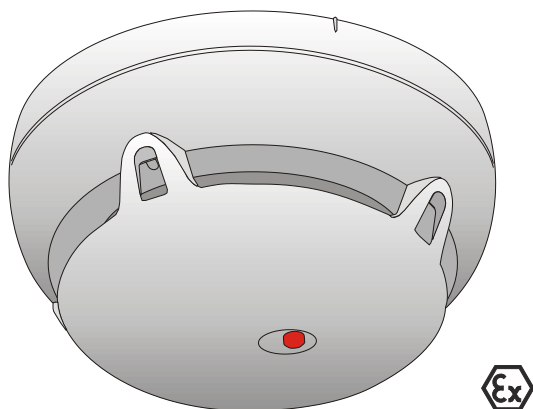


SIEMENS



OOH740-A9-Ex

Automatic fire detector

Technical Manual

Legal notice

Technical specifications and availability subject to change without notice.

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1 About this document

Retention and availability

	NOTICE
	Missing information Damage due to misuse <ul style="list-style-type: none"> This document must be available in a usable format throughout the entire life cycle of the product. Keep the document for reference and ensure that it can be accessed by target groups.

Should you require another copy of this document, please contact the Customer Support Center, phone +49 89 9221-8000.

Goal and purpose



This document contains all the information relating to the automatic fire detector OOH740-A9-Ex. Following the instructions consistently will ensure that the product can be used safely and without any problems.

This document is aimed at users who are planning, installing, commissioning, operating, and maintaining a fire detection installation FS720 or SIGMASYS with a line card (FDnet/C-NET) with addressed detector lines within the scope of Directive 94/9/EC (ATEX directive) or IECEx.

General knowledge about the structure and function of fire detection installations FS720 is required in order to understand the information.



The use of peripheral devices on collective detector lines in potentially explosive atmospheres is described in document 001204.
See chapter 'Applicable documents'.

	 WARNING
	Document A6V10324618 is an integral part of this document. You must observe the information in both this document and document A6V10324618!

Before installing the device, you must make yourself familiar with the content of document A6V10324618 'Planning, Mounting/Installation, Commissioning, Maintenance of fire detection installations with addressed detector lines in potentially explosive atmospheres'. You can download the current version of the document from the Internet, at the address <http://siemens.com/bt/download>.

Device labeling

Device type	OOH740-A9-Ex
Manufacturer	Siemens Switzerland Ltd. Infrastructure & Cities Sector Building Technologies Division International Headquarters Gubelstrasse 22 CH-6301 Zug Tel. +41 41 724-2424 www.siemens.com/buildingtechnologies
Year of construction	2014 or later
IECEx scheme	Ex ia IIC T4 Ga, Ta = -35...70 °C
Directive 94/9/EC (ATEX Directive)	II 1 G Ex ia IIC T4 Ga, Ta = -35...70 °C

When used in atmospheres at risk of gas explosion:

The automatic fire detector OOH740-A9-Ex must be protected against electrostatic charging, along with all its accessory parts.

Intended use

The automatic fire detector OOH740-A9-Ex may only be used as follows:

- On an C-NET-Ex detector line in a fire detection installation FS720 or in collective mode.
- On the detector line the automatic fire detector OOH740-A9-Ex must be installed downstream of a line adapter (Ex) approved in accordance with national and international regulations or a safety barrier.
 - For the C-NET-Ex detector line, this is line adapter (Ex) FDCL221-Ex.
 - For a collective detector line, these are safety barriers SB2 or SB3.



Please note the documents listed in the chapter 'Applicable documents'.

Target groups

The information in this document is intended for the following target groups:

Target group	Activity	Qualification
Product Manager	<ul style="list-style-type: none"> Is responsible for information passing between the manufacturer and regional company. Coordinates the flow of information between the individual groups of people involved in a project. 	<ul style="list-style-type: none"> Has obtained suitable specialist training for the function and for the products. Has attended the training courses for Product Managers.
Project Manager	<ul style="list-style-type: none"> Coordinates the deployment of all persons and resources involved in the project according to schedule. Provides the information required to run the project. 	<ul style="list-style-type: none"> Has obtained suitable specialist training for the function and for the products. Has attended the training courses for Project Managers.
Project engineer	<ul style="list-style-type: none"> Sets parameters for product depending on specific national and/or customer requirements. Checks operability and approves the product for commissioning at the place of installation. Is responsible for trouble-shooting. 	<ul style="list-style-type: none"> Has obtained suitable specialist training for the function and for the products. Has attended the training courses for Product Engineer.
Installation personnel	<ul style="list-style-type: none"> Assembles and installs the product components at the place of installation. Carries out a performance check following installation. 	<ul style="list-style-type: none"> Has received specialist training in the area of building installation technology or electrical installations.
Maintenance personnel	<ul style="list-style-type: none"> Carries out all maintenance work. Checks that the products are in perfect working order. Searches for and corrects malfunctions. 	<ul style="list-style-type: none"> Has obtained suitable specialist training for the function and for the products.

There are various tasks that may only be performed by qualified persons in accordance with the national implementation of Directive 2009/104/EC (e.g. in Germany: Section 2 (7) of the Ordinance on Industrial Safety and Health (BetrSichV)).

Source language and reference document

- The source/original language of this document is German (de).
- The reference version of this document is the international version in English. The international version is not localized.

Document identification

The document ID is structured as follows:

ID code	Examples
ID_ModificationIndex_Language_COUNTRY -- = multilingual or international	A6V10215123_a_de_DE A6V10215123_a_en_-- A6V10315123_a_--_--

Date format

The date format in the document corresponds to the recommendation of international standard ISO 8601 (format YYYY-MM-DD).

Conventions for text marking

Markups

Special markups are shown in this document as follows:

>	Requirement for a behavior instruction
1. 2.	Behavior instruction with at least two operation sequences
–	Version, option, or detailed information for a behavior instruction
⇒	Intermediate result of a behavior instruction
⇒	End result of a behavior instruction
●	Numbered lists and behavior instructions with an operation sequence
[→ X]	Reference to a page number
'Text'	Quotation, reproduced identically
<Key>	Identification of keys

Supplementary information and tips



The 'i' symbol identifies supplementary information and tips for an easier way of working.

See also

Applicable documents [→ 11]

1.1 Applicable documents

Document ID	Title
001204	Principles, applications, installation, maintenance Fire alarm signal in areas at risk of explosion
001227	Installation instructions Shunt Zener Diode SB2, SB3
001519	Installation instructions Input / output module DC1192
007228	Data Sheet Test equipment and accessories FDUD291, FDUD292, FDUD293, RE6, RE7T, RE8ST, RE8STCO, RE10, FDUM291, FDUM292, FDUL221, Sinteso-Test, FDUD29x-E
008250	Technical Manual Line tester FDUL221
009122	Technical manual Input/output module (transponder) FDCIO223
A6V10208532	Installation Sealing element FDBZ295
A6V10208546	Installation Detector base FDB20x/FDB201-AA, FDB22x/FDB221-AA, Base attachment FDB291, Detector designation plate FDBZ291, Dummy detector FDX291
A6V10208552	Installation Detector locking device FDBZ293
A6V10210416	FS720 Fire detection system - Commissioning, Maintenance, Troubleshooting
A6V10210424	FS720 Fire detection system - Configuration
A6V10260486	Installation Alarm indicators, adapter frame, surface-mounted housing, indicator housing, incl. washer FDAI92EX, FDAI93EX, AI330, DCA1191, DJZ1193
A6V10324618	Planning, Mounting/Installation, Commissioning, Maintenance of fire detection installations with addressed detector lines in potentially explosive atmospheres
A6V10331076	Installation Base attachment wet FDB295, Detector designation plate DBZ1193A, Protective cage DBZ1194, EMC-protective cage FDBZ294
A6V10333771	Technical Manual Line adapter (Ex) FDCL221-Ex
A6V10367523	Installation Automatic fire detector OOH740-A9-Ex
A6V10371417	Data sheet Automatic fire detector OOH740-A9-Ex
A6V10414910	Technical manual Zone module, external powered FDCI723
A6V10443621	Modernizing fire detection installations with multiple protocol detectors in potentially explosive atmospheres

Please also observe the documentation for your fire detection system.

1.2 Download center

You can download various types of documents, such as data sheets, installation instructions, and license texts via the following Internet address:

<http://siemens.com/bt/download>

- Enter the document ID in the 'Find by keyword' input box.



You will also find information about search variants and links to mobile applications (apps) for various systems on the home page.

1.3 Technical terms, abbreviations, and formula symbols

Term	Explanation
AI	Alarm indicator
ASA	Advanced Signal Analysis
ES	Product version
C-NET	Addressed detector line
C-NET-Ex	Addressed detector line in a potentially explosive atmosphere downstream of a line adapter (Ex) FDCL221-Ex
K-MK	Maximum current connection factor on a collective detector line
LED	Light-emitting diode

Symbol	Meaning
C_0	Maximum external capacity
C_c	Maximum permissible cable capacitance
C_i	Maximum internal capacity
I_0	Maximum output current
I_i	Maximum input current
L_0	Maximum external inductivity
L_c	Maximum permissible cable inductance
L_i	Maximum internal inductivity
P_0	Maximum output power
P_i	Maximum input power
R_c	Resistance of the connection cable
T_a	Ambient temperature in a potentially explosive atmosphere
U_i	Maximum input voltage
U_m	Maximum r.m.s. value of the alternating voltage. Maximum permissible voltage of an associated item of electrical equipment without canceling the energy limitation.
U_0	Maximum output voltage

You will find more technical terms in the glossary at the end of this document.



The symbols used correspond to the EN 60079-11 standard.

1.4 Revision history

The reference document's version applies to all languages into which the reference document is translated.



The first edition of a language version or a country variant may, for example, be version 'd' instead of 'a' if the reference document is already this version.

The table below shows this document's revision history:

Modification index	Edition date	Brief description
h	2015-02-02	Table listing published language versions corrected; base attachment wet FDB295 added as optional accessory; sealing element FDBZ295 added; IP protection category amended in 'Technical data' chapter; editorial changes
g	2014-07-22	Editorial changes
f	2014-05-08	Editorial changes
e	2014-02-04	Changes in chapter: parameter sets for addressed operation; editorial changes
d	2013-04-30	'Technical Ambient Supervision Alarm' added; editorial changes
c	2012-08-17	Labels adapted; Annex added
b	2012-06-15	Editorial changes
a	2012-05-11	First edition



The table below shows the published language versions with the corresponding modification index:

Modification index	en_--	de_--	fr_--	it_--	es_--
h	X	X	X	X	X
g	X	X	X	X	X
f	–	X	–	–	–
e	–	X	–	–	–
d	X	X	–	–	–
c	–	X	–	–	–
b	–	X	–	–	–
a	–	X	–	–	–

X = published

– = no publication with this modification index

2 Safety

	 WARNING
	Contradictory safety instructions Risk of explosion caused by disregarding safety instructions <ul style="list-style-type: none"> Should safety instructions relating to explosion protection contradict other safety instructions, please observe the safety instructions relating to explosion protection.

2.1 Safety instructions

The safety notices must be observed in order to protect people and property.

The safety notices in this document contain the following elements:

- Symbol for danger
- Signal word
- Nature and origin of the danger
- Consequences if the danger occurs
- Measures or prohibitions for danger avoidance

Symbol for danger



This is the symbol for danger. It warns of **risks of injury**.
Follow all measures identified by this symbol to avoid injury or death.

Additional danger symbols

These symbols indicate general dangers, the type of danger or possible consequences, measures and prohibitions, examples of which are shown in the following table:



General danger



Explosive atmosphere



Voltage/electric shock



Laser light



Battery



Heat



Signal word

The signal word classifies the danger as defined in the following table:

Signal word	Danger level
DANGER	DANGER identifies a dangerous situation, which will result directly in death or serious injury if you do not avoid this situation.
WARNING	WARNING identifies a dangerous situation, which may result in death or serious injury if you do not avoid this situation.
CAUTION	CAUTION identifies a dangerous situation, which could result in slight to moderately serious injury if you do not avoid this situation.
<i>NOTICE</i>	<i>NOTICE</i> identifies possible damage to property that may result from non-observance.


How risk of injury is presented

Information about the risk of injury is shown as follows:

	 WARNING
	Nature and origin of the danger Consequences if the danger occurs <ul style="list-style-type: none"> Measures / prohibitions for danger avoidance

How possible damage to property is presented

Information about possible damage to property is shown as follows:


	NOTICE
	Nature and origin of the danger Consequences if the danger occurs <ul style="list-style-type: none"> Measures / prohibitions for danger avoidance

2.2 Safety regulations for the method of operation

National standards, regulations and legislation

Siemens products are developed and produced in compliance with the relevant European and international safety standards. Should additional national or local safety standards or legislation concerning the planning, mounting, installation, operation or disposal of the product apply at the place of operation, then these must also be taken into account together with the safety regulations in the product documentation.


Electrical installations

	⚠ WARNING
	Electrical voltage Electric shock <ul style="list-style-type: none"> • Work on electrical installations may only be carried out by qualified electricians or by instructed persons working under the guidance and supervision of a qualified electrician, in accordance with the electrotechnical regulations.

- Wherever possible disconnect products from the power supply when carrying out commissioning, maintenance or repair work on them.
- Lock volt-free areas to prevent them being switched back on again by mistake.
- Label the connection terminals with external external voltage using a 'DANGER External voltage' sign.
- Route mains connections to products separately and fuse them with their own, clearly marked fuse.
- Fit an easily accessible disconnecting device in accordance with IEC 60950-1 outside the installation.
- Produce earthing as stated in local safety regulations.

Mounting, installation, commissioning and maintenance

- If you require tools such as a ladder, these must be safe and must be intended for the work in hand.
- When starting the fire control panel ensure that unstable conditions cannot arise.
- Ensure that all points listed in the 'Testing the product operability' section below are observed.
- You may only set controls to normal function when the product operability has been completely tested and the system has been handed over to the customer.

	⚠ WARNING
	Work carried out by personnel who are not qualified Risk of explosion <ul style="list-style-type: none"> • Work in potentially explosive areas may only be carried out by qualified specialists or by specially instructed persons, in accordance with the national and international directives and regulations.

- You must only mount, install, and test the devices if the atmosphere in the area is not at risk of explosion.

Testing the product operability

- Prevent the remote transmission from triggering erroneously.
- If testing building installations or activating devices from third-party companies, you must collaborate with the people appointed.
- The activation of fire control installations for test purposes must not cause injury to anyone or damage to the building installations. The following instructions must be observed:
- Use the correct potential for activation; this is generally the potential of the building installation.
- Only check controls up to the interface (relay with blocking option).
- Make sure that only the controls to be tested are activated.
- Inform people before testing the alarm devices and allow for possible panic responses.
- Inform people about any noise or mist which may be produced.
- Before testing the remote transmission, inform the corresponding alarm and fault signal receiving stations.

Modifications to the system design and the products

Modifications to the system and to individual products may lead to faults, malfunctioning and safety risks. Written confirmation must be obtained from Siemens and the corresponding safety bodies for modifications or additions. No changes may be made to devices with EC-type examination certificates.

Modules and spare parts

- Components and spare parts must comply with the technical specifications defined by Siemens. Only use products specified or recommended by Siemens.
- Only use fuses with the specified fuse characteristics.
- Wrong battery types and improper battery changing lead to a risk of explosion. Only use the same battery type or an equivalent battery type recommended by Siemens.
- Batteries must be disposed of in an environmentally friendly manner. Observe national guidelines and regulations.

Disregard of the safety regulations

Before they are delivered, Siemens products are tested to ensure they function correctly when used properly. Siemens disclaims all liability for damage or injuries caused by the incorrect application of the instructions or the disregard of danger warnings contained in the documentation. This applies in particular to the following damage:

- Personal injuries or damage to property caused by improper use and incorrect application
- Personal injuries or damage to property caused by disregarding safety instructions in the documentation or on the product
- Personal injury or damage to property caused by poor maintenance or lack of maintenance

Disclaimer

We have checked that the content of this document matches the hardware and software described. Despite this, we cannot rule out deviations and cannot therefore assume liability for them matching completely. The details in this document are checked regularly and any corrections needed included in subsequent editions.



We are grateful for any suggestions for improvement.

2.3 Standards and directives complied with

A list of the standards and directives complied with is available from your Siemens contact.

2.4 Release Notes

Limitations to the configuration or use of devices in a fire detection installation with a particular firmware version are possible.

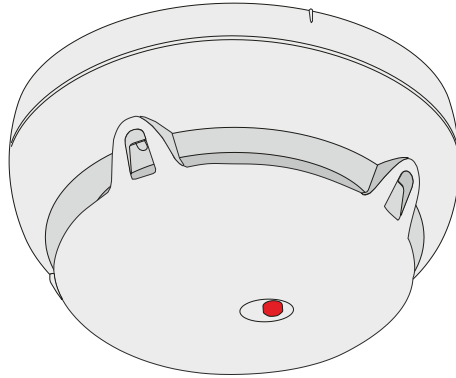
	<p>⚠ WARNING</p> <p>Limited or non-existent fire detection Personal injury and damage to property in the event of a fire.</p> <ul style="list-style-type: none"> • Read the 'Release Notes' before you plan and/or configure a fire detection installation. • Read the 'Release Notes' before you carry out a firmware update to a fire detection installation.
--	--

	<p>NOTICE</p> <p>Incorrect planning and/or configuration Important standards and specifications are not satisfied. Fire detection installation is not accepted for commissioning. Additional expense resulting from necessary new planning and/or configuration.</p> <ul style="list-style-type: none"> • Read the 'Release Notes' before you plan and/or configure a fire detection installation. • Read the 'Release Notes' before you carry out a firmware update to a fire detection installation.
--	---

3 Structure and function

3.1 Setup

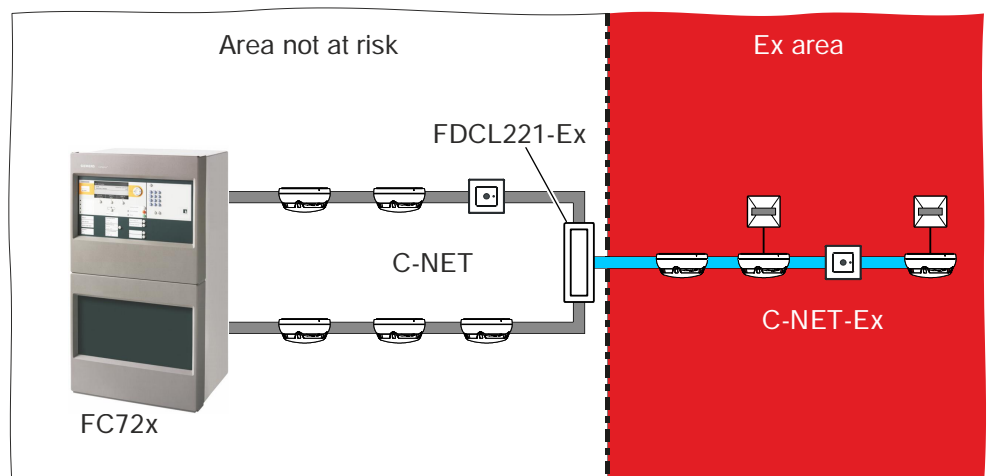
3.1.1 Point detector OOH740-A9-Ex with ASAtechnology



View of point detector OOH740-A9-Ex

Properties

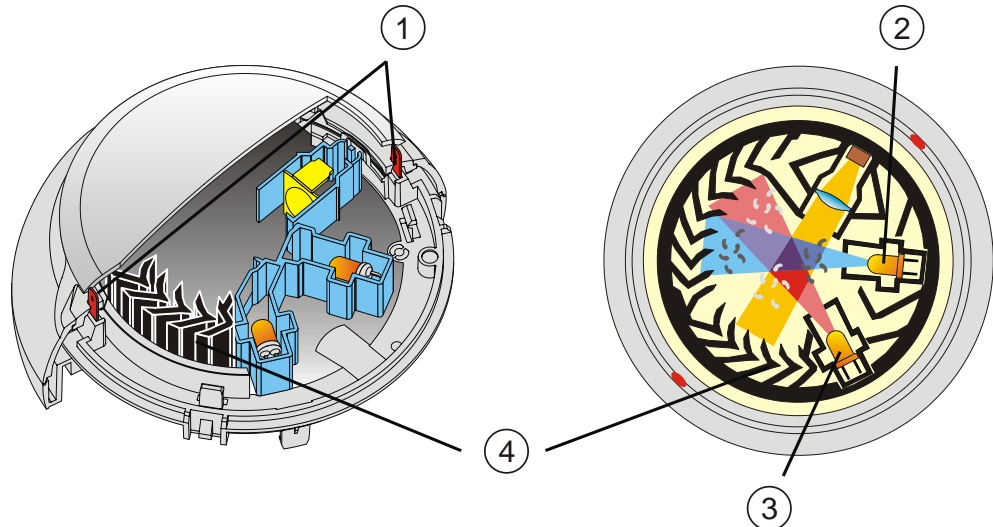
- Signal processing with *ASAtechnology*
- Can be used either addressed to the C-NET-Ex detector line or to collective Ex detector lines
- Can be set as neural fire detector, wide-spectrum smoke detector or heat detector on the software side
- Selectable detection behavior thanks to application-specific ASA parameter sets
- Adjustable monitoring of ambient temperature based on hysteresis. The configuration is set with the 'Cerberus-Engineering-Tool' software.
- Indication of the condition (alarm, localization or test) by means of a red LED
- Mounting on the C-NET-Ex downstream of a line adapter (Ex) FDCL221-Ex
- With collective detector lines, mounting downstream of an input/output module DC1192 or FDCIO223 or a zone module FDCI723 and a safety barrier SB2 or SB3



Use of several point detectors OOH740-A9-Ex on the C-NET-Ex downstream of a line adapter (Ex) FDCL221-Ex

Setup of the point detector

The point detector OOH740-A9-Ex has two optical and two thermal sensors.



1 Heat sensors

2 Backward scatterer

3 Forward scatterer

4 Labyrinth

The detector has a sophisticated opto-electronic measuring chamber with two optical transmitters, an optical receiver, and two thermal sensors.

The transmitters illuminate the smoke particles from different angles. One sensor acts as forward scatterer, the other as backward scatterer. The scattered light then hits the receiver (photodiode) and generates a measurable electric signal.

The combination of a forward and backward scatterer facilitates an optimum detection and the differentiation of light and dark particles, which leads to a homogenous response behavior and optimizes the differentiation of wanted signals and deceptive phenomena.

In addition, the heat sensors make it possible to detect fires without smoke generation.

The combination of optical and thermal sensor signals optimizes detection reliability. This has the following advantages:

- Early detection of all types of fire, whether they generate light or dark smoke, or no smoke at all.
- The multisensor fire detector can be operated at a lower sensitivity level and thus achieves a higher immunity against false alarms, which can be caused by cold aerosols (e.g., by smoking). In the case of an open fire, the smoke sensitivity is heightened by the temperature increase, which means that a detection reliability level that is comparable to that of the wide-spectrum smoke detector can be achieved.

The detector can also be used purely as an optical smoke detector or purely as a heat detector. This is determined by selecting one of the following sensor modes:

- Sensor mode 0: Application as neural fire detector
- Sensor mode 1: Application as heat detector
- Sensor mode 2: Application as smoke detector

See also

📄 Applicable documents [→ 11]

3.1.2 Features of fire detection functionality

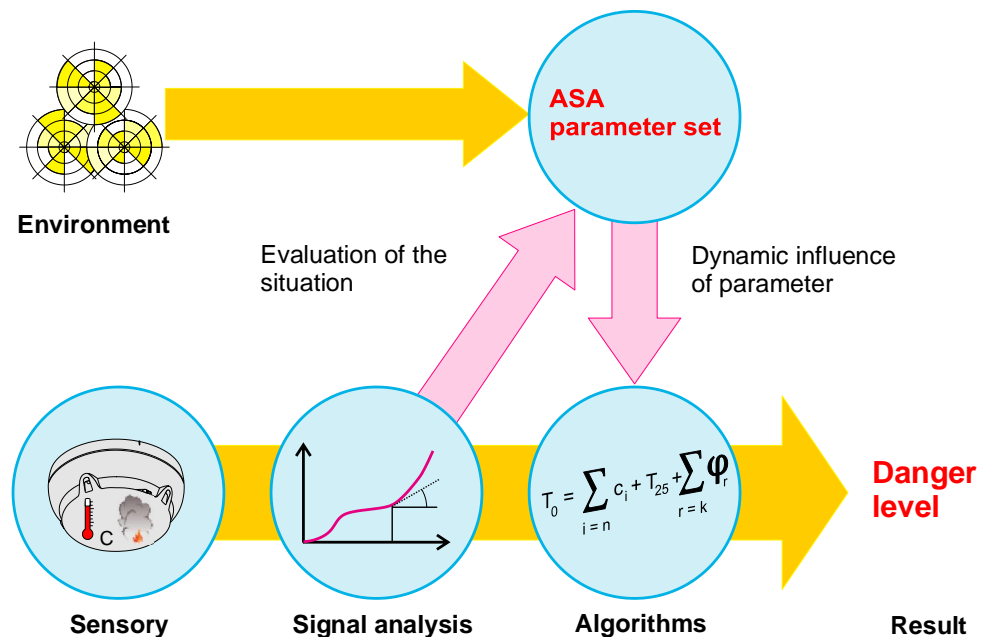
The point detector OOH740-A9-Ex has the following features in terms of its fire detection functions:

- Dynamic influence on the parameter sets
- Pattern recognition
- Real time interpretation of the situation
- Process- and time-controlled switchover of the parameter sets

Signal processing is based on ASAtchnology (ASA = Advanced Signal Analysis). ASAtchnology can also be characterized as second generation algorithms. Signal processing with ASAtchnology allows for optimum adaptation of detector behavior to the corresponding ambient conditions.

Operating mode: Signal processing with ASAtchnology

The figure below shows signal processing in the form of a diagram:



Signal processing with ASAtchnology

Sensory

The signals captured by the sensory are transmitted to the algorithm. The algorithms are set by selecting the parameter set.

Algorithms

In comparison to the detection algorithms (DA), the individual parameters of the selected parameter set can be adapted with ASAtchnology. A real time interpretation of the situation leads to a dynamic influence on the algorithm. The real time interpretation results in a broadening of the application range of the parameter set and thus of the detector. The detector reacts more sensitively in the event of fire, and more robustly in the event of deceptive phenomena.

Switching over the parameter set

In addition to selecting the parameter set, the point detectors with ASAt technology enable time- or process-controlled switching over of the parameter sets (Manned/Unmanned switchover). The time- or process-controlled switching over of parameter sets allows the detector to be used in places where the situation changes significantly on a regular basis (e.g. kitchens, production halls).

Parameter sets which can be loaded

The detectors have several permanently programmed parameter sets. For special applications new, additional parameter sets can be downloaded in the field (depending on the control panel).

3.1.3 Features of the 'Technical Ambient Supervision Message'



The 'Technical Ambient Supervision Message' cannot be configured on all fire control panels. Observe the information in the 'List of compatibility'.

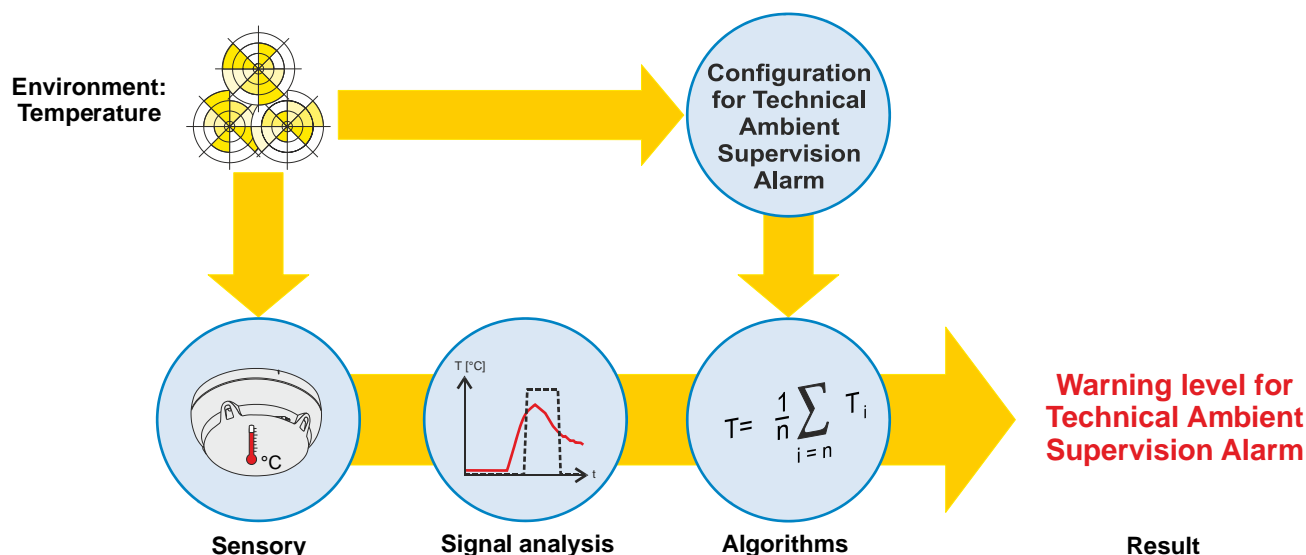
'Technical Ambient Supervision Message' mode detects an increase in temperature caused by hysteresis above a specified threshold.

Temperature monitoring compares the current measured temperature with a preset threshold value.


You can configure the following parameters for the point detector:

- Threshold value for temperature
- Alarming when the temperature threshold value is exceeded or undershot
- Hysteresis range

Parameter configuration is carried out using the software 'Cerberus-Engineering-Tool'.



Signal processing by the 'Technical Ambient Supervision Message'


	NOTICE
	<p>The system is not controlled as laid down in EN 54-2 Infringement of the EN 54-2 standard</p> <ul style="list-style-type: none">• The signals for temperature detection must not be used to control fire detection equipment in accordance with EN 54-2.

See also Technical Ambient Supervision Message [→ 42]

3.1.4 Details for ordering

Type	Order no.	Designation
OOH740-A9-Ex	S54329-F8-A1	Multisensor fire detector

3.1.5 Reference to technical manual

	<p>You will find this symbol on all devices designed for use in areas at risk of explosion. It indicates that you will find important information on using the device correctly in the technical manuals.</p> <p>Read and follow the instructions in the technical manual.</p>
---	--

3.1.6 Product version ES

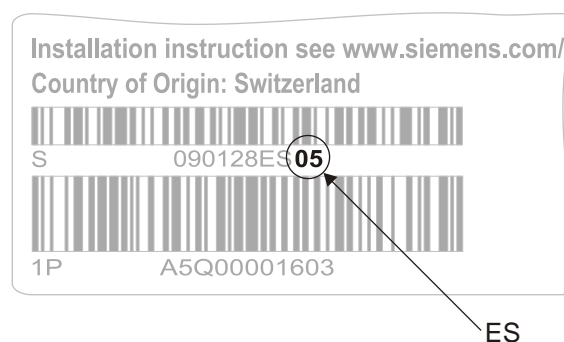
The product version ES provides the technical status of a device in terms of software and hardware. The product version is provided as a two-digit number.

You will find the details of your device's product version:

- On the packaging label
- On the product label or the type plate

Product version on the packaging label

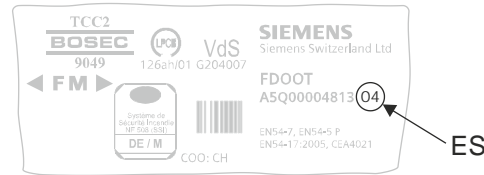
Details of the product version can be found directly on the packaging label in the barcode:



Example of a packaging label with details of the product version

Product version on the product label and the type plate

Details of the product version can be found after the device order number:



Example of a product label with details of the product version



Depending on the product and various approvals, the product labels may differ in terms of the information type and layout.

Look for your device's order number on the product label.

You will find the product version after the order number.

3.2 Function

3.2.1 Parameter sets

The detection behavior of the point detector is influenced by the parameter sets so that it can be specifically adjusted to the fire phenomena and environmental conditions expected in the environment to be monitored.

All parameter sets are programmed in the point detector. During commissioning, the optimum parameter set must be selected for the conditions at the place of installation.

You can select and set the parameter sets as follows:

When operating the point detector on an C-NET-Ex detector line:

- Using the 'Cerberus-Engineering-Tool' software
- Directly on your fire detection system

When operating the point detector on a collective detector line:

- With reference resistors installed in the detector base.

See also

Applicable documents [→ 11]

3.2.2 Danger levels

The detector's signal processing efficiently distinguishes between fire events and deceptive phenomena. The basis for reaching a danger level is not only given by measured values exceeding a "response threshold"; moreover, the smoke density progression is observed over a longer period of time and assessed by the algorithms.

The automatic fire detector OOH740-A9-Ex can transmit the following danger levels to the control panel:

Danger level	Meaning	Comment
0	No danger	Normal condition
1	Check the situation	A different parameter set should potentially be selected (inappropriate application)
2	Warning	Possible danger
3	Alarm	Fire

- The danger level evaluation and the decisions that are to be taken (e.g. activation of remote transmission) are configured in the control panel.
- On a collective line only the danger levels 0 and 3 can be transmitted to the control panel.

3.2.3 Diagnosis levels

The point detector monitors its operation largely autonomously. The signals of all sensors are permanently monitored.

The following components in particular should be monitored for correct functionality:

- Temperature sensors
- Light emitters
- Light receivers

Signal processing takes account of the monitoring results and adapts its behavior accordingly.

The following diagnosis levels are derived from the different control measurements:

- Normal
- Observe information
- Replacement recommended
- Replacement necessary
- Fault

When an error occurs which impairs the correct functionality of the device, a fault message is reported to the control panel.

3.2.4 Automatic recognition of the detector line protocol

The automatic fire detector OOH740-A9-Ex can communicate using various detector line protocols. The detectors recognize the protocol on the detector line (e.g. C-NET-Ex or collective) and automatically switch to the protocol in question. This functionality facilitates commissioning in case of modernization, as no actions need to be taken on the detector itself. For exceptions, see 'List of compatibility'.

3.2.5 Internal alarm indicator

The point detectors have a red LED that acts as an internal alarm indicator. The internal alarm indicator shows the operating condition of the point detector according to the tables below:

Addressed operation

Operating condition	Flashing mode of the AI
Alarm	AI flashes every second
Localization	AI flashes every second
Device test (with alarm)	AI flashes every second
Device test (without alarm)	No flashing (AI off)

Collective operation

Operating condition	Flashing mode of the AI
Alarm	AI flashes every second
Device test (with alarm)	AI flashes every second
Device test (without alarm)	Flashes in relation to parameter set

3.2.6 Connection for external alarm indicators


An external alarm indicator FDAI9x-Ex can be connected to the point detector OOH740-A9-Ex.

On the C-NET-Ex, it is possible to connect external alarm indicator to any point detector. The trigger for activating the alarm indicator can be programmed at the control panel.

3.2.7 Renovation mode

When operating point detectors on the C-NET-Ex, individual detectors can be set specifically to renovation mode on the control panel.

Select renovation mode if major work is being carried out in the room and large volumes of dust or aerosols are being produced.

	NOTICE
	Changed settings Limited alarm function in renovation mode <ul style="list-style-type: none"> In renovation mode, the multisensor fire detector only triggers an alarm when the temperature exceeds 80 °C for 20 seconds.

3.2.8 Test mode

For testing purposes the point detector OOH740-A9-Ex can be set to test mode. In test mode the point detector reacts faster and with a higher sensitivity level.

Physical testing:

- The optical function part can be tested with the test gas REF8 or REF8-S.
- The heat sensors can be tested with the following tools:
 - Hot air fan
 - Detector tester RE7T

3.2.9 Behavior in degraded mode

For the C-NET and a C-NET connected to the , the following applies:



When the main processor of the fire control panel fails, the control panel is in degraded mode operation. Depending on the control panel type, the fire control panel can continue to perform the most important alarming and signaling functions in degraded mode operation.

Behavior of control panels that support degraded mode operation:

Alarming is still ensured in degraded mode operation. However, in degraded mode only collective alarming is possible. This means that in the event of an alarm, it is possible to identify the C-NET detector line but not the exact location of the detector triggering the alarm.

Degraded mode operation on the C-NET is not supported in the same way by all control panels. The information in the 'List of compatibility' and in the corresponding control panel documentation must be taken into account during project planning.

3.2.10 Line tester

	 WARNING
	Using the line tester FDUL221 during commissioning Risk of explosion <ul style="list-style-type: none">• Only operate the line tester FDUL221 in the area that is not at risk of explosion.• If peripheral devices on an C-NET-Ex detector line are to be read into the line tester FDUL221, make sure there is a line adapter (Ex) FDCL221-Ex between the line tester and the peripheral devices.

The line tester FDUL221 is able to recognize and localize the following errors on the C-NET-Ex:

- Wiring error
- Open line
- Short-circuit

In addition, the line tester recognizes the devices connected to the C-NET-Ex detector line.

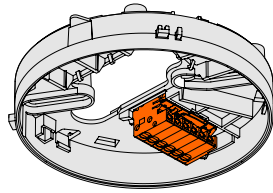
You will find more information in document 008250.

See also

 Applicable documents [→ 11]

3.3 Accessories

3.3.1 Addressable detector base FDB221

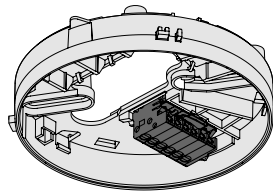


- For the mounting of point detectors
- For the recess-mounted cable entry
- For surface-mounted cable entry, up to 6 mm cable diameter
- Orange terminal block
- Order no. FDB221: A5Q00001664

See also

- 📄 Collective and addressable detector base FDB201/221
[→ 47]

3.3.2 Collective detector base FDB201

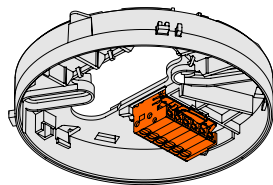


- For the mounting of point detectors
- For the recess-mounted cable entry
- For surface-mounted cable entry, up to 6 mm cable diameter
- Gray terminal block
- Order no. FDB201: A5Q00003814

See also

- 📄 Collective and addressable detector base FDB201/221
[→ 47]

3.3.3 Flat, addressable detector base FDB222

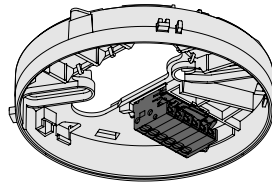


- For the mounting of point detectors
- For the recess-mounted cable entry
- Directly attached to the mounting surface
- Orange terminal block
- Order no.: S54319-F1-A1

See also

- 📄 Flat detector base FDB202/222 [→ 48]

3.3.4 Flat, collective detector base FDB222

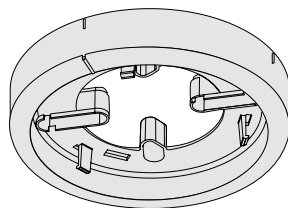


- For the mounting of point detectors
- For the recess-mounted cable entry
- Directly attached to the mounting surface
- Collective
- Gray terminal block
- Order no.: S54319-F3-A1

See also

Flat detector base FDB202/222 [→ 48]

3.3.5 Base attachment FDB291

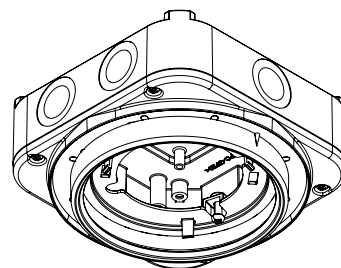


- For the surface-mounted cable entry, as of 6 mm cable diameter
- Compatible with:
 - Detector base FDB2xx/-AA
- Order no.: A5Q00001603

See also

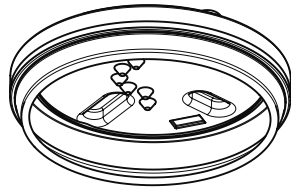
Base attachment FDB291 [→ 49]

3.3.6 Base attachment wet FDB295



- For mounting in humid or wet environments
- Six break-out points for M20 x 1.5 metal cable glands
- Compatible with:
 - Detector base FDB201/FDB221
 - Flat detector base FDB222
 - Designation plate DBZ1193A
 - M20 x 1.5 metal cable gland
- Order no.: S54319-F21-A1

3.3.7 Sealing element FDBZ295

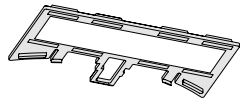


- To protect a point detector against dirt and splash water
- Cannot be used in conjunction with designation plate FDBZ291
- A detector base FDB2x1/FDB2x1-AA must be used in addition to the point detector
- Compatible with:
 - Automatic fire detector FDOOT241-A9-Ex
 - Automatic fire detector OOH740-A9-Ex
- Order no.: S54319-F10-A1

See also

 Sealing element FDBZ295 [→ 50]

3.3.8 Designation plate FDBZ291

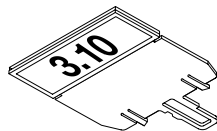


- To identify the location
- Compatible with:
 - Detector base FDB2xx/-AA
 - Base attachment FDB291
- Order no.: A5Q00002621

See also

 Designation plate FDBZ291 [→ 52]

3.3.9 Designation plate DBZ1193A

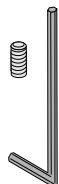


- To identify the location
- Compatible with:
 - Base attachment humid FDB293
 - Base attachment wet FDB295
- Order no.: BPZ:4864330001

See also

 Designation plate DBZ1193A [→ 52]

3.3.10 Detector locking device FDBZ293

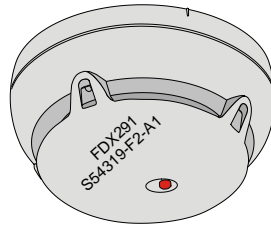


- To protect the point detector OOH740-A9-Ex against theft
- Order no.: A5Q00005035

See also

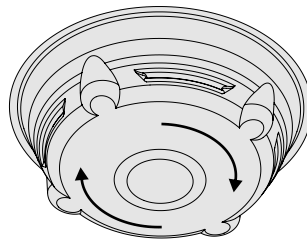
 Detector locking device FDBZ293 [→ 51]

3.3.11 Dummy detector FDX291




- To protect the detector base from dirt
- External labelling for identification
- Does not open the contact in the detector base
- Order no.: S54319-F2-A1

3.3.12 Detector dust cap FDZ291

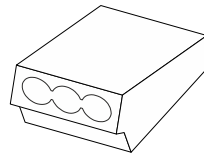


- To protect the point detector OOH740-A9-Ex from dust
- Order no.: A5Q00004814

See also

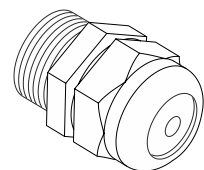
 Detector dust cap FDZ291 [→ 53]

3.3.13 Connection terminal DBZ1190-AB



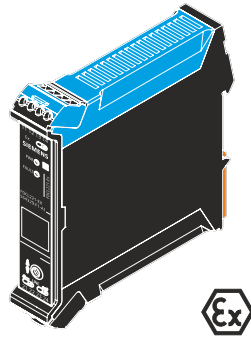
- Auxiliary terminal for connecting cables
- For T-branches of additional cabling
- For wire diameters of 1...2.5 mm²
- 3 poles
- Order no.: BPZ:4942340001

3.3.14 M20 x 1.5 metal cable gland



- For introducing a cable into the following devices:
 - Base attachment humid FDB293
 - Base attachment wet FDB295
 - Manual call point FDM223-Ex
- For cable diameters of 3.5...5.5 mm
- Temperature range: -40...+100 °C
- Allows for increased IP protection
- Order no.: A5Q00004478

3.3.15 Line adapter (Ex) FDCL221-Ex



- For operating peripheral devices on the C-NET-Ex in areas at risk of explosion
- Electrical isolation of detector lines in an area at risk of explosion from detector lines in an area not at risk of explosion
- Mounting on a U-rail TS35 or in a separate housing
- For details, see document A6V10333771
- Order no.: S54329-F4-A1

4 Planning

4.1 Compatibility

Compatible with control panels that support the C-NET-Ex detector line.

Additionally, the point detector OOH740-A9-Ex can be operated on a collective detector line.

The table below shows the compatibility of the point detector with various control panels:

Detector line	Control panel			
	FC20xx	FC72x	SIGMASYS	AlgoRex
C-NET-Ex	–	X	–	–

X = compatible

– = not compatible

You will find details in the 'List of compatibility'.



Note the information provided in document 001204 when using the detector in collective mode.

See also

Applicable documents [→ 11]

4.2 Ambient features

In selecting the optimum parameter set, the following factors must be taken into account:

- Risk of injury to persons
- Concentration of valuable items
- Room geometry
- Deceptive phenomena
- Risk of fire
- Critical fire size

Risk of injury to persons

People's lives are severely at risk in venues such as concert halls, nursing homes, and hospitals. The risk of injury to persons is therefore very high in such places. In canteen kitchens the situation is different. Few people work in such facilities and are able to save themselves in the event of timely alarms. The risk of injury to persons is thus rather low in this case.

Concentration of valuable items

Irreplaceable cultural assets are often on display in museums. Computer centers house servers with large data volumes. The concentration of valuable items is rather high. In a normal hotel room the concentration of valuable items must be classified as low.

Room geometry

High ceilings, complex room shapes or well ventilated rooms have a complex room geometry. This aggravates early fire detection, as it is difficult for the fire phenomenon to reach the fire detector. An office room with normal ceiling height has a simple room geometry.

Deceptive phenomena

Deceptive phenomena can deceive a fire detector and bring about a false alarm. The deceptive phenomena differ depending on the fire detector. Examples of deceptive phenomena include steam, cigarette smoke, dust, dry ice in discotheques, exhaust fumes, aerosols occurring during welding, and heat sources such as radiant heaters or hot engines.

In a small hotel room with a rather low ceiling where vapor from the bathroom may penetrate the room, or in operating facilities where a lot of dust is generated, many deceptive phenomena must be taken into consideration. In a clean room where electronic modules are fabricated the risk of deceptive phenomena is rather low.

Risk of fire

In production facilities where highly combustible materials such as flammable liquids, cotton, paper etc. are processed and where electrical machines are operated, the risk of fire is very high. Minor overheating or sparks may cause a fire. In a storehouse where steel is stored and where no electrical installation is provided with the exception of lighting, the risk of fire is very low.

Critical fire size

When a waste paper basket in a metal-processing facility catches fire, the consequential damage is usually rather low. Here we are talking about a critical, medium fire size that can still be tolerated. The situation is completely different in pharmaceutical production facilities where even the lowest smoke concentration may impair the process and where combustible materials are processed. Even the smallest fire must be detected immediately. Therefore, we need to define what is termed a small admissible critical fire size.

4.3 Parameter sets for addressed operation

4.3.1 Sensor mode 0 – Multisensor fire detector

4.3.1.1 Description

(Parameter set numbers in brackets)

High Suppression (8):

To cover applications with permanent, optical deceptive phenomena (dry ice in discotheques, welding), this parameter set only reacts when a temperature rise of approx. 8 K is detected in addition to the optical signal. Due to the combination of optical and thermal signals, it is better suited than a pure heat detector. This parameter set is also suited for applications that can otherwise only be covered with special detectors.

Suppression (5):

Thanks to its very robust behavior, the 'Suppression' parameter set is particularly suitable for rooms where deceptive phenomena such as cigarette smoke or exhaust fumes can be expected. It reacts in a very robust way to the deceptive phenomenon vapor.

High Compensation (7):

This parameter set reacts in the same way as the 'Robust' parameter set; however, the compensation range is twice as large. This parameter set is thus especially suited for rooms in which a lot of dust and other deposits can be expected during longer periods.

Robust (2):

The priority of the 'Robust' parameter set is to a robust response. The sensitivity is the same as with the 'Suppression' parameter set; however, deceptive phenomena are not explicitly analyzed and suppressed. It is thus particularly suited to application in rooms where deceptive phenomena such as cigarette smoke or dust can be expected. The 'Robust (2)' parameter set is suitable for higher rooms in comparison to the 'Suppression (5)' parameter set.

Default (0):

If no parameter set is selected, the point detector automatically uses a preset parameter set. In the case of the point detector OOH740-A9-Ex, this is the parameter set 'High Compensation (7)'.

Balanced (4):

The 'Balanced' parameter set reveals a balanced response behavior regarding reaction to fires and robustness to deceptive phenomena. It reacts faster with open fires. It reacts slower with vapor, cigarette smoke or smoldering fires.

Fast Response (6):

This parameter set reacts in a fast and highly sensitive manner. It is thus especially suitable for rooms without deceptive phenomena, where the priority is on detecting the fire as early as possible.

High Sensitive Fast (9):

This parameter set is suited for applications requiring very high sensitivity levels. It reveals a significantly higher optical and thermal sensitivity than 'Fast Response'. This parameter set is also suited for applications that can otherwise only be covered with special detectors.

Download 1 (14) / download 2 (15):

Application-specific parameter sets that can be loaded on site (depending on the control panel).

4.3.1.2 Use

No.	Name	Risk of injury to persons	Concentration of valuable items	Room geometry	Deceptive phenomena	Risk of fire	Critical fire size
		small ... large	low ... high	simple ... complex	few ... many	small ... large	small ... medium
8	High Suppression						
5	Suppression						
0 and 7	High Compensation						
2	Robust						
4	Balanced						
6	Fast Response						
9	High Sensitive Fast						



The 'High Suppression' and 'High Sensitive Fast' parameter sets are only suited for special applications.

4.3.1.3 Specification

The following table shows the properties of the parameter sets for the point detector in sensor mode 0:

No.	Name	Optical			Thermal		
		Typ. Response time from - typ. - to	Sensitivity, open fire	Sensitivity, smoldering fire	Static activation temperature	Differential activation temperature ²	Differential activation possible from:
		[s]	[%/m]	[%/m]	[°C]	ΔT [K]	[°C]
8	High Suppression	60 - 80 - 360	2.3	8	80	25	30
5	Suppression	90 - 160 - 760	3.2	11.4	80	29	30
7 and 0 ¹	High Compensation	80	3.2	11.4	80	29	30
2	Robust	80	3.2	11.4	80	29	30
4	Balanced	40 - 64 - 300	2.3	8	80	25	30
6	Fast Response	20 - 30	1.6	5.6	80	22	3
9	High Sensitive Fast	20 - 30	0.8	2.8	60	16	3
14	Application-specific parameter sets						
15							

¹ Default parameter set

² Applicable with fast temperature increases >10 K/min.



All parameter sets except for 8, 14, and 15 comply with standards EN 54-7 and CEA 4021.

4.3.2 Sensor mode 1 – Heat detector

4.3.2.1 Description

This sensor mode is especially suited for applications where the point detector should only respond thermally.

No.	Parameter set
0 ¹ and 1	A1R
2	BR
3	A1S
4	BS
14 ²	Download 1
15 ²	Download 2

¹ Default parameter set

² Application-specific parameter sets that can be loaded on site (depending on the control panel)

Notes on the designations A1 and B

- A1 parameter sets should be operated at a room temperature of around 25 °C. However, they can be applied at temperatures up to 50 °C. The static response temperature is 60 °C.
- B parameter sets are normally operated at around 40 °C. They can however be used at up to 65 °C. The static response temperature is 80 °C.

Notes on the designations R and S

Compared with S parameter sets, R parameter sets also trigger an alarm when the temperature increases (e.g. from 20 °C to 50 °C within a few minutes).

4.3.2.2 Specification

No.	Name	Operating temperature typ. / max.	Static activation temperature ¹	Differential activation temperature ²	Differential activation possible from:
		[°C]	[°C]	ΔT [K]	[°C]
1	A1R 60 °C rate of rise	25 / 50	60	25	3
2	BR 80 °C rate of rise	40 / 65	80	29	30
3	A1S 60 °C maximum	25 / 50	60	–	–
4	BS 80 °C Maximum	40 / 65	80	–	–
14	Application-specific parameter sets				
15					

¹ Applicable with slow temperature increases <1 K/min.

² Applicable with fast temperature increases of >10 K/min. When there is a slow temperature increase of <10 K/min, this value rises by a few degrees.



All parameter sets apart from 14 and 15 comply with standard EN 54-5.

4.3.3 Sensor mode 2 – Smoke detector

4.3.3.1 Description

This sensor mode should be selected if fast temperature changes that are not caused by fire may occur (e.g. in the case of radiant heaters, hot engines). In this sensor mode the detector only reacts optically; this is comparable with a wide-spectrum smoke detector. Thanks to a second optical sensor, however, it reveals a balanced response behavior in relation to the different types of fire.

Universal (1):

With 'Universal' the sensitivity and response time to aerosols are between 'Robust' and 'Sensitive'.

Robust (2):

This parameter set responds to aerosols in a similar way as the parameter set 'Robust' in sensor mode 0, without taking the temperature into account.

Sensitive (3):

With regard to aerosols, this parameter set reacts in a way that is comparable to 'Fast Response' in sensor mode 0 without temperature influence.

4.3.3.2 Specification

No.	Name	Response time [s]	Sensitivity open fire/smoldering fire [%/m]
0 ¹ and 1	Universal	50	2.3 / 8
2	Robust	64	2.3 / 8
3	Sensitive	30	1.6 / 5.6

¹ Default parameter set



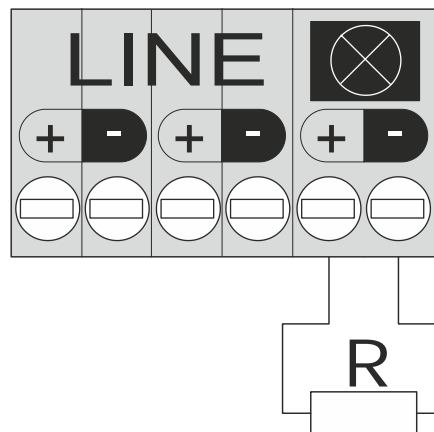
All parameter sets meet the criteria of standard EN 54-7.

4.4 Parameter sets for collective operation

In collective operation, the following parameter sets can be selected in the point detector:

- Sensitive, DOO emulation
- A1R, DT emulation
- BR, DT emulation

A parameter set is selected by omitting or installing a resistor with a specified value from/at the connection terminals for the external alarm indicator in the detector base.



Resistor at terminals for connecting an external alarm indicator

When the detector line is being commissioned, the LED for the internal alarm indicator in the point detector flashes for a period of 3 minutes to show the set parameter set.

The following table provides an overview of the resistances with which a specific parameter set can be set:

Parameter set	Resistance value R	Flashing pattern of internal alarm indicator after commissioning
Sensitive, DOO emulation	∞ (no resistor installed)	Once every 6 s
A1R, DT emulation	18 k Ω , min. 200 mW	Twice every 6 s
BR, DT emulation	10 k Ω , min. 200 mW	Three times every 8 s

4.4.1 Replacing existing AlgoRex point detectors

The point detector OOH740-A9-Ex can replace a range of point detectors from the AlgoRex range. The following table provides an overview of which parameter set needs to be set in order to replace a particular detector type.

Point detector to be replaced	Parameter set to be selected	Required resistance
DO1101A-Ex	Sensitive, DOO emulation	∞ (no resistor installed)
DT1101A-Ex	A1R, DT emulation	18 k Ω
DT1102A-Ex	BR, DT emulation	10 k Ω

4.5 Default settings

The detector operates in the default parameter set as long as the control panel has not assigned a valid parameter set to the detector.

The following table shows the default parameter set for the point detector OOH740-A9-Ex in the various sensor modes:

Fire detector	Default parameter set
OOH740-A9-Ex in C-NET-Ex operation mode	High Compensation
OOH740-A9-Ex in collective operation (no resistor installed in detector base)	Sensitive, DOO emulation

Upon commissioning of the fire detection system, the optimum parameter set must be selected based on the existing risk and the ambient conditions. See chapters 'Parameter sets for addressed operation [→ 35]' and 'Parameter sets for collective operation [→ 41]'.

If the point detector is operated on the C-NET-Ex (addressed), it is automatically set to the basic setting for the country in question when the control panel is started up for the first time. Individual adaptation takes place using the commissioning software on the corresponding control panel.

If the point detector is operated in collective operation, it operates with the default setting when it is first commissioned. In this operating mode, the detector behavior is adapted on an individual basis by installing configuration resistors in the detector base.

In collective operation, the selected parameter set is displayed for 3 minutes when the detector line is started up and when it is reset, by means of the LED for the internal alarm indicator flashing.



You will find information on the default settings in 'Technical Ambient Supervision Alarm' mode in chapter 'Default settings for the 'Technical Ambient Supervision Message'.

See also

- Default settings for the 'Technical Ambient Supervision Message' [→ 44]

4.6 Technical Ambient Supervision Message

	NOTICE
	<p>The system is not controlled as laid down in EN 54-2 Infringement of the EN 54-2 standard</p> <ul style="list-style-type: none"> The signals for temperature detection must not be used to control fire detection equipment in accordance with EN 54-2.



The 'Technical Ambient Supervision Message' cannot be configured on all fire control panels. Observe the information in the 'List of compatibility'.

4.6.1 Ambient conditions

In markets where the use of the 'Technical Ambient Supervision Message' is permitted, the point detector can be positioned above or near objects which require the ambient temperature to be monitored in order to prevent damage.

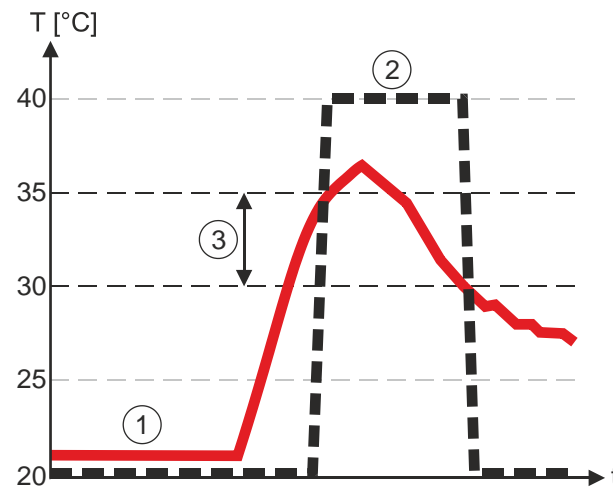
'Technical Ambient Supervision Message' mode detects an increase or decrease in temperature.

You can set the following parameters using the 'Cerberus-Engineering-Tool' software:

- Threshold value in the range of -20...+70 °C
- Alarming when the temperature threshold value is exceeded or undershot
- Hysteresis

You will find more detailed information in the fire detection system documentation.

Example of temperature monitoring caused by hysteresis:



Ambient supervision message/output signal when the ambient temperature threshold value of 35 °C is exceeded and a hysteresis of 5 °C is selected

- | | |
|---------------------------|--------------|
| 1 Temperature progression | 3 Hysteresis |
| 2 Message/output signal | |

When an ambient temperature of 35 °C is reached, the point detector sends a message to the control panel. As long as the hysteresis is not undershot, the message is sent.

In the example shown, the message is no longer sent once the ambient temperature of 30 °C (threshold value minus hysteresis) is undershot.

4.6.1.1 Temperature monitoring

Temperature monitoring compares the current measured temperature with a preset threshold value.

You can select the following comparisons:

- **Temperature exceeded:** Alarming takes place when the measured temperature exceeds the set threshold value.
- **Temperature undershot:** Alarming takes place when the measured temperature undershoots the set threshold value.

The threshold value can be selected within the permissible ambient temperature.


You will find specifications for the permissible ambient temperature in chapter 'General (irrespective of the detector line)'.

Hysteresis ranges

You can set two hysteresis ranges:

- Normal hysteresis range with a range of 1 °C.
- Large hysteresis range with a range of 5 °C.

See also

 General (irrespective of the detector line) [→ 62]

4.6.2 Configuration

You can configure the point detector as follows:

Adjustable values	Notes
Normal hysteresis range	Hysteresis range of 1 °C
Large hysteresis range	Hysteresis range of 5 °C
Temperature [°C]	Permissible temperature range: -20...+70 °C Adjustable increment: 1 °C
Temperature undershot/ temperature exceeded	Selects whether the message should be sent when the set threshold value is undershot or exceeded.


4.6.3 Default settings for the 'Technical Ambient Supervision Message'

When the point detector is delivered, the 'Technical Ambient Supervision Message' mode is switched off.

You can switch on and configure the 'Technical Ambient Supervision Message' using the 'Cerberus-Engineering-Tool' software.

You will find more detailed information in the fire detection system documentation.

5 Mounting/Installation

	<p>⚠ WARNING</p>
	<p>Electrostatic charging when installing devices in an area at risk of explosion</p> <p>Risk of explosion</p> <ul style="list-style-type: none"> • Only install devices if the atmosphere in the mounting area is not at risk of explosion. • Observe the relevant regulations and recommendations for installing devices in areas at risk of explosion.

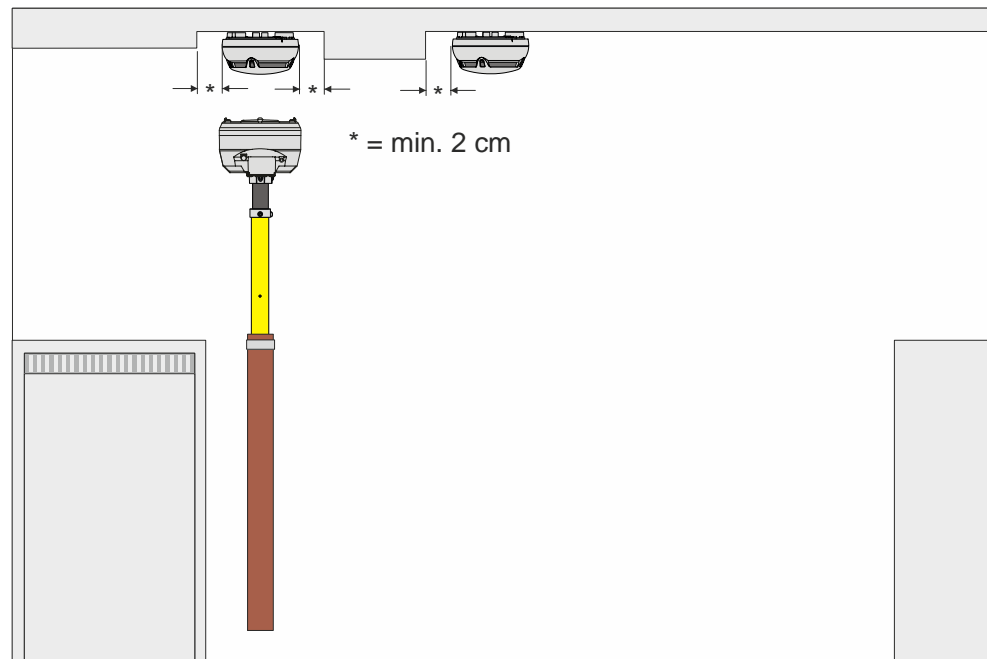


Peripheral devices approved in accordance with Directive 94/9/EC (ATEX directive) may only be commissioned on a test basis in such a way that internal components required for explosion protection are not damaged in a way that goes unnoticed. Therefore, it is only permitted to operate C-NET-Ex peripheral devices in conjunction with a line adapter (Ex) FDCL221-Ex.

It is only permitted to operate peripheral devices on a collective detector line in a potentially explosive atmosphere with a safety barrier SB2 or SB3.

5.1 Required space

- Upon insertion of the detector, the detector base is stressed by compression, tension and torsion. The fixing must thus be designed accordingly.
- Detector bases must be placed flat on the ceiling.
- Avoid mounting on steps, concrete ribs, etc.
- Install the detector base directly on the recessed box, or together with a base attachment, when the supply lead is surface-mounted and the cable diameter is more than 6 mm.
- There must be at least 50 cm of free space below and at least 2 cm to the sides of the detector, so that the detector can be removed with the detector exchanger.
- Contorted detector bases complicate or even impede the insertion of the detectors with the detector exchanger.



Minimum spacing when installing detector bases



⚠ WARNING

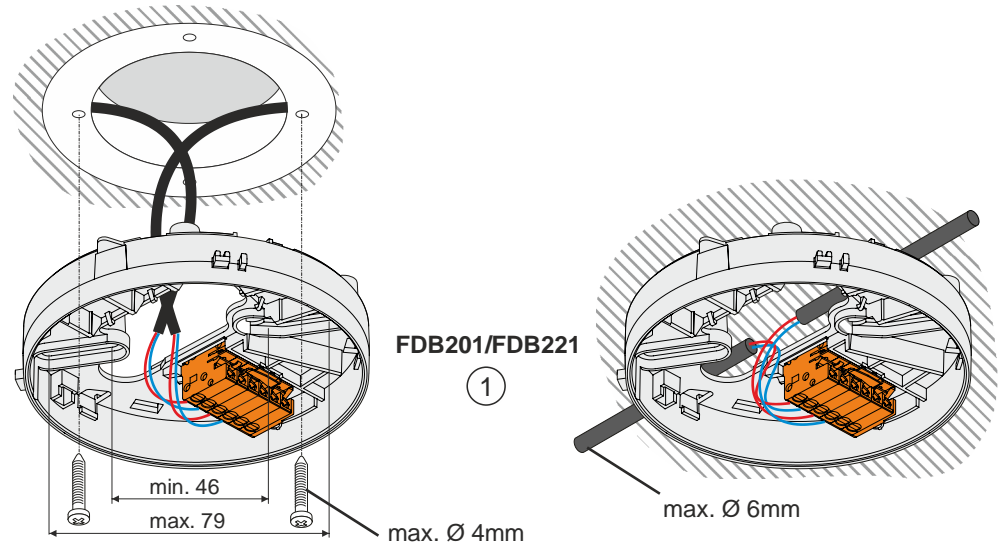
Using non-intrinsically safe devices in areas at risk of explosion

Risk of explosion

- Do not use the detector exchanger and tester FDUD292 or the intelligent detector tester FDUD293 in areas at risk of explosion.

5.2 Collective and addressable detector base FDB201/221

1. Route the recess-mounted cable or surface-mounted cable with an outer diameter of max. 6 mm directly into the detector base.
2. Ensure that the cables are flat on the bottom of the detector base. This way, they do not pose an obstruction when inserting the detector.

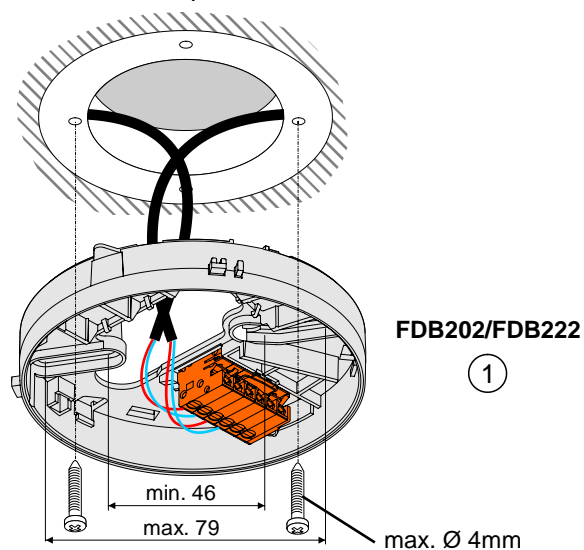


Installing the detector bases FDB201 and FDB221

1 Detector base

5.3 Flat detector base FDB202/222

- The cables are routed recess-mounted through detector base FDB202/222.
- The cables must be placed flat on the bottom of the detector base so that they do not hamper insertion of the detector.

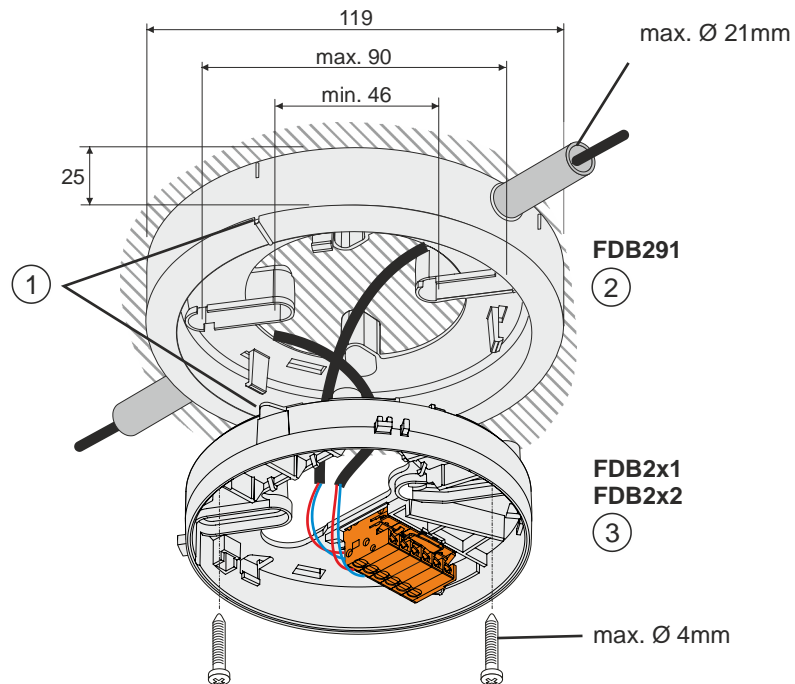


Mounting of detector base FDB202/FDB222

1 Detector base

5.4 Base attachment FDB291

- For cable diameters > 6 mm, the base attachment FDB291 is required.
- The required cable entries must be broken out on the base attachment FDB291.



Mounting of detector base on base attachment FDB291

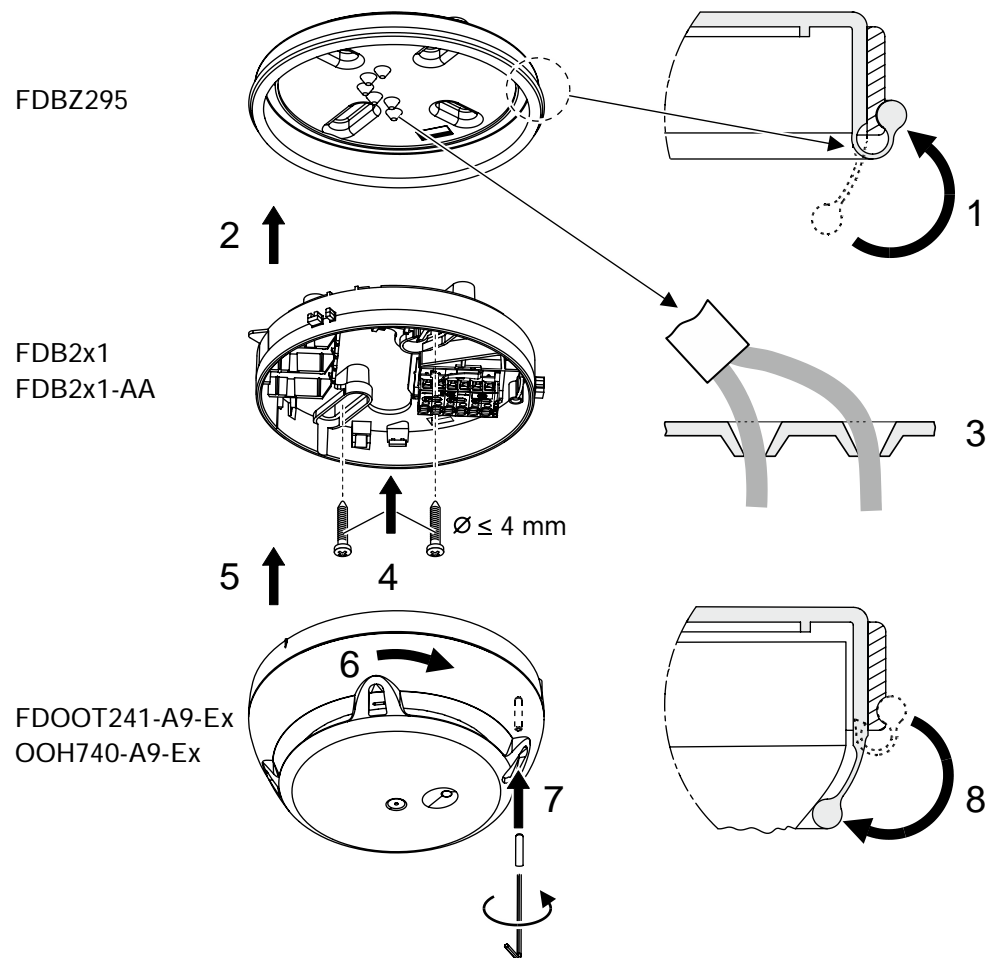
1 Identification

3 Detector base

2 Base attachment

5.5 Sealing element FDBZ295

Sealing element FDBZ295 is used in conjunction with detector bases FDB2x1/FDB2x1-AA. The sealing element provides the device with protection against dirt and spray water.



Mounting of sealing element FDBZ295

Mounting

▷ The kit is installed by hand

1. Fold the sealing lip back.
2. Insert the detector base into the sealing element. Make sure that the opening in the detector base lines up with the marking and opening on the rubber base.

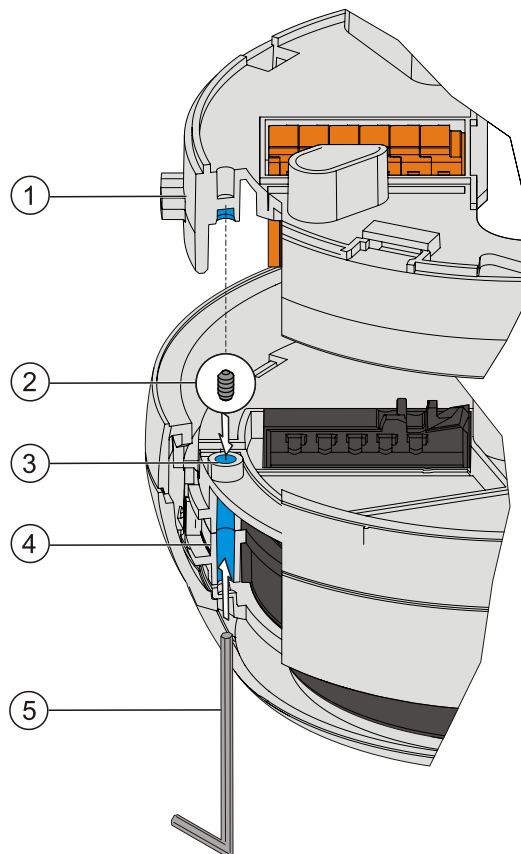
!	<p>NOTICE</p> <p>Risk when piercing the rubber base with a tool! Consequences: Leaks in rubber base</p> <ul style="list-style-type: none"> • Do not use tools for piercing!
----------	---

3. Push the connection wires through the rubber base from the rear.
4. Install the detector base.
5. Insert a point detector into the detector base.

6. Turn the point detector to the right to screw it firmly into the detector base.
 7. Screw the supplied set screw into the point detector or alarm sounder until it no longer protrudes. This step is not needed when using detector locking device FDBZ293.
 8. Fold the folded-back sealing lip over the point detector.
- ⇒ The sealing element is installed.

5.6 Detector locking device FDBZ293

The detector can be protected against theft with the detector locking device FDBZ293.



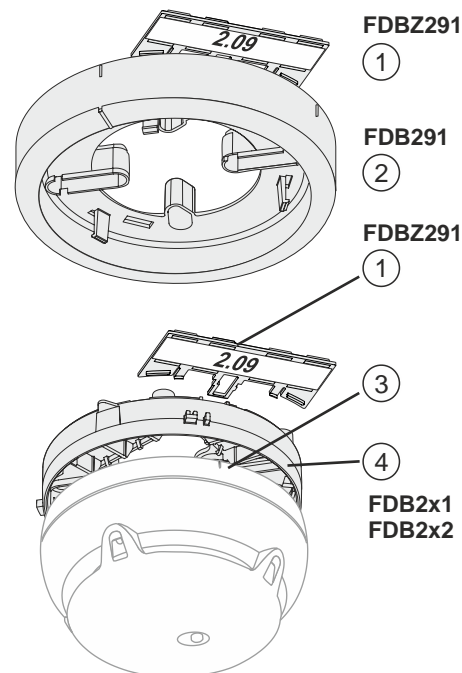
Mounting of detector locking device FDBZ293

- | | |
|-----------------------------------|-------------|
| 1 Detector base | 4 Detector |
| 2 Set screw with a hexagon socket | 5 Allen key |
| 3 Hole | |

1. Place the 'set screw with a hexagon socket' (2) in the hole (3) on the detector (4).
 2. Insert the detector (4) into the detector base (1).
 3. Using the Allen key provided (5), insert the 'set screw with a hexagon socket' (2) through the hole in the detector base (1) and tighten.
- ⇒ The detector can no longer be removed from the base without tools.

5.7 Designation plate FDBZ291

To provide the detector with a location address, the address is inscribed on the designation plate FDBZ291 and placed on the detector base or base attachment.

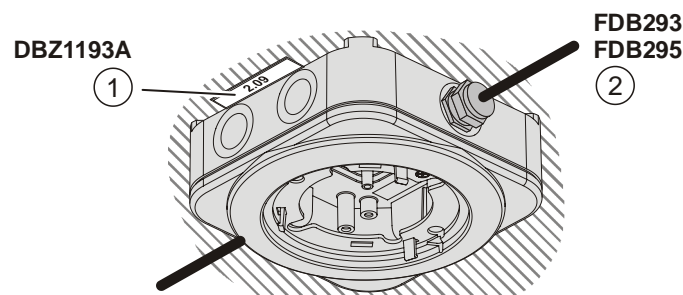


Mounting of designation plate FDBZ291

- | | |
|-----------------------------|------------------|
| 1 Designation plate FDBZ291 | 3 Identification |
| 2 Base attachment FDB291 | 4 Detector base |

5.8 Designation plate DBZ1193A

To identify a detector on a base attachment humid, the designation plate DBZ1193A is labeled and placed on the base attachment humid FDB293 or the base attachment wet FDB295.

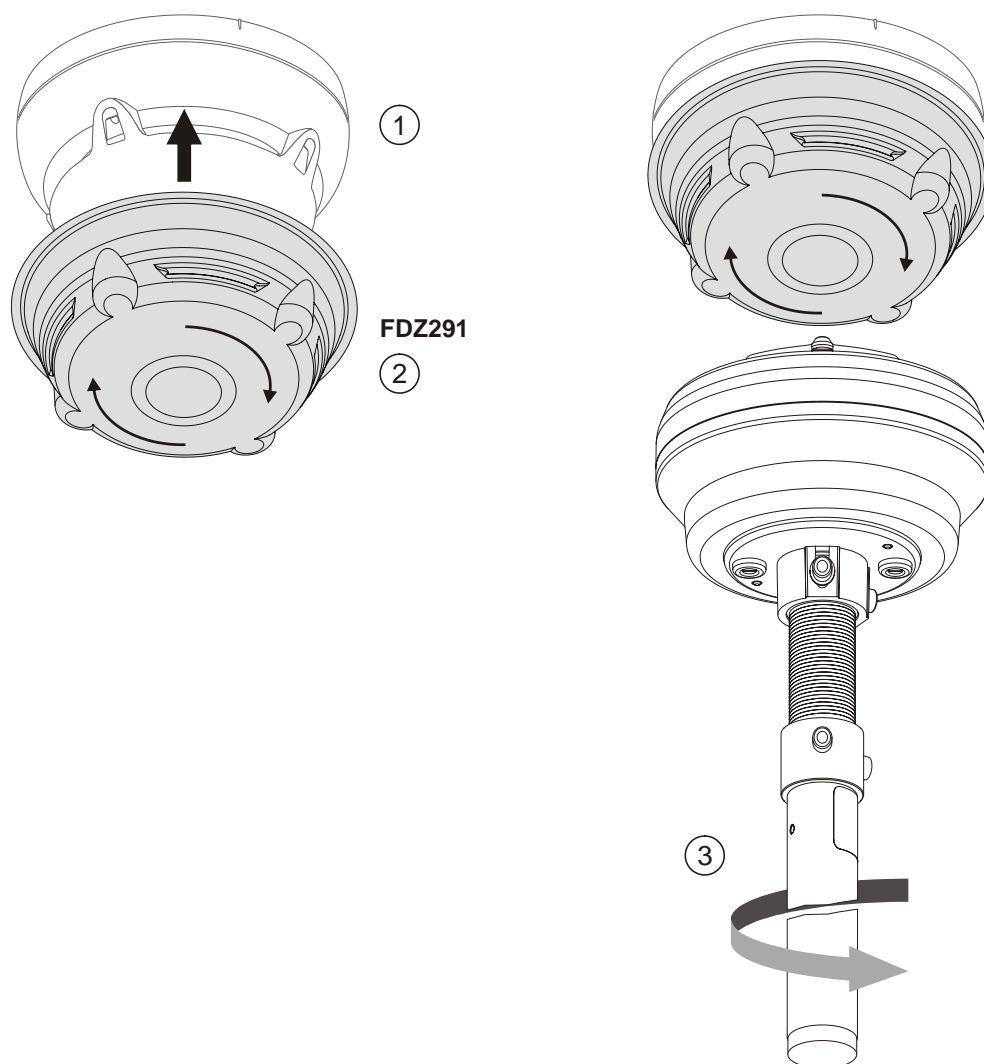


Mounting of designation plate DBZ1193A

- | | |
|------------------------------|--|
| 1 Designation plate DBZ1193A | 2 Base attachment humid FDB293 or base attachment wet FDB295 |
|------------------------------|--|

5.9 Detector dust cap FDZ291

During the construction phase the detector may be covered with a detector dust cap FDZ291 to protect it from dust and dirt.



Mounting / removal of detector dust cap FDZ291

- 1 Detector
- 2 Detector dust cap
- 3 Remove the detector dust cap either manually by turning it to the right, or by using a detector exchanger and tester.

5.10 Connecting the detector base



WARNING

Connecting non-approved devices in an intrinsically safe circuit

Risk of explosion

- In an intrinsically safe circuit, only connect equipment that conforms to country-specific regulations and is approved for ignition protection category 'Intrinsic safety Ex ia' or 'Intrinsic safety Ex ib'.



Note the positive and negative poles.

Only connect one wire per terminal. This is the only way to ensure the connection is failure-free for the entire service life of the device.

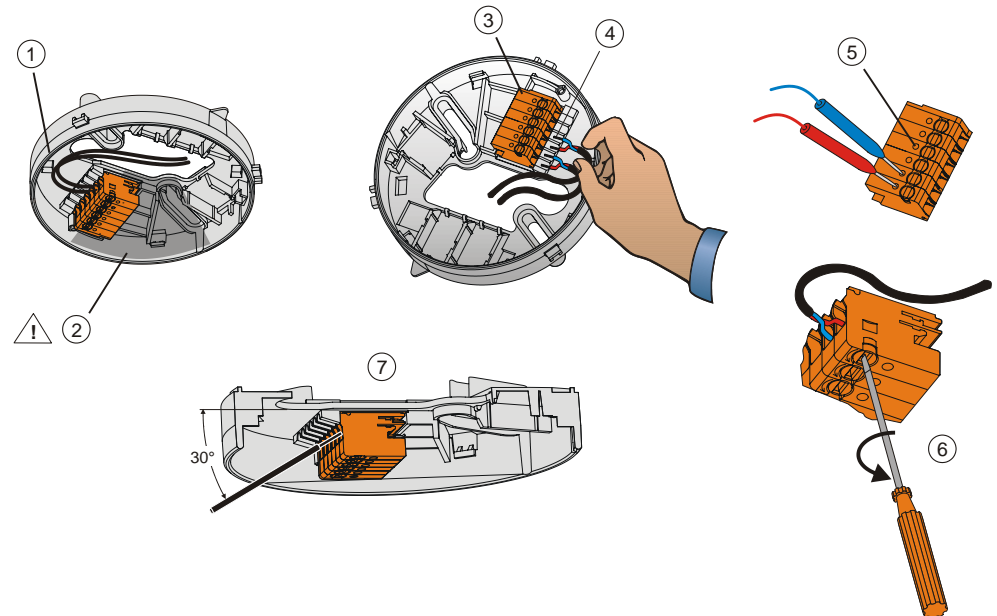


If you are permanently decommissioning the equipment, observe the national regulations governing unused cables in areas at risk of explosion.



We recommend that you do not use shielded cables for stub lines in areas at risk of explosion.

The detector bases contain a spring clip. Permissible wire/strand cross-section 0.28...1.5 mm².

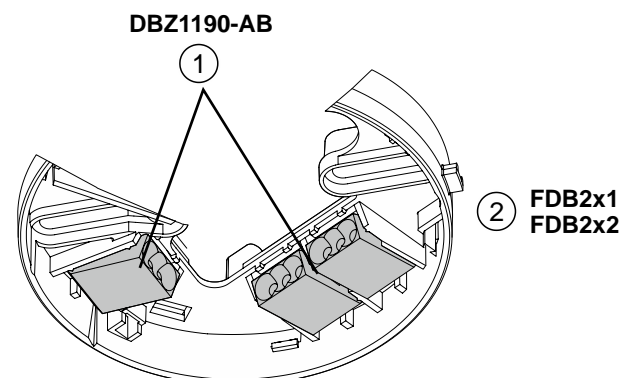


Cable entry in detector base

- | | |
|--|--|
| 1 The conductor loops must be placed flat in the base bottom. | 5 Contact for test tips |
| 2 The conductor loops must not be placed over this zone, as otherwise the detector cannot be inserted correctly. | 6 Turn the screwdriver 90° in the direction of the arrow to remove the conductor or insert a strand. |
| 3 Screwless connection terminals | 7 Optimum insertion of the wire without tool, at an angle of approx. 30° |
| 4 Bare length 6.5...7.5 mm | |

5.10.1 Connection terminal DBZ1190-AB

Use the connection terminal DBZ1190-AB for multiple connections.



Installing connection terminals in the detector base

1 Connection terminals

2 Detector base

5.10.2 Connection diagram (C-NET-Ex)



⚠ WARNING

Connecting cables in environments at risk of explosion

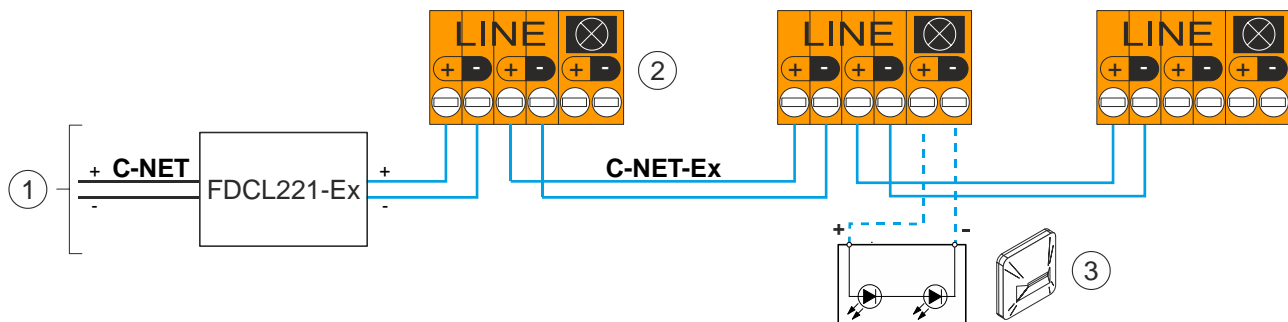
Risk of explosion

- Only connect cables in an environment that is not at risk of explosion.

The following applies to C-NET-Ex detector lines:

- Only stubs are permitted.
- The detector line must start with a line adapter (Ex) FDCL221-Ex.
- Observe the maximum number of detectors that may be operated on a stub.
- External alarm indicators may only be connected to **one** detector.
- Only connect passive, external alarm indicators with negligibly low inductance and capacitance levels. The external alarm indicators FDAI9x-Ex conform to these requirements.

The connection is established from base to base using twisted or non-twisted wire pairs.



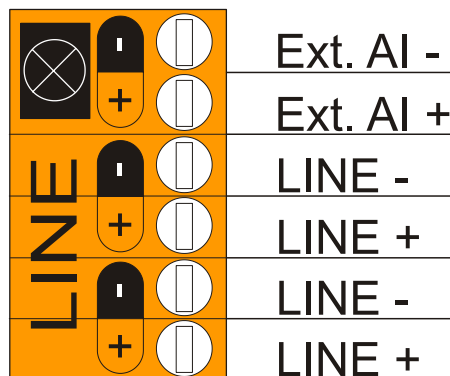
Connection diagram for addressed detector line C-NET-Ex with and without external alarm indicators

1 Control panel

3 External alarm indicator FDAI9x-Ex

2 Detector base FDB221, FDB222

Assignment of terminals in detector base



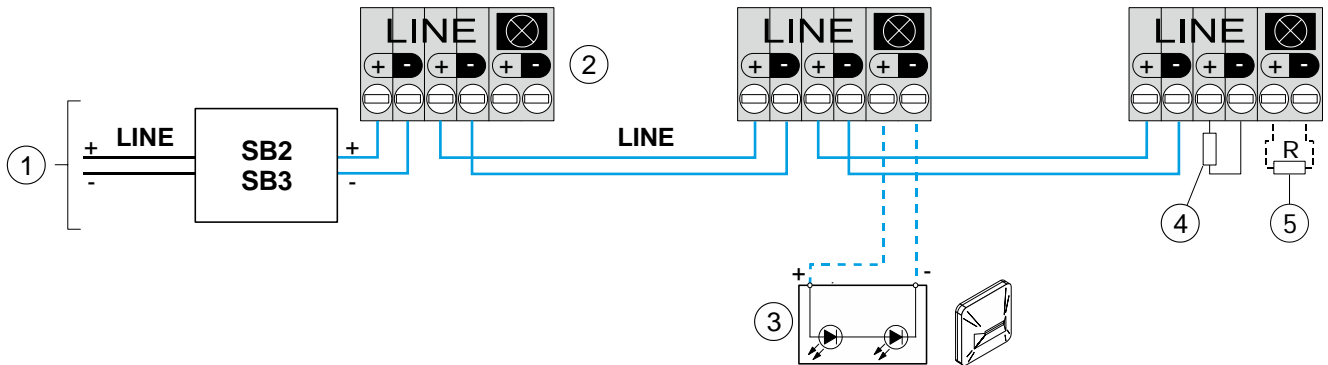
5.10.3 Connection diagram (collective)

	⚠ WARNING
Connecting cables in environments at risk of explosion	
Risk of explosion	
<ul style="list-style-type: none"> Only connect cables in an environment that is not at risk of explosion. 	

The following applies to collective detector lines:

- The detector line must start with a safety barrier SB2 or SB3.
- Connect a control panel-specific end-of-line (EOL) to the end of the collective detector line.
- External alarm indicators may only be connected to **one** detector.
- Only use external alarm indicators FDAI9x-Ex.

The connection is established from base to base using twisted or non-twisted wire pairs.












Connection diagram for collective detector line with and without external alarm indicator

- | | |
|--------------------------------------|--|
| 1 Control panel | 4 End-of-line depending on control panel |
| 2 Detector base FDB201, FDB202 | 5 Parameter set resistor R |
| 3 External alarm indicator FDAI9x-Ex | |


Values for the parameter set resistance R

R	Parameter set
∞	Sensitive (when replacing a point detector DO1101-Ex)
18 k Ω	A1R (when replacing a point detector DT1101A-Ex)
10 k Ω	BR (when replacing a point detector DT1102A-Ex)

Assignment of terminals in detector base

			Ext. AI -
			Ext. AI +
			LINE -
			LINE +
			LINE -
			LINE +

6 Commissioning

	<p>⚠ WARNING</p> <p>Using the line tester FDUL221 during commissioning</p> <p>Risk of explosion</p> <ul style="list-style-type: none"> • Only operate the line tester FDUL221 in the area that is not at risk of explosion. • If peripheral devices on an C-NET-Ex detector line are to be read into the line tester FDUL221, make sure there is a line adapter (Ex) FDCL221-Ex between the line tester and the peripheral devices.
---	---

Commissioning on the C-NET-Ex

The control panel is used to commission the detectors. The exact procedure is described in the control panel documentation.

Commissioning on a collective detector line in potentially explosive atmospheres

Commissioning on a collective detector line is performed on the control panel. The exact procedure is described in the control panel documentation.

After commissioning the detector line, the parameter sets can be selected by installing or leaving out resistors in the detector base. See the chapter 'Parameter sets for collective operation [→ 41]'.

You will find more information in document 001204.

Changing over from 'Collective' to C-NET-Ex

When changing over from a collective detector line with point detectors OOH740-A9-Ex to a C-NET-Ex detector line, the following must be taken into account:

- There is no need to exchange the detector base FDB201 by a detector base FDB221.
- When a detector is removed from an C-NET-Ex detector line and that detector is installed on a **collective** detector base (FDB201 or FDSB292), the communication between the control panel and the next detectors is interrupted. In this case, alarming by the subsequent detectors is no longer possible. A fault is indicated on the control panel.
- The changeover must take place by reading in the line several times. Repeat the reading-in process until the correct number of installed detectors per line is read in. Use the line tester FDUL221 for the changeover.

You will find details in the 'List of compatibility'.

See also

 Applicable documents [→ 11]

7 Maintenance / Repair

7.1 Performance check

The selftest automatically subjects the detectors to an extensive electrical performance check. Nonetheless, a manual function check needs to be performed on the detectors regularly.


The manual function check can be undertaken using the following tools:

- Test gas
- Hot air

Recommendation:

- Check the devices every year.
- Replace heavily soiled or damaged devices.
- All point detectors should be replaced after 6 to 8 years of service, depending on the ambient conditions.

See also

 Testing detectors [→ 61]

7.1.1 'Technical Ambient Supervision Message' performance check

You cannot test whether the 'Technical Ambient Supervision Message' is functioning correctly with test devices.

Checking can only take place indirectly:

- ▷ You must know the current ambient temperature.
- Enter the following parameters in the 'Cerberus-Engineering-Tool' software:
 - A hysteresis range of 5 °C.
 - A temperature threshold which is at least 10 °C below the current ambient temperature.
 - Alarming when value falls below threshold
- ⇒ The detector sends a signal to the control panel.
- ⇒ The 'Technical Ambient Supervision Message' is working correctly if the control panel displays an alarm.

7.2 Testing detectors



⚠ WARNING

Use of testers in potentially explosive atmospheres

Risk of explosion

- Testers RE6 and RE7T must only be operated in the area not at risk.

Testing of the point detector OOH740-A9-Ex can be carried out with one or more of the following tools:

- Detector tester RE6
- Test gas
 - REF8-S (recommended)
 - REF8
- Hot air
 - Detector tester RE7T for heat detectors

The table below shows suitable tools for testing the different sensor modes of the point detector:

Sensor mode	Test gas	Hot air
Sensor mode 0	X	X
Sensor mode 1	–	X
Sensor mode 2	X	–

X = suitable

– = not suitable

The fire detectors are highly resistant to deceptive phenomena. This means that optical fire detectors, for example, will recognize the immediate occurrence of smoke (such as that which occurs during testing with test gas) as a deceptive phenomenon and will not trigger an alarm. This is desirable in normal operation; however, it does make testing with test gas problematical.

To enable detector testing with test gas or hot air, the detector must be switched to test mode. Testing with test gas or hot air differs with addressed and collective detector lines.

Addressed detector lines (C-NET)

On addressed detector lines, the detector or detector zone can be switched to 'Test' mode on the control panel. Testing with test gas or hot air is then possible without problems.

Collective detector lines

Detectors on a collective line are automatically switched to test mode for 3 minutes during startup and reset. A detector that has been newly inserted (or that has been briefly removed from the detector line and re-inserted) is therefore automatically in test mode during the first 3 minutes.



To trigger a detector using test gas, normally 2...4 gas discharges at intervals of approx. 2 seconds are required. When the detector is in test mode, activation takes place after approximately 10 seconds.

8 Specifications

8.1 Technical data for OOH740-A9-Ex

8.1.1 General (irrespective of the detector line)

Device labeling

IECEX Scheme: Ex ia IIC T4 Ga, Ta = -35...70 °C

Directive 94/9/EC: II 1 G Ex ia IIC T4 Ga, Ta = -35...70 °C
(ATEX Directive)

Ex-related connection data, intrinsically safe	U_i	28 V
	I_i	100 mA
	P_i	700 mW
	L_i	Negligible
	C_i	0,2 nF
	Operating current (quiescent)	200...280 µA
Line to external alarm indicator	U_o	14.2 V
	I_o	480 mA
	P_o	195 mW
	L_o	100 µH
	C_o	38 nF
	Only for connecting passive, external alarm indicators to negligibly small inductivities and capacities.	

You will find an explanation of the symbols in the chapter 'Technical terms, abbreviations, and formula symbols [→ 12]'.
 You will find information on approvals, CE marking, and the relevant EU directives for this device (these devices) in the following document(s); see 'Applicable documents' chapter:

- Document A6V10371417

Device characteristics

Response sensitivity (typ.)	3...12 %/m (depending on the parameter set)
Compensation speed	≤1/45 voltage increase for detection/h
Temperature range in 'Technical Ambient Supervision Message' mode	-20...+70 °C

Ambient conditions	Operating temperature	-25...+70 °C
	Storage temperature	-30...+75 °C
	Air humidity	≤95 % rel.
	Protection categories (IEC 60529):	
	● Base FDB2x1, FDB2x1-AA, FDB2x2 with base attachment FDB291	IP43
	● Base FDB2x1 with sealing kit FDBZ295	IP44
	● Base FDB2x1, FDB2x1-AA, FDB2x2 with base attachment wet FDB295	IP44
	Electromagnetic compatibility:	
	● 1 MHz...2 GHz	50 V/m
	Permissible wind speed:	Max. 20 m/s
Mechanical data	Color	~RAL 9010 pure white
Connections (in the detector base)	Detector line and external alarm indicators:	
	● Design	Spring clips
	● Cable cross section	0.2...1.5 mm ²
Standards	European standards	<ul style="list-style-type: none"> ● EN 54-5 ● EN 54-7
	International standards	<ul style="list-style-type: none"> ● IEC/EN 60079-0 ● IEC/EN 60079-11
Approvals	IECEX/ATEX:	BVS 12 ATEX E 087 X

8.1.2 Detector lines

C-NET-Ex detector line

Detector line	Operating voltage (modulated)	DC 13...28 V
	Operating current (quiescent)	Typ. 220 µA
	Maximum current connection factor	1.25
	Quiescent current connection factor	1.25
	Address connection factor	1
	Protocol	C-NET-Ex
	Compatibility	See 'List of compatibility'
External alarm indicators	Number of external alarm indicators that can be connected:	Max. 1 external alarm indicator FDAI9x-Ex
	Voltage	DC 9...14.2 V
	Current	9...15 mA
	Length of line	<ul style="list-style-type: none"> ● Max. 30 m with unshielded cables, or when the shielding is connected to the positive pole of the detector base ● Max. 5 m, if the shielding is connected to earth
	Flashing interval times:	
	● Bright	12 ms
	● Dark	1 s

Collective detector line

You will find more information in document 001204.

Detector line

Operating voltage DC 14...28 V

Maximum current connection factor 1.25

Quiescent current at maximum current connection factor 65...125 μ A

Surge current at maximum current connection factor 180 μ A

You will find details in the corresponding section

Alarm voltage at:

- Alarm current = 1...15 mA DC 5...11 V

- Alarm current = 25 mA DC 9...12 V

Alarm current limitation at operating voltage = DC 13...28 V 30...65 mA

Reset voltage UR:

- Alarm is reliably reset DC 0...2 V

- Alarm may possibly not be reset DC 2...4 V

Reset time at UR \leq DC 2 V:

- Alarm is reliably reset >2 s

- Alarm may possibly not be reset 1...2 s

Minimum length of time until the line separator opens in the event of a short-circuit 5 s

Protocol Collective (with and without current limitation)

Compatibility See 'List of compatibility'

External alarm indicators

Number of external alarm indicators that can be connected: Max. 1 external alarm indicator FDAI9x-Ex

Voltage Typ. DC 6...14.2 V

Current 9...15 mA

Length of line

- Max. 30 m with unshielded cables, or when the shielding is connected to the positive pole of the detector base
- Max. 5 m, if the shielding is connected to earth

Flashing interval times: Depending on the control panel

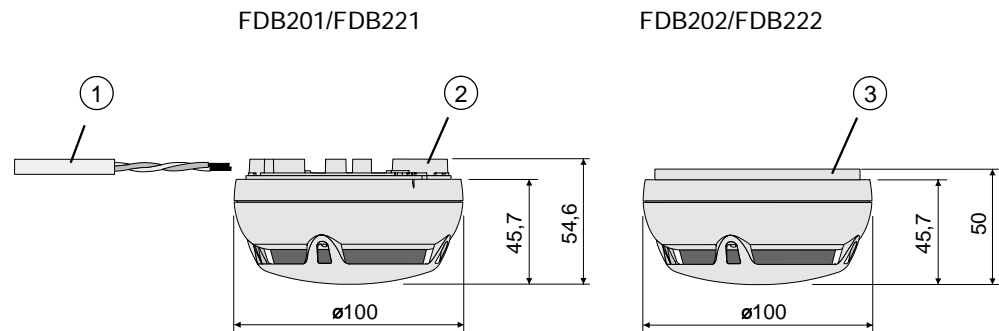
Collective maximum current connection factor/Alarm verification

The default parameter set is set in all fire detectors in their as-delivered state.

Use as	Installed resistance value in the detector base	Parameter set name	K-MK	Alarm verification permitted on control panel
Smoke detector	∞ (no resistor installed)	Sensitive (DO1101A-Ex replacement)	1.25 ¹	Yes
Heat detector	18 k Ω , min. 200 mW	A1R (DT1101A-Ex replacement)	1.25 ¹	Yes
	10 k Ω , min. 200 mW	BR (DT1102A-Ex replacement)	1.25 ¹	Yes

¹ The same maximum current connection factor as for the DO1101A-Ex/DT1101A-Ex/DT1102A-Ex can be expected during direct use on the DC1192

8.2 Dimensions



Dimensions with detector bases at distance or directly attached

1 Surface-mounted cable entry:
cable diameter max. 6 mm

2 Detector base at a distance

3 Detector base directly attached to
the mounting surface

8.3 Environmental compatibility and disposal



This equipment is manufactured using materials and procedures which comply with current environmental protection standards as best as possible. More specifically, the following measures have been undertaken:

- Use of reusable materials
- Use of halogen-free plastics
- Electronic parts and synthetic materials can be separated

Larger plastic parts are labeled according to ISO 11469 and ISO 1043. The plastics can be separated and recycled on this basis.



Electronic parts and batteries must not be disposed of with domestic waste.

- Take electronic parts and batteries to local collection points or recycling centers.
- Contact local authorities for more information.
- Observe national requirements for disposing of electronic parts and batteries.

9 Annex

PTB numbers for older safety barriers

Device name	PTB number
Safety barrier SB2	PTB 01 ATEX 2053 X
Safety barrier SB3	PTB 01 ATEX 2088 X

Glossary

Associated electrical equipment

Electrical equipment that contains both energy-limited and non-energy-limited circuits, and is structured in such a way that the non-energy-limited circuits cannot have a negative effect on any of the energy-limited circuits.

Qualified person

A qualified person is someone who, as a result of their professional training and current occupational activities, has the knowledge required to test the work equipment. In some cases, the relevant national ordinances (such as the Ordinance on Industrial Safety and Health in Germany) make distinctions according to different qualification requirements; for example, they may place different requirements on a person's qualifications, skills, and experience.

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