Automatic Fire Detectors LSN improved version

FAP-DO420/FAP-420/FAH-420

BOSCH

en Product Information

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1 Product Description

NOTICE!
This product information describes the entire product range for the FAP-420/FAH-420 Automatic Fire Detectors LSN improved version series.
Wherever the term DO detector is used in this document, this refers to the following detectors: FAP-DO420, FAP-DOT420, FAP-DOTC420.

The FAP-420/FAH-420 Automatic Fire Detectors LSN improved version series is specially designed for connection to the FPA-1200 and the FPA-5000 Modular Fire Panel. The fire detector series combines standard detection procedures such as scattered light measurement and temperature measurement with gas measuring technology at the highest configuration level.
This method uses intelligent evaluation electronics (Intelligent Signal Processing - ISP) to evaluate the signals from the smoke sensor, thermal sensor and gas sensor. Thus security against deceptive alarms is increased significantly and detection time is reduced in comparison to the fire detectors available on the market today.
Thanks to the higher information content of the multisensor detectors, the use of detectors is possible in environments where simple smoke detectors cannot be used.
The detectors are available in the following configuration levels:
- FAP-DOTC420: combined dual-optical, thermal and chemical smoke detector
- FAP-OTC 420: combined optical, thermal and chemical smoke detector
- FAP-DOT420: combined dual-optical and thermal smoke detector
- FAP-OT 420: combined optical and thermal smoke detector
- FAP-DO420: dual-optical smoke detector
- FAP-O 420/FAP-O 420 KKW: optical smoke detector
- FAH-T 420/FAH-T 420 KKW: thermal detector

The line technology variants are:
- LSN classic (classic Local Security Network)
- LSN improved version (Local Security Network improved version)

The detector's timeless and innovative design is a result of the cooperation between engineers and designers. With this design it is possible to reconcile the contradictory goals of a generous installation space and a small detector.
The placement of the dual-color individual display on the detector tip is the first externally visible characteristic of the installation-friendly development concept. The stable and robust detector base need no longer be aligned due to the position-independent position of the individual display.
It is suitable for surface and flush mounting and includes separate mounting points for dropped ceiling and concealed sockets. In addition, it fits all common bore patterns. For surface mounting, the cable may be fed through on the side.
The integrated strain relief for interfloor cables prevents the removal of cables from the terminal after installation. The terminals are easily accessible; a retainer for the end of line resistor is integrated. Cable diameters of up to 2.5 mm^2 can be used.
It can be equipped with a damp room seal so that all installation requirements can be covered with one base.

2 System Overview

2.1 Detector Configuration

1 Smoke measurement chamber with optical sensor
2 Thermal sensor
3 Chemical sensor (covered on the cross-section)
4 Individual display
5 PC board with evaluation electronics
6 MS 400 Detector Base

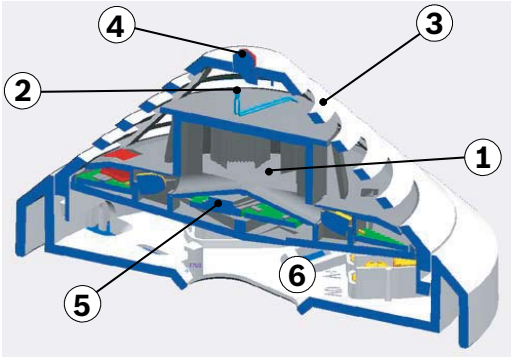


Figure 2.1 Detector Configuration

2.2 Functional Description of the Sensor Technology

2.2.1 Optical Sensor (Smoke Detector)

This optical sensor utilizes the scattered-light method.
An LED sends light into the measuring chamber (see *Figure 2.1*, item 1), where it is absorbed by the labyrinth structure. In the event of a fire, smoke enters the measuring chamber. The light is scattered by the smoke particles and hits the photo diodes, which transform the quantity of light into a proportional electrical signal.
The DO detectors have a dual optical sensor that uses the different infrared and blue light wavelengths (Dual Ray technology). This allows fires to be detected early and even the smallest quantities of smoke (TF1) to be reliably detected.

2.2.2 Thermal Sensor (Heat Detector)

A thermistor (see *Figure 2.1*, item 2) in a resistance network is used as a thermal sensor; an analog-digital converter measures the temperature-dependent voltage at regular intervals. Depending on the specified detector class, the thermal sensor triggers the alarm status when the maximum temperature of 54 °C or 69 °C is exceeded (thermal maximum), or if the temperature rises by a defined amount within a specified time (thermal differential).

2.2.3 Chemical Sensor (Gas Sensor)

The gas sensor (see *Figure 2.1*, item 3) detects mainly the carbon monoxide (CO) that is produced by a fire, but it also detects hydrogen (H) and nitrogen monoxide (NO).
The underlying measurement principle is CO oxidation and the measurable current that it creates. The sensor signal value is proportional to the concentration of gas.
The gas sensor supplies additional information in order to reliably suppress disturbance variables.

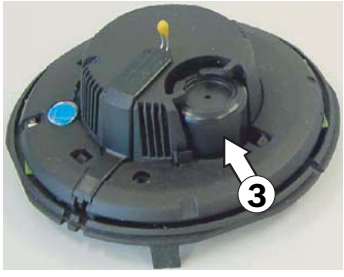


Figure 2.2 Chemical sensor

2.3 System Description

Up to three detection principles are integrated in FAP-420/FAH-420 series detectors:

- Optical (for smoke): O
- Dual-optical (for smoke): DO
- Thermal (for heat): T
- Chemical (for gas): C

The individual sensors are programmed via the LSN network manually or using a timer. All sensor signals are analyzed continually by the internal signal analysis electronics (ISP) and are linked with each other. By linking the sensors (combined detectors), the detector can also be used in places where the work carried out gives rise to light smoke, steam or dust. If a signal combination fits the selected identifier for the area of operation for the detectors, an alarm is triggered automatically.

2.4 Flash Frequency and Error Detection

The LSN improved detector has two centrally positioned two-color LEDs that flash green to display the operational status.
The green LED on LSN improved FAP-420/FAH-420 series detectors is deactivated when delivered. It can be activated as required via the programming software.
The LSN improved detector permanently monitors and adjusts itself throughout its life cycle in order to adapt its sensitivity to the set threshold value.
A message is sent to the fire panel if the detector becomes too contaminated.
The LED will start to flash red as soon as an alarm is triggered.
The detector will return to its normal operating condition when the alarm is canceled via the control panel or if the alarm cause disappears.

2.5 Features

- Active self-monitoring of the sensors, with display on the fire panel:
  - Active adjustment of the threshold (drift compensation) if the optical sensor becomes contaminated.
  - Active adjustment of the threshold (drift compensation) of the chemical sensor.
- EMC safety is 50 V/m in the 1-3000 MHz range and is therefore much higher than required by VdS 2110 (VdS Schadenverhütung GmbH). (Except DO detectors.)
- Preservation of LSN loop functions in the event of wire break or short-circuit of a detector through integrated isolators.
- Individual detector identification on the fire panel in the event of an alarm. Alarm indication on the detector with a flashing red LED.
- Programmable, i.e. can be adjusted to the area of operation.
- Increased detection and false alarm security thanks to evaluation of the temporal behavior of fire and disturbance variables.
- Activation of a remote indicator is possible.
- Optional mechanical removal safeguard (can be activated/deactivated).
- Dust-resistant labyrinth and cap construction.
- Every detector base has a Chamber Maid Plug (a cleaning opening with a plug) for blowing out the optical chamber with compressed air (not required for the FAH-T 420 Heat Detector).
- For connecting to the FPA-5000 and FPA-1200 fire panels with extended range of LSN features.

- You can only use DO detectors with the MPC-xxxx-B Panel Controller or the FPA-1200. The MPC-xxxx-A Panel Controller cannot be used.
- In classic mode, can be connected to the BZ 500 LSN, UEZ 2000 LSN and UGM 2020 LSN fire panels and to other panels or their receiver modules with identical connection properties but with the existing LSN system limits. (Not DO detectors.)
- It is possible to read out the serial number, contamination level (for the O sensor), operating hours and current analog values for each configured detector (except for KKW types) via LSN.
- The DO detectors are not supported by the WinPara software.
- Use of shielded and unshielded cables.
- The LSN improved version line technology supports the connection of up to 254 FAP-420/FAH-420 series detectors per loop or stub (please observe national regulations in this regard).
- Flexible network structures without additional elements ("T-Tapping") are possible.
- Automatic or manual detector addressing selectable.
- Compliant with EN 54, EN 50131 and VdS guidelines.

3 Planning

NOTICE!
FAP-420/FAH-420 Automatic Fire Detectors are not designed for exterior use.

3.1 Basic Installation/Configuration Notes

- Multi-sensor fire detectors must be planned in line with the guidelines for optical detectors until a guideline for their planning is developed in collaboration with the VdS (see also DIN VDE 0833 Part 2 and VDS 2095):
  - Maximum monitoring area 120 $m^{2.}$
  - Maximum installation height 16 m.
- If occasional switch-off of the optical sensor is required, the planning must occur according to the guidelines for heat detectors (see DIN VDE 0833 Part 2 and VDS 2095):
  - Maximum monitoring area 40 $m^{2.}$
  - Maximum installation height 7.5 m.
- Maximum permissible air speed: 20 m/s.
- FAH-T 420 detectors must be configured according to Class A1R when planning fire barriers conforming to DIBt.

3.2 Use in a Local Security Network (LSN/LSN improved version)

In a Local Security Network, the detectors connected to a fire panel can be operated in the following operating modes:

Detector Type	**Operating mode**			
	Combined	**Optical**	**Thermal maximum**	**Thermal differential**
FAP-OTC 420	X	X	X	X
FAP-OT 420	X	X	X	X
FAP-O 420/ FAP-O 420 KKW	-	X	-	-
FAH-T 420/ FAH-T 420 KKW	-	-	X	X
FAP-DO420	-	X	-	-
FAP-DOT420	X	X	X	X
FAP-DOTC420	X	X	X	X

NOTICE!
Planning should take the anticipated total current and line resistance into account to ensure each detector has an operating voltage of at least 15 V DC.

3.3 Use in Areas with Elevated Radioactivity

There are two detector types available especially for use in areas with elevated radioactivity, such as in nuclear power plants:

- FAP-O 420-KKW
- FAH-T 420-KKW

4 Programming

Programming occurs via a PC or laptop connected to the fire panel

– With FSP-5000-RPS (Remote Programming System) for panels with LSN improved version line technology
– With WinPara for panels with conventional LSN line technology (not DO-Melder).

420 series detectors are programmed by entering the area of operation. The selection of the area of operation determines the optimum characteristic field for fire and disturbance variable evaluation.

When optical sensor sensitivity in the FAP-OTC 420 and FAP-DOTC420 is low, the detector only triggers if both smoke and an increase in CO concentration or temperature is detected.

The operating mode can be changed for the FAP-OTC 420 and FAP-OT 420 detector models, as well as the FAP-DOTC420 and FAP-DOT420 models, i.e. individual sensors can be switched off:

– Switch to optical (O sensor sensitivity = low, T sensor = switched off)
– Switch to thermal differential (T sensor sensitivity = A2R, O sensor = switched off)
– Switch to thermal maximum (T sensor sensitivity = A2S, O sensor = switched off).

In the case of the purely optical FAP-O 420 and FAP-DO420 detectors, the sensitivity of the optical sensor can be set to three levels. Depending on the operating location, the optical sensor in the detector is thus adjusted to the environmental conditions.

NOTICE!

For fire detection, the purely optical detector also evaluates the time behavior of the fire characteristics, which differs significantly from the time behavior of disturbance variables and that occurring during a detector test

As a result, there are also different trigger times when testing with a test aerosol outside of Walk test operation (10 s to max 60 s), depending on the selected sensitivity adjustment.

The FAH-T 420 Heat Detector is programmed by taking into account the ambient temperature, the installation height and the sensitivity class selection.

Programming of the optical, thermal, and chemical sensors and the linking of all sensors via algorithms significantly increases the detection ability and security against false alarms.

4.1 FAP-DOTC420 / FAP-OTC 420

Selectable installation locations in the programming software (WinPara and FSP-5000-RPS)	Detector Type	Sensitivity		
		Thermomax (T_{max})	Optical (O)	Chemical (C)
Office (after hours)	O, T_{max}, T_{diff}, C	High (A2)	High	High
Office (smoker)/waiting room/ restaurant/meeting room	O, T_{max}, T_{diff}, C	High (A2)	Low*	Low
Office (day mode)	O, T_{max}, T_{diff}, C	Low (B)	Medium	High
EDP room	O, T_{max}, T_{diff}, C	High (A2)	High	High
Production location	O, T_{max}, T_{diff}, C	Low (B)	Low*	Medium
Garage	O, T_{max}, T_{diff}, C	High (A2)	Low*	Low
High storage warehouse without vehicle traffic with combustion engine	O, T_{max}, T_{diff}, C	Low (B)	High	High
Conference hall/waiting room/ fairground	O, T_{max}, T_{diff}, C	High (A2)	Low*	Medium
Kitchen/casino/restaurant during active operation	O, T_{max}, C	Low (B)	Low*	Low
Warehouse with vehicle traffic	O, T_{max}, T_{diff}, C	Low (B)	Low*	Low
Rate of rise only (optical sensor off)**	T_{max}, T_{diff}	High (A2)	-	-
Optical only (thermal sensor off)**, ***	O	-	Low	-
Fixed temperature heat only (optical sensor off)**	T_{max}	High (A2)	-	-
Optical/chemical (thermal sensor off)**, ***	O, C	-	Low	High
Schools/kindergarten	O, T_{max}, T_{diff}, C	High (A2)	Medium	High
Theater/concert hall	O, T_{max}, T_{diff}, C	High (A2)	Medium	High

O = optical sensor (dual-optical in FAP-DOTC420 detectors)
T_{max} = thermal maximum unit
T_{diff} = thermal differential unit
C = chemical sensor
* If optical sensor sensitivity is low, the detector will only trigger if smoke as well as an increase in CO concentration or temperature is detected.
** FSP-5000-RPS only
*** For FAP-DOTC420: does not comply with EN54-7
For details on installation height, see *Section 4.4 FAH-T 420/FAH-T 420-KKW, page 13*

NOTICE!
The FAP-DOTC420 detector is not supported by the WinPara programming software.

4.2 FAP-DOT420 / FAP-OT 420

Selectable installation locations in the programming software (WinPara and FSP-5000-RPS)	Detector Type	Sensitivity	
		Thermomax (T_{max})	Optical (O)
Office (after hours)	O, T_{max}, T_{diff}	High (A2)	High
Office (smoker)/waiting room/restaurant/ meeting room	O, T_{max}, T_{diff}	High (A2)	Low
Office (day mode)	O, T_{max}, T_{diff}	Low (B)	Medium
EDP room	O, T_{max}, T_{diff}	High (A2)	High
Production location	O, T_{max}, T_{diff}	Low (B)	Low
Garage – FAP-OT 420 – FAP-DOT420	 T_{max}, T_{diff} T_{max}, T_{diff}	 High (A2) High (A2)	 - Low
High storage warehouse without vehicle traffic with combustion engine	O, T_{max}, T_{diff}	Low (B)	High
Conference hall/waiting room/fairground	O, T_{max}, T_{diff}	High (A2)	Low
Kitchen/casino/restaurant during active operation	T_{max}	Low (B)	-
Warehouse with vehicle traffic	O, T_{max}, T_{diff}	Low (B)	Low
Rate of rise only (optical sensor off)**	T_{max}, T_{diff}	High (A2)	-
Optical only (thermal sensor off)**	O	-	Low
Fixed temperature heat only (optical sensor off)**	T_{max}	High (A2)	-
Schools/kindergarten	O, T_{max}, T_{diff}	High (A2)	Medium
Theatre/concert hall	O, T_{max}, T_{diff}	High (A2)	Medium

O = optical sensor (dual-optical in FAP-DOT420 detectors)
T_{max} = thermal maximum unit
T_{diff} = thermal differential unit
** FSP-5000-RPS only
For details on installation height, see *Section 4.4 FAH-T 420/FAH-T 420-KKW, page 13*

NOTICE!
The FAP-DOT420 detector is not supported by the WinPara programming software.

4.3 FAP-DO420 / FAP-O 420 / FAP-O 420-KKW

Installation locations	Selectable sensitivity
Theater/concert hall	Medium
Warehouse with vehicle traffic	Low
Office (smoker)/waiting room/restaurant/meeting room	Low
Conference hall/waiting room/fairground	Low
Office (after hours)	High
School/kindergarten	Medium
Production location	Low

Installation locations	Selectable sensitivity
EDP room	High
High storage warehouse without vehicle traffic with combustion engine	High
Office (day mode)	Medium

4.4 FAH-T 420/FAH-T 420-KKW

Selectable installation locations in the programming software (WinPara and FSP-5000-RPS)	
§ A2R	Typical application temperature: 25 °C, T_{max} + T_{diff}, height up to 6 m
A2S	Typical application temperature: 25 °C, only T_{max}, height up to 6 m
A1R	Typical application temperature: 25 °C, T_{max} + T_{diff}, height 6 m to 7.5 m
A1	Typical application temperature: 25 °C, only T_{max}, height 6 m to 7.5 m
BR	Typical application temperature: 40 °C, T_{max} + T_{diff}, height up to 6 m
BS	Typical application temperature: 40 °C, only T_{max}, height up to 6 m
§ = Basic setting in the WinPara and FSP-5000-RPS programming software	

Sensitivity classes as per EN 54 Part 5

With the detector types FAH-T 420 and FAH-T 420-KKW, it is possible to set one of the sensitivity classes listed above in line with planning.

In the sensitivity classes A1, A2S and BS, the FAH-T 420 or FAH-T 420-KKW is operated purely as a thermal maximum detector. In this case, the detector does not activate at below 54 °C in class A2S, and not below 69 °C in class BS.

The sensitivity classes A2S and BS are therefore particularly suitable for applications where higher temperature rates-of-rise occur over a longer period, e.g. in kitchens or boiler rooms.

The sensitivity classes A1R, A2R and BR indicate that the thermal differential unit is active in addition to the thermal maximum unit.

These sensitivity classes are especially well-suited for use in unheated buildings where the ambient temperature can vary greatly but high temperature rates-of-rise do not last long.

The thermal differential unit enables class A1R/A2R detectors to respond at T<54 °C and class BR detectors at T<69 °C.

The selection of the sensitivity class also depends on the installation height of the detector. To maintain the greatest possible security against false alarms, classes A1 and A1R should not be selected for room heights below 6 m, although these classes are in theory permitted. Furthermore, the expected application temperature must be taken into consideration.

Temperature rate-of-rise [K min^{-1}]	Response time for detectors in the sensitivity class A1R		Response time for detectors in the sensitivity classes A2R/BR	
	Lower limiting value [min/sec]	Upper limiting value [min/sec]	Lower limiting value [min/sec]	Upper limiting value [min/sec]
10	1 min	4 min 20 s	2 min	5 min 30 s
20	30 s	2 min 20 s	1 min	3 min 13 s
30	20 s	1 min 40 s	40 s	2 min 25 s

5 Connection

5.1 Overview of Detector Bases

Detectors in the FAP-420/FAH-420 series are operated in one of the detector bases listed below.
The detector bases are suitable for surface and flush mounting, and provide separate fixing points for ceiling and flush mount back boxes. They also fit all common bore patterns.
The bases are made from white ABS plastic (color similar to RAL 9010) and have a matte surface finish.
The bases have screw terminals for connection of the detector and its accessories to the fire panel. Contacts connected with the terminals guarantee a secure electrical connection when installing the FAP-420/FAH-420 Detector Head. Cable diameters of up to 2.5 mm^2 can be used.
The detector head can be secured against unauthorized removal with a variable lock.

MS 400
The MS 400 is the standard detector base. It has seven screw terminals.

MSF 400
The MSF 400 Detector Base with Damp Room Seal is available for use of the detector in a humid environment.
The integrated TPE seal protects the MSF 400 Detector Base reliably against the penetration of condensed water.

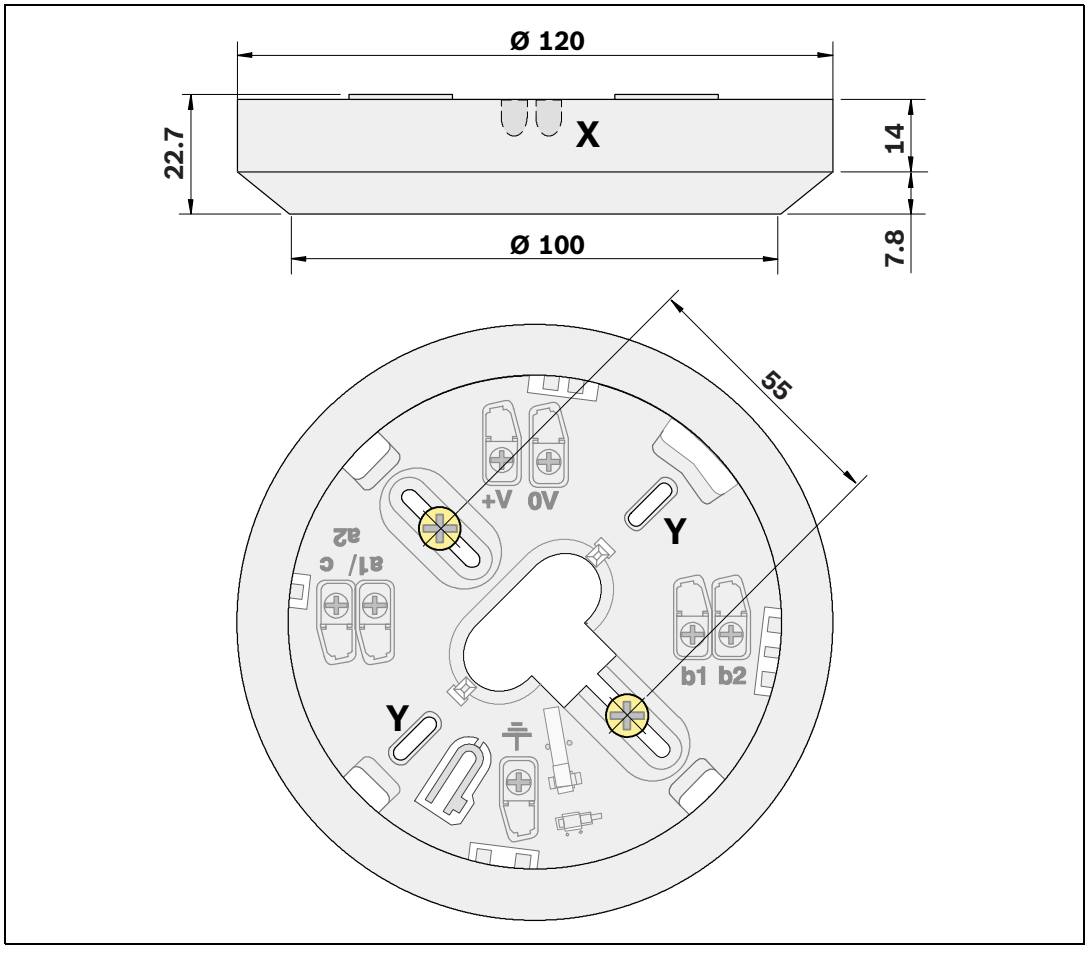
FAA-MSR 420
The FAA-420-R is a detector base with a change-over contact relay (type C).
The FAA-MSR 420 Detector Base with Relay can only be used in connection with the Local Security Network improved version (FPA-5000 Modular Fire Panel).

MSC 420
The MSC 420 Additional Base was designed specially for surface-mounted cable feed via cable protection conduits and has two opposing pre-cut entry points of 20 mm diameter and two additional opposing and prepared entry points for diameters up to 28 mm.
The additional base has a diameter of 120 mm and a height of 36.7 mm. To protect against condensed water penetration, a seal is placed on the bottom of the MSC 420.

5.2 Installing the Base

The detector bases are screwed to the even, dry surface using two screws approx. 55 mm apart.
To feed cables through for surface mounting, punch out the prepared entry points (X) on the housing.
For flush-mounted cable insertion, feed the cable through the opening in the middle of the base.
The long holes marked in the sketch with "Y" are intended for base installation in a flush mount back box and should only be used for this purpose.

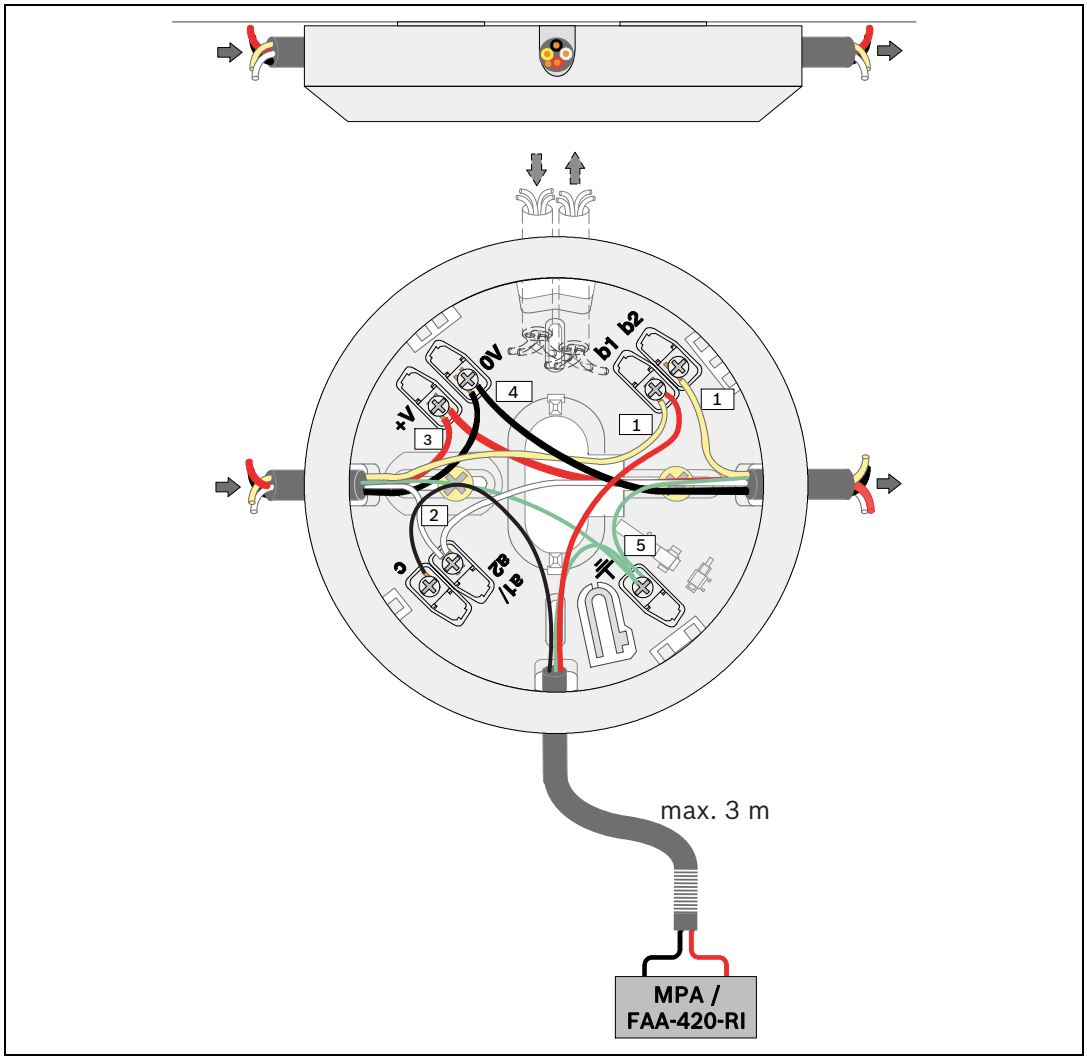
NOTICE!
Cables can be fed in and out on the same side.
On the MSF 400 and MSC 420, punch out the integrated seal with a sharp tool. Do not cut with a knife.



5.3 Connection

NOTICE!
Keep shield wire as short as possible and insulate.

5.3.1 Connecting the MS 400/MSF 400

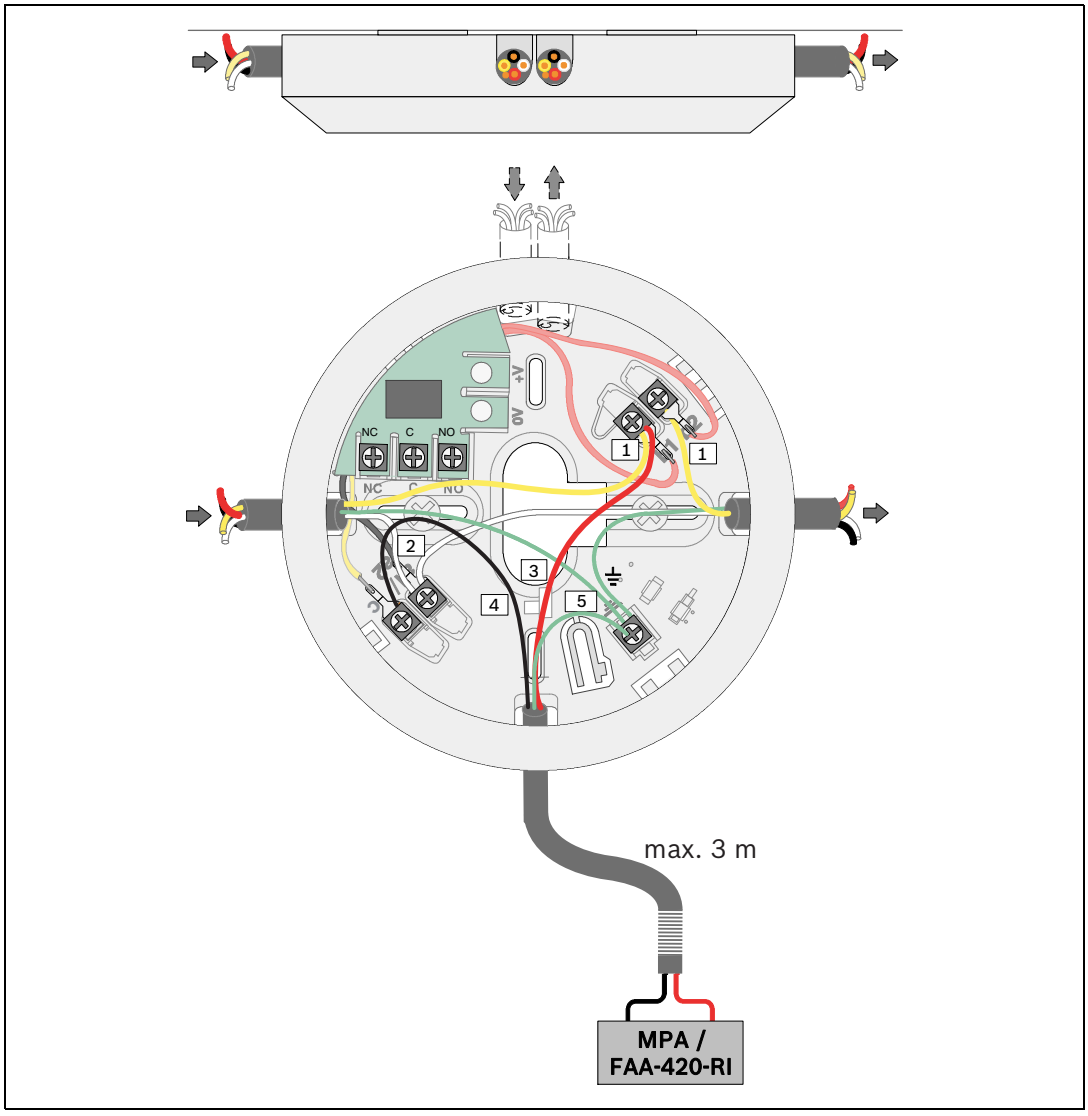


Key	
1	Yellow, connection to b1/b2 (LSN +)
2	White, connection to a1/a2 (LSN -)
3	Red, connection to +V
4	Black, connection to 0 V
5	Green, connection to shielding wire
c	Indicator output
+V/0 V	Terminals for looping through the supply voltage for downstream elements
EOL	Line termination (end-of-line module)
MPA/FAA-420-RI	Remote indicator

5.3.2 Connecting the FAA-MSR 420

Maximum contact load (resistive load) of the change-over contact relay:

- 62.5 VA: 0.5 A at 125 V AC
- 30 W: 1 A at 30 V DC

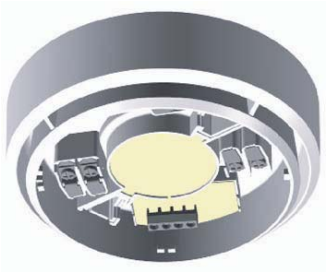


Key	
1	Yellow, connection to b1/b2 (LSN +)
2	White, connection to a1/a2 (LSN -)
3	MPA/FAA-420-RI: Red, connection to b1
4	MPA/FAA-420-RI: Black, connection to c (indicator output)
5	Green, connection to shield wire
NC/C/NO	Change-over contact relay
+V/0 V	Terminals for looping through the supply voltage for downstream elements
EOL	Line termination (end-of-line module)
MPA/FAA-420-RI	remote indicator

5.4 Detector Base Sounders

Detector base sounders are used if acoustic alarm signaling is required directly at the fire source. Detector base sounders are available in four variants.

- MSS 300 Detector Base Sounder White, for conventional line technology, activation via the C point of the detector in use.
- MSS 300 WS-EC Detector Base Sounder White, for conventional line technology, with external activation (via an interface module).
- FNM-420-A-BS Detector Base Sounder White or Red, for LSN line technology, with power supply via the LSN with 32 different tones.
- MSS 401 Detector Base Sounder White, for LSN line technology, with separate power supply.



The integrated tone generator has 11 tones for selection (incl. tones conforming to DIN 33404 and EN 457) with sound pressure of max. 100 dBA, depending on the type of tone selected.
With the LSN variants, the volume (4 levels) and also the tone type are programmed via the fire panel. The tone type on conventional variants is set via four DIP switches and the volume is adjusted continuously via a potentiometer.

5.5 Installation of the Detector Module

NOTICE!
The packaging for the multisensor detector with C sensor consists of tear-proof PE-ALU laminated film and must be cut open carefully.

After installation and connection of the base, the detector head is set into the base and turned to the right as far as it will go.
Detector bases are delivered with inactive locks.
The detector module can be locked in the base (removal protection). The locking feature is activated by breaking the bolt (X) out of the base and pushing it into the corresponding guide, as shown in *Figure 5.1*.

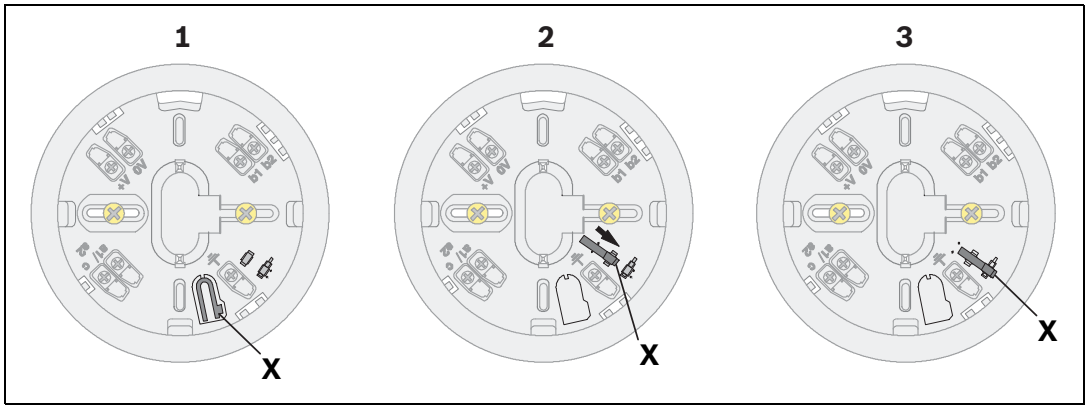


Figure 5.1 Activation of the removal protection mechanism

Key	
1	Bolt (X) before breaking out
2	Bolt (X) fitted, but deactivated
3	Locking activated

5.6 Detector Removal

Unlocked detector heads are disassembled by turning them to the left and removing them from the base.
Locked detector heads are disassembled by inserting a screwdriver into the unlocking opening (Y) so that the bolt is pushed upward; at the same time, the detector head should be turned to the left (see *Figure 5.2*).

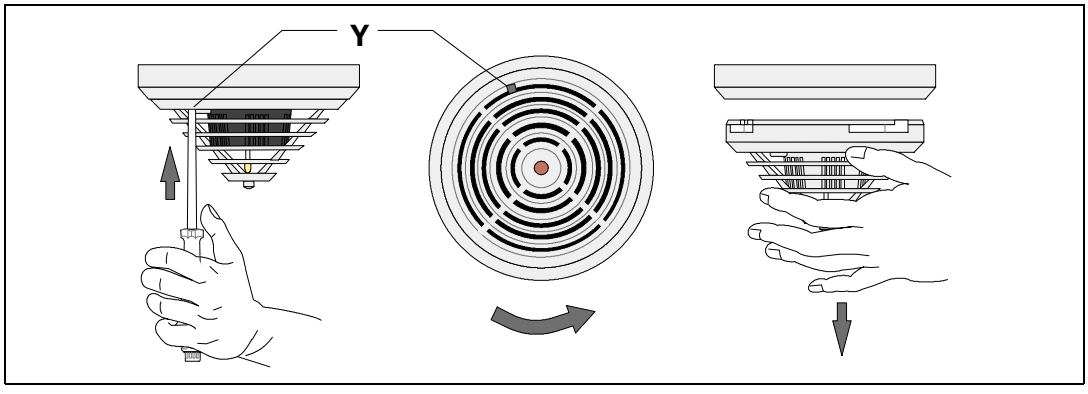
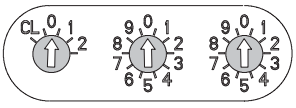
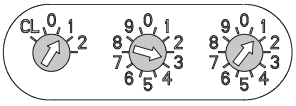
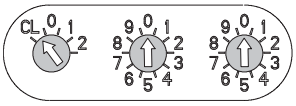


Figure 5.2 Detector removal (locked detector module)

5.7 Addressing

There are three rotary switches on the bottom of the detector; these are used to select automatic or manual address allocation with or without auto-detection.
The following settings are possible:

Rotary switch setting	Address	Operating mode
	0 0 0	Loop/stub with LSN improved version mode and automatic address allocation (T-tapping not possible) = delivery status
	0 0 1 ... 2 4 5	Loop/stub/T-tapping with LSN improved mode and manual address allocation (address shown in example = 131)
	CL 0 0	Loop/stub in classic LSN mode with automatic address allocation (T-tapping not possible, maximum number of elements = 127)

The rotary switches are moved to the required position using a slotted-head screwdriver.

Automatic address allocation
If addresses are automatically allocated by a fire panel with LSN improved version technology, all detectors must have the address "0 0 0" (delivery status).
For connection to classic LSN fire panels (BZ 500 LSN, UEZ 2000 LSN, UGM 2020), all detectors must have the address "CL 0 0".

Manual address allocation
For manual address allocation, the detector address is set with the three rotary switches. The right-hand rotary switch is used to set the units, the central rotary switch is used to set the tens and the left-hand rotary switch is used to set the hundreds.

NOTICE!
It is not permissible to use addresses greater than 254.
This will prompt the display of an error message on the fire panel.
All the detectors in a loop, stub or T-tap must have an address between 1 and 254 when addressed manually.

From LSN module software version 1.0.35, you can operate LSN improved version and LSN classic elements together in one loop or stub. If an LSN classic element is present, only 127 elements can be used in the loop.
Please note that only loop or stub structures can be used for configurations with mixed LSN classic and LSN improved elements.

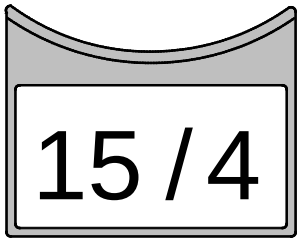
6 Accessories

6.1 Support Plate for Detector Identification

The support plates are made from 1.8 mm thick ABS plastic and are clamped between the detector base and the ceiling.

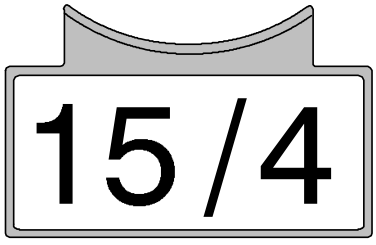
TP4 400 Support Plate

The TP4 400 Support Plate is intended for an installation height up to 4 m and is designed for labels up to a size of approx. 65 x 34 mm.



TP8 400 Support Plate

The TP8 400 Support Plate is intended for an installation height up to 8 m and is designed for labels up to a size of approx. 97 x 44 mm.



6.2 SK 400 Protective Basket

The SK 400 Protective Basket is installed over the detector and gives the detector substantial protection against damage.
If the detector is mounted in a sports facility, for example, the protective basket prevents balls or other sports equipment from hitting the detector and damaging it.

6.3 SSK 400 Protective Dust Cover

The SSK 400 Protective Dust Cover is necessary during construction work to protect an installed detector base, with or without detector module, from contamination. The protective dust cover made of polypropylene (PP) is pushed onto the installed detector base.

6.4 MK 400 Detector Console

The MK 400 Detector Console is used to install detectors above door frames or similar in compliance with DIBt. The console is supplied with a pre-mounted MS 400 Detector Base (the detector shown is not included in the scope of delivery).

6.5 MH 400 Detector Heating Element

The MH 400 Detector Heating Element is required if the detector is used in an environment where water condensation can occur, such as in a warehouse that must frequently be opened briefly for delivery vehicles.
The detector heating element is connected to the + V/0 V terminals in the detector base.
Operating voltage: 24 V DC
Resistance: 1 kΩ
Power consumption: 3 W.
The heating is supplied with power either by the fed-through supply voltage via the central unit or by a separate power pack.
With supply via the central unit, the number of detector heating elements depends on the cable diameter and line length used.

6.6 External Detector Alarm Displays/Remote Indicators

A remote indicator is required if the detector is not directly visible or has been mounted in false ceilings or floors. The remote indicator should be installed in corridors or access pathways to the corresponding building sections or rooms. The red alarm indication of the FAA-420-RI Remote Indicator and MPA External Detector Alarm Display conforms to DIN 14623.

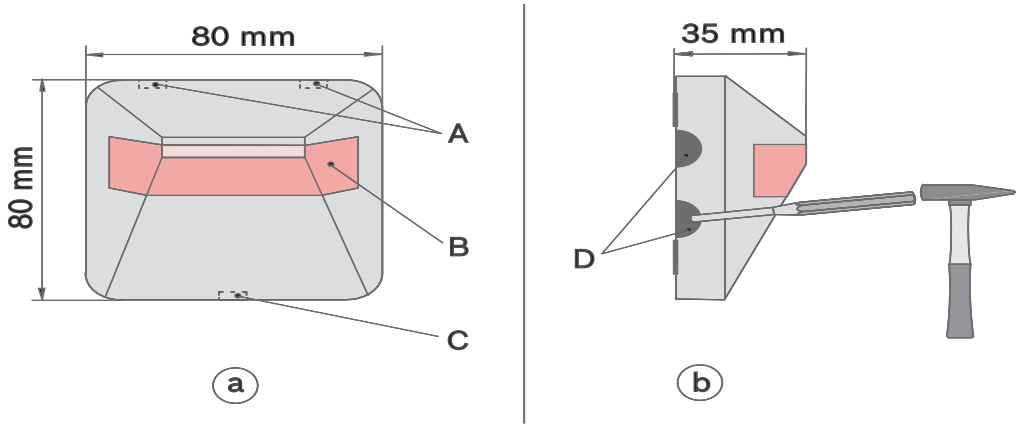
6.6.1 Installation Note for FAA-420-RI Remote Indicator

NOTICE!
The FAA-420-RI Remote Indicator must be installed such that the broad side of the red alarm indication (see image, item B) follows the observer's line of sight.

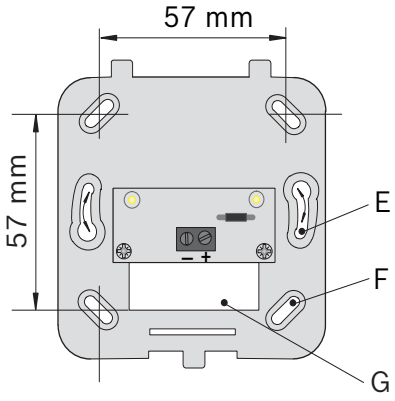
WARNING!
If the maximum current consumption of the connected detector is larger than 20 mA, it can result in malfunctions and damage to the remote indicator.
In order to prevent damage to the device, ensure that the maximum current consumption of 20 mA is not exceeded.
Point-type automatic Bosch detectors already have an internal resistor that limits current consumption.

Installation

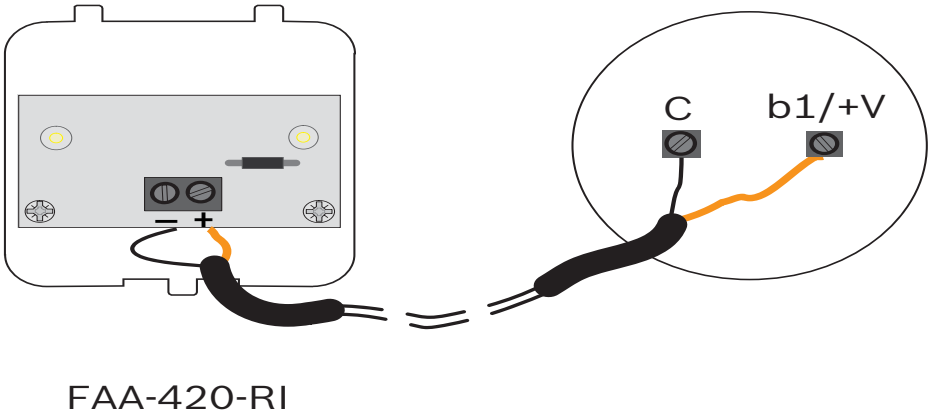
1. Before assembly, remove the cap from the base plate: To unlock the snap-fit hooks (see image, item C) with a flat object (e.g. screwdriver), press in and lift the cap carefully.



2. Fit the FAA-420-RI directly to the ceiling or wall. To do this, secure the base plate to a level, dry surface with two (item E) or four (item F) screws.



3. Punch out the pre-punched cable entries (item D) to insert cables for surface mounting. For flush mounting, insert cables through the opening (item G) under the connection board.
4. Connect the FAA-420-RI via two terminals.



5. Place the cap on the base plate in such a way that the two hooks (item A) are inserted into the slits. Press the cap lightly onto the base plate until the snap-fit hook (item C) engages.

Technical data

Operating voltage	5–30 V DC
Weight	45 g
Display medium	2 LEDs
Permissible wire gauge	0.6–2 mm
Maximum current consumption	20 mA

6.6.2 MPA External Detector Alarm Display

Installation note

- Fitted directly to the wall or ceiling.
- To feed cables through for surface mounting, punch out the prepared entry points (see *Figure 6.1*, item X) on the housing.
- For flush-mounted cable insertion, feed the cable through the opening beneath the connection board.

NOTICE!
The flat side of the prism (see *Figure 6.1*, item Y) must follow the observer's line of sight.

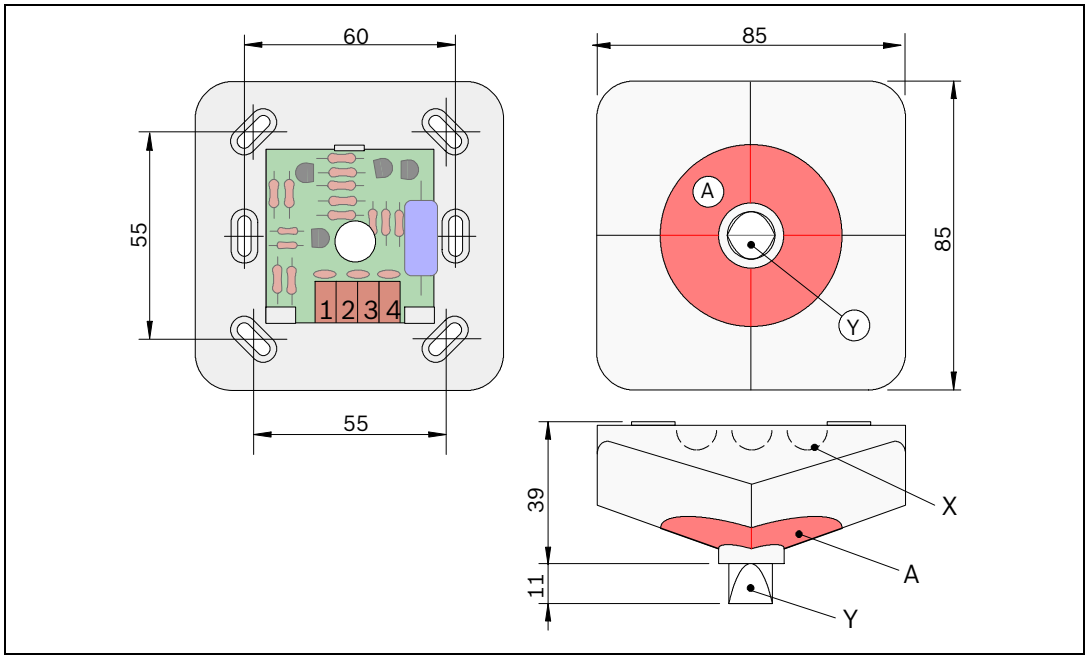


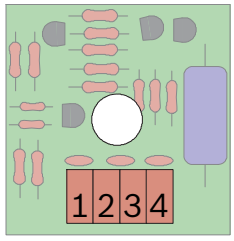
Figure 6.1 Installation of the MPA External Detector Alarm Display

Connection

The MPA is connected via four Wago terminals.
Connecting: Insert the stripped cable end (no braided wire) into the terminal.
Disconnecting: Turn wire alternately to the left and right, thus pulling it out of the terminal.
Up to 4 detectors can be connected to each MPA.
Three inputs (terminals 2-4) allow adjustment to various line technologies.

Connection depending on the line technology

Line technology	Fire panel	Terminals
Conventional	BZ 1060	1 + 2
Conventional	FPA-5000, UEZ 1000, UGM 2020, FP 102/104/106	1 + 3
LSN	FPA-5000, FPA-1200, BZ 500 LSN, UEZ 1000, UEZ 2000 LSN, UGM 2020	1 + 4

Terminal	Connection	
1	Ground	
2	Entry point flashing (LED flashes)	
3	Entry point static (LED flashes)	
4	Entry point static (LED flashes)	
A resistor is necessary to connect to terminal 4; otherwise, the LED may be damaged. All current Bosch detectors are equipped with an internal resistor to restrict current consumption.		

CAUTION!

If the current consumption for the connected detector exceeds 20 mA, it can lead to the malfunction of or damage to the MPA.
You should restrict the maximum detector current consumption to 20 mA to avoid damaging the MPA.

NOTICE!

The cable length between the detector and the MPA must not exceed 3 m when connected by an unshielded cable.

MPA technical specifications	
Operating voltage	9 V DC to 30 V DC
Maximum current consumption – Terminal 2 – Terminal 3 – Terminal 4	 – approx. 2 mA – limited to approximately 13 mA – limit to maximum 20 mA
Display medium	1 LED
Permissible wire gauge	0.6 mm. . . 0.8 mm
Dimensions	79 x 79 x 31 mm
Weight	Approx. 65 g
VdS approval number	G 294 052

6.7 Service and Detector Test Accessories

SOLO200 Detector Removal Tool
The pivoting grips and three different diameters make the SOLO200 Detector Removal Tool suitable for removing and replacing most fire detectors.
The plastic caps enable the fire detector to be securely gripped and protect the detector surface against damage.

RTL-cap plastic caps for the SOLO200 Detector Removal Tool
Scope of delivery = 2 pieces

FME-420-ADAP Tool Adapter for MS 420
The FME-420-ADAP Tool Adapter can be used in addition to the SOLO200 Detector Removal Tool. The plastic bowl and the adapter pole optimize the insertion and removal of fire detectors when using detector bases with springs (MS 420, FAA-MS 420-R-SP).
Note: Only use the plastic bowl in conjunction with the adapter pole. On the adapter pole there is a rubber bearing that cushions the turning motion when removing the fire detectors and prevents damage.

SOLO330 Smoke Detector Tester
The SOLO330 Smoke Detector Tester is used to test smoke detectors on site. A testing gas that simulates smoke particles is used to do this.

Solo A3-001 Test Aerosol for Optical Smoke Detectors
Spray can with 250 ml test aerosol for optical smoke detectors
DU = 12 pieces

Solo CO testing gas

Spray can with CO testing gas for multisensor detectors with C sensor.
Contents: approx. 4 l compressed gas
DU = 12 pieces

SOLO461 Heat Detector Tester

The SOLO461 Heat Detector Tester is battery-operated and conducts hot air to the heat detector sensor.
The SOLO461 uses patented CAT™ technology (Cross Air Technology), which bundles the air and feeds it to the sensor horizontally, regardless of the size or form of the detector.

SOLO100 Telescopic Access Pole

The SOLO100 Telescopic Access Pole is used to install and replace fire detectors on high ceilings. It can be extended by three SOLO101 Fixed Extension Poles.
The telescopic access pole is suitable for applications in high-voltage environments and was tested at a voltage of 20 kV in line with BS EN 61235 Part 12.
Length: 1 m to 3.4 m

SOLO101 Fixed Extension Pole

The SOLO101 Fixed Extension Pole is used to install and replace fire detectors on ceilings.
It can be used on its own, with up to three other fixed extension poles or with the SOLO100 Telescopic Access Pole.
Length: 1 m

SOLO610 Test Equipment Bag

The SOLO610 Test Equipment Bag is made from strongly woven polyester with a PVC coating and is suitable for carrying or storing test and service products.

7 Order Information

7.1 Detector Variants

Type number	Designation	Product ID
FAP-DOTC420	Dual-optical, thermal, chemical multisensor detector	F.01U.116.034
FAP-OTC 420	Optical, thermal, chemical multisensor detector	F.01U.508.816
FAP-DOT420	Dual-optical, thermal multisensor detector	F.01U.116.033
FAP-OT 420	Multisensor Detector Optical/Thermal	F.01U.508.815
FAP-DO420	Dual-optical smoke detector	F.01U.116.032
FAP-O 420	Optical Smoke Detector	F.01U.508.813
FAH-T 420	Heat Detector	F.01U.508.915
FAP-O 420 KKW	Optical smoke detector for use in areas with elevated radioactivity	F.01U.508.687
FAH-T 420 KKW	Heat detector for use in areas with elevated radioactivity	F.01U.508.686

7.2 Detector Bases

Type number	Designation	Product ID
MS 400	Standard detector base, for surface-mount and flush-mount cable insertion	4.998.021.535
MSF 400	Detector base with damp room seal, for surface-mount and flush-mount cable insertion	4.998.079.480
FAA-MSR 420	Detector Base with Relay	F.01U.508.658
MSC 420	Additional base with damp room seal, for surface-mount cable insertion	4.998.113.025

7.3 Detector Accessories

Type number	Designation	Product ID
TP4 400	Support Plate for Detector Identification, installation heights up to 4 m (1 pack = 50 pieces)	4.998.084.709
TP8 400	Support Plate for Detector Identification, installation heights up to 8 m (1 pack = 50 pieces)	4.998.084.710
SK 400	Protective Basket to guard against mechanical damage	4.998.025.369
SSK 400	Protective Dust Cover (1 pack= 10 pieces)	4.998.035.312
MH 400	Detector heating element	4.998.025.373

7.4 Installation Accessories

Type number	Designation	Product ID
MK 400	Detector Console, for DIBt-compliant detector installation above doors or similar, incl. detector base	4.998.097.924
FMX-DET-MB	Mounting bracket, with installation material for false floors, no detector base	2.799.271.257

7.5 Detector Base Sounders

Type number	Designation	Product ID
MSS 300	Detector Base Sounder White, conventional line technology, only C point activation via attached detector, for surface-mount and flush-mount cable insertion	4.998.025.372
MSS 300 WS-EC	Detector Base Sounder White, conventional line technology, only for external activation, for surface-mount and flush-mount cable insertion	4.998.120.501
FNM-420-A-BS-WH	Detector Base Sounder White, LSN, power supply via LSN, C point activation via attached detector or external activation via LSN, for surface-mount and flush-mount cable insertion	F.01U.064.687
MSS 401 LSN	Detector Base Sounder White, LSN, separate power supply required, C point activation via attached detector or external activation via LSN, for surface-mount and flush-mount cable insertion	4.998.102.859

7.6 Service accessories

Type number	Designation	Product ID
SOLO200	Detector Removal Tool	4.998.112.113
RTL-cap	Plastic caps for the SOLO200 Detector Removal Tool (scope of delivery = 2 pieces)	4.998.082.502
FME-420-ADAP	Tool Adapter for MS 420	F.01U.510.318
SOLO330	Smoke Detector Tester	4.998.112.071
Solo A3-001	Test Aerosol for Optical Smoke Detectors	4.998.112.074
Solo CO Testing gas	Solo CO Testing gas (400 ml, 1 pack = 10 pieces)	4.998.109.056
SOLO461	Heat Detector Tester	4.998.112.072
SOLO720	Battery for SOLO461 Heat Detector Tester	4.998.147.576
SOLO100	Telescopic Access Pole	4.998.112.069
SOLO101	Fixed Extension Pole	4.998.112.070
SOLO610	Test Equipment Bag	4.998.112.073

8 Maintenance and Service

In Germany, maintenance work and inspection work on security systems are governed by the regulations of DIN VDE 0833; these regulations stipulate reference to the manufacturer's instructions for maintenance intervals.

- Maintenance and inspection work should be carried out regularly and by trained personnel.
- BOSCH ST recommends carrying out a functional and visual inspection at least once a year.

Testing	**Detector Type**			
	FAP-DO420 FAP-O 420 FAP-O 420 KKW	**FAH-T 420 FAH-T 420 KKW**	**FAP-DOT420 FAP-OT 420**	**FAP-DOTC420 FAP-OTC 420**
Check of the LED display	X	X	X	X
Visual check of the mounting	X	X	X	X
Visual check for damage	X	X	X	X
Check the monitoring range has not been restricted, for instance by shelves or similar installations.	X	X	X	X
Triggering with hot air	-	X	X	X
Triggering with Solo A3-001 Test Aerosol	X	-	X	X
Triggering with Solo CO Testing gas	-	-	-	X

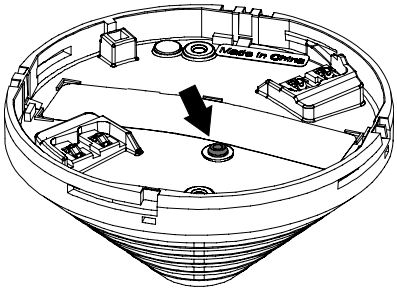
- **FAP-OTC 420 / FAP-DOTC420**
  An FAP-OTC 420 will deactivate its C sensor after 5 years of operation due to the gas sensor's limited life cycle.

  On the panel, the detector in question is displayed with "EMERGENCY OPERATION" and it continues to function as an OT or O detector.

  With the FAP-DOTC420, the gas sensor has a life cycle of 6 years. Once the gas sensor has been switched off, this detector continues to function as a DOT or DO detector and is displayed on the panel with "EMERGENCY OPERATION".

  This is why multisensor detectors with C sensors need to be exchanged every 5-6 years.
- Optical fire detectors should, depending on the environmental conditions, be cleaned and exchanged every 4-6 years.
  In especially dusty environments, cleaning and exchange may be necessary earlier.

Every detector base has a Chamber Maid Plug (cleaning opening with a plug) for blowing out the optical chamber with compressed air (not required for the FAH-T 420 Heat Detector).



8.1 Notes for the Service

NOTICE!
The DO detectors are not supported by the WinPara programming software.

NOTICE!
With the exception of the special KKW detector types, you can use the WinPara programming software (V 4.53 or higher) to display the serial number, contamination level, operating hours and current analog values for all configured detectors.

8.1.1 Display of Operating Data in WinPara

Anzeige der Betriebsdaten von MAGIC-Meldern

BG-Adr.	Adresse	Kurzinfo	Typ	Serien-nummer	Optik-Wert	Temp.-Wert[°C]	CO-Wert	Betr.-Std.-Zähler Jahre/Tage/Std.	Fehlercode C-Störung	Verschmutzung
1	2-01	0400 auf MSS400	0400	2000480	94	24	--	0/130/ 4	00000000	0
1	3-01	OTC410	OTC410	3910020	110	28	0	0/ 27/ 4	00000000	0
1	4-01	OT400	OT400	3931859	71	24	--	0/ 27/12	00000000	0
1	7-01		0400	2000439	91	--	--	0/245/12	00000000	0
1	7-02		0400	2000489	82	--	--	0/293/16	00000000	0
1	7-03		0400	2000467	75	--	--	0/288/ 8	00000000	0
1	7-04		0400	2000481	89	--	--	0/285/16	00000000	0
1	7-05		0400	2000468	86	--	--	0/288/ 4	00000000	0
1	7-06		0400	2000479	88	--	--	0/287/12	00000000	0
1	9-01		OT400	3906955	83	23	--	0/130/ 4	00000000	0
1	10-01	0400	0400	2000486	73	--	--	0/241/20	00000000	0
1	10-02	0400	0400	2000466	78	--	--	0/247/ 0	00000000	0

Module Address
Module where the detector or detector line is installed.

Address
Detector installation address, e.g. 10-03: The detector is in zone 10 and is the detector number 3.

Brief Info
Additional information entered during programming. e.g. "FAP-O 420 on MSS400" means that the FAP-O 420 is installed together with an MSS 400 Detector Base Sounder. You can also enter the position of the detector here.

Type
display of the set detector type.

Serial number
The first digit of the 8-digit serial number represents the year of manufacture, i.e. a detector with the serial number 3931859 was manufactured in 2003.

Current analog values

Optical system value (display of the current contamination value):

0 . . . 170	Initial set-up value for a new detector
0 . . . 350	Normal working range
350 . . . 450	Slight contamination: Exchange detector soon
450 . . . 510	Heavy contamination: Exchange detector immediately

From 511 O fault: optical sensor is deactivated!

Temperature value [°C] (display of the value currently being measured by the thermal sensor):

FAH-T 420	-20 °C. . . +65 °C
FAP-OT 420	-20 °C. . . +50 °C
FAP-OT 420	-10 °C to +50 °C

CO value: Display of the value currently being measured by the CO sensor
The CO value specifies the currently-measured CO concentration.
The specified number is calculated as the difference between the current measurement value and the stand-by value stored in the detector.
The CO concentration displayed lies in the range between 0 (normal operating condition) and 555 (max. measurement value of the sensor).

Operating hours counter

Display of the duration of operation since the initial start-up of the detector.

Error code C malfunction

Error code	Cause of trouble and troubleshooting
01000000	General C malfunction Possible causes: – Thermal sensor fault – Maximum operation duration (5 years) of the C sensor has been exceeded. T and C sensors are switched off; the optical sensor is still in operation. **Exchange detector immediately!**
01100000	The impedance of the electrochemical cell is too high. The C sensor is switched off; the rest of the sensors are still in operation. **Exchange detector immediately!**
01010000	The permissible operating temperature (-10 °C to +50 °C) has been exceeded. The C sensor is switched off; the rest of the sensors are still in operation.
01001111	Malfunction due to read/write error in the EEPROM **Detector is switched off and must be exchanged immediately!**
00000xxx	Number of read/write errors in the EEPROM

Contamination

The optical initial set-up value of a new detector is stored in the integrated EEPROM during the final inspection. The contamination value specifies by how much this analog value has increased in comparison with the delivery state.

8.2 Detector Type Encoding

With the exception of the FAP-O 420 and FAP-O 420-KKW, all detectors are fitted with a colored ring around the central individual display to identify the detector type.
This facilitates inspection by service personnel.

Type number	Color code
FAP-DOTC420	2 x yellow
FAP-OTC 420	Yellow
FAP-DOT420	2 x black
FAP-OT 420	Black
FAH-T 420	Red
FAH-T 420-KKW	Red
FAP-DO420	2 x gray
FAP-O 420	-
FAP-O 420-KKW	-

8.3 Test Instructions for LSN improved version Fire Detectors

The latest generation of FAP-DOTC420 / FAP-OTC 420 Multisensor Detectors is equipped with an additional sensor for detecting CO in the event of a fire. The CO sensor provides improved response behavior and increased malfunction suppression in critical environmental conditions.
For fire detection, detectors use the time behavior of the fire characteristics, which deviates significantly from the time behavior of disturbance variables and also from the time behavior of a detector check with aerosol.
Therefore, for a functional test, the detector must be switched to revision mode.

8.3.1 Test Instructions for All Fire Detectors With Optical Sensor

- On the fire panel, switch the detector zone to be inspected to revision mode. Thus the detector is set automatically into revision operation and prepared for the detector test.
- Only in walktest mode can the detector's individual sensors be made to trigger one after the other with the corresponding test device. For this, you should use the service accessories we recommend.
- The optical sensor is tested with the detector tester for smoke detectors with the Solo A3-001 Test Aerosol.

NOTICE!
The test head must remain over the detector until the detector has been triggered. The distribution of the test aerosol in the transceiver and thus the trigger time of the sensor can take up to 10 seconds.

8.3.2 Test Instructions for FAP-DOTC420 / FAP-DOT420 / FAP-OTC 420 / FAP-OT 420

Sequential walktest
Select walktest type "Sequential walktest" on the FPA-5000/FPA-1200 panel controller in the walktest menu.

- The same test device is used to test the CO sensor in the FAP-DOTC420 / FAP-OTC 420. You only need to exchange the Solo A3-001 testing gas bottle with the CO testing gas bottle. The testing gas must be applied for 1/2 to 1 second for the CO test.

NOTICE!
The test head must remain over the detector until the detector has been triggered. The time taken to distribute the test aerosol in the test head and therefore the trigger time of the sensor can be up to 20 seconds.

– The thermal sensor of the FAP-DOTC420 / FAP-DOT420 / FAP-OTC 420 / FAP-OT 420 is tested with the test device for heat detectors.

Simultaneous walktest
Select walktest type "Simultaneous Walktest" on the FPA-5000/FPA-1200 panel controller in the walktest menu.
Multisensor detectors can be tested simultaneously with the Testifire detector test device with multiple triggering from NoClimb Products Ltd. Observe the notes in the detector testing device and fire panel operating instructions.

NOTICE!
An alarm message is only displayed on the panel if all sensors are triggered during the simultaneous walktest. If this does not happen, one of the sensors is faulty.

8.4 Warranty

Defective detectors are exchanged free of charge in the case of a claim under the warranty.

8.5 Repair

In the event of a defect, the entire detector is exchanged.

8.6 Disposal

Unusable electrical and electronic devices or modules must not be disposed of with normal household refuse. They must be disposed of in compliance with the applicable regulations and directives (e.g. WEEE in Europe).

Packaging film for the FAP-OTC 420/FAP-DOTC420
The packaging bag used for multisensor detectors with C sensor consists of tear-resistant PE-ALU laminated film and may be disposed of with the household refuse.
Defective detectors are exchanged and should be disposed of in accordance with legal regulations.

8.7 Additional documentation

NOTICE!
For those with access rights, the current product information and the installation guide enclosed with the device are available in PDF format from
the Bosch Security Systems Extranet at http://www.boschbest.de.

9 Technical Data

DO detectors

Detector Type	FAP-DOTC420	FAP-DOT420	FAP-DO420
Detection principle	Combination of: – Scattered-light measurement – Measurement of absolute temperature and temperature increase		Scattered-light measurement
	– Combustion gas measurement	-	-
Special features	– Two optical sensors – Contamination detection – Drift compensation in the optical sensor		
	– Operation switching/sensor deactivation in the optical unit and in the thermal unit		-
Operating voltage	15 V DC to 33 V DC		
Current consumption	< 0.55 mA		
Individual display	Two-color LED (red/green)		
Alarm output	Per data word by two-wire signal line		
Indicator output	Open collector connects 0 V over 1.5 kilohm, max. 15 mA		
Response sensitivity (basic data) – Optical sensor	< 0.15 dB/m (EN 54-7)		
– Thermal differential unit – Thermal maximum unit	EN 54-5 > 54 °C/> 69 °C		-
– Chemical sensor	ppm range	-	-
Max. monitoring area	120 m^2 (observe VdS guidelines)		
Max. installation height	16 m (observe VdS guidelines)		
Permitted air speed	20 m/s		
Permissible operating temperature	-10 °C. . . +50 °C	-20 °C. . . +50 °C	-20 °C. . . +65 °C
Permitted relative humidity	< 95% (non-condensing)		
Protection category according to EN 60529	IP 40/IP 43 with detector base with damp room seal		
Color code	2 yellow rings	2 black rings	2 gray rings
Dimensions without base Dimensions with base	∅ 99.5 x 52 mm ∅ 120 x 63.5 mm		
Housing material/color	ABS/white, similar to RAL 9010, matte surface		
Weight without packaging Weight with packaging	Approx. 80 g Approx. 135 g	Approx. 75 g Approx. 125 g	Approx. 75 g Approx. 125 g
Product ID	F.01U.116.034	F.01U.116.033	F.01U.116.032

Multisensor detector

Detector type	FAP-OTC 420	FAP-OT 420
Detection principle	Combination of: – Scattered-light measurement – Measurement of absolute temperature and temperature increase – Combustion gas measurement	Combination of: – Scattered-light measurement – Measurement of absolute temperature and temperature increase
Special features	– Contamination detection – Drift compensation in the optical sensor and the gas sensor – Operation switching/ sensor deactivation in the optical unit and in the thermal unit	– Contamination detection – Drift compensation in the optical sensor – Operation switching/ sensor deactivation in the optical unit and in the thermal unit
Operating voltage	15 V DC to 33 V DC	
Current consumption	< 0.55 mA	
Individual display	Two-color LED (red/green)	
Alarm output	Per data word by two-wire signal line	
Indicator output	Open collector connects 0 V over 1.5 kilohm, max. 15 mA	
Response sensitivity (basic data)	– Optical sensor: < 0.15 dB/m (EN 54-7) – Thermal differential unit: EN 54-5 – Thermal maximum unit: > 54 °C/> 69 °C – Chemical sensor: ppm range	– Optical sensor: < 0.15 dB/m (EN 54-7) – Thermal differential unit: EN 54-5 – Thermal maximum unit: > 54 °C/> 69 °C
Max. monitoring area	120 m^2 (observe VdS guidelines)	
Max. installation height	16 m (observe VdS guidelines)	
Permitted air speed	20 m/s	
Permissible operating temperature	-10 °C. . . +50 °C	-20 °C. . . +50 °C
Permitted relative humidity	< 95% (non-condensing)	
Protection category according to EN 60529	IP 40 / IP 43 with detector base with damp room seal	
Color code	yellow ring	black ring
Dimensions without base Dimensions with base	∅ 99.5 x 52 mm ∅ 120 x 63.5 mm	
Housing material/color	ABS/white, similar to RAL 9010, matte surface	
Weight without packaging Weight with packaging	Approx. 80 g Approx. 125 g	Approx. 75 g Approx. 115 g
Product ID	F.01U.508.816	F.01U.508.815

Smoke and heat detectors

Detector type	FAP-O 420 / FAP-O 420 KKW	FAH-T 420 / FAH-T 420 KKW
Detection principle	Scattered-light measurement	Measurement of absolute temperature and temperature increase
Special features	– Contamination detection – Drift compensation in the optical sensor – FAP-O 420 KKW: For use in areas with elevated radioactivity	– FAH-T 420 KKW: For use in areas with elevated radioactivity
Operating voltage	15 V DC to 33 V DC	
Current consumption	< 0.55 mA	
Individual display	Two-color LED (red/green)	
alarm output	Per data word by two-wire signal line	
Indicator output	Open collector connects 0 V over 1.5 kilohm, max. 15 mA	
Response sensitivity (basic data)	< 0.15 dB/m (EN 54-7)	– Thermal differential unit: EN 54-5 – Thermal maximum unit: > 54 °C/> 69 °C
Max. monitoring area	120 m^2 (observe VdS guidelines)	40 m^2 (observe VdS guidelines)
Max. installation height	16 m (observe VdS guidelines)	7.5 m (observe VdS guidelines)
Permitted air speed	20 m/s	
Permissible operating temperature	-20 °C. . . +65 °C	-20 °C. . . +50 °C
Permitted relative humidity	< 95% (non-condensing)	
Protection category according to EN 60529	IP 40 IP 43 with detector base with damp room seal	
Color code	-	red ring
Dimensions without base Dimensions with base	∅ 99.5 x 52 mm ∅ 120 x 63.5 mm	
Housing material/color	ABS/white, similar to RAL 9010, matte surface	
Weight without packaging Weight with packaging	Approx. 75 g Approx. 115 g	
Product ID	F.01U.508.813 / F.01U.508.687	F.01U.508.915 / F.01U.508.686

A Abbreviations

ABS	AcrylonitrileButadieneStyrene
DIBt	Deutsches Institut für Bautechnik (German Institute for Technology)
DIN	German Institute for Standardization
DO	Dual-optical
DOT	Dual-optical and thermal
DOTC	Dual-optical, thermal and chemical
EN	European Standard
Conventional	Conventional technology
LED	Light Emitting Diode
LSN	Local Security Network
PI	Product Information
PP	Polypropylene
UEZ	Universelle Europazentrale (Universal European Central)
UGM	Universelle Gefahrenmeldezentrale (Universal danger detection system)
VDE	Association of German Electrical Engineers
VdS	VdS Schadenverhütung GmbH
OTC	Optical/thermal/chemical (gas)
OT	Optical/thermal
O	Optical
T	Thermal

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