

Преобразователи серии 5000 5332A, 5332D

Технические характеристики

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Россия +7(495)268-04-70

Казахстан +7(727)345-47-04

Беларусь +375-257-127-884

Узбекистан +998(71)205-18-59

Киргизия +996(312)96-26-47

эл.почта: pcn@nt-rt.ru || сайт: <https://prelectronics.nt-rt.ru/>

2-WIRE TRANSMITTER WITH HART® PROTOCOL

PRetop 5335

CONTENTS

Safety instructions.....	16
Declaration of Conformity	17
Application	18
Technical characteristics	18
Mounting / installation.....	18
Applications.....	19
Order	20
Electrical specifications.....	20
Connections	24
Block diagram	25
Programming.....	26
Connection of transmitters in multidrop mode.....	28
Mechanical specifications.....	28
Mounting of sensor wires.....	28
Appendix:	
FM Installation Drawing No. 5300Q502.....	58
CSA Installation Drawing No. 533XQC03	60

Safety instructions

Ex / I.S. installation:

For a safe installation of 5335B, C and D in hazardous area the following must be observed. The module must only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

Year of manufacture can be taken from the first two digits in the serial number.

For installation requirements and Ex / I.S. data see ATEX certificates.

DECLARATION OF CONFORMITY

As manufacturer

PR electronics A/S

Lerbakken 10

DK-8410 Rønde

hererby declares that the following product:

Type: 5335

Name: 2-Wire transmitter with HART® protocol

is in conformity with the following directives and standards:

EMC directive 2004/108/EC and later amendments

EN 61326

This declaration is issued in compliance with article 10, subclause 1 of the EMC directive. For specification of the acceptable EMC performance level, refer to the electrical specifications for the module.

The ATEX directive 94/9/EC and later amendments

EN 50014, EN 50020, EN 50021,

EN 50281-1-1 and EN 50284

ATEX certificate: KEMA 03ATEX1508 X (5335A)

ATEX certificate: KEMA 03ATEX1537 X (5335B, C and D)

Notified body for CENELEC/ATEX: UL International Demko A/S 0539

2-WIRE TRANSMITTER WITH HART® PROTOCOL PRetop 5335

- *RTD, TC, Ohm, or mV input*
- *Extremely high measurement accuracy*
- *HART® communication*
- *Galvanic isolation*
- *For DIN form B sensor head mounting*

Application:

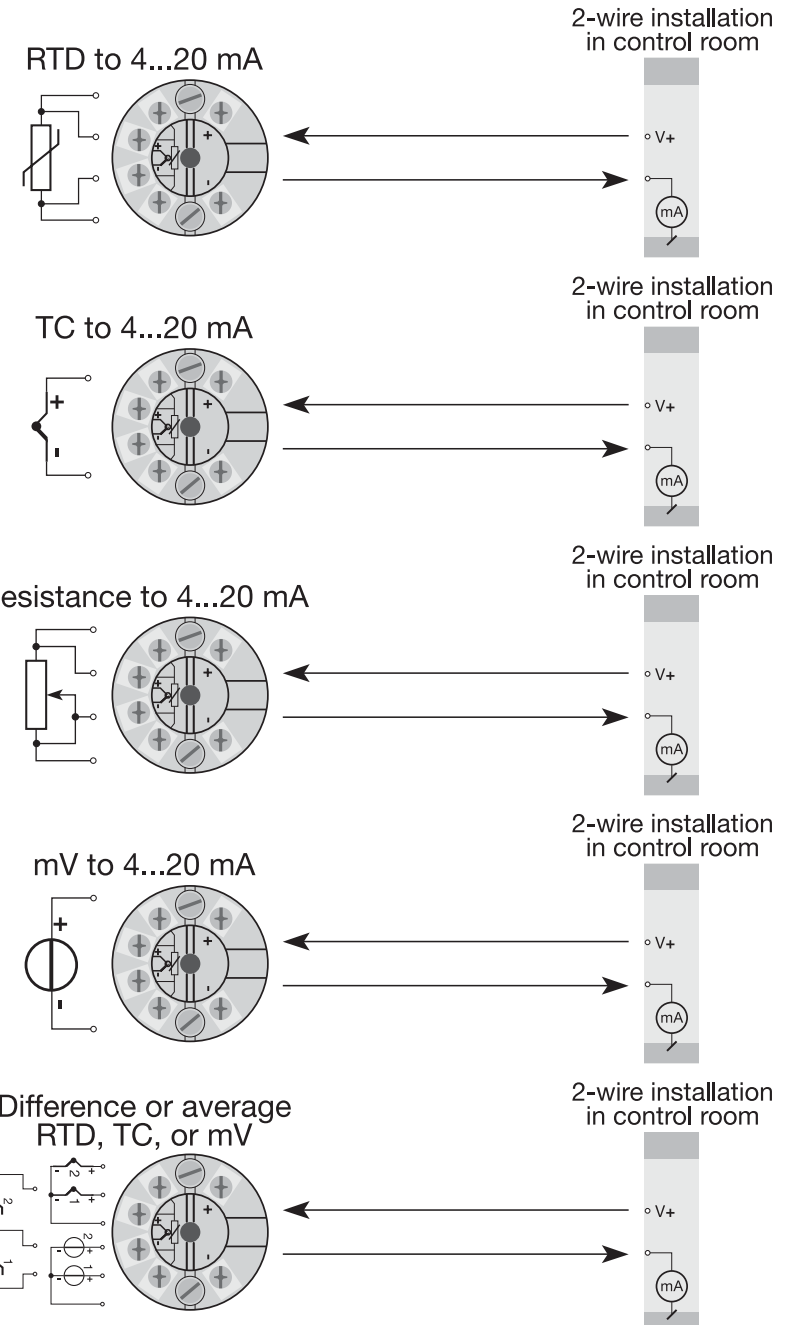
- Linearised temperature measurement with Pt100...Pt1000, Ni100...Ni1000, or TC sensor.
- Difference or average temperature measurement of 2 resistance or TC sensors.
- Conversion of linear resistance variation to a standard analogue current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.
- Connection of up to 15 transmitters to a digital 2-wire signal with HART® communication.

Technical characteristics:

- Within a few seconds the user can program PR5335 to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- Continuous check of vital stored data for safety reasons.
- Sensor error detection according to the guidelines in NAMUR NE 89.

Mounting / installation:

- For DIN form B sensor head mounting. In non-hazardous areas the 5335 can be mounted on a DIN rail with a special fitting.
- **NB:** As Ex barrier for 5335B, C and D we recommend 5106B.



Order: 5335

Type	Version
5335	Standard : A
	ATEX : B
	FM and ATEX : C
	CSA, FM and ATEX : D

Electrical specifications:

Specifications range:

-40°C to +85°C

Common specifications:

Supply voltage, DC

Standard, 5335A 8.0...35 V

ATEX, 5335B 8.0...30 V

FM and CSA, 5335C and D 8.0...28 V

Isolation voltage, test / operation 1.5 kVAC / 50 VAC

Warm-up time 30 s

Communications interface HART® and Loop Link

Signal / noise ratio Min. 60 dB

Response time (programmable) 1...60 s

EEPROM error check < 10 s

Signal dynamics, input 22 bit

Signal dynamics, output 16 bit

Calibration temperature 20...28°C

Accuracy, the greater of general and basic values:

General values		
Input type	Absolute accuracy	Temperature coefficient
All	≤ ±0.05% of span	≤ ±0.005% of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
Pt100 and Pt1000	≤ ±0.1°C	≤ ±0.005°C/°C
Ni100	≤ ±0.2°C	≤ ±0.005°C/°C
Lin. R	≤ ±0.1 Ω	≤ ±5 mΩ/°C
Volt	≤ ±10 µV	≤ ±0.5 µV/°C
TC type: E, J, K, L, N, T, U	≤ ±0.5°C	≤ ±0.025°C/°C
TC type: B, R, S, W3, W5	≤ ±1°C	≤ ±0.1°C/°C

EMC immunity influence < ±0.1% of span

Extended EMC immunity:

NAMUR NE 21, A criterion, burst < ±1% of span

Effect of supply voltage variation < 0.005% of span / VDC

Vibration IEC 60068-2-6 Test FC

Lloyd's specification no. 1 4 g / 2...100 Hz

Max. wire size 1 x 1.5 mm² stranded wire

Relative humidity < 95% RH (non-cond.)

Dimensions Ø 44 x 20.2 mm

Tightness (enclosure / terminals) IP68 / IP00

Weight 50 g

Electrical specifications, input:

Max. offset 50% of selec. numerical max. value

RTD and linear resistance input:

RTD type	Min. value	Max. value	Min. span
Pt100	-200°C	+850°C	10°C
Ni100	-60°C	+250°C	10°C
Lin. R	0 Ω	7000 Ω	25 Ω

Cable resistance per wire (max.) 5 Ω

Sensor current Nom. 0.2 mA

Effect of sensor cable resistance

(3- / 4-wire) < 0.002 Ω/Ω

Sensor error detection Yes
 Short circuit detection If 0% > 30 Ω

TC input:

Type	Min. temperature	Max. temperature	Min. span	Norm
B	+400°C	+1820°C	100°C	IEC584
E	-100°C	+1000°C	50°C	IEC584
J	-100°C	+1200°C	50°C	IEC584
K	-180°C	+1372°C	50°C	IEC584
L	-100°C	+900°C	50°C	DIN 43710
N	-180°C	+1300°C	50°C	IEC584
R	-50°C	+1760°C	100°C	IEC584
S	-50°C	+1760°C	100°C	IEC584
T	-200°C	+400°C	50°C	IEC584
U	-200°C	+600°C	50°C	DIN 43710
W3	0°C	+2300°C	100°C	ASTM E988-90
W5	0°C	+2300°C	100°C	ASTM E988-90

Cold junction compensation < $\pm 1.0^\circ\text{C}$
 External CJC with Ni100 or Pt100 $-40 \leq T_{\text{amb.}} \leq 135^\circ\text{C}$
 Sensor error detection Yes
 Sensor error current:
 When detecting Nom. 33 μA
 Else 0 μA
 Short circuit detection If 0% > 5 mV

Voltage input:

Measurement range -800...+800 mV
 Min. span 2.5 mV
 Input resistance 10 M Ω

Current output:

Signal range 4...20 mA
 Min. signal range 16 mA
 Updating time 440 ms
 (660 ms for diff.)
 Fixed output signal Between 4 and 20 mA
 Output signal at EEPROM error $\leq 3.5 \text{ mA}$
 Load resistance $\leq (V_{\text{supply}} - 8) / 0.023 [\Omega]$
 Load stability < $\pm 0.01\%$ of span / 100 Ω

Sensor error detection:

Programmable 3.5...23 mA
 NAMUR NE43 Upscale 23 mA
 NAMUR NE43 Downscale 3.5 mA

Ex / I.S. data:

Signal output / supply, terminal 1 to 2:
 U_i : 30 VDC
 I_i : 120 mADC
 P_i : 0.84 W
 L_i : 10 μH
 C_i : 1.0 nF

Sensor input, terminal 3, 4, 5 and 6:

U_o : 9.6 VDC
 I_o : 28 mA
 P_o : 67 mW
 L_o : 35 mH
 C_o : 3.5 μF

Ex / I.S. approval 5335A:

Kema 03ATEX1508 X  II 3 GD
 EEx nA[L] IIC T4...T6

Ex / I.S. approval 5335B, C and D:

KEMA 03ATEX1537 X  II 1 GD, T80°C...T105°C
 EEx ia IIC T6 / T4
 Max. amb. temperature for T1...T4 85°C
 Max. amb. temperature for T5 and T6 60°C
ATEX, applicable in zone 0, 1, 2, 20, 21 or 22
FM, applicable in IS, Class I, DIV. 1, Group A, B, C, D
 IS, Class I, Zone 0, AEx ia IIC
 Entity, FM Installation Drawing No. 5300Q502
CSA, applicable in IS, Class I, DIV. 1, Group A, B, C, D,
 Ex ia IIC
 IS, Class I, Zone 0, AEx ia IIC
 Installation Drawing No. 533XQC03

Marine approval:

Det Norske Veritas, Ships & Offshore Standard for Certification No. 2.4

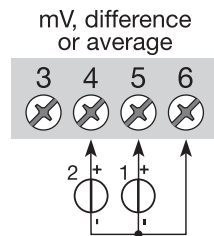
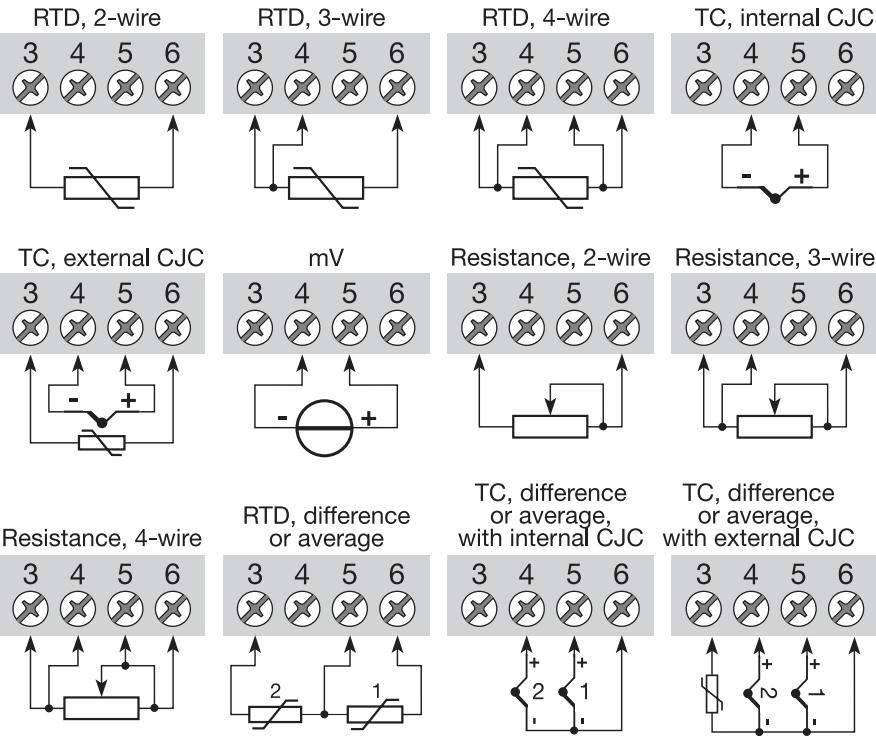
Observed authority requirements: Standard:

EMC 2004/108/EC
 Emission and immunity EN 61326
 ATEX 94/9/EC EN 50014, EN 50020, 50284
 EN 50021 and EN 50281-1-1
 FM, ASCN 3600, 3611, 3610
 CSA, CAN / CSA C22.2 No. 157, E60079-11, UL 913

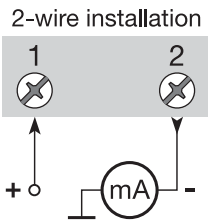
Of span = Of the presently selected range

Connections:

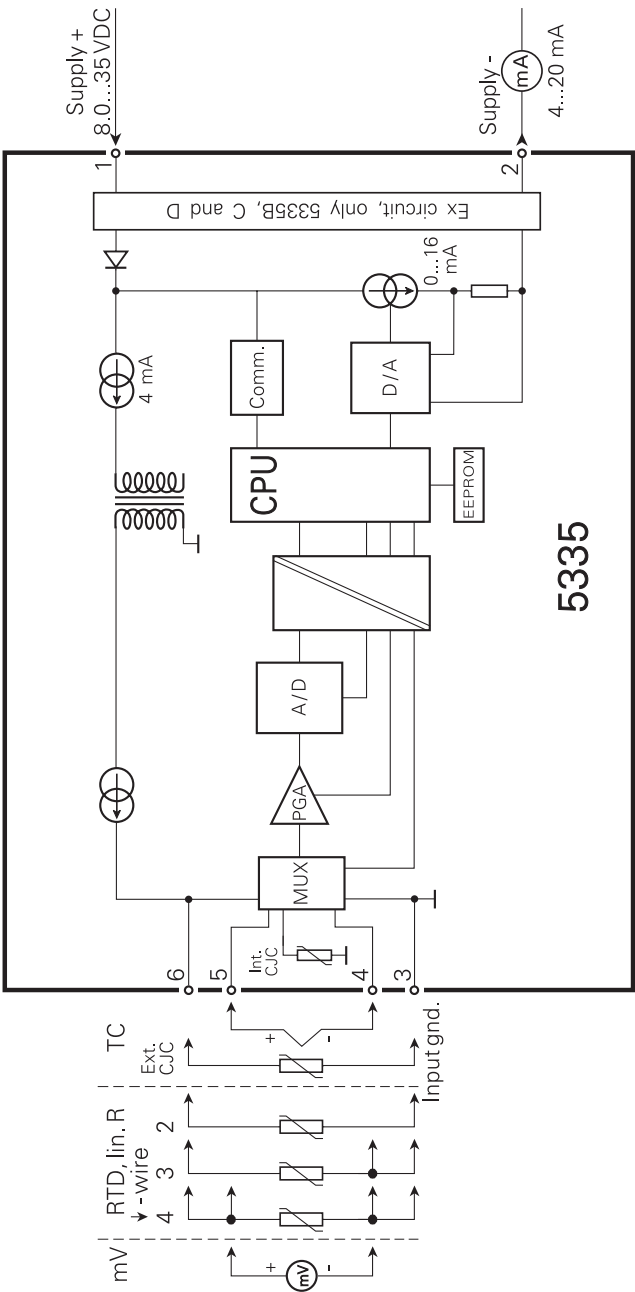
Input:



Output:



BLOCK DIAGRAM:



Programming:

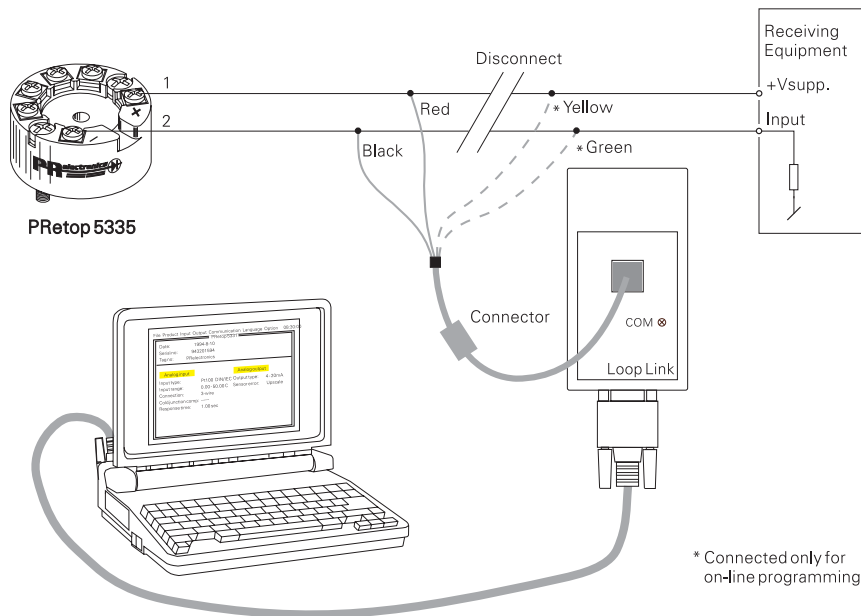
PRetop 5335 can be configured in the following 3 ways:

- 1 With PR electronics A/S' communications interface Loop Link and PReset PC configuration software.
2. With a HART® modem and PReset PC configuration software.
3. With a HART® communicator with PR electronics A/S' DDL driver.

1: Loop Link:

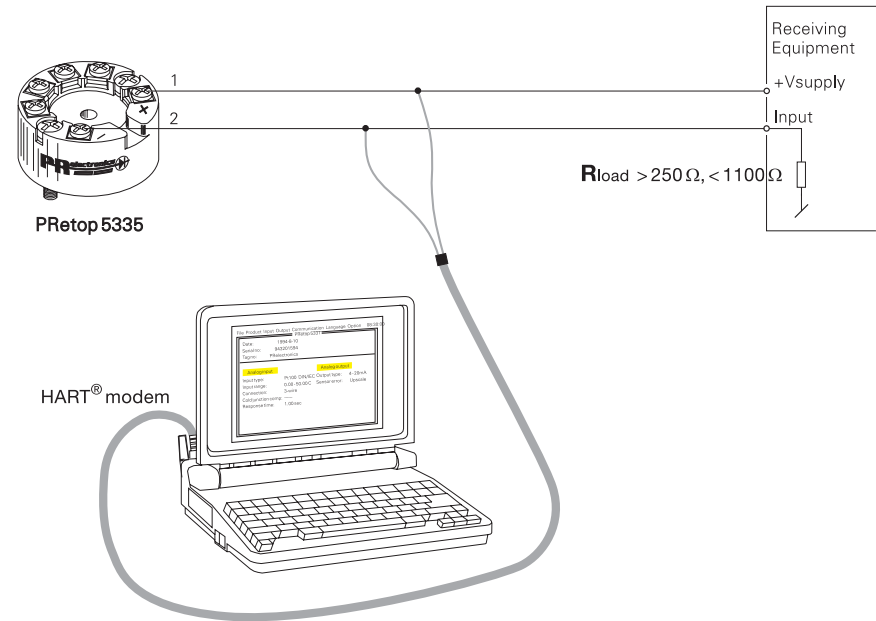
For programming please refer to the drawing below and the help functions in PReset.

Loop Link is not approved for communication with modules installed in hazardous (Ex) areas.



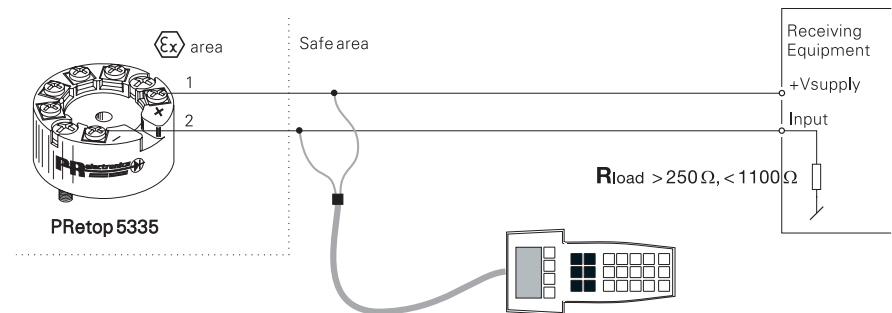
2: HART® modem:

For programming please refer to the drawing below and the help functions in PReset.



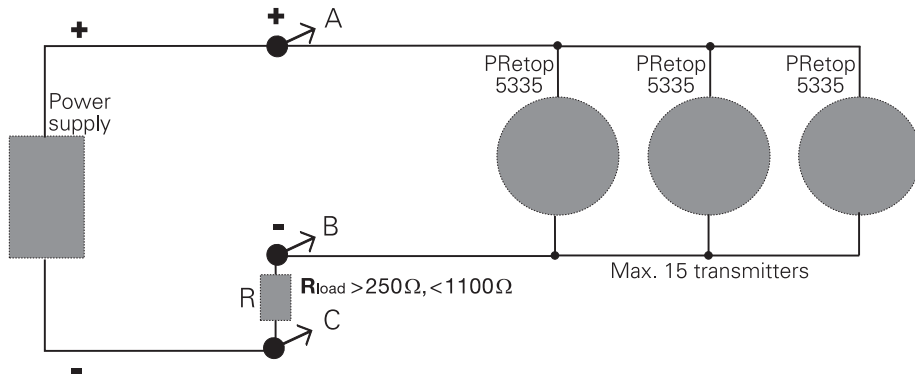
3: HART® communicator:

For programming please refer to the drawing below. To gain access to product-specific commands, the HART® communicator must be loaded with the PR electronics A/S DDL driver. This can be ordered either at the HART® Communication Foundation or at PR electronics A/S.



Connection of transmitters in multidrop mode:

The HART® communicator or a PC modem can be connected across AB or BC.

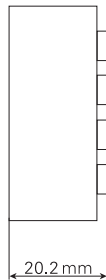
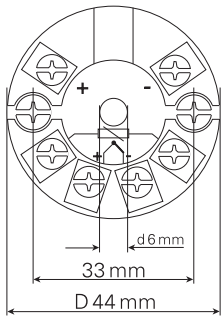


The outputs of max. 15 transmitters can be connected in parallel for a digital HART® communication on 2-wires.

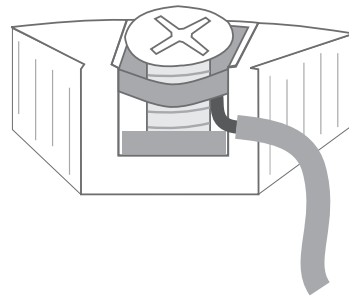
Before it is connected, each transmitter must be configured with a unique number from 1 to 15. If 2 transmitters are configured with the same number, both will be excluded. The transmitters must be programmed for multidrop mode (with a fixed output signal of 4 mA). Maximum current in the loop is therefore 60 mA. The communication is either by means of a HART® communicator or a HART® modem.

The PRreset PC configuration software can configure the individual transmitter for multidrop mode and provide it with a unique polling address.

Mechanical specifications:



Mounting of sensor wires



Wires must be mounted between the metal plates.

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