ASD 535

Aspirating smoke detector

From production version 131221 and FW version 01.10.xx

The ASD 535 aspirating smoke detector performs the task of taking continuous air samples via one or two sampling pipe networks from a monitored area and feeding the samples to one or two smoke sensors.

The ASD 535 consists of the detector housing and one or two sampling pipe tube networks. The sampling pipes have several sampling holes whose size is such that each hole withdraws the same amount of air. The sampling pipes may be I-, U-, T-, H-, or E-shaped. The sampling pipes are usually symmetrically designed. Asymmetrical sampling pipe tube networks can also be implemented using the "ASD PipeFlow" calculation software.

Fig. 1 ASD 535-4

Description

Integrated in the detector housing is a high-speed fan which, in conjunction with the sampling pipe, ensures uninterrupted air supply to the detector housing. Airflow monitoring detects any blockages or breaks in each of the sampling pipe networks.

Available versions:
- ASD 535-1   for 1 sampling tube, and 1 smoke sensor without smoke level indicator;
- ASD 535-2   for 2 sampling tubes, and 2 smoke sensors without smoke level indicator;
- ASD 535-3 ①   for 1 sampling tube, and 1 smoke sensor with smoke level indicator;
- ASD 535-4 ①   for 2 sampling tubes, and 2 smoke sensors with smoke level indicator.
- ASD 535-3 HD ① like ASD 535-3, with increased IP protection and painted printed circuit boards;
- ASD 535-4 HD ① like ASD 535-4, with increased IP protection and painted printed circuit boards.

> ① The descriptions for ASD 535-3 and -4 in this document also apply to the ASD 535-3 HD and -4 HD versions.

Usable smoke sensors:
- SSD 535-1   Sensitivity range 0.5 to 10%/m
- SSD 535-2   Sensitivity range 0.1to 10%/m
- SSD 535-3   Sensitivity range 0.02 to 10%/m

Usable expansion modules (max. 4 units)
- XLM 35, ML-SFD, SLM 35, RIM 35, MCM 35, SIM 35, UIM 35

The ASD 535 can be linked to a higher level FACP by means of potential-free change-over contacts.

With the **XLM 35**, **ML-SFD** or **SLM 35**, the ASD 535 can be ideally connected to the SecuriFire and Integral fire alarm systems (with SLM also to SecuriPro).

The **RIM 35** enables the availability of all three pre-signal levels as well as the states "smoke sensor dirty" and "LS-Ü blockage" as relay contacts. The relays are freely configurable (via "ASD Config").

The **MCM 35** serves to record operating data.

Up to 250 ASDs can be networked with the **SIM 35**; they can then be visualised and operated using "ASD Config".

The ASD 535 aspirating smoke detector can be used for:
- **Equipment monitoring**: EDP systems, electrical distributors, switch cabinets, etc.
- **Space surveillance**: EDP rooms, clean rooms, warehouses, high-rack storage buildings, deep-freeze warehouses, hollow floors, protection of cultural objects, transformer stations, prison cells, etc.

In agricultural areas and applications as well as in areas with increased requirements for IP protection and resistance to moisture and corrosion, the **ASD 535-x HD** device version can be used.

The response behaviour of the ASD 535 has been tested in compliance with EN 54-20, Class A, B and C.

> When setting up ASD 535 fire alarm systems, the information and specifications in "**Technical description ASD 535**" must be observed and adhered to. This includes among others:
> - **General**   Section 1
> - **Safety informations**   Section 1.2.2
> - **Planning**   Section 4
> - **Mounting**   Section 5
> - **Installation**   Section 6
> - **Commissioning**   Section 7
> - **Operation**   Section 8

Opening the detector housing

> **Press** the **rotary snap locks** down **firmly** with a screwdriver (min. No. 5) toward the housing base and then **turn** 90°. The position of the lock slit shows the current state:
> - approx. 45° angled toward detector housing corner = closed
> - approx. 45° angled toward detector housing edge = open
>
> The rotary snap locks **must** snap into place.
>
> The **housing cover** (control unit) is connected to the Main Board by a **flat cable**. Make sure that when the housing cover is lifted away the flat cable does not become damaged.

Data sheet

Connection

Bottom part of detector box

- 3 x M20 cable screw unions
- Reserve openings for cable screw unions 1 x M20 / 1 x M25
- Air outlet
- Fan unit
- AMB 35 Main Board
- Device terminals
- Indicators and control elements for commissioning
- USB interface
- 4 x slots for additional modules
- Internal connection elements
- Airflow sensors
- 2 x mounting points for opened housing cover (commissioning/maintenance)
- Smoke sensor chamber I
- Smoke sensor chamber II
- 4 x mounting points closed housing cover
- 4 x fastening holes
- Connection for sampling pipe II
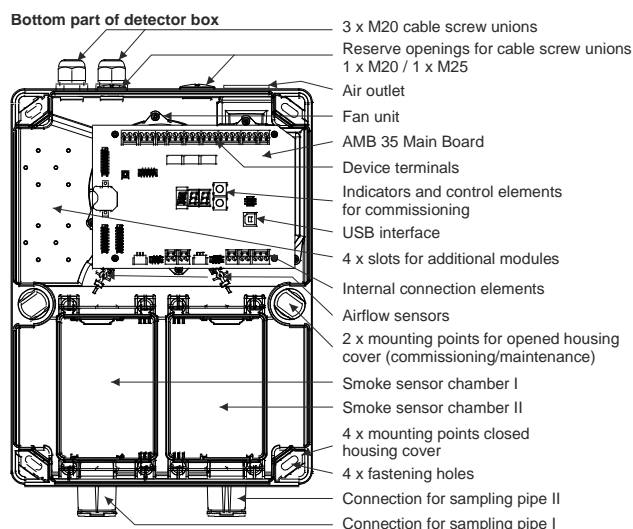- Connection for sampling pipe I

Fig. 2 View inside the ASD 535

AMB 35 device connections

The electrical connection is implemented by means of plug-in terminals.

Term.	Signal	
1	+10.5 to +30 VDC ①	Main power supply line
2	0 V	
3	+10.5 to +30 VDC ①	Redundant power supply line
4	0 V	
5	+ Supply (for OC consumers)	
6	Output fault, OC (all events)	
7	Output alarm I, OC	
8	Output alarm II or freely programmable, OC	
9	unused	
10	Rel. 1 "(NO)"	Fault ②
11	Rel. 1 "(NC)"	
12	Rel. 1 "COM"	
13	Rel. 2 "NO"	Alarm I
14	Rel. 2 "NC"	
15	Rel. 2 "COM"	
16	Rel. 3 "NO"	Alarm II or freely programmable
17	Rel. 3 "NC"	
18	Rel. 3 "COM	
19	External reset input +	Optocoupler input
20	External reset input -	
21	+ F	(may be available at a later date)
22	DF	
23	-	
24	+ S	Connection MFU 535, REK 535 (available later)
25	DS	
26	-	

ⓘ ① UL/FM: +12.4 to 27 VDC
② The "Fault" relay has picked up in the normal state ➔ contact Te. 12/10 closed, 12/11 open (ASD 535 under voltage; no fault present).

AMB 35 internal connections

Terminal	Signal	
MOT / M-	Fan - (black wire)	
MOT / T	Fan tacho signal (white wire)	
MOT / M+	Fan + (red wire)	
OEM2 / AI-	Optocoupler inputs OEM2	• In some cases, actuations may **not** comply with the requirements of **EN 54-20**; thus, use only after consulting with the manufacturer. • The OEM inputs are **not** line monitored.
OEM2 / AI+		
OEM2 / St-		
OEM2 / St+		
OEM1 / AI-	Optocoupler inputs OEM1 ①	
OEM1 / AI+		
OEM1 / St-		
OEM1 / St+		

ⓘ ① The "**OEM1 / St**" input can also be used for activating the day/night control (priority over triggering from third-party detector).

Terminal assignment of the additional modules

The terminal assignments of the additional modules are shown in the corresponding data sheets (see "Article numbers and spare parts").

Wiring principle

ⓘ Examples of and information about wiring are found in Technical description ASD 535, T 131 192 E, Sec. 6.

Deploying smoke sensors

Smoke sensors are not fitted when the ASD 535 is delivered. They are application specific (according to required sensitivity range), purchased from the manufacturer and installed after the detector housing is mounted (see **Fig. 3**).

ⓘ
- The smoke sensors should always be removed from their protective packaging just before deployment in the detector housing.
- Depending on the situation (e.g. if there is a long time between mounting and commissioning or if the environment is very dusty due, for example, to construction), the smoke sensors should be installed just before commissioning the ASD 535.
- Before installing the smoke sensors, check that the protective screens against insects are properly fitted to the air inlet and outlet in the smoke sensor chambers.
- The smoke sensor chamber must be absolutely free of dirt and dust. Any waste or other materials resulting from mounting the detector housing must be removed.

The installation position of the smoke sensors depends on the particular smoke sensor chamber (I or II). The connectors of the smoke sensors are oriented toward the outside of the ASD housing. Incorrect installation positioning is prevented by the anti-twist rib on the smoke sensor housing.

The smoke sensors are fastened with the two lock clamps in the ASD housing. The electrical connection to the AMB 35 Main Board is accomplished with the supplied ribbon cable.

The smoke sensor chamber II on the ASD 535-1 and -3 (only one smoke sensor) remain open (insect protection screens and lock clamps are not fitted, air channels are closed).
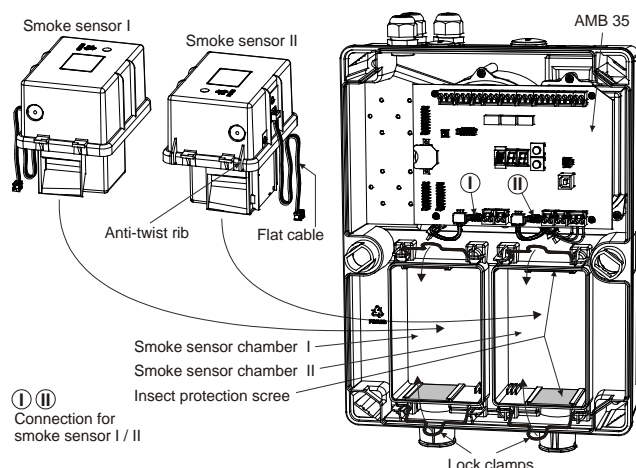
Fig. 3 Deploying the smoke sensors

(Labels: Smoke sensor I; Smoke sensor II; AMB 35; Anti-twist rib; Flat cable; Smoke sensor chamber I; Smoke sensor chamber II; Insect protection scree; ① ② Connection for smoke sensor I / II; Lock clamps)

Displays on the control unit

Several LEDs on the control unit indicate the current state of the ASD 535. The table below lists only the states for the ASD 535-1 resp. -3 (one smoke sensor / one sampling pipe). Except for the operation display, the displays are doubled for the ASD 535-2 resp. -4 (I and II).

Function / state	Operation	Alarm	Fault	Det. dusty / dirty	Smoke level ①
	green	red	yell.	yell.	yell.
System Off (no voltage)					
System inactive (external reset)	On		½ T		
Smoke sensor Off (from FACP)	On		½ T		
Idle state	On				
Blockage / pipe breakage, delay time running ②	On		1 T		
Blockage / pipe breakage, fault triggered	On		On		
Fan tacho signal lacking	On		On		
Fault triggered	On		On		
Pre-signal 1 (ASD 535-1 / -2)	On	2 T			
Pre-signal 2 (ASD 535-1 / -2)	On	1 T			
Pre-signal 3 (ASD 535-1 / -2)	On	½ T			
Smoke level 1–10 (ASD 535-3 / -4) ③	On				On
Pre-signal 1, 2, 3 (ASD 535-3 / -4) ③	On				1 T
Alarm	On	On			
Smoke sensor filter fault	On			2 T	
Smoke sensor dusty	On			1 T	
Smoke sensor dirty	On			½ T	
Smoke sensor fault	On			On	
Lamp test (press "Reset" 10 s)	1 T	1 T	1 T	1 T	1 T

① Additional for ASD 535-3 and -4

② No fault triggered (triggers only after the delay time expires ➔ "Fault" LED display continuously lit).

③ The LED of the respective smoke level 1–10 (corresponds to 10–100% of alarm threshold) is continuously lit when exceeded. If a pre-signal is programmed on this level, the LED subsequently begins to flash (default: VS 1 = level 3, VS 2 = level 5, VS 3 = level 7).

T = Flashing indicator; ½ s cycle / 1 s cycle / 2 s cycle

Displays on the AMB 35 Main Board

On the AMB 35 there is a 3-digit segment display which can have the following outputs and displays:

- flashing, point and **AL** = Autolearning running;
- flashing, point and **Fr** = filter replacement is running;
- flashing point and point continuously lit = day/night control active;
- switch setting **d** > **RE** = filter service life;
- switch setting **E** = event memory **E01** to **E99**;
- switch setting **F** = firmware version;
- press "UP" key = set configuration **A11** to **X03**;
- switch setting **V** = airflow values (airflow rate);
- flashing **000** = invalid entry;
- flashing **U - -** = initial reset is running;
- flashing **IA1**, **IA2**, **IF1**, **IF2**, **IP1**, **IP2**, **IE1**, **IE2** = test trigger is activated.

Programming

The ASD 535 has switch settings which are configured with permanently assigned parameters:

- normative system limits according to EN 54-20, Class A to C, settings **A11** to **C32**;
- non-normative system limits, settings **W01** to **W48**;
- Configurable positions for settings after using "ASD PipeFlow" and/or "ASD Config" or SecuriPro, SecuriFire or Integral FACP (SLM 35 / ML-SFD / XLM 35), **X01** to **X03**.

The parameters are saved at the factory with values for compliance with EN 54-20. Changing the parameters may result in non-compliance with EN 54-20. Reprogramming on the ASD 535 using "ASD Config" may be carried out only by the manufacturer or by persons under the supervision of and trained by the manufacturer.

Switch settings on the AMB 35 Main Board

Pos.	Range / Display	Purpose
A	**A11** / **A12**	acc. to EN 54-20, Class A
b	**b11** / **b12** / **b21** / **b22**	acc. to EN 54-20, Class B
C	**C11** / **C12** / **C21** / **C22** / **C31** / **C32**	acc. to EN 54-20, Class C
d	Polling (**RE**) Setting (**SE**) ✎ **on** / **T** / **R** / **oFF**	**on** = On / **oFF** = Off **T** = filter service life **R** = filter replacement **b** = both **ch1** = channel I
E	**E01** to **E99** ✎ **G00** to **G99**	Event memory **E01** – **E99** ✎ Event group **G00** – **G99**
F	**F00** to **F99** (3 x)	Display of firmware version
I	**IA1** / **IA2** **IF1** / **IF2** **IP1** / **IP2** **IE1** / **IE2**	Trigger; Test alarm (**IA.**) Test fault (**IF.**) Test pre-signal (**IP.**) Test alarm 2 (**IE.**)
o	**o00**	Log off additional modules (optional modules)
T	**Y10** to **Y99** / **M01** to **M12** **d01** to **d31** / **H00** to **H23** **M00** to **M59**	Polling (**RE**) and setting (**SE**) the date and time
U	**U01**	Execute initial reset
V	**V01** / **V02**, each **000** to **255**	Output airflow rate in % Pipe I (=**V01**), pipe II (=**V02**)
W	**W01** to **W48**	non-normative
X	**X01** to **X03**	configurable

The table lists only the available switch settings. Information about entry procedure is found in Technical description T 131 192 E, Sec. 8.3.

Data sheet

System limits without "ASD PipeFlow" calculation

The system limits apply to planning <u>without</u> the "ASD PipeFlow" calculation software. There are two areas with the following meaning:

- **Normative system limits** compliant to EN 54-20, Class A to C, switch settings **A11** to **C32**;
- **Non-normative system limits**, switch settings **W01** to **W48**.

Normative system limits

Switch settings **A11** to **C32** have configured values which are necessary for alarm response sensitivity and airflow monitoring compliance with EN 54-20 Class A to C. The switch setting designation is deciphered as follows:

- First digit   Response class **A**, **b**, **C** compliant with EN 54-20;
- Second digit   System limit **1**, **2**, **3** (pipe topology);
- Third digit   Number of pipe networks **1**, **2** on the ASD.

Example: **b22**   Response class **b** / system limit **2** / **2** sampling pipe tube networks.

Non-normative system limits

Switch settings **W01** to **W48** contain system limits which fulfil **<u>only</u>** the alarm response sensitivity for EN 54-20 Class A to C **but not** the normative limits concerning airflow monitoring. Since these are identical to system limits **A11** to **C32** concerning pipe topology (pipe network length, number of sampling holes), switch settings **W01** to **W48** are also included in the tables below. Additional information about switch settings **W01** to **W48** concerning number of pipe networks and airflow monitoring can be found in Technical description T 131 192, Sec. 4.4.4.4.

> Switch settings **W01** to **W48** may be used only after consulting with the manufacturer. The configured values they contain concerning airflow monitoring are **not** tested in accordance with EN. For further information about using the system limits table is found in Technical description T 131 192, Sec. 4.4.4.3 and 4.4.4.4.

System limits table for planning without "ASD PipeFlow" calculation

EN 54-20 compliance, Class A (highly sensitive)

Shape	System limit	Switch setting to EN 54-20 1 tube	Switch setting to EN 54-20 2 tube	Switch setting Non-normative 1 tube	Switch setting Non-normative 2 tube	Smoke sensor type SSD 535	Alarm threshold (%/m)t	Length from ASD to the last T-piece/cross	Max. length from ASD to the farthest sampling hole	Number of sampling holes per sampling branch	Max. total length of the sampling pipe per pipe network (smoke sensor)
I	1	A11	A12	W01 – W04	W05 – W08	–3	0.03	---	50 m	1 – 7	50 m
U / T	1	A11	A12	W01 – W04	W05 – W08	–3	0.03	1 – 20 m	40 m	1 – 4	80 m
H	1	A11	A12	W01 – W04	W05 – W08	–3	0.03	1 – 20 m	40 m	1 – 2	160 m
E	1	A11	A12	W01 – W04	W05 – W08	–3	0.03	1 – 20 m	40 m	1 – 3	120 m

EN 54-20 compliance, Class B (sensitive)

Shape	System limit	1 tube	2 tube	Non-norm 1 tube	Non-norm 2 tube	SSD 535	Alarm threshold	Length from ASD to last T-piece/cross	Max. length to farthest sampling hole	Number of sampling holes per branch	Max. total length per pipe network
I	1	b11	b12	W09 – W12	W13 – W16	–3	0.09	---	50 m	1 – 7	50 m
I	2	b21	b22	W17 – W20	W21 – W24	–3	0.06	---	70 m	5 – 9	70 m
U / T	1	b11	b12	W09 – W12	W13 – W16	–3	0.09	1 – 20 m	40 m	1 – 3	80 m
U / T	2	b21	b22	W17 – W20	W21 – W24	–3	0.06	1 – 20 m	55 m	3 – 5	110 m
H	1	b11	b12	W09 – W12	W13 – W16	–3	0.09	1 – 20 m	35 m	1 – 2	140 m
H	2	b21	b22	W17 – W20	W21 – W24	–3	0.06	1 – 20 m	45 m	2 – 3	180 m
E	1	b11	b12	W09 – W12	W13 – W16	–3	0.09	1 – 20 m	40 m	1 – 2	120 m
E	2	b21	b22	W17 – W20	W21 – W24	–3	0.06	1 – 20 m	50 m	2 – 3	150 m

EN 54-20 compliance, Class C (standard)

Shape	System limit	1 tube	2 tube	Non-norm 1 tube	Non-norm 2 tube	SSD 535	Alarm threshold	Length from ASD to last T-piece/cross	Max. length to farthest sampling hole	Number of sampling holes per branch	Max. total length per pipe network
I	1	C11	C12	W25 – W28	W29 – W32	–1	0.8	---	40 m	1 – 5	40 m
I	2	C21	C22	W33 – W36	W37 – W40	–2	0.35	---	80 m	3 – 9	80 m
I	3	C31	C32	W41 – W44	W45 – W48	–2	0.13	---	110 m	7 – 16	110 m
U / T	1	C11	C12	W25 – W28	W29 – W32	–1	0.8	1 – 20 m	30 m	1 – 3	60 m
U / T	2	C21	C22	W33 – W36	W37 – W40	–2	0.35	1 – 20 m	60 m	3 – 5	120 m
U / T	3	C31	C32	W41 – W44	W45 – W48	–2	0.13	1 – 20 m	70 m	5 – 9	140 m
H	1	C11	C12	W25 – W28	W29 – W32	–1	0.8	1 – 25 m	35 m	1 – 2	140 m
H	2	C21	C22	W33 – W36	W37 – W40	–2	0.35	1 – 25 m	45 m	2 – 3	180 m
H	3	C31	C32	W41 – W44	W45 – W48	–2	0.13	1 – 25 m	60 m	3 – 5	240 m
E	1	C11	C12	W25 – W28	W29 – W32	–1	0.8	1 – 20 m	30 m	1 – 2	90 m
E	2	C21	C22	W33 – W36	W37 – W40	–2	0.35	1 – 20 m	50 m	2 – 3	150 m
E	3	C31	C32	W41 – W44	W45 – W48	–2	0.13	1 – 20 m	60 m	3 – 6	180 m

Sampling holes for planning without "ASD PipeFlow"-calculation

The tables below show the respective hole diameters for the numbers in **Fig. 4** as a function of the number of sampling holes per sampling branch.

I-shaped sampling pipes

Number of sampling holes per sampling branch	Hole diameter in mm for the sampling hole number from ASD															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	5.0															
2	4.0	5.0														
3	4.0	4.0	5.0													
4	3.5	3.5	4.0	5.0												
5	3.5	3.5	3.5	4.0	5.0											
6	2.5	2.5	2.5	2.5	3.0	5.0										
7	2.5	2.5	2.5	2.5	2.5	2.5	5.0									
8	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5.0								
9	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	5.0							
10	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	3.0	7.0						
11	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	2.5	4.0	7.0					
12	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	4.0	7.0				
13	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	2.5	4.0	7.0			
14	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	2.5	4.0	7.0		
15	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	4.0	7.0	
16	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.5	4.0	7.0

U/T-shaped sampling pipes

Number of sampling holes per sampling branch	Hole diameter in mm for the sampling hole number from ASD								
	1	2	3	4	5	6	7	8	9
1	5.0								
2	4.0	5.0							
3	4.0	4.0	5.0						
4	4.0	4.0	4.0	5.0					
5	4.0	4.0	4.5	5.0	6.5				
6	3.0	3.0	3.5	3.5	4.0	6.5			
7	2.5	3.0	3.0	3.5	3.5	4.0	6.5		
8	2.5	2.5	3.0	3.0	3.5	3.5	3.5	7.0	
9	2.5	2.5	3.0	3.0	3.5	3.5	3.5	3.5	7.0

H/E-shaped sampling pipes

Number of sampling holes per sampling branch	Hole diameter in mm for the sampling hole number from ASD					
	1	2	3	4	5	6
1	5.0					
2	4.0	5.0				
3	4.0	4.0	5.5			
4	3.0	3.0	3.5	5.5		
5	2.5	3.0	3.0	3.0	6.0	
6 (E-shaped only)	2.5	2.5	3.0	3.0	3.5	6.0

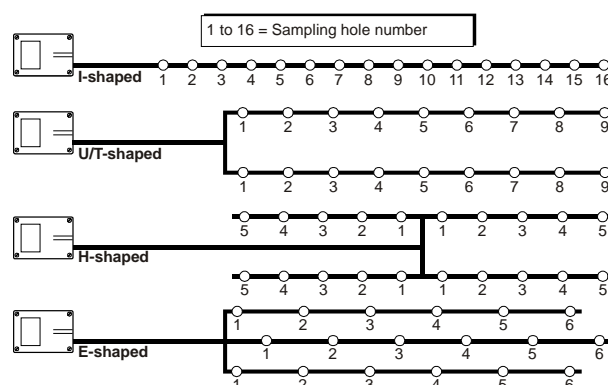1 to 16 = Sampling hole number

Fig. 4 Size of sampling holes

Data sheet

Configuration options, Table A:

The following criteria can be set for each smoke sensor / sampling pipe. Also, the criteria for day/night control can be separately set. Configuration changes are saved on **X01** to **X03**.

Sector • Parameter	Default Setting	Range	Resolution / Levels	Saving after change
Alarm 2				
• Alarm 2 On / Off	Off	Off / On		**X01 – X03**
• Sensitivity (always at least 20% over Alarm)	1 %/m	– 10 %/m	0.0002 %/m	**X01 – X03**
• Alarm 2 delay	2 s	0 s – 60 s	1 s	**X01 – X03**
• Alarm 2 latching	On	On / Off		**X01 – X03**
• Holding time for area switching (Al 2 to Al)	20	10 – 250	1 s	**X01 – X03**
Alarm				
• Alarm threshold (dependent on smoke sensor type and response class according to EN 54-20)	**C11** / **C12**	0.02 – 10%/m 0.1 – 10%/m 0.5 – 10%/m	0.0002 %/m	**X01 – X03**
• Smoke level average value formation (number)	4	1 – 10	1	**X01 – X03**
• Alarm delay (**UL/ULC max. 30 s**)	2 s	0 s – 60 s	1 s	**X01 – X03**
• Alarm cascade	Off	Off / On		**X01 – X03**
• Alarm latching	On	On / Off		**X01 – X03**
Pre-signal				
• Pre-signal 1 On / Off	On	On / Off		**X01 – X03**
• Pre-signal 2 On / Off	On	On / Off		**X01 – X03**
• Pre-signal 3 On / Off	On	On / Off		**X01 – X03**
• Pre-signal 1 (100% = alarm threshold)	30%	10 – 90%	10%	**X01 – X03**
• Pre-signal 2 (100% = alarm threshold)	50%	VS 1 + 10 – 90%	10%	**X01 – X03**
• Pre-signal 3 (100% = alarm threshold)	70%	VS 2 + 10 – 90%	10%	**X01 – X03**
• Pre-signal delay (VS 1 – VS 3)	2 s	0 s – 60 s	1 s	**X01 – X03**
• Pre-signal latching	Off	Off / On		**X01 – X03**
Smoke sensor dust/dirt				
• Smoke sensor dust On / Off	On	On / Off		**X01 – X03**
• Smoke sensor dirt On / Off	On	On / Off		**X01 – X03**
• Dust threshold (% of Al)	50%	5 – 60%	5%	**X01 – X03**
• Dirt threshold (% of Al)	75%	65 – 100%	5%	**X01 – X03**
• Dust latching	On	On / Off		**X01 – X03**
• Dirt latching	On	On / Off		**X01 – X03**
• Fault delay of smoke sensor	30 s	0 s – 60 s	1 s	**X01 – X03**
Airflow monitoring				
• LS-Ü blockage On / Off	On	On / Off		**X01 – X03**
• LS-Ü pipe breakage On / Off	On	On / Off		**X01 – X03**
• LS-Ü sensitivity (applies to **A01** to **C32**) ①	±20% ①	±10 – ±70%	± 10%	**X01 – X03**
• LS-Ü average value formation (number)	20	1 – 30	1	**X01 – X03**
• LS-Ü delay time (applies to **A01** to **C32**) ①	300 s ①	10 s – 3.600 s	1 s	**X01 – X03**

① Increased values are configured for switch settings **W01** to **W48**; these are **not** tested for EN compliance (see Technical description T 131 192 E, Sec. 4.4.4.4).

Configuration options, Table B:

The following criteria apply to the entire ASD 535. Saving a configuration after changes is performed in the context of the adaptations in Table A on one of the freely programmable switch settings **X01** to **X03**.

Sector • Parameter	Default Setting	Range	Resolution / Levels	Saving after change
Autolearning				
• Autolearning On / Off	Off	On		**X01 – X03**
• Autolearning duration	3 days	1 min to 14 days	min, h, days	**X01 – X03**
• Autolearning factor (of measured Al threshold)	1.5	1.1 – 10 x		**X01 – X03**
Day/night control / day of the week control				
• Day/night control On / Off	Off	Off / clock / FACP / input "OEM1 / St"		**X01 – X03**
• Day start time (only with "Clock")	06:00	00:00 – 24:00	1 min	**X01 – X03**
• Night start time (only with "Clock")	20:00	00:00 – 24:00	1 min	**X01 – X03**
• Day of the week control (only with "Clock")	On	Mo to Su	days	**X01 – X03**

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Continuation table B:

General faults				
• Lithium battery / clock fault	On	On / Off		*X01 – X03*
Ventilator				
• Fan speed	Level III	Level I to V	1	*X01 – X03*
Deactivate / switch off sensor				
• Smoke sensor I / Smoke sensor II • Switch off (partial planning) only smoke sensor II	On	On / deactivated / switched off (partial planning)		*X01 – X03*

Configuration options, Table C:
Independent configurations. These can be changed independently of the switch settings in the ASD 535.

Sector • Parameter	Default Setting	Selection
Time		
• Year, month, day, hour, minute	---	minutes – year
Relay / OC module / reset button / various		
• Relay 3 and OC module 3, AMB 35	Alarm II	According to *"Configuration options relay allocation"*
• Relay 1, 1ˢᵗ RIM 35	Pre-signal 1 smoke sensor I	
• Relay 2, 1ˢᵗ RIM 35	Pre-signal 2 smoke sensor I	
• Relay 3, 1ˢᵗ RIM 35	Pre-signal 3 smoke sensor I	
• Relay 4, 1ˢᵗ RIM 35	Smoke sensor I dirty	
• Relay 5, 1ˢᵗ RIM 35	Sampling pipe I blockage	
• Relay 1, 2ⁿᵈ RIM 35	Pre-signal 1 smoke sensor II	
• Relay 2, 2ⁿᵈ RIM 35	Pre-signal 2 smoke sensor II	
• Relay 3, 2ⁿᵈ RIM 35	Pre-signal 3 smoke sensor II	
• Relay 4, 2ⁿᵈ RIM 35	Smoke sensor II dirty	
• Relay 5, 2ⁿᵈ RIM 35	Sampling pipe II blockage	
• Reset button On / Off	On	On / Off
• Heating control, subsequent heating time	2 min	1 – 60 min
• MCM settings, recording interval	1 s	1 – 120 s
• MCM smoke peak value memory	Off	Off / On
• Perform initial reset	---	On / Off
• Smoke sensor operation mode (smoke sensor I / II)	SSD/DMB	SSD/DMB or OEM inputs (single or in combination) Switched off
• Isolate smoke sensor (smoke sensor I / II)	Normal operation	Isolate / normal operation
• REK configuration	Off	Alarm 1 – Alarm 4 / faults
• Filter monitoring (smoke sensor I / II)	Off	Off / On
• Filter service life	6 months	1 – 24 months
• Read out operation time	---	months / days
• Filter replacement	---	start / finish

Relay allocation configuration options:

The following criteria can be programmed on a max. of 11 relays (1 AMB 35 unit on ASD 535-1 and -3, 5 units on 1ˢᵗ RIM 35, 5 units on 2ⁿᵈ RIM 35):

Smoke sensor I / LS-Ü I	Smoke sensor II / LS-Ü II	General
Smoke sensor I alarm	Smoke sensor II alarm	Fan fault
Pre-signal 1 smoke sensor I	Pre-signal 1 smoke sensor II	Operating voltage fault
Pre-signal 2 smoke sensor I	Pre-signal 2 smoke sensor II	Initial reset fault
Pre-signal 3 smoke sensor I	Pre-signal 3 smoke sensor II	Lithium battery / clock fault
Smoke sensor I dusty	Smoke sensor II dusty	
Smoke sensor I dirty	Smoke sensor II dirty	**only with ASD 535-1 and ASD 535-3**
Smoke sensor I fault	Smoke sensor II fault	REK event, alarm 1
Sampling pipe I pipe blockage	Sampling pipe II pipe blockage	REK event, alarm 1
Sampling pipe I pipe breakage	Sampling pipe II pipe breakage	REK event, alarm 1
Heating control sampling pipe I	Heating control sampling pipe II	REK event, alarm 1
Alarm 2 smoke sensor I	Alarm 2 smoke sensor II	REK event, faults

The criteria can also be allocated with the or function (example: smoke sensor dust or dirt together on one relay).

Data sheet

Commissioning

When commissioning the ASD 535, it is necessary to perform an initial reset for automatically adjusting the airflow monitoring on the connected sampling pipe(s).

If the ASD 535 is operated without "ASD PipeFlow" calculation, commissioning with the "**EasyConfig**" **method** can be carried out directly on the ASD 535.

For projects in which the "ASD PipeFlow" calculation software was used or in which customer-specific adaptations have to be made in the device configuration, the "**ASD Config**" configuration software has to be used.

Starting up

Before the ASD 535 is switched on, it is absolutely necessary that all of the required measures have been performed (see T 131 192, Sec. 7.1).
- sampling pipe correctly mounted and connected;
- smoke sensors installed and connected;
- isolation strip on the Lithium battery (AMB 35) removed.

Sequence and procedure for starting up:

1. Switch on supply voltage (FACP); while the fan accelerates stepwise to its final speed (takes about 100 s), the next procedure can be carried out. **The system is immediately armed for alarm**.
2. "**EasyConfig**": select necessary switch setting for operation according to *"System limit table"* (e.g. "*b22*") ➔ see *"Reprogramming"*.
   - or:
   "**ASD Config**": after adapting the configuration (alarm threshold according to "ASD PipeFlow" and other criteria in Tables A and B), select switch setting "*X01*", "*X02*" or "*X03*".
3. Set date and time via AMB 35 with "EasyConfig" or from "ASD Config" (adoption by PC).
4. Following a **minimum waiting time of 5 min** after switching on, an initial reset must be performed (possible only via AMB 35) ➔ see *"Initial reset"*.
5. The ASD 535 is now ready for operation.

Re-programming

Example: Response class B, system limit 2, ASD 535-4 (2 sampling tubes), required switch setting *b22*.

Measure	Display	Procedure, remarks
Switch settings *W01* to *W48* may be used only after consulting with the manufacturer. The configured values they contain concerning airflow monitoring are **not** tested in accordance with EN.		
6. Press the "UP" key	flashing *C32*	• Display of the default setting
7. Press "UP" key twice until display shows *b*	in succession *A* / *b*	• Display switch setting group *b*
8. Press the "OK" key	*b11*	• Display of the smallest possible setting in group *b*
9. Press the "UP" key until display shows *b22*	in succession *b11* / *b12* / *b21* / *b22*	• Display of the possible settings in group *b*
10. Press the "OK" key	flashing *b - -* (approx. 4 x)	• New setting is programmed
11. Check: Press the "UP" key	flashing *b22*	• Display of the new setting

Initial reset

Measure	Display	Procedure, remarks
Before performing an initial reset after switching on the ASD 535, a **waiting time of at least 5 min** must be observed.		
1. Press the "UP" key	flashing *C32* or other	• Display of the default setting or the installation-specific switch setting
2. Press the "UP" key several times until display shows *U*	in succession *A* to *U*	• Display of the switch setting group *U*
3. Press the "OK" key	*U01*	• Display initial reset On
4. Press the "OK" key again	flashing *U - -* (5 to max. 120 s)	• Initial reset in progress
5. Wait	flashing point (watchdog indicator)	• Initial reset completed

Filter replacement

When filter monitoring is activated and after expiry of the configured filter service life, a "Filter fault (service life exceeded)" fault is triggered. To remedy, the filter element in a dust filter unit must be replaced. When the expired filter service life (read out via *EasyConfig* switch position *d* > *RE*) is periodically checked, the replacement can take place before the fault is triggered.

For an activated filter replacement the ASD is set to the "**isolate**" state. This insures that during the replacement work falling dust particles from the filter element do not cause a false alarm.

When the ASD 535 housing is closed, the "Start filter replacement" function can be activated by means of the **"Reset" key**. To do so, press the key **longer than** 15 s (attention: lamp test after 10 s). After 15 s the filter replacement is started and indicated by switching to the "Isolate" state (LED "Fault"). On an ASD 535-2 and -4 (2-channel device) the filter replacement is started simultaneously for both smoke sensors (provided the filter monitoring is activated). When the "Reset" key is deactivated (via "ASD Config"), the "Start filter replacement" function is not accessible.

After the filter has been replaced, the "Filter replacement" procedure is completed by pressing the **"Reset" key** on the ASD. This cancels the "Isolate" state and resets the fault on the ASD. "Filter service life" monitoring is restarted at 0.

The filter replacement can also be started via *EasyConfig* switch position *d* > *SE*. For information please refer to Technical Description T 131 192, Section 7.8.

Measurements / commissioning protocol

Carry out the following measurements:
- Measure operating voltage on terminals 1 (+), 2 (-) (if redundant supply, then also terminals 3 & 4) ➔ target value = 12.3 to 13.8 VDC (in 12 VDC operation) or 21.6 to 27.6 VDC (in 24 VDC operation).
- Airflow values in switch settings *V* (see Technical description T 131 192, Sec. 7.6.1)

The commissioning protocol is like a personal history of the ASD 535 and should therefore be filled out conscientiously and completely and stored in the ASD 535. If required, a copy can be made and stored in the installation dossier.

Checking fault and alarm actuation

Test	Procedure	Action
⚠		Block or switch off fire control installations and remote alarms on the superordinate FACP.
Check airflow monitoring	Tape sampling holes (adhesive tape; number depends on the pipe configuration).	• As soon as the change is exceeded by ±20% the "Fault" LED begins to flash. • When the LS-Ü delay expires (300 s), the ASD triggers a fault ➜ fault on FACP ① / ②.
Check alarm actuation	Subject maintenance sampling hole or sampling hole to smoke.	• ASD actuates an alarm ➜ alarm on FACP; correct alarm actuation checked (zone and range actuation) on the FACP ① / ②. • If there are pre-signals they are also actuated.

① Between each check the ASD 535 must be reset.

② For the ASD 535-2 and -4 checks have to be carried out for both sampling pipes.

Alternatively, this control can also be performed using *EasyConfig* switch position *I*.

Article numbers and spare parts

Short designation		Article number
Aspirating smoke detector	ASD 535-1	11-2000015-01-XX
	ASD 535-2	11-2000016-01-XX
	ASD 535-3	11-2000017-01-XX
	ASD 535-4	11-2000018-01-XX
	ASD 535-3 HD	11-2000036-01-XX
	ASD 535-4 HD	11-2000037-01-XX
AI 0,5 – 10 %/m	SSD 535-1	11-2000008-01-XX
VS 0,05 – 9 %/m	SSD 535-1 CP	11-2000011-01-XX
AI 0,1 – 10 %/m	SSD 535-2	11-2000009-01-XX
VS 0,01 – 9 %/m	SSD 535-2 CP	11-2000012-01-XX
AI 0,02 – 10 %/m	SSD 535-3	11-2000010-01-XX
VS 0,002 – 9 %/m	SSD 535-3 CP	11-2000013-01-XX

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Continuation:

Short designation		Article number
eXtended Line Module XLM 35		11-2200003-01-XX
Module M-Line ML-SFD		11-2200015-01-XX
SecuriLine module SLM 35		4000286.0101
Relay Interface Module RIM 35		11-2200031-01-XX
Memory Card Module MCM 35		4000285.0101
SD memory card (industrial version)		11-4000007-01-XX
Serial Interface Module SIM 35		11-2200000-01-XX
Serial Master Module SMM 535		11-2200001-01-XX
USB cable, 4.5 m		4301248
Overvoltage Protection Board OPB 911 CP		11-2200038-01-XX
AMB 35-1 (for ASD 535-1 / -3)		11-2200016-01-XX
AMB 35-2 (for ASD 535-2 / -4)		11-2200017-01-XX
AMB 35-1 CP (painted, for ASD 535-3 HD)		11-2200021-01-XX
AMB 35-2 CP (painted, for ASD 535-4 HD)		11-2200022-01-XX
BCB 35 (without smoke level indicator)		4301220.0101
ACB 35 (with smoke level indicator)		4301221.0101
ACB 35 CP (painted, for ASD 535-x HD)		11-2200020-01-XX
Aspirating fan unit AFU 35, complete		4000299
Airflow sensor AFS 35		4000300
Insect Protection Screen IPS 35 (set of 2)		11-2300012-01-XX
Latch plate 2nd channel (set of 50)		11-2300009-01-XX
Lithium battery		11-4000002-01-XX
Cable screw union	M20 (set of 10)	11-4000003-01-XX
	M25 (set of 10)	11-4000004-01-XX
Adapter US cable screw union AD US M-Inch		11-2300029-01-XX
Universal Module Support UMS 35		4301252.0101
Technical description ASD 535		T 131 192
Application guidelines for deep-freeze warehouses		T 131 390
Material for the sampling pipe		T 131 194
Commissioning protocol		T 131 199
Data sheets	XLM 35	T 140 088
	ML-SFD	T 140 822
	SLM 35	T 131 197
	RIM 35	T 131 196
	MCM 35	T 131 195
AFU 35 installation instructions		T 131 200
Integration description on SecuriPro		T 131 218

Declaration of performance

www.securiton.ch/declaration-of-performance

Dimensional drawing
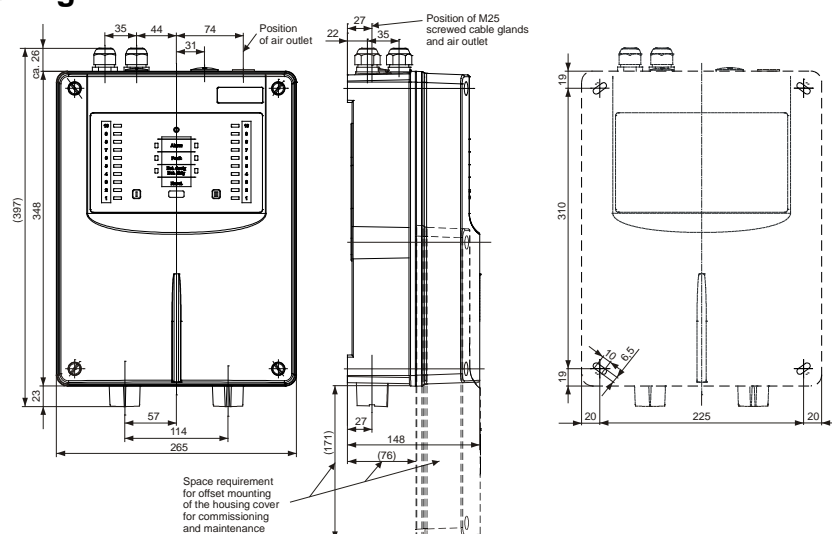
Fig. 5 Detector housing dimensional drawing

Data sheet

Technical data

		12 VDC operation	24 VDC operation	Typical	
Type				ASD 535	
Supply voltage range				10.5 to 30 (**UL/FM = 12.4 to 27**)	VDC
Max. current consumption, measured in		12 VDC operation	24 VDC operation	Typical	
Fan speed level V and at ➔		10.5 VDC ①	18 VDC ①	24 VDC	
ASD 535-1	Idle/fault	approx. 575	approx. 340	approx. 260	mA
	Alarm I	approx. 660	approx. 390	approx. 295	mA
ASD 535-2	Idle/fault	approx. 645	approx. 380	approx. 290	mA
	Alarm I + II	approx. 745	approx. 450	approx. 350	mA
ASD 535-3 / -3 HD	Idle/fault	approx. 575	approx. 340	approx. 260	mA
	Alarm I	approx. 695	approx. 405	approx. 310	mA
ASD 535-4 / -4 HD	Idle/fault	approx. 645	approx. 380	approx. 290	mA
	Alarm I + II	approx. 820	approx. 490	approx. 385	mA
additionally with 1 RIM 35 unit (all relays triggered)		approx. 15	approx. 10	approx. 7	mA
additionally with 2 RIM 35 units (all relays triggered)		approx. 30	approx. 20	approx. 14	mA
additionally with XLM 35 / ML-SFD / SLM 35		approx. 20	approx. 10	approx. 5	mA
additionally with MCM 35		approx. 25	approx. 15	approx. 10	mA
additionally with SIM 35		approx. 20	approx. 10	approx. 5	mA
SMM 535 (not from ASD but rather from PC via USB connection)				max. 100	mA
Switch-on current peak ② (caused by EMC protection elements on the ASD supply input)				approx. 5 A for max. 1 ms	
Sampling pipe length				see T 131 192, Sec. 4.2.1	
Sampling pipe Ø, typical (inner/outer)				Ø 20 / 25	mm
Max. number of sampling holes				see T 131 192, Sec. 4.2.1	
Sampling hole diameter				Ø 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5 / 5.5 / 6 / 6.5 / 7	mm
Response range (smoke sensor sensitivity see section "Article numbers and spare parts")				EN 54-20, Class A, B, C	
Protection type acc. to IEC 60529 / EN 60529				54 (for **ASD 535-x HD = 66** ③)	IP
Ambient conditions acc. to IEC 60721-3-3 / EN 60721-3-3				3K5 / 3Z1	class
Extended ambient conditions:					
• Detector housing temperature range				−30 – +60 (**UL max. +40**)	°C
• Temperature range of detector housing to Australian Standard AS 1603.8				−30 – +55	°C
• Sampling pipe temperature range				−30 – +60 ④	°C
• Temperature range of sampling pipe to Australian Standard AS 1603.8				−30 – +55	°C
• Max. approved temperature fluctuation in detector housing and sampling pipe operation				20 ④	°C
• Max. permitted storage temperature of detector housing (without condensation)				−30 – +70	°C
• Ambient pressure difference of detector housing to sampling pipe (sampling holes)				must be identical	
• Detector housing humidity ambient condition (transient without condensation)				95 ④	% rel. hum.
• Detector housing and sampling pipe humidity ambient condition (continuous)				70 ④	% rel. hum.
Max. loading capacity relay contact				50 VDC (**UL max. 30**) / 1 A / 30 W	
Max. loading capacity per open collector module (dielectric strength 30 VDC)				100	mA
Plug-in terminals				2.5	mm²
Cable entry for cable Ø				Ø 5 – 12 (M20) / Ø 9 – 18 (M25)	mm
Sound pressure level for fan speed level I / II / III / IV / V				34 / 36 / 39 / 40 / 41	dB (A) / 1 m
Housing	material			ABS blend, UL 94-V0	
	colour			grey 280 70 05 / anthracite violet 300 20 05	RAL
Approvals		EN 54-20 / EN 54-27 / FM 3230-3250 / UL 268 7th Ed / UL 268A 4th Ed / ULC-S529 4th Ed			
VdS approval				G 208154	
Dimensions	ASD 535-x (W x H x D)			265 x 397 x 148	mm
Weight	ASD 535-x (incl. SSD 535-x)			3,555	g

① Current consumption at maximum permitted voltage drop in the electrical installation (guideline value for calculating the conductor cross-section).

② May cause an immediate actuation of the protection circuit in power supplies with overload protection circuits (primarily in devices with no emergency power supply and output current of < 1.5 A).

③ For protection type IP 66 an air re-circulation conduit is imperative.

④ Lower or higher temperature ranges are possible after consulting with the manufacturer. The manufacturer must be consulted if deployment is to be in the condensation range.

Changes to Index "k" on pages: 1, 2, 3, 7, 7, 8, 9, 10

T 131 193 k en / 60000015, 13.12.2021 Po/Ksa **ASD 535**