5337 HART 2-х проводной программируемый преобразователь (Ex)

Руководство по эксплуатации

Архангельск (8182)63-90-72
Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
Краснодар (861)203-40-90
Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
Рязань (4912)46-61-64
Самара (846)206-03-16
Санкт-Петербург (812)309-46-40
Саратов (845)249-38-78
Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
Уфа (347)229-48-12
Хабаровск (4212)92-98-04
Челябинск (351)202-03-61
Череповец (8202)49-02-64
Ярославль (4852)69-52-93

Единый адрес для всех регионов: pcn@nt-rt.ru || www.prelectronics.nt-rt.ru

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

CONTENTS

EC DECLARATION OF CONFORMITY

As manufacturer

PR electronics A/S

hererby declares that the following product:

Type: 5337

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 device.

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 (5337A)
ATEX certificate: KEMA 03ATEX1537 (5337D)

No changes are required to enable compliance with the replacement standard:

EN 60079-11 : 2012

Notified body

DEKRA Certification B.V. (0344)

Kim Rasmussen
Manufacturer's signature

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

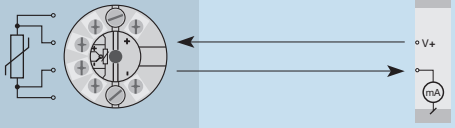
- HART® protocol revision can be changed by user configuration to either HART® 5 or HART® 7 protocol.
- The HART® 7 protocol offers:
  · Long Tag numbers of up to 32 characters.
  · Enhanced Burst Mode and Event notification with time stamping.
  · Device variable and status mapping to any dynamic variable 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

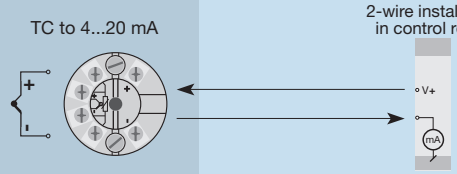
- For DIN form B sensor head or DIN rail mounting via the PR fitting type 8421.
- Configuration via standard HART® communication interfaces or by PR 5909 Loop Link.
- NB: As Ex barrier for 5337D we recommend 5106B and 9106B.

APPLICATIONS

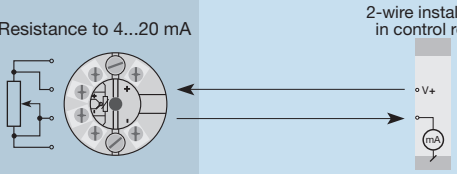
RTD to 4...20 mA



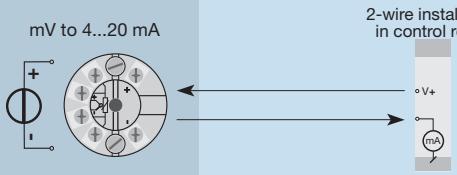
TC to 4...20 mA



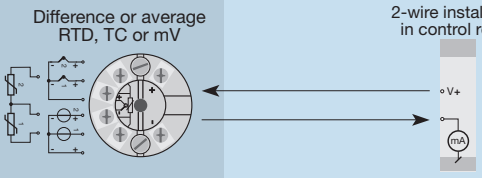
Resistance to 4...20 mA



mV to 4...20 mA



Difference or average
RTD, TC or mV



Ordering codes for 5337

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

Accessories

5909 = Loop Link USB interface and PReset 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
Lloyd's specification no. 1	4 g / 2...100 Hz

Mechanical specifications:

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

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	≤ ±0.05% of span	≤ ±0.005% of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
Pt50 - Pt1000	≤ ±0.1°C	≤ ±0.005°C/°C
Ni50 - Ni1000	≤ ±0.2°C	≤ ±0.005°C/°C
Lin. R	≤ ±0.1 Ω	≤ ±5 mΩ / °C
Volt	≤ ±10 µV	≤ ±0.5 µV / °C
TC type: E, J, K, L, N, T, U	≤ ±0.5°C	≤ ±0.025°C / °C
TC type: B[1], Lr, R, S, W3, W5	≤ ±1°C	≤ ±0.1°C / °C
TC type:B[2]	≤ ±3°C	≤ ±0.3°C / °C
TC type:B[3]	≤ ±8°C	≤ ±0.8°C / °C
TC type:B[4]	not specified	not specified

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

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

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

Input specifications:

RTD input types:

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

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	-----

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 and HART®:

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

Switching HART® protocol revision

It is possible to change the HART® protocol revision by using the PReset software and a PR 5909 Loop Link interface or a HART® compatible modem. Other HART® configuration tools like a handheld terminal can also be used.

Switching protocol from HART® 7 to HART® 5:

Procedure when using the PR PReset Software:

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

Please note that this action will change the 5337 into a 5335 device.

Switching from HART® 5 to HART® 7:
Please note that this is only possible if the transmitter is marked as "5337" on the label!

Enter the 5335 PReset tab "**OPTIONS**" and click "**Protect**".
Write protection must be set to "ON". Select **Change Password**.
Type in the **New Password** "**HARTREV7**" and **Re-enter** "**HARTREV7**". Press OK.
Switch **Write protection OFF** and write-enable the device by typing in the **Password** "**-CHANGE-**" in the top menu **-** acknowledge by pressing OK.
The above action will reset the password to the default active password ("**********") and restart the device in the updated HART® 7 mode with write protection disabled.

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.:

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 certificate 2D5A7
- CSA certificate 1125003
- INMETRO certificate ..... NCC 12.0844 X
- GOST Ex

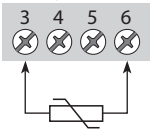
Functional Safety:

Hardware assessed for use in SIL applications

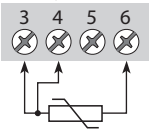
CONNECTIONS

Input:

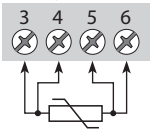
RTD, 2-wire



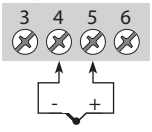
RTD, 3-wire



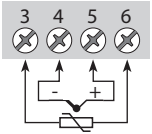
RTD, 4-wire



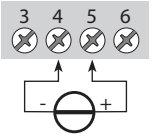
TC, internal CJC



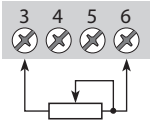
TC, external CJC



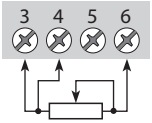
mV



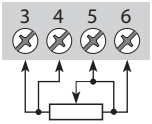
Resistance, 2-wire



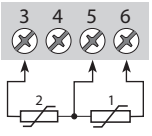
Resistance, 3-wire



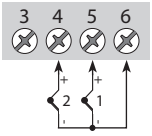
Resistance, 4-wire



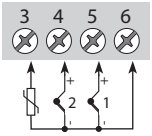
RTD, difference or average



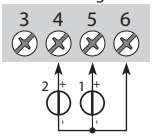
TC, difference or average, with internal CJC



TC, difference or average, with external CJC

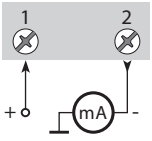


mV, difference or average

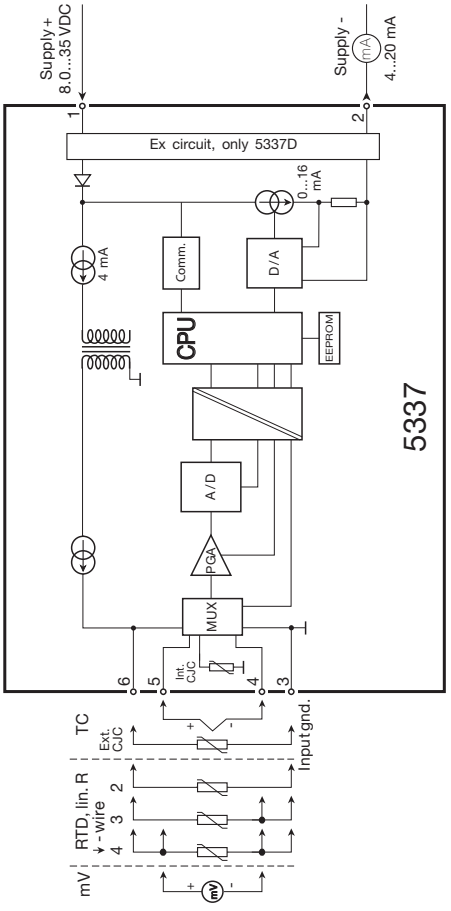


Output:

2-wire installation



BLOCK DIAGRAM



PROGRAMMING

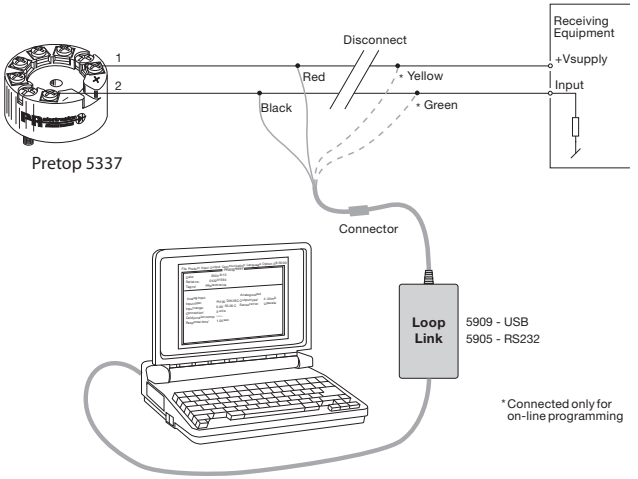
5337 can be configured in the following 3 ways:

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

1: Loop Link

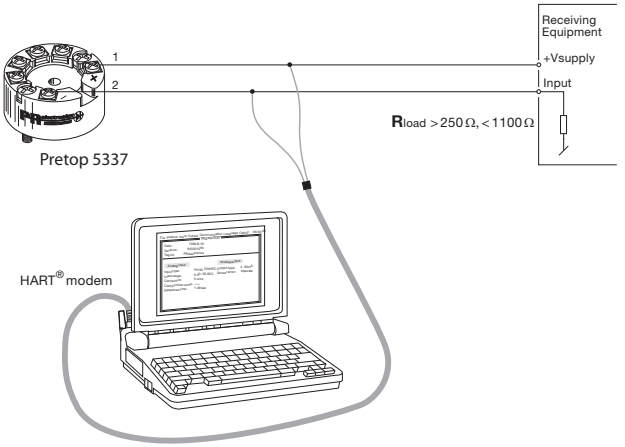
For programming please refer to the drawing below and the help functions in PReset.

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



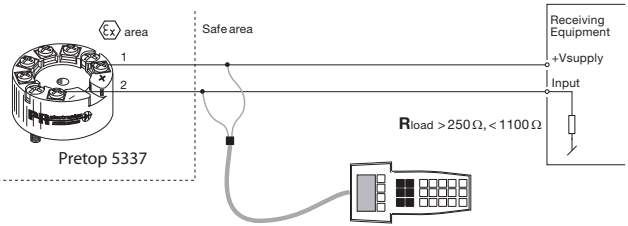
2: HART® modem

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



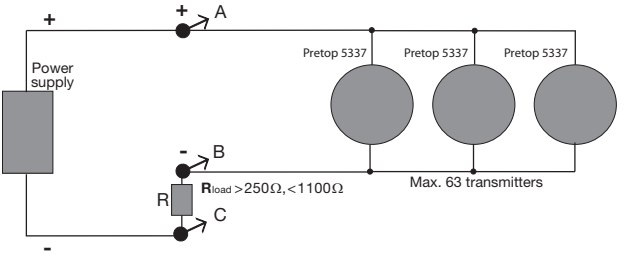
3: HART® communicator

For programming please refer to the drawing below. To gain access to product-specific commands, 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 accross AB or BC.



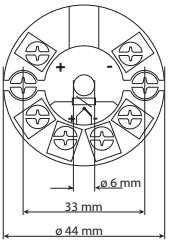
The outputs of max. 63 transmitters can be connected in parallel for a digital HART® 7 communication on 2-wires.

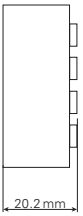
Before it is connected, each transmitter must be configured with a unique number from 1 to 63. If 2 transmitters are configured with the same number, both will be excluded. The transmitters must be programmed for multidrop mode (with a fixed output signal of 4 mA). Maximum current in the loop is therefore 252 mA.

The communication is either by means of a HART® communicator or a HART® modem.

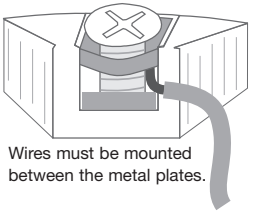
The PReset PC configuration software can configure the individual transmitter for multidrop mode and provide it with a unique polling address.

Mechanical specifications





Mounting of sensor wires



Wires must be mounted between the metal plates.

APPENDIX

ATEX Installation Drawing - 5337A

IECEx installation drawing - 5337A

ATEX Installation Drawing - 5337D

IECEx installation drawing - 5337D

FM Installation Drawing No. 5300Q502

CSA Installation Drawing No. 533XQC03

INMETRO Instruções de Segurança - 5337D

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

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 ≥ 60 °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

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

Installation note:

For installation in a potentialy 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 ≥ 60ºC, 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 atmposphere, the following instructions apply:
If the transmitter is supplied with an intrinsically safe signal "ic" and interfaces an intrinsically safe signal "ic" (e.g. a passive device), the transmitter shall be mounted in a metal enclosure form B according to DIN 43729 that provides a degree of protection of at least IP6X according to IEC60529, and that is suitable for the application. Cable entry devices and blanking elements shall fulfill the same requirements.

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

ATEX Installationstegning

For sikker installation af 5335D, 5336D eller 5337D skal følgende overholdes: Modulet må kun installeres af kvalificerede personer, som er bekendt med national og international lovgivning, direktiver og standarder i det land, hvor modulet skal installeres.
Produktionsår fremgår af de to første cifre i serienummeret.

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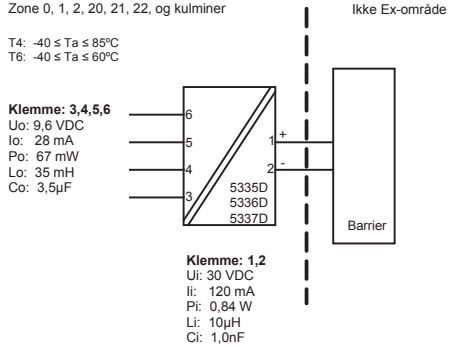
ATEX-certifikat KEMA 03ATEX 1537

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

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



Installationsforskrifter

For installation i områder med potential eksplosionsfare på grund af brændbar gas, skal følgende overholdes:

Følerkredsløbet er ikke ufejlbarligt galvanisk isoleret fra forsynings-udgangskredsløbet, men den galvaniske isolation mellem kredsene kan modstå en testspænding på 500 VAC i 1 minut.. Transmitteren skal monteres i et form B metalhus i overensstemmelse med DIN 43729 eller tilsvarende. Huset skal have en tæthedsgrad på mindst IP20 i overensstemmelse EN60529 og skal være egnet til den pågældende applikation samt være installeret korrekt.
Hvis huset er lavet af aluminium, skal det installeres således, at der selv ved sjældent opstående hændelser ikke er risiko for antændelse på grund af stød og friktionsgnister.
Hvis huset er lavet af ikke-metallisk materiale, skal elektrostatiske ladninger på transmitterens hus undgås.

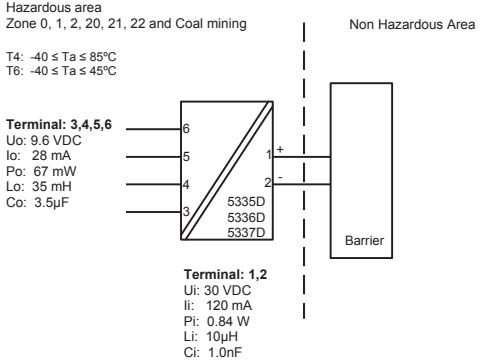
For installation i områder med potentiel eksplosionsfare på grund af brændbart støv skal følgende overholdes:
Transmitteren skal monteres i et form B metalhus i overensstemmelse med DIN 43729 eller tilsvarende. Huset skal have en tæthedsgrad på mindst IP 6X i overensstemmelse med EN 60529 og skal være egnet til den pågældende applikation samt være installeret korrekt.
Der må kun anvendes kabelforskruninger og blindstik, som egner sig til den pågældende applikation og som installeres korrekt.
Hvis omgivelsestemperaturen ≥ 60°C, skal der bruges varmebestandige kabler med specifikationer på mindst 20K over omgivelsestemperaturen.

For installalation i miner skal følgende overholdes:
Transmitteren skal monteres i et metalhus med en tæthedsgrad på mindst IP 6X i overensstemmelse med EN 60529. Huset skal være egnet til den pågældende applikation samt være installeret korrekt.
Der må kun anvendes kabelforskruninger og blindstik, som egner sig til den pågældende applikation og som installeres korrekt
Husets vægt må højest udgøres af
a) 15 % aluminium, magnesium, titanium and zirconium i alt, og
b) 7,5 % magnesium, titanium og zirconium i alt.

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



Installation notes.

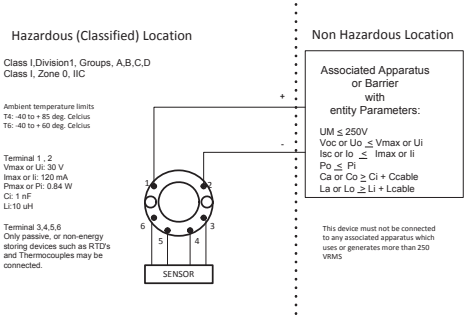
For installation in a potentially explosive gas atmosphere, the following instructions apply:
The sensor circuit is not infallibly galvanic isolated from the supply output circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500Vac during 1 minute.
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 ≥ 60ºC, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

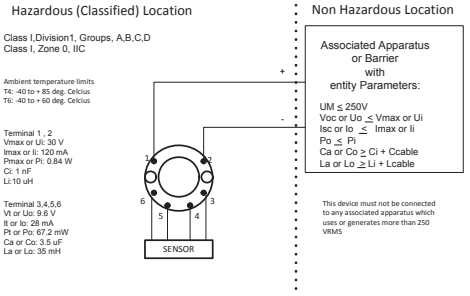
For installalation in mines the following instructions apply:
The transmitter shall be mounted in a metal enclosure that is providing a degree of protection of at least IP6X according to IEC 60529, and is suitable for the application and correctly installed.
Cable entries and blanking elements shall be used that are suitable for the application and correctly installed
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



Model 5335C, 5335D, 5336D,5337D.



The entity concept.

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

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

The entity concept criteria are as follows:

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

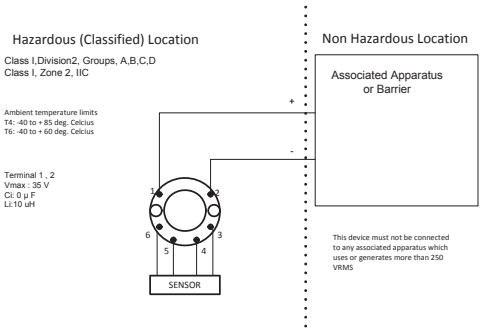
The sum of the maximum unprotected capacitance (C_i) for each intrinsically device and the interconnecting wiring must be less than the capacitance (C_a) which can be safely connected to the barrier.

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

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

NI Field Circuit Parameters

Model 5331C, 5331D, 5333C, 5333D, 5335C, 5335D, 5336D,5337D

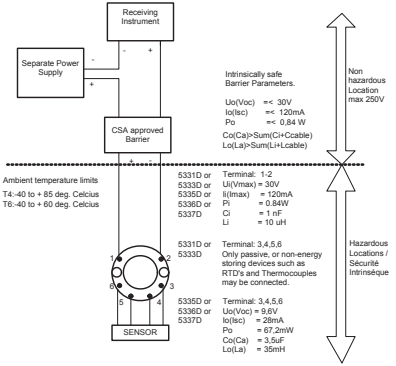


CSA Installation Drawing 533XQC03.

5331D, 5333D, 5335D, 5336D and 5337D transmitters are intrinsically safe in Zone 0 Group IIC or Class I,Division1,Group A,B,C,D when installed according to Installation Drawing.

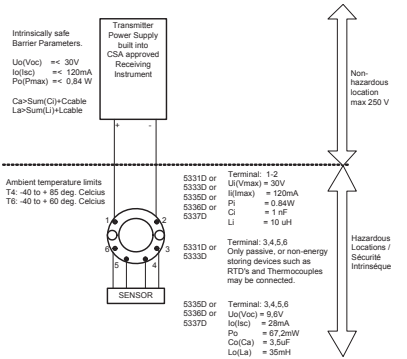
1. Connections with separate power supply and receiver.

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 isolação galvânica total em relação ao circuito de entrada. Todavia a isolação 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 ≥60ºC, 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 devices 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 devices with analogue 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, linearisation and auto-diagnosis.

По вопросам продажи и поддержки обращайтесь:

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Астана (7172)727-132
Астрахань (8512)99-46-04
Барнаул (3852)73-04-60
Белгород (4722)40-23-64
Брянск (4832)59-03-52
Владивосток (423)249-28-31
Волгоград (844)278-03-48
Вологда (8172)26-41-59
Воронеж (473)204-51-73
Екатеринбург (343)384-55-89
Иваново (4932)77-34-06
Ижевск (3412)26-03-58
Казань (843)206-01-48
Калининград (4012)72-03-81
Калуга (4842)92-23-67
Кемерово (3842)65-04-62
Киров (8332)68-02-04
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Красноярск (391)204-63-61
Курск (4712)77-13-04
Липецк (4742)52-20-81
Магнитогорск (3519)55-03-13
Москва (495)268-04-70
Мурманск (8152)59-64-93
Набережные Челны (8552)20-53-41
Нижний Новгород (831)429-08-12
Новокузнецк (3843)20-46-81
Новосибирск (383)227-86-73
Омск (3812)21-46-40
Орел (4862)44-53-42
Оренбург (3532)37-68-04
Пенза (8412)22-31-16
Пермь (342)205-81-47
Ростов-на-Дону (863)308-18-15
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Севастополь (8692)22-31-93
Симферополь (3652)67-13-56
Смоленск (4812)29-41-54
Сочи (862)225-72-31
Ставрополь (8652)20-65-13
Сургут (3462)77-98-35
Тверь (4822)63-31-35
Томск (3822)98-41-53
Тула (4872)74-02-29
Тюмень (3452)66-21-18
Ульяновск (8422)24-23-59
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Ярославль (4852)69-52-93

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