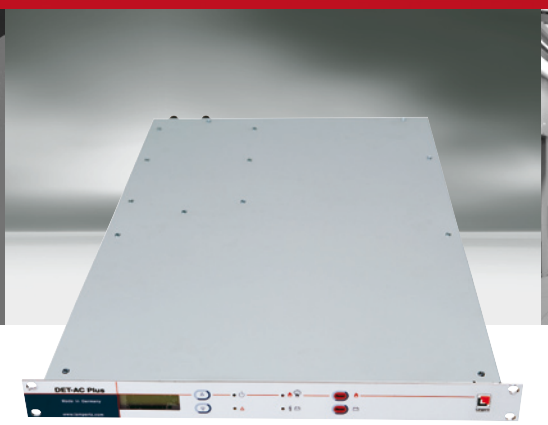
DET-AC PLUS



User Manual

DET-AC Plus

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General information

The Active Extinguishing System DET-AC Plus is a quality product in accordance with the latest state of the technical art.

As the sole supplier in Europe for mobile and stationary fire protection solutions from a single source Minimax offers individual protection concepts for every risk. More than 100 years of experience, intensive contributions to national and international expert committees, and the close co-operation with insurers and test institutes form the basis of the high quality and safety of problem solutions for fire protection from Minimax.

The successful implementation of the installation and the safe operation of this device requires knowledge found in these operating instructions.

The information is presented concisely and clear.

Device manufacturer:
Minimax GmbH & Co. KG
Industriestraße 10/12
23840 Bad Oldesloe
Germany
Tel.: +49 (0)4531/803 - 0
Fax: +49 (0)4531/803 - 248
Email: info@minimax.de
Internet: www.minimax.de

Contents

1. General

1.1 Explanation of symbols and notices

In this documentation safety notices and important explanations are indicated by the following symbols:

Caution!

Is placed before warnings which require particular observation to ensure the proper operation of the system, the compliance with directives, regulations, notices and correct procedures, and the prevention of personal injury, malfunctions, faults or damage to the device or the whole system.

Note

Indicates general notes and explanations.

1.2 Intended use

This device is only to be used in accordance with the operating conditions detailed in the contract documentation and the operating manual.

Any other or additional use is not as intended. The manufacturer is not liable for any damage resulting from such use, the risk in such cases is born exclusively by the operator or commissioner.

The intended use also includes:
- observing all notices contained in the operating instructions
- complying with the operating, servicing and maintenance conditions prescribed by Minimax.

The operator must carry out regular visual and functional inspections in accordance with the check list in the chapter maintenance / service and must document them in the report book, if necessary.

The operator must coordinate modifications of the object to be protected with the installer or commissioner of the system if they affect the function of the DET-AC Plus Active Extinguishing System (e.g. additional holes in the cabinet to be protected).

These operating instructions
- relate to the DET-AC Plus Active Extinguishing System and are intended to serve as working documentation for the operators and users of this device. However, they cannot replace the training / instruction in the DET-AC Plus Active Extinguishing System.

- do not replace applicable laws, standards, regulations and technical guidelines in any way.
  The observance of such requirements is the responsibility of the installer or operator of the system.
- do not claim to be complete and are subject to continuous updates without prior notice.
- are aimed exclusively at specially trained experts familiar with the corresponding specialist knowledge relating to the installation, commissioning, maintenance and modification of technical devices of this kind.

1.3 Safe operation

The device described here has been manufactured in accordance with the latest state of the technical art and accepted safety rules and features a high degree of operational safety.

However, the device can pose hazards or impair the system or other property if used improperly or other than intended.
The device must only be used in an undamaged and fully functional condition.
The notices on the installation, operation and maintenance of this device contained in these operating instructions aim at the proper, safe and error-free operation. Since relevant regulations may differ across the world, the applicable national regulations and laws at the location of use must be observed even if they contradict the notices contained in these operating instructions. The following details must in particular be observed:

- National safety and accident prevention regulations
- National standards and laws, particularly with regard to hazard detection systems
- National assembly and installation regulations
- Generally accepted technical principles
- These operating instructions including the safety and warning notices contained therein
- The characteristics and technical specifications of this device

Where it is suspected that a safe operation is no longer possible (e.g. damage) the device must be immediately decommissioned and protected against unintentional re-commissioning.

1.4 Operator's obligation

The operator commits to only allows individuals to work at/with the DET-AC Plus Active Extinguishing System,

- who are familiar with the basic regulations on occupational safety and accident prevention,
- who have been instructed in the handling of this device and the overall system, and
- who have read and understood the operating instructions including the safety and warning notices contained therein.

1.5 User's obligation

Installation, maintenance, inspections and repairs may only be carried out by individuals with adequate professional qualifications. These individuals are, for example, “competent individuals in matters relating to hazard detection systems” or “qualified electricians for hazard detection systems”. The applicable national regulations, in particular with regard to the required qualifications, in the country of use must be observed.

Furthermore, all individuals working with the device commit

- to always observe the basic regulations on occupational safety and accident prevention,
- to familiarise themselves prior to starting work with the conditions of the object and its environment, the safety concept, the protection task and possibly the monitoring task of an overriding fire detection system, and

- to have read and understood the operating instructions including its safety and warning notices.

Any questions with regard to the operating instructions must immediately be clarified with the respective supervisor or the manufacturer of the device.

1.6 Alterations and modifications

Unauthorised alterations and modifications of the device are not permitted and invalidate any manufacturer liability.

1.7 Documentation of additional system components

If the device is used in conjunction with other components from Minimax (or other manufacturers), it must be ensured prior to commissioning the system that the relevant manufacturer documentation has been read and understood.

1.8 Spare parts

Spare parts must meet the technical requirements of the manufacturer. Only original parts meet this requirement.

1.9 Technical developments

The manufacturer reserves the right to modifications in the interest of technical development whilst retaining the key features of the device type described without corrections to these operating instructions.

2. Function and design of the DET-AC Plus Active Extinguishing System

2.1 Short description

The DET-AC Plus active system has been designed for installation in enclosed switch cabinets and is a separate compact unit capable of detecting and extinguishing fires.

The extinguishing agent used is Novec™ 1230, a chemically acting liquid which evaporates at a nozzle and has extinguishing powers in gaseous form.

Fire detection takes place via sensors to be adjusted for the anticipated fire characteristics (automatic fire detectors).

Alarms and faults can be transmitted via potential-free contacts or optionally via the CMC-TC with I/O unit to a superordinated location (monitoring or control device).

The compact Active Extinguishing System with a space requirement of only 1 unit is intended for installation in the upper third, preferably the top slot of a 19" switch cabinet system. The device is easy to install and cheap to maintain.

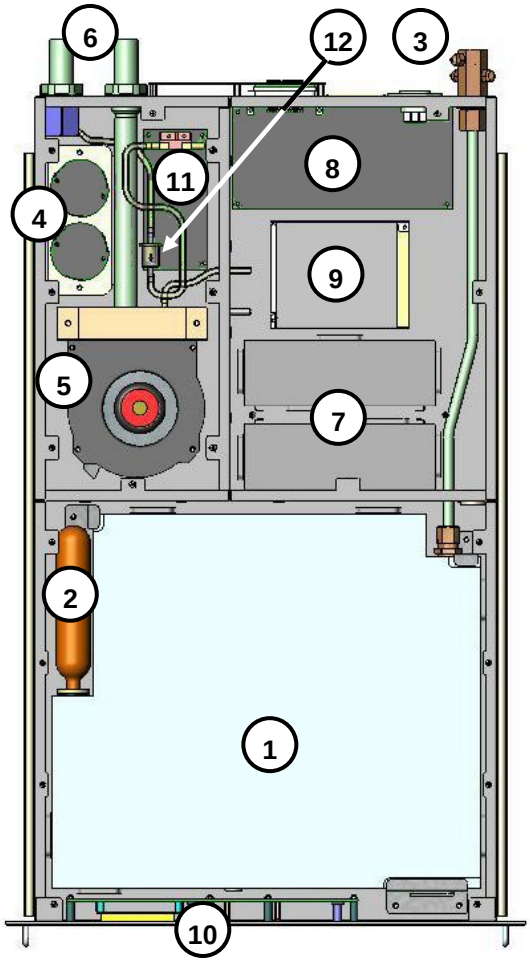
Areas of application

The DET-AC Plus Active Extinguishing System is used to protect high quality technical installations whose high availability is a must.
These include:

- **IT, server and network technology**
  which must provide important data for the enterprise process and ensure the data flow itself
- **Production controls**
  whose technology ensures the uninterrupted running of the manufacturing processes
- **Telecommunications installations**
  which ensure that the communication of the enterprise works without interruptions
- **Power supply and control systems**
  which ensure sufficient energy at the right time at the right place in the enterprise

The earliest detection of a fire together with potential extinguishing action ensures that downtimes and subsequent damage caused by a technical fault are minimised.

2.2 Design



1) Extinguishing agent container with level monitoring, overpressure protection and electric release device
2) Propelling gas cartridge
3) Extinguishing nozzle
4) Fire sensors
5) Aspiration fan
6) Aspiration and exhaust air connections
7) Emergency power supply (accumulators)
8) Main board
9) Power supply unit
10) Front panel with display and control panel
11) Detector interface
12) Filter for air flow monitoring

2.3 Function

Via a pipe system a fan (5) constantly sucks air samples from the monitoring area (6) and passes them via the fire sensors (4).

The sensors are monitored permanently by the evaluation and control electronics (8) for functionality and potential soiling.

When the first fire alarm criterion is reached, the evaluation electronics controls the process programmed for this event: It displays the alarm condition on a display (10), if necessary triggers the transmission to superordinated systems, controls optional acoustic and optical alarm devices.

When the second alarm criterion is reached the release device (2) will be electrically triggered after a preset analysis time, opening the propelling gas cartridge (2) and causing the propelling gas to flow into the extinguishing agent container (1). The propelling gas presses the extinguishing agent through an extinguishing pipe towards the extinguishing nozzle (3). At this nozzle the extinguishing agent evaporates and builds up the necessary extinguishing concentration for extinguishing the fire.
The extinguishing agent container is protected against overpressure. The filling level monitor integrated into the extinguishing agent container reports a loss of extinguishing agent to the evaluation electronics which indicates this fault (extinguishing agent loss) on the display and if necessary transmits it to superordinated systems.

The power supply for the Active Extinguishing System is secured from 2 sources. Once source is a power supply unit (9) which also charges the batteries for the emergency power supply (7). The other source is the emergency power supply which is switched in parallel. The emergency power supply is designed for the uninterrupted operation of the system for 4 hours.

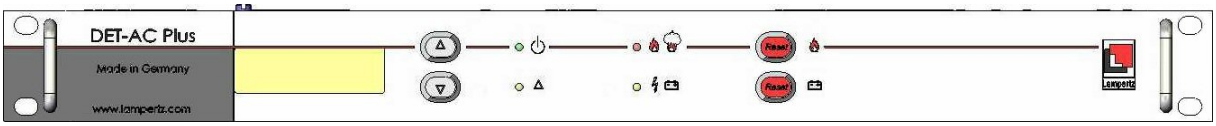
The control and display of the current state of the extinguishing system is achieved via the integrated control unit. This has both LED indicators and an LCD display to display the current status. The LEDs are used to display collective conditions, whereas the individual conditions are displayed in detail as clear text on the LCD.

If there are several messages, the cursor keys can be used to switch between them. The existing messages are sorted in accordance with their priority and the order of arrival. If the cursor keys are not used for a duration of 30 seconds, the display switches back to the normal state.

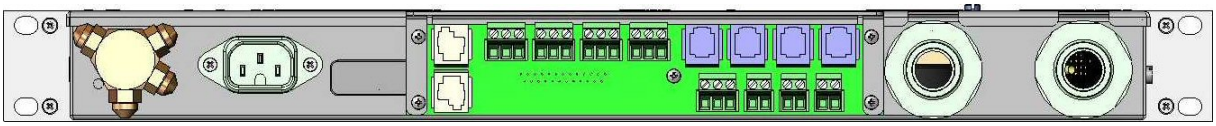
The display of collective conditions via the LEDs of the control unit is independent of the content of the LCD and therefore independent of the scrolling using the cursor keys. It always represents the current system state.

Besides the cursor keys the control unit has another two keys for resetting stored messages.

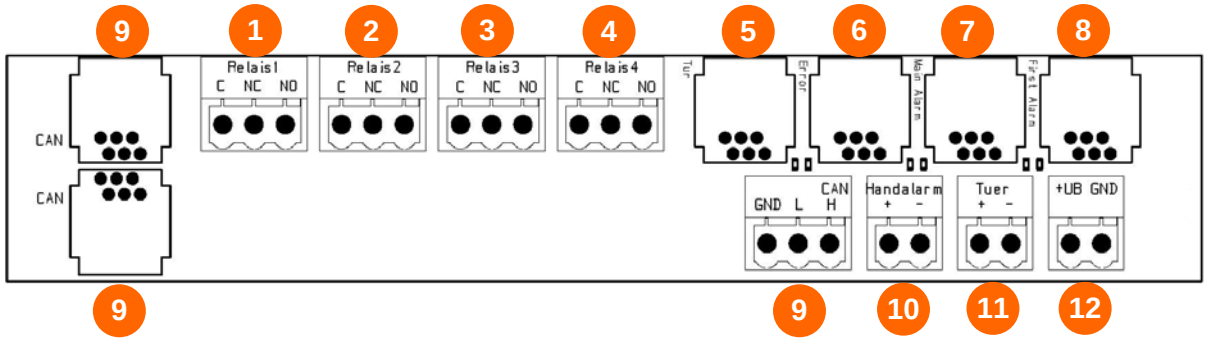
Front view



Rear view



2.4 Connections



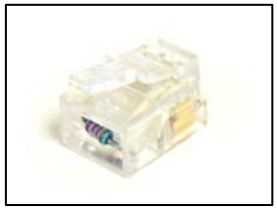
1) Relay output “first alarm”, see 2.4.4
2) Relay output “main alarm”, see 2.4.4
3) Relay output “extinguishing”, see 2.4.4
4) Relay output “collective error”, see 2.4.4
5) Connector (RJ12) to connect to Rittal CMC I/O unit (door contact 1), see 2.4.1
6) Connector (RJ12) to connect to Rittal CMC I/O unit (error)
7) Connector (RJ12) to connect to Rittal CMC I/O unit (main alarm)
8) Connector (RJ12) to connect to Rittal CMC I/O unit (first alarm)
9) Still without function - reserved for future applications
10) Two-pole plug for for manual release, see 2.4.2
11) Two-pole plug for door contact 2, see 2.4.1
12) Two-pole plug for external power supply (U_S), see 2.4.3

2.4.1 Door contact / blocking

Via the input "door switch" the release of the extinguishing system is blocked. This is necessary because the build-up of a sufficient concentration of extinguishing agent cannot be guaranteed with the door open. This blocking is displayed in the LCD and via the green flashing operating LED.

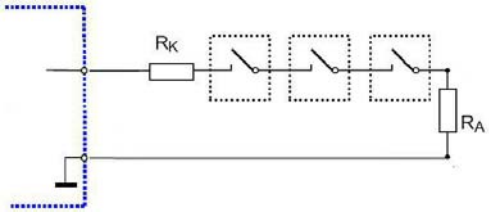
Caution!
All extinguishing requests registered during the condition "Extinguishing system blocked" (= blocking of the extinguishing system) place the device into the status "extinguishing system blocked" but do not cause the extinguishing action to be started.

a) Input "door switch" as RJ12 connector
One input "door switch" (5) is designed for the model Rittal 7320.530 (see also figure on the left).
As termination an RJ12 connector with a resistor 22 K is provided between the contacts 2 and 6 (see figure on the right).
Via the connection X2 several door switches of this type can be switched in series.



b) Input "door switch" as two-pole plug
The additional input "door switch" (11) is a two-pole plug.
The connection must be made in accordance with the adjacent drawing.
The corresponding plugs are available as accessories (see list in the appendix).

The connections are monitored for wire breaks and short circuits. Up to ten switches can be connected to the inputs.



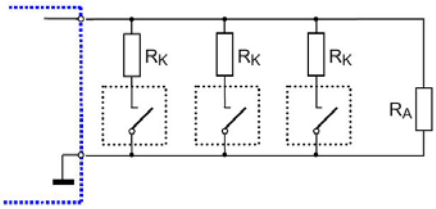
The resistors must be dimensioned as follows:
- R_A: 22K Ohm, 1/10 Watt
- R_K: 22K Ohm, 1/10 Watt

Caution!
In each case either the RJ12 connector **or** the two-pole plug may be used as input "door switch".

Caution!
If during a fire alarm in the status "Extinguishing system blocked" (= blocking of the extinguishing system) there is a transition from "blocking" to "blocking cancelled", e.g. by closing the door, the extinguishing action is triggered one second after the condition "blocking cancelled" has been reached.

2.4.2 Manual release

By operating an optional connectable manual release the extinguishing action is triggered manually.



The resistors must be dimensioned as follows:
- R_A: 1K8 Ohm, 1/10 Watt
- R_K: 470 Ohm, 1/10 Watt

To trigger the extinguishing action the push button "manual release" must be operated for at least 1 second. The release is always direct and independent of the condition of the automatic detectors. The programmed dual detector dependency will not be considered during manual release.
The release via the input "manual release" is suppressed during an open door contact (see chapter 2.4.1) or if an external blocking is present.
The alarm message of the manual release must be reset manually (see chapter 3.5.1).

2.4.3 External power supply

For external consumers there is a two-pole connection (U_S) with an output voltage of 21-29 V DC. This output is protected by a 500 mA fuse and supplied with emergency current. If the power supply is exclusively from the battery (during mains failure) the voltage can drop to 21 V DC!

2.4.4 Relay outputs

The Active Extinguishing System has 4 relay outputs with change-over contacts:
(connection diagram see chapter 2.4.)

Relay 1	Pre-alarm 1 (NO)	A detector has triggered. The relay remains energised until the alarm criterion is no longer present and the reset key button has been pressed.
Relay 2	Fire alarm (NO)	The second detector has triggered. The relay remains energised until the alarm criterion is no longer present and the reset key has been pressed.
Relay 3	Extinguishing (NO)	The relay is energised parallel to the release of the extinguishing function and remains energised until the reset key is pressed.
Relay 4	Collective fault (NC)	The relay is energised permanently as long as there is a fault.

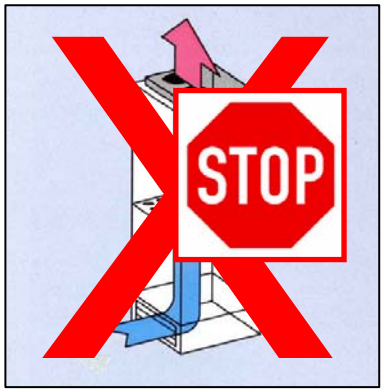
All relays stay permanently energised when triggered. The maximum switching voltage is 30V with a maximum switching current of 0.5A and a pure resistive load. Inductive or capacitive loads require external protective circuits which must be provided by the operator.

Caution!
If the CMC-TC with I/O unit is connected, the relay outputs must not be used!

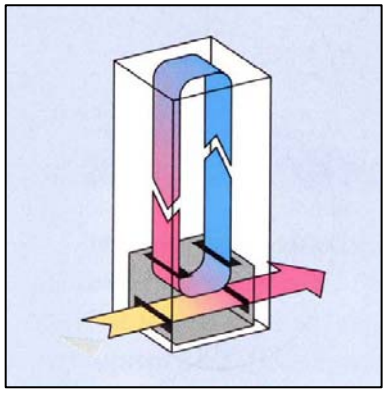
3. Installation, operation and control of the DET-AC Plus Active Extinguishing System

3.1 Conditions for use and installation

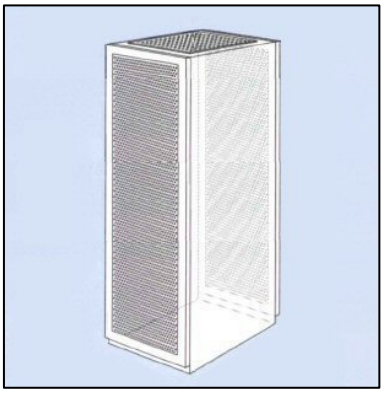
- Permitted ambient temperature range: +10 °C to +35 °C
- Temperature difference between the air sucked in and the installation location of the device max. 5 °C
- Relative humidity: up to 96 %, humidifying inside the device through temperature change is not permitted
- Ambient air low in dust and contamination
- The use in areas where gases or vapours corrosive to metal or plastic can be sucked in is not permitted
- The installation of the device in areas with vibrations caused e.g. by nearby punching machines is not permitted
- Operation only with closed cooling air circuit within the airtight closed cabinet or closed cabinet without ventilation (see drawings below), the air exchange rate of the switch cabinet system to be protected must not be greater than 10 % within 20 min.
- Max. permitted protection volume: 3 m^3 (condition: small opening surface)
- An empty unit in the upper third, preferably the top slot, of the cabinet
- Existing minimum installation depth of 850 mm
- 100/240 Volt mains connection



Installation of the DET-AC Plus Active Extinguishing System in a cabinet with open cooling air circuit is not possible!



Installation of the DET-AC Plus Active Extinguishing System in a closed cabinet with closed cooling air circuit is possible.



Installation of the DET-AC Plus Active Extinguishing System in a airtight closed cabinet without cooling air circuit is possible.

Installation of the DET-AC Plus Active Fire Extinguishing System in differently equipped racks only after prior consultation.

3.2 Installation and commissioning of the device

Note
Always retain the transport packaging of the DET-AC Plus Active Extinguishing System. For maintenance or repair the device may only be sent in the special original transport packaging or a equivalent one.

Scope of delivery
Besides the actual device the scope of delivery of the DET-AC Plus Active Extinguishing System includes the following components:

- These operating instructions
- 4 screws each M5 and M6 to electively attach the device via the front panel to the 19" frame
- mains cable (protected IEC power plug)

Recommended accessories:

- standard set of sampling pipes
- sliding rail of varying depth

Note
Ensure early on that the cabinet to be protected meets all space and installation option requirements to enable the proper installation of the DET-AC Plus Active Extinguishing System.
During installation consider the switching off of electrical devices within the monitoring area during a fire in order to remove the supporting electric energy early on.

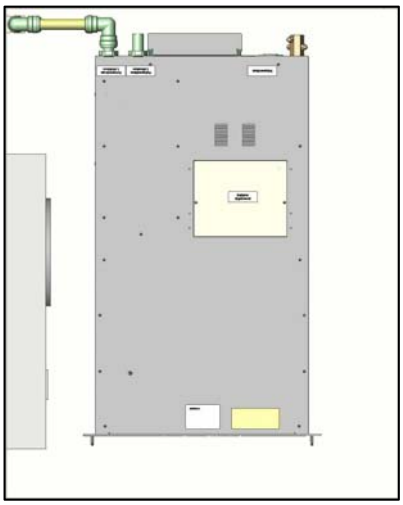
3.2.1 Installation notes

Caution!

- All tasks developing smoke and dust (smoking, soldering, cleaning etc.) must be prevented during installation and commissioning of the device!
- It is possible for an alarm to be triggered during commissioning!
  It must be ensured that any controls downstream from the device (e.g. additional extinguishing systems or transmitted messages) have been switched off beforehand!

The device must be positioned in the upper third, preferably the top slot, of the 19" cabinet to be protected in order to achieve a fast extinguishing action.
Care must be taken that

- the sampling pipe at the intake side of the air conditioning unit is installed vertically (see adjacent drawing) and the bores of the sampling pipe are directed against the air flow
- the nozzle is positioned in such a way that within a radius of 200 mm around the nozzle spraying is not obstructed by anything other than the cabinet wall (e.g. cables or energy rails). This must also be observed without fail during any future changes within the cabinet!



An adapter piece to move the nozzle position, e.g. for deeper cabinets, is available as an option (see accessories).

Caution!

After installation a trigger test must be carried out (see 7.1.6)!
Before the trigger test the door must be opened to block the extinguishing action. This must be checked via the green flashing operating LED and the indication "extinguishing system blocked" in the display.
After the trigger test at least 2 minutes must pass to allow the test gas concentration in the detector heads to dissipate and the alarm must be reset.
No fire message (red LED) may be indicated before the blocking is cancelled by closing the doors, otherwise the extinguishing action will be initiated!

Caution!

Installation position: The DET-AC Plus Active Extinguishing System must be installed in a horizontal position (aligned with spirit level) to ensure that the extinguishant can be discharged completely.

3.2.2 Installation steps and functional test

Caution!
Please always carry out the installation steps in the order given below. Record the steps in the installation and test report (see appendix)

Installation steps:

- Check the temperature indicator for proper condition (see figure 1)
  If the temperature indicator is dark, it is possible that the positive pressure safety device of the extinguishing tank was released. In this case with start-up the message "fire extinguishing agent decrease" is indicated in the display.
- Install the sliding rails (supplied by customer) to support the device
- Open the cover plate of the battery compartment
- Attach the plug of the batteries for emergency power supply to the free plug contact. Thus the batteries are attached in 24 V function! (see figure 2)
  Caution! The battery must only be connected if it is immediately followed by connecting the mains supply since otherwise the batteries will be discharged!
- Screw the cover plate of the battery compartment back
- Screw in the transport protection pin (see figure 3a) of the extinguishing unit up to the stop
  Caution! After this step the device is ready for operation and release (see figure 3b). Therefore great care is required during the following installation steps!
- Slide the device horizontally onto the sliding rails. Ensure that the device slides in easily without jamming up to the stop of the font panel at the frame
- Attach the device to the front panel using four of the screws and block plastic washers included through the holes of the front panel in the 19" frame (see figure 4)
- Install the sampling pipe (see chapter 3.2.3)
- Connect the device to the 100/240 V power supply
- Press the button "reset mains fault"

For the subsequent functional tests of the device and of additional devices see commissioning and test report (see 7.1); connection of additional electrical devices see chapter 3.3

Temperature indicator bright:
- **OK**

Figure 1
Temperature indicator 54 °C

Temperature indicator dark:
- **Caution, temperature was exceeded!**

Figure 2
Connecting the batteries

Figure 3a
Transport protection pin (the device in the blocked condition)

Figure 3b
Transport protection pin (the device is not blocked any more!)

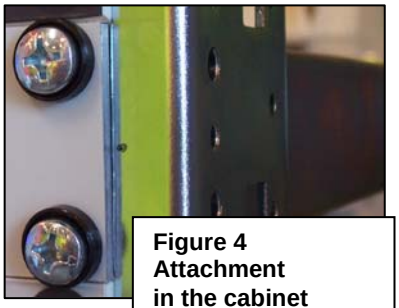


Figure 4
Attachment in the cabinet

3.2.3 Installation notes for the sampling pipe

Caution!

Air intake (sampling pipe connection): Ensure the correct connection of the sampling pipe (air intake) ① to the device! Never connect to the air flow return (air outlet) ②. See also the photo below.
Air outlet: An L-shaped plug-in connection (angle) with the opening facing downwards must be fitted to the air outlet to comply with IP 20.

The vertical sampling pipe must be attached at a location aiding the flow (bores of the sampling pipe directed against the air flow) using the clamps. The diagrams on the following page indicate the fans. It is assumed that the fans on the side of the sampling pipe aspirate air from the cabinet. The 4 holes in the sampling pipe must be directed away from the fans towards the cabinet!

The sampling pipe is sealed with an angle and a plug at the bottom.

A trigger test using test aerosol must always be carried out!
(**Caution**, to do so block the extinguishing system, see 7.1.6)

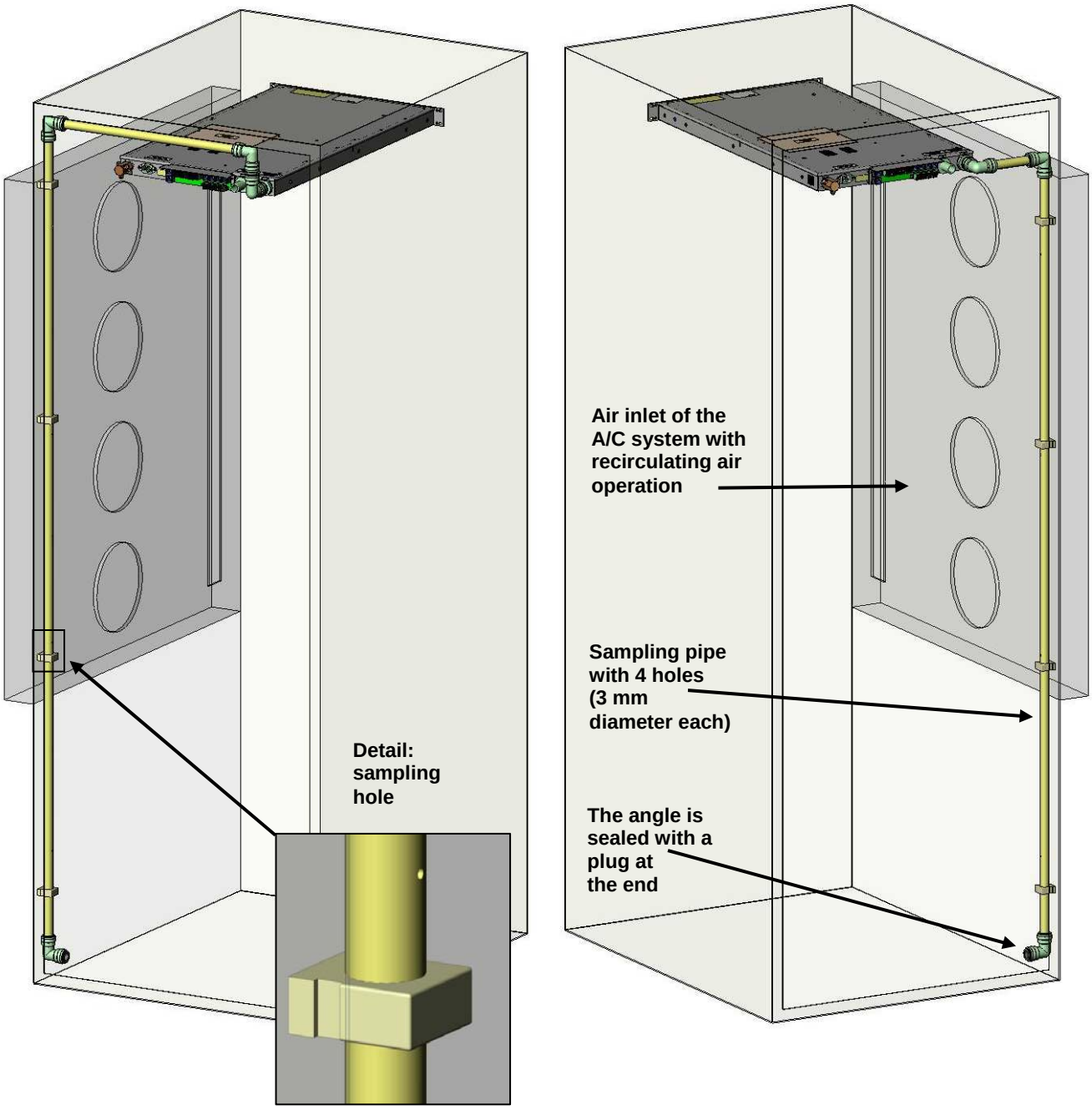
Caution!

The following figures are recommendations. Other arrangements for fans and air conditioning devices might require a different position of the sampling pipe. The installation of the device must always be coordinated with the operator. During future changes of the cable configuration the bores of the sampling pipe have to remain free. The pipe system must not obstruct the future cable routing within the cabinet!

Sampling pipe installation options

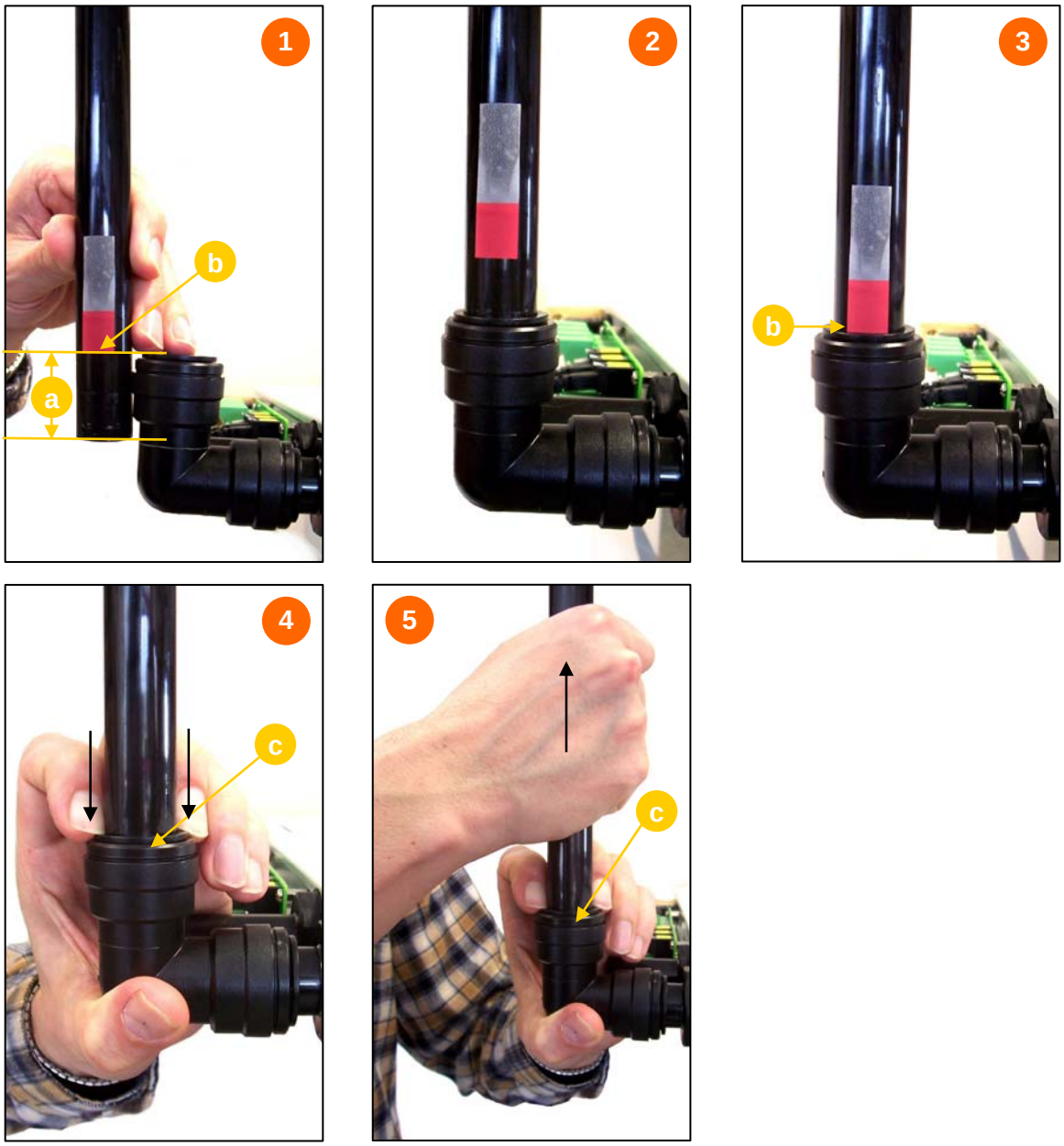
Installation of the sampling pipe with routing on the left cabinet side

Installation of the sampling pipe with routing on the right cabinet side



In racks without air conditioning a varying installation of the sampling pipe can be needful.

Installation of the sampling pipe



Installation of the sampling pipe

1) Mark the insertion depth (a) of the pipe (b)
   (use guiding line at the pipe angle!)
2) Insert pipe loosely
3) Press in the pipe strongly until the stop can be heard and felt and up to the marking (b)

Removal of the sampling pipe

4) Press the fixing element (c) down
   (only visible as a ring from the outside)
5) Pull out the pipe with the fixing element (c) pressed down

3.3 Installation and commissioning of additional electric devices

After the proper installation and commissioning of the DET-AC Plus Active Extinguishing System additional electric devices can be connected.

Caution!

Connection of additional electric devices: For the connection of additional electric devices the following information must always be observed:

- It is possible for an alarm to be triggered during commissioning!
  It must be ensured that any controls downstream from the device (e.g. additional extinguishing systems or transmitted messages) have been switched off beforehand!
- Before the functional test the door must be opened to block the extinguishing action. This must be checked via the flashing green operating LED and the indication "extinguishing system blocked".
  No fire message (red LED) may be indicated before the blocking is cancelled by closing the doors, otherwise the extinguishing action will be initiated!
- The conditions must be checked in accordance with the commissioning and test report

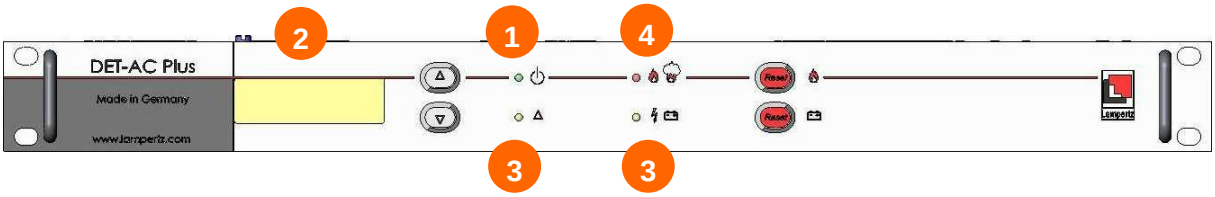
3.3.1 External alarm devices

External alarm devices, e.g. flashing lights and/or alarm horns (see also chapter spare parts and accessories) can be connected to the relay outputs pre- and main alarm (see 2.4.4 relay outputs).

3.3.2 Push button for manual release

To connect the push button for manual release the sequence in the commissioning and test report
(see 7.1) must be observed.

3.4 Alarms and faults



The correct operating state of the DET-AC Plus Active Extinguishing System is indicated by a permanently illuminated green operating LED (1).

If a fire alarm or faults occur, they are indicated on the LCD display (2) and by fault LED (3) or alarm LED (4).

The DET-AC Plus Active Extinguishing System must therefore be installed in a clearly visible location and monitored by an overriding system, if necessary.

3.4.1 Alarm and fault messages

Alarm messages
The DET-AC Plus Active Extinguishing System can implement two alarm levels with different indications and controls via two sensors responding at different sensitivities. The respective indications and their meanings are explained in the table "LCD display indications" below.

Fault messages
The DET-AC Plus Active Extinguishing System monitors the most important functions itself. Faults are indicated and reported externally, if applicable. The respective indications and their meanings are explained in the table "LCD display indications" below.

Caution!
In case of a fault the proper functioning of the device is not guaranteed. If a fault message arrives it might not be possible to detect and extinguish a fire!
Therefore, the cause of the fault message must be immediately removed!

Caution!
Before the functional test the door must be opened to block the extinguishing action. This must be checked via the flashing operating LED and the indication "extinguishing system blocked".
No fire message (red LED) may be indicated before the blocking is cancelled by closing the doors, otherwise the extinguishing action will be initiated!

3.5 Display and control elements

To display the current device state the extinguishing system has an LCD with background illumination and four LEDs to indicate collective conditions. Operation is via four keys on the front.

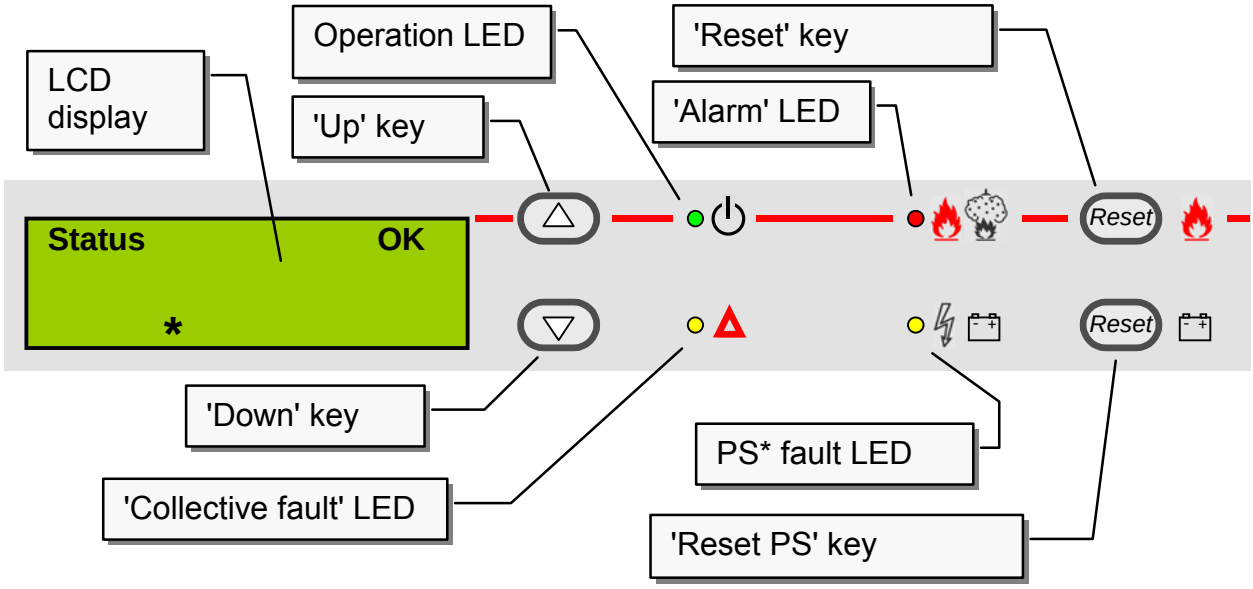


Figure 1: Display and control elements
*PS = Power Supply

3.5.1 LED indications

The collective indications are implemented via four LEDs on the front. These are activated in accordance with the indication types in Table 1.

Type of indication	Activation
off	LED is permanently off
flashing	LED is energised every 2 seconds for 200 ms
blinking	LED is alternately on for 0.5 seconds and off for 0.5 seconds
on	LED is permanently on

Table 1: LED indication types

The four LEDs implement the following indications:

LED	Colour	State	Meaning
Operation	green	off	System disconnected or not ready for operation
		on	System ready for operation
		blinking	System in operation, but extinguishing is blocked (e.g. door open)
		flashing	The system is being reset
Alarm	red	off	System at rest
		flashing	A detector has triggered with dual detector dependency programmed, but the other is still inactive (pre-alarm)
		blinking	A fire alarm has been detected but no extinguishing action has been triggered (e.g. because of a blocking present)
		on	The extinguishing action has been triggered
Collective fault	yellow	off	No faults (except possibly power supply unit faults) are present
		blinking	In conjunction with operating LED off: the central control station has failed or there is no communication between the central control station and the control panel
		blinking	In conjunction with operating LED on: faults are present which prevent an extinguishing action if requested
		on	Faults are present which do not prevent an extinguishing action
Fault Power supply unit/charger (PS)	yellow	off	Power supply unit / charger work properly
		blinking	Mains power supply failure
		on	There are faults in the power supply unit / charger

Table 2: Meaning of the LED indications

Caution!
Faults of the power supply unit / charger are not included in the collective fault indications. This means that the collective fault LED will not be activated if only faults of the power supply unit / charger are present. If faults of the power supply unit / charger are present and the collective LED is also activated in any way, this means that other faults in addition to the power supply unit / charger faults are present.

3.5.2 Keys

System operation is via four keys located on the front of the device. For the functions of the keys it is differentiated whether the system is in the state 'Message display' (normal state) or whether a control menu is active.

Key	Function	
	In the message display	**In the menus**
Up	if other older messages are present, they can be called using this key (scrolling)	previous menu entry
Down	if other more recent messages are present, they can be called using this key (scrolling)	next menu entry
Reset	currently stored messages are deleted	Cancels the selected functions or exits the current menu level (ESC). If a submenu is active this returns to the main menu. In the main menu the key returns to the message indication (exiting the control menu).
Reset PS	battery faults are reset (if they are no longer active)	Enables the selected function or accepts the settings (Enter). If this key is pressed in the main menu for an entry referring to a submenu, the submenu is activated. If no submenu exists, the allocated control function is activated.

Table 3: Function of the control keys

3.5.3 LCD display

The LCD display is used to display the individual current messages in text format. The LCD is also used to permit the menu-guided control of the system.

Message display
Normal state
In the normal state of the message display the most recent current message is displayed in the LCD (Figure 2).

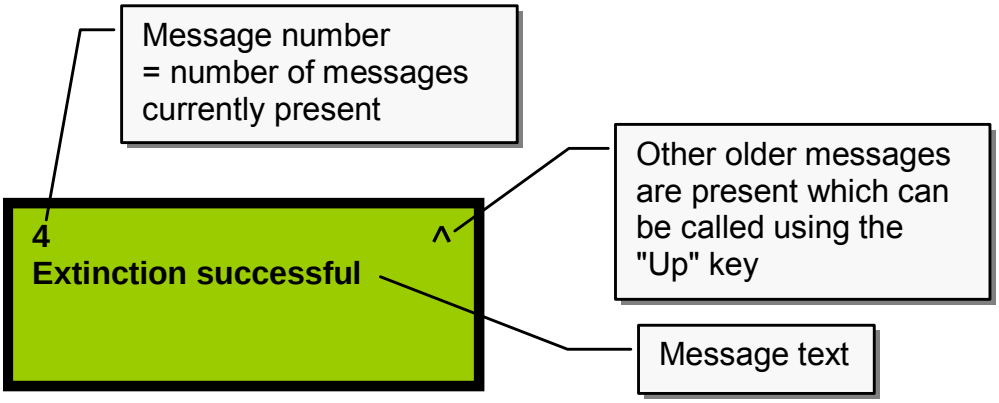


Figure 2: Normal state of the message display

If no current message is present, the message in is shown in the LCD.

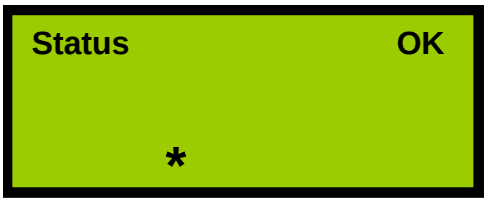


Figure 3: Display without messages

To indicate operability the character '*' runs from left to right through the screen in the lowest line. As soon as at least one message is present, the display automatically changes to the normal state of the message display.

Scrolling through messages
If more than one current message are present, the individual messages can be viewed (scrolling) using the arrow keys ('Up' and 'Down'). The message display then shows a symbol indicating that other more recent events then the one currently being displayed are present (Figure 4).

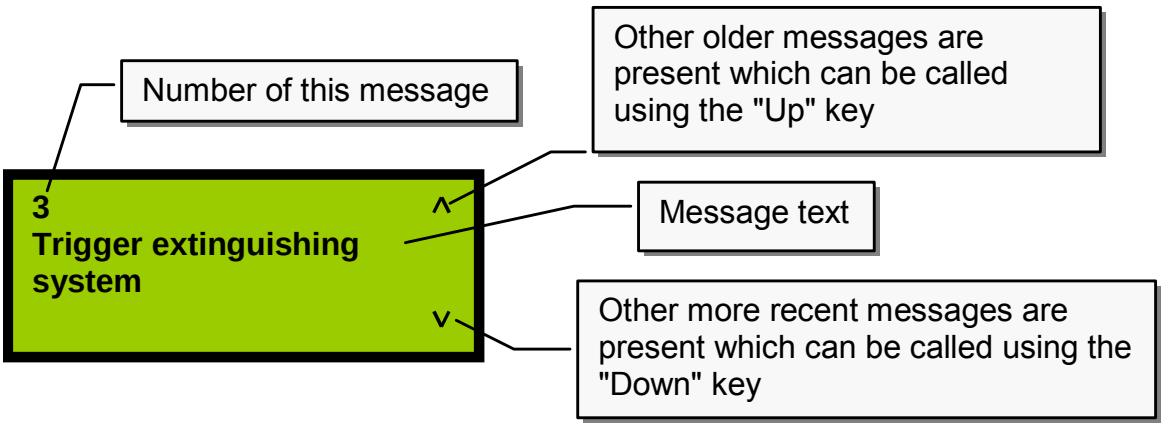


Figure 4: Scrolling through messages

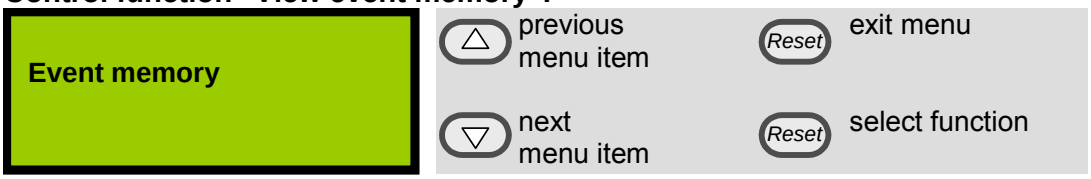
If no entry is being made in this state for 30 seconds the display automatically changes to the normal state of the message display (display of the most recent message).

Control menus

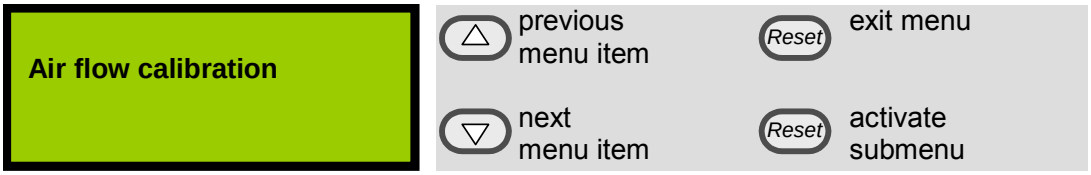
If the control panel is in the 'Message display' state, the control menu is activated by simultaneously pressing both arrow keys ('Up' and 'Down'). This operation activates the main menu and its first entry (event memory) will be shown. The control menu can be exited by pressing the 'Reset' key, if the main menu was active. An activated control menu is automatically exited if no entry is made for 30 seconds. The display then always changes to the normal state of the message display.

Main menu

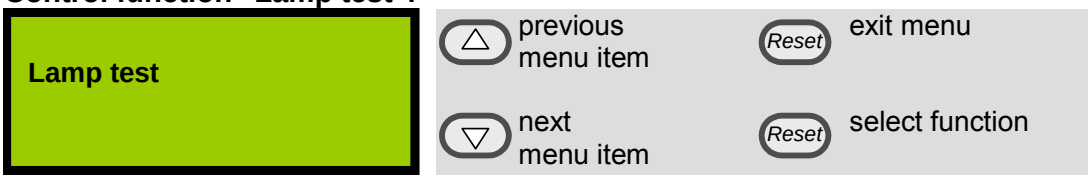
Control function "View event memory":



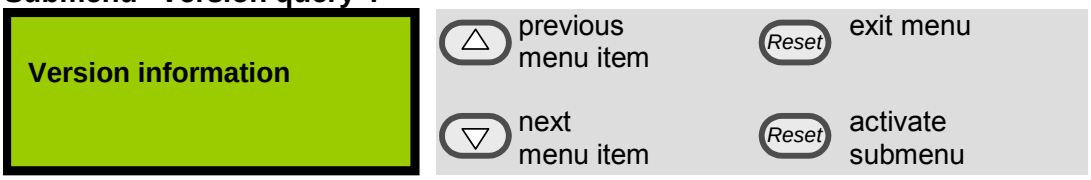
Submenu "Air flow calibration":



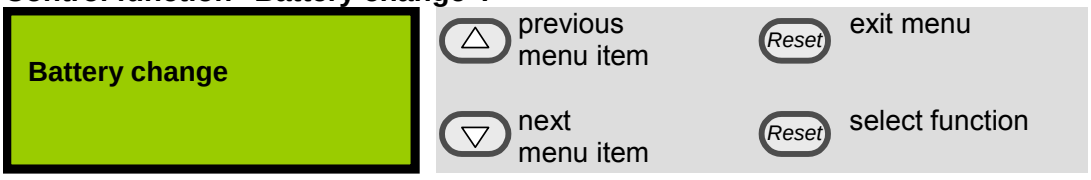
Control function "Lamp test":



Submenu "Version query":



Control function "Battery change":



Submenu Air flow calibration

Control function "Display of the current air flow measurement":

Air flow indication

△ previous submenu item

Reset back to main menu

▽ next submenu item

Reset select function

Control function "Automatic calibration of air flow monitoring":

Automatic air flow calibration

△ previous submenu item

Reset back to main menu

▽ next submenu item

Reset select function

Control function "Manual calibration of air flow monitoring":

Manual air flow calibration

△ previous submenu item

Reset back to main menu

▽ next submenu item

Reset select function

Control function "Adjusting the integration time for air flow monitoring":

Filtering time

△ previous submenu item

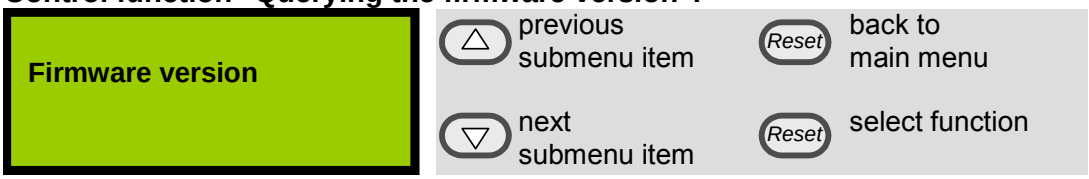
Reset back to main menu

▽ next submenu item

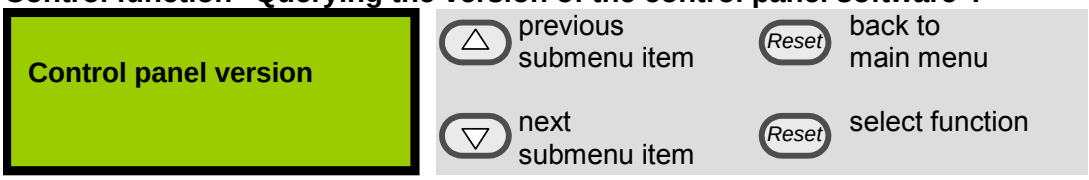
Reset select function

Submenu Version information

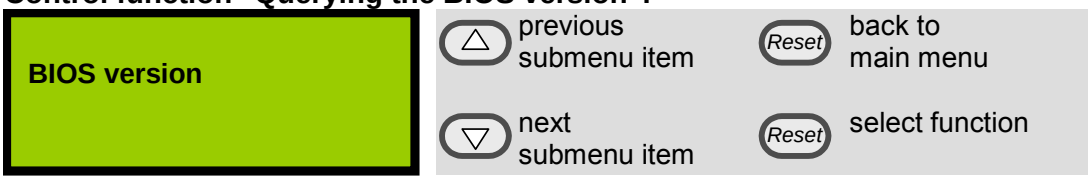
Control function "Querying the firmware version":



Control function "Querying the version of the control panel software":

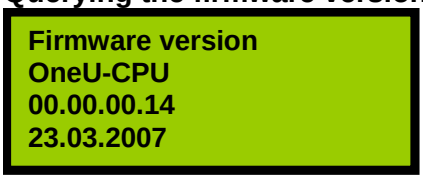


Control function "Querying the BIOS version":



Description of the menu functions

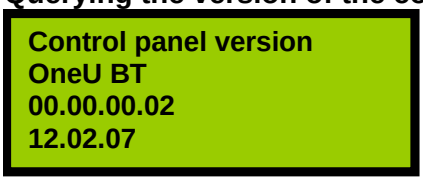
Querying the firmware version



△	back to menu	Reset	back to menu
▽	back to menu	Reset	back to menu

The following information is shown: device name, version number and date of version creation.

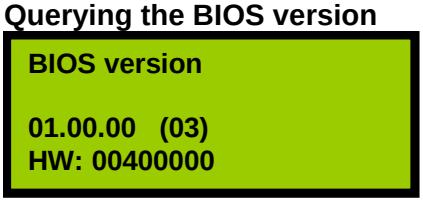
Querying the version of the control panel software



△	back to menu	Reset	back to menu
▽	back to menu	Reset	back to menu

The following information is shown: device name, version number and date of version creation.

Querying the BIOS version



△	back to menu	Reset	back to menu
▽	back to menu	Reset	back to menu

The following information is shown: version number and hardware ID.

View event memory

The display of messages from the event memory is identical to the message display of the system. To indicate that this is a display from memory the text 'EMEM' is shown at the top right. Unlike in the message display, messages are also entered in the event memory if a state causing a message has been removed. The display of the current message is either by way of a correspondingly different text message (Figure 5) or using the same message plus the symbol for current messages.

Figure 5: current message 1

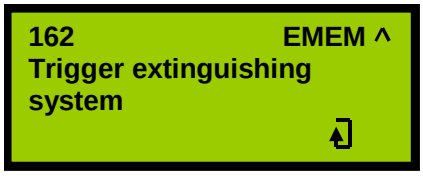


Figure 6: current message 2

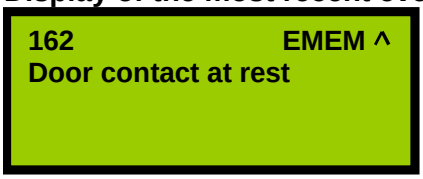
The number of the message is numbered from the start of the current event memory. I.e. the oldest event still present in the memory has the number 1. If the event memory is full, the next event overwrites the so far oldest event. During the next display of the event memory the event previously carrying the number 2 now carries the number 1 (the stored events move down to allow the new event to be inserted at the top). The numbering in the event memory has no relation to the number shown for the event in the message display when the event was still current.

In the display of the event memory one can change from any entry to the chronologically oldest event by simultaneously pressing the two arrow keys 'UP' and 'down'. Likewise the key 'RESET EV' always leads to the chronologically recent event. If one keeps the respective arrow key longer pressed while scrolling, the display continues to run automatically into the selected direction, as long as the key remains pressed.

Display if no entries are present in the event memory

△	exit display	Reset	exit display
▽	exit display	Reset	exit display

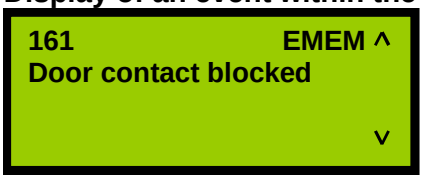
Display of the most recent event



△	to previous message	Reset	exit display
▽	no function	Reset	no function

By activating this control function "View event memory" the most recent message in time will always be displayed. Changing to older messages is possible using the arrow key "Up".
The symbol ^ at the top right of the display indicates that older messages are present.

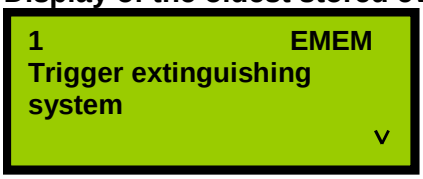
Display of an event within the memory



△ to previous message	Reset exit display
▽ to next message	Reset to recent message

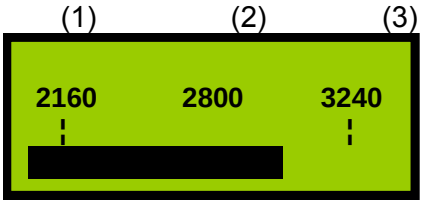
The symbol v at the bottom right of the display indicates that more recent messages are present.

Display of the oldest stored event



△ no function	Reset exit display
▽ to next message	Reset to recent message

Display of the current air flow measurement



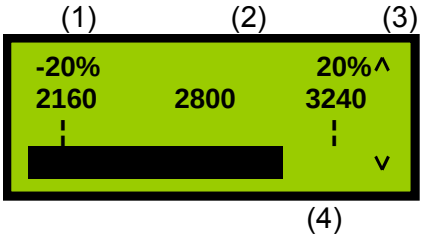
△ no function	Reset exit display
▽ no function	Reset exit display

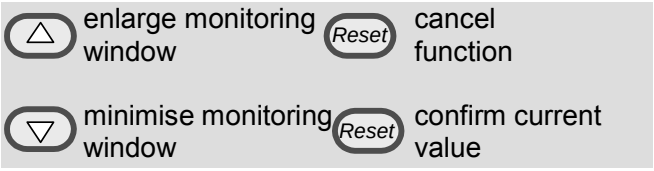
(1) currently set lower limit value for monitoring
(2) current measurement
(3) currently set upper limit value for monitoring
(4) display of the current measurement as a bar graph

The current measurements and the currently set monitoring thresholds are shown. The measurement is updated cyclically to show changes.

Automatic calibration of air flow monitoring
Determination of the current values

The current values are determined! The displayed value counts up to 64 (progress indication). No operation is possible during this phase.
Please wait for this phase to complete.



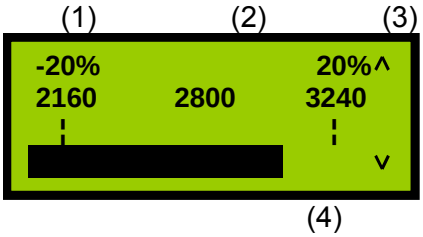


(1) currently set lower limit value for monitoring
(2) current measurement
(3) currently set upper limit value for monitoring
(4) display of the current measurement as a bar graph

The current measurement is determined and the corresponding thresholds are calculated from it in accordance with the selected width of the monitoring window (±10 %, ±20 % or ±40 %).
The determined values have to be confirmed to become effective (key Reset PS).

Manual calibration of air flow monitoring
Determination of the current values

The current values are determined! The displayed value counts up to 64 (progress indication). No operation is possible during this phase.
Please wait for this phase to complete.

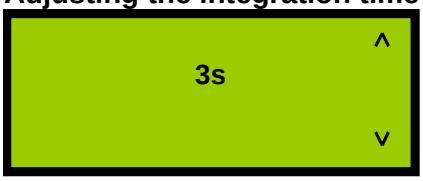


△ increase monitoring range	Reset cancel function
▽ decrease monitoring range	Reset confirm current value

(1) currently set lower limit value for monitoring
(2) current measurement
(3) currently set upper limit value for monitoring
(4) display of the current measurement as a bar graph

The set monitoring range is moved as a whole (lower and upper threshold simultaneously). If the width of the currently set monitoring range (here ±20 %) is to be changed, an automatic calibration must first be carried out!
The set values have to be confirmed to become effective (key Reset PS).

Adjusting the integration time for air flow monitoring



△ increase filtering time	Reset cancel function
▽ decrease filtering time	Reset confirm current value

If an arrow key is held pressed for more than 3 seconds, the value automatically changes up or down. Due to the communication method between the main processor and the control panel there is a small delay between pressing the key and the system response. This results in the value still being increased or reduced by approx. 2 when a key is released which was previously held down. The automatic function is only disabled afterwards.
Simultaneous pressing of the keys ▲ and ▼ sets the value to 0.
The set value has to be confirmed to become effective (key Reset PS).

Lamp test
All segments of the LCD are blanked in black and all LEDs are switched on permanently.

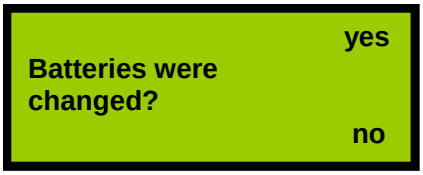
△ exit test display	Reset exit test display
▽ exit test display	Reset exit test display

The lamp test is exited when any key is pressed. If no key is pressed for more than 5 seconds, the lamp test is automatically exited.

Battery change

The period of operation of the batteries is monitored by the system. If it exceeds the maximally permissible time, an appropriate message is displayed and the system goes into the failure mode. In order to reset this monitoring after a battery change, the function ‘battery change’ must be called up. Since the system cannot recognise the exchange of the batteries automatically, the function must be called up also if the battery exchange takes place, before the failure message appears. Otherwise the operating hours meter for the batteries is not put back and the failure message would come before expiration of the permissible period of operation.

After the start of the function the inquiry takes place:



△ confirm change	Reset cancel function
▽ cancel function	Reset cancel function

If this question is answered with ‚yes‘, the resetting of the operating hours meter must be confirmed in the following dialogue:

△ cancel function	Reset cancel function
▽ cancel function	Reset carry out function

If the function was carried out the following confirmation message appears:

△ back to menu	Reset back to menu
▽ back to menu	Reset back to menu

After this message the operating hours meter of the batteries is reset, so that the entire maximum period of operation is available again. A failure message with the request to change the batteries eventually displayed before is reset thereafter.

If the function is discontinued in any position, a warning message appears:

△ back to menu	Reset back to menu
▽ back to menu	Reset back to menu

If this message appears, the operating hours meter of the batteries was not reset, it keeps running from the temporally last condition. A failure message with the request to change the batteries eventually displayed before is not reset thereafter.

Operating hours meter
Apart from the monitoring of the operation hours of the batteries the system evenly monitors the period of operation since the last maintenance. If this exceeds the maximum maintenance interval, a failure message is generated.
For resetting this message a fabricator reset must be carried out. For this purpose the housing of the OneU must be opened. On the CPU board the key 'Reset' is to be pressed for longer than 3 seconds. Afterwards the failure message to the maintenance interval is deleted and the operation hours meter of the system reset. This resetting does not have any influence on the monitoring of the period of operation of the batteries.

3.5.4 LCD display - List of messages

For the following conditions messages will be displayed on the LCD display:

Display text	Display text meaning
Extinguishing action triggered	Both sensors have triggered a fire alarm or on of them triggered a fire alarm and the other one reported a fault and activated the extinguishing release as a result.
Fire	Both sensors have triggered a fire alarm or on of them triggered a fire alarm and the other one reported a fault without triggering the extinguishing action.
Manual release	An externally connected push button for manual release has been released.
Manual release fault	An externally connected push button for manual release is faulty or the line to it is faulty.
External blocking	The extinguishing release is blocked by a door contact switch or an external contact.
Fire alarm detector 1	The first sensor has detected a particle with typical fire characteristics in the intake air.
Fire alarm detector 2	The second sensor has detected a particle with typical fire characteristics in the intake air.
Blocking by door contact	A cabinet door is open and the door contact for suppressing the extinguishing action is enabled, the extinguishing system cannot be triggered. or A terminating resistor for the door switch is missing
Door contact fault	A connected door contact switch is faulty or the line to it is faulty.
Mains failure	The mains voltage is missing or the power supply unit is faulty.

Display text	Display text meaning
Battery fault	One or both batteries are missing, not connected, fully discharged or are not being charged.
Charging fault	The charging does not function correctly.
Air flow fault, dynamic pressure too high	Contamination or blocking of the sampling pipe or of individual holes.
Air flow fault, dynamic pressure too low	Fracture or torn connection of the sampling pipe or Change in ambient conditions (changed flow velocities of an air conditioning system, open or closed doors of the 19" cabinet, etc.).
Detector 1 fault	Sensor 1 is missing, does not make contact or is faulty.
Detector 2 fault	Sensor 2 is missing, does not make contact or is faulty
Extinguishing output fault	The electric release device cannot be actuated.
Extinguishing agent loss	The extinguishing agent volume has reduced due to loss
Extinguishing agent monitoring fault	The monitoring device of the extinguishing agent is faulty
Maintenance interval expired	After approx. 2 years the device needs to be serviced. Call service engineer.
Battery change required	Battery life of 4 years has been exceeded. Call service engineer.
Triggering extinguishing system	Extinguishant tank was triggered
Extinguishing fault	Extinguishant tank was triggered but filling level indicator does not indicate loss of extinguishant
Extinguishing successful	Extinguishant tank was triggered and filling level indicator indicates loss of extinguishant
Battery failure	Fall below the final discharging voltage
Failure battery loading	Batteries cannot be loaded any longer
Reboot	Device accomplished a restart during the normal operation
Cold start	Reset key of the processor board was pressed
Quiescence	Device is in the normal operating condition

4. Behaviour during a fire

Caution!
This information does not replace the locally prescribed behaviour during a fire in any way but serves as additional information about the behaviour during alarms/fires or triggering of the extinguishing system in a cabinet protected by a DET-AC Plus active extinguishing system!

Measures in case of an alarm in a cabinet protected by a DET-AC Plus Active Extinguishing System:

- Always keep the cabinet doors closed during the hold time (10 minutes). If the concentration required for extinguishing drops due to ventilation, any still existing source of ignition might flare up again.
- If no fire or smoke can be seen, the cabinet can be ventilated with extinguishing aids (e.g. carbon dioxide fire extinguisher) at the ready.

Release of the DET-AC Plus Active Extinguishing System
The release of the DET-AC Plus Active Extinguishing System takes place immediately after the fire alarm. A fire alarm is triggered by the actuation of both automatic fire detectors or operation of the push button for manual release.
If the extinguishing system is triggered manually via the push button for manual release, the release takes place immediately without time delay.

The presence in rooms flushed with the extinguishing agent Novec™ 1230 is harmless but should be avoided, because smoke development may endanger life due to toxic combustion products.

5. Control, service, maintenance and repair after release

The operator carries out the regular visual inspections at the device himself.
The maintenance and repair of the device is carried out by the Lampertz / Rittal Service or a specialist company authorised by Lampertz / Rittal.

A specialist company authorised for maintenance and fault removal is a company whose employees have been trained by Lampertz / Rittal in the DET-AC Plus Active Extinguishing System. Normally this is a member of the installation company or a specially trained employee of the operator or a specialist company commissioned by him.
In case of improper handling and faulty or missing regular inspections and maintenance Lampertz / Rittal does not accept any liability.

5.1 Regular inspections by the operator

Daily inspections (operator)

- No fault may be present in the DET-AC Plus Active Extinguishing System.
  (operating state without fault or alarm: green operation LED is on, no yellow fault LED is on or flashing).
  Any faults present must be recorded and removal must be initiated.

Daily inspections may be omitted if it can be ensured that any faults are safely detected elsewhere.

Monthly inspection (operator)

- Sampling pipe and extinguishing nozzle must be free of external damage and the nozzle must be free of contamination and obstacles in the spray
- Sampling pipe connections must not be disconnected

Display air flow and compare with the value from the commissioning report to detect any contamination. The max. deviation must not exceed 10 %.

Quarterly inspection (operator)

This should additionally investigate any constructive modifications (especially with regard to the air tightness of the cabinet: the air exchange rate of the switch cabinet system to be protected must not be greater than 10 % within 20 min) or changes in use, and the device should be checked for the proper operation of the alarm, fault and control functions.

5.2 Tests, maintenance and repairs

Caution!
During maintenance work at the device an alarm may / should be triggered! It must be ensured that any controls downstream from the device (e.g. transmitted messages or shut-off device) have been switched off/bridged beforehand!

Semi-annual maintenance (Lampertz / Rittal or specialist company)
Visual inspection, complete service (e.g. test and, if necessary, clean sampling pipe and extinguishing nozzle, check cover seal, replace filter for air flow sensor, if necessary, check air flow calibration and adjust, if necessary) plus operational check.
The history memory must be checked for errors (see 3.5.3 “View event memory”).

Biennial maintenance (Lampertz / Rittal or specialist company)
At least every two years the DET-AC Plus Active Extinguishing System must be serviced by Lampertz / Rittal Service or a specialist company authorised by Lampertz / Rittal. During this maintenance the system is fully tested and, if necessary, returned to the target condition.
Non-observance of these intervals may cause faults or false alarms.
After 4 years, in the context of the second 2 biennial maintenance, the batteries for the emergency power supply must be renewed.

5.2 Notes on transport

During the transport of the device with extinguishing agent container and propelling gas cartridge 25,3 g (85 ml) Argon the following special rules must be taken into account.

Special notes on transport for overland transportation
Hazardous substance: UN 1006, category 2, limited quantity LQ1* as per ADR 2007

Special notes on transport for sea transportation
Hazardous substance: UN 1006, category 2.2 (argon, compressed), limited quantity* 3.4.2.1 IMDG code

Special notes on transport for air transportation
UN 1006, category 2.2 (argon, compressed), IATA-DGR – no limited quantity

*for limited quantity: most permissible net quantity for each interior packing 120 ml argon, gross weight per package max. 30 kg

The safety data sheet for Novec™ 1230 by 3M™ must be observed and is included with the device during delivery.

Packaging

Always retain the transport packaging of the DET-AC Plus Active Extinguishing System. For maintenance or repair the device may only be sent in the special original transport packaging or a equivalent one.

6. Technical data

Housing dimensions	19“, 1HE, 850 mm deep (sheet metal)
Weight	approx. 25 kg incl. extinguishing agent and propelling gas cartridge
Nominal voltage	100/240V AC, 50/60Hz
Emergency power supply	approx. 4 h
Ambient temperature	+10 °C to +35 °C (operation), -20 °C to +65 °C (storage)
Humidity	up to 96 %, non-condensing
Protection category	IP 20
Connections	▪ 1 potential-free change-over contact "pre-alarm" (RJ12 connector) ▪ 1 potential-free change-over contact "fire" (RJ12 connector) ▪ 1 potential-free change-over contact "extinguishing" (RJ12 connector) ▪ 1 potential-free change-over contact "collective fault" (RJ12 connector) ▪ 24 V -3/+5 V nominal voltage / 0.5A, resistive load
Displays	▪ 1 LCD with clear text display of status messages ▪ 1 LED green "operation" ▪ 1 LED red "alarm" ▪ 1 LED yellow "collective fault" ▪ 1 LED yellow "power supply unit/charger fault"
Sensors (2 different scattered light sensors for 2 alarm thresholds)	▪ optical smoke detector (sensitivity: approx. 3.5 %/m light obscuration) ▪ optical smoke detector HS (sensitivity: approx. 0.25 %/m light obscuration)
Sampling pipe	glueless connector system, black (outer diameter: 22 mm, inner diameter: 18 mm)
Sampling holes	min. 4 sampling holes, diameter: 3 mm
Air flow monitoring	approx. +/-10 % volume flow
Protection volume	max. 3.0 m^3 (for airtight cabinets: the air exchange rate of the switch cabinet system to be protected must not be greater than 10 % within 20 min.)
External devices	▪ connection for push button for manual release ▪ connection for door contact ▪ bus connection for system networking Rittal CMC (RJ12 connector) ▪ connection for external signalling devices
Approvals	▪ electric components meets UL requirements ▪ CE conformity of the extinguishing unit per EC directive 97/23/EC
Extinguishing agent container	material: aluminium / steel empty volume: approx. 2.2 l content: 2 litres (= 3.2 kg) Novec™ 1230 extinguishing agent dispersal by pressure build-up via propelling gas cartridge with integrated electric release device integrated extinguishing agent loss / filling level monitoring (indication of > 15 % loss)

7 Appendix

7.1 Commissioning and test report

Date of commissioning / commissioner: _____

Serial number of the device: _____

	OK	Notes
Temperature indicator		
Mains connection		Device connected with enclosed mains cable
Lamp test		
Air flow detection		
Mains fault detection		After connecting the batteries the message "Mains failure" must appear in the display. After approx. 1 min. "power supply unit failure" will be reported and the yellow mains fault LED blinks
External voltage output		Please enter the measured voltage (25- 29 V with mains supply connected)

7.1.1 Air flow calibration

The air flow calibration must be carried out with the cabinet closed and the ventilation switched on. Immediately after starting the calibration function the door must also be closed via the control menu (see also 3.5.3).

Nominal value	Lower limit	Upper limit	Filter time

Initially 10 % should be set as permitted deviation because this setting permits the earliest possible detection of a contamination of the sampling holes. If the air flow reports frequent faults due to the flow conditions, the tolerance can be raised to 20 or 40 %, which however makes the recognition of contamination more insensitive.

The following measures must be carried out in the sequence described for the functional test

7.1.2 Reset power supply fault, reset alarm, close door.

The device is in quiescent condition.

Detector 1		Detector 2		push button for manual release		Door		System condition	LCD	LED	Relay
Quiescent	Alarm	Quiescent	Alarm	Quiescent	Alarm	Open	Closed				
x		x		x			x	OK	Status OK	Green on	Quiescent condition

7.1.3 Opening the door

Detector 1		Detector 2		push button for manual release		Door		System condition	LCD	LED	Relay
Quiescent	Alarm	Quiescent	Alarm	Quiescent	Alarm	Open	Closed Closed				
x		x		x		x		Blocked	Extinguishing system blocked	Green blinks	Quiescent condition

Caution!
The message "Extinguishing system blocked" must appear in the display otherwise the extinguishing action will be activated during the subsequent steps.

7.1.4 Disabling the system by pulling the door contact plug

This is done for additional safety. Should somebody unintentionally close the door during the subsequent steps, no release will result.

Detector 1		Detector 2		push button for manual release		Door		System condition	LCD	LED	Relay
Quiescent	Alarm	Quiescent	Alarm	Quiescent	Alarm	Open	Closed				
x		x		x		x		Blocked	Extinguishing system blocked; Door contact fault	Green blinks; Yellow illuminates	Fault

7.1.5 Connecting the push button for manual release.

The system state must not change in the process!

Detector 1		Detector 2		push button for manual release		Door		System condition	LCD	LED	Relay
Quiescent	Alarm	Quiescent	Alarm	Quiescent	Alarm	Open	Closed				
x		x		x		x		Blocked	Exting. syst. blocked; Door contact fault	Green blinks; Yellow illuminates	Fault

Trigger push button for manual release

Detector 1		Detector 2		push button for manual release		door		System condition	LCD	LED	Relay
Quiescent	Alarm	Quiescent	Alarm	Quiescent	Alarm	Open	Closed				
x		x			x	x		Blocked; Alarm	Exting. syst. blocked; Door contact fault; Manual alarm release; Fire	Green blinks; Yellow illuminates; Red blinks	Fault; Pre-alarm; Main alarm

Reset push button for manual release and press fire reset key.

The state before the release will be restored.

Detector 1		Detector 2		push button for manual release		Door		System condition	LCD	LED	Relay
Quiescent	Alarm	Quiescent	Alarm	Quiescent	Alarm	Open	Closed				
x		x		x		x		Blocked	Exting. syst. blocked; Door contact fault	Green blinks; Yellow illuminates	Fault

7.1.6 Triggering the automatic detectors

Trigger with test gas at the last hole of the air sampling pipe

Detector 1		Detector 2		push button for manual release		Door		System condition	LCD	LED	Relay
Quiescent	Alarm	Quiescent	Alarm	Quiescent	Alarm	Open	Closed				
	x		x	x		x		Blocked; Alarm	Extinguishing system blocked; Door contact fault; Fire alarm detector 1; Pre-alarm; Fire alarm detector 2; Fire	Green blinks; Yellow illuminates; Red blinks	Fault; Pre-alarm; Main alarm

Reset the alarm after 2 min. using the fire reset key.

The previous state must be restored.

Detector 1		Detector 2		push button for manual release		Door		System condition	LCD	LED	Relay
Qquiescent	Alarm	Quiescent	Alarm	Quiescent	Alarm	Open	Closed				
x		x		x		x		Blocked	Extinguishing system blocked; Door contact fault	Green blinks; Yellow illuminates	Fault

7.1.7 Generating an air flow fault

Close 10 % of the sampling holes to generate an air flow fault

Detector 1		Detector 2		push button for manual release		Door		System condition	LCD	LED	Relay
Quiescent	Alarm	Quiescent	Alarm	Quiescent	Alarm	Open	Closed				
x		x		x		x		Blocked	Extinguishing system blocked; Door contact fault	Green blinks; Yellow illuminates	Fault

Note: for the air flow fault detection 2 holes must be closed with insulating tape. After the set filtering time the yellow fault LED must illuminate and the message air flow too low must appear in the display.

7.1.8 Reactivate the system

Refit the door contact plug, press the reset key and close the door

Detector 1		Detector 2		push button for manual release		Door		System condition	LCD	LED	Relay
Quiescent	Alarm	Quiescent	Alarm	Quiescent	Alarm	Open	Closed				
x		x		x			x	OK	Status OK	Green on	Quiescent condition

7.2 Spare parts, accessories and consumables + tools

S			M	Item	L	Order number
Spare parts						
1			**E**	Active Extinguishing System DET-AC Plus complete device		90 6744
2			**E**	Extinguishing tank complete, incl. propelling gas cartridge		90 6699
3			**E**	Set of batteries (2x 12V/ 2.2 Ah)		23 6023
4			**E**	Fire detector head OMX1002C		90 6323
4			**E**	Fire detector head OMX1002C HS		90 6324
4			**E**	Air flow sensor filter 50µm		89 3663
X			**E**	Fuse 0,315 A / 250 Volt		75 0018
X			**E**	Fuse 0.5 A / 250 Volt		15 0136
X			**E**	Fuse 2.0 A / 250 Volt		15 0240
X			**E**	Fuse 4.0 A / 250 Volt		15 0276
X			**E**	Fuse 6,3 A / 250 Volt (power supply unit)		79 7132
X			**E**	Terminator resistor 22k, 1/10 watt with RJ12 connector (door contact connection)		90 6913
X			**E**	Terminator 1K8 Ohm, 1/10 watt (for door contact or push button for manual release)		67 5235
X			**E**	Resistor 470 Ohm, 1/10 watt (for door contact or push button for manual release)		67 5223
X			**E**	Power cable		90 6083
X			**E**	German operating instructions		90 6849
X			**E**	English operating instructions		90 6850
0			**E**	Sliding rail of varying depth		Rittal: DK 7063.880
Accessories						
0			**Z**	Test gas		90 5904
0			**Z**	Sampling pipe complete with attachment clips		90 6095
0			**Z**	Alarm combination SONFL1 MX (flashing light + alarm horn)		90 6508
0			**Z**	Push button for manual release, yellow		88 8845
Tools						
0			**W**	Pipe cutter		90 5281
0			**W**	FESTO release fork for disconnecting sampling pipe connections		90 7066
2			**W**	Phillips screwdriver for battery cover screws		
2			**W**	Size 8 open-jawed spanner for attachment angle		
X			**W**	Size 22 open-jawed spanner for extinguishing nozzle		
2			**W**	Size 19 open-jawed spanner for extinguishing pipe		
x			**W**	Vacuum lifting pad		

- **S = Service level**
  (0 = installation / commissioning, 1 = device replacement, 2 = extinguishing module replacement, 3 = wearing parts replacement (e.g. batteries), 4 = re-commissioning after release)
- **M = characteristic**
  (E = spare part, W = tool, Z = accessory)
- **L = storage location / supplier**

7.3 Trouble-shooting

Fault, Fault Message	Possible Cause	Necessary Measure
Power failure	▪ Mains voltage supply short-term failed	Eliminate possible disturbances of the mains voltage supply
Failure power supply unit	▪ Power supply unit does not deliver voltage for longer time (e.g. if mains cables is not attached)	Connect mains voltage supply again
Failure batteries and yellow LED power supply faulty	▪ Batteries deeply discharged or ▪ batteries not connected	Examine whether a power failure was present. If so, load batteries 24 hours in the OneU. (The fault signal must be resetable then if not, the batteries have to be exchanged).
Failure air stream - Pressure too high	▪ Sampling pipe came loose	Fix sampling pipe
Failure air stream - Pressure too low	▪ Sampling pipe badly dirty, or ▪ Filter in the air flow monitoring is dirty	Clean sampling pipe. If disturbance furthermore exists, exchange filter.
Failure sensor 1	▪ Sensor 1 faulty or ▪ Sensor 1 missing	Advise service
Failure sensor 2	▪ Sensor 2 faulty or ▪ Sensor 2 missing	Advise service
Failure door contact	▪ Short-circuit or wire break at the door contact (e.g. cable not attached), or ▪ Termination plug is missing, if no door contact is planned, or ▪ RJ12 connector and two-pole plug for door contact are attached at the same time.	Examination of the door contact plugs. Attach cables or put in termination plugs if necessary.
Failure push button	▪ Short-circuit or wire break at the push button for manual release (e.g. cable not attached), termination plugs is missing, if no hand alarm unit is planned	Examination of plugs of the push button for manual release. Attach cables or put in termination plugs if necessary
Failure extinguishant monitoring	▪ Internal wire break or short-circuit to the level sensor of the tank	Advise service
Loss of extinguishant	▪ Loss of extinguishant in the tank	Advise service
Failure release magnet	▪ Magnet or internal wiring defective	Advise service

Fault, Fault Message	Possible Cause	Necessary Measure
Extinguishing action failed	▪ Extinguishing action was released during mechanical blocking ▪ The DET AC plus detected a fire and the extinguishing action was triggered but the extinguishant tank was however not emptied	Advise service
No data in the event memory, although messages existed	▪ Backup battery on the processor board is missing or empty	Advise service
Failure sensor 1, failure sensor 2, failure air stream and no air discharge	▪ Interface processor board / detector board defective	Advise service
There no function of the front panel, but the aspirating fan runs and there is external 24V	▪ Interface processor board / front panel defective	Advise service
System failure EC=0010 P=00000001	▪ Interface processor board / front panel defective	Press reset button on the processor board, advise service
Aspirating fan does not start	▪ Interface processor board / aspirating fan defective	Advise service
Test release with test gas does not work	▪ Test gas was not sprayed directly into the bore of the sampling pipe or ▪ Test gas was not sprayed in long enough.	Repeat test release
Display does not indicate anything, but the LED work	▪ Contrast of display is mis-adjusted	Readjust the contrast at the back potentiometer of the front panel
OneU does not run / start, although mains voltage lies close	▪ Power supply unit defective	Start of the OneU with the batteries. Disconnect the batteries by way of trial, in order to determine whether the power supply unit takes over voltage supply. If the system fails anyway then advise service
Message „Breakdown battery charge“	▪ Batteries cannot be charged any longer	Change batteries

7.4 Declaration of Conformity

Konformitätserklärung
Declaration of Conformity

Minimax Gerät für eine Brandmelde- und Löschsteueranlage
Minimax device for fire detection and extinguishing control system

Gegenstand / Typ: DET-AC Plus
Subject / Type:
Spezialgerät zum Schutz für besondere Risiken: Objekt- und Einrichtungsschutz
Device for protection of special risks: Local application and object protection
Das/Die vorgenannten Bauteile entsprechen in der gelieferten Ausführung den im Folgenden genannten einschlägigen Bestimmungen:
The above mentioned units corresponds in the delivered condition to the relevant regulations:

Angewandte EG Richtlinie: Elektromagnetische Verträglichkeit 2004/108/EG
Applied EC-Directives: Electromagnetic compatibility 2004/108/EC
Angewandte harmonisierte Normen: EN 61000-6-3, EN 55022 Kl B, EN 61000-6-2, EN 50130-4
Applied harmonized standards:

Angewandte EG Richtlinie: Niederspannung 2006/95/EG
Applied EC-Directives: Low Voltage 2006/95/EC
Angewandte harmonisierte Normen: EN 60950, EN 60950/A11
Applied harmonized standards:

Angewandte EG Richtlinie: RoHS 2002/95/EC
Applied EC-Directives:

Es sind keine anderen als die oben beschriebenen Anwendungen im Rahmen der technischen Spezifikationen und unter Beachtung aller einschlägigen Errichterbestimmungen zulässig.
No other than the above described use within the scope of the technical specifications and paying attention to all safety regulations for erection is permitted.
Schnittstellen zu Anlagen und Systemen, die in den Geltungsbereich anderer als obengenannter europäischer Regelwerke fallen, sind ggf. gesondert zu berücksichtigen.
Interfaces to systems, which are under the scope of other than above mentioned European rules must be specially considered if needed be.
Die Produkte der Minimax GmbH & Co. KG erfüllen alle Anforderungen des durch den VdS zertifizierten QM-Systems gemäß DIN EN ISO 9001
The products of the Minimax GmbH & Co. KG comply with all requirements of VdS certified QM-system acc. to DIN EN ISO 9001

Diese Erklärung wird abgegeben durch: Art.-Nr.:
This declaration has been stated by:

Bad Oldesloe, den 24.04.2007

Minimax GmbH & Co. KG Leiter Qualitätswesen
Minimax GmbH & Co. KG Quality Management
Dipl.-Ing. Thomas Jegodtka

Minimax GmbH & Co. KG Produkt Linien Manager Brandmeldeanlagen
Minimax GmbH & Co. KG Product Line Manager Fire Detection Systems
Dipl.-Ing. Jan Witte

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Minimax GmbH & Co. KG
Industriestraße 10/12
23840 Bad Oldesloe
Tel.: +49 4531 803-0
Fax: +49 4531 803-248
www.minimax.de

Sitz der Gesellschaft: Bad Oldesloe
AG Lübeck HRA 4797 HL
Komplementärin:
Minimax Management GmbH
AG Lübeck HRB 2082 OD

Unsere Ust-Ident-Nr.: DE813746399
Unsere Steuer-Nr.: 30 289 45306

Geschäftsführer:
Klaus Hofmann (Vorsitzender)
Dr. Volker Bechtloff
Wolfgang Hartwig
Vorsitzender des Aufsichtsrats:
Dr. Dietrich Rümker

HypoVereinsbank AG, Hamburg
BLZ 200 300 00 Kto.-Nr. 400 7161
IBAN DE61 2003 0000 0004 0071 61
SWIFT-BIC: HYVEDEMM300

Deutsche Bank AG
BLZ 230 707 10 Kto.-Nr. 18 20 430
IBAN DE46 2307 0710 0182 0430 00
SWIFT-BIC DEUTDEHH222

West LB AG, Düsseldorf
BLZ 300 500 00 Kto.-Nr. 135 1618
IBAN: DE30 3005 0000 0001 3516 18
SWIFT-BIC: WELADEDD

Dresdner Bank AG
BLZ 230 800 40 Kto.-Nr. 3111 29500
IBAN DE15 2308 0040 0311 1295 00
SWIFT-BIC DRESDEFF230

Your IT security is our business - all over the world

Lampertz GmbH & Co. KG
Industriestraße 24
D-56472 Hof / Germany

Phone +49(0)26 61 9 52-200
Fax +49(0)26 61 9 52-209

E-Mail: info@lampertz.com
www.lampertz.com

Lampertz

816129