5552H4402 Ed. 02

AKO-555244

Alarm centre for trapped person, gas and temperature

User manual

AKO

Index Page

AKO Electromecánica thanks you and congratulates you on the purchase of our product, the development and manufacture of which involved the most innovative technologies, as well as rigorous production and quality control processes.

Our commitment to achieving customer satisfaction and our continuous efforts to improve day by day are confirmed by the various quality certificates obtained.

This is a high performance, technologically advanced product. Its operation and the final performance achieved will depend, to a great extent, on correct planning, installation, configuration and commissioning. Please read this manual carefully before proceeding to install it and respect the instructions in the manual at all times.

Only qualified personnel may install the product or provide technical support.

This product has been developed for use in the applications described in the manual. AKO Electromecánica does not guarantee its operation in any use not foreseen in this document and accepts no liability in the case of damage of any type which may result from incorrect use, configuration, installation or commissioning.

Complying with and enforcing the regulations applying to installations where our products are destined to be used is the responsibility of the installer and the customer. AKO Electromecánica accepts no liability for damage which may occur due to failure to comply with these regulations. Rigorously follow the instructions described in this manual.

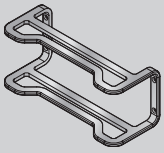
In order to extend the lifetime of our products to the maximum, the following points must be observed:

- Do not expose electronic equipment to dust, dirt, water, rain, moisture, high temperatures, chemical agents or corrosive substances of any type.
- Do not subject equipment to knocks or vibrations or attempt to handle them in any way differently to that indicated in the manual.
- Do not under any circumstances exceed the specifications and limitations indicated in the manual.
- Respect the indicated environmental conditions for operation and storage at all times.
- During installation and on completion of this, avoid the presence of loose, broken or unprotected cables or cables in poor condition. These may constitute a risk for the equipment and its users.

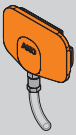
AKO Electromecánica reserves the right to make any modification to the documentation and the product without prior notification.

Versions and references

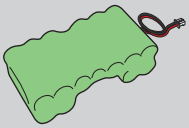
MODEL	DESCRIPTION	POWER SUPPLY
AKO-555244	Alarm centre for detectors / transmitters / trapped person pushbuttons / extraction pushbuttons	90 - 240 V~ 50/60 Hz
AKO-55326	Trapped person luminous pushbutton	-
AKO-55327	Extraction luminous pushbutton	-
AKO-575400	Universal transmitter **R-23 / R-32 / R-125 / R-134a / R-404A / R-407A / R-407F / R-410A / R-448A / R-449A / R-452A / R-455A / R-513A *(R-450A / R-442A / R-454A / R-454c / R-1234yf / R-1234ze)**	12-30 Vdc
AKO-575400N	Universal transmitter with **NBIoT communication** **R-23 / R-32 / R-125 / R-134a / R-404A / R-407A / R-407F / R-410A / R-448A / R-449A / R-452A / R-455A / R-513A *(R-450A / R-442A / R-454A / R-454c / R-1234yf / R-1234ze)**	
AKO-575400NE	Universal transmitter with **NBIoT communication** and external antenna **R-23 / R-32 / R-125 / R-134a / R-404A / R-407A / R-407F / R-410A / R-448A / R-449A / R-452A / R-455A / R-513A *(R-450A / R-442A / R-454A / R-454c / R-1234yf / R-1234ze)**	
AKO-575744	**R-744 (CO_2)** gas transmitter	
AKO-575744N	**R-744 (CO_2)** gas transmitter with **NBIoT communication**	
AKO-575744NR	**R-744 (CO_2)** gas transmitter with **NBIoT communication** (Includes external adapter from 230 Vac to 15 Vcc)	
AKO-57613	R-717 (NH3 / ammonia)	
AKO-57614	R-134a, R-22, R-404A, R-407A, R-407C, R-407F, R-409A, R-408A, R-410A, R-422A, R-422D, R-424A, R-434A, R-442A, R-448A, R-449A, R-450A, R-452A, R-453A, R-507A, R-513A	
AKO-58120	Protector for pushbutton / detector	-
AKO-58110	Calibration tool	-
AKO-58010	Optional battery*	-



AKO-58120



AKO-58110



AKO-58010

*If installing the trapped person in cold room store pushbutton, it's essential to install the optional **AKO-58010** battery to meet **EN-378-1:2016 and RSIF (RD552:2019)** standards.

Cautions

-If the device is used without following the manufacturer's instructions, it may fail to meet its safety requirements. Only probes supplied by AKO must be used for the unit to operate correctly.

-From -40 °C to +20 °C, if the NTC sensor is extended to 1000 m with at least a 0.5 mm^2 cable, the maximum deviation will be 0.25 °C (cable for sensor extension ref. AKO-15586. Earth the cable mesh at one end only).
-Only NTC probes supplied by AKO should be used for the appliance to operate correctly.
-The product should be installed in a place protected from vibrations, water and corrosive gases, where the ambient temperature does not exceed the value indicated in the technical data.
-For the reading to be correct, the sensor should be used in a place without heat influences apart from the temperature you want to measure or control.
- The IP65 protection degree is only valid with the protection cover closed.
- The IP65 protection degree is only valid if the cables enter the device using a tube for electric conductions + gland with IP65 or above. The gland should be the right size for the diameter of the tube used.
-Do not spray the unit directly with high-pressure hoses, as this could damage it.
-The centre should be installed in a monitored area, where it is guaranteed that people able to alert to the presence of alarms will be present.
-Neither the alarm nor the gas transmitter / detector are suitable for areas classified as potentially explosive.
-Transmitters / detectors monitor a point and not an area. If the gas leak does not reach the sensor, or the level of concentration in that point does not reach the foreseen values according to the type of gas, no alarm will be activated.
-Transmitters / detectors measure gas concentration at a given point. If the gas leak does not reach the transmitter / detector, the alarm will not be activated.
-Transmitters / detectors cannot supervise areas. If perimeter supervision is required, several transmitters / detectors should be installed surrounding the area to be supervised.
-Thoroughly studying transmitters' / detectors' location is recommended, bearing in mind the areas most vulnerable to suffering leaks, the type of gas used, the size and shape of the room, air flows, maintenance work, etc.

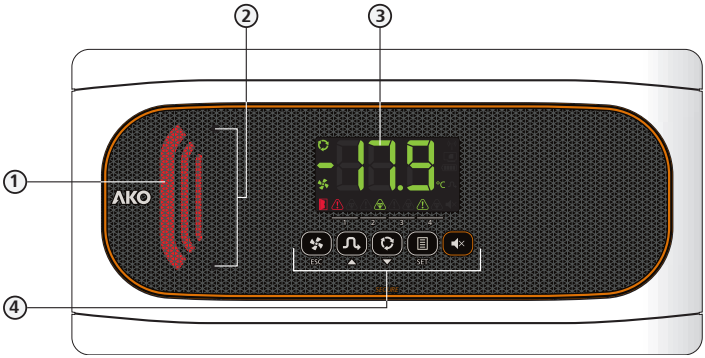
Working conditions:
-Avoid handling refrigerant gases near the transmitter / detector.
-Do not paint the transmitter / detector or place it near solvents or paints.
-Exposure to acetone vapours may generate false alarms.
The transmitter / detector should be installed away from:
Smoke outlets located in confined spaces or from engines, generators or motorised machinery (fork-lift trucks, etc.).
Particularly damp areas or areas with strong ventilation.

Maintenance

Clean the surface of the unit with a soft cloth, water and soap.
Do not use abrasive detergents, petrol, alcohol or solvents, as this might damage the unit.

The **EN-378** and **F-GAS** international standards require that correct transmitter / detector functioning be checked at least once per year. Review what current local regulations specify for these cases. Consult the appropriate verification method in the transmitter / detector manual.
Always ensure that you comply with current local regulations.

Description



1: Visual alarm **2: Audible alarm** **3: Display** **4: Keypad**

Constant green: Trapped person pushbutton connected.
Quick-flashing red: Malfunction / wiring fault in pushbutton.
Slow-flashing red: Pushbutton not detected or disconnected.
Constant red: Trapped person alarm active.

Constant green: Gas transmitter / detector connected.
Flashing green: Gas pre-alarm / alarm saved.
Quick-flashing red: Malfunction / Wiring fault in transmitter / detector.
Slow-flashing red: Transmitter / detector not detected or disconnected.
Constant red: Gas pre-alarm / alarm active.
Flashing red: Gas alarm disabled for battery work.

Scheduled ventilation cycle active.

Steady: Ventilation is activated through programming or forced.
Blinking: Ventilation should be active according to programming, but its stop has been forced.

Constant green: One of the digital inputs has been configured as an open door alarm.
Flashing red: Open cold room door alarm.

Gas alarm muted.

°C Temperature indicated in degrees Celsius.

Steady: Set Hold mode active.
Blinking: Maintenance mode active.

Battery connected.

ESC Toggle ventilation on / off.

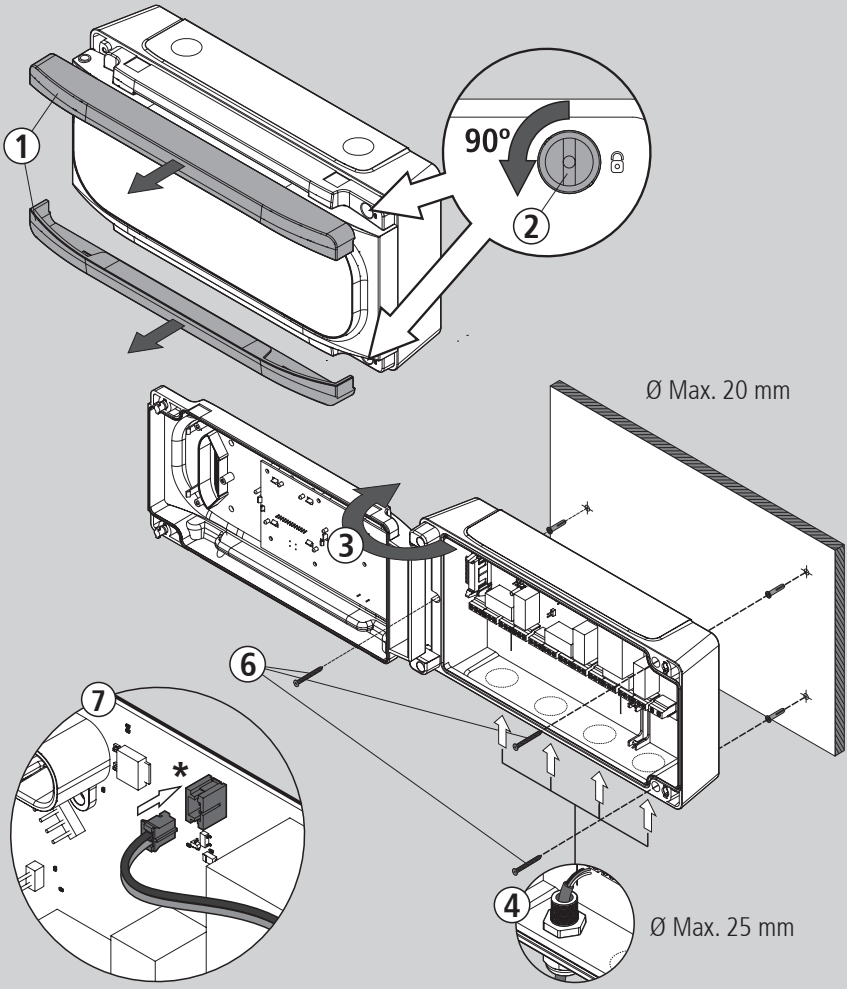
Pressing for 3 seconds activates / deactivates Set Hold function.
Pressing for 6 seconds activates / deactivates Maintenance mode.

Pressing for 3 seconds activates / deactivates scheduled ventilation cycle.

SET Pressing for 6 seconds accesses the programming menu.

For gas alarm, pressing briefly silences the alarm tone.
Trapped person alarms cannot be silenced.
Pressing for 1 second clears saved gas alarms.
Pressing for 3 seconds reactivates short-circuited inputs (in error state).

Installation



- Remove the bezels (1)
- Make a 1/4 turn of the screws (2) anti-clockwise and open the door (3).
- Install the necessary glands (4 / 5) by drilling holes in the points indicated on the box.
- Mark and make the holes in the wall with the aid of the template included.
- Fix the device to the wall. If it is a brick wall, use the screws and plugs supplied; if the wall is made of sheet metal (cold room store), use the screws provided without plugs (6).
-If installing the optional **AKO-58010** battery, connect it as shown in the figure (7)
- Wire the device by following the recommendations indicated on pagepage 14.
- Close the cover (3), tighten the screws (2) and replace the bezels (1).

Wiring

Always disconnect the power supply to do the wiring.
The probes and their cables must **NEVER** be installed in a conduit together with power, control or power supply cables.

For disconnection, the power supply circuit must be equipped with at least a 2 A, 230 V switch, located near the device. The power supply cable shall be of the H05VV-F or NYM 1x16/3 type. The section to be used will depend on current local regulations, but should never be less than 1.5 mm^2.

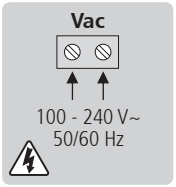
Cables for relay or contactor outputs should have a section of 2.5 mm^2, allow working temperatures equal to or over 70°C, and be installed with as little bending as possible.

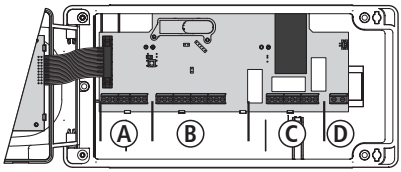
The 120 / 230 V~ wiring area must be kept clear of any other external element.

The wiring to be undertaken depends on the options selected in the initial configuration wizard (See page 15).

Check the enclosed schematic and the defined configuration before wiring.

Ⓓ





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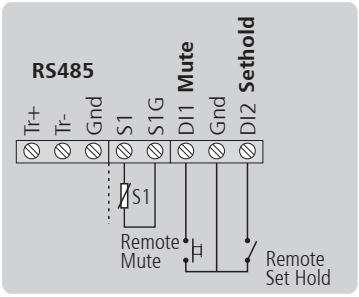

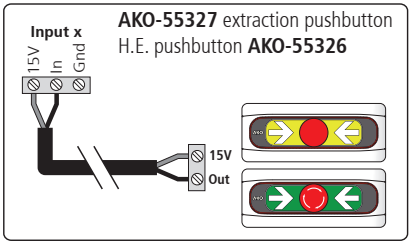

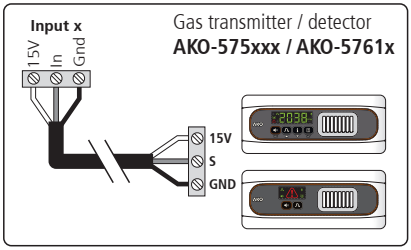

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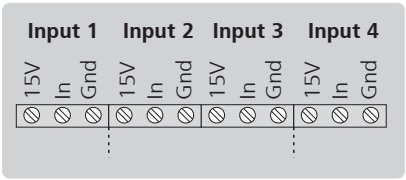

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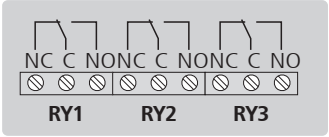
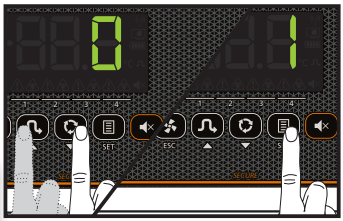


Initial configuration (wizard)



The first time the unit receives the power supply, it will enter into ASSISTANT mode. The display will show the message **InI** flashing at **0**.

The pushbuttons / detectors / transmitters / probes should be connected before initiating the process, otherwise, they will not be detected.

Step 1:

Select the most suitable InI option based on the type of installation to be carried out and press **SET**. The available options will be shown in the following table:

InI	Installation location	Trapped person pushbutton input	Gas detector / transmitter input	Forced ventilation pushbutton input	Temperature alarms	Open door alarm
0	Demo mode, only displays temperature on the screen					
1	Machine room	No	Yes	Yes	Yes	No
2	Cold room store	Yes	Yes	No	Yes	Yes

Step 2:

The display shows the message **dFP** (default parameters) with two options to choose from:

- **0:** Only change the parameters which affect the wizard. The other parameters will remain the same.
- **1:** All parameters return to their factory setting except those which have been modified by the wizard.

Press **SET** to accept the changes.

Step 3:

The input auto-detection process begins; the display sequentially lights up all inputs in green while detection takes place.

After a few seconds, the auto-detection concludes with 5 short beeps and the device restarts, entering normal operation.

The configuration wizard will not reactivate. To reactivate it, switch off the power supply, switch it on again and, within 2 minutes, press the following keys in this order (one after the other, not at the same time) ▲, ▼, **SET**.

Operation

Messages

Probe 1 faulty
(Open circuit, crossed circuit or temperature outside the limits of the probe).

Maximum temperature alarm in probe 1. The temperature value programmed in A1 has been reached.

Minimum temperature alarm in probe 1. The temperature value programmed in A2 has been reached.

Gas pre-alarm active.

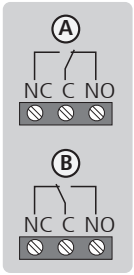
Gas alarm active.

Trapped person alarm active.

Open door alarm active.

Probe disabled by parameter I00.

Relay management



Relay RY1
InI= 1 Machine room: Activated (A) and deactivated (B) based on ventilation cycles (Parameters U1 and U2)

InI=2 Cold room: Activated (A) in case of gas pre-alarm or alarm in any of the gas detectors / transmitters.

Relay RY2
Cold stop, activated (A) in case of gas alarm, stopping the cooling regulation of the cold room or the centre.

Relay RY3 CMS (Central Monitoring Station)
Remote alarm, operates inversely, deactivating (B) in case of:

- Gas pre-alarm
- Gas alarm
- Ventilation pushbutton error (If InI=1)
- Trapped person alarm (If InI=2)
- Maximum temperature alarm (If InI=2)
- Minimum temperature alarm (If InI=2)
- Open door alarm (If InI=2)
- Ventilation pushbutton error (If InI=1)
- Trapped person pushbutton error (If InI=1)
- Gas detector / transmitter error
- Error in probe 1

If none of these alarms is active, the relay will be activated (A).

Operation in machine room mode (InI=1)

Extractor fan (C)
Controlled by relay **RY1**, it automatically activates and deactivates according to the programmed times in parameters U1 and U2 **(Scheduled ventilation cycle)**.
If necessary, its activation or stop can be forced by pressing the **AKO-55327** pushbutton (B) for more than 1 second.

Gas leak detection (A)
If one of the connected detectors / transmitters (A) detects a gas leak (pre-alarm or alarm), the station's visual and acoustic alarm activates, and relay **RY3** (D) switches to state B, (See page 16) activating forced ventilation (**RY1**).
Only in the case of a gas alarm (not pre-alarm), relay **RY2** is activated, sending a signal to the cold room's controller (E) to stop cold production.

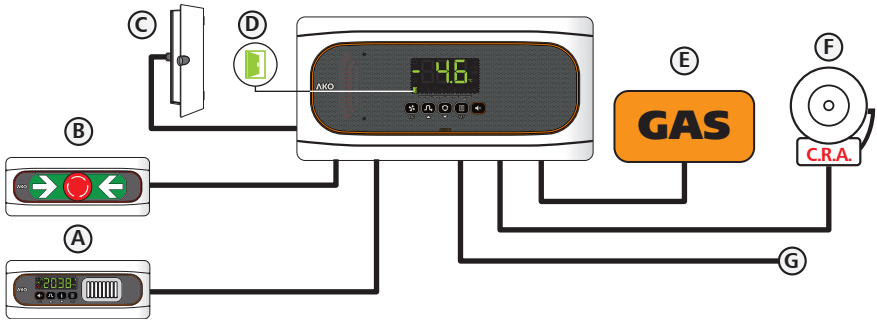
Temperature display
The display shows the temperature of probe S1 (See page 14).

Ventilation activation due to high temperature
If the temperature in probe S1 exceeds the value configured in parameter A0, after the delay programmed in parameter A5, forced ventilation (**RY1**) is activated and relay **RY3** (D) switches to state B (See page 16).

Maximum temperature alarm
If the temperature in probe 1 exceeds the value configured in parameter A1, the maximum temperature alarm (AH) is activated.
The maximum temperature alarm activates the station's visual and acoustic alarm once the delay programmed in parameter A5 has passed, and relay **RY3** (D) remains in state B (See page 16).

Input errors
In case of an error in any of the inputs (pushbutton, detector, transmitter or temperature probe), the corresponding indicator activates (see page 13 and page 16) and relay **RY3** (D) switches to state B (See page 16).

Operation in cold room mode (InI=2)



Gas leak detection (A)
If one of the connected detectors / transmitters (A) detects a gas leak (pre-alarm or alarm), the station's visual and acoustic alarm activates, relay **RY3** (F) switches to state B (See page 16) and relay **RY1** (E) is activated.
Only in the case of a gas alarm (not pre-alarm), relay **RY2** is activated, sending a signal to the cold room's controller (G) to stop cold production.

Trapped person alarm (B)
If one of the trapped person pushbuttons **AKO-55326** (B) is pressed, the station's visual and acoustic alarm activates, and relay **RY3** (F) switches to state B (See page 16).

Temperature display

The display shows the temperature of probe S1 (See page 14).

Temperature alarms
If the temperature surpasses the set value in parameter A1, the maximum temperature alarm (AH) is activated.
If the temperature falls below the configured value in parameter A2, the minimum temperature alarm (AL) is activated.
Both alarms initiate the visual and acoustic alarm in the station after the programmed delay in parameter A5, causing relay **RY3** (F) to switch to state B ((See page 16).

Open door alarm
Upon detecting the opening of the cold room door (C), indicator D changes from green to red. If it remains open for a duration exceeding the defined time in parameter A12, the station's visual and acoustic alarm activates, and relay **RY3** (F) switches to state B (See page 16).
This requires configuring one of the inputs (DI1 or DI2) as a door contact (I50 or I60 = 4).

Input errors
In the event of an error in any of the inputs (pushbutton, detector, transmitter or temperature probe), relay **RY3** (F) switches to state B (See page 16).

Operation in the event of power failure
In the event of a power failure, with the optional battery **AKO-58010** installed, the station only maintains the functionality of the trapped person alarm active (InI=2).

*When installing the trapped person pushbutton in negative-pressure cold rooms, it's necessary to install the optional battery **AKO-58010** to comply with the **EN-378-1:2016** standard.

Programming the ventilation cycle

Ventilation cycles allow you to establish periods during which the fans are active.
The programming is defined by parameters U1 (fan OFF time) and U2 (fan ON time). If U2 is set to "0", the programming never starts.

Set Hold mode

Prevents false alarms when charging or cleaning the chambers.
While this mode is activated, pre-alarms will not signal and alarms will signal as pre-alarms when faced with all effects (sound, relay activation and signalling).
To activate/deactivate this mode, press the key for 3 seconds. The display will show the indicator.
You may also activate/deactivate this function remotely using digital input 2 (DI2) if required.
This mode will remain active for a maximum of 5 hours, then will deactivate automatically.

If this mode is activated using the key, it can only be deactivated using the same key. This is also true when activating the mode using digital input 2.

Maintenance mode

Disables gas pre-alarms and alarms for 1 hour for maintenance tasks.
While this mode is activated, no gas pre-alarm or alarm will sound.
To activate/deactivate this mode, press the key for 6 seconds. The indicator will flash.

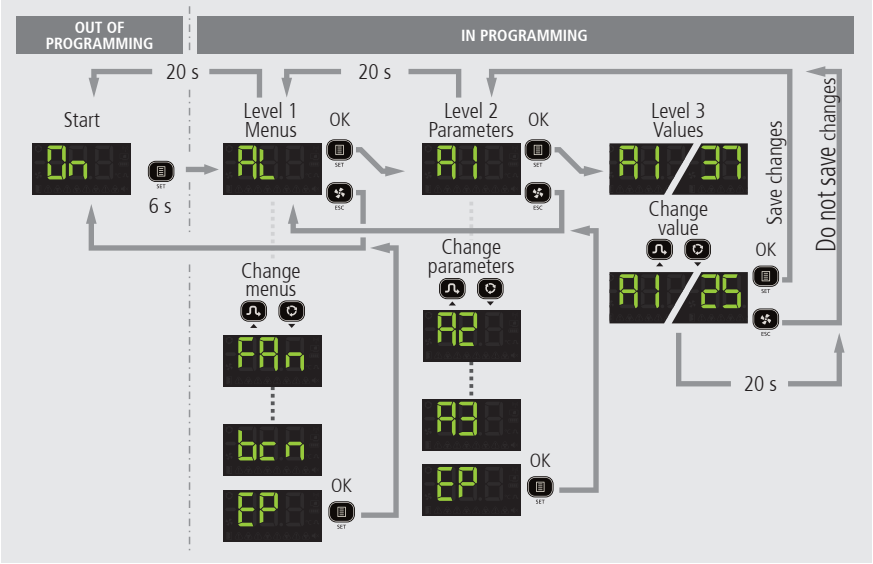
If there is a sudden increase in temperature near the transmitter, either in the cold room loading process, or because the door has been accidentally left open, there is a risk of condensation occurring inside the transmitter. In these conditions, the maintenance mode temporarily activates to avoid false alarms. The transmitter returns to normal operation after 3 to 15 minutes.
In these cases, the maintenance mode cannot be manually deactivated.

Programming menu

Use the extended programming menu to configure all of the unit's parameters in order to adapt it to your installation requirements. Press the **SET** key for 6 seconds to access it.

IMPORTANT: If the password function has been configured as a keypad lock (**b10**=2), or as an access to parameters block (**b10**=1), you will be requested to enter the password programmed in **PAS** when attempting to access either of the two functions. If the entered password is not correct, the unit will go back to showing the temperature.

IMPORTANT: Certain parameters or menus may not be visible depending on the configuration of the other parameters and the options chosen during set-up.



Parameters

Alarm control

Level 1	Level 2	Description	Values	Min.	Def.	Max.
	A0	Ventilation for excessive temperature	°C	-50.0	40.0	A1
AL	**A1**	Maximum in probe 1 alarm	°C	A2	37	99.9
	A2	Minimum in probe 1 alarm	°C	-50.0	-50.0	A1
	A3	Start-up delay for alarms A0, A1 and A2	min.	0	0	120
	A5	Delay for Alarms A0, A1 and A2 after reaching the programmed value	min.	0	30	99
	A10	Differential of temperature alarms (A0, A1 and A2)	°C	0.1	1	2.0
	A12	Delay to open door alarm	min.	0	5	99
	A13	Enable pre-alarm: 0=Disabled; 1=Enabled		0	1	1
	EP	Output to level 1				

Ventilation cycle

Level 1	Level 2	Description	Values	Min.	Def.	Max.
FAn	**U1**	Fan OFF time	min.	1	7	255
	U2	Fan ON time (0=disabled)	min.	0	3	255
	EP	Output to level 1				

Basic configuration

Level 1	Level 2	Description	Values	Min.	Def.	Max.
bcn	**b10**	Password function 0=Inactive 1=Parameter access lock 2=Keypad lock		0	0	2
	PAS	Password		0	0	99
	b20	MODBUS address		1	**	247
	b21	Communication speed: 0=9600 bps 1=19200 bps 2=38400 bps 3=57600 bps		0	0	3
	Unt	Working units 0=Whole numbers; 1= 1 decimal		0	1	1
	EP	Output to level 1				

** Indicated on the device label.

Inputs / outputs

Level 1	Level 2	Description	Values	Min.	Def.	Max.
InO	I00	Type of probe: 0: Not connected; 1: NTC; 2: PT1000		0	1	2
	I01	Differential of Probe 1	°C	-5.0	0.0	5.0
	I50	Configuration of digital input 1: 0=Disabled; 1=Remote Gas Pre-Alarm; 2=Remote Gas Alarm; 3=Remote Set-Hold; 4=Door Contact		0	0	*
	I51	Polarity of digital input 1 0=Activates on closing contact; 1=Activates on opening contact		0	0	1
	I60	Configuration of digital input 2: 0=Disabled; 1=Remote Gas Pre-Alarm; 2=Remote Gas Alarm; 3=Remote Set-Hold; 4=Door Contact		0	0	*
	I61	Polarity of digital input 2 0=Activates on closing contact; 1=Activates on opening contact		0	0	1
	EP	Output to level 1				

Information (read-only)

Level 1	Level 2	Description	Values	Min.	Def.	Max.
tid	InI	Option chosen in the configuration wizard 0= Demo mode; 1= Machine room; 2= Cold room		0	*	2
	PU	Program version	°C	-5.0	0.0	5.0
	Pr	Program revision		0	0	4
	PSr	Program subrevision		0	0	1
	EP	Output to level 1				

*The maximum value depends on the option selected in the wizard.
**Defined in the configuration wizard.

Technical specifications

Power supply..... 100 - 240 V ~ 50/60 Hz
Maximum input power ..... 3.1 W
Relays ..... SPDT 8(2) A 250 V~
No. of relay operations ..... EN 60730-1:100000 operations
Temperature probe range (NTC/Pt1000)..... -50.0 °C to 99.9 °C
Resolution, adjustment and differential ..... 0.1 °C
Thermometric accuracy ..... ±0.5 °C
Input for NTC probe AKO-14901
Working ambient temperature ..... -5 °C to 50 °C (H.R.: 90%)
Ambient storage temperature ..... -30 °C to 60 °C (H.R.: 90%)
Protection degree ..... IP 65
Installation category ..... II as per EN 61010-1
Degree of pollution ..... II as per EN 61010-1
Sound power..... 90 dB(A) at 1 metre
Accumulators ..... Ni-MH 1.6 Ah
Lighting + alarm autonomy ..... > 10 Hours *
MODBUS address ..... Indicated on the label
Maximum cable distance for pushbutton / detector / transmitter ..... 300 m
Double isolation between power supply, secondary circuit and relay output.
Dimensions ..... 290 mm (W) x 141 mm (H) x 84.4 mm (D)

Probe extensions: **

NTC ..... Extendable up to 100 metres with AKO-15586H extension cable
PTC ..... Extendable up to 100 metres with AKO-15586H extension cable
PT1000 ..... Extendable up to 30 metres with AKO-15586H extension cable
4-20mA ..... Extendable up to 200 metres with AKO-15586H extension cable
0.5–4.5V ..... Extendable up to 100 metres with AKO-15586H extension cable
0–10V ..... Extendable up to 100 metres with AKO-15586H extension cable

*Duration in alarm status at an ambient temperature of between 25 °C.
** The AKO-15586H extension cable has an impedance of maximum cable distance 0.0172 Ohms* mm^2/m

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