



**5 3 3 5**

**2-tråds transmitter  
med HART®-protokol**

Nr. 5335V115-DK  
Fra serienr. 120917001



- 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-TRÅDS TRANSMITTER MED HART® PROTOKOL

## PRetop 5335

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# 2-TRÅDS TRANSMITTER MED HART® PROTOKOL PRetop 5335

- *Indgang for RTD, TC, Ohm eller mV*
- *Ekstrem målenøjagtighed*
- *HART®-kommunikation*
- *Galvanisk isolation*
- *Kan monteres i DIN form B følerhoved*

## Anvendelse

- Temperaturlineariseret måling med Pt100...Pt1000, Ni100...Ni1000 eller termoelementføler.
- Differens- eller gennemsnitstemperaturmåling på 2 modstands- eller TC-følere.
- Omsætning af lineær modstandsændring til standard analogt strømsignal, f.eks. fra ventiler eller ohmske niveaustave.
- Forstærkning af bipolært mV-signal til et standard 4...20 mA strømsignal.
- Kobling af op til 15 transmittere til et digitalt 2-leder signal med HART®-kommunikation.

## Teknisk karakteristik

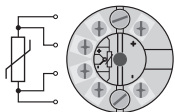
- PR5335 kan af brugeren i løbet af få sekunder programmeres til at måle inden for alle normerede temperaturområder.
- RTD- og modstandsindgangen har kabelkompensering for 2-, 3- og 4-leder tilslutning.
- 5335 er konstrueret med et højt sikkerhedsniveau, så den er anvendelig i SIL 2 installationer.
- Der er løbende sikkerhedscheck af gemte data.
- Følerfejlsdetektering iht. retningslinierne i NAMUR NE 89.

## Montage / installation

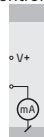
- Kan monteres i DIN form B følerhoved. I ikke-eksplosionsfarlige områder kan 5335 monteres på en DIN-skinne med PR-beslag type 8421.
- **NB:** Som Ex-barriere for 5335D anbefaler vi 5106B.

# APPLIKATIONER

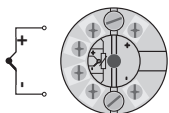
RTD til 4...20 mA



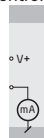
2-trådsinstallation  
i kontrolrum



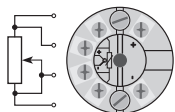
TC til 4...20 mA



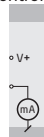
2-trådsinstallation  
i kontrolrum



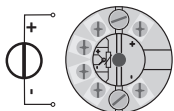
Modstand til 4...20 mA



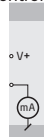
2-trådsinstallation  
i kontrolrum



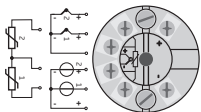
mV til 4...20 mA



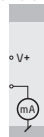
2-trådsinstallation  
i kontrolrum



Differens eller middel  
RTD, TC eller mV



2-trådsinstallation  
i kontrolrum



## Bestillingsskema: 5335

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

### Tilbehør

5909 = Loop Link USB interface og PReset software  
8421 = DIN-skinneklips

### Elektriske specifikationer

#### Specifikationsområde:

-40°C til +85°C

#### Fælles specifikationer:

Forsyningsspænding, DC

Standard..... 8,0...35 V

CSA, FM, ATEX, IECEX & INMETRO..... 8,0...30 V

Isolationsspænding, test / drift..... 1,5 kVAC / 50 VAC

Opvarmningstid ..... 30 s

Kommunikationsinterface ..... HART® og Loop Link

Signal- / støjforhold..... Min. 60 dB

Reaktionstid (programmerbar) ..... 1...60 s

EEPROM fejlcheck..... < 10 s

Signaldynamik, indgang..... 22 bit

Signaldynamik, udgang..... 16 bit

Kalibreringstemperatur ..... 20...28°C

Nøjagtighed, størst af generelle og basisværdier:

Generelle værdier		
Indgangstype	Absolut nøjagtighed	Temperaturkoefficient
Alle	$\leq \pm 0,05\%$ af span	$\leq \pm 0,005\%$ af span / °C

Basisværdier		
Indgangstype	Basisnøjagtighed	Temperaturkoefficient
Pt100 og 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-immunitetspåvirkning.....	< $\pm 0,1\%$ af span
Udvidet EMC-immunitet: NAMUR NE 21, A-kriterium, gniststøj.....	< $\pm 1\%$ af span

Virkning af forsyningsspændingsændring .....	< 0,005% af span / VDC
Vibration.....	IEC 60068-2-6 Test FC
2...25 Hz.....	$\pm 1,6 \text{ mm}$
25...100 Hz.....	$\pm 4 \text{ g}$
Max. ledningskvadrat .....	1 x 1,5 mm <sup>2</sup> flerkoret ledning
Klemskruetilspændingsmoment.....	0,4 Nm
Luftfugtighed.....	< 95% RH (ikke kond.)
Mål .....	$\emptyset 44 \times 20,2 \text{ mm}$
Kapslingsklasse (hus / klemme) .....	IP68 / IP00
Vægt.....	50 g

#### Elektriske specifikationer indgang:

Max. nulpunktsforskydning (offset)..... 50% af valgt numerisk max. værdi

**RTD- og lineær modstandsindgang:**

RTD-type	Min. værdi	Max. værdi	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	-----

Kabelmodstand pr. leder (max.)..... 5 Ω  
(mulighed for op til 50 Ω pr. leder, med reduceret målenøjagtighed)  
Følerstrøm..... Nom. 0,2 mA  
Virkning af følerkabelmodstand (3- / 4-leder).. < 0,002 Ω/Ω  
Følerfejlsdetektering..... Ja  
Kortslutningsdetektering ..... Hvis 0% > 30 Ω

**TC-indgang:**

Type	Min. temperatur	Max. temperatur	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

Koldt loddestedskomp. (CJC)..... < ±1,0 °C  
Ekstern CJC med Ni100 eller Pt100..... -40 ≤ T<sub>omg.</sub> ≤ 135°C  
Følerfejlsdetektering..... Ja  
Følerfejlsstrøm:  
    under detektering..... Nom. 33 µA  
    ellers..... 0 µA  
Kortslutningsdetektering ..... Nej

**Spændingsindgang:**

Måleområde..... -800...+800 mV  
Min. måleområde (span)..... 2,5 mV  
Indgangsmodstand ..... 10 MΩ



**Strømodgang:**

Signalområde.....	4...20 mA
Min. signalområde.....	16 mA
Opdateringstid .....	440 ms
	(660 ms for diff.)
Fast udgangssignal.....	Mellem 4 og 20 mA
Udgangssignal ved EEpromfejl.....	≤ 3,5 mA
Belastningsmodstand .....	≤ (V <sub>forsyn.</sub> - 8) / 0,023 [Ω]
Belastningsstabilitet .....	< ±0,01% af span / 100 Ω

**Følerfejlsdetektering:**

Programmerbar .....	3,5...23 mA
NAMUR NE43 Upscale .....	23 mA
NAMUR NE43 Downscale.....	3,5 mA

**Af span** = Af det aktuelt valgte område

**Godkendelser:**

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

**Marinegodkendelse:**

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

5335A:

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

5335D:

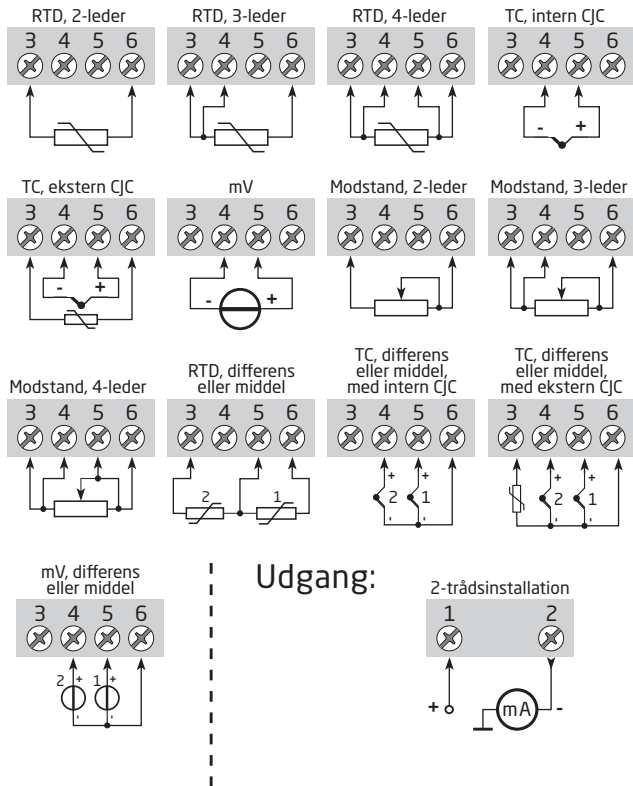
ATEX 94/9/EF .....	KEMA 03ATEX1537
IECEX.....	KEM 10.0083 X
FM .....	2D5A7
CSA .....	1125003
INMETRO.....	NCC 12.0844 X
GOST Ex	

**Funktionel sikkerhed:**

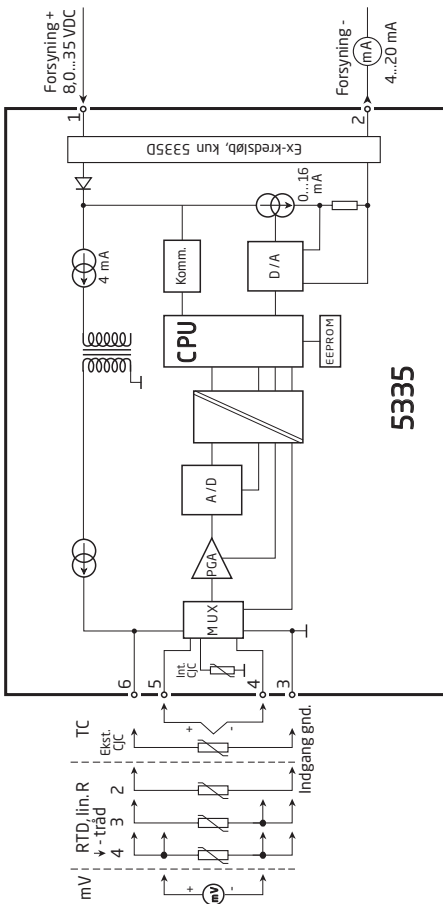
Hardware-assessed for anvendelse i SIL-applikationer  
FMEDA-rapport - [www.preelectronics.com](http://www.preelectronics.com)

# TILSLUTNINGER

## Indgang:



# BLOKDIAGRAM



# PROGRAMMERING

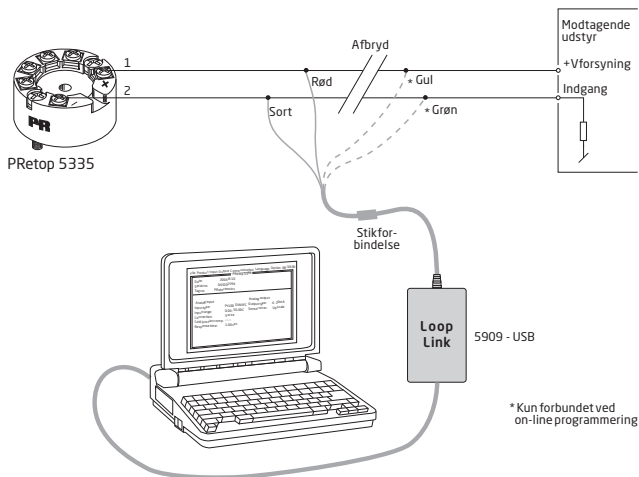
## PRetop 5335 kan konfigureres på 3 måder:

1. Med PR electronics A/S' kommunikationsinterface Loop Link og PReset PC konfigurationssoftware.
2. Med HART® modem og PReset PC konfigurationssoftware.
3. Med HART® kommunikator indeholdende PR electronics A/S' DDL driver.

### 1: Loop Link

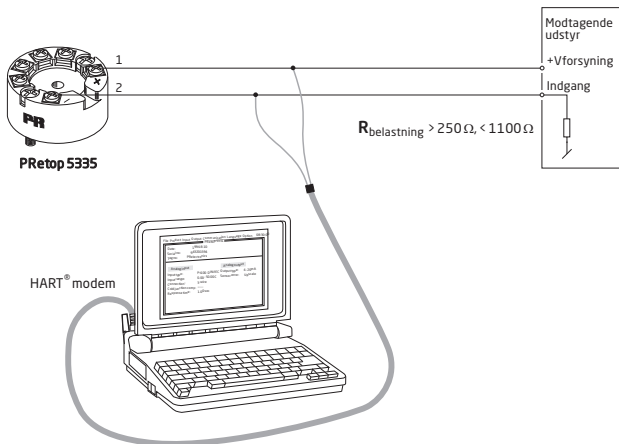
Ved programmering henvises til tegningen nedenfor og hjælpefunktionen i PReset programmet.

Loop Link må ikke benyttes til kommunikation med moduler installeret i Ex-område.



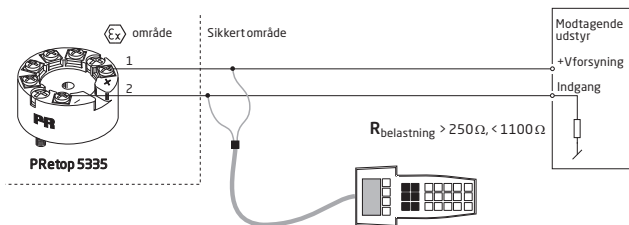
## 2: HART® modem

Ved programmering henvises til tegningen nedenfor og hjælpefunktionen i PReset programmet.



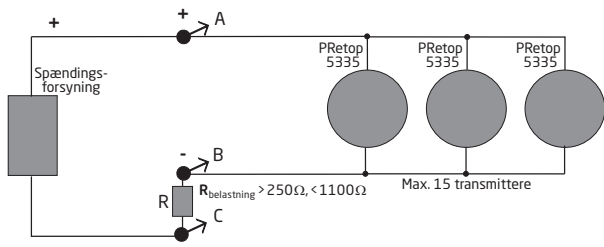
## 3: HART® kommunikator

Ved programmering henvises til tegningen nedenfor. For at få adgang til produktspecifikke kommandoer skal HART® kommunikatoren indeholde PR electronics A/S' DDL driver. Denne kan rekvireres enten hos HART® Communication Foundation eller hos PR electronics A/S.



# FORBINDELSE AF TRANSMITTERE I MULTIDROP

HART® kommunikatoren eller PC-modem kan tilsluttes over punkterne AB eller BC.

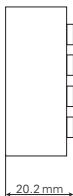
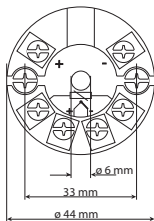


Udgangene på op til 15 transmittere kan parallelforbindes for digital HART®-kommunikation på 2-ledere.

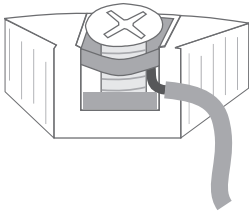
Hver transmitter skal, inden den tilsluttes, konfigureres med et unikt nummer fra 1 - 15. Hvis 2 transmittere konfigureres med samme nummer, ses der bort fra begge. Transmitterne skal programmeres til multidrop mode (med et fast udgangssignal på 4 mA). Den maksimale strøm i sløjfen kan dermed blive 60 mA. Kommunikationen kan foregå via HART® kommunikator eller HART® modem.

PRset PC konfigurationssoftwaren kan konfigurere den enkelte transmitter til multidrop mode og tildele en unik polling adresse.

## Mekaniske specifikationer



## Montering af følerledninger



Ledninger monteres mellem metalpladerne

# APPENDIX

**ATEX Installation Drawing - 5335A**

**ATEX Installation Drawing - 5335D**

**IECEX installation drawing - 5335A**

**IECEX installation drawing - 5335D**

**FM Installation Drawing - 5335D**

**CSA Installation Drawing - 5335D**

**INMETRO Instruções de Segurança - 5335D**

## ATEX Installationstegning

For sikker af 5335A, 5336A eller 5337A 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.

ATEX-certifikat KEMA 03ATEX 1508X

Mærkning



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

Standarder EN60079-0:2009, EN60079-11:2007, EN60079-15:2010 EN61241-11:2006

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

**Klemme: 3,4,5,6**  
Ex nA [ic]

**Klemme: 1,2**  
Ex nA

**Klemme: 1,2**  
Ex ic

Uo: 9,6 V  
Io: 28 mA  
Po: 67 mW  
Lo: 45 mH  
Co: 28  $\mu\text{F}$

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

Ui = 35 VDC  
Li = 10  $\mu\text{H}$   
Ci = 1,0 nF

### Installationsanvisninger:

Ved brug i eksplosive atmosfærer forårsaget af støv, skal transmitteren monteres i et hus med en kapslingsklasse på mindst IP6X i overensstemmelse med EN 60529, f.eks. et form B hus iht. DIN 43729. Husets overfladetemperatur er lig med den maksimale omgivelsestemperatur plus 20 K for støvlæg med en tykkelse på op til 5 mm.

### Særlige betingelser for sikker anvendelse:

Ved installationer i eksplosive atmosfærer forårsaget af gas skal transmitteren monteres i et hus med en kapslingsklasse på mindst IP54 i overensstemmelse med EN 60529.

Hvis omgivelsestemperaturen  $\geq 60^{\circ}\text{C}$ , skal der bruges varmebestandige kabler med specifikationer på mindst 20K over omgivelsestemperaturen.



## IECEX Installation drawing



For safe installation of 5335A, 5336A or 5337A the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

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

IECEX Certificate IECEX KEM 10.0083X

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

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

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

### Installation note:

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

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

IP54 according to IEC60529 or in an enclosure with type of protection Ex n or Ex e.

Cable entry devices and blanking elements shall fulfill the same requirements

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

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

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

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

## ATEX Installationstejning



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.

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

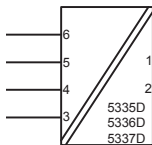
Standarder EN 60079-0 : 2009, EN 60079-11 : 2007,  
EN 60079-26 : 2007, EN 61241-11: 2006

Ex-område  
Zone 0, 1, 2, 20, 21, 22, og kulminer

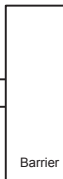
T4:  $-40 \leq T_a \leq 85^\circ\text{C}$   
T6:  $-40 \leq T_a \leq 60^\circ\text{C}$

**Klemme: 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



Ikke Ex-område



**Klemme: 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>: 10µH  
C<sub>i</sub>: 1,0nF

**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 tæthedegrad 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 opståede hændelser ikke er risiko for antændelse på grund af stød og friktionsgnister. Hvis huset er lavet af ikke-metallisk materiale, skal elektrostatisk ladning 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 tæthedegrad 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 kabelforskrninger og blindstik, som egner sig til den pågældende applikation og som installeres korrekt. Hvis omgivelsestemperaturen  $\geq 60^{\circ}\text{C}$ , skal der bruges varmebestandige kabler med specifikationer på mindst 20K over omgivelsestemperaturen.

For installation i miner skal følgende overholdes:

Transmitteren skal monteres i et metalhus med en tæthedegrad 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 kabelforskrninger og blindstik, som egner sig til den pågældende applikation og som installeres korrekt

Husets vægt må højst udgøres af

- 15 % aluminium, magnesium, titanium and zirconium i alt, og
- 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

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**

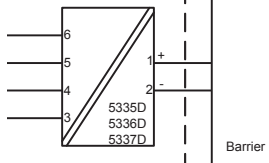
U<sub>o</sub>: 9.6 VDC

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

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

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

C<sub>o</sub>: 3.5µF



**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>: 10µH

C<sub>i</sub>: 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 IEC 60529 that is suitable for the application and correctly installed.

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

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

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

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

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

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

For installation in mines the following instructions apply:

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

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

The enclosure shall not contain by mass more than

- a) 15 % in total of aluminium, magnesium, titanium and zirconium, and
- b) 7,5 % in total of magnesium, titanium and zirconium.

## FM Installation Drawing 5300Q502 Rev AH

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

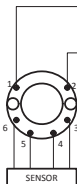
#### Hazardous (Classified) Location

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

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

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

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



#### Non Hazardous Location

Associated Apparatus or Barrier with entity Parameters:

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

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

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

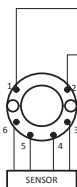
#### Hazardous (Classified) Location

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

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

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

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



#### Non Hazardous Location

Associated Apparatus or Barrier with entity Parameters:

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

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

**The entity concept**

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

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

The entity concept criteria are as follows:

The intrinsically safe devices, other than barriers, must not be a source of power.

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

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

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

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

**NI Field Circuit Parameters**

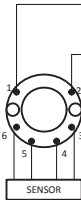
**Model 5331C, 5331D, 5333C, 5333D, 5335C, 5335D, 5336D, 5337D and 5343B**

**Hazardous (Classified) Location**

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

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

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

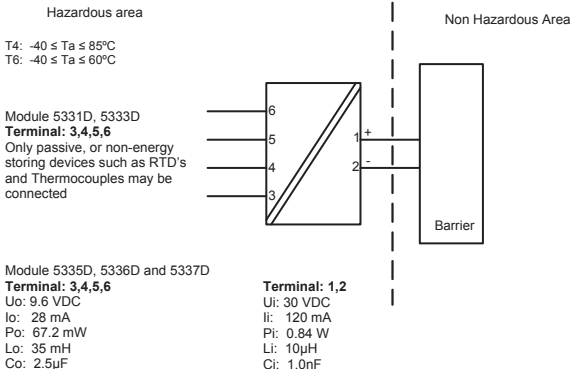


**Non Hazardous Location**

Associated Apparatus  
or Barrier

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

## CSA Installation drawing 533XQC03



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

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

**Warning:**

Substitution of components may impair intrinsic safety.

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



## Instruções de Segurança

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

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

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

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

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

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

Em atmosferas explosivas compostas por misturas de ar / poeira:

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

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

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

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

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

Ex ia IIC T6...T4 Ga

Ex ia I Ma

Certificado:: NCC 12.0844 X

Temp. amb. máxima T1...T4 ..... 85°C  
Temp. amb. máxima T5 e T6 ..... 45°C  
Aplicável em Zona ..... 0, 1, 2

Sinal de saída / alimentação , terminal 1 e 2:

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

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

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

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

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

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

Ex ic IIC T6...T4 Gc

Certificado:: NCC 12.0844 X

Temp. amb. máxima T1...T4 ..... 85°C  
Temp. amb. máxima T5 e T6 ..... 60°C  
Aplicável em Zona ..... 2

Sinal de saída / alimentação , terminal 1 e 2:

Ui ..... : 35 VDC

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

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



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



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



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



























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



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



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

