PR electronics 5332V105-SE 2 Wire Programmable RTD Temperature Transmitter

PR electronics 5332V105-SE 2 Wire Programmable RTD Temperature Transmitter Instruction Manual

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PR electronics 5332V105-SE 2 Wire Programmable RTD Temperature Transmitter

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

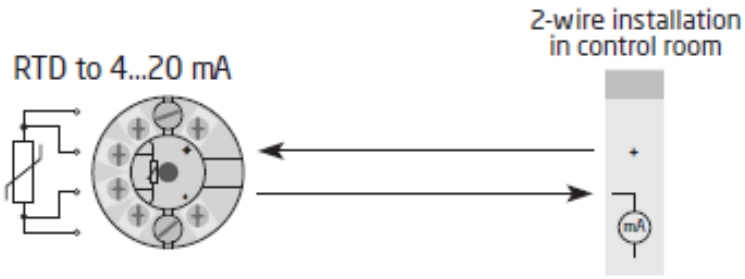
- Linearised temperature measurement with Pt100… Pt1000 or Ni100…Ni1000 sensor.
- Conversion of linear resistance variation to a standard analogue current signal, for instance from valves or Ohmic level sensors.

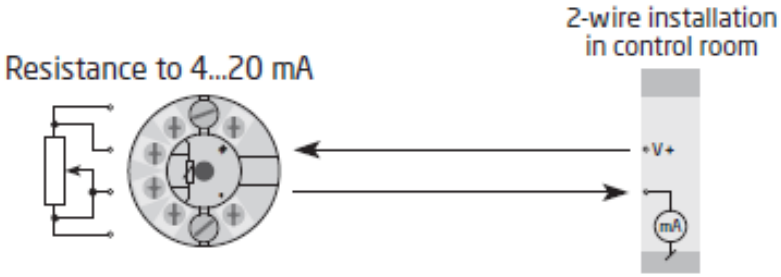
Technical characteristics

- 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 Zone 2 / Div. 2 : A Zone 0, 1, 2, 21, 22, M1 / DIV. 1, DIV. 2 : D

Accessories
5909 = Loop Link USB interface and PReset Software

Electrical specifications

Environmental conditions

- **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 mm2 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.
  - Power on to stable output . . . . . 4.5 s
  - Programming . . . . . Loop Link
  - Signal / noise ratio . . . . . > 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 mn / °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	—

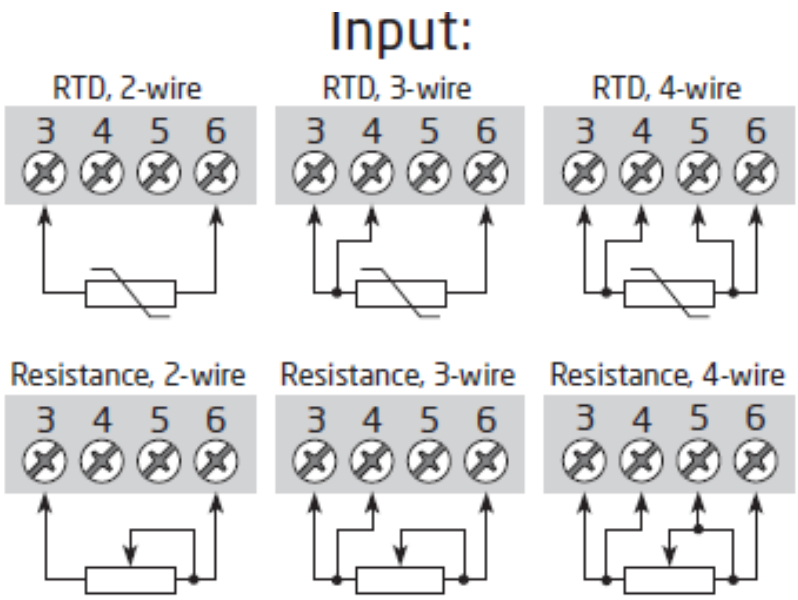
- Max. offset . . . . . 50% of selec. max. value
- Cable resistance per wire (max.) . . . . . 5 Ω
- Sensor current . . . . . Nom. 0.2 mA
- Effect of sensor cable resistance (3- / 4-wire) . . . . . < 0.002 Ω/Ω
- Sensor error detection . . . . . Yes

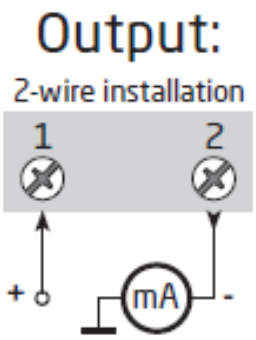
Output specifications

- **Current output**
  - Signal range . . . . . 4…20 mA
  - Min. signal range . . . . . 16 mA
  - Updating time . . . . . 440 ms
  - Load resistance . . . . . ≤ (Vsupply – 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 & UK SI 2016/1091
  - ATEX . . . . . 2014/34/EU & UK SI 2016/1107
  - RoHS . . . . . 2011/65/EU & UK SI 2012/3032
  - EAC . . . . . TR-CU 020/2011
  - EAC Ex . . . . . TR-CU 012/2011
  - Ex / I.S. approvals:
- **5332A:**
  - ATEX . . . . . DEKRA 20ATEX0096X
  - 5332D:
  - ATEX . . . . . DEKRA 20ATEX0095X
  - FM FM17US0013X
- **5332A & 5332D**
  - IECEx . . . . . DEK 20.0059X
  - CSA 1125003
  - INMETRO . . . . . DEKRA 23.0009X

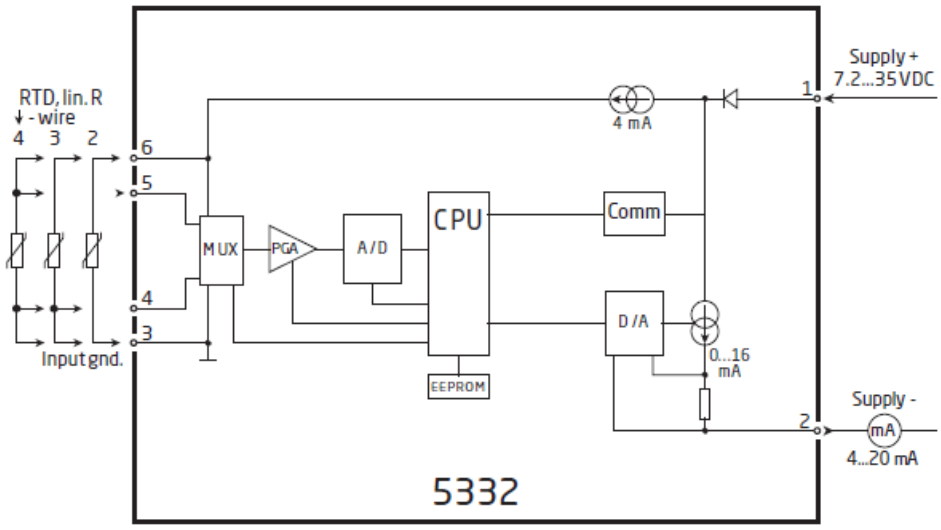
- EAC Ex . . . . . RU C-DK.HA65.B.00355/19

Connections





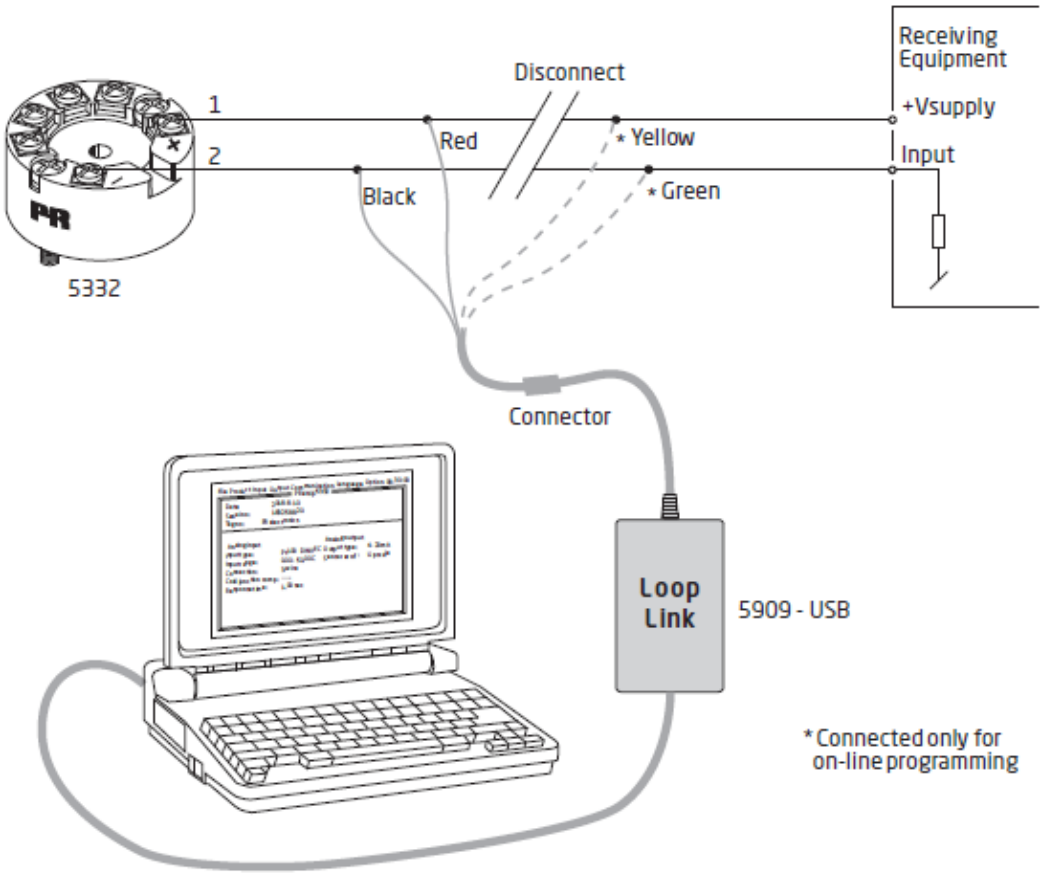
Block diagram



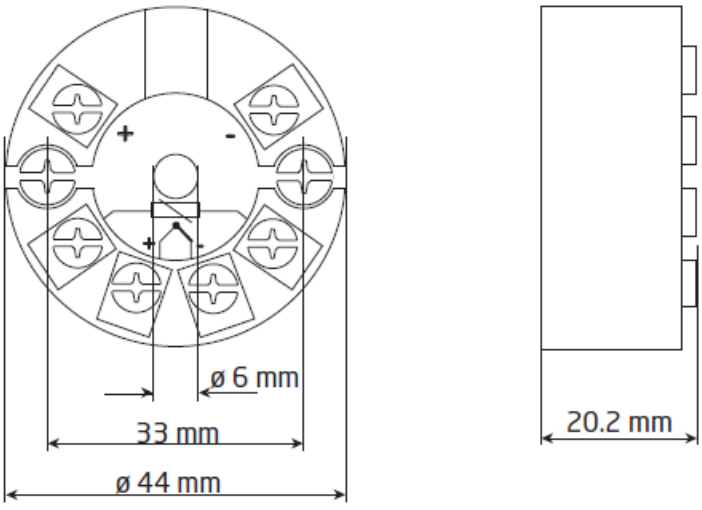
Programming

- 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 hazardous (Ex) areas.

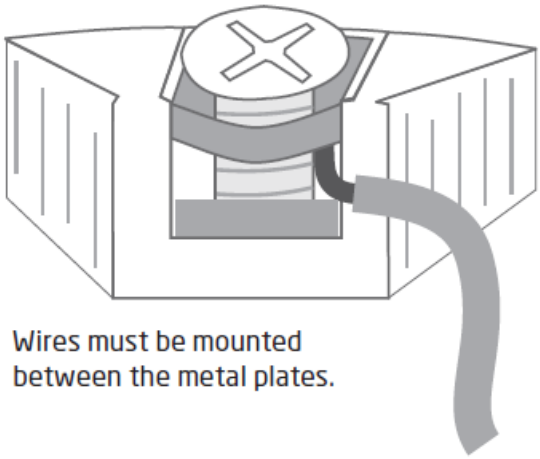
Order: Loop Link



Mechanical specifications



Mounting of sensor wires



ATEX-installation drawing 5332QA02-V2R0

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** DEKRA 20ATEX0096 X
- **Marking** II 3 G Ex nA [ic] IIC T6 … T4 Gc
  II 3 G Ex ec [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: 2018, EN 60079-11: 2012,
  EN 60079-15: 2010, EN 60079-7:2015 +A1: 2018

Terminal 3,4,5,6	Terminal 1,2	Terminal 1,2	Terminal 1,2
Ex ic IIC,Ex ic IIIC	Ex ic IIC,Ex ic IIIC	Ex ic IIC,Ex ic IIIC	Ex nA, Ex ec
Uo: 9.6 V Io: 25 mA Po: 60 mW Lo: 33 mH Co: 2.4 µF	Ui = 35 V Ii = 110 mA Ci = 1 nF Li = 10 µH	Ui = 24 V Ii = 260 mA Ci = 1 nF Li = 10 µH	Umax ≤ 35 VDC or Umax ≤ 24 VDC

Ex ic IIC, Ex ic IIIC Temperature Class	Ambient temperature range	
	Ui=35 V	Ui=24 V
T6	-40°C to +54°C	-40°C to +63°C
T5	-40°C to +69°C	-40°C to +78°C
T4	-40°C to +85°C	-40°C to +85°C

Ex ec, Ex nA Temperature Class	Ambient temperature range	
	Vmax=35 V	Vmax=24 V
T6	-40°C to +43°C	-40°C to +55°C
T5	-40°C to +85°C	-40°C to +85°C
T4	-40°C to +85°C	-40°C to +85°C

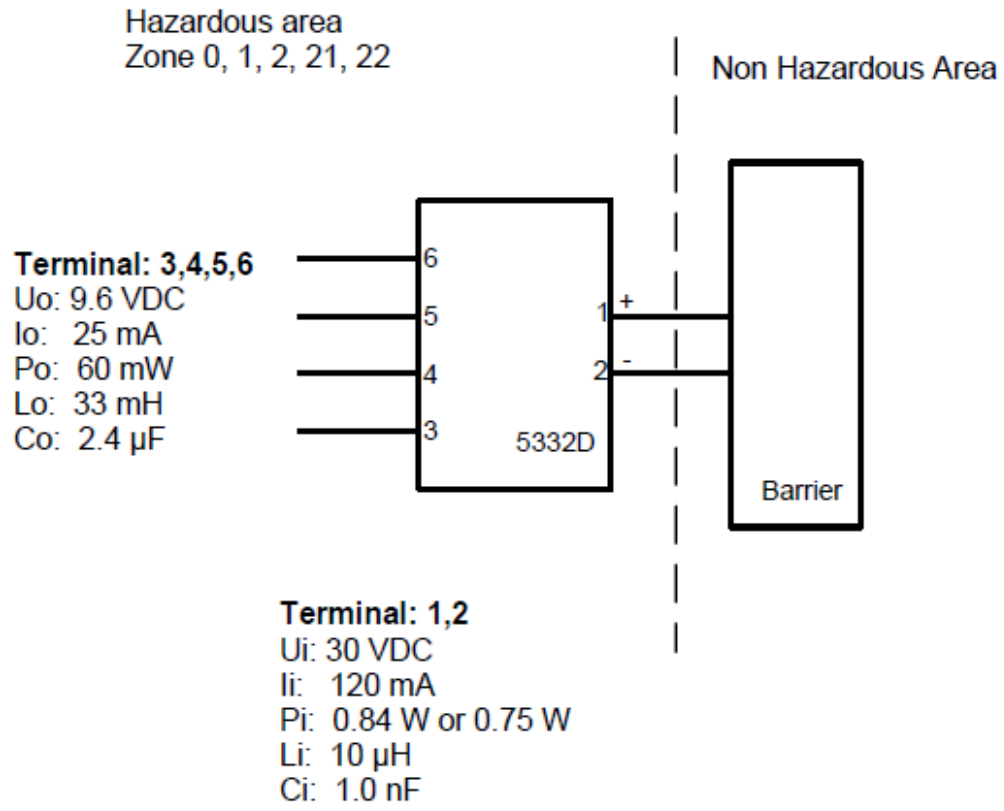
Installation notes

- If the enclosure is made of non-metallic plastic materials, electrostatic charges on the transmitter enclosure shall be avoided.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Gc and applied in type of protection Ex ic, the transmitter shall be mounted in an enclosure that provides a degree of protection of at least IP20 according to EN 60529, and that is suitable for the application and correctly installed.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Dc, the transmitter shall be mounted in a separately certified enclosure that provides a degree of protection of at least
- IP5X according to EN 60079-0, and that is suitable for the application and correctly installed. The surface temperature of the outer enclosure is +20 K above the ambient temperature, determined without a dust layer. Ambient temperature range: -40°C to +85°C.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Gc and applied in type of protection Ex nA or Ex ec, the transmitter shall be mounted in a separately certified enclosure that provides a degree of protection of at least IP54 according to EN 60079-0, and that is suitable for the application and correctly installed.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Gc and applied in type of protection Ex nA or Ex ec, the equipment shall only be used in an area of not more than pollution degree 2, as defined in EN 60664-1.

ATEX-installation drawing 5332QA01-V2R0
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** DEKRA 20ATEX0095 X
- **Marking** II 1 G Ex ia IIC T6…T4 Ga
  II 2 D Ex ia IIIC Db
  I M1 Ex ia I Ma

- **Standards** EN 60079-0: 2018, EN 60079-11: 2012



Temperature Class	**Ambient temperature range**	
	Pi: 0.84 W	**Pi: 0.75 W**
T6	-40°C to +47°C	-40°C to +50°C
T5	-40°C to +62°C	-40°C to +65°C
T4	-40°C to +85°C	-40°C to +85°C

Installation notes

- If the enclosure is made of non-metallic plastic materials, electrostatic charges on the transmitter enclosure shall be avoided.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Ga, the transmitter shall be mounted in an enclosure that provides a degree of protection of at least IP20 according to EN 60529, and that is suitable for the application and correctly installed.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Ga or Ma, and if the enclosure is made of aluminum, it must be installed such, that ignition sources due to impact and friction sparks are excluded.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Db, the transmitter shall be mounted in a separately certified enclosure that provides a degree of protection of at least

- IP5X according to EN 60079-0, and that is suitable for the application and correctly installed.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Ma, the transmitter shall be mounted in an enclosure that provides a degree of protection of at least IP54 according to EN 60529, and 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.

IECEx-installation drawing 5332QI02-V2R0
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 20.0059X
- **Marking** Ex nA [ic] IIC T6 … T4 Gc Ex ec [ic] IIC T6 … T4 Gc Ex ic IIC T6 … T4 Gc Ex ic IIIC Dc
- **Standards** IEC 60079-0: 2017, IEC 60079-11: 2011, IEC 60079-15: 2010, IEC 60079-7:2017

Terminal 3,4,5,6	Terminal 1,2	Terminal 1,2	Terminal 1,2
Ex ic IIC,Ex ic IIIC	Ex ic IIC,Ex ic IIIC	Ex ic IIC,Ex ic IIIC	Ex nA, Ex ec
Uo: 9.6 V Io: 25 mA Po: 60 mW Lo: 33 mH Co: 2.4 µF	Ui = 35 V Ii = 110 mA Ci = 1 nF Li = 10 µH	Ui = 24 V Ii = 260 mA Ci = 1 nF Li = 10 µH	Umax ≤ 35 VDC or Umax ≤ 24 VDC

Ex ic IIC, Ex ic IIIC Temperature Class	**Ambient temperature range**	
	Ui=35 V	**Ui=24 V**
T6	-40°C to +54°C	-40°C to +63°C
T5	-40°C to +69°C	-40°C to +78°C
T4	-40°C to +85°C	-40°C to +85°C

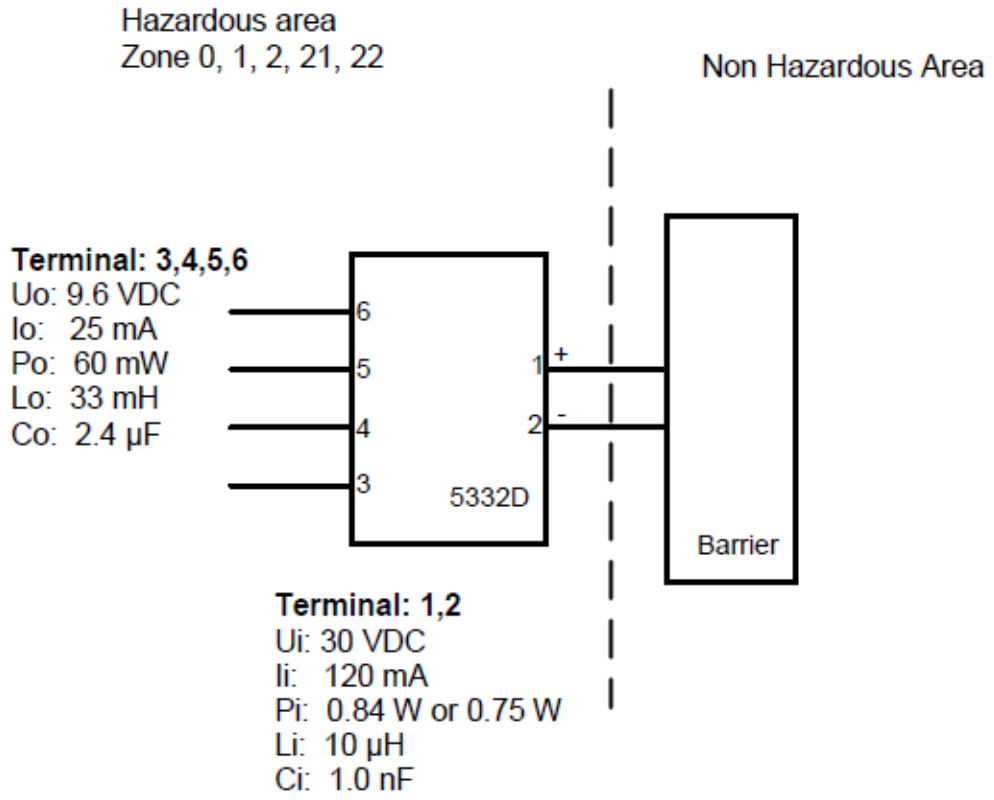
Ex ec, Ex nA Temperature Class	**Ambient temperature range**	
	Vmax=35 V	**Vmax=24 V**
T6	-40°C to +43°C	-40°C to +55°C
T5	-40°C to +85°C	-40°C to +85°C
T4	-40°C to +85°C	-40°C to +85°C

Installation notes

- If the enclosure is made of non-metallic plastic materials, electrostatic charges on the transmitter enclosure shall be avoided.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Gc and applied in type of protection Ex ic, the transmitter shall be mounted in an enclosure that provides a degree of protection of at least IP20 according to IEC 60529, and that is suitable for the application and correctly installed.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Dc, the transmitter shall be mounted in a separately certified enclosure that provides a degree of protection of at least
- IP5X according to IEC 60079-0, and that is suitable for the application and correctly installed. The surface temperature of the outer enclosure is +20 K above the ambient temperature, determined without a dust layer. Ambient temperature range: -40°C to +85°C.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Gc and applied in type of protection Ex nA or Ex ec, the transmitter shall be mounted in a separately certified enclosure that provides a degree of protection of at least IP54 according to IEC 60079-0, and that is suitable for the application and correctly installed.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Gc and applied in type of protection Ex nA or Ex ec, the equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.

IECEx-installation drawing 5332QI01-V2R0
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 20.0059X
- **Marking** Ex ia IIC T6…T4 Ga Ex ia IIIC Db Ex ia I Ma
- **Standards** IEC 60079-0: 2017, IEC 60079-11: 2011



Temperature Class	**Ambient temperature range**	
	Pi: 0.84 W	**Pi: 0.75 W**
T6	-40°C to +47°C	-40°C to +50°C
T5	-40°C to +62°C	-40°C to +65°C
T4	-40°C to +85°C	-40°C to +85°C

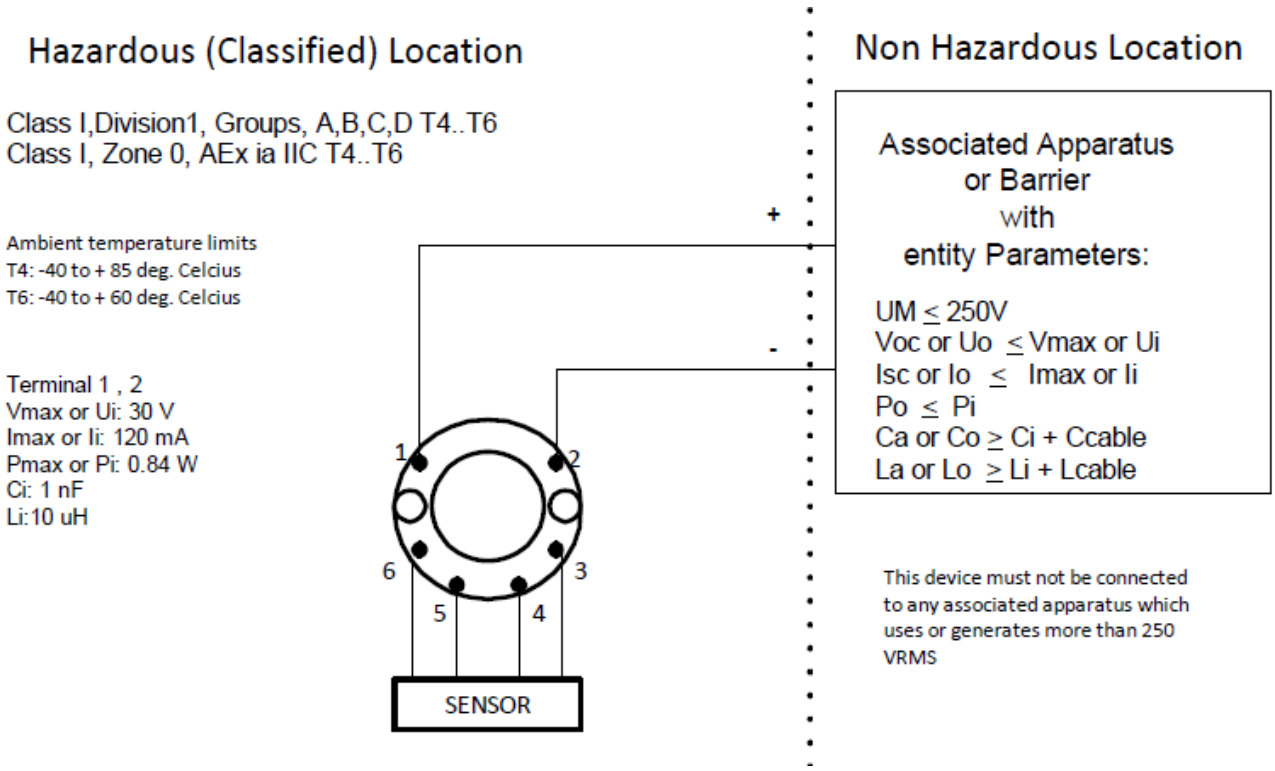
Installation notes

- If the enclosure is made of non-metallic plastic materials, electrostatic charges on the transmitter enclosure shall be avoided.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Ga, the transmitter shall be mounted in an enclosure that provides a degree of protection of at least IP20 according to IEC 60529, and that is suitable for the application and correctly installed.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Ga or Ma, and if the enclosure is made of aluminum, it must be installed such, that ignition sources due to impact and friction sparks are excluded.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Db, the transmitter shall be mounted in a separately certified enclosure that provides a degree of protection of at least
- IP5X according to IEC 60079-0, and that is suitable for the application and correctly installed. The surface temperature of the outer enclosure is +20 K above the ambient temperature, determined without a dust layer. Ambient temperature range: -40°C to +85°C.
- If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Ma, the transmitter shall be mounted in an enclosure that provides a degree of protection of at least IP54 according to

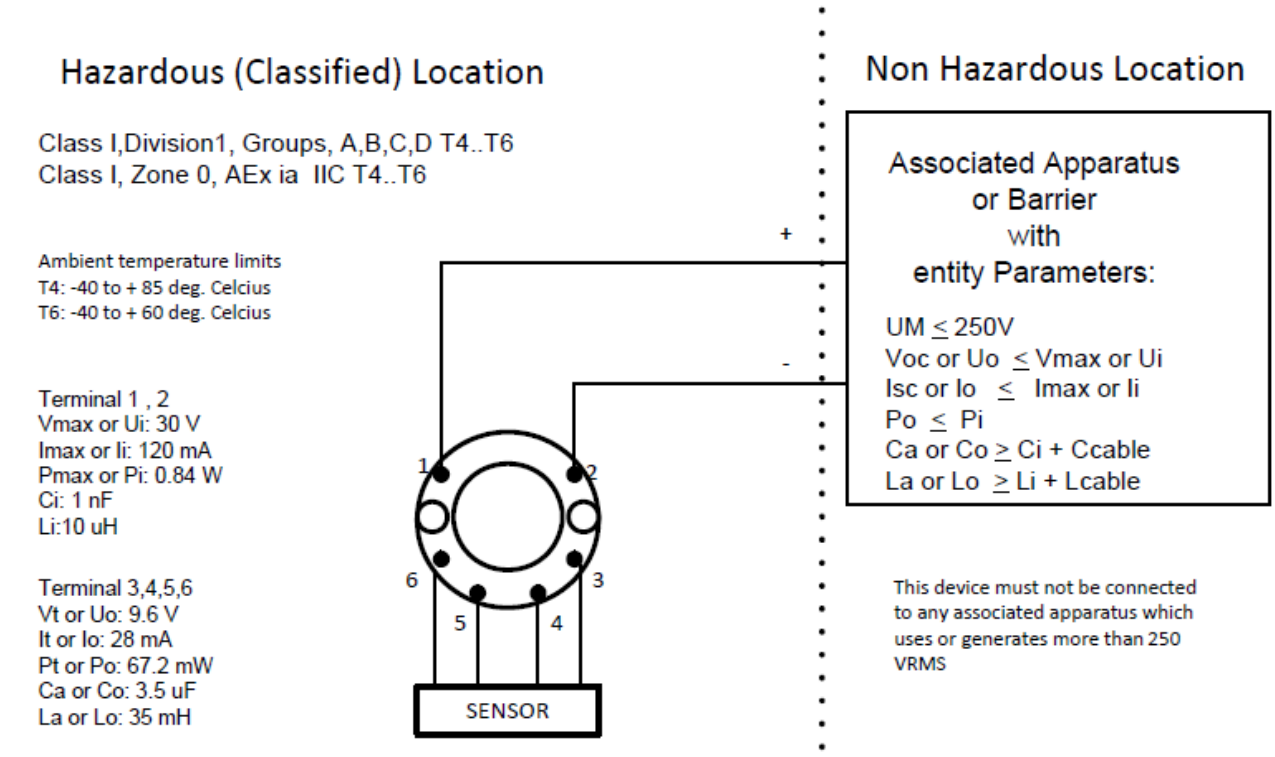
IEC 60529, and that is suitable for the application and correctly installed. Ambient temperature range: -40°C to +85°C.

- 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.

FM Installation Drawing
Model 5331D, 5332D, 5333D and 5343B



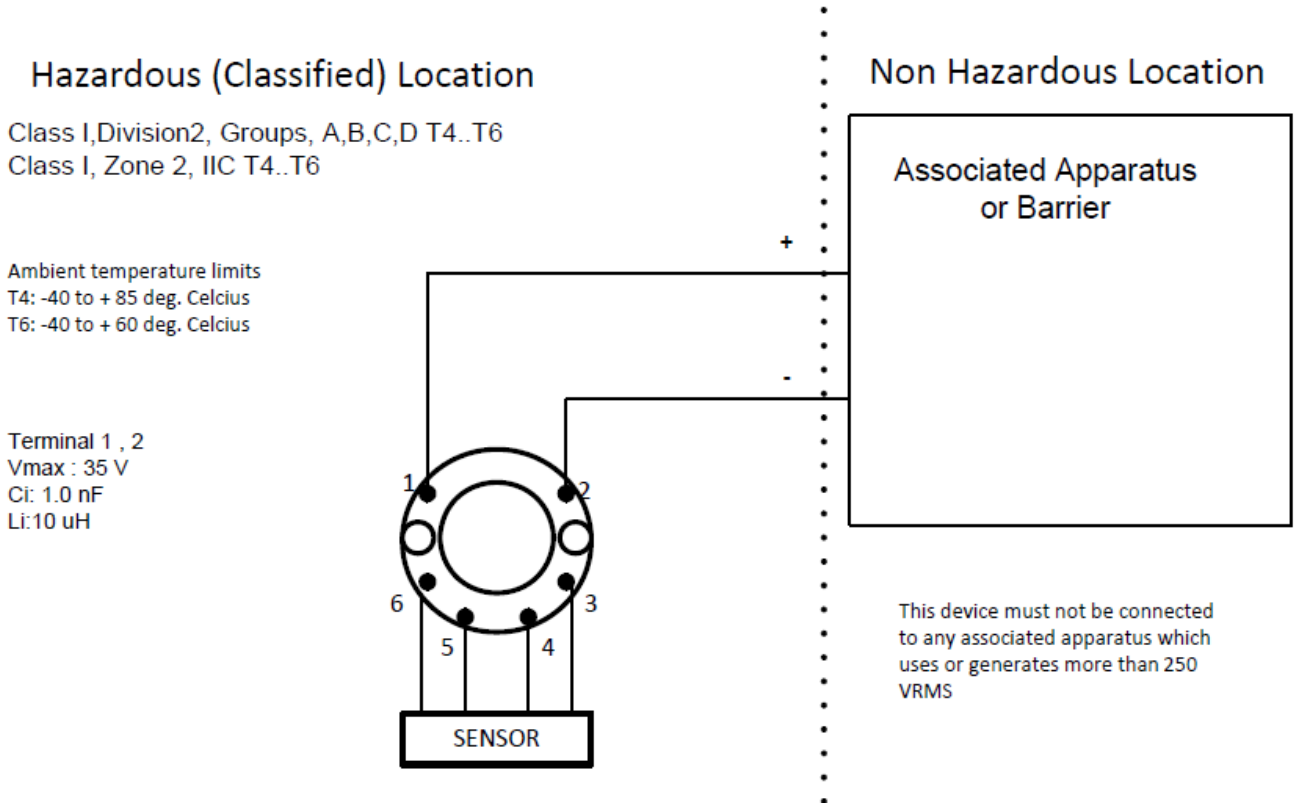
Model 5335D, 5337D



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(VMAX) and current Ii(IMAX), 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 (Ci) for each intrinsically device and the interconnect-ing wiring must be less than the capacitance (Ca) which can be safely connected to the barrier.
- The sum of the maximum unprotected inductance (Li) 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.
- NI Field Circuit Parameters

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



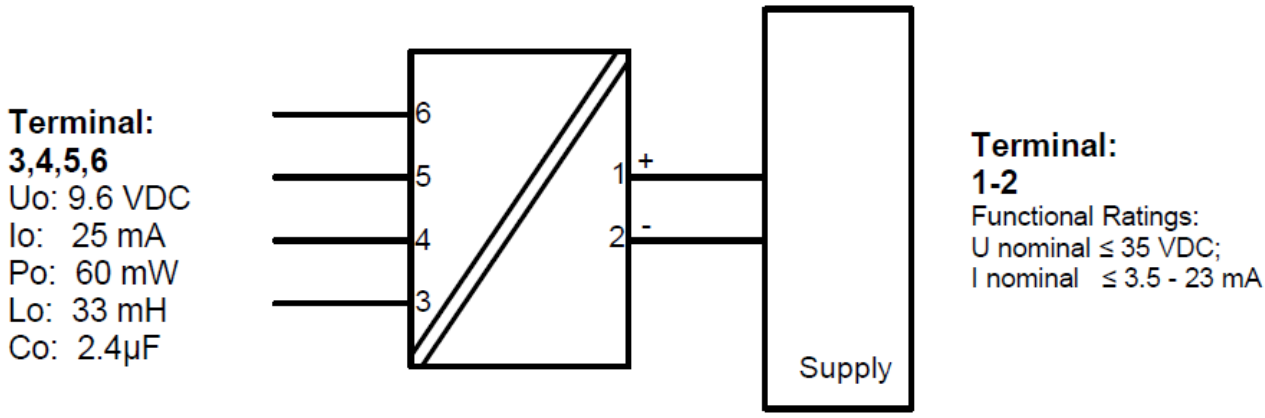
For safe installation of the 5331A and 5332A the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

Marking

- Class I, Division 2, Group A,B,C,D T6…T4 Ex nA[ic] II C T6…T4
- Class I Zone 2 AEx nA[ic] IIC T6…T4

Hazardous Area

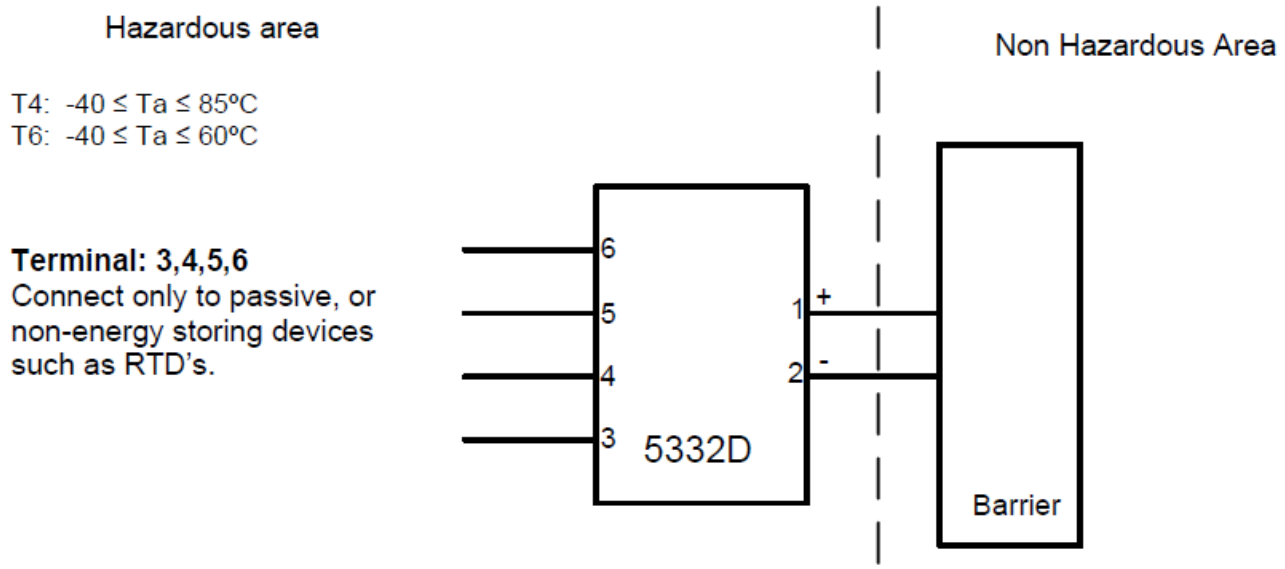
- CL I, Div 2, GP ABCD
- CL I, Zone 2, IIC
- T4: -40ºC to 85 ºC
- T6: -40ºC to 60 ºC



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.
- Non Incentive field wiring installation
- The non incentive 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 ≥ Ci + cable , La ≥ Li + Cable.

CSA Installation drawing 5332QC01



Terminal: 1,2

- Ui: 30 VDC
- Ii: 120 mA
- Pi: 0.84 W
- Li: 10 µH
- Ci: 1.0 nF
- CLASS 2258 04 – PROCESS CONTROL EQUIPMENT – Intrinsically Safe Entity – For Hazardous Locations
- 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 T6…T4
- Ex ia IIC T6…T4 Ga
- 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.
- 101 2007 EAC, EAC Ex and INMETRO approvals added.
- CSA installation drawing for 5332A added.
- 102 2145 ATEX and IECEx approvals updated – Ex na changed to Ex ec.
- 103 2202 CSA installation drawings updated.
- 104 2245 UKCA added.
- 105 2411 INMETRO approval updated – Ex nA replaced by Ex ec.

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Documents / Resources

	PR electronics 5332V105-SE 2 Wire Programmable RTD Temperature Transmitter [pdf] Instruction Manual 5332V105-SE, 5332V105-SE 2 Wire Programmable RTD Temperature Transmitter, 5332V105-SE, 2 Wire Programmable RTD Temperature Transmitter, Programmable RTD Temperature Transmitter, RTD Temperature Transmitter, Temperature Transmitter, Transmitter

References

- User Manual