SECURITON

ASD 2004

Aspirating Smoke Detector

Technical documentation

1 • 17.06.2025

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1 Overview

The content of this document reflects the technical status of the product at the time of publication. The manufacturer reserves the right to make changes. Product illustrations may differ from the delivered product due to continuous development.

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1.1 Validity of this document

This document applies to ASD 2004 with production version as of 060524 and firmware version as of 4.0.921.

1.2 Abbreviations and terms

Abbreviation	Term	Definition
AEB	ASD extension board	Extension board for the ASD 2002 and ASD 2004 aspirating smoke detectors
AFS	Airflow sensor	Airflow sensor for monitoring the airflow in the aspirating smoke detector
AMB	ASD main board	Main board of the ASD aspirating smoke detector
ASD	Aspirating smoke detector	Aspirating smoke detector with smoke sensors and fan, which checks the ambient air via a sampling pipe tube network
BCB	Basic Control Board	Printed circuit board with alarm and fault indicators as well as Bluetooth interface
SSD	Scattered light smoke detector	Highly sensitive smoke sensor for detecting the smoke concentration in the aspirating smoke detector
UMS	Universal module support	Universal module support consisting of an angled sheet metal plate with mounting options for additional modules

1.3 Data protection

Recording of data during operation

When MobileConfig communicates with the ASD, data is recorded on the ASD during operation. This supports the user and the manufacturer as well as authorised partners with Maintenance and Warning and fault rectification. The data also serves as evidence of the proper use and maintenance of the system and can be used for analysis in the event of disputes or liability issues. Only authenticated and authorised users of MobileConfig have access to the data. Various technical measures prevent unauthorised access by third parties.

The user can share the data with the manufacturer's customer support or its authorised partners for more in-depth analyses (see Share data). The following data is saved on the ASD during operation for this purpose:

- User names of the user as assigned during cloud registration; see section *Recording data in the user's cloud account*
- Time stamp and date
- Changed parameters and settings during operation
- Interface from which the ASD was accessed

The data is stored in a loop memory and overwritten (FIFO) after a usage-dependent time has elapsed.

Recording of data in the user's cloud account

A valid account in the cloud managed by the manufacturer is required to use MobileConfig. The user name and password assigned there are used to log in to MobileConfig. The following user data is stored in the cloud:

- User name
- Password
- Email address
- Telephone number
- First name, surname

User name and password are checked in the cloud for authenticity and validity. The account data is required for the identification of the user during operation and is not evaluated. If the account is deactivated, the user can request the manufacturer to delete the data irrevocably.

Data security measures

Data transmission between MobileConfig and the cloud is encrypted using HTTPS (TLS 1.2, AES 256 GCM, ECDHE RSA). Identity access management and two-factor authentication protect the data from unauthorised third-party access.

1.4 Other documents

Document	T-number
Data sheet ASD 2001, 2002, 2004	T 140 915
Material for the sampling pipe	T 140 928
Commissioning and maintenance protocol	T 140 921

2 Safety

2.1 Icons in this document

Particularly important notices are indicated by the following icons in this document:

Icon	Explanation
	Notice. Failure to comply may result in property damage.
	General information.
	Warning of electrostatic discharge. Contact with ESD-sensitive components may result in material damage.
	Environmental notice for the EU and Switzerland. Electrical and electronic devices must not be disposed of with household waste. As the end user you are legally obliged to return them. After use, electrical and electronic devices can be returned free of charge to the seller or to the designated collection points (e.g., municipal collection points or retailers). Correct disposal protects the environment. For more detailed information, please contact your waste disposal services.

2.2 Intended use

The ASD is intended for fire detection and fire incident control. To ensure proper functioning and precise detection behaviour, planning and project design as described in this document must be carried out before use.

The system may be used only by users who meet the Requirements for installers and end users. The user must comply with the safety guidelines, operating instructions and maintenance instructions described in this document. The user must comply with the applicable country-specific laws, regulations and guidelines; see Regulations, guidelines, approvals. Use outside the applicable regulations requires the explicit approval of the manufacturer.

2.3 Product changes

No changes may be made to the ASD. In the event of product changes, all warranty claims and the approval issued to the manufacturer are void.

2.4 Requirements for installers and end users

The ASD may be used only by installers and end users who

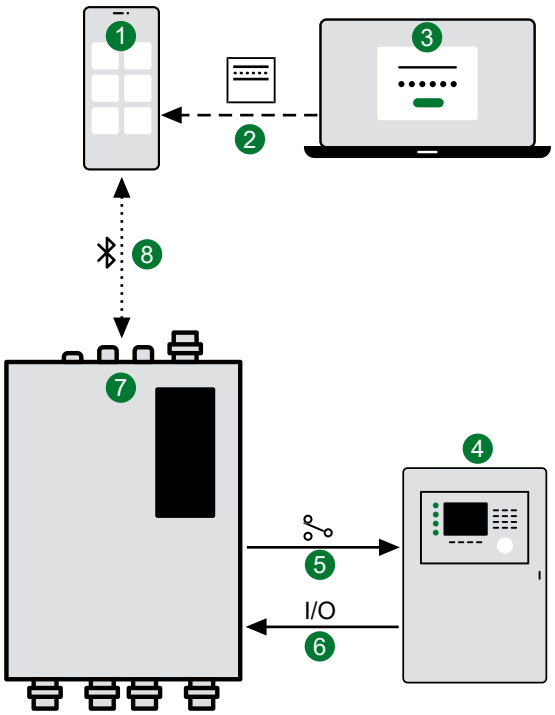
- have been trained directly by the manufacturer

or

- have been trained by third parties authorised by the manufacturer.

3 System description

3.1 ASD in the system context



1	MobileConfig
2	Parameter transfer with PipeFlow report
3	PipeFlow on PC
4	Fire alarm system
5	Control and communication via relay
6	Reset via reset input
7	ASD
8	Control and communication via Bluetooth

3.2 Intended use

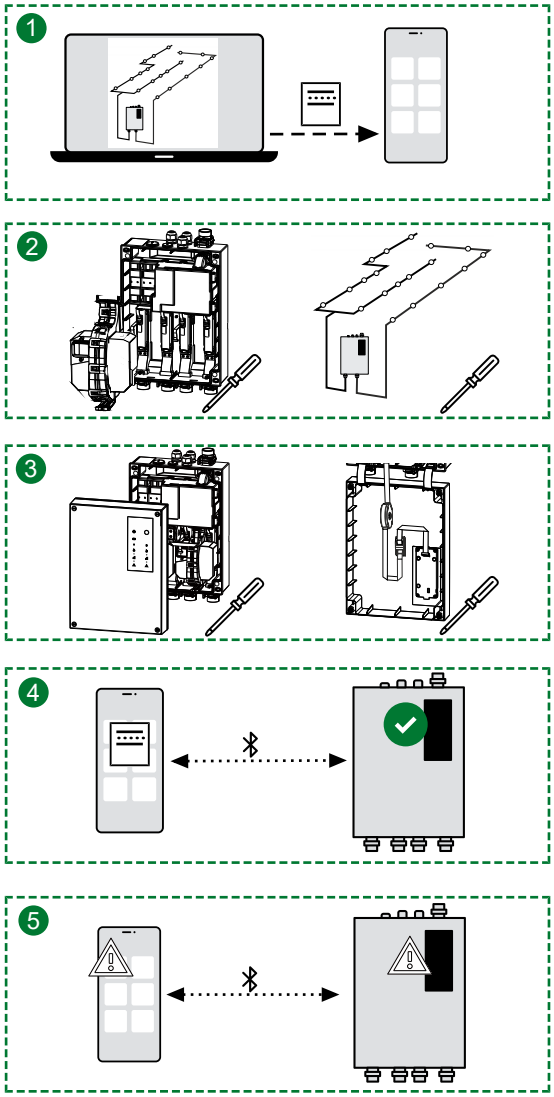
The ASD checks the ambient air for smoke particles. If the concentration exceeds an adjustable threshold value, the ASD triggers an alarm. In addition, a second alarm and 3 pre-signals can be configured. The ASD forwards the signals via relays to other fire alarm control panels.

3.3 Product versions

The ASD is available in the following versions:

Type	Number of channels	Number of airflow sensors	Number of smoke sensors
ASD 2001	1	1	1
ASD 2002	2	2	2
ASD 2004	4	4	2

3.4 Project phases



1	Planning and project management with PipeFlow
2	Mounting ASD and sampling pipe tube network
3	Installation of the ASD
4	Commissioning with MobileConfig
5	Maintenance as well as warning and fault rectification with MobileConfig

Planning and project design

Planning and project design are performed with PipeFlow. The application ensures conformity in accordance with the respective required standard.

Mounting

Mounting comprises the mounting of detector housing, smoke sensors, additional modules and sampling pipe tube network.

Installation

The installation comprises connection to the power supply and other system components (e.g., fire alarm control panels). It also includes the configuration of relays, inputs and outputs.

Commissioning

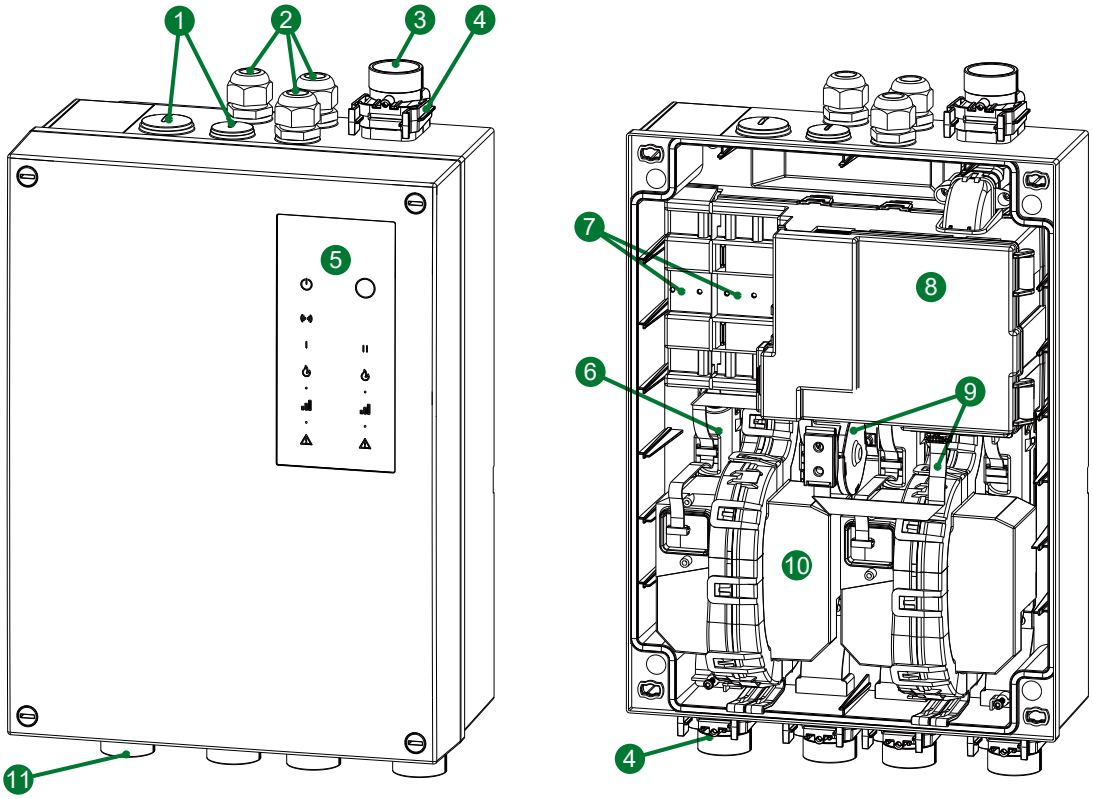
Commissioning the ASD is performed with MobileConfig. The parameters calculated during the planning and project design process with PipeFlow are then transferred to the ASD.

Maintenance

During maintenance and Warning and fault rectification, live values and recorded events can be read out with MobileConfig.

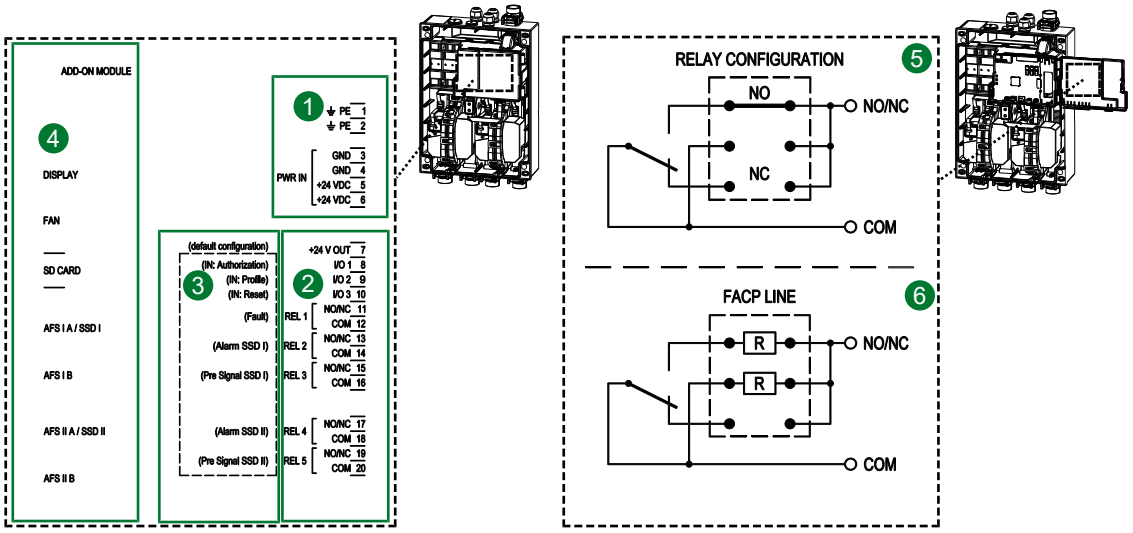
4 Components of the ASD

4.1 Design



1	Openings for additional connections
2	Cable screw unions for electrical connections
3	Air outlet / connection for returning the sampling pipe
4	Insect protection screen
5	Display panel
6	Airflow sensor
7	Shafts for additional modules
8	AMB mainboard cover
9	Pullback cable for connection to the housing cover
10	Smoke sensor
11	Connection for the sampling pipe Outlet side

Labels on the AMB cover



1	Power supply
2	Inputs and outputs as well as relay connections
3	Default configuration; can be subsequently changed
4	System components
5	Definition of the switching contact (NO/NC) with jumper
6	Resistor assembly for connection including quiescent current monitoring

4.2 Rating plate

The ASD and components of the ASD are identified with rating plates as shown below.

1	Type designation
2	Article number
3	Production version (DayMonthYear)
4	Approvals / approval marks
5	Response grade
6	Approval number
7	Current consumption
8	Document number of data sheet
9	Serial number
10	Manufacturer
11	Production date (day.month.year)

Rating plates and other markings on devices and printed circuit boards must not be removed, overwritten or otherwise rendered unrecognisable.

4.3 Smoke sensors

The ASD can be operated with smoke sensors of varying sensitivity. The required smoke sensor and sensitivity are calculated during planning and project design with PipeFlow. During commissioning, the smoke sensor is configured according to these values.

Type	Sensitivity range
SSD 1030	0.01-30%/m

NOTICE

If non-original smoke sensors are used, approval for the ASD in use becomes void.

The VdS approval is valid only for the use of the listed smoke sensors.

- Use only the listed smoke sensors.

NOTICE

Danger of irregular signal triggering with high sensitivities concurrent with strong temperature fluctuations.

A temperature fluctuation of 40 Kelvin can cause a signal deviation of up to 0.003% for a sensitivity of 0.001-0.1%/m. As a result, signals can be triggered irregularly.

- Select low sensitivities for high temperature fluctuations.

4.4 Fan

The fan of the ASD generates negative pressure, whereby ambient air is continuously sucked in. A higher fan speed enables larger tube networks and more sampling holes. At the same time, noise and energy consumption increase.

Parameters	Default value	Value range
Fan speed (rpm)	7,000	7,000-20,000

NOTICE

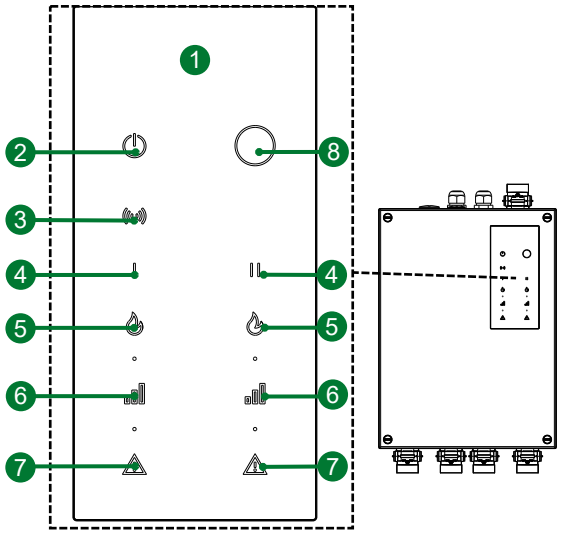
Changes to the fan speed change the transport time.

After a change in the fan speed, compliance with standards for the created project is no longer guaranteed.

- Every time the fan speed is changed, recalculate the project in PipeFlow. Compare results with the values set in MobileConfig. In the event of deviation, adjust values in MobileConfig.

Evaluating the motor speed enables you to detect whether the fan is blocked. If the specified threshold is undershot, the fan supply is deactivated and a fault is triggered.

4.5 Indicators



1	Display panel
2	Power LED green
3	Bluetooth LED blue
4	Channel
5	Alarm LED red
6	Orange LED (pre-signal / smoke level)
7	Fault LED yellow
8	Operation button with LED white

Display	Visualisation	Meaning
Power LED green	Off	ASD inactive
	Lights up	ASD active
Bluetooth LED blue	Off	No active Bluetooth connection
	Flashes at 1 Hz	User authorised
	Flashes at 10 Hz	Unauthorised connection active
	Lights up	Bluetooth connection active
Alarm LED red	Lights up	Alarm active
	Off	No active alarm

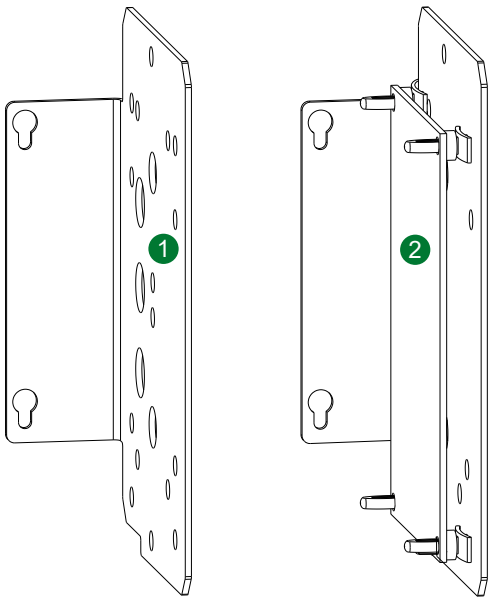
Display	Visualisation	Meaning
Orange LED (default pre-signal)	Off	No active pre-signal
	Flashes at 0.5 Hz	Pre-signal 1 active
	Flashes at 1 Hz	Pre-signal 2 active
	Flashes at 2 Hz	Pre-signal 3 active
Orange LED (smoke level display)	Off	Smoke level less than 10% above alarm threshold
	Flashes	▸ Smoke level more than 10% above alarm threshold ▸ Flashing corresponds to 10% smoke level ▸ A display sequence always lasts 10 seconds and ends with an additional second without flashing ▸ Example of smoke level of 36%: Flashes 3 times, then no flashing for 8 s
Fault LED yellow	Off	
	Flashes	Warning active
	Lights up	Fault active
Control button LED white	Flashes	ASD starts
	Lights up	ASD ready for operation

4.6 Additional modules

4.6.1 UMS

With the UMS universal module support, additional modules from the manufacturer or additional modules from third-party providers can be integrated in the ASD. The UMS must be ordered separately.

To enable installation, two slots for additional modules must be removed; see Design and Installing additional modules. The additional module must be fastened to the UMS before installation.



1	Universal module support
2	Third-party module mounted on universal module support

4.7 Sampling pipe tube network

The sampled ambient air is transported to the ASD via the sampling pipe tube network. It consists of several sampling tubes with sampling holes in different diameters and designs. For room monitoring, the sampling pipe tube network is usually mounted on the ceiling. In equipment monitoring, there are various types of installation depending on the application.

The sampling pipe tube network is created by the user in 3D during Planning and project design with PipeFlow. PipeFlow calculates the amount of material required.

4.8 Mobile app

The mobile app MobileConfig is an application for configuration and control of the ASD via Bluetooth and for reading out data.

4.9 PipeFlow

Tasks of PipeFlow:

- Plan special fire detector projects based on floor plans in 3D.
- Determine technical parameters for the ASD configuration during Commissioning.
- Calculate the smoke sensor sensitivity for Commissioning.
- Optimise the design of the sampling pipe tube network.
- Determine the required material for the sampling pipe tube network.

▸ Create project report.

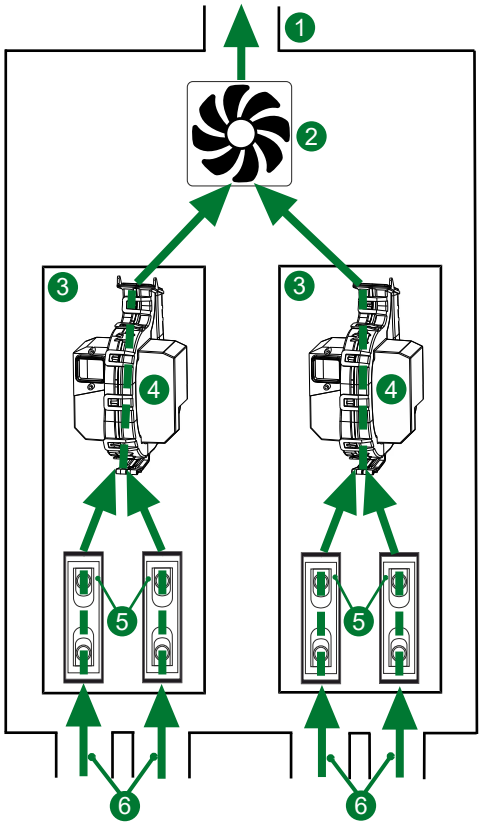
See also: Planning and project design with PipeFlow.

Material selectable in PipeFlow is a component of VdS approval.

See also the document Material for the sampling pipe.

5 Functions of the ASD

5.1 Operating principle



1	Air outlet
2	Fan
3	Detection unit
4	Smoke sensor
5	Airflow sensor
6	Supply duct

The ASD uses a fan to continuously draw in ambient air via a Sampling pipe tube network. The sampled air is conducted through highly sensitive smoke sensors and then released again. The Airflow monitoring ensures that the sampled air flows to the smoke sensor in the correct amount and at the correct speed.

The smoke sensors analyse the smoke particle concentration in relation to adjustable threshold values and tolerance ranges. If a threshold value is outside the tolerance range, the ASD signals alarms or pre-signals.

Relays as well as inputs and outputs enable:

- Forwarding alarms and pre-signals to fire alarm control panels or other devices and systems.

- Remote control of ASD functions.

5.1.1 Alarms and pre-signals

Alarms and pre-signals are set for the first time during Commissioning with the MobileConfig. Both signals react to the detection of a smoke concentration above a definable threshold value. The response behaviour can also be set with the parameters Delay and Latching.

Alarm

Main signal of the smoke detection process. Triggered when a smoke concentration is detected above the alarm threshold defined by the standard.

Parameters	Default value	Value range	State/Unit
Threshold	0.6	SSD 1030: 0.01-30	%/m
Delay time	2	0-60	s
Latching	On	On/Off	

Alarm 2

Optional follow-up signal of the alarm signal. Triggered when a smoke concentration above an adjustable alarm threshold is detected. Always either less sensitive than the main alarm or equally sensitive.

Parameters	Default value	Value range	State/Unit
Threshold	1	SSD 1030: 0.01-30	%/m
Delay time	2	0-60	s
Active	On	On/Off	
Latching	On	On/Off	

Pre-signal 1-3

Optional, flexibly adjustable signals. Triggered when a smoke concentration is detected above an adjustable threshold below the alarm threshold. Always more sensitive than Alarm and Alarm 2. Up to 3 pre-signals can be set. Pre-signals are entered as relative values by default. In MobileConfig, pre-signals can optionally be entered as absolute values.

Parameters	Default value (relative)	Value range	State/Unit
Threshold	Pre-signal 1: 30 Pre-signal 2: 50 Pre-signal 3: 70	Relative: 10-90	%
		Absolute: SSD 1030: 0.001-27	%/m
Delay time	2	0-60	s
Active	Off	On/Off	
Latching	Off	On/Off	

5.1.2 Delay

For all Alarms and pre-signals as well as for Airflow monitoring, an adjustable time period that must elapse after the detection of a threshold value is exceeded before the corresponding signal is triggered.

5.1.3 Latching

Latching can be activated for Alarms and pre-signals, Airflow monitoringand other events.

Behaviour with active latching:

- The triggered signal remains active until it is reset.
- The relay of the triggered signal and the LED display remain active until reset.
- The triggered signal is displayed in MobileConfig under **Dashboard > Pending events**.

Behaviour with inactive latching:

- The triggered signal remains active as long as the criterion required for the signal is fulfilled.
- The relay of the triggered signal and the LED display remain active as long as the criterion required for the signal is fulfilled.
- The triggered signal is displayed in MobileConfig under **Dashboard > Pending events**.

5.2 Airflow monitoring

Airflow monitoring detects deviations from the airflow setpoint within defined limits and signals a warning or fault if the value is exceeded or undershot; see Indicators.

Warning

Warning is a pre-stage of the fault and is displayed as a signal on the display panel and in MobileConfig.

Fault

Fault is displayed as a signal on the display panel and in MobileConfig. The fault relay is also actuated; see Relays.

Airflow setpoint

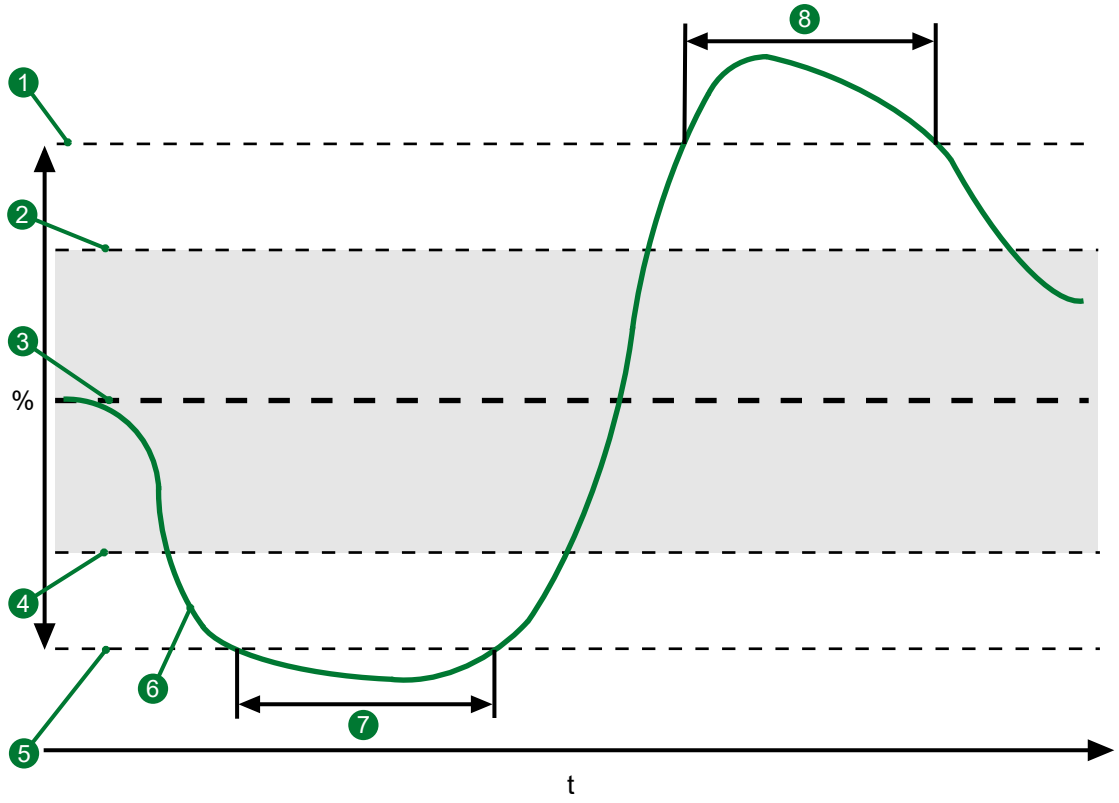
The 100 percent setpoint of the airflow is defined during Airflow normalisation.

Airflow parameters

During commissioning, the following parameters can be defined for airflow monitoring with MobileConfig:

Parameters	Default value	Value range	State/Unit
Positive deviation (fault)	On	On/Off	
Negative deviation (fault)	On	On/Off	
Positive deviation (warning)	Off	On/Off	
Negative deviation (warning)	Off	On/Off	
Positive deviation (fault)	15	1-100	%
Negative deviation (fault)	15	1-100	%
Positive deviation (warning)	10	1-100	%
Negative deviation (warning)	10	1-100	%
Latching	On	On/Off	
Delay	280	10-3600	s

5.2.1 Principle of airflow monitoring



1	Positive threshold for fault
2	Positive threshold for warning
3	100 percent setpoint
4	Negative threshold for warning
5	Negative threshold for fault
6	Airflow
7	Airflow below negative threshold for fault, [delay time] exceeded: Fault is triggered
8	Airflow above the positive threshold for fault, [delay time] not exceeded: Fault is not triggered

Condition for fault trigger

- The currently measured airflow actual value is more than [Positive deviation] over the setpoint.

or

- The currently measured airflow value is more than [Negative deviation] below the setpoint.

and in both cases

- The deviation lasts more than [Delay time].

Settings for airflow monitoring compliant with EN 54-20

For airflow monitoring compliant with EN 54-20, the airflow values must be set as follows:

- Positive deviation (fault): 15%
- Negative deviation (fault): 15%
- Delay deviation: 280 s

Settings for airflow monitoring compliant with UL 268

For airflow monitoring compliant with UL 268, the following must be set:

- Delay: 70 s

5.3 Smoke sensor monitoring

Amongst other things, the smoke sensor monitoring signals soiling or failure of a smoke sensor. All smoke sensor faults and warnings are described in Warning and fault rectification.

Dependence on degree of soiling and response sensitivity

The displayed degree of soiling depends on the set response sensitivity. With increasing response sensitivity, the same degree of soiling of the smoke sensor increases the displayed degree of soiling.

Event	Message	Degree of soiling (%)
Soiling (dirty)	Fault	75
Soiling (dirty)	Warning	50

5.4 Relays

Relay assignment

Unit	Relay designation	Function/events	Switching contact [1]
AMB	REL 1: Fault	Fault (all events), ASD inactive	NO [2]
	REL 2: SSD I alarm	SSD I alarm release	NO
	REL 3: SSD I pre-signal	Pre-signal triggering SSD I	NO
AEB	REL 4: SSD II alarm	SSD II alarm release	NO
	REL 5: SSD II pre-signal	Pre-signal triggering SSD II	NO

5.5 Inputs and outputs

Unit	Terminal designation	Function	Behaviour
AMB	I/O 1	Authorisation	Authorises the user to access the ASD with MobileConfig.
AMB	I/O 2	No function	-
AMB	I/O 3	Reset and inactive switching	▸ Reset is actuated if input is active for more than 0.5 and less than 10 seconds. ▸ ASD is switched inactive if input is active for more than 20 seconds. ASD triggers a fault and the fan is switched off.

[1] The Wiring via relay contacts can be changed by moving wire bridges.

[2] REL 1 is picked up in the quiescent state, failsafe (ASD in operation, no fault event).

5.6 Mobile app

MobileConfig guides the user through the application with intuitive navigation.

The following sections show the basic functions.

5.6.1 Functional description

MobileConfig offers the following functions:

- Guided commissioning of the ASD
- Indicators of current events and live values
- Reading out the event memory
- Sharing of log data, events and commissioning report
- Update firmware
- Control functions such as smoke sensor isolation

5.6.2 Cloud login

The use of MobileConfig requires a valid account in the cloud managed by the manufacturer and user authorisation available from the manufacturer. The account can be created at https://securiton.sop.swiss.

Authorisation levels:

- Demo: Demo mode without ASD connection
- Operator: Indicators, limited control
- Technician: Indicators, complete control, configuration

After opening MobileConfig, the **Cloud login** page appears.

- **Log in:**

1. Select the target cloud.
2. Tap **Login**.
   ⇨ The login page opens.
3. Enter user name, email address and password.
4. Tap **Login**.

5.6.3 Device list

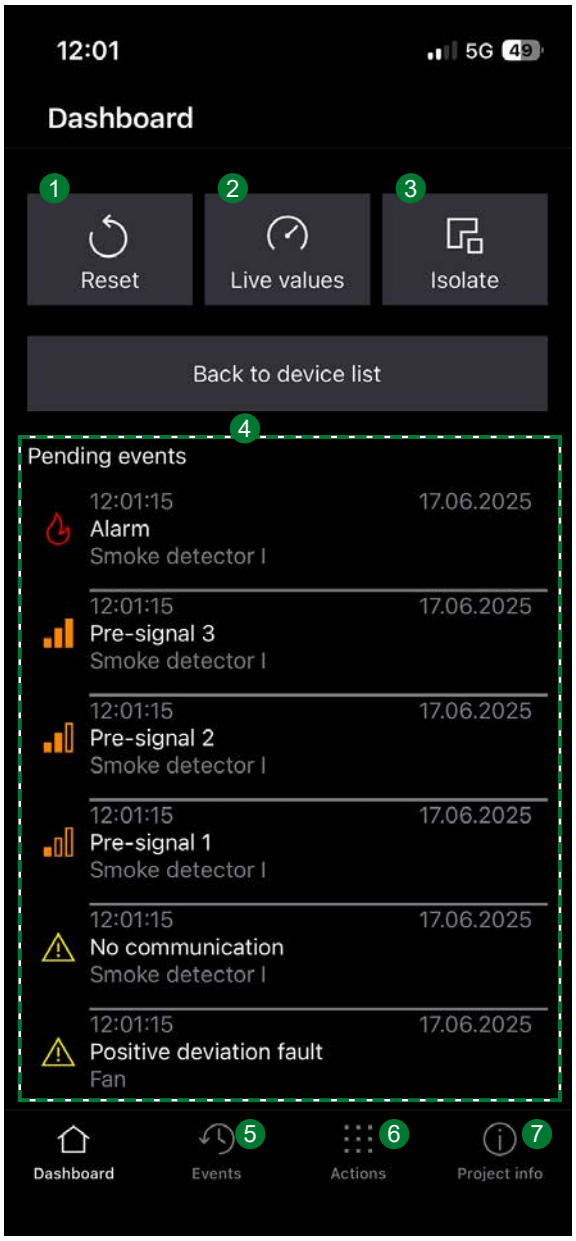
The device list shows all ASDs found in the environment by the mobile device used. The ASDs are displayed ex works with their serial numbers (e.g., ASD0000000000).

▸ **Select the device to be accessed with the MobileConfig:**

1. Tap the name of the desired device.

⇨ The dashboard opens.

5.6.4 Dashboard



The dashboard is the home page of MobileConfig. Here the user will find:

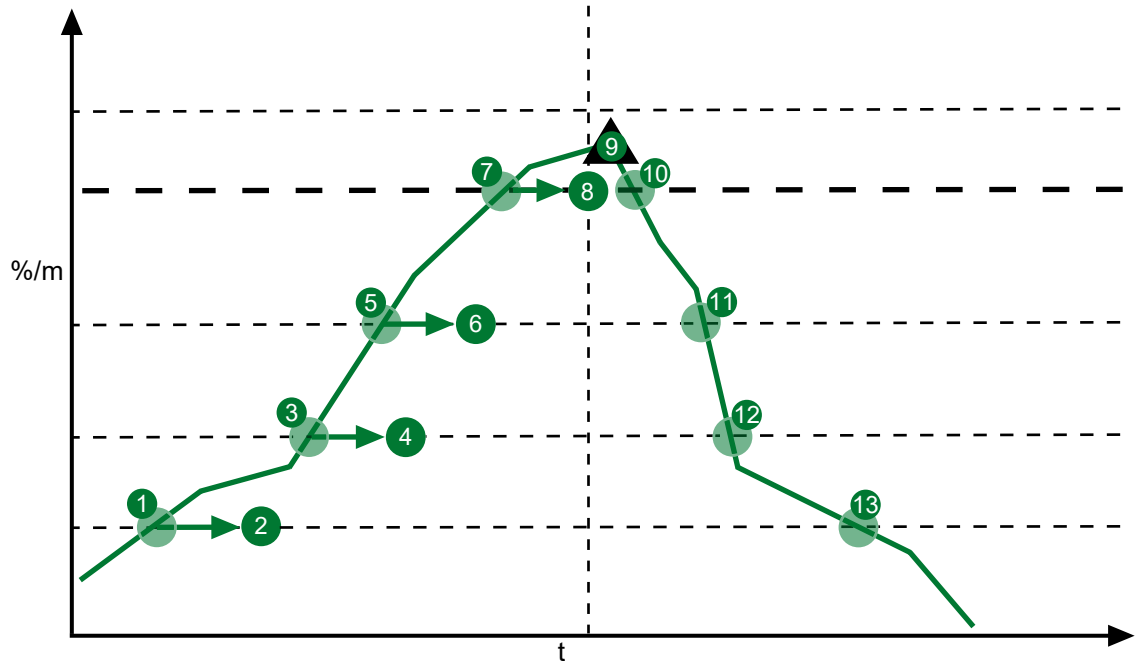
- Direct access to the functions **Reset** 1, **Live values** 2 and Isolate 3
- A list of pending events 4
- Direct access to Events 5, Actions 6 and Project information 7

5.6.5 Events

The ASD stores up to 20,000 events that can provide important information for Maintenance and for Warning and fault rectification. Events from the following categories are displayed in MobileConfig:

Category	Explanation
Single event	Single occurring event.
Multiple event	A group of different events that occur in succession in the same context. Example: The alarm event consists of the events pre-signal threshold value and pre-signal as well as alarm threshold value and alarm (see diagram below).
Audit log event	Any interaction with the ASD with details of the application, user, interface and time.

Diagram of a multiple event using alarm as an example

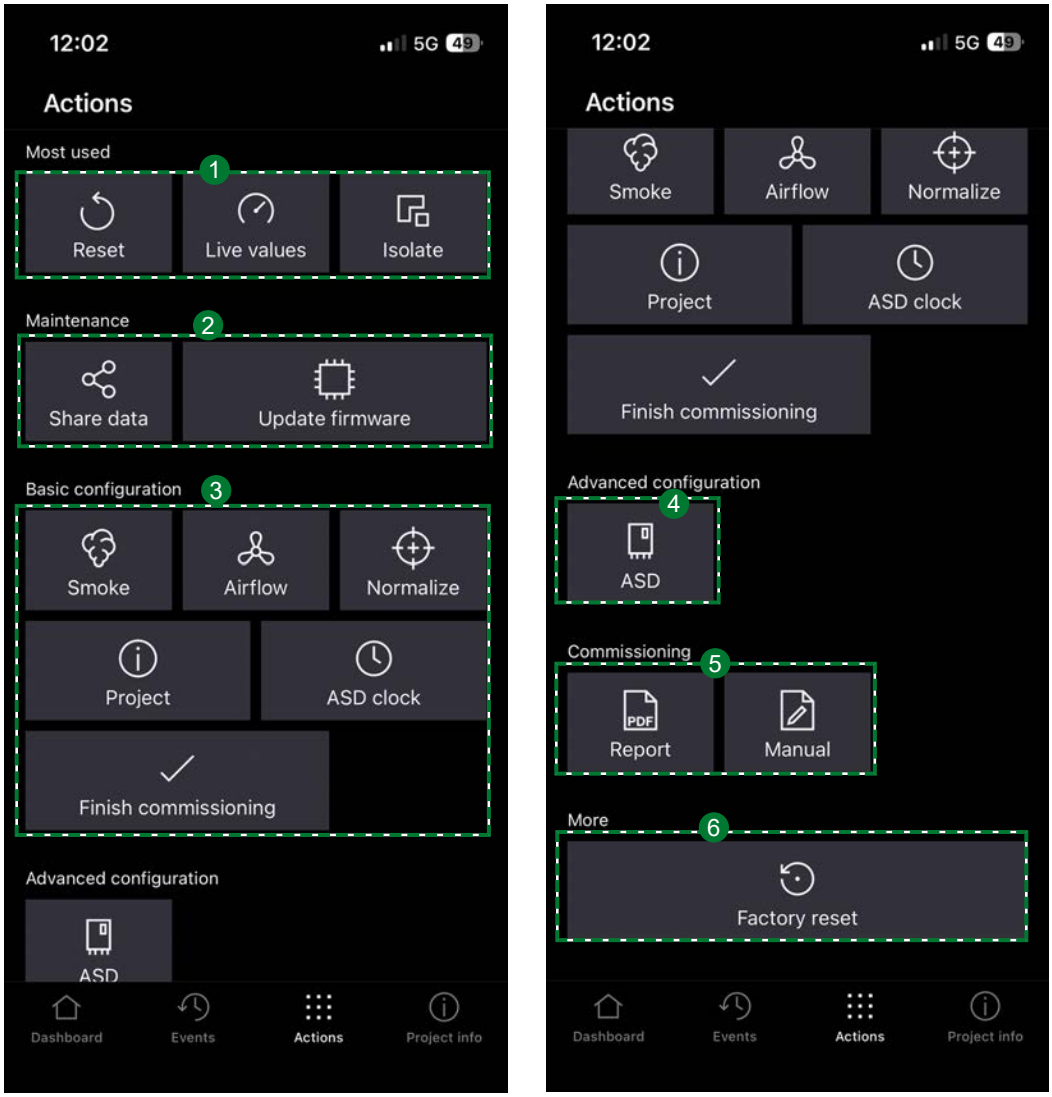


1	Pre-signal 1 (threshold exceeded) – start of the multiple event
2	Pre-signal 1 (event triggered after delay time)
3	Pre-signal 2 (threshold exceeded)
4	Pre-signal 2 (event triggered after delay time)
5	Pre-signal 3 (threshold exceeded)
6	Pre-signal 3 (event triggered after delay time)
7	Alarm (threshold exceeded)
8	Alarm (event triggered after delay time)
9	Peak value
10	Alarm (undershot threshold)
11	Pre-signal 3 (threshold undershot)
12	Pre-signal 2 (threshold undershot)
13	Pre-signal 1 (threshold value undershot) – end of multiple event

Data protection when storing events

Section Data protection explains how the data collected during event storage is processed and protected.

5.6.6 Actions



The following functions can be accessed under Actions:

Most used 1

- Reset
- Live values
- Isolate

Maintenance 2

- Share data
- Update firmware

Basic setting 3

- Smoke
- Airflow
- Normalise

- Project
- ASD time
- Finalise commissioning

Advanced settings 4

- Ethernet
- ASD

Commissioning 5

- Manual

More 6

- Reset to factory settings

5.6.7 Project information

Project information displays the following information:

ASD

- ASD name
- Installation location
- Serial number

Project

- Project name
- Reference number
- System provider
- Client details

6 Planning and project design

The following section is a guideline for planning and project design for special fire detector systems with the ASD for standards-compliant room monitoring and equipment monitoring.

6.1 Regulations, guidelines, approvals

The use of the ASD is subject to country-specific regulations and guidelines and must be approved by the relevant specialist departments, authorities or insurance companies. Specific planning guidelines and other country-specific regulations apply for certain applications. All regulations and guidelines can be requested from the manufacturer or from the responsible specialist departments and authorities. The manufacturer has planning examples for various applications.

When planning and using the ASD, country-specific regulations and guidelines always take precedence over the guidelines described in this document.

6.2 General system limits compliant with EN 54-20

When using the ASD compliant with EN 54-20, the following system limits must be observed. The system limits are automatically adhered to during Planning and project design with PipeFlow.

	Class A	Class B	Class C
ASD 2004			
Maximum overall length of the sampling pipe tube network per ASD (m)	700		
Maximum overall length of the sampling pipe tube network per smoke sensor (m)	400		
Maximum overall length from the detector housing to the farthest sampling hole per channel (m)	70	90	90
Maximum number of sampling holes per ASD	62	160	240
Maximum number of sampling holes per channel	15 -16	40	60

6.3 Planning and project design requirements

Differences in air pressure

If ASDs and pipes are to be installed in areas with different air pressures, an air re-circulation conduit must be planned.

Environmental conditions

Observe the environmental conditions under Technical data. Consult the manufacturer for planning outside the environmental conditions.

Dust load and humidity

Use accessories available from the manufacturer if there is a high level of dust or dirt or if there is a high level of humidity outside the environmental conditions. Observe maintenance positions for heavy soiling (dirty).

Pipe network

90-degree bends are aerodynamically more favourable than 90-degree angles. Preferably use 90-degree bends for changes of direction. Please note: changes in direction increase the detection time. The specified maximum tube length must not be exceeded.

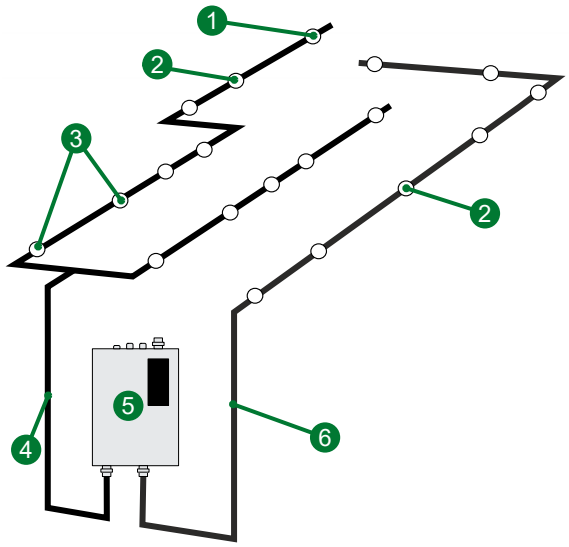
Material for the sampling pipe

When designing the tube network, only materials that are listed in the document Material for the sampling pipe or that comply with the Material requirements for the sampling pipe may be used. The use of other materials requires the written consent of the manufacturer.

Maintenance holes for hard-to-reach sampling pipe

In applications with sampling holes that are difficult to access, a maintenance hole makes it easier to check alarm and fault triggering. The maintenance sampling hole must be closed with a maintenance clip during normal operation.

6.4 Planning and project design with PipeFlow



1	Farthest sampling hole
2	Sampling branch
3	Sampling holes
4	Tube network 1
5	ASD
6	Tube network 2

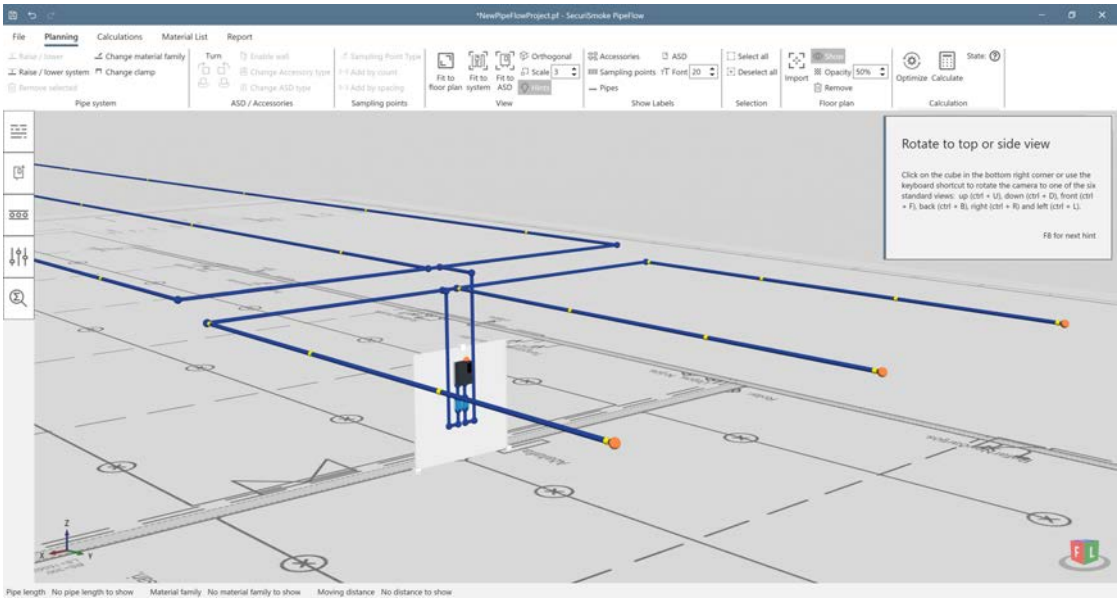
Planning and project design with PipeFlow

Special fire detector systems are projected and planned with the PipeFlow application. The floor plan of the room to be monitored serves as the basis.

PipeFlow automatically calculates all parameters for the configuration of the ASD and the technical design of the sampling pipe tube network in accordance with the selected standard.

Basic planning steps with PipeFlow:

1. Import floor plan.
2. Draw the sampling pipe tube network in 3D.
3. Place sampling holes on the pipes.
4. Add ASDs and accessories.
5. Optimise and calculate project.



⇨ PipeFlow determines the required smoke sensor sensitivity for Commissioning.

⇨ PipeFlow creates a subsequently configurable material list

⇨ PipeFlow creates a report with:
- Project information
- 3D graphic of the project with freely definable views
- Calculation results with smoke sensor sensitivity and technical details
- Detailed overview of the sampling points
- Material list

Renovating existing systems with new ASDs

If smoke detectors are replaced by ASD 2001, ASD 2002, ASD 2004 when renovating existing systems, the existing sampling pipe tube network must be recalculated with PipeFlow. Before commissioning, the existing sampling pipe must be cleaned and checked for damage.

6.5 Room monitoring

6.5.1 Applications for room monitoring

The ASD can be used for room monitoring for the following applications:

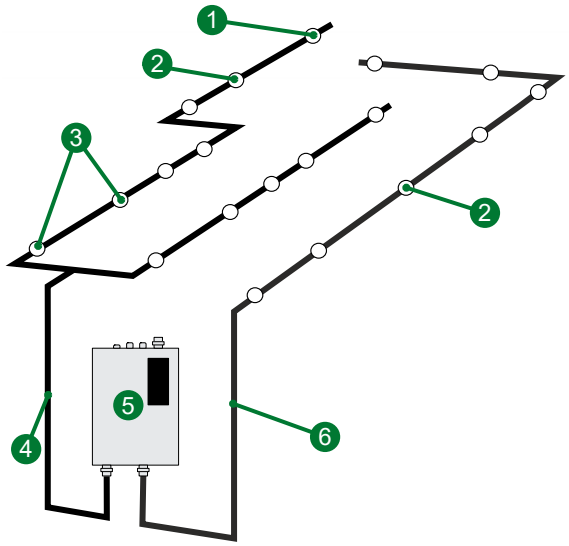
- If the mounting of point detectors is not technically possible (e.g., in cable floors, cable tunnels, false ceilings, hollow floors, machine halls, production halls, low- and high-voltage rooms, computer rooms or clean rooms)
- In extremely high rooms where monitoring is required on several levels (e.g., in high-bay storage)
- If point detectors are not acceptable for aesthetic reasons (e.g., in museums or cultural assets)

- Where point detectors can be damaged (e.g., in prison cells or in public spaces)
- In spaces with localized smoke development (e.g., in warehouses with forklift traffic)
- In rooms with high levels of dust or high humidity

6.5.2 Principles for room monitoring

- Country-specific and application-specific guidelines apply to the area to be monitored for each ASD. For orientation, the values for point type smoke detectors apply.
- Only one room may be monitored per ASD. Observe exceptions, as specified in, for example, DIN VDE 0833-2 and VKF.
- Observe the permissible maximum heights in the applied guidelines. If information is missing, refer to Table 3 of the FIA Code of Practice.
- Starting at a height of 16 metres, take into account the manufacturer, insurer and fire brigade.

6.5.3 Design examples for room monitoring



1	Farthest sampling hole
2	Sampling branch
3	Sampling holes
4	Tube network 1
5	ASD
6	Tube network 2

6.6 Equipment monitoring

6.6.1 Equipment monitoring applications

Equipment monitoring is installed in addition to room monitoring. Machines, devices or equipment are monitored directly, for example:

- Electrical cabinets with or without forced ventilation
- Data centres
- Cabinets with or without ventilation
- Devices or machines in the manufacturing industry
- Transmitting and transmission systems
- After consulting with the manufacturer: Vacuum chambers in the chemical industry

6.6.2 Principles of equipment monitoring

- The use of PipeFlow for planning and project design is imperative.
- Observe country-specific application guidelines.
- Use EN 54-20, Class A or B.
- Sampling fixtures on the equipment to be monitored must be supplied with the air flowing from the equipment ventilation system. If possible, distribute sampling holes per sampling fixture symmetrically over the ventilation slot of the device.
- Use a sampling funnel on equipment with strong ventilation (see Material for the sampling pipe).
- Avoid false alarms.

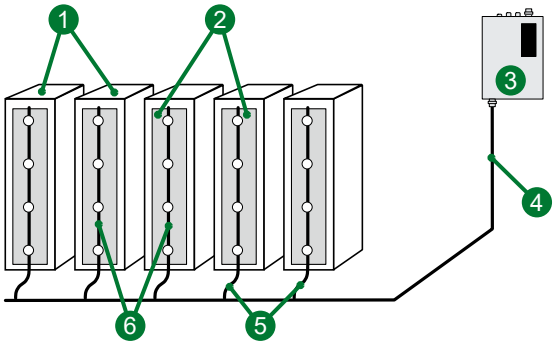
Sampling fixtures and sampling holes for equipment monitoring

The size and number of sampling holes depend on the size of the ventilation slot of the object to be monitored. The following reference values apply:

Size of ventilation slot, length × width (cm)	Shape of the sampling fixture	Number of sampling holes	Hole diameter (mm)
< 20 × < 15	I	2	According to calculation with PipeFlow
< 30 × < 15	I	3	
< 40 × < 15	I or T	4	
< 80 × < 20	T	4	
< 40 × < 40	U	4	
> 40 × > 40	H	4	

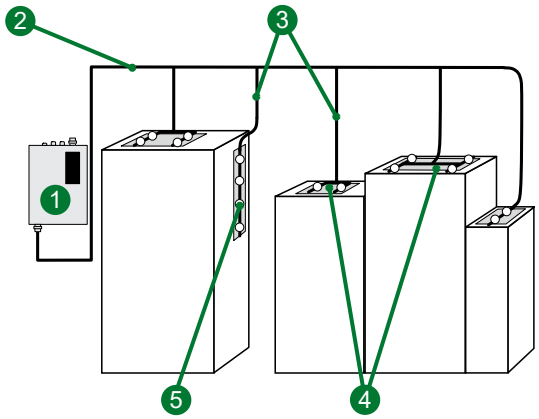
6.6.3 Design examples for equipment monitoring

Pipe routing through hollow floor



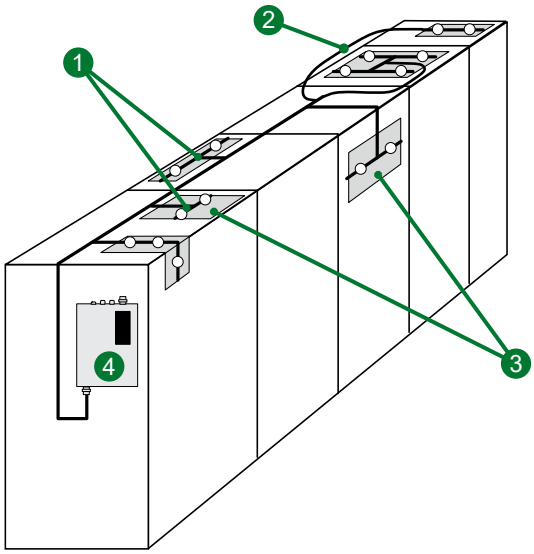
1	Rear view of computer units
2	Ventilation slots
3	ASD
4	Supply line / trunk line in hollow floor
5	Flexible sampling branches
6	Sampling fixtures with sampling holes

Pipe routing from wall or ceiling



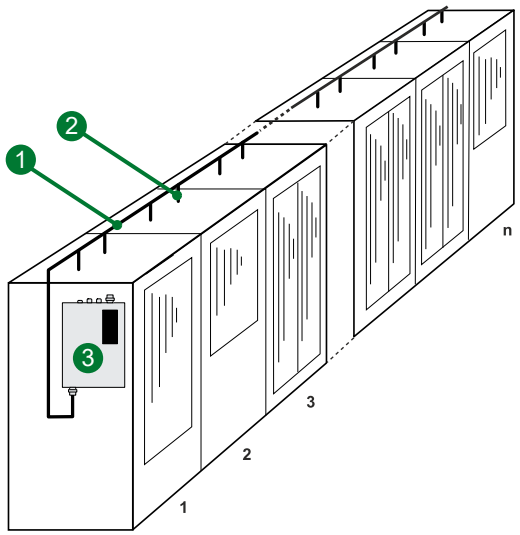
1	ASD
2	Supply line / trunk line
3	Rigid or flexible sampling branches
4	Ventilation slots
5	Sampling fixtures with sampling holes

Direct installation on ventilated EDP cabinets



1	Sampling fixtures with sampling holes
2	Flexible sampling branch
3	Ventilation slots
4	ASD

Direct mounting on electrical cabinets without ventilation

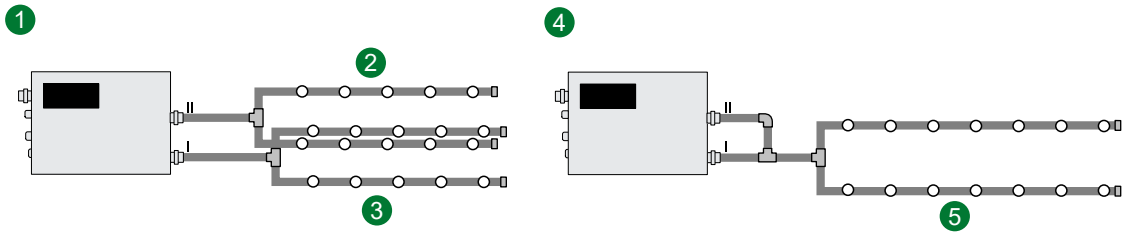


1	Supply line / trunk line
2	Sampling stub with sampling hole in the end cap
3	ASD

6.7 2-detector dependency

ASD 2002 and ADS 2004 can be used with a 2-detector dependency. The sampling pipe tube network can be designed as single or duplicate. When monitoring with a single sampling pipe tube network, the tube inputs must be merged before entry into the detector housing. The smoke sensors must be evaluated independently of each other.

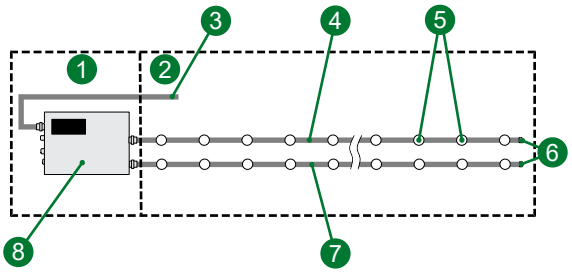
When monitoring extinguishing areas, a duplicate layout of the sampling pipe tube networks is required. The country-specific guidelines must be observed.



1	Double tube network
2	Tube network II
3	Tube network I
4	Single tube network, merged
5	Tube network I

6.8 Air re-circulation conduit planning

If ASDs and pipes are to be installed in areas with different air pressures, an air re-circulation conduit must be planned. PipeFlow must be used for planning. Multiple returns not permitted to be merged.



1	Air pressure zone 1
2	Air pressure zone 2
3	Air re-circulation conduit, pipe end open
4	Tube network 1
5	Sampling holes
6	End caps
7	Tube network 2
8	ASD

6.9 Planning the electrical installation

Country-specific regulations, standards and guidelines apply.

Requirements for installation cables and conductor cross-section

- Use commercially available installation cables.
- In some countries, special fire alarm cables are required.
- Minimum wire diameter: 0.8 mm (cross-section 0.5 mm²).

To ensure that the maximum required current consumption is available on the ASD, the conductor cross-section must be calculated based on the conductor length.

Calculation formula

$$A = \frac{I \; x \; L \; x \; 2}{\gamma \; x \; \Delta U}$$

- I = Current consumption (A)
- 2 = Factor for return line
- L = Single line length (m)
- γ = Conductivity, Cu = 58 MS/m

- ΔU = Voltage drop (V)

Calculation example

- ASD 2002
- Alarm state for SSD I and SSD II
- Line length = 300 m
- 24 VDC operation

$$\frac{0.468\ A\ x\ 300\ m\ x\ 2}{58\ MS/m\ x\ 5\ V} = 0.97\ \text{mm}^2$$

- Required conductor cross-section = 1.0 mm²

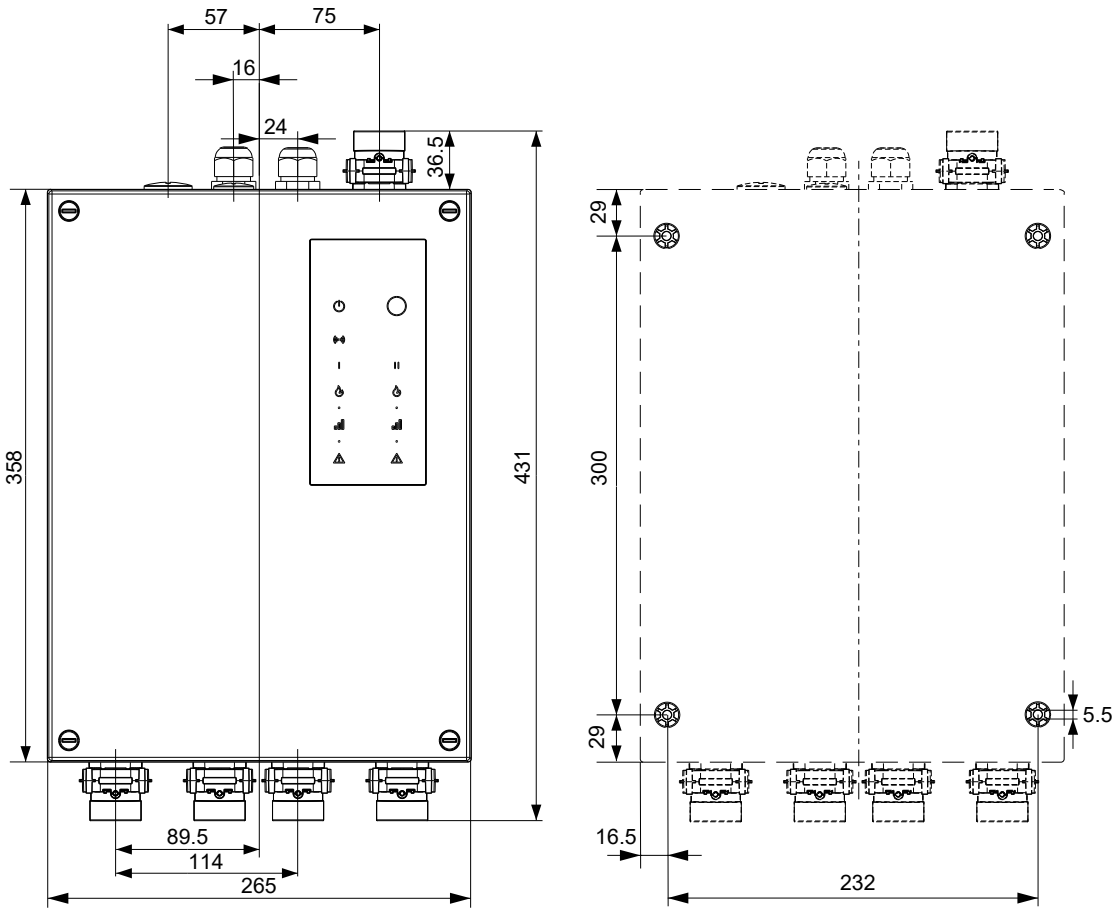
7 Mounting

7.1 Aids for mounting

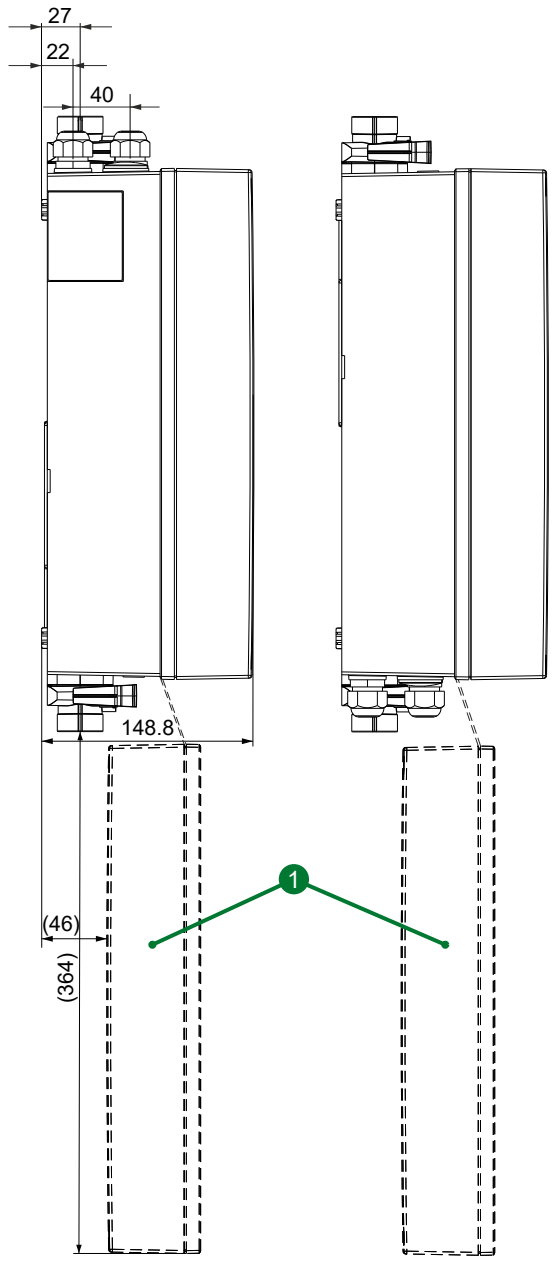
The following aids are required for mounting:

Aids	Assembly step
Screwdriver Torx T10	▸ Fasten housing hinges ▸ Mount UMS
Screwdriver Torx T20	Fasten the detector housing to the wall using the enclosed screws
Screwdriver Torx T10	Optional vandal-proof design for Mount insect protection screen

7.2 Dimensions



Front and back, dimensions in mm

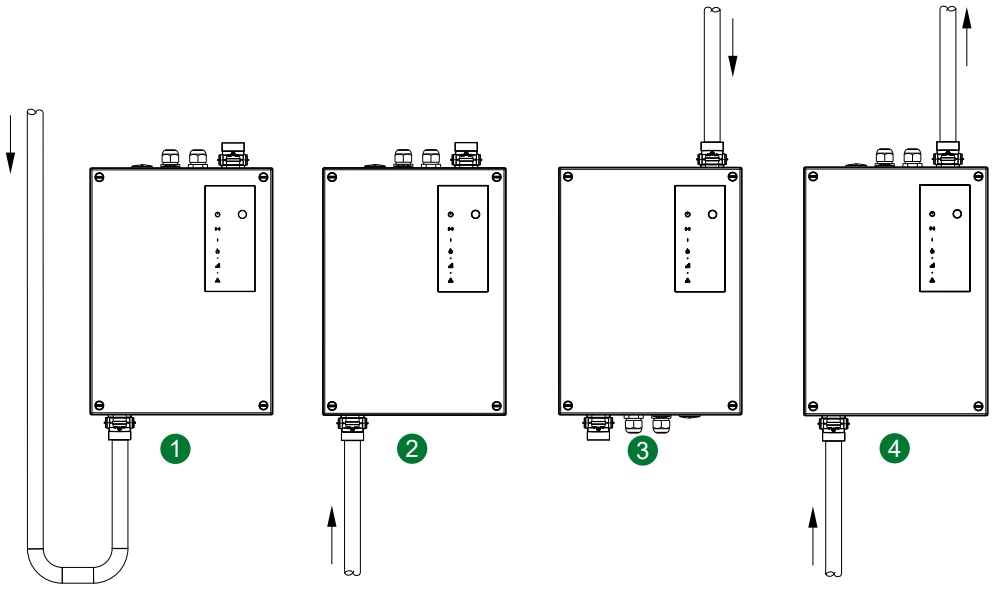


Side view and side view turned 180 degrees during mounting, dimensions in mm

1	Space required for open detector housing

7.3 Mounting positions

When using accessories, the required space requirements must be included.



1	Sampling pipe arriving from above
2	Sampling pipe arriving from below
3	Housing base rotated 180 degrees
4	Return of the sampling pipe

7.4 Material requirements for the sampling pipe

The material requirements are based on the selected standard and are part of the corresponding device approval.

The material listed in the document Material for the sampling pipe corresponds to the device approval.

Material that is not purchased from the manufacturer must meet the following requirements:

- Classification according to at least EN 61386-1, Class 1131
- Compliant with EN 54-20
- Impact resistance: at least 0.5 kg at a fall height of 100 mm (EN 61386-1)
- Compression resistance: at least 125 N (EN 61386-1)
- Temperature range: at least –15°C to +60°C (EN 61386-1)
- Inner diameter of tube: 19 to 22 mm
- Bending radius of bend: at least 30 mm

7.5 Mounting the sampling pipe tube network

Fastening the sampling pipe

The sampling pipe is locked in place using pipe clamps at 1-metre intervals.

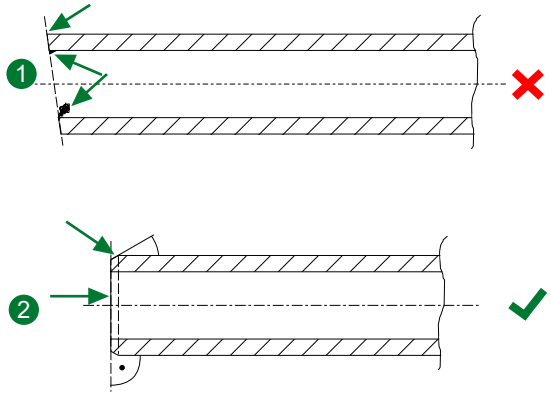
7.5.1 Tubes and fittings

Tube diameter

The tube sockets of the ASD are designed for the following tube outer diameters:

- 25 mm
- 3/4-inch with definition outer diameter 26.9 mm

7.5.2 Cutting tubes to length



1	Incorrect: Bevelled cut edge, pressure points, burrs
2	Correct: Straight cut edge, 30-degree chamfer

Cutting tubes to length

1. Use a pipe cutter to shorten the tubes to the required size. Make sure to the cut at right angles to the pipe axis.
2. Remove all burrs.
3. Bevel the pipe ends slightly with a pipe peeler.

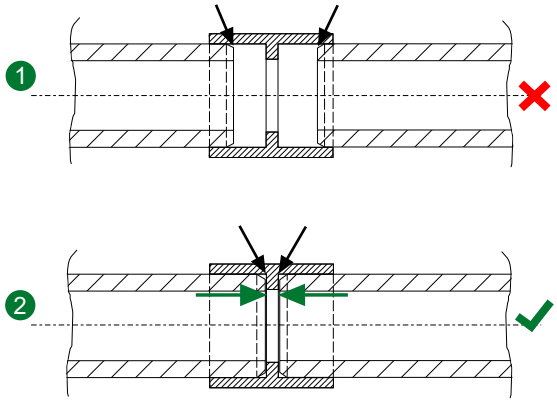
7.5.3 Assemble tubes

NOTICE

If pipe connections are leaking, air can penetrate the sampling pipe tube network.

Air entering the sampling system from the outside can falsify the detection results.

- Ensure tightness when connecting tubes.

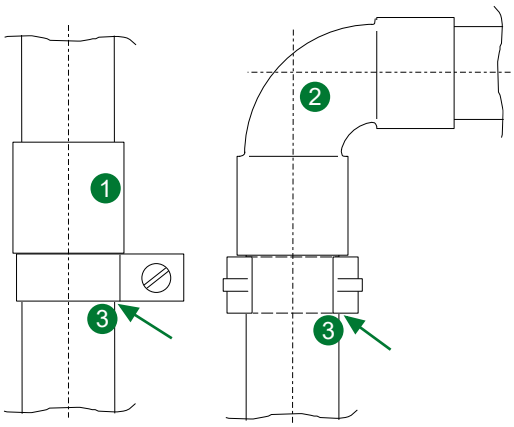


1	Incorrect: Tubes not pushed into the sleeve to the stop
2	Correct: Tubes pushed into the sleeve to the stop

Gluing tubes together

1. Remove dust and grease residues from bonding surfaces on the pipe ends with PVC/ABS cleaner.
2. Apply PVC/ABS adhesive to the bonding surfaces on the pipe ends.
3. Push both pipe sections into the fittings to the stop with a gentle turning movement.

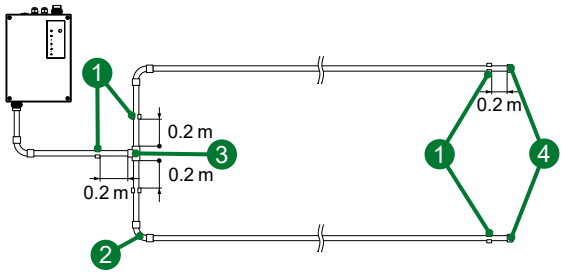
7.5.4 Mount the vertical sampling pipe



1	Sleeve
2	90-degree bend
3	Pipe clamp below fitting

- If the sampling pipe is arranged vertically, make sure that the tubes cannot slide downwards.
- Attach the pipe clamps directly below the fittings.

7.5.5 Mount 90-degree bends and branches



1	Pipe clamp
2	90° bend
3	T-piece
4	End cap

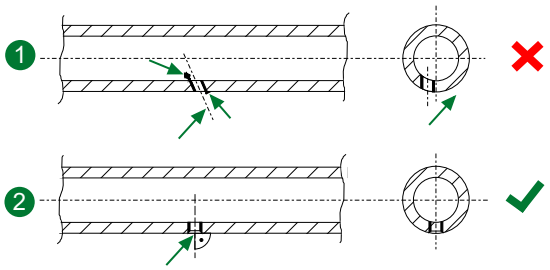
Pay attention to the linear expansion of the sampling pipe

Sampling tubes can expand lengthwise. A sampling pipe measuring 110 m can expand up to 176 mm within a temperature fluctuation of 20°C. The sampling pipe must therefore be able to move sufficiently in the longitudinal direction in the pipe clamps. A distance of 200 mm must be maintained from the last pipe clamp to a pipe fitting.

In the event of changes of direction, observe notices during planning and project design

See Planning and project design requirements.

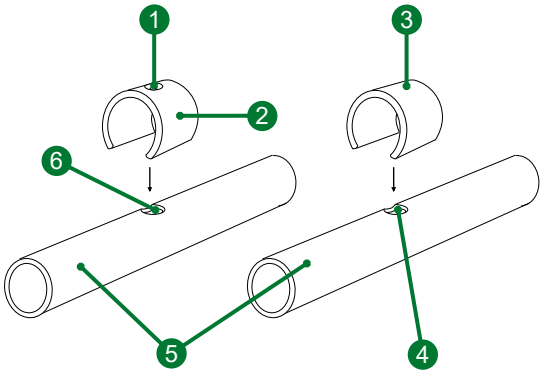
7.5.6 Create sampling holes



1	Incorrect: Burrs, pressure marks, angled borehole, borehole next to the middle of the pipe
2	Correct: straight hole

- Determine the diameter of the sampling holes in Planning and project design.
- Use only new or good as new drills.
- Avoid burrs and pressure marks.
- For equipment monitoring, place sampling holes in the direction of the air outlet of the monitored object. Drill directly into the sampling fixture. Provide sampling holes with sampling funnels as required.

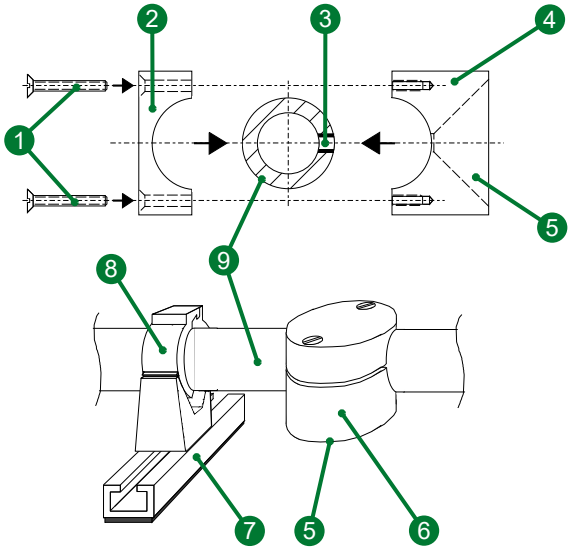
7.5.7 Insert sampling hole and maintenance clips



1	Sampling hole
2	Sampling holes clip
3	Maintenance clips
4	Maintenance sampling hole Ø 8.5 mm
5	PVC or ABS sampling tube
6	Sampling hole

- Only use with plastic pipes.
- Sampling hole with 8.5 mm diameter required.
- Determine the size of the sampling holes clips during Planning and project design.
- Create holes at right angles, in the middle of the tube axis.
- Click the sampling hole clips and maintenance clip on the sampling tube and snap into the hole.

7.5.8 Mount sampling funnel

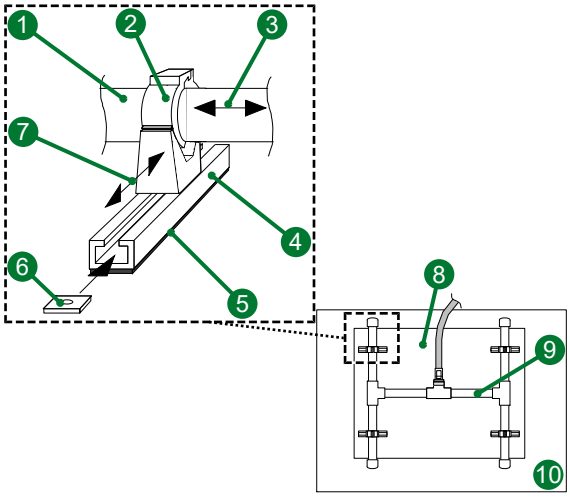


1	Screws M4 × 25
2	Upper part of funnel
3	Sampling hole
4	Lower part of funnel
5	Funnel opening
6	Sampling funnel
7	Support rail
8	Upper part of funnel
9	Tube of the sampling fixture

- Only use with plastic pipes.
- Recommended for equipment monitoring with high airflow rate.
- Mandatory for objects with forced ventilation.
- Lock the sampling funnel on the tube of the sampling fixture and position on the sampling holes.

7.5.9 Installation example for equipment monitoring

Screw-free fastening of the sampling fixture



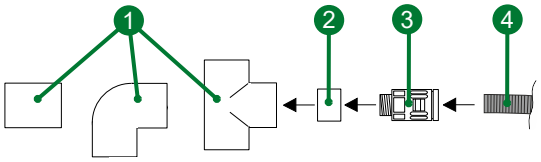
1	Tube
2	Click pipe mounting
3	Moving the tube in the click pipe mounting
4	Support rail
5	Double-sided adhesive tape
6	Threaded plate
7	Moving the click pipe mounting on the support rail
8	Ventilation slot
9	Sampling fixture
10	EDP cabinet

Use click pipe mountings to quickly remove the sampling fixture or sampling pipe during maintenance work.

▶ **Lock the click pipe mountings:**

1. Place support rails 4 at right angles to the tube axis.
2. Secure the support rails with double-sided adhesive tape or cable tie. When using double-sided adhesive tape, clean adhesive surfaces with non-aggressive cleaning product beforehand.
3. Screw the click pipe mountings 2 with threaded plates 6 onto support rails.

Transition to flexible tube



1	Sleeve, angle/bend or T-piece
2	PVC or ABS adapter M20
3	Quick-release coupling M20
4	Flexible tube Ø 16/21 mm

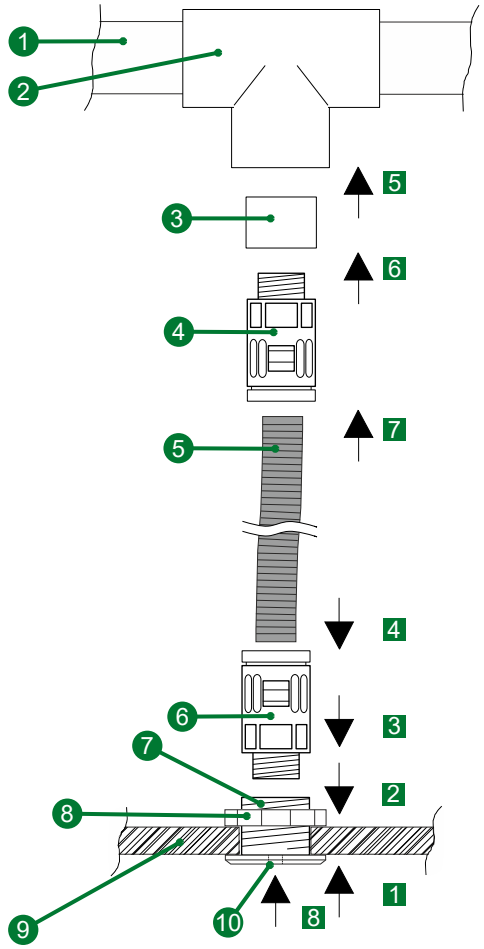
▶ **Create transition from fitting to flexible tube:**

1. Glue the adapter 2 with an M20 female thread to the outlet of the fitting 1.
2. Screw the M20 quick-release coupling 3 for the flexible tube into the adapter.
3. Click the flexible tube 4 into the quick-release coupling. Unclick the flexible tube again during maintenance work.

▶ Avoid burrs at the interfaces of the flexible tube in order to protect the sealing ring in the quick-release coupling.

▶ Ensure that the flexible tube is tight when clicking in.

7.5.10 Mount sampling stub for ceiling duct



1	Sampling tube
2	T-piece
3	Adapter M20
4	Quick-release coupling M20
5	Flexible tube, diameter 16/21 mm, max. length 1.5 m
6	Quick-release coupling M20
7	Sampling hole / ceiling duct M20
8	Adapter M25
9	Intermediate ceiling
10	Sampling hole

- Only possible with plastic pipes.
- Install the T-piece in the sampling pipe; see diagram.
- Determine the diameter of the sampling holes in Planning and project design.
- The flexible tube must not be more than 1.5 m long.

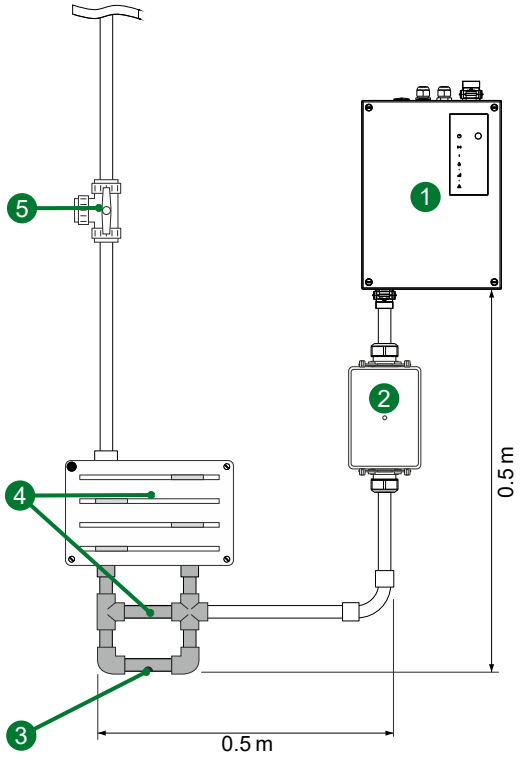
- Avoid burrs at the interfaces of the flexible tube in order to protect the sealing ring in the quick-release coupling.
- Observe the sequence (see diagram).
- Ensure that the flexible tube is tight when clicking in.

7.6 Mount accessories

Guideline for mounting accessories

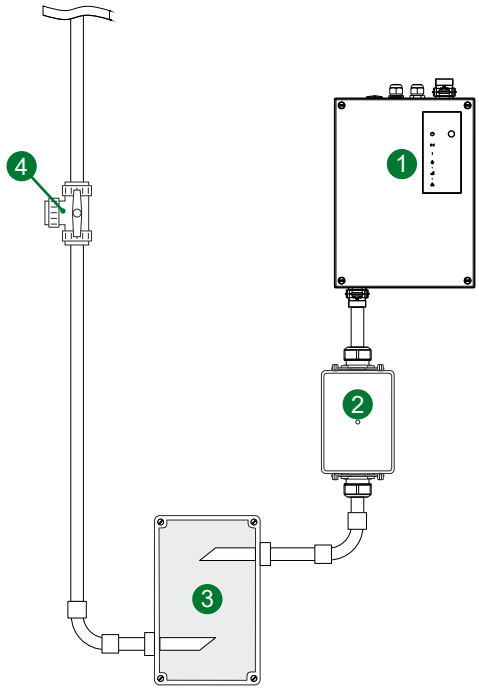
- Use water retaining box and dust trap box only with dust filter unit.
- Recommendation: Always use the automatic blow-out device in combination with dust trap box and dust filter unit.
- Dust filter unit, dust trap box and water retaining box underneath the detector housing. Mount the water retaining box at the lowest point. Recommendation: Maintain a minimum distance of 0.5 m to the water outlet.

Mount the dust filter unit and water retaining box



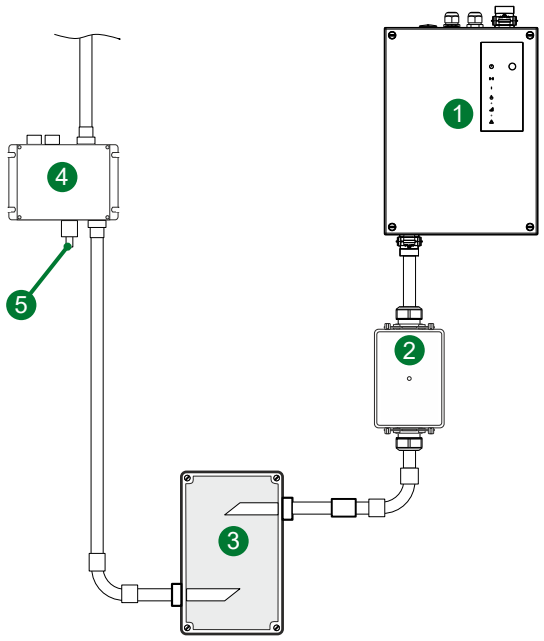
1	ASD
2	Dust filter unit
3	Hole 2.5 mm for water outlet
4	Water retaining box
5	Manual ball valve

Mount the dust filter unit and dust trap box



1	ASD
2	Dust filter unit
3	Dust trap box
4	Manual ball valve

Mount the automatic blow-out device, dust filter unit and dust trap box

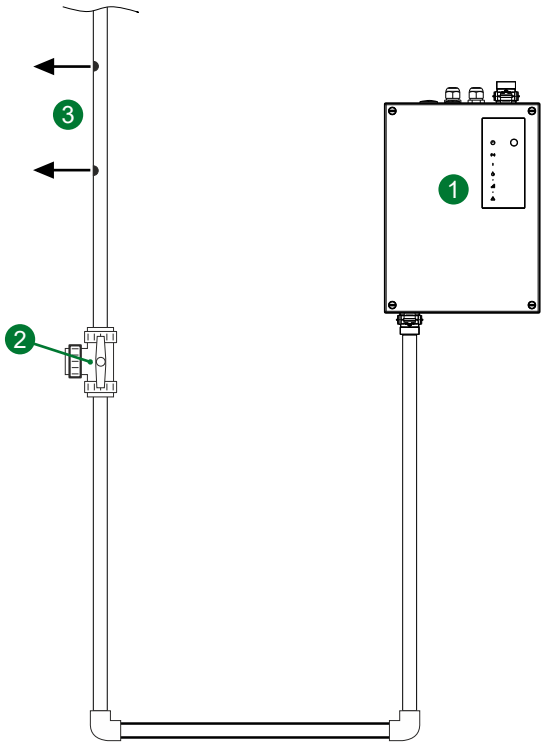


1	ASD
2	Dust filter unit
3	Dust trap box
4	Automatic blow-out device
5	Compressed-air connection

Mount accessories for cleaning the sampling pipe

The manufacturer recommends the use of the following aids for easy cleaning:

- Optional cleaning kit available from the manufacturer. Connection to manual ball valve.
- Compressed air for example with compressor; connection with CC 25 ABS to manual ball valve.



1	ASD
2	Manual ball valve
3	Dirt particles escape

7.7 Fasten the detector housing to the wall

Make a note of the serial number before mounting

When mounting in places that are difficult to access later, logging the serial number facilitates identification of the ASD.

Fasten the detector housing directly to the wall

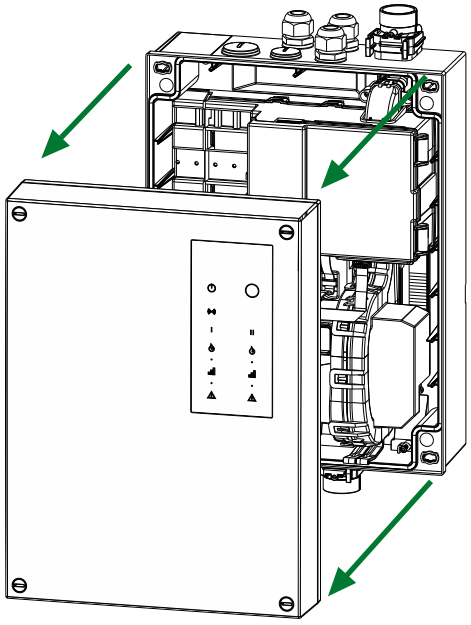
Prerequisite

✓ Observe Mounting positions and space requirements for open detector housing.

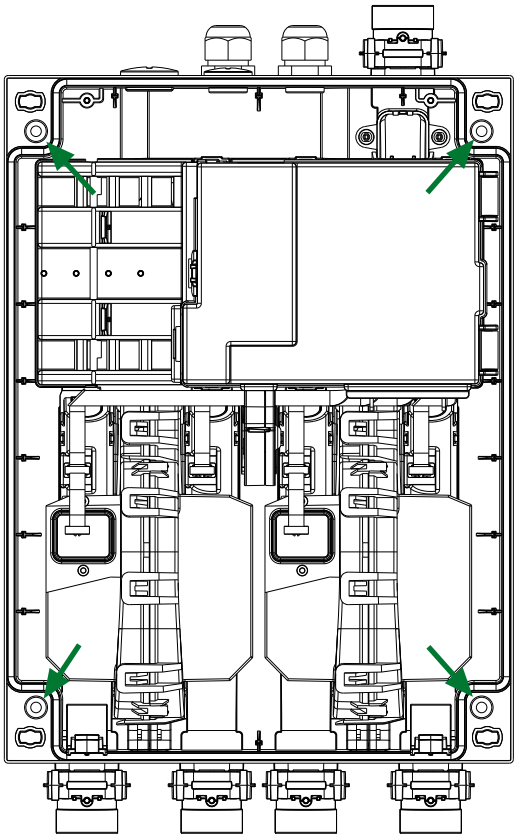
✓ Observe the drilling template from the package insert.

Fasten the detector housing to the wall:

1. Remove housing cover.



2. Fasten the housing base to the wall.



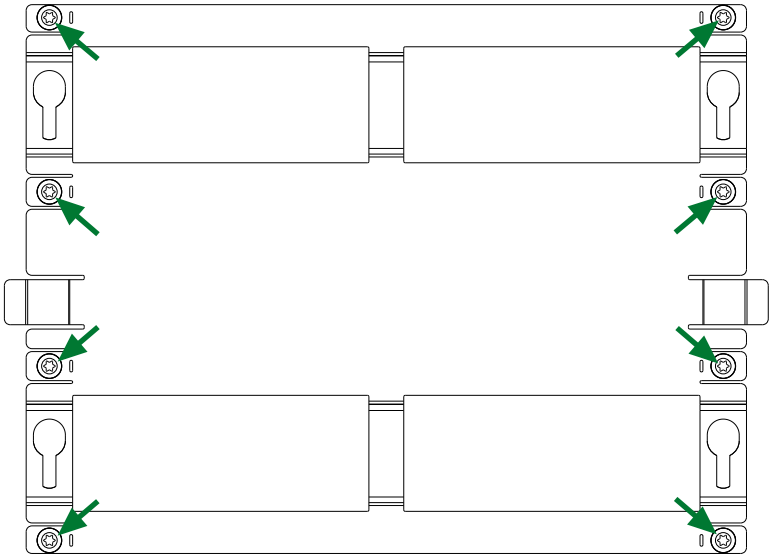
Fasten detector housing to the wall with mounting plate

Prerequisite

✓ Observe Mounting positions and space requirements for open detector housing.

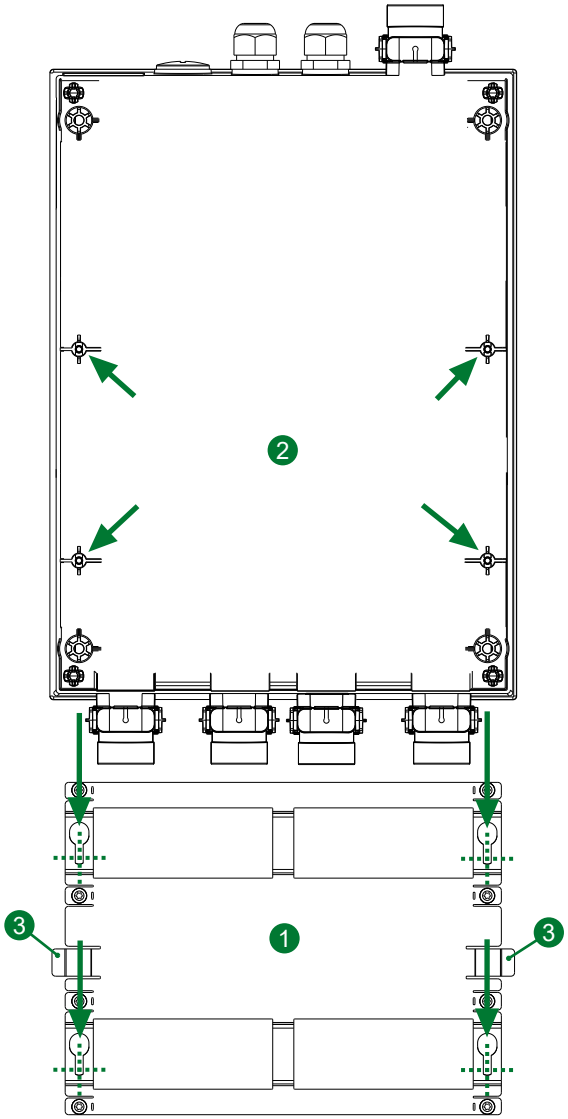
▶ **Connect the detector housing to the wall with the holding frame:**

1. Fasten the mounting plate ❶ to the wall with screws.



2. Screw the supplied screws into the fastening holes on the ASD ❷ to the stop.
3. Insert detector housing into the mounting plate from above. Insert the screws of the ASD into the retaining eyes until the release tab ❸ clicks into place.

⇨ To release, press the release tabs ❸ and move the detector housing upwards.



7.8 Mount smoke sensors

NOTICE

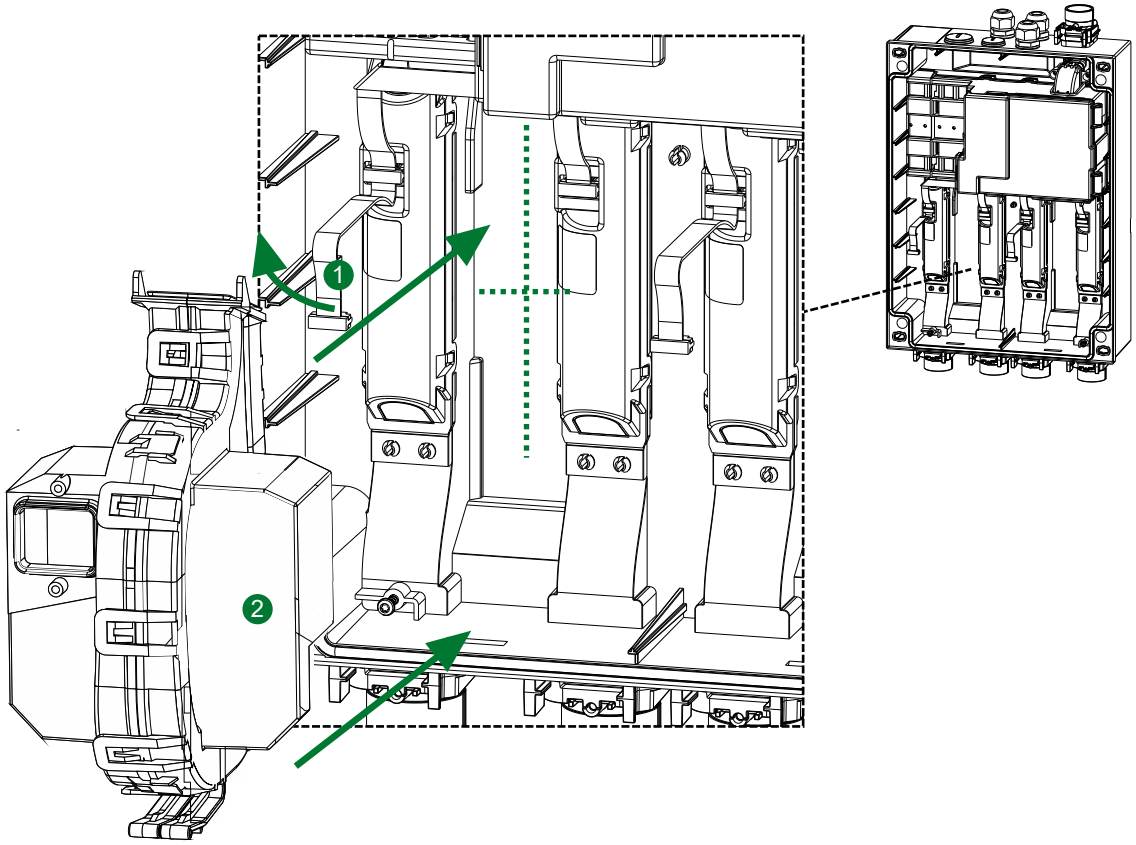
Dust exposure can impair the function of unpackaged smoke sensors.

Direct exposure to dust can impair the quality measurement of smoke sensors and cause incorrect measurement results.

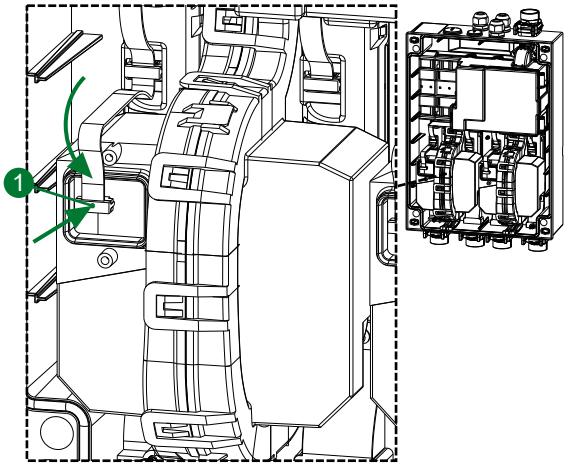
- Remove the smoke sensors from the packaging only immediately before mounting. If mounting and commissioning are a long time apart, insert smoke sensors only immediately before commissioning.

Insert smoke sensors:

1. Lift the flat cable 1.
2. Set the smoke sensor 2 in the detector housing.
   ⇨ The smoke sensor engages on the lower edge of the housing.



3. Connect the flat cable 1 to the smoke sensor.

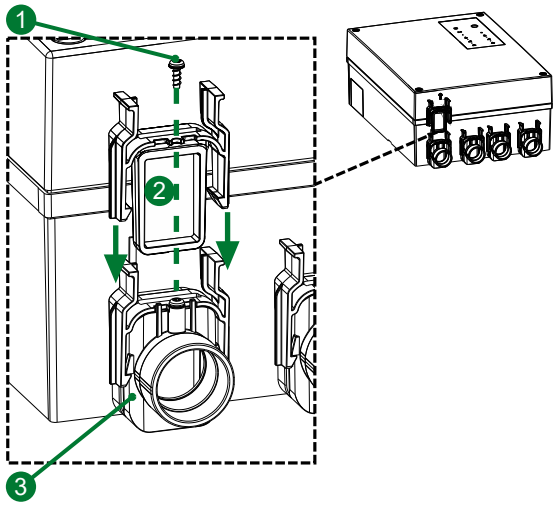


7.9 Mount insect protection screen

Each connection for the sampling pipe is fitted ex works with an insect protection screen in the pipe socket.

To remove the insect protection screen, fully compress the tabs on the slide-in frame and pull out of the pipe socket. When reinserting, reinsert the slide-in frame until it clicks into the pipe socket.

For vandal-proof use, the insect protection screens can be fastened with the optional 3 × 8 mm Torx locking screws supplied.



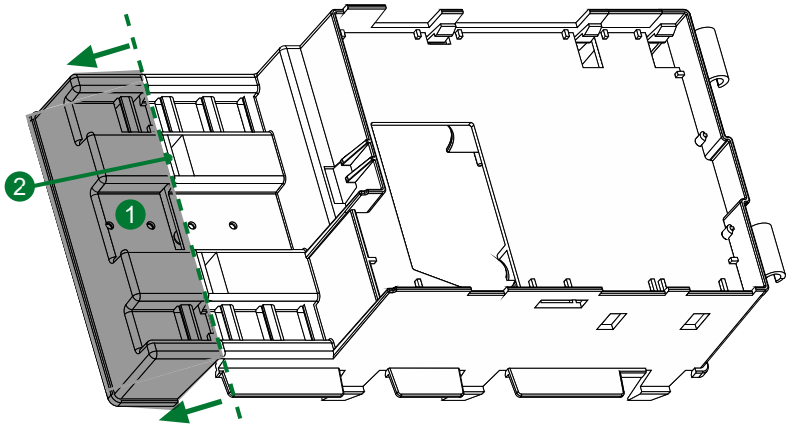
1	Lock screw
2	Insect protection screen
3	Pipe socket

7.10 Mount UMS

The UMS universal module support can be fitted with an additional module from the manufacturer or a third-party provider and mounted in the ASD. To do this, the two outermost installation slots for additional modules must first be irretrievably removed.

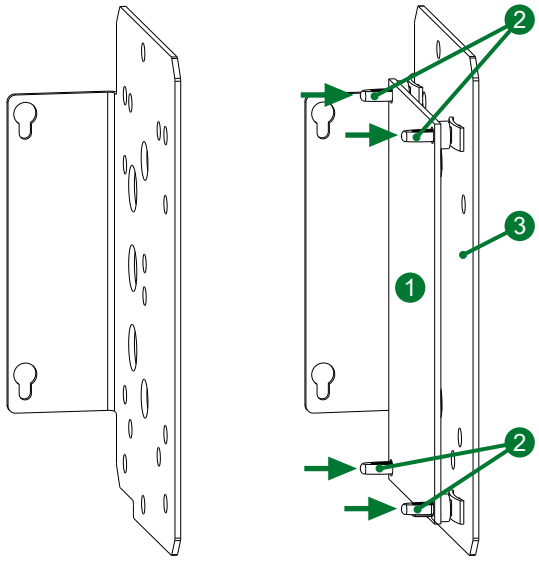
Mount UMS with additional module:

1. Remove the support module: Follow steps 1 to 4 in Replace fan unit.
2. Bend and break outermost and second outermost installation slot 1 on the right-hand edge 2.



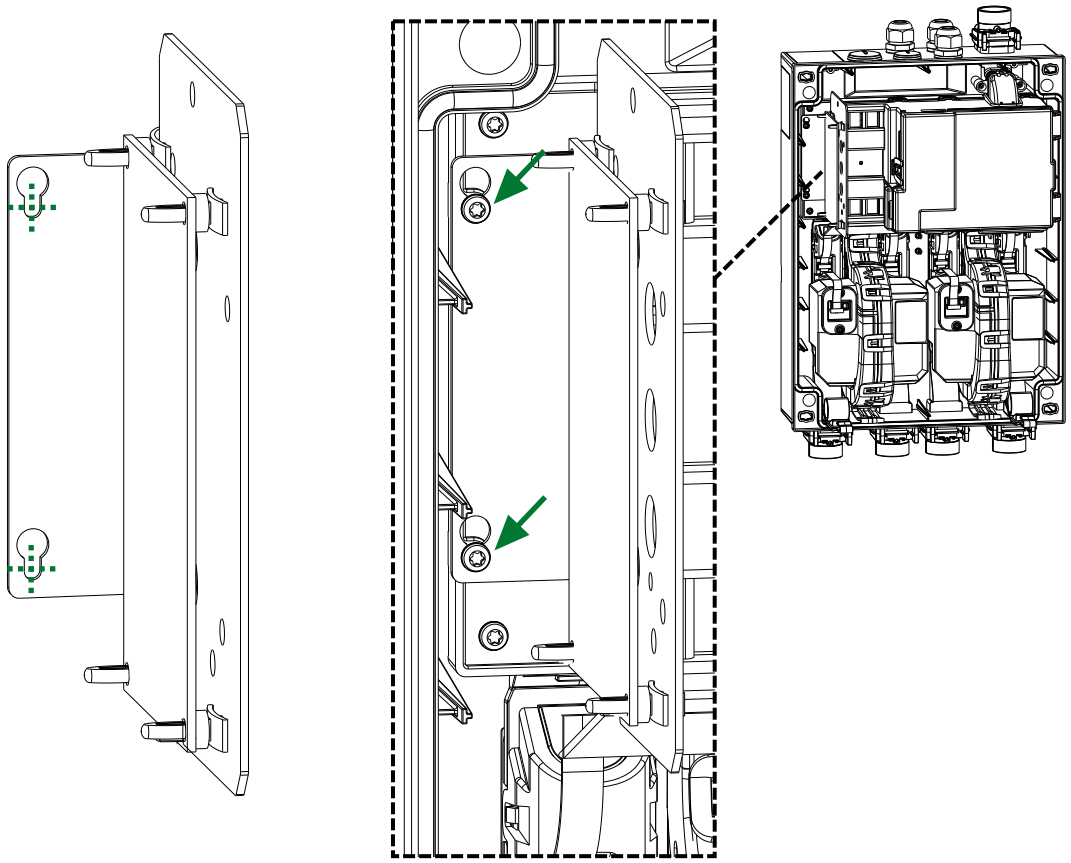
⇨ The UMS can be mounted with the additional module in the now free installation slot.

3. Connect additional module; see data sheet of the additional module.
4. Lock the additional module on the UMS with the printed circuit board spacers that are supplied.



1	Additional module
2	PCB spacers
3	Universal module support

5. Fasten the UMS in the installation slot of the ASD with the supplied screws.



7.11 Connect the sampling pipe tube network to the detector housing

Prerequisite

✓ The detector housing is fastened to the wall.

▶ **Connect the sampling pipe tube network to the detector housing:**

1. Connect sampling tubes to the sampling holes of the detector housing by plugging in.

⇨ The detector housing is ready for installation.

Plug sampling tubes into the detector housing. Do not glue in.

The conical shape of the sampling holes guarantees tight plug-in connections for all approved tubes. See Material requirements for the sampling pipe.

Recommendation: Secure pipe connection with pipe clamp.

To maximise safety, fasten all sampling tubes 5 cm after the sampling hole with pipe clamps.

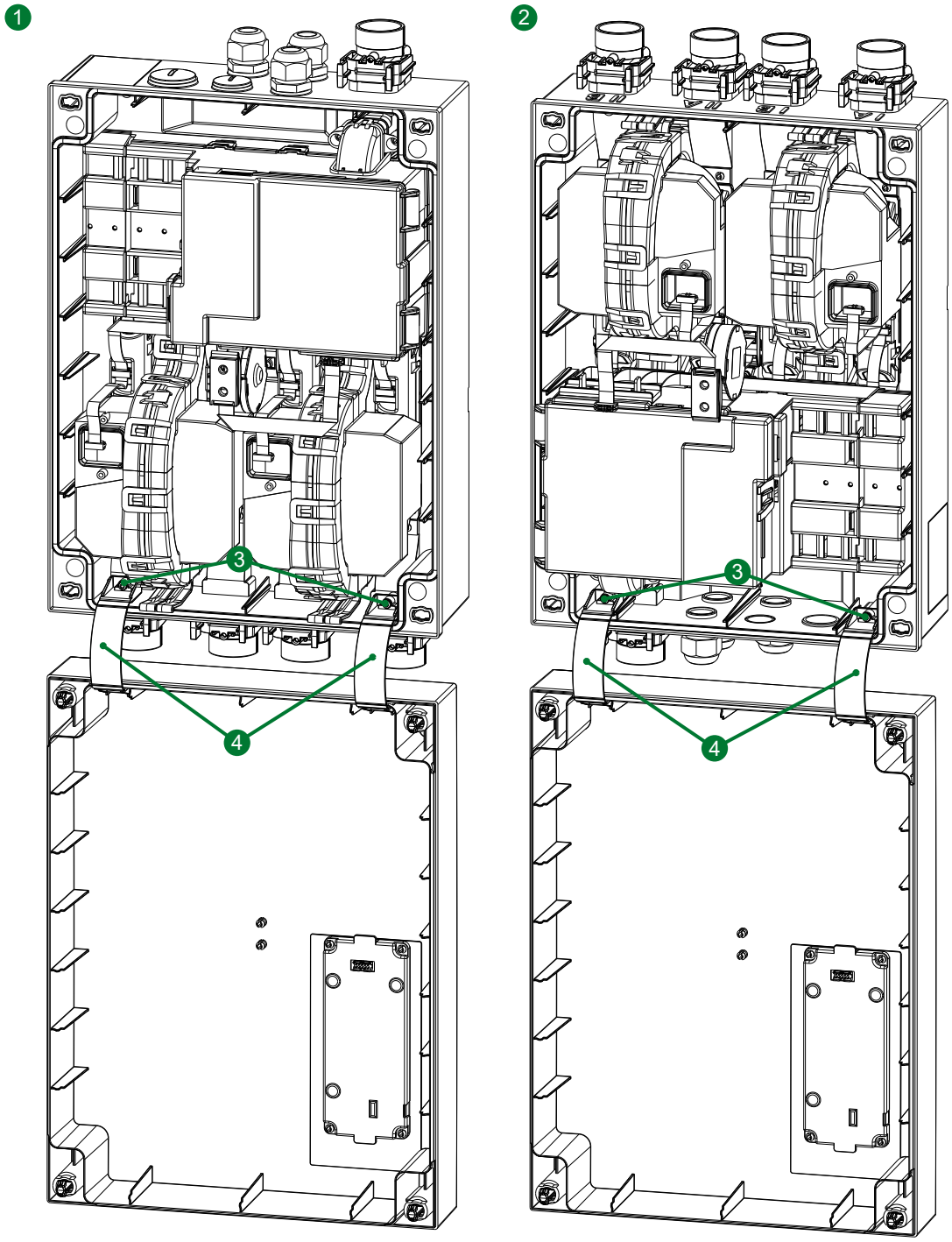
7.12 Fasten housing hinges

Prerequisite

✓ Orientation of the housing base selected: Default or turned 180 degrees.

▶ **Fasten housing hinges:**

1. Insert housing hinges into the housing base.
2. Secure the housing hinges with a Torx T10 screwdriver.
   ⇨ The housing cover is connected to the housing base and can be opened and closed.
   ⇨ The housing hinges are clicked into the housing cover and can be easily released by clicking out.



1	Housing base in default orientation
2	Housing base rotated 180 degrees
3	3×8 mm Torx screws
4	Housing hinges

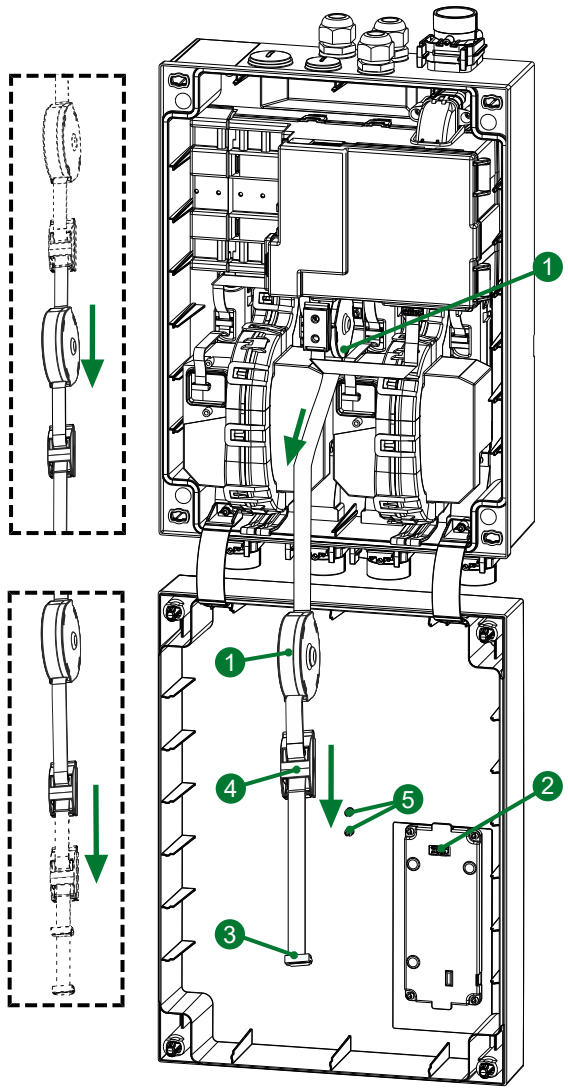
7.13 Connect detector housing and housing cover with pullback cable

Prerequisite

✓ Mounting of the detector housing concluded.

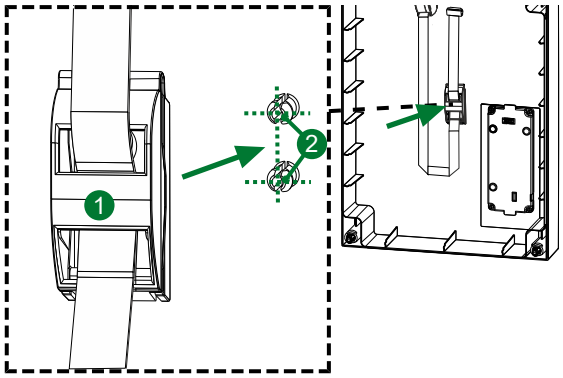
▶ **Connect the pullback cable:**

1. Pull out the pullback cable.



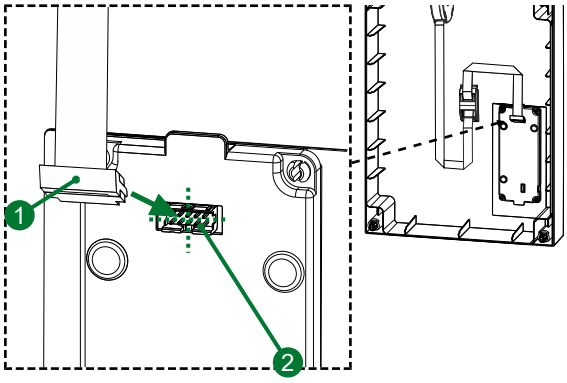
1	Pullback cable reel
2	Front panel plug
3	Plug socket
4	Strain relief
5	Fastening clips

2. Attach the pullback cable strain relief to the clips of the housing cover.



1	Strain relief
2	Fastening clips

3. Insert the plug socket at the end of the pullback cable into the front panel plug.



1	Plug socket connection cable
2	Display panel plug

⇨ Detector housing and housing cover are connected.

⇨ The front panel is functional.

8 Installation

8.1 Installation aids

The following aids are required for installation:

Aids	Installation step
Slotted screwdriver size 4	Open and close detector housing
Slotted screwdriver size 0	Connection

8.2 Open and close detector housing

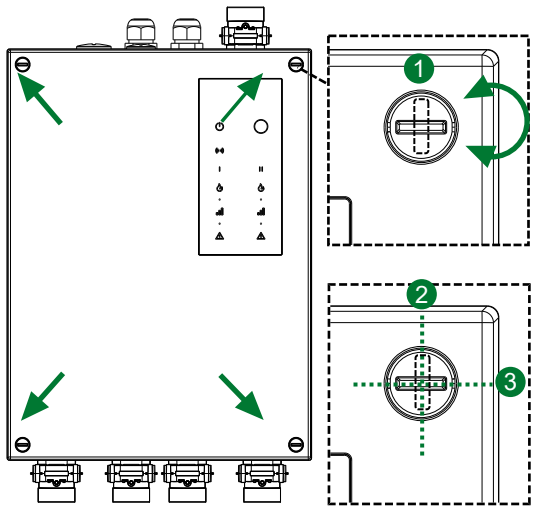
Use size 4 slotted screwdriver.

Open the detector housing:

1. Press rotary snap locks 1 towards the housing base and turn 90 degrees counter-clockwise.
   ⇨ The detector housing is open; see position 2 in the following graphic.
   ⇨ The housing cover can be carefully folded down. The pullback cable connects it to the housing base; see Connect detector housing and housing cover with pullback cable.

Close detector housing:

1. Fold the housing cover upwards.
2. Press the rotary snap locks 1 towards the housing base and turn 90 degrees clockwise.
   ⇨ The detector housing is closed; see position 3 in the following graphic.



2	90 degrees to side edge = open
3	90 degrees to upper edge = closed

8.3 Connection

The electrical connection is by means of tool-free push-in terminals for rigid wires. Use a size 0 slotted screwdriver for fastening stranded wires.

NOTICE

Danger due to connection under voltage.

Components of the ASD may be damaged.

- Disconnect the ASD from the voltage supply before performing any connection and wiring work.

NOTICE

Loop cabling prevents monitoring of the connections.

The system cannot be monitored.

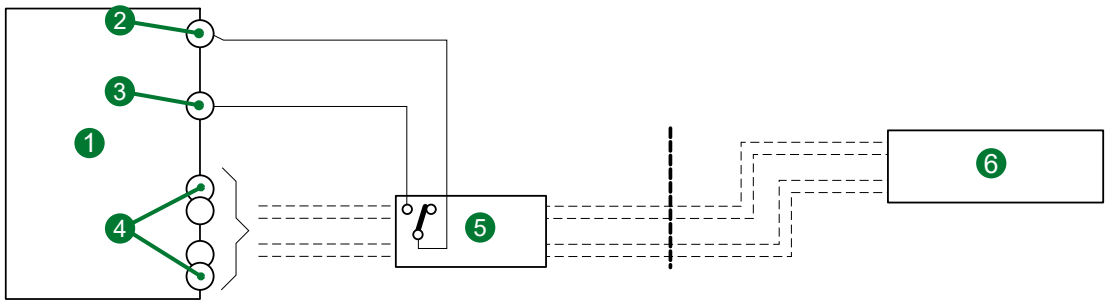
- Do not connect any looped lines to the *alarm* and *fault* terminals.
- Disconnect existing loop cabling.

8.3.1 AMB terminal assignment

Terminal	Connection	Function	Default configuration
3	GND	Power supply	
4	GND		
5	+24 VDC		
6	+24 VDC		
7	+24 VDC OUT	Signal for I/O actuation	
8	I/O 1		IN: Access authorisation
9	I/O 2		No function
10	I/O 3		IN: Reset
11	REL 1 NO/NC		Fault
12	REL 1 COM		
13	REL 2 NO/NC		SSD I alarm
14	REL 2 COM		
15	REL 3 NO/NC		SSD I pre-signal
16	REL 3 COM		

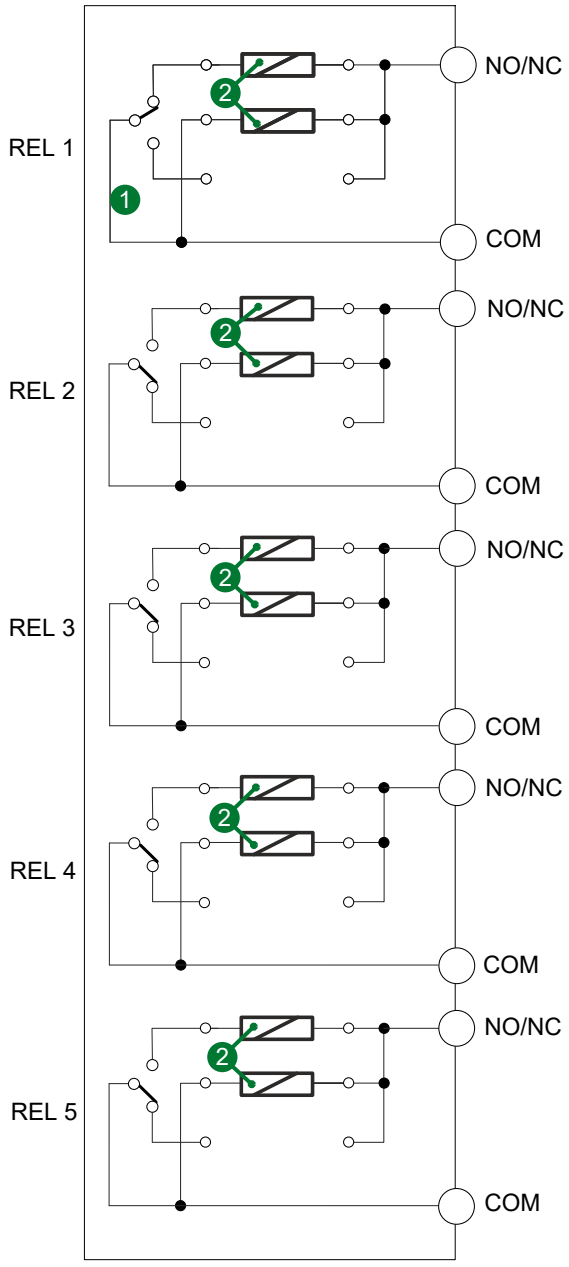
Terminal	Connection	Function	Default configuration
17	REL 4 NO/NC		SSD II alarm
18	REL 4 COM		
19	REL 5 NO/NC		SSD II pre-signal
20	REL 5 COM		

8.3.2 Control via reset input



1	AMB
2	+24 V OUT
3	I/O 3 (IN: reset)
4	REL 1-3
5	Control module / alarm transmitter
6	Fire alarm control panel

8.3.3 Wiring with quiescent current monitoring

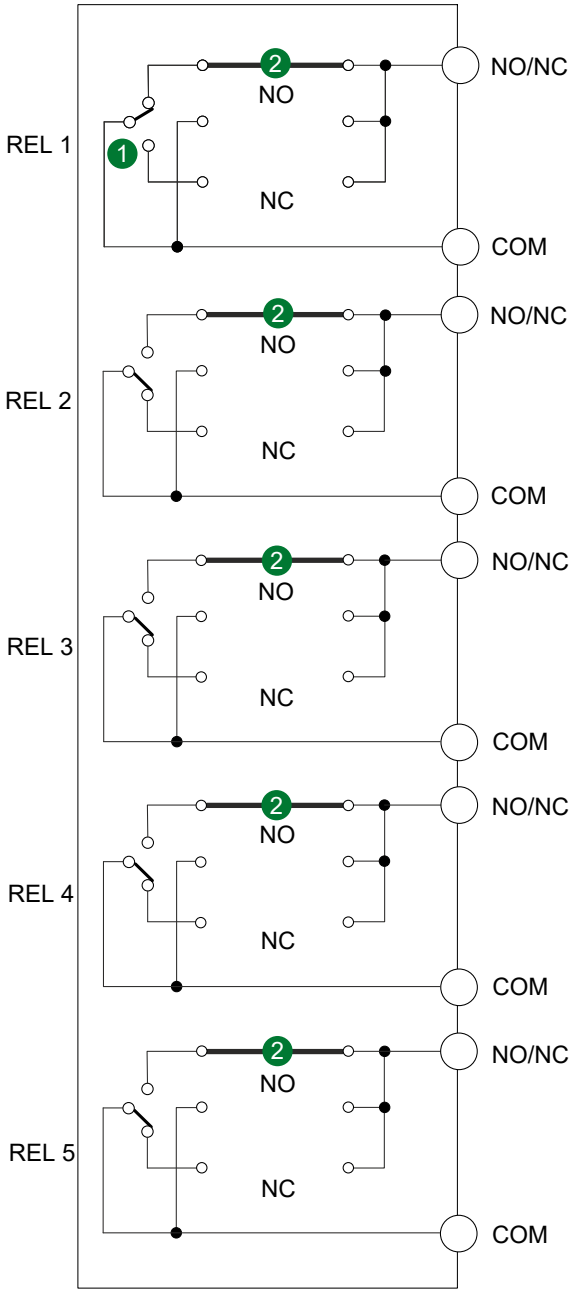


1	Relay in normal state: no event triggered
2	Resistance R*

Re-lays	Function	Relay state	Loop resistance (COM – NC)
REL 1	Fault	▸ Failsafe ▸ No fault ▸ Fault relay picked up, coil energised	▸ No fault: R_{total} = R* x R* / (R* + R*) ▸ Fault: R_{total} = R* ▸ Line interruption: 0 Ω or ∞Ω
REL 2	SSD I alarm	▸ No alarm ▸ Alarm relay dropped, coil not energised	▸ No alarm: R_{total} = R* ▸ Alarm: R_{total} = R* x R* / (R* + R*) ▸ Line interruption: 0 Ω or ∞Ω
REL 3	SSD I pre-signal	▸ No pre-signal ▸ Pre-signal relay dropped, coil not energised	▸ No pre-signal: R_{total} = R* ▸ Alarm: R_{total} = R* x R* / (R* + R*) ▸ Line interruption: 0 Ω or ∞Ω
REL 4	SSD II alarm	▸ No alarm ▸ Alarm relay dropped, coil not energised	▸ No alarm: R_{total} = R* ▸ Alarm: R_{total} = R* x R* / (R* + R*) ▸ Line interruption: 0 Ω or ∞Ω
REL 5	SSD II pre-signal	▸ No pre-signal ▸ Pre-signal relay dropped, coil not energised	▸ No pre-signal: R_{total} = R* ▸ Alarm: R_{total} = R* x R* / (R* + R*) ▸ Line interruption: 0 Ω or ∞Ω

8.3.4 Wiring via relay contacts

With the enclosed wire bridges, the following wiring can be carried out using relay contacts:



1	Relay in normal state: no event triggered
2	Wire bridge default

Relays	Function	Relay state
REL 1	Fault	▸ Failsafe ▸ No fault ▸ Fault relay picked up, coil energised
REL 2	SSD I alarm	▸ No alarm ▸ Alarm relay dropped, coil not energised
REL 3	SSD I pre-signal	▸ No pre-signal ▸ Pre-signal relay dropped, coil not energised
REL 4	SSD II alarm	▸ No alarm ▸ Alarm relay dropped, coil not energised
REL 5	SSD II pre-signal	▸ No pre-signal ▸ Pre-signal relay dropped, coil not energised

9 Commissioning

Commissioning the ASD may be carried out only by users who meet the Requirements for installers and end users.

9.1 Carry out commissioning

Commissioning the ASD is performed with MobileConfig using one of the following methods:

- Manual: The values calculated by PipeFlow or defined in it are entered manually in MobileConfig.
- Automatic: The report generated by PipeFlow is read in by MobileConfig and the values are inserted automatically.

For both variants, a number of parameters must be entered manually.

From MobileConfig, transfer values to the ASD and read out from the ASD.

During commissioning: Values entered in MobileConfig are automatically transferred to the ASD when you leave a page by tapping the right or left arrow. When switching to a new page, the current values are always read out and displayed by the ASD.

NOTICE

Changes to the fan speed change the transport time.

After a change in the fan speed, compliance with standards for the created project is no longer guaranteed.

- Every time the fan speed is changed, recalculate the project in PipeFlow. Compare results with the values set in MobileConfig. In the event of deviation, adjust values in MobileConfig.

9.1.1 Manual commissioning

Prerequisite

- ✓ Planning and project design have been concluded.
- ✓ Mounting and installation are concluded.
- ✓ The sampling pipe is laid correctly. All connection points and sampling holes are correctly implemented.
- ✓ All maintenance holes are closed.

- **Put ASD into operation manually with MobileConfig:**

1. Authorise yourself to operate the ASD as described in Authorisation.
   ⇨ The Bluetooth LED flashes.
2. Select the desired ASD in the **Device list**. The ASD is displayed ex works with its serial number (e.g., ASD0000000000).

⇨ MobileConfig and ASD are connected.

⇨ The Bluetooth LED is lit.

3. When commissioning for the first time, tap **Dashboard > Commissioning > Manual**. On devices that have already been in operation, tap **Actions > Commissioning > Manual**.

   ⇨ **Time and time zone** appears. The time zone of the connected mobile device is preselected by default.

4. Adopt or adjust the time zone.
5. Tap the right arrow to access the smoke parameters for smoke sensor I.
6. Under **Smoke parameters > Alarm > Threshold**: Enter the calculated value from PipeFlow for smoke sensor sensitivity.
7. Enter other smoke parameters and settings if required.
8. Swipe left to access the parameters for smoke sensor II. Repeat steps 6 to 7.
9. Tap the right arrow to access the **Airflow parameters**.
10. Under **Fan > Fan speed**: Enter the fan speed defined in PipeFlow.
11. Activate or deactivate latching of fan faults under **Actions > Advanced settings > ASD > Latching for general faults**.
12. Swipe left and enter airflow parameters and settings for channel I A if required; see Airflow monitoring.
13. Swipe left to access the parameters for channels I B, II A and II B. Repeat step 9 in each case.
14. Tap the right arrow to go to **Airflow normalisation**.
15. Perform Airflow normalisation.

    ⇨ The successful normalisation of the airflow is confirmed.

16. Tap the right arrow to go to **Project information**.
17. Assign ASD name (e.g., detection zone designation). Enter other project information if required: Installation location, reference number, system provider, customer.
18. Tap the right arrow to go to **Finalise commissioning**.

    ⇨ A summary of the steps performed appears.

19. Tap **Finalise**.

⇨ The ASD is put into operation.

⇨ The digital commissioning report can be created under **Actions > Maintenance > Share data > Report > Commissioning**.

9.1.2 Automatic commissioning

The procedure corresponds to the manual method. However, the values calculated in PipeFlow are already automatically adopted and do not have to be entered manually.

Prerequisite

- ✓ Planning and project design have been concluded.
- ✓ Mounting and installation are concluded
- ✓ The sampling pipe is laid correctly. All connection points and sampling holes are correctly implemented.
- ✓ All maintenance holes are closed.
- ✓ The report created by PipeFlow during Planning and project design is available on the mobile device used for commissioning.

▶ **Put ASD automatically into operation with MobileConfig:**

1. Authorise yourself to operate the ASD as described in Authorisation.
   ⇨ The Bluetooth LED flashes.
2. Select the desired ASD in the **Device list**. The ASD is displayed ex works with its serial number (e.g., ASD0000000000).
   ⇨ MobileConfig and ASD are connected.
   ⇨ The Bluetooth LED is lit.
3. When commissioning the first time, tap **Dashboard > Commissioning > Automatic**. On devices that have already been put into operation, tap **Actions > Commissioning > Automatic**.
4. Confirm the parameter page with the automatically entered values. Tap right to go to the next page.
5. Enter other smoke parameters and settings manually if required.

⇨ The ASD is put into operation.

⇨ The digital commissioning report can be created under **Actions > Maintenance > Share data > Report > Commissioning**.

9.1.3

9.2 Authorisation

▶ **Authorise yourself for ASD access:**

1. Press the operation button on the ASD until the Bluetooth LED flashes; see Indicators.

or

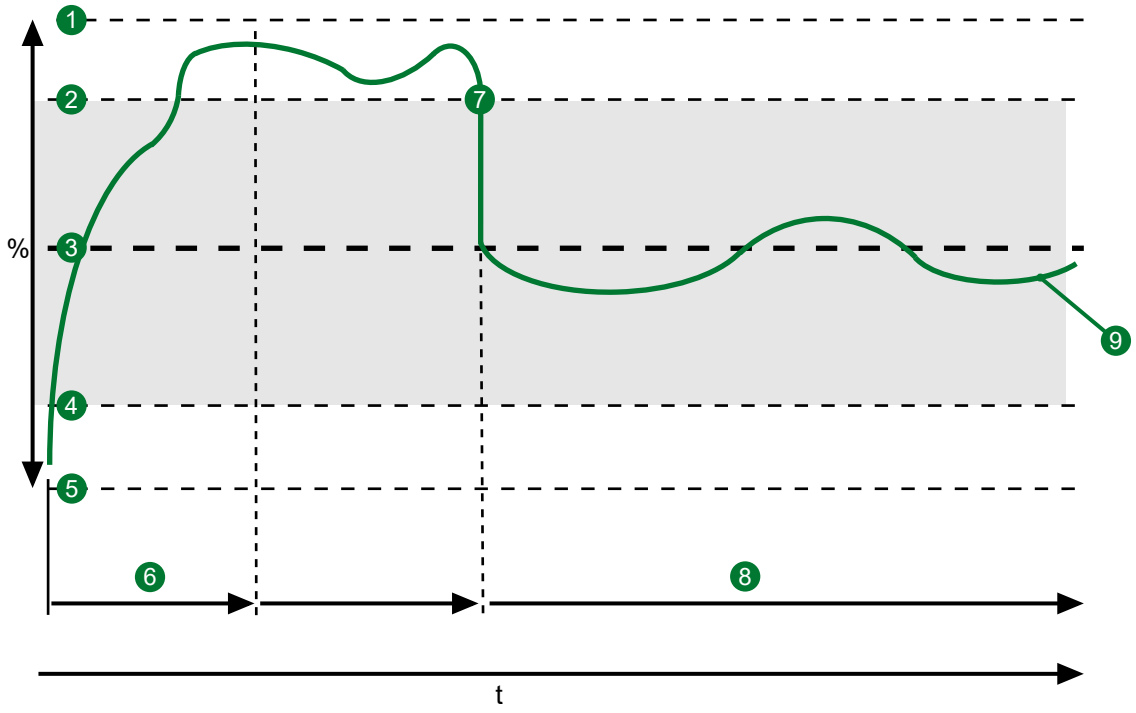
1. Perform authorisation via I/O 1; use ASD power supply +24 V OUT as source: Activate input 3 to 15 seconds and then deactivate again; see Inputs and outputs.
   ⇨ The signal is actuated with a falling edge.
   ⇨ Bluetooth LED flashes.

⇨ The user is authorised to access the ASD.

9.3 Airflow normalisation

During airflow normalisation, the ASD saves the currently measured airflow value per channel as a 100 percent reference value. The airflow normalisation must be carried out:

- During the first commissioning.
- After any change to the tube network.
- After conversions.
- After repairs.
- After changing the fan speed.



1	Threshold for positive deviation (fault)
2	Threshold for positive deviation (warning)
3	100 percent setpoint
4	Threshold for negative deviation (warning)
5	Threshold for negative deviation (fault)
6	Startup process
7	Airflow normalisation
8	ASD in normal operation
9	Airflow

Prerequisite

✓ Operating conditions prevail at the place of use. All ventilation and air conditioning systems are active.

✓ The sampling pipe tube network was fully assembled and connected to the detector housing as described (see Mounting the sampling pipe tube network and Connect the sampling pipe tube network to the detector housing.

✓ The sampling pipe tube network is fully functional; all sampling points are free.

✓ The sampling pipe tube network is free of impurities.

▸ **Perform airflow normalisation:**

1. Select **Actions > Airflow normalisation**.
2. Tap **Normalize airflow**.
   ⇨ A pop-up window with notices about the prerequisites appears.
3. Tap **Start airflow normalisation**.
   ⇨ The current measured airflow value is stored as a 100 percent reference value.
   ⇨ The message *Normalization concluded* appears.

See also

▸ Principle of airflow monitoring

9.4 Load and install firmware

In applications compliant with UL 268, all smoke sensors must be isolated. The alarm criterion must not be fulfilled.

▸ **Load and install firmware on the ASD:**

1. Only applies to applications compliant with UL 268: Isolate all smoke sensors. The alarm criterion must not be fulfilled.
2. Tap **Actions > Firmware installation > Select**.
   ⇨ The file directory opens.
3. Select the desired firmware package (bin file).
4. Tap **Upload**.
   ⇨ The firmware package is loaded to the ASD.
   ⇨ Once the charging process is complete, the message appears: *Firmware loaded successfully.*
5. Tap **Install**.
   ⇨ The firmware is installed on the ASD. In the meantime, the connection between the mobile device and ASD is disconnected.

⇨ After successful installation, the ASD instance appears again under **Device list** and can be reconnected.

⇨ The ASD is ready for operation.

The installed firmware can be checked under **Actions > Firmware installation > Current firmware version**.

ASD configuration for firmware update

The original ASD configuration is retained after a firmware update.

9.5 Commissioning protocol and commissioning report

The commissioning and maintenance log and the digital commissioning report can provide important data for Warning and fault rectification about the configuration of the ASD.

Commissioning and maintenance protocol

The following data is entered in the commissioning and maintenance protocol document after commissioning has been finalised:

- The values of the smoke parameters and airflow parameters entered by the user
- Results of measurements, test and check
- Project information
- Information about the ASD type and the SSDs

Commissioning report

Digital report that is automatically created after commissioning with MobileConfig. The commissioning report can be shared with Support for warning and fault rectification; see Share data.

9.6 Check alarm and fault triggering

Alarm and fault triggering must be checked to ensure the correct function of:

- Signal triggering of the ASD
- Sampling pipe tube network
- FACP programming and FACP communication

Alarm and fault triggering must be checked:

- After initial commissioning
- After any change to the tube network
- After conversions
- After repairs
- After changing the fan speed

Checking the alarm and fault triggering must be entered in the Commissioning protocol.

▸ **Check airflow monitoring.**

1. Close sampling holes. Recommendation: Masking.
2. Check the airflow in MobileConfig under **Actions > Live values**.
   ⇨ If the airflow value changes by at least 15 percent and the change persists in the time window of the set delay, the ASD must trigger a fault.
3. Check fault on FACP.

▸ **Check alarm trigger.**

1. Apply smoke to the last sampling hole of each tube branch.
2. Check the alarm release of the ASD.
3. Check alarm and correct detection zone or area trigger on FACP.

Use maintenance hole.

During maintenance, the maintenance hole can be used for simplified exposure to smoke. If there is no maintenance hole, remove the insect screen and apply smoke directly to the pipe socket.

10 Maintenance

Maintenance interval and filter service life

The respective country-specific regulations and guidelines apply. The manufacturer recommends at least one maintenance per year. In applications with high levels of dust or dirt, the maintenance interval is shortened (e.g., in production, recycling or wood processing).

The maintenance interval is influenced, amongst other things, by the service life of the filter element. This depends on the level of dust and dirt and must be determined individually based on the application. The service lives of the DFU 911 dust filter unit are specified in data sheet T 140 705.

The degree of soiling of the various elements determined during maintenance over the past operating life is an indication of when the next maintenance must be carried out. In certain cases, a replacement of components may be necessary.

Prepare for maintenance

To prepare for the maintenance, one of the following steps must be followed.

▸ **Perform before maintenance:**

1. Deactivate fire incident control and remote alerting on the superordinate FACP.
   ⇨ The FACP does not forward any signals externally.

▸ **Alternatively, perform before maintenance:**

1. Isolate smoke sensors.

10.1 Maintenance positions and tools

	Maintenance position	Aids
1	Visual inspection	
2	Check airflow values For measured values outside the tolerance, carry out maintenance positions 3 to 8 stepwise until the measured values are within the permitted range. Manufacturer's recommendation: Switch ASD inactive or disconnect from the power supply. This prevents the fan from drawing in dirt particles.	MobileConfig: **Actions > Live values**
3	Clean the insect protection screen	▸ Soft brush

	Maintenance position	Aids
		▸ Running water [1] [2]
4	Clean accessories	▸ Soft, dry brush or ▸ Oil-free compressed air or nitrogen
5	After expiry of the filter service life Replace filter element	
6	Clean sampling holes	▸ Pipe cleaner
7	Clean sampling pipe [3]	▸ Cleaning kit available from the manufacturer ▸ Compressor with oil-free compressed air or nitrogen
8	Clean airflow sensor [1]	▸ Soft brush
9	Functional check	

10.2 Isolate smoke sensors

▸ **Isolate smoke sensors:**

1. In MobileConfig under **Actions > Isolate smoke sensor**: Select all smoke sensors.
   ⇨ The fault relay is triggered.
   ⇨ The relay outputs for alarm and pre-signal are not actuated.
   ⇨ All indicators of the ASD remain active.
   ⇨ The ASD sends no alarms or pre-signals via its outputs.

10.3 Visual inspection

▸ **Perform visual inspection:**

1. Check the technical state of the installation.
2. Check the installation site for structural changes that could impair functioning, for example concealed sampling points.
3. Check compliance with installation guidelines.

[1] In the case of heavy soiling (dirty)

[2] Dry the insect protection screen before reinserting.

[3] Determine necessity by Check airflow values. In the event of heavy soiling or difficult access to the sampling holes

⇨ In the event of deviations from the installation guideline, inform the person responsible and plan rectification.

10.4 Check airflow values

Check airflow values:

1. In MobileConfig **Actions > Live values**, compare airflow values with the commissioning report from MobileConfig.
   Carry out the following steps if the actual deviation is more than 50% of the airflow deviation set in MobileConfig; see example below.
   Recheck deviations after each step. Continue until the airflow values are again in the permitted range.
   NOTICE! Airflow normalisation during maintenance distorts calibration. Do not use airflow normalisation to compensate for the effect of soiling.
2. Clean the insect protection screen and Clean accessories.
3. Clean sampling holes.
4. Clean airflow sensor.
5. In MobileConfig under **Actions > Live values**: Check smoke sensor soiling values. If the smoke sensor soiling value exceeds 75%, Replace smoke sensors.
6. Enter the measured values in the commissioning protocol.

Example for calculation and evaluation of the actual airflow deviation:

1. Read out airflow values:
   Commissioning airflow = 100% (defined).
   Airflow deviation set in MobileConfig under **Actions > Airflow parameters** = ± 20%.
   Measured real-time airflow = 88%.
2. Calculate actual deviation:
   Actual deviation = difference between commissioning airflow and live airflow.
   Actual deviation = 100% − 88% = 12%
3. Compare actual deviation with permitted deviation:
   Airflow deviation set in MobileConfig = ± 20%. 50% of 20% = 10%.
   Actual deviation of 12% greater than 10%. Carry out maintenance positions 3 to 8 stepwise until the measured values are in the permitted range.

10.5 Clean the insect protection screen

Check the inlet and outlet for soiling and clean with a soft brush if necessary. In the event of heavy soiling, clean the insect protection screen under running water and dry before reinserting.

10.6 Clean accessories

▶ **Perform the following steps to clean accessories:**

1. Open the accessory housing.
2. Clean accessories with a soft, dry brush. As an alternative, use oil-free compressed air or nitrogen.
3. Close the accessory housing again.

Filter cartridges cannot be cleaned.

Replace filter cartridges after expired service life.

10.7 Clean sampling holes

Remove soiling from the sampling holes with pipe cleaners.

10.8 Clean sampling pipe

Include the recommended accessories for cleaning the sampling pipe during planning and project design.

See also: Mount accessories.

NOTICE

Danger due to incorrectly connected compressed air.

Components of the ASD may be damaged.

▶ Connect compressed air to the sampling pipe tube network as described. Do not connect compressed air directly to the ASD and do not pass through the smoke sensor and fan.

▶ **Clean the sampling pipe; recommended procedure:**

1. Connect compressor with manual ball valve and compressed-air connection CC 25 ABS to the sampling pipe tube network. Place the ball valve directly after the ASD or the last accessory element.
2. Remove dirt particles from the sampling pipes.

▶ **Clean sampling pipe; procedure with cleaning kit or vacuum cleaner:**

1. Connect the cleaning kit or vacuum cleaner to the sampling pipe tube network using a manual ball valve.
2. Remove dirt particles from the sampling pipes.

▶ **Clean sampling pipes; alternative procedure:**

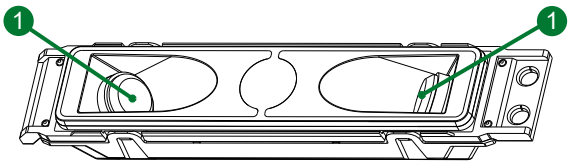
1. Disconnect the tube connection of the last accessory part in the sampling pipe tube network.

2. Connect the compressor or cleaning kit to the sampling pipe tube network after the last accessory part.
3. Remove dirt particles from the sampling pipe.

10.9 Clean airflow sensor

Clean airflow sensor

1. Detach the airflow sensor from the ASD. To do so, follow steps 1 and 2 in Replace airflow sensor.
2. Remove dirt and dust particles from the inside of the airflow sensor with a soft, dry brush. The transducers 1 must be completely free of dirt and dust.



3. Reinsert airflow sensor. To do so, follow steps 1 and 2 in Replace airflow sensor in reverse sequence.

10.10 Functional check

Carry out a functional check:

1. Check fault and alarm release.
2. Check transmission on FACP.

11 Replace components

NOTICE

Components under voltage.

Replacing active components during operation may damage them.

- Disconnect the ASD from the power supply before replacing active components.

NOTICE

Electrostatic discharge.

The ASD contains components at risk of ESD. Damage may occur if touched.

- Wear an earthing strap when replacing components.

The AMB is connected to the AEB with a plug.

It is imperative that the AEB be removed when replacing the AMB.

Before replacing components, open the detector housing.

11.1 Tools for replacing components

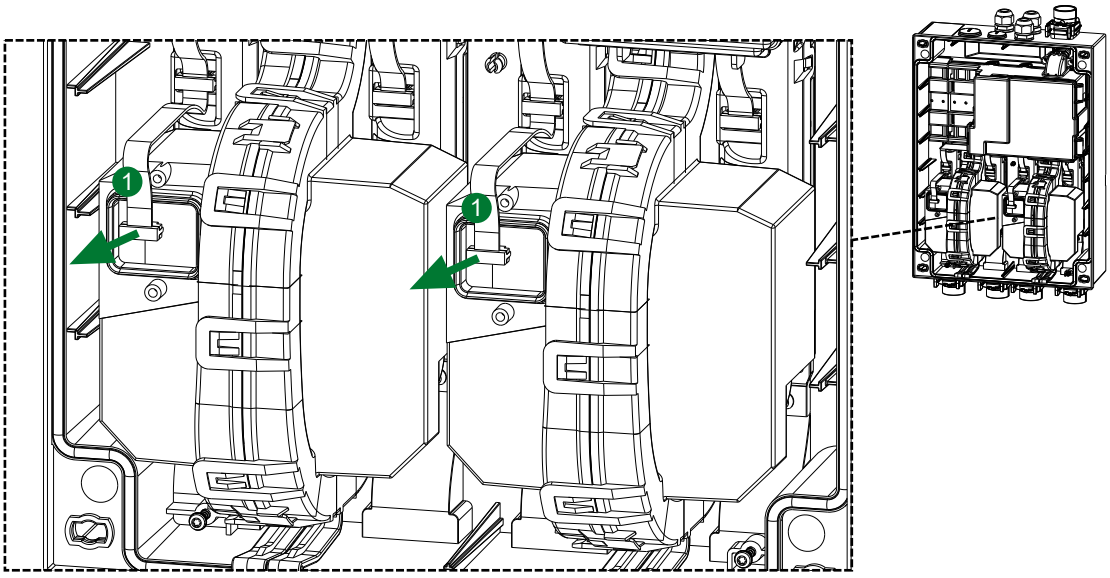
The following aids are required for component replacement:

Aids	Assembly step
Screwdriver Torx T10	Replace fan unit

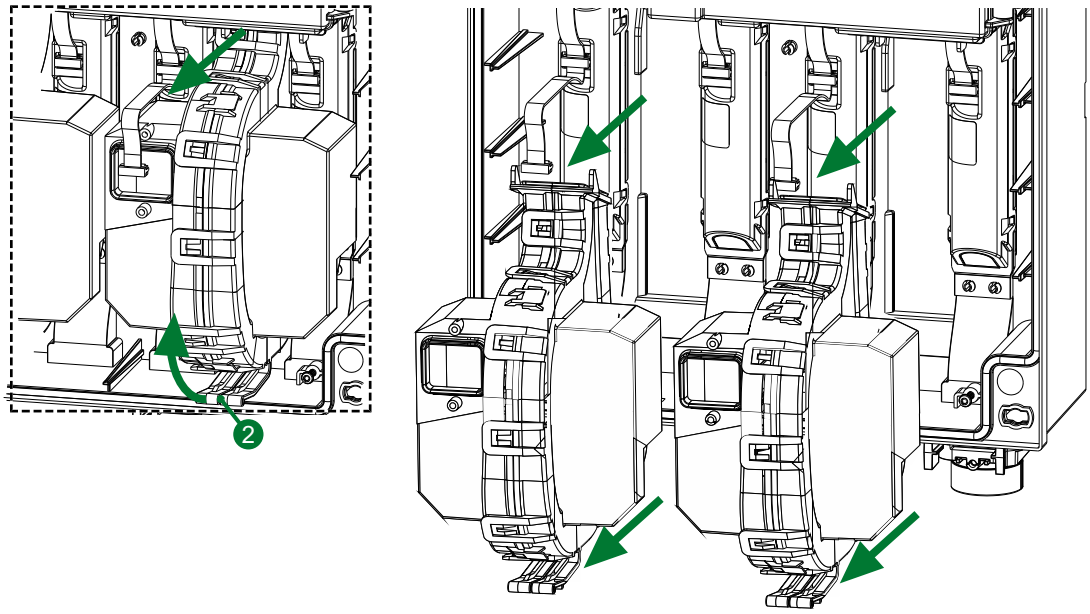
11.2 Replace smoke sensors

Replace smoke sensors:

1. Disconnect flat cable 1 on the smoke sensors.



2. Release retaining clips 2 and remove smoke sensors from the detector housing.



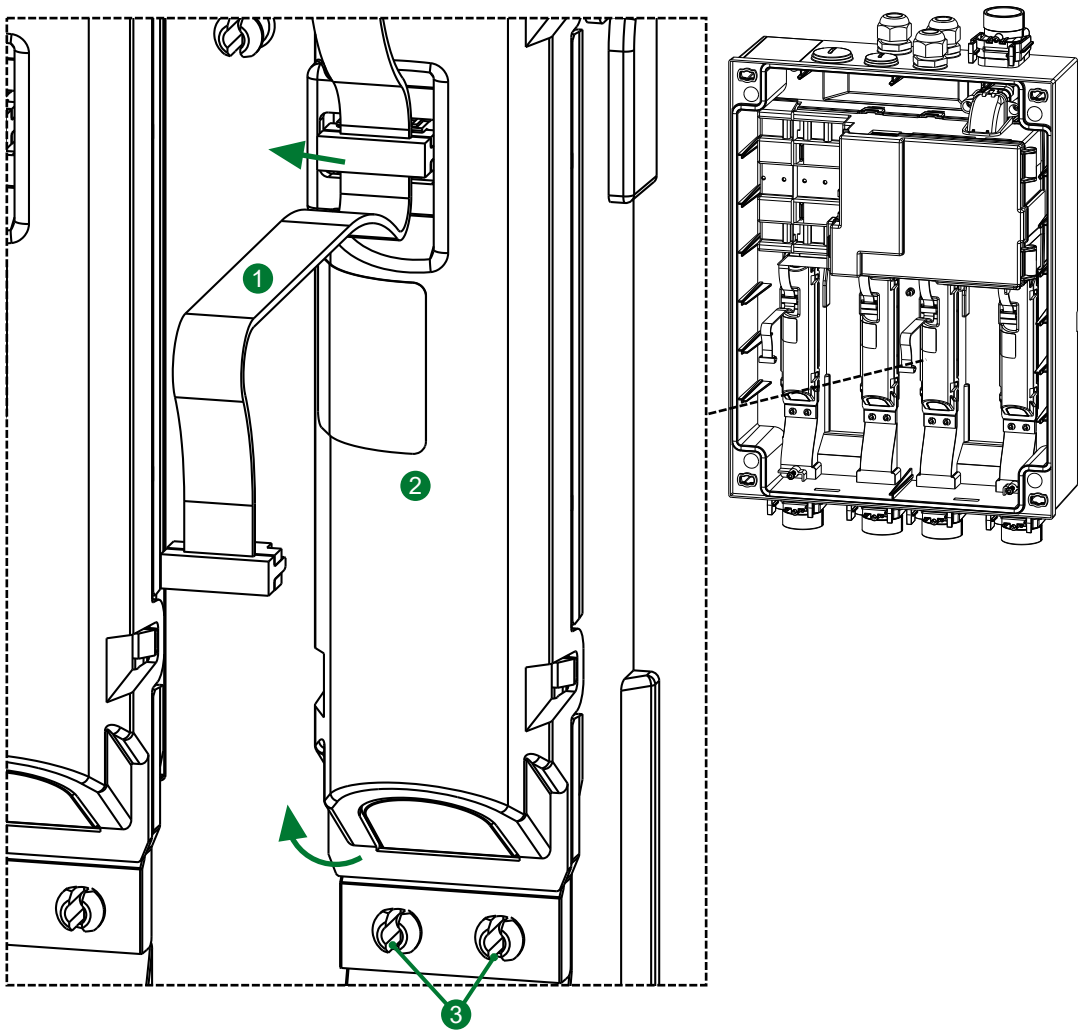
3. To mount new smoke sensors, follow the listed steps in reverse sequence. See Mount smoke sensors.

11.3 Replace airflow sensor

Prerequisite

✓ All smoke sensors are removed.

▶ **Replace airflow sensor:**



1. Disconnect flat cable 1.
2. Release the airflow sensor 2 from the fastening clips 3 on the detector housing and remove. To avoid damage, do not use any tools.
3. To install the new airflow sensor, perform the listed steps in reverse sequence.

11.4 Replace filter element

▶ **Replace filter element:**

1. Isolate all smoke sensors with MobileConfig; see Maintenance.
2. Open filter housing.
3. Remove filter element.
4. Insert new filter element.

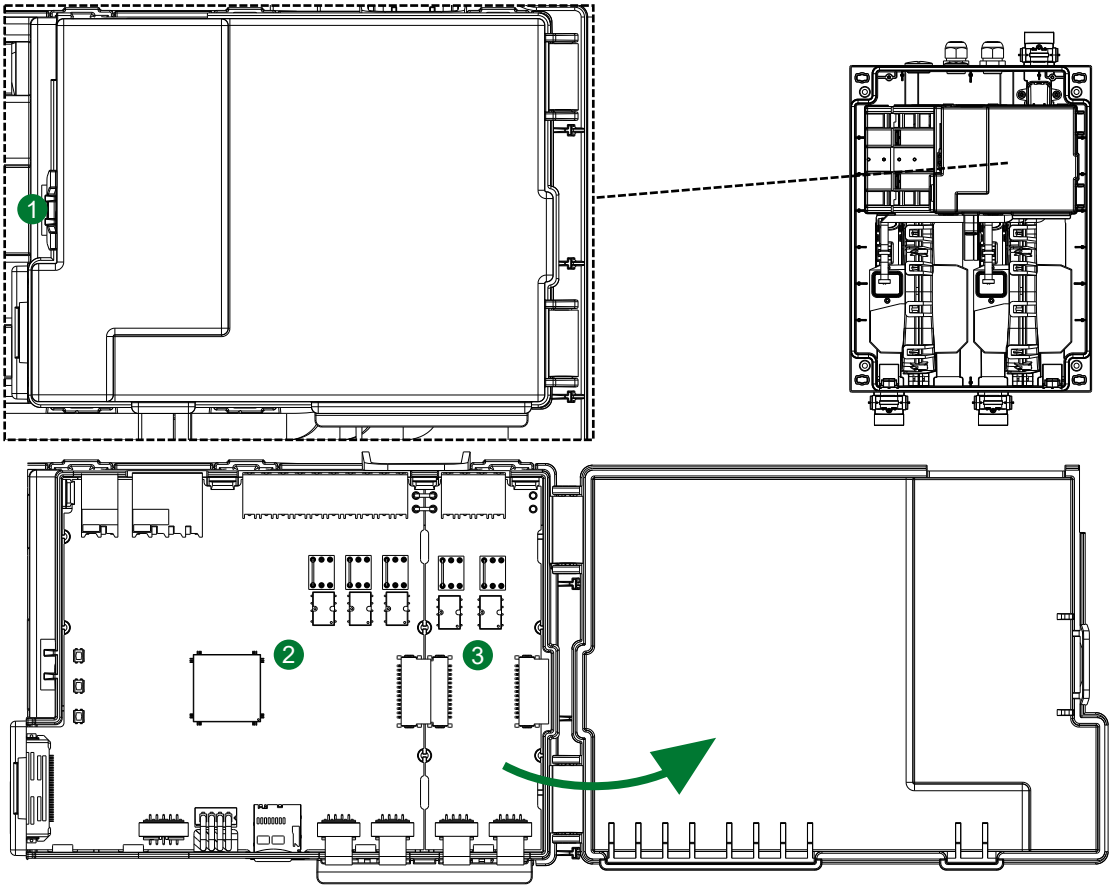
11.5 Replace AMB

The AMB is connected to the AEB with a plug.

It is imperative that the AEB be removed when replacing the AMB.

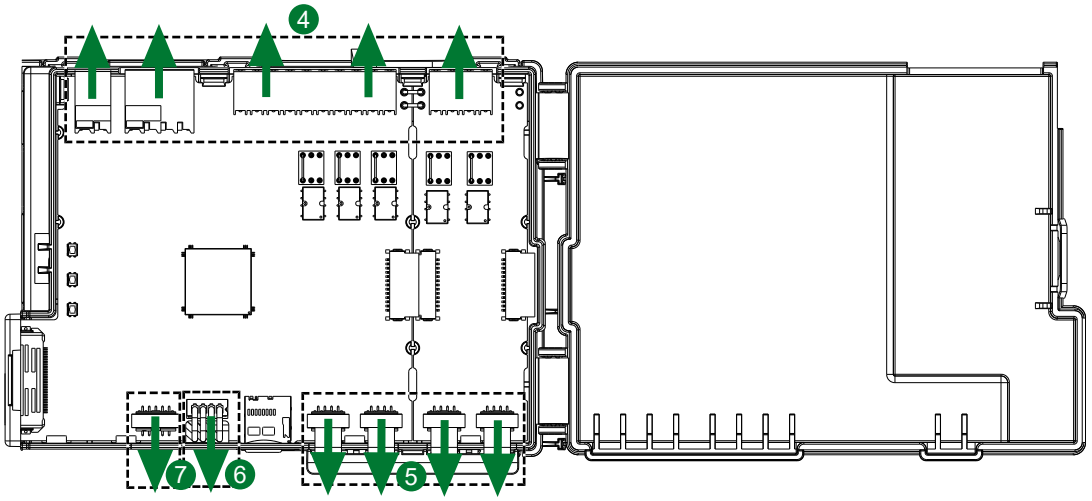
Replace AMB:

1. Use a slotted screwdriver to press the locking clip 1 outwards slightly and open the AMB cover.



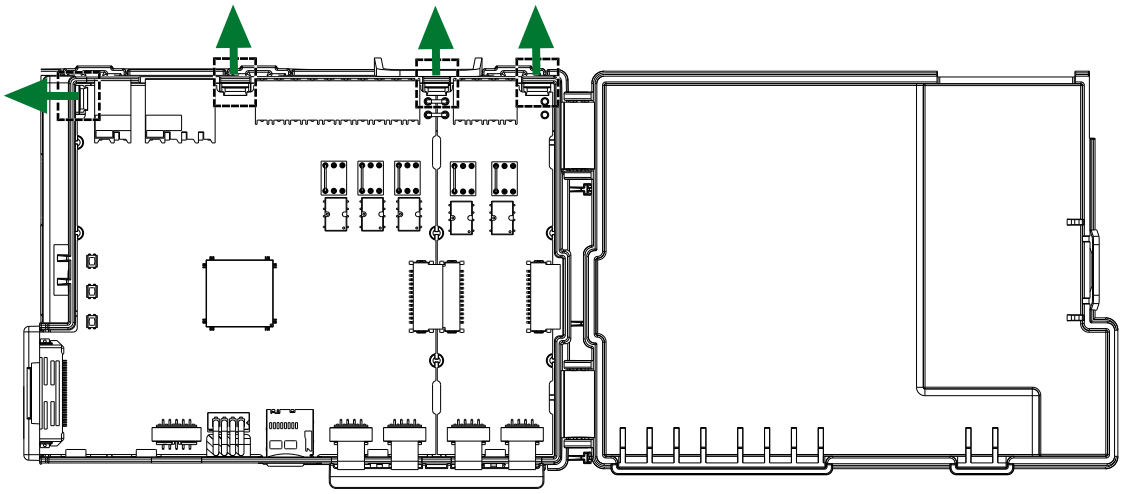
2	AMB
3	AEB

2. Disconnect all supply cables from the terminals 4 on the top side of the AMB and AEB [1].
3. Disconnect all connection cables to the airflow sensors 5.
4. Loosen connection cable to aspirating fan unit 6.
5. Disconnect the connection cable to the BCB 7.



6. Gently press the retaining clips on the upper and left edge of AMB and AEB [1] outwards using a slotted screwdriver.

   ⇨ AMB and AEB [1] detach from the holder and can be removed together.



7. To install the new AMB, follow the listed steps in reverse sequence. When connecting the supply cable to the terminals on the top of the AMB, observe the AMB terminal assignment and the labelling on the AMB cover.
8. After replacing the AMB, the ASD is displayed in the device list in MobileConfig with the AMB serial number (e.g., AMB0000000000). Attach the enclosed sticker to the detector housing for clear identification.

[1] Applies only to ASD 2002 and ASD 2004 product versions.

System configuration must be refreshed.

Note messages in MobileConfig.

Refresh system configuration: Define ASD type and check firmware

After the installation of a new AMB, the MobileConfig displays the message *Define ASD type*.

Define ASD type:

1. In MobileConfig select correct ASD type according to Rating plate and confirm.

   ⇨ The firmware is checked.

   ⇨ If the firmware versions of AMB and all other ASD components match, the ASD is ready for operation.

If the new AMB has a different firmware version than one or more components of the ASD, MobileConfig displays under **Dashboard > Pending events** the message *Module firmware discrepancy*. The correct firmware must be loaded to the ASD; see Load and install firmware.

Refresh system configuration: Define ASD type and check firmware

After the installation of a new AMB, the ASD must be put into operation again. Parameters and settings can be found in the commissioning report.

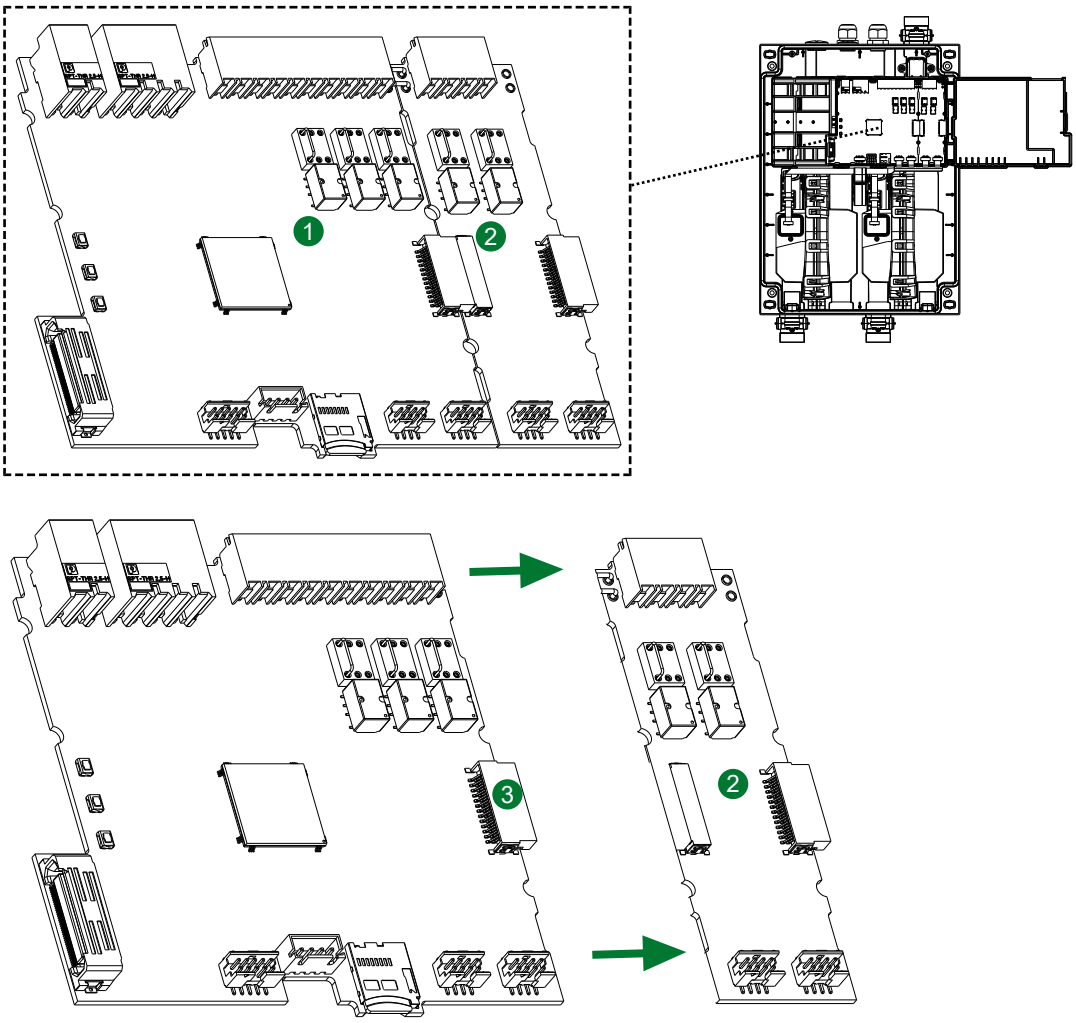
11.6 Replace AEB

The AMB is connected to the AEB with a plug.

It is imperative that the AEB be removed when replacing the AMB.

Replace AEB:

1. Remove AMB as described in Replace AMB.

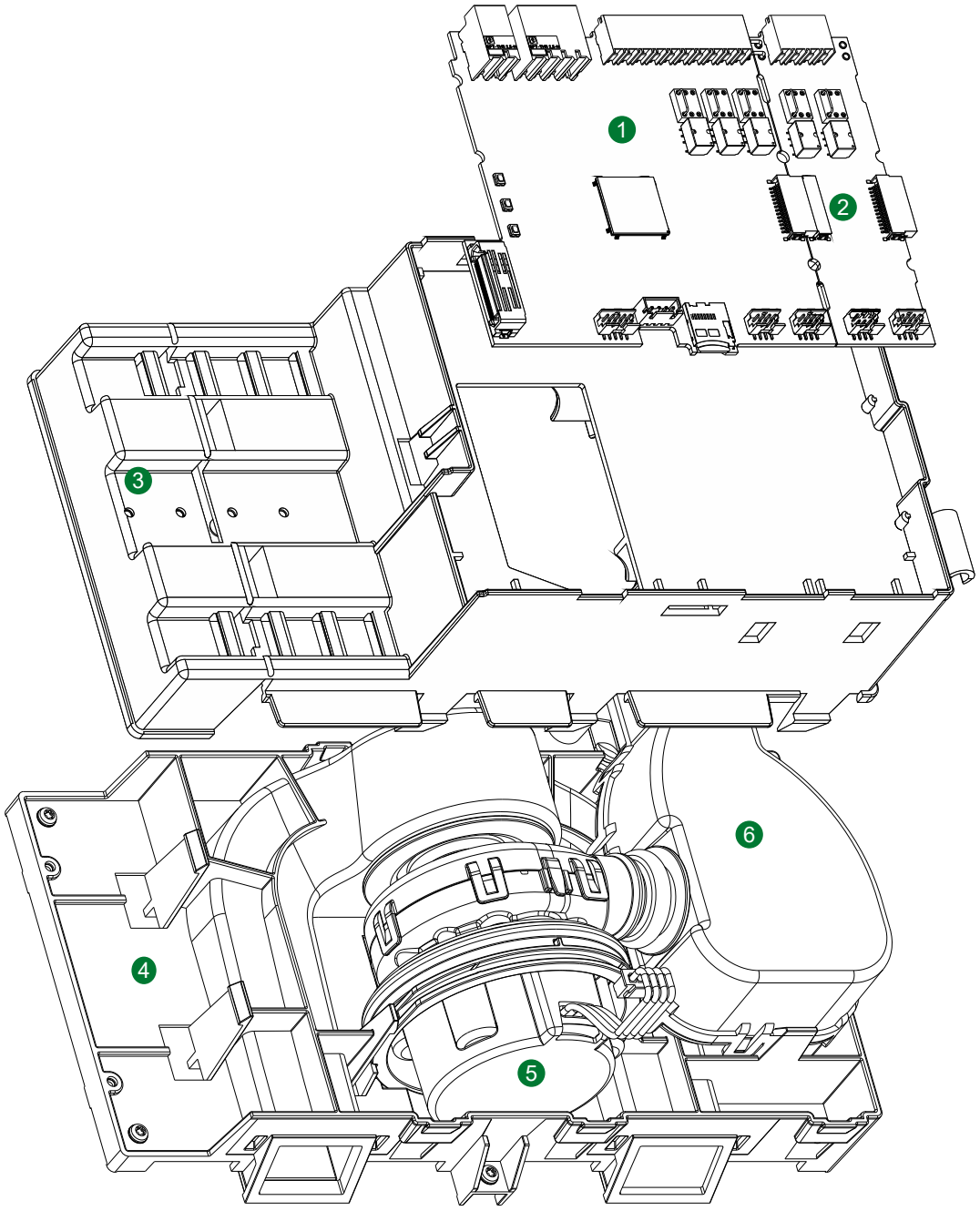


2. Loosen the AEB 2 on the 3 connector of the AMB 1 and pull off.
3. To install the new AEB, follow the listed steps in reverse sequence.

11.7 Replace fan unit

The fan unit consists of the following components. If one of these components is defective, the complete fan unit must be replaced:

- Fan
- Air circulation module
- Silencer



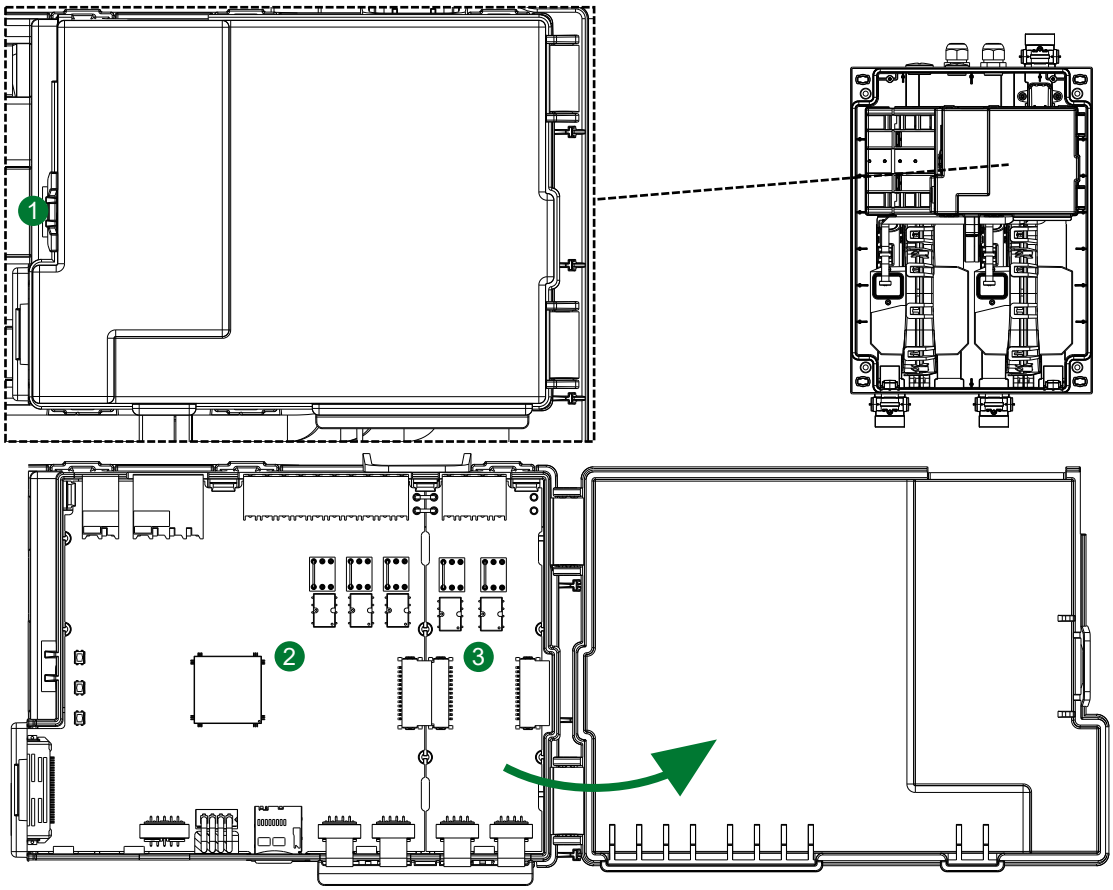
1	AMB
2	AEB
3	Support module
4	Air circulation module
5	Fan
6	Silencer

Prerequisite

✓ All smoke sensors are removed.

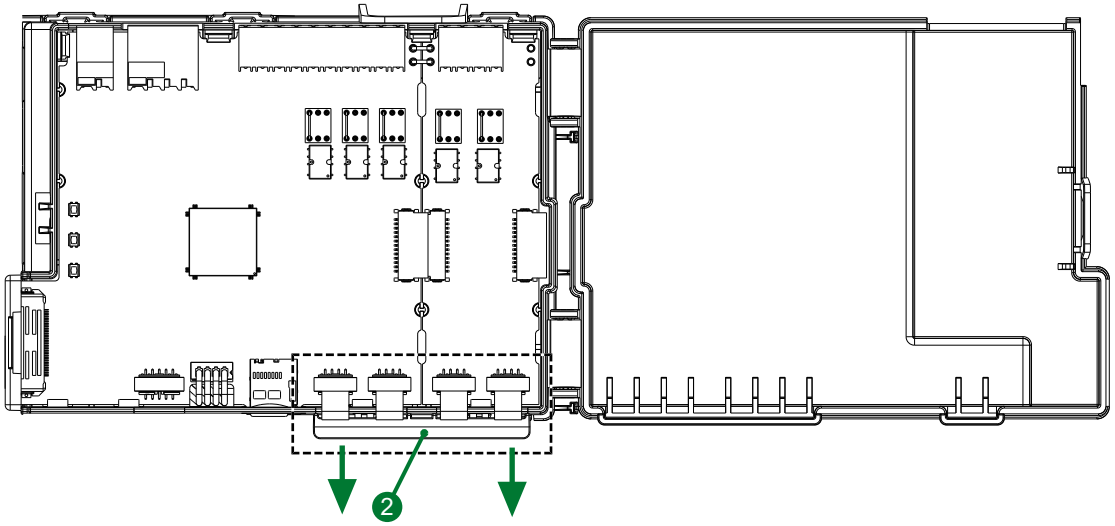
Replace the air circulation module:

1. Use a slotted screwdriver to press the locking clip 1 outwards slightly and open the AMB cover.

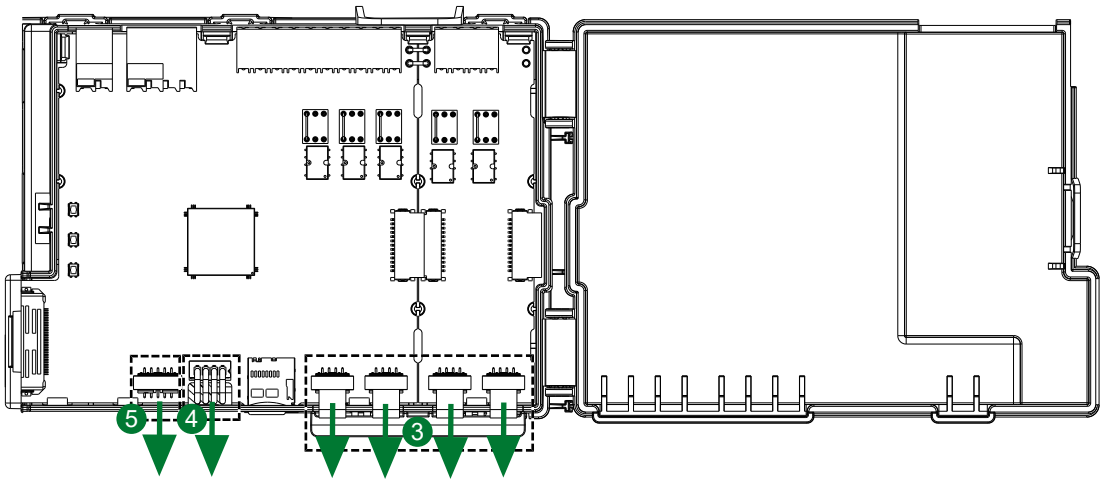


2	AMB
3	AEB

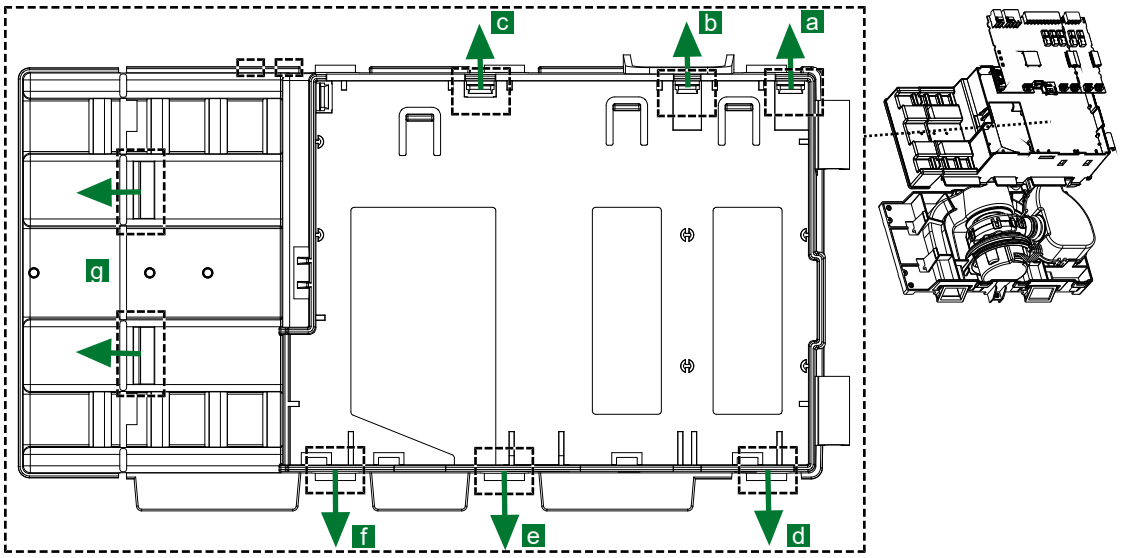
2. Loosen and remove the holding rail 2 by pressing the holding tabs together.



3. Disconnect all connection cables to the airflow sensors 3 on the AMB and AEB. Disconnect the connection cable to the BCB 5 and the connection cable to the aspirating fan unit 4.

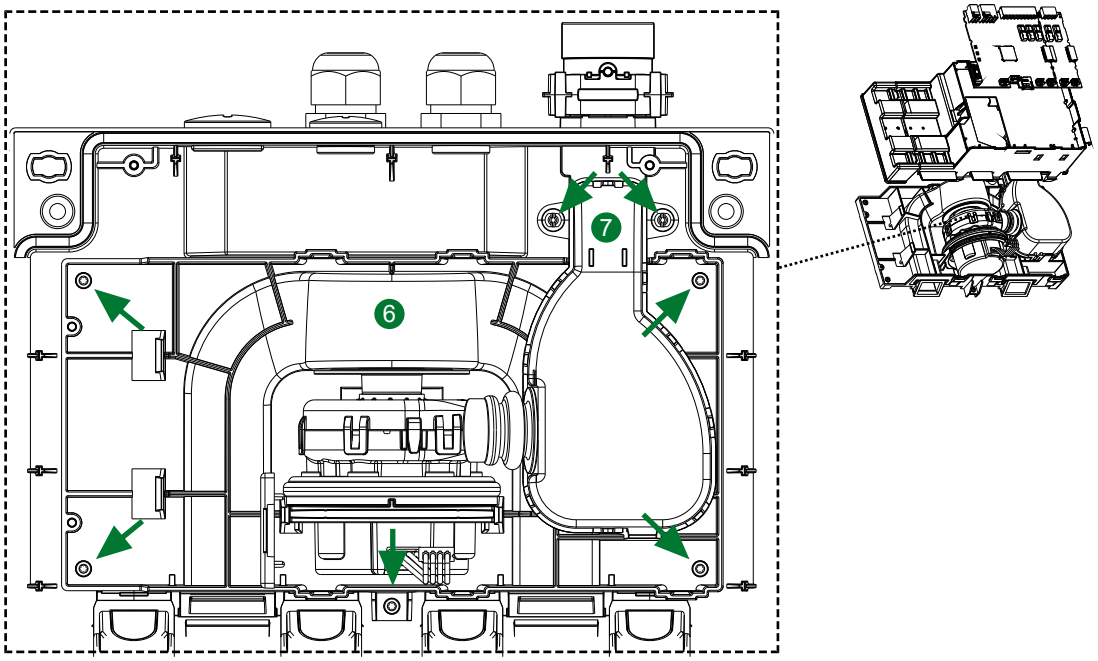


4. Use the slotted screwdriver to press the clips outwards in the sequence described. Carefully lift the support module out of the detector housing with the wired AMB. Fold up AMB while doing so.

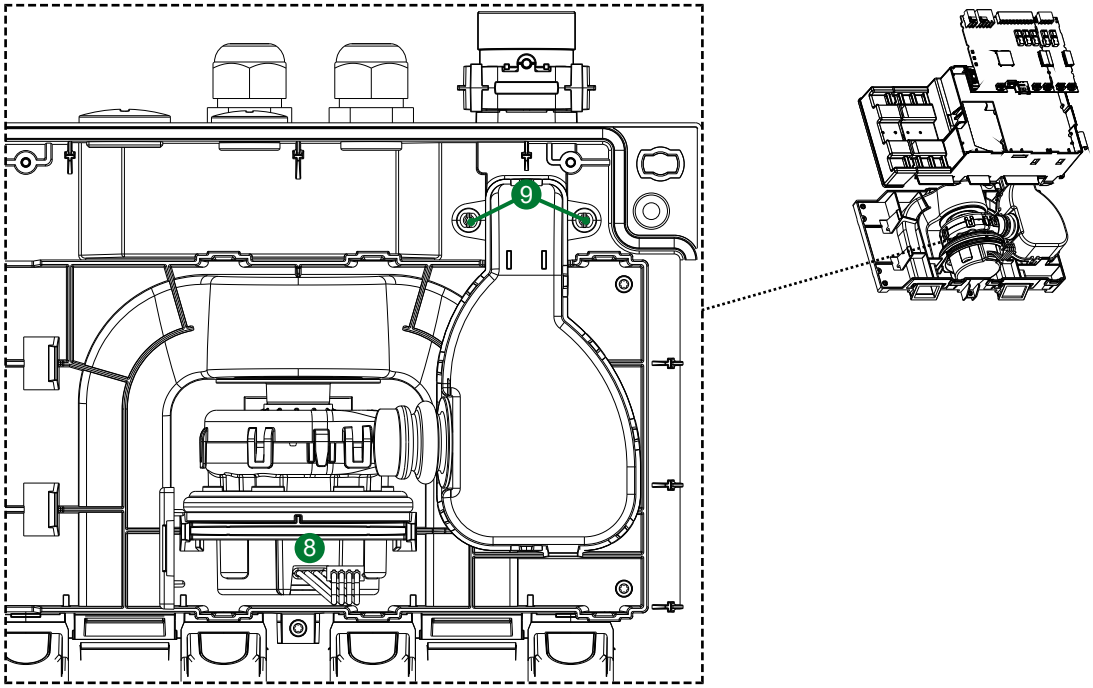


⇨ In the next step, the air circulation module 6 underneath can be detached.

5. Release the silencer from the fixing points 7.
6. Loosen the 4 Torx T10 screws on the airflow module using a screwdriver.

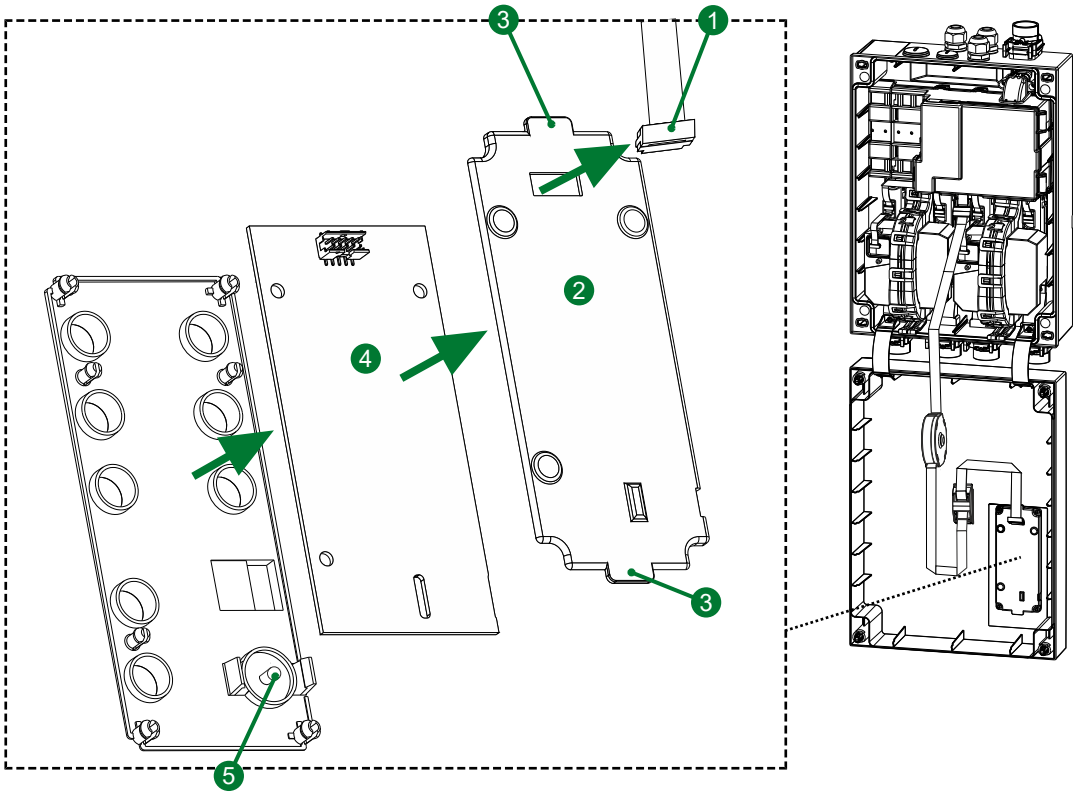


7. Remove the air circulation module from the detector housing.
8. To install the new air recirculation module, follow the listed steps in reverse sequence. Feed the connection cable to the aspirating fan unit through the opening on the support module 8. When reinserting the silencer, ensure that it snaps into place on the snap locks 9.



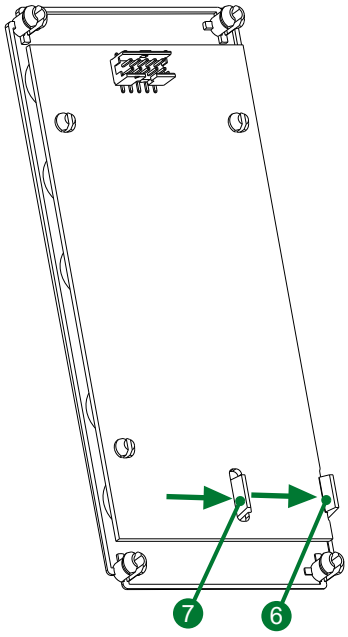
11.8 Replace BCB

▶ **Replace BCB:**



1. Disconnect flat cable 1.
2. Loosen and remove cover 2 by pulling the tabs 3.
3. Starting at the left edge, carefully pull BCB 4 out of the holder in a curved motion. Protect the extension button 5 from falling out.

   ⇨ A new BCB can be installed.



4. Set the outer edge of the printed circuit board to the outer retaining clip 6 and insert into the inner retaining clip 7 at the slot. Press the printed circuit board gently towards the housing cover.

   ⇨ The printed circuit board snaps into place.

5. Replace the cover and fix in place by lightly pressing.
6. Reconnect flat cable.

12 Warning and fault rectification

Display of warnings and faults on the display panel

Warnings and faults are displayed on the display panel:

- Warning: yellow fault LED flashes.
- Fault: yellow fault LED is lit.

Display of warnings and faults in MobileConfig

Warnings and faults are displayed in MobileConfig under Events.

Self-monitoring and self-recovery

The ASD has self-monitoring and self-recovery functions that trigger a restart in the event of certain faults.

Functionality:

- Self-monitoring: Triggers a restart in the event of certain non-resettable faults. See column “Leads to restart” in the following tables.
- Self-recovery: Activated if the ASD is in operation for at least 12 hours. A restart takes place 30 seconds after an error occurs.
- Exception: Self-recovery is activated immediately when internal errors occur (see table below).

12.1 Share data

When troubleshooting, the user can support the manufacturer’s support team by sharing log data, events and the commissioning report.

- **Share data:**

  1. In MobileConfig under **Actions > Maintenance**, tap **Share data**.
  2. Activate the data types to be shared.
  3. Tap **Share**.
     ⇨ The desired data is collected.
  4. Tap **Share**.
  5. Follow further instructions on the mobile device.

12.2 Internal error

The following errors cause the ASD to restart immediately.

Error designation	Explanation/cause	Corrective measure	Leads to restart
AMB: Internal fault detected	The ASD performed a restart as part of the self-recovery process.	▸ The system was able to rectify the fault itself. If not: ▸ Perform firmware update. ▸ Replace affected components.	x
Smoke sensor: Internal fault detected			
Airflow monitoring: Internal fault found			
Display panel: Internal fault detected			

12.3 Configuration of general faults

Error designation	Explanation/cause	Remedial measures	Leads to restart
Fault: Invalid configuration	Configuration of the *General faults* not legible. Cause: ▸ Technical problem on the AMB.	▸ In MobileConfig under **Actions > ASD settings** re-configure *Latching for general faults*. ▸ Reset ASD to factory settings and put back into operation. ▸ Replace AMB.	

12.4 Fan

Error designation	Explanation/cause	Remedial measures	Leads to restart
Fault: Invalid configuration	▸ Incompatible hardware change. ▸ Firmware update. ▸ AMB defect.	▸ Reset fan speed. ▸ Reset ASD to factory settings. ▸ Replace AMB.	
Fault: Positive deviation	The fan turns more than 10 percent faster than set for more than 30 seconds. Cause: ▸ Overpressure in the pipe network.	1. Check the pipe network. 2. Eliminate causes of overpressure.	
Fault: Negative deviation	The fan turns 10 percent slower than set for more than 30 seconds. Cause: ▸ Blockage in the pipe network.	1. Check the pipe network. 2. Remove the blockage.	
Fault: No tacho signal	The system receives no speed value. Causes: ▸ Faulty connection. ▸ Fan defect. ▸ AMB defect.	▸ Check the fan connection. ▸ Replace fan unit. ▸ Replace AMB.	

12.5 Airflow sensor

Error designation	Explanation/cause	Remedial measures	Leads to restart
Fault: Not normalised	No airflow normalisation performed. Causes: ▸ New ASD is put into operation.	1. Perform airflow normalisation.	

Error designation	Explanation/cause	Remedial measures	Leads to restart
	▸ ASD was reset to factory settings.		
Fault: Reference data missing	▸ Airflow sensor defective.	▸ Replace airflow sensor	
Fault: No communication	No communication possible with airflow sensor. Causes: ▸ Connector faulty or defective. ▸ Airflow sensor defective. ▸ AMB defect.	▸ Restart ASD. ▸ Check cable connection to airflow sensor. ▸ Replace cable. ▸ Check airflow sensor; if defective Replace airflow sensor. ▸ Replace AMB.	x
Fault: Invalid configuration	▸ Incompatible hardware change. ▸ Incompatible firmware update.	▸ Reconfigure airflow sensor. ▸ Reset ASD to factory settings and put back into operation. ▸ Replace AMB.	
Fault: Measurement not successful	Calculation of airflow value not possible. Causes: ▸ Invalid ambient conditions.	▸ Check that the airflow sensor is correctly seated; if defective, Replace airflow sensor. ▸ Check the wiring of the airflow sensor; if defective, Replace airflow sensor.	
Warning: Weak signal	Airflow sensor receives weak signal. Cause: ▸ Airflow sensor dirty.	1. Wait one minute for the fault to clear. 2. Clean airflow sensor. 3. If the fault persists, Replace airflow sensor.	
Fault: Weak signal	Airflow sensor receives weak signal. Cause: ▸ Airflow sensor dirty.		

Error designation	Explanation/cause	Remedial measures	Leads to restart
Fault: Voltage outside tolerance	Supply voltage on the airflow sensor is outside the required range. Causes: ▸ Feeder cable incorrectly connected or defective. ▸ Airflow sensor defective.	▸ Restart ASD. ▸ Check feeder cable; replace cable if defective. ▸ Check that the airflow sensor is correctly seated; if defective, Replace airflow sensor.	x
Fault: Airflow not within tolerance	The measured airflow value is not within the measuring range. Cause: ▸ Defect on sampling pipe tube network or air outlet.	▸ Check sampling pipe tube network and air outlet.	
Fault: Hardware defect	Airflow sensor defective.	▸ Restart ASD. ▸ Replace airflow sensor.	x
Warning: Positive deviation	Airflow above threshold for positive warning.		
Warning: Negative deviation	Airflow above threshold for negative warning.		
Fault: Positive deviation	Airflow above the threshold for positive fault.		
Fault: Negative deviation	Airflow above the threshold for negative fault.		
Fault: Reflection surface missing	The reflection surface attached to the airflow sensor is missing. Airflow measurement not possible.	1. Install reflection surface. 2. Restart ASD.	

12.6 Smoke sensor

Error designation	Explanation/cause	Remedial measures	Leads to restart
Fault: Invalid configuration	▸ Incompatible hardware change. ▸ Incompatible firmware update. ▸ AMB defect.	▸ Re-configure smoke sensor. ▸ Reset ASD to factory settings and put back into operation. ▸ Replace AMB	
Fault: Invalid production data	▸ Smoke sensor defect.	1. Replace smoke sensors.	
Fault: No communication	No communication with the smoke sensor possible. Cause: ▸ Smoke sensor missing. ▸ Cable connection faulty. ▸ Smoke sensor defect. ▸ AMB defect.	▸ Restart ASD. ▸ Install smoke sensor. ▸ Check cable connection to the smoke sensor. ▸ Check smoke sensor; if defective Replace smoke sensors ▸ Check cable connection to the smoke sensor. ▸ Check AMB; if defective Replace AMB.	x
Fault: Temperature outside the tolerance	▸ Ambient temperature too high or too low.	1. Correct the ambient temperature or wait until it is within the tolerance range again.	
Fault: Input value outside the tolerance	Cause: Smoke sensor defect.	1. Replace smoke sensors.	
Fault: Measurement error	Incorrect measuring procedure of the smoke sensor.	1. Restart ASD. 2. If the error persists, perform firmware update. 3. If the error persists, Replace smoke sensors.	x
Fault: Hardware defect	Smoke sensor defect.	1. Replace smoke sensors.	x

12.7 Smoke sensor isolation and detector dirty

Error designation	Explanation/cause	Remedial measures	Leads to restart
Fault: Isolated	Smoke sensor was isolated.	▸ Remove the isolation of the smoke sensor in MobileConfig.	
Fault: Soiling (dirty)	Smoke sensor at least 75% dirty; function impaired.	▸ Replace smoke sensors.	
Warning: Soiling (dirty)	Smoke sensor at least 50 percent dirty; function still guaranteed.	▸ Replace smoke sensors.	

12.8 Display panel

Error designation	Explanation/cause	Remedial measures	Leads to restart
Fault: No communication	Causes: ▸ Cable connection defective. ▸ BCB defect. ▸ AMB defect.	▸ Restart ASD. ▸ Check cable connection to BCB. ▸ Check BCB; if defective Replace BCB. ▸ Replace AMB.	x
Fault: Hardware defect	Causes: ▸ BCB defect.	▸ Restart ASD. ▸ Replace BCB.	x

12.9 File system

Error designation	Explanation/cause	Remedial measures	Leads to restart
Fault: File system error	Technical problem on the AMB.	▸ Restart ASD. ▸ Replace AMB. Temporarily reset the ASD to factory settings and put it back into operation.	x

12.10 Set detection unit inactive

Error designation	Explanation/cause	Remedial measures	Leads to restart
Fault: Detection unit deactivated	Detection unit was set inactive.	▸ Reactivate detection unit via terminal I/O 3; see Inputs and outputs.	

12.11 Time

Error designation	Explanation/cause	Remedial measures	Leads to restart
Warning: Time not set	Cause: ▸ Commissioning. ▸ Prolonged interruption of the power supply.	▸ Set the time in MobileConfig under **Actions > ASD time**.	
Warning: Time not synchronised	Difference between MobileConfig and ASD greater than 2 minutes.		

12.12 ASD type definition

Error designation	Explanation/cause	Remedial measures	Leads to restart
Fault: ASD type missing	ASD type in MobileConfig not defined, ASD not operable.	1. Connect ASD with MobileConfig. 2. Define ASD type via **Device list**.	

13 Disposal

The ASD is manufactured in accordance with the latest environmental protection and sustainability standards. Disposal must be carried out in accordance with the applicable country-specific guidelines.

The following regulation applies in the EU member states as well as in Switzerland:

NOTICE

Electrical/electronic devices

Electrical and electronic devices must not be disposed of with household waste. As the end user you are legally obliged to return them. After use, electrical and electronic devices can be returned free of charge to the seller or to the designated collection points (e.g., municipal collection points or retailers). Correct disposal protects the environment. For more detailed information, please contact your waste disposal services.

14 Items and spare parts

ASD

Designation	Article number
Aspirating smoke detector ASD 2001	11-2100003-01-xx
Aspirating smoke detector ASD 2002	11-2100004-01-xx
Aspirating smoke detector ASD 2004	11-2100005-01-xx

SSD

Designation	Article number
Smoke sensor SSD 1030	11-2100022-01-xx

Spare parts

Designation	Article number
ASD main board AMB 100	11-2200033-01-xx
ASD extension board AEB 100	11-2200034-01-xx
Basic control board BCB 100	11-2200035-01-xx
Airflow sensor AFS 100	11-2200040-01-xx
Replacement cable RC ASD 2001	11-0000029-01-xx
Replacement cable RC ASD 2002	11-0000030-01-xx
Replacement cable RC ASD 2004	11-0000031-01-xx
Replacement cable RC AMB-BCB	11-0000032-01-xx
Aspirating fan unit AFU 2001	11-0000033-01-xx
Aspirating fan unit AFU 2002/4	11-0000034-01-xx
Insect protection screen IPS 100	11-0000035-01-xx
Empty board IPS-O 100	11-0000036-01-xx
Replacement cover hinge RCH 100	11-0000037-01-xx
Replacement cover screw CLS 100	11-0000038-01-xx

Accessories

Designation	Article number
Universal module support UMS 1000	11-4000019-01-xx
Mounting plate MOP 2000	11-4000020-01-xx

15 Technical data

Supply voltage range		14 to 30	VDC
		UL: 16.4 to 27	
Nominal voltage		24	
Maximum power consumption at 24 VDC, measured at maximum fan speed (unloaded)			
ASD 2004	Normal state	467	mA
	Alarm simultaneously on SSD I, SSD II	490	
Switch-on current peak at 24 VDC		500	mA
		for a maximum of 10	ms
Sampling pipe length	Complies with general system limits according to EN 54-20		
Sampling pipe diameter, typical (inner/outer)		20/25	mm
Maximum number of sampling holes	Complies with general system limits according to EN 54-20		
Sampling hole diameter	∅ 2 / 2.5 / 3 / 3.5 / 4 / 4.5 / 5 / 5.5 / 6 / 6.5 / 7		mm
Response range, smoke sensor sensitivity	EN 54-20, Class A, B, C		
Protection class according to IEC 60529 / EN 60529		IP 54	
Operating temperature range		-20 to +60 UL: max. +40	°C
Maximum permissible temperature fluctuation of detector housing and sampling pipe in operation (condensation not permitted)	Sensitivity range 0.01 to 0.5%/m	Sensitivity range ≥ 0.5%/m	
	60	80	K
Maximum permissible storage temperature of the detector housing (without condensation)		-30 to +70	°C
Ambient pressure difference between detector housing and sampling pipe (sampling holes)		Must be identical	
Ambient condition humidity detector housing (briefly without condensation)		95	% rel. humidity

Ambient condition humidity detector housing sampling pipe continuous		70	
Maximum load capacity relay contact		50 (UL: maximum 30)	VDC
		1	A
		30	W
Maximum load capacity of the open collector output (dielectric strength 30 VDC)		100	mA
Terminal cross-section power supply		2.5	mm^2
Connection terminal cross-section inputs, outputs		1.5	
Cable screw unions for cable diameters	∅ 5 to 12 (M20) / ∅ 9 to 18 (M25)		mm
Sound pressure level compliant with ISO 3744 at fan speed	7,000	20,000	RPM
	21	40	dB (A)
Housing	Material	PC ABS	
	Flammability class UL	94-V0	
	Colour compliant with NCS	S 8005 R80B (anthracite)	
Approvals		EN 54-20	
VdS approval		G 225014	
Dimensions		265×431×148.8	mm
Weight with SSD		4,120	g
Weight SSD 10x0		388	

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Specifications subject to change | T 140 927 en | 1 | 17.06.2025