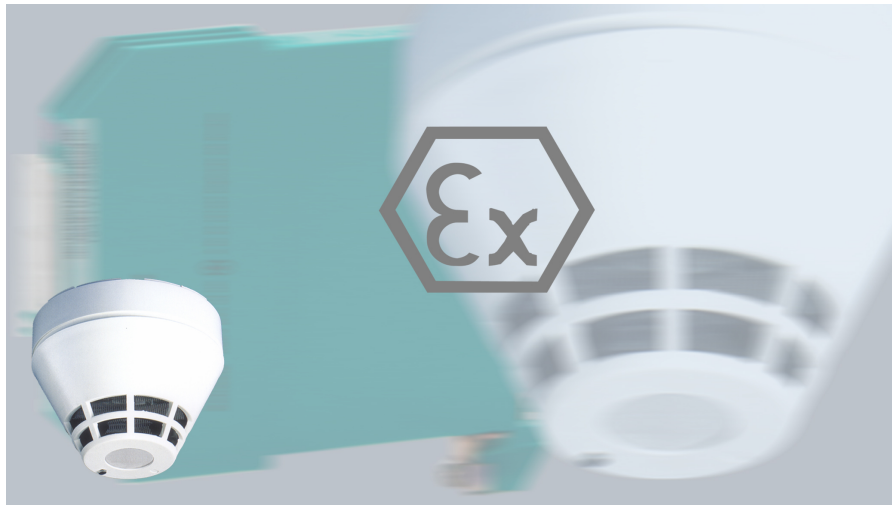
ESSER
by Honeywell

Installation and Operating Instruction

Automatic Fire Detectors Series 9100 Ex (i)



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Intended purpose

This product must only be used for the applications outlined in the catalogue and the technical description. Only connect third-party equipment or components recommended by Esser by Honeywell.

Warning

In order to ensure correct and safe operation of the product, all guidelines concerning its transport, storage, installation, and mounting must be observed. This includes the necessary care in operating the product.

Safety-relevant user information

This manual includes all information required for the proper use of the products described here.

The term 'qualified personnel' in the context of the safety information included in this manual or on the product itself designates:

- project engineers who are familiar with the safety guidelines concerning fire alarm and extinguishing systems
- trained service engineers who are familiar with the components of fire alarm and extinguishing systems and the information on their operation as included in this manual.
- trained installation or service personnel with the necessary qualification for carrying out repairs on fire alarm and extinguishing systems or who are authorised to operate, ground and label electrical circuits and/or safety equipment/systems.

Safety warnings

The following information is given in the interest of your personal safety and to prevent damage to the product described in this manual and all equipment connected to it.

Safety information and warnings for the prevention of dangers putting at risk the life and health of user and maintenance personnel as well as causing damage to the equipment itself are marked by the following pictograms. Within the context of this manual, these pictograms have the following meanings:

Danger of severe injury, death or considerable material damage if the relevant safety precautions are not observed.

Important information on the product or a particular section of this manual, which should be read with particular attention.

Dismantling

In accordance with Directive 2002/96/EG (WEEE), after being dismantled, electrical and electronic equipment is taken back by the manufacturer for proper disposal.

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Appendix

- Examination Certificate TÜV NORD
- Examination Certificate EECS
- Examination Certificate BASEEF
- Manufacturer's Declaration
- Examination Certificate BASEEFA

This list of certificates is an excerpt only and is not guaranteed to be either complete or exhaustive. The full list of certificates can be viewed on the manufacturer's website at *www.Pepperl-Fuchs.de*.

5 Standards and guidelines

The general technical rules must be observed when installing fire alarm systems. Any deviation from those rules is only admissible if the same degree of safety can be ensured with different means. Installations within the European Community are primarily subject to all EU regulations defining the current standards for security systems.

In Germany, systems are considered to be in compliance with the general technical rules or the standards of the EU for security systems if they meet the technical guidelines of the VDE (Verband Deutscher Elektrotechniker, Association of German Electrical Engineers). They may also be considered to be in compliance with the standards of the EU for security systems if they meet the technical guidelines of another comparable institution within the European Community which have been accepted in accordance with directive 73/23 EEC of the Council dd. 19 February 1973 – directive on low-voltage systems- (ABL. EG No. L 77 page 29).

These technical guidelines must be observed within the European Community. The VDE guidelines must be observed within Germany. In other countries (e.g. U.S.A.: NFPA and UL requirements), the relevant national standards, guidelines and legislation must be observed.

On 1 July 2003 new legislation came into force in Germany that significantly changes the legal situation for all workplaces where gases or dusts can create an explosive atmosphere. On this date the European directives ATEX 95 (94/9/EC) and ATEX 137 (1999/92/EC) were implemented in German law through the *Explosionsschutzverordnung* (ExVo, Explosion Protection Ordinance) and the *Betriebssicherheitsverordnung* (BetrSichV, Workplace Safety Ordinance).

These include, for example*:

- EN 1127-1 Explosive Atmospheres – Explosion Prevention and Protection
- DIN EN 60079-10 Classification VDE 0165 - 101 Electrical Apparatus for Explosive Gas Atmospheres, Classification of Hazardous Areas
- DIN EN 60079-17 Classification VDE 0165 -10 Electrical Apparatus for Explosive Gas Atmospheres, Inspection and Maintenance of Electrical Installations in Hazardous Areas with Explosive Gas Atmospheres

All the applicable national regulations and standards must also be observed.

* Provided as examples only, not guaranteed to be complete.

6 Automatic Fire Detector Series 9100 (PDM)

Purpose

Automatic fire detectors for use in explosive environments and for connection to the 8000 / **IQ8**Control Series fire alarm system.

Notes on the IP rating, installation and installation location

Achieving the targeted IP rating depends to a great extent on the proper installation of the automatic fire detector and the detector base. Both the detectors and the detector bases may only be installed in indoor locations.

Never install these units in outdoor locations – this is not permitted under any circumstances!

Proper installation is critical for safety. It is thus very important to ensure that the IP rating necessary for the installation location (environmental conditions) is achieved. [*1)].

The information on IP ratings in the specifications always applies to the entire assembly consisting of the detector base and the installed detector unit.

Always switch off the relevant detector zone's power when performing any installation or maintenance work on the fire detectors. Also ensure that the environmental conditions are suitable during installation and maintenance work (dry, clean, properly supervised).

Do not perform any work that could impair any protective functions relevant to safety!

In Zone 1 areas up to and including Explosive Class IIC T4, the intrinsically safe Ex class Series 9100 detectors may only be operated with the 764744 safety barrier, in accordance with the requirements for equipment category 2G.

Maximum length of the connected detector zone cable: 150m
(telecommunications cable IY (St) Y n x 2 x 0,8 mm).

[*1)] For example, EN 50020:2002 permits a rating of IP 20 for equipment in dry, clean and properly supervised environments.

The limits specified in the table below and the following instructions must be observed:

In the event of a malfunction the detector acts as a power source that feeds a current of max. 10mA into the intrinsically safe power circuit. The limit conditions caused by this increased current are taken into account in the table below.

Application II 2G	Ex class	Max. No. of Detectors	C_{omax}	L_{omax}
Series 9100 detectors with ATEX approval	IIC	9	248nF	0.032mH
		5	150nF	0.15mH
	IIB	17	1.52µF	0.8mH
	IIA	30	6.03µF	0.8mH

Conformity of cable parameters C_C and L_C must be checked with the cable manufacturer; use of standard values is no longer permitted.

The external effects of parameters Ci and Li for the detectors are so negligible that they can be ignored. Thus, only the cable parameters need to be considered. Taking the specifications listed in the table into account, conditions for intrinsic safety are satisfied when:

$$C_C \leq C_{omax} \text{ and } L_C \leq L_{omax}$$

Possible causes of false alarms

Smoke detectors — Visible airborne particles or vapour, e.g. cigarette smoke and steam, or dust deposits.

Heat detectors — Rapid and substantial temperature increases, e.g. caused by fan heaters or hot vapours in kitchens or generated by machines etc., or substantial temperature fluctuations within short periods.

Installation / detector base

The fire detectors are installed directly in the matching detector base units.

The following detector bases are approved:	Part No.
Standard detector base (without diagnostics and addressing functions)	781590
Detector base with addressing circuit board for individual addressing in Ex areas (without additional switching output for connection of an additional remote indicator)	781588

Maintenance

Device status and all detector functions are checked at regular intervals by the integrated diagnostics. The results are transferred to the control panel and any errors are displayed there when System 8000 / **IQ8**Control is in test mode. Optional service and diagnostics software is available for PC-based maintenance.

Before using the smoke detector test device Part No. 769870 or 805582 you must obtain the necessary permit from the operator. Take steps to ensure that no potentially explosive atmosphere can be present for the entire duration of the maintenance work. Only the approved test gas Part No. 769070 or 060430.10 for testing detector functioning.

The commencement and completion of the maintenance work must be documented.

Only use the prescribed safety barrier (Part No. 764744) with Ex type (i) detector zones.

The detector lock (Part No. 781496) is mandatory for fire detectors containing ionising material when they are used in the accessible close-up range.

Fire detectors containing radioactive material may only be installed and serviced by authorised personnel with the necessary permits and qualifications in conformance with the applicable national and/or local radioactivity protection regulations.

Technical data

General detector data

Examination Certificate No.	:	TÜV 03 ATEX 2326
Category	:	II 2G (with safety barrier 764744)
Ex protection	:	EEx ib IIC T4
Nominal voltage	:	9 V DC / 17 V DC, addressing voltage
Quiescent current (average)	:	ca. 45 µA
Alarm current	:	approx. 9 mA, pulsed
Ambient temperature	:	-20 °C to +70 °C
Storage temperature	:	-25 °C to +75 °C
Rel. humidity	:	≤ 95 % rel. humidity, (no condensation)
Protection rating	:	IP 40
with mounting plate	:	IP 42
With base adapter	:	IP 43
Material	:	ABS plastic
Colour	:	white, similar to RAL 9010
Weight	:	approx. 90 g
Dimensions	:	Ø 90 mm, H = 72 mm (with detector base)

Detector specification

Ionization smoke detector I-1061 Ex (Part No. 766060)

VdS approval	:	G 29214
Detector specification	:	EN 54 - 7
Design approval	:	NW 609/90
Radioactive source	:	Am 241≤ 5 kBq
Temperature range	:	-20 °C to +60 °C
Air velocity	:	≤ 1 m/s (shortly 5 m/s)
Area to be monitored	:	max. 120m²
Mounting hight	:	max. 12m
CE certificate	:	0786 - CPD - 20172

Rate-of-rise heat detecto TD-1261 Ex (Part No. 766061)

VdS approval	:	G 29215
Detector specification	:	EN 54 - 5 A1
Area to be monitored	:	max. 30m²
Mounting hight	:	max. 7,5m
CE certificate	:	0786 - CPD - 20101

Fixed heat detector TM-1161 Ex (Part No. 766062)

VdS approval	:	G 293008
Detector specification	:	EN 54 - 5 A1
Area to be monitored	:	max. 30m²
Mounting hight	:	max. 7,5m

Optical smoke detector O-1361 Ex (Part No. 766063)

VdS approval	:	G 29214
Detector specification	:	EN 54 - 7
Area to be monitored	:	max. 120m²
Mounting hight	:	max. 12m
CE certificate	:	0786 - CPD - 20100

OT-multisensor analog detector OT-1363 Ex (Part No. 766064)

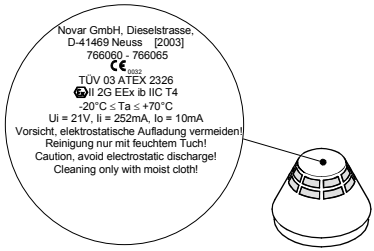
VdS approval	:	G 29214
Detector specification	:	EN 54 - 7
Area to be monitored	:	max. 120m²
Mounting hight	:	max. 12m
CE certificate	:	0786 - CPD - 20173

OTI-multisensor analog detector OTI-1963 Ex (Part No.766065)

VdS approval	:	G 29214
Detector specification	:	EN 54 - 7
Design approval	:	NW 609/90
Radioactive source	:	Am 241 ≤ 5 kBq
Air velocity	:	≤ 1 m/s (shortly 5 m/s)
Area to be monitored	:	max. 120m²
Mounting hight	:	max. 12m
CE certificate	:	0786 - CPD - 20174

All values based on a temperature of 25°C and a nominal voltage of 9 V.

Detector identification label according to ATEX (Example)



CE label according to the Construction Product Directive (CPD)

CE
0786

Novar GmbH, Dieselstraße 2, D-41469 Neuss
05
0786 - CPD - 20xxx

7 Detector Bases for Series 9100 Automatic Fire Detectors

Purpose

Detector base for use in Ex environments for installation of automatic Series 9100 fire detectors and for connection to the Series 8000 / **IQ8**Control fire alarm system.

Installation

The fire detectors are installed directly in the matching detector bases.

The following bases are approved for these detectors:	Part No.
Standard detector base (without diagnostics and addressing functionality)	781590
Detector base with addressing circuit board for individual addressing in Ex zones (without additional switching output for connection of an additional remote indicator)	781585

Base accessories

Installation plate for pre-installation of wiring, with water drip guard and clips	781495
Detector lock to prevent unauthorised removal of the detector The action of the drip guard is impaired when this is used in combination with installation plate (Part No. 781495)	781496
Flush-mount adapter for ceiling/suspended ceiling installation	781497
Surface-mount base adapter for cable glands or installation conduits	781498

Example: Imprint of the detector base identification

Novar GmbH, Dieselstrasse, D-41469 Neuss Seriennummer xxxx 781585	CE 0032 TÜV 03 ATEX 2326 II 2G EEx ib IIC T4 -20°C ≤ Ta ≤ +70°C Ui = 21V, Ii = 252mA, Io = 10mA	Vorsicht, elektrostatische Aufladung vermeiden! Reinigung nur mit feuchtem Tuch! Caution, avoid electrostatic discharge! Cleaning only with moist cloth!

If the optical smoke detectors of the 9000, 9100 and 9200 series are installed on closed suspended ceilings or on wall-to-wall ceilings (such as concrete ceilings) with the cables passed through conduits, the mounting plate (Part No. 781495) has to be used in addition. Ensure tight closure of the cable conduit, otherwise the response may be impaired by the air compensating current.

Technical data

Examination certificate no.	:	TÜV 03 ATEX 2326
VdS approval	:	G 203062
Ambient temperature	:	-20 °C to +70 °C
Storage temperature	:	-25 °C to +75 °C
Rel. humidity	:	≤ 95 % rel. humidity, (no condensation)
Protection rating	:	IP 40[*2]
with mounting plate	:	IP 42[*2]
with base adapter	:	IP 43[*2]
Material	:	ABS plastic
Colour	:	white, simsilar RAL 9010
Weight	:	approx. 60 g
Dimensions (without detector)	:	Ø 89 mm, H = 22 mm

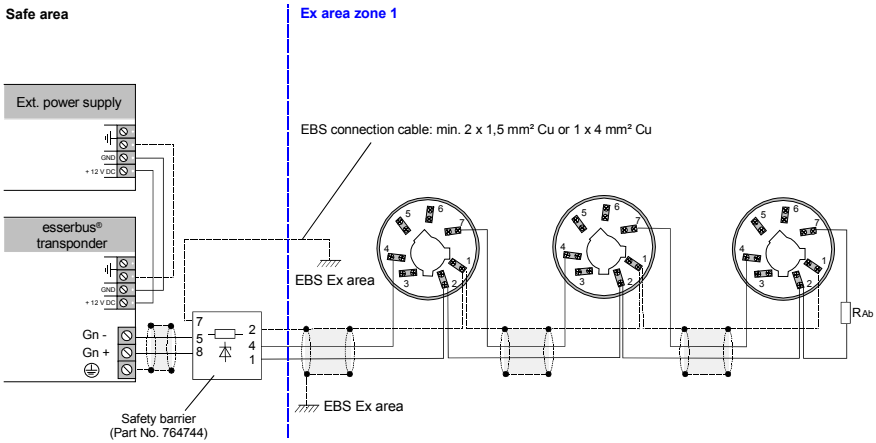
[*2)] The specified IP rating is always for the complete assembly, e.g. the detector base with the installed detector.

7.1 Wiring Example – Detector Base 781590

Ex (i) diagnostic fire detectors (Series 9100) can only be used with this standard detector base without individual addressing (the function is then the same as a standard Series 9000 detector). A esserbus® transponder for fire alarm systems (e.g. Part No. 808614) is required for connection to the Series 8000 / **IQ8**Control fire alarm system. The use of the EED module (Part No. 784381) is not permissible.

Installation of the safety barrier

The safety barrier (Part No. 764744) must be installed as close as possible to the Ex zone to be monitored (Zone 1), for example in a housing (Part No. 764752) or in another suitable location. The safety barrier earth must be connected to the equipotential bonding system (EBS) of the Ex zone.



Never connect the cable shielding in the safe area to the cable shielding in the Ex area!

Fig. 5: Connecting detector base (Part No. 781590) for Ex (i) detectors series 9100

Specifications for the terminating resistor (R_{Ab}) of the detector zone

Resistor	:	Terminating resistor 10KΩ ±5%
Type	:	Film resistor
Rating at 70°C	:	P_{70} min. 250mW
Thermal resistance	:	R_{Th} max. 300K/W

7.2 Wiring Example – Detector Base 781585

This special Detector base is required for operation of the Ex (i) diagnostic fire detector (Series 9100) in DFD mode. The use of the detector base on fire alarm systems 8000 / **IQ8**Control is not permissible. An addressing circuit board with DIP switches for setting the individual detector address is integrated in this detector base unit. Up to 30 different detector addresses can be configured, depending on the installation zone and the connection lines used (which in turn depend on the deployment location).

Installation of the safety barrier

The safety barrier (Part No. 764744) must be installed as close as possible to the Ex-area to be monitored (Zone 1), for example in a housing (Part No. 764752) or in another suitable location. The safety barrier earth must be connected to the equipotential bonding system (EBS) of the Ex area.

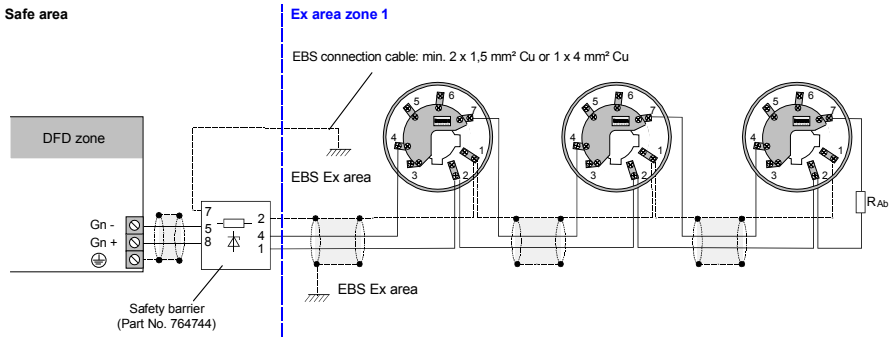
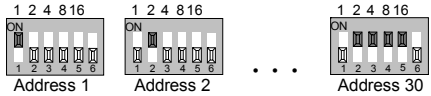


Fig. 6: Connecting detector base (Part No. 781585) with individual addressing of Ex (i) detectors series 9100

Example: Addressing



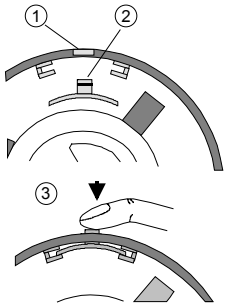
Do not change position DIP switch no. 6. Factory setting!

Specifications for the terminating resistor (R_{Ab}) of the detector zone

Resistor	:	Terminating resistor 10KΩ ±5%
Type	:	Film resistor
Rating at 70°C	:	P_{70} min. 250mW
Thermal resistance	:	R_{Th} max. 300K/W

Detector lock

A



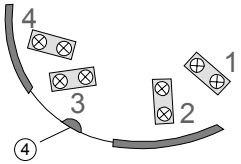
Installation of the detector lock

① Remove rupture joint from the detector housing

② Insert detector lock

③ Check for proper functioning

B



④ Remove rupture joint from the base housing

Insert the detector and check lock

The detector lock (Part No. 781496) is mandatory for fire detectors containing ionising material when they are mounted in the accessible close-up range.
Use of the detector removal tool is only possible without detector lock!

8 Safety Barriers for Automatic Fire Detectors Series 9100 Ex (i)

Purpose

The safety barrier (Part No. 764744) is used for installation of Ex (i) detector zones in combination with Series 9100 Ex (i) diagnostic fire detectors. The safety barrier separates inherently safe from non inherently safe circuits outside the explosive hazard area (Ex zone).

Depending on the connection lines used and the conditions in the Ex area of Zone 1, detector zones with up to max. 30 Ex diagnostics detectors can be connected to this safety barrier *(see Chapter 6)*.

Accessories	Part No.
Housing (IP 64) for max. 10 safety barriers Part No. 764744 incl. equipotential bonding system connection clips	764752
Cable gland (blue) for housing 764752	764754

Mounting

- Observe category, area and temperature classifications.
- Observe the limits for the maximum permitted number of detectors and the cable specifications (as listed in the table in *Chapter 6)*.
- Study and follow the installation and operating instructions for the automatic fire detector and the fire detector base.
- Check that the ambient temperature conditions are within range: -20 °C to + 60 °C for ionisation smoke detectors, -20 °C to +70 °C for all other detector types.
- The automatic fire detectors and fire detector bases may not be installed in areas with atmospheres containing benzene, acetic acid or esters as the ABS plastic of the housing is not resistant to these chemicals.
- The safety barrier must be connected to the equipotential bonding system (EBS) of the Ex zone. The connection cable used for this must conform to the requirements of the installation zone and the minimum requirements of standard VDE 0165 - 1:

Min. cable cross-section 2 x 1.5mm², Cu

or alternatively

Min. cable cross-section 1 x 4mm², Cu

- All earth potentials must be identical. An additional equipotential bonding conductor may be necessary.
- Take suitable steps to protect the system against electrostatic discharge.
- Observe that two-detector dependency mode is not supported by Series 91000 Ex (i) detectors.

Technical data

Examination Certificate No.	:	BAS 01 ATEX 7005
Specification	:	Z 969
Operating voltage	:	UN = 19,24 V
Complete internal resistance	:	Ri = 86,13 Ω
Max. Voltage Ex (i) circuit	:	U_0 = 19,24 V
Max. short circuit current Ex (i) circuit	:	I_0 = 224 mA
Max load Ex (i) circuit	:	P_0 = 1.08 W
Max. Capacity Ex (i) circuit	:	II C / Co = 250 nF
		II B / Co = 750 nF
		II A / Co = 2 µF
Max. Inductivity Ex (i) circuit	:	II C / Lo = 650 µH
		II B / Lo = 1.95 mH
		II A / Lo = 5.2 mH
Max. Voltage non- Ex (i) circuit	:	Um = 250 V
Fuse	:	80 mA
Min. protection rating for housing	:	IP 20 in accordance to IEC 144 or local requirements
Ambient temperature	:	- 20°C to + 60°C
Storage temperature	:	- 40°C to + 80°C
Weight	:	approx. 150 g
Dimensions (w x h x d)	:	12.5 x 110 x 115 (mm)

The specifications listed above corresponds to the denoted serial operation of the barrier channels (without connection of the detector to the earth potential).

This specification apply accordingly as well to the connection of a Zone 0 (Cat. 1G) device.
For the operation of the Ex–Fire detector the specification table on page 24 is mandatory.

Wiring diagram

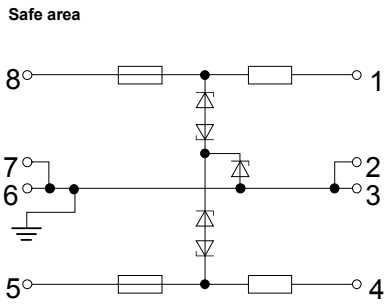


Fig. 7: Safety barrier (Part No. 764744)

Example

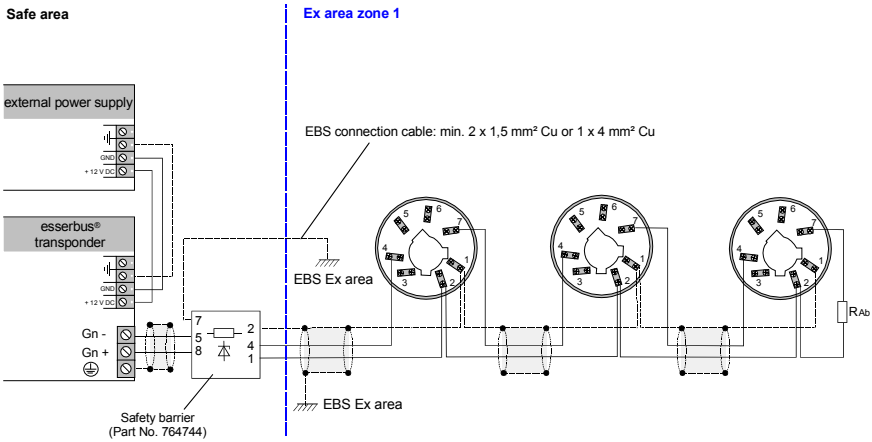


Fig. 8: Wiring safety barrier (Part No. 764744)

The esserbus® transponder for fire alarm systems is powered by a power supply unit that is electrically isolated from the fire alarm control panel.

Notes