Alarm Sounder PF-IS-SM-105 Signal Beacon PF-IS-BM-* Alarm Sounder/Signal Beacon PF-IS-CM-105-*

Marking

Alarm Sounder: PF-IS-SM-105 Signal Beacon: PF-IS-BM-* Alarm Sounder with Signal Beacon: PF-IS-CM-105-*
ATEX certificate: ERO 24 ATEX 0014X ATEX marking PF-IS-SM-105: Ⓔx II 1 GD Ex ia IIC T6 Ga Ex ia IIIC T_{200} 85°C Da Ⓔx I M1 Ex ia I Ma ATEX marking PF-IS-BM-* / PF-IS-CM-105-*: Ⓔx II 1 GD Ex ia IIC T5 Ga Ex ia IIIC T_{200} 85°C Da Ⓔx I M1 Ex ia I Ma
IECEx certificate: IECEx EMT 24.0011X UKCA certificate: EMA 24 UKEX 0006X

The *-marked letters of the type code are placeholders for versions of the device.

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Internet: www.pepperl-fuchs.com

Target Group, Personnel

Responsibility for planning, assembly, commissioning, operation, maintenance, and dismounting lies with the plant operator.

The personnel must be appropriately trained and qualified in order to carry out mounting, installation, commissioning, operation, maintenance, and dismounting of the device. The trained and qualified personnel must have read and understood the instruction manual.

Reference to Further Documentation

Observe directives, standards, and national laws applicable to the intended use and the operating location.

The corresponding datasheets, manuals, declarations of conformity, EU-type examination certificates, certificates, and control drawings if applicable (see datasheet) are an integral part of this document. You can find this information under www.pepperl-fuchs.com.

In order to access this documentation, enter the product name, i. e. the type code, or the item number of the product in the search field of the website.

For specific device information such as the year of construction, scan the QR code on the device. As an alternative, enter the serial number in the serial number search at www.pepperl-fuchs.com.

Intended Use

The device is only approved for appropriate and intended use. Ignoring these instructions will void any warranty and absolve the manufacturer from any liability.

The device can be used indoors.

The device can be used outdoors.

The device can be used in Zone 0.

The device can be used in Zone 1.

The device can be used in Zone 21.

The device can be used in Zone 2.

The device can be used in Zone 20.

The device can be used in Zone 22.

The device is designed for wall mounting.

The device is designed for ceiling mounting.

The device is designed for mounting to a steel framework.

Improper Use

Protection of the personnel and the plant is not ensured if the device is not used according to its intended use.

Mounting and Installation

Observe directives, standards, and national laws applicable to the intended use and the operating location.

Examples for such regulations are regulations regarding electricity, grounding, installation as well as hygiene and safety.

When mounting and installing the device, ensure that the environment is dry.

Mount the device so that it is visible from the area to be covered.

Mount the device so that it is audible from the area to be covered.

Ensure that the enclosure is mounted on a flat surface. This prevents the deformation of the enclosure and ensures the safe sealing function of the cover seal.

Protect the device against long-term or excessive mechanical vibrations.

If mounting the enclosure on concrete use expansion anchors. When mounting the enclosure to a steel framework use vibration resistant mounting material.

Use suitable fixing material for mounting.

Mount the enclosure at the fixing points provided.

If you intend to install the device or enclosure in areas that may be exposed to aggressive substances, ensure that the stated surface materials are compatible with these substances. If required, contact Pepperl+Fuchs for further information.

Avoid electrostatic charges which could result in electrostatic discharges while installing, operating, or maintaining the device.

Mount the device in a location with low electrostatic charge.

Ensure that the device provides and maintains a degree of protection of at least IP66 according to IEC/EN 60079-0.

Safety-relevant markings are found on the nameplate supplied. Ensure that the nameplate is present and legible. Take the ambient conditions into account.

Additional warning markings may be affixed next to the nameplate.

Ensure that the enclosure is not damaged, distorted, or corroded.

Close all unused enclosure holes with the appropriate stopping plugs.

Ensure that all seals are clean, undamaged, and correctly fitted.

If external connections are present, ensure that the connections are in good condition, and are not damaged or corroded.

To ensure compliance with the temperature class, ensure that there is adequate free air space around the enclosure.

Ensure that there are no external heat sources around the enclosure.

In order to prevent condensation in the enclosure, use suitably certified breather drains.

Requirements for Internal Components

Contact Pepperl+Fuchs before installing additional components. Pepperl+Fuchs will check whether these components are listed in the certificate. The maximum power dissipation of this installation solution must be within the permitted limits.

Requirements for Cables and Connection Lines

Only use cables and connection lines with a temperature range appropriate to the application.

Only use the terminals which are supplied with the device.

Ensure that the terminals are in good condition and are not damaged or corroded.

The terminals may have several connections.

Observe the tightening torque of the terminal screws.

Use the shortest possible cable lengths and avoid small core cross sections.

Observe the minimum bending radius of the conductors.

When installing the conductors the insulation must reach up to the terminal.

When using stranded conductors, crimp wire end ferrules on the conductor ends.

Unused cables and connection lines must be either connected to terminals or securely tied down and isolated.

Ensure that unused terminal screws are properly tightened down.

Insulation by tape alone is not permitted.

Requirements for Cable Glands

Only use cable glands that are suitably certified for the application.

Only use stopping plugs that are suitably certified for the application.

Only use cable glands with a temperature range appropriate to the application.

For cable glands only use incoming cable diameters of the appropriate size.

Use seals that are suitable for the specified application.

Ensure that the degree of protection is not violated by the cable glands.

Install cables and cable glands in a way that they are not exposed to mechanical hazards.

The cables and connection lines must be free from mechanical stress. Use appropriate strain relief, which must be fitted outside of the enclosure.

Ensure that all cable glands are in good condition and are securely tightened.

Close all unused cable glands with the appropriate sealing plugs.

Observe the specific ambient conditions of sealing plugs.

Tighten all cable glands with the appropriate torque.

Ground metal cable glands.

Specific Conditions of Use

Installation shall be carried out in accordance with the relevant, local code of practice for Ex equipment, e.g. EN & IEC 60079-14, EN 50628 and IEC 60079-25 and that capacitance and inductance limits are not exceeded by distributed capacitance (Cc) or distributed inductance (Lc) due to cable length.

Observe directives, standards, and national laws applicable to the intended use and the operating location.

For mining applications, observe directives, standards, and national laws applicable to the operating location.

When connecting intrinsically safe devices with intrinsically safe circuits of associated apparatus, observe the maximum peak values with regard to explosion protection (verification of intrinsic safety). Observe the standards IEC/EN 60079-14 or IEC/EN 60079-25.

Observe the installation instructions according to IEC/EN 60079-14.

Observe the installation instructions according to IEC/EN 60079-25.

The energy stored in the cable must not exceed the maximum permissible energy limits.

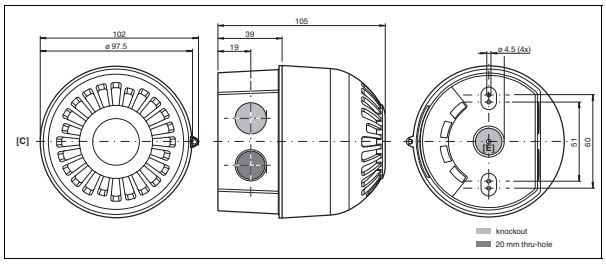
Only use the device in fixed installations.

Installation Sequence

PF-IS-SM-105 / PF-IS-BM / PF-IS-CM-105-*

Only use pre-drilled entries or knockout positions. Additional entries outside this area are not permitted.

Mount the enclosure directly by creating and using the pre-determined mounting holes in the enclosure rear. These are in pre-determined positions and can be drilled to a maximum of 4.5 mm:



Use at least two mounting holes for mounting the enclosure.

It is recommended to use screws according to ISO 4762 or equivalent.

Mount the enclosure by doing the following:

1. Remove the cover from the base by rotating anticlockwise until it comes free.
2. Select and create the relevant mounting holes for your application.
3. Consider the position of the pre-drilled thru-hole or remove a knockout if required.
4. Mark the position of the pre-drilled mounting holes on the mounting surface.
5. Drill the appropriate holes into the mounting surface.
6. Install the mounting gasket between the enclosure and the mounting surface.
7. Mount the enclosure using appropriate screws in the pre-drilled mounting holes.
8. Tighten all mounting screws with the appropriate torque.
9. Install a suitably rated entry device into the selected thru-hole as required.
10. Select the required wiring option for the required operation (see 'Wiring').
11. For PF-IS-CM-105-* and PF-IS-BM-*, select flashing or static output using the DIP switch (see 'Wiring').
12. For PF-IS-CM-105-* and PF-IS-SM-105, select the tone by configuring the DIP switches in the cover as per tone table (pre-set to tone 18).
13. Mount the cover gasket to the enclosure base, making sure that the surface is clean and not damaged.
14. Relocate the cover onto the mounted base and rotate clockwise until it is locked in place.
15. Install the anti-rotation grub screw into the cover screw hole and turn until the screw meets the body.

Note

Torque moments depend on the used screws and the material where they are screwed into.

Wiring

Wiring Connections and Entity Parameters

PF-IS-SM-105 / PF-IS-BM / PF-IS-CM-105-*

Refer to the table below, which shows markings inside the base for wiring connections.

Markings for Wiring Connections

Line	Terminal Marking
Common Positive Supply IN	(3) IN+
Alarm Sounder Negative Supply	(2) -
Second Stage / Signal Beacon Negative Supply	(1) ♫/☼

Power each device with a Pepperl+Fuchs Zener barrier or galvanic isolator to ensure the signaling device entity parameters are not exceeded.

Refer to the table below for entity parameters.

Entity Parameters

Table of Entity Parameters	
Parameter	**Barrier Supply**
U_i	28 V max.
L_i	93 mA max.
P_i	660 mW max.
L_i	0 µF max.
C_i	0 mH max.

The value for Uo must be between 16 V and 28 V and Ie should not be below 50 mA.

Warning!

Powering the device up without the correctly rated barrier or galvanic isolator could damage the device and may void protection ratings.

Contact your local Pepperl+Fuchs sales representative for suitable barriers or isolators.

Operation

Refer to the tables below for the operation of the device.

PF-IS-SM-105

Line	Terminal Marking	Alarm Sounder Active
Common Positive Supply IN	(3) IN+	+
Alarm Sounder Negative Supply	(2) -	-
Second Stage / Signal Beacon Negative Supply	(1) ♫/☼	

PF-IS-BM-*

Line	Terminal Marking	Signal Beacon
Common Positive Supply IN	(3) IN+	+
Alarm Sounder Negative Supply	(2) -	
Second Stage / Signal Beacon Negative Supply	(1) ♫/☼	-

PF-IS-CM-105-*

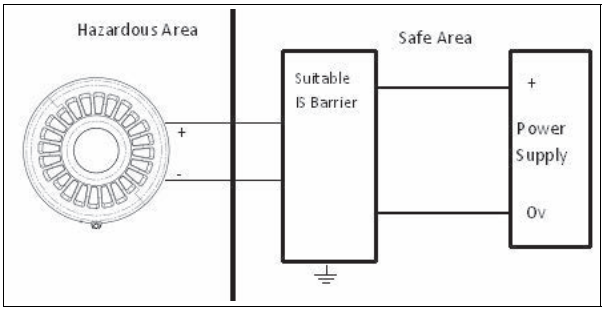
Line	Terminal Marking	Signal Beacon Active	Alarm Sounder Active	Both Active
Common Positive Supply IN	(3) IN+	+	+	+
Alarm Sounder Negative Supply	(2) -		-	-
Second Stage / Signal Beacon Negative Supply	(1) ♫/☼	-		-

Single-Stage Alarm

PF-IS-SM-105 / PF-IS-CM-105-*

Before the final installation of the PF-IS-SM-105 alarm sounder cover or the PF-IS-CM-105-* alarm sounder with LED signal beacon cover onto the installed base, you must set the alarm tone. Refer to the tone table (see 'Tone Table'). For the PF-IS-CM-105-* alarm sounder with LED signal beacon you must also set the light output style (see 'Single-Stage Visual Alarm').

Use either a switch in the safe area on either the positive or negative lines into the Pepperl+Fuchs barrier, or switch the power supply on and off to control the device as shown in the diagram. Refer to the diagram below.



Single-Stage Visual Alarm

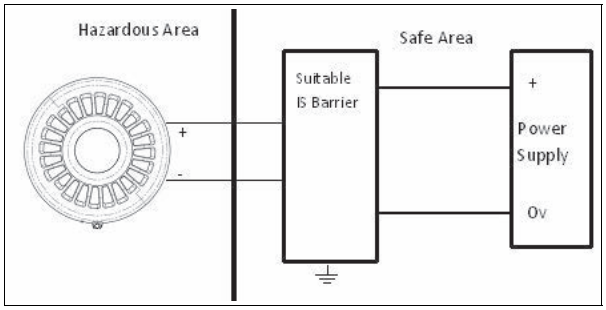
PF-IS-BM-* / PF-IS-CM-105-*

Before the final installation of the PF-IS-BM-* LED signal beacon cover or the PF-IS-CM-105-* alarm sounder with LED signal beacon cover onto the installed base, you must set the light output style. Refer to the table below to set the light output style.

Light Output Style

Light Output	Switch 6 Position
Flashing	OFF
Static	ON

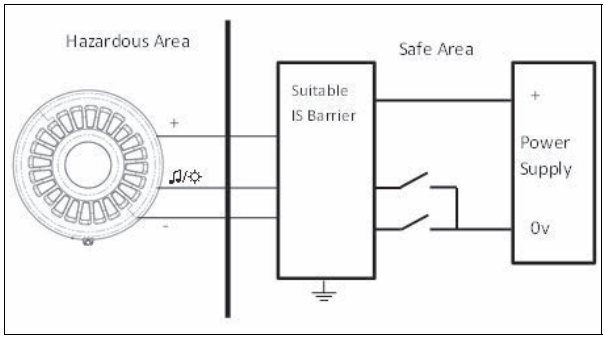
Use either a switch in the safe area on either the positive or negative lines into the Pepperl+Fuchs barrier, or switch the power supply on and off to control the device as shown on the diagram. Refer to the diagram below.



Two-Stage Alarm

PF-IS-SM-105 / PF-IS-CM-105-*

When a two-stage alarm is required, it is possible to activate an alternate tone by connecting the "♫☼" (signal beacon ground) pin to 0 V as detailed in the wiring table. For this application, a barrier with 2 diode return paths is required. Refer to the diagram below.

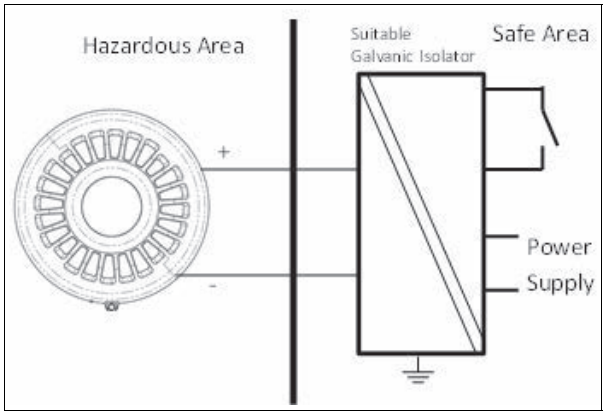


Switching between return paths for the two-stage system will enable the second tone. You can find the second stage tone in the tone table (see 'Tone table').

Galvanic Isolator

PF-IS-SM-105 / PF-IS-CM-105-*

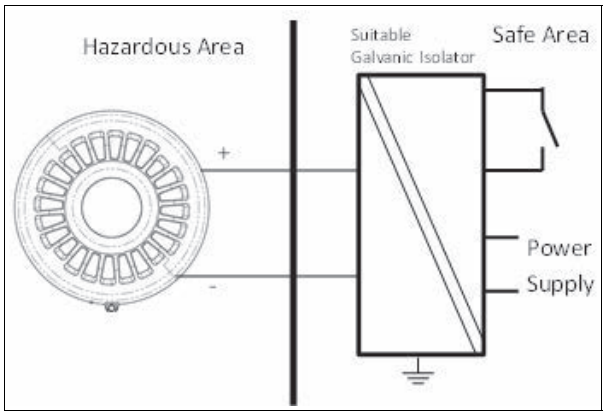
The PF-IS-SM-105 intrinsically safe alarm sounder series and the PF-IS-CM-105-* alarm sounder with LED signal beacon series is compatible for use with suitably rated galvanic isolators. The galvanic isolators have the advantage of not requiring the installation of an isolated high integrity ground to connect the Zener barrier(s). These isolators are often more expensive per device but can reduce installation costs as the ground is not required. You can power the PF-IS-SM-105 and PF-IS-CM-105-* series with the galvanic isolators with matching parameters as described in the entity parameters section of the installation sheet. You can switch the device on and off either by using a suitably placed switch in the positive or negative rails (the switch must have suitable ratings if installed in the hazardous area), or by switching the galvanic isolator on and off as shown in below diagram.



As with the Zener barriers, you can trigger the second stage alarm when using galvanic isolators, however an additional intrinsically safe relay is required to make the additional connection. As with all equipment in the system, the correct ratings must be maintained to ensure integrity and safety to the correct levels. You can switch the relay to change between stage one and stage two.
End of line monitoring is applicable to the device. For this to function correctly you must connect the resistor between the IN+ terminal and the Alarm sounder Negative Supply. You must also use a suitable Pepperl+Fuchs Zener barrier that can provide reverse polarity monitoring to take place and a fire panel compatible with intrinsically safe devices.
If required, you can wire an external switch in series with the (1) and/or (2) connections to provide independent remote change over from 1st stage to 2nd stage tones. This switch must comply with intrinsically safe installation (EN 60079-0, EN 60079-11, EN 50303:2000).

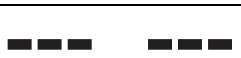
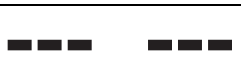
PF-IS-BM-*

The PF-IS-BM-* intrinsically safe signal beacon series is compatible for use with suitably rated galvanic isolators. The galvanic isolators have the advantage of not requiring an isolated high integrity ground to be installed to connect the Zener barrier(s). These isolators are often more expensive per device but may reduce installation costs as the ground is not required. You can power the PF-IS-BM-* series by the galvanic isolators with matching parameters as described in the entity parameters section of the installation sheet. You can turn the device on and off either by using a suitably placed switch in the positive or negative rails (switch must be of suitable ratings if installed in the hazardous area), or by switching the galvanic isolator on and off as shown in below diagram.



As with all equipment in the system, the correct ratings must be maintained to keep the integrity and safety to the correct levels. End of line monitoring is applicable to the device. For this to function correctly you must connect the resistor between the IN+ terminal and the Alarm sounder Negative Supply. You must also use a suitable Pepperl+Fuchs Zener barrier which can allow reverse polarity monitoring to take place and a fire panel compatible with intrinsically safe devices.

Tone Table

Tone	Tone Type	Tone Description/Application	Dip Switch 1 - 2 - 3 - 4 - 5 - 6	dB (A) @ 1 m ± 3 dB
1.		970 Hz	O - O - O - O - O - O	87
2.		800 Hz/970 Hz @ 2 Hz	O - O - O - O - I - O	91
3.		800 Hz/970 Hz @ 1 Hz	O - O - O - I - O - O	91
4.		970 Hz 1s OFF/1s ON	O - O - O - I - I - O	92
5.		970 Hz 0.5s/630 Hz, 0.5s	O - O - I - O - O - O	92
6.		554 Hz, 0.1/440 Hz, 0.4s (AFNOR NF S 32001)	O - O - I - O - I - O	89
7.		500 - 1200 Hz, 3.5s/0.5s OFF (NEN 2575·2000 Dutch Slow Whoop)	O - O - I - I - O - O	90
8.		420 Hz 0.6s ON/0.6s OFF (Australia AS1670 Alert tone)	O - O - I - I - I - O	93
9.		1000 - 2500 Hz, 0.5/0.5s OFF x 3/1.5s OFF (AS1670 Evacuation)	O - I - O - O - O - O	97
10.		550 Hz/440 Hz @ 0.5 Hz	O - I - O - O - I - O	94
11.		970 Hz, 0.5s ON/0.5s OFF x 3/1.5s OFF (ISO 8201)	O - I - O - I - O - O	92
12.		2850 Hz, 0.5s ON/0.5s OFF x 3/1.5s OFF (ISO 8201)	O - I - O - I - I - O	90
13.		1200 Hz - 500 Hz @ 1 Hz (DIN 33404)	O - I - I - O - O - O	89
14.		400 Hz	O - I - I - O - I - O	92
15.		550 Hz, 0.7s/1000 Hz, 0.33s	O - I - I - I - O - O	93
16.		1500 Hz - 2700 Hz @ 3 Hz	O - I - I - I - I - O	98
17.		750 Hz	I - O - O - O - O - O	93
18.		2400 Hz	I - O - O - O - I - O	105
19.		660 Hz	I - O - O - I - O - O	93
20.		660 Hz 1.8s ON/1.8s OFF	I - O - O - I - I - O	93
21.		660 Hz 0.15s ON/0.15s OFF	I - O - I - O - O - O	93
22.		510 Hz, 0.25s/610 Hz, 0.25s	I - O - I - O - I - O	92
23.		800/1000 Hz 0.5s each (1 Hz)	I - O - I - I - O - O	95
24.		250 Hz - 1200 Hz @ 12 Hz	I - O - I - I - I - O	91
25.		500 Hz - 1200 Hz @ 0.33 Hz	I - I - O - O - O - O	95

Tone	Tone Type	Tone Description/Application	Dip Switch 1 - 2 - 3 - 4 - 5 - 6	dB (A) @ 1 m ± 3 dB
26.		2400 Hz - 2900 Hz @ 9 Hz	I - I - O - O - I - O	90
27.		2400 Hz - 2900 Hz @ 3 Hz	I - I - O - I - O - O	90
28.		500 - 1200 Hz, 0.5s/0.5s OFF x 3/1.5s OFF (AS1670 Evacuation)	I - I - O - I - I - O	93
29.		800 Hz - 970 Hz @ 9 Hz	I - I - I - O - O - O	95
30.		800 Hz - 970 Hz @ 3 Hz	I - I - I - O - I - O	95
31.		800 Hz, 0.25s ON/1s OFF	I - I - I - I - O - O	92
32.		500 Hz - 1200 Hz, 3.75s/0.25s OFF (AS2220)	I - I - I - I - I - O	96

Operation, Maintenance, Repair

Observe the requirements according to IEC/EN 60079-14 during operation.

Observe IEC/EN 60079-17 for maintenance and inspection.

Observe the requirements according to IEC/EN 60079-19 for repair and overhaul.

If there is a defect, the device must be repaired by Pepperl+Fuchs.

When energized, the enclosure may only be opened for maintenance, if only intrinsically safe circuits are used inside the enclosure.

When maintaining the device, ensure that the environment is dry.

Check the wear on the device and the device components at specific intervals. The interval between checks depends on the operating conditions and loads that occur.

Ensure that all fasteners are present.

Before assembly, check that the seal and sealing surface are clean and in good condition to ensure the degree of protection.

To avoid hearing damage, keep a safe distance from the device.

To avoid eye damage, do not stare into the device.

Do not climb on the device.

Do not stand on the device.

Do not cover the device.

Specific Conditions of Use

If the device is installed in potentially explosive dust atmosphere, observe that the thickness of the dust layer does not exceed 5 mm. Remove the dust layers in regular intervals.

Clean equipment regulary to prevent dust build-up with a damp or anti-static cloth only.

If cleaning is necessary while the device is located in a hazardous area, in order to avoid electrostatic charging only use a clean damp cloth.

Delivery, Transport, Disposal

Store the device in a clean and dry environment. The permitted ambient conditions must be considered, see datasheet.

Check the packaging and contents for damage.

Check if you have received every item and if the items received are the ones you ordered.

The device, built-in components, packaging, and any batteries contained within must be disposed in compliance with the applicable laws and guidelines of the respective country.

Technical Data

General	
Types and variants	PF-IS-SM-105 PF-IS-BM-* PF-IS-CM-105-*
Electrical specifications	
Operating voltage	16 ... 28 V DC , via zener barrier or galvanic isolator See certification label for more information
Operating current	31 mA @ 24 V DC max. - value measured with Zener barrier connected See certification label for more information
Terminal capacity	0.5 ... 2.5 mm^2
Mechanical specifications	
Dimensions	see datasheet
Enclosure cover	fully detachable
Degree of protection	IP66
Mass	see datasheet
Material	
Enclosure	Polycarbonate UL94 V2
Finish	RAL 3000 (red)
Seal	nitrile O-ring
Seal insert	Neoprene
Grounding	Internal connection
Ambient conditions	
Ambient temperature	-40 ... 60 °C (-40 ... 140 °F)
Storage temperature	-40 ... 70 °C (-40 ... 158 °F)
Data for application in connection with hazardous areas	
Maximum power dissipation	See certification label
Conformity	
Degree of protection	EN60529
CE marking	2829
UKCA marking	2503