COUNTERS
REFRIGERATED

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 module has been manufactured for drink cold storage.

- **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 N° 2006/42/CE: Machinery
- Directive N° 2006/95/CE: Low tension
- Norm CEI 17-13/1 (EN 60439/1): Realization of Electric Installations
- Norm CEI EN 60335-1 (CEI 61-150): Safety of household and similar electrical appliances
- Norm CEI EN 60335-2-24 (CEI 61-56): Special norms for refrigerators, freezers and ice machines

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 up-date 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

![Sample Data Plate]

<table>
<thead>
<tr>
<th>Model</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serial No.</td>
<td>2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Production Date</th>
<th>3</th>
</tr>
</thead>
</table>

- **Type**: 7
- **Gas**: 9
- **Kg**: 10
- **Cl.**: 11

<table>
<thead>
<tr>
<th>Pmax</th>
<th>12 psig</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pmin</td>
<td>13 psig</td>
</tr>
</tbody>
</table>

1. Commercial name of the unit
2. Identification number
3. Production date
4. Voltage
5. Phases
6. Frequency
7. Compressor type
8. Number of compressor
9. Refrigerant type
10. Refrigerant weight
11. Climatic rate (C3 = +25°C/60% U.R., C4 = +30°C/55% U.R.)
12. Test pressure – system high pressure side
13. Test pressure – system low pressure side
14. Nominal power/current absorbed during defrost
15. Max. power absorbed during defrost
16. Nominal power absorbed by heating elements (only if higher than 100W)
17. Lighting nominal power
3. INSTALLATION

3.1. MACHINE HANDLING

- The chocolate display cabinet handling, from the truck to the final place, has to be made by any truck-lift, which is proper to its weight. The display cabinet shall be always balanced in order to ensure personnel integrity and machine functionality.

- The cabinet 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 display cabinet in order to not damage its frame, especially its glasses.

- Do not drag the display cabinet on the floor and do not push it on the upper glasses.

3.2. STOCK OF THE DISPLAY CABINET

- Whenever the cabinet has to be stoked, follow carefully what suggested before.
- Environmental temperature during the cabinet stock can have following range -15°C and +55°C and humidity between 30% and 90%.
- The display cabinet has always to be protected by sunrays and raining.
- In case the display cabinet 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 display cabinet 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. DISPLAY CABINET POSITION

The refrigerated display cabinet 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 display cabinet on the horizontal position in order to guarantee a perfect defrosting water drain and avoid boring compressor noises.

- The display cabinet 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 determinate an increase of temperature of displayed product and an increasing power consume.

- The display cabinet 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 suggestions 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 consistency.

- The display cabinet has not to be placed close any heat source as heaters, ovens, etc.

- The display cabinet 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 no have any obstacle or to invest other equipments in order to not reduce the correct functions.
3.5. REMOTE CONDENSING UNIT PLACING

- According to the model of ice cream display cabinet you have No.1 or No.2 internal, or remote, condensing units.
- The remote condensing unit has to be checked by specialised technicians and according to the required refrigerating power and their position respect the cabinet.
- 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.3.5)
  - 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 cabinets 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 around the four sides of the display cabinet 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 closed 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 cabinet.
- The electric connection has to be made by qualified personnel and following manufacturer's instructions taking into consideration the relevant norms in force.
- The display cabinet 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 display cabinet 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!
The display cabinet has no main switch breaking both the phases.
Before any maintenance operation disconnect the electrical supply of the display cabinet (see label on the rear of the display cabinet).
4. ROUTINE MAINTENANCE AND PERIODIC CHECKS

➢ These kinds of operations are at client’s expenses.
➢ In case some malfunctioning of the unit are observed, please make sure this is not due to non-maintenance reasons, before you apply to qualified assistance.
➢ The accurate and periodic cleaning of the unit will reduce the risk of damages to the unit itself and to the products stored within.
➢ See following tab for reference.

ATTENTION! Before starting any maintenance and cleaning operation make sure you operate on the main switch in order to deactivate tension (pic. 4)

<table>
<thead>
<tr>
<th>OPERATION</th>
<th>DESCRIPTION</th>
<th>FREQUENCY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surfaces’ cleaning</td>
<td>Wash exclusively with warm water and neutral soap; rinse abundantly and wipe off with a soft cloth. Do not use abrasive products</td>
<td>weekly</td>
</tr>
<tr>
<td>Plastic surfaces’ cleaning</td>
<td>Wash exclusively with warm water and neutral soap; rinse abundantly and wipe off with a soft cloth. Do not use alcohol, acetone and any solvent that might spoil the look and structure of the material.</td>
<td>weekly</td>
</tr>
<tr>
<td>Glass surfaces’ cleaning</td>
<td>Use only specific products for glass cleaning. Using water alone might lead to calcareous deposits on the glass surfaces</td>
<td>daily</td>
</tr>
<tr>
<td>Wooden surfaces’ cleaning</td>
<td>Use exclusively a wet cloth.</td>
<td>weekly</td>
</tr>
<tr>
<td>Additional defrost</td>
<td>Under particular conditions of temperature and humidity, the frost that normally forms on the evaporator and fans might increase in volume, so leading to a faulty functioning the unit. If these conditions should last, the assistance of a qualified technician shall be needed. Waiting for this service, it is suggested to operate one or more defrost cycles (despite the damages this might cause to the stored product)</td>
<td>Waiting for qualified assistance</td>
</tr>
<tr>
<td>Periodic defrost</td>
<td>In order to obtain the best performance from the cooling system, we suggest to operate an extended defrost cycle. Before you do that, please remove displayed products from inside the cabinet; always operate an additional defrost cycle in order to remove from the evaporator the largest possible amount of frost or ice. Turn the main switch off for 5 hours (min.) Before re-starting the unit, make sure that frost has totally melted and wipe carefully.</td>
<td>max. 15 DAYS</td>
</tr>
</tbody>
</table>

ATTENTION! DO NOT CLEAN THE UNIT WITH WATER JETS

5. EXTRAORDINARY MAINTENANCE

This type of operation has to be made by qualified technician only.

ATTENTION! Before operating any maintenance, make sure the tension is deactivated. (pic.11).

➢ Lamps’ replacement: qualified technician needed.
➢ Air condenser cleaning: qualified technician needed. When the fan is switched off you can clean the condenser with a compressed air jet. Never use metallic brushes. Use protection gloves (pic.5).
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 hereinafter. 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.
- Do not make any tests in the presence of flammable gases or liquids.
- It is not possible to perform any tests on the instrument back to the distributor or to "Dixell S.p.A." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- The controller is not equipped for power failure and the power supply are separated and far enough from each other, without crossing or intertwining.
- In case of applications in industrial environment, the use of mains filters (our mod. FTI) in parallel with redundant loads could be useful.

2. GENERAL DESCRIPTION

Model XW60L format 30x185mm, is a microprocessor based controller, suitable for applications on medium or low temperature ventilated refrigeration units. It has 4 relay outputs to control compressor, fan, defrost, which can be either electrical or reversible cycle (hot gas and cool) (configurable). It is possible to be connected with an external module XA15S-CT, to a network line ModBUS-RTU compatible such as the dixell monitoring units of X-WEB family. It allows to program the controller by means of the dixell 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 turn 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 "COn" and "COF".

3.2 DEFROST

Two defrost modes are available through the "tdf" parameter: defrost through electrical heater (tDF = EL) and hot gas defrost (tDF = hG). The defrost interval depends on the presence of the RTC (optional). If the RTC is present, the defrost interval is controlled by means of parameter "tDF". If the defrost is made every "tDF" time – standard way for controller without RTC.

Other parameters are used to control defrost cycle: its maximum length (tDF) and two defrost modes: timed or controlled by the evaporator probe (P25).

At the end of the defrosting time is started, its length is set in the Fdf parameter.

3.3 CONTROL OF EVAPORATOR FANS

The fan control mode is selected by means of the "Fnc" parameter:
Fnc = a: fans will switch ON and OFF with the compressor and not run during defrost;
Fnc = n: fans will run even if the compressor is off, and not run during defrost;
Fnc = y: fans will run continuously all during defrost.

An additional parameter "FBR" provides the setting of temperature detected by the evaporator probe above which the fans are always OFF. This is used to make sure circulation of air only if its temperature is lower than set in "FBR".

3.3.1 Forced activation of fans

This function managed by the Fct parameter is designed to avoid short cycles of fans, that could happen when the controller is switched on or after a defrost, when the room air warms the evaporator. Functioning: if the difference of temperature between the evaporator and the room probes is more than the value of the Fct 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 Fnc = a or n (fans in parallel to the compression), by means of the Fan and Foc parameters the fans can be turned on and off every cycle even if the compressor is switched off. When the compressor is stopped the fans go on running for the Fct time. With Foc=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 a3A parameter, according to the kind of application. In the following paragraph the possible setting:

3.4.1 Auxiliary thermostat

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

Parameters involved:
- a3A: Kind of regulation for the auxiliary relay: HT, heating; CL, cooling;
- a5A: Set point for auxiliary relay;
- a6A: Differential for auxiliary relay;
- a7A: Probe for auxiliary relay;
- a8A: 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 SH 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 a3A = AUS and a5A = 1 (no probe for auxiliary output).

In the case the relay 1-3 can be activated only by digital input with if1 or if2 = AUS.

3.4.2 On/off relay – a3A = onf

In this case the relay is activated when the controller is turned on and deactivated when the controller is turned off.

3.4.3 Neutral zone regulation

With a3A = onf, the relay 1-3 can control a heater element to perform a neutral zone action. a3A out in = SET-HY a3A out out = SET

3.4.4 Second compressor

With a3A = onf, 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 a3A parameter. Both the compressors are switched off at the same time.

3.4.5 Alarm relay

With a3A = Alarm the relay 1-3 operates as alarm relay. It is activated every time an alarm happens.

3.4.6 Night blind management during energy saving cycles

With a3A = NES, the relay 1-3 operates to manage the night blind: the relay is energized when the energy saving cycle is activated, by digital input, front 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 confirms an operation.

(Def) to start a manual defrost.

(UP) To see the max. stored temperature: in programming mode it browse the parameter values.

(DOWN) To see the min. stored temperature: in programming mode it browse the parameter values.

(T) To switch the instrument OFF, if ON = OFF.

(T) To switch the light, if a3A = tig.

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 “99” 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, it’s necessary to program the time and date.
1. Enter the P1 menu, by pressing the SET + key 3x.
2. The rtc parameter is displayed. Press the SET key to enter the real time clock menu.
3. The Hr (hour) parameter is displayed.
4. Press the SET and set current hour by the UP and Down keys, then press SET to confirm the value.
5. Repeat the same operations on the Min (minutes) and d/a (day) parameters.
To exit: Press SET+UP keys or wait for 15s 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 value.
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 will be displayed and the “C” or “F” LED starts blinking;
3. To change the Set value push the + or - keys within 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’s value operate as follows:
1. Enter the Programming menu by pressing the SET + key 3x (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.

NOTE: the set value is stored only when the procedure is exited 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 (the “C” or “F” LED starts blinking).
2. Released the keys, then push again the Set + keys for more than 7s. The P2 label will be displayed immediately followed from the HY parameter.
3. NOW 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 a key.
NOTE: if some parameter is present in P1, after 3s the “NOF” message is displayed. Keep the keys pressed till the P2 message is displayed.
NOTE: the set value is stored even when the procedure is exited 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 “POF” 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 OFF Min temperature stored.
3. If a key is pressed more than 3s the “POF” message will be displayed.

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

6.9 THE CONTINUOUS CYCLE
When defined is in progress, it is activated by holding the “-” key pressed for about 3 seconds.
The compressor operates to maintain the “ccs” set point for the time set through the “CCS” parameter.
The cycle can be terminated before the end of the set time using the same activation key “-“ for 3 seconds.

6.10 THE ON/OFF FUNCTION

With “OFF=OFF”, pushing the ON/OFF key, 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 ON/OFF key.

WARNING: Loads connected 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

tc: Real time clock menu (only for controller with RTC), to set the time and date and defrost start time.

REGULATION

Hy: Differential (0.1°C + 25.5°C / 1-25.5 °C) function of the compressor Cut In is Set Point + differential (Hy). Compressor Cut Out is when the temperature reaches the set point.
LS: Minimum set point: (−5°C < SET < +25°C). Sets the minimum value for the set point.
US: Maximum set point: ( +25°C < SET < +280°C). Sets the maximum value for set point.
Or: Thermostat probe calibration: (−12.0°C to +12.0°C). Allows to adjust possible offset of the thermostat probe.
P2P: Evaporator probe presence: 0= not present; the defrost stops by temperature; 1= present; the defrost stops by time.
OE: Evaporator probe calibration: (−12.0°C to +12.0°C). Allows to adjust possible offset of the evaporator probe.
P3P: Third probe presence: 0= not present; the terminals 13-14 operate as digital input; 1= present; the terminals 13-14 operate as third probe.
P3: Third probe calibration: (−12.0°C to +12.0°C). Allows to adjust possible offset of the third probe.
P4P: Fourth probe presence: in= not present; y= present.
C4: Fourth probe calibration: (−12.0°C to +12.0°C). Allows to adjust possible offset of the fourth probe.
O4: Outputs activation delay at start up: (0-255ms). This function is enabled at the initial start up of the instrument and inhibits any output activation for the period of time set in the parameter.
AC: Anti-short cycle delay: (0-60 min) minimum interval between the compressor start and the following instant.
AC1: 1st compressor delay at start up: (0-60s). Used only if ac = c2. Time interval between the switching on of the first compressor and the second one.
Cnf: Percentage of the second and first probe for regulation (0=100; 100 = P1 + P2 = 120). It allows to set the regulation according to the percentage of the first and second probe, as for the following formula (m1=P1/100+P2).
Cnn: Compressor ON time during continuous cycle: (0-120s). Allows to set the length of the continuous cycle. The compressor stays on without interruption for the CCI time. Can be used, for instance, when the room is filled with new products.
CCI: Set point for continuous cycle: (0-150°C) it sets the set point used during the continuous cycle.
COn: Compressor ON time with faulty probe: (0-255 min) time during which the compressor is in active in case of faulty thermostat probe. With COn=0 compressor is always OFF.
COf: Compressor OFF time with faulty probe: (0-255 min) time during which the compressor is OFF in case of faulty thermostat probe. With COf=0 compressor is always active.

DISPLAY

CF: Temperature measurement unit: °C=°Celsius, °F=°Fahrenheit. WARNING: When the measuring unit is changed the SET point and the values of the parameters Hy, US, Ot, ALU and all 1.0°C are determined using the new unit.
RES: Resolution (°C) (in °C: 0.1°C allows decimal point display.)
INSTALLING AND OPERATING INSTRUCTIONS

CONDENSER TEMPERATURE ALARM

ALP Probe selection for temperature alarm of condenser; nP = no probe; P1 = thermostat probe; P2 = evaporator probe; P3 = display probe; P4 = Probe on Hot Key plug.

AL2 Low temperature alarm of condenser; (55-150°C) when this temperature is reached the LA2 alarm is signalled, possibly after the AD2 delay.

AH2 Differential for temperature alarm condenser temperature (0.1-25°C, 1-145°F) AD2 Condenser temperature alarm delay (0-255 min) time interval between the detection of the temperature control alarm and conditions signalling.

EdF Defrost temperature (only for controller with RTD): rtc = Real Time Clock mode. Defrost time follows Ld1=Ld6 parameters on weekdays and Sd5=66 on holidays.

idF Interval between defrost cycles (0-120h) Sets the time interval between the beginning of two defrost cycles.

MeF Maximum length for defrost (0-255min) When P2 = n, (not evaporator probe) timer delay) Sets the defrost duration, when P2 = y (defrost based on temperature) it sets the maximum length for defrost.

sdD Start defrost delay (0-99min) This is useful when different defrost start times are necessary to avoid overlapping the defrost cycles.

pdF Temperature displayed during defrost (r = real time; t = temperature at defrost start set = set point, def = "DEF" label)

AMAX MAX display delay after defrost (0-255min) Sets the maximum time between the end of defrost and the restarting of the real room temperature display.

Fft Drip time (0-120min) time interval between reaching defrost termination temperature and the restarting of the control's normal operation. This time allows the evaporator to eliminate water drops that might have formed during defrost.

dP0 First defrost after start-up (y = immediately, n = after the dFf delay)

AFD Defrost delay after continuous cycle. (0-23.5h) time interval between the end of the last freezing cycle and the following defrost delayed to it.

FANS FANs operating mode: C = runs with the compressor, OFF during defrost; n = continuous mode, OFF during defrost; C = runs with the compressor, ON during defrost; n = continuous mode, ON during defrost.

Fnd Fans delay after defrost (0-255min) interval between end of defrost and evaporator fans start.

Fct Temperature differential avoiding short cycles of fans (0-39°C, Fco=Function 6 disabled). If the difference of temperature between the evaporator and the room probe is more than the value of the Fct parameter, the fans are switched on.

FsT Fans stop temperature (50-50°C) setting of temperature, detected by evaporator probe, above which fans are switched OFF.

Fon Fan on time (0-15min) interval between the last freezing cycle and the following defrost delayed to it.

FAP Fan error for temperature alarm; nP = no probe, the auxiliary relay is switched only by button, P1 = Probe 1 (Thermostat probe), P2 = Probe 2 (evaporator probe), P3 = Probe 3 (display probe), P4 = Probe on Hot Key plug.

AUXILIARY THERMOSTAT CONFIGURATION (terms 1-3) = AUS = AUS

ACH Kind of regulation for auxiliary relay: Ht = heating; CL = cooling

SAA Set Point for auxiliary relay: (0.0-110°C, -58-230°F) it defines the room temperature setpoint to switch auxiliary relay.

SHY Differential for auxiliary output: (0.1 + 25°C (25 °F) Intervention differential for auxiliary output setpoint.

With ACH = Ht, AUS Cut In is SAA + Shy, AUS Cut out is SAA

With ACH = Ht, Ht Cut In is SAA + Shy, AUS Cut out is SAA

Ap Probe selection for auxiliary: nP = no probe, the auxiliary relay is switched only by button, P1 = Probe 1 (Thermostat probe), P2 = Probe 2 (evaporator probe), P3 = Probe 3 (display probe), P4 = Probe on Hot Key plug.

SdD Auxiliary delay off during: n = the auxiliary relay operates during defrost.

ALPR Probes selection for alarm; nP = no probe, the temperature alarms are disabled; P1 = Probe 1 (Thermostat probe), P2 = Probe 2 (evaporator probe), P3 = Probe 3 (display probe), P4 = Fourth probe.

ALC Temperature alarms configuration: (1d) – tE Absolute temperature alarm, temperature is given by the ALL or AUL values. tE = temperature alarms are referred to the set point. Temperature alarm is enabled when the temperature exceeds the "SET-ALL=" or "SET-AUL=" values.

ALL Max ALLHUM temperature alarm (20°C-120°C, 68°F-248°F) when this temperature is reached the alarm is enabled, after the "ALHUM" delay time.

ALL Minimum temperature alarm (50.0-SET °C, -58-230°F) When this temperature is reached the alarm is enabled, after the "ALMIN" delay time.

AHF Differential for temperature alarm fan recovery: (1.0+25°C, 1-45°F) Intervention differential for recovery of temperature alarm. It's also used for the restart of the fan when the FSI temperature is reached.

AL4 Maximum temperature alarm (0-255 min) time interval between the detection of an alarm condition and alarm signalling.

AL6 Alarm delay at start-up (from 0.0 min to 23.5h) time interval between the detection of the temperature alarm condition after instrument power on and alarm signalling.

DIGITAL INPUTS

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

1IF Digital input configuration (13-14): EAL = external alarm: "EA" message is displayed, bald = series alarm "CA" message is displayed, PAL = pressure switch alarm, "CA" message is displayed, derr = detective alarm function, def = activation of a defrost cycle, AUS = not enabled, HtE = kind of action inversion (cooling = heating), Fan does not set; ESh = Energy saving, Hf = Holiday defrost (enable only with RTD), oFF = to switch the controller off.

ddD (0-255 min) with Hf = EAL or (16 = BAL digital input alarm delay (13-14), delay between the detection of the external alarm condition and its signalling.

dF1s Digital input polar capacitor (15-19): with dF1 = defrost open, dF2 = with dF2 = Fan open, dF3 = with dF3 = Pressure switch function, time interval to calculate the number of the pressure switch actuation.

IF2 2nd digital input polarity (15-19): op = the digital input is activated by opening the contact; CL = the digital input is activated by closing the contact.

2IF 2nd digital input configuration (13-19): EAL = external alarm: "EA" message is displayed, bald = series alarm "CA" message is displayed, PAL = pressure switch alarm, "CA" message is displayed, derr = detective alarm function, def = activation of a defrost cycle, AUS = not enabled, HtE = kind of action inversion (cooling = heating), Fan does not set; ESh = Energy saving, Hf = Holiday defrost (enable only with RTD), oFF = to switch the controller off.

ddD (0-255 min) with 2F1 = EAL or (16 = BAL digital input delay (13-19), delay between the detection of the external alarm condition and its signalling.

dF1s Digital input polar capacitor (15-19): with dF1 = defrost open, dF2 = with dF2 = Fan open, dF3 = with dF3 = Pressure switch function, time interval to calculate the number of the pressure switch actuation.

nPS Pressure switch number. (0.1 15) Number of activation of the pressure switch, during the "dY" interval, beforesignalling the alarm event (0=OFF, P=AL.

If the nPS activation in the dY time is reached, switch off and on the instrument to reset normal regulation.

docF Compressor and fan status when open door: no = normal; Fan = Fan OFF, Cph = CPH OFF, F1 = Fan 1 OFF, C1 = CPH1 OFF.

rdt Outputs restart after doa alarm: no = NOT affected by the doa alarm, yes = outputs restart with the doa alarm.

HfE Temperature increase during the Energy Saving cycle (0°C-30°C, 32°F-86°F) it sets the increasing value of the set point during the Energy Saving cycle.

SET TO CURRENT TIME AND WEEKLY HOLIDAYS (ONLY FOR MODELS WITH RTC)

Hr Current hour (0-23h)

Min Current minute (0-59min)

dAY Current day (Sd1 = Sun)

Hh1 First weekly holiday (Sun = nu) Set the first day of the week which follows the holiday time.

Hh2 Second weekly holiday (Sun = nu) Set the second day of the week which follows the holiday time.

N.B. Hb/Hh2 can be set also as "nu" value (Not Used)
8. DIGITAL INPUTS

The first digital input 13-14 is enabled with P3P = n
With P3P = n and (1F = 0) the second digital input is disabled
The free voltage digital inputs are programmable by the "1F" and "2F" parameters.

8.1 GENERIC ALARM (1F or 2F = EAL)

As soon as the digital input is activated the unit will wait for "dld" time delay before signalling the "EAL" alarm message. The outputs status don't change. The alarm stops just after the digital input is de-activated.

8.2 SERIOUS ALARM MODE (1F or 2F = bAL)

When the digital input is activated, the unit will wait for "dld" delay before signalling 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 2F = PAL)

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

8.4 DOOR SWITCH INPUT (1F or 2F = dor)

It signals the door status and the corresponding relay output status through the "edc" parameter. The normal regulation will restart only if the digital input is disabled otherwise the instrument will wait until the "MDF" safety time is expired.

8.5 START DEFROST (1F or 2F = 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 "MDF" safety time is expired.

8.6 SWITCH THE AUXILIARY RELAY (1F or 2F = AUS)

With AUS = AUS the digital input switches the status of the auxiliary relay.

8.7 INVERSION OF THE KIND OF ACTION: HEATING-COOILING (1F or 2F=Htr)

This function allows to invert the regulation of the controller: from cooling to heating and vice versa.

8.8 ENERGY SAVING (1F or 2F = E)

The Energy Savings feature allows to change the set point value as the result of the SET+HES parameter. This function is enabled until the digital input is activated.

8.9 HOLIDAY DEFROST (1F or 2F = HDF) -ONLY FOR MODELS WITH RTC

This function enables the holiday defrost setting.

8.10 ON OFF FUNCTION (1F or 2F = onF)

To switch the controller on and off.

8.11 DIGITAL INPUTS POLARITY

The digital input polarity depends on the "1F" and "2F" parameters.
- If or 2F = CL, the input is activated by closing the contact.
- If = 0 the input is activated by opening the contact.

9. TTL SERIAL LINE - FOR MONITORING SYSTEMS

The TTL serial line, available through the HOT KEY connector, allows by means of the external TTTLS485 converter, X464-CX, to connect the instrument to a monitoring system ModBUS-RTU compatible such as the X-WEBS000/000/300.

10. X-REP OUTPUT – OPTIONAL

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

To connect the X-REP to the instrument the following connectors must be used:
- CAB/REP1(1m), CAB/REP2 (2m), CAB/REP3 (5m).

11. INSTALLATION AND MOUNTING

The controller XW60L shall be mounted on vertical panel, in a 150x31 mm hole, and fixed using two screws of 3 x 2mm. To obtain an IPRS protection grade use the front panel rubber gasket (mod. RO-41). The temperature range allowed for correct operation is 0 - 60 °C. Avoid places subject to strong vibrations, corrosive gases, excessive dirt or humidity. The same recommendations apply to probes.

Let the air circulation by the cooling holes.

12. ELECTRICAL CONNECTIONS

The instruments are provided with screw terminal block to connect cables with a cross section up to 2.5 mm² for the 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 instruments 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.

N.B. Maximum current allowed for all the loads is 20A.

12.1 PROBE CONNECTION

The probes shall be mounted with the bulb upwards to prevent damages due to casual liquid addition. It is recommended to place the thermostat 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 "key": the "wPL" message appears followed by flashing "End".
3. Push "SET" key 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 "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 "dld" 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>&quot;P1&quot;</td>
<td>Room probe failure</td>
<td>Compressor output</td>
</tr>
<tr>
<td>&quot;P2&quot;</td>
<td>Evaporator probe failure</td>
<td>Compressor output</td>
</tr>
<tr>
<td>&quot;P3&quot;</td>
<td>Third probe failure</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>&quot;P4&quot;</td>
<td>Fourth probe failure</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>&quot;L1&quot;</td>
<td>Maximum temperature</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>&quot;L2&quot;</td>
<td>Condenser high</td>
<td>Temperature</td>
</tr>
</tbody>
</table>
14.1. SILencing BUZZER / ALARM RELAY OUTPUT

If ‘b’ = 0, the buzzer and the relay are silenced by pressing any key.
If ‘b’ = 1, only the buzzer is silenced while the alarm relay is on until the alarm condition recovers.

14.2. ALARM RECOVERY

Probe alarms P1, P2, P3 and P4 start some seconds after the fault in the related probe, they automatically stop some seconds after the probe returns to normal operation. Check connections before replacing the probe.

Temperature alarms ‘LA’, ‘LA’ and ‘L2’ automatically stop as soon as the temperature return to normal values.

Alarm ‘EA’ and ‘CA’ (with IF=FAIL) recover as soon as the digital input is disabled.
Alarm ‘CA’ (with IF=FAIL) recovers only by switching off and on the instrument.

14.3. OTHER MESSAGES

No P: Keyboard unlocked.
No P: In programming mode: none parameter is present in P.

15. TECHNICAL DATA

- Housing: self-extinguishing ABS.
- Case: fibra 30x165 mm, depth 25 mm.
- Mounting: panel mounting in a 150x31 mm panel out with two screws, or 3 x 2 mm.
- Distance between the holes 16 mm.
- Protection: IP20, Frontal protection: IP65 with frontal gasket mod RG-L. (optional)
- Connections: Screw terminal block. 2.5 mm² heat-resistant wiring and 6.3 mm fasten.
- Power supply: 230VAC or 110VAC or 24Vac ±10%.
- Power absorption: 5VA, max.
- Display: 3 digits, red LED, 14.2 mm high.
- Display: 3 digits, red LED, 14.2 mm high. Inputs: Up to 4 NTC or PTC probes.
- Digital inputs: 2 free voltage.
- Relay outputs: Total current on loads MAX 20A.
- compressor: relay 8SP7 A, 250Vac.
- light: relay 8SP7 8A (16) A, 250Vac.
- fans: relay 8SP7 A, 250Vac.
- defrost: relay 8SP7 A, 250Vac.
- Other output: buzzer (optional).
- Serial output: TTL: standard communication protocol: Modbus - RTU.
- Data storing: on non-volatile memory (EEPROM).
- Internal clock back-up: 24 hours (only for model with RTC).
- Kind of action: 18. Polarization: 2. Software class A.
- Rated Impulsive voltage: 2500V, Over voltage Category: II.
- Operating temperature: -20°C to 55°C, Storage temperature: -30°C to 85°C.
- Relative humidity: 20-85% (no condensation).
- Resolution: 0.1°C or 1°F (selectable).
- Accuracy (ambient temp. 25°C): ±0.5°C or ±1°F.

16. CONNECTIONS

Supply: 120Vac or 24Vac; connect to terminals 11-12.

The X-RSP output is optional.

The light relay can be also (5GA) according to the model.

17. DEFAULT SETTING VALUES

<table>
<thead>
<tr>
<th>Label</th>
<th>Default Name</th>
<th>Range</th>
<th>°C/F</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>rts</td>
<td>Real time clock menu</td>
<td>-</td>
<td>-</td>
<td>PT1</td>
</tr>
<tr>
<td>Hy</td>
<td>Differential</td>
<td>0.1-25.5°C/1-250°F</td>
<td>2.0</td>
<td>PT1</td>
</tr>
<tr>
<td>LS</td>
<td>Maximum set point</td>
<td>0°C-35°C/32°F</td>
<td>30.0</td>
<td>P2</td>
</tr>
<tr>
<td>US</td>
<td>Maximum set point</td>
<td>-15°C-100°C/-15°F-392°F</td>
<td>119 P2</td>
<td></td>
</tr>
<tr>
<td>Ot</td>
<td>Thermostat control calibration</td>
<td>12°C-12°C (12°C-12°C)</td>
<td>9.0</td>
<td>Pt1</td>
</tr>
<tr>
<td>P2P</td>
<td>Evaporator probe calibration</td>
<td>-12°C-12°C (12°C-12°C)</td>
<td>0.0</td>
<td>P2</td>
</tr>
<tr>
<td>OE</td>
<td>Evaporator probe calibration</td>
<td>-12°C-12°C (12°C-12°C)</td>
<td>0.0</td>
<td>P2</td>
</tr>
<tr>
<td>T3</td>
<td>Third probe calibration</td>
<td>-12°C-12°C (12°C-12°C)</td>
<td>0.0</td>
<td>P2</td>
</tr>
<tr>
<td>T4</td>
<td>Fourth probe calibration</td>
<td>-12°C-12°C (12°C-12°C)</td>
<td>0.0</td>
<td>P2</td>
</tr>
<tr>
<td>06</td>
<td>Outputs delay at start up</td>
<td>0-255 min</td>
<td>0.0</td>
<td>P2</td>
</tr>
</tbody>
</table>

1202072050 XW60L RTC O/B 1.02 07.06.2008.doc XW60L 5V6
<table>
<thead>
<tr>
<th>Label</th>
<th>Name</th>
<th>Range</th>
<th>°C/°F</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ld51</td>
<td>1st workdays defrost start</td>
<td>0 – 23h 50 min. - nu</td>
<td>6.0</td>
<td>nc.</td>
</tr>
<tr>
<td>Ld52</td>
<td>2nd workdays defrost start</td>
<td>0 – 23h 50 min. - nu</td>
<td>13.0</td>
<td>nc.</td>
</tr>
<tr>
<td>Ld53</td>
<td>3rd workdays defrost start</td>
<td>0 – 23h 50 min. - nu</td>
<td>21.0</td>
<td>nc.</td>
</tr>
<tr>
<td>Ld54</td>
<td>4th workdays defrost start</td>
<td>0 – 23h 50 min. - nu</td>
<td>0.0</td>
<td>nc.</td>
</tr>
<tr>
<td>Ld55</td>
<td>5th workdays defrost start</td>
<td>0 – 23h 50 min. - nu</td>
<td>0.0</td>
<td>nc.</td>
</tr>
<tr>
<td>Sd51</td>
<td>1st holiday defrost start</td>
<td>0 – 23h 50 min. - nu</td>
<td>6.0</td>
<td>nc.</td>
</tr>
<tr>
<td>Sd52</td>
<td>2nd holiday defrost start</td>
<td>0 – 23h 50 min. - nu</td>
<td>13.0</td>
<td>nc.</td>
</tr>
<tr>
<td>Sd53</td>
<td>3rd holiday defrost start</td>
<td>0 – 23h 50 min. - nu</td>
<td>21.0</td>
<td>nc.</td>
</tr>
<tr>
<td>Sd54</td>
<td>4th holiday defrost start</td>
<td>0 – 23h 50 min. - nu</td>
<td>0.0</td>
<td>nc.</td>
</tr>
<tr>
<td>Sd55</td>
<td>5th holiday defrost start</td>
<td>0 – 23h 50 min. - nu</td>
<td>0.0</td>
<td>nc.</td>
</tr>
<tr>
<td>Adr</td>
<td>Serial address</td>
<td>1-247</td>
<td>1</td>
<td>Pr2</td>
</tr>
<tr>
<td>Pcb</td>
<td>Kind of probe</td>
<td>Pto: pol.</td>
<td>int.</td>
<td>Pr2</td>
</tr>
<tr>
<td>onF</td>
<td>On/off key enabling</td>
<td>nu: off; ES: on</td>
<td>off</td>
<td>Pr2</td>
</tr>
<tr>
<td>dp1</td>
<td>Room probe display</td>
<td>--</td>
<td>-</td>
<td>Pr2</td>
</tr>
<tr>
<td>dp2</td>
<td>Evaporator probe display</td>
<td>--</td>
<td>-</td>
<td>Pr2</td>
</tr>
<tr>
<td>dp3</td>
<td>Third probe display</td>
<td>--</td>
<td>-</td>
<td>Pr2</td>
</tr>
<tr>
<td>dp4</td>
<td>Fourth probe display</td>
<td>--</td>
<td>-</td>
<td>Pr2</td>
</tr>
<tr>
<td>rSe</td>
<td>Real set</td>
<td>actual set</td>
<td>-</td>
<td>Pr2</td>
</tr>
<tr>
<td>rEL</td>
<td>Software release</td>
<td>--</td>
<td>1.0</td>
<td>Pr2</td>
</tr>
<tr>
<td>Ptb</td>
<td>Map code</td>
<td>--</td>
<td>Pr2</td>
<td></td>
</tr>
</tbody>
</table>

* Only for model with real time clock
* Only for XW60L with X-REP output

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