PERFORMANCE
MADE
SMARTER

产品手册
5335
二线制 HART 变送器

温 度 | 安 全 柵 | 通 讯 接 口 | 多 功 能 | 隔 离 器 | 数 显 表

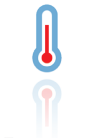
No. 5335V118-CN
序列号 :180971088-210946797

PR electronics

6 大特色产品
满足您的一切需求

单品出色，组合无敌

凭借创新型专利技术，信号调节更加简单、智能。产品组合由六大产品类组成，具备多种模拟量和数字量模块，涵盖上千种工业自动化应用。所有产品都符合甚至高于行业的最高标准。这可确保产品即便在最恶劣的环境条件下仍能可靠运行。5 年产品保修期，让您使用更安心。



Temperature

温度变送器和温度传感器系列产品，提供从温度测量点到系统控制一站式信号解决方案，从而在最大程度上保证信号的完整性。仅需一套点对点解决方案，您就可以在任何环境中将工业过程中的温度信号转换为模拟量信号、总线信号或数字通讯信号。该方案具备响应时间短，自动校准，传感器故障检测，低漂移和卓越 EMC 性能等诸多优点。

I.S. Interface

我们采用最严格的安全标准来检验产品，以期提供最安全的信号。秉承创新精神，我们已经在 SIL 2 全面评估本质安全型接口方面取得了开创性成就，其既高效又经济，效果卓著，成效斐然。模拟量和数字量本质安全栅种类齐全，同时提供多种输入输出。这使得 PR 标准成为一项易于实施的现场检验标准。在大型项目安装过程中，新背板方案大大简化安装和布线，且能与标准 DCS 系统无缝集成。

Communication

我们提供经济实惠、使用方便、面向未来的通讯接口，以便您能够访问所安装的 PR 产品。所有接口均可拆卸，并带有屏幕和按钮，可以显示过程值/诊断值和对参数进行配置。产品特定功能包括通过 Modbus 和蓝牙进行通讯，以及使用我们的 PR 过程主管 (PPS) 应用程序进行远程访问，适用于 iOS和Android 等终端。

Multifunction

单品为多功能系列产品，可涵盖大量现场应用，可轻而易举按照您的现场标准进行配置。此种单品可适用多种应用方式，既节省安装和培训时间，又大大简化库存备件管理。该设备专为长期信号精度高、功耗低、抗电噪声优异、编程简单而设计。

Isolation

基于微处理器技术研发的 6 mm 隔离器，小巧精致、响应迅速、品质一流，以极低的总拥有成本为专用应用提供卓越性能和抗电磁干扰。可水平或垂直安装，装置间无需间隙。

Display

数显表系列以其灵活性和稳定性著称。该设备系列几乎满足过程信号读数显示的所有需求，并具有通用的输入和供电能力。无论哪种行业，无论环境条件何其苛刻，该设备均能实时测量过程值并提供用户友好型界面和值得信赖的继电器信号。

二线制 HART 变送器
5335

目录

二线制 HART 变送器
5335

- RTD · TC · Ohm 或 mV 信号输入
- 超高测量精度
- HART 5 协议
- 电气隔离
- 标准 DIN B型传感器头部安装

应用

- Pt100...Pt1000 · Ni100...Ni1000 或 TC 传感器线性化温度测量。
- 两个 TC 或电阻信号差值或平均值测量。
- 转换线性电阻阻值变化为标准模拟量电流信号 · 例如 : 阀信号 · 或欧姆输出液位计。
- 转换双极性 mV 信号为标准 4...20 mA 电流信号。
- 通过 HART总线形式可连接多达15个变送器进行数字通讯。

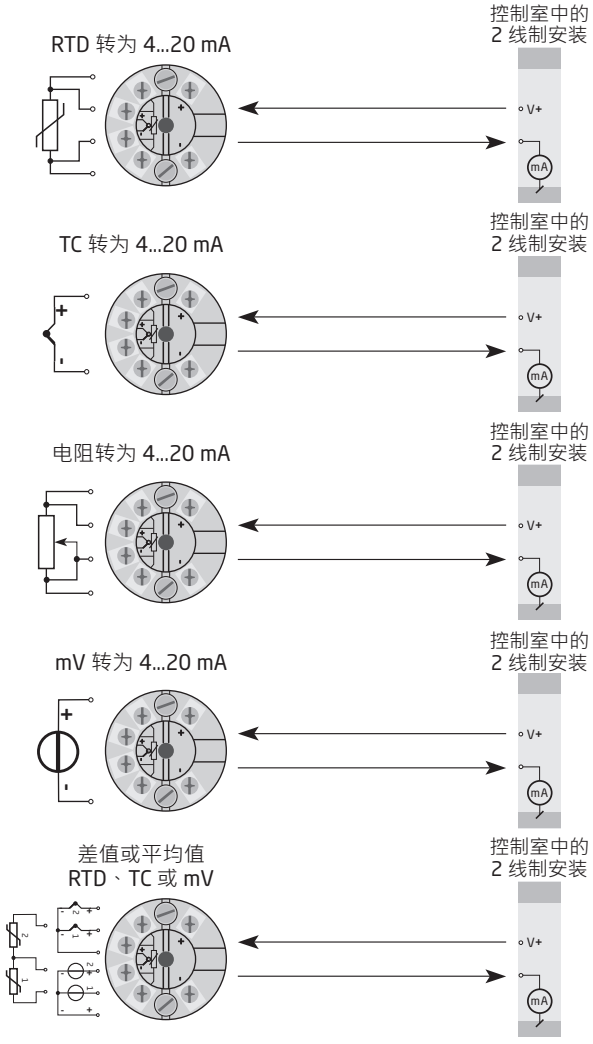
技术特点

- 参数设定简单方便。
- 2- · 3- 和 4-线 RTD 和电阻输入电缆自动补偿。
- 5335D 按照严格的安全要求进行设计 · 因此适用于 SIL 安装应用。
- 持续监测重要数据 · 保障使用安全。
- 符合 NAMUR NE89 要求的传感器故障检测功能。

安装调试

- 标准 DIN B型传感器头部安装。在非危险区域内 · 5335 可通过型号为 PR 8421 的配件安装在 DIN 导轨之上。

应用



订购

型号	版本	
5335	Zone 2 / Div. 2 Zone 0 · 1 · 2 · 20 · 21 · 22 · M1 / DIV.1 · DIV.2	: A : D

附件

5909 = USB 接口 Loop Link 和 PReset 软件
8421 = DIN 导轨卡扣

电气规格

环境条件:

工作温度	-40°C 至 +85°C
标定温度	20...28°C
湿度	< 95% RH (无冷凝)
防护等级 (外壳/端子)	IP68 / IP00

机械规格 :

结构尺寸	Ø 44 x 20.2 mm
重量 (大约)	50 g
最大导线规格	1 x1.5 mm^2 绞线
螺丝端子力矩	0,4 Nm
抗振规格	IEC 60068-2-6
2...25 Hz	±1.6 mm
25...100 Hz	±4 g

常用规格 :

电源电压 · DC	
5335A	8.0...35 VDC
5335D	8.0...30 VDC
内部功率耗散	
5335A	25 mW...0.8 W
5335D	25 mW...0.7 W
隔离电压 · 测试/工作	1.5 kVAC / 50 VAC
预热时间	30 s
设置参数	Loop Link 和 HART
信噪比	最低 60 dB
响应时间 (可设定)	1...60 s
EEPROM 错误校验	< 10 s
信号动态范围 · 输入	22 位
信号动态范围 · 输出	16 位
电源电压变化的影响	< 0.005% 所设量程 / VDC

精度 · 一般值和基本值中较大的一个 :

一般值		
输入类型	绝对精度	温度系数
所有	≤ ±0.05% 所设量程	≤ ±0.005% 所设量程/°C

基本值		
输入类型	基本精度	温度系数
Pt100 & Pt1000	≤ ±0.1°C	≤ ±0.005°C/°C
Ni100	≤ ±0.2°C	≤ ±0.005°C/°C
线性电阻	≤ ±0.1 Ω	≤ ±5 mΩ / °C
电压	≤ ±10 µV	≤ ±0.5 µV / °C
TC 型号 : E、J、K、L、N、T、U	≤ ±0.5°C	≤ ±0.025°C / °C
TC 型号 : B · R · S · W3 · W5	≤ ±1°C	≤ ±0.1°C / °C

EMC – 抗扰性影响 . . . . . < ±0.1% 所设量程
扩展的 EMC 电磁兼容 :
NAMUR NE 21, A criterion, burst . . . . . < ±1% 所设量程

电气规格 · 输入 :

最大偏移量 . . . . . 所设量程高值的 50%

RTD 和线性电阻输入 :

RTD 类型	最小 值	最大 值	最小 量程	标准
Pt100 Ni100 线性电阻	-200°C -60°C 0 Ω	+850°C +250°C 7000 Ω	10°C 10°C 25 Ω	IEC 60751 DIN 43760 -----

单根导线电缆电阻 (最大) . . . . . 5 Ω
(降低测量精度后 · 单根导线最大可达 50 Ω)
传感器电流 . . . . . 额定0.2 mA
传感器电缆电阻对精度的影响 (3/4 线制) . . . . . < 0.002 Ω/Ω
传感器故障检测 . . . . . 是
短路检测 . . . . . 如果 0% > 30 Ω

TC 输入 :

型号	最低 温度	最高 温度	最小 量程	标准
B	+400°C	+1820°C	100°C	IEC584
E	-100°C	+1000°C	50°C	IEC584
J	-100°C	+1200°C	50°C	IEC584
K	-180°C	+1372°C	50°C	IEC584
L	-100°C	+900°C	50°C	DIN 43710
N	-180°C	+1300°C	50°C	IEC584
R	-50°C	+1760°C	100°C	IEC584
S	-50°C	+1760°C	100°C	IEC584
T	-200°C	+400°C	50°C	IEC584
U	-200°C	+600°C	50°C	DIN 43710
W3	0°C	+2300°C	100°C	ASTM E988-90
W5	0°C	+2300°C	100°C	ASTM E988-90

冷端补偿	< ±1.0°C
Ni100 或 Pt100 的外部 CJC	-40 ≤ $T_{环境}$ ≤ 135°C
传感器故障检测	是
传感器故障电流：	
检测时	额定33 µA
其他	0 µA
短路检测	否

电压输入：

测量范围	-800...+800 mV
最小量程	2.5 mV
输入电阻	10 MΩ

电流输出：

信号范围	4...20 mA
最小信号范围	16 mA
更新时间	440 ms （差值测量时，为 660 ms）
固定输出信号	4 - 20 mA 之间
EEprom 错误时的输出信号	≤ 3.5 mA
负载电阻	≤ ($V_{电源}$ - 8.0) / 0.023 [Ω]
负载稳定性	< ±0.01% 所设量程 / 100 Ω

传感器故障检测：

可设定	3.5...23 mA
（在选择 TC 和 mV 输入时不检测传感器短路报警）	
NAMUR NE43 上限	23 mA
NAMUR NE43 下限	3.5 mA

所设量程 = 当前设定的量程范围

遵守主管机关要求：

EMC	2014/30/EU
RoHS	2011/65/EU
ATEX	2014/34/EU
EAC	TR-CU 020/2011
EAC Ex	TR-CU 012/2011

认证：

DNV-GL· 船舶和近海	TAA0000101

本质安全/ 防爆认证：

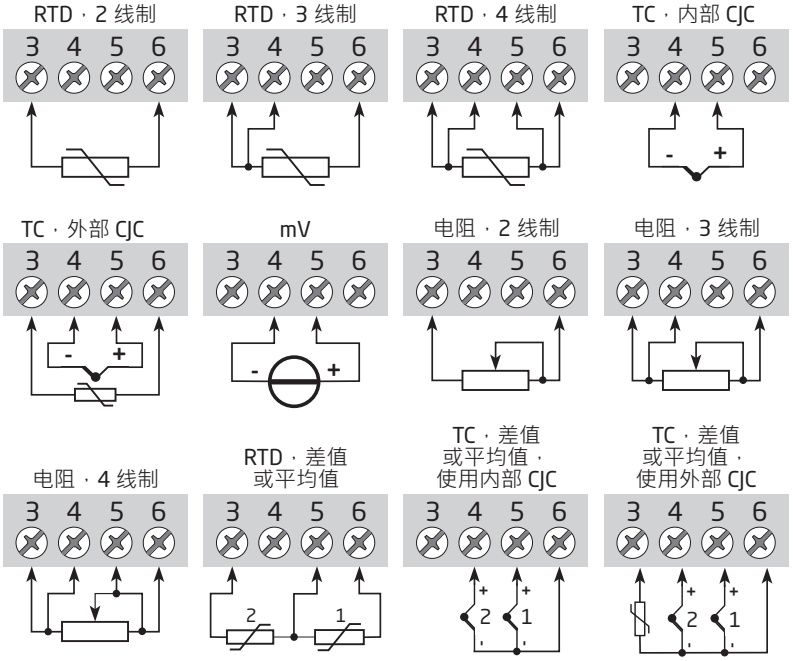
5335A：	
ATEX	KEMA 03ATEX1508 X
5335D：	
ATEX	KEMA 030ATEX1537
FM	FM17US0013X
5335A & 5335D：	
IECEx	IECEx KEM 10.0083X
CSA	1125003
INMETRO	DEKRA 18.0002X
EAC Ex	RU C-DK.HA65.B.00355/19

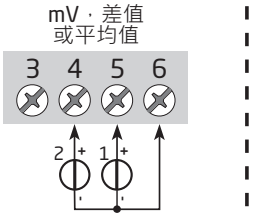
功能安全：

符合 SIL 应用要求的硬件评估
FMEDA 报告下载 - www.prelectronics.com

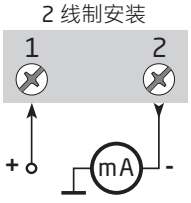
接线方式

输入：

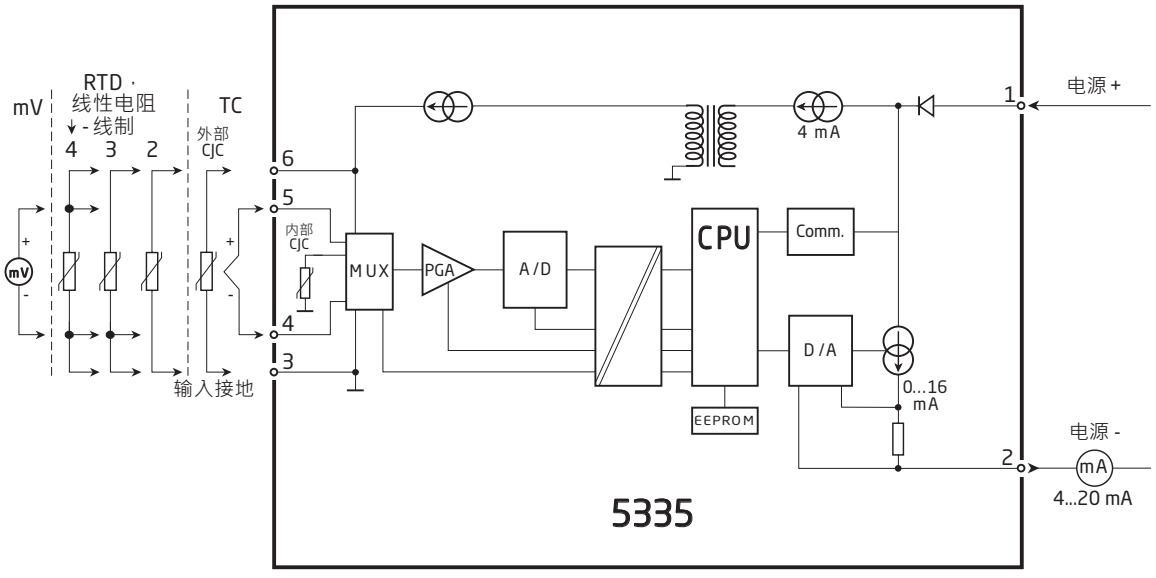




输出：



方框图



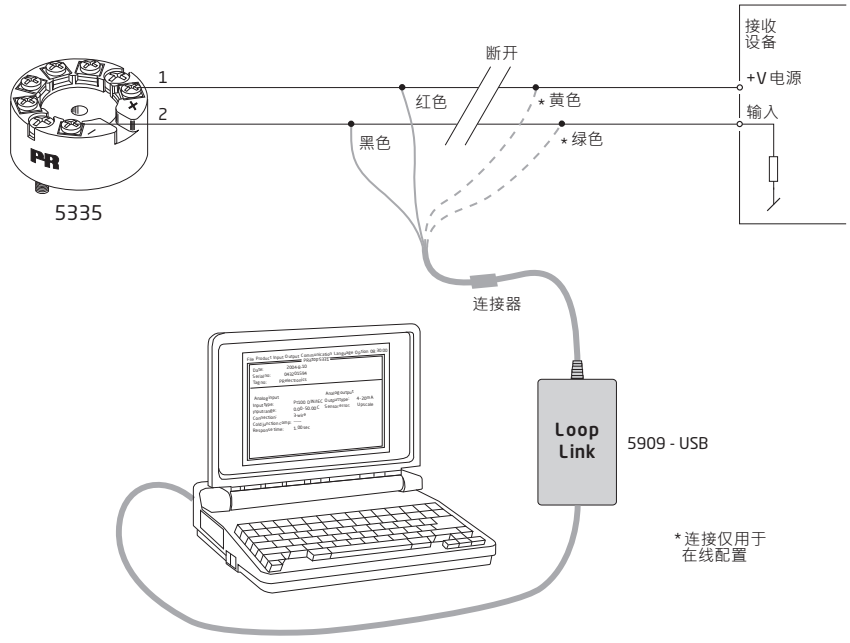
设置参数

5335 可以通过以下 3 种方式进行配置：

1.通过 PR electronics A/S 的通信接口 Loop Link 和电脑 PReset 配置软件。
2.通过 HART 调制解调器和电脑 PReset 配置软件。
3.通过具备 PR electronics A/S' DDL 驱动的 HART 通信器。

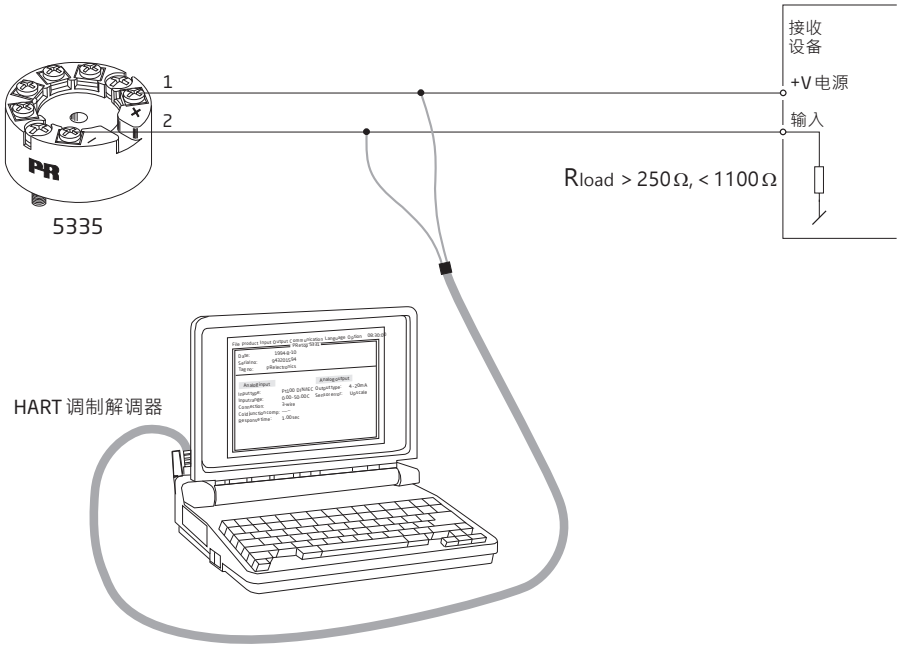
1：Loop Link

有关配置相关内容，请参阅下图和 PReset 软件中的帮助功能。
Loop Link 不允许与危险 (Ex) 区域中安装的设备进行通信。



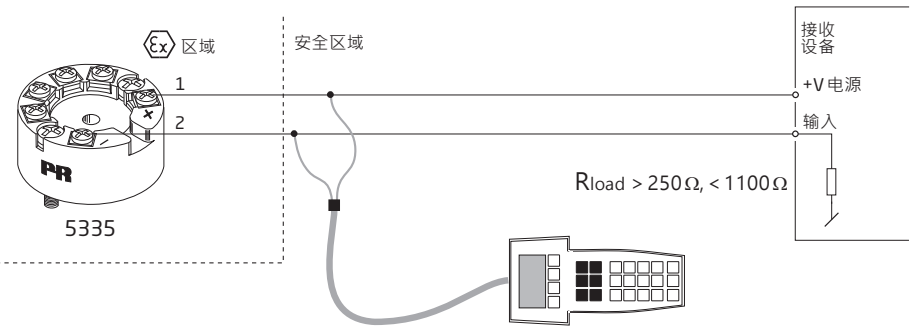
2：HART 调制解调器

有关配置相关内容，请参阅下图和 PReset 软件中的帮助功能。



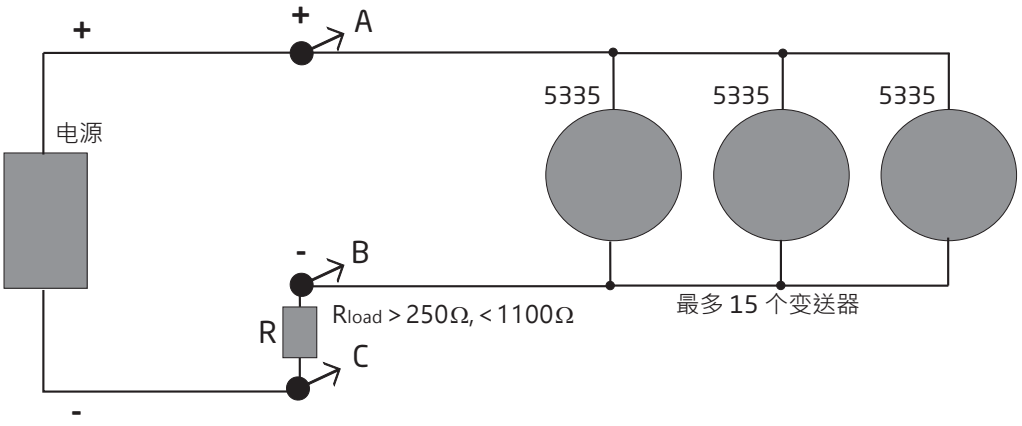
3 : HART 通信器

有关配置相关内容，请参考下图。要访问特定产品菜单，HART 通信器必须装有 PR electronics A/S DDL 驱动文件。可以从 HART Communication Foundation 或 PR electronics A/S 订购它们。



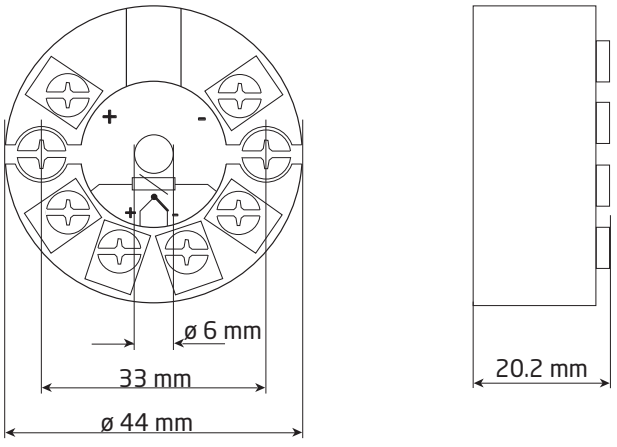
变送器多点模式连接

- HART 通信器或 PC 调制解调器可以连接 AB 或 BC。
- 二线 HART 数字通讯，可以并联连接最多 15 个变送器。

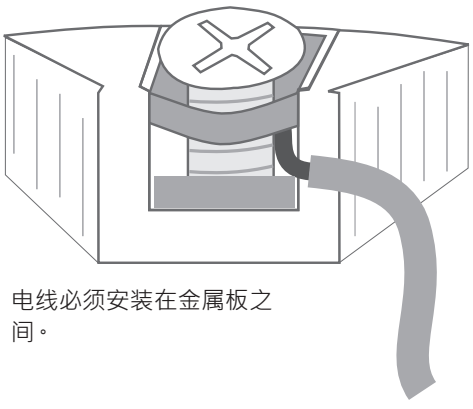


- 在连接之前，每个变送器必须配置一个唯一的轮询地址，范围从 1 到 15。如果两个变送器配置了相同的地址，则两者都将被排除。变送器必须配置为多点模式 (固定输出 4 mA 不变)。因此，回路中的最大电流为 60 mA。
- 通过 HART 通信器或 HART 调制解调器进行通信。
- PReset 配置软件可以将单个变送器配置为多点模式，并为其提供唯一的轮询地址。

机械规格



传感器电缆的连接



电线必须安装在金属板之间。

ATEX 安装图 5335QA02

为安全安装 5335A 或者 5337A，必须遵守以下规定。该模块仅由熟悉适用于该地区国家和国际法律、指令和标准的合格专业人员安装。
设备制造年份由序列号的前两位数字指示。

ATEX 认证 KEMA 03ATEX 1508X

标志

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

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

		端子：3,4,5,6	端子：1,2	端子：1,2
T4：	-40 ≤ Ta ≤ 85℃	Ex nA [ic]	Ex nA	Ex ic
T6：	-40 ≤ Ta ≤ 60℃	Uo：9.6 V Io： 28 mA Po： 67 mW Lo： 45 mH Co：28 μF	U ≤ 35 VDC I = 4 - 20 mA	Ui = 35 VDC Li = 10 μH Ci = 1.0 nF

一般安装说明

若外壳由非金属材料或涂漆金属制成，则应避免静电放电。

若环境温度 ≥ 60°C，则应使用耐热电缆，其额定耐热温度至少应比环境温度高出 20 K。

对于安装在潜在爆炸性气体环境中，必须遵循以下说明：

对于“Ex ic”，变送器必须安装在外壳内，该外壳能根据 EN60529 提供至少为 IP20 的防护等级，且适用于相关应用并正确安装。

对于“Ex nA”，变送器必须安装在外壳内，该外壳能根据 EN60529 提供至少为 IP54 的防护等级，且适用于相关应用并正确安装。或者安装在保护类型为 Ex n 或 Ex e 的外壳内。

电缆入口装置和堵封件应满足相同的要求。

对于安装在潜在爆炸性粉尘环境中，必须遵循以下说明：

若变送器连接本质安全信号“ic”，并且作为本质安全信号“ic”的接口界面（例如无源设备），则变送器应安装在符合 DIN 43729 标准的 B 型金属外壳内，该外壳能根据 EN60529 提供至少为 IP6X 的防护等级，且适用于相关应用并正确安装。电缆入口装置和堵封件应满足相同的要求。

若变送器连接无火花信号“nA”，或者作为无火花信号“nA”的接口界面，则变送器应安装在符合 DIN 43729 标准的 B 型金属外壳内，该外壳能根据 EN60529 提供至少为 IP6X 的防护等级，且符合防爆保护类型 Ex tD，并适用于相关应用。电缆入口装置和堵封件应满足相同的要求。

ATEX 安装图 5335QA01

为安全安装 5335D 或者 5337D，必须遵守以下规定。该模块仅由熟悉适用于该地区国家和国际法律、指令和标准的合格专业人员安装。
设备制造年份由序列号的前两位数字指示。

ATEX 认证 KEMA 03ATEX 1537

标志

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

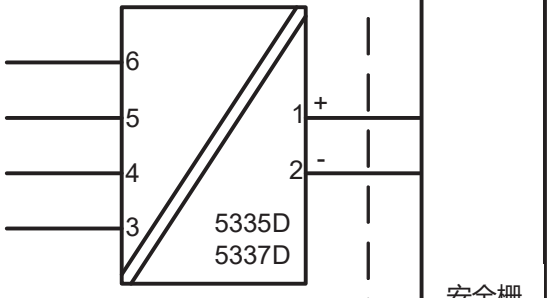
标准： EN 60079-0 : 2012，EN 60079-11：2012， EN 60079-26：2007

危险区
Zone 0、1、2、20、21、22 和煤矿开采

非危险区

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

端子：3,4,5,6
Uo：9.6 VDC
Io： 28 mA
Po： 67 mW
Lo： 35 mH
Co： 3.5 µ F



端子：1,2
Ui：30 VDC
Ii： 120 mA
Pi： 0.84 W
Li： 10 µ H
Ci： 1.0 nF

安装说明。

一般安装说明

传感器电路与输出电路并非绝对电气隔离。然而，电路间的电气隔离能够承受 1 分钟交流 500Vac 的测试电压。

若外壳由铝材质制成，则必须保证安装后，即使发生罕见事故，由于冲击和摩擦引起的点火源，也不会产生火花。

若外壳由非金属材料或涂漆金属制成，则应避免静电放电。

对于安装在潜在爆炸性气体环境中，必须遵循以下说明：

变送器应安装在符合 DIN43729 标准的 B 型外壳内，该外壳能根据 EN60529 提供至少为 IP20 的防护等级，且适用于相关应用并正确安装。

对于安装在潜在爆炸性粉尘环境中，必须遵循以下说明：

变送器应安装在符合 DIN43729 标准的 B 型金属外壳内，该外壳能根据 EN60529 提供至少为 IP6X 的防护等级，且适用于相关应用并正确安装。

应使用适用于相关应用和正确安装的电缆封口和堵封件。

对于矿井安装，必须遵循以下说明：

变送器应安装在金属外壳内，该外壳能根据 EN60529 提供至少为 IP6X 的防护等级，且适用于相关应用并正确安装。

应使用适用于相关应用和正确安装的电缆封口和堵封件

若外壳由铝材质制成，则必须保证安装后，即使发生罕见事故，由于冲击和摩擦引起的点火源，也不会产生火花。

若外壳由非金属材料或涂漆金属制成，则应避免静电放电。

以质量计，外壳不应包含超出以下比率的材料：

a) 总共 15 % 的铝、镁、钛和锆，以及

b) 总共 7.5 % 的镁、钛和锆。

IECEx Installation drawing 5335QI02

For safe installation of 5335A or 5337A the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.
Year of manufacture can be taken from the first two digits in the serial number.

IECEx Certificate	IECEx KEM 10.0083X
Marking	Ex nA [ic] IIC T6..T4 Gc Ex ic IIC T6..T4 Gc Ex ic IIIC Dc
Standards	IEC 60079-0 : 2011, IEC 60079-11 : 2011, EN 60079-15 : 2010

	Terminal: 3,4,5,6	**Terminal: 1,2**	**Terminal: 1,2**
T4: -40 ≤ Ta ≤ 85ºC T6: -40 ≤ Ta ≤ 60ºC	Ex nA [ic]	Ex nA	Ex ic
	Uo: 9.6 V Io: 28 mA Po: 67 mW Lo: 45 mH Co: 28 µF	U ≤ 35 VDC I = 4 - 20 mA	Ui = 35 VDC Li = 10 µH Ci = 1.0 nF

General installation instructions

If the enclosure is made of non-metallic materials or of painted metal, electrostatic charging shall be avoided.
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 potentialy explosive gas atmosphere, the following instructions apply:

For “Ex ic” the transmitter must be installed in an enclosure providing a degree of protection of at least IP20 according to IEC60529 that is suitable for the application and is correctly installed.
For “Ex nA” 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, or in an enclosure with type of protection Ex n or Ex e.
Cable entry devices and blanking elements shall fulfill the same requirements

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

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IECEx Installation drawing 5335QI01

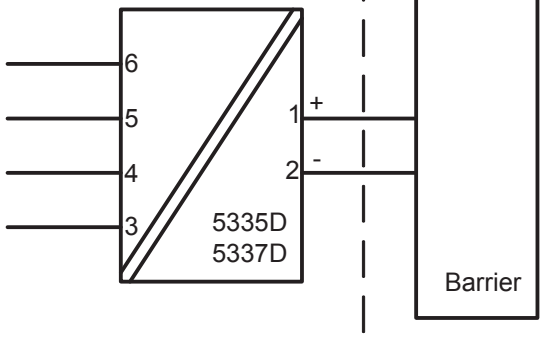
For safe installation of 5335D or 5337D the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.
Year of manufacture can be taken from the first two digits in the serial number.

IECEx Certificate	IECEx KEM.10.0083X
Marking	Ex ia IIC T6..T4 Ga Ex ia IIIC Da Ex ia I Ma
Standards	IEC60079-11:2011, IEC60079-0: 2011, IEC60079-26:2006

Hazardous area
Zone 0, 1, 2, 20, 21, 22 and Coal mining

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

Terminal: 3,4,5,6
Uo: 9.6 VDC
Io: 28 mA
Po: 67 mW
Lo: 35 mH
Co: 3.5 µF



Non Hazardous Area

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

Installation notes.

General installation instructions

The sensor circuit is not infallibly galvanic isolated from the supply output circuit. However, the galvanic isolation between the circuits is capable of withstanding a test voltage of 500Vac during 1 minute.

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

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

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

The transmitter shall be mounted in an enclosure form B according to DIN43729 or equivalent that is providing a degree of protection of at least IP20 according to IEC 60529 that is suitable for the application and correctly installed.

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

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

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

For installalation in mines the following instructions apply:

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

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

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

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

The enclosure shall not contain by mass more than

a) 15 % in total of aluminium, magnesium, titanium and zirconium, and

b) 7,5 % in total of magnesium, titanium and zirconium.

CSA Installation drawing 5337QC02

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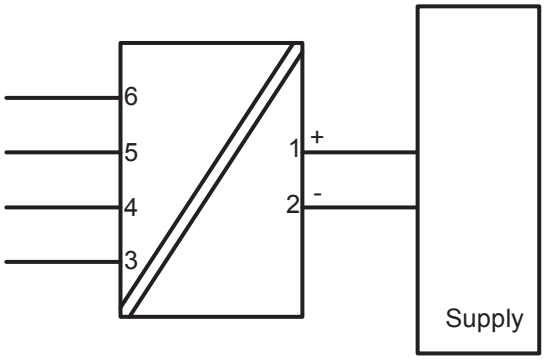
For safe installation of the 5335A and 5337A the following must be observed. The module shall only be installed by qualified personnel who are familiar with the national and international laws, directives and standards that apply to this area.

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

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

T4: -40ºC to 85ºC
T6: -40ºC to 60ºC

Terminal:
3,4,5,6
Uo: 9.6 VDC
Io: 28 mA
Po: 67 mW
Lo: 45 mH
Co: 28 µF



Terminal:
1-2
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.

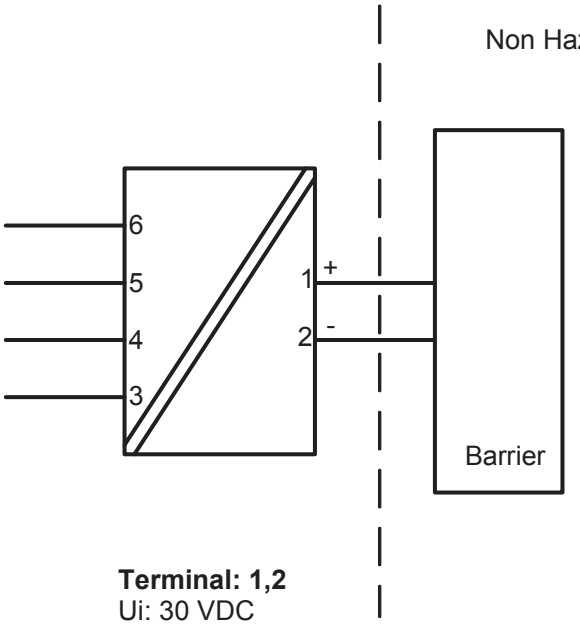
Non Incendive field wiring installation
The non incendive field Wiring Circuit concept allows interconnection of Nonincendive Field wiring Apparatus with Associated Nonincendive Field Wiring Apparatus or Assosicated Intrinsically Safe Apparatus or Associated Apparatus not specially examined in combination as a syatem using any of the wiring methods permitted for unclassified locations,
Voc < Vmax, Ca ≥ Ci + Ccable , La ≥ Li + Lcable.

CSA Installation drawing 533XQC03

Hazardous area

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

Module 5331D and 5333D
Terminal: 3,4,5,6
Only passive, or non-energy storing devices such as RTD's and Thermocouples may be connected



Module 5335D and 5337D
Terminal: 3,4,5,6
Uo: 9.6 VDC
Io: 28 mA
Po: 67.2 mW
Lo: 35 mH
Co: 3.5µF

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

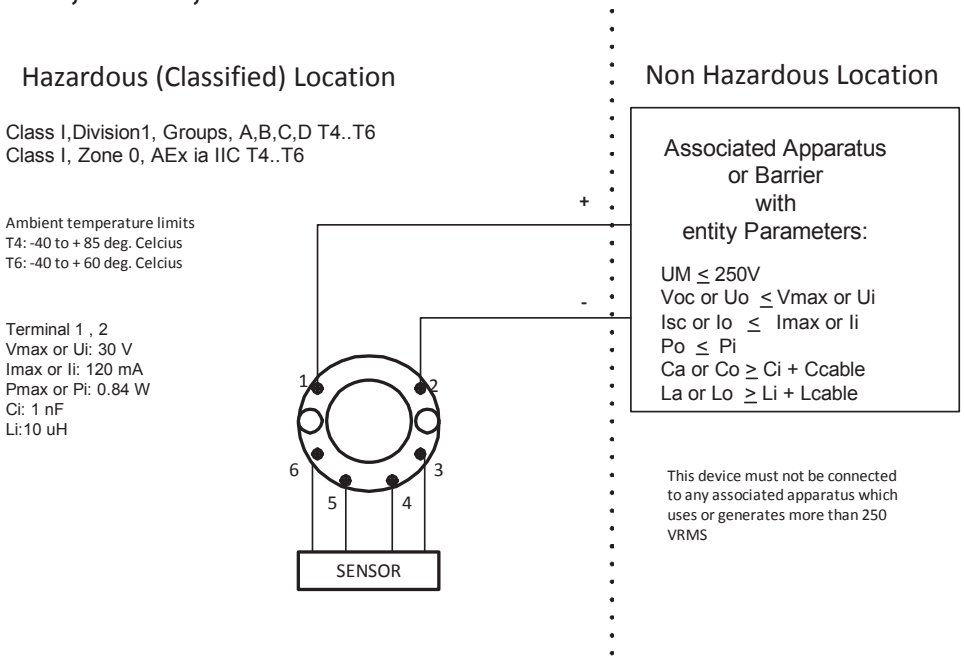
CLASS 2258 84 - PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity - For Hazardous Locations - Certified to US Standards
Class I, Division 1, Groups A, B, C and D
Class I, Zone 0, AEx ia IIC, Ga

Warning:
Substitution of components may impair intrinsic safety.

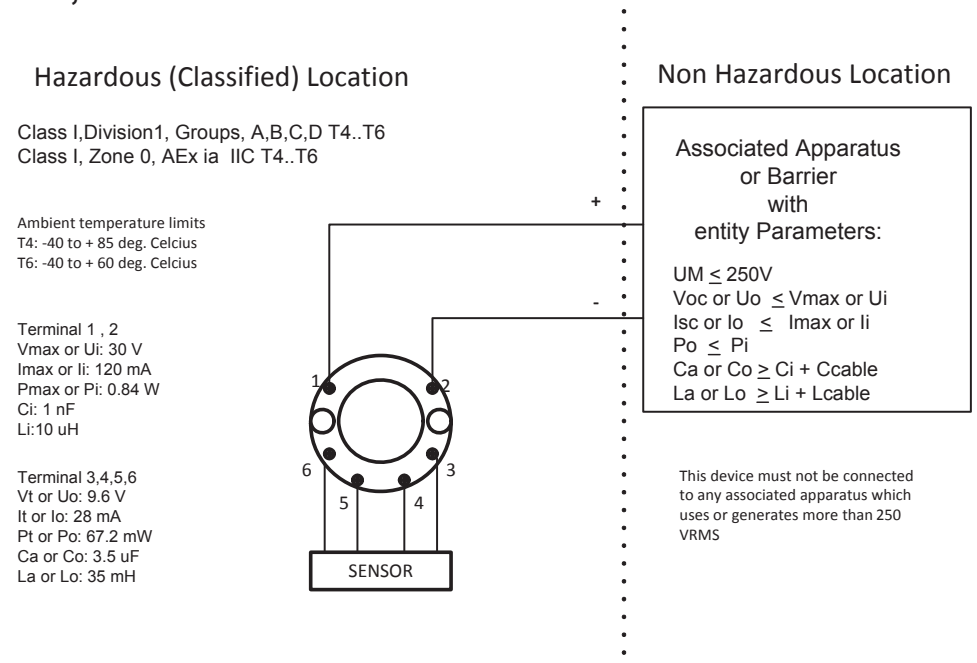
The transmitters must be installed in a suitable enclosure to meet installation codes stipulated in the Canadian Electrical Code (CEC) or for US the National Electrical Code (NEC).

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.

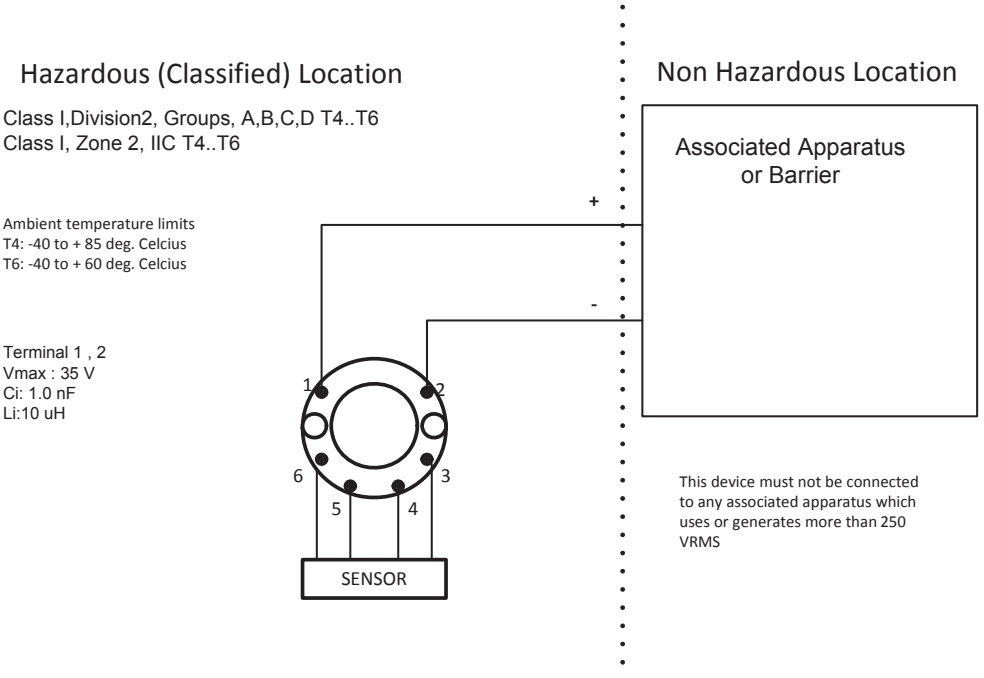
The sum of the maximum unprotected capacitance (C_i) for each intrinsically device and the interconnecting wiring must be less than the capacitance (C_a) which can be safely connected to the barrier.

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



Instalação INMETRO 5335QB01-V8R0

Para uma instalação segura, o seguinte deve ser observado. O módulo só deve ser instalado por pessoal qualificado e familiarizado com as leis, diretrizes e normas nacionais e internacionais aplicáveis a essa área.

Certificado	DEKRA18.0002X
Normas	ABNT NBR IEC 60079-0:2013 Versão corrigida 2: 2016 ABNT NBR IEC 60079-11:2013 : Versão corrigida 2017 ABNT NBR IEC 60079-15:2012

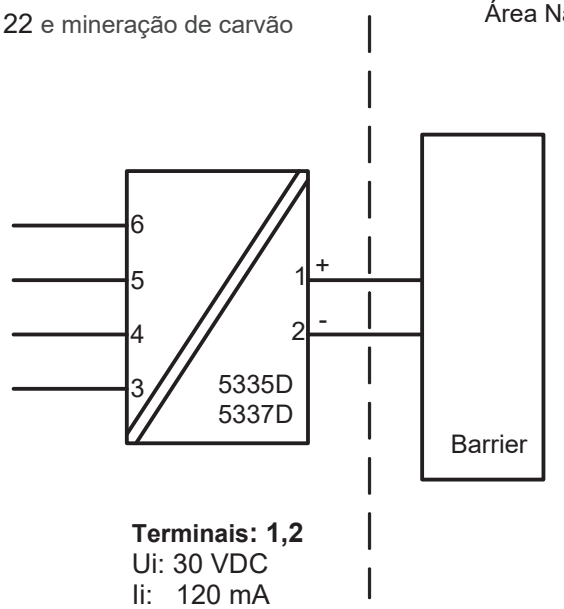
5335D, 5337D:

Notas	Ex ia IIC T6...T4 Ga Ex ia IIIC Da Ex ia I Ma

Área Classificada
Zona 0, 1, 2, 20, 21, 22 e mineração de carvão

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

Terminais :
3,4,5,6
Uo: 9.6 VDC
Io: 28 mA
Po: 67 mW
Lo: 35 mH
Co: 3.5µF



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

Instruções Gerais de Instalação.

O circuito do sensor não é galvanicamente infalivelmente isolado do circuito de saída de alimentação. No entanto, o isolamento galvânico entre os circuitos é capaz de suportar uma tensão de teste de 500Vac durante 1 minuto.
Se o invólucro for feito de alumínio, ele deve ser instalado de tal forma que, mesmo em caso de incidentes raros, fontes de ignição devidas a impactos e fricção, faíscas sejam excluídas.
Se o invólucro for feito de materiais não metálicos ou metais pintados, o carregamento eletrostático deve ser evitado.

Para instalações com uma atmosfera de gás potencialmente explosiva, a seguinte instrução se aplicará:

O transmissor deverá ser montado em um gabinete de formato tipo B de acordo com a norma DIN43729 ou equivalente que possibilita um grau mínimo de proteção IP20 de acordo com a ABNT NBR IEC60529 adequado para a aplicação e instalado corretamente.

Para instalação em uma atmosfera de poeira potencialmente explosiva, as seguintes instruções se aplicam:

O transmissor deve ser montado em um invólucro metálico B de acordo com DIN43729 ou equivalente que esteja fornecendo um grau de proteção de pelo menos IP6X de acordo com a ABNT NBR IEC 60529 que seja adequado para a aplicação e instalado corretamente..
Entradas de cabos e bujões de fechamento' devem ser usados adequados à aplicação e instalados corretamente.

Para instalação em minas, as seguintes instruções se aplicam:

O transmissor deve ser montado em um invólucro de metal que forneça um grau de proteção de pelo menos IP6X de acordo com a ABNT NBR IEC 60529 e seja adequado para a aplicação e instalado corretamente.
Entradas de cabos e bujões de fechamento' devem ser usados adequados à aplicação e instalados corretamente.
Se o invólucro for feito de alumínio, ele deve ser instalado de tal forma que, mesmo em caso de incidentes raros, fontes de ignição devidas a impactos e fricção, faíscas sejam excluídas.
Se o invólucro for feito de materiais não metálicos ou metais pintados, o carregamento eletrostático deve ser evitado.
O recinto não deve conter mais de massa
a) 15% no total de alumínio, magnésio, titânio e zircónio e
b) 7,5% no total de magnésio, titânio e zircónio.

5335A, 5337A:

Notas

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

	Terminais: 3,4,5,6	**Terminais: 1,2**	**Terminais: 1,2**
T4: -40 ≤ Ta ≤ 85ºC T6: -40 ≤ Ta ≤ 60ºC	Ex nA [ic]	Ex nA	Ex ic
	Uo: 9.6 V Io: 28 mA Po: 67 mW Lo: 45 mH Co: 28 µF	U ≤ 35 VDC I = 4 - 20 mA	Ui = 35 VDC Li = 10 µH Ci = 1.0 nF

Instruções gerais de instalação

Se o invólucro for feito de materiais não metálicos ou de metal pintado, o carregamento eletrostático deve ser evitado.
Para uma temperatura ambiente ≥ 60ºC, devem ser utilizados cabos resistentes ao calor com uma classificação de pelo menos 20 K acima da temperatura ambiente.

Para instalação em uma atmosfera de gás potencialmente explosiva, as seguintes instruções se aplicam:

Para “Ex ic”, o transmissor deve ser instalado em um gabinete que ofereça um grau de proteção de pelo menos IP20 de acordo com a ABNT NBR IEC60529, adequado para a aplicação e que esteja instalado corretamente.
Para “Ex nA” o transmissor deve ser instalado em um invólucro que ofereça um grau de proteção de pelo menos IP54 de acordo com a ABNT NBR IEC60529 que seja adequado para a aplicação e esteja corretamente instalado, ou em um invólucro com tipo de proteção Ex n ou Ex e. Dispositivos de entrada de cabos e bujões de fechamento’ devem cumprir os mesmos requisitos

Para instalação em atmosferas potencialmente explosivas, aplicam-se as seguintes instruções:

Se o transmissor for fornecido com um sinal intrinsecamente seguro "ic" e fizer a interface de um sinal intrinsecamente seguro "ic" (por exemplo, um dispositivo passivo), o transmissor será montado em um invólucro metálico B de acordo com a norma DIN 43729 que fornece um grau de proteção pelo menos IP6X de acordo com a ABNT NBR IEC60529, e é adequado para a aplicação. Dispositivos de entrada de cabos e bujões de fechamento’ devem atender aos mesmos requisitos.
Se o transmissor for fornecido com um sinal não centelhante "nA" ou fizer a interface de um sinal não centelhante, o transmissor será montado em um invólucro metálico B de acordo com a norma DIN 43729, proporcionando um grau de proteção de pelo menos IP6X conforme ABNT NBR. IEC60529, e em conformidade com o tipo de proteção Ex t e adequado para a aplicação. Dispositivos de entrada de cabos e bujões de fechamento’ devem atender aos mesmos requisitos.

文档更新记录

以下列表提供了有关本文档修订的说明。

版本号	日期	说明
117	1837	添加了 有关内部功率耗散的规格。 INMETRO 认证更改为 DEKRA。 更新 FM 证书编号。 更新 FM 安装图。
118	2006	获得 5335A 的 CSA 认证。添加安装图。

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我们始终在您身边

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