

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 0.1 to 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.

Connection

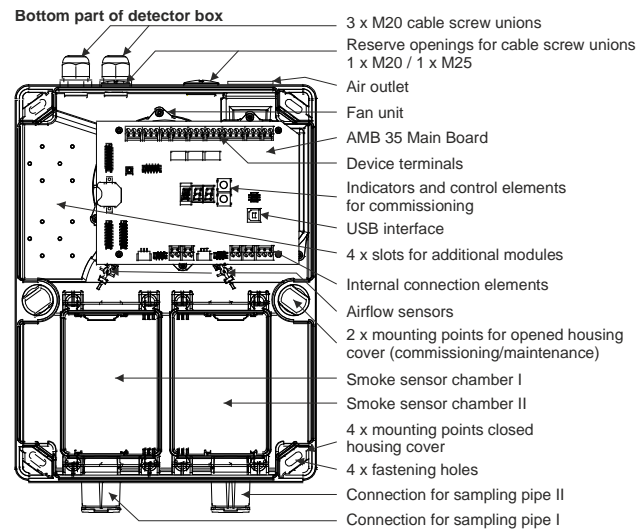


Fig. 2 View inside the ASD 535

AMB 35 device connections

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

| Term. | Signal |
|-------|--|
| 1 | +10.5 to +30 VDC ① |
| 2 | 0 V |
| 3 | +10.5 to +30 VDC ① |
| 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" |
| 11 | Rel. 1 "NC" |
| 12 | Rel. 1 "COM" |
| 13 | Rel. 2 "NO" |
| 14 | Rel. 2 "NC" |
| 15 | Rel. 2 "COM" |
| 16 | Rel. 3 "NO" |
| 17 | Rel. 3 "NC" |
| 18 | Rel. 3 "COM" |
| 19 | External reset input + |
| 20 | External reset input - |
| 21 | + F |
| 22 | DF |
| 23 | - |
| 24 | + S |
| 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 tach signal (white wire) |
| MOT / M+ | Fan + (red wire) |
| OEM2 / AI- | Optocoupler inputs OEM2 |
| OEM2 / AI+ | |
| OEM2 / St- | |
| OEM2 / St+ | |
| OEM1 / AI- | Optocoupler inputs OEM1 ① |
| OEM1 / AI+ | |
| OEM1 / St- | |
| OEM1 / St+ | |



- 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.
- 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).

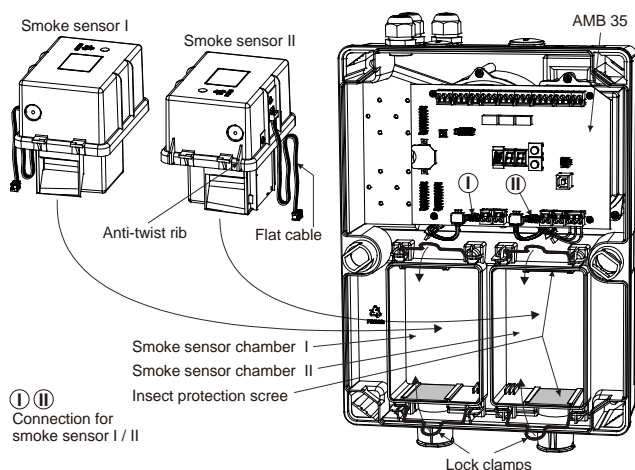


Fig. 3 Deploying the smoke sensors

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 without 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 only 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 | | Switch setting Non-normative | | 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) |
|-------|--------------|----------------------------|--------|------------------------------|-----------|---------------------------|------------------------|---|--|--|--|
| | | 1 tube | 2 tube | 1 tube | 2 tube | | | | | | |
| 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)

| | | | | | | | | | | | |
|-------|---|-----|-----|-----------|-----------|----|------|----------|------|-------|-------|
| I | 1 | b11 | b12 | W09 – W12 | W13 – W16 | -3 | 0.09 | --- | 50 m | 1 – 7 | 50 m |
| | 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 |
| | 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 |
| | 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 |
| | 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)

| | | | | | | | | | | | |
|-------|---|-----|-----|-----------|-----------|----|------|----------|-------|--------|-------|
| I | 1 | C11 | C12 | W25 – W28 | W29 – W32 | -1 | 0.8 | --- | 40 m | 1 – 5 | 40 m |
| | 2 | C21 | C22 | W33 – W36 | W37 – W40 | -2 | 0.35 | --- | 80 m | 3 – 9 | 80 m |
| | 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 |
| | 2 | C21 | C22 | W33 – W36 | W37 – W40 | -2 | 0.35 | 1 – 20 m | 60 m | 3 – 5 | 120 m |
| | 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 |
| | 2 | C21 | C22 | W33 – W36 | W37 – W40 | -2 | 0.35 | 1 – 25 m | 45 m | 2 – 3 | 180 m |
| | 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 |
| | 2 | C21 | C22 | W33 – W36 | W37 – W40 | -2 | 0.35 | 1 – 20 m | 50 m | 2 – 3 | 150 m |
| | 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 |

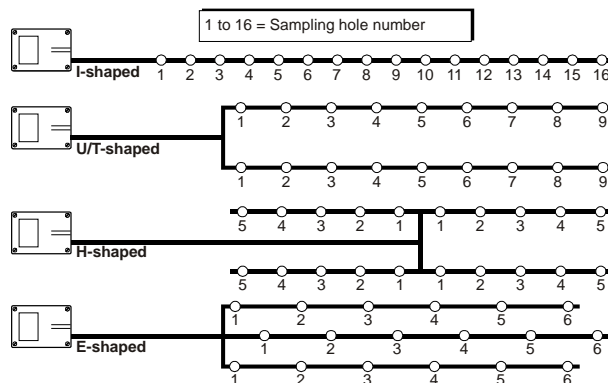


Fig. 4 Size of sampling holes

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 (AI 2 to AI) | 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 AI) | 50% | 5 – 60% | 5% | X01 – X03 |
| • Dirt threshold (% of AI) | 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 AI 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 |

→→

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 | Default Setting | Selection | |
|---|------------------------------|--|------------|
| • Parameter | | | |
| 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, 1 st RIM 35 | Pre-signal 1 smoke sensor I | | |
| • Relay 2, 1 st RIM 35 | Pre-signal 2 smoke sensor I | | |
| • Relay 3, 1 st RIM 35 | Pre-signal 3 smoke sensor I | | |
| • Relay 4, 1 st RIM 35 | Smoke sensor I dirty | | |
| • Relay 5, 1 st RIM 35 | Sampling pipe I blockage | | |
| • Relay 1, 2 nd RIM 35 | Pre-signal 1 smoke sensor II | | |
| • Relay 2, 2 nd RIM 35 | Pre-signal 2 smoke sensor II | | |
| • Relay 3, 2 nd RIM 35 | Pre-signal 3 smoke sensor II | | |
| • Relay 4, 2 nd RIM 35 | Smoke sensor II dirty | | |
| • Relay 5, 2 nd 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).

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 "Re-programming".
- 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 | <ul style="list-style-type: none"> As soon as the change is exceeded by $\pm 20\%$ 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 | <ul style="list-style-type: none"> 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 |



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 2 nd 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

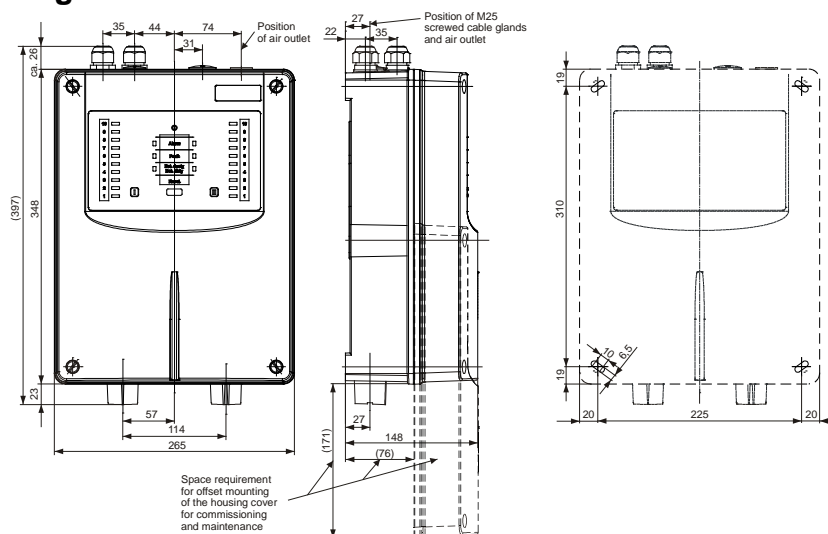


Fig. 5 Detector housing dimensional drawing

Data sheet

Technical data

| Type | ASD 535 | | | VDC |
|---|---|------------------|-------------|-----------------|
| 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. 260 | mA |
| | Alarm I | approx. 660 | approx. 295 | mA |
| ASD 535-2 | Idle/fault | approx. 645 | approx. 290 | mA |
| | Alarm I + II | approx. 745 | approx. 350 | mA |
| ASD 535-3 / -3 HD | Idle/fault | approx. 575 | approx. 260 | mA |
| | Alarm I | approx. 695 | approx. 310 | mA |
| ASD 535-4 / -4 HD | Idle/fault | approx. 645 | approx. 290 | mA |
| | Alarm I + II | approx. 820 | 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 | | | mm ² |
| 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 | | | |
| Housing colour | grey 280 70 05 / anthracite violet 300 20 05 | | | RAL |
| Approvals | EN 54-20 / EN 54-27 / FM 3230-3250 / UL 268 7 th Ed / UL 268A 4 th Ed / ULC-S529 4 th 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