FAP-520 Automatic Fire Detectors LSN improved version

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- Modern, ultra-flat design
- Smooth, easily-cleaned detector surface
- Innovative fastening mechanism
- High reliability
- Maintains LSN loop functions in the event of wire interruption or short-circuit thanks to two integrated isolators

The FAP-520 Automatic Fire Detectors combine the advantages of the improved LSN technology with the aesthetic benefits of flush-mounted installation and the option to choose the color. The detectors are specially designed for connection to the Local SecurityNetwork LSN improved version with the significantly extended system parameters.
The FAP-520 is available as a scattered light smoke detector or as a multi-sensor detector with an additional gas sensor. The respective versions of the detectors are available in white or transparent with color toning inserts.

Functions

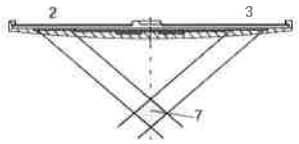
The smooth, flush-installation surface means the FAP-520 Fire Detectors can be installed in areas with high aesthetic requirements. In addition, the detectors are suitable for areas with heightened dust exposure. The detectors and trim rings in the "transparent with color inserts" version are supplied complete with reversible printed color ring sets, offering a choice of 16 colors for individual color matching.



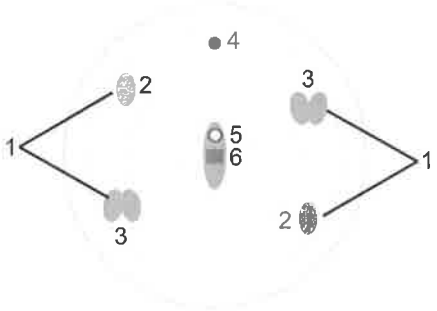
Sensor technology and signal processing
All detectors in the FAP-520 Series are equipped with two optical sensors and a pollution sensor. The FAP-OC-520 multisensor detector contains a gas sensor as an additional detection channel.

The individual sensors can be programmed with RPS or WinPara software via the LSN network. All sensor signals are constantly analyzed by the internal signal evaluation electronics and are linked with each other through algorithms.
By linking the optical sensors and the gas sensor, the OC detector can also be used in places where the work carried out gives rise to small amounts of smoke, steam or dust. The alarm will only be triggered automatically if the signal combination corresponds with the characteristic diagram of the installation location that was selected during configuring. Consequently, a very high reliability against false alarms is obtained.
When 50% of the alarm threshold is reached, a pre alarm is signaled (displayed in the event database of the fire panel).

Optical sensor (smoke sensor)
The optical sensor (1) operates according to the scattered light method.
The LEDs (3) transmit light at a defined angle into the scattered light area (7).



In case of fire, the light is scattered by the smoke particles and strikes the photo diodes (2), which transform the quantity of light into a proportional electrical signal.



Interference effects from daylight and commercial lighting sources are filtered out with an optical daylight filter and by the use of electronic filtering and phase-locked rectification (ambient light stability: glare test DIN EN 54-7).
The various light-emitting and photo diodes of the sensor are individually controlled by the detector electronics. Consequently, signal combinations are produced that are independent of each other and ideally suitable for the detection of smoke, which makes it possible to differentiate between smoke and interference agents (insects, objects). In addition, the time characteristics and the correlation of the optical sensor signals for the fire or interference detection are evaluated.
Moreover, plausibility checking of the various signals makes it possible to detect errors in the analysis electronics and the LEDs.

Chemical sensor (CO gas sensor)
The gas sensor (4) detects mainly the carbon monoxide (CO) that is produced by a fire, but it also detects hydrogen (H) and nitrogen monoxide (NO).
The basic measuring principle is CO oxidation on an electrode and the measurable current that arises from this. The sensor signal value is proportional to the concentration of gas.
The gas sensor delivers additional information to effectively suppress deceptive values.
The CO sensor is monitored by measuring the internal capacity. If the capacity lies outside the permitted range, an error message is output on the fire panel. In this case, the detector continues to operate purely as a scattered light smoke detector.
Depending on the service life of the gas sensor, the FAP-OC 520 Fire Detector switches off the C sensors after five years of operation. The detector will continue to function as an O detector. The detector should then be exchanged immediately in order to be able to keep using the higher reliability of detection of the OC detector.

Pollution sensor
The contamination level on the detector surface is continually measured by the pollution sensor (6); the result is evaluated and indicated in three stages on the fire panel.
Contamination of the detector surface leads to active adaptation of the threshold (drift compensation) and to a fault indication in the case of heavy contamination.

Improved LSN features
The 520 Series Fire Detectors offer all the features of the improved LSN technology:

- Flexible network structures, including "T-tapping" without additional elements
- Up to 254 LSN improved elements per loop or stub line
- Automatic or manual detector addressing selectable via rotary switch, in each case with or without auto-detection
- Power supply for connected elements via LSN bus
- Unscreened fire detection cable can be used
- Cable length up to 3000 m (with LSN 1500 A)
- Downwards compatibility to existing LSN systems and control panels.

In addition, the FAP-520 Fire Detectors offer all the established benefits of LSN technology. The following data can be read out for each configured detector:

- Serial number
- Contamination level of the optical section,
- Operating hours
- Current analog values.

In the event of an alarm, individual detector identification is transmitted to the fire panel.

The sensor is self-monitoring. The following errors are indicated on the fire panel:

- Failure of the evaluation electronics or one of the LEDs on the optical sensor
- Heavy contamination (instead of false alarm)
- Failure of the CO sensor (in the case of FAP-OC 520).

Further performance characteristics

Various operating states are indicated on the detector by means of a clearly visible two-color LED. In the event of an alarm, the LED flashes red.

The control of an external detector alarm display is possible.

Preservation of the LSN loop function is guaranteed in the event of wire interruption or short circuit by means of integrated isolators.

The innovative detector locking, which operates on the ballpoint-pen principle, provides fast and simple insertion and replacement of the detector. We recommend the specially developed FAA-500-RTL exchanger device, especially in the case of high installation heights.

To allow convenient detector testing, the FAA-500-TTL test adapter with magnet and additional service accessories is available. The magnet triggers a reed contact, which sets the detector in test mode.

Certifications and approvals

Complies with

- EN54-7:2000/A1:2002/A2:2006
- EN54-17:2005

Region	Certification	
Germany	VdS	G 205125 FAP-O 520/520-P_G205125
	VdS	G 205119 FAP-OC 520/520-P_G205119
Europe	CE	FAP-520/FAA-500-R
	CPD	0786-CPD-20201 FAP-O 520 / 520-P
	CPD	0786-CPD-20202 FAP-OC 520 / 520-P
Poland	CNBOP	2565/2007 FAP-O 520, FAP-O 520-P
	CNBOP	2566/2007 FAP-OC 520, FAP-OC 520-P
Hungary	TMT	TMT-20/2006 FAP-O 520, FAP-O 520-P
	TMT	TMT-21/2006 FAP-OC 520, FAP-OC 520-P
Ukraine	MOE	UA1.016-0002820-10 FAP-O520 -P _FAA-500 -R

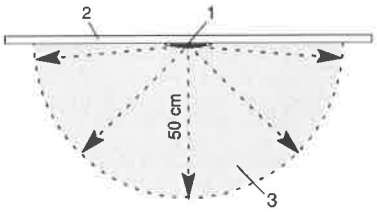
Installation/configuration notes

- Can be connected to the fire panels FPA-5000 and FPA-1200 with the improved LSN system parameters
- in "Classic Mode" can be connected to the LSN fire panels BZ 500 LSN, UEZ 2000 LSN, UGM 2020 and to other panels or their receiver modules with identical connection conditions, although with the previous LSN system parameters
- The detectors and detector bases can be used together with the „Rotaris" lamp by Philips.
- The detectors must be installed exclusively in the FAA-500 LSN Bases provided. In addition, the detector base must be installed in an FAA-500-BB Ceiling Mount Back Box or in an FAA-500-SB Surface Mount Back Box.

Notice

For flush ceiling mounting with FAA-500-BB:
The false ceiling may have a maximum thickness of 32 mm. Above the false ceiling, a free height of at least 110 mm is required.

- The detectors are not intended for outdoor use.
- A hemispherical space with a radius of 50 cm must remain free below the detectors.



1 Detector

2 Ceiling

3 Hemispherical space below the detector

- Care must be taken to ensure that neither people, large animals, plants, swinging doors nor any objects intrude into this area and that no parts of the detector surface become covered.
- The detectors may only be installed in a position which is out of arm's reach. We therefore recommend a minimum installation height of 2.70 m.
- The detectors may not be installed in rooms in which data is transmitted by means of high-intensity infrared light (e g. in rooms with IR systems for interpreters).
- The detectors must be mounted so that they are not exposed to any direct sunlight.
- A minimum distance of 50 cm from lamps must be maintained. The detectors may not be mounted in a cone of light from lamps.
- The bases are equipped as standard with a spring which is suitable for installation of the detector in false ceilings. When the detector is installed in concrete or wooden ceilings, these need to be replaced by the stronger springs FAA-500-SPRING with red markings.
- Maximum permitted air speed: 20 m/s
- Country-specific standards and guidelines must be observed during the planning phase.

Installation/configuration notes in accordance with VdS/VDE

- The FAP-OC 520, like the FAP-O 520, is planned according to the guidelines for optical detectors (see DIN VDE 0833 Part 2 and VDS 2095).

Parts included

Detector type	Qty.	Components
FAP-O 520	1	Optical Smoke Detector, White
FAP-O 520-P	1	Optical Smoke Detector, Transparent with Color Inserts
FAP-OC 520	1	Multisensor Detector Optical/Chemical, White
FAP-OC 520-P	1	Multisensor Detector Optical/Chemical, Transparent with Color Inserts

Technical specifications

Electrical

Operating voltage	15 V DC to 33 V DC
Current consumption	< 3.25 mA
Alarm output	Per data word by two-wire signal line
Indicator output	Open collector connects 0 V over 1.5 kΩ through, max. 15 mA

Mechanics

Dimensions	
• Detector	Ø 113 x 55 mm
• Detector with Tim Ring	Ø 150 x 55 mm
• Detector with Trim Ring, Base and Ceiling Mount Back Box	Ø 150 x 110 mm
Housing material	Polycarbonate
Color	
• Detector housing	Signal white, RAL 9003
• Detector front plate FAP-O 520/ FAP-OC 520	signal white matt
• Detector front plate FAP-O 520-P/ FAP-OC 520-P	transparent/silver-gray
Weight	Without / with packaging
• FAP-OC 520(-P)	180 g / 370 g
• FAP-O 520(-P)	170 g / 360 g
• Trim Ring	30 g / 60 g

Environmental conditions

Permissible operating temperature	
• FAP-O 520 (-P)	-20 °C to +65 °C
• FAP-OC 520 (-P)	-10 °C to +50 °C
Permissible relative humidity	95% (non-condensing)
Permissible air speed	20 m/s
Protection class as per EN 60529	
• FAP-O 520 (-P)	IP 53
• FAP-OC 520 (-P)	IP 33

Planning

Monitoring area	Max. 120 m² (Heed local guidelines!)
Maximum installation height	16 m (Heed local guidelines!)
Minimum installation height	Out of arm's reach Minimum installation height recommended by BOSCH: 2.70 m
Minimum distance to lamps	0.5 m
For flush ceiling mounting with FAA-500-BB	
• Thickness of the false ceiling	Max. 32 mm
• Required bored hole	Ø 130 mm (-1 mm to +5 mm)
• Installation depth	110 mm Note: Above the false ceiling, a free height of at least 110 mm is required.

Further characteristics

Detection principle	
• FAP-O 520(-P)	Scattered light measurement
• FAP-OC 520(-P)	Combination of scattered light measurement and combustion gas measurement
Response sensitivity	
• FAP-O 520(-P)	< 0.18 dB/m (EN 54-7)
• FAP-OC 520(-P)	Optical section: < 0.36 dB/m (EN 54-7) Gas sensor section: in ppm range
Individual display	Two-color LED, red (alarm), green (test mode)

Ordering information

FAP-O 520 Optical Smoke Detector, White
for LSN improved version, ultra-flat design
Order number **FAP-O 520**

FAP-O 520-P Optical Smoke Detector, Transparent with Color Inserts
for LSN improved version, ultra-flat design
Order number **FAP-O 520-P**

FAP-OC 520 Multisensor Detector Optical/Chemical, White
for LSN improved version, ultra-flat design
Order number **FAP-OC 520**

FAP-OC 520-P Multisensor Detector Optical/Chemical, Transparent with Color Inserts
for LSN improved version, ultra-flat design
Order number **FAP-OC 520-P**

Accessories

FAA-500-TR-W Trim Ring, White
for 500 and 520 Series Fire Detectors
Order number **FAA-500-TR-W**

FAA-500-TR-P Trim Ring, Transparent with Color Inserts
for 500 and 520 Series Fire Detectors
Order number **FAA-500-TR-P**

FAA-500 LSN Base
for installation of the FAP-520 Fire Detector
Order number **FAA-500**

FAA-500-R LSN Base with Relay
Only used in conjunction with the 5000 Series Modular Fire Panel.
Order number **FAA-500-R**

FAA-500-GB LSN Base for GB
required for installation from FAP-520 base in Great Britain
Order number **FAA-500-GB**

FAA-500-R-GB LSN Base with Relay for GB
usable only in conjunction with the 5000 Series Modular Fire Panel
Order number **FAA-500-R-GB**

FAA-500-BB Ceiling Mount Back Box
for ceiling flush installation in false ceilings when mounting 500 and 520 Series Bases and Fire Detectors
Order number **FAA-500-BB**

FAA-500-CB Built-in Housing for Concrete Ceilings
for installing 500 and 520 Series Fire Detectors in concrete ceilings. In addition, you need to order a FAA-500-BB Ceiling Mount Back Box, which contains the base and the detector.
Order number **FAA-500-CB**

FAA-500-SB Surface Mount Back Box
for special applications where it is not possible to flush-mount the 500 and 520 Series Fire Detectors in a ceiling
Order number **FAA-500-SB**

FAA-500-SB-H Surface Mount Back Box with Damp Room Seal
for special applications where it is not possible to flush-mount the 500 and 520 Series Fire Detectors in a ceiling
Order number **FAA-500-SB-H**

FAA-500-SPRING for Concrete/Wooden Ceilings
(DU = 10 units)
Order number **FAA-500-SPRING**

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	FAP-O 520 Optical Smoke Detector, White	FAP-O 520-P Optical Smoke Detector, Transparent with Color Inserts	FAP-OC 520 Multisensor Detector Optical/Chemical, White	FAP-OC 520-P Multisensor Detector Optical/Chemical, Transparent with Color Inserts
				
Detector type	optical	optical	optical/chemical	optical/chemical
Operating voltage	15 V DC . . . 33 V DC	15 V DC . . . 33 V DC	15 V DC . . . 33 V DC	15 V DC . . . 33 V DC
Current consumption	< 3.26 mA	< 3.26 mA	< 3.26 mA	< 3.26 mA
Protection category	IP 53	IP 53	IP 33	IP 33
Permissible operating temperature	-20 °C . . . +65 °C	-20 °C . . . +65 °C	-10 °C . . . +50 °C	-10 °C . . . +50 °C
Monitoring area	max. 120 m²	max. 120 m²	max. 120 m²	max. 120 m²
Maximum installation height	16 m	16 m	16 m	16 m
Color	white	transparent with color inserts	white	transparent with color inserts

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