

PR



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

No. 5335V115-UK
From ser. no. 120917001



ATEX



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 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 5335

CONTENTS

EC declaration of conformity	2
Application	3
Technical characteristics	3
Mounting / installation.....	3
Applications.....	4
Order: 5335	5
Electrical specifications.....	5
Connections	9
Block diagram	10
Programming.....	11
Connection of transmitters in multidrop mode	13
Mechanical specifications	13
Mounting of sensor wires.....	13
Appendix	15
ATEX Installation Drawing - 5335A.....	16
IECEX Installation Drawing - 5335A	17
ATEX Installation Drawing - 5335D	18
IECEX Installation Drawing - 5335D.....	20
FM Installation Drawing - 5335D.....	22
CSA Installation Drawing - 5335D.....	24
INMETRO Instruções de Segurança	26

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 : 2009, EN 60079-11 : 2007,
EN 60079-15 : 2010, EN 60079-26 : 2007
and EN 61241-11 : 2006
ATEX certificate: KEMA 03ATEX1508 X (5335A)
ATEX certificate: KEMA 03ATEX1537 (5335D)**

No changes are required to enable compliance with the replacement standard:
EN 60079-11 : 2012

Notified body

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

Rønde, 9 August 2012



Kim Rasmussen
Manufacturer's signature

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.

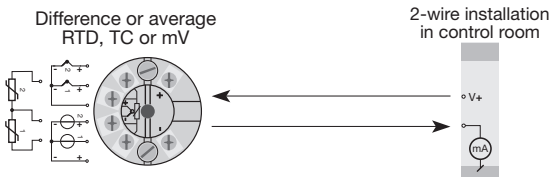
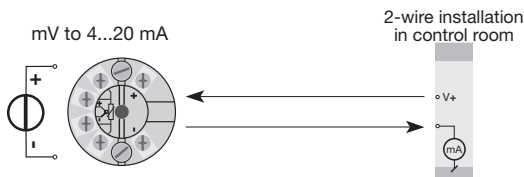
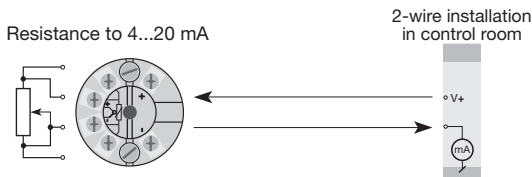
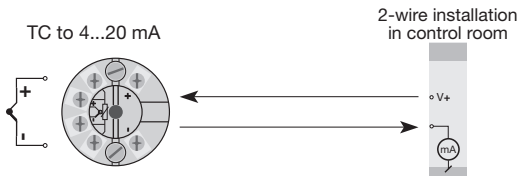
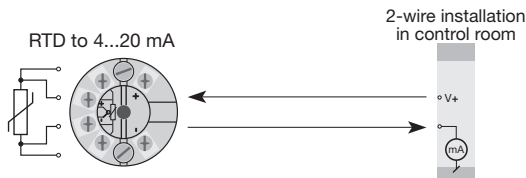
Technical characteristics

- 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 and 9106B.

APPLICATIONS



Order: 5335

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

Accessories

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

Electrical specifications

Specifications range:

-40°C to +85°C

Common specifications:

Supply voltage, DC

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

CSA, FM, ATEX, IECEx & INMETRO.... 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 mm² 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 Ω	7000 Ω	25 Ω	-----

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

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 < ±1.0°C

External CJC with Ni100 or Pt100 -40 ≤ T_{amb.} ≤ 135°C

Sensor error detection Yes

Sensor error current:

When detecting Nom. 33 µA

Else 0 µA

Short circuit detection No

Voltage input:

Measurement range -800...+800 mV

Min. span 2.5 mV

Input resistance 10 MΩ

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 ≤ 3.5 mA

Load resistance ≤ (V_{supply} - 8) / 0.023 [Ω]

Load stability < ±0.01% of span / 100 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

Of span = Of the presently selected range

Approvals:

EMC 2004/108/EC EN 61326-1

GOST R

Marine approval:

Det Norske Veritas, Ships & Offshore Stand. for Certific. No. 2.4

Ex / I.S.:

5335A:

ATEX 94/9/EC..... KEMA 03ATEX1508 X

IECEx KEM 10.0083 X

5335D:

ATEX 94/9/EC..... KEMA 03ATEX1537

IECEx KEM 10.0083 X

FM certificate 2D5A7

CSA certificate 1125003

INMETRO certificate NCC 12.0844 X

GOST Ex

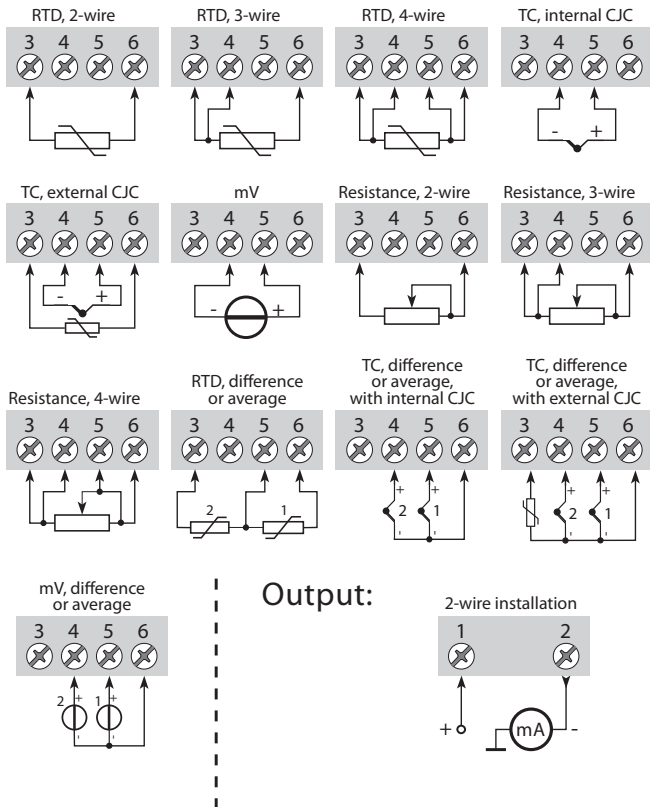
Functional Safety:

Hardware assessed for use in SIL applications

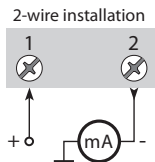
FMEDA report - www.prelectronics.com

CONNECTIONS

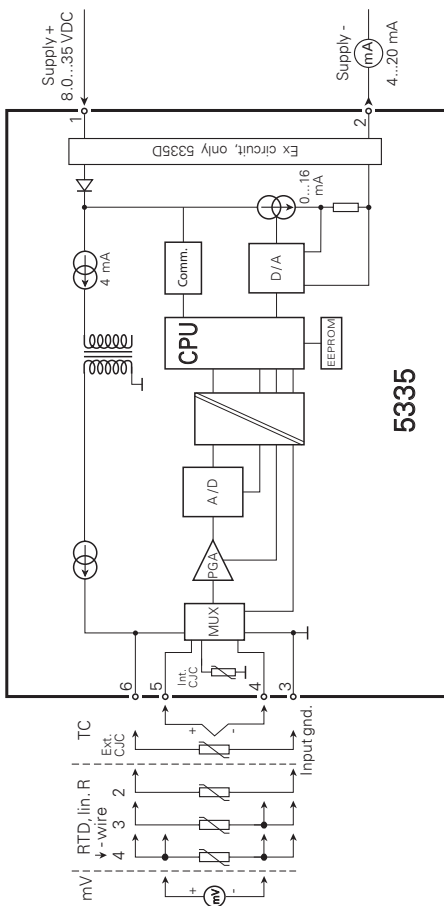
Input:



Output:



BLOCK DIAGRAM



PROGRAMMING

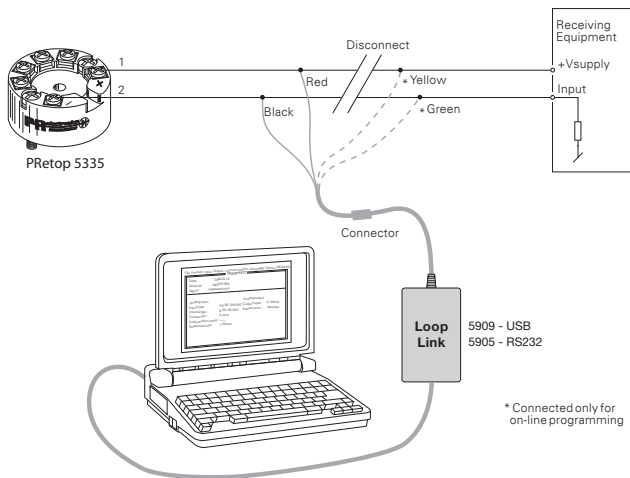
PRetop 5335 can be configured in the following 3 ways:

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

1: Loop Link

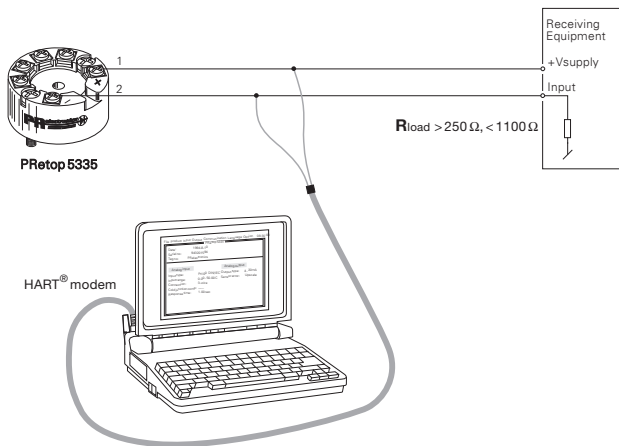
For programming please refer to the drawing below and the help functions in PReset.

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



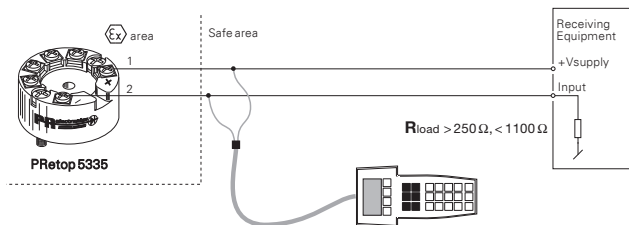
2: HART® modem

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



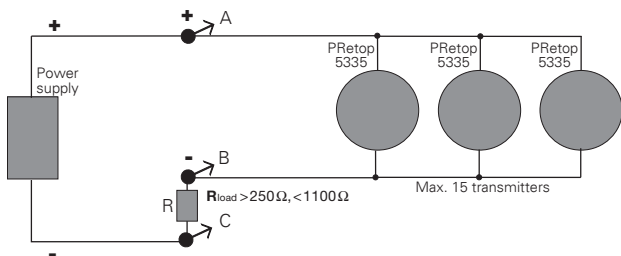
3: HART® communicator

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



CONNECTION OF TRANSMITTERS IN MULTIDROP MODE

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

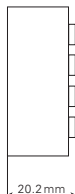
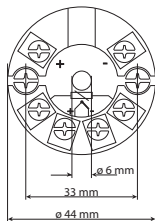


The outputs of max. 15 transmitters can be connected in parallel for a digital HART® communication on 2-wires.

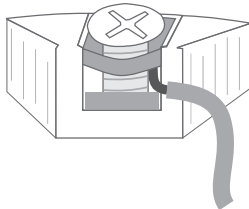
Before it is connected, each transmitter must be configured with a unique number from 1 to 15. If 2 transmitters are configured with the same number, both will be excluded. The transmitters must be programmed for multidrop mode (with a fixed output signal of 4 mA). Maximum current in the loop is therefore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

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

Mechanical specifications



Mounting of sensor wires



Wires must be mounted between the metal plates.

APPENDIX

ATEX Installation Drawing - 5335A

IECEx 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 - 5335D

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

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

Terminal: 3,4,5,6

Ex nA [ic]

Terminal: 1,2

Ex nA

Terminal: 1,2

Ex ic

U_o: 9.6 V

I_o: 28 mA

P_o: 67 mW

L_o: 45 mH

C_o: 28 μF

U $\leq$ 35 VDC

I = 4 - 20 mA

U_i = 35 VDC

L_i = 10 μH

C_i = 1.0 nF

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 IIC Dc

Standards IEC 60079-0 : 2007, IEC 60079-11 : 2006, EN 60079-15 : 2010

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
Ex nA [ic]

U_o: 9.6 V
I_o: 28 mA
P_o: 67 mW
L_o: 45 mH
C_o: 28 μF

Terminal: 1,2
Ex nA

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

Terminal: 1,2
Ex ic

U_i = 35 VDC
L_i = 10 μH
C_i = 1.0 nF

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

Non Hazardous Area

Terminal: 3,4,5,6

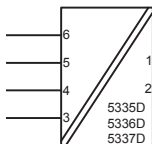
Uo: 9.6 VDC

Io: 28 mA

Po: 67 mW

Lo: 35 mH

Co: 3.5µF



Terminal: 1,2

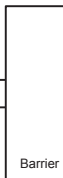
Ui: 30 VDC

Ii: 120 mA

Pi: 0.84 W

Li: 10µH

Ci: 1.0nF



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

Non Hazardous Area

Terminal: 3,4,5,6

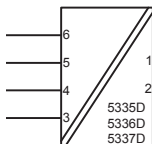
Uo: 9.6 VDC

Io: 28 mA

Po: 67 mW

Lo: 35 mH

Co: 3.5 μ F



Terminal: 1,2

Ui: 30 VDC

Ii: 120 mA

Pi: 0.84 W

Li: 10 μ H

Ci: 1.0nF

Barrier

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 AG

Model 5331C, 5331D, 5333C and 5333D

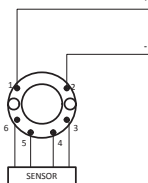
Hazardous (Classified) Location

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 ≤ 250V
Voc or Uo ≤ Vmax or Ui
Isc or Io ≤ Imax or Ii
Po ≤ Pi
Ca or Co ≥ Ci + Ccable
La or Lo ≥ 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.

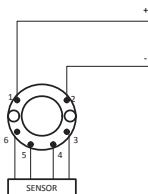
Hazardous (Classified) Location

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
Vt or Uo: 9.6 V
It or Io: 28 mA
Pt 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 ≤ 250V
Voc or Uo ≤ Vmax or Ui
Isc or Io ≤ Imax or Ii
Po ≤ Pi
Ca or Co ≥ Ci + Ccable
La or Lo ≥ 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.

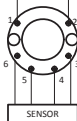
The entity parameters U_o, V_{OC} or V_i and I_o, I_{SC} or I_i , and C_a and L_a for barriers are provided by the barrier manufacturer.

NI Field Circuit Parameters
Model 5331C, 5331D, 5333C, 5333D, 5335C, 5335D, 5336D, 5337D
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. Celsius
T6: -40 to +60 deg. Celsius

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


Non Hazardous Location

Associated Apparatus
or Barrier

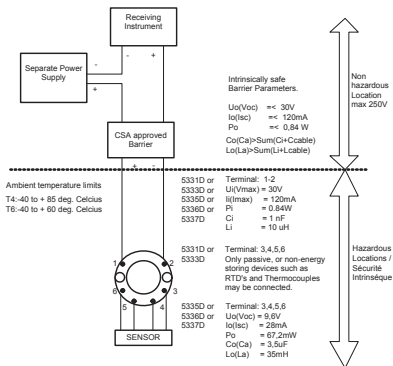
This device must not be connected
to any associated apparatus which
uses or generates more than 250
VRMS

CSA Installation Drawing 533XQC03.

5331D, 5333D, 5335D, 5336D and 5337D 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 - 20mA loop



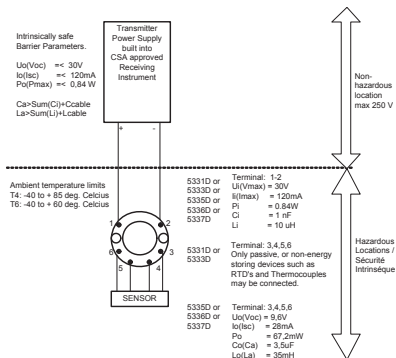
Warning:

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 - 20mA 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).

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

