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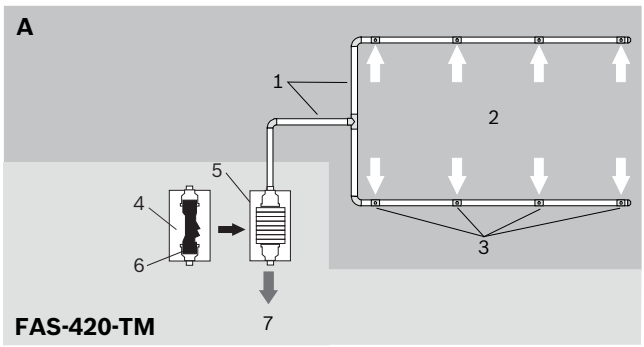
FAS-420-TM Series Aspirating Smoke Detectors LSN improved version

- **For connecting to the fire panels FPA-5000 and FPA-1200 with LSN improved technology**
- **High deceptive alarm immunity with intelligent *LOGIC·SENS* signal processing**
- **Innovative fire source identification technology allows the exact location of the fire to be pinpointed by monitoring up to five distinct zones**
- **Innovative airflow monitoring including single-hole monitoring detects obstruction and breakage**
- **Installation and commissioning made easy by plug-and-play function**
- **Easy to diagnose using FAS-ASD-DIAG Diagnostic Software**
- **Simple implementation of the pipe system planning through patented aspiration reducing film sheets**
- **Preservation of LSN loop functions in the event of wire interruption or short-circuit through two integrated isolators**

The FAS-420-TM Series Aspirating Smoke Detectors are specially designed for direct connection to the Local SecurityNetwork improved version with the extended range of features. These active fire detection systems are for early fire detection in zone and equipment protection, as well as for the monitoring of air-conditioning units or ducts. The exact location of the fire can be pinpointed using the innovative fire source identification.

The aspirating smoke detectors are fitted with the latest fire detection technology. Their resistance to contamination, the temperature compensation of the sensor signals and initialization in relation to air pressure ensure reliable operation even under difficult environmental conditions.

System Overview



A	Pipe system
FAS-420-TM series	Aspirating smoke detector
1	Smoke aspiration pipe
2	Air intake
3	Air sampling openings
4	Detection unit incl. airflow sensor
5	Housing base
6	Aspiration unit
7	Air outlet

Functions

The aspiration unit uses a pipe system with defined air sampling openings to draw in air samples from the monitoring range and route them to the detection unit.

Depending on the programmed response sensitivity of the detection unit and the alarm threshold, the FAS-420-TM Aspirating Smoke Detector triggers the alarm when the appropriate light obscuration level is reached. The alarm is displayed via the pre-alarm or main alarm LED on the device and forwarded to the connected fire panel.

Various time-delay settings can be selected for displaying and forwarding alarms and malfunctions.

A malfunction message is reset via the connected fire panel. Alarm and malfunction messages are displayed simultaneously on the device via the Local SecurityNetwork (LSN) using the reset function on the detector line.

Avoiding false alarms

The *LOGIC·SENS* intelligent signal processing compares the measured smoke level with known disturbance variables and decides whether something is an alarm or deception.

Fire source identification

Innovative fire source identification technology allows the exact location of the fire to be pinpointed by monitoring up to five distinct zones.

Airflow monitoring

An airflow sensor checks the connected pipe system for breakage and obstruction.

Response sensitivity

FAS-420-TM series Aspirating Smoke Detectors have a response sensitivity of 0.5%/m to 2%/m light obscuration. The alarm threshold can be set at intervals of 0.1%/m with FAS-ASD-DIAG. The smoke level display on the FAS-420-TM-RVB model allows a response sensitivity of 0.05%/m to 0.2%/m light obscuration.

Allocating detector address

The address on the Aspirating Smoke Detector is set using the DIP switch. Both automatic and manual address allocation are possible, with or without auto detection.

The following settings are possible:

Address	Operating mode
0	Automatic address allocation for loop/stub in LSN improved mode (T-tap not possible)
1 - 254	Manual address allocation for loop/stub/T-tap in LSN improved mode
255	Automatic address allocation for loop/stub in LSN classic mode (address range: max. 127)

LSN improved features

FAS-420-TM series Aspirating Smoke Detectors feature LSN improved technology:

- Flexible network structures, including T-tapping with no additional elements
- Up to 254 LSN improved elements per loop or stub line
- Unshielded cable can be used.

The FAS-420-TM series also offers all the established benefits of LSN technology. The operating data and fault messages can be found on the panel controller.

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

FAS-420-TM series variant models

All FAS-420-TM series Aspirating Smoke Detectors have LED displays for operating mode, malfunction and main alarm, as well as offering an infrared diagnostics port. In addition to this, the FAS-420-TM-R and FAS-420-TM-RVB variants offer an optical fire location display for up to five zones. The FAS-420-TM-RVB also includes a pre-alarm display and a 10-segment smoke level display.

Certifications and Approvals

Region	Certification	
Germany	VdS	G209144 FCS-320-TM_FAS-420-TM
Switzerland	VKF	AEAI 21137 FCS-320-TM_FAS-420-TM
Europe	CE	FAS-420-TM Series
	CPD	0786-CPD-20879 FCS-320-TM_FAS-420-TM

Installation/Configuration Notes

- You can use this device only with the Panel Controller MPC-xxxx-B or the FPA-1200. The Panel Controller MPC-xxxx-A cannot be used.
- For connecting to the fire panels FPA-5000 and FPA-1200 with extended range of LSN features.
- Programming is carried out via the programming software FSP-5000-RPS.

Pipe system planning

In planning, a distinction is made between area monitoring and equipment monitoring.

The aspiration pipe system should be arranged such that any fires can be detected at the initial stage. The number of air sampling openings and the structure of the pipe system depend on the size and geometry of the monitoring area.

Symmetrical structure

The aspiration pipe system incl. aspiration borings should preferably be symmetrical in structure, i.e.:

- Same number of air sampling openings per pipe branch
- Same pipe branch lengths (maximum deviation ± 20%)
- Same distance between adjacent air sampling openings on the smoke aspiration pipe (maximum deviation ± 20%)

Asymmetrical structure

If structural issues make it impossible to maintain this symmetry, the following conditions apply:

- The number of air sampling openings and the length of the shortest and longest pipe branch within the pipe system must not exceed a quantity ratio of 1:2.
- The distance between adjacent air sampling openings on the smoke aspiration pipe must be the same (maximum deviation ± 20%).
- The diameters of the air sampling openings are determined separately for each pipe branch. The diameters depend on the total number of air sampling openings in the pipe branch in question.

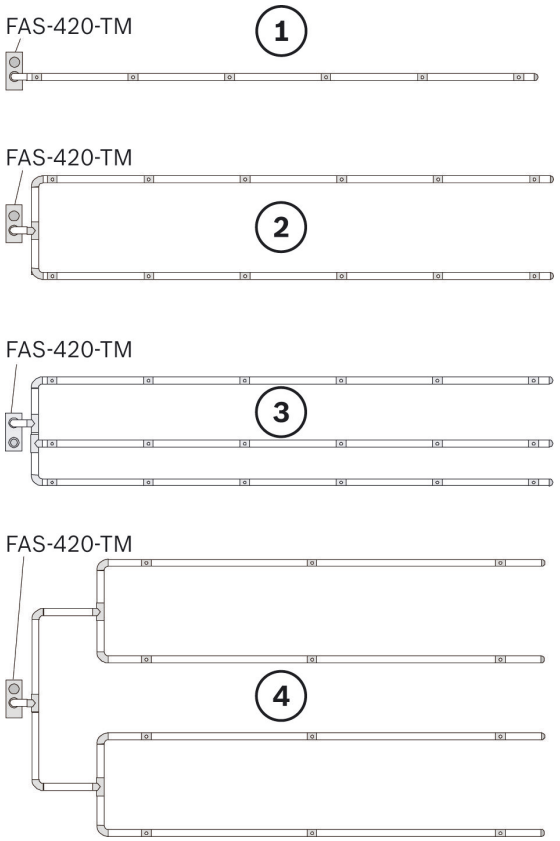
Branch length

For faster detection, it is best to select several short branches rather than a few long branches (U and double-U pipe systems preferable).

Pipe configuration

Depending on the geometry of the area, the aspiration pipe is planned as an I, U, M or double-U pipe system.

Note Planning with fire source identification requires I pipe configuration.



Item	Designation
1	I-pipe system
2	U-pipe system
3	M-pipe system
4	Double-U pipe system

For further information on the following aspects of FAS-420-TM planning, please refer to the operation guide “FAS-420-TM Series Aspirating Smoke Detectors LSN improved version” (Product ID F.01U.088.878):

- Planning airflow monitoring
- Defining the sensitivity
- Planning limitations
- Planning air sampling pipes
- Standard Pipe Planning
- Simplified Pipe Planning
- Planning for Forced Airflow
- Setting of the fan current

Parts Included

Type of device	Qty.	Components
FAS-420-TM	1	Standard Aspirating Smoke Detector unit with LED displays for operating mode, malfunction and alarm
FAS-420-TM-R	1	Standard Aspirating Smoke Detector unit with LED displays for operating mode, malfunction, alarm and fire source identification
FAS-420-TM-RVB	1	Standard Aspirating Smoke Detector unit with LED displays for operating mode, malfunction, pre-alarm, main alarm, fire source identification and 10-segment smoke level display

Note The FAS-420-TM-HB Housing Base must be ordered separately for standard units.

Technical Specifications

Electrical

LSN power supply	15 V DC . . 33 V DC		
Auxiliary power supply	15 V DC . . 30 V DC		
LSN current consumption	6.25 mA		
Current consumption from auxiliary power supply	Fan voltage		
	9 V	10.5 V	12 V
- Starting current	150 mA	150 mA	150 mA
- In standby	105 mA	125 mA	145 mA
- With alarm, device variants FAS-420-TM and FAS-420-TM-R	110 mA	130 mA	150 mA
- With alarm, device variant FAS-420-TM-RVB	140 mA	160 mA	180 mA

Displays on the device

	FAS-420-TM	FAS-420-TM-R	FAS-420-TM-RVB
Operation	Green LED	Green LED	Green LED
Malfunction	Yellow LED	Yellow LED	Yellow LED
Alarm	Red LED	Red LED	2 red LEDs (pre-alarm and main alarm)
Fire location display	-	5 red LEDs (zones A-E)	5 red LEDs (zones A-E)
Smoke level display	-	-	Yellow smoke level display with 10 segments (1-10)
Infrared port	IR transmitter/receiver	IR transmitter/receiver	IR transmitter/receiver

Mechanics

Conical duct connections Ø 25 mm	1x aspiration pipe 1x air return
• Aspiration pipe	1 pipe
• Air return	1 pipe
Cable bushings:	
• Housing base sides	8 x M 20 and 2 x M 25
• Housing base rear wall	4 x M 25
Dimensions (W x H x D)	140 x 222 x 70 mm
Weight	Approx. 0.8 kg
Housing material	Plastic (ABS)
Housing color	Papyrus white (RAL 9018)

Environmental conditions

Protection category according to EN 60529	
• Without air return	IP 20
• With pipe section 100 mm/pipe bend	IP 42
• With air return	IP 54
Permissible temperature range:	
• FAS-420-TM series Aspirating Smoke Detector	-20 °C to +60 °C
• PVC pipe system	0 °C to +60 °C
• ABS pipe system	-40 °C to +80 °C
Permissible relative humidity (non-condensing)	Max. 95%

Special features

Sound power level (at 9 V fan voltage) EN27779, 1991	40 dB(A)
Response sensitivity (light obscuration)	0.5 to 2.0%/m
Life cycle of fan (at 12 V and 24 °C)	60,000 hrs

Ordering Information

FAS-420-TM Aspirating Smoke Detector LSN improved version with LED displays for operating mode, malfunction and alarm	**FAS-420-TM**
FAS-420-TM-R Aspirating Smoke Detector LSN improved version with LED displays for operating mode, malfunction, alarm and fire source identification	**FAS-420-TM-R**
FAS-420-TM-RVB Aspirating Smoke Detector LSN improved version with LED displays for operating mode, malfunction, alarm, fire source identification and smoke level display	**FAS-420-TM-RVB**
Accessories	
FAS-420-TM-HB Housing Base for Aspirating Smoke Detectors Series FAS-420-TM	**FAS-420-TM-HB**
FAS-ASD-DIAG Diagnostic Software The FAS-ASD-DIAG Diagnostic Software enables reading out all stored device data and gives advices to remove failures. Including connection cable for USB interface and diagnosis tool with an infrared interface.	**FAS-ASD-DIAG**
Test Pipe	**RAS test pipe**
Test Adapter	**RAS test adapter**
AF-BR Marking Tapes for Aspiration Reducing Film Sheets Price per piece, DU 10 pieces	**TITANUS AF-BR**
AF-2.0 Aspiration Reducing Film Sheets 2.0 mm Price per piece, DU 10 pieces	**TITANUSAF-2.0**
AF-2.5 Aspiration Reducing Film Sheets 2.5 mm Price per piece, DU 10 pieces	**TITANUSAF-2.5**
AF-3.0 Aspiration Reducing Film Sheets, 3.0 mm Price per piece, DU 10 pieces	**TITANUSAF-3.0**
AF-3.2 Aspiration Reducing Film Sheets, 3.2 mm Price per piece, DU 10 pieces	**TITANUSAF-3.2**
AF-3.4 Aspiration Reducing Film Sheets, 3.4 mm Price per piece, DU 10 pieces	**TITANUSAF-3.4**
AF-3.8 Aspiration Reducing Film Sheets, 3.8 mm Price per piece, DU 10 pieces	**TITANUSAF-3.8**
AF-4.0 Aspiration Reducing Film Sheets, 4.0 mm Price per piece, DU 10 pieces	**TITANUSAF-4.0**
AF-4.2 Aspiration Reducing Film Sheets, 4.2 mm Price per piece, DU 10 pieces	**TITANUSAF-4.2**

Ordering Information

AF-4.4 Aspiration Reducing Film Sheets, 4.4 mm Price per piece, DU 10 pieces	**TITANUSAF-4.4**
AF-4.6 Aspiration Reducing Film Sheets, 4.6 mm Price per piece, DU 10 pieces	**TITANUSAF-4.6**
AF-5.0 Aspiration Reducing Film Sheets, 5.0 mm Price per piece, DU 10 pieces	**TITANUSAF-5.0**
AF-5.2 Aspiration Reducing Film Sheets, 5.2 mm Price per piece, DU 10 pieces	**TITANUSAF-5.2**
AF-5.6 Aspiration Reducing Film Sheets, 5.6 mm Price per piece, DU 10 pieces	**TITANUSAF-5.6**
AF-6.0 Aspiration Reducing Film Sheets, 6.0 mm Price per piece, DU 10 pieces	**TITANUSAF-6.0**
AF-6.8 Aspiration Reducing Film Sheets, 6.8 mm Price per piece, DU 10 pieces	**TITANUSAF-6.8**
AF-7.0 Aspiration Reducing Film Sheets, 7.0 mm Price per piece, DU 10 pieces	**TITANUSAF-7.0**

FAS-420-TM Series Aspirating Smoke Detectors LSN improved version

	FAS-420-TM	FAS-420-TM-R	FAS-420-TM-RVB
Model variant	with simple alarm indication (only main alarm)	with simple alarm indication (only main alarm) and fire source indication	with differentiated alarm indication (pre- and main alarm), fire source indication and smoke level display
Operating voltage	15 V DC . . . 33 V DC	15 V DC . . . 33 V DC	15 V DC . . . 33 V DC
Current consumption LSN	6.25 mA	6.25 mA	6.25 mA
Current consumption AUX	depending on the configuration between 105 mA and 150 mA	depending on the configuration between 105 mA and 150 mA	depending on the configuration between 105 mA and 180 mA
Protection category according to EN 60529			
- without air-return pipe	IP 20	IP 20	IP 20
- with pipe section 100 mm/ pipe bend	IP 42	IP 42	IP 42
- with air-return pipe	IP 54	IP 54	IP 54
Permissible operating temperature			
- Aspirating smoke detectors	-20 °C . . . +60 °C	-20 °C . . . +60 °C	-20 °C . . . +60 °C
- Pipe system PVC	0 °C . . . +60 °C	0 °C . . . +60 °C	0 °C . . . +60 °C
- Pipe sytem ABS	-40 °C . . . +80 °C	-40 °C . . . +80 °C	-40 °C . . . +80 °C
Max. sensitivity (light obscuration)			
- max. response sensitivity	0.5 %/m	0.5 %/m	0.5 %/m
- max. display sensitivity	–	–	0.05 %/m
Max. number of air sampling openings per pipe system			
- without fire source identification	8	8	8
- with fire source identification	–	5	5
Max. monitoring area	400 m²	400 m²	400 m²
Max. length of the pipe system			
- pipe Ø 25 mm	50 m	50 m	50 m
- additional pipe Ø 12 mm	8 x 3 m	8 x 3 m	8 x 3 m

Americas:
Bosch Security Systems, Inc.
130 Perinton Parkway
Fairport, New York, 14450, USA
Phone: +1 800 289 0096
Fax: +1 585 223 9180
security.sales@us.bosch.com
www.boschsecurity.us

Europe, Middle East, Africa:
Bosch Security Systems B.V.
P.O. Box 80002
5600 JB Eindhoven, The Netherlands
Phone: + 31 40 2577 284
Fax: +31 40 2577 330
emea.securitysystems@bosch.com
www.boschsecurity.com

Asia-Pacific:
Robert Bosch (SEA) Pte Ltd, Security Systems
11 Bishan Street 21
Singapore 573943
Phone: +65 6258 5511
Fax: +65 6571 2698
apr.securitysystems@bosch.com
www.boschsecurity.asia

Represented by

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