SECURITON

# ASD 535

## Aspirating Smoke Detector

## Mounting and installation

Beginning with FW version 01.07.00


# Imprint

**Notice**

This documentation, T 140 333, is valid only for the product described in technical description T 131 192, Section 1. The document contains the mounting and installation instructions for the ASD 535 aspirating smoke detector. Technical description T 131 192 is a component of the mounting and installation instructions.

In this document, T 140 333, only the points necessary for mounting and installing the ASD 535 are described. The general specifications of the ASD 535 aspirating smoke detector can be found in technical description T 131 192.



This document, T 140 333[1], is available in the following languages:

| | |
|---|---|
| German | T 140 333 de |
| English | T 140 333 en |
| French | T 140 333 fr |
| Italian | T 140 333 it |

Current edition: Index b 16.01.2016 Po/ksa

**Notice**

**Applicability for production version and firmware version**

The following documentation is applicable only to the ASD 535 aspirating smoke detector with the following production version and firmware version:

| **Production version** | **FW version** |
|---|---|
| from 160116 | from 01.07.00 |

**Other documents**

| | | | |
|---|---|---|---|
| Technical description ASD 535 | | T 131 192 | de / en / fr / it |
| Data sheet ASD 535 | | T 131 193 | de / en / fr / it |
| Maintenance instructions for ASD 535 | | T 140 352 | de / en / fr / it |
| Application guidelines for deep-freeze warehouses | | T 131 390 | de / en / fr / it |
| Application guidelines for locking systems | | T 131 391 | de |
| Material for the sampling pipe | | T 131 194 | multilingual (ED / FI) |
| Commissioning protocol | | T 131 199 | multilingual (EDFI) |
| Data sheets | XLM 35 | T 140 088 | de / en / fr / it |
| | SLM 35 | T 131 197 | de / en / fr / it |
| | RIM 35 | T 131 196 | de / en / fr / it |
| | MCM 35 | T 131 195 | de / en / fr / it |
| | SIM 35 | T 140 011 | de / en / fr |
| | SMM 535 | T 140 010 | de / en / fr |
| Installation instructions for aspirating fan unit | | T 131 200 | multilingual (EDFI) |
| Integration description ASD 535 on SecuriPro | | T 131 218 | de / en / fr / it |

[1] Reference document: T 131 192, index g

# Safety information

Provided the product is deployed by trained and qualified persons in accordance with the present documentation T 140 333 and the Technical Description T 131 192 and the hazard, safety and general information in this technical description is observed, there is no danger to persons or property under normal conditions and when used properly.
National and state-specific laws, regulations and guidelines must be observed and adhered to in all cases.

Below are the designations, descriptions and symbols of general, danger, and safety information as found in this document.

### Danger

If the “Danger” notice is not properly observed, the product and any other system parts may present a hazard for persons and property, or the product and other system parts may be damaged to the extent that malfunctioning results in danger to persons and property.

- Description of which dangers can occur
- Measures and preventative actions
- How dangers can be averted
- Other safety-relevant information

### Warning

The product may be damaged if the warning information is not heeded.

- Description of which damage can occur
- Measures and preventative actions
- How dangers can be averted
- Other safety-relevant information

### Notice

The product may malfunction if this notice is not observed.

- Description of the notice and which malfunctions can be expected
- Measures and preventative actions
- Other safety-relevant information

### Environmental protection / recycling

Neither the product nor product components present a hazard to the environment provided they are handled properly.

- Description of parts for which there are environmental issues
- Description of how devices and their parts have to be disposed of in an environmentally-friendly way
- Description of the recycling possibilities

### Batteries

It is not permitted to dispose of batteries in the domestic rubbish. As the end user you are legally obliged to return used batteries. Used batteries can be returned gratis to the seller or brought to a designated recycling point (e.g. to a communal collection point or retailer). You can also send them back to the seller by post. The seller refunds the postage when old batteries are returned.

# Document history

**First issue** **Date 31.07.2012**

**Index “a”** **Date 24.06.2014**

**Most important changes compared with first issue:**

| Section | New (n) / changed (c) / deleted (d) | | What / Reason |
|---|---|---|---|
| • 3.2 | n | Notice supplemented: for UL, replacement of the screw-junction pieces with AD US M-Inch adapter | New UL use |
| • 4.1 | n | New accessory: AD US M-Inch | New UL use |
| • 5 | n | Note about UL use concerning supply voltage range, temperature range, relay contact, approvals | New UL use |

**Index “b”** **Date 16.01.2016**

**Most important changes compared with the previous issue:**

| Section | New (n) / changed (c) / deleted (d) | | What / Reason |
|---|---|---|---|
| • Imprint | c | Footnote [1]<br>Notice about reference document T 131 192, Index g | Correction |
| • 3.6.4.3 | c | Notice about screening (observe manufacturer’s specifi-cations of the FACP and SecuriFire/Integral addressable loop) | Rectification |
| • 4.1 | c | Cable screw union in set of 10, industrial SD memory cards | Correction |

# Table of contents

# 1 General information

## 1.1 Purpose

The ASD 535 aspirating smoke detector performs the task of taking continuous air samples via one or two sampling pipe tube networks from a monitored sector and feeding the samples to one or two smoke sensors. Thanks to this detection method and the product's excellent properties under severe ambient conditions, the ASD 535 aspirating smoke detector is used wherever problems are to be expected owing to poorly accessible monitored areas or latent disturbance variables during operation such that optimal protection can no longer be guaranteed with conventional point detectors.

The ASD 535 aspirating smoke detector is available in four versions:

- ASD 535-1 for 1 sampling tube without smoke level indicator, for 1 smoke sensor
- ASD 535-2 for 2 sampling tubes without smoke level indicator, for 2 smoke sensors
- ASD 535-3 for 1 sampling tube with smoke level indicator, for 1 smoke sensor
- ASD 535-4 for 2 sampling tubes with smoke level indicator, for 2 smoke sensors.

The SSD 535 smoke sensor is used in the ASD 535. It is available in the three following versions and sensitivity ranges:

- SSD 535-1 alarm sensitivity range 0.5%/m to 10%/m
- SSD 535-2 alarm sensitivity range 0.1%/m to 10%/m
- SSD 535-3 alarm sensitivity range 0.02%/m to 10%/m.

The ASD 535 aspirating smoke detector has four slots for expansion modules. The following modules can be added:

- XLM 35 eXtended Line Module (only if no SLM 35 fitted)
- SLM 35 SecuriLine module (only if no XLM 35 fitted)
- RIM 35 Relay Interface Module with 5 relays
- MCM 35 Memory Card Module
- SIM 35 Serial Interface Module

## 1.2 Abbreviations, symbols and terms

The following abbreviations, symbols and terms are used in the present document T 140 333. The abbreviations for tube material and accessories are listed in a separate document: T 131 194.

| | | |
|---|---|---|
| µC | = | Microcontroller / microprocessor |
| ABS | = | Acrylonitrile-butadiene styrene (plastic) |
| ACB 35 | = | Printed circuit board with smoke level indicator Advanced Control Board |
| AFS 35 | = | Air Flow Sensor |
| AFU 35 | = | Aspirating Fan Unit |
| AI | = | Alarm |
| AMB 35 | = | ASD Main Board |
| ASD | = | Aspirating Smoke Detector |
| ASD Config | = | Configuration software for ASD 535 |
| ASD PipeFlow | = | Calculation software for the sampling pipe, "ASD PipeFlow" beginning Version 2 |
| BCB 35 | = | Printed circuit board without smoke level indicator "Basic Control Board" |
| CE | = | Communauté Européenne (European Community) |
| DA | = | Detection area |
| Default | = | Preset values and adjustments |
| DET | = | Detector |
| DIN | = | Deutsche Industrie Norm (German industry standard) |
| DMB | = | Detector Mounting Box (third-party detectors / OEM) |
| DZ | = | Detection zone |
| EasyConfig | = | Commissioning procedure without configuration software "ASD Config" |

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Continuation:

| | | |
|---|---|---|
| EDP | = | Electronic data processing |
| EEC | = | European Economic Community |
| EEPROM | = | Memory component for system data and ASD configuration |
| EMC | = | Electromagnetic compatibility |
| EN 54 | = | European standards for fire alarm systems (Germany = DIN, Switzerland = SN, Austria = Ö-Norm) |
| Ex-zone | = | Hazardous area |
| FACP | = | Fire alarm control panel |
| FAS | = | Fire alarm system |
| Fault | = | Fault |
| FW | = | Firmware |
| Flash PROM | = | Memory component for operating software |
| Flush mounting / surface mounting | = | Flush mounted / surface mounted |
| GND | = | Supply ground (minus pin) |
| H-Al | = | Main alarm |
| HF | = | High frequency |
| HW | = | Hardware |
| Hz | = | Heating control |
| IEC | = | International Electrotechnical Commission |
| Initial reset | = | First start-up when commissioning |
| IPS 35 | = | Insect Protection Screen |
| LED | = | Light-emitting diode (indicator) |
| LS | = | Airflow |
| LS-Ü | = | Airflow monitoring |
| Manufacturer | = | Securiton |
| MCM 35 | = | Memory Card Module |
| NO / COM / NC | = | Relay contacts: NO = normally open, COM = common, NC = normally closed |
| OC | = | Open collector output |
| PA | = | Polyamide (plastic) |
| PC | = | Personal computer |
| PC | = | Polycarbonate (plastic) |
| PE | = | Polyethylene (plastic) |
| Pin | = | Terminal pin |
| PMR 81 | = | Semi-conductor relay |
| Port | = | Input or output component |
| PVC | = | Polyvinyl chloride (plastic) |
| RAM | = | Memory component |
| RIM 35 | = | Relay Interface Module |
| RoHS | = | Restriction of Certain Hazardous Substances (environmentally friendly manufacturing processes) |
| SecuriFire | = | Fire alarm system |
| SecuriLine | = | Fire detector addressable loop |
| SecuriPro | = | Fire alarm system |
| SIM 35 | = | Serial Interface Module |
| SLM 35 | = | SecuriLine module |
| SMM 535 | | Serial Master Module |
| SSD 535 | = | Smoke sensor |
| St | = | Fault |
| St-LS | = | Airflow fault |
| SW | = | Software |
| Te. | = | Terminal |
| Update / Release | = | Renewal / update of the operating Firmware |

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Continuation:

| | | |
|---|---|---|
| V-AI | = | Pre-alarm |
| VDC | = | Direct current voltage |
| VdS | = | Verband der Schadenversicherer (Association of Indemnity Insurers, Germany) |
| VKF | = | Vereinigung Kantonaler Feuerversicherungen (Cantonal Fire Insurance Union, Switzerland) |
| VS | = | Pre-signal |
| Watchdog | = | Monitoring of the microcontroller |
| XLM 35 | = | eXtended Line Module |

# 2 Mounting

## 2.1 Mounting guidelines

### Notice

**Material and products.** When the system is set up, only the following supplied, approved and listed materials may be used:

- Detector housing, smoke sensors, expansion modules
- Tube materials and fittings for sampling pipe, accessory materials, pipe clamp (according to T 131 194).

Other materials do not conform to EN 54-20 approval and may be used only if the manufacturer's written consent has been obtained.

Installation materials such as cable, intermediate distributors and fastening materials are usually supplied by the customer.

**Tools for working with the detector housing.** The tools listed below are required for mounting and installation (sorted by the sequence of use in this document):

| | |
|---|---|
| • Opening the detector housing | Flat-blade screwdriver no. 5 (8 mm) |
| • Removal of pipe plugs | Flat-blade screwdriver no. 2 (4 mm) |
| • Fastening the detector housing | Torx screwdriver T20 |
| • Module holder for expansion modules | Torx screwdriver T15 |
| • Terminals | Flat-blade screwdriver no. 1 (3.5 mm) |
| • Replacing printed circuit boards AMB, ACB, BCB | Torx screwdriver T10 |
| • Replacing aspirating fan unit | Torx screwdriver T15 |

## 2.2 Dimensioned drawing / drilling plan for detector housing

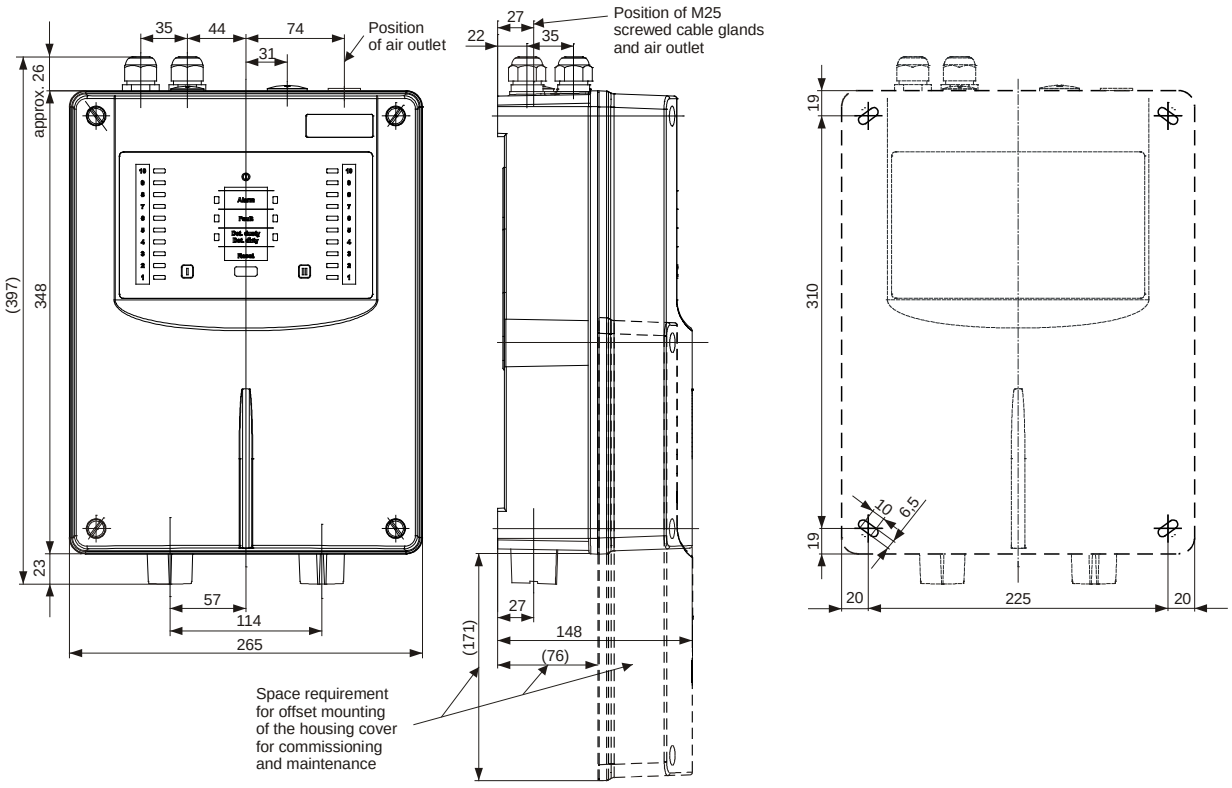



**Fig. 1 Dimensioned drawing, ASD 535 detector housing drilling plan**

## 2.3 Material for the sampling pipe

### Notice

Tube materials and fittings must satisfy the requirements of at least Class 1131 of **EN 61386-1**. Document **T 131 194** lists materials that meet this standard; it is part of the device approval of the ASD 535 according to EN 54-20.

Other materials do not conform to the EN 54-20 standard and may be used only if the manufacturer's written consent has been obtained and the following conditions are met.

- Compression resistance = at least 125 N (EN 61386-1)
- Shock resistance = at least 0.5 kg, fall height of 100 mm (EN 61386-1)
- Temperature range = at least –15°C to +60°C (EN 61386-1)
- Tube inner diameter = 19 to 22 mm
- Bend radius = at least 30 mm.

The tube material is available as different plastics and metals. The individual plastic tube parts are usually glued. The flexible tube material for equipment monitoring is pluggable. The metal tubes are connected by means of press fittings.

The rigid plastic tubes can be shaped by heating them. The tubes can be painted a different colour, whereby attention must be paid to the chemical compatibility of the paint to the tube.

The following materials are available:

| Material | Connection method |
|---|---|
| PVC (polyvinyl chloride, contains halogen) | Gluing |
| ABS (acrylonitrile-butadiene styrene, contains no halogen) | Gluing |
| PA (polyamide, contains no halogen) | Plug-in connection |
| Copper | Press fitting |
| Stainless steel | Press fitting |

### Notice

The two materials that use glues (PVC and ABS) must not be combined, since different adhesives are used.

Transitions from PVC or ABS to PA materials (flexible tube parts) are possible with special adhesive screw junctions.

### Danger

PVC produces corrosive and toxic gases if burned or improperly disposed of. The use of PVC materials should therefore be limited to where it is expressly permitted by the operator of the installation. In applications where halogen-free plastics are prescribed, ABS or PA materials must be used for laying the sampling pipe. Country-specific guidelines and regulations must be observed.

The adhesives and cleaning agents used for connecting PVC and ABS materials contain solvents and are combustible. For this reason, prior to working with these materials it is imperative to read and observe the safety instructions and information provided by the adhesive supplier.

A list of the available **materials for the sampling pipe** (tubes, fittings etc.) for the ASD 535 is available in a separate document (**T 131 194**).

## 2.4 Mounting the detector housing

**Warning**

- Mounting work on the detector housing is best done without fitted smoke sensors.
- The smoke sensors are always installed in the detector housing just when the ASD 535 is commissioned (see section 3.3).
- Depending on the situation (e.g. if there is a long time between mounting and commissioning or if the environment is very dusty due to construction for example), the housing cover should be kept closed until commissioning the device.
- Mounting of the detector housing within hostile environments (according to Australian Standard AS 1603.8) is not allowed.

The detector housing should always be kept in the room to be monitored. If this is not possible, it must be guaranteed that the detection housing is located in a room which has the same air pressure or – for air-conditioned rooms – the same climate and pressure zone. In applications where the sampling pipe and detector housing are mounted in different climate zones, a return sampling pipe to the monitored area is required. The return line can be adapted after removing the air outlet pipe plug on the ASD 535 housing. In this context, see also sections 2.4.2 and 2.4.3. The maximum length of the return line must not exceed 20 m.

In areas with significant temperature fluctuations of more than 20°C, special adjustments (larger airflow window, longer delay time etc.) may have to be performed for the sampling pipe and on the detector housing. This also applies to temperature differences of more than 20°C between sampling pipe and detector housing.

An easily accessible installation location should be chosen so that the detector housing can be worked on without aids such as ladders and scaffolding. The ideal installation height of the detector housing is about 1.6 m above the ground (top edge of the detector housing).

On the entry side of the sampling pipes a minimum distance of 20 cm from building elements should be maintained (see **Fig. 1**) to enable fastening the housing cover (commissioning and maintenance work). On the entry side of the supply cable, 10 cm distance is sufficient.

When determining a location for the detector housing, take into account that the noise caused by the fan may in some instances be disturbing. If no suitable location is available for the detector housing, it may be necessary to mount it in an acoustically insulated cabinet (e.g. ASD sound insulation housing). If air recirculation in the same climate zone as the sampling pipe is necessary, it can be implemented by means of a tube piece out of the acoustically insulated cabinet. The pipe piece exiting from the acoustically insulated cabinet (transition) must be properly sealed. When using the ASD sound insulation housing, an M32 cable screw union is used for the transition. Contact the manufacturer for more information about the ASD sound insulation housing.

### 2.4.1 Opening and closing the detector housing

**Warning about opening and closing**

- To open the detector housing, use a **flat-blade screwdriver no. 5** (8 mm). Smaller flat-blade screwdrivers may damage the material of the rotary snap locks.
- To use the **rotary snap locks**, **press** **firmly** with the screwdriver toward the housing base and then **turn** 90°. The position of the lock slit shows the current state (see **Fig. 2**):
  ⇒ 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.

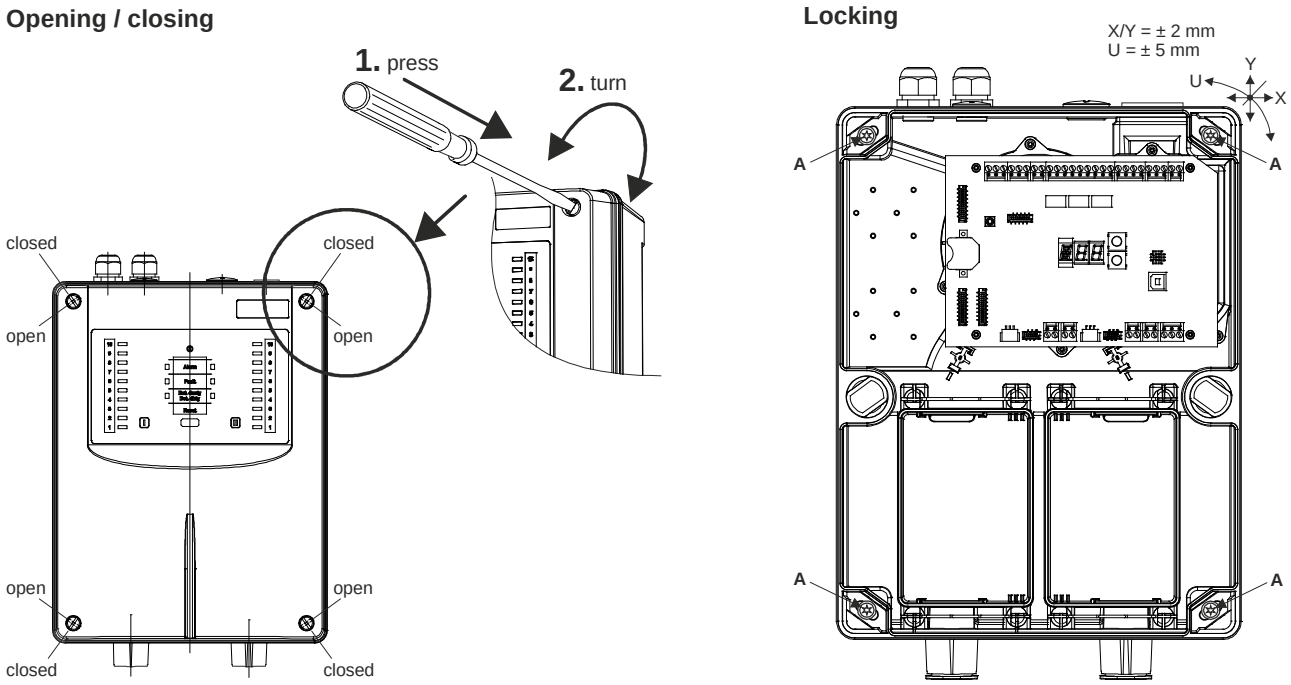



**Fig. 2 Opening, closing and fastening the detector housing**

After the detector housing is open, the four mounting holes in the housing base are accessible. To facilitate mounting work, remove the entire housing cover of the detector housing (including control unit). To do that, pull off the 10-pin flat cable connector from the AMB 35 Main Board.

The detector housing is fastened with the four supplied Torx wood screws (Ø 4.5 x 35 mm) and the four U-washers (Ø 4.3/12 x 1 mm), "**A**". Use a **Torx T20 screwdriver** to insert and tighten the screws.

The positions of the fastening holes are seen in dimensioned drawing **Fig. 1.** When fastening to masonry, the supplied S6 dowels are used.

**Notice**

When mounting several ASD 535 units next to each other, it is important to ensure that the mounting holes are **drilled precisely**. The device can be moved a maximum of ±2 mm horizontally and vertically to correct the mounting position. A rotation correction of approx. ±5 mm is possible.

### 2.4.2 Mounting positions of the detector housing

In principle the detector housing can be mounted in the X, Y or Z axis. Because of the indicator elements labelling, however, mounting in the Y axis is advisable (vertical, control unit up). The sampling pipes are then inserted into the detector housing from below. This makes it easier to conduct pipes to accessory parts such as filter box / filter unit and water separators, which, for physical reasons, should always be below the ASD detector housing. If introducing the sampling pipes into the detector housing from above is unavoidable, the detector housing can be turned 180° and mounted (control unit down). So that the control unit labelling is not upside down, the labelling strips of the control unit can be turned accordingly (see section 2.4.4).

The allocation of the tube networks to the smoke sensors is permanently preset and is recognisable by the identification (ribs) on the tube inputs (**I** and **II**). To prevent dirt from entering, the detector housing is delivered with fitted pipe plugs (tube network I and II entries). Similarly, all cable screw unions are closed. The pipe plug is removed on entry I for ASD 535-1 and -3 and on entry II for ASD 535-2 and -4. For ASD 535-1 and -3 with only one tube network, the pipe plug on entry II is not removed. If there is a return sampling pipe in the monitored area, it can be directly connected to the detector housing in place of the air outlet pipe plugs.

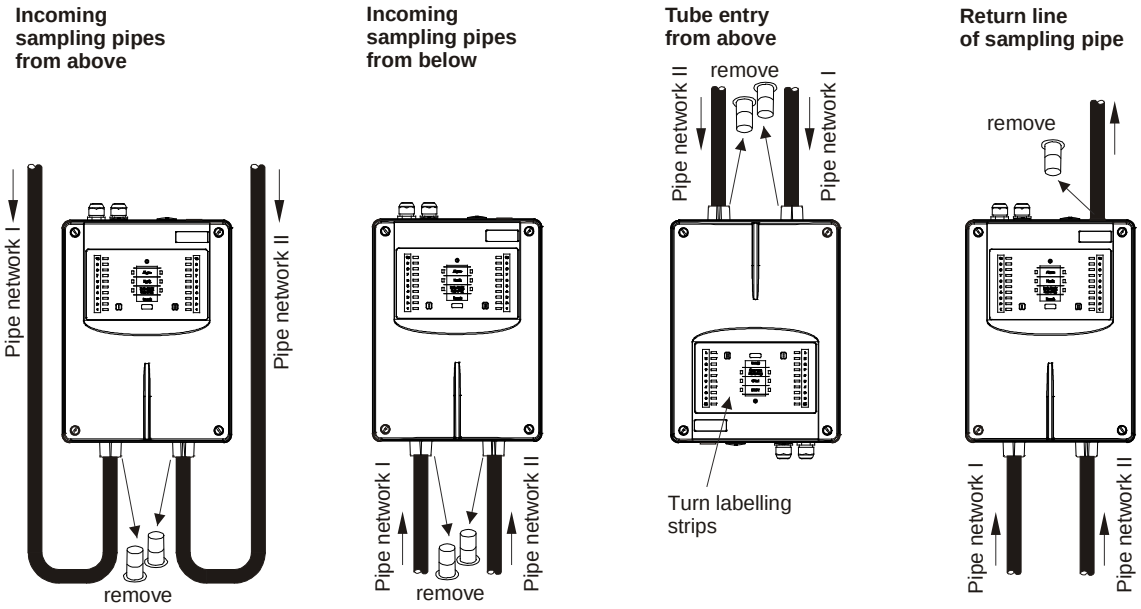



**Fig. 3 Mounting position and pipe entries on the detector housing**

## Warning about pipe entries

- The entry openings in the detector housing are designed so that the sampling pipe only has to be inserted (conical opening). Using an adhesive agent on the sampling pipe should be done only in special cases and after consulting with the manufacturer.
- On the ASD 535-1 and ASD 535-3 the pipe plug must remain on entry II.
- The air outlet pipe plug (with openings) may be fitted only in the air outlet opening.
- The pipe plugs must not be glued in the ASD housing (connector).

### 2.4.3 Removal of the air outlet pipe plug

Insert the blade of a **flat-blade screwdriver no. 2** (4 mm) into one of the side recesses of the air outlet pipe plug. A slight prying movement toward the ASD housing releases the pipe plug.

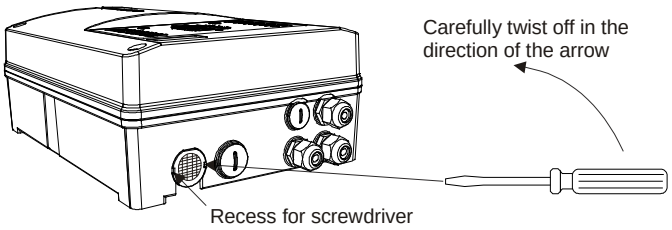



**Fig. 4 Removal of the air outlet pipe plug**

### 2.4.4 Turning the labelling strips

To turn the labelling strips, open the detector housing and completely remove the cover from the device (undo the flat cable).

Depending on the device version, there is a different number of labelling strips printed on both sides in the control unit:

- ASD 535-1 = 1 x **"A"**
- ASD 535-2 = 1 x **"A"**
- ASD 535-3 = 1 x **"A"** and 1 x **"B"**
- ASD 535-4 = 1 x **"A"** and 2 x **"B"**

The labelling strips can be pulled out of the control unit by their tabs and after turning over inserted again into the holder.

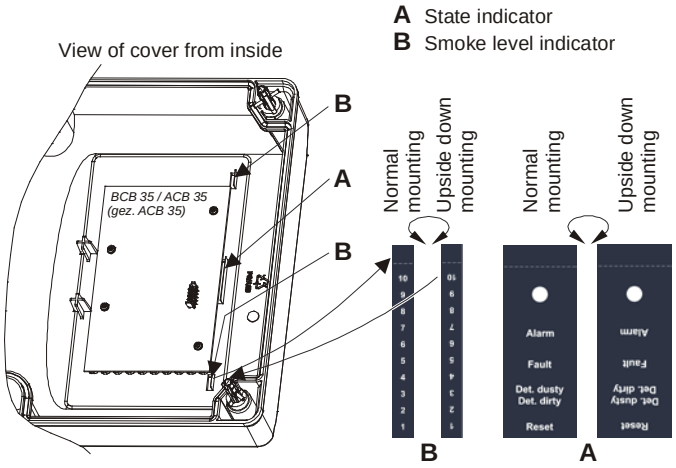



**Fig. 5 Turning the labelling strips**

## 2.5 Mounting sampling pipe

### 2.5.1 General information

Mounting and installation is based on the “Planning” section in technical description T 131 192. Deviating from the layout of the sampling pipe and sampling holes (also outside the limits calculated with “ASD PipeFlow”) is permissible only with the consent of the manufacturer.

The sampling pipe can be hard PVC or halogen-free ABS material, depending on requirements. In special applications (e.g. in an extremely corrosive environment) other pipe materials may be used subject to the specifications in section 2.3.

**Warning about pipe installation / modification**

The performance of this system is dependent upon the sampling pipe. Any extensions or modifications to the designed installation may cause improper operation. The operational effects of such changes shall be verified. Section “Planning” (T 131 192) must be considered in any case. The calculation software “ASD PipeFlow” is available from the manufacturer.

### 2.5.2 Mounting with PVC tubes and fittings

As a rule, when the installation operator does not demand halogen-free installation, sampling pipe can be laid out with hard PVC tubing. When PVC tube material is installed, the individual tube parts are glued together with a special PVC glue (e.g. Tangit for PVC). The glue manufacturer’s instructions must be followed. Before gluing, use household paper to remove dust and grease deposits from the surfaces to be glued (do not use textile cloths). If the tube parts are very dirty, a cleaning agent specified by the glue manufacturer may have to be used.

**Danger**

The adhesives and cleaning agents used for connecting PVC materials contain solvents and are combustible. For this reason, prior to working with these materials it is imperative to read and observe the safety instructions and information provided by the adhesive supplier.

**Notice**

The two glueable materials – PVC and ABS – must not be combined, since different adhesives are used.

### 2.5.3 Mounting with ABS tubes and fittings

If required, halogen-free ABS material can be used for the sampling pipe. When ABS pipe material is installed, the individual tube parts are glued together with a special ABS glue (e.g. Tangit for ABS). The glue manufacturer’s instructions must be followed. Before gluing, use household paper to remove dust and grease deposits from the surfaces to be glued (do not use textile cloths). If the tube parts are very dirty, a cleaning agent specified by the glue manufacturer may have to be used.

**Danger**

The adhesives and cleaning agents used for connecting ABS materials contain solvents and are combustible. For this reason, prior to working with these materials it is imperative to read and observe the safety instructions and information provided by the adhesive supplier.

**Notice**

The two glueable materials – PVC and ABS – must not be combined, since different adhesives are used.

### 2.5.4 Mounting with metal pipes and fittings

Metal tubes (copper, stainless steel) are connected using press fittings according to the manufacturer's instructions. For this purpose a special press tool can be obtained from the manufacturer on loan.

### 2.5.5 Linear expansion

Due to the large linear temperature expansion coefficient of plastics, special attention should be given to linear expansion (extensions and shortenings) of the sampling tube. An increase in temperature causes lengthening; a decrease in temperature causes the tube to become shorter. The importance of taking linear expansion into account increases as the temperature at the time of installation deviates from the usual operating temperature.

Linear expansion can be calculated as follows:

Calculation: $\Delta L = L \times \Delta T \times \alpha$

$\Delta L$ = Linear expansion in mm
$L$ = Length in meters of the sampling pipe between two fixed points
$\Delta T$ = Temperature change in °C
$\alpha$ = Linear expansion coefficient in mm/m°C
for **PVC** = 0.08
for **ABS** = 0.10

Example: sampling pipe length 20 m, expected temperature change 10°C, material PVC:

Calculation: $\Delta L = 20 \times 10 \times 0.08 = 16$ mm

**Notice**

For straight layout the linear expansion can be up to **176 mm** over the total sampling pipe length (110 m) within the permitted temperature fluctuation range (20°C). It must therefore be ensured that the sampling pipe can "work" (slide) in the clips and fastening clamps. A distance of 200 mm (0.2 m) should be maintained between the last clip or fastening clamp to the end cap.

### 2.5.6 Mounting the sampling pipe

**Notice**

When mounting the sampling pipe, the points below must be observed and adhered to (see section 2.5.5):

- Clips and pipe clamps at 1 m intervals are used to fasten the sampling pipe.
- The tubes must be cut with a pipe cutter to required lengths. In doing so, ensure that the cut is at a right-angle to the tube axis. Any projecting burrs must be removed **Fig. 6**.
- The ends of the individual tube pieces are to be slightly angled with a suitable tool, e.g. slightly bevel with a pipe peeler, **Fig. 6**.
- The individual pipe sections are connected to each other with fittings. Depending on the used tube material, gluing as described in sections 2.5.2 and 2.5.3 or pressing as described in section 2.5.4 is used. The tubes are pushed into the fittings to the stop, **Fig. 7**.
- The connection points must be absolutely sealed to prevent the wrong air from entering.
- For vertically arranged sampling pipe or parts thereof (e.g. in a riser or high-rack storage building) make certain that the tubes cannot slide down (fasten clips directly under fittings as shown in **Fig. 8**).
- The sampling pipe must be fastened so that the tube can “work” in the clips (linear expansion, see section 2.5.5).
- Beginning at the branching points of the sampling pipe, a distance of at least 0.2 m must be maintained from the T-piece to the clips, **Fig. 9**.
- For changes of direction in space surveillance installations, it is advisable to use 90° bends rather than 90° angles, **Fig. 9**.
- When using flush mounting or in false ceilings, it must be ensured that the tubes are not able to vibrate.
- How the tubes are laid out – especially for flush mounting – must be precisely entered in the dimensional data in the installation plans.

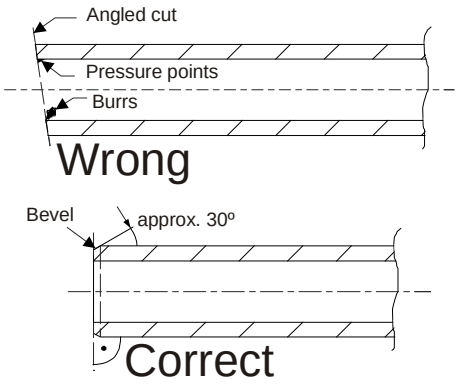



**Fig. 6 Cutting the tubes**

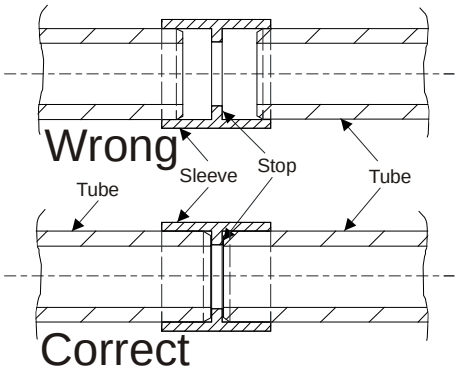



**Fig. 7 Joining the tubes**

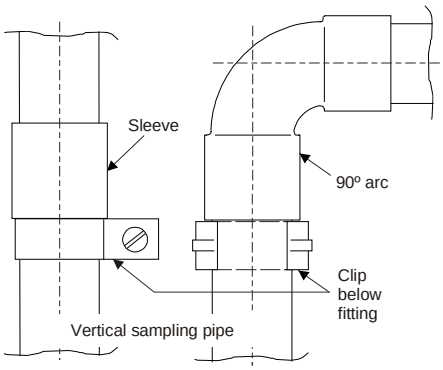



**Fig. 8 Vertical sampling pipe**

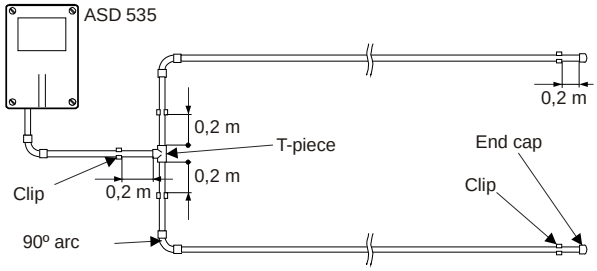



**Fig. 9 90° bend, branching point**

### 2.5.7 Mounting for equipment monitoring

When mounting equipment-monitoring systems (EDP installations, electrical cabinets etc.), plastic tube materials are always to be used. Further, the same guidelines as described in section 2.5.6 apply.

All air outlet openings of the monitoring devices have to be used for equipment monitoring. Please note that an ASD 535 can be fitted with a maximum of six sampling fixtures.

Whenever possible, sampling pipe and detector housing are always fastened directly to the object to be monitored.

#### 2.5.7.1 Screw-free fastening of the sampling pipe

For screw-free fastening of sampling pipe parts (sampling fixtures) the click pipe clamps are used. This makes it possible to quickly remove the sampling fixture or the sampling pipe during maintenance work on the monitored objects.

The click pipe clamps are screwed onto the support rails by means of threaded plates.

The support rails are best fastened at a right angle to the pipe axis to ensure precise positioning of the sampling pipe (sampling fixture).

Double-sided adhesive tape is used to fasten the support rails in the desired position on the object, **Fig. 10**.

Prior to using the double-sided adhesive tape, the adhesion surfaces should be cleaned with a **non-aggressive** cleaning agent (e.g. soap suds or similar).

Using a cable binder instead of the double-sided adhesive tape is also possible.

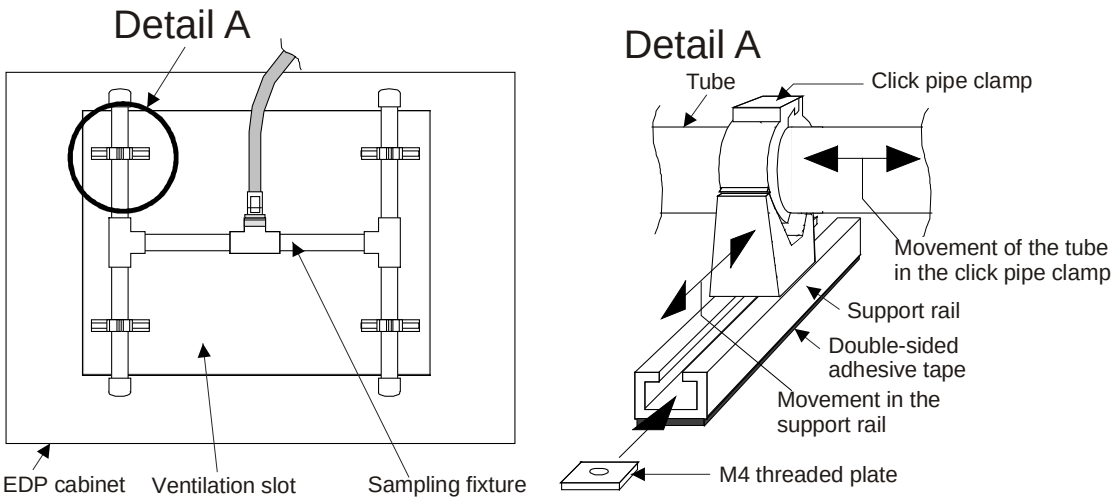



**Fig. 10 Screw-free fastening of a sampling fixture**

### 2.5.7.2 Transition to flexible tube

For equipment monitoring, the transition from rigid to flexible tube can be done in principle using any kind of fitting. **Fig. 11** shows the parts that can be used.

For a rigid sampling pipe made of **PVC**, a **PVC threaded ring** with M20 internal thread is glued into the exit side of the fitting. The M20 quick-release coupling is screwed into the threaded ring for the flexible tube.

If the rigid sampling pipe is made of **halogen-free ABS**, the procedure is identical to that for PVC. Instead of the PVC threaded ring, however, a suitable **threaded ring made of ABS** is used.

The flexible tube can be easily snapped into the quick-release coupling, and for maintenance work it can be easily snapped out.

**Warning**

It is imperative to implement the interfaces of the flexible tube “cleanly” so that the sealing ring does not become damaged in the quick-release coupling.

When clicking in the flexible tube, make sure that the tube and quick-release coupling are pressed well against each other to prevent wrong air from being sucked in.

For transitions from flexible tubes to sampling fixtures, proceed in the reverse order as described above.

**Transition from PVC or ABS fittings to flexible tube**

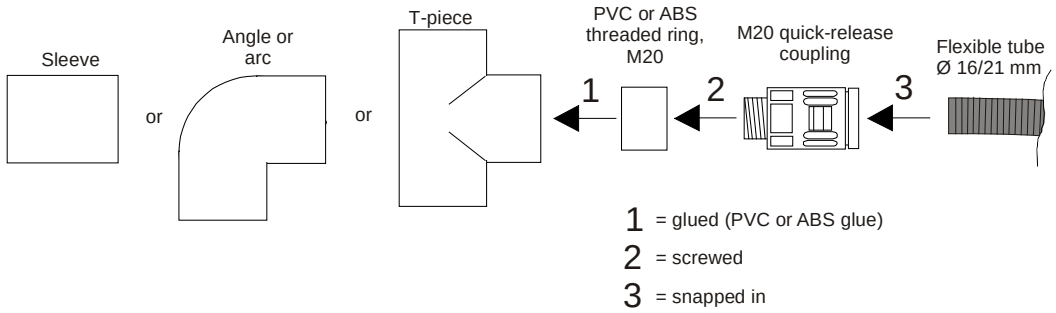



**Fig. 11 Transition from fitting to flexible tube**

### 2.5.8 Making the sampling holes

The hole diameters of the sampling holes have to be determined and made by the customer as described in section “Planning” (T 131 192) and the specifications of the “ASD PipeFlow” calculation software.

The sampling holes must be drilled cleanly so that no burrs or pressure points result. Use “new” drills with correctly ground surfaces (**Fig. 12**).

Whistling noises are a sign that the holes are not clean. The holes must then be re-drilled or deburred.

For space surveillance, the sequence of the hole diameters as per section “Planning” (T 131 192) and the specifications of the “ASD PipeFlow” calculation software must be strictly adhered to.

If required, the sampling holes can be realized by means of the special “sampling hole clips” (see section 2.5.9).

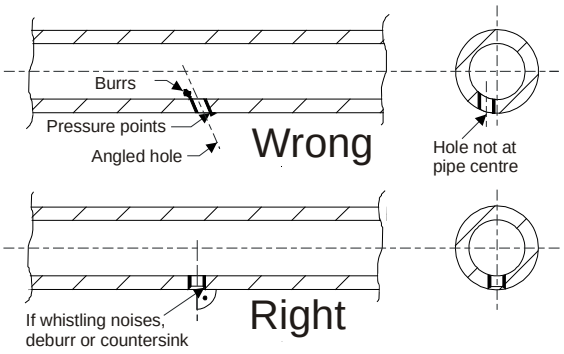



**Fig. 12 Making the sampling holes**

For equipment monitoring the sampling holes are drilled in the sampling fixture. The sampling holes are drilled in the sampling fixture so that they face the air outlet of the object to be monitored. If required, these sampling holes can be fitted with sampling funnels (section 2.5.10).

### 2.5.9 Mounting maintenance and sampling hole clips

**Possible only with plastic tubes (PVC/ABS)!**

At each required position a hole of Ø 8.5 mm is made in the sampling pipe (uniform Ø). The holes are made at a right angle to the centre of the pipe axis (as shown in **Fig. 12**).

The sampling hole clips are available in various sizes (Ø 2.0 / 2.5 / 3.0 / 3.5 / 4.0 / 4.5 / 5.0 / 5.5 / 6.0 / 6.5 / 7.0 mm). For determining the required sampling hole clips, refer to section “Planning” (T 131 192) and the specifications of the “ASD PipeFlow” calculation software.
The sampling hole clips and the maintenance clips are clipped onto the sampling tube so that they snap onto the 8.5 mm hole, **Fig. 13**.

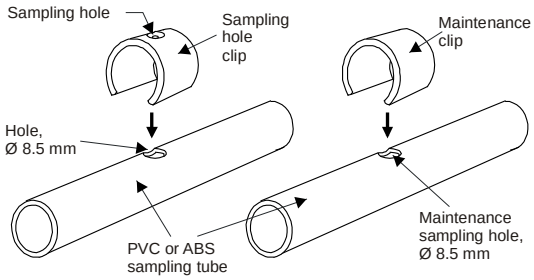



**Fig. 13 Mounting clips**

### 2.5.10 Mounting the sampling funnel

**Possible only with plastic tubes (PVC/ABS)!**

For equipment monitoring objects with a high air flow rate (strong ventilation), the sampling holes can be fitted with funnels for optimal detection of smoke.
If forced ventilation is used in rooms and/or for equipment, the use of sampling funnels is imperative.

The sampling funnels are fastened to the tube of the sampling fixture and adjusted on the previously drilled sampling holes as described in **Fig. 14**.

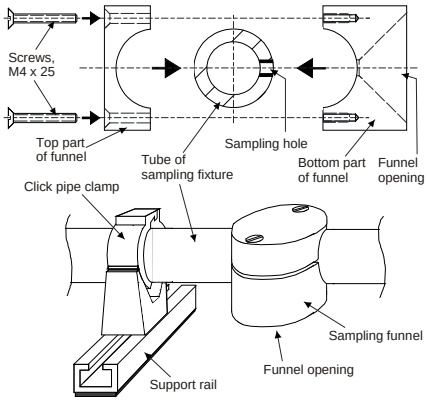



**Fig. 14 Using sampling funnels**

### 2.5.11 Mounting sampling stubs for the ceiling duct

**Possible only with plastic tubes (PVC/ABS)!**
The required parts of a sampling stub for the ceiling duct are shown in **Fig. 15**.

A T-piece is built into the sampling pipe at the required point.

The assembly sequence is performed as indicated by the numbering **1** to **8**.

The size of the sampling hole (8) is based on the specification in section “Planning” (T 131 192) and the specifications of the “ASD PipeFlow” calculation software.

**Warning**

It is imperative to implement the interfaces of the flexible tube “cleanly” so that the sealing ring does not become damaged in the quick-release coupling.

When clicking in the flexible tube, make sure that the tube and quick-release coupling are pressed well against each other to prevent wrong air from being sucked in.

The maximum length of the flexible tube must not exceed **1.5 m**.

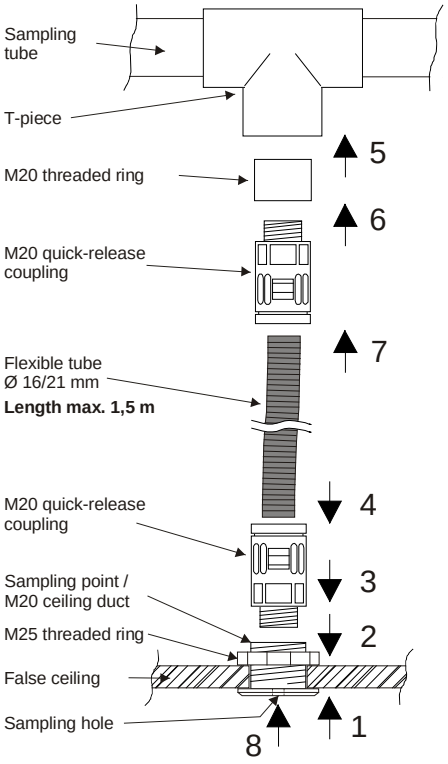



**Fig. 15 Mounting the ceiling duct**

### 2.5.12 Mounting filter box, filter unit, dust trap, dust separator, water separator

Applications with an extremely high level of dust and/or dirt, extreme temperature ranges and/or atmospheric humidity outside the specified limit values require the use of accessory parts as recommended by the manufacturer. For example:

- Filter box / filter unit;
- Dust trap;
- Dust separator;
- Water separator;
- Manual ball-cock for sporadic cleaning of the sampling pipe with compressed air;
- Automatic blow-out device.

**Notice**

The following rules must be adhered to when using accessory parts:

- The use of a filter box and/or filter unit by itself is possible.
- The water separator, dust separator and the dust trap should always be used in conjunction with a filter box and/or filter unit.
- An automatic blow-out device should be used in combination with a dust separator or a dust trap and a filter box and/or filter unit.
- Filter box / filter unit, dust trap, dust separator and water separator must always be mounted under the detector housing. The water separator or dust separator must be located at the lowest point (water drain). The specified minimum dimensions (0.5 m) must be adhered to.
- The mounting positions of water separator, dust trap and dust separator must be observed as shown in **Fig. 16**.

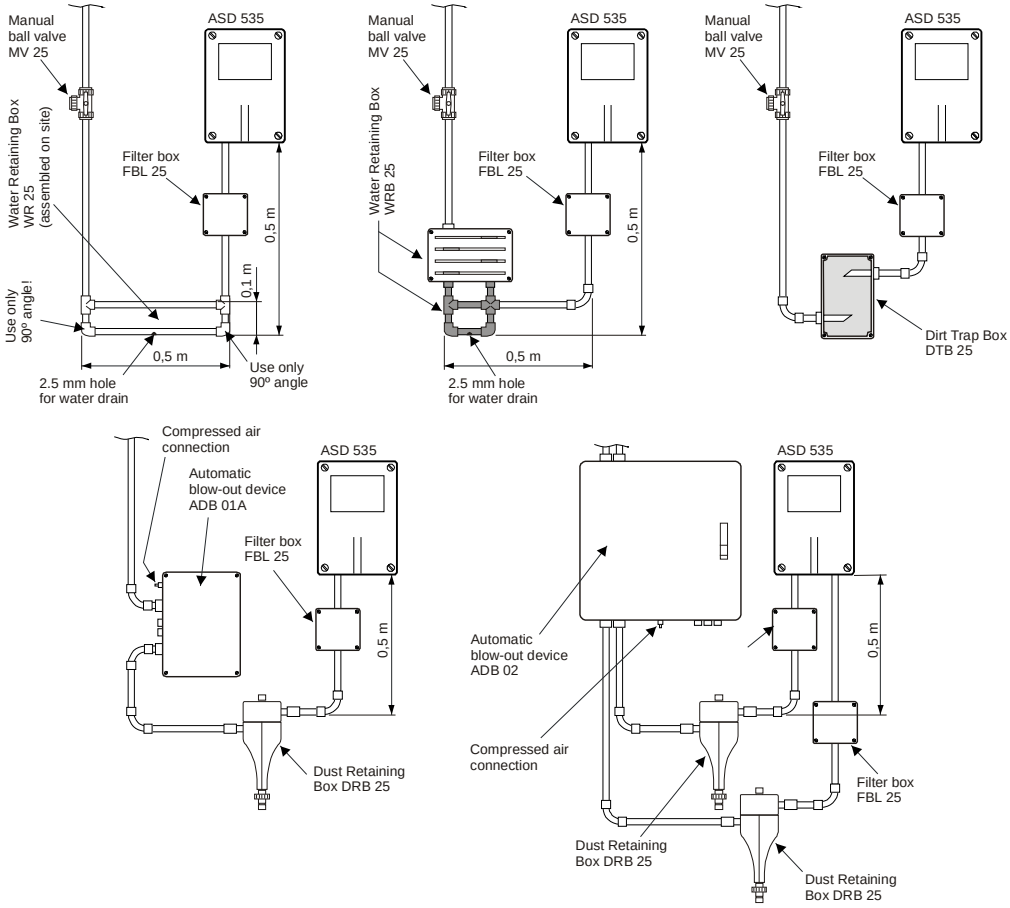



**Fig. 16 Mounting accessory parts**

# 3 Installation

## 3.1 Regulations

**Danger**

The electrical installation is to be carried out in accordance with the applicable country-specific regulations, standards and guidelines. Likewise, the local provisions must also be observed.

**Notice**

Besides country-specific regulations and guidelines, the specifications concerning requirements for installation cable and conductor cross-section as described in section “Planning” (T 131 192) must be observed and implemented.

## 3.2 Cable entry

To facilitate installation work, remove the entire housing cover of the detector housing (including control unit). To do that, pull off the 10-pin flat cable connector from the AMB 35 Main Board.

**Danger**

The voltage must be disconnected for all connection and wiring work on the ASD 535.

There are three M20 cable screw unions in the detector housing for the electrical installation. If needed, two reserve holes (blind plugs) can be fitted with two more cable screw unions (1 x M20, 1 x M25).

The cable screw unions are suitable for cable with an external diameter of 5 to 12 mm (M20) or 9 to 18 mm (M25).

**Notice**

- When the device is delivered, the cable screw unions are closed with a dust protection insert, which has to be removed before introducing the cable. The dust protection inserts are only for preventing dust and dirt from entering when the device is mounted and provide no mechanical protection. Cable screw unions which are not used must be replaced with blind plugs (mounting set) in order to maintain the IP 54 protection class.
- **Use in compliance with UL 268:** When using the ASD 535 in compliance with UL 268, special **1/2“** and **3/4“** cable screw unions are to be used (customer-side). To be able to use them in the ASD housing, the existing M20 and M25 screw-junction pieces must be removed and replaced by 1/2“ M20 adapters and 3/4“ M25 adapters. The adapters are available from the manufacturer in the **AD US M-Inch** range of accessories.

## 3.3 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.

### Warning when deploying smoke sensors

- 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 installation position is always such that 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 flat cable delivered with the smoke sensor is connected to the smoke sensor (big flat cable connecter) and to the AMB 35 Main Board (small flat cable connector).

The insect protection screens and lock clamps are not fitted to smoke sensor chamber II on the ASD 535-1 and ASD 535-3 (only one smoke sensor). Instead of using the insect protection screens, the air channels are closed. Smoke sensor chamber II remains open for operation.

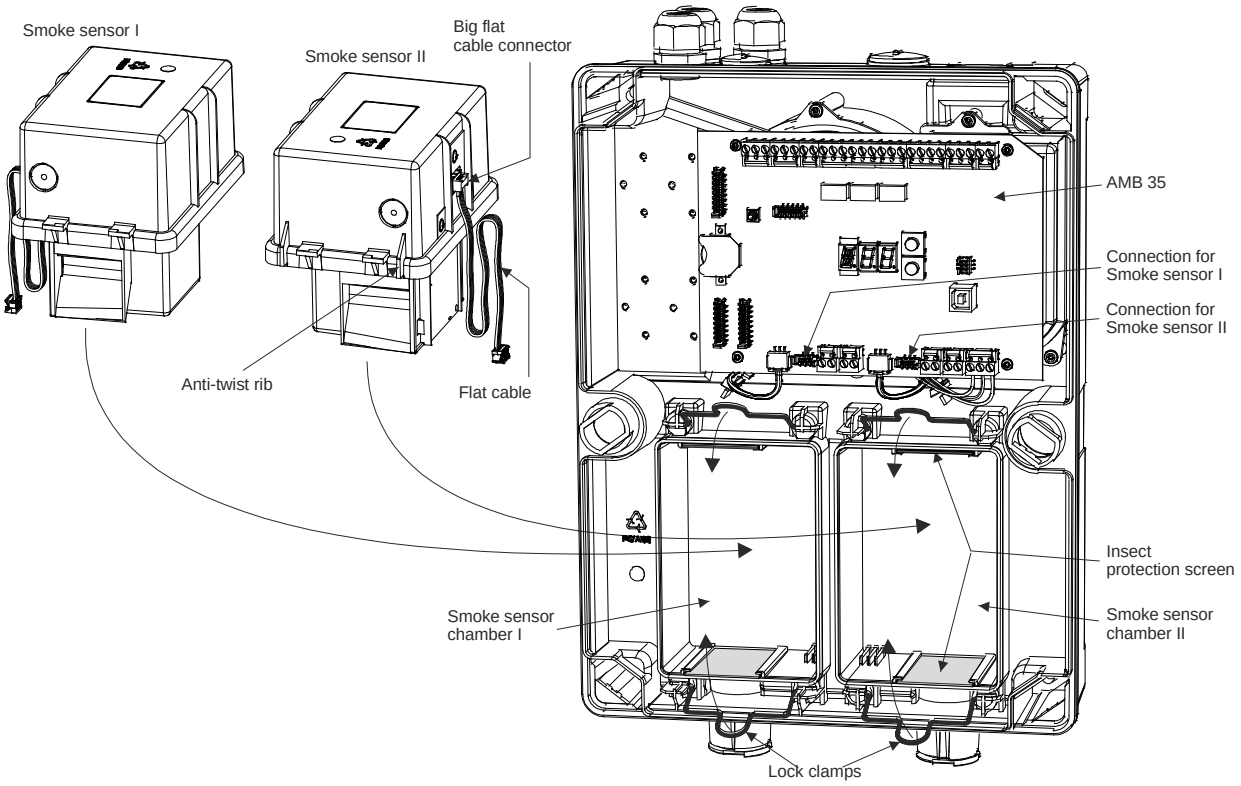



**Fig. 17 Deploying the smoke sensors**

## 3.4 Installing expansion modules XLM 35, SLM 35, RIM 35, MCM 35, SIM 35

There are four expansion slots for equipping the detector housing with the optional expansion modules. Because of the module-based assignment of the flat cable connectors on the AMB 35 Main Board we recommend the arrangement as shown in **Fig. 18**.

Each module set has a module holder, mounting screws and the connection cable (flat cable) for connecting to the AMB 35. A **Torx T15 screwdriver** is used to tighten the mounting screws. The module can be removed from the holder for mounting in the detector housing and for the subsequent electrical installation.

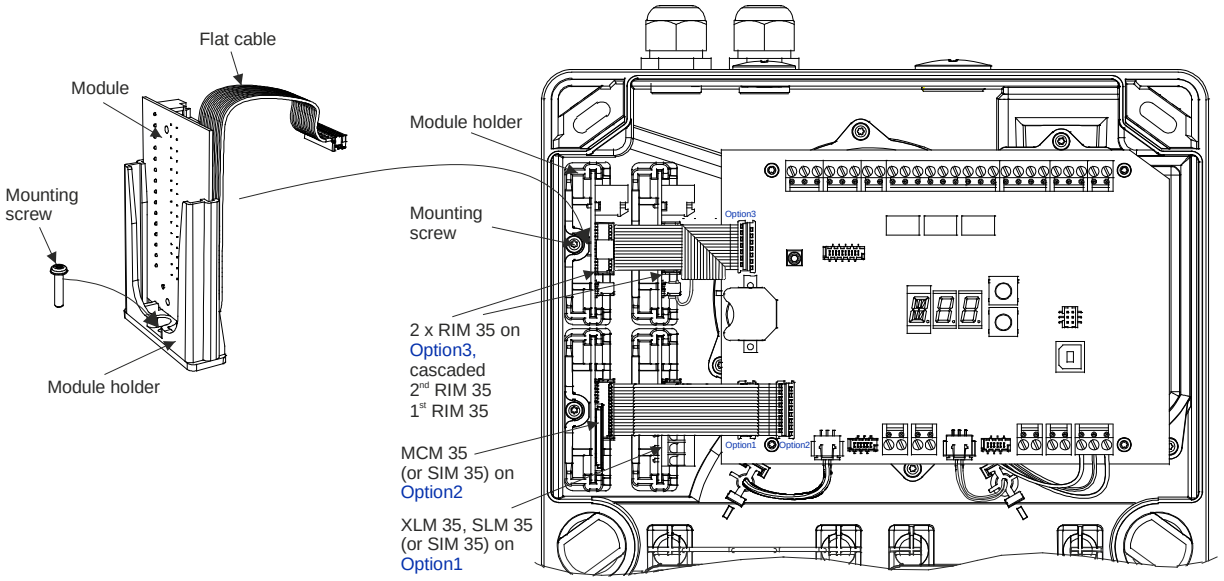



**Fig. 18 Installing expansion modules**

### Notice

The expansion modules are automatically detected when the device is switched on, from which point they are monitored and functional. The MCM 35 begins logging data as soon as the SD memory card is inserted (approx. after 10 s; indicated by the flashing red LED on the MCM). To read out the SD memory card or when subsequently removing an expansion module (e.g. if not used), the expansion module must first be logged off via operation on the AMB 35 Main Board (switch setting ***o***).

When installing modules other than XLM, SLM, RIM, MCM or SIM, the UMS 35 universal module holder is available. This is fastened in the detector housing instead of the above described module holder and requires two expansion slots one above the other (directly next to the AMB 35). The UMS 35 consists of an angled sheet metal plate with various fastening options for expansion modules.

## 3.5 Electrical connection

The electrical connection is implemented by means of plug-in screw terminals. A **flat-blade screwdriver no. 1** (3.5 mm) is used to tighten the screw terminals. Individual terminal blocks are built on for supply voltage, relay contacts, inputs, outputs, etc.

### Danger

- Inside the detector housing the lines should be conducted the shortest possible path to the terminals. Reserve loops via the Main Board are to be avoided (EMC).
- **Caution:** For system monitoring – for terminals “**Alarm I**”, “**Alarm II**” and “**Fault**”, **do not use looped wire** under terminals. Break wire run to provide monitoring of connections.

### 3.5.1 Terminal assignment of AMB 35 Main Board

| AMB terminal | Signal | | Wiring |
|---|---|---|---|
| **1** | +10.5 to +30 VDC (UL/FM = 12.4 to 27) | | Main supply line from FACP or external source according to **Fig. 19** |
| **2** | 0 V | | |
| **3** | +10.5 to +30 VDC (UL/FM = 12.4 to 27) | | Redundant supply line from FACP or external source according to **Fig. 19** |
| **4** | 0 V | | |
| **5** | + Power supply | | Wiring of feedback loop signals according to **Fig. 26** |
| **6** | Output fault, OC (all fault events) | | |
| **7** | Output alarm I, OC | | |
| **8** | Output alarm II or freely programmable, OC | | |
| **9** | unused | | |
| **10** | Rel. 1 (“NO”) ① | Fault | Wiring the line according to **Fig. 23** to **Fig. 24** or specifications of the used line |
| **11** | Rel. 1 (“NC”) | | |
| **12** | Rel. 1 “COM” ① | | |
| **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** | Reset external input + (opto-isolator input) | | Wiring acc. to **Fig. 20** and **Fig. 22** |
| **20** | Reset external input – (opto-isolator input) | | |
| **21** | + F | + power supply “F” | (may be available at a later date) |
| **22** | DF | Asynchronous data line “F” | |
| **23** | - | 0 V power supply “F” | |
| **24** | + S | + power supply “S” | Connection MFU 535, REK 535 (available at a later date) |
| **25** | DS | Asynchronous data line “S” | |
| **26** | - | 0 V power supply “S” | |

**Notice**

① 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**

| AMB terminal | Signal | Wiring |
|---|---|---|
| **MOT / M-** | Fan - | Fan, black wire |
| **MOT / T** | Fan tacho signal | Fan, white wire |
| **MOT / M+** | Fan + | Fan, red wire |
| **OEM2 / AI-** | Opto-isolator inputs for OEM2 | Wiring similar to **Fig. 20** |
| **OEM2 / AI+** | | |
| **OEM2 / St-** | | |
| **OEM2 / St+** | | |
| **OEM1 / AI-** | Opto-isolator inputs for OEM1 | |
| **OEM1 / AI+** | | |
| **OEM1 / St-** | | |
| **OEM1/ St+** | | |

**Warning**

- In some cases, actuations may **not** comply with **EN 54-20**; thus, use only after consulting with the manufacturer).
- The inputs are **not** line monitored.

### 3.5.2 eXtended Line Module XLM 35 / SecuriLine module SLM 35 terminal assignment

| SLM terminal | Signal | Wiring |
|---|---|---|
| **L1 / T** | Data A | Addressable loop acc. to **Fig. 22** or **Fig. 25** |
| **C1 / U** | GND A | |
| **G1 / V** | Screen | |
| **L2 / X** | Data B | Addressable loop acc. to **Fig. 22** or **Fig. 25** |
| **C2 / Y** | GND B | |
| **G2 / Z** | Screen | |

### 3.5.3 Relay interface module RIM 35 terminal assignment

| RIM terminal | | Signal ① | | Wiring |
|---|---|---|---|---|
| **1** | Rel. 1 | "NO" | Pre-signal 1 or freely programmable | Local info or wiring on FACP input |
| **2** | | "NC" | | |
| **3** | | "COM" | | |
| **4** | Rel. 2 | "NO" | Pre-signal 2 or freely programmable | |
| **5** | | "NC" | | |
| **6** | | "COM" | | |
| **7** | Rel. 3 | "NO" | Pre-signal 3 or freely programmable | |
| **8** | | "NC" | | |
| **9** | | "COM" | | |
| **10** | Rel. 4 | "NO" | Dirty smoke sensor or freely programmable | |
| **11** | | "NC" | | |
| **12** | | "COM" | | |
| **13** | Rel. 5 | "NO" | Sampling tube pipe blockage or freely programmable | |
| **14** | | "NC" | | |
| **15** | | "COM" | | |

**Notice**

① Depending on the device version, the assigned criteria (signals) upon product delivery apply to smoke sensor I on the first RIM 35 (connected to the AMB 35) and to smoke sensor II on the second RIM 35 (connected to the first RIM 35, cascaded). The assignment of individual or all relays can be changed with the "ASD Config" configuration software.
If two RIM 35 devices are deployed in the ASD 535-1 or ASD 535-3, the relays of the second RIM 35 are not configured with default criteria. The required programming must be performed with the "ASD Config" configuration software.

### 3.5.4 Terminal assignment of an SIM 35 serial interface module

| SIM terminal | Signal | Wiring / installation | | |
|---|---|---|---|---|
| **1** | GND | Input | 1st conductor from wire pair 2 | |
| **2** | D + | | 1st conductor from wire pair 1 | twisted |
| **3** | D – | | 2nd conductor from wire pair 1 | |
| **4** | GND | Output | 1st conductor from wire pair 2 | |
| **5** | D + | | 1st conductor from wire pair 1 | twisted |
| **6** | D – | | 2nd conductor from wire pair 1 | |

## 3.6 Connection variants

**Notice**

The connection variants are determined by the possible lines and FACP technologies. For more information about wiring alarm transmitters, line monitoring elements etc., please contact the manufacturer and/or supplier of the fire detection system.

In all cases the ASD 535 must have an emergency power supply compliant with EN 54-4.

### 3.6.1 Power supply

The ASD 535 must always have emergency power supply. Depending on the available output current of the fire alarm control panel (FACP) and the number of ASD 535 units to be connected, the power supply can be provided by the FACP or the power supply will have to be supplied by auxiliary means locally.

The supply is via terminals 1 and 2. In applications where a redundant power supply line is prescribed (country specific), it is connected to terminals 3 and 4, **Fig. 19**.

**Notice**

- The supply inputs are not connected internally in the ASD and thus cannot be used for direct continuation to neighbouring systems.
- The terminals of the ASD 535 are designed for maximum 2.5 mm². For continuing the supply line to a neighbouring ASD it may be necessary to install additional distributor or support terminals.

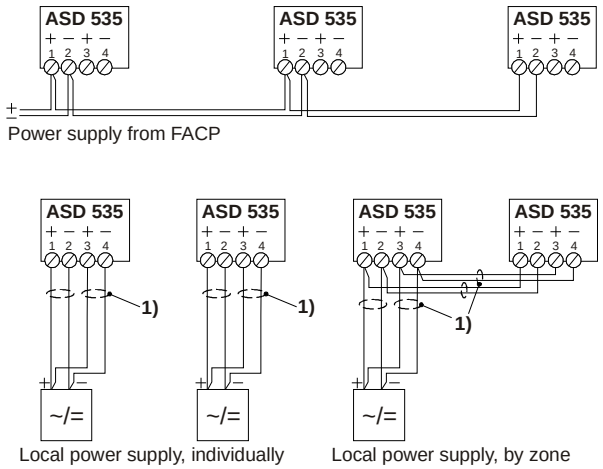



**Fig. 19 Types of power supply**

**Danger**

To determine the required power supply and cable cross-section, it is essential to perform the calculations described in section “Planning” (T 131 192). For applications with redundant power supply, the calculations must be performed for both supply lines individually.

### 3.6.2 Reset input

The reset input is potential-free (opto-isolator) and can be actuated “plus” side or “minus” side, **Fig. 20**. The input operates in the range of 5 to 30 VDC and in an impulse bandwidth of 0.5 to 10 s. Thanks to the continuous current consumption of approx. 3 mA in the overall operating range, the triggering can be performed directly via an open collector module.

If a continuous signal is present longer than 20 s, the ASD 535 is switched inactive, the fault relay becomes active (triggered), and the fan is switched off. Once the continuous signal is switched off, the ASD is switched to armed again. Switching inactive via the “Reset external” input works only if the ASD 535 is not equipped with an XLM 35 or SLM 35.

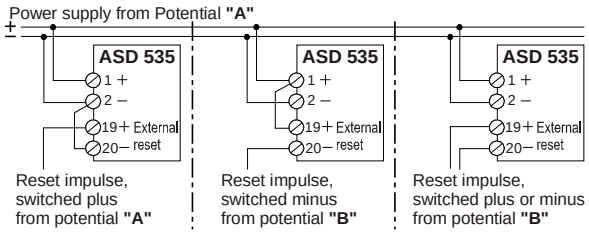



**Fig. 20 Reset input**

### 3.6.3 Control

The ASD 535 units connected to a FACP are controlled according to the detection zone mapping using the FACP states “Zone ON/OFF” and “Reset”. Two possibilities are available:

- Control via supply voltage (auxiliary relays in the ASD power supply line)
- Control via the “Reset external” input.

#### 3.6.3.1 Control via supply voltage by means of auxiliary relay

Depending on the location of the ASD supply, the auxiliary relay may be placed in the FACP or directly in the ASD 535.

The auxiliary relay can be actuated in the following ways (see **Fig. 21**):

**A.** line plus or minus
**B.** SW output of the FACP
**C.** SW output or function of a control module

The function types listed above are determined by the FACP technology in use. It is therefore essential to contact the manufacturer and/or the supplier of the fire alarm unit before implementing.

**Danger**

- The EMC protective elements at the input of the ASD electronics cause a brief current peak (5 A / 1 ms). When using auxiliary relays with a max. contact load of 1 A, this may lead to the relay contact sticking. For this reason auxiliary relays with a contact load of over **1 A** should **always** be used, e.g. PMR 81 semiconductor relay (see **Fig. 21 C)**).
- The ASD supply path via the auxiliary relay contact must be short-circuit-proof or conducted via a fuse component (circuit-breaker card).

**Notice**

- When using a PMR 81 semiconductor, it may be necessary to invert the actuation signal (PMR has only a normally open contact function).
- To guarantee comprehensive emergency running properties, the wiring must in all cases be implemented in such a way that if there is an FACP computer failure the ASD will continue to function (reset input not actuated).

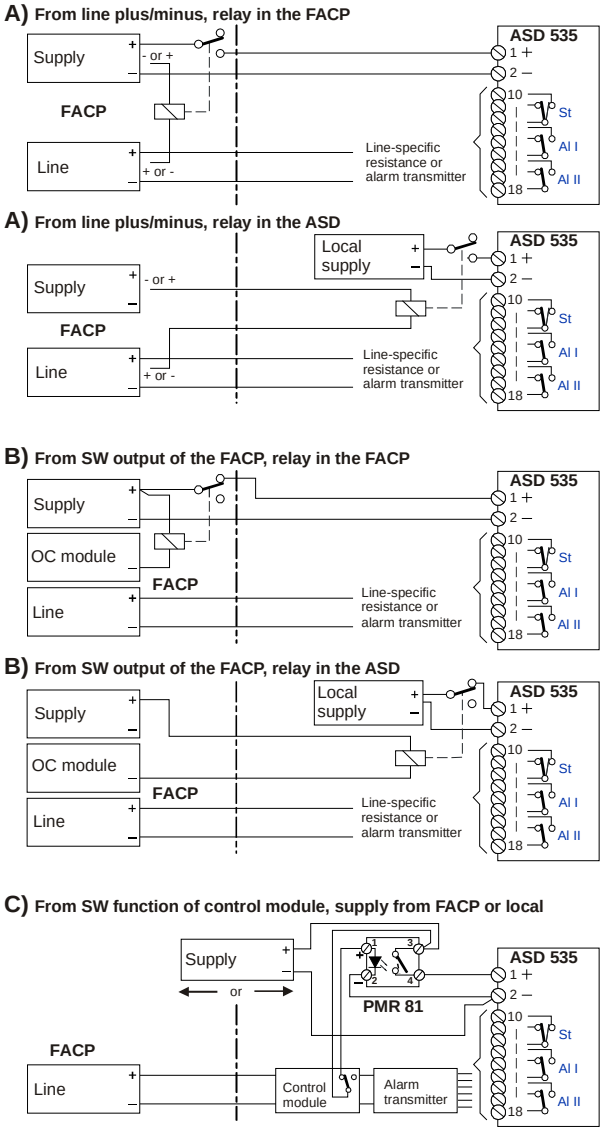



**Fig. 21 Control via supply with relay**

### 3.6.3.2 Control via the “Reset external” input

The following options are available for control via the reset input (see **Fig. 22**):

**A.** Control via auxiliary relay from line plus

**B.** Control via auxiliary relay or semi-conductor relay (PMR 81) from control output (open collector)

**C.** Control without auxiliary relay, directly from control output (relay contact or open collector)

**D.** Control via addressable loop when using the XLM 35 / SLM 35. The control is then not by means of the reset input but rather directly with the corresponding command entry via the XLM 35 / SLM 35 on the ASD 535.

The function types listed above are determined by the FACP technology in use. It is therefore essential to contact the manufacturer and/or the supplier of the fire alarm unit before implementing.

**Notice**

- When using a PMR 81 semiconductor, it may be necessary to invert the actuation signal (PMR has only a normally open contact function).
- To guarantee comprehensive emergency running properties, the wiring must in all cases be implemented in such a way that if there is an FACP computer failure the ASD will continue to function (reset input not actuated).

**Warning**

**Attention:** When control is via the “Reset external” input, the ASD 535 is supplied with voltage even if the zone (FACP) is switched off.

For this reason, if any repair work is performed on the device, the supply line to the ASD must be disconnected (e.g. pull off terminals 1 and 2 on the ASD; do the same for 3 and 4 for redundant supply).

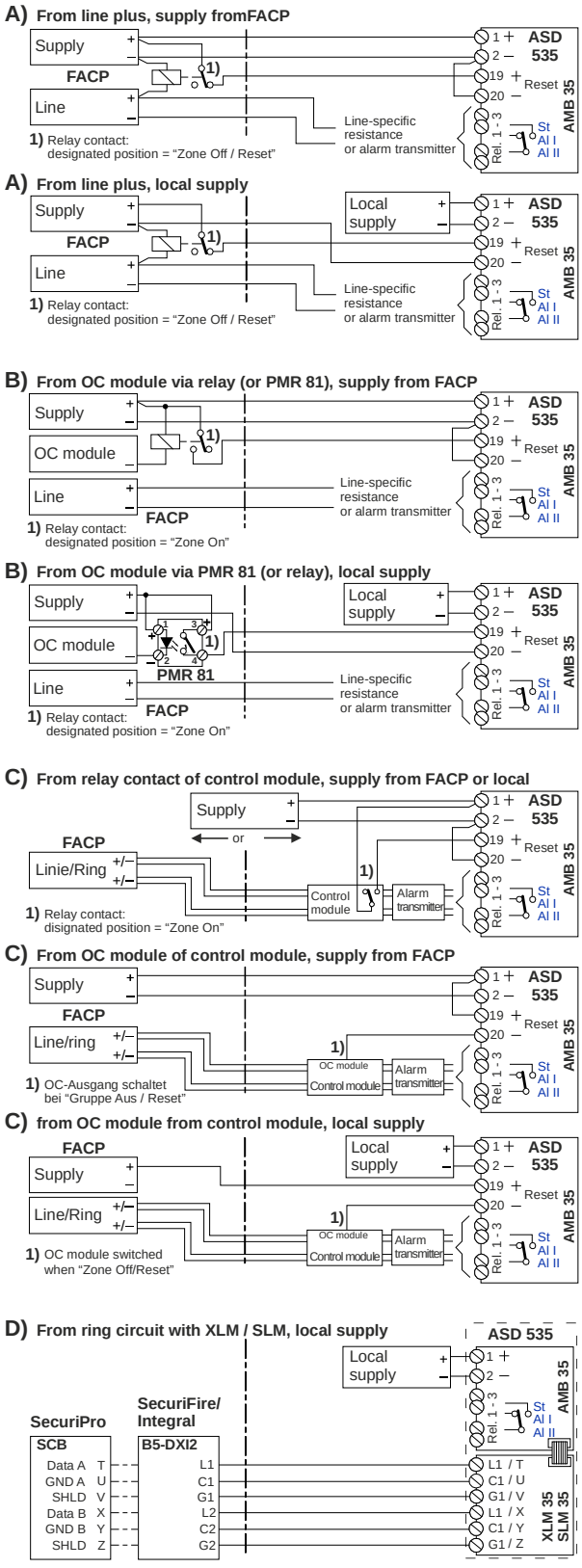



**Fig. 22 Control via the “Reset external” input**

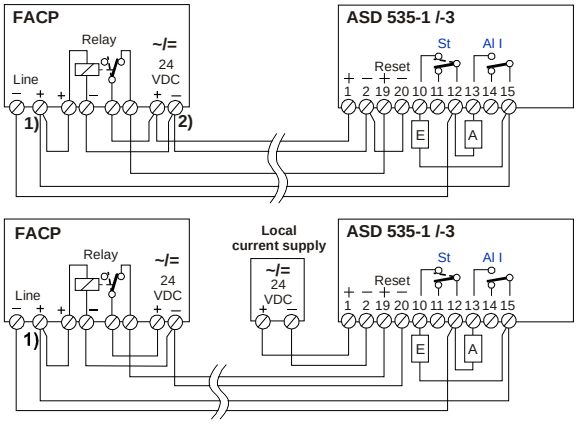
### 3.6.4 Wiring the FACP line

The following examples show how control via reset input as described in section 3.6.3.2 is implemented. If wiring with control via the voltage supply is necessary, the control circuit in the following figures can be implemented as described in section 3.6.3.1.

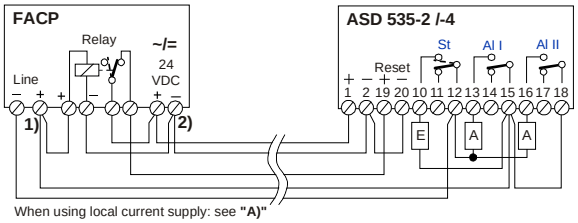
#### 3.6.4.1 Circuitry on zone detection via AI / St relay

- For circuitry on zone detection lines, actuation of the auxiliary relay is, as a rule, from the line plus. A condition for this, however, is that the line plus also switches for “Zone ON/OFF” and “Reset” (see **Fig. 23, C)**).
- Circuitry as shown in **Fig. 23, B)** is used exclusively when the FACP line is to operate with **2-detector dependency** (V-AI / H-AI) from smoke sensors I and II. For that purpose the FACP line is programmed for 2-detector dependency. The ASD has **two** sampling pipes which cover the **same monitoring area**, or only **one**, and **merging** takes place before the ASD on tube input I and II.
- When wiring as shown in **Fig. 23, C)**, AI I and AI II can be evaluated in the FACP as independent zones from two independent monitoring areas. A **2-line dependency** can also be programmed in the FACP. In that case, the same applies as in **B)**; both sampling pipes from one monitoring area, or merging of a sampling pipe on tube input I and II.
- If wiring as in **Fig. 23, C)** is used, the control signal for the reset input can no longer be picked up from the line plus; instead, a software output has to be created with the following programming:
  Output switches when:
  **Line/Zone A** or **B „Reset“**
  or:
  **Line/Zone A** and **B „Off“**

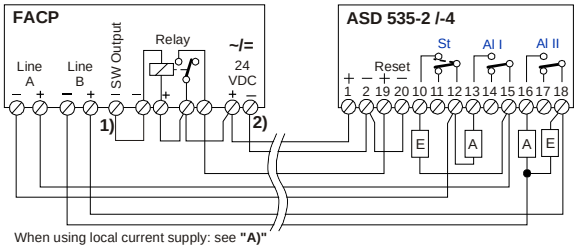
**A)** **ASD 535 with one smoke sensor, connected to one line**




**B)** **ASD 535 with two smoke sensors, connected to one line**




**C)** **ASD 535 with two smoke sensors, connected to two lines**




**1)** Output switches if: "Line/zone A or B reset"
or: "Line/zone A and B Off"

**2)** From short-circuit card if not short-circuit proof

**E** = terminal resistor
(only in the last ASD)
**A** = alarm resistor

**Fig. 23 Wiring for zone detection**

### 3.6.4.2 Circuitry on selective identification or addressable loop via AI / St relay

- For line technologies such as selective identification lines and addressable loops, actuation of the auxiliary relay is to be implemented from a software-controlled output (output card or control module). The output is programmed via the FACP software with the “Zone Off” and “Reset” functions.
- If AI I and AI II are evaluated in the FACP as individual zones (also 2-line dependency), programming of the SW output is as follows:
  Output switches when:
  **Zone A** or **B „Reset“**
  or:
  **Zone A** and **B „Off“**

A normal relay or a PMR 81 semi-conductor relay can be used as control relay.

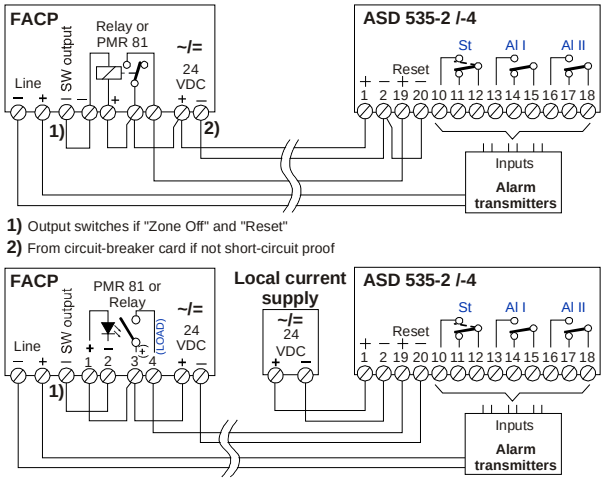



**Fig. 24 Wiring for selective identification or addressable loop**

### 3.6.4.3 Circuitry on SecuriPro / SecuriFire / Integral addressable loop from XLM 35 / SLM 35

- For the circuitry on SecuriPro / SecuriFire / Integral addressable loop from the XLM 35 / SLM 35 no additional control relay is needed. Likewise, the AI and St relays of the ASD 535 are not used. The state query and the control of the ASD 535 take place directly between the XLM 35 or SLM 35 and the addressable loop.
- When using an ASD 535 with two smoke sensors and XLM 35 / SLM 35 (ASD 535-2 or ASD 535-4), a 2-detector dependency (V-AI / H-AI) can be programmed on the FACP. Evaluation of the individual zones (AI I and AI II) in the FACP is also possible.
- On the **SLM 35** the S2 switch is positioned at “I” or “I + II”, depending on the ASD type (number of smoke sensors).

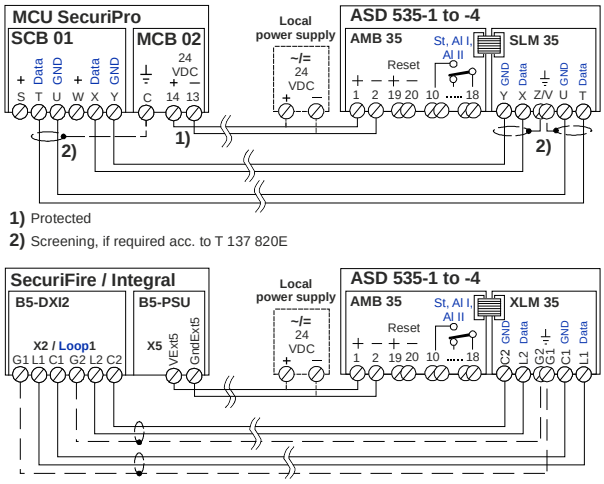



**Fig. 25 Wiring from XLM 35 / SLM 35**

Maximum connectable XLM 35 / SLM 35 units:
(see also notice box below)

| | |
|---|---|
| per SecuriLine (only SLM 35) | 50 units |
| per SecuriFire / Integral addressable loop | 32 units |

## Notice

- There are two switches – S1 and S2 – on the **SLM 35** that have to be differently set depending on the use of the ASD 535.
- When operating an ASD 535-2 and ASD 535-4 (with 2 smoke sensors), two addresses are allocated on the **SLM 35**.
- The circuitry and wiring routing between **SLM 35** and the FACP SecuriPro, SecuriFire or Integral must be carried out as shown in **Fig. 25** (X on X, Y on Y or X on L2, Y on C2, etc.).
- The installation of the SecuriFire / Integral addressable loop must be shielded.
- The circuitry and wiring routing between **XLM 35** and the FACP SecuriFire or Integral must be carried out as shown in **Fig. 25** (L1 on L1, C1 on C1, etc.).

### 3.6.5 Open collector outputs

The ASD criteria “Alarm I”, “Alarm II” and “Fault” (all fault events) are available as open collector outputs.

Parallel and feedback indicators and other consumers (e.g. relays) can be connected to the open collector outputs.

In ASD 535-1 and ASD 535-3 the output on terminal 8 is not “Alarm II” but rather freely programmable (it is always identical with the programming on relay 3 of the AMB 35).

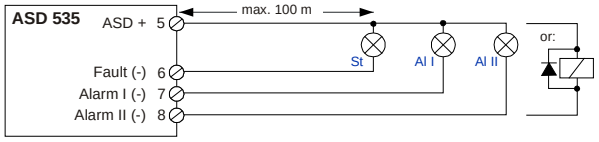



**Fig. 26 Wiring the OC outputs**

**Danger**

When connecting inductive consumers (e.g. relays), a freewheel diode is to be installed directly at the consumer, **Fig. 26**.

**Notice**

The outputs are 0-Volt switched and have a loading capacity of max. **100 mA** per output. All outputs together cannot switch more than **200 mA**. The electrical strength is 30 VDC per output. The outputs are not short-circuit-proof and not potential-free. Connection to the outputs affects the overall power consumption of the ASD 535.

# 4 Article numbers and replacement parts

## 4.1 Detector housing and accessories

| Designation | Article no. |
|---|---|
| ASD 535-1 without smoke level indicator, for 1 smoke sensor (without smoke sensor) | 5000623.0101 |
| ASD 535-2 without smoke level indicator, for 2 smoke sensors (without smoke sensor) | 5000623.0102 |
| ASD 535-3 with smoke level indicator, for 1 smoke sensor (without smoke sensor) | 5000623.0103 |
| ASD 535-4 with smoke level indicator, for 2 smoke sensors (without smoke sensor) | 5000623.0104 |
| Smoke sensor SSD 535-1; sensitivity: alarm 0,5 %/m – 10 %/m, pre-signals 0,05 %/m – 9 %/m | 5000613.0101 |
| Smoke sensor SSD 535-2; sensitivity: alarm 0,1 %/m – 10 %/m, pre-signals 0,01 %/m – 9 %/m | 5000613.0102 |
| Smoke sensor SSD 535-3; sensitivity: alarm 0,02 %/m – 10 %/m, pre-signals 0,002 %/m – 9 %/m | 5000613.0103 |
| Smoke sensor SSD 535-1 CP (painted); sensitivity: alarm 0,5 %/m – 10 %/m, pre-signals 0,05 %/m – 9 %/m | 5000613.2201 |
| Smoke sensor SSD 535-2 CP (painted); sensitivity: alarm 0,1 %/m – 10 %/m, pre-signals 0,01 %/m – 9 %/m | 5000613.2202 |
| Smoke sensor SSD 535-3 CP (painted); sensitivity: alarm 0,02 %/m – 10 %/m, pre-signals 0,002 %/m – 9 %/m | 5000613.2203 |
| eXtended Line Module XLM 35 including mounting set | 11-2200003-01-XX |
| SecuriLine module SLM 35 including mounting set | 4000286.0101 |
| Relay Interface Module RIM 35 including mounting set | 4000287.0101 |
| Memory Card Module MCM 35 with SD memory card (industrial version) including mounting set | 4000285.0101 |
| SD memory card (industrial version) | 11-4000007-01-XX |
| Serial Interface Module SIM 35, including mounting set | 11-2200000-01-XX |
| Serial Master Module SMM 535 | 11-2200001-01-XX |
| USB cable, 4.5 m | 4301248 |
| Printed circuit board Main Board AMB 35-1 (for ASD 535-1 / -3) | 94301218.0101 |
| Printed circuit board Main Board AMB 35-2 (for ASD 535-2 / -4) | 94301218.0102 |
| Printed circuit board without smoke level indicator BCB 35 | 4301220.0101 |
| Printed circuit board with smoke level indicator ACB 35 | 4301221.0101 |
| Aspirating fan unit AFU 35, complete | 4000299 |
| Airflow sensor AFS 35 | 4000300 |
| Insect Protection Screen IPS 35 (set of 2) | 11-2300012-01-XX |
| Lithium battery | 11-4000002-01-XX |
| Cable screw union M20 (set of 10) | 11-4000003-01-XX |
| Cable screw union M25 (set of 10) | 11-4000004-01-XX |
| Adapters for US cable screw unions AD US M-Inch | 11-2300029-01-XX |
| Universal Module Support UMS 35 | 4301252.0101 |

## 4.2 Sampling pipe and accessories

The article numbers of all available parts of the sampling pipe (tubes, fittings, etc.) are listed in a separate document (T 131 194).

# 5 Technical data

| | | | | | |
|---|---|---|---|---|---|
| Type | | | | ASD 535 | |
| Supply voltage range | | | | 10.5 to 30 (**UL/FM = 12.4 to 27**) | VDC |
| Max. power 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 | Idle/fault | approx. 575 | approx. 340 | approx. 260 | mA |
| | Alarm I | approx. 695 | approx. 405 | approx. 310 | mA |
| ASD 535-4 | Idle/fault | approx. 645 | approx. 380 | approx. 290 | mA |
| | Alarm I + II | approx. 820 | approx. 490 | approx. 385 | mA |
| additionally with 1 RIM 35 units | | approx. 15 | approx. 10 | approx. 7 | mA |
| additionally with 2 RIM 35 units | | approx. 30 | approx. 20 | approx. 14 | mA |
| additionally with XLM 35 / 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 |
| Sampling pipe Ø, typical (inner/outer) | | | | Ø 20 / 25 | mm |
| Max. number of sampling holes | | | | | See T 131 192 |
| 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 4.1) | | | | EN 54-20, class A, B, C | |
| Protection type acc. to IEC 529 / EN 60529 (1991) | | | | 54 | IP |
| Ambient conditions acc. to IEC 721-3-3 / EN 60721-3-3 (1995) | | | | 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 ③ | °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 ③ | °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 ③ | % rel. hum. |
| • Humidity ambient condition detector housing and sampling pipe (continuous) | | | | 70 ③ | % rel. hum. |
| Max. loading capacity relay contact | | | | 50 (**UL max. 30**) | VDC |
| | | | | 1 | A |
| | | | | 30 | W |
| Max. loading capacity per open collector output (electrical 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 |
| Noise level (at fan speed level III) | | | | 43 | dB (A) |
| Housing | material | | | ABS blend, UL 94-V0 | |
| | colour | | | grey 280 70 05 / anthracite violet 300 20 05 | RAL |
| Approvals | | | | EN 54-20 / FM 3230-3250 / UL 268 / ULC-S529 | |
| Dimensions (W x H x D) | | | | 265 x 397 x 148 | mm |
| Weight (ASD 535-4, incl. expansion modules) | | | | max. 3'850 | g |

**Notice**

① Power 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 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.

# 6 List of figures