x 6.69 x 4.53 inches)
<b>Weight</b>	Panel mounted instrument: Field instrument:	max. 0.7 kg (1.5 lb) max. 2.3 kg (5.1 lb)
<b>Materials</b>	Housing of panel mounted instrument: Field housing: Front membrane:	Polycarbonate ABS PC FR Polyester, UV-resistant
<b>Terminals</b>	Cross section	max. 2.5 mm <sup>2</sup>