

AVENAR detector 4000



- ▶ Highly reliable and accurate thanks to Intelligent Signal Processing (ISP)
- ▶ Earliest detection of lightest smoke with dual-optical versions (Dual-Ray technology)
- ▶ Monitors environment for electromagnetic influence for fast root-cause analysis
- ▶ Automatic and manual address setting

The automatic fire detectors of the AVENAR detector 4000 series feature a superb accuracy and swiftness in detection. The range includes versions with rotaries, manually and automatically addressable, and versions without rotaries for automatic address setting.

Multiple-criteria detectors can support, if single sensors are not sufficient. They have highest stability against deceptive phenomena and response to a broad range of fires.

The versions with two optical sensors (dual-optical) detect the lightest smoke.

The versions with heat sensor detect fires with rapid temperature increase or with a maximum temperature value.

CO fire detectors react promptly to smoldering and suit better for applications with dust, steam, cooking vapors. Included CO-detection helps to support an even more reliable fire detection and leads in parallel to a higher false alarm stability.

Functions

Sensor technology and signal processing

The individual sensors can be configured in the FSP-5000-RPS programming software.

All sensor signals are analyzed continuously by the internal evaluation electronics (ISP, Intelligent Signal Processing) and are linked with each other via an inbuilt microprocessor. The link between the sensors means that the combined detectors can also be used where light smoke, steam or dust must be expected during the course of normal operation.

Only if the signal combination corresponds to the characteristics of the area of operation, selected during the programming, the alarm is triggered

automatically. Additionally the time behavior of the sensor signals is evaluated for fire and malfunction detection. Thus, for each individual sensor the reliability of detection is increased. This complex evaluation of fire characteristics (Pattern matching of fire characteristics) reduces the risk of a false alarm. Active adjustment of the response threshold of the optical or of the chemical sensor takes place (drift compensation). Adjustment to extreme disturbance variables is possible through manual or time-controlled switch-off of individual sensors. All detectors of the AVENAR detector 4000 series are suitable as a technical measure to avoid false alarms.

Optical sensor (smoke sensor)

The optical sensor uses the scattered-light method. An LED transmits light to the measuring chamber, where it is absorbed by the labyrinth structure. In the event of a fire, smoke enters the measuring chamber and the smoke particles scatter the light from the LED. The amount of light hitting the photo diode is converted into a proportional electrical signal.

The dual-optical versions use two optical sensors with different wavelengths. The Dual-Ray technology works with an infrared and a blue LED so that lightest smoke is detected fast and reliably (TF1 and TF9 detection).

Thermal sensor (temperature sensor)

A thermistor in a resistance network is used as a thermal sensor from which an analog-digital converter measures the temperature-dependent voltage at regular intervals.

Depending on the specified detector class, the temperature 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).

Chemical sensor (CO gas sensor)

The main function of the chemical sensor is to detect carbon monoxide (CO) generated as a result of a fire, but it will also detect hydrogen (H) and nitrous monoxide (NO). The sensor signal value is proportional to the concentration of gas. The chemical sensor delivers additional information to effectively suppress deceptive values.

Since the service life of the chemical sensor is limited, the C sensor shuts down automatically after a maximum time of operation. The detector will then still operate as a multisensor detector with dual-optical and thermal sensor. It is recommended to exchange the detector immediately in order to keep the higher detection reliability of the version with C sensor. Make sure you have a working detector depending on the chosen sensitivity setting in RPS.

Improved LSN features

AVENAR detector 4000 offers all the features of the improved LSN technology:

- Flexible network structures, including T-tapping without additional elements (no T-tapping feasible for versions without rotaries)
- Up to 254 LSN improved elements per loop or stub line
- Automatic or manual detector addressing, with or without auto-detection
- Power supply for connected elements via LSN bus
- Unshielded fire detection cable can be used
- Cable length up to 3000 m (with LSN 1500 A)
- Backwards compatibility to existing LSN systems and central units
- Monitoring of environmental electromagnetic impact for fast root-cause analysis (EMC values are displayed on the panel)

In addition, the range offers all the established benefits of LSN technology. The panel programming software can be used to change the detection characteristics of the respective room utilization. Each configured detector can provide the following data:

- Serial number
- Contamination level of the optical section
- Operating hours
- Current analog values
 - Optical system values: current measured value of the scattered light sensor; the measuring range is linear and shows different degrees of pollution, from slight to heavy.

- Contamination: the contamination value shows how much the current contamination value has increased relative to the original condition.
- CO value: display of the currently measured value.

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

- Fault indication in the event of the failure of the detector electronics
- Continuous display of contamination level during service
- Fault indication if heavy contamination is detected (instead of triggering a false alarm)

In the event of wire interruption or short-circuit, integrated isolators maintain the functional security of the LSN loop.

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

Further characteristics

- A red flashing LED visible 360° indicates the alarm.
- Connection to a remote indicator is possible.
- The strain relief for cables in false ceilings prevents the cables from being unplugged accidentally from the terminals after installation. The terminals for cable cross-sections up to 2.5 mm² are very easily accessible.
- The detectors have a dust-repellent labyrinth and cap construction. The chamber maid plug (an opening with closing plug) on the bottom is used to clean the optical chamber with compressed air (not required for the heat detector).
- The detector bases no longer have to be directed due to the centralized position of the individual display. They also have a locking clip. To prevent that unauthorized persons have access to the detector, the locking clip can be activated.

Regulatory information

Region	Regulatory compliance/quality marks	
Europe	CE	FAP/FAH/-425
	CPR	0786-CPR-21398 FAP-425-O
	CPR	0786-CPR-21399 FAP-425-O-R
	CPR	0786-CPR-21400 FAP-425-OT
	CPR	0786-CPR-21401 FAP-425-OT-R
	CPR	0786-CPR-21403 FAP-425-DO-R
	CPR	0786-CPR-21404 FAP-425-DOT-R
	CPR	0786-CPR-21405 FAP-425-DOTC-R
	CPR	0786-CPR-21402 FAH-425-T-R

Region	Regulatory compliance/quality marks	
	CPR	21798 FAP-425-DOTCO-R
Germany	VdS	G214100 FAP-425-O
	VdS	G214099 FAP-425-O-R
	VdS	G119017 FAP-425-O-R
	VdS	G214098 FAP-425-OT
	VdS	G214097 FAP-425-OT-R
	VdS	G119018 FAP-425-OT-R
	VdS	G214104 FAP-425-DO-R
	VdS	G214103 FAP-425-DOT-R
	VdS	G214102 FAP-425-DOTC-R
	VdS	G119016 FAP-425-DOTC-R
	VdS	G214101 FAH-425-T-R
	VdS	G119019 FAH-425-T-R
	VdS	G223051 FAP-425-DOTCO-R
Morocco	CMIM	FAP-425
Macao Special Administrative Region Government	CB	3175/GEL/DPI/2017
Poland	CNBOP	063-UWB-0423 FAP-425-DOT-R

Installation/configuration notes

- Connectable to Bosch fire panels with the improved LSN system parameters.
- FAP-425-DOTCO-R has to be connected to an AVENAR panel 8000 or AVENAR panel 2000, firmware version 4.3 or higher.
- FAP-425-DOTCO-R excluded, AVENAR detector in LSN classic mode is connectable 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, also with the previous LSN system parameters.
- You cannot use the dual-optical detectors with Panel Controller MPC version A.
- During planning works, it is essential to adhere to national standards and guidelines.
- The detector can be painted (cap and base) and thereby adapted to the surrounding colour scheme. Note the information in the Painting Instructions.

- All detectors of the 420 series can be replaced by the versions of the AVENAR detector 4000 without re-configuring the panel.

Installation/configuration notes in accordance with VdS/VDE

- The FAP-425-DOTC-R, FAP-425-DOT-R, FAP-425-OT-R, and FAP-425-OT versions are planned in accordance with the guidelines for optical detectors if operated as optical detectors or as combined optical/thermal detectors (see DIN VDE 0833 Part 2 and VDS 2095)
- If occasional deactivation of the optical unit (scattered light sensor) is required, planning must be based on the guidelines for heat detectors (see DIN VDE 0833 Part 2 and VDS 2095)
- When planning fire barriers according to DIBt, note that the heat detector (FAH-425-T-R) must be configured in accordance with class A1R.

Technical specifications

Heed local guidelines. The local guidelines may overrule the given limits for example for the installation height or the monitoring area.

Electrical

Operating voltage	15 V DC to 33 V DC
Current consumption	0.55 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.

Mechanical

Dimensions (Ø x H) (mm)	
• Without base	Ø 99.5 x 52 mm
• With base	Ø 120 x 63.5 mm
Housing	
• Material	Plastic
• Color	White, similar to RAL 9010, matt finish
LED color	Red, Green
Weight (g)/Shipping weight (g)	
• FAP-425-O	73 g/107 g

• FAP-425-O-R	76 g/110 g
• FAP-425-OT	74 g/108 g
• FAP-425-OT-R	77 g/111 g
• FAP-425-DO-R	77 g/111 g
• FAP-425-DOT-R	78 g/112 g
• FAP-425-DOTC-R	82 g/122 g
• FAP-425-DOTCO-R	82 g/122 g
• FAH-425-T-R	75 g/109 g

Color code

• FAP-425-O	No marking
• FAP-425-O-R	No marking
• FAP-425-OT	Black loop
• FAP-425-OT-R	Black loop
• FAP-425-DO-R	2 gray concentric loops
• FAP-425-DOT-R	2 black concentric loops
• FAP-425-DOTC-R	2 yellow concentric loops
• FAP-425-DOTCO-R	2 pastel blue concentric loops
• FAH-425-T-R	Red loop

Environmental

Operating temperature (°C)

• FAP-425-O	-20 °C – 65 °C
• FAP-425-O-R	-20 °C – 65 °C
• FAP-425-OT	-20 °C – 50 °C
• FAP-425-OT-R	-20 °C – 50 °C
• FAP-425-DO-R	-20 °C – 65 °C
• FAP-425-DOT-R	-20 °C – 50 °C
• FAP-425-DOTC-R	-10 °C – 50 °C
• FAP-425-DOTCO-R	-10 °C – 50 °C
• FAH-425-T-R	-20 °C – 50 °C

Operating relative humidity, non-condensing (%)

• All versions except FAP-425-DOTC-R and FAP-425-DOTCO-R	15% - 95%
• FAP-425-DOTC-R	15% – 90%
• FAP-425-DOTCO-R	15% – 90%
Permissible air speed (m/s)	20 m/s
Installation height (m) (all versions except FAH-425-T-R)	Max. 16 m
Installation height (m) FAH-425-T-R	0 m – 7.50 m
IP rating (IEC 60529)	IP41 , IP43 with detector base and FAA-420-SEAL or MSC 420

Operation

Operating time (years) FAP-425-DOTCO-R	10*
Response sensitivity	
• Optical part	In accordance with EN 54-7 (programmable)
• Thermal maximum part	> 54°C / > 69°C
• Thermal differential part (FAP-425-OT, FAP-425-OT-R, FAP-425-DOT-R, FAP-425-DOTC-R and FAP-425-DOTCO-R)	A2S / A2R / BS / BR, in line with EN 54-5 (programmable)
• Thermal differential part (FAH-425-T-R)	A2S / A2R / A1 / A1R / BS / BR, in line with EN 54-5 (programmable)
• Chemical sensor	In accordance with VdS 6017, VdS 6018, VdS 6019, depending on sensitivity configuration

*FAP-425-DOTCO-R detectors need to be exchanged after 10 years at the latest.

Ordering information

FAP-425-O Smoke detector, optical auto-addressable

Analog addressable detector with one optical sensor, automatic address setting.

Order number **FAP-425-O**

FAP-425-O-R Smoke detector, optical

Analog addressable detector with one optical sensor, manually and automatically addressable.

Order number **FAP-425-O-R**

FAP-425-OT Detector optic/thermal auto-addressable

Analog addressable detector with one optical and one thermal sensor, automatic address setting.

Order number **FAP-425-OT**

FAP-425-OT-R Multisensor detector, optical/thermal
Analog addressable detector with one optical and one thermal sensor, manually and automatically addressable.

Order number **FAP-425-OT-R**

FAP-425-DO-R Smoke detector, dual-optical
Analog addressable detector with two optical sensors, manually and automatically addressable.

Order number **FAP-425-DO-R**

FAP-425-DOT-R Multisensor detector, dual-optic/thermal

Analog addressable detector with two optical sensors and one thermal sensor, manually and automatically addressable.

Order number **FAP-425-DOT-R**

FAP-425-DOTC-R Detector dual-optical/thermal/chemical

Analog addressable detector with two optical sensors, one thermal and one chemical sensor, manually and automatically addressable.

Order number **FAP-425-DOTC-R**

FAP-425-DOTCO-R Detector dual-optical/thermal/CO

Analog addressable detector with two optical, one thermal and one chemical sensor (CO gas sensor), manually and automatically addressable.

Order number **FAP-425-DOTCO-R**

FAH-425-T-R Heat detector

Analog addressable heat detector with one thermal sensor, manually and automatically addressable.

Order number **FAH-425-T-R**

Accessories

FAA-420-SEAL Damp room seal, 10 pcs

Damp room seal
Delivery unit is 10.

Order number **FAA-420-SEAL**

MS 400 B Detector base with Bosch logo

Bosch-branded detector base for surface mounted and flush-mounted cable feed

Order number **MS 400 B**

MS 400 Detector base

Detector base for surface mounted and flush-mounted cable feed, not branded.

Order number **MS 400**

MSC 420 Base extension with damp room sealing

Extension for detector bases with surface-mounted cable feed

Order number **MSC 420**

FAA-MSR420 Detector base with relay

with a change-over relay (Form C)

Order number **FAA-MSR420**

FNM-420-A-BS-WH Base sounder indoor, white

analog addressable base sounder for indoor use, white, delivered without cover

Order number **FNM-420-A-BS-WH**

FNM-420-A-BS-RD Base sounder indoor, red

analog addressable base sounder for indoor use, red, delivered with cover

Order number **FNM-420-A-BS-RD**

FNM-420U-A-BSWH Base sounder uninterruptible, white

uninterruptible analog addressable base sounder for indoor use, white, delivered without cover

Order number **FNM-420U-A-BSWH**

FNM-420U-A-BSRD Base sounder uninterruptible indoor, red

uninterruptible analog addressable base sounder for indoor use, red, delivered with cover

Order number **FNM-420U-A-BSRD**

FNX-425U-WFWH Acoustic/visual alarm wh, wh

uninterruptible analog addressable combination of base sounder (EN 54-3) and visual alarm (EN 54-23) for indoor use, white housing, white flash. A battery pack is included in the delivery. For use without detector, order the cover separately.

Order number **FNX-425U-WFWH**

FNX-425U-RFWH Acoustic/visual alarm rd, wh

uninterruptible analog addressable combination of base sounder (EN 54-3) and visual alarm (EN 54-23) for indoor use, white housing, red flash. A battery pack is included in the delivery. For use without detector, order the cover separately.

Order number **FNX-425U-RFWH**

FNX-425U-WFRD Acoustic/visual alarm wh, rd

uninterruptible analog addressable combination of base sounder (EN 54-3) and visual alarm (EN 54-23) for indoor use, red housing, white flash. A red cover and a battery pack are included in the delivery.

Order number **FNX-425U-WFRD**

FNX-425U-RFRD Acoustic/visual alarm rd, rd

uninterruptible analog addressable combination of base sounder (EN 54-3) and visual alarm (EN 54-23) for indoor use, red housing, red flash. A red cover and a battery pack are included in the delivery.

Order number **FNX-425U-RFRD**

FAA-420-RI-DIN Remote indicator for DIN application

For applications where the automatic detector is not visible, or mounted in false ceilings/floors.

This version complies with DIN 14623.

Order number **FAA-420-RI-DIN**

FAA-420-RI-ROW Remote indicator

For applications where the automatic detector is not visible, or mounted in false ceilings/floors.

Order number **FAA-420-RI-ROW**

WA400 Wall bracket

Console for DIBt compliant mounting of detectors above doors etc., including detector base

Order number **WA400**

MH 400 Heating element

usable at locations where the functional safety of the detector might be impaired by condensation

Order number **MH 400**

FMX-DET-MB Mounting bracket

Mounting bracket for installation in false floors

Order number **FMX-DET-MB**

SK 400 Protective cage

prevents damage

Order number **SK 400**

SSK400 Dust protection, 10pcs

Protective dust cover for automatic point type detectors.

Delivery unit is 10.

Order number **SSK400**

TP4 400 Label plate small

Support plate for detector identification.

Delivery unit is 50.

Order number **TP4 400**

TP8 400 Label plate large

Support plate for detector identification, large.

Delivery unit is 50.

Order number **TP8 400**

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