New LAE controller for Plug-in cabinets

Dear Sirs,

with the aim of a continuous improvement we are going to introduce our new LAE electronic controller in our plug-in cabinets:

- **CRONOS**
- **IT2000X**
- **GLYCOS**
- **PROTEUS PLUS**

The reason that drive us to make this change is the better performance of LAE controller compared with EC 10 controller actually assembled in plug-in cabinets.

**LAE performance**

The advantage of LAE controller depends on some additional features as:

- Easy to use console that integrates all electrical and electronic switches in one compact board.

- Possibility to use the third probe that monitors the running temperature inside the cabinet (not in air suction or air intake).
- Intelligent management program that reduces power consumption because it is possible to use a day and a night setting in order to optimise the use of night covers or sliding doors (where available).
Easy maintenance of the controller as it is composed of two easy replacing parts; the console and an electric/electronic integrated circuit connected each other and with the cabinet components with faston wiring easy to replace and to connect.

For additional information about LAE controller see Product Info P-1.002/00(56).

### Timing of LAE introduction

The start of production of LAE electronic controller is planned for beginning of **week 18** (30th April 2001) and deliveries will follow after end of stock.

Note also that will be issued a price-list update as the codes of these cabinets will change.

Best regards

Gian Lonardi
EC LAE CONTROL PANEL

THE BUTTONS ON THE CONTROLLER ALLOW:

- Turning the controller on or off ("ON" led off, "OFF" led alight).
- Turning the cabinet hood lights on ("ON" led alight, "OFF" led off);
- passing from a parameter to the previous one;
- reducing the value associated with the parameter;
- turning the lights on under the middle shelf (optionals) ("ON" led alight, "OFF" led off);
- passing from a parameter to the following one;
- increasing the value associated with the parameter;
- activating manual defrosting;
- turning the demisting ventilator on ("ON" led alight, "OFF" led off). This is used when the cabinet is positioned in a very damp area, which could cause the formation of condensation on the glass;
- returning to the display function;
- visualising the value associated with the chosen parameter;
- accessing the parameter menus.

THE LIGHTED LEDS INDICATE:

- Compressor working;
- Belly section ventilation working;
- Defrosting working.

The control panel is fitted with a user interface, which contains a three-figure display and a keyboard with five function buttons.

NORMAL WORKING STATUS

During normal working, the display shows the actual temperature inside the cabinet.

USER PROGRAMMING STATUS

On installation, the user needs only programme the working temperature for the cabinet. To set this function, the user must depress the button and then "SEL" appears on the display. Using the buttons and the given value can be increased or decreased until the desired value is reached.

To terminate the operation, release the button . The working temperature to set on the electronic chart must coincide with the temperature indicated by the manufacturer of the goods displayed (see recommended conservation temperature printed on the product packaging).
NUMBER OF DAILY DEFROSTINGS
The number of daily defrostings is equally divided throughout the 24 hours. Defrosting time depends on the temperature after defrosting, which is checked by a probe connected to the control panel. However, defrosting time cannot exceed a maximum time, which is controlled by the electronic chart and varies depending on the defrosting version used:
- defrosting by blocking refrigeration: 4 cycles maximum duration 60 minutes (Cronos e Glycos).
- electrical defrosting (optional Cronos): 4 cycles maximum duration 30 minutes (Cronos) and 35 minutes (Proteus Plus).

When immediate defrosting is required, button \( \text{button symbol} \) must be pressed once and then again \( \text{button symbol} \) until the "dF" abbreviation appears. Press and keep depressed \( \text{button symbol} \) followed by \( \text{button symbol} \).

During the defrosting cycle, the display shows the last temperature taken before beginning the cycle.

ALARM STATUS
The controller allows checking that the thermostat is working correctly, the periodic signal for condenser cleaning, besides the functional and anomaly alarms of the T1, T2 and T3 probes. When an alarm is set off, the controller activates the specific relay and signals the anomaly, by flashing the relative LED, ALR appears on the display and a sound alarm is set off.

If a new alarm occurs, press button \( \text{button symbol} \), the ALR indication can be removed permanently, the buzzing silenced and the cause of the alarm can be seen. The indications on the display are:
- A L low temperature;
- A H high temperature;
- A C condenser cleaning;
- A 1 anomaly with probe T1 (delivery);
- A 2 anomaly with probe T2 (evaporator);
- A 3 anomaly with probe T3 (suction).

By pressing button \( \text{button symbol} \), the buzzer is silenced after which, if the alarm continues, it is activated periodically for 20 seconds every hour until the alarm ceases. This is valid for all alarms, except the condenser cleaning alarm. The alarm led and relay are always activated while the alarm persists.

IF THE CONTROLLER IS TURNED OFF OR PUT IN STANDBY, THE COUNTERS AND ALARMS ARE ZEROED.
However, if any sort of alarm persists, the user must contact the nearest service centre.

THERMOMETER (OPTIONAL)
WARNING. The thermometer is fed by a D357H 1.5V battery supplied as standard. If it is off on installation: extract the thermometer from the appropriate support place under the shelf and gain access to the battery by unscrewing the rear cover and removing the insulation (film or piece of paper) placed behind the battery to prevent running down.
PARAMETERS:
The password must be entered to view and/or change any of the parameters.

ENTER PASSWORD:
The display must be working normally (showing the cabinet temperature);
• press button Ⓐ once, followed by button Ⓐ repeatedly until “Pc” is displayed;
• press and keep pressed button Ⓐ (code “00” is displayed) press button Ⓐ repeatedly until the access code (password) “250” is displayed, release the button Ⓐ;
• the first parameter to be modified is displayed.

CHANGING THE PARAMETERS:
• With buttons Ⓐ and Ⓐ the parameter menu can be viewed;
• when the parameter to be changed is displayed, press and keep pressed button Ⓐ, this parameter change is accessed and using buttons Ⓐ and Ⓐ, the displayed value can be increased or reduced until the desired value is reached;
• release the button Ⓐ, the controller automatically passes to the following parameter.

EXIT FROM THE DISPLAY OR PARAMETER CHANGE TAKES PLACE BY PRESSING BUTTON Ⓐ OR AFTER 30 SECONDS WITHOUT THE KEYBOARD BEING USED.
# Parameters Table for Cabinet with LAE Control Panel

To modify the configuration parameters use the password = 250

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SPL</strong> (Minimum set allowed) (°C/°F)</td>
<td>-10</td>
<td>-10</td>
</tr>
<tr>
<td><strong>SPH</strong> (Maximum set allowed) (°C/°F)</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td><strong>SP</strong> (Main point) (°C/°F)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>HY</strong> (Main thermostat delay) (°C/°F)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>NSP</strong> (Night set point) (°C/°F)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>NHY</strong> (Night thermostat delay) (°C/°F)</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>DFR</strong> (Defrosting frequency) (n°)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>DLI</strong> (Defrosting end temperature) (°C/°F)</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td><strong>DTO</strong> (Maximum defrosting duration) (min)</td>
<td>60</td>
<td>30</td>
</tr>
<tr>
<td><strong>DTY</strong> (Defrosting type) (OFF/ELE/GAS)</td>
<td>OFF</td>
<td>ELE</td>
</tr>
<tr>
<td><strong>DRN</strong> (Dripping time) (min)</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td><strong>DDY</strong> (Display control during defrosting) (min)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td><strong>FDC</strong> (Fan control during defrosting (END/THS/CON))</td>
<td>CON</td>
<td>CON</td>
</tr>
<tr>
<td><strong>FRT</strong> (Fan delay after defrosting) (°C/°F)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td><strong>ATL</strong> (Lower alarm threshold) (°C/°F)</td>
<td>-7</td>
<td>-7</td>
</tr>
<tr>
<td><strong>ATH</strong> (Upper alarm threshold) (°C/°F)</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td><strong>ATD</strong> (Temperature alarm delay) (min)</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td><strong>ATI</strong> (T1/T3 control alarm probe) (T1/T3)</td>
<td>T1/T3</td>
<td>T1</td>
</tr>
<tr>
<td><strong>ACL</strong> (Condenser cleaning interval time) (weeks)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>CRT</strong> (Compressor stop) (min)</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td><strong>CDC</strong> (Security cycle) (0,,10)</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td><strong>HEA</strong> (Heating function starting)</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td><strong>NGT</strong> (Night function starting)</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td><strong>T2</strong> (T2 probe starting)</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td><strong>T3</strong> (T3 probe starting)</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td><strong>TDI</strong> (Display selection) (T1/T3)</td>
<td>T1/T3</td>
<td>T1</td>
</tr>
<tr>
<td><strong>SCL</strong> (Display scale) (°C/°F)</td>
<td>°C</td>
<td>°C</td>
</tr>
<tr>
<td><strong>OS1</strong> (T1 probe correction) (°C/°F)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>OS2</strong> (T2 probe correction) (°C/°F)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>OS3</strong> (T3 probe correction) (°C/°F)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>ADR</strong> (Peripheral unit address) (0,,255)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
**LEGEND FOR THE PLUG IN ELECTRICAL DIAGRAMS**

① Terminals 6 to 8 = contact output N.O. MAX. 2A (remove jumper from terminals 5 and 6)
② Terminals 8 to 10 = refrigeration output 230V 50Hz 1PH+N MAX. 2A
③ Electric panel.
   Lighting ballast box.
④ Control dash-board.
⑤ Display case length.
⑥ Lamps/ballast rated electrical powers.
⑦ Rated power referred to 230 Vac 50 Hz mains supply.
   Refrigeration outlet max. 2A AC3.
⑧ Presence and features of electrical components or user elements.
   230 Vac 50 Hz supply, 1PH+N+Gnd.
   Refrigerated unit control electric wiring diagram.
⑨ 8-11 = N.O. clean contact refrigerator outlet (remove cable 32 in terminals 10 and 11).
⑩ 8-9 = 230 Vac 50 Hz refrigeration outlet, max. 6A AC1.

AA  Open angle.
AC  Closed angle.
A31  Control card for refrigerated unit.
A58  Display card.
A67  Speed change for motor-driven fan.
B15  Control level water switch.
B23  Evaporator temperature probe.
B24  Room temperature probe.
D00  Compressor 2 delaying device.
D14  Timer.
E00  Upper lighting.
E02  Anterior front apron lighting - optional.
E03  Interim shelf lighting.
E10  Condenser unit.
F00  Refrigeration outlet fuse.
F001  Compressor 1 fuse.
F002  Compressor 2 fuse.
F03  Fuse for R34-E00-E03-R11.
F05  Fuse for auxiliaries M66-M111-M112.
F4A1  Compressor 1 high pressure pressure switch.
F4A2  Compressor 2 high pressure pressure switch.
K00  Remote switch for refrigeration outlet.
K001  Compressor 1 remote switch.
K002  Compressor 2 remote switch.
L0_  Fluorescent lamp ballast.
M011  Motor driven compressor n° 1.
M012  Motor driven compressor n° 2.
M111  n° 1 Condenser unit fan.
M112  n° 2 Condenser unit fan.
M66  Evaporator motor driven fans.
R-C  Anti-noise filter.
R11 Evaporator defrost resistance element.
R34 Anti-fog resistance element.
R37 Re-evaporation water heater.
S4B Night temperature thermostat (only with night cover) remove the cable that is between terminals 4 and 5.
S4I Safety heater thermostat.
S44 End-defrost thermostat.
S13 Anti-fog resistance element switch.
S17 Display case lighting switch.
S19 Display case supply switch.
S45 Temperature thermostat.
S171 Line n° 1 light switch.
S172 Line n° 2 light switch.
T3A Controller supply transformer for refrigerated unit.
V0 Fluorescent lamp.
W00 Flat.
XA Terminal block for to be earth-wire wiring.
X2C 2 poles terminal.
X2I Insulation derivation terminal.
X00 User connector terminal board.
X00_1 Display case supply terminal box.
X00_2 Terminal box for defrost resistance element outlet and condenser unit or solenoid valve.
L-N = refrigeration outlet. 220 Vac 50 Hz max. 2A (AC3).
X40 Power supply connection for re-evaporatin water heater.
X50 Plug for the re-evaporatin water heater.
X60 Display case supply plug. Connect to mains 220/230 Vac 50 Hz.
Y13 Liquid line solenoid valve.
Y15 Hot-gas defrost solenoid valve.