MURO MILK

Maintenance
And Use Manual

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1. INTRODUCTION

PRESENTATION
Dear Client,
Oscartek is pleased to number you among its customers and relies the bought machine will match your expectation. In order to get the best performances of the machine, we recommend you to follow all suggestions and instructions, which are included in this manual.

1.2. HOW TO USE THE MACHINE

- **PERMITTED USES**
  This refrigerated display cabinet has been manufactured for beverage products presentation and sell.
- **NOT PERMITTED USES**
  It is absolutely forbidden the use of the refrigerated display cabinet for pharmaceutical products.

1.3. RESPECTED NORMS

The refrigerated display cabinet has been manufactured in respect of the safety issues relevant to the following norm:

- Directive 2006/95/CE: Low tension
- Directive 97/23/EC (P.E.D.): European Pressure Equipment
- Norm CEI 17-13/1 (EN 60497-1): Realization of Electric Installations
- Norm CEI 60335-1 (CEI 51-150): Safety of household and similar electrical appliances
- Norm CEI 60335-2-24 (CEI 61-56): Special norms for refrigerators, freezers and ice machines
- UL471
- NSF 7

1.4. RESPONSIBILITY

Oscartek declines any responsibility relevant to damages on persons, animals and/or products in case of:

- No respect of in force norms
- Installation, which is not conform to the instructions manual
- No observance of all maintenance operations, which are suggested in this manual
- No previously agreed change operations with the manufacturer
- No proper use of the refrigerated display cabinet, for which the machine has been produced.

1.5. WARNING

Anytime Oscartek reserves the right to r-update the content of this manual and/or to modify the product in order to improve its quality and performance, without any previous notice and/or communication.

2. DISPLAY CASE DATA PLATE

2.1. DATA PLATE CONTENT

![Data Plate Sample]

<table>
<thead>
<tr>
<th>1. Commercial name of the unit</th>
<th>10. Refrigerant weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Identification number</td>
<td>11. Climatic rate (Cl.3 = +25°C/60% U.R., Cl.4 = +30°C/55% U.R.)</td>
</tr>
<tr>
<td>3. Production date</td>
<td>12. Test pressure – system high pressure side</td>
</tr>
<tr>
<td>4. Voltage</td>
<td>13. Test pressure – system low pressure side</td>
</tr>
<tr>
<td>5. Phases</td>
<td>14. Nominal power/current absorbed during defrost</td>
</tr>
<tr>
<td>6. Frequency</td>
<td>15. Max. power absorbed during defrost</td>
</tr>
<tr>
<td>7. Compressor type</td>
<td>16. Nominal power absorbed by heating elements (only if higher than 100W)</td>
</tr>
<tr>
<td>8. Number of compressors</td>
<td>17. Lighting nominal power</td>
</tr>
<tr>
<td>9. Refrigerant type</td>
<td></td>
</tr>
</tbody>
</table>
3. INSTALLATION

3.1. MACHINE HANDLING

- The wall showcase handling, from the truck to the final place, has to be made by any truck-lift, which is proper to its weight. The showcase shall be always balanced in order to ensure personnel integrity and machine functionality.
- The showcase can be shipped with or without wood packaging, in case wood crate will be used, will have a pallet base for an easy fork-lift handling. The pallet, however should be handle in the central position.
- During the shipment, it is necessary to avoid any crash or and shake of the wall showcase in order to not damage its frame, especially its glasses.
- Do not drag the wall showcase on the floor and do not push it on the upper glasses.
- In case the wall showcase has front or side room-glasses avoids its shipment by air.

3.2. STOCK OF THE SHOWCASE

- Whenever the showcase has to be stoked, follow carefully what suggested before.
- Environmental temperature during the showcase stock can have following range -15°C and + 55°C and humidity between 30% and 80%.
- The wall showcase has always to be protected by sunrays and raining.
- In case the wall showcase has to remain in stock quite long time before its use, keep it with its packaging in order to maintain its protection.

3.3. PACKAGING REMOVE

Before getting the wall showcase from the forwarding agent, check its conditions. In case it will be some damages, inform the driver and sign it on shipping documents. Eventual damages relevant to the shipment and/or to the wrong stock, have not to be ascribed to the manufacturer.

3.4. SHOWCASE POSITION

The refrigerated showcase needs particular environmental conditions in order to offer the right performance, so that the area where it will be used has to respect following indications:

- Floor has to be levelled perfectly, on the contrary keep the wall showcase on the horizontal position in order to guarantee a perfect defrosting water drain and avoid boring compressor noises.
- The wall showcase has to not be under the sun-rays in order to have its better refrigeration performance, has to remain inside the local or to be sheltered by window curtain. If what described above is not observed, it can determine an increase of temperature of displayed product and an increasing power consume.
- The wall showcase has not to be under air currents due to open doors or windows, or under roof ventilators or under air condition outlets. In case will be not respected the above suggested, it can arise an increasing of temperature of the displayed product and/or an increasing ice phenomena on the evaporator and internal fans, which compromise the correct cold air circulation and product consistence.
- The wall showcase has not to be placed close any heat source as heaters, ovens, etc

- The wall showcase has to have a sufficient place in order to ensure a correct custom service, to make an easy maintenance operation, to guarantee the right air flow necessary to make cold the condenser. Besides the warm air which flows out has to not have any obstacle or to invest other equipments in order to not reduce the correct functions.

3.5. REMOTE CONDENSING UNIT PLACING

- The remote condensing unit has to be checked by specialised technicians and according to the required refrigerating power and their position respect the showcase.
- The condensing unit has to be placed following these points:
  - The condensing unit has to be located at least 250 mm from any eventual wall. (pic.5.5)
  - Air flow direction has to be from the eventual wall towards compressor.
  - The local, in case will be closed, has to be with enough air circulation.
  - By the condenser has to be guaranteed in any case as much as possible cold air.
  - In case will be necessary it has to be foreseen a forced air exchange by any fan according to the air flow of condenser.
  - The condensing units of display showcase have to be fixed properly.
  - The generated noise has not exceed the admitted noise levels relevant to the public places, especially in case of domestic buildings.
  - It is always necessary a sufficient place along the four sides of the wall showcase in order to make easy any type of check and maintenance operations.
  - When the condensing units are external will be necessary a frame holder that has to be fixed in a proper way and eventually added with amortising elements. Besides this frame has to be closet with no-water protection grid and sufficient opening holes for ventilation.
3.6 ELECTRICAL CONNECTION

- Before proceeding with electrical connection, be sure that the available electric power and tension are what is required on technical label of the wall showcase.
- The electric connection has to be made by qualified personnel and following manufacturer’s instructions.
- The wall showcase has already a general switch, however it is necessary an omni polar switch, with a minimum distance among the contacts of 3mm.
- It is obligatory that the wall showcase will be connected properly with an efficient ground socket.

WARNING! A wrong connection may occur always to persons, animals and things, where the manufacturer cannot be considered as responsible.

WARNING! Although the wall showcase has main switch breaking both the phases. Before any maintenance operation disconnect the electrical supply of the wall showcase. (pic.3.6).

3.7 HYDRAULIC CONNECTION - REMOTE CONDENSING UNIT

- In the case then wall showcase has a remote condensing unit, it is necessary make the connection of defrosting water outlet with the main water drain outlet.
<table>
<thead>
<tr>
<th>TECHNICAL FEATURES</th>
<th>MODELS</th>
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<tr>
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<td>MURO MILK 1150</td>
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<td></td>
<td>MURO MILK 1480</td>
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<tr>
<td>External Dimensions (L-D-H)</td>
<td>Inches</td>
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<td>45 1/4” - 40 11/16” - 61 9/16”</td>
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<td>58 1/4” - 40 11/16” - 61 9/16”</td>
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<td>Inches-MM</td>
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<td>1480 - 1034 - 1564</td>
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<td>62” - 44 3/8” - 60”</td>
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<td>Refrigeration Display Area</td>
<td>Type</td>
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<td>+10°F</td>
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<td>208-220/1/60 (USA)</td>
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<tr>
<td>Power Consumption</td>
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<td></td>
<td>7A</td>
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<td></td>
<td>11A</td>
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<tr>
<td>Net Weights</td>
<td>Kg/Lb</td>
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<tr>
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<td>200Kgs / 440Lbs</td>
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<tr>
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<td>240Kgs / 528Lbs</td>
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<tr>
<td>Crated Weights</td>
<td>Kg/Lb</td>
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<tr>
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<td>220Kgs / 484Lbs</td>
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<tr>
<td></td>
<td>255Kgs / 561Lbs</td>
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</tbody>
</table>

SECTION VIEW

PLAN VIEWS

REAR ELEVATIONS (OPERATOR SIDE)

FRONT ELEVATIONS (CUSTOMER SIDE)
Digital controller for medium-low temperature refrigeration applications

XW60L

1. GENERAL WARNING

1.1 PLEASE READ BEFORE USING THIS MANUAL
- This manual is part of the product and should be kept near the instrument for easy and quick reference.
- The instrument shall not be used for purposes different from those described herein. It cannot be used as a safety device.
- Check the application limits before proceeding.

1.2 SAFETY PRECAUTIONS
- Check the supply voltage is correct before connecting the instrument.
- Do not expose to water or moisture: use the controller only within the operating limits avoiding sudden temperature changes with high atmospheric humidity to prevent formation of condensation.
- Warning: disconnect all electrical connections before any kind of maintenance.
- Fix the probe where it is not accessible by the End User. The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to "Dixell Sp. A." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or interfering.
- In case of applicative in industrial environments, the use of mains filters (not mod. FT1) in parallel with inductive loads could be useful.

2. GENERAL DESCRIPTION

Model XW60L, format 2xR16SM, is a microprocessor based controller suitable for applications on medium or low temperature ventilated refrigerated units. It has 4 relay outputs to control compressors, fans, defrost, which can be either electrical or reverse cycle (heat pump) and light (configurable). It could be provided with a Real Time Clock which allows programming of up to 24 daily defrost cycles, divided into holidays and workdays. A "Day and Night" function with three different set points is fitted for energy saving. It is also provided with up to four RTD or PTC probe inputs, the first one fixed, not temperature controlled, the second one, to be located onto the evaporator, to control the defrost termination temperature and to managed the fan. One of the 2 digital inputs can operate as third temperature probe. The fourth probe is used to signal the defrost end and alarm or to display a temperature.

The HOT KEY output allows to connect the unit, by means of the external module XJ405-CX, to a network line ModBUS-RTU compatible such as the dixell monitoring units of XWEB family. It allows to program the controller by means the HOT KEY programming keyboard.

The instrument is fully configurable through special parameters that can be easily programmed through the keyboard.

3. CONTROLLING LOADS

3.1 COMPRESSOR

The regulation is performed according to the temperature measured by the thermostat probe with a positive differential from the set point: if the temperature increases and reaches set point plus differential the compressor is started and then turned off when the temperature reaches the set point value again.

In case of fault in the thermostat probe the start and stop of the compressor are timed through parameters "CDE" and "COF".

3.2 DEFROST

Two defrost modes are available through the "Def" parameter: defrost through electrical heater (Def = EL) and hot gas defrost (Def = HG). The defrost interval depends on the presence of the RTC (optional), if the RTC is present it is controlled by means of parameter "Def":
- with Def=H: the defrost is made every 1/4h time, standard way for controller without RTC.
- with Def=N: the defrost is made in real time depending on the hours set in the parameters L/H/1L/8. It operates on workdays and in Summer/Summer in holidays.

Other parameters are used to control defrost cycles: its maximum length (MDf) and two defrost modes: timed or controlled by the evaporator's probe (DPf).

At the end of defrost dripping time is started, its lengths is set in the Def parameter. With Def=0 the dripping time is disabled.

3.3 CONTROL OF EVAPORATOR FANS

The fan control mode is selected by means of the "Fct" parameter:

Fct = C: fans will switch ON and OFF with the compressor and not run during defrost.
Fct = A: fans run even if the compressor is off, and not run during defrost.
Fct = "0": fans will run even if the compressor is off.
Fct = "Y": will be disabled if the evaporator probe, above which the fans are always OFF. This is used to make sure circulation of air if the temperature is lower than set in "TSF3".
Fct = "Y": fans will run continuously also during defrost.
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Fct = "Y": fans will run continuously also during defrost.
An additional parameter "FBF" provides the settings of temperature, detected by the evaporator probe, above which defrost is always OFF. This is used to make sure circulation of air if the temperature is lower than set in "TSF2".

3.3.1 Forced activation of fans

This function managed by the Fct parameter is also used to avoid short cycles of fans that could happen when the controller is switched on or after a defrost, when the room warms the evaporator. Functioning: if the difference of temperature between the evaporator and the room probes is more than the value of the Fd parameter, the fans are switched on. With Fct=0 the function is disabled.

3.3.2 Cyclical activation of the fans with compressor off.

When Fct = C or A (fans in parallel to the compressor), by means of the Fc and Fd parameters the fans can carry out on and off cycles even if the compressor is switched off. When the compressor is stopped the fans go on working for the Fon time. With Fon=0 the fans remain always off, when the compressor is off.

3.4 LIGHT RELAY CONFIGURATION

The functioning of the auxiliary relay (terminals 1-3) can be set by the "AFA" parameter, according to the kind of application. In the following paragraph the possible setting:

3.4.1 Auxiliary thermostat

I.E. condensing heater) with the possibility of switching it on and off also by keyboard.

Parameters involved:
- ACH: Kind of regulation for the auxiliary relay: Ht: heating; C: cooling.
- AFA: Set point for auxiliary relay
- AFA: Differential for auxiliary relay
- AFA: Probe for auxiliary relay
- AFA: Auxiliary output off during defrost.

By means of these 5 parameters the functioning of the auxiliary relay can be set. The differential is given by the SBY parameter. The auxiliary relay can be switched on also by the AUX button. In this case it remains on till it's manually switched off.

NOTE: Set AFA=AUS and AFA=A (no probe for auxiliary output).

In this case the relay 1-3 can be activated only by digital input with "H" or "Z" or AUS.

3.4.2 On/off relay - "AFA = onF"

In this case the relay is activated and de-activated when the controller is turned on.

3.4.3 Neutral zone regulation

With AFA=d the relay 1-3 can control a heater element to perform a neutral zone action.

3.4.4 Second compressor

With AFA=C, the relay 1-3 operates as second compressor: it is activated in parallel with the relay of the first compressor, with a possible delay set in the ACC parameter. Both the compressors are switched off at the same time.

3.4.5 Alarm relay

With AFA=AL, the relay 1-3 operates as alarm relay. It is activated every time an alarm happens. Its status depends on the IA parameter: if "IA = Y", the relay is silenced by pressing any key. If "IA = N", the alarm relay remains ready on until the alarm condition recovers.

3.4.6 Night blind management during energy saving cycles

With AFA=HES, the relay 1-3 operates to manage the night blind: the relay is energised when the energy saving cycle is activated, by digital input, frontal button or RTC (optional).

4. FRONT PANEL COMMANDS

4.1 STANDARD FRONTAL PANEL

4.2 STEEL FINISHING

SET: To display target set point, in programming mode it selects a parameter or confirm an operation.
(DEF): To start a manual defrost.
(UP): To see the stored temperature; in programming mode it moves the parameter codes or decreases the displayed value.
(DOWN): To see the stored temperature; in programming mode it moves the parameter codes or decreases the displayed value.

To switch the instrument off, set OnF = OFF.
To switch the light, if AFA = Lig.

KEY COMBINATIONS:
- + To lock & unlock the keyboard.
5. MAX & MIN TEMPERATURE MEMORIZATION

5.1 HOW TO SEE THE MIN TEMPERATURE
1. Press and release the + key.
2. The “Lo” message will be displayed followed by the minimum temperature recorded.
3. By pressing the + key again or by waiting 5s the normal display will be restored.

5.2 HOW TO SEE THE MAX TEMPERATURE
1. Press and release the - key.
2. The “Hi” message will be displayed followed by the maximum temperature recorded.
3. By pressing the - key again or by waiting 5s the normal display will be restored.

5.3 HOW TO RESET THE MAX AND MIN TEMPERATURE RECORDED
1. Hold press the SET key for more than 3s, while the max or min temperature is displayed (Hi message will be displayed).
2. To confirm the operation the “Hi” message starts blinking and the normal temperature will be displayed.

6. MAIN FUNCTIONS

6.1 TO SET THE CURRENT TIME AND DAY (ONLY FOR INSTRUMENTS WITH RTC)
When the instrument is switched on, its program to set the time and day.
1. Enter the Programming mode by pressing the SET + + keys for 3s.
2. The “00” parameter is displayed. Push the SET key to enter the real time clock menu.
3. The “Th” parameter is displayed.
4. Push the SET and set current hour by the UP and Down keys, then push SET to confirm the value.
5. Repeat the same operations on the Min (minutes) and day (day) parameters.
To exit: Push SET+UP keys or wait for 15 ssec without pressing any keys.

6.2 HOW TO SEE THE SET POINT
1. Push and immediately release the SET key: the display will show the set point.
2. Push and immediately release the SET key or wait for 5 seconds to display the probe value again.

6.3 HOW TO CHANGE THE SET POINT
1. Push the SET key for more than 2 seconds to change the Set point value;
2. The value of the set point is displayed and the “C” or “F” LED starts blinking.
3. To change the Set value push the + or - arrow into 10s.
4. To memorise the new set point value push the SET key again or wait 10s.

6.4 HOW TO START A MANUAL DEFROST
Push the DEF key for more than 2 seconds and a manual defrost will start.

6.5 HOW TO CHANGE A PARAMETER VALUE
To change the parameter value operate as follows:
1. Enter the Programming mode by pressing the SET + + keys for 3s the “C” or “F” LED starts blinking.
2. Select the required parameter. Press the “SET” key to display its value.
3. Use “UP” or “DOWN” to change its value.
4. Press “SET” to store the new value and move to the following parameter.
To exit: Press SET+UP or wait 10s without pressing a key.
NOTE: the set value is stored even when the procedure is ceased by waiting the time-out to expire.

6.6 THE HIDDEN MENU
The hidden menu includes all the parameters of the instrument.

6.6.1 HOW TO ENTER THE HIDDEN MENU
1. Enter the Programming mode by pressing the SET + + keys for 3s.
2. Release the keys, then press again the SET + + keys for more than 7s. The Pi2 label will be displayed immediately followed from the HY parameter.
3. How you are in the hidden menu.
4. Select the required parameter.
5. Press the “SET” key to display its value.
6. Use “+” or “-” to change its value.
7. Press “SET” to store the new value and move to the following parameter.
To exit: Press SET + + or wait 15s without pressing any key.
NOTE: If no parameter is present press “SET” for 3s, the “Hi” message is displayed. Keep the keys pressed till the Pi2 message is displayed.
8. NOTE: the first value is stored even when the procedure is ceased by waiting the time-out to expire.

6.6.2 HOW TO MOVE A PARAMETER FROM THE HIDDEN MENU TO THE FIRST LEVEL AND VICEVERSA.
Each parameter present in the HIDDEN MENU can be removed or put into “THE FIRST LEVEL” (user level) by pressing “SET + +” in HIDDEN MENU when a parameter is present in First Level the decimal point is on.

6.7 HOW TO LOCK THE KEYBOARD
1. Keep pressed for more than 3s the UP + DOWN keys.
2. The “POE” message will be displayed and the keyboard will be locked. At this point it will be possible only to see the set point or the MAX Min temperature stored.
3. If a key is pressed more than 3s the “POE” message will be displayed.

6.8 TO UNLOCK THE KEYBOARD
Keep pressed together for more than 3s the + and - keys, till the “Pen” message will be displayed.

6.9 THE ONOFF FUNCTION
With “on” the ONOFF button, the instrument is switched off. The “OFF” message is displayed. In this configuration, the regulation is disabled. To switch the instrument on, push again the ONOFF button.
WARNING: Connections to the normally closed contacts of the relays are always supplied and under voltage, even if the instrument is in stand-by mode.

7. PARAMETERS

7.1 REAL TIME CLOCK MENU (ONLY FOR CONTROLLERS WITH RTC): to see the time and date and defrost start time.

7.2 REGULATION

7.2.1 Hy Differential: [8.1 - 25.5°C/16.8°F] [8.5-25.0°C/18.0°F] intervention differential for set point. Compressor Cut IN is Set Point + differential (Hy). Compressor Cut OUT is when the temperature reaches the setpoint.
7.2.2 LS Minimum set point: [-5°C/-25°F], Ssets the minimum value for the set point.
7.2.3 US Maximum set point: [110°C/230°F], Ssets the maximum value for set point.
7.2.4 Öt Thermostat probe calibration: [-4°C/25°F], [120°C/212°F], allows to adjust possible offset of the thermostat probe.
7.2.5 Öt Evaporator probe presence: 1=n: present the defrost stops by time, y: present: the defrost stops by temperature.
7.2.6 Evaporator probe calibration: [-4°C/25°F], [120°C/212°F], allows to adjust possible offset of the probe.
7.2.7 Öt Third probe calibration: [-4°C/25°F], [120°C/212°F], allows to adjust possible offset of the probe.
7.2.8 Öt Fourth probe calibration: [-4°C/25°F], [120°C/212°F], allows to adjust possible offset of the probe.
7.2.9 Öt Anti-short cycle delay: [0-80 min] minimum interval between the compressor stop and the next start.
7.2.10 Öt 1st compressor delay at start up: [0-255s] used only if Öt = Öt2 = Öt2 Time interval between the switching on of the first compressor and the second one.
7.2.11 Percentage of the first and second probe for regulation: [0-100%; 100%; 100%]; 8 = Öt2): it allows to set the regulation according to the percentage of the first and second probe, as for the following formula: min([P1·P2]/[P1·P2]).
7.2.12 Öt Compressor On time during continuous cycle: [0-24.0h]; res. 10min, Allows to set the length of the continuous cycle, the compressor stays on without interruption for the OTC time. Can be used for instance, when the room is filled with new products.
7.2.13 Öt Set point for continuous cycle: [-50°C/10°F] sets the set point used during the continuous cycle.
7.2.14 Öt Compressor On time with faulty probe: [0-255s] minute time during which the compressor is active in case of faulty thermostat probe. With C0P=1 compressor is always OFF.
7.2.15 Öt Compressor Off time with faulty probe: [0-255s] time during which the compressor is OFF in case of faulty thermostat probe. With C0P=0 compressor is always active.

DISPLAY

CF Temperature measurement unit: °C=Celsius, °F=Fahrenheit. WARNING: When the measurement unit is changed the set point and the values of the parameters Hy, LS, US, Öt, ALU and ALL have to be checked and modified if necessary.
rES Resolution for °C: (r = 1°C, cr = 0.1°C) allows decimal place display.
Installing and Operating Instructions

Lod Instrument display: 1P, 1F, 2P, 3P, 4P, SET, dtr; it selects which probe is displayed by the instrument; 1P=Thermistor probe; 2P=Evaporator probe; 3P=Thermistor probe (only for model with this option enabled); 4P=Fourth probe, SET = set point; dtr = percentage of visualization.

r83d K= X-REP display (optional): 1P, 1F, 2P, 3P, SET, dtr; it selects which probe is displayed by X-REP: 1P=Thermistor probe; 2P=Evaporator probe; 3P=Probe excluded from the set point. A minimum temperature alarm is enabled when the temperature exceeds the "SET+ALU" or "SET-ALU" values.

ALU Maximum temperature alarm: (SET+10°C, SET+20°C) when this temperature is reached the alarm is enabled, after the "ALU" delay time.

ALU Maximum temperature alarm (SET+1°C, SET+2°C) when this temperature is reached the alarm is enabled, after the "ALU" delay time.

AFH Differential for temperature alarm/fan recovery: 0,1+25°C, 1+65°F) interval detection for recovery temperature alarm; it’s also used for the reset of the fan when the FST temperature is reached.

Ald Temperature alarm delay: (0,255) time interval between the detection of an alarm condition and alarm signaling.

AEO Exclusion of temperature alarm at start-up: (0,0 to 50,0) time interval between the detection of the temperature alarm condition after instrument power on and alarm signaling.

CONDENSER TEMPERATURE ALARM

AP2 Probe selection for temperature alarm for condenser: nP= no probe; 1P=Thermistor probe; 2P=Evaporator probe; 3P=Condignible probe; 4P=Probe on Hot Key plug.

AL2 Low temperature alarm for condenser: (0,15°C to 15°C) when this temperature is reached the L2 alarm is signalled, possibly after the AD2 delay.

A2u High temperature alarm of condenser: (15°C to 150°C) when this temperature is reached the H2 alarm is signalled, possibly after the AD2 delay.

A2d Differential for temperature condenser alarm recovery: (0,15°C to 15°F) condenser alarm.

A2d Condenser temperature alarm delay: (0,255) time interval between the detection of the condenser alarm condition and alarm signaling.

A2c Condenser temperature alarm exclusion at start up: (0,0 to 25,0, 150, 150, 0) condenser alarm.

A2c Condenser alarm with high temperature alarm of condenser: nP= no compressor keeps on working; y= yes, compressor is switched off till the alarm is present; in any case regulation restores the AC low temperature alarm.

A2p Condenser alarm with high temperature alarm of condenser: nP= no compressor keeps on working; y= yes, compressor is switched off till the alarm is present, in any case regulation restores the AC low temperature alarm at minimum.

AUXILIARY RELAY

ibA Alarm relay silencing with ao3=ALaR: n= silencing disabled, alarm relay stays on till alarm condition lasts, y= silencing enabled; alarm relay is switched off by pressing a key during an alarm.

A5A Fourth relay configuration: (1-12): DEF, FAN; do not select if Alt alarm, LG= light; Alt alarm relay; on= always on with instrument on; dE= neutral zone; F2P= second compressor; dEF2; do not select if; HES= night blind.

A5p Alarm relay polarity: it set if the alarm relay is open or closed when an alarm happens. CL: terminals 1,3 closed during an alarm; dEF terminals 1,3 open during an alarm.

DIGITAL INPUTS

1IP Digital input polarity (13-14): 0P: the digital input is activated by opening the contact; CL: the digital input is activated by closing the contact.

1P2 Digital input configuration (13-15): EAL= external alarm: "EA" message is displayed, bAn= alarm signal, "CA" message is displayed, PAL= pressure switch alarm, "CM" message is displayed, dOr= door switch function, dEF= activation of a defect cycle; AUS= not enabled, Ht= time of action in minutes, C= cycle time; F2P= Energy saving, Hid= Holiday disable (enable only with RTD); of= to switch the controller off.

1dI (0,255) min with ifH= EAL or ifH= bAn= digital input alarm delay (13-14): delay between the detection of the external alarm condition and its signalling.

1IP2= IPL pressure switch function; time interval to calculate the number of the pressure switch activation.

1P2 Digital input polarity (13-19): 0P: the digital input is activated by opening the contact; CL: the digital input is activated by closing the contact.

1P2 Digital input configuration (13-15): EAL= external alarm: "EA" message is displayed, bAn= alarm signal, "CA" message is displayed, PAL= pressure switch alarm, "CM" message is displayed, dOr= door switch function, dEF= activation of a defect cycle; AUS= not enabled, Ht= time of action in minutes, C= cycle time; F2P= Energy saving, Hid= Holiday disable (enable only with RTD); of= to switch the controller off.

2dI (0,255) min with ifZP= EAL or ifZP= bAn= 2nd digital input alarm delay (13-19): delay between the detection of the external alarm condition and its signalling.

2IP= IPL pressure switch function; time interval to calculate the number of the pressure switch activation.

NPS Pressure switch number: (0,15) Number of activation of the pressure switch, during the "did" interval, before signalling the alarm event (2IP=PAL).

If the ifP activation in the did time is reached, switch off and on the instrument to the external alarm control.

oco Compressor and fan status when open: no= normal, Fan = Fan OFF, Cpf= Compressor OFF, F= C= Compressor and fan OFF.

or Outputs restart for alarm: no= outputs not affected by the doA alarm; yES= outputs restart with the doA alarm.

HE5 Temperature increase during the Energy Saving cycle:

12°C to 5°C (30°C to 0°C) it indicates the increasing value of the set point during the Energy Saving cycle.

TO SET CURRNT TIME AND WEEKLY HOLIDAYS (ONLY FOR MODELS WITH RTG)

Hr Current hour (0-23 h)
Min Current minute (0-59m)
Day Current day (Sun = SA)
H1 First weekly holiday (Sun = su) Set the first day of the week which follows the holiday times.
H2 Second weekly holiday (Su = su) Set the second day of the week which follows the holiday times.
N.B. H1H2 can be set also as "nu" value (Not Used).

TO SET ENERGY SAVING TIMES (ONLY FOR MODELS WITH RTG)

IE Power Energy cycle start during worksdays: (0-24h 50m) During the Energy Saving cycle the set point is increased by the value in HES so that the operation set point is SET + HES.

IE Energy cycle length during worksdays: (0-24h 0m) Sets the duration of the IEH Energy cycle on worksdays.

IE Energy cycle start on holidays: (0-25h 50m)

IE Energy cycle length on holidays: (0-25h 0m)

TO SET DEFROST TIMES (ONLY FOR MODELS WITH RTG)

Ld1-Ld6 Workday defrost start (0-25h 50m) These parameters set the beginning of the 6 programmable defrost cycles during worksdays. Ex: When Ld2 = 12 the second defrost starts at 12:00 during worksdays.

Ld1-Ld6 Holiday defrost start (0-25h 50m) These parameters set the beginning of the 6 programmable defrost cycles on holidays. Ex: When Sd2 = 3 the second defrost starts at 3:00 during holidays.

N.B. To disable a defrost cycle set it to "nu"(not used). Ex: If Ld2=nu; the sixth defrost cycle is disabled.

Ad Serial address (1-244) indicates the instrument address when connected to a ModBUS compatible monitoring system.
8. DIGITAL INPUTS

The digital inputs are programmable by the "1H" and "1F" parameters.

8.1 GENERIC ALARM (1F or 1F = EAL)

As soon as the digital input is activated, the unit will wait for "dim" time delay before sending the "EAL" alarm message. The outputs status don't change. The alarm stops immediately when the input is de-activated.

8.2 SERIOUS ALARM MODE (1F or 1F = BAL)

When the digital input is activated, the unit will wait for "dim" delay before sending the "CA" alarm message. The relay outputs are switched OFF. The alarm will stop as soon as the digital input is de-activated.

8.3 PRESSURE SWITCH (1F or 1F = PAL)

If during the interval time set by "dp" parameter, the pressure switch has reached the set activation of the "dp" parameter, the "CA" pressure alarm message will be displayed. The compressor and the regulator are stopped. When the digital input is ON the compressor is always ON. If the "dp" activation in the "dp" time is reached, switch off and on the instrument to restart normal regulation.

8.4 DOOR SWITCH INPUT (1F or 1F = dor)

Signals the door status and the corresponding relay output status through the "dp" parameter: no normal (any change) Fan = Fan OFF, Cpr = Compressor OFF, F = Compressor and fan OFF. If the door is opened, the relay outputs are switched OFF. The alarm stops as soon as the door is closed.

8.5 START DEFROST (1F or 1F = dEF)

It starts a defrost if there are the right conditions. After the defrost is finished, the normal regulation will restart only if the digital input is disabled otherwise the instrument will wait until the "X" safety time is elapsed.

8.6 SWITCH THE AUXILIARY RELAY (1F or 1F = AUS)

With the digital input switched the status of the auxiliary relay.

8.7 INVERSION OF THE KIND OF ACTION: HEATING-COOLING (1F or 1F = Hitr)

This function inverts the regulation of the set point value from a normal regime to a reverse one.

8.8 ENERGY SAVING (1F = ES)

The Energy Saving function allows to change the set point value as the result of the set point parameter. This function is enabled until the digital input is activated.

8.9 HOLIDAY DEFROST (1F or 1F = HDF) – ONLY FOR MODELS WITH RTC

This function enabled the holiday defrost setting.

8.10 ON OFF FUNCTION (1F or 1F = onF)

To switch the controller on and off.

8.11 DIGITAL INPUTS POLARITY

The digital input polarity depends on the "1H" and "1F" parameters.

8.12 TTL SERIAL LINE – FOR MONITORING SYSTEMS

The TTL serial line, available through the "RTD" connector, allows for monitoring through the external TTL/RS485 converter, X485-CA, to connect the instrument to a monitoring system ModBUS-RTU compatible such as the X-485000/0300/030.

10. X-REP OUTPUT - OPTIONAL

As optional, an X-REP can be connected to the instrument, through the dedicated connector.

11. INSTALLATION AND MOUNTING

The control panel is mounted on a vertical panel, in a 150x31 mm hole, and fixed using two screws of 3.2 x 2.5 mm. To obtain an IP65 protection grade use the front panel cover (mod. RS-1).

12. ELECTRICAL CONNECTIONS

The instruments are provided with screw terminal block to connect cables with a cross section up to 2.5 mm² for digital and analogue inputs. Relays and power supply have a Faston connection (6.3mm). Heat-resistant cables have to be used. Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier loads use a suitable external relay.

12.1 PROBE CONNECTION

The probes shall be mounted with the bulb upwards to prevent damages due to casual liquid infiltration. It is recommended to place the thermometer probe away from air streams to correctly measure the average room temperature. Place the defrost termination probe among the evaporator fins in the coldest place, where most ice is formed, far from heaters or from the warmest place during defrost, to prevent premature defrost termination.

13. HOW TO USE THE HOT KEY

13.1 HOW TO PROGRAM A HOT KEY FROM THE INSTRUMENT (UPLOAD)

1. Program one controller with the front keypad.
2. When the controller is ON, insert the "Hot key" and push a key, the "OPL" message appears followed by flashing "End".
3. Push "SET" and the End will stop flashing.
4. Turn OFF the instrument remove the "Hot key", then turn it ON again.

NOTE: the "Err" message is displayed for failed programming. In this case push a key if you want to restart the upload again or remove the "Hot key" to abort the operation.

13.2 HOW TO PROGRAM AN INSTRUMENT USING A HOT KEY (DOWNLOAD)

1. Turn OFF the instrument.
2. Insert a programmed "Hot Key" into the 5 PIN receptacle and then turn the Controller ON.
3. Automatically the parameter list of the "Hot Key" is downloaded into the Controller memory, the "OPL" message is blinking followed by flashing "End".
4. After 10 seconds the instrument will restart working with the new parameters.
5. Remove the "Hot key".

NOTE: the message "Err" is displayed for failed programming. In this case turn the unit off and on if you want to restart the download again or remove the "Hot key" to abort the operation.

14. ALARM SIGNALS

<table>
<thead>
<tr>
<th>Message</th>
<th>Cause</th>
<th>Outputs</th>
</tr>
</thead>
<tbody>
<tr>
<td>RP</td>
<td>Room probe failure</td>
<td>Compressor output changed, to par &quot;On&quot; and &quot;Off&quot;</td>
</tr>
<tr>
<td>TP</td>
<td>Evaporator probe failure</td>
<td>Defrost and &quot;on&quot;</td>
</tr>
<tr>
<td>TP</td>
<td>Third probe failure</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>FP</td>
<td>Fourth probe failure</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>MA</td>
<td>Maximum temperature alarm</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>LH</td>
<td>Condenser high temperature</td>
<td>Depends on the &quot;AC&quot; parameter</td>
</tr>
</tbody>
</table>
14.1 SILENCING BUZZER / ALARM RELAY OUTPUT

If "TA" = "Y", the buzzer and the relay are silenced by pressing any key.
If "TA" = "N", only the buzzer is silenced while the alarm relay is on until the alarm condition recovers.

14.2 ALARM RECOVERY

Probe alrams P1", "P2", "P3" and "P4" start some seconds after the fault in the related probe; they automatically stop some seconds after the probe restores normal operation. Check connections before replacing the probe.

Temperature alarms "HA", "LA" "HA2" and "LA2" automatically stop as soon as the temperature returns to normal values.
Alarm "EA1" and "CA1" with (IF=INL) recover as soon as the digital input is disabled.
Alarm "CA2" (with IF=INL) recovers only by switching off and on the instrument.

14.3 OTHER MESSAGES

Panon Keyboard unlocked
Pkey Keyboard locked
nOP In programming mode; none parameter is present in Pr1
On the display or in p12, p4, p4, the selected probe is not enabled

15. TECHNICAL DATA

Housing: steel
Display: 6x10 mm
Mounting: panel mounting in a 100x30 mm panel cut-out with two screws.
Dimensions: 200x100 mm
Protection: IP20, Frontal protection: IP65 with frontal gasket and RGL (optional)
Connections: Serial terminal block: 2x5 mm² heat-resistant wire and 5 mm Faston
Power supply: 220Vac or 110Vac and 24Vac ±10%
Power consumption: 8VA max.
Display: 3 digits, real LED, 14 mm high.
Display: 3 digits, real LED, 14 mm high, inputs up to 4 NTC or PT100 probes
Digital inputs: 2 time voltage
Relay outputs: Total current on loads MAX 20A compressor: relay SPS 3 (B, A) 250Vac
light: relay SPS 6 or 603) A 250Vac fans: relay SPS 8 (B, A) 250Vac

defrost: relay SPS 8 (B, A) 250Vac
Output other: buzzer (optional)
Serial output: TTL standard, Communication protocol: Modbus - RTU
Data storage: on the non-volatile memory (EEPROM)
Internal clock back-up: 24 hours (only for model with RTC)
Kind of alarm: 18. Pollution grade: A, B, C, D, E, F
Rated impulse voltage: 2500V. Over vage Category: II
Operating temperature: 0-40 °C, Storage temperature: -30-85 °C.
Relative humidity: 20-85% (no condensing)
Measuring and regulation range: NTC probe: -40-150 °C (0-230 °F)
PTC probe: -50-150 °C (-59-302 °F)
Resolution: 0.1 °C or 1 °F (selectable).

16. CONNECTIONS

Supply: 100Vac or 24Vac connect to terminals 11-12.
The K-REI output is optional.
The light relay can be also 16A2A according to the model

17. DEFAULT SETTING VALUES

<table>
<thead>
<tr>
<th>Label</th>
<th>Name</th>
<th>Range</th>
<th>°C</th>
<th>F</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>LS</td>
<td>3-15</td>
<td>15-11</td>
<td>1-255</td>
<td>0-255</td>
</tr>
<tr>
<td>S</td>
<td>Total</td>
<td>0-100</td>
<td>0-30</td>
<td>0-50</td>
<td>0-90</td>
</tr>
<tr>
<td>D</td>
<td>Thermistor probe calibration</td>
<td>-12-125</td>
<td>-20-0</td>
<td>0-200</td>
<td>0-300</td>
</tr>
<tr>
<td>P1</td>
<td>Evaporator probe presence</td>
<td>-12-125</td>
<td>-20-0</td>
<td>0-200</td>
<td>0-300</td>
</tr>
<tr>
<td>P5</td>
<td>Evaporator probe calibration</td>
<td>-12-125</td>
<td>-20-0</td>
<td>0-200</td>
<td>0-300</td>
</tr>
<tr>
<td>P8</td>
<td>P82</td>
<td>Evaporator probe presence</td>
<td>-12-125</td>
<td>-20-0</td>
<td>0-200</td>
</tr>
<tr>
<td>P9</td>
<td>P92</td>
<td>Evaporator probe presence</td>
<td>-12-125</td>
<td>-20-0</td>
<td>0-200</td>
</tr>
<tr>
<td>P4</td>
<td>P42</td>
<td>Evaporator probe presence</td>
<td>-12-125</td>
<td>-20-0</td>
<td>0-200</td>
</tr>
<tr>
<td>P5</td>
<td>P52</td>
<td>Evaporator probe presence</td>
<td>-12-125</td>
<td>-20-0</td>
<td>0-200</td>
</tr>
<tr>
<td>P6</td>
<td>P62</td>
<td>Evaporator probe presence</td>
<td>-12-125</td>
<td>-20-0</td>
<td>0-200</td>
</tr>
<tr>
<td>P7</td>
<td>P72</td>
<td>Evaporator probe presence</td>
<td>-12-125</td>
<td>-20-0</td>
<td>0-200</td>
</tr>
<tr>
<td>OZS</td>
<td>OZS2</td>
<td>Outputs delay at start</td>
<td>0-255</td>
<td>0-100</td>
<td>0-200</td>
</tr>
</tbody>
</table>

AOP | Alarm relay polarity (a3+AL) | 1-2 | 1-2 | 1-2 |
| IF | Digital input polarity (13-14) | 1-2 | 1-2 | 1-2 |
| IH | Digital input 1 configuration (13-14) | 1-2 | 1-2 | 1-2 |
| ip | Digital input 1 alarm (13-14) | 1-2 | 1-2 | 1-2 |
| i2 | Digital input 2 configuration (13-14) | 1-2 | 1-2 | 1-2 |
| i3 | Digital input 2 alarm (13-14) | 1-2 | 1-2 | 1-2 |
| i4 | Digital input 3 configuration (13-14) | 1-2 | 1-2 | 1-2 |
| i5 | Digital input 3 alarm (13-14) | 1-2 | 1-2 | 1-2 |
| Le | Number of alarm | 1-2 | 1-2 | 1-2 |
| M | Number of alarm | 1-2 | 1-2 | 1-2 |
| N | Number of alarm | 1-2 | 1-2 | 1-2 |
| O | Compress and fan status | 1-2 | 1-2 | 1-2 |
| P | Power supply | 1-2 | 1-2 | 1-2 |
| R | Power supply | 1-2 | 1-2 | 1-2 |
| S | Power supply | 1-2 | 1-2 | 1-2 |
| T | Temperature measurement | 1-2 | 1-2 | 1-2 |
| U | Temperature measurement | 1-2 | 1-2 | 1-2 |
| V | Temperature measurement | 1-2 | 1-2 | 1-2 |
| W | Temperature measurement | 1-2 | 1-2 | 1-2 |
| X | Temperature measurement | 1-2 | 1-2 | 1-2 |
| Y | Temperature measurement | 1-2 | 1-2 | 1-2 |
| Z | Temperature measurement | 1-2 | 1-2 | 1-2 |
| a | Temperature measurement | 1-2 | 1-2 | 1-2 |
| b | Temperature measurement | 1-2 | 1-2 | 1-2 |
| c | Temperature measurement | 1-2 | 1-2 | 1-2 |
| d | Temperature measurement | 1-2 | 1-2 | 1-2 |
| e | Temperature measurement | 1-2 | 1-2 | 1-2 |
| f | Temperature measurement | 1-2 | 1-2 | 1-2 |
| g | Temperature measurement | 1-2 | 1-2 | 1-2 |
| h | Temperature measurement | 1-2 | 1-2 | 1-2 |
| i | Temperature measurement | 1-2 | 1-2 | 1-2 |
| j | Temperature measurement | 1-2 | 1-2 | 1-2 |

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<table>
<thead>
<tr>
<th>Label</th>
<th>Name</th>
<th>Range</th>
<th>°C°F</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ld³t</td>
<td>1st workingday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>6.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Ld²t</td>
<td>2nd workingday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>13.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Ld³t</td>
<td>3rd workingday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>21.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Ld⁴t</td>
<td>4th workingday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Ld⁵t</td>
<td>5th workingday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Ld⁶t</td>
<td>6th holiday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>6.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd²t</td>
<td>2nd holiday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>13.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd³t</td>
<td>3rd holiday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>21.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd⁴t</td>
<td>4th holiday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd⁵t</td>
<td>5th holiday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd⁶t</td>
<td>6th holiday defrost start</td>
<td>0 = 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
</tbody>
</table>

Atr Serial address 1-247 1 Fr2
PhC Kind of probe Phc, etc rtc Fr2
onF bolt key enabling nu, off, ES off Fr2
dP1 Room probe display - - Fr2
dP2 Evaporator probe display - - Fr2
dP3 Third probe display - - Fr2
dP4 Fourth probe display - - Fr2
rSE Real set actual set - Fr2
rEL Software release - 1.8 Fr2
Pb5 Map code - - Fr2

* Only for model with real time clock
* Only for XW60L with XREP output

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