AKOCAM is a solution for static or ventilated cold room stores. It directly controls single-phase units with compressors of up to 2 PH. These models control and record the temperature. Depending on the model, they also have: A printer for printing data or graphs. An alarm for persons trapped inside, with an optical acoustic alarm, and a lamp for requesting help. These models control and record the temperature.

### 1- Versions and references

<table>
<thead>
<tr>
<th>MODEL</th>
<th>PRINTER</th>
<th>ALARM</th>
<th>CONTROL RELAYS (250V, cos φ = 1)</th>
<th>POWER SUPPLY</th>
</tr>
</thead>
<tbody>
<tr>
<td>AKO-15613</td>
<td>NO</td>
<td>NO</td>
<td>Cool: 16 A SPST</td>
<td>230 V ~ +10% -15% 50/60 Hz ± 3 Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Light: 16 A SPST</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alarm: 8 A SPDT</td>
<td></td>
</tr>
<tr>
<td>AKO-15633</td>
<td>NO</td>
<td>NO</td>
<td>Cool: 16 A SPST</td>
<td>230 V ~ +10% -15% 50/60 Hz ± 3 Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Light: 16 A SPST</td>
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<tr>
<td></td>
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<td></td>
<td>Fan: 8 A SPDT</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Alarm: 8 A SPDT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aux: 16 A SPST</td>
<td></td>
</tr>
<tr>
<td>AKO-15631</td>
<td>YES</td>
<td>NO</td>
<td>Cool: 16 A SPST</td>
<td>100 - 240 V ~ 50/60 Hz ± 3 Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Def: 16 A SPST</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fan: 8 A SPDT</td>
<td></td>
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<td></td>
<td>Light: 16 A SPST</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Alarm: 8 A SPDT</td>
<td></td>
</tr>
<tr>
<td>AKO-15632</td>
<td>NO</td>
<td>YES</td>
<td>Cool: 16 A SPST</td>
<td>230 V ~ +10% -15% 50/60 Hz ± 3 Hz</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Def: 16 A SPST</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Fan: 8 A SPDT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Alarm: 8 A SPDT</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Aux: 16 A SPST</td>
<td></td>
</tr>
</tbody>
</table>

### 2- Technical data

- **Temperature range**: -40.0 ºC to +99.9 ºC
- **Resolution, Set Point and differential**: ± 0.1 ºC
- **Thermometric accuracy**: ± 1 ºC s/EN 12830 and EN 13485
- **Denomination**: EN 12830, S, A, 1, -40 ºC +40 ºC; EN 13485, S, A, 1, -40 ºC +40 ºC
- **Probe tolerance at 25 ºC**: ± 0.4 ºC
- **Input for probe**: AKO-149XX
- **Maximum input power**: 24 VA
- **Working ambient temperature**: 0ºC to 50ºC
- **Storage ambient temperature**: -30ºC to 70ºC
- **Installation category**: II under EN 61010-1
- **Pollution degree**: II under EN 61010-1
- **Double insulation between the power supply, the secondary circuit and the relay output.**
- **Recorder autonomy in the event of a power failure**: 48 Hours
- **Alarm autonomy in the event of a power failure**: 10 Hours
- **Battery**: Li-Polymer for recorder
- **Internal buzzer**:

### 3- Installation

The controller should be installed in a place protected from vibrations, water and corrosive gases, and where ambient temperature does not surpass the value specified in the technical data. In order for the controllers to have IP65 protection degree, the gasket should be properly installed between the apparatus and the perimeter of the panel cut-out where it is to be fitted. In order to give a correct reading, the probe should be installed in a place without heat influences other than the temperature that is to be measured or controlled.

### 3.1 Wall mounting

- Remove cover T from the equipment (Fig.1a or Fig.1b).
- Drill the holes for the glands that are necessary for the cables to pass through, guided by the pre-cut centres on the sides of the housing.
- Drill 3 holes for anchoring the housing at the centres indicated 1, 2, 3 (Fig.3a or 3b).
- Drill 3 holes in the wall, in accordance with the anchoring holes made previously in the equipment.
- Anchor the glands to the equipment.
- Insert and tighten the 3 screws+plug through the housing, on the 3 holes drilled in the wall.
- Insert the cables into the glands.
- Mount the front part on the housing (Fig.2).
- Insert and tighten screws D, E, F (Fig.1a or Fig.1b).
- After connecting the cables based on the connection diagram, close cover T, insert and tighten screws A, B, C (Fig.1a or Fig.1b).

### 3.2 Panel Mounting (maximum panel thickness: 3mm)

- Remove cover T from the equipment (Fig.1a or Fig.1b).
- Open the equipment and separate the front part of the housing (Fig.2).
- Replace the joint installed at the front by the panel joint, ensuring that it is in the right position.
- Make an opening in the panel with the dimensions indicated (Fig.3a or 4b).
- Drill the holes for the glands that are necessary for the cables to pass through, guided by the pre-cut centres on the sides of the housing.
- Finish drilling holes G, H, J with a 4 mm bit (Fig.3a or Fig.3b).
- Anchor the glands to the equipment.
- Insert the cables into the glands.
- Join the front with the housing, through the panel and tighten the 45 mm screws through holes D, E, F, G, H, J (Fig.3a or Fig.3b).
- After connecting the cables in accordance with the connection diagram, close cover T, and insert and tighten screws A, B, C (Fig.1a or Fig.1b).

### 3.3- Lamp Mounting (on equipment that has an alarm indicating a person is trapped inside)

- See AKO-52064 instructions
3.4 Connection

CONNECT THE BATTERIES PRIOR TO STARTING UP THE EQUIPMENT.

IMPORTANT: The function of every probe entry depends on its configuration (See table “Assignment of entries”).

To obey EN 1.2830 you must configure the control probe and the register probe separately. The probe and its lead should NEVER be installed in ducting along with power, control or power supply wiring.

Always disconnect the power supply when making the connections.

The power supply circuit should be connected with a minimum 2 A, 230 V, switch located close to the unit. Power supply cables should be H05VV-F 2x0,5 mm² or H05V-K 2x0,5 mm². Section of connecting wires for relays contacts should be 2,5 mm².

4.3 Description
This allows a brief description of the facility to be inserted or a name to be given to the equipment. Configurable in the menu: (CLOCK).

4.4 Status
View the status of the functions performed by the control.

4.5 Browser
The key function help screen appears after any key on the browser is pressed

UP key
-When pressed for 5 seconds, manual defrost is activated/deactivated for the programmed duration.
-When programming, it moves the selection upwards.
-When programming, it makes the displayed value increase.

DOWN key
-When pressed for at least 5 seconds, the SP Set Point temperature is displayed.
-When programming, it moves the selection downwards.
-When programming, it makes the displayed value reduce.

SET key
-When pressed for at least 5 seconds, it activates the CONTINUOUS CYCLE during the time for which it has been programmed.
-Pressing during 5 seconds with the CONTINUOUS CYCLE active, it interrupts the process immediately.
-When programming, it moves the selection to the right.

COOL (Compressor)
Permanent: Cooling relay COOL (compressor) energised.
Flash: Because of the temperature detected by probe 1, the COOL relay should be energised, but is not due to a programmed parameter.

DEFROST
Permanent: Indicates defrost in operation.
DEFROST ENDED BY TIME
Permanent: Indicates last defrost ended by time.
CONTINUOUS CYCLE
Permanent: Indicates that the continuous cycle is active.
ALARM ON
Permanent: It means that an alarm has occurred.

HACCP (Hazard Analysis and Critical Control Point)
Permanent: Indicates that energy saving function is on.
HACCP alarm stored.

AUX (Auxiliary)
Flash: AUX relay actuated by digital input.
Flash: AUX relay indicating whether the equipment is connected or disconnected.
Flash: AUX relay operating as a second defrosting device.
Flash: AUX relay operating as PUMP DOWN.
Flash: AUX relay active copying relay status for compressor.

4- Front panel functions

4.1 Hour and Battery
View hour in format: YY/MM/DD HH:MM:SS Day of the Week
View the status of the equipment battery.
Battery flat Battery charging Battery charged

4.2 Temperatures
Configure in the menu: (GENERAL STATUS)

4.3 Description
A Lamp with Pushbutton
Alarm indicating person trapped inside

4.4 Status
See AKO-52064 Instructions

See AKO-52064 Instructions

Set parameter.

Set parameter.

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Set parameter.
5.2 Parameters configuration

Level 1 Menus
- Press the SET key for 5 seconds to view the MENUS.
- Press the browser keys to select the menu.
- Press the SET key to access the parameters of the selected menu. If PASSWORD appears, enter the access code (Password) programmed in the ACCES CODE parameter of the menu to access the current adjustment (Set Point).
- Press the browser keys to enter the programmed code (Password).
- Press the SET key to accept the code. The menu that can be modified will appear.

Level 2 Parameters
- In the desired menu of level 1 MENUS, press SET. Level 2 PARAMETERS programming is accessed. The first parameter of the selected menu is displayed on the screen.
- Press the navigation keys to select the parameter.

Level 3 Values
- To display the current value of any parameter, select the required one and press SET key simultaneously. Once it is displayed, press the browser keys to change the value.
- Press SET key to accept the new value. The programming returns to LEVEL 2 PARAMETERS.

REMARK: If no key is pressed for 25 seconds in either of the previous steps, the controller will automatically return to the CURRENT TEMPERATURE display status without modifying any of the parameters values.

5- Adjustment and configuration

It should only be programmed or modified by personnel who are fully conversant with the equipment operation and possibilities.

5.1 Set Point temperature

The factory SET POINT default value is 0.0 °C.
- Press the SET key for at least 5 seconds to display SET POINT. It displays the current SET POINT value.
- Press the browser keys to change the SET POINT to the required value.
- Press SET key to accept the new SET POINT value.

When PASSWORD is displayed, PASSWORD programmed in PASSWORD parameter of menu should be entered to access the current SET POINT.
- Press the browser keys to enter the programmed password.
- Press SET key to accept password. The current SET POINT value will be displayed and it can be already modified.

6- Description of parameters and messages

Values in the Def. column are factory-set.

Ako-15613, Ako-156131 (3 Relays)
AKO-15613, AKO-156131 (3 Relays)

AKO-15633, AKO-156331, AKO-156332 (6 Relays)

Level 2

**FANS control (Evaporator)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fans stop temperature by probe 2 if probe 2 is programmed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(°C/°F) | 40.0 | 4.0 | 99.9 |
| Fans stop temperature by probe 2 differential | 
(°C/°F) | 0.1 | -2.0 |
| Fans status during defrost | 
Connected | | 
Disconnected | |
| Start-up delay after defrost | 
(min.) | 0 | 3 | 255 |
| Stop fans if the door opens? | 
(probes) | No | | |

**ALARM control (Visual)**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Configuration of temperature alarms</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Relative to SP (Absolute) | | | |
| Minimum alarm in probe 1 | 
(°C/°F) | 40.0 | 16.0 | 32.0 |
| Differential Alarms temperature | 
(°C/°F) | 1.0 | 0.0 | 20.0 |
| Temperature alarm delay from the moment at which they should operate due to temperature | 
(min.) | 0 | 30 | 255 |
| Temperature alarm delay in the cycle | 
(min.) | 0 | 0 | 255 |
| Temperature alarm delay from digital input enabling | 
(if programmed as “Door contact” | | | |
| Temperature alarm delay from digital input disabling | 
(if programmed as “Door contact” | | | |
| Alarm relay state | 
(Connected) | | | |

**DIGITAL INPUTS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital input N°1 configuration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(Disabled) (Door Contact) (External alarm | 
(Sensed external alarm) (Remote defrost) | 
(Remote Energy saving) (Auxiliary activation | 
(Low pressure input) (Thermostat control | 
| | | | | |
| Alarm delay of digital input 1 | 
(min.) | 0 | 0 | 255 |
| Polarity of digital input N°1 | 
(Normally Open Normally Closed | | | |
| Digital input N°2 configuration | 
(Disabled) (Door Contact) (External alarm | 
(Sensed external alarm) (Remote defrost) | 
(Remote Energy saving) (Auxiliary activation | 
(Low pressure input) (Thermostat control | 
| | | | | |
| Alarm delay of digital input N°2 | 
(min.) | 0 | 0 | 255 |
| Polarity of digital input N°2 | 
(Normally Open Normally Closed | | | |
| Inact. with door open (time) | 
(min.) | | | |
| Cold room light timing | 
(min.) | | | |

**AUX RELAY**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUX relay configuration</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(Disabled) (Activated by key | 
(Activated by input) (Equal state of equipment | 
(Second Defrost) (Pump down control) (Equal compressor state | 
| | | | |
| Defrost 2 maximum duration | 
(min.) | 0 | 30 | 255 |
| Defrost 2 final temperature | 
(°C/°F) | 80.0 | 8.0 | 98.9 |
| Defrost 2 probe | 
| | | |
| Pump down duration | 
(sec.) | 1 | 30 | 1800 |
| Pump down On delay | 
(sec.) | 0 | 60 | 60 |

**COMMUNICATION STATUS**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Access password to parameters and the setup</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Address to Set Point</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polarity of password</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Initial parameters</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(3% configuration to “Def” and exit programming | | | |
| Registry interval | 
(min.) | 0 | 15 | 60 |
| Address for units with communication | 
(min.) | 0 | 1 | 255 |
| Parameters transfer | 
(Disabled) (Send) (Receive | | | |
| Connected probes (Probe 1) (Probe 1 + 2) | 
(Probe 1 + 2) (Probe 1 + 2a) | | | |
| Probe to be displayed | | | |
| Display mode | 
(probe + clock) | | | |
| Date and time | | | |
| Temperature display unit | 
°C | | | |
| Decimals point | | | |
| Probe temperature (ºC) | 
(ºC/ºF) | | | |
| Temperature delay | 
(min.) | 0 | 0 | 255 |
| Program version information | | | |

**CONTINUOUS CYCLE**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous cycle duration</td>
<td></td>
<td>0.1</td>
<td>1</td>
<td>24</td>
</tr>
</tbody>
</table>

**ENERGY SAVING**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set Point during energy saving</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(ºC/°F) | 40.0 | 0 | 120 |
| Energy saving duration | 
(h.) | 0 | 0 | 34 |

**HACCP**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delay in registering an event after a temperature alarm</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
(min.) | 0 | 1 | 255 |

**LANGUAGE**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CLOCK**

<table>
<thead>
<tr>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date (Day Month Year)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time (Day, Hour Minute)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Day of the week (Day)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Door contact</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>External alarm</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**MESSAGES**

**PASSWORD**

Password request to enter programming parameters or SET POINT

**DEFROST**

It indicates defrosting is being carried out.

**EXTERNAL ALARM**

Flashing with temperature

**SEVERE EXTERNAL ALARM**

Flash with temperature

**ALARM HIGH TEMP.**

Flashing with temperature - Probe 1 temperature exceeds the parameter programmed in Maximum alarm in probe 1.

**ALARM LOW TEMP.**

Flashing with temperature - Probe 1 temperature is lower than the parameter programmed in Minimum alarm in probe 1.

**ALARM LOW PRESSURE**

Flash with temperature - Low pressure switch error with compressor On

**probe 1, 2 or 3 FAILURE**

alarm probe 1, 2 or 3 failure (Open circuit, crossed temp. >110°C or temp.<-55°C)

**REMARK:**

When time parameters are modified, the new values are applied when the current cycle is completed. In order for it to have an immediate effect, switch the controller off and then on again.

**ASSIGNMENT OF ENTRIES ACCORDING TO CONFIG. OF PROBE**

**TEM** at S1/REG at S3 (According to EN12830)

<table>
<thead>
<tr>
<th>Probe</th>
<th>Connectors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>25 and 26 (S1)</td>
</tr>
<tr>
<td>2</td>
<td>3 and 24 (S2)</td>
</tr>
<tr>
<td>3</td>
<td>21 and 22 (S3)</td>
</tr>
</tbody>
</table>

**TEM and REG at S3:**

The temperature control, alarms and HACCP probe is also the data logger probe (Probe 1) and it is connected in input S3, the product temperature probe is connected in the S1 input.

**7- Accessories**

AKO-14923 portable server, with no power supply, in which parameters programmed in a powered controller can be copied by transfer. Parameters can be transferred again from the server to other identical powered controllers.

**8- Maintenance**

Clean the controller surface with a soft cloth, soap and water. Do not use abrasive detergents, petrol, alcohol or solvents.

**Equipment including rechargeable electrical batteries:**

This unit includes batteries which must be replaced when the device’s autonomy time is below the indicated in the specifications. At the end of the unit’s service life the batteries should be disposed of at a selective refuse collection site or returned to the manufacturer.

**9- Warnings**

The use of the unit without observing the manufacturer’s instructions may alter its safety qualification. To ensure correct operation of the apparatus, only NTC type probes supplied by AKO should be used. Between -40 ºC and +20 ºC, when the probe is extended up to 1.000 m with minimum 0.5 mm cable, deviation will be less than 0.25 ºC (Probe extension cable ref. AKO-14923).

We reserve the right to supply materials that might vary slightly to those described in our Technical Sheets. Updated information is available on our website: www.ako.com

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