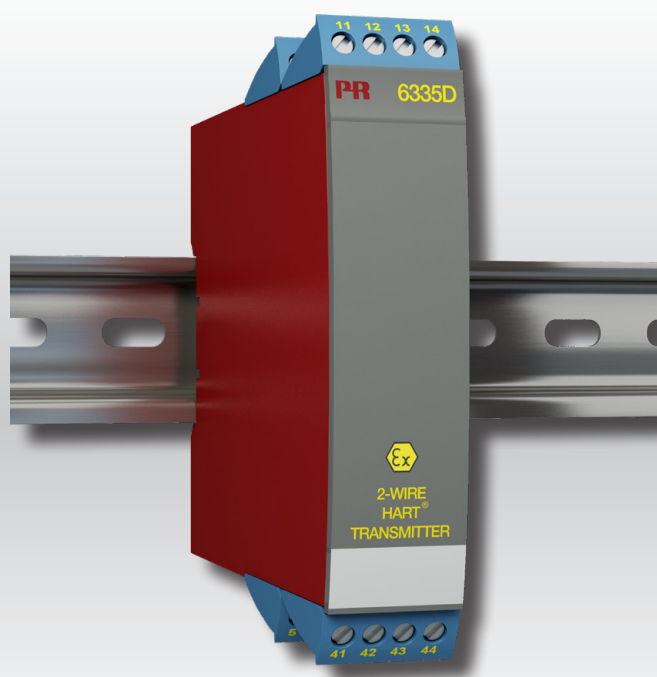


PERFORMANCE
MADE
SMARTER

Product manual

6335

2-wire HART transmitter



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

No. 6335V114-UK
From serial no.: 210934337

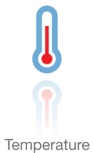
PR
electronics

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.



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 HART transmitter 6335

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2-wire HART transmitter 6335

- RTD, TC, Ohm, or mV input
- Extremely high measurement accuracy
- HART communication
- Galvanic isolation
- 1- or 2-channel version

Application

- Linearized temperature measurement with Pt100...Pt1000, Ni100...Ni1000, TC or sensor.
- Difference or average temperature measurement of 2 resistance or TC sensors.
- Conversion of linear resistance variation to a standard analog current signal, for instance from valves or Ohmic level sensors.
- Amplification of a bipolar mV signal to a standard 4...20 mA current signal.
- Connection of up to 15 channels to a digital 2-wire signal with HART communication.

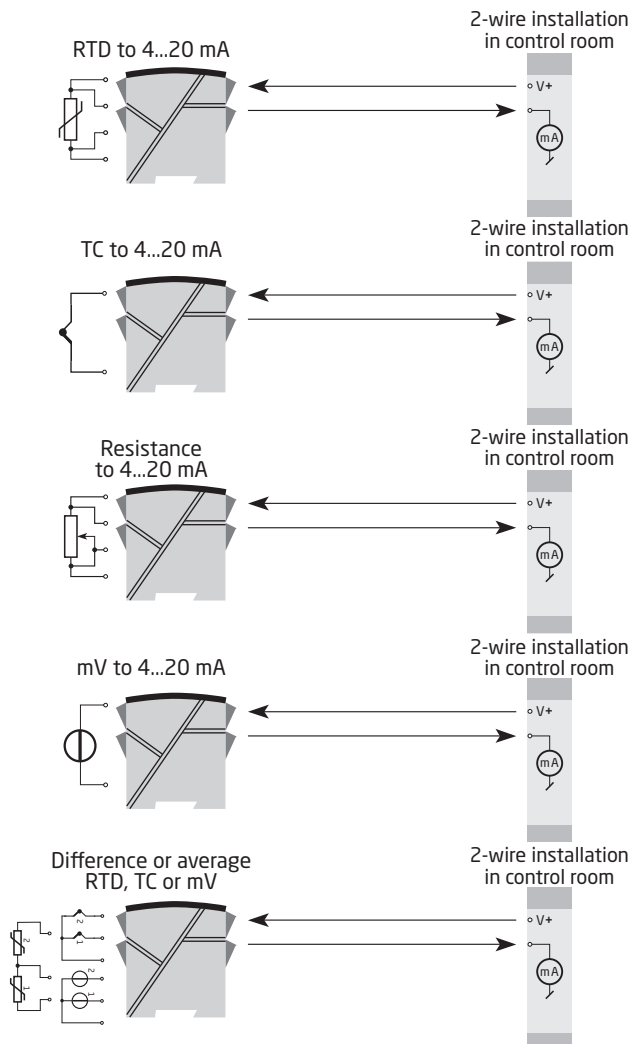
Technical characteristics

- Within a few seconds the user can program PR6335 to measure temperatures within all ranges defined by the norms.
- The RTD and resistance inputs have cable compensation for 2-, 3- and 4-wire connection.
- The 6335 has been designed according to strict safety requirements and is thus suitable for application in SIL installations.
- A limit can be programmed on the output signal.
- Continuous check of vital stored data for safety reasons.
- Sensor error detection according to the guidelines in NAMUR NE 89.

Mounting / installation

- Mounted vertically or horizontally on a DIN rail. Using the 2-channel version up to 84 channels per metre can be mounted.
- Configuration via standard HART communication interfaces or by PR 5909 Loop Link.
- The 6335A can be mounted in zone 2, 22 / Class I, Division 2, Groups A, B, C, D.
- The 6335D can be mounted in zone 0, 1, 2 and zone 21, 22 including M1 / Class I/II/ III, Division 1, Groups A, B, C, D.

Applications



Order

| Type | Version | Galvanic isolation | Channels |
|------|---|--------------------|------------|
| 6335 | Zone 2, 22 / Div. 2 : A | 1500 VAC : 2 | Single : A |
| | Zone 0, 1, 2, 21, 22, M1 / DIV. 1, DIV. 2 : D | | Double : B |

Accessories

5909 = Loop Link USB interface
 5910 / 5910Ex = CJC connector for channel 1
 5913 / 5913Ex = CJC connector for channel 2

Electrical specifications

Environmental conditions:

Specification range: -40°C to +85°C
 Storage temperature -40°C to +85°C
 Calibration temperature. 20...28°
 Humidity. < 95% RH (non-cond.)
 Protection degree IP20

Mechanical specifications:

Dimensions (H x W x D) 109 x 23.5 x 104 mm
 Weight (1 / 2 channels) 145 / 185 g
 DIN rail type. DIN EN/IEC 60715 - 35 mm
 Wire size. 0.13...2.08 mm² / AWG 26...14 stranded wire
 Screw terminal torque. 0.5 Nm

Common specifications:

Supply voltage, DC
 6335A. 8.0...35 VDC
 6335D. 8.0...30 VDC
 Internal power dissipation
 6335A, 1 / 2 ch. 19 mW...0.8 / 1.6 W
 6335D, 1 / 2 ch. 19 mW...0.7 / 1.4 W
 Voltage drop 8.0 VDC
 Isolation voltage, test / operation. 1.5 kVAC / 50 VAC
 Warm-up time. 30 s
 Programming Loop Link & HART
 Signal / noise ratio Min. 60 dB
 Response time (programmable) 1...60 s
 EEPROM error check < 10 s
 Signal dynamics, input 22 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 | $\leq \pm 0.05\%$ of span | $\leq \pm 0.005\%$ of span / °C |

| Basic values | | |
|---------------------------------|------------------------------|---|
| Input type | Basic accuracy | Temperature coefficient |
| Pt100 / 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 | $\leq \pm 0.1 \Omega$ | $\leq \pm 5 \text{ mW} / ^\circ\text{C}$ |
| 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 - immunity influence. | $< \pm 0.1\%$ of span |
| Extended EMC immunity: NAMUR NE 21, A criterion, burst | $< \pm 1\%$ of span |

Electrical specifications, inputs:

Max. offset 50% of selected numerical max. value

RTD and linear resistance input:

| RTD type | Min. value | Max. value | 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 | ----- |

Cable resistance per wire (max.). 5 Ω

(up to 50 Ω per wire is possible with reduced measurement accuracy)

Sensor current Nom. 0.2 mA

Effect of sensor cable resistance (3- / 4-wire) $< 0.002 \Omega/\Omega$

Sensor error detection Yes

Short circuit detection. If 0% > 30 Ω

TC inputs:

| Type | Min. temperature | Max. temperature | 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° | +2300°C | 100°C | ASTM E988-90 |

| | |
|--|---------------------------------|
| Cold junction compensation | < ±1.0°C |
| External CJC with Ni100 or Pt100 | -40 ≤ T _{amb.} ≤ 135°C |
| Sensor error detection | Yes |
| Sensor error current: | |
| When detecting | Nom. 33 µA |
| Else. | 0 µA |
| Short circuit detection. | No |

Voltage inputs:

| | |
|-----------------------------|----------------|
| Measurement range | -800...+800 mV |
| Min. span | 2.5 mV |
| Input resistance | 10 MΩ |

Output:

Current output:

| | |
|---|---|
| Signal range. | 4...20 mA |
| Min. signal range.. | 16 mA |
| Updating time | 440 ms |
| | (660 ms for diff.) |
| Fixed output signal | Between 4 and 20 mA |
| Output signal at EEPROM error | ≤ 3.5 mA |
| Load resistance. | ≤ (V _{supply} - 8.0) / 0.023 [Ω] |
| Load stability | < ±0.01% of span / 100 Ω |

Sensor error detection:

| | |
|--|-------------|
| Programmable | 3.5...23 mA |
| (shorted sensor error detection is ignored at TC and mV input) | |
| 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 |

I.S. / Ex approvals:

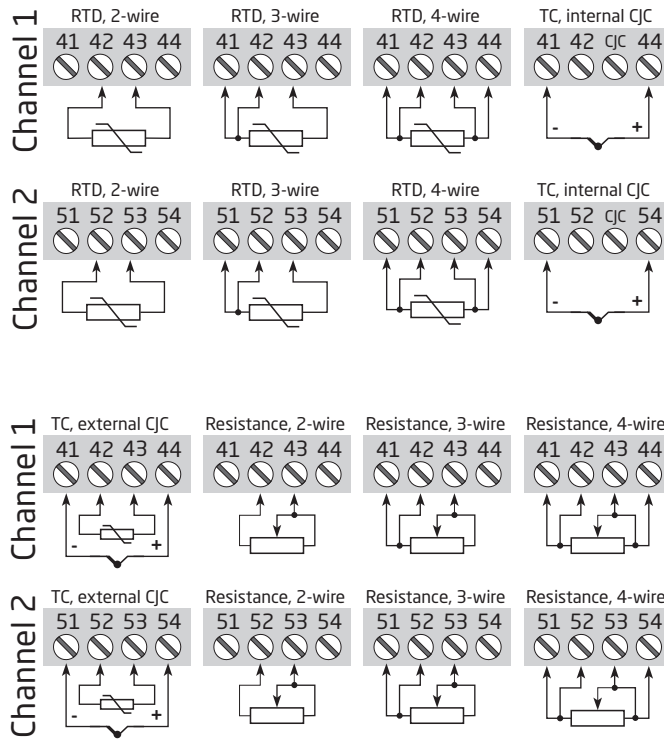
| | |
|------------------|-------------------------|
| 6335A: | |
| ATEX | DEKRA 20ATEX0109 X |
| 6335D: | |
| ATEX | DEKRA 20ATEX0108 X |
| FM | FM17US0013X |
| 6335A & 6335D: | |
| IECEX. | DEK 20.0063X |
| CSA | 1125003 |
| EAC Ex | RU C-DK.HA65.B.00355/19 |

Functional safety:

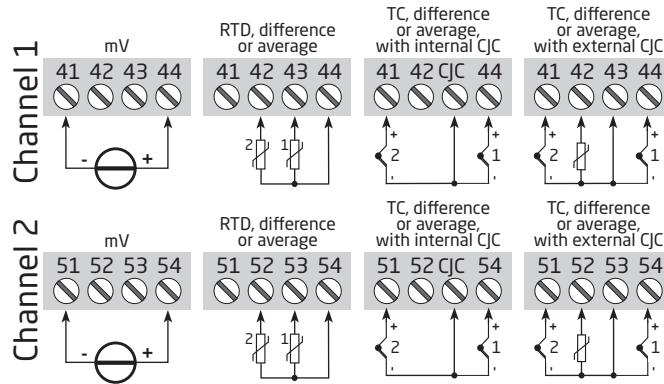
Hardware assessed for use in SIL applications
 FMEDA-report - www.prelectronics.com

Connections

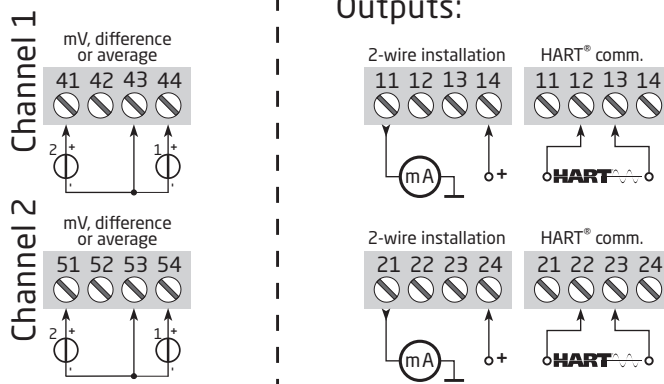
Inputs:



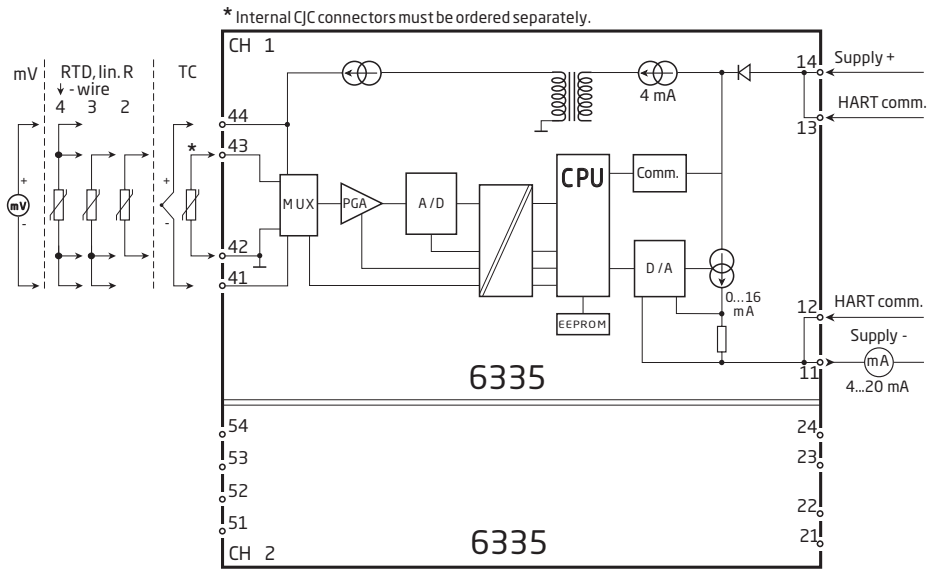
Inputs:



Outputs:



Block diagram



Programming

6335 can be configured in the following 3 ways:

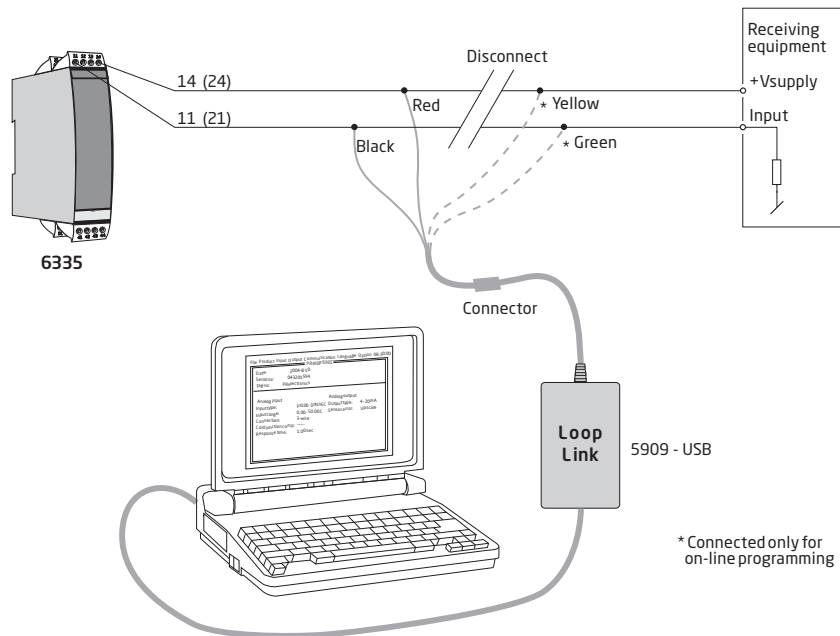
1. With PR electronics A/S' communications interface Loop Link and PRreset PC configuration software.
2. With a HART modem and PRreset PC configuration software.
3. With a HART communicator with PR electronics A/S' DDL driver.

1: Loop Link

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

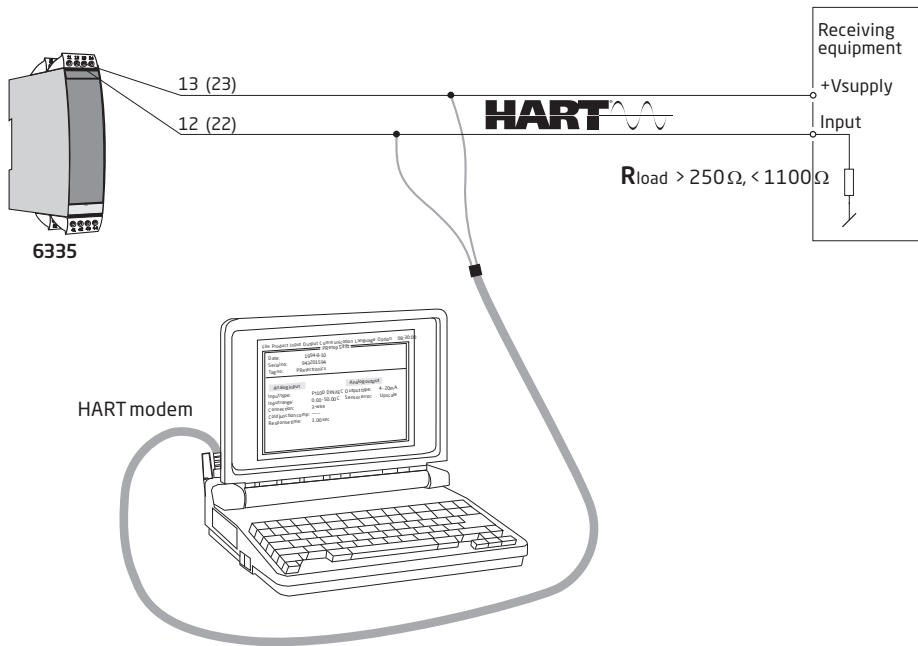
When communicating with non-installed devices, connectors 11, 12, 13, 14 (channel 1) and 21, 22, 23, 24 (channel 2) can be dismantled in the safe area to connect the terminals of the communications interface to the pins.

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



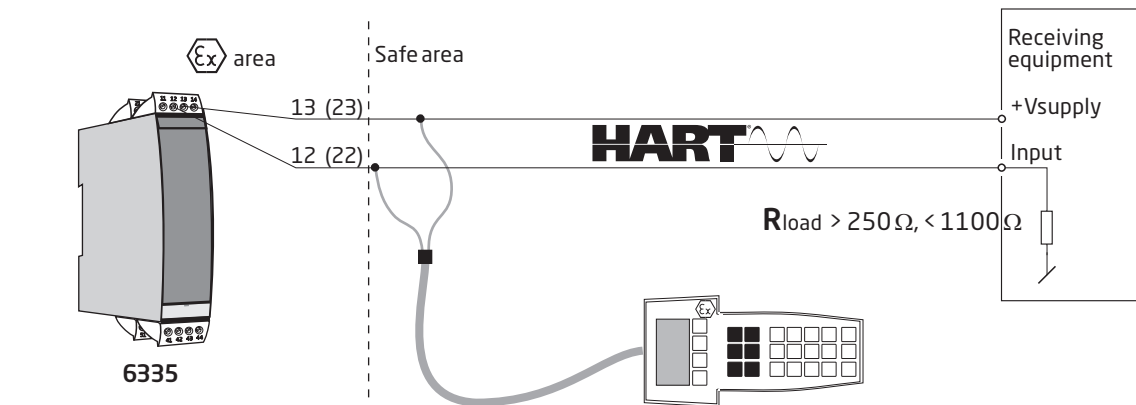
2: HART modem

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



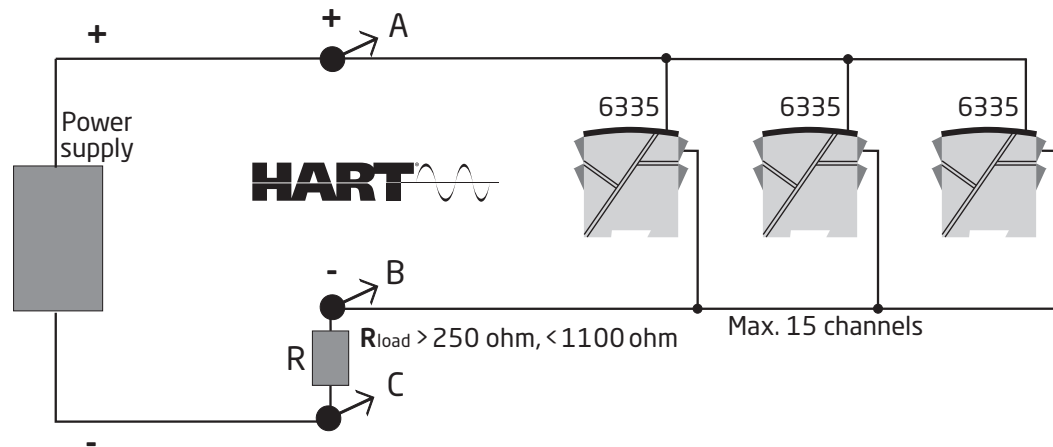
3: HART communicator

For programming please refer to the drawing below. To get access to productspecific commands, the HART communicator must be loaded with the PR electronics A/S DDL driver. This can be ordered either at the HART Communication Foundation or PR electronics A/S.



Connection of transmitters in multidrop mode

- The HART communicator or a PC modem can be connected across AB or BC.



- The outputs of max. 15 transmitters can be connected in parallel for a digital HART communication on 2-wires.
- Before it is connected, each transmitter must be configured with a unique number from 1 to 15. If 2 transmitters are configured with the same number, both will be excluded. The transmitters must be programmed for multidrop mode (with a fixed output signal of 4 mA). Maximum current in the loop is therefore 60 mA.
- The communication is either by means of a HART communicator or a HART modem.
- The PReset PC configuration software can configure the individual transmitter for multidrop mode and provide it with a unique polling address.

ATEX-installation drawing 6335QA02-V5R0

For safe installation of 6335A and 6337A 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 DEKRA 20ATEX0109 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 41,42,43,44 51,52,53,54 | Terminal 11,12,13,14 21,22,23,24 | Terminal 11,12,13,14 21,22,23,24 | Terminal 11,12,13,14 21,22,23,24 |
| 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: 28 mA Po: 67 mW Lo: 35 mH Co: 3.5 μF | Ui = 35 V Ii = 110 mA Ci = 1 nF Li = 0 μH | Ui = 24 V Ii = 260 mA Ci = 1 nF Li = 0 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 6335QA01-V5R0



For safe installation of 6335D or 6337D 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 DEKRA 20ATEX0108X

Marking



II 1 G Ex ia IIC T6...T4 Ga
II 2 D Ex ia IIIC Db
I M1 Ex ia I Ma

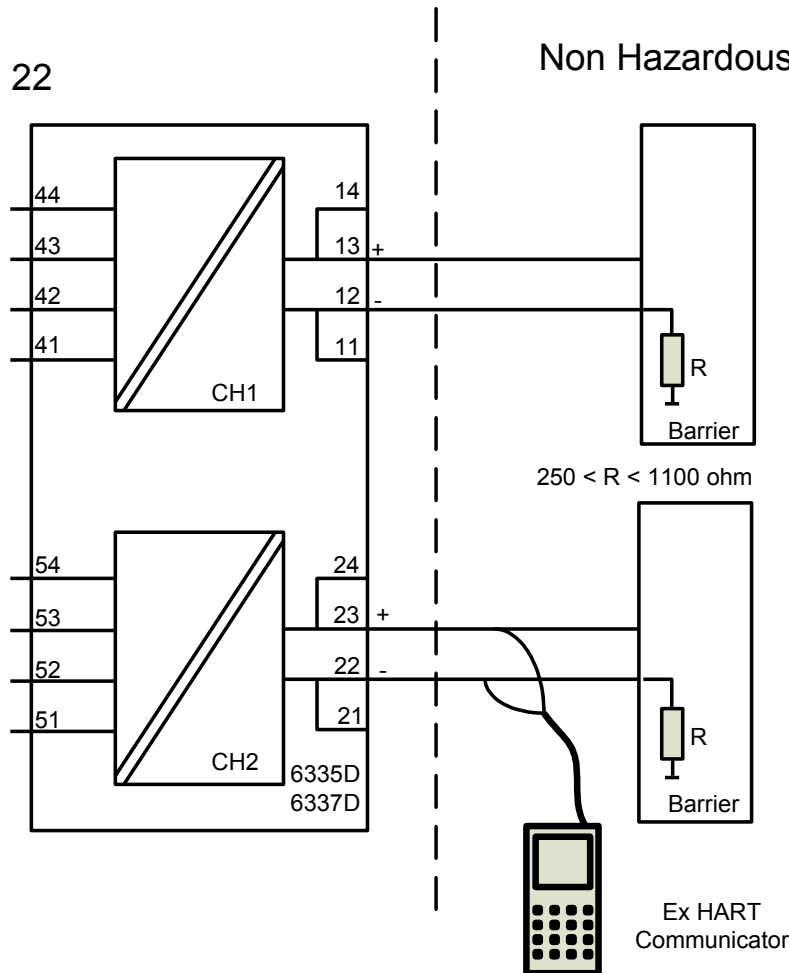
Standards EN IEC 60079-0: 2018, EN 60079-11: 2012

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

Non Hazardous Area

**Terminal:
41,42,43,44**
Uo: 9.6 VDC
Io: 28 mA
Po: 67.2 mW
Lo: 35 mH
Co: 3.5 μ F

**Terminal:
51,52,53,54**
Uo: 9.6 VDC
Io: 28 mA
Po: 67.2 mW
Lo: 35 mH
Co: 3.5 μ F



Terminal: 11,13 and 21,23

Ui: 30 VDC li: 120 mA Pi: 0.84 W or Pi: 0.75 W
Li: 0 μ H Ci: 1.0 nF

| Temperature Class | Ambient temperature range | |
|-------------------|---------------------------|----------------|
| | Pi: 0.84 W | Pi: 0.75 W |
| T6 | -40°C to +40°C | -40°C to +45°C |
| T5 | -40°C to +55°C | -40°C to +60°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. 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 EN 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 $\geq 60^\circ\text{C}$, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

The sensor circuit is not infallibly galvanically isolated from the input circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500 VAC for 1 minute.

IECEX-installation drawing 6335QI02-V5R0

For safe installation of 6335A and 6337A 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 20.0063X

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 41,42,43,44 51,52,53,54 | Terminal 11,12,13,14 21,22,23,24 | Terminal 11,12,13,14 21,22,23,24 | Terminal 11,12,13,14 21,22,23,24 |
| 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: 28 mA Po: 67 mW Lo: 35 mH Co: 3.5 µF | Ui = 35 V Ii = 110 mA Ci = 1 nF Li = 0 µH | Ui = 24 V Ii = 260 mA Ci = 1 nF Li = 0 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 6335QI01-V5R0



For safe installation of 6335D or 6337D 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 20.0063X

Marking
 Ex ia IIC T6...T4 Ga
 Ex ia IIIC Db
 Ex ia I Ma

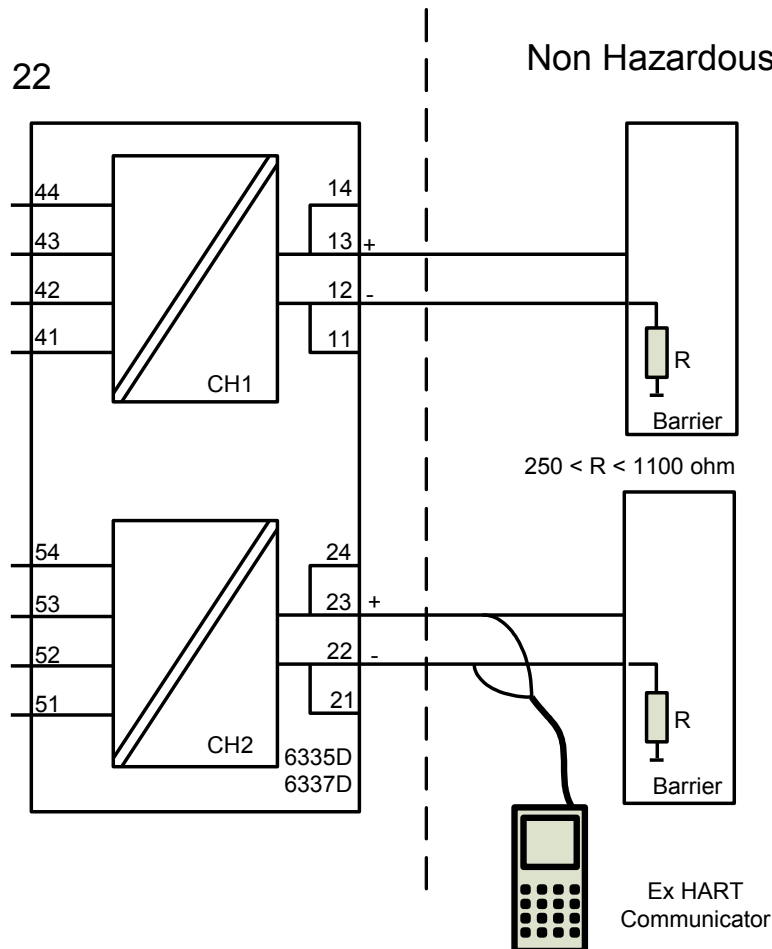
Standards IEC 60079-0: 2017, IEC 60079-11: 2011

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

Non Hazardous Area

**Terminal:
 41,42,43,44**
 U_o: 9.6 VDC
 I_o: 28 mA
 P_o: 67.2 mW
 L_o: 35 mH
 C_o: 3.5 µF

**Terminal:
 51,52,53,54**
 U_o: 9.6 VDC
 I_o: 28 mA
 P_o: 67.2 mW
 L_o: 35 mH
 C_o: 3.5 µF



Terminal: 11,13 and 21,23
 U_i: 30 VDC I_i: 120 mA P_i: 0.84 W or P_i: 0.75 W
 L_i: 10 µH C_i: 1.0 nF

| Temperature Class | Ambient temperature range | |
|-------------------|---------------------------|----------------|
| | Pi: 0.84 W | Pi: 0.75 W |
| T6 | -40°C to +40°C | -40°C to +45°C |
| T5 | -40°C to +55°C | -40°C to +60°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 $\geq 60^{\circ}\text{C}$, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

The sensor circuit is not infallibly galvanically isolated from the input circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500 VAC for 1 minute.

For safe installation of the single channel 6335A2A, 6337A2A or the two channel 6335A2B, 6337A2B 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

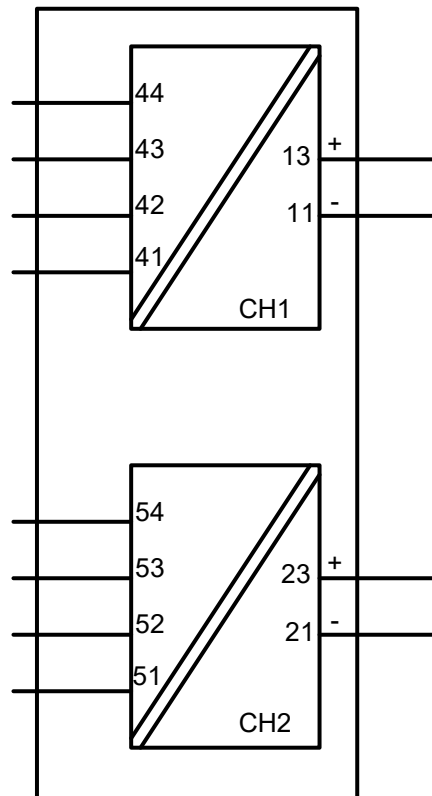
Ex nA[ic] IIC T6...T4

Class I Zone 2 AEx nA[ic] IIC T6...T4

T4: -40°C to 85 °C
T6: -40°C to 60 °C

Hazardous Area
CL I, Div 2, GP ABCD
CL I, Zone 2, IIC

Terminal:
41,42,43,44
Uo: 9.6 VDC
Io: 25 mA
Po: 60 mW
Lo: 33 mH
Co: 2.4µF



Terminal:
11-13
Functional Ratings:
U nominal ≤ 35 VDC;
I nominal ≤ 3.5 - 23 mA

Terminal:
51,52,53,54
Uo: 9.6 VDC
Io: 25 mA
Po: 60 mW
Lo: 33 mH
Co: 2.4µF

Terminal:
21-23
Functional Ratings:
U nominal ≤ 35 VDC;
I nominal ≤ 3.5 - 23 mA

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.

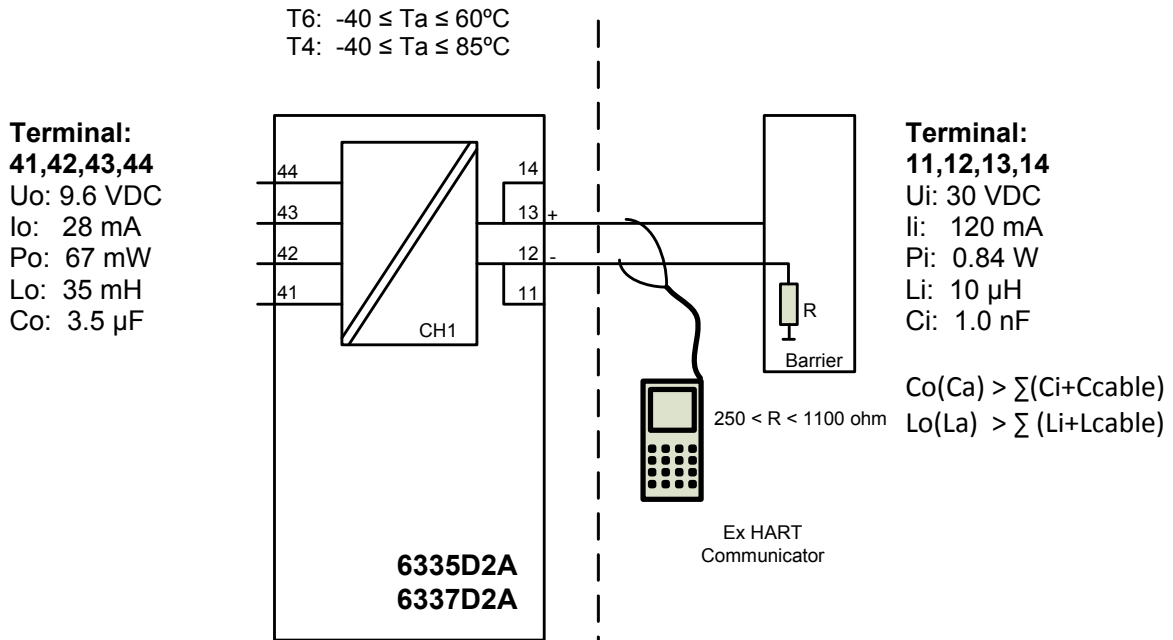
Non Incendive field wiring installation

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,

$V_{oc} < V_{max}$, $C_a \geq C_i + C_{cable}$, $L_a \geq L_i + L_{cable}$.

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



Installation notes.

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

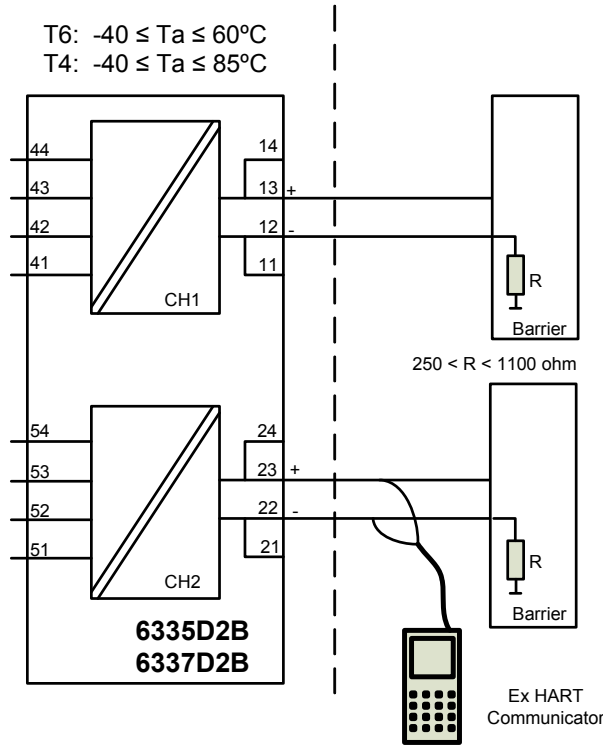
Substitution of components may impair intrinsic safety.

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:
41,42,43,44**
Uo: 9.6 VDC
Io: 28 mA
Po: 67 mW
Lo: 35 mH
Co: 3.5µF

**Terminal:
51,52,53,54**
Uo: 9.6 VDC
Io: 28 mA
Po: 67 mW
Lo: 35 mH
Co: 3.5µF



**Terminal:
11,12,13,14 and
21,22,23,24**
Ui: 30 VDC
Ii: 120 mA
Pi: 0.84 W
Li: 10µH
Ci: 1.0nF

$C_o(C_a) > \sum(C_i+C_{cable})$
 $L_o(L_a) > \sum(L_i+L_{cable})$

Installation notes.

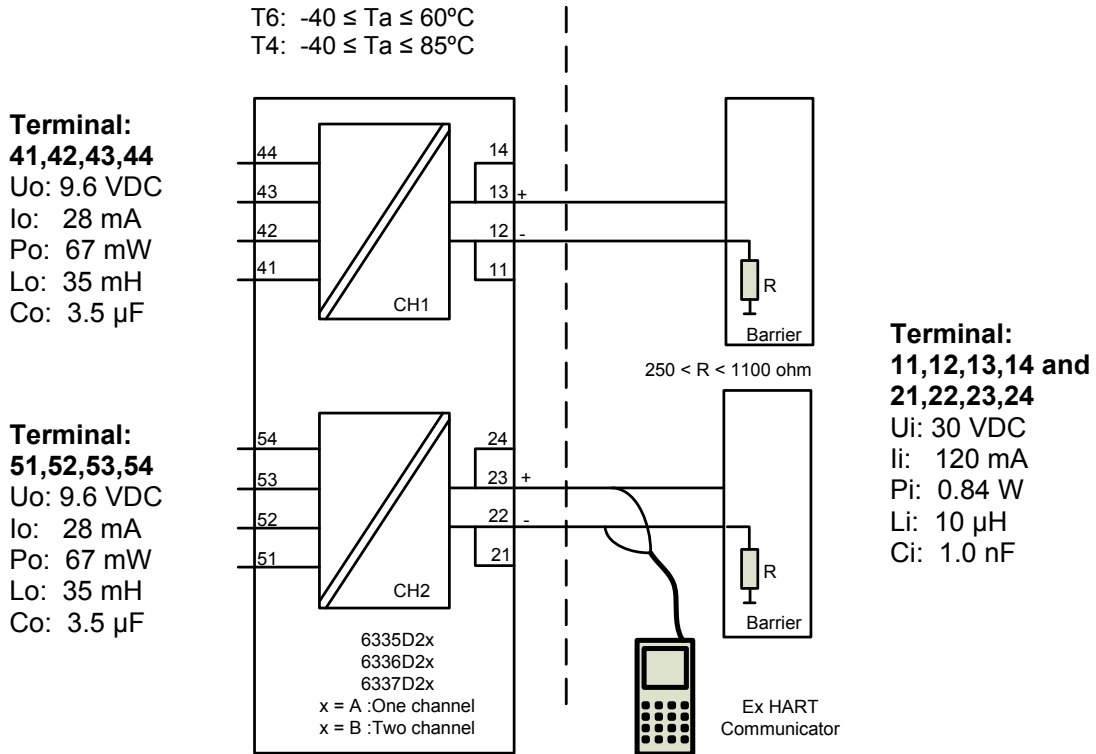
The Transmitter must be installed in a suitable enclosure to meet installation codes stipulated in The Canadian Electrical Code (CEC).

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.

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

Non Hazardous Location



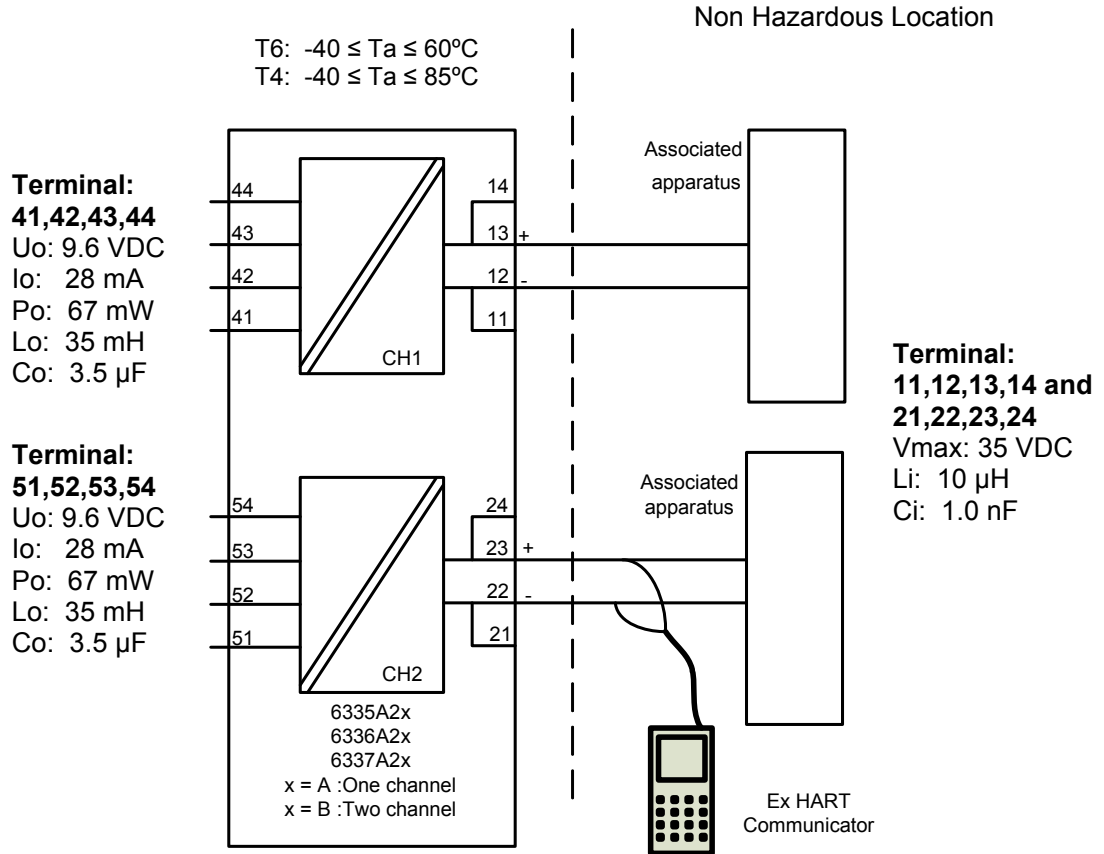
Installation notes

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 $U_i(V_{MAX})$ 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_t) 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_t , and C_a and L_a for barriers are provided by the barrier manufacturer.

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



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 |
|----------------|-------------|--|
| 111 | 1550 | ATEX & IECEx M1 approval added. |
| 112 | 1945 | CSA approval for 6335A received. Installation drawing added. FM certificate no updated. |
| 113 | 2235 | ATEX and IECEx approvals updated - Ex na changed to Ex ec. |
| 114 | 2307 | CSA installation drawing for 6335A updated. UKCA added. |

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