AKO-575xxx

Gas transmitter

User manual
AKO Electromecánica thanks and congratulates you for purchasing our product, in whose development and manufacture the most innovative technology has been used, as well as strict production and quality control processes. Our commitment to satisfy our customers and our continuous efforts to improve every day can be seen in the various quality certifications we have obtained.

This is a high performance, high technology product. The operation and final performance of the equipment depend on proper planning, installation, configuration and commissioning. Read this manual carefully before installation, and always follow its instructions. Only qualified personnel should install or perform technical assistance on this product.

This product is designed to be used in the applications described in the product manual. AKO Electromecánica gives no guarantee of its operation in any use not foreseen in the manual, and is not responsible for any damage resulting from improper use, configuration, installation or commissioning.

It is the responsibility of the installer and the customer to comply with and ensure others comply with all regulations applicable to installations incorporating our products. AKO Electromecánica is not responsible for any damage caused by non-compliance with regulations. Follow strictly the instructions given in this manual.

To maximise the service life of our equipment, these recommendations should be followed:

- Do not expose electronic equipment to dust, dirt, water, rain, humidity, high temperatures, chemicals or corrosive substances of any sort.
- Do not submit the equipment to blows or vibrations nor try to manipulate it differently from shown in the manual.
- Never exceed the specifications and limitations indicated in the manual.
- Always respect the specified ambient working and storage conditions.
- During and after installation, avoid leaving loose, broken, unprotected or damaged wiring, since they might constitute a risk for the equipment and its users.

AKO Electromecánica reserves the right to make any non-metrology modification to the documentation or the equipment without previous notice.
1.- Versions and references

<table>
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<th>DESCRIPTION</th>
<th>POWER SUPPLY</th>
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<td>AKO-575134A</td>
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<td></td>
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<td>AKO-575507A</td>
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<td></td>
</tr>
<tr>
<td>AKO-575400</td>
<td>Universal gas transmitter for</td>
<td>12-30 Vdc</td>
</tr>
<tr>
<td></td>
<td>R-23 / R-32 / R-125 / R-134a / R-404A /</td>
<td></td>
</tr>
<tr>
<td></td>
<td>*(R-450A / R-442A / R-454A / R-454c / R-1234yf / R-1234ze)</td>
<td></td>
</tr>
<tr>
<td>AKO-575744</td>
<td>R-744 (Co2) gas transmitter</td>
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</tr>
<tr>
<td>AKO-58500</td>
<td>CAMM module</td>
<td>-</td>
</tr>
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<td>AKO-58120</td>
<td>Protector for push-button/detector</td>
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</tr>
<tr>
<td>AKO-58110</td>
<td>Calibration tool</td>
<td>-</td>
</tr>
</tbody>
</table>

* Gases in brackets are detected early, albeit without a specific measurement set parameter. Further details can be found in the table on page 23.

2.- Warning

- Transmitters 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.
- The transmitter is not suitable for areas classified as potentially explosive.
- Transmitters/detectors supervise 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 (see page 3) no alarm will be activated. If perimeter supervision is required, several sensors should be installed around that area.
3.- Equipment description

Indicators

- Gas alarm on mute
- **Fixed:** Set Hold mode activated
  **Flashing:** Maintenance mode activated
- **Fixed:** CAMM module in operation
  **Flashing:** Malfunction in CAMM module
- **Fixed:** Gas pre-alarm activated.
  **Flashing:** Gas alarm activated.
- **Bluetooth activated (CAMM module only)**
- **x10** The value displayed should be multiplied by 10.
- **PPM** The display shows the current gas concentration in ppm (parts per million).
- **PRG** Unit in programming mode.
- **The display shows the type of gas detected.**

Keypad

- **If the gas Pre-Alarm or Alarm sounds, pressing once will mute the alarm tone (See parameter b03).**
  In the programming menu, it exits the parameter without saving changes, returns to previous level or exits programming.

  - Pressing for 3 seconds activates or deactivates Set Hold mode (See page 11).
  - Pressing for 6 seconds activates or deactivates maintenance mode (See page 11).
  - In the programming menu it allows scrolling around the different levels, or during the setting of a parameter, changing its value.

- **Pressing once (< 1 second) will show the type of gas detected, the date and time in sequential order.**
  - Pressing for 3 seconds displays the Pre-Alarm and Alarm levels that have been configured.
  - In the programming menu it allows scrolling around the different levels, or during the setting of a parameter, changing its value.

- **Pressing for 3 seconds accesses the configuration of alarm levels (See page 14).**
  - Pressing it for 6 seconds accesses the advanced programming menu (See page 14).
  - In the programming menu, it accesses the level shown on the display or, during the setting of a parameter, accepts the new value.
Messages

Setup wizard initiated (See page 9).

Gas Pre-Alarm activated. Flashing together with the gas concentration (See page 12).

Gas alarm activated. Flashing together with the gas concentration (See page 12).

Initialisation process of the gas sensor. This process may last for up to 3 minutes.

Error or malfunction of the sensor. Deactivate the power supply and activate it again. If after a few seconds the error persists, please contact your technical support centre.

Request for protection code (See pages 21 and 22).

SA reading of greater than 300 PPM has been detected during the reset to zero process (See page 21).

The temperature of the sensor has experienced a variation of greater than 5 °C during the calibration or reset to zero process (See pages 21 and 22).

The maximum time has been exceeded without the reading stabilising during the calibration process (15 min) or reset to zero process (5 min) (See pages 21 and 22).

The calibration or reset to zero process has been completed successfully (See pages 21 and 22).

The sensor has reached its maximum working temperature.

The sensor has reached its minimum working temperature.

Calibrating or resetting to zero (See pages 21 and 22).
4.- Installation

**WARNING**
- Transmitters/detectors supervise 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 (see page 3) no alarm will be activated. If perimeter supervision is required, several sensors should be installed around that area.
- The transmitter/detector 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.
- Gas transmitters/detectors are not suitable for areas classified as potentially explosive.

**Working conditions:**
- Avoid handling refrigerant gases near the sensor. If this is unavoidable, use Set Hold or Maintenance mode (see page 11)
- Do not paint the sensor or place it near solvents or paints.
- Exposure to acetone vapours may generate false alarms.
- The sensor should be installed away from:
  - Smoke outlets located in confined spaces or from engines, generators or motorised machinery (forklift trucks, etc.).
  - Particularly damp areas or areas with strong ventilation.

The detector should usually be installed in an area where gas may concentrate, near places where gas leaks could start:

- **In compressor/cooling generator rooms:** near to compressors and pressure accumulation tanks. In this environment, the elements most susceptible to refrigerant leaks are valves, pressure sensors, flanges and soldering. In this environment (compressor/cooling generator rooms) with little ventilation there are two practical strategies for installation:
  - **Point detection:** Transmitters are placed close to places identified as being critical/susceptible to leaks.
  - **Perimeter detection:** Transmitters surround the service area to ensure that a potential leak in the system is detected by one of the transmitters.
- **Refrigerated spaces (chambers, islands, cabinets, display cases, etc.):** It is advisable to use the sensor in low-lying areas close to the evaporator. However, it is important to avoid areas with high air velocity such as the input/output of air in the evaporator and areas close to doors with heavy footfall.

Accessible installation is important for carrying out maintenance tasks. It is also advisable to place the sensor away from transit areas or areas where it could be accidentally knocked.

The gases currently used in industrial refrigeration, for which this transmitter has been designed, are heavier than air. They are therefore always concentrated in the lowest part of the refrigerated room or space. Please take this into consideration when choosing the installation site. It is advisable to leave a distance of around 50 cm free.
Assembly

- Remove the bezels (1) from the unit.
- Loosen the screws (2) by turning them a 1/4 turn and open the cover (3).
- Drill the holes needed for the cable entry glands using the pre-stamped centres on the sides of the housing for guidance. Fix the glands onto the device (4).
- Make the 2 holes in the wall using template included.
- Fix the unit to the wall using the screws and plugs supplied (5). If the wall is made of sheet metal (prefabricated cold room stores), use only the screws provided without plugs.
- Insert the cables into the glands. Wire the unit following the diagram on page 8.
- Close the cover (3), insert and tighten the screws (2) and replace the bezels (1).
Wiring

The wiring between the transmitter and the station must **NEVER** be installed in a conduit together with power, control or power supply cables. Always disconnect the power supply to do the wiring. Cables for wiring the relay contact should have an adequate section depending on the unit to be connected. Certain international standards maintain that the power supply of the alarm should originate from a different circuit to that used by the refrigeration and ventilation system. **Please ensure that you comply with current local regulations.**

Connection to alarm station

Independent operation
Setup wizard

1. The first time the transmitter receives the power supply, it will enter into ASSISTANT mode. The display will show the message \( \text{Inl} \) flashing with 0.

2. Using keys \( \uparrow \) and \( \downarrow \), select one of the options depending on the type of installation and press SET to confirm:
   - \( \text{Inl}=0 \): Demo mode*
   - \( \text{Inl}=1 \): Connection to alarm station
   - \( \text{Inl}=2 \): Independent operation

   If 1 minute elapses without any key being pressed, the transmitter will automatically proceed to demo mode*.

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3. The display will show the message \( \text{Gc2} \). Use keys \( \uparrow \) and \( \downarrow \) to select the type of gas to be measured (ALL, 125, 134A, 404A, 407A, 407F, 410A, 448A, 449A, 513A, 452A, 32, 23 or 455A), and press SET to confirm.

All models

The transmitter will begin to operate normally.

![Image of transmitter interface]

If the transmitter is connected to an alarm station, initiate the setup wizard in the transmitter before doing so in the station.

This function will not reactivate once the transmitter has been configured. To reactivate the function, disconnect the power supply, reconnect it and press \( \uparrow \), \( \downarrow \) and SET before 2 minutes are up.

4. If this is not the first time you initiate the wizard, after completing the last step the display will show the message \( \text{dFP} \) (parameters per defect). You may choose between two options:
   - \( 0 \): Only changing the parameters which affect the wizard (\( \text{Gc2} \), \( \text{b04} \) and \( \text{a00} \)). The other parameters will remain the same.
   - \( 1 \): All parameters return to their factory setting except those which have been modified by the wizard.

   It is advisable to reset to zero on start-up. See the different methods on page 21.

* Demo mode shows the reading of the gas concentration on a flashing panel with the message \( \text{Inl} \). It does not activate Alarms or Pre-Alarms. This mode allows postponement of the configuration of the transmitter.
Operating modes

Demo mode
Demonstration mode in which the display alternates between displaying the gas concentration and the message Inl.
No alarm is activated and no function may be activated.
This mode is activated using option 0 on the setup wizard or after 60 seconds if none of the other options has been selected.
If you press any key, the device will return to “Setup wizard” mode.

Connection to alarm station
Choose this option if the transmitter is connected to a compatible alarm station.
In this mode, the acoustic alarm is disabled and the output is configured to communicate with the station.

- Compatible stations: AKO-555241 AKO-555242 AKO-558241
  AKO-558242 AKO-55624 AKO-55724.

Independent operation
Choose this option if you want the transmitter to function independently.

Both the operation mode and the configuration of the output can be checked using the read only parameters of Inl and o00 respectively.

5.- Operation

Without alarms
The display shows the current gas concentration in ppm (Parts per million) (if b01=0) or the type of gas to be measured (b01=1).
Parameter b02 allows you to fix a value below which the display will always show zero.

Concentrations measuring under 75 PPM can be due to measuring or calibration errors. For greater precision, it is recommendable to carry out a calibration once installation of the transmitter has been completed.

Sensor error/malfunction
The station emits 3 short beeps every two minutes and the input indicator affected flashes red. Deactivate the power supply and activate it again. If after a few seconds the error persists, please contact your technical support centre.

MUTE function
Mutes the sound and/or deactivates the relays of gas pre-alarms and alarms according to the configuration of parameter b03. This does not affect the operation of the indicators.
To activate this function, press the key at any time when a pre-alarm or alarm is activated. The display shows the indicator of alarm on mute.
You may also activate this function remotely using digital input 1 (DI1) if required.
This function will automatically cancel each type an alarm changes status (from pre-alarm to alarm, from alarm to pre-alarm).
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.
The maintenance mode automatically activates for 5 minutes to prevent activation of alarms after calibration has finished.
In this case, the maintenance mode cannot be manually deactivated.

Access code (Password)
Restricts access to the transmitter’s functions to authorised personnel. Parameter defines the code and parameter defines the function of the code:
\[ b10 = 0 \] Disabled
\[ b10 = 1 \] Blocks access to programming (Parameters) but enables the use of the rapid keypad functions
\[ b10 = 2 \] Blocks any keypad function
Alarms

The transmitter emits an acoustic alarm, the alarm indicator flashes and activates the relays when certain gas concentration levels are exceeded. If the transmitter is connected to a station, the station will emit the acoustic alarm. The relays will be activated in both devices.

There are two alarm levels depending on the concentration of gas detected: Pre-Alarm and Alarm. These levels have a factory setting of 500 and 1000 PPM respectively. These values comply with domestic and international regulations. However, please ensure that these values comply with current local regulations. In order to modify these values, parameter AL1 should be configured to 1.

Pre-Alarm

 Warns the user that the gas concentration is increasing.

The Pre-Alarm relay can be connected to air extraction systems to disregard possible temporary leaks or false detections caused by external agents.

The activation level of the Pre-Alarm is determined by parameter AL3 and is deactivated when it drops below AL3 minus differential AL4.

Parameter AL5 can be used to apply a delay period between AL3 being exceeded and the Pre-Alarm being set off. Parameter AL2 can be used to disable the Pre-Alarm. Before doing this, ensure that relevant regulations permit this action.

Alarm

 Warns the user that the gas concentration has reached high levels.

It is advisable to use the alarm relay to halt installation by connecting it to the security chain.

The activation level of the Pre-Alarm is determined by parameter AL6 and is deactivated when it drops below AL6 minus differential AL7.

Parameter AL8 can be used to apply a delay period between AL6 being exceeded and the Alarm being set off.

Digital inputs

The transmitter has 2 digital inputs which are used to remotely activate the Mute (DI1) and Set Hold (DI2) functions. The wiring of both is explained on page 8.

Pressing once activates or deactivates each function. The polarity of the inputs is configured using parameters I11 (DI1) and I21 (DI2).
## Statuses

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<th>STATUS</th>
<th>TRANSMITTER</th>
<th>Relays</th>
</tr>
</thead>
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<td></td>
<td></td>
</tr>
<tr>
<td>Without alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delayed pre-alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pre-alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delayed alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muted pre-alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Muted alarm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sensor error</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Without power supply</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Without alarm**

- Status: **OFF**
- Pre-alarm: **OFF**
- Alarm: **OFF**

**Delayed pre-alarm**

- Status: **OFF**
- Pre-alarm: **OFF**
- Alarm: **OFF**

**Pre-alarm**

- Status: **Intermittent sound**
- Pre-alarm: **OFF**
- Alarm: **Intermittent sound**

**Delayed alarm**

- Status: **Intermittent sound**
- Pre-alarm: **OFF**
- Alarm: **Intermittent sound**

**Alarm**

- Status: **Bitonal sound**
- Pre-alarm: **Depending on b03**
- Alarm: **Depending on b03**

**Muted pre-alarm**

- Status: **OFF**
- Pre-alarm: **Depending on b03**
- Alarm: **Depending on b03**

**Muted alarm**

- Status: **OFF**
- Pre-alarm: **Depending on b03**
- Alarm: **Depending on b03**

**Sensor error**

- Status: **3 short tones every 2 minutes**
- Pre-alarm: **OFF**
- Alarm: **OFF**

**Without power supply**

- Status: **OFF**
- Pre-alarm: **OFF**
- Alarm: **OFF**
6.- Configuration

Direct access to alarm levels
To configure the Pre-Alarm and Alarm levels, hold the SET key down for 3 seconds. (Only if AL1=1)

Programming menu
Use the programming menu to configure the various parameters in order to adapt the transmitter’s operation to the requirements of its installation.
Press the SET key for 6 seconds to access the programming menu.

IMPORTANT: If the function of the password has been configured as a keypad block (b10=2), or as an access block to parameters (b10=1), you will be requested to enter the access code programmed in b11 when attempting to access either of the two functions. If the password entered is not correct, the unit will go back to showing the gas concentration. (See page 11).

Operation of the keypad in programming

ESC: It exits the parameter without saving changes, returns to previous level, or exits programming.

It allows you to scroll through the different levels, or when setting a parameter, to change its value.

It accesses the level shown on the display or, when setting a parameter, it accepts the new value.

SET: It allows you to scroll through the different levels, or when setting a parameter, to change its value.
Parameters

The unit operating parameters are organised in different groups or families according to their function. The Def. column indicates the default parameters set in the factory.

### ALARM CONFIGURATION

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>AL</strong> Alarm levels: 0: According to regulation 1: Set by user</td>
<td></td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>AL1</strong> Pre-Alarm 0: Disabled 1: Enabled</td>
<td></td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td><strong>AL2</strong> Pre-Alarm Level *</td>
<td><strong>AKO-575744</strong> PPM b02 or AL4+1</td>
<td>3000</td>
<td>500</td>
<td>AL6</td>
</tr>
<tr>
<td><strong>AL3</strong> Pre-Alarm Level *</td>
<td><strong>Other models</strong> PPM</td>
<td>3000</td>
<td>500</td>
<td>AL6</td>
</tr>
<tr>
<td><strong>AL4</strong> Pre-Alarm Differential</td>
<td></td>
<td>10</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td><strong>AL5</strong> Pre-Alarm Delay (0: Disabled)</td>
<td></td>
<td>0</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td><strong>AL6</strong> Alarm Level *</td>
<td><strong>AKO-575744</strong> PPM AL3</td>
<td>4000</td>
<td>5000</td>
<td>2000</td>
</tr>
<tr>
<td><strong>AL7</strong> Alarm Differential</td>
<td><strong>Other models</strong> PPM</td>
<td>4000</td>
<td>5000</td>
<td>2000</td>
</tr>
<tr>
<td><strong>AL8</strong> Alarm Differential</td>
<td></td>
<td>10</td>
<td>100</td>
<td>200</td>
</tr>
<tr>
<td><strong>AL9</strong> Alarm Delay (0: Disabled)</td>
<td></td>
<td>0</td>
<td>0</td>
<td>15</td>
</tr>
</tbody>
</table>

### BASIC CONFIGURATION

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>bcn</strong> Type of gas to be measured (Reading only)</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>gc1</strong> Gas to be measured with the Universal sensor (Only if gc1=brd1 ALL; 125; 134A; 404A; 407A; 407F; 410A; 448A; 449A; 513A; 452A; 32; 23; 455A)</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>b00</strong> Display 0: Measurement in PPM; 1: Type of gas to be measured</td>
<td></td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td><strong>b02</strong> Minimum value to be shown on the display (Lower values are shown as 0) Does not affect the values shown by communication (AKONet or CAMM module)</td>
<td></td>
<td>0</td>
<td>0</td>
<td>250</td>
</tr>
<tr>
<td><strong>b03</strong> Function of the mute key (Applicable to Alarm and Pre-Alarm) 0: Disabled 1: Deactivate acoustic alarm 2: Deactivate relay 3: Deactivate both</td>
<td></td>
<td>0</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>b04</strong> Acoustic alarm 0: Disabled; 1: Enabled</td>
<td></td>
<td>0</td>
<td><strong>1</strong></td>
<td>1</td>
</tr>
<tr>
<td><strong>b10</strong> Access code (password) function 0: Disabled; 1: Block access to parameters</td>
<td></td>
<td>0</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>b11</strong> Access code (password)</td>
<td></td>
<td>0</td>
<td>0</td>
<td>99</td>
</tr>
<tr>
<td><strong>b20</strong> MODBUS address</td>
<td></td>
<td>1</td>
<td>***</td>
<td>247</td>
</tr>
<tr>
<td><strong>b24</strong> MODBUS speed 0: 9600 bps 1: 19200 bps 2: 38400 bps 3: 57600 bps</td>
<td></td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

* In order to modify these levels, parameter AL1 should be configured to 1.
** According to the setup wizard, see page 9.
*** The MODBUS address will be shown on the transmitter label by default.
### INPUT AND OUTPUT CONFIGURATION

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reset to zero of the sensor (Calibration only, see page 21)</td>
<td>0: Disabled; 1: Reset to zero activated</td>
<td>0</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Setting the sensor (Calibration only, see page 22)</td>
<td>0: Disabled; 1: Setting activated</td>
<td>0</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>Polarity of digital input 1 (Remote Mute)</td>
<td>0: Activates on opening contact; 1: Activates on closing contact</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Polarity of digital input 2 (Remote Set Hold)</td>
<td>0: Activates on opening contact; 1: Activates on closing contact</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Type of output 4/20 mA (Reading only)</td>
<td>0: Calibrated for alarm station; 1: Linear</td>
<td>0</td>
<td>**</td>
<td>1</td>
</tr>
<tr>
<td><strong>EP</strong> Exit to level 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** INFORMATION (Reading only)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation modes (Reading only)</td>
<td>0: Demo mode; 1: Connection to alarm station; 2: Independent operation</td>
<td>0</td>
<td>**</td>
<td>2</td>
</tr>
<tr>
<td><em>PU</em> Programme version</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>Pr</em> Programme revision</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>bU</em> Bootloader version</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>br</em> Bootloader revision</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>PR</em> Parameter map revision</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>PC</em> CRC value of the programme</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><em>bC</em> CRC value of the bootloader</td>
<td></td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>EP</strong> Exit to level 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** According to the setup wizard, see page 9.
7.- Connectivity

The transmitters are equipped with a port for connection of RS485 (MODBUS) data, which allows it to remotely manage these using an AKO-5012 server.

The MODBUS address is set at the factory and is indicated on the rating plate located on the left side of the alarm. This address must be different for each unit within the same network. The address can be changed using parameter \textbf{b20}. Once modified, the old address indicated on the plate will not be valid.

*AKO controller with communication

**AKO-80024 Use if connecting more than 25 units
8.- 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 sensor.

9.- Installation of AKO-58110 calibration kit
The AKO-58110 calibration kit enables the testing, verification of accuracy, reset to zero and calibration of the transmitter. These tasks will be explained in the following pages.

Install the kit, attaching it to the transmitter window as shown in the image.

Press hard until it fits together perfectly.

Connect the regulator of the gas pump to the free end of the transparent tube.

To extract it, pull out from the lower end.
10.- Operation test (Bump Test)

Materials required: **AKO-58110** calibration kit
Cylinder of refrigerant gas diluted in air (< 2000 ppm)*

**EN-378** and **F-GAS** international standards require verification of the correct operation of the transmitter at least once per year. Please check what current local regulations specify for such cases. **Always ensure that you comply with current local regulations.**

- Before starting the verification procedure, check the Pre-Alarm configuration (RL2). This should be enabled in order to check it has been activated. It is advisable to disable the Pre-Alarm delay (RL5) and Alarm delay (RL8) to speed up the verification process.
- Install the **AKO-58110** calibration kit following the instructions on page 18.
- Open the shut-off valve of the gas cylinder and wait.
- After a few moments, the transmitter concentration reading will begin to rise until it reaches the Pre-Alarm and then Alarm level.
- Check that both the Pre-Alarm and the Alarm signal correctly and that the corresponding relays are activated.
- Close the shut-off valve of the gas cylinder, disconnect the cylinder and remove the calibration kit from the transmitter.

The transmitter may take a few moments to go back to showing the concentration values from before the verification procedure.

Once the verification procedure is complete, remember to readjust the Pre-Alarm (RL2) and delay (RL5 and RL8) parameters to the values prior to the beginning of the verification procedure.

*Use a cylinder with a type of gas that is suitable to the sensitivity of the transmitter to be calibrated.
11.- Verification of accuracy (Calibration)

Materials required:  
AKO-58110 calibration kit  
Cylinder of refrigerant gas diluted in air (≤ 2000 ppm)*

⚠ AKO recommends verifying the accuracy of the transmitter at least once per year. Please check what current local regulations specify for such cases.  
Always ensure that you comply with current local regulations.

- Install the AKO-58110 calibration kit following the instructions on page 18.  
- Open the shut-off valve of the gas cylinder and wait.  
- After a few moments, the transmitter concentration reading will begin to rise. Wait for the reading to stabilise.  
- Compare the reading displayed with the calibrated value of the gas cylinder. If the accuracy is sufficient for the intended application, it is not necessary to carry out a calibration. If the opposite is true, calibrate the transmitter following the instructions set out on page 22.  
- Close the shut-off valve of the gas cylinder, disconnect the cylinder and remove the calibration kit from the transmitter.

ℹ️ The transmitter may take a few moments to go back to showing the concentration values from before the verification procedure.

*Use a cylinder with a type of gas that is suitable to the sensitivity of the transmitter to be calibrated.
12.- Reset to zero

OPTION A: CLEAN AIR (Not valid for AKO-575744)

- Before beginning the reset to zero procedure, ensure that the area of the premises is free of freon gas and any other substances that could affect the transmitter, and that the transmitter has been operating for at least 20 minutes.
- Enter the programming menu by pressing the SET key for 10 seconds and access parameter {00 (See page 14). The unit will request a confirmation code (Cod). Use keys ▼ and ▲ to enter code 63 and press SET.
- Use keys ▼ and ▲ to select option 1 and press SET. This will start the process.
- During the process, the display will alternate between showing the gas concentration and the CAL message and the illuminated symbol. This process will last for between 30 seconds and 5 minutes. On completion, if the reset to zero process has been successful, the display will show “End” and emit a long beep.

OPTION B: WITH NITROGEN GAS

Materials required: AKO-58110 calibration kit
Nitrogen gas cylinder

- After initiating the reset to zero process, ensure that the transmitter has been operating for at least 20 minutes.
- Install the AKO-58110 calibration kit following the instructions on page 18.
- Enter the programming menu by pressing the SET key for 10 seconds and access parameter {00 (See page 14). The unit will request a confirmation code (Cod). Use keys ▼ and ▲ to enter code 63 and press SET.
- Use keys ▼ and ▲ to select option 1 and press SET. This will start the process.
- Open the shut-off valve of the gas cylinder and wait.
- During the process, the display will alternate between showing the gas concentration and the CAL message and the symbol illuminated. This process will last for between 30 seconds and 5 minutes. On completion, if the reset to zero process has been successful, the display will show “End” and emit a long beep.
- Close the shut-off valve of the nitrogen gas cylinder, disconnect the cylinder and remove the calibration kit from the transmitter.

If any problems have been detected during the reset to zero process, the transmitter will emit three short beeps and display one of the following error codes:

<table>
<thead>
<tr>
<th>CODE</th>
<th>ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>EC</td>
<td>A reading of greater than 300 PPM has been detected during the process.</td>
</tr>
<tr>
<td>Et</td>
<td>The temperature of the sensor has experienced a variation of greater than 5 °C.</td>
</tr>
<tr>
<td>Eto</td>
<td>The maximum time period (5 min) has been exceeded and the reading has not stabilised.</td>
</tr>
</tbody>
</table>
13.- Full scale setting

Materials required: **AKO-58110** calibration kit
Cylinder of refrigerant gas diluted in air (< 2000 ppm)* (5000 PPM for AKO-575744)

Check whether current local regulations require a specific calibration frequency. **Always ensure that you comply with current local regulations.**

- After initiating the calibration process, ensure that the transmitter **has been operating for at least 20 minutes.**
- Reset the transmitter to zero following the instructions on page 21.
- Install the **AKO-58110** calibration kit following the instructions on page 18.
- Press the SET key for 10 seconds to enter the programming menu.
- When calibrating an **AKO-575400** universal transmitter, configure parameter **Gc2** to **RLL**.
- Access parameter **01**. The unit will request a confirmation code (**Cod**). Use keys `Q` and `N` to enter code 63 and press SET.
- Use keys `V` and `A` to select option 1 and press SET. This will start the process.
- Open the shut-off valve of the gas cylinder and wait.
- During the process, the display will alternate between showing the gas concentration and the **CAL** message and the illuminated **符号** symbol. This process will last for up to 15 minutes. On completion, if the calibration process has been successful, the display will show “**End**” and emit a long beep.
- Close the shut-off valve of the nitrogen gas cylinder, disconnect the cylinder and remove the calibration kit from the transmitter.

If any problems have been detected during the calibration process, the transmitter will emit three short beeps and show one of the following error codes:

<table>
<thead>
<tr>
<th>CODE</th>
<th>ERROR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Et</td>
<td>The temperature of the sensor has experienced a variation of greater than 5 °C.</td>
</tr>
<tr>
<td>Eto</td>
<td>The maximum time period (15 min) has been exceeded and the reading has not stabilised.</td>
</tr>
</tbody>
</table>

The transmitter may take a few moments to go back to showing the concentration values from before the calibration procedure.

**AKO-575400 only:** Once the verification procedure has been completed, remember to adjust parameter **Gc2** to the value prior to the start of the calibration procedure.

The maintenance mode automatically activates for 5 minutes to prevent activation of alarms after calibration has finished.

**In this case, the maintenance mode cannot be manually deactivated.**

* Use a cylinder with a type of gas that is suitable to the sensitivity of the transmitter to be calibrated. To set model **AKO-575400**, set parameter **Gc2** to **134A** and use a cylinder of refrigerant gas R134a diluted in air at 2000 ppm.
14.- Technical specifications

Power supply ...................................................................................................................................... 12 - 30 Vdc
Consumption Typical.............................................................................................................................. 75 mA
Maximum........................................................................................................................................... 125 mA
Pre-Alarm/Alarm relay ....................................................................................................................... SPDT 30 Vdc 2 A, 30 Vac 2A cos φ=1
Working ambient temperature ........................................................................................................... -30 °C to 50 °C
Storage ambient temperature ............................................................................................................. -30 °C to 60 °C
Range of maximum moisture permitted.......................................................................................... 0 - 95 % HR (without condensation)
Protection degree ............................................................................................................................... IP 68
Type of sensor ................................................................................................................................. NDIR (Non-Dispersive Infrared Technology)
Display range AKO-575744....................................................................................................... 0 - 5000 x1 ppm
Other models ................................................................................................................................... 0 - 2000 x1 ppm
Estimated working life ............................................................................................................................... 7 years
Dimensions .................................................................................................................................. 202 mm (W) x 82 (H) x 55.5 mm (D)

Sensor specifications:

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Measurement error based on parameter $G_{c2}$ configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>R-13 (R-133A)</td>
</tr>
<tr>
<td>Temperature</td>
<td></td>
</tr>
<tr>
<td>-30 °C to -20 °C / 45 °C to 50 °C</td>
<td>6% 10% 8% 10% 10% 10% 12% 12% 12% 11% 13% 13% 13% 13%</td>
</tr>
<tr>
<td>-20 °C to 45 °C</td>
<td>4% 7% 5% 7% 7% 10% 10% 10% 8% 10% 10% 10% 10%</td>
</tr>
</tbody>
</table>

The precision values indicated are valid if the transmitter is reset to zero once installed in its definitive location and with the planned working temperature.

Table 2: AKO-575400 transmitter measurement error

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Measurement error if $G_{c} = M/L$</th>
</tr>
</thead>
<tbody>
<tr>
<td>-30 °C to 50 °C</td>
<td>32% 35%</td>
</tr>
</tbody>
</table>

* Alarm levels are customisable. The values are shown by default and are acceptable for complying with all local and international regulations covering the safety of individuals. These values can be excessive for detecting small leaks.
** The response time was indicated for an alarm level at 1000 PPM. The time depends on the alarm value set by the user.
*** It is necessary to use a calibrated gas when carrying out the verification procedure.
15.- Accessories

Calibration tool for AKO-58110 transmitters
This enables testing (Bump Test), verification of accuracy, reset to zero and field calibration of AKO-575xxx gas transmitters.

AKO-58120 protector
Protects the AKO-575xxx gas transmitter against possible knocks.
AKO-58500 CAMM Module

Together with the application for mobile devices, this module provides the unit with multiple functionalities:

- Data logging
- Logging of configuration changes
- Remote configuration
- Clock functions in real time
- Activity summaries
- Logging of events and alerts
- Remote control of functions