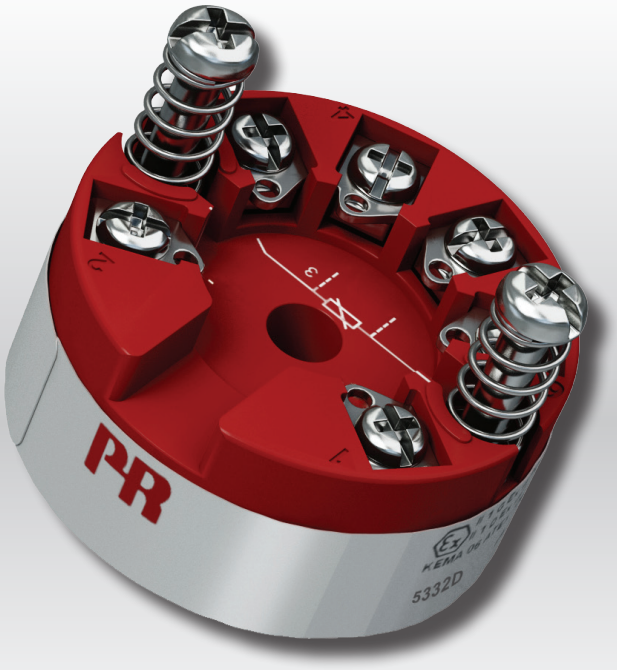
PERFORMANCE
MADE
SMARTER

Product manual
5332
2-wire programmable RTD transmitter



TEMPERATURE | I.S. INTERFACES | COMMUNICATION INTERFACES | MULTIFUNCTIONAL | ISOLATION | DISPLAY

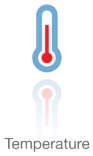
No. 5332V100-UK
From serial no: 181903001

PR electronics

6 Product Pillars
to meet your every need

Individually outstanding, unrivalled in combination

With our innovative, patented technologies, we make signal conditioning smarter and simpler. Our portfolio is composed of six product areas, where we offer a wide range of analog and digital devices covering over a thousand applications in industrial and factory automation. All our products comply with or surpass the highest industry standards, ensuring reliability in even the harshest of environments and have a 5-year warranty for greater peace of mind.



Temperature

Our range of temperature transmitters and sensors provides the highest level of signal integrity from the measurement point to your control system. You can convert industrial process temperature signals to analog, bus or digital communications using a highly reliable point-to-point solution with a fast response time, automatic self-calibration, sensor error detection, low drift, and top EMC performance in any environment.

I.S. Interface

We deliver the safest signals by validating our products against the toughest safety standards. Through our commitment to innovation, we have made pioneering achievements in developing I.S. interfaces with SIL 2 Full Assessment that are both efficient and cost-effective. Our comprehensive range of analog and digital intrinsically safe isolation barriers offers multifunctional inputs and outputs, making PR an easy-to-implement site standard. Our backplanes further simplify large installations and provide seamless integration to standard DCS systems.

Communication

We provide inexpensive, easy-to-use, future-ready communication interfaces that can access your PR installed base of products. All the interfaces are detachable, have a built-in display for readout of process values and diagnostics, and can be configured via push-buttons. Product specific functionality includes communication via Modbus and Bluetooth and remote access using our PR Process Supervisor (PPS) application, available for iOS and Android.

Multifunction

Our unique range of single devices covering multiple applications is easily deployable as your site standard. Having one variant that applies to a broad range of applications can reduce your installation time and training, and greatly simplify spare parts management at your facilities. Our devices are designed for long-term signal accuracy, low power consumption, immunity to electrical noise and simple programming.

Isolation

Our compact, fast, high-quality 6 mm isolators are based on microprocessor technology to provide exceptional performance and EMC-immunity for dedicated applications at a very low total cost of ownership. They can be stacked both vertically and horizontally with no air gap separation between units required.

Display

Our display range is characterized by its flexibility and stability. The devices meet nearly every demand for display readout of process signals, and have universal input and power supply capabilities. They provide a real-time measurement of your process value no matter the industry, and are engineered to provide a user-friendly and reliable relay of information, even in demanding environments.

2-wire programmable RTD transmitter 5332

Table of contents

2-wire programmable RTD transmitter
5332

- RTD or Ohm input
- Accuracy: Better than 0.05% of selected range
- Programmable sensor error value
- For DIN form B sensor head mounting

Application

- Linearised temperature measurement with Pt100... Pt1000 or Ni100...Ni1000 sensor.
- Conversion of linear resistance variation to a standard analogue current signal, for instance from valves or Ohmic level sensors.

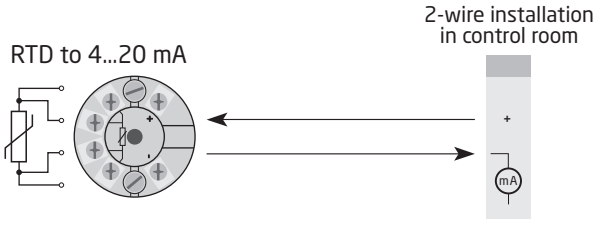
Technical characteristics

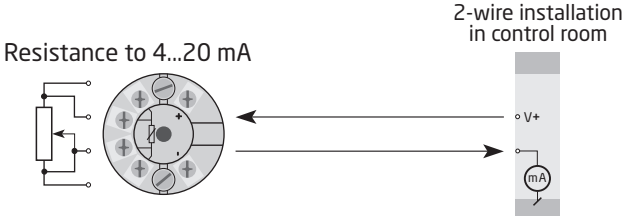
- Within a few seconds the user can program PR5332 to measure temperatures within all ranges defined by the norms.
- Dedicated programmable non-isolated 4-wire RTD transmitter.
- RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- Continuous check of vital stored data for safety reasons.

Mounting / installation

- For DIN form B sensor head mounting. In non-hazardous areas the 5332 can be mounted on a DIN rail with the PR fitting type 8421.

Applications





Order

Type	Version	
5332	Simple, no approvals	: N
	General purpose, Zone 2, ATEX, IECEx	: A
	Hazardous area, Zone 0 / Div. 0, ATEX, IECEx, FM, CSA	: D

Accessories

5909	=	Loop Link USB interface and PReset Software

Electrical specifications

Environmental conditions:

Operating temperature . . . . . -40°C to +85°C
Calibration temperature. . . . . 20...28°C
Relative humidity . . . . . < 95% RH (non-cond.)
Protection degree (encl./terminal) . . . . . IP68 / IP00

Mechanical specifications:

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

Common specifications:

Supply voltage, DC
5332N & 5332A. . . . . 7.2...35 VDC
5332D. . . . . 7.2...30 VDC
Internal power dissipation
5332N & 5332A. . . . . 25 mW...0.8 W
5332D. . . . . 25 mW...0.7 W
Voltage drop . . . . . 7.2 VDC
Warm-up time. . . . . 5 min.
Programming . . . . . Loop Link
Signal / noise ratio. . . . . Min. 60 dB
Response time (programmable) . . . . . 1...60 s
EEprom error check . . . . . < 3.5 s
Signal dynamics, input . . . . . 20 bit
Signal dynamics, output . . . . . 16 bit
Effect of supply voltage variation. . . . . < 0.005% of span / VDC

Accuracy, the greater of general and basic values:

General values		
Input type	Absolute accuracy	Temperature coefficient
All	≤ ±0.05% of span	≤ ±0.01% of span / °C

Basic values		
Input type	Basic accuracy	Temperature coefficient
RTD	≤ ±0.2°C	≤ ±0.01°C/°C
Lin. R	≤ ±0.1 Ω	≤ ±10 mΩ / °C

EMC - immunity influence	< ±0.5% of span
Extended EMC immunity:	
NAMUR NE 21, A criterion, burst	< ±1% of span

Input specifications:

RTD and linear resistance input:

RTD type	Min. value	Max. value	Min. span	Standard
Pt100...Pt1000	-200°C	+850°C	25°C	IEC 60751
Ni100...Ni1000	-60°C	+250°C	25°C	DIN 43760
Linear resistance	0 Ω	5000 Ω	30 Ω	-----

Max. offset . . . . . 50% of selec. max. value
Cable resistance per wire (max.) . . . . . 5 Ω
Sensor current . . . . . Nom. 0.2 mA
Effect of sensor cable resistance (3- / 4-wire) . . . . . < 0.002 Ω/Ω
Sensor error detection . . . . . Yes

Output specifications:

Current output:
Signal range . . . . . 4...20 mA
Min. signal range . . . . . 16 mA
Updating time . . . . . 440 ms
Load resistance . . . . . $\leq (V_{supply} - 7.2) / 0.023$ [Ω]
Load stability . . . . . < ±0.01% of span / 100 Ω

Sensor error detection:
Programmable . . . . . 3.5...23 mA
NAMUR NE43 Upscale . . . . . 23 mA
NAMUR NE43 Downscale . . . . . 3.5 mA

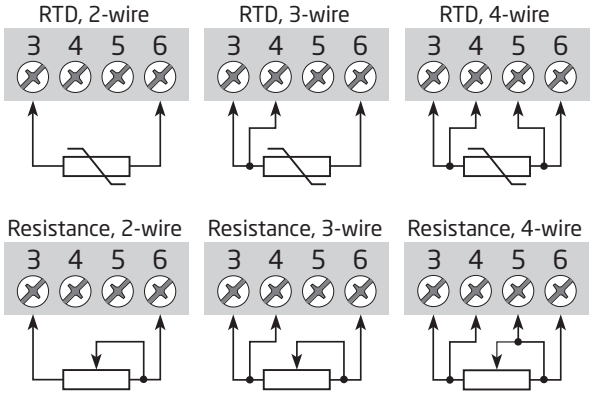
Of span = Of the presently selected range

Observed authority requirements:
EMC 2014/30/EU
RoHS 2011/65/EU
ATEX 2014/34/EU

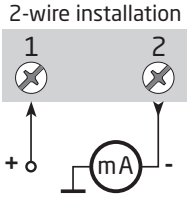
Ex / I.S. approvals:
ATEX
5332A . . . . . KEMA 10ATEX0002 X
5332D . . . . . KEMA 06ATEX0062 X
IECEx . . . . . DEK 13.0035 X
FM FM17US0013X
CSA 1125003

Connections

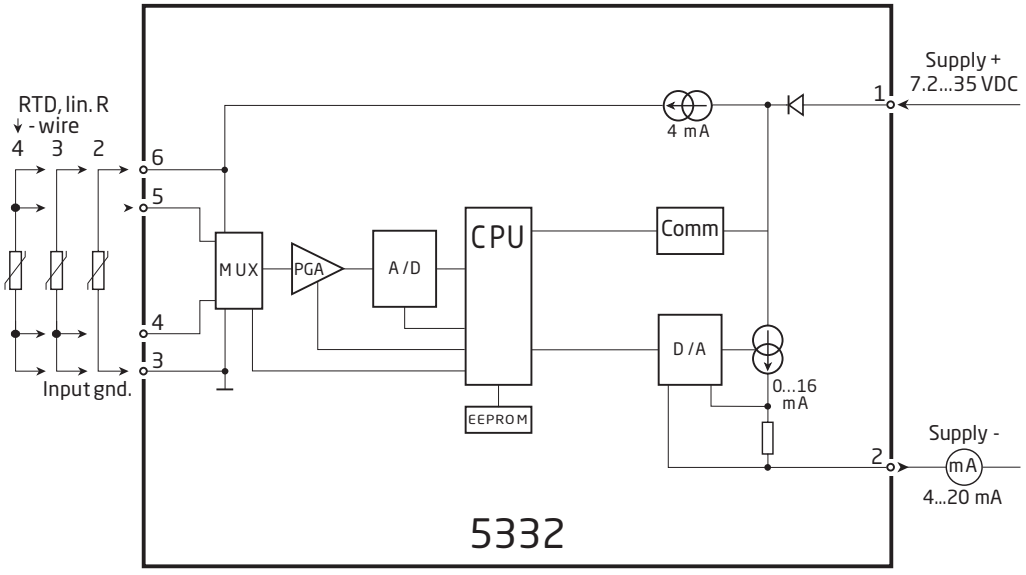
Input:



Output:



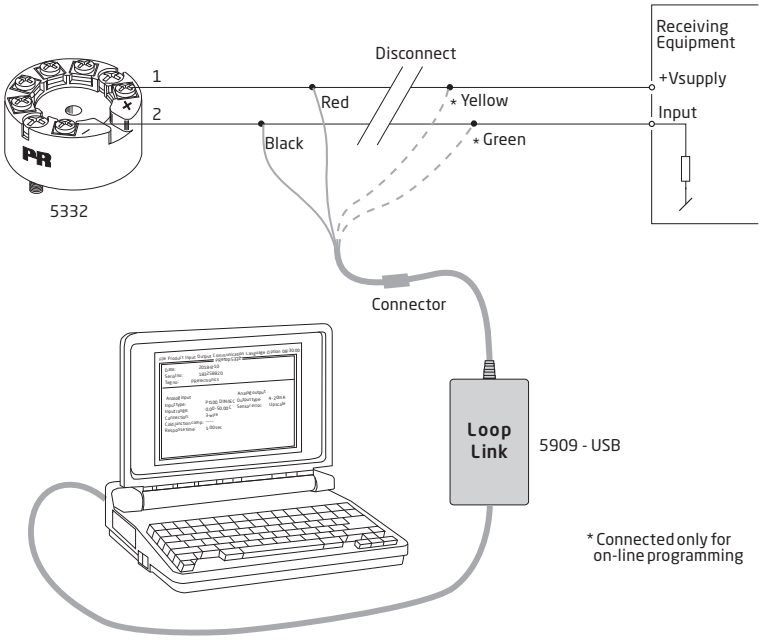
Block diagram



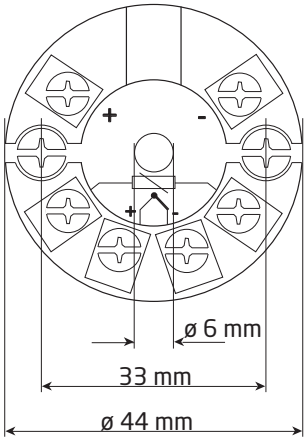
Programming

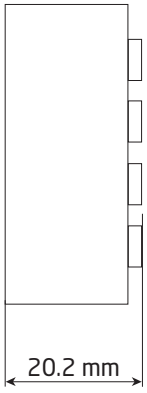
- Loop Link is a communications interface that is needed for programming 5332.
- For programming please refer to the drawing below and the help functions in PReset.
- Loop link is not approved for communication with modules installed in harzardous (Ex) areas.

Order: Loop Link

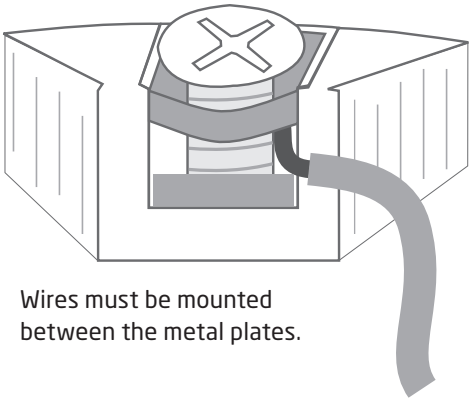


Mechanical specifications





Mounting of sensor wires



Wires must be mounted between the metal plates.

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ATEX Installation drawing

For safe installation of 5332A 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 10ATEX 0002X

Marking II 3 G Ex nA [ic] IIC T4 … T6 Gc
II 3 G Ex ic IIC T4…T6 Gc
II 3 D Ex ic IIIC Dc

Standards EN 60079-0 : 2012, EN 60079-11 : 2012, EN 60079-15 : 2010

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: 25 mA Po: 60 mW Lo: 33 mH Co: 2.4 µF	Umax ≤ 35 VDC	Ui = 35 VDC Ii = 110 mA Li = 10 µH Ci = 1.0 nF

Special conditions for safe use.

For type of protection Ex nA, the transmitter shall be mounted in a metal enclosure providing a degree of protection of at least IP54 according to EN60529.

For use in the presence of combustible dusts the transmitter shall be mounted in an enclosure providing a degree of protection of at least IP6X in accordance with o EN60529, the surface temperature of the outer enclosure is 20 K above the ambient temperature.

For an ambient temperature ≥ 60ºC, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

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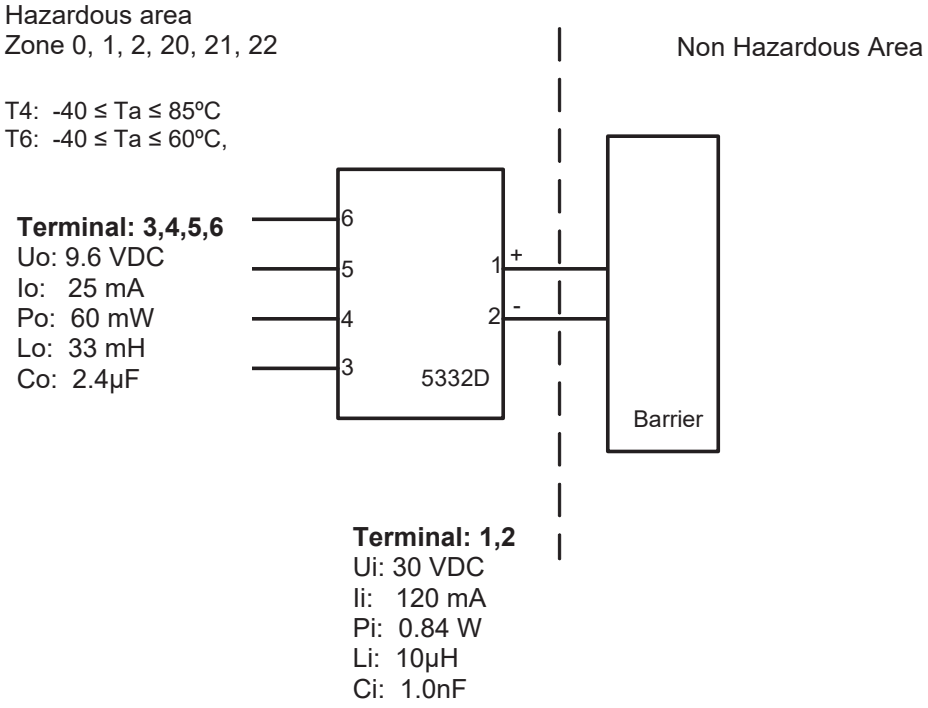
ATEX Installation drawing

For safe installation of 5332D 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 06ATEX 0062 X

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

Standards EN 60079-0 : 2012, EN 60079-11 : 2012, EN 60079-26 : 2007, EN 60079-15 :2010



Installation notes.

In a potentially explosive gas atmosphere, the transmitter shall be mounted in an enclosure in order to provide a degree of protection of at least IP20 according to EN60529.

If the transmitter is installed in an explosive atmosphere requiring the use of equipment of category 1 G, 1 M or 2 M, and if the enclosure is made of aluminum, if must be installed such, that ignition sources due to impact and friction sparks are excluded.

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

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

The transmitter shall be mounted in a metal enclosure form B according to DIN43729 that is providing a degree of protection of at least IP6X according to 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 ≥ 60ºC, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

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

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IECEx Installation drawing

For safe installation of 5332A 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.

Certificate	IECEx DEK 13.0035X
Marking	Ex nA [ic] IIC T4..T6 Gc Ex ic IIC T4..T6 Gc Ex ic IIIC Dc
Standards	IEC 60079-0 : 2011, IEC 60079-11 : 2011, IEC 60079-15 : 2010

T4: -40 ≤ Ta ≤ 85ºC T6: -40 ≤ Ta ≤ 60ºC	**Terminal: 3,4,5,6** Uo: 9.6 V Io: 25 mA Po: 60 mW Lo: 33 mH Co: 2.4 µF	**Terminal: 1,2** Ex nA Umax =35 VDC	**Terminal: 1,2** Ex ic Ui = 35 VDC Ii = 110mA Li = 10 µH Ci = 1.0 nF

Installation note:

For installation in a potentialy explosive gas atmosphere, the following instructions apply:
For nA installation the transmitter must be installed in an metal enclosure, e.g. a form B 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.

For ic installation the transmitter must be installed in enclosure providing a degree of protection of at least IP20 according to IEC60529 and that is suitable for the application.

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

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IECEx Installation drawing

For safe installation of 5332D 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.

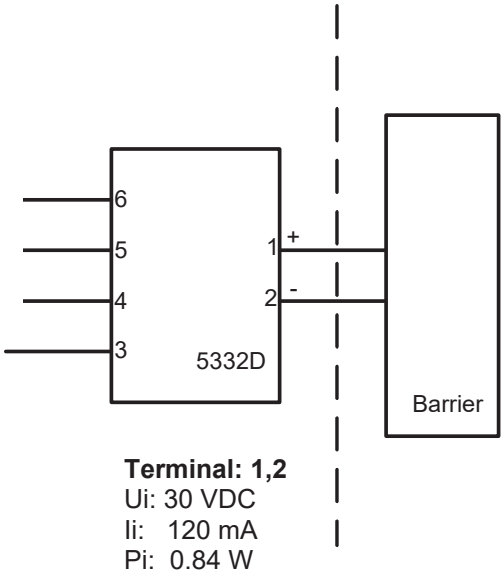
Certificate	IECEx DEK 13.0035X
Marking	Ex ia IIC T4…T6 Ga Ex ia IIIC Da Ex ia I Ma
Standards	IEC 60079-0 : 2011, IEC 60079-11 : 2011, IEC 60079-26:2006

Hazardous area
Zone 0, 1, 2, 20, 21, 22, M1

Non Hazardous Area

T4: -40 ≤ Ta ≤ 85ºC
T5: -40 ≤ Ta ≤ 60ºC
T6: -40 ≤ Ta ≤ 45ºC

Terminal: 3,4,5,6
Uo: 9.6 VDC
Io: 25 mA
Po: 60 mW
Lo: 33 mH
Co: 2.4µF



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

Installation notes.

In a potentially explosive gas atmosphere, the transmitter shall be mounted in a metal form B enclosure in order to provide a degree of protection of at least IP20 according to IEC60529. If however the environment requires a higher degree of protection, this shall be taken into account.

If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Ga, Ma and Mb, and if the enclosure is made of aluminum, it must be installed such, that ignition sources due to impact and friction sparks are excluded.

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

For explosive dust atmospheres, the surface temperature of the outer enclosure is 20 K above the ambient temperature.

The transmitter shall be mounted in a metal enclosure form B according to DIN43729 that is providing a degree of protection of at least IP6X according to IEC60529, that is suitable for the application and correctly installed.

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

For an ambient temperature ≥ 60ºC, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

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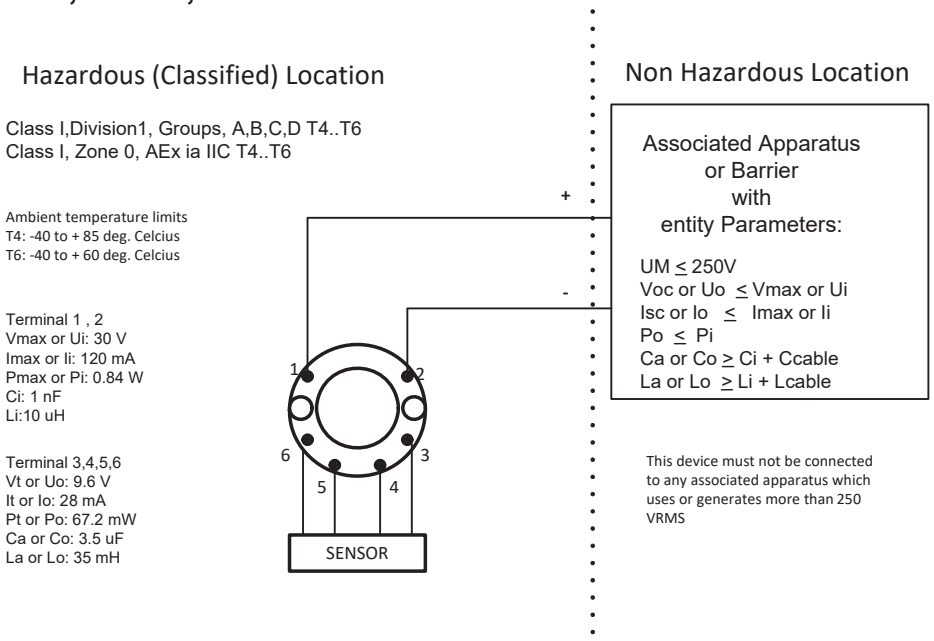
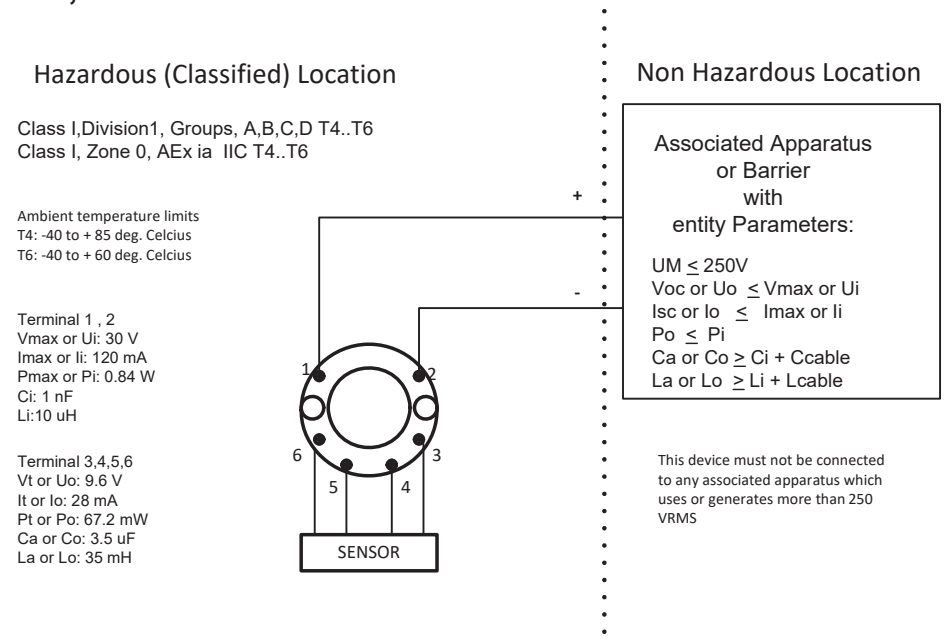
FM Installation Drawing

Model 5331D, 5332D, 5333D and 5343B



Model 5335D, 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.

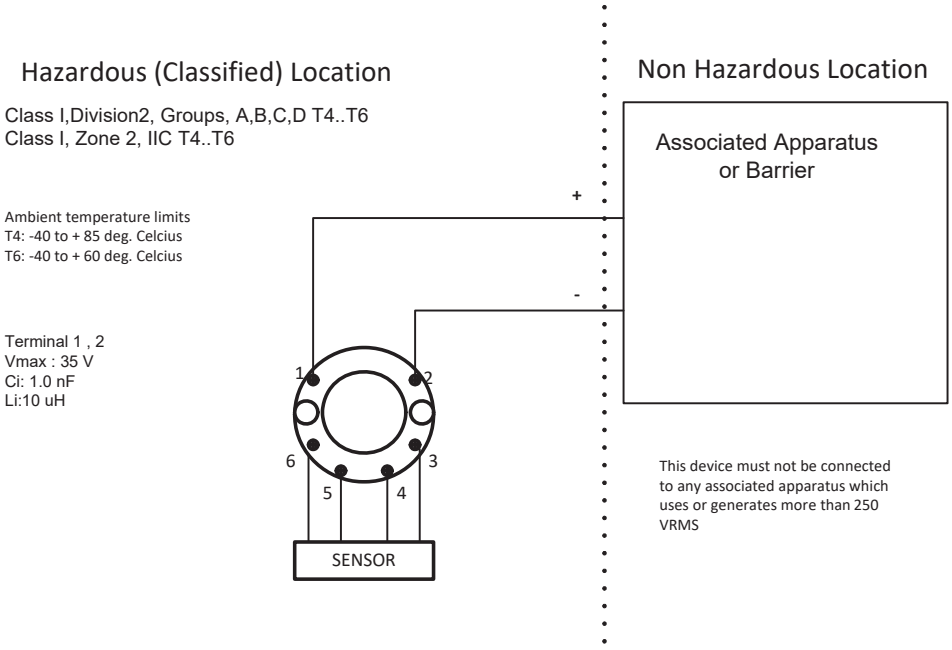
The sum of the maximum unprotected capacitance (C_i) for each intrinsically device and the interconnecting wiring must be less than the capacitance (C_a) which can be safely connected to the barrier.

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 5331D, 5332D, 5333D, 5335D, 5337D and 5343B

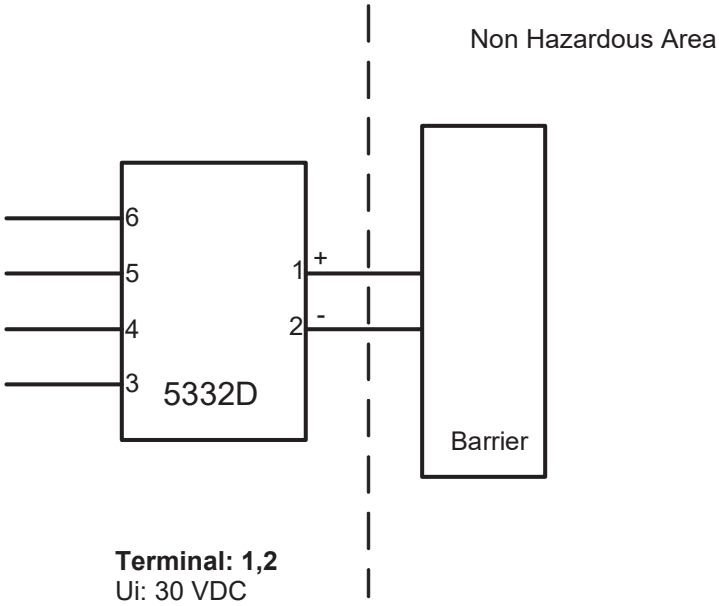


CSA Installation drawing 5332QC01

Hazardous area

T4: -40 ≤ Ta ≤ 85ºC
T6: -40 ≤ Ta ≤ 60ºC

Terminal: 3,4,5,6
Connect only to passive, or non-energy storing devices such as RTD's.



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

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).

Document history

The following list provides notes concerning revisions of this document.

Rev. ID	Date	Notes
100	1845	Initial release of the product

We are near you, *all over the world*

Our trusted red boxes are supported wherever you are

All our devices are backed by expert service and a 5-year warranty. With each product you purchase, you receive personal technical support and guidance, day-to-day delivery, repair without charge within the warranty period and easily accessible documentation.

We are headquartered in Denmark, and have offices and authorized partners the world over. We are a local business with a global reach. This means that we are always nearby and know your local markets well. We are committed to your satisfaction and provide PERFORMANCE MADE SMARTER all around the world.

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PR electronics is the leading technology company specialized in making industrial process control safer, more reliable and more efficient. Since 1974, we have been dedicated to perfecting our core competence of innovating high precision technology with low power consumption. This dedication continues to set new standards for products communicating, monitoring and connecting our customers' process measurement points to their process control systems.

Our innovative, patented technologies are derived from our extensive R&D facilities and from having a great understanding of our customers' needs and processes. We are guided by principles of simplicity, focus, courage and excellence, enabling some of the world's greatest companies to achieve PERFORMANCE MADE SMARTER.