Surface temperature controller with 3 relays and 2 probes

Device designed to display, control and regulate cooling generators (manual or automatic programmable defrosting).

1- Versions and references

<table>
<thead>
<tr>
<th>MODEL</th>
<th>FUNCTION</th>
<th>RELAY</th>
<th>POWER SUPPLY, 50/60 Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>AKO-14632</td>
<td>Controller</td>
<td></td>
<td>COOL: 16 A, 250 V, cos φ=1, SPST</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>DEF: 8 A, 250 V, cos φ=1, SPDT</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FAN: 6 A, 250 V, cos φ=1, SPST</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>230 V – ±10 %</td>
</tr>
</tbody>
</table>

2- Technical data

- Temperature range: -50.0 °C to 99.9 °C (-58.0 °F to 211 °F)
- Resolution, Set Point and differential: 0,1 or 1 °C/°F configurable by parameter P7
- Input for NTC probe: AKO-149XX
- Thermometric accuracy: ± 1 °C
- Probe tolerance at 25 °C: ± 0,4 °C
- Maximum input power: 7 VA
- Working ambient temperature: 5 °C to 50 °C
- Storage ambient temperature: -30 °C to 70 °C
- Control device classification: Independent mounting, with characteristic of automatic operation Type 1.B action, to be used in a clean situation, logical medium (software) class A and continuous operation.
- Degree of contamination 2 on UNE-EN 60730-1
- Double insulation between the power supply, the secondary circuit and the relay output.
- Allocated pulse temperature: 2500 V
- Pressure ball test temperature:
  - Accessible parts: 75 °C
  - Parts that position active elements: 125 °C
- Voltage and current declared by the EMC tests: 207 V, 22 mA
- Current of radio jamming suppression test: 270 mA

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 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 Fastening

- Press down lightly to open the cover.
- Suitable fixing screw-holes for universal flush-mounting wall box.

3.2 Connection:

- The probe and its lead should never be installed in ducting along with power, control or power supply wiring.
- The power supply circuit should be connected with a mini break 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- Funciones del frontal

**LED Cool (Compressor)**
- Permanent: Cooling relay COOL (compressor) energised.
- Flashing: Because of the temperature detected by Sensor 1 (TEM), the COOL relay should be energised, but it is due to a programmed parameter.

**LED Fan**
- Permanent: Fan relay energised.
- Flashing: Because of the temperature detected by Sensor 2 (DEF), the Fan relay should be energised, but it is due to a programmed parameter.

**LED Def**
- Permanent: Indicates defrost in operation.

**LED Alarm**
- Permanent: Alarm indicator enabled.
- Flashing: Alarm detected, but display maintained.

**LED DT**
- Permanent: Indicates last defrost ended by time.
- Continuous cycle: Indicates that the continuous cycle is active.

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 SET key for at least 5 seconds to DISPLAY SET POINT. It displays the CURRENT SET POINT value and LED °C or °F starts flashing.
- Press left or right keys to CHANGE SET POINT into the required value.
- Press SET key to ACCEPT THE NEW SET POINT. The display returns to the CURRENT TEMPERATURE display status.

5.2 Parameters configuration

**Level 1 menus**

- When the keys Up, Down are pressed simultaneously for at least 10 seconds, the display shows Pro for 10 seconds. LED °C or °F will be flashing, we are in the programming LEVEL 1 MENUS and the first menu "RE" is displayed.
- Press key to access the next menu and key to return to previous one.
- Pressing key, the controller returns to the CURRENT TEMPERATURE display status and LED °C or °F will stop flashing.
- When PA is displayed, PASSWORD programmed in L5 parameter of tid menu should be entered to access the CURRENT SET POINT.
- Press key. 0 will be displayed to ENTER PASSWORD.
- Press key. The key is started / stopped with the unit leaving it in STAND-BY. The display shows OFF when the unit is disconnected.
- Press key to access the alarms, but they remain displayed.
- Exit programming level.
- SET key to cancel the alarms, but they remain displayed.
- In programming, accept the programmed new value.
- When pressed it displays the help message corresponding to the function performed by the key.

**Level 2 menus**

- When pressed for at least 5 seconds, the SP SET point temperature is displayed.

**Level 3 menus**

- Press or keys to CHANGE SET POINT into the required value.
- Press key for at least 5 seconds to DISPLAY SET POINT. It displays the CURRENT SET POINT value and LED °C or °F starts flashing.
- Press or keys to CHANGE NUMBER and DISPLAY PASSWORD programmed.
- 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.

### Level 2 Parameters
- In the desired menu of LEVEL 1 MENUS, press key. LEVEL 2 PARAMETERS programming on the screen.
- Press key to access the next parameter and key to return to the previous one.
- Pressing key, the controller returns to the LEVEL 1 MENUS.

**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 parameter values.

### Level 3 Values
- To DISPLAY the CURRENT VALUE of any parameter, select the required one and press or key. Once it is displayed, you can CHANGE VALUE, pressing or key.
- Press SET key to ACCEPT THE NEW The programming returns to LEVEL 2 PARAMETERS.
- Pressing key, the controller returns to the LEVEL 2 PARAMETERS.

### Level 3 Values

#### Level 1 Menus and Description

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Menus and Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>Level 1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>01</td>
<td>Level 2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>02</td>
<td>Level 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Example 1: Level 2 Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Temperature alarm delay from (min.)</td>
<td>0 0 255</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C2</td>
<td>Temperature alarm delay from the end of defrost (min.)</td>
<td>0 0 255</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3</td>
<td>Temperature alarm delay from the start of defrost (min.)</td>
<td>0 0 255</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C4</td>
<td>Temperature alarm delay from the end of defrost (min.)</td>
<td>0 0 255</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C5</td>
<td>Temperature alarm delay from the start of defrost (min.)</td>
<td>0 0 255</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C6</td>
<td>Temperature alarm delay from the end of defrost (min.)</td>
<td>0 0 255</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C7</td>
<td>Temperature alarm delay from the start of defrost (min.)</td>
<td>0 0 255</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C8</td>
<td>Temperature alarm delay from the end of defrost (min.)</td>
<td>0 0 255</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C9</td>
<td>Temperature alarm delay from the start of defrost (min.)</td>
<td>0 0 255</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C10</td>
<td>Temperature alarm delay from the end of defrost (min.)</td>
<td>0 0 255</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**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.

### 7- Parameters transfer

Storeage dump or fast copy of the parameters entered in the portable server, with no power supply.

**DESCRIPTION**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Values</th>
<th>Min.</th>
<th>Def.</th>
<th>Max.</th>
</tr>
</thead>
<tbody>
<tr>
<td>P1</td>
<td>Password request to enter programming parameters</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>P2</td>
<td>Memory request to enter programming parameters</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>P3</td>
<td>Programming password to enter programming parameters</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>P4</td>
<td>Security request to enter programming parameters</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>P5</td>
<td>Security request to enter programming parameters</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>P6</td>
<td>Security request to enter programming parameters</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>P7</td>
<td>Security request to enter programming parameters</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>P8</td>
<td>Security request to enter programming parameters</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

**REMARK:** When the programmer is not 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.

### 8- Maintenance

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

### 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 °C and +20 °C, when the NTC probe is extended up to 1.000 m with minimum 0.5 mm2 cable, deviation will be less than 0.25 °C (Probe extension cable ref. AKO-15586).