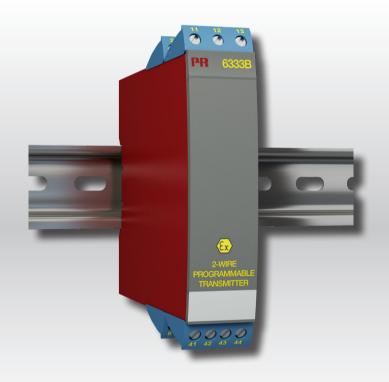
Product manual 6333

2-wire programmable transmitter



















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

No. 6333V105-UK

Serial no.: 151787180-212340107



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.



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.



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.



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.



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.



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.



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 transmitter 6333

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2-wire programmable transmitter 6333

- · RTD or Ohm input
- High measurement accuracy
- 3-wire connection
- Programmable sensor error value
- 1- or 2-channel version

Application

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

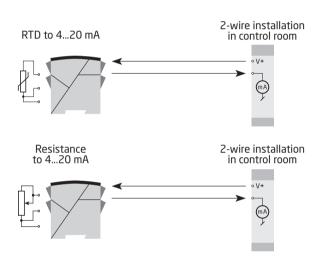
Technical characteristics

- Within a few seconds the user can program PR6333 to measure temperatures within all RTD ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 3-wire connection.
- A limit can be programmed on the output signal.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version up to 84 channels per metre can be mounted.
- The 6333A can be mounted in zone 2 and zone 22 / Class I, Division 2, Groups A, B, C, D.
- The 6333B can be mounted in zone 0, 1, 2 and zone 20, 21, 22 including M1 / Class I, Division 1, Groups A, B, C, D.

Applications



Туре	Version		Galvanic isolation		Channels	
6333	Zone 2, 22 / Div. 2 Zone 0, 1, 2, 20, 21, 22, M1 / DIV. 1, DIV. 2	: A : B	None		Single Double	: A : B

Electrical specifications

Environmental conditions:

Mechanical specifications:

Common specifications:

Supply voltage, DC

 6333A
 8...35 VDC

 6333B
 8...30 VDC

 Max. required power, 1 / 2 channels, 6333A
 0.8 W / 1.6 W

 Max. required power, 1 / 2 channels, 6333B
 0.7 W / 1.4 W

 Internal power dissipation, 6333A
 0.19...0.8 W

 Internal power dissipation, 6333B
 0.19...0.7 W

 Voltage drop
 8 VDC

 Warm-up time
 5 min

 Communications interface
 Loop Link

 Signal / noise ratio
 Min. 60 dB

 Response time (programmable)
 0.33...60 s

 Signal dynamics, input
 19 bit

 Signal dynamics, output
 16 bit

Accuracy, the greater of general and basic values:

General values			
Input type	Absolute accuracy	Temperature coefficient	
All	≤ ±0.1% of span	≤ ±0.01% of span / °C	

Basic values			
Input type	Basic accuracy	Temperature coefficient	
RTD	≤ ±0.3°C	≤ ±0.01°C/°C	
Lin. R	≤ ±0.2 Ω	≤ ±20 mW / °C	

Electrical specifications, inputs:

RTD and linear resistance inputs:

RTD	Min.	Max.	Min.	
type	value	value	span	Standard
Pt100	-200°C	+850°C	25°C	IEC 60751
Ni100	-60°C	+250°C	25°C	DIN 43760
Lin. R	0 Ω	10000 Ω	30 Ω	

Effect of sensor cable resistance (3-wire) < 0.002 Ω/Ω

Outputs:

Current outputs:

 Signal range.
 4...20 mA

 Min. signal range.
 16 mA

 Updating time
 135 ms

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

 ATEX.
 2014/34/EU

 RoHS.
 2011/65/EU

 EAC.
 TR-CU 020/2011

 EAC Ex.
 TR-CU 012/2011

I.S. / Ex approvals:

 ATEX
 KEMA 09ATEX0147 X

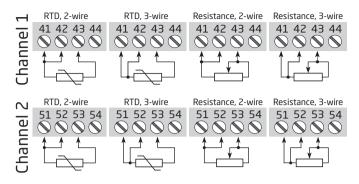
 IECEx
 IECEx DEK 14.0049X

 FM
 FM17US0013X

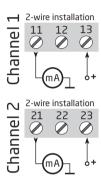
 CSA
 1125003

Connections

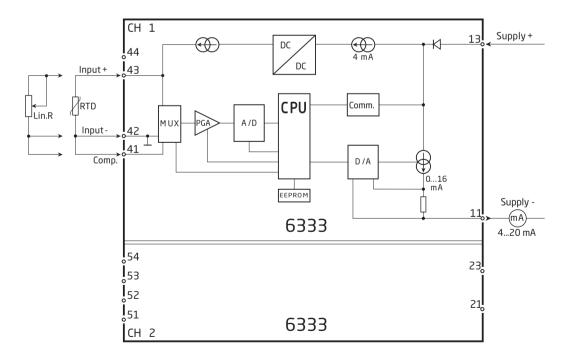
Inputs:



Outputs:

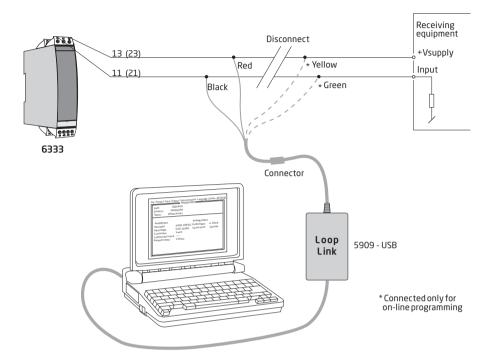


Block diagram



Programming

- Loop Link is a communications interface that is needed for programming 6333.
- For programming please refer to the drawing below and the help functions in PReset.
- When communicating with non-installed devices, connectors 11, 12, 13 (channel 1) and 21, 22, 23 (channel 2) can be dismantled in the safe area to connect the terminals of the communications interface to the pins.
- Loop Link is not approved for communication with devices installed in harzardous (Ex) areas.





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ATEX Installation drawing



For safe installation of 6333A and 6343A 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 09ATEX 0147X

Marking

Ex || 3

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

T4: -40°C to 85 °C T6: -40°C to 60 °C

10. -40 0 10 00 0

Terminal: 41,42,43 / 51,52,53

Ex nA [ic]

Uo: 5 VDC lo: 4 mA Po: 20 mW Lo: 900 mH Co: 1000 µF 42 11 -41 CH1

52

51

43

13

21

CH2 6333 6343 Hazardous Area Zone 2

Terminal: 11-13 / 21-23

Fx nA

Umax ≤ 35 VDC

Ex ic

Ui = 35 VDC Li = 10 μH Ci = 6.2 nF

Revision date: Version Revision Page: 2014-06-20 V3R0 1/2



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General installation instructions

To avoid risk of ignition during installation and maintenance appropriate safety measures against electrostatic discharge (ESD) are to be considered.

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

If the transmitter is applied in type of protection "Ex nA", it shall be installed in an enclosure that is Ex nA certified according to IEC-EN 60079-15, or "Ex e" certified and suitable for the application and correctly installed.

Cable entry devices and blanking elements shall fulfill the same requirements

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 that provides a degree of protection of at least IP6X according to EN/IEC 60529, and that is suitable for the application. Cable entry devices and blanking elements shall fulfill the same requirements. The surface temperature of the enclosure is equal to the ambient temperature +20K for a dust layer with a maximum thickness of 5 mm.

Revision date: Version Revision Page: 2014-06-20 V3R0 2/2



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ATEX Installation drawing



For safe installation of 6333B and 6343B 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.

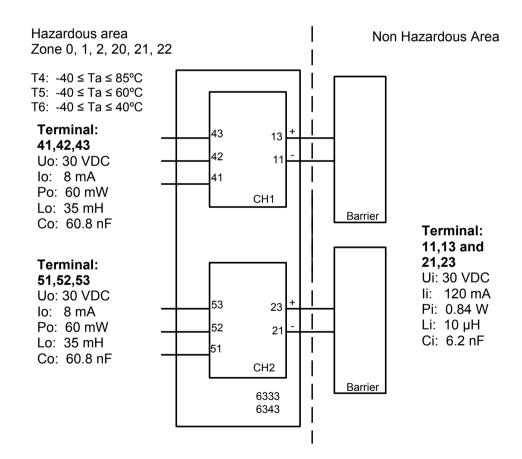
Year of manufacture can be taken from the first two digits in the serial number.

ATEX Certificate KEMA 09ATEX 0147 X

Marking

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

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



Revision date: Version Revision Page: 2014-06-20 V2R0 1/2



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General installation instructions

To avoid risk of ignition during installation and maintenance appropriate safety measures against electrostatic discharge (ESD) are to be considered.

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

To avoid risk of ignition due to electrostatic discharge (ESD) the transmitter shall be mounted in an enclosure providing a degree of protection of at least IP20 according to EN/IEC 60529.

Ambient temperature range:

T4: $-40 \le Ta \le 85^{\circ}C$ T5: $-40 \le Ta \le 60^{\circ}C$ T6: $-40 \le Ta \le 40^{\circ}C$

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

The transmitter shall be mounted in a metal enclosure or equivalent that is providing a degree of protection of at least IP6X according to EN/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. The surface temperature of the enclosure is equal to the ambient temperature +20K for a dust layer with a maximum thickness of 5 mm. Ambient temperature range:

T4: -40 ≤ Ta ≤ 85°C

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

Ambient temperature range:

T4: -40 ≤ Ta ≤ 85°C

Revision date: Version Revision Page: 2014-06-20 V2R0 2/2



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IECEx Installation drawing

For safe installation of 6333A and 6343A 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 DEK 14.0049X

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

Ex ic IIC T6..T4 Gc Ex ic IIIC Dc

Standards IEC 60079-0 : 2011, IEC 60079-11 : 2011, IEC 60079-15 : 2010

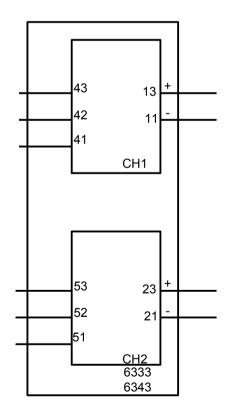
Hazardous Area Zone 2

T4: -40°C to 85 °C T6: -40°C to 60 °C

Terminal: 41,42,43 / 51,52,53

Ex nA [ic]

Uo: 5 VDC lo: 4 mA Po: 20 mW Lo: 900 mH Co: 1000 µF



Terminal: 11-13 / 21-23

Ex nA

Umax ≤ 35 VDC

Ex ic

Ui = 35 VDC Li = 10 μ H Ci = 6.2 nF

Revision date: Version Revision Page: 2014-06-20 V1R0 1/2



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General installation instructions

To avoid risk of ignition during installation and maintenance appropriate safety measures against electrostatic discharge (ESD) are to be considered.

For installation in a potentialy explosive gas atmosphere, the following instructions apply: If the transmitter is applied in type of protection "Ex nA", it shall be installed in an enclosure that is Ex nA certified according to IEC-EN 60079-15, or "Ex e" certified and suitable for the application and correctly installed.

Cable entry devices and blanking elements shall fulfill the same requirements

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 that provides a degree of protection of at least IP6X according to EN/IEC 60529, and that is suitable for the application. Cable entry devices and blanking elements shall fulfill the same requirements. The surface temperature of the enclosure is equal to the ambient temperature +20K for a dust layer with a maximum thickness of 5 mm.

Revision date: Version Revision Page: 2014-06-20 V1R0 2/2



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IECEx Installation drawing

For safe installation of 6333B and 6343B 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 DEK 14.0049X

Ex ia IIC T6..T4 Ga Marking

Ex ia IIIC Da Ex ia I Ma

Standards: IEC60079-11:2011, IEC60079-0: 2011, IEC60079-26:2006

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

Non Hazardous Area

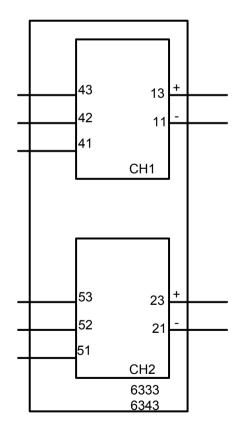
T4: -40 ≤ Ta ≤ 85°C T5: -40 ≤ Ta ≤ 60°C T6: -40 ≤ Ta ≤ 40°C

Terminal: 41,42,43

Uo: 30 VDC lo: 8 mA Po: 60 mW Lo: 35 mH Co: 60.8 nF

Terminal: 51,52,53

Uo: 30 VDC lo: 8 mA Po: 60 mW Lo: 35 mH Co: 60.8 nF



Terminal: 11,13 and 21,23

Ui: 30 VDC li: 120 mA Pi: 0.84 W Li: 10 µH Ci: 6.2 nF

Revision date: Version Revision 0Page: 2014-06-20 V1R0 1/2



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General installation instructions

To avoid risk of ignition during installation and maintenance appropriate safety measures against electrostatic discharge (ESD) are to be considered.

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

To avoid risk of ignition due to electrostatic discharge (ESD) the transmitter shall be mounted in an enclosure providing a degree of protection of at least IP20 according to EN/IEC 60529.

Ambient temperature range:

T4: $-40 \le Ta \le 85^{\circ}C$ T5: $-40 \le Ta \le 60^{\circ}C$ T6: $-40 \le Ta \le 40^{\circ}C$

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

The transmitter shall be mounted in a metal enclosure or equivalent that is providing a degree of protection of at least IP6X according to EN/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. The surface temperature of the enclosure is equal to the ambient temperature +20K for a dust layer with a maximum thickness of 5 mm. Ambient temperature range:

T4: -40 ≤ Ta ≤ 85°C

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

Ambient temperature range:

T4: -40 ≤ Ta ≤ 85°C

 Revision date:
 Version Revision
 0Page:

 2014-06-20
 V1R0
 2/2



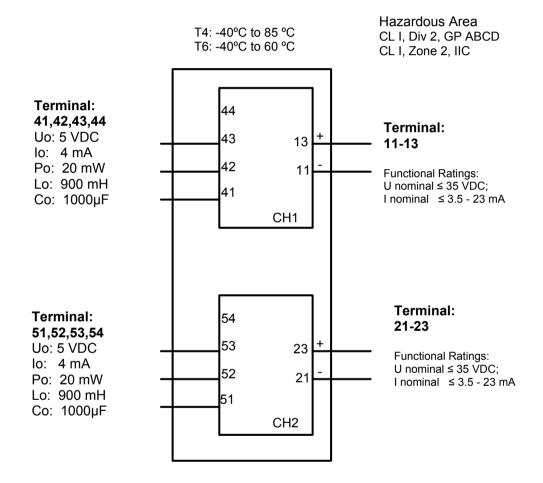
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For safe installation of the single channel 6333A1A or the two channel 6333A1B the following must be observed. The module shall only be Installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

Marking

Class I, Division 2, Group A,B,C,D T4..T6 Class I Zone 2 Ex/AEx nA[ic] IIC T4..T6 Class I Zone 2 Ex/AEx nA IIC T4..T6 NIFW Class I Division 2, Group A,B,C,D





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NI Installation instructions

The transmitter must be installed in an enclosure providing a degree of protection of at least IP54 according to IEC60529 that is suitable for the application and is correctly installed. Cable entry devices and blanking elements shall fulfill the same requirements.

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

Use supply wires with a rating of at least 5 K above the ambient temperature.

Supply from a Class 2 Power Supply with Transient protection or equivalent.

WARNING: Substitution of components may impair suitability for Class I, Division 2 AVERTISSEMENT: la substitution de composants peut nuire à l'aptitude à la Classe I, Division 2.

WARNING: Do not disconnect equipment unless power has been switched off or the area is known to be safe.

AVERTISSEMENT: Ne débranchez pas l'équipement sauf si l'alimentation a été coupée ou si la zone est connue pour être sûre.

Non Incendive field wiring installation

The non incendive field Wiring Circuit concept allows interconnection of Nonincendive Field wiring Apparatus with Associated Nonincendive Field Wiring Apparatus or Associated Intrinsically Safe Apparatus or Associated Apparatus not specially examined in combination as a system using any of the wiring methods permitted for unclassified locations,

 $Voc < Vmax, Ca \ge Ci + Ccable, La \ge Li + Lcable.$

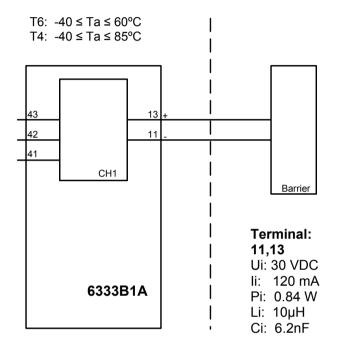


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Hazardous (Classified) Location IS,Class I, Division 1, Group A,B,C,D T4..T6 Ex ia IIC T4..T6 Ga Class I, Zone 0, AEx ia IIC T4..T6 Ga Non Hazardous Location

Terminal: 41,42,43
Connect to passive or non-energy storing devices such as RTD's Resistors and Thermocouples only.



 $Co(Ca) > \sum(Ci+Ccable)$ $Lo(La) > \sum(Li+Lcable)$

Installation notes.

The Transmitter must be installed in a suitable enclosure to meet installation codes stipulated in The Canadian Electrical Code (CEC).

Substitution of components may impair intrinsic safety.



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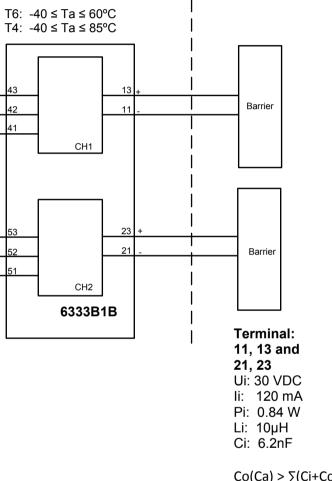
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Hazardous (Classified) Location IS,Class I, Division 1, Group A,B,C,D T4..T6 Ex ia IIC T4..T6 Ga Class I, Zone 0, AEx ia IIC T4..T6 Ga

Non Hazardous Location

Terminal: 41,42,43 51,52,53 Connect to passive or non-energy storing

Connect to passive or non-energy storing devices such as RTD's Resistors and Thermocouples only.



 $Co(Ca) > \sum (Ci+Ccable)$ $Lo(La) > \sum (Li+Lcable)$

Installation notes.

The Transmitter must be installed in a suitable enclosure to meet installation codes stipulated in The Canadian Electrical Code (CEC).

Channel 1 and Channel 2 are separate channels and therefore separate shielded cables shall be used for each channel.

Substitution of components may impair intrinsic safety.

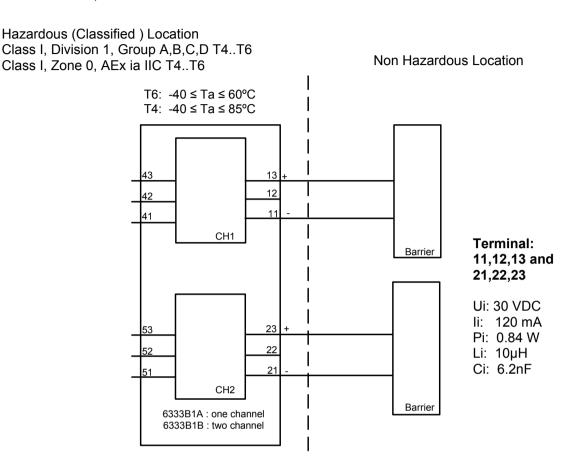
Revision date: Version Revision Page: 2014-10-20 V1R0 2/2



FM Installation drawing 6333QF01

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Installation notes.

For installation in Class I the Transmitter must be installed in a suitable enclosure to meet installation codes stipulated in The National Electrical Code (ANSI-NFPA 70).

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 Voc or Vt) and current (Io or Isc or It) 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 (La) which can be safely connected to the barrier. The entity parameters Uo, Voc or Vt and Io, Isc or It, and Ca and La for barriers are provided by the barrier manufacturer.

Revision date: Version Revision Page: 2014-09-17 V1R0 1/2



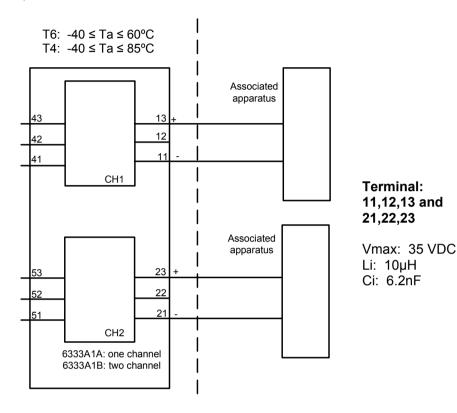
FM Installation drawing 6333QF01

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Hazardous (Classified) Location Class I, Division 2, Group A,B,C,D T4..T6 Class I, Zone 2, IIC T4..T6

Non Hazardous Location



Installation notes.

The Transmitter must be installed in a suitable enclosure to meet installation codes stipulated in The National Electrical Code (ANSI-NFPA 70).

To assure a Non-Incendive system the transmitter and associated apparatus must be wired in accordance with the associated apparatus manufacturers field wiring instructions and the circuit diagram shown above.

Document history

The following list provides notes concerning revisions of this document.

Rev. ID	Date	Notes
104	1543	CSA, FM & IECEx approvals added.
105	2015	Specifications for max. required power added.
		New FM certificate.
		CSA approval for 6333A received. Installation
		drawing added.

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