



# Conventional Automatic Detectors

FCP-320/FCH-320



**BOSCH**

en Operation Guide



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# 1 Product Description

**NOTICE!**

This Product Information describes the entire product range of the FCP-320/FCH-320 Conventional Automatic Fire Detectors.

The FCP-320/FCH-320 Conventional Automatic Fire Detectors works on the basis of the conventional technology and combines standard detection methods such as scattered light measurement and temperature measurement with gas measuring technology at the highest configuration level.

This method uses state-of-the-art processing methods to evaluate the signals from the gas sensor and scattered light sensor or thermal sensor.

Security against false alarms is thus increased significantly and detection time is reduced in comparison with the fire detectors generally available on the market today.

Thanks to the higher information content of the multisensor detectors, the use of detectors is possible in environments where pure smoke detectors cannot be used.

The detectors are available in the following configuration levels:

- FCP-OC320: Combined optical, gas-sensitive smoke detectors
- FCP-OT320: Combined optical, thermal smoke detectors
- FCP-O320: Optical smoke detectors
- FCH-T320: Thermal detectors.

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 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<sup>2</sup> can be used.

It can be equipped with a damp room seal so that all installation requirements can be covered with one base.

The 320 Series detectors are available with either a 420 Ω alarm resistor or a 320 Ω alarm resistor. The operating voltage range is 8.5 V DC to 32 V DC, which allows the detectors to be used with almost every common conventional fire panel.

## 2 System Overview

### 2.1 Configuration of the Detector

- 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 / MS 400 B Base

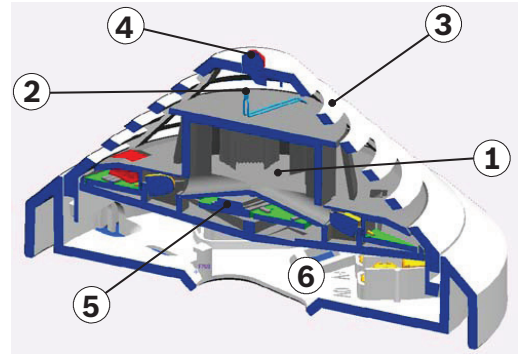


Figure 2.1 Configuration of the Detector

### 2.2 Functional Description of Sensor Technology

#### 2.2.1 Optical Sensor (Smoke Detector)

The optical sensor uses the scattered-light method.

An LED sends light into the measuring chamber (refer to *Figure 2.1*, item 1); this light 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.

#### 2.2.2 Thermal Sensor (Heat Detector)

A thermistor (refer to *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 detector class set, the temperature sensor switches to an alarm state if the maximum temperature exceeds 54 °C (thermal maximum) or a defined temperature increase within a particular timeframe (thermal differential).

#### 2.2.3 Chemical Sensor (Gas Sensor)

The gas sensor (refer to *Figure 2.1* and *Figure 2.2*, 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 deception variables.

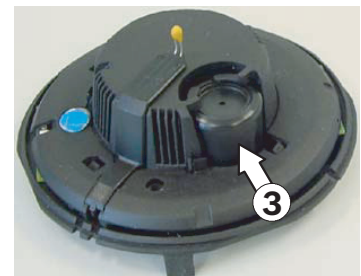


Figure 2.2 Chemical Sensor

### 2.3 System Description

Up to two detection principles are integrated into the FCP-320/FCH-320 Series Fire Detectors:

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

All sensor signals are analyzed continually by the internal signal analysis electronics and are linked with each other. If a signal combination fits the detector's programmed code field, an alarm is automatically triggered.

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.

The FCP-OC320/FCP-OC320-R470 detectors analyze the present CO concentration and adjust the threshold of the optical sensor in accordance with the CO concentration. If no CO is in the air, the alarm is triggered nonetheless at a certain level of smoke density and above. However, the alarm is not triggered if only CO is detected in the air.

The FCP-OT320/FCP-OT320-R470 detectors trigger an alarm in the case of smoke as well as in the case of a temperature rise. Additionally, the threshold of the optical sensor is adjusted in accordance with the absolute temperature and the rate of temperature rise.

## 2.4 Features

- Active adjustment of the threshold (drift compensation) if the optical sensor becomes contaminated.
- Active adjustment of the threshold (drift compensation) of the chemical sensor.
- Activation of a remote external detector alarm display 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 FCH-T 320/FCH-T 320-R470/FCH-T 320-FSA Heat Detectors).
- Connectable to Bosch fire panels and the majority of conventional fire panels available on the market.
- Two variants with 820  $\Omega$  alarm resistor and 470  $\Omega$  alarm resistor enables the detector application with nearly all conventional fire panels.
- An unscreened cable may be used for the primary line.

## 3 Planning

**NOTICE!**

FCP-320/FCH-320 Conventional Automatic Fire Detectors are not designed for exterior use.

### 3.1 Basic Planning Guidelines

- The planning of multisensor fire detectors takes place according to the guidelines for optical detectors, until an independent guideline has been worked out with the VdS (see DIN VDE 0833 Part 2 and VDS 2095):
  - Maximum monitoring area 120 m<sup>2</sup>
  - Maximum installation height 16 m.
- Maximum permitted air speed: 20 m/s.
- A maximum of 32 detectors can be connected per primary line. This number is limited to 20 detectors when connected to an UGM 2020 (GIF/GIF2).

### 3.2 Use in Fire Barriers Conforming to DIBt

The FCH-T320-FSA and FCP-O320 are available for use in fire barriers conforming to the guideline of the DIBt (Deutsches Institut für Bautechnik/German Institute for Building Technology).

When planning for fire barriers conforming to DIBt, the FCH-T 320-FSA detector must be set to class A1R.

Both models have DIBt approval.



## 4 Installation

### 4.1 Overview of Detector Bases

The FCP-320/FCH-320 Series detector head is used in one of the following listed detector bases, which are suitable for both flush-mounted and surface-mounted cable feed. They have separate attachment points for ceiling mount/flush-mounted back boxes. In addition, they fit all standard bore patterns.

The detector 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 provide for a secure electrical connection when mounting the FCP-320/FCH-320 detector heads. Cables up to 2.5 mm<sup>2</sup> can be used.

To protect against unauthorized removal, the detector head can be secured with a variable locking.

#### **MS 400**

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



#### **MSF 400 B**

The standard MS 400 Detector Base with Bosch-branding.



#### **FAA-420-SEAL**

Seal for using the MS 400 and MS 400 B detectors in a humid environment. The TPE seal protects the detector reliably against the penetration of condensed water.



**MSR 320**

The MSR 320 Conventional Detector Base with Relay is provided with an integrated relay that has NO/C/NC contacts for switching applications (e. g. dampers, door holders, etc.).

**MSC 420**

The MSC 420 Additional Base was designed specially for surface mounted cable feed via cable protection conduits. It is used in combination with any of the above listed bases. It has two opposing pre-cut inlets of 20 mm diameter and two additional opposing and prepared inlets for up to 28 mm diameter.

The additional base has a diameter of 120 mm and a height of 36.7 mm.

To protect against condensed water penetration, a seal made of TPE is situated on the base of the MSC 420.



## 4.2 Mounting the Bases

The detector bases are screwed to the even, dry surface using two screws approx. 55 mm apart.

In the case of cable feed for surface mounting, break out the prepared entry points (X) on the housing.

In the case of flush mounted cable feed, route the cable through the opening in the centre of the base.

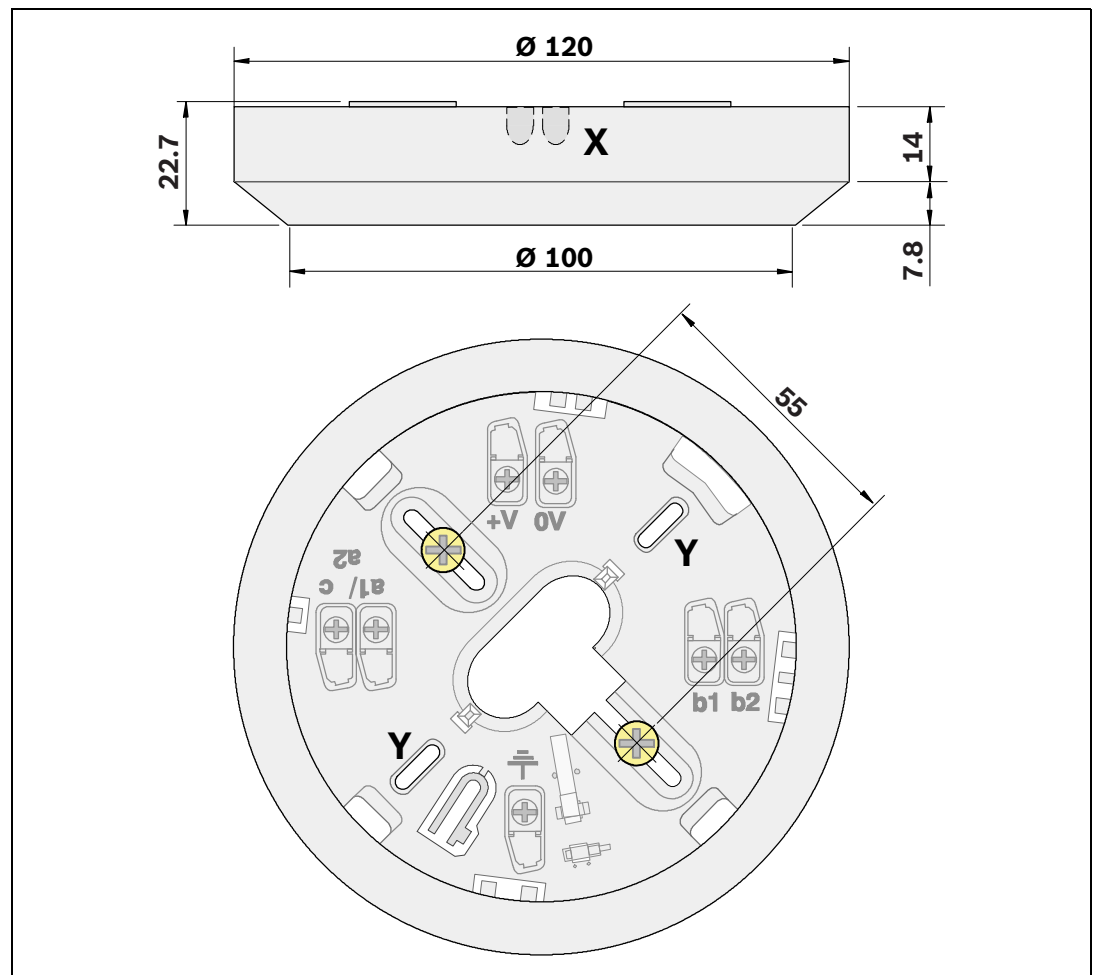
The short mounting bores marked in the sketch with "Y" may be used only for fixing over a back box.



### NOTICE!

Cable feed and outfeed can be on the same side.

For cable feed at the FAA-420-SEAL and MSC 420 puncture the sealing with a pointed tool. Do not cut the sealing with a knife.



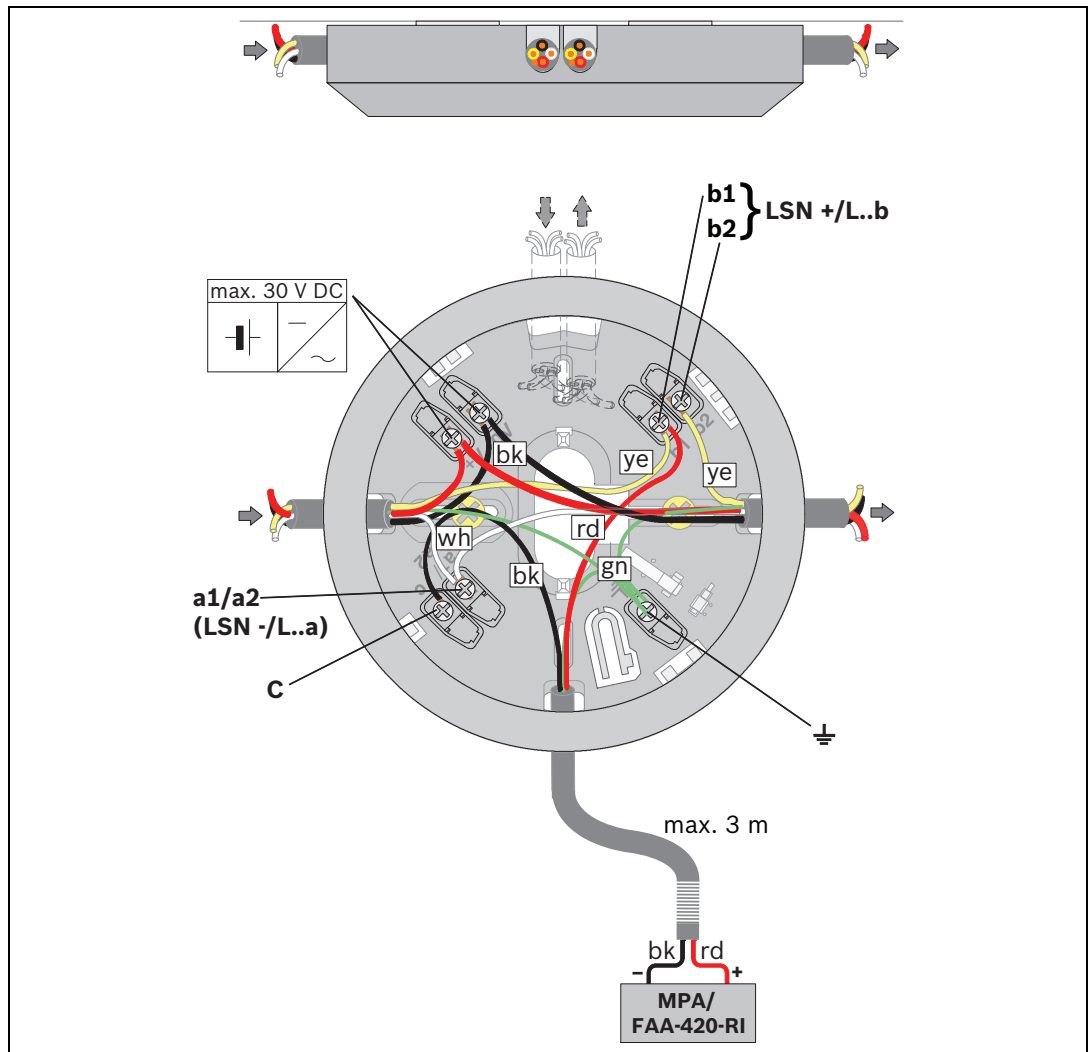
## 4.3 Wiring



### NOTICE!

Keep screening wire as short as possible and insulate it.

### 4.3.1 Wiring the MS 400/MS 400 B



#### Legend

ye	yellow, connects to b1/b2 + / L..b (conventional)
wh	white, connects to a1/a2 - / L..a (conventional)
rd	red, connects to +V
bk	black, connects to 0V
gn	green, connects to shielding wire
c	Indicator output
+V / 0V	Terminals for looping through the power supply to subsequent elements
MPA / FAA-420-RI	External Detector Alarm Display / Remote Indicator



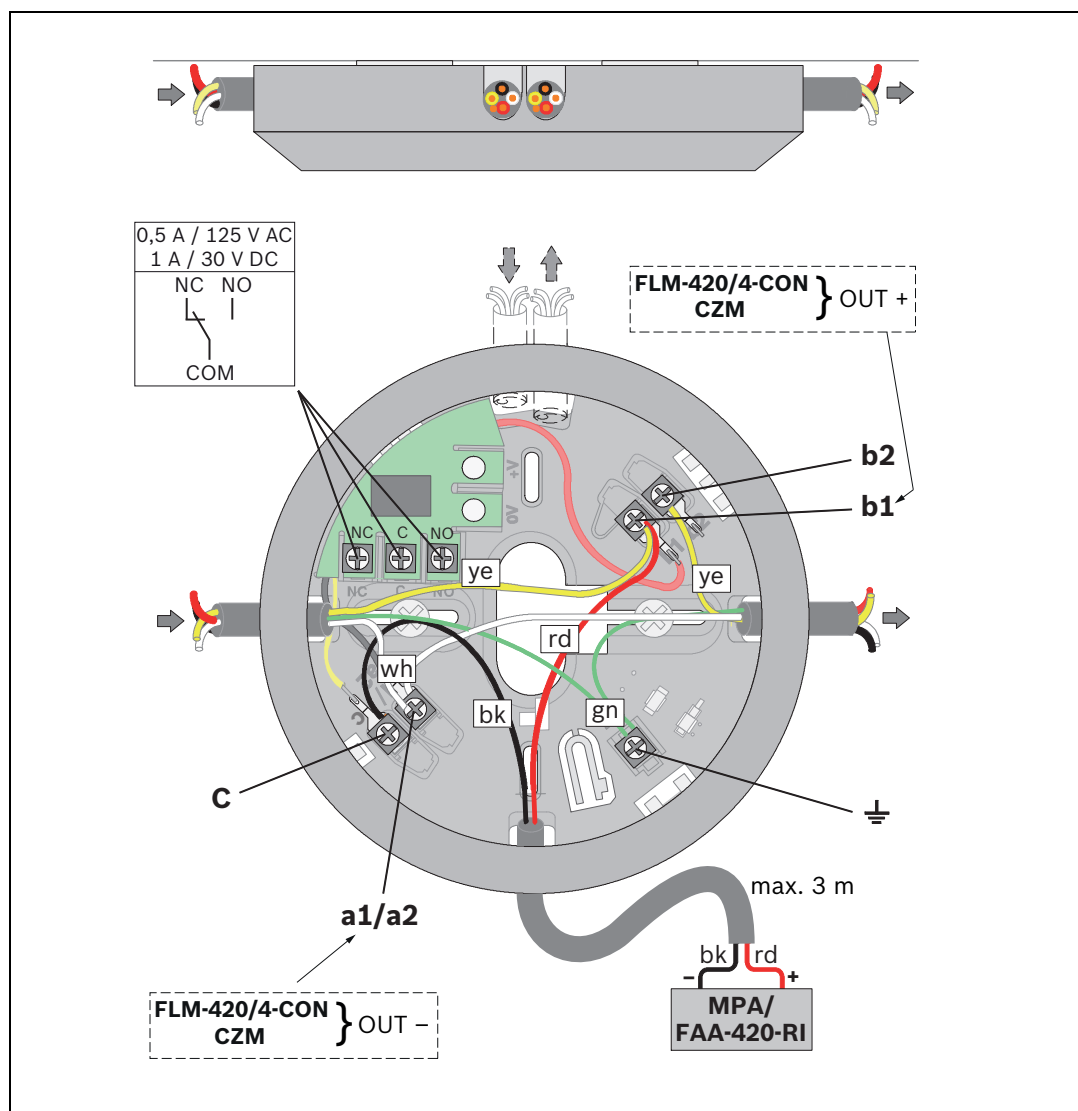
**NOTICE!** The last detector in a conventional line can be terminated either with a terminal resistor in the detector base or with an FLM-320-EOL2W EOL module. For terminating the line according to the EN-54-13 standard, the FLM-320-EOL2W EOL module is required.

### 4.3.2

#### Wiring the MSR 320

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

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



Legend	
ye	yellow, connects to b1/b2 + / L..b (conventional)
wh	white, connects to a1/a2 - / L..a (conventional)
rd	MPA/FAA-420-RI: red, connects to b1
bk	MPA/FAA-420-RI: black, connects to c (Indicator output)
gn	green, connects to shielding wire
NC / C / NO	Changeover relay (for the MSR 320 only)

Legend	
+V / 0V	Terminals for looping through the power supply to subsequent elements
MPA / FAA-420-RI	External Detector Alarm Display / Remote Indicator



**NOTICE!** The last detector in a conventional line can be terminated either with a terminal resistor in the detector base or with an FLM-320-EOL2W EOL module. For terminating the line according to the EN-54-13 standard, the FLM-320-EOL2W EOL module is required.

## 4.4

### Detector Base Sounder

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

- MSS 300 Detector Base Sounder white, for conventional technology, connection via the detector C point.
- MSS 300 WS-EC Detector Base Sounder white, for conventional technology, with external activation.

The integrated tone generator has 11 tones for selection (incl. tones according to DIN 33404 and EN 457) with sound pressure of max. 100 dBA, depending on the type of tone selected.

The tone type on conventional variants is set via four DIP switches and the volume adjusted continuously via a potentiometer.

Surface mounted and flush mounted cable feed are possible.



## 4.5

### Installing the Detector Head



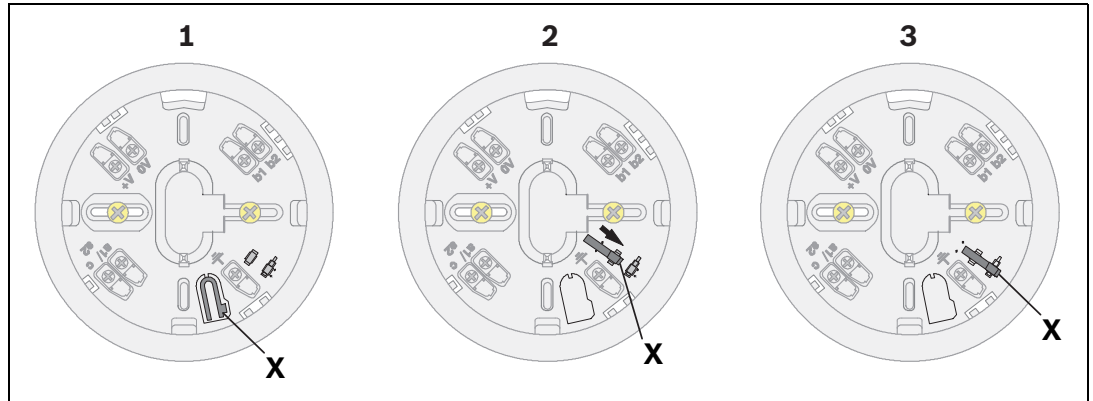
**NOTICE!**

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 head can be locked into 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 4.1*.



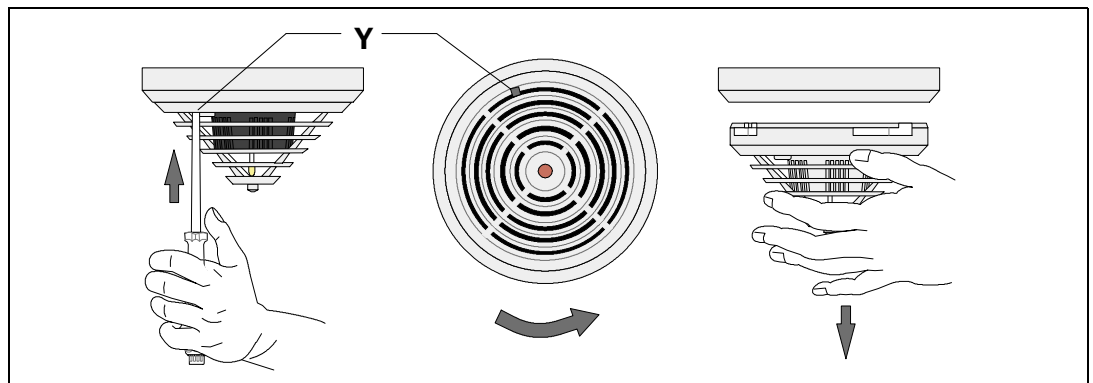
**Figure 4.1** Activating the Removal Protection

Legend	
1	Bolt (X) prior to breaking out
2	Bolt (X) installed but inactive
3	Locking activated

## 4.6 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 (refer to *Figure 4.2*).



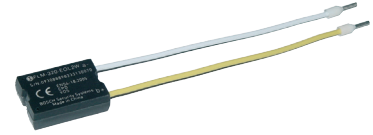
**Figure 4.2** Detector Removal (Locked Detector)

## 5 Accessories

### 5.1 EOL Module for Line Termination According to EN 54-13

#### FLM-320-EOL2W EOL-Modul

The FLM-320-EOL2W EOL module is a 2-wire module for terminating a conventional line according to EN 54-13. It detects faults in the line according to EN 54-13 and transmits a notification to the fire panel display. For a conventional connection according to EN 54-13 one line must not contain more than 32 automatic detectors.

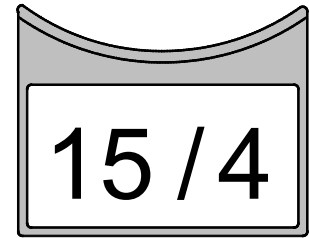


### 5.2 Support Plates for Detector Identification

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

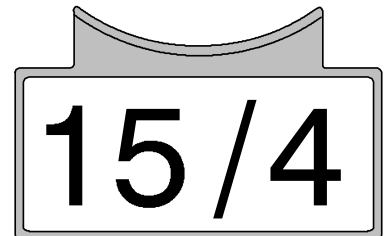
#### TP4 400 Support Plate

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 approximately 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 approximately 97 x 44 mm.



### 5.3 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.





## 5.4 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 upper detector section, from contamination. The protective dust cover made from polypropylene (PP) is pushed onto the installed detector base.



## 5.5 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).



## 5.6 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

Resistor: 1 k $\Omega$

Power consumption: 3 W.

The heating is supplied with power either by the looped-through supply voltage via the control panel or by a separate power supply unit.

With supply via the control panel, the number of detector heating elements depends on the cable cross section and cable length used.



## 5.7 External Detector Alarm Display / Remote Indicator

An External Detector Alarm Display or Remote Indicator is required if the detector is not directly visible or has been mounted in false ceilings or floors.

The remote indicators should be installed in corridors or access pathways to the corresponding building sections or rooms. The red alarm indication of both FAA-420-RI and MPA correspond to DIN 14623.

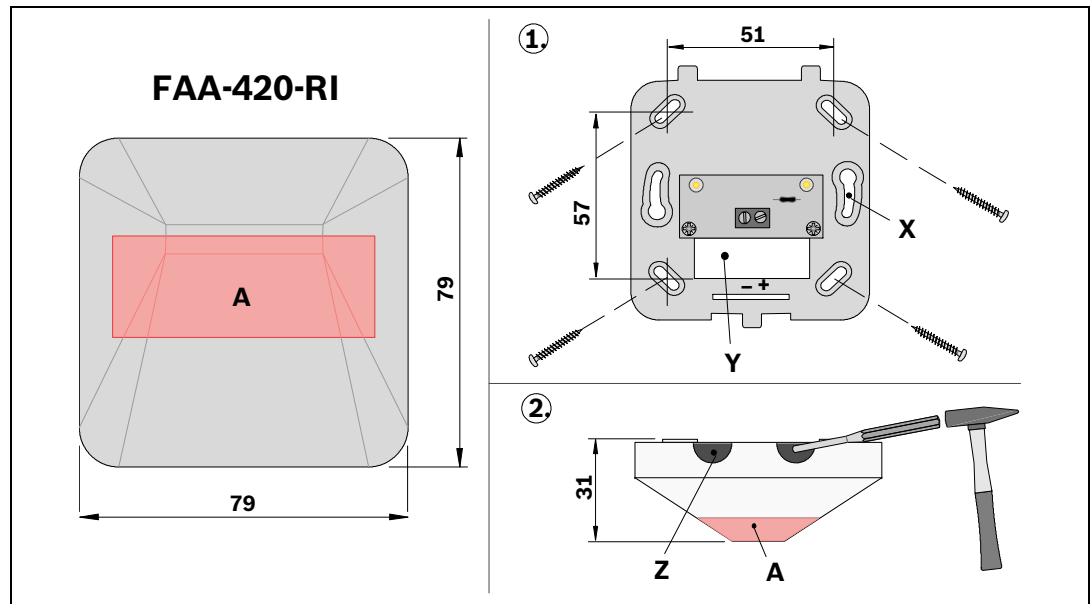
## 5.7.1 Remote Indicator FAA-420-RI

### Installation Notes



#### NOTICE!

The FAA-420-RI must be installed such that the broad side of the red alarm indication (A) follows the observer's line of sight.



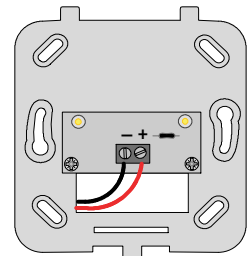
**Figure 5.1** Mounting the FAA-420-RI

1. Remove the hood from the baseplate prior to installation. To do so, press on the snap-fit hook with a flat object (e. g. screwdriver) and carefully lift off the hood.
2. Install the FAA-420-RI on a dry and even ceiling or wall.
3. In the case of surface mounted cable feed, break off the pre-punched cable entries (refer to *Figure 5.1*, item Z) from the housing.  
In the case of flush mounted cable feed, insert the cable through the opening (refer to *Figure 5.1*, item Y) below the connection board.
4. Refit the hood and click into place when installation and connection are complete.

### Wiring

The FAA-420-RI is connected to two screw terminals.

Terminal	Connector
-	GLT - / LSN -
+	GLT + / LSN +



#### CAUTION!

If the current consumption for the connected detector exceeds 20 mA, it can lead to the malfunction of or damage to the FAA-420-RI Remote Indicator. You should restrict the maximum detector current consumption to 20 mA to avoid damaging the FAA-420-RI.

All current Bosch fire detectors are equipped with an internal resistor to restrict current consumption.



**NOTICE!**

The cable length between the detector and the FAA-420-RI must not exceed 3 m when connected by an unshielded cable.

Technical Specification FAA-420-RI	
Operating voltage	5 V DC to 30 V DC
Maximum current consumption	20 mA
Display medium	2 LEDs
Permissible wire gauge	0.6 mm to 2 mm
Dimensions	79 x 79 x 31 mm
Weight	approx. 45 g

**5.7.2 External Detector Alarm Display MPA**

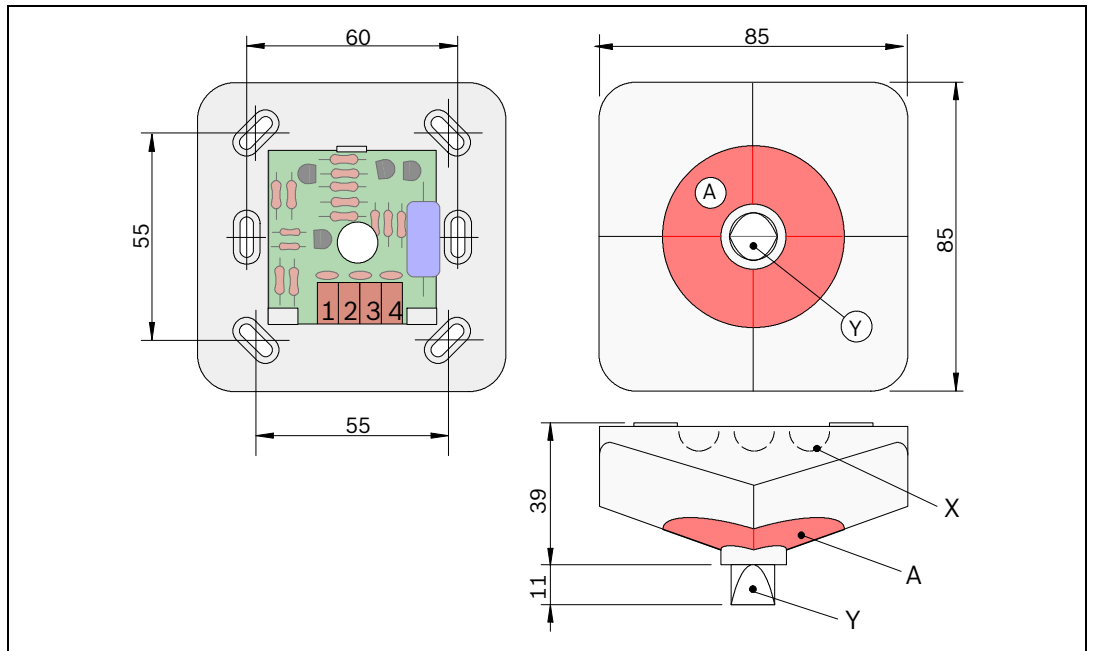
**Installation Notes**

- Installation directly onto wall or ceiling.
- For surface cable feed break out the prepared inlets (X) at the housing wall.
- For rear entry, conduit box mounting, feed the cable through the opening in the base center.



**NOTICE!**

The flat side of the prism (Y) must show in direction of the viewer.



**Figure 5.2** Mounting the MPA

**Connecting the MPA**

The MPA will be connected to the Wago-clamps 1 to 4.

Connect: Put in the isolated wire (no braid) into the clamp.

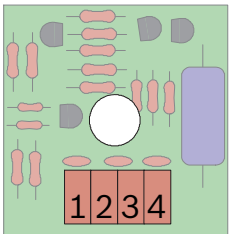
Disconnect: Pull the wire out of the clamp by turning it back and forth.

You can connect up to four detectors onto each MPA.

Three inputs (terminal 2 to terminal 4) allow the adaptation to the different line technologies.

#### Connection on reliance to the used line technology

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

Terminal	Connector	
1	Ground	
2	Input flashing (LED flashes)	
3	Input static (LED steady on)	
4	Input static (LED steady on)	
Connect onto terminal 4 only via pre resistor, otherwise the LED could be destroyed. All current Bosch fire 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 External Detector Alarm Display. You should restrict the maximum detector current consumption to 20 mA to avoid damaging the FAA-420-RI.



#### NOTICE!

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

Technical Specifications MPA	
Operating voltage	9 V DC to 30 V DC
Maximum current consumption	<ul style="list-style-type: none"> <li>- approx. 2 mA</li> <li>- limited to 13 mA</li> <li>- limit to maximum 20 mA</li> </ul>
Display medium	1 LED
Permissible wire gauge	0.6 mm to 0.8 mm
Dimensions	79 x 79 x 31 mm
Weight	approx. 65 g
VdS approval number	G 294 052

## 5.8 Accessories for Service und Detector Testing

### SOLO200 Detector Removal Tool

With its pivoting grip segments and three different diameters, the SOLO200 Detector Removal Tool is suitable for the insertion and removal of most fire detectors.

The plastic caps ensure secure gripping of fire detectors and thus also protect the detector surface against damage.



### RTL-cap Plastic Caps for the SOLO200 Detector Removal Tool

Scope of delivery = 2 pieces



### SOLO330 Smoke Detector Tester

Use the SOLO330 Smoke Detector Tester for in place testing of smoke detectors using an aerosol designed to simulate smoke particles.



### SOLO A3-001 Test Aerosol for Optical Smoke Detectors

Spray with 250 ml Test Aerosol for Optical Smoke Detectors  
DU = 12 pieces



### SOLO CO Testing Gas

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



**SOLO461 Heat Detector Tester**

The SOLO461 Heat Detector Tester operates with a battery to direct heated air at heat detector sensors. It uses a patented CAT™ (Cross Air Technology) system to focus the air and direct it horizontally at the sensor regardless of the detector's size or shape.

**FME-TESTIFIRE Multi-Stimulus Detector Tester**

The FME TESTIFIRE is the first functional test tool for optical and ionization fire detectors, heat detectors (fixed temperature and rate-of-rise), carbon monoxide (CO) detectors, as well as multi sensor detectors and multi criteria detectors. Testing stimuli (heat, smoke, and carbon monoxide) are created without using pressurized aerosol cans or hazardous media. Testing stimuli are generated at the time of test using safe and patented processes fuelled by replaceable capsules.

**FME-TS3 Smoke Capsule**

Smoke Capsule for FME-TESTIFIRE testing tool

**FME-TC3 CO Capsule**

CO Capsule for FME-TESTIFIRE testing tool

**SOLO100 Telescopic Access Pole**

The SOLO100 Telescopic Access Pole enables the installation and replacement of fire detectors at high ceilings. It can be expanded with up to three SOLO101 Fixed Extension Poles.

The Telescopic Access Pole withstands high voltage situations and is checked for Safety compliance in accordance with the requirements of BS EN 61235 Section 12 using an applied voltage of 20 kV.

Length: 1 m to 3.4 m



**SOLO101 Fixed Extension Pole**

The SOLO101 Fixed Extension Pole enables the installation and replacement of fire detectors at ceilings. Use it individually or with up to three other Fixed Extension Poles. It also can be used with the SOLO100 Telescopic Access Pole.

The Fixed Extension Pole withstands high voltage situations and is checked for safety compliance in accordance with the requirements of BS EN 61235 Section 12 using an applied voltage of 20 kV.

Length: 1 m

**SOLO610 Test Equipment Bag**

The SOLO610 Test Equipment Bag is made of sturdy woven polyester with a PVC coating for carrying and storing test and service products. It is designed with special compartments to hold a full range of products.



## 6 Order Overview

### 6.1 Detector Variants

#### 6.1.1 Detectors with 820 Ohm Alarm Resistor

Type Number	Designation	Product ID
FCP-OC320	Multisensor Detector Optical/Chemical	F.01U.026.292
FCP-OT320	Multisensor Detector Optical/Thermal	F.01U.026.295
FCP-O320	Optical Smoke Detector	F.01U.026.293
FCH-T320	Heat Detector	F.01U.026.291
FCH-T320-FSA	Heat Detector for Fire Barriers conforming to DIBt, Quality-controlled	F.01U.026.294

#### 6.1.2 Detectors with 470 Ohm Alarm Resistor\*

Type Number	Designation	Product ID
FCP-OC320-R470	Multisensor Detector Optical/Chemical	F.01U.029.867
FCP-OT320-R470	Multisensor Detector Optical/Thermal	F.01U.029.862
FCP-O320-R470	Optical Smoke Detector	F.01U.029.857
FCH-T320-R470	Heat Detector	F.01U.029.861

Detectors with 470 Ohm Alarm Resistors are not available in all countries.

### 6.2 Detector Bases

Type Number	Designation	Product ID
MS 400	Standard Detector Base for surface-mounted and flush-mounted cable feed	4.998.021.535
MS 400 B	Standard Detector Base for surface-mounted and flush-mounted cable feed, with Bosch-branding	F.01U.215.139
FAA-420-SEAL	Damp Room Seal for the MS 400 and MS 400 B Detector Bases	F.01U.215.142
MSR 320	Conventional Detector Base with Relay for surface-mounted and flush-mounted cable feed	4.998.114.565
MSC 420	Additional Base with Damp Room Seal, for surface-mounted cable feed	4.998.113.025

### 6.3 Detector Accessories

Type Number	Designation	Product ID
FLM-320-EOL2W	EOL Module 2-Wire	F.01U.083.619
TP4 400	Support Plate for Detector Identification up to 4 m installation height (1 pack = 50 pieces)	4.998.084.709
TP8 400	Support Plate for Detector Identification up to 8 m installation height (1 pack = 50 pieces)	4.998.084.710
SK 400	Protective Basket, to protect against mechanical damage	4.998.025.369



Type Number	Designation	Product ID
SSK 400	Protective Dust Cover (1 pack = 10 pieces)	4.998.035.312
MH 400	Detector Heating Element	4.998.025.373

## 6.4 Installation Accessories

Type Number	Designation	Product ID
MK 400	Detector Console, for DIBt compliant mounting of detectors above doors etc., including detector base	4.998.097.924
FMX-DET-MB	Mounting Bracket, with mounting material for false floors, without detector base	2.799.271.257

## 6.5 Detector Base Sounders

Type Number	Designation	Product ID
MSS 300	Detector Base Sounder White, only C point activation via attached detector, for surface-mounted and flush-mounted cable feed	4.998.025.372
MSS 300 WS-EC	Detector Base Sounder White, only for separate activation e.g. via Interface Module, for surface-mounted and flush-mounted cable feed	4.998.120.501

## 6.6 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
SOLO330	Smoke Detector Tester	4.998.112.071
SoloA3-001	Test Aerosol for Optical Smoke Detectors	4.998.112.074
Solo CO testgas	Solo CO Testing Gas (400 ml, 1 pack = 10 pieces)	4.998.109.056
SOLO461	Heat Detector Tester (wireless)	4.998.112.072
SOLO720	Battery for SOLO461 Heat Detector Tester	4.998.147.576
FME-TESTIFIRE	Multi-Stimulus Testing Tool	F.01U.143.407
FME-TS3	Smoke Capsule	F.01U.143.404
FME-TC3	CO-Capsule	F.01U.143.405
SOLO100	Telescopic Access Pole	4.998.112.069
SOLO101	Fixed Extension Pole	4.998.112.070
SOLO610	Test Equipment Bag	4.998.112.073

## 7 Maintenance and Service

Maintenance and inspection work on security systems are governed in Germany 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 a functional and visual inspection at least once a year.

Testing	Detector Type			
	FCP-O320 FCP-O320- R470	FCH-T320 FCH-T320- R470 FCH-T320-FSA	FCP-OT320 FCP-OT320- R470	FCP-OC320 FCP-OC320- R470
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 testing gas	X	-	X	X
Triggering with CO testing gas	-	-	-	X

### – FCP-OC320/FCP-OC320-R470

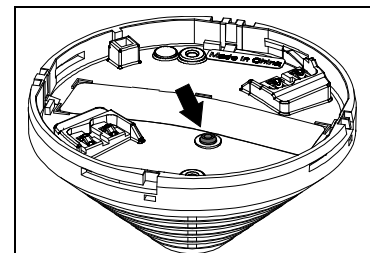
Multisensor detectors with C sensors must be exchanged every 5 years.

An FCP-OC320 and FCP-OC320-R470 will deactivate its C sensor after 5 years of operation due to the gas sensor's limited life cycle. The detector continues to function as an O detector.

Depending on the system, there may be no message to the control panel, and the deactivation of the C sensor is only noticed when the detector is tested. The FCP-OC320/FCP-OC320-R470 should therefore be exchanged promptly before 5 years of operation has elapsed.

- Optical smoke detectors should, depending on the environmental conditions, be cleaned and exchanged regularly.

Every detector bottom has a “Chamber Maid Plug” (cleaning opening with a plug) for blowing out the optical chamber with compressed air (not required for the FCH-T320/FCH-T320-R470 Heat Detectors).



## 7.1 Coding of the Detector Types

With the exception of the FCP-O320 and FCP-O320-R470, every detector has a colored detector type identification ring around the central individual display. This facilitates inspection by service personnel.

Type Number	Color Code
FCP-OC320/ FCP-OC320-R470	Blue
FCP-OT320/ FCP-OT320-R470	Black
FCH-T320/ FCH-T320-R470/ FCH-T320-FSA	Red
FCP-O320/ FCP-O320-R470	-



## 7.2 Test Procedure for Detectors with C-Sensor

You must first test the optical unit of the FCP-OC320 with the test aerosol. Reset the detector when you have released the O sensor. This switches the C sensor into revision mode for 15 minutes and it can then be tested. Since the aerosol test for the detectors works like a disturbance signal, (very large signal with very quick increase), the signal evaluation for disturbance variables is brought to bear and alarm signaling occurs only after approx. one minute.

1. Position the Smoke Detector Tester on the FCP-OC320.
2. Spray aerosol (1 to 2 seconds).  
Do not remove the test device from the detector; the O sensor triggers only approx. 60 seconds after the application of the test aerosol.
3. Reset detector.  
This switches the detector to revision mode.
4. Place CO Testing Gas bottle in the test device.
5. Position test device on the detector.
6. Apply CO gas for 1/2 to 1 second.  
The C sensor triggers after approx. 20 seconds.



### NOTICE!

In revision mode the chemical unit of the detector can be tested separately. A minimum CO gas concentration of 30 to 35 ppm is required when the chemical sensor is tested. This is guaranteed if the test is performed with the CO Test Gas bottle as described.

### 7.3 Test Procedure for Detectors without C-Sensor

1. Position the Smoke Detector Tester on the detector.
2. Spray aerosol (1 to 2 seconds).  
Do not remove the test device from the detector; the O sensor triggers only approx. 30 seconds after the application of the test aerosol.
3. Reset detector.  
This switches the detector to revision mode.
4. The thermal sensor of the FCP-OT320/FCP-OT320-R470 and all heat detectors is tested with the test device for heat detectors.

### 7.4 Warranty

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

### 7.5 Repair

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

### 7.6 Disposal

Unusable electrical and electronic devices/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).



#### FCP-OC320 Packaging Film

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 statutory regulations.**

### 7.7 Additional Documentation



#### NOTICE!

The latest Product Information and the Installation Guide for the device are available as a downloadable PDF file at <http://www.boschsecurity.com/emea/fire>.

## 8 Specifications

### Multisensor Detectors

Device Type	FCP-OC320/FCP-OC320-R470	FCP-OT320/FCP-OT320-R470
Detection principle	Combination of: – Scattered light measurement – Combustion gas measurement	Combination of: – Scattered light measurement – Measurement of absolute temperature and temperature increase
Special features	– Drift compensation of the optical sensor and the gas sensor	– Drift compensation of the optical sensor
Operating voltage	8.5 V DC to 30 V DC	
Current consumption	< 0.12 mA	
Individual display	LED red	
Alarm output	Current increase (alarm resistor approx. 820 Ω or 470 Ω)	
Indicator output	Open collector, connects through 0 V via 3.92 kΩ, max. 8 mA	
Response sensitivity (basic data)	– Optical sensor: < 0.15 dB/m (EN54-7) – Chemical sensor: ppm range	– Optical sensor: < 0.15 dB/m (EN54-7) – Thermal sensor: Class A2R acc. to EN 54-5 – Thermal maximum unit: > 54 °C – Thermal differential unit: refer to table <i>Page 30</i>
Max. monitoring range	120 m <sup>2</sup> (observe VdS guidelines)	
Maximum installation height	16 m (observe VdS guidelines)	
Permissible air speed	20 m/s	
Permissible operating temp.	-10 °C . . . +50 °C	-20 °C . . . +50 °C
Permissible relative humidity	< 95% (non-condensing)	
Protection category according to EN 60529	IP 40 IP 43 with detector base with damp room seal	
Color code	Blue ring	Black ring
Dimensions without base	circumference 99,5 x 52 mm	
Dimensions with base	circumference 120 x 63,5 mm	
Housing material / color	ABS / white, similar to RAL 9010, matte surface	
Weight without packaging	approx. 80 g	approx. 75 g
Weight with packaging	approx. 125 g	approx. 115 g
Product ID	F.01U.026.292/F.01U.026.867	F.01U.026.295/F.01U.026.862

## Smoke and Heat Detectors

Device Type	FCP-O320/FCP-O320-R470	FCH-T320/ FCH-T320-R470/	FCH-T320-FSA
Detection principle	Scattered light measurement	Measurement of absolute temperature and temperature increase	
Special features	Drift compensation of optical sensor		For Fire Barriers conforming to DIBt, Quality-controlled
Operating voltage	8.5 V DC to 30 V DC		
Current consumption	< 0.12 mA		
Individual display	LED red		
Alarm output	Current increase (alarm resistor approx. 820 Ω or 470 Ω)		
Indicator output	Open collector, connects through 0 V via 3.92 kΩ, max. 8 mA		
Response sensitivity (basic data)	< 0.15 dB/m (EN54-7)	<ul style="list-style-type: none"> <li>- Class A2R acc. to EN 54-5</li> <li>- Thermal max. unit: &gt; 54 °C</li> <li>- Thermal diff. unit: refer to table <i>Page 30</i></li> </ul>	<ul style="list-style-type: none"> <li>- Class A1R acc. to EN 54-5V</li> <li>- Thermal max. unit: &gt; 54 °C</li> <li>- Thermal diff. unit: refer to table <i>Page 30</i></li> </ul>
Max. monitoring range	120 m <sup>2</sup> (observe VdS guidelines)	40 m <sup>2</sup> (observe VdS guidelines)	
Maximum installation height	16 m (observe VdS guidelines)	6 m (observe VdS guidelines)	
Permissible air speed	20 m/s		
Permissible operating temp.	-20 °C . . . +65 °C	-20 °C . . . +50 °C	
Permissible 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	circumference 99,5 x 52 mm		
Dimensions with base	circumference 120 x 63,5 mm		
Housing material / color	ABS / white, similar to RAL 9010, matte surface		
Weight without packaging	approx. 75 g		
Weight with packaging	approx. 115 g		
Product ID	F.01U.026.293/ F.01U.029.857	F.01U.026.291/ F.01U.029.861	F.01U.026.294

## Response Sensitivity of the Thermal Differential Unit According to EN 54-5

Temperature Rate of Rise [K min <sup>-1</sup> ]	Response Time for Detectors in the Sensitivity Class A1R		Response Time for Detectors in the Sensitivity Classes A2R	
	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

Temperature Rate of Rise [K min <sup>-1</sup> ]	Response Time for Detectors in the Sensitivity Class A1R		Response Time for Detectors in the Sensitivity Classes A2R	
	Lower Limiting Value [min/sec]	Upper Limiting Value [min/sec]	Lower Limiting Value [min/sec]	Upper Limiting Value [min/sec]
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

## I Abbreviations

ABS	Acrylonitrile butadiene styrene
DIBt	Deutsches Institut für Bautechnik (German Institute for Building Technology)
DIN	Deutsches Institut für Normung e.V. (German Institute for Standardization)
EN	European Standard
GLT	Conventional technology
LED	Light Emitting Diode
LSN	Local SecurityNetwork
PI	Product information
PP	Polypropylene
UEZ	Universelle Europazentrale (Universal European Fire Panel)
UGM	Universelle Gefahrenmeldezentrale (Universal Security System)
VDE	Verband Deutscher Elektrotechniker e.V. (German Association for Electrical, Electronic & Information Technologies)
VdS	VdS Schadenverhütung GmbH
OTC	Optical/Thermal/Chemical (gas)
OT	Optical/Thermal
O	Optical
T	Thermal







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