

**PR**  
electronics



**5 3 3 7**

**2-wire Transmitter  
with HART® Protocol**

No. 5337V102-UK  
From ser. no. 120917007



- DK** ▶ PR electronics A/S tilbyder et bredt program af analoge og digitale signalbehandlingsmoduler til industriel automation. Programmet består af Isolatorer, Displays, Ex-barrierer, Temperaturtransmittere, Universaltransmittere mfl. Vi har modulerne, du kan stole på i selv barske miljøer med elektrisk støj, vibrationer og temperaturudsving, og alle produkter opfylder de strengeste internationale standarder. Vores motto »Signals the Best« er indbegrebet af denne filosofi - og din garanti for kvalitet.
- UK** ▶ PR electronics A/S offers a wide range of analogue and digital signal conditioning devices for industrial automation. The product range includes Isolators, Displays, Ex Interfaces, Temperature Transmitters, and Universal Devices. You can trust our products in the most extreme environments with electrical noise, vibrations and temperature fluctuations, and all products comply with the most exacting international standards. »Signals the Best« is the epitome of our philosophy - and your guarantee for quality.
- FR** ▶ PR electronics A/S offre une large gamme de produits pour le traitement des signaux analogiques et numériques dans tous les domaines industriels. La gamme de produits s'étend des transmetteurs de température aux afficheurs, des isolateurs aux interfaces SI, jusqu'aux modules universels. Vous pouvez compter sur nos produits même dans les conditions d'utilisation sévères, p.ex. bruit électrique, vibrations et fluctuations de température. Tous nos produits sont conformes aux normes internationales les plus strictes. Notre devise »SIGNALS the BEST« c'est notre ligne de conduite - et pour vous l'assurance de la meilleure qualité.
- DE** ▶ PR electronics A/S verfügt über ein breites Produktprogramm an analogen und digitalen Signalverarbeitungsgeräte für die industrielle Automatisierung. Dieses Programm umfasst Displays, Temperaturtransmitter, Ex- und galvanische Signaltrenner, und Universalgeräte. Sie können unsere Geräte auch unter extremen Einsatzbedingungen wie elektrisches Rauschen, Erschütterungen und Temperaturschwingungen vertrauen, und alle Produkte von PR electronics werden in Übereinstimmung mit den strengsten internationalen Normen produziert. »Signals the Best« ist Ihre Garantie für Qualität!

# 2-WIRE TRANSMITTER WITH HART® PROTOCOL

## PRetop 5337

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## **PRetop 5337**

### **2-WIRE TRANSMITTER WITH HART® PROTOCOL**

- *RTD, TC, Ohm, or mV input*
- *2 analogue 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 NE21 recommendations, the 5337 HART® transmitter ensures top measurement performance in harsh EMC environments. Additionally, the 5337 meets NAMUR NE43 and NE89 recommendations.

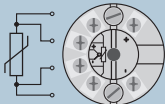
## Mounting / installation / programming

- 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.
- NB: As Ex barrier for 5337D we recommend 5106B and 9106B.



## APPLICATIONS

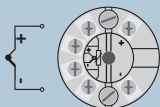
RTD to 4...20 mA



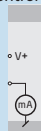
2-wire installation  
in control room



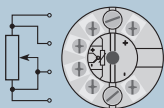
TC to 4...20 mA



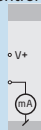
2-wire installation  
in control room



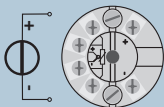
Resistance to 4...20 mA



2-wire installation  
in control room



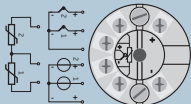
mV to 4...20 mA



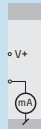
2-wire installation  
in control room



Difference or average  
RTD, TC or mV



2-wire installation  
in control room



## Ordering codes for 5337

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

### Accessories

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

### Technical data

#### Environmental conditions:

Specifications range..... -40°C to +85°C  
Calibration temperature ..... 20...28°C  
Relative humidity..... < 95% RH (non-cond.)  
Protection degree (encl./terminal)..... IP68/IP00  
Vibration..... IEC 60068-2-6 Test FC  
    2...25 Hz..... ±1.6 mm  
    25...100 Hz ..... ±4 g

#### Mechanical specifications:

Dimensions ..... Ø 44 x 20.2 mm  
Weight approx..... 50 g  
Max. wire size..... 1 x1.5 mm<sup>2</sup> stranded wire  
Screw terminal torque ..... 0.4 Nm

#### Common electrical specifications:

Supply voltage, DC:  
    Standard..... 8.0...35 V  
    ATEX, CSA, FM, IECEx & INMETRO ..... 8.0...30 V  
Voltage drop ..... 8.0 V  
Isolation - test / working..... 1.5 kVAC / 50 VAC  
Signal / noise ratio ..... > 60 dB  
Communications interface ..... Loop Link & HART®  
Response time (programmable)..... 1...60 s

Accuracy, the greater of general and basic values:

General values		
Input type	Absolute accuracy	Temperature coefficient
All	$\leq \pm 0.05\%$ of span	$\leq \pm 0.005\%$ of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
Pt50 - Pt1000	$\leq \pm 0.1^\circ\text{C}$	$\leq \pm 0.005^\circ\text{C}/^\circ\text{C}$
Ni50 - Ni1000	$\leq \pm 0.2^\circ\text{C}$	$\leq \pm 0.005^\circ\text{C}/^\circ\text{C}$
Lin. R	$\leq \pm 0.1 \Omega$	$\leq \pm 5 \text{ m}\Omega / ^\circ\text{C}$
Volt	$\leq \pm 10 \mu\text{V}$	$\leq \pm 0.5 \mu\text{V} / ^\circ\text{C}$
TC type: E, J, K, L, N, T, U	$\leq \pm 0.5^\circ\text{C}$	$\leq \pm 0.025^\circ\text{C} / ^\circ\text{C}$
TC type: B <sup>1</sup> , Lr, R, S, W3, W5	$\leq \pm 1^\circ\text{C}$	$\leq \pm 0.1^\circ\text{C} / ^\circ\text{C}$
TC type:B <sup>2</sup>	$\leq \pm 3^\circ\text{C}$	$\leq \pm 0.3^\circ\text{C} / ^\circ\text{C}$
TC type:B <sup>3</sup>	$\leq \pm 8^\circ\text{C}$	$\leq \pm 0.8^\circ\text{C} / ^\circ\text{C}$
TC type:B <sup>4</sup>	not specified	not specified

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

TC cold junction compensation ..... <  $\pm 1.0^\circ\text{C}$   
 Max. offset on input signal ..... 50% of selec. max. value

EMC immunity influence ..... < $\pm 0.1\%$ of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst ..... < $\pm 1\%$ of span



**Input specifications:****RTD input types:**

RTD type	Min. value	Max. values	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:**

Voltage input range..... -800...+800 mV

Min. span..... 2.5 mV

Input resistance..... 10 MΩ

**Output specifications:**

Signal range .....	4...20 mA
Min. signal range.....	16 mA
Updating time .....	440 ms
Load resistance.....	$\leq (V_{\text{supply}} - 8) / 0.023 [\Omega]$
Sensor error detection, programmable .....	3.5...23mA
(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

**Approvals:**

EMC 2004/108/EC .....	EN 61326-1
GOST R	

**Marine approval:**

Det Norske Veritas, Ships & Offshore .....	Stand. for Certific. No. 2.4
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**Ex / I.S.:**

## 5337A:

ATEX 94/9/EC .....	KEMA 03ATEX1508 X
IECEX.....	KEM 10.0083 X

## 5337D:

ATEX 94/9/EC .....	KEMA 03ATEX1537
IECEX.....	KEM 10.0083 X
FM.....	2D5A7
CSA .....	1125003
INMETRO.....	NCC 12.0844 X
GOST Ex	

**Functional Safety:**

Hardware assessed for use in SIL applications  
FMEDA report - [www.prelectronics.com](http://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 "

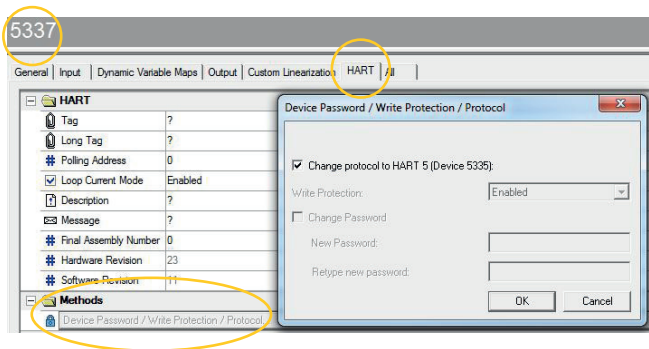
Select **Write enable** and enter "-CHANGE-".

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

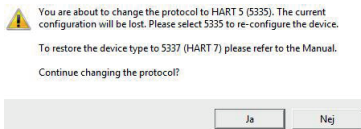
## Changing the HART® protocol version using the PReset software and 5909 Loop Link or a HART® communication interface

### Switching from HART® 7 to HART® 5

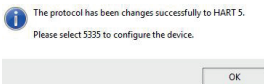
Select the 5337 product, click the "HART" tab and open the folder "Methods". Click "Device Password / Write Protection / Protocol..." and select "Change protocol to HART 5" in the pop-up window, then acknowledge by pressing OK.



The following message will now appear:



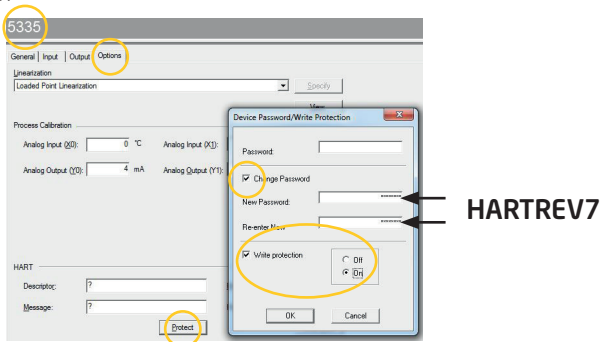
If you press "Ja" (Yes):



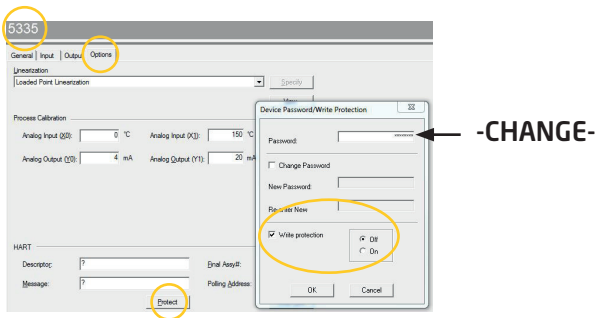
## Switching from HART® 5 to HART 7®

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.

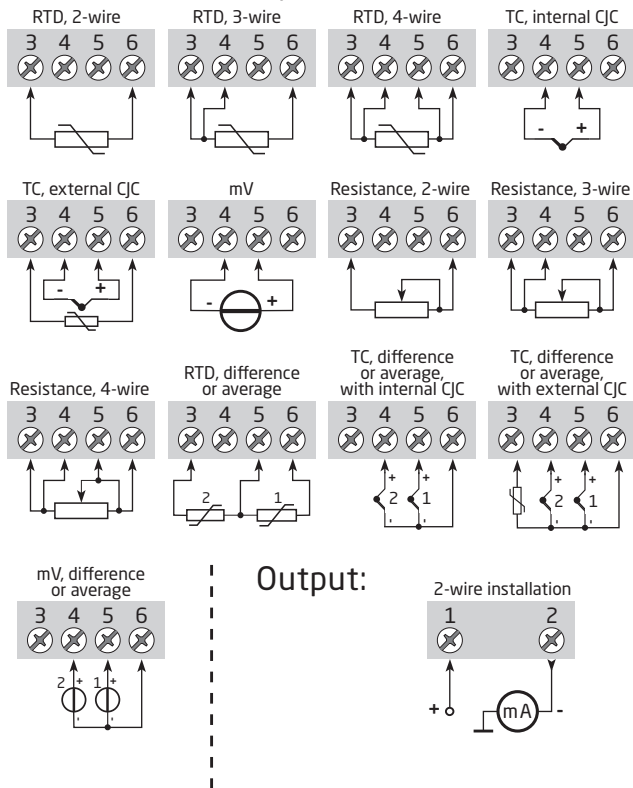


Switch **Write protection OFF** and write-enable the device by typing in the **Password "-CHANGE-"** in the top menu - acknowledge by pressing OK. This action will reset the password to the default active password "\*\*\*\*\*" (8 stars) and restart the device in the updated HART® 7 mode with write protection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

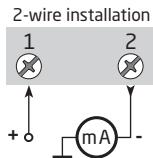


# CONNECTIONS

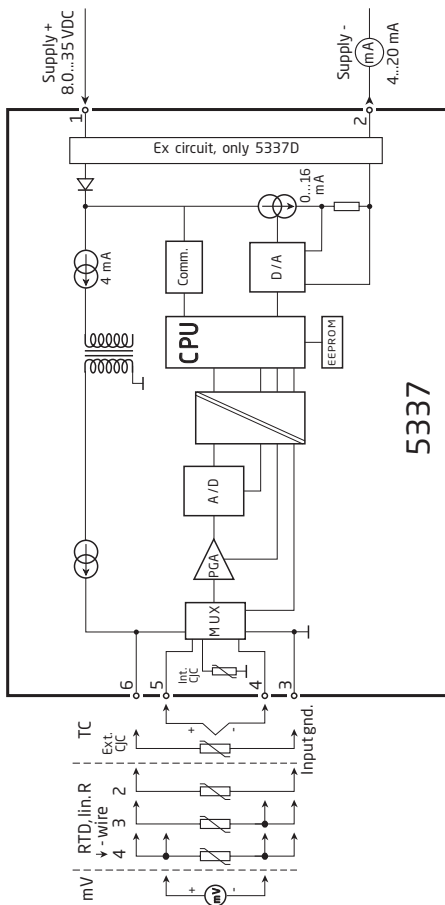
## Input:



## Output:



# BLOCK DIAGRAM



# PROGRAMMING

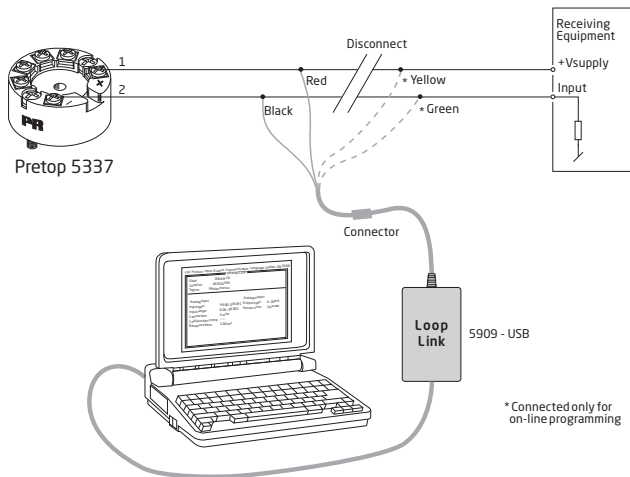
5337 can be configured in the following 3 ways:

1. With PR electronics A/S' communications interface Loop Link and PReset PC configuration software.
2. With a HART<sup>®</sup> modem and PReset PC configuration software.
3. With a HART<sup>®</sup> 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.

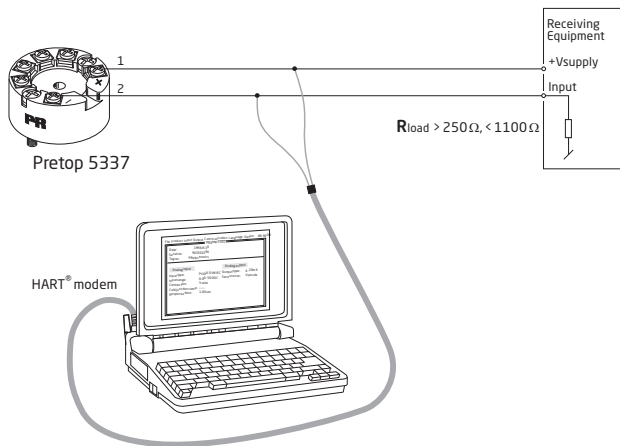
Loop Link is not approved for communication with devices installed in hazardous (Ex) areas.





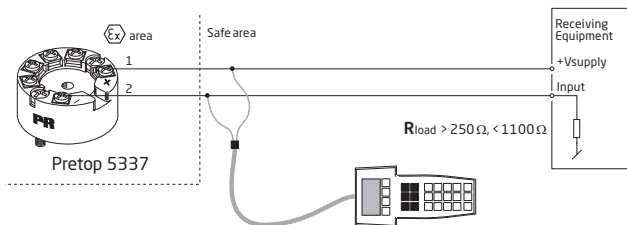
## 2: HART® modem

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



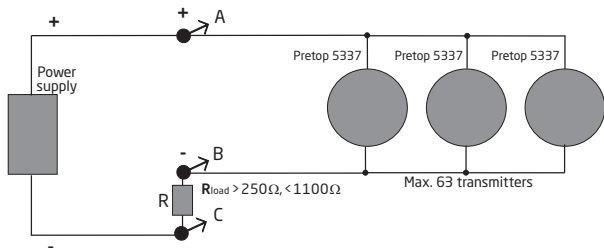
## 3: HART® communicator

For programming please refer to the drawing below. To gain access to product-specific commands, a suitable 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.

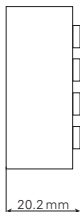
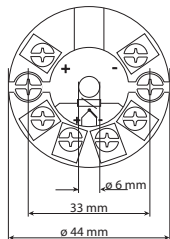


The outputs of max. 63 transmitters can be connected in parallel for a digital HART® 7 communication on 2-wires.

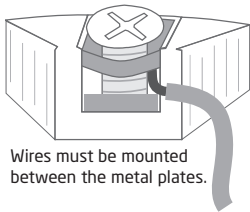
Before it is connected, each transmitter must be configured with a unique number from 1 to 63. If 2 transmitters are configured with the same number, both will be excluded. The transmitters must be programmed for multidrop mode (with a fixed output signal of 4 mA). Maximum current in the loop is therefore 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



# APPENDIX

**ATEX Installation Drawing - 5337A**

**IECEX installation drawing - 5337A**

**ATEX Installation Drawing - 5337D**

**IECEX installation drawing - 5337D**

**FM Installation Drawing - 5337D**

**CSA Installation Drawing - 5337D**

**INMETRO Instruções de Segurança**

## ATEX Installation drawing

For safe installation of 5335A, 5336A 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      EN60079-0:2009, EN60079-11:2007, EN60079-15:2010 EN61241-11:2006

T4: $-40 \leq T_a \leq 85^\circ\text{C}$	<b>Terminal: 3,4,5,6</b>	<b>Terminal: 1,2</b>	<b>Terminal: 1,2</b>
T6: $-40 \leq T_a \leq 60^\circ\text{C}$	Ex nA [ic]	Ex nA	Ex ic
	Uo: 9.6 V	U $\leq$ 35 VDC	Ui = 35 VDC
	Io: 28 mA	I = 4 - 20 mA	Li = 10 $\mu\text{H}$
	Po: 67 mW		Ci = 1.0 nF
	Lo: 45 mH		
	Co: 28 $\mu\text{F}$		

### Installation note:

For use in an explosive dust atmosphere, the transmitter shall be mounted in an enclosure providing a degree of protection of at least IP6X in accordance with EN60529, eg. a form B enclosure according to DIN 43729. The surface of the enclosure is equal to the ambient temperature + 20K, for a dust layer with a maximum thickness of 5 mm.

### Special conditions for safe use:

For use in an explosive gas atmosphere, the transmitter shall be mounted in an enclosure providing a degree of protection of at least IP54 in accordance with EN60529.

For an ambient temperature  $\geq 60^\circ\text{C}$ , heat resistant cables shall be used with a rating of at least 20K above the ambient temperature.

## IECEX Installation drawing



For safe installation of 5335A, 5336A 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 : 2007, IEC 60079-11 : 2006, EN 60079-15 : 2010

T4: $-40 \leq T_a \leq 85^\circ\text{C}$	<b>Terminal: 3,4,5,6</b>	<b>Terminal: 1,2</b>	<b>Terminal: 1,2</b>
T6: $-40 \leq T_a \leq 60^\circ\text{C}$	Ex nA [ic]	Ex nA	Ex ic
	Uo: 9.6 V	U $\leq 35$ VDC	Ui = 35 VDC
	Io: 28 mA	I = 4 - 20 mA	Li = 10 $\mu\text{H}$
	Po: 67 mW		Ci = 1.0 nF
	Lo: 45 mH		
	Co: 28 $\mu\text{F}$		

### Installation note:

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

The transmitter shall be installed in an enclosure providing a degree of protection of at least

IP54 according to IEC60529 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 an ambient temperature  $\geq 60^\circ\text{C}$ , heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

For installation in a potentially explosive dust atmosphere, 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 a 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.

## ATEX Installation drawing



For safe installation of 5335D, 5336D 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

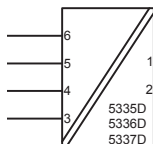
Marking  II 1 G Ex ia IIC T6 ...T4 Ga  
II 1 D Ex ia IIC Da  
I M1 Ex ia I Ma

Standards EN 60079-0 : 2009, EN 60079-11 : 2007,  
EN 60079-26 : 2007, EN 61241-11: 2006

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

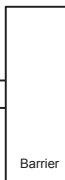
T4:  $-40 \leq T_a \leq 85^\circ\text{C}$   
T6:  $-40 \leq T_a \leq 60^\circ\text{C}$

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



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

Non Hazardous Area



**Installation notes.**

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

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.

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, electrostatic charging shall be avoided.

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 an ambient temperature  $\geq 60^{\circ}\text{C}$ , heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

For installation 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

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



For safe installation of 5335D, 5336D 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.

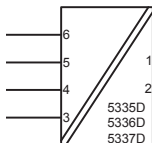
Year of manufacture can be taken from the first two digits in the serial number.

IECEx Certificate	IECEx KEM.10.0083X
Marking	Ex ia IIC T6..T4 Ga Ex ia IIIC Da Ex ia I Ma
Standards	IEC60079-11:2006, IEC60079-0: 2007 IEC60079-26:2006, IEC61241-11:2005

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

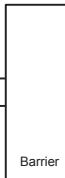
T4:  $-40 \leq T_a \leq 85^\circ\text{C}$   
T6:  $-40 \leq T_a \leq 45^\circ\text{C}$

**Terminal: 3,4,5,6**  
Uo: 9.6 VDC  
Io: 28 mA  
Po: 67 mW  
Lo: 35 mH  
Co: 3.5 $\mu$ F



**Terminal: 1,2**  
Ui: 30 VDC  
Ii: 120 mA  
Pi: 0.84 W  
Li: 10 $\mu$ H  
Ci: 1.0nF

Non Hazardous Area





**Installation notes.**

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

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.

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.

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, electrostatic charging shall be avoided.

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 an ambient temperature  $\geq 60^{\circ}\text{C}$ , heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

For installation 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

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.

## FM Installation Drawing 5300Q502 Rev AH

### Model 5331C, 5331D, 5333C, 5333D and 5343B

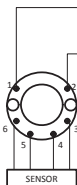
#### Hazardous (Classified) Location

Class I, Division 1, Groups, A, B, C, D  
Class I, Zone 0, IIC

Ambient temperature limits  
T4: -40 to +85 deg. Celsius  
T6: -40 to +60 deg. Celsius

Terminal 1, 2  
Vmax or Ui: 30 V  
Imax or Ii: 120 mA  
Pmax or Pi: 0.84 W  
Ci: 1 nF  
Li: 10 uH

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



#### Non Hazardous Location

Associated Apparatus  
or Barrier  
with  
entity Parameters:

$UM \leq 250V$   
 $Voc \text{ or } Uo \leq Vmax \text{ or } Ui$   
 $Isc \text{ or } Io \leq Imax \text{ or } Ii$   
 $Po \leq Pi$   
 $Ca \text{ or } Co \geq Ci + Ccable$   
 $La \text{ or } Lo \geq Li + Lcable$

This device must not be connected to any associated apparatus which uses or generates more than 250 VRMS

### Model 5335C, 5335D, 5336D, 5337D

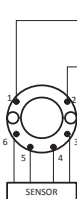
#### Hazardous (Classified) Location

Class I, Division 1, Groups, A, B, C, D  
Class I, Zone 0, IIC

Ambient temperature limits  
T4: -40 to +85 deg. Celsius  
T6: -40 to +60 deg. Celsius

Terminal 1, 2  
Vmax or Ui: 30 V  
Imax or Ii: 120 mA  
Pmax or Pi: 0.84 W  
Ci: 1 nF  
Li: 10 uH

Terminal 3, 4, 5, 6  
Vi or Uo: 9.6 V  
Ii or Io: 28 mA  
Pi or Po: 67.2 mW  
Ca or Co: 3.5 uF  
La or Lo: 35 mH



#### Non Hazardous Location

Associated Apparatus  
or Barrier  
with  
entity Parameters:

$UM \leq 250V$   
 $Voc \text{ or } Uo \leq Vmax \text{ or } Ui$   
 $Isc \text{ or } Io \leq Imax \text{ or } Ii$   
 $Po \leq Pi$   
 $Ca \text{ or } Co \geq Ci + Ccable$   
 $La \text{ or } Lo \geq Li + Lcable$

This device must not be connected to any associated apparatus which uses or generates more than 250 VRMS

**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  $U_i(V_{MAX})$  and current  $I_i(I_{MAX})$ , and maximum power  $P_i(P_{MAX})$ , which the device can receive and remain intrinsically safe, must be equal to or greater than the voltage ( $U_o$  or  $V_{OC}$  or  $V_i$ ) and current ( $I_o$  or  $I_{SC}$  or  $I_i$ ) and the power  $P_o$  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  $U_o, V_{OC}$  or  $V_i$  and  $I_o, I_{SC}$  or  $I_i$ , and  $C_a$  and  $L_a$  for barriers are provided by the barrier manufacturer.

**NI Field Circuit Parameters**

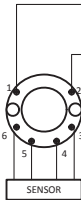
**Model 5331C, 5331D, 5333C, 5333D, 5335C, 5335D, 5336D, 5337D and 5343B**

**Hazardous (Classified) Location**

Class I, Division 2, Groups, A, B, C, D  
Class I, Zone 2, IIC

Ambient temperature limits  
T4: -40 to +85 deg. Celcius  
T6: -40 to +60 deg. Celcius

Terminal 1, 2  
 $V_{max}$ : 35 V  
 $C_i$ : 0  $\mu$ F  
 $L_i$ : 10  $\mu$ H

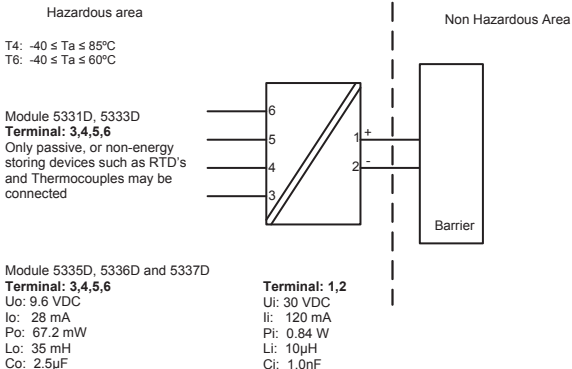


**Non Hazardous Location**

Associated Apparatus  
or Barrier

This device must not be connected to any associated apparatus which uses or generates more than 250 VRMS

## CSA Installation drawing 533XQC03



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).

## Instruções de Segurança

### **5335D, 5336D, 5337D: Instalação Ex:**

Para a instalação segura do transmissor 5335D-5337D em áreas classificadas, deve-se observar o seguinte:

O módulo necessita ser instalado somente por pessoal qualificado e que tenham familiaridade com normas internacionais, diretivas e normalização aplicadas à estas áreas.

O ano de fabricação do instrumento pode ser obtido, observando-se os primeiros dois dígitos do seu número de série.

O circuito do sensor não está com isolamento galvânica total em relação ao circuito de entrada. Todavia a isolamento galvânica entre os circuitos é capaz de suportar teste de voltagem de 500 Vac durante 1 minuto.

O transmissor precisa ser montado em um invólucro com um grau de proteção pelo menos IP-20.

Em atmosferas explosivas compostas por misturas de ar / poeira:

O transmissor somente poderá ser instalado em uma atmosfera potencialmente explosiva composta por poeira combustível se estiver montado no interior de um invólucro metálico forma B de acordo com a norma DIN 43729 com um grau de proteção pelo menos IP-6X de acordo com a norma IEC 60529, que seja adequado para esta aplicação e corretamente instalado.

As entradas dos cabos e outras barreiras a serem utilizadas devem ser adequadas e corretamente instaladas.

Onde a temperatura ambiente for  $\geq 60^{\circ}\text{C}$ , devem ser utilizados cabos resistentes ao calor que resistam pelo menos 20K acima da temperatura ambiente.

Se o invólucro onde o transmissor está montado for feito de alumínio e instalado em Zona 0, 1 ou Zona 20,21 ou 22, este não deve conter mais do que 6% do seu peso total de magnésio e titânio.

Acessórios adicionais ao invólucro devem ser projetados e/ou instalados de tal modo que até mesmo eventos de rara incidência, fontes de ignição causadas por impactos e faíscas por fricção sejam excluídas.

Ex ia IIC T6...T4 Ga

Ex ia I Ma

Certificado:: NCC 12.0844 X

Temp. amb. máxima T1...T4 ..... 85°C

Temp. amb. máxima T5 e T6 ..... 45°C

Aplicável em Zona ..... 0, 1, 2

Sinal de saída / alimentação , terminal 1 e 2:

Ui ..... : 30 VDC  
 Ii ..... : 120 mADC  
 Pi ..... : 0,84 W  
 Li ..... : 10 µH  
 Ci ..... : 1,0 nF

Entrada do sensor, terminais 3, 4, 5 e 6:

Uo ..... : 9,6 VDC  
 Io ..... : 28 mA  
 Po ..... : 67 mW  
 Lo ..... : 35 mH  
 Co ..... : 3,5 µF

### 5335A, 5336A, 5337A: Instalação Ex:

Montado no interior de um invólucro metálico forma B de acordo com a norma DIN 43729 com um grau de proteção pelo menos IP-54 de acordo com a norma IEC 60529, que seja adequado para esta aplicação e corretamente instalado.

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

Ex ic IIC T6...T4 Gc

Certificado:: NCC 12.0844 X

Temp. amb. máxima T1...T4 ..... 85°C

Temp. amb. máxima T5 e T6 ..... 60°C

Aplicável em Zona ..... 2

Sinal de saída / alimentação , terminal 1 e 2:

Ui ..... : 35 VDC

Entrada do sensor, terminais 3, 4, 5 e 6:

Uo ..... : 9,6 VDC  
 Io ..... : 28 mA  
 Po ..... : 67 mW  
 Lo ..... : 35 mH  
 Co ..... : 3,5 µF



**Displays** Programmable displays with a wide selection of inputs and outputs for display of temperature, volume and weight, etc. Feature linearization, scaling, and difference measurement functions for programming via PReset software.



**Ex interfaces** Interfaces for analog and digital signals as well as HART® signals between sensors / I/P converters / frequency signals and control systems in Ex zone 0, 1 & 2 and for some devices in zone 20, 21 & 22.



**Isolation** Galvanic isolators for analog and digital signals as well as HART® signals. A wide product range with both loop-powered and universal isolators featuring linearization, inversion, and scaling of output signals.



























**Temperature** A wide selection of transmitters for DIN form B mounting and DIN rail devices with analog and digital bus communication ranging from application-specific to universal transmitters.



**Universal** PC or front programmable devices with universal options for input, output and supply. This range offers a number of advanced features such as process calibration, linearization and auto-diagnosis.



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QUALITY SYSTEM AND ENVIRONMENTAL MANAGEMENT SYSTEM  
 DS/EN ISO 9001  
 DS/EN ISO 14001

