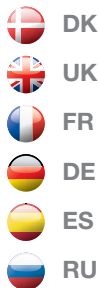


# PR



## 5 3 3 5

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

No. 5335V113-IN  
From ser. no. 100924000



SIGNALS THE BEST

- 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 modules for industrial automation. The product range includes Isolators, Displays, Ex Interfaces, Temperature Transmitters, and Universal Modules. 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 Signalverarbeitungsmodulen 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 5335

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# 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.
- The 5335 has been designed according to strict safety requirements and is thus suitable for application in SIL 2 installations.
- 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 the PR fitting type 8421.
- **NB:** As Ex barrier for 5335D we recommend 5106B.

# EC 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:

The EMC Directive 2004/108/EC and later amendments

**EN 61326-1 : 2006**

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 60079-0 : 2006, EN 60079-11 : 2007,**

**EN 60079-15 : 2005 and EN 60079-26 : 2007**

**EN 61241-0 : 2006 and EN 61241-11 : 2006**

**ATEX certificate: KEMA 03ATEX1508 X (5335A)**

**ATEX certificate: KEMA 03ATEX1537 (5335D)**

Notified body

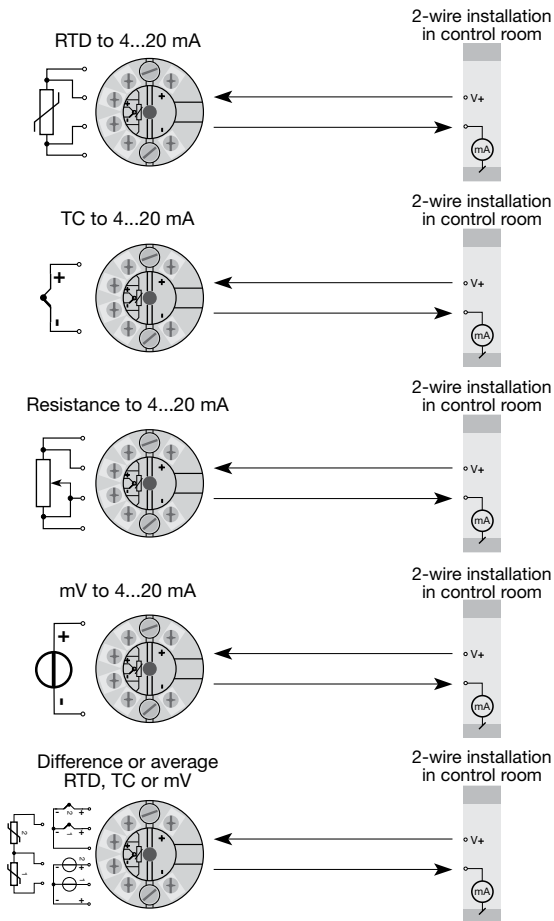
**KEMA Quality B.V. (0344)  
Utrechtseweg 310, 6812 AR Arnhem  
P.O. Box 5185, 6802 ED Arnhem  
The Netherlands**

Rønde, 18 December 2009



Kim Rasmussen  
Manufacturer's signature

# APPLICATIONS



Order: 5335

Type	Version
5335	Standard : A CSA, FM, ATEX & IECEX : D

## Electrical specifications

### Specifications range:

-40°C to +85°C

### Common specifications:

Supply voltage, DC

Standard..... 8.0...35 V

CSA, FM, ATEX & IECEX..... 8.0...30 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	$\leq \pm 0.05\%$ of span	$\leq \pm 0.005\%$ of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
Pt100 and Pt1000	$\leq \pm 0.1^{\circ}\text{C}$	$\leq \pm 0.005^{\circ}\text{C}/^{\circ}\text{C}$
Ni100	$\leq \pm 0.2^{\circ}\text{C}$	$\leq \pm 0.005^{\circ}\text{C}/^{\circ}\text{C}$
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, R, S, W3, W5	$\leq \pm 1^{\circ}\text{C}$	$\leq \pm 0.1^{\circ}\text{C} / ^{\circ}\text{C}$

EMC immunity influence .....	$< \pm 0.1\%$ of span
Extended EMC immunity: NAMUR NE 21, A criterion, burst .....	$< \pm 1\%$ 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 mm <sup>2</sup> stranded wire
Screw terminal torque.....	0.4 Nm
Relative humidity .....	$< 95\%$ RH (non-cond.)
Dimensions.....	$\varnothing 44 \times 20.2 \text{ mm}$
Protection degree (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	Standard
Pt100	-200°C	+850°C	10°C	IEC 60751
Ni100	-60°C	+250°C	10°C	DIN 43760
Lin. R	0 $\Omega$	7000 $\Omega$	10 $\Omega$	-----

Cable resistance per wire (max.).....	5 $\Omega$
Sensor current.....	Nom. 0.2 mA
Effect of sensor cable resistance (3- / 4-wire).....	$< 0.002 \Omega/\Omega$
Sensor error detection .....	Yes
Short circuit detection.....	If 0% $> 30 \Omega$



**TC input:**

Type	Min. temperature	Max. temperature	Min. span	Standard
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  $\mu\text{A}$

Else..... 0  $\mu\text{A}$

Short circuit detection..... If 0% > 5 mV

**Voltage input:**

Measurement range ..... -800...+800 mV

Min. span..... 2.5 mV

Input resistance..... 10 M $\Omega$

**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  $\Omega$

**Sensor error detection:**


Programmable..... 3.5...23 mA

NAMUR NE43 Upscale ..... 23 mA


NAMUR NE43 Downscale..... 3.5 mA

**Of span** = Of the presently selected range

**Ex approval - 5335A:**

KEMA 03ATEX1508 X.....	 II 3 GD Ex nA [nL] IIC T6...T4 or II 3 GD Ex nL IIC T6...T4 or II 3 GD Ex nA [ic] IIC T6...T4 or II 3 GD Ex ic IIC T6...T4
ATEX Installation Drawing No. ....	5335QA02

**Ex / I.S. approvals - 5335D:**

ATEX KEMA 03ATEX1537 .....	 II 1 G Ex ia IIC T4 or T6 II 1 D Ex iaD
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
ATEX Installation Drawing No. ....	5335QE01
IECEX KEM 10.0083.....	Ex ia IIC T4...T6 Ga Ex ia IIIC T135°C...T80°C Da
IECEX Installation Drawing No. ....	5335QE01
FM, applicable in.....	IS, Class I, Div. 1, Group A, B, C, D IS, Class I, Zone 0, AEx ia IIC
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
CSA Installation Drawing No. ....	533XQC03
INMETRO 09/UL-BRCO-0002 .....	BR-Ex ia IIC T4 or T6 or -40°C ≤ T <sub>amb.</sub> ≤ +85°C, or -40°C ≤ T <sub>amb.</sub> ≤ +60°C

**Marine approval:**

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

**GOST R approval:**

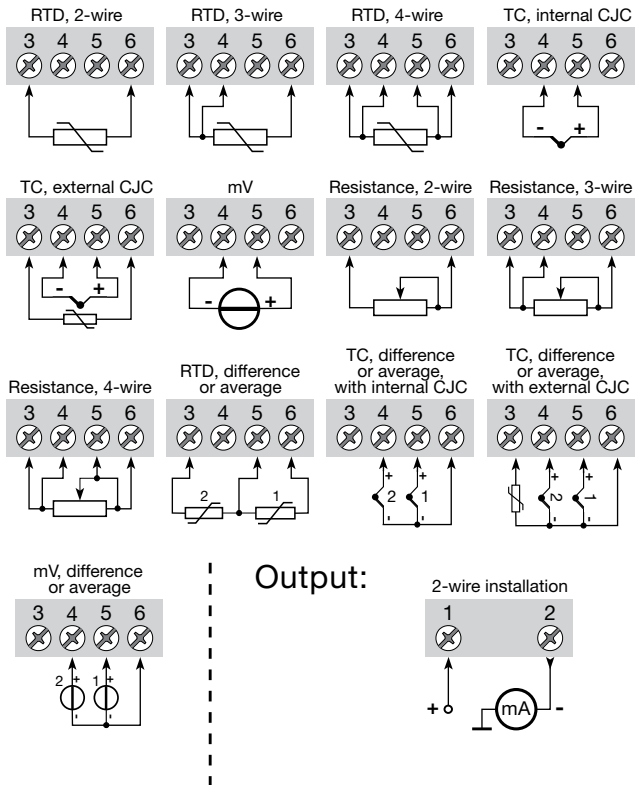
VNIIM & VNIIFTRI, Cert. no. .... See [www.prelectronics.com](http://www.prelectronics.com)

**Observed authority requirements:****Standard:**

EMC 2004/108/EC .....	EN 61326-1
ATEX 94/9/EC.....	EN 60079-0, EN 60079-11, EN 60079-15 and EN 60079-26 EN 61241-0 and EN 61241-11
IECEX.....	IEC 60079-0, -11, 26, IEC 61241-11
FM .....	3600, 3611, 3610
CSA, CAN / CSA.....	C22.2 No. 157, E60079-11, UL 913
INMETRO .....	IEC 60079-0 and IEC 60079-11

# CONNECTIONS

Input:



## BLOCK DIAGRAM

# PROGRAMMING

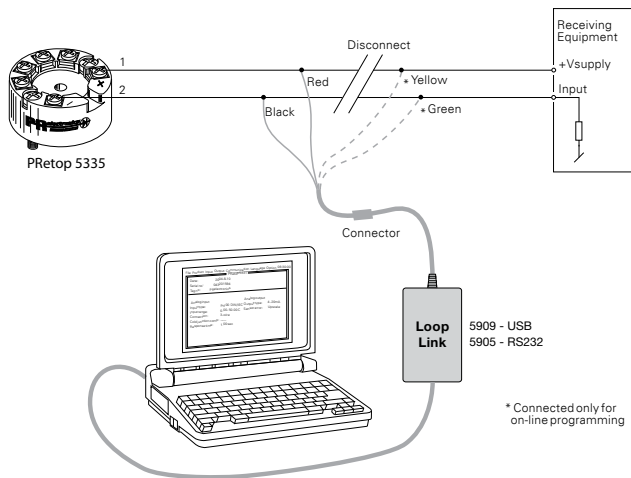
## PRetop 5335 can be configured in the following 3 ways:

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

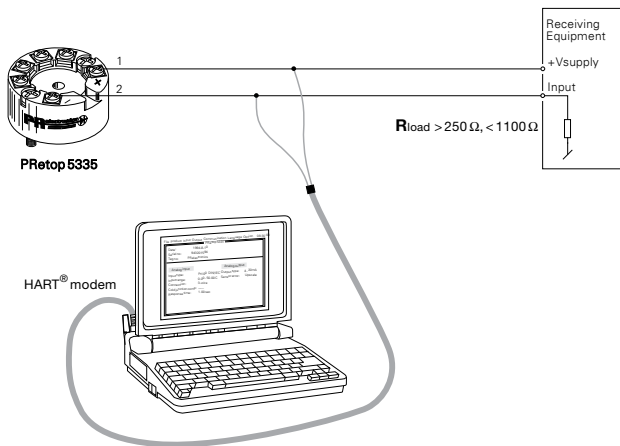
For programming please refer to the drawing below and the help functions in PReset.

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



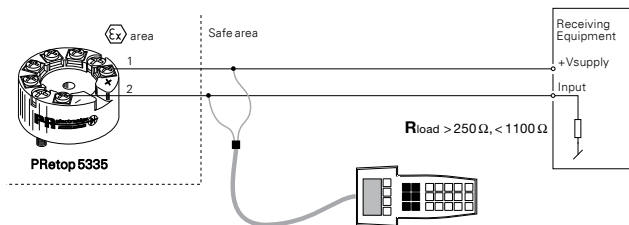
## 2: HART® modem

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



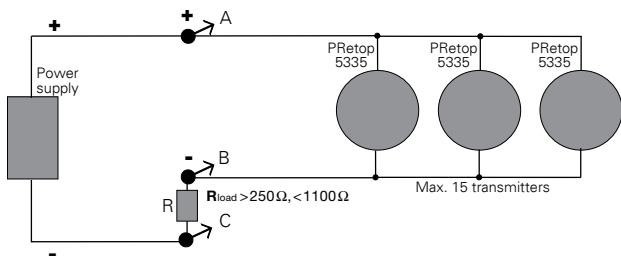
## 3: HART® communicator

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.

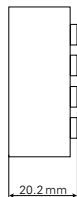
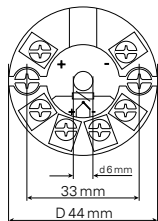


The outputs of max. 15 transmitters can be connected in parallel for a digital HART® communication on 2-wires.

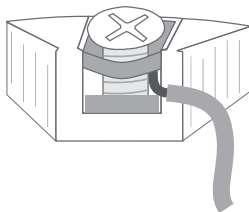
Before it is connected, each transmitter must be configured with a unique number from 1 to 15. If 2 transmitters are configured with the same number, both will be excluded. The transmitters must be programmed for multidrop mode (with a fixed output signal of 4 mA). Maximum current in the loop is therefore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





# APPENDIX

**ATEX INSTALLATION DRAWING - 5335A**

**ATEX INSTALLATION DRAWING - 5335D**

**IECEX INSTALLATION DRAWING - 5335D**

**FM INSTALLATION DRAWING NO. 5300Q502**

**CSA INSTALLATION DRAWING NO. 533XQC03**

**INMETRO INSTRUÇÕES DE SEGURANÇA**

## ATEX Installation drawing

**5335**

For safe installation of 5335A 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 GD Ex nA [nL] IIC T6..T4  
 II 3 GD Ex nL IIC T6..T4  
 II 3 GD Ex nA [ic] IIC T6..T4  
 II 3 GD Ex ic IIC T6..T4

Standards            EN 60079-0 : 2006, EN 60079-11 : 2007, EN 60079-15 : 2005

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**

U<sub>o</sub>: 9.6 V  
 I<sub>o</sub>: 28 mA  
 P<sub>o</sub>: 67 mW  
 L<sub>o</sub>: 45 mH  
 C<sub>o</sub>: 28  $\mu\text{F}$

**Terminal: 1,2**  
 Ex nA

U  $\leq$  35 VDC  
 I = 4 - 20 mA

**Terminal: 1,2**  
 Ex nL or Ex ic

U<sub>i</sub> = 35 VDC  
 L<sub>i</sub> = 10  $\mu\text{H}$   
 C<sub>i</sub> = 1.0 nF

### Special conditions for safe use

For use in a potentially explosive atmosphere of flammable gasses, vapours or mists, the transmitter shall be mounted in an enclosure providing a degree of protection of at least IP54 in accordance with EN60529.

For use in the presence of combustible dusts the transmitter shall be mounted in an enclosure providing a degree of protection of at least IP6X in accordance with EN60529. The surface temperature of the enclosure shall be determined after installation of the transmitter.

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.

## ATEX Installation drawing


**5335**

For safe installation of 5335D 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  
II 1 D Ex iaD

Standards

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

Hazardous area

Zone 0, 1, 2, 20, 21, 22

T4:  $-40 \leq T_a \leq 85^\circ\text{C}$  T105 °C

T6:  $-40 \leq T_a \leq 60^\circ\text{C}$  T80 °C

**Terminal: 3,4,5,6**

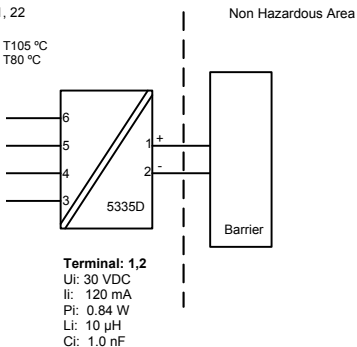
U<sub>o</sub>: 9.6 VDC

I<sub>o</sub>: 28 mA

P<sub>o</sub>: 67 mW

L<sub>o</sub>: 35 mH

C<sub>o</sub>: 3.5µF



**Installation notes.**

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

In a potentially explosive gas atmosphere, the transmitter shall be mounted in an enclosure in order to provide a degree of protection of at least IP20 according to EN 60529.

If the transmitter is installed in an explosive atmosphere requiring the use of equipment of category 1G and 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 DIN 43729 that is providing a degree of protection of at least IP6X according to EN 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.

The surface temperature of the enclosure is equal to the ambient temperature plus 20 K, for a dust layer with a thickness up to 5 mm.

### IECEX Installation drawing



For safe installation of 5335D or 5336D 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.

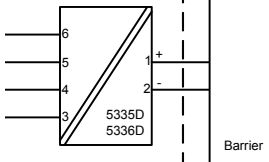
IECEX Certificate	IECEX KEM.10.0083
Marking	Ex ia IIC T6. T4 Ga Ex ia IIIC T85°C – T135°C Da
Standards	IEC60079-11:2006, IEC60079-0: 2007 IEC60079-26: 2006, IEC61241-11:2005

**Hazardous area**  
Zone 0, 1, 2, 20, 21, 22

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**

U<sub>o</sub>: 9.6 VDC  
I<sub>o</sub>: 28 mA  
P<sub>o</sub>: 67 mW  
L<sub>o</sub>: 35 mH  
C<sub>o</sub>: 3.5  $\mu\text{F}$



**Terminal: 1,2**

U<sub>i</sub>: 30 VDC  
I<sub>i</sub>: 120 mA  
P<sub>i</sub>: 0.84 W  
L<sub>i</sub>: 10  $\mu\text{H}$   
C<sub>i</sub>: 1.0 nF

**Installation notes.**

The transmitter is only approved for mounting in an enclosure form B according to DIN 43729, or equivalent.

If the transmitter is installed in an explosive atmosphere requiring equipment protection level Ga, and 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 that is providing a degree of protection of at least IP6X according to IEC60529, 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.

The surface temperature of the enclosure is equal to the ambient temperature plus 20 K, for a dust layer with a thickness up to 5 mm.

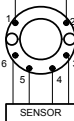
**FM Installation drawing 5335Q502**
**Model 5331C, 5331D, 5333C and 5333D**
**Hazardous (Classified) Location**

Class I, Division 1, Groups, A, B, C, D  
 Class II Division 1 Groups E, F, G or  
 Class I, Zone 0, IIC

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

Terminal 1, 2  
 $V_{max}$  or  $U_i$ : 30 V  
 $I_{max}$  or  $I_i$ : 120 mA  
 $P_{max}$  or  $P_i$ : 0.84 W  
 $C_i$ : 1 nF  
 $L_i$ : 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:

$U_M \leq 250V$   
 $V_{oc}$  or  $U_o \leq V_{max}$  or  $U_i$   
 $I_{sc}$  or  $I_o \leq I_{max}$  or  $I_i$   
 $P_o \leq P_i$   
 $C_a$  or  $C_o \geq C_i + C_{cable}$   
 $L_a$  or  $L_o \geq L_i + L_{cable}$

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

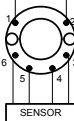
**Model 5335C, 5335D**
**Hazardous (Classified) Location**

Class I, Division 1, Groups, A, B, C, D  
 Class II Division 1 Groups E, F, G or  
 Class I, Zone 0, IIC

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

Terminal 1, 2  
 $V_{max}$  or  $U_i$ : 30 V  
 $I_{max}$  or  $I_i$ : 120 mA  
 $P_{max}$  or  $P_i$ : 0.84 W  
 $C_i$ : 1 nF  
 $L_i$ : 10 uH

Terminal 3, 4, 5, 6  
 $V_i$  or  $U_o$ : 9.5 V  
 $I_i$  or  $I_o$ : 28 mA  
 $P_i$  or  $P_o$ : 67.2 mW  
 $C_a$  or  $C_o$ : 3.5 uF  
 $L_a$  or  $L_o$ : 35 mH


**Non Hazardous Location**

Associated Apparatus  
 or Barrier  
 with  
 entity Parameters:

$U_M \leq 250V$   
 $V_{oc}$  or  $U_o \leq V_{max}$  or  $U_i$   
 $I_{sc}$  or  $I_o \leq I_{max}$  or  $I_i$   
 $P_o \leq P_i$   
 $C_a$  or  $C_o \geq C_i + C_{cable}$   
 $L_a$  or  $L_o \geq L_i + L_{cable}$

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).

When installed in Class II locations the Transmitter shall be installed in an enclosure with a specified ingress protection of IP6X according to IEC 60529 and dust-tight conduit seals must be used.

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.

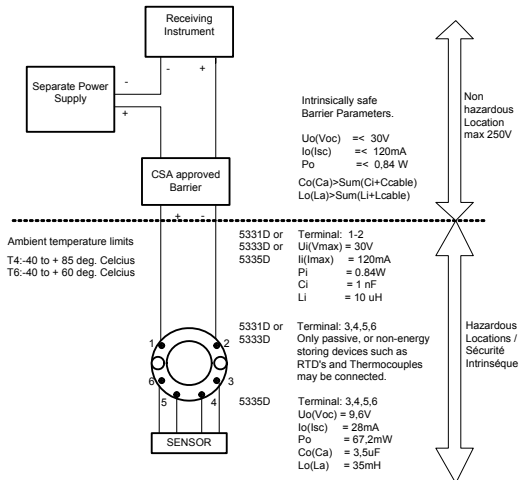


### CSA Installation Drawing 533XQC03.

5331D, 5333D and 5335D transmitters are intrinsically safe in Zone 0 Group IIC or Class I, Division 1, Group A,B,C,D when installed according to Installation Drawing.

#### 1. Connections with separate power supply and receiver

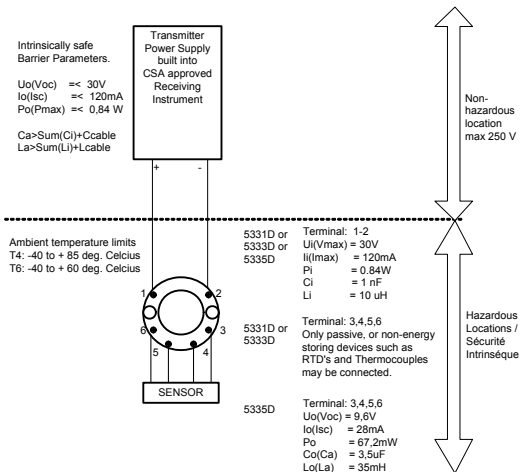
Output: Standard 4 – 20 mA loop



#### 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).

**2. Connection with power supply and barrier built into receiver**
**Output: Standard 4 – 20 mA loop**

**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).

## 5335D: Instruções de Segurança

### Instalação Ex:

Para a instalação segura do transmissor 5335D 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.

	BR-Ex ia IIC T6 / T4
Temp. amb. máxima T1...T4 .....	85°C
Temp. amb. máxima T5 e T6 .....	60°C
Aplicável em Zona .....	0, 1, 2, 20, 21 ou 22

**Dados Ex / I.S.:**

Sinal de saída / alimentação , terminal 1 e 2:

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



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



**Ex interfaces** Interfaces for analogue 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 modules in zone 20, 21 & 22.



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
























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



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



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