

Detection Devices

ASD+ - Aspirating Smoke Detector [with *Dual Wavelength Technology*]

Models FDA422 | FDA442

Architect & Engineer Specifications

- Patented Dual wavelength sensor technology
 - Provides enhanced detection via Blue and Infrared light-scattering technology
 - Differentiates between deceptive phenomena and an actual fire (nuisance-alarm avoidance)
- Responds to flaming and smoldering fires
- Dust Sensor & Indicator
- Detection coverage area 10,500 sq. ft. (1,000 m²)
- "Asyst-Tool" pipe network design software
- Programmable Alarm thresholds
- 'Out of Box' install and QR code commissioning
- Optional relay output module provides 6 additional programmable relay outputs
- Optional detector expansion modules
 - (6) programmable dry contacts per module or
 - (2) 4-20 mA outputs per module
- Optional 4-20 mA output supports real-time monitoring of:
 - Smoke value
 - Sample pipe airflow
 - Background dust value
 - Background fine dust value
- Pre-engineered pipe network designs
- 3 general-purpose inputs (GPI)
- 40,000 entry event log
- Non-volatile event memory
- Service access for field personnel
- UL 268 & UL 268A Listed
- ULC S529 Listed
- Complies with NFPA 72 and NFPA 76
- VdS Approved
 - Li-Ion battery electrolyte particle detection

Product Overview

The FDA422 and FDA442 aspirating detectors use patented dual-wavelength technology and a single detection chamber to deliver very early, reliable fire detection across large spaces up to 10,500 sq. ft. (1,000 m²).

All ASD+ models enhance lithium-ion battery protection applications and hold VdS approval for reliably detecting Li-Ion off-gassing events — key early indicators of battery failure and potential thermal runaway.

Using Blue and Infrared light-scattering, these detectors distinguish combustion particles from dust or steam, helping prevent nuisance alarms.

Each ASD+ unit draws air through the sample pipe network into its detection chamber, and the devices are configured using the ASD+ Connect App via Bluetooth or USB.

The 'FXS2056 ASD Asyst-Tool V3' software calculates the hydraulic performance of desired pipe network layout to specific site geometry, position and size of the sample holes, and specified sample hole sensitivities. The configuration ensures that the air passes from the aspirating hole to the detector within the transport time specified and with the calculated sensitivity.

Models FDA422 and FDA442 are ideal for spaces with high or false ceilings, tunnels, data centers, and other challenging areas where point detectors are ineffective.

Each unit can also use the optional ASD filter box (Model FDAZ292) to improve resistance to dust and airborne contaminants in high-pollution areas such as factories, recycling centers, and transportation facilities.

Out-of-box installation is fast and simple thanks to built-in Smoke and Airflow normalization and preset smoke, alarm, and fault thresholds. The 'ASYST' QR code feature and ASD+ Connect App apply pipe-design settings in seconds, ensuring consistent setup while saving time and labor.



Aspirating Smoke Detector
[with *Dual wavelength technology*]



Operation

Dual wavelength Light-Scattering Technology

Designed with dual-wavelength light-scattering, the detector chamber distinguishes both small and large combustion particles and identifies dust, steam, and other contaminants. FDA422 and FDA442 detectors can detect both smoldering and flaming fires.

The high-quality, optical-electronic measuring chamber houses the following components:

- Two (2) optical transmitters
- One (1) optical receiver
- One (1) IR optical transmitter
- One (1) Blue optical transmitter

IR and Blue transmitters illuminate smoke particles from different angles, and the dual-wavelength scattered light reaches the photodiode to produce a measurable signal, enabling optimal detection and differentiation of particle color and sizes.

This type of detection creates standardized, responsive behavior, therefore optimizing the differentiation between wanted signals and deceptive phenomena. Additionally, this scenario generates the following advantages:

- ✓ Early detection of all fire types of fire – whether they generate light-or-dark smoke, or no visible smoke
- ✓ The fire detector can be operated at a very sensitive threshold level, by achieving a higher immunity against false alarms caused by deceptive phenomena.












User interface

The Front Indicator panel shows device status, including *dust*, *airflow*, *power*, *connection*, *fault*, *buzzer*, and *bar graphs* for smoke and airflow. When the cover is open, the operator can access *Reset*, *Normalize Smoke*, *Normalize Flow*, and the USB-C connector.



Front Indicator Panel

Legend for user interface indicators

		Label field			
	Fire 2				Unit power
	Fire 1				Blue tooth connection
	Pre-alarm		Dust		Fault
	Early warning		Airflow		Service button

Application Data

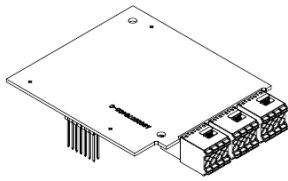
Installing these detectors requires a sample pipe network with properly spaced & sized sample holes, and each unit must be powered by a suitably sized 24 VDC supply listed for fire alarm use.

The FDA422 and FDA442 applications use the 'FXS2056 ASD ASYST Tool V3' to support required sample-hole spacing & sizing for each project. For questions on pipe networks or hole spacing, contact your local Siemens Fire Safety representative. Always follow NFPA guidelines and product listings, including installation instructions, and relevant local codes.

Accessories

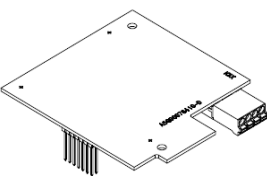
The application of the aspirated smoke detector is supported with the following accessories which provide additional capability when application requirements create the need.

FDAZ295 relay card



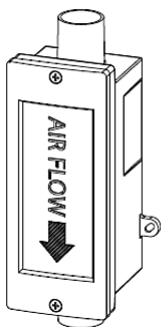
- Accessory for the aspirating smoke detectors FDA422, FDA442, FDA461, FDA462
- Extension card with 6 relay outputs

FDAZ296 4...20mA card



- Accessory for the aspirating smoke detectors FDA422, FDA442, FDA461, FDA462
- Extension card with two 4...20 mA outputs

FDAZ292 ASD filter box

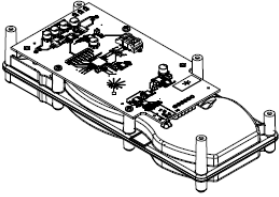


- Filter box for installation in the pipe system for aspirating smoke detectors
- Filters dust and other dirt out of the air aspirated by the aspirating smoke detector
- Minimizes internal contamination of the aspirating smoke detector
- Contains filter set FDAZ292-AA with three filters: coarse, medium, fine
- Compatible with Siemens branded aspirating smoke detectors
- Can be modeled in ASYST calculation software
- You will find more information in document A6V10877841

Spare Parts

Listed below are the replacement components for the aspirating smoke detectors and the ASD filter box:

FDAS291 detection chamber (FDA422, FDA442, FDA461, FDA462)



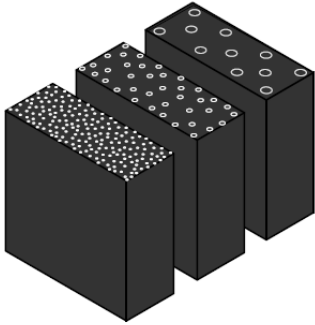
- Spare part for the aspirating smoke detectors FDA422, FDA442, FDA461, FDA462
- Calibrated detection chamber for replacement on-site

FDAS292 aspirator (FDA422, FDA442, FDA461, FDA462)



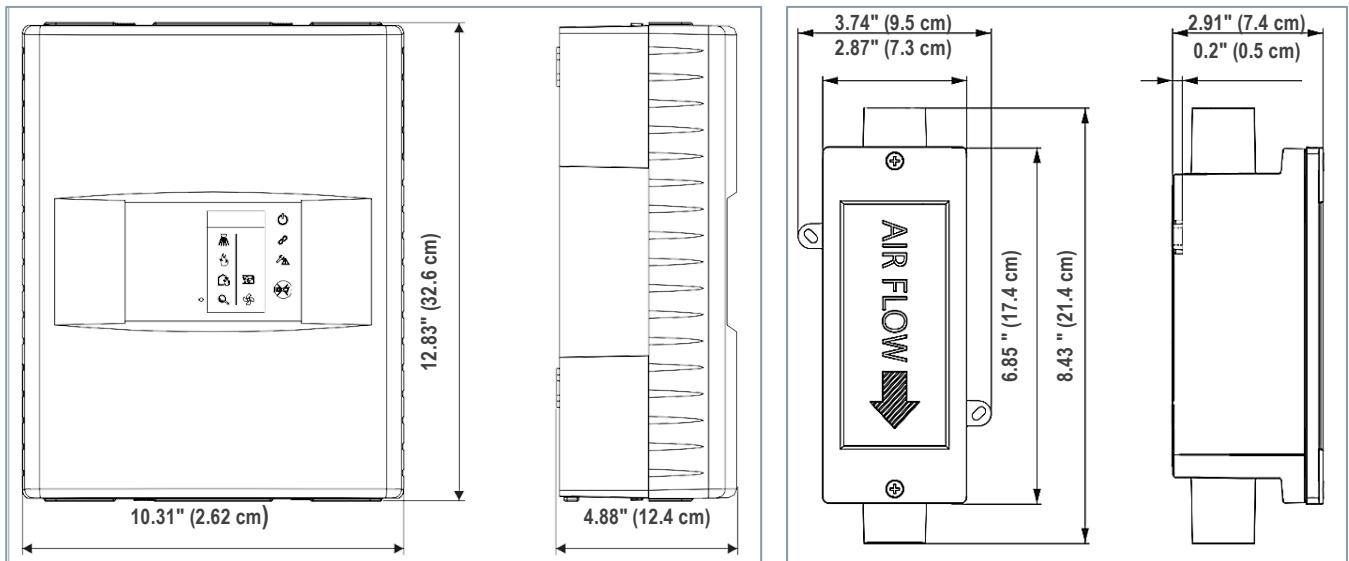
- Spare part for the aspirating smoke detectors FDA422, FDA442, FDA461, FDA462
- Brushless DC motor (with ball bearing)

FDAZ292-AA ASD filter set



- Spare part for the ASD filter box FDAZ292
- Filter set contains one coarse filter, one medium filter, and one fine filter

Dimensions



FDA422 | FDA442
Aspirating Smoke Detector

FDAZ292
ASD Filter Box

Technical Data		
	FDA422	FDA442
Operating Voltage	21-30 VDC	
Typical Operating Current: <ul style="list-style-type: none"> • Typical pipe system • Aspirator set to 'Medium' • Operating voltage 24 VDC • Brightness set to 'Medium' 	Normal operation: 230 mA Alarm: 250 mA	Normal operation: 280 mA Alarm: 300 mA
Maximum Operating Current: <ul style="list-style-type: none"> • Pipe system with high flow • Aspirator set to 'High' • Operating voltage 21 VDC • Brightness set to 'Bright' • Alarm: 'Steady-On' • Maximum sound level 	Normal operation: 425 mA Alarm: 445 mA	Normal operation: 495 mA Alarm: 515 mA
Operating Temperature	32 - 120 °F (0 - 49 °C)	
Air Humidity	5 - 95 % (no moisture condensation)	
Maximum area of coverage	72,118 sq.ft (6,700 m ²) **	
Monitoring Area: <ul style="list-style-type: none"> • Open area: 9000 sq.ft (836 m²) (in accordance with local specifications and standards) 	Special Application: <ul style="list-style-type: none"> ▪ Long pipe: 3000 sq.ft (279 m²) ▪ High dilution: 5000 sq.ft (465 m²) 	Special Application: <ul style="list-style-type: none"> ▪ Long pipe: 6000 sq.ft (557 m²) ▪ High dilution: 10,000 sq.ft (929 m²)
Alarm Ranges for Detection	Special Application: 0.002 - 6.096 %/ft obs Open Area: 0.018 – 6.096 %/ft obs	Special Application: 0.001 - 6.096 %/ft obs Open Area: 0.018 – 6.096 %/ft obs
Maximum Pipe Length		
<ul style="list-style-type: none"> • Single Pipe (per air inlet) 	<ul style="list-style-type: none"> ▪ Long pipe: 164 ft (50 m) ▪ High dilution: 131 ft (40 m) ▪ Duct: 131 ft (40 m) ▪ Open area: 98 ft (30 m) 	<ul style="list-style-type: none"> ▪ Long pipe: 394 ft (120 m) ▪ High dilution: 262 ft (80 m) ▪ Duct: 164 ft (50 m) ▪ Open area: 98 ft (30 m)
<ul style="list-style-type: none"> • Entire Pipe System 	<ul style="list-style-type: none"> ▪ Long pipe: 410 ft (125 m) ▪ High dilution: 328 ft (100 m) ▪ Open area: 246 ft (75 m) 	<ul style="list-style-type: none"> ▪ Long pipe: 984 ft (300 m) ▪ High dilution: 656 ft (200 m) ▪ Open area: 246 ft (75 m)
Maximum Number of Aspirating Holes	Special Application: <ul style="list-style-type: none"> ▪ Long pipe: 15 ▪ High dilution: 25 ▪ Open area: 10 	Special Application: <ul style="list-style-type: none"> ▪ Long pipe: 30 ▪ High dilution: 50 ▪ Open area: 10
Protection Category	IP30	
Dimensions (W x H x D)	10.31" x 12.83" x 4.88" (2.62 cm x 3.26 cm x 12.4 cm)	
Air Intake Pipe, Exhaust Pipe	Outer Ø 0.98" (2.5 cm) Inner Ø 0.83" (2.1 cm)	
*Sound Power Level depending on the aspirator level	<ul style="list-style-type: none"> ▪ 'High': 36 dBA ▪ 'Medium': 35 Dba ▪ 'Low': 34 dBA 	<ul style="list-style-type: none"> ▪ 'High': 39 dBA ▪ 'Medium': 36 dBA ▪ 'Low': 35 dBA

* A-weighted sound power level [dB] as per DIN EN ISO 3744-2010. Measured values are typical values, measured with a pipe piece at the air inlet and at the air outlet.

** System design & regulatory requirements may restrict allowable coverage area.

Technical Data		
	FDA422	FDA442
Cable Inlet Cable Gland	Side Ø 0.98 " (M25 × 1.5) Top Ø 0.78" (M20 × 1.5)	
3 Relay Alarm Outputs	Can be selected: with/without latching Nominal current: 2.0 A at 30 VDC Can be selected: normally open contact/normally closed contact (NO/ NC)	
1 Fault Relay	Nominal current: 2.0 A at 30 VDC Normally closed contact (NC)	
GPI: Connection of external contacts 3 inputs	Can be selected: inverted/not inverted Can be selected: with/without monitoring for open line or open line and short-circuit <ul style="list-style-type: none"> ▪ Monitoring voltage 3 VDC ▪ Max. line resistance 20 Ω 	
Terminals	Push-in connector	
SD card	FAT32 formatted, max. 32GB	
Cable cross section: <ul style="list-style-type: none"> • Power supply • Relay • GPI 	14 – 24 AWG flexible 16 – 24 AWG rigid 16 – 24 AWG flexible/rigid	
Interface (accessories) FDAZ295	Relay card with 6 outputs <ul style="list-style-type: none"> ▪ Can be selected with/without latching ▪ Nominal current 2.0A at 30 VDC ▪ Can be selected: normally open contact/normally closed contact (NO/NC) 	
Interface (accessories) FDAZ296	4-20mA card with 2 outputs <ul style="list-style-type: none"> ▪ Polarity invariant ▪ Electrically isolated ▪ 10 - 30 VDC 	
Dust Indicator	Yes - Blue LED indicator on user interface of detector. Measured background dust level can also be monitored via optional 4-20 mA output.	
Indication	<ul style="list-style-type: none"> ▪ 4x alarm status threshold indicator ▪ Faults ▪ Dust ▪ Connection status 	
Service Area	'Status OK' LED USB-C <ul style="list-style-type: none"> ▪ Settings: reset function ▪ Settings: smoke density, airflow 	
Normalization: Smoke Value, Airflow	<ul style="list-style-type: none"> ▪ Settings: threshold values for smoke alarms and faults ▪ Settings: smoke density and airflow ▪ During normalization: preset values are retained 	
Event Log: Time and Date specified (max. 40000 entries)	Non-volatile internal event memory: <ul style="list-style-type: none"> ▪ smoke density ▪ airflow ▪ detector status ▪ faults 	
Warranty Period	2 years	
Standards / Approvals	<ul style="list-style-type: none"> ▪ UL 268, UL 268A ▪ ULC S529 ▪ VdS 	

Ordering Details			
Model	Description	Part number	Weight lb. (kg)
FDA422	Aspirating smoke detector	S54333-F110-A1	5.291 (2.400)
FDA442	Aspirating smoke detector	S54333-F111-A1	5.291 (2.400)
Accessories			
FDAZ295	Relay card	S54333-B105-A1	0.099 (0.045)
FDAZ296	4...20mA card	S54333-B106-A1	0.055 (0.025)
FDAZ292	ASD filter box	S54333-C92-A1	0.485 (0.220)
Spare Parts			
FDAS291	Detection chamber	S54333-B11-A1	0.507 (0.230)
FDAS292	Aspirator	S54333-B12-A1	0.265 (0.120)
FDAZ292-AA	ASD filter set	S54333-S91-A1	0.020 (0.009)

NOTICE – The information contained in this data-sheet document is intended only as a summary and is subject to change without notice. The product(s) described here has/have a specific instruction sheet(s) that cover various technical, limitation and liability information.

Copies of install-type, instruction sheets – as well as the *General Product Warning and Limitations* document, which also contains important data, are provided with the product. All are available from the Manufacturer.

Data contained in the aforesaid type of documentation should be consulted with a fire-safety professional before specifying or using the product.

Any further questions or assistance concerning particular problems that might arise, relative to the proper functioning of the equipment, please contact the Manufacturer.

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March - 2026
 (Rev. 1)