

PERFORMANCE
MADE
SMARTER

产品手册

5343

二线制液位变送器



温度 | 安全栅 | 通讯接口 | 多功能 | 隔离器 | 数显表

No. 5343V110-CN
序列号 : 211879175-231839574

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·

二线制液位变送器

5343

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二线制液位变送器 5343

- 电位器或欧姆信号输入
- 可设定传感器故障状态
- 高测量精度
- 独特的过程校准功能
- 通过标准 PC 设定参数

应用

- 转电阻阻值变化为标准模拟量电流信号·例如：欧姆输出液位计。
- 用户自定义线性化输出表格功能。

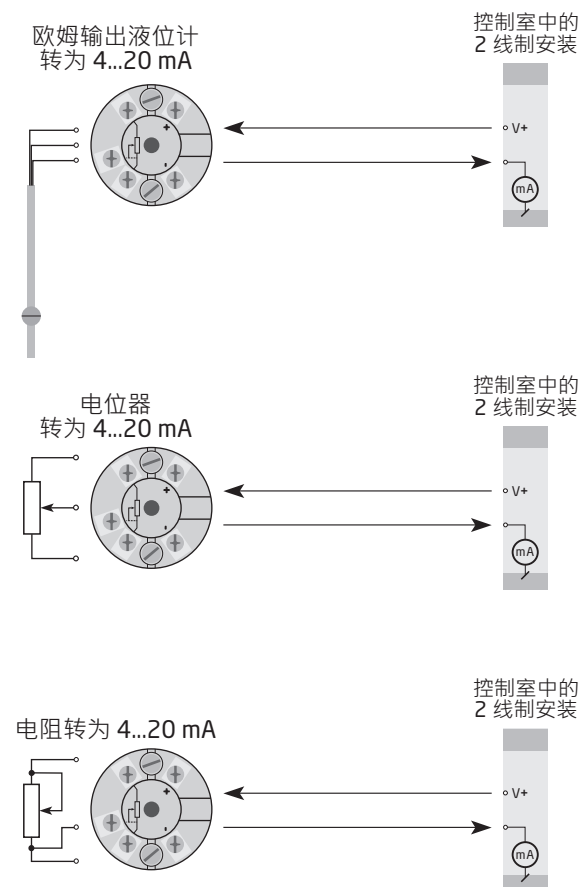
技术特点

- 参数设定简单方便。
- 持续监测重要数据·保障使用安全。
- 端子带极性反接保护。
- PR5343B 变送器能通过安装在标准 PC 上的 PReset 软件配合回路通讯器设定产品参数。
- PReset 软件和回路通讯器专为欧姆输出液位计应用优化·具备“在线”查看欧姆输入范围·以及卧罐体积输出线性化表格编制功能。

安装调试

- 标准 DIN B 型传感器头部安装。在非危险区域内·5343 可通过特殊配件安装在 DIN 导轨之上。

应用



订购

| 型号 | 版本 |
|------|---|
| 5343 | Zone 2 / Div. 2 : A |
| | Zone 0 · 1 · 2 · 21 · 22 · M1 / DIV.1 · DIV.2 : B |

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 | 50 g |
| 最大导线规格 | 1 x 1.5 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 | |
| 5343A | 8.0...35 VDC |
| 5343B | 8.0...30 VDC |
| 内部功率耗散 | |
| 5343A | 25 mW...0.8 W |
| 5343B | 25 mW...0.7 W |
| 电压降 | 8.0 VDC |
| 预热时间 | 5 分钟 |
| 设置参数 | Loop Link |
| 信噪比 | 最低 60 dB |
| 响应时间 (可设定) | 0.33...60 s |
| 信号动态范围 · 输入 | 19 位 |
| 信号动态范围 · 输出 | 16 位 |
| 电源电压变化的影响 | < 0.005% 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 |
| 线性电阻 | ≤ ±0.1% 所设量程 | ≤ ±0.01% 所设量程/°C |

| 基本值 | | |
|------|-----------|-----------------|
| 输入类型 | 基本精度 | 温度系数 |
| 线性电阻 | ≤ ±0.05 Ω | ≤ ±0.002 Ω / °C |

| | |
|-------------|--------------|
| EMC – 抗扰性影响 | < ±0.5% 所设量程 |
|-------------|--------------|

电气规格·输入:

线性电阻输入:

| | |
|--------------------|--------------------|
| 测量范围 | 0...100 kΩ |
| 最小测量范围 (量程) | 1 kΩ |
| 最大偏移量 | 所设量程高值的 50% |
| 电缆电阻 (单根导线 ; 最大) | 100 Ω |
| 传感器电流 | > 25 μA · < 120 μA |
| 传感器电缆电阻的影响 (3 线) | < 0.002 Ω / Ω |
| 传感器故障检测 | 是 |

输出:

电流输出:

| | |
|--------|---|
| 信号范围 | 4...20 mA |
| 最小信号范围 | 16 mA |
| 更新时间 | 135 ms |
| 负载电阻 | $\leq (V_{\text{电源}} - 8.0) / 0.023 [\Omega]$ |
| 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 |
| 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 & 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 |

海洋船舶认证:

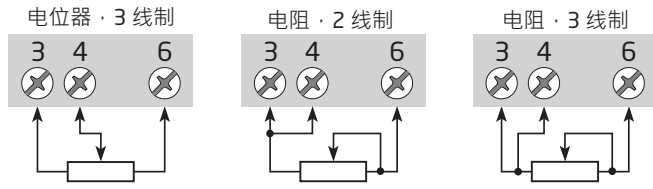
| | |
|----------------|------------|
| DNV-GL · 船舶和近海 | TAA0000101 |
|----------------|------------|

Ex / I.S. 认证:

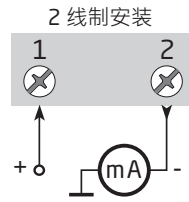
| | |
|-----------------|-------------------------|
| 5343A : | |
| ATEX | DEKRA 20ATEX0106 X |
| 5343B: | |
| ATEX | DEKRA 20ATEX0105 X |
| FM | FM17US0013X |
| 5343A 和 5343B : | |
| IECEx | DEK 20.0062X |
| INMETRO | DEKRA 16.0014 X |
| EAC Ex | RU C-DK.HA65.B.00355/19 |

接线方式

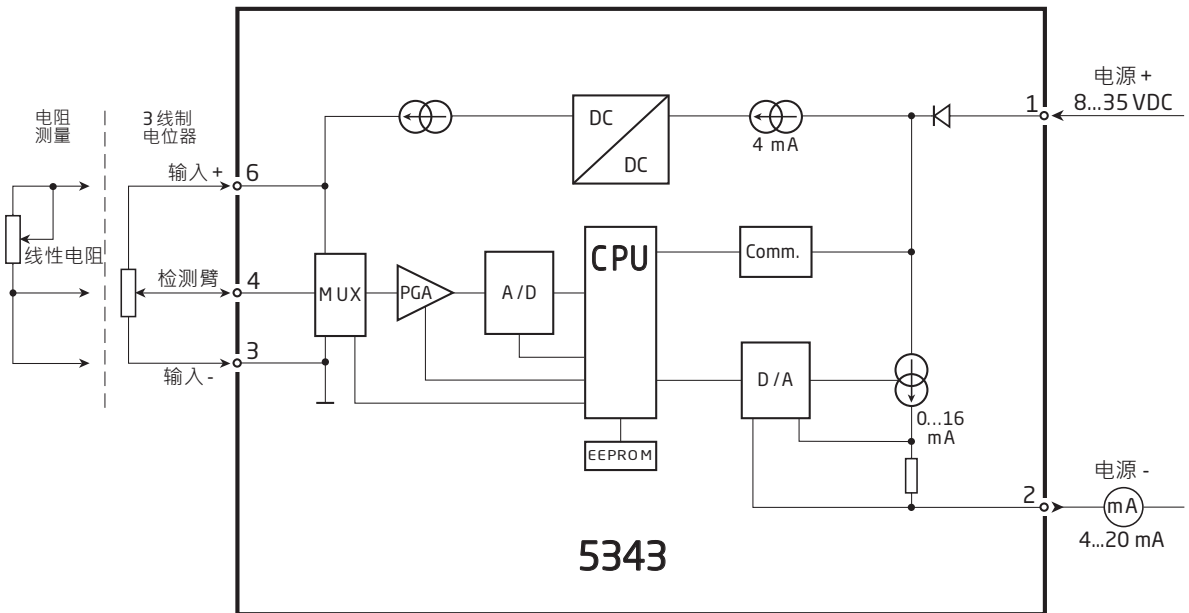
输入：



输出：

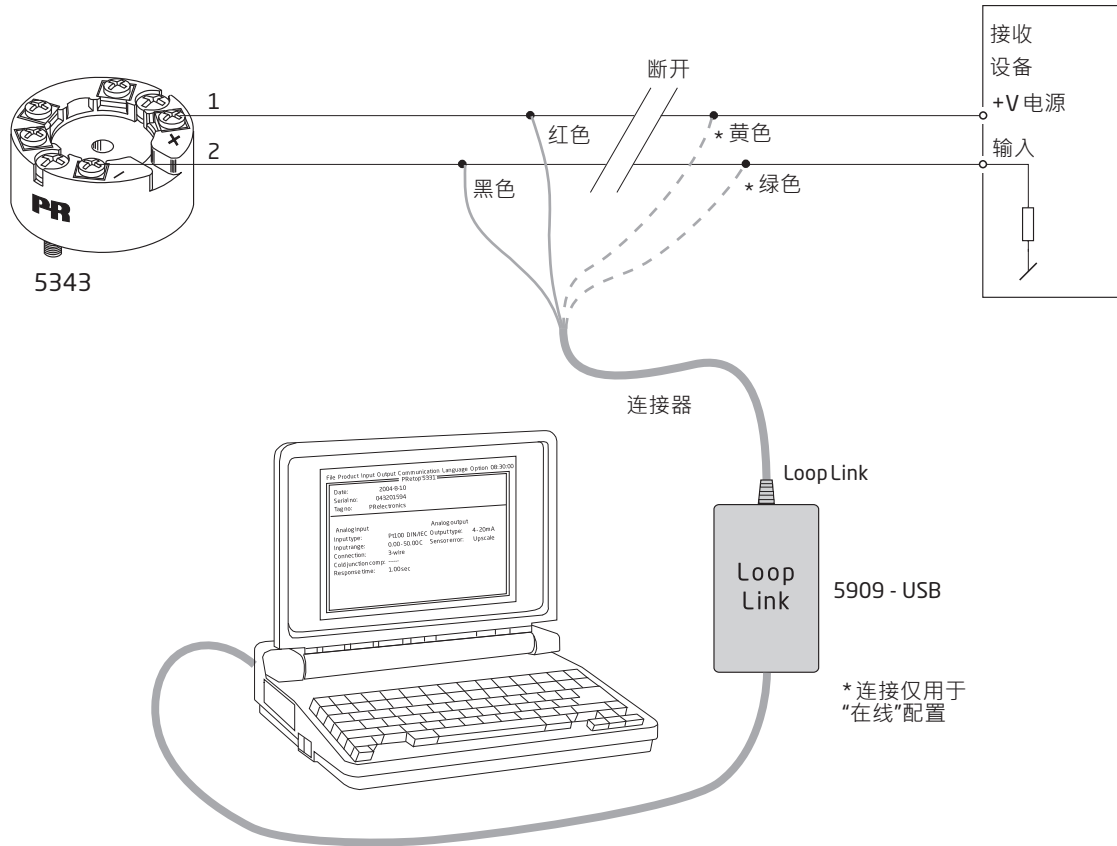


方框图

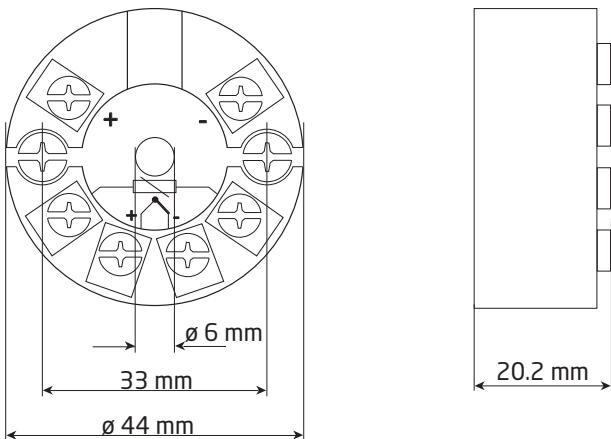


设置参数

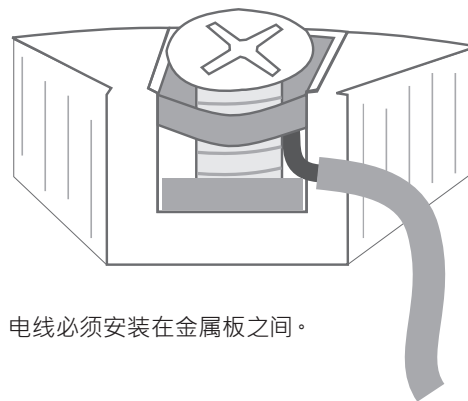
- Loop Link 是 5343 配置所需的通信接口。
- 有关配置，请参考下图和 PReset 中的帮助功能。
- Loop link 不允许与安装在危险 (Ex) 区域中的模块进行通信。



机械规格



传感器电线的安装



电位器输入的配置

在欧姆输出液位计中，当磁性浮子激活液位计中的簧片触点时，电阻值会有所更改。这意味着通常不可能将整个液位计用作输入量程。当 PR5343 配置为电位器输入使用时，PRelevel 软件包含以下特殊配置功能：

[Calibration Password] (校验密码) 为 4711。应在程序启动时输入此密码。无需输入此密码即可更改的唯一参数是电位器输入的输入低值和输入高值。该菜单项位于 **Tools > Options** (工具 > 选项) 之下。

在传输过程中，请特别注意 **Information** (信息) 窗口中的文本。当由于缺少密码而无法将配置发送至变送器时，将显示以下文本：**Operation aborted!** (操作中止) **Configuration NOT transmitted to the device!** (配置未传送至设备)

以下电位器输入的配置说明基于图 1。请注意：PRelevel 软件仅提供英文版本。因此，菜单文本在此处的显示与在屏幕上相同。首先选择 **[Input]** (输入) 选项卡：

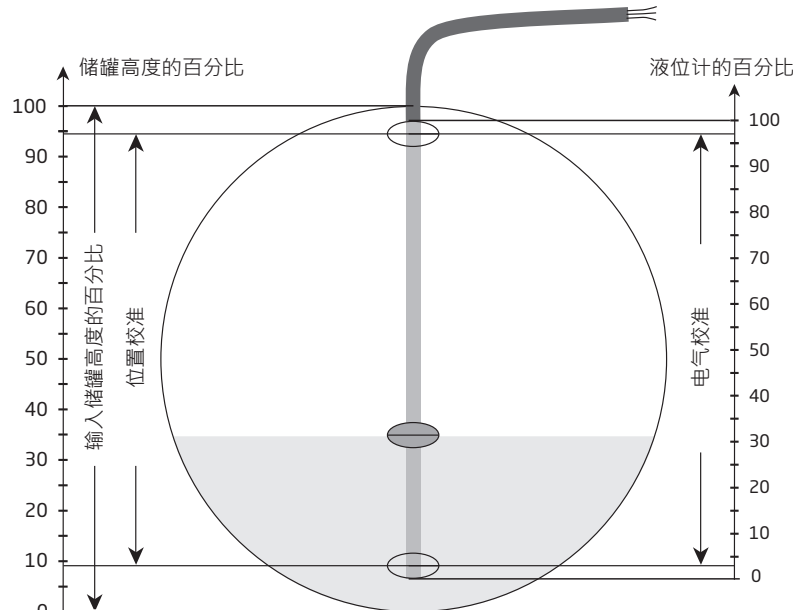


图 1 · 卧式圆筒形储罐的横截面

[Electrical Calibration] (电气校准) · 输入所连接电位器的检测范围，或者让 PRelevel 自行测量可用范围。在测量之前，必须将变送器连接至通信接口。

图 1 中的值为最低 = 3% · 最高 = 97%。

[Placement Calibration] (位置校准) · 输入“电气校准”后得出的液位计的高/低位置相对于储罐实际高度的最低和最高点。这些值将被用于计算线性化表值，以及计算 0 和 100% 高度。

图 1 中的值为最低 = 9% · 最高 = 94%。

[Input] (输入) · 输入相对于储罐实际高度的，所需的输入范围。如图一所示，在将输入低值和高值分别选为 0 和 100% 时，由于液位计的设计和实际安装位置，那么在今后的测量中，输入值就永远不会低于 9% 或高于 94%。如果输出范围是 4...20 mA，则输出就只能在 5.44...19.04 mA 之间变化。

图 1 中的值为最低 = 0% · 最高 = 100%。

嵌入式线性化的激活

PRelevel 软件包含针对卧式圆筒形储罐和球形储罐的嵌入式线性化功能。可按照以下步骤激活线性化功能：

自定义输入类型：为了访问客户定义的线性化，[General Type] (一般类型) 选框中的内容文本最后必须有 ' Custom' (定制) 字样，且必须输入 [Calibration Password] (校准密码) "4711"。

线性化的激活：选择 PRelevel 5343 窗口中的 [Options] (选项) 选项卡。如果要使用一个嵌入式线性化，则 ' Linearization ' (线性化) 窗口中的选择必须为 ' Polynomial.....(Relative) ' (多项式.....(相对))，以检索最准确的线性化文件。通过以下菜单检索文件：>Specify (指定) · 在主菜单中选择 >File > Open (>文件 >打开) · 在文件对话框中选择 >File name >Open (>文件名 >打开)。

用户定义的线性化：可在 ">Specify menu" (>"指定" 菜单) 中输入特定的线性化表格。

ATEX 安装图 5343QA02-V3R0

为安全安装 5343A，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 DEKRA 20ATEX0106 X

标记牌



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

标准

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

EN 60079-15: 2010, EN 60079-7:2015 +A1: 2018

| | | | |
|---|--|--|---|
| 端子 3,4,6 | 端子 1,2 | 端子 1,2 | 端子 1,2 |
| Ex ic IIC, Ex ic IIIC | Ex ic IIC, Ex ic IIIC | Ex ic IIC, Ex ic IIIC | Ex nA, Ex ec |
| U _o : 5 V I _o : 4.0 mA P _o : 20 mW L _o : 900 mH C _o : 1000 μ F | U _i = 35 V I _i = 110 mA C _i = 1 nF L _i = 10 μ H | U _i = 24 V I _i = 260 mA C _i = 1 nF L _i = 10 μ H | U _{max} ≤ 35 VDC 或 U _{max} ≤ 24 VDC |

| Ex ic IIC, Ex ic IIIC 温度等级 | 环境温度范围 | |
|-------------------------------|----------------------|----------------------|
| | U _i =35 V | U _i =24 V |
| T6 | -40°C 至 +54°C | -40°C 至 +63°C |
| T5 | -40°C 至 +69°C | -40°C 至 +78°C |
| T4 | -40°C 至 +85°C | -40°C 至 +85°C |

| Ex ec, Ex nA 温度等级 | 环境温度范围 | |
|----------------------|------------------------|------------------------|
| | V _{max} =35 V | V _{max} =24 V |
| T6 | -40°C 至 +43°C | -40°C 至 +55°C |
| T5 | -40°C 至 +85°C | -40°C 至 +85°C |
| T4 | -40°C 至 +85°C | -40°C 至 +85°C |

安装说明

如果外壳由非金属塑料材料制成，应避免变频器外壳上的静电荷。

如果变频器安装在需要使用设备保护级别 Gc 的爆炸性环境中并应用 Ex ic 保护类型，则变频器应安装在可根据 EN 60529 提供至少 IP20 防护等级的外壳中，并且适合应用并正确安装。

如果变频器安装在需要使用设备保护等级 Dc 的爆炸性环境中，则变频器应安装在单独认证的外壳中，该外壳可根据 EN 60079-0 提供至少 IP5X 的防护等级，并且适合应用并正确安装。外壳的表面温度比环境温度高 +20 K，确定没有灰尘层。

环境温度范围: -40°C 至 +85°C.

如果变频器安装在需要使用设备保护级别 Gc 的爆炸性环境中并应用 Ex nA 或 Ex ec 保护类型，则变频器应安装在单独认证的外壳中，该外壳可根据 EN 60079-0 提供至少 IP54 的防护等级，并且适合应用并正确安装。

如果变频器安装在需要使用设备保护级别 Gc 的爆炸性环境中并应用 Ex nA 或 Ex ec 保护类型，则该设备只能在不超过 EN 60664-1 中定义的污染等级 2 的区域中使用。

ATEX 安装图 5343QA01-V3R0



为安全安装 5343B，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

DEKRA 20ATEX0105 X

标记牌



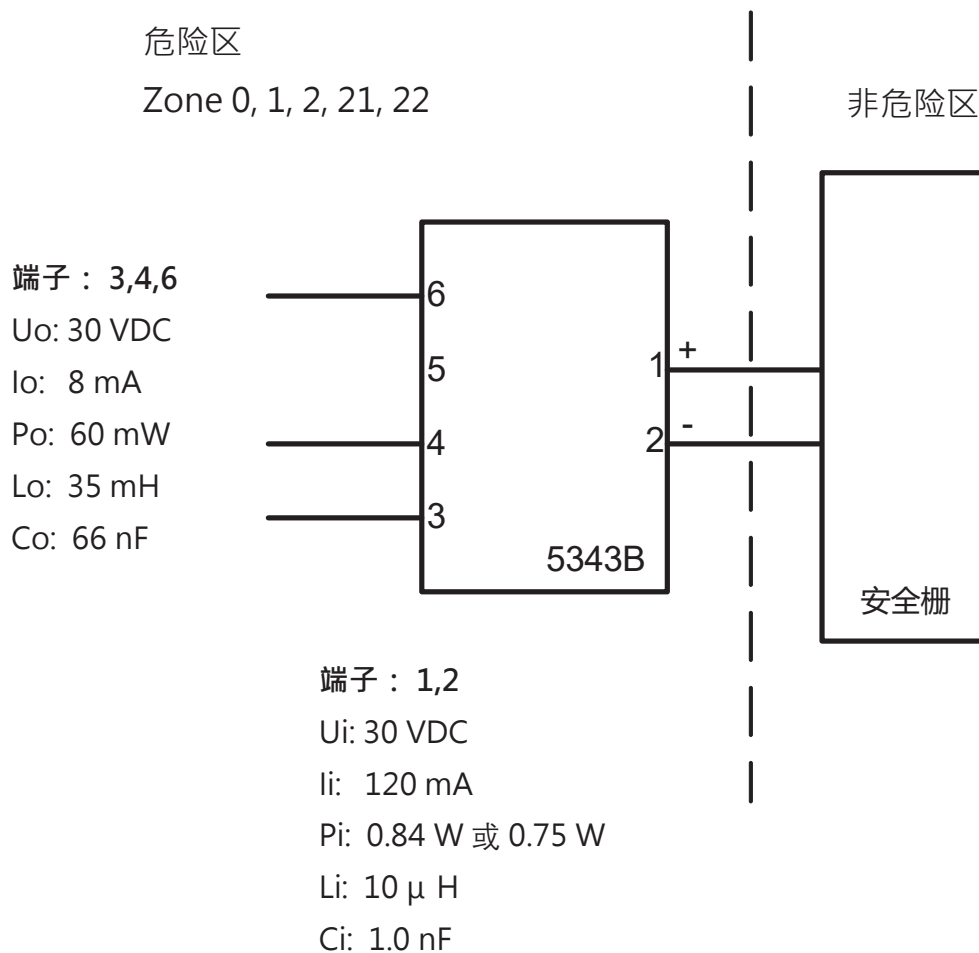
II 1 G Ex ia IIC T6...T4 Ga

II 2 D Ex ia IIIC Db

I M1 Ex ia I Ma

标准

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



| 温度等级 | 环境温度范围 | |
|------|---------------|---------------|
| | Pi: 0.84 W | Pi: 0.75 W |
| T6 | -40°C 至 +47°C | -40°C 至 +50°C |
| T5 | -40°C 至 +62°C | -40°C 至 +65°C |
| T4 | -40°C 至 +85°C | -40°C 至 +85°C |

安装说明

如果外壳由非金属塑料材料制成，应避免变频器外壳上的静电荷。

如果变频器安装在需要使用设备保护级别 Ga 的爆炸性环境中，则变频器应安装在单独认证的外壳中，该外壳可根据 EN 60529 提供至少 IP20 的防护等级，并且适合应用并正确安装。

如果变频器安装在需要使用设备防护等级 Ga 或 Ma 的爆炸性环境中，并且如果外壳是铝制的，则必须将其安装在能避免因冲击和摩擦火花而形成点火源的位置。

如果变频器安装在需要使用设备保护等级 Db 的爆炸性环境中，则变频器应安装在单独认证的外壳中，该外壳可根据 EN 60079-0 提供至少 IP5X 的防护等级，并且适合应用并正确安装。外壳的表面温度比环境温度高 +20 K，确定没有灰尘层。

环境温度范围: -40°C 至 +85°C.

如果变频器安装在需要使用设备保护等级 Ma 的爆炸性环境中，则变频器应安装在单独认证的外壳中，该外壳可根据 EN 60079-0 提供至少 IP54 的防护等级，并且适合应用并正确安装。环境温度范围: -40°C 至 +85°C.

应使用适用于相关应用和正确安装的电缆封口和堵封件。

若环境温度 $\geq 60^\circ\text{C}$ ，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。

IECEX-installation drawing 5343QI02-V3R0

For safe installation of 5343A 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 20.0062X

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: 5 V Io: 4 mA Po: 20 mW Lo: 900 mH Co: 1000 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.

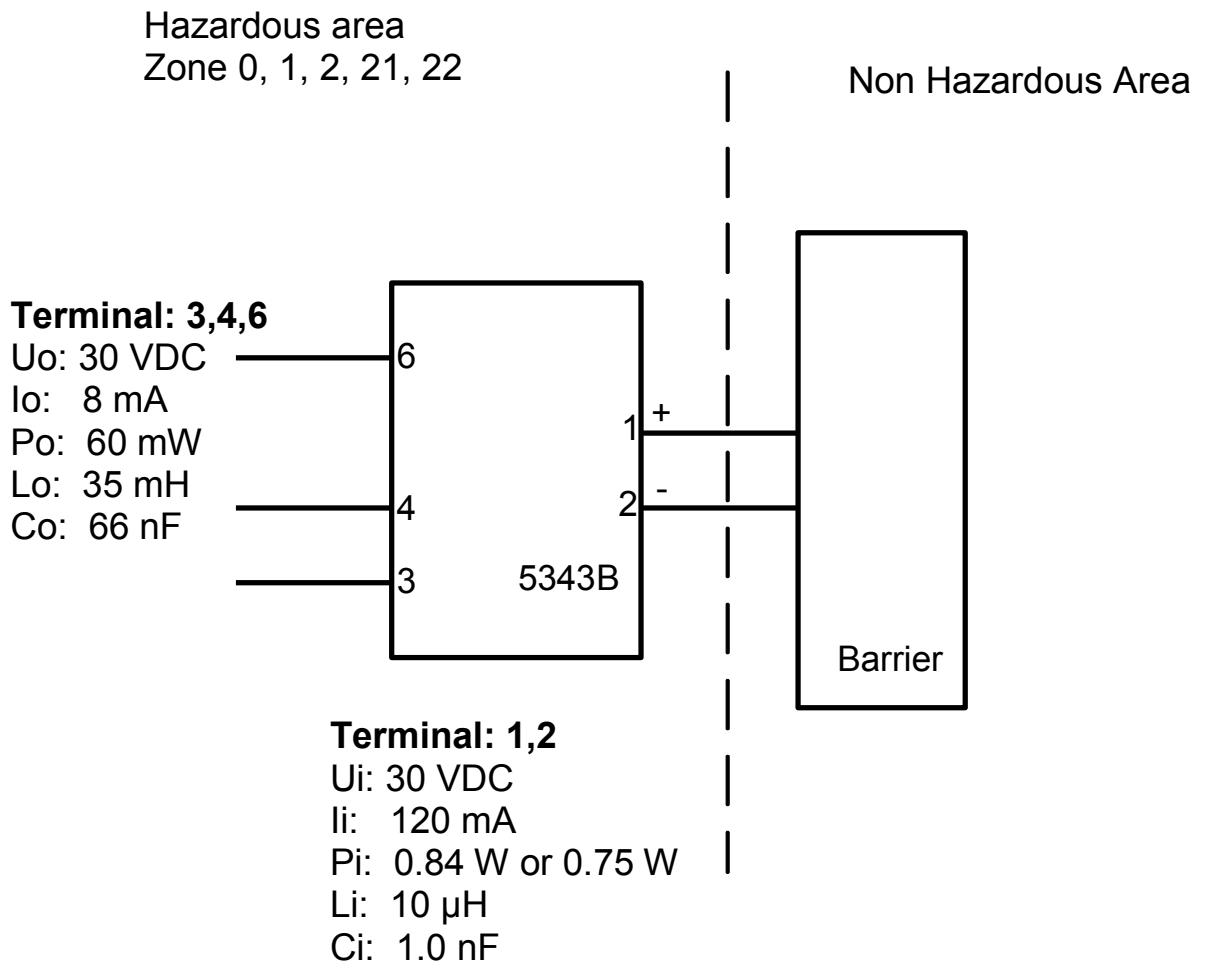
If the transmitter is installed in an explosive atmosphere requiring the use of equipment protection level Gc and applied in type of protection Ex nA or Ex ec, the equipment shall only be used in an area of not more than pollution degree 2, as defined in IEC 60664-1.

IECEX-installation drawing 5343QI01-V3R0



For safe installation of 5343B 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 20.0062X |
| 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 $\geq 60^\circ\text{C}$, heat resistant cables shall be used with a rating of at least 20 K above the ambient temperature.

FM Installation Drawing

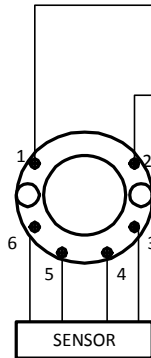
Model 5331D, 5332D, 5333D and 5343B

Hazardous (Classified) Location

Class I, Division 1, Groups, A, B, C, D T4..T6
Class I, Zone 0, AEx ia IIC T4..T6

Ambient temperature limits
T4: -40 to +85 deg. Celcius
T6: -40 to +60 deg. Celcius

Terminal 1, 2
Vmax or Ui: 30 V
Imax or Ii: 120 mA
Pmax or Pi: 0.84 W
Ci: 1 nF
Li: 10 uH



Non Hazardous Location

Associated Apparatus
or Barrier
with
entity Parameters:

$UM \leq 250V$
 $Voc \text{ or } Uo \leq Vmax \text{ or } Ui$
 $Isc \text{ or } Io \leq Imax \text{ or } Ii$
 $Po \leq Pi$
 $Ca \text{ or } Co \geq Ci + Ccable$
 $La \text{ or } Lo \geq Li + Lcable$

This device must not be connected
to any associated apparatus which
uses or generates more than 250
VRMS

Model 5335D, 5337D

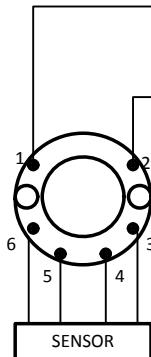
Hazardous (Classified) Location

Class I, Division 1, Groups, A, B, C, D T4..T6
Class I, Zone 0, AEx ia IIC T4..T6

Ambient temperature limits
T4: -40 to +85 deg. Celcius
T6: -40 to +60 deg. Celcius

Terminal 1, 2
Vmax or Ui: 30 V
Imax or Ii: 120 mA
Pmax or Pi: 0.84 W
Ci: 1 nF
Li: 10 uH

Terminal 3, 4, 5, 6
Vt or Uo: 9.6 V
It or Io: 28 mA
Pt or Po: 67.2 mW
Ca or Co: 3.5 uF
La or Lo: 35 mH



Non Hazardous Location

Associated Apparatus
or Barrier
with
entity Parameters:

$UM \leq 250V$
 $Voc \text{ or } Uo \leq Vmax \text{ or } Ui$
 $Isc \text{ or } Io \leq Imax \text{ or } Ii$
 $Po \leq Pi$
 $Ca \text{ or } Co \geq Ci + Ccable$
 $La \text{ or } Lo \geq Li + Lcable$

This device must not be connected
to any associated apparatus which
uses or generates more than 250
VRMS

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

NI Field Circuit Parameters

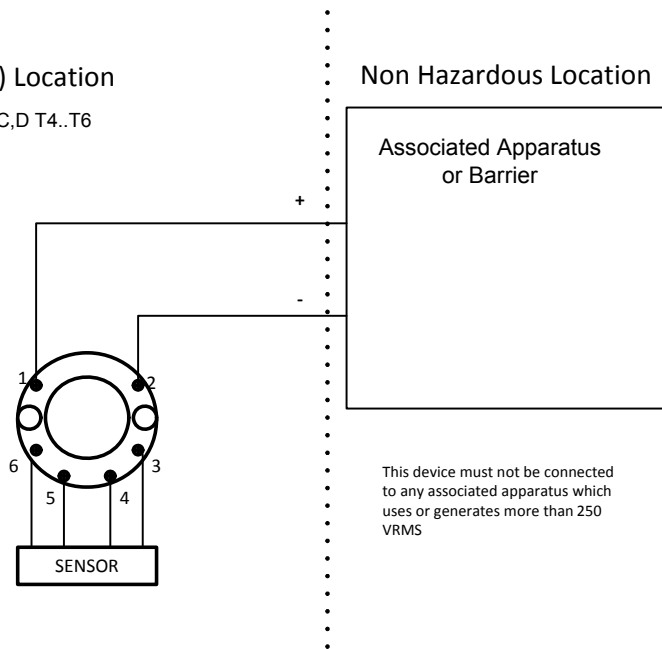
Model 5331D, 5332D, 5333D, 5335D, 5337D and 5343B

Hazardous (Classified) Location

Class I, Division 2, Groups, A,B,C,D T4..T6
Class I, Zone 2, IIC T4..T6

Ambient temperature limits
T4: -40 to + 85 deg. Celcius
T6: -40 to + 60 deg. Celcius

Terminal 1 , 2
 $V_{max} : 35 V$
 $C_i : 1.0 nF$
 $L_i : 10 uH$



Desenho de Instalação INMETRO



Para instalação segura do 5333A ou 5343A o seguinte deve ser observado. O modo deve apenas ser instalado por pessoas qualificadas que são familiarizadas com as leis nacionais e internacionais, diretrizes e padrões que se aplicam a esta área.

Ano de fabricação pode ser pego dos dois primeiros dígitos do número de série.

Certificado DEKRA 16.0014 X

Marcas

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

T4: $-40 \leq T_a \leq 85^\circ\text{C}$

T6: $-40 \leq T_a \leq 60^\circ\text{C}$

Normas ABNT NBR IEC 60079-0 : 2013; ABNT NBR IEC 60079-11 : 2013
ABNT NBR IEC60079-15 : 2012

| Terminais | Ex nA [ic] | Ex ic |
|-----------|--|---|
| 1,2 | $U \leq 35\text{V}$ | $U_i : 35\text{V}, I_i:110\text{mA}, I_i:10\mu\text{H}, C_i:1,0\text{nF}$ |
| 3,4,6 | $U_o: 5\text{V}, I_o: 4\text{mA}, P_o: 20\text{mW},$ | $L_o: 900\text{mH}, C_o: 1000\mu\text{F}$ |

Notas para instalação

Para a instalação em uma atmosfera de gás potencialmente explosivo, se aplicam as instruções a seguir:

Para a instalação nA o transmissor deve ser instalado em um invólucro de metal, por exemplo, gabinete em forma B que forneça um grau de proteção de pelo menos IP54 de acordo com IEC60529 ou em um invólucro com tipo de proteção Ex n ou Ex e.

Para a instalação Ex ic o transmissor deve ser instalado em um invólucro proporcionando um grau de proteção de IP20, pelo menos, de acordo com a norma ABNT NBR IEC 60529. E o invólucro deve ser adequado para a aplicação e corretamente instalado.

Dispositivos de entrada de cabos e elementos de supressão devem cumprir os mesmos requisitos.

Para temperatura ambiente $\geq 60^\circ\text{C}$, fios de resistência ao calor devem ser usados com uma faixa de pelo menos 20K acima da temperatura ambiente.

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

O transmissor deve ser montado em invólucro de metal forma B de acordo com DIN43729 que está fornecendo um grau de proteção de pelo menos IP6X de acordo com ABNT NBR IEC60529.

O invólucro deve ser adequado para aplicação e instalado corretamente.

As entradas dos cabos e os elementos de obturação que podem ser utilizados são adequados para a aplicação e corretamente instalados.

A temperatura da superfície do invólucro é igual à temperatura ambiente mais 20 K, para uma camada de pó , com uma espessura até 5 mm.

Desenho de Instalação INMETRO



Para instalação segura do 5333D ou 5343B o seguinte deve ser observado. O modelo deve apenas ser instalado por pessoas qualificadas que são familiarizadas com as leis nacionais e internacionais, diretrizes e padrões que se aplicam a esta área.

O ano de fabricação pode ser pego dos dois primeiros dígitos do número de série.

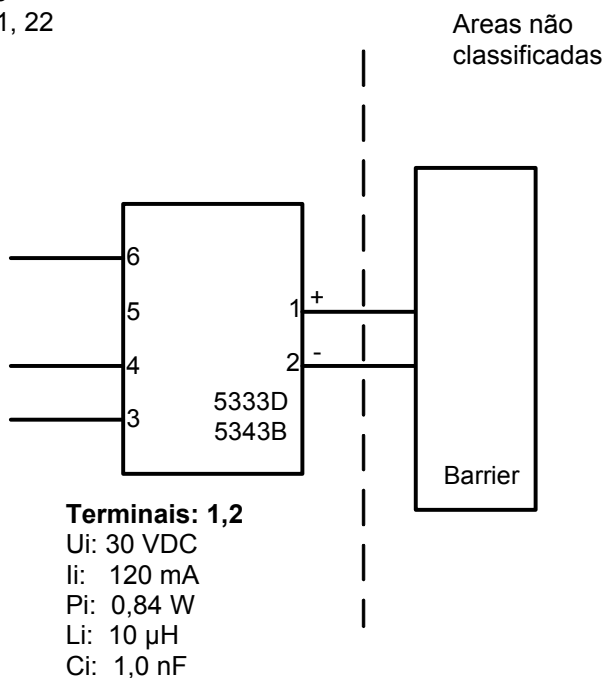
| | |
|-------------|---|
| Certificado | DEKRA 16.0014 X |
| Marcas | Ex ia IIC T6...T4 Ga Ex ia IIIC Da Ex ia I Ma |
| Normas | ABNT NBR IEC 60079-0 : 2013; ABNT NBR IEC 60079-11 : 2013 |

Áreas classificadas
Zona 0, 1, 2, 20, 21, 22

T4: $-40 \leq T_a \leq 85^\circ\text{C}$
T5: $-40 \leq T_a \leq 60^\circ\text{C}$
T6: $-40 \leq T_a \leq 45^\circ\text{C}$

**Terminais:
3,4,5,6**

Uo: 30 VDC
Io: 8 mA
Po: 60 mW
Lo: 35 mH
Co: 66 nF



Notas de Instalação.

Em uma atmosfera de gás potencialmente explosiva, o transmissor deve ser montado em um invólucro a fim de garantir no mínimo um grau de proteção IP20 de acordo com ABNT NBR IEC60529. Se contudo o ambiente necessitar um nível de proteção maior, isso deve ser levado em consideração.

Se o transmissor é instalado em uma atmosfera explosiva exigindo o uso de equipamento de proteção de nível Ga, Ma e Mb, e se o invólucro for feito de alumínio, ele deve ser instalado de modo que, mesmo em caso de avaria remota, fontes de ignição devido a impacto e fricção, faíscas são eliminadas; Se o invólucro é feito de materiais não metálicos, cargas eletrostáticas devem ser evitadas.

Se o invólucro é feito de materiais não metálicos, cargas eletrostáticas devem ser evitadas.

Para instalação em atmosfera de poeira potencialmente explosiva, as instruções a seguir são aplicáveis:

O transmissor deve ser montado em invólucro de metal forma B de acordo com DIN43729 que está fornecendo pelo menos um grau de proteção IP6X de acordo com ABNT NBR IEC60529. O invólucro deve ser adequado para aplicação pretendida e instalado corretamente.

As entradas dos cabos e os elementos de obturação que podem ser utilizados devem ser adequados à aplicação pretendida e corretamente instalados.

Para temperatura ambiente $\geq 60^{\circ}\text{C}$, fios de resistência ao calor devem ser usados com uma faixa de pelo menos 20K acima da temperatura ambiente.

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 |
|-----|------|------------------------------------|
| 104 | 1414 | IECEX·添加 FM 和 INMETRO 认证。 |
| 105 | 1503 | 添加 GL marine 认证。 |
| 106 | 1707 | 更新 IECEX·FM 和 INMETRO 安装图。 |
| 107 | 1848 | 更新 FM 安装图。 |
| 108 | 2004 | 更新 INMETRO 安装图。 |
| 109 | 2139 | ATEX和IECEX认证已更新 - Ex na 更改为 Ex ec。 |
| 110 | 2245 | 添加了 UKCA。 |

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