PERFORMANCE
MADE
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Product Manual
5337
2-wire transmitter with HART protocol



TEMPERATURE | I.S. INTERFACES | COMMUNICATION INTERFACES | MULTIFUNCTIONAL | ISOLATION | DISPLAY

No. 5337V104-UK
From serial no.: 180971088

PR electronics

6 Product Pillars
to meet your every need

Individually outstanding, unrivalled in combination

With our innovative, patented technologies, we make signal conditioning smarter and simpler. Our portfolio is composed of six product areas, where we offer a wide range of analog and digital devices covering over a thousand applications in industrial and factory automation. All our products comply with or surpass the highest industry standards, ensuring reliability in even the harshest of environments and have a 5-year warranty for greater peace of mind.



Temperature

Our range of temperature transmitters and sensors provides the highest level of signal integrity from the measurement point to your control system. You can convert industrial process temperature signals to analog, bus or digital communications using a highly reliable point-to-point solution with a fast response time, automatic self-calibration, sensor error detection, low drift, and top EMC performance in any environment.



I.S. Interface

We deliver the safest signals by validating our products against the toughest safety standards. Through our commitment to innovation, we have made pioneering achievements in developing I.S. interfaces with SIL 2 Full Assessment that are both efficient and cost-effective. Our comprehensive range of analog and digital intrinsically safe isolation barriers offers multifunctional inputs and outputs, making PR an easy-to-implement site standard. Our backplanes further simplify large installations and provide seamless integration to standard DCS systems.



Communication

We provide inexpensive, easy-to-use, future-ready communication interfaces that can access your PR installed base of products. All the interfaces are detachable, have a built-in display for readout of process values and diagnostics, and can be configured via push-buttons. Product specific functionality includes communication via Modbus and Bluetooth and remote access using our PR Process Supervisor (PPS) application, available for iOS and Android.



Multifunction

Our unique range of single devices covering multiple applications is easily deployable as your site standard. Having one variant that applies to a broad range of applications can reduce your installation time and training, and greatly simplify spare parts management at your facilities. Our devices are designed for long-term signal accuracy, low power consumption, immunity to electrical noise and simple programming.



Isolation

Our compact, fast, high-quality 6 mm isolators are based on microprocessor technology to provide exceptional performance and EMC-immunity for dedicated applications at a very low total cost of ownership. They can be stacked both vertically and horizontally with no air gap separation between units required.



Display

Our display range is characterized by its flexibility and stability. The devices meet nearly every demand for display readout of process signals, and have universal input and power supply capabilities. They provide a real-time measurement of your process value no matter the industry, and are engineered to provide a user-friendly and reliable relay of information, even in demanding environments.

2-wire transmitter with HART protocol 5337

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2-wire transmitter with HART protocol
5337

- RTD, TC, Ohm, or mV input
- 2 analog inputs and 5 device variables with status available
- HART protocol revision selectable from HART 5 or HART 7
- Hardware assessed for use in SIL applications
- Mounting on a DIN rail in safe area or hazardous gas and dust area

Application

- Linearised temperature measurement with TC and RTD sensors e.g. Pt100 and Ni100.
- HART communication and 4...20 mA analogue PV output for individual, difference or average temperature measurement of up to two RTD or TC input sensors.
- Conversion of linear resistance to a standard analogue current signal, e.g from valves or Ohmic level sensors.
- Amplification of bipolar mV signals to standard 4...20 mA current signals.
- Up to 63 transmitters (HART 7) can be connected in a multidrop communication setup.

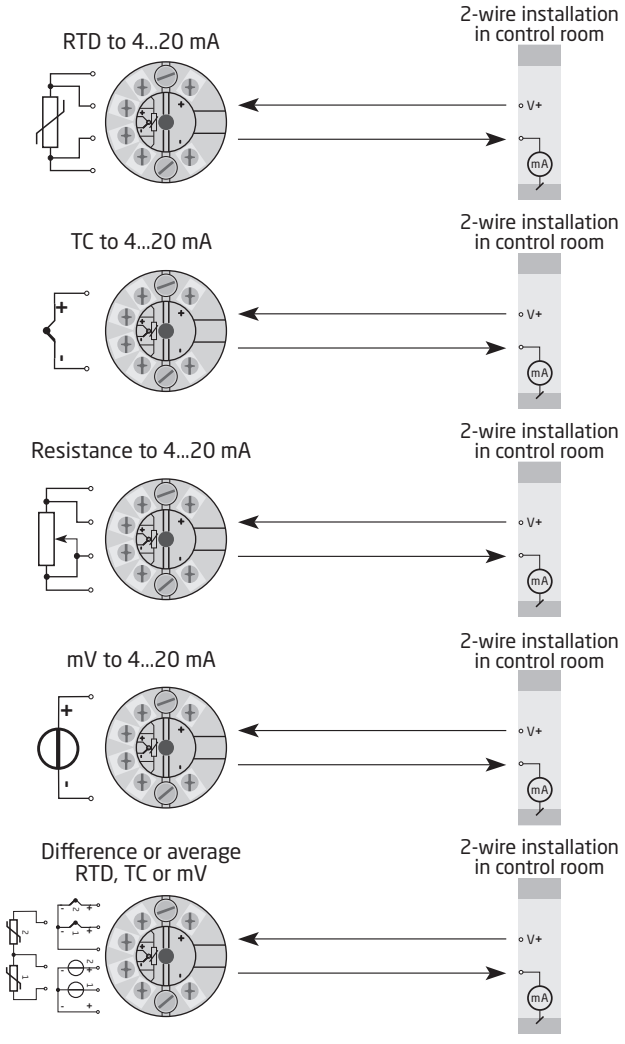
Technical characteristics

- HART protocol revision can be changed by user configuration to either HART 5 or HART 7 protocol.
- The HART 7 protocol offers:
  · Long Tag numbers of up to 32 characters.
  · Enhanced Burst Mode and Event notification with time stamping.
  · Device variable and status mapping to any dynamic variable PV, SV, TV or QV.
  · Process signal trend measurement with logs and summary data.
  · Automatic event notification with time stamps.
  · Command aggregation for higher communication efficiency.
- 5337 is designed according to strict safety requirements and is therefore suitable for applications in SIL installations.
- Continuous check of vital stored data.
- Meeting the NAMUR NE 21 recommendations, the 5337 HART transmitter ensures top measurement performance in harsh EMC environments. Additionally, the 5337 meets NAMUR NE43 and NE89 recommendations.

Mounting / installation / programming

- For DIN form B sensor head or DIN rail mounting via the PR fitting type 8421.
- Configuration via standard HART communication interfaces or by PR 5909 Loop Link.

Applications



Order

Type	Version	
5337	Standard CSA, FM, ATEX, IECEx & INMETRO	: A : D

Accessories

5909 = Loop Link USB interface and PReset Software
8421 = DIN rail clip

Electrical specifications

Environmental conditions:

Specification range . . . . . -40°C to +85°C
Calibration temperature . . . . . 20...28°
Humidity . . . . . < 95% RH (non-cond.)
Protection degree (encl./terminal) . . . . . IP68 / IP00

Mechanical specifications:

Dimensions . . . . . Ø 44 x 20.2 mm
Weight approx. . . . . 50 g
Max. wire size . . . . . 1 x1.5 mm^2 stranded wire
Screw terminal torque . . . . . 0.4 Nm
Vibration . . . . . IEC 60068-2-6
  2...25 Hz . . . . . ±1.6 mm
  25...100 Hz . . . . . ±4 g

Common specifications:

Supply voltage, DC
  Standard . . . . . 8.0...35 VDC
  ATEX, CSA, FM, IECEx & INMETRO . . . . . 8.0...30 VDC
Internal power dissipation
  Standard . . . . . 25 mW...0.8 W
  ATEX, CSA, FM, IECEx & INMETRO . . . . . 25 mW...0.7 W
Voltage drop . . . . . 8.0 VDC
Isolation voltage, test / operation . . . . . 1.5 kVAC / 50 VAC
Programming . . . . . Loop Link & HART
Signal / noise ratio . . . . . > 60 dB
Response time (programmable) . . . . . 1...60 s
Signal dynamics, input . . . . . 22 bit
Signal dynamics, output . . . . . 16 bit

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
Pt50 - Pt1000	≤ ±0.1°C	≤ ±0.005°C/°C
Ni50 - Ni1000	≤ ±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[1], Lr, R, S, W3,W5	≤ ±1°C	≤ ±0.1°C / °C
TC type: B[2]	≤ ±3°C	≤ ±0.3°C / °C
TC type: B[3]	≤ ±8°C	≤ ±0.8°C / °C
TC type: B[4]	not specified	not specified

TC B[1] accuracy specification range . . . . . > 400°C
TC B[2] accuracy specification range . . . . . > 160°C < 400°C
TC B[3] accuracy specification range . . . . . > 85°C < 160°C
TC B[4] accuracy specification range . . . . . < 85°C

TC cold junction compensation. . . . . < ±1.0°C
Max. offset on input signal . . . . . 50% of selec. max. value

EMC - immunity influence. . . . . < ±0.1% of span
Extended EMC immunity:
NAMUR NE 21, A criterion, burst . . . . . < ±1% of span

Input specifications:

RTD input types:

RTD type	Min. value	Max. value	Min. span	Standard
Pt100	-200°C	+850°C	10°C	IEC 60751
Ni100	-60°C	+250°C	10°C	DIN 43760
Lin. R	0 Ω	7000 Ω	25 Ω	-----

Pt50, Pt100, Pt200, Pt500, Pt1000, Ni50, Ni100, Ni120, Ni1000
Cable resistance per wire (max.). . . . . 5 Ω
(up to 50 Ω per wire is possible with reduced measurement accuracy)
Sensor current . . . . . Nom. 0.2 mA

TC input types:

Type	Min. temperature	Max. temperature	Min. span	Standard
B	0°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	-200°C	+900°C	50°C	DIN 43710
Lr	-200°C	+800°C	50°C	GOST 3044-84
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 (CJC):
Constant, internal or external via a Pt100 or Ni100 sensor

mV input:

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

Output specifications and HART:

Signal range. . . . . 4...20 mA
Min. signal range . . . . . 16 mA
Updating time . . . . . 440 ms
Load resistance. . . . . ≤ (V_{supply} - 8) / 0.023 [Ω]
Sensor error detection, programmable . . . . . 3.5...23 mA
(shorted sensor error detection is ignored at TC and mV input)
NAMUR NE43 Upscale . . . . . 23 mA
NAMUR NE43 Downscale. . . . . 3.5 mA
HART protocol revisions. . . . . HART 5 and HART 7

of span = of the presently selected range

Observed authority requirements:

EMC. 2014/30/EU
RoHS 2011/65/EU
ATEX 2014/34/EU
EAC . . . . . TR-CU 020/2011

Approvals:

DNV-GL, Ships & Offshore . . . . . Standard for Certification No. 2.4

I.S. / Ex approvals:

5337A:
ATEX . . . . . KEMA 03ATEX1508 X
IECEx. . . . . KEM 10.0083 X
INMETRO . . . . . DEKRA 18.0002X
5337D:
ATEX . . . . . KEMA 030ATEX1537
IECEx. . . . . IECEx KEM 10.0083X
CSA. 1125003
FM FM17US0013X
INMETRO . . . . . DEKRA 18.0002X
EAC Ex TR-CU 012/2011 . . . . . RU C-DK.GB08.V.00410

Functional Safety:

Hardware assessed for use in SIL applications
FMEDA report - www.prelectronics.com

Changing the HART protocol version

It is possible to change the unit's HART protocol revision by using the PReset software and a PR 5909 Loop Link interface or a HART interface.
Other HART configuration tools like a Handheld HART Terminal may also be used.

Procedure for using a HART hand-held terminal to change the 5337 from HART 7 to HART 5 and vice versa:

Change the 5337 from HART 7 to HART 5:

Drive the 5337 device **Online** and enter **Device setup** - **Diag/Service**.
Select **Write protection** and **Write protect** by entering " * * * * * * * * * " (8 stars).
Select **New password** - type " * * * * * * * * * " (8 stars) & then "**HARTREV5**".
Select **Write enable** by entering "**-CHANGE-**".

Change the 5335 (5337) from HART 5 to HART 7:

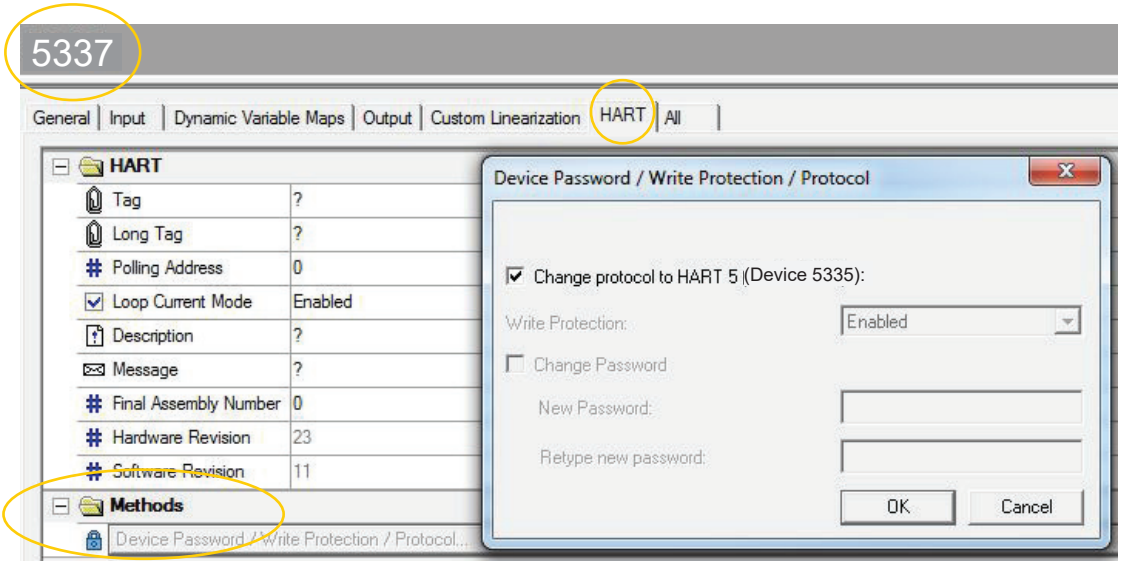
Drive the 5335 device **Online** and enter **Device setup** - **Diag/Service**.
Select **Write protection** and **Write protect** by entering " * * * * * * * * * " (8 stars).
Select **New password** - type " * * * * * * * * * " (8 stars) & then "**HARTREV7**".
Select **Write enable** and enter "**-CHANGE-**".

Please note this is only possible if the transmitter is marked "5337" on the label!

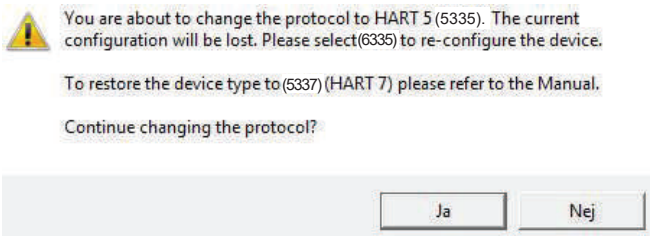
Changing the HART protocol version using the PReset software and 5909 Loop Link or HART communication interface

Switching from HART 7 to HART 5:

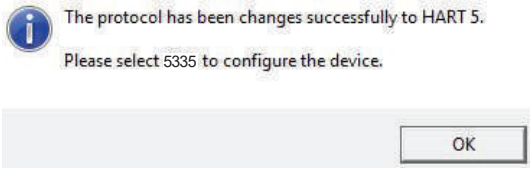
Select the 5337 product, click the "**HART**" tab and open the folder "**Methods**".
Click **Device Password / Write Protection / Protocol...** and select "**Change protocol to HART 5**" in the pop-up window, then acknowledge by pressing OK.



The following message will now appear:



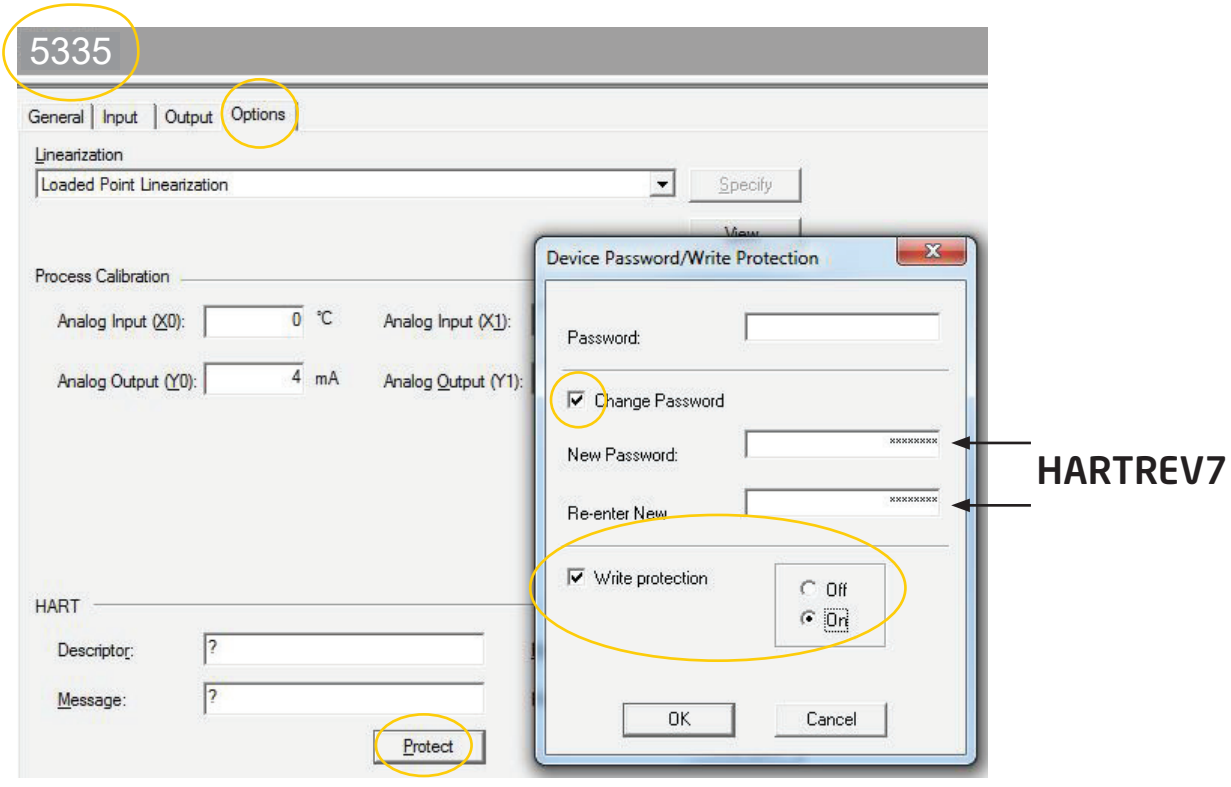
If you press "Ja" (Yes):



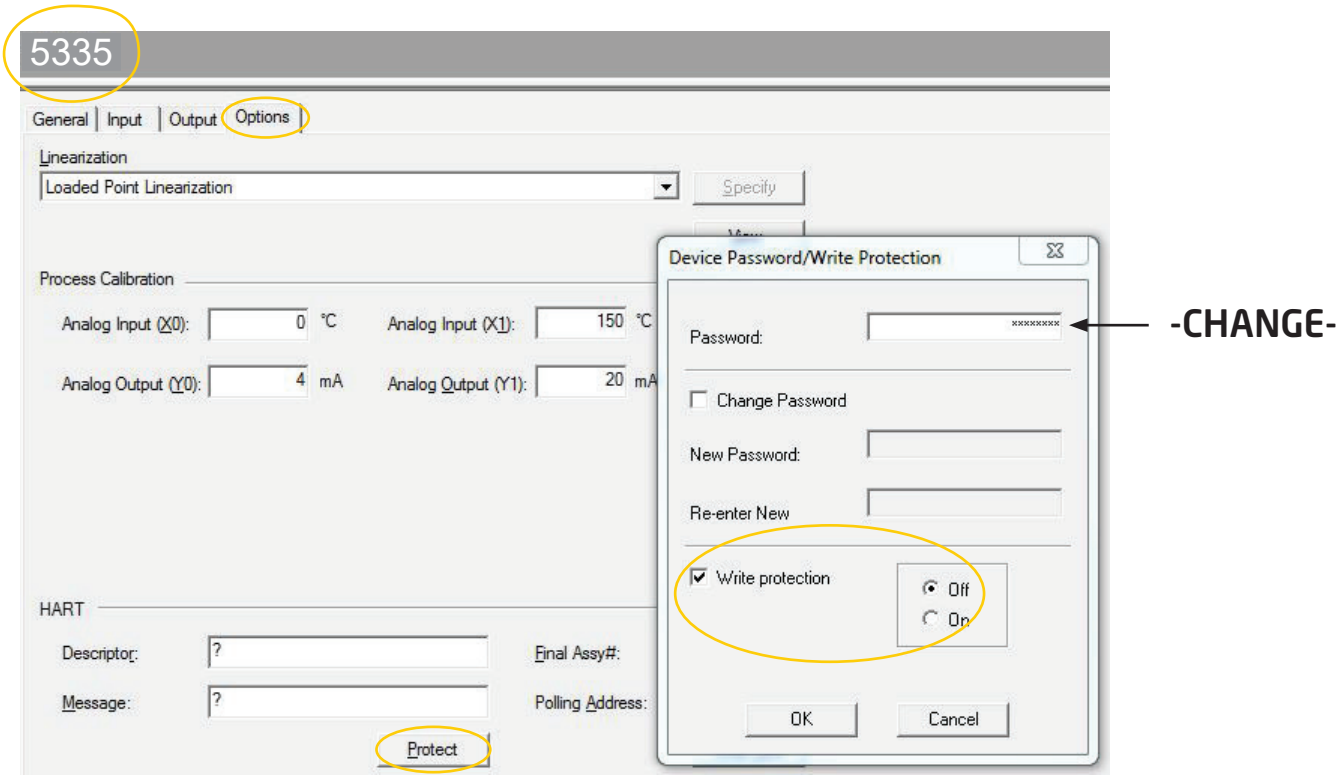
Switching from HART 5 to HART 7:

Please note this is only possible if the transmitter is marked "5337" on the label!

From PReset, select the 5335 product, click the "**OPTIONS**" tab click "**Protect**".
Write protection must be set to "**ON**". Select **Change Password**.
Type in the new password "**HARTREV7**" and Re-enter "**HARTREV7**". Click OK.

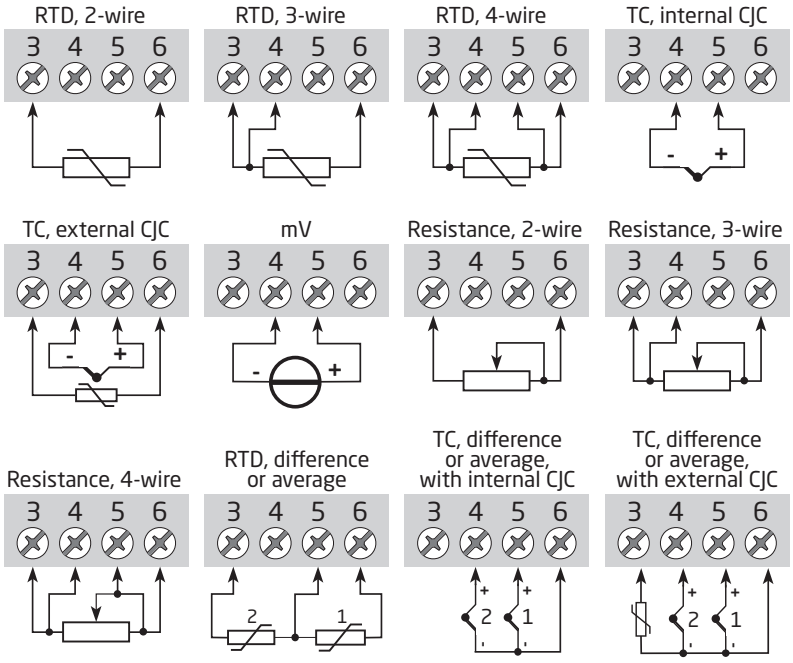


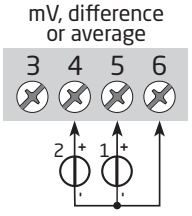
Switch **Write protection OFF** and write-enable the device by typing in the **Password** "**-CHANGE-**" in the top menu - acknowledge by pressing OK.
This action will reset the password to the default active password " * * * * * * * * " (8 stars) and restart the device in the updated HART 7 mode with write protection disabled. Now, select 5337 in PReset and reconfigure the device.



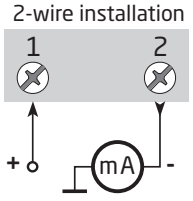
Connections

Input:

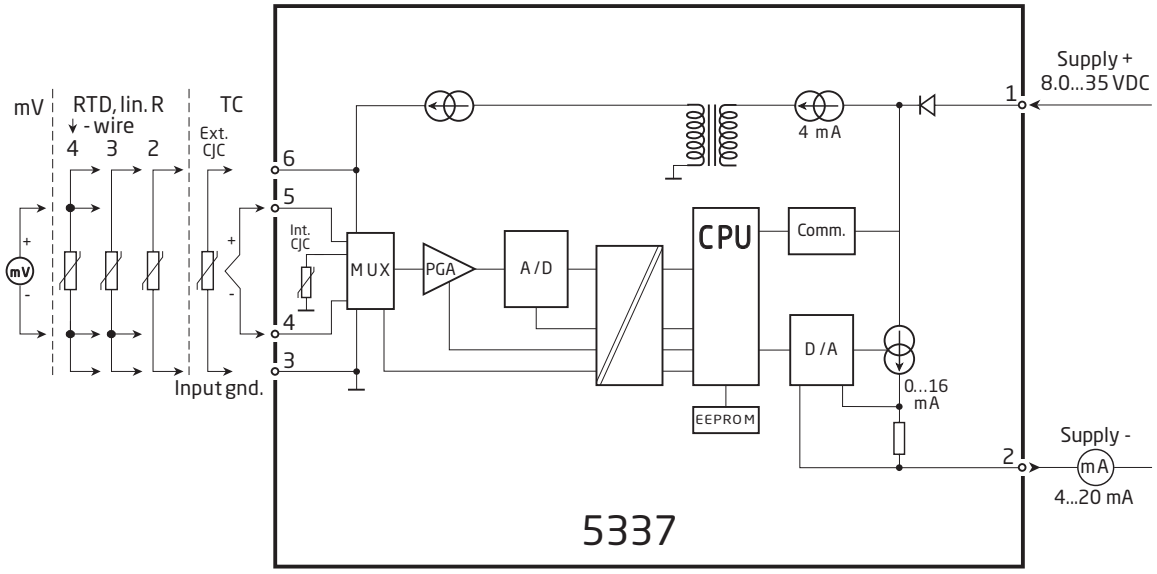




Output:



Block diagram



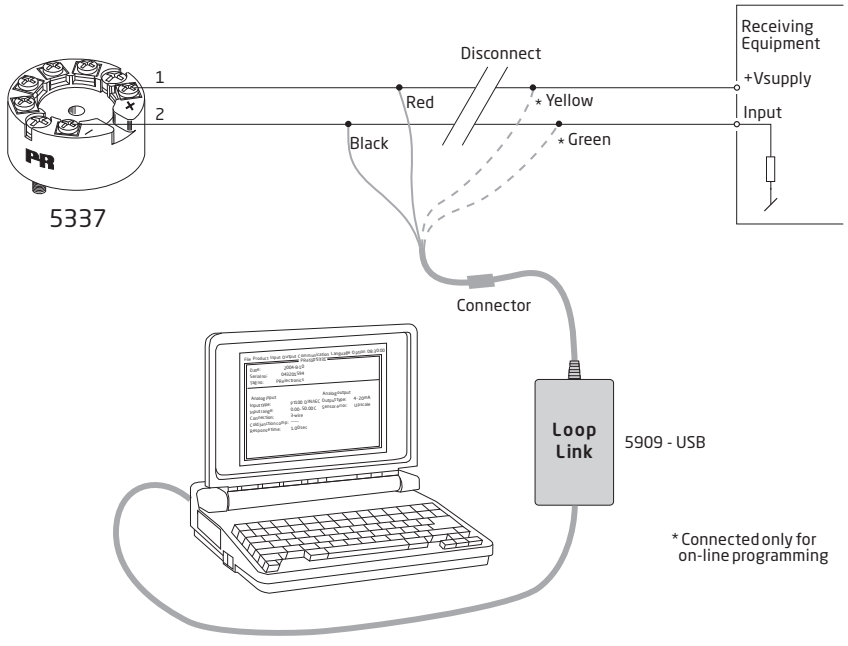
Programming

5337 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.

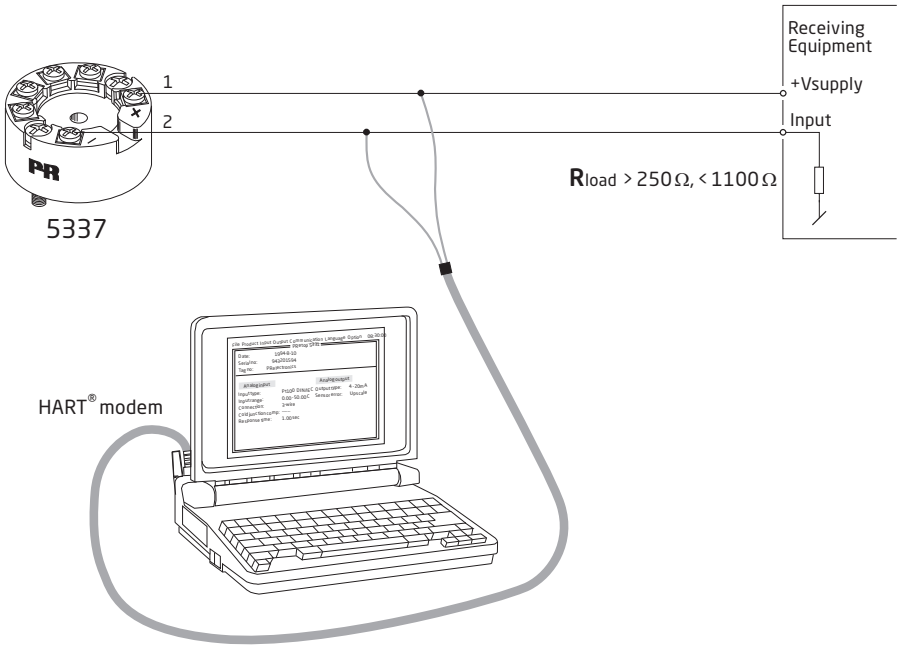
1: Loop Link

For programming please refer to the drawing below and the help functions in PReset.
Loop Link is not approved for communication with devices installed in hazardous (Ex) area.



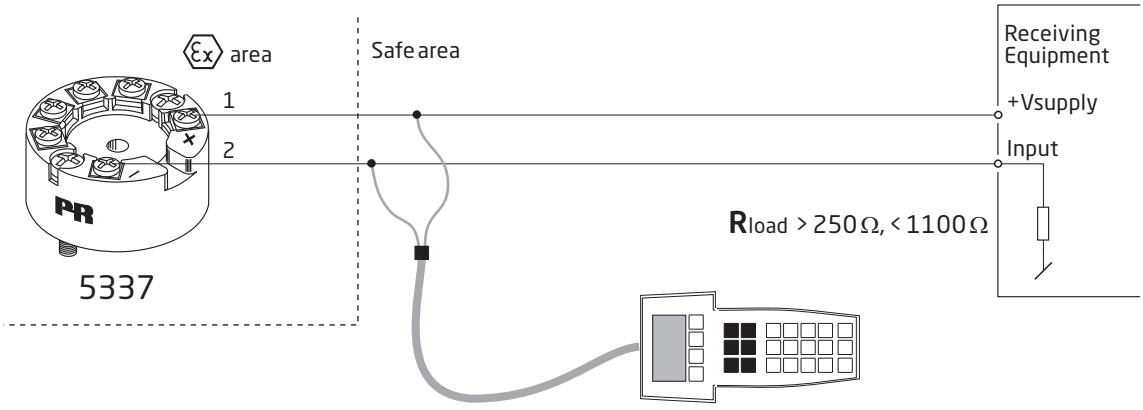
2: HART modem

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



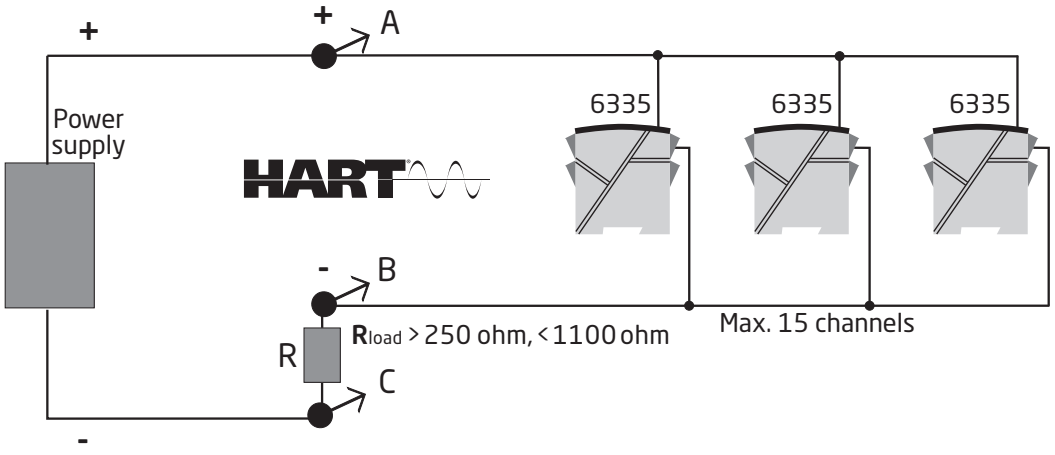
3: HART communicator

For programming please refer to the drawing below. To get access to productspecific 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 PR electronics A/S.



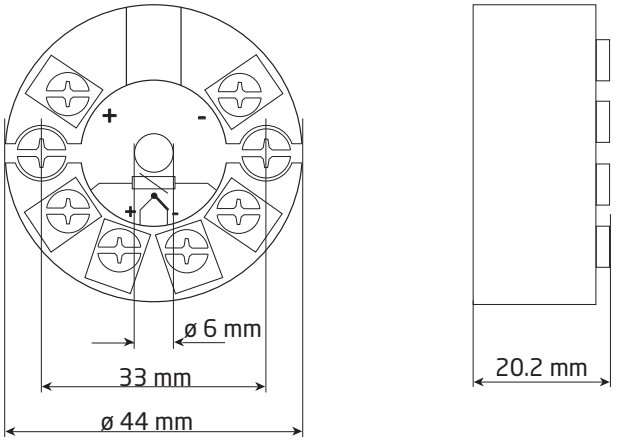
Connection of transmitters in multidrop mode

- The HART communicator or a PC modem can be connected accross AB or BC.

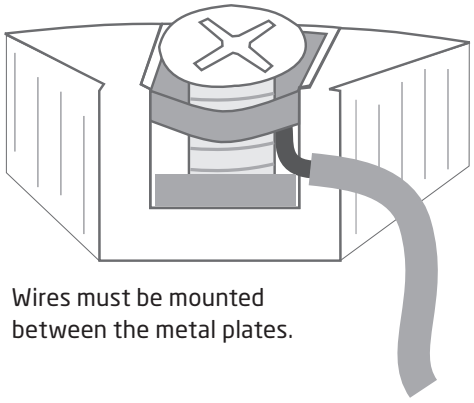


- The outputs of max. 63 transmitters can be conected in parallel for a digital HART communication on 2-wires.
- Before it is connected, each transmitter must be configured with a unique number from 1 to 63. If 2 transmitters are configured with the same number, both will be excluded. The transmitters must be programmed for multidrop mode (with a fixed output signal of 4 mA). Maximum current in the loop is therefore 252 mA.
- The communication is either by means of a HART communicator or a HART modem.
- The PReset 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.

ATEX Installation drawing 5335QA02

For safe installation of 5335A, or 5337A the following must be observed. The module shall 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.

ATEX Certificate KEMA 03ATEX 1508X

Marking

II 3 G Ex nA [ic] IIC T6..T4 Gc
II 3 G Ex ic IIC T6..T4 Gc
II 3 D Ex ic IIIC Dc

Standards EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010

	Terminal: 3,4,5,6	**Terminal: 1,2**	**Terminal: 1,2**
T4: -40 ≤ Ta ≤ 85ºC T6: -40 ≤ Ta ≤ 60ºC	Ex nA [ic]	Ex nA	Ex ic
	Uo: 9.6 V Io: 28 mA Po: 67 mW Lo: 45 mH Co: 28 µF	U ≤ 35 VDC I = 4 - 20 mA	Ui = 35 VDC Li = 10 µH Ci = 1.0 nF

General installation instructions

If the enclosure is made of non-metallic materials or of painted metal, electrostatic charging shall be avoided.
For an ambient temperature ≥ 60ºC, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

For installation in a potentialy explosive gas atmosphere, the following instructions apply:

For “Ex ic” the transmitter must be installed in an enclosure providing a degree of protection of at least IP20 according to EN60529 that is suitable for the application and is correctly installed.
For “Ex nA” the transmitter must be installed in an enclosure providing a degree of protection of at least IP54 according to EN60529 that is suitable for the application and is correctly installed, or in an enclosure with type of protection Ex n or Ex e.
Cable entry devices and blanking elements shall fulfill the same requirements.

For installation in a potentially explosive dust atmposphere, the following instructions apply:

If the transmitter is supplied with an intrinsically safe signal "ic" and interfaces an intrinsically safe signal "ic" (e.g. a passive device), the transmitter shall be mounted in a metal enclosure form B according to DIN 43729 that provides a degree of protection of at least IP6X according to EN60529, and that is suitable for the application. Cable entry devices and blanking elements shall fulfill the same requirements.

If the transmitter is supplied with an non-sparking signal "nA", or interfaces a non sparking signal, the transmitter shall be mounted in a metal enclosure form B according to DIN 43729 providing a degree of protection of at least IP6X according to EN60529, and in conformance with type of protection Ex tD and suitable for the application. Cable entry devices and blanking elements shall fulfill the same requirements.

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ATEX Installation drawing 5335QA01

For safe installation of 5335D or 5337D the following must be observed. The module shall 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.

ATEX Certificate KEMA 03ATEX 1537

Marking

II 1 G Ex ia IIC T6 ...T4 Ga
II 1 D Ex ia IIIC Da
I M1 Ex ia I Ma

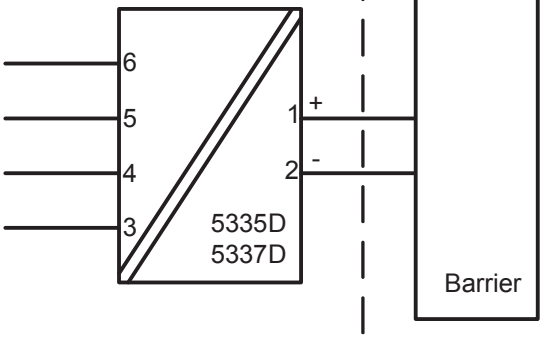
Standards: EN 60079-0 : 2012, EN 60079-11 : 2012, EN 60079-26 : 2007

Hazardous area
Zone 0, 1, 2, 20, 21, 22, and Coal mining

Non Hazardous Area

T4: -40 ≤ Ta ≤ 85ºC
T6: -40 ≤ Ta ≤ 60ºC

Terminal: 3,4,5,6
Uo: 9.6 VDC
Io: 28 mA
Po: 67 mW
Lo: 35 mH
Co: 3.5 µF



Terminal: 1,2
Ui: 30 VDC
Ii: 120 mA
Pi: 0.84 W
Li: 10 µH
Ci: 1.0 nF

Installation notes.

General installation instructions

The sensor circuit is not infallibly galvanic isolated from the supply output circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500Vac during 1 minute.
If the enclosure is made of aluminium, it must be installed such, that even in the event of rare incidents, ignition sources due to impact and friction, sparks are excluded.
If the enclosure is made of non-metallic materials or painted metals electrostatic charging shall be avoided.

For installation in a potentially explosive gas atmosphere, the following instructions apply:

The transmitter shall be mounted in an enclosure form B according to DIN43729 or equivalent that is providing a degree of protection of at least IP20 according to EN60529 that is suitable for the application and correctly installed.

For installation in a potentially explosive dust atmosphere, the following instructions apply:

The transmitter shall be mounted in a metal enclosure form B according to DIN43729 or equivalent, that is providing a degree of protection of at least IP6X according to EN60529 that is suitable for the application and correctly installed.
Cable entries and blanking elements shall be used that are suitable for the application and correctly installed.

For installalation in mines the following instructions apply:

The transmitter shall be mounted in a metal enclosure that is providing a degree of protection of at least IP6X according to EN60529, and is suitable for the application and correctly installed.
Cable entries and blanking elements shall be used that are suitable for the application and correctly installed

If the enclosure is made of aluminum, it must be installed such, that even in the event of rare incidents, ignition sources due to impact and friction, sparks are excluded.
If the enclosure is made of non-metallic materials or painted metals electrostatic charging shall be avoided.

The enclosure shall not contain by mass more than
a) 15 % in total of aluminium, magnesium, titanium and zirconium, and
b) 7,5 % in total of magnesium, titanium and zirconium.

IECEx Installation drawing 5335QI02



For safe installation of 5335A or 5337A the following must be observed. The module shall 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.

IECEx Certificate IECEx KEM 10.0083X

Marking
Ex nA [ic] IIC T6..T4 Gc
Ex ic IIC T6..T4 Gc
Ex ic IIIC Dc

Standards IEC 60079-0 : 2011, IEC 60079-11 : 2011, EN 60079-15 : 2010

	Terminal: 3,4,5,6	**Terminal: 1,2**	**Terminal: 1,2**
T4: -40 ≤ Ta ≤ 85ºC T6: -40 ≤ Ta ≤ 60ºC	Ex nA [ic]	Ex nA	Ex ic
	Uo: 9.6 V Io: 28 mA Po: 67 mW Lo: 45 mH Co: 28 µF	U ≤ 35 VDC I = 4 - 20 mA	Ui = 35 VDC Li = 10 µH Ci = 1.0 nF

General installation instructions

If the enclosure is made of non-metallic materials or of painted metal, electrostatic charging shall be avoided.
For an ambient temperature ≥ 60ºC, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

For installation in a potentialy explosive gas atmosphere, the following instructions apply:

For “Ex ic” the transmitter must be installed in an enclosure providing a degree of protection of at least IP20 according to IEC60529 that is suitable for the application and is correctly installed.
For “Ex nA” the transmitter must be installed in an enclosure providing a degree of protection of at least IP54 according to IEC60529 that is suitable for the application and is correctly installed, or in an enclosure with type of protection Ex n or Ex e.
Cable entry devices and blanking elements shall fulfill the same requirements

For installation in a potentially explosive dust atmposphere, the following instructions apply:

If the transmitter is supplied with an intrinsically safe signal "ic" and interfaces an intrinsically safe signal "ic" (e.g. a passive device), the transmitter shall be mounted in a metal enclosure form B according to DIN 43729 that provides a degree of protection of at least IP6X according to IEC60529, and that is suitable for the application. Cable entry devices and blanking elements shall fulfill the same requirements.
If the transmitter is supplied with an non-sparking signal "nA", or interfaces a non sparking signal, the transmitter shall be mounted in a metal enclosure form B according to DIN 43729 providing a degree of protection of at least IP6X according to IEC60529, and in conformance with type of protection Ex tD and suitable for the application. Cable entry devices and blanking elements shall fulfill the same requirements.

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IECEx Installation drawing 5335QI01

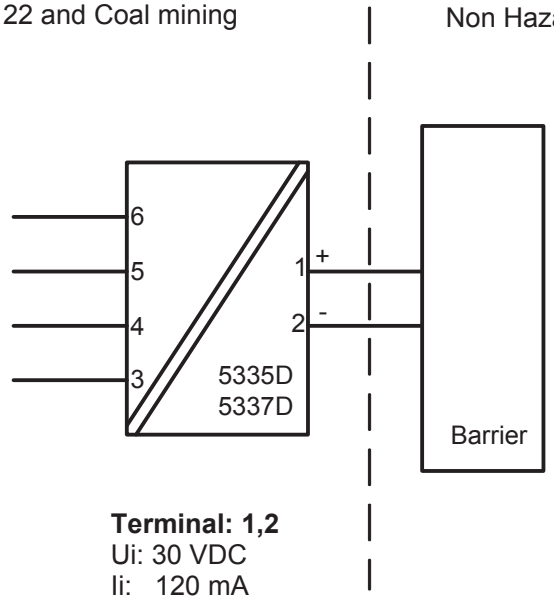
For safe installation of 5335D or 5337D the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.
Year of manufacture can be taken from the first two digits in the serial number.

IECEx Certificate	IECEx KEM.10.0083X
Marking	Ex ia IIC T6..T4 Ga Ex ia IIIC Da Ex ia I Ma
Standards	IEC60079-11:2011, IEC60079-0: 2011, IEC60079-26:2006

Hazardous area
Zone 0, 1, 2, 20, 21, 22 and Coal mining

T4: -40 ≤ Ta ≤ 85ºC
T6: -40 ≤ Ta ≤ 45ºC

Terminal: 3,4,5,6
Uo: 9.6 VDC
Io: 28 mA
Po: 67 mW
Lo: 35 mH
Co: 3.5 µF



Terminal: 1,2
Ui: 30 VDC
Ii: 120 mA
Pi: 0.84 W
Li: 10 µH
Ci: 1.0 nF

Installation notes.

General installation instructions

The sensor circuit is not infallibly galvanic isolated from the supply output circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500Vac during 1 minute.

If the enclosure is made of aluminium, it must be installed such, that even in the event of rare incidents, ignition sources due to impact and friction, sparks are excluded.

If the enclosure is made of non-metallic materials or painted metals electrostatic charging shall be avoided

For installation in a potentially explosive gas atmosphere, the following instructions apply:

The transmitter shall be mounted in an enclosure form B according to DIN43729 or equivalent that is providing a degree of protection of at least IP20 according to IEC 60529 that is suitable for the application and correctly installed.

For installation in a potentially explosive dust atmosphere, the following instructions apply:

The transmitter shall be mounted in a metal enclosure form B according to DIN43729 or equivalent, that is providing a degree of protection of at least IP6X according to IEC 60529 that is suitable for the application and correctly installed.

Cable entries and blanking elements shall be used that are suitable for the application and correctly installed.

For installalation in mines the following instructions apply:

The transmitter shall be mounted in a metal enclosure that is providing a degree of protection of at least IP6X according to IEC 60529, and is suitable for the application and correctly installed.

Cable entries and blanking elements shall be used that are suitable for the application and correctly installed

If the enclosure is made of aluminium, it must be installed such, that even in the event of rare incidents, ignition sources due to impact and friction, sparks are excluded.

If the enclosure is made of non-metallic materials or painted metals electrostatic charging shall be avoided.

The enclosure shall not contain by mass more than

a) 15 % in total of aluminium, magnesium, titanium and zirconium, and

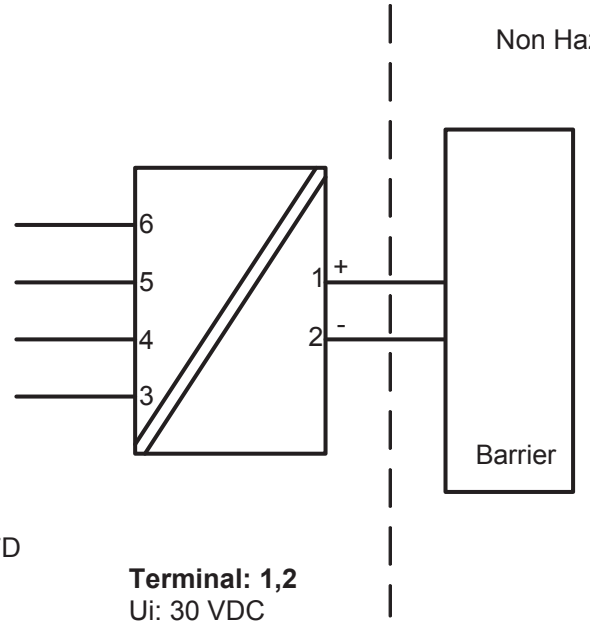
b) 7,5 % in total of magnesium, titanium and zirconium.

CSA Installation drawing 533XQC03

Hazardous area

T4: -40 ≤ Ta ≤ 85ºC
T6: -40 ≤ Ta ≤ 60ºC

Module 5331D, 5333D
Terminal: 3,4,5,6
Only passive, or non-energy storing devices such as RTD's and Thermocouples may be connected



Module 5335D, 5336D and 5337D
Terminal: 3,4,5,6
Uo: 9.6 VDC
Io: 28 mA
Po: 67.2 mW
Lo: 35 mH
Co: 2.5 µF

Terminal: 1,2
Ui: 30 VDC
Ii: 120 mA
Pi: 0.84 W
Li: 10 µH
Ci: 1.0 nF

CLASS 2258 04 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations
Class I, Division 1, Groups A, B, C and D
Ex ia IIC, Ga

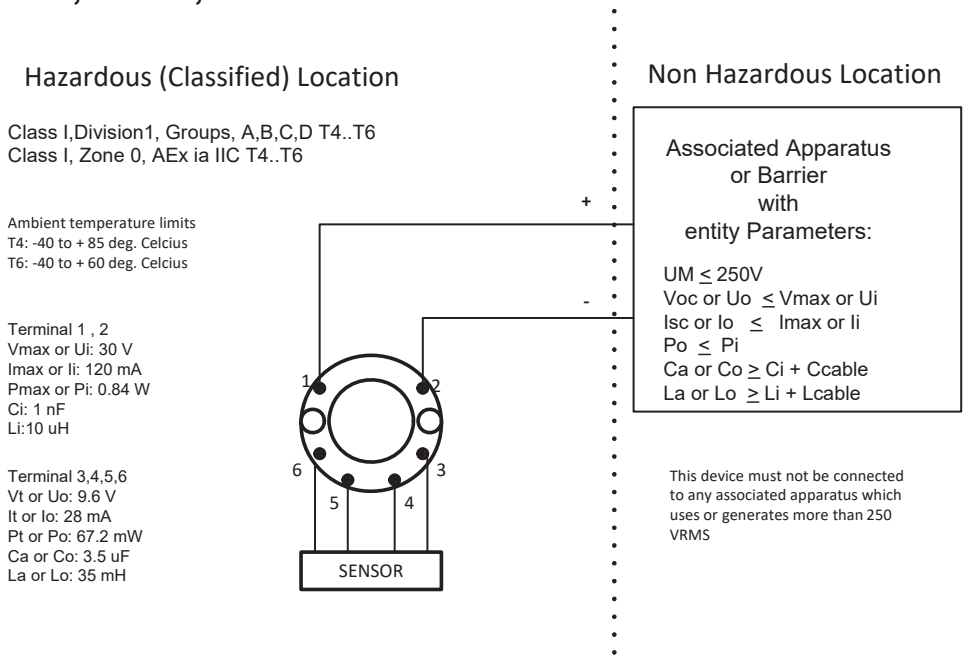
CLASS 2258 84 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations - Certified to US Standards
Class I, Division 1, Groups A, B, C and D
Class I, Zone 0, AEx ia IIC, Ga

Warning:
Substitution of components may impair intrinsic safety.

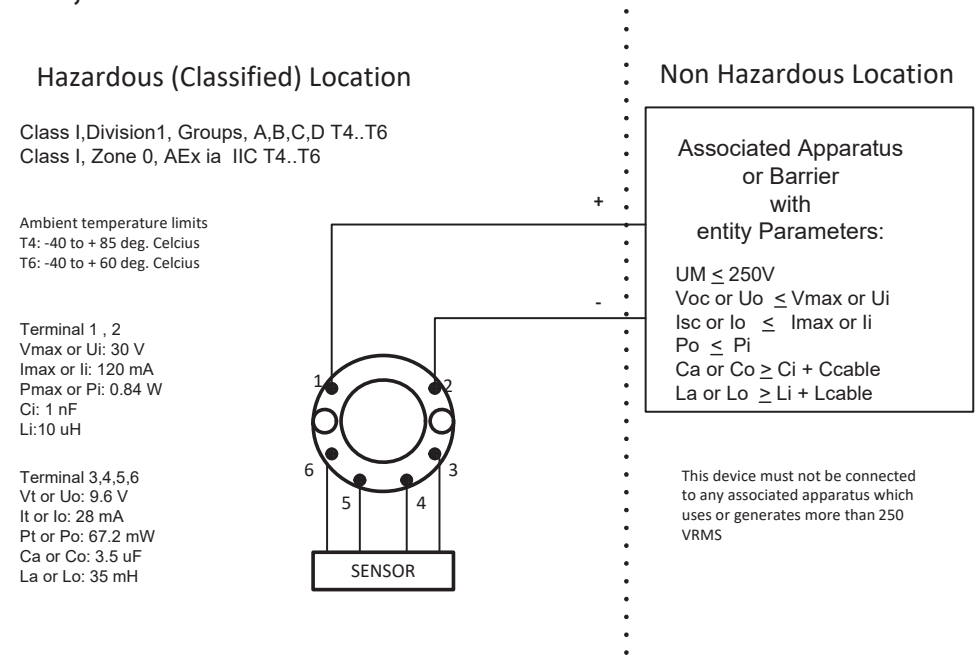
The transmitters must be installed in a suitable enclosure to meet installation codes stipulated in the Canadian Electrical Code (CEC) or for US the National Electrical Code (NEC).

FM Installation Drawing

Model 5331D, 5332D, 5333D and 5343B



Model 5335D, 5337D



The entity concept
The Transmitter must be installed according to National Electrical Code (ANSI-NFPA 70) and shall be installed with the enclosure, mounting, and spacing segregation requirement of the ultimate application.

Equipment that is FM-approved for intrinsic safety may be connected to barriers based on the ENTITY CONCEPT. This concept permits interconnection of approved transmitters, meters and other devices in combinations which have not been specifically examined by FM, provided that the agency's criteria are met. The combination is then intrinsically safe, if the entity concept is acceptable to the authority having jurisdiction over the installation.

The entity concept criteria are as follows:

The intrinsically safe devices, other than barriers, must not be a source of power.
The maximum voltage Ui(V_{MAX}) and current Ii(I_{MAX}), and maximum power Pi(Pmax), which the device can receive and remain intrinsically safe, must be equal to or greater than the voltage (Uo or V_{OC} or V_t) and current (Io or I_{SC} or I_t) and the power Po which can be delivered by the barrier.

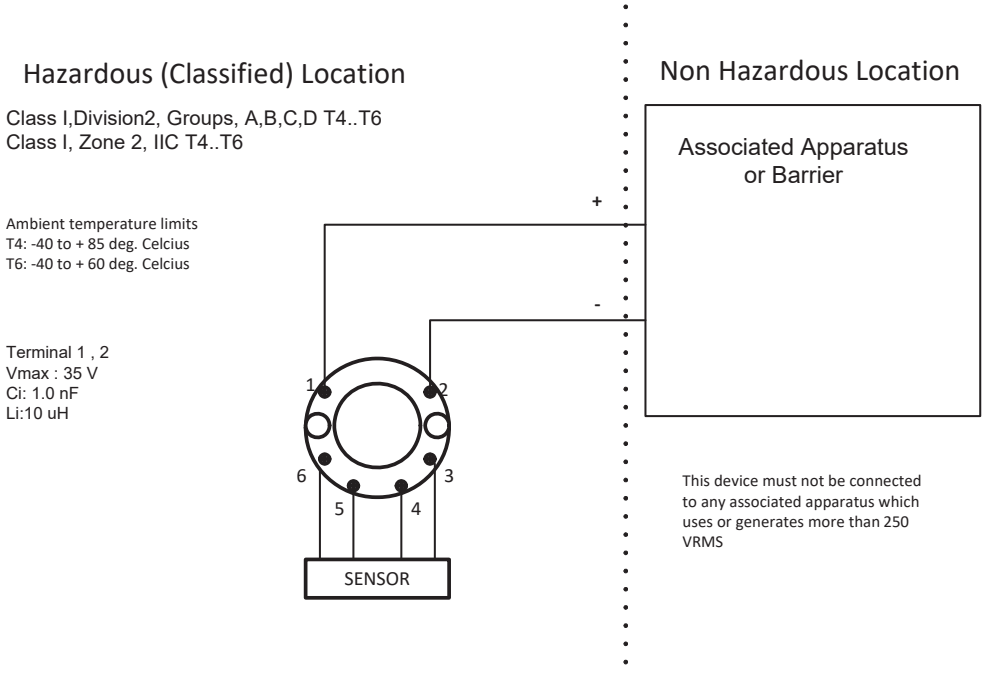
The sum of the maximum unprotected capacitance (C_i) for each intrinsically device and the interconnecting wiring must be less than the capacitance (C_a) which can be safely connected to the barrier.

The sum of the maximum unprotected inductance (L_i) for each intrinsically device and the interconnecting wiring must be less than the inductance (L_a) which can be safely connected to the barrier.

The entity parameters Uo,V_{OC} or V_t and Io,I_{SC} or I_t, and C_a and L_a for barriers are provided by the barrier manufacturer.

NI Field Circuit Parameters

Model 5331D, 5332D, 5333D, 5335D, 5337D and 5343B



Instalação INMETRO 5335QB01-V8R0

Para uma instalação segura, o seguinte deve ser observado. O módulo só deve ser instalado por pessoal qualificado e familiarizado com as leis, diretrizes e normas nacionais e internacionais aplicáveis a essa área.

Certificado	DEKRA18.0002X
Normas	ABNT NBR IEC 60079-0:2013 Versão corrigida 2: 2016 ABNT NBR IEC 60079-11:2013 : Versão corrigida 2017 ABNT NBR IEC 60079-15:2012

5335D, 5337D:

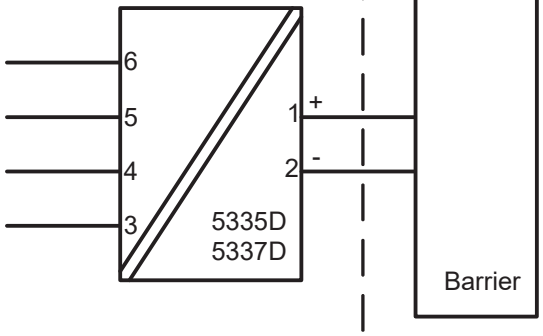
Notas	Ex ia IIC T6...T4 Ga Ex ia IIIC Da Ex ia I Ma

Área Classificada
Zona 0, 1, 2, 20, 21, 22 e mineração de carvão

Área Não classificada

T4: -40 ≤ Ta ≤ 85ºC
T6: -40 ≤ Ta ≤ 45ºC

Terminais :
3,4,5,6
Uo: 9.6 VDC
Io: 28 mA
Po: 67 mW
Lo: 35 mH
Co: 3.5µF



Terminais: 1,2
Ui: 30 VDC
Ii: 120 mA
Pi: 0.84 W
Li: 10µH
Ci: 1.0nF

Instruções Gerais de Instalação.

O circuito do sensor não é galvanicamente infalivelmente isolado do circuito de saída de alimentação. No entanto, o isolamento galvânico entre os circuitos é capaz de suportar uma tensão de teste de 500Vac durante 1 minuto.
Se o invólucro for feito de alumínio, ele deve ser instalado de tal forma que, mesmo em caso de incidentes raros, fontes de ignição devidas a impactos e fricção, faíscas sejam excluídas.
Se o invólucro for feito de materiais não metálicos ou metais pintados, o carregamento eletrostático deve ser evitado.

Para instalações com uma atmosfera de gás potencialmente explosiva, a seguinte instrução se aplicará:

O transmissor deverá ser montado em um gabinete de formato tipo B de acordo com a norma DIN43729 ou equivalente que possibilita um grau mínimo de proteção IP20 de acordo com a ABNT NBR IEC60529 adequado para a aplicação e instalado corretamente.

Para instalação em uma atmosfera de poeira potencialmente explosiva, as seguintes instruções se aplicam:

O transmissor deve ser montado em um invólucro metálico B de acordo com DIN43729 ou equivalente que esteja fornecendo um grau de proteção de pelo menos IP6X de acordo com a ABNT NBR IEC 60529 que seja adequado para a aplicação e instalado corretamente..
Entradas de cabos e bujões de fechamento' devem ser usados adequados à aplicação e instalados corretamente.

Para instalação em minas, as seguintes instruções se aplicam:

O transmissor deve ser montado em um invólucro de metal que forneça um grau de proteção de pelo menos IP6X de acordo com a ABNT NBR IEC 60529 e seja adequado para a aplicação e instalado corretamente.
Entradas de cabos e bujões de fechamento' devem ser usados adequados à aplicação e instalados corretamente.
Se o invólucro for feito de alumínio, ele deve ser instalado de tal forma que, mesmo em caso de incidentes raros, fontes de ignição devidas a impactos e fricção, faíscas sejam excluídas.
Se o invólucro for feito de materiais não metálicos ou metais pintados, o carregamento eletrostático deve ser evitado.
O recinto não deve conter mais de massa
a) 15% no total de alumínio, magnésio, titânio e zircónio e
b) 7,5% no total de magnésio, titânio e zircónio.

5335A, 5337A:

Notas

Ex nA [ic] IIC T6..T4 Gc
Ex ic IIC T6..T4 Gc
Ex ic IIIC Dc

	Terminais: 3,4,5,6 Ex nA [ic]	**Terminais: 1,2** Ex nA	**Terminais: 1,2** Ex ic
T4: -40 ≤ Ta ≤ 85ºC T6: -40 ≤ Ta ≤ 60ºC	Uo: 9.6 V Io: 28 mA Po: 67 mW Lo: 45 mH Co: 28 µF	U ≤ 35 VDC I = 4 - 20 mA	Ui = 35 VDC Li = 10 µH Ci = 1.0 nF

Instruções gerais de instalação

Se o invólucro for feito de materiais não metálicos ou de metal pintado, o carregamento eletrostático deve ser evitado.
Para uma temperatura ambiente ≥ 60ºC, devem ser utilizados cabos resistentes ao calor com uma classificação de pelo menos 20 K acima da temperatura ambiente.

Para instalação em uma atmosfera de gás potencialmente explosiva, as seguintes instruções se aplicam:

Para “Ex ic”, o transmissor deve ser instalado em um gabinete que ofereça um grau de proteção de pelo menos IP20 de acordo com a ABNT NBR IEC60529, adequado para a aplicação e que esteja instalado corretamente.
Para “Ex nA” o transmissor deve ser instalado em um invólucro que ofereça um grau de proteção de pelo menos IP54 de acordo com a ABNT NBR IEC60529 que seja adequado para a aplicação e esteja corretamente instalado, ou em um invólucro com tipo de proteção Ex n ou Ex e. Dispositivos de entrada de cabos e bujões de fechamento’ devem cumprir os mesmos requisitos

Para instalação em atmosferas potencialmente explosivas, aplicam-se as seguintes instruções:

Se o transmissor for fornecido com um sinal intrinsecamente seguro "ic" e fizer a interface de um sinal intrinsecamente seguro "ic" (por exemplo, um dispositivo passivo), o transmissor será montado em um invólucro metálico B de acordo com a norma DIN 43729 que fornece um grau de proteção pelo menos IP6X de acordo com a ABNT NBR IEC60529, e é adequado para a aplicação. Dispositivos de entrada de cabos e bujões de fechamento’ devem atender aos mesmos requisitos.
Se o transmissor for fornecido com um sinal não centelhante "nA" ou fizer a interface de um sinal não centelhante, o transmissor será montado em um invólucro metálico B de acordo com a norma DIN 43729, proporcionando um grau de proteção de pelo menos IP6X conforme ABNT NBR. IEC60529, e em conformidade com o tipo de proteção Ex t e adequado para a aplicação. Dispositivos de entrada de cabos e bujões de fechamento’ devem atender aos mesmos requisitos.

Document history

The following list provides notes concerning revisions of this document.

Rev. ID	Date	Notes
104	18/37	Specifications for internal power dissipation added INMETRO certification changed to DEKRA FM certifcate number updated FM installation drawing updated

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