UNDER COUNTER WINDOW DISPLAY

E

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° 2009/149/CE : Low tension
- Directive N° 97/23/EC (P.E.D.) : European Pressure Equipment
- 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]

| 1. Commercial name of the unit | 8. Refrigerant type |
| 2. Identification number | 9. Refrigerant type |
| 3. Production date | 10. Refrigerant weight |
| 4. Voltage | 11. Climatic rate (Cl. 3 = -25°C/60% U.R.; Cl. 4 = +30°C/55% U.R.) |
| 5. Phases | 12. Test pressure – system high pressure side |
| 6. Frequency | 13. Test pressure – system low pressure side |
| 7. Compressor type | 14. Nominal power/current absorbed during defrost |
| 8. Number of compressor | 15. Max. power absorbed during defrost |
| 9. Refrigerant type | 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 not to 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 consistence.

- 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 along 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 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 cabinet.
- The electric connection has to be made by qualified personnel 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 soup; rinse abundantly and wipe off with a soft cloth.</td>
<td>weekly</td>
</tr>
<tr>
<td></td>
<td>Do not use abrasive products</td>
<td></td>
</tr>
<tr>
<td>Plastic surfaces’ cleaning</td>
<td>Wash exclusively with warm water and neutral soup; rinse abundantly and wipe off with a soft cloth.</td>
<td>weekly</td>
</tr>
<tr>
<td></td>
<td>Do not use alcohol, acetone and any solvent that might spoil the look and structure of the material.</td>
<td></td>
</tr>
<tr>
<td>Glass surfaces’ cleaning</td>
<td>Use only specific products for glass cleaning</td>
<td>daily</td>
</tr>
<tr>
<td></td>
<td>Using water alone might lead to calcareous deposits on the glass surfaces</td>
<td></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 of the unit.</td>
<td>Waiting for qualified assistance</td>
</tr>
<tr>
<td></td>
<td>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></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.</td>
<td>max. 15 DAYS</td>
</tr>
<tr>
<td></td>
<td>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.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Before re-starting the unit, make sure that frost has totally melted and wipe carefully.</td>
<td></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).
| AGD | DIGITAL FLAVOURS DISPLAY FEEDER | RES28 | FRONT GLASS LOWER FRAME HEATING ELEMENT |
| AEL | ELECTRONIC BALLAST | RES29 | FRONT GLASSES COUPLING PROFILE HEATING ELEMENT |
| AP  | SERVICE VALVE | RES30 | DOORS FRAME MIDDLE POST HEATING ELEMENT |
| CA  | SUPPLY CABLE | RES31 | GLASSES PERIMETRAL FRAME HEATING ELEMENT |
| CAR | AIR CONDENSER | RES32 | HEATED DOORS HEATING ELEMENTS |
| CE  | ELECTRONIC CONTROL | RES33 | WATER DRAIN HEATING ELEMENT |
| CN  | MULTIPOLAR CONNECTOR | RES34 | FRAMES FRAME HEATING ELEMENT |
| CO  | COMPRESSOR | RES35 | COMPRESSOR CRANKCASE HEATING ELEMENT |
| D   | DIOX | RES36 | FRONT GLASS FRAME HEATING ELEMENT |
| DEV | SHUNT | REV | CONDENSER FAN SPEED CONTROL |
| DR  | REMOTE DISPLAY | REVC | CONDENSER FAN RELAY |
| EM  | PHOTOCELLL EMITTER | RI | REFRIGERANT TAP |
| EV  | EVAPORATOR | RIC | COMPRESSOR DELAYER |
| F   | FUSE | RICV | PHOTOCELL RECEIVER |
| FD  | FILTER DRIER | RIS | RESERVE, ANTI-FOG HEATING ELEMENT |
| FLU | WATER FLOW SWITCH | RL | LIQUID RECEIVER |
| FR | COMPRESSOR THERMAL PROTECTION | RLA | WATER LEVEL ELECTRONIC CONTROL |
| IL  | COMPRESSOR ALARM LIGHT | RO | OIL HEATER ELEMENT |
| IEC | GENERIC SWITCH | SAA | ABSENCE OF WATER LIGHT |
| IGD | DIGITAL FLAVOURS DISPLAY | SC | CONDENSER PROBE |
| IL  | LIGHTING SWITCH | SD | TERMINAL BOX |
| ILG | FLAVOURS DISPLAY LIGHTING | SDC | COMPRESSOR TERMINAL BOX |
| LIP | REAR LIGHTING | SE | PROXIMITY SENSOR |
| MDIG | DIGITAL MODULE FOR FLAVOURS DISPLAY | SEC | MAIN SWITCH |
| MM | SPINNING SHELVES ELECTRIC MOTOR | SEV | TANK BOTTOM HEATING COIL |
| MUC | CONDENSING UNIT ELECTRIC CONNECTIONS | SEDG | FLAVOURS DISPLAY DIGITAL SYSTEM |
| PA | HIGH PRESSURE CONTROL | SEL | LIQUID SEPARATOR |
| PD | HIGH-LOW PRESSURE CONTROL | SLA | WATER LEVER PROBE |
| PO | WATER PUMP | SPMC | WARM SHELF LIGHT |
| QE | EXTERNAL ELECTRIC PANEL | SPR | ELECTRIC SUPPLY LIGHT |
| QF | MAGNETIC-THRERMIC SWITCH | SPS | DEFROSTING LIGHT |
| R  | LIGHTING BALLAST | SS | DEFROSTING PROBE |
| RADD | RECTIFIER | ST | TEMPERATURE PROBE |
| REL | GENERIC RELAY | STR | LIGHTING STARTER |
| REP | ELECTRONIC CONTROL TEMPERATURE REPEATER | SU | HUMIDITY PROBE |
| RES1 | COLD AIR DISCHARGE HEATING ELEMENT | TI | TEMPERATURE CONTROL |
| RES2 | FRONT PROFILE HEATING ELEMENT | TC | WINTER THERMOSTAT |
| RES3 | RIGHT/LEFT GLASS HEATING ELEMENT | TE | CAPILLARY TUBE |
| RES4 | FRONT GLASS HEATING ELEMENT | TEH | TIMER |
| RES5 | DEFROST HEATING ELEMENT | TER | THERMOMETER |
| RES6 | WATER EVAPORATION HEATING ELEMENT | TF | FUSIBLE PLUG |
| RES7 | TOP LIGHTING FIXTURE HEATING ELEMENT | TMC | WARM SHELF THERMOSTAT |
| RES8 | LATERAL GLASS SUPPORT HEATING ELEMENT | TP | LIGHTING FIXTURES REFRIGERATOR THERMOMETER |
| RES9 | FRONT BAND HEATING ELEMENT | TRA | TRANSFORMER |
| RES10 | COUPLING BAND HEATING ELEMENT | TRC | ELECTRONIC CONTROL TRANSFORMER |
| RES11 | SERVICE TOP HEATING ELEMENT | TREV | WATER EVAPORATION HEATER ELEMENT THERMOSTAT |
| RES12 | UPPER BAND DOOR FRAME HEATING ELEMENT | TS | SECURITY THERMOSTAT |
| RES13 | HOT DRY/BAIN MARIE DISPLAY HEATING ELEMENT | TVC | CONDENSER THERMOSTAT |
| RES14 | ANTI-FOG SUCTION AIR BAND HEATING ELEMENT | V | COMPRESSOR THERMOSTAT |
| RES15 | WARM SHELF HEATING ELEMENT | VCC | WINTER THERMOSTAT |
| RES16 | SIDE BANDS' FRONT GLASS HINGE HEATING ELEMENT | VEC | CONDENSER FAN |
| RES17 | DEHUMIDIFICATION HEATING ELEMENT | VES | WATER EVAPORATION BIN |
| RES18 | DEFROSTING WATER DRAIN HEATING ELEMENT | VFA | EXPANSION VALVE |
| RES19 | RING FRAME HEATING ELEMENT | VFA | INTERNAL TANK |
| RES20 | SIDE BAND HEATING ELEMENT | VFA | CONDENSING PRESSURE CONTROL WATER VALVE |
| RES21 | SUCTION AIR GLASS HEATING ELEMENT | VR | CHECK VALVE |
| RES22 | OUTLET AIR HEATING ELEMENT | VRA | SUCTION PRESSURE REGULATION VALVE |
| RES23 | REAR GLASS HEATING ELEMENT | VRE | EVAPORATING PRESSURE REGULATION VALVE |
| RES24 | INTERNAL GLASS HEATING ELEMENT | VSF | GENERAL USE SOLENOID VALVE |
| RES25 | FRONT GLASS UPPER FRAME HEATING ELEMENT | VSA | SOLENOID WATER VALVE |
| RES26 | FRONT GLASS LOWER/LOWER FRAME HEATING ELEMENT | VSA | BY-PASS SOLENOID WATER VALVE |
| RES27 | FRONT GLASS LOWER FRAME HEATING ELEMENT | VSIC | REVERSING CYCLE SOLENOID VALVE |
| RES28 | FRONT GLASS LOWER FRAME HEATING ELEMENT | VSL | LIQUID SOLENOID VALVE |
| RES29 | FRONT GLASS LOWER FRAME HEATING ELEMENT | VSS | DEFROSTING SOLENOID VALVE |
| RES30 | DOORS FRAME MIDDLE POST HEATING ELEMENT | VT | POWER REGULATOR |
| RES31 | GLASSES PERIMETRAL FRAME HEATING ELEMENT | VV | GLASS FAN |
| RES32 | HEATED DOORS HEATING ELEMENTS | X1 | CABINET CONNECTIONS |
| RES33 | WATER DRAIN HEATING ELEMENT | X2 | EXTERNAL ELECTRIC PANEL CONNECTIONS |
| RES34 | FRAMES FRAME HEATING ELEMENT | X3 | CONDENSING UNIT CONNECTIONS |
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 hereunder. 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.
- Fit the probe where it is not possible to be used 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 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).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

2. GENERAL DESCRIPTION

Model XW60L, formal 38x185mm, is microprocessor based controller, suitable for applications on medium or low temperature ventilated refrigerating units. It has 4 relay outputs to control compressor, fan, defrost, which can be either electrical or reverse cycle (hot gas) and light (configurable). It could be provided with a Real Time Clock which allows programming of up to 6 daily defrost cycles, divided into holidays and workdays. A “Day and Night” function with two different set points is fitted for energy saving. It is also provided with up to four NTC or PTC probe inputs, the first 2 for defrost cycles, divided into holidays and workdays. A “Day and Night” function with two different set points is fitted for energy saving.

The instrument shall not be used for purposes different from those described hereunder. It cannot be used as a safety device.

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 the set point plus differential the compressor is started and then turned off when the temperature reaches the set point value again.

3.2 DEFROST

Two defrost modes are available through the "Defrost" parameter: defrost through electrical heater (Defrost = EL) and hot gas defrost (Defrost = HGD). The defrost interval depends on the presence of the RTC (optional). If the RTC is present is medium or low temperature ventilated refrigerating units. It has 4 relay outputs to control compressor, fan, defrost, which can be either electrical or reverse cycle (hot gas) and light (configurable).

3.3 CONTROL OF EVAPORATOR FANS

The fan control mode is selected by means of the "FnC" parameter:
- FnC = C: fans will switch ON and OFF with the compressor and not run during defrost;
- FnC = o,n: fans will run even if the compressor is off, and not run during defrost;
- After defrost, there is a timed fan delay allowing for drip time, set by means of the "Fon" parameter.

An additional parameter "FSt" 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 the temperature is lower than set in "FSt".

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 Fcrt=0 the function is disabled.

3.3.2 Cyclical activation of the fans with compressor off.

When FnC = o (fans in parallel to the compressor), by means of the Fon and Fof parameters the fans can carry 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 oA3 parameter, according to the kind of application. In the following paragraph the possible setting:

3.4.1 Auxiliary thermostat

I.E. anti 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; cl: cooling;
- SAA Set point for auxiliary relay
- Sht Differential for auxiliary relay
- APr Probe for auxiliary relay
- Sdd 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 Sht 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 oA3 = AUS and APr = n (no probe for auxiliary output).

In this case the relay 1-3 can be activated only by digital input with IF1 or IF2 = AUS.

3.4.2 On/off relay – oA3 = onF

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

3.4.3 Neutral zone regulation

With oA3 = db the relay 1-3 can control a heater element to perform a neutral zone action.

3.4.4 Second compressor

With oA3 = CP2, 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 ACh parameter. Both the compressors are switched off at the same time.

3.4.5 Alarm relay

With oA3 = AL the relay 1-3 operates as alarm relay. It is activated every time an alarm happens. Its status depends on the tba parameter: if "tba = y", the relay is silenced by pressing any key. If "tba = n", the alarm relay remains on until the alarm condition recovers.

3.4.6 Night blind management during energy saving cycles

With oA3 = 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 FRONT 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 max. stored temperature; in programming mode it browse the parameter codes or increases the displayed value.

Down: to see the min. stored temperature; in programming mode it browse the parameter codes or decreases the displayed value.

To switch the instrument off, if onF = off.

To switch the light, if oA3 = Lig.

KEY COMBINATIONS:

To lock & unlock the keyboard.
4. USE OF LEDS

Each LED function is described in the following table.

<table>
<thead>
<tr>
<th>LED MODE</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>ON</strong></td>
</tr>
<tr>
<td></td>
<td>Compressor enabled</td>
</tr>
<tr>
<td></td>
<td>Anti-short cycle delay enabled</td>
</tr>
<tr>
<td></td>
<td>Defrost enabled</td>
</tr>
<tr>
<td></td>
<td>Drip time in progress</td>
</tr>
<tr>
<td></td>
<td>Fans enabled</td>
</tr>
<tr>
<td></td>
<td>Fans delay after defrost in progress</td>
</tr>
<tr>
<td></td>
<td>An alarm is occurring</td>
</tr>
<tr>
<td></td>
<td>Continuous cycle is running</td>
</tr>
<tr>
<td></td>
<td>Energy saving enabled</td>
</tr>
<tr>
<td></td>
<td>Light on</td>
</tr>
<tr>
<td></td>
<td>Auxiliary relay on</td>
</tr>
<tr>
<td></td>
<td>Measurement unit</td>
</tr>
<tr>
<td></td>
<td>Flashing Programming phase</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. MAX & MIN TEMPERATURE MEMORIZATION

5.1 HOW TO SEE THE MIN TEMPERATURE

1. Press and release the °C or °F key.
2. The “Lo” message will be displayed followed by the minimum temperature recorded.
3. By pressing the °C or °F 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 °C or °F key.
2. The “Hi” message will be displayed followed by the maximum temperature recorded.
3. By pressing the °C or °F 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/Lo message will be displayed)
2. To confirm the operation the “SFr” 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 day.

1. Enter the Pr1 programming menu, by pushing the SET + UP keys for 3s.
2. The rtc parameter is displayed. Push the SET key to enter the real time clock menu.
3. The Hour (hour) 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 sec 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 °C or °F arrows 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 mode by pressing the SET + °C or °F 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 15s without pressing a key.

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 + °C keys for 3s (the °C or °F LED starts blinking).
2. Release the keys, then push again the SET + °F keys for more than 7s. The Pr2 label will be displayed immediately followed from the HY parameter.

NOW YOU ARE IN THE HIDDEN MENU.

3. Select the required parameter.
4. Press the “SET” key to display its value.
5. Use °C or °F to change its value.
6. Press “SET” to store the new value and move to the following parameter.

NOTE1: If none parameter is present in Pr1, after 3s the “noP” message is displayed. Keep the keys pushed till the Pr2 message is displayed.

NOTE2: 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 + °F”. In HIDDEN MENU when a parameter is present in First Level the decimal point is on.

6.7 HOW TO LOCK THE KEYBOARD

Keep pressed together for more than 3s the °C and °F keys, till the “Pon” message will be displayed.

6.8 TO UNLOCK THE KEYBOARD

With °C or °F, 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: If none parameter is present in Pr1, after 3s the “noP” message is displayed.

6.9 THE CONTINUOUS CYCLE

When defrost is not in progress, it can be activated by holding the °C or °F key for about 3 seconds. The compressor operates to maintain the “ccF” set point for the time set through the “ccC” parameter. The cycle can be terminated before the end of the set time using the same activation key °C or °F for 3 seconds.

6.10 THE ON/OFF FUNCTION

With °C or °F, 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: If none parameter is present in Pr1, after 3s the “noP” message is displayed.

7. PARAMETERS

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

REGULATION

Hy Differential: (0.1÷25.5°C [0÷25°F]) Intervention differential for set point. Compressor Cut IN is Set Point + differential (Hy). Compressor Cut OUT is when the temperature reaches the set point.

LS Minimum set point: (-30°C [2°F]÷SET÷50°F[SET]) Sets the minimum value for the set point.

US Maximum set point: (SET÷110°C [SET÷200°F]) Sets the maximum value for set point.

OT Thermostat probe calibration: (-12.0÷12.0°C [120÷120°F]) Allows to adjust possible offset of the thermostat probe.

P3P Evaporator probe presence: n = not present; the defrost stops by time; y = present: the defrost stops by temperature.

OE Evaporator probe calibration: (-12.0÷12.0°C [120÷120°F]) Allows to adjust possible offset of the evaporator probe.

P3P Third probe presence (P3): n = not present; the terminals 13-14 operate as digital input; y = present; the terminals 13-14 operate as third probe.

P3S Third probe calibration (P3): (-12.0÷12.0°C [120÷120°F]) Allows to adjust possible offset of the third probe.

P4P Fourth probe presence: (n = Not present; y = present).

P4H Fourth probe calibration: (-12.0÷12.0°C) Allows to adjust possible offset of the fourth probe.

US 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÷50 min) Minimum interval between the compressor stop and the following restart.

AC1 Anti-short compressor delay at start up (0÷255s) Used only if oA3 = cP2 Time interval between the switching on of the first compressor and the second one.

rT Percentage of the second and first probe for regulation (0÷100; 100 = P1; 0 = P2): it allows to set the regulation according to the percentage of the first and second probe, as for the following formula (oP1/P2)×100 + P2).

CC1 Compressor ON time during continuous cycle: (0.0÷24.0h; res. 10min) Allows to set the length of the continuous cycle: compressor stays on without interruption for the CCI cycle. Can be used, for instance, when the room is filled with new products.

CCS Set point for continuous cycle: (0÷150°C) It sets the set point used during the continuous cycle.

CCn Compressor ON with faulty probe: (0÷255 ms) Time during which the compressor is active in case of faulty thermostat probe. With COF=0 compressor is always OFF.

COF Compressor OFF time with faulty probe: (0÷255 ms) Time during which the compressor is OFF in case of faulty thermostat probe. With COF=0 compressor is always OFF.

CF Temperature measurement unit: °C=Celsius; °F=Farhenheit. WARNING: When the measurement unit is changed the SET point and the values of the parameters Hy, LS, US, OT, ALU and ALL have to be checked and modified if necessary.

rES Resolution for °C (°F = 1°C; rE = 0.1°C) Allows decimal point display.
**Installing and Operating Instructions**

**CONDENSER TEMPERATURE ALARM**

AP2 Probe selection for temperature alarm of condenser: npr = no probe; P1 = thermostat probe; P2 = evaporator probe; P3 = configurable probe; P4 = Probe on Hot Key plug.

AU2 Low temperature alarm of condenser: (0÷-55°C) when this temperature is reached the H2 alarm is signalled, possibly after the AD2 delay.

**X-REP Display (optional):** (P1, P2, P3, P4, SET, dr) it selects which probe is displayed when X-REP is: P1 = thermostat probe; P2 = evaporator probe; P3 = third probe (for this option enabled); P4 = Fourth probe; SET = point set; dr = percentage of visualization.

**Display delay:** (0÷20.0s; res. 10s) when the temperature increases, the display is updated 1°C/1min after this time.

**Ld2 Condenser temperature alarm delay:** (0÷255 min) time interval between the detection of the condenser alarm condition and alarm signalling.

**Alarming:** Condenser temperature alarm exclusion at start up: from (0.0 min to 23.9 min) time interval between the detection of the temperature alarm condition after instrument power on and alarm signalling.

**OTHER**

Adr Serial address (1÷244): identifies the instrument address when connected to a ModBUS compatible monitoring system.
8. DIGITAL INPUTS

The first digital input i1F or i2F is an input for high and low temperature alarms. If the digital input is activated, the unit will wait for "did" time delay before signalling the "CA" alarm message. The relay outputs are switched OFF. The alarm stops as soon as the digital input is deactivated.

8.1 GENERIC ALARM (i1F or i2F = EAL)

When the digital input is activated, the unit will wait for "did" time delay before signalling the "CA" alarm message. The relay outputs are switched OFF. The alarm stops as soon as the digital input is deactivated.

8.2 SERIOUS ALARM MODE (i1F or i2F = EAL)

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

8.3 PRESSURE SWITCH (i1F or i2F = PAL)

If during the interval time set by "did" 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 (i1F or i2F = dor)

It signals the status of the auxiliary relay. The unit will switch the status of the auxiliary relay.

8.5 START DEFROST (i1F or i2F = 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 "MF" safety time is expired.

8.6 SWITCH THE AUXILIARY RELAY (i1F or i2F = AUS)

With i1F=AUS the digital input switched the status of the auxiliary relay

8.7 INVERSION OF THE KIND OF ACTION: HEATING-COOLING (i1F or i2F=H\(\text{H}\))

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

8.8 ENERGY SAVING (i1F or i2F = ES)

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

8.9 HOLIDAY DEFROST (i1F or i2F = HDF) – ONLY FOR MODELS WITH RTC

This function enabled the holiday defrost setting.

8.10 ON OFF FUNCTION (i1F or i2F = onF)

To switch the controller on and off.

8.11 DIGITAL INPUTS POLARITY

The digital input polarity depends on the i1F and i2F parameters.

iF or i2F=CL: the input is activated by closing the contact.
iF or i2F=OP: 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 TTLRS485 converter, XJ485-CX, to connect the instrument to a monitoring system ModBUS-RTU compatible such as the X-WEBS500/3000300.

10. X-REP OUTPUT – OPTIONAL

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

To connect the X-REP to the instrument the following connectors must be used:

- CAB/REP1 (1m), CAB/REP2 (2m), CAB/REP5 (5m),

11. INSTALLATION AND MOUNTING

The controller XW60L shall be mounted on vertical panel, in a 150x63 mm hole, and fixed using two screws 3 x 3 mm. To obtain an improved protection use the front panel rubber gasket (mod. RG-L). 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 circulate 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 (0,3mm²). 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.

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 infiltration. 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 must 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 message appears followed by flashing "End".
3. Push "SET" key and the End will flash in the message.
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 again  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 "dol" message is blinking followed by a 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 then 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>P1*</td>
<td>Room probe failure</td>
<td>Compressor output acc. to par. &quot;Con&quot; and &quot;COF&quot;</td>
</tr>
<tr>
<td>P2*</td>
<td>Evaporator probe failure</td>
<td>Defrost end is timed</td>
</tr>
<tr>
<td>P3*</td>
<td>Third probe failure</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>P4*</td>
<td>Fourth probe failure</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>HAE</td>
<td>Maximum temperature alarm</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>LAE</td>
<td>Minimum temperature alarm</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>HAC</td>
<td>Condenser high temperature</td>
<td>Depends on the &quot;AC2&quot; parameter</td>
</tr>
</tbody>
</table>
14.1 SILENCING BUZZER | ALARM RELAY OUTPUT

If "TB = y", the buzzer and the relay are silenced by pressing any key.
If "TB = n", 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 restores normal operation. Check connections before replacing the probe.

Temperature alarms “MA”, “HAZ” and “LAZ” automatically stop as soon as the temperature returns to normal values.

Alarms “EA” and “CA” (with I2F=I2b) recover as soon as the digital input is disabled.

Alarm “CA” (with I2F=I2b) recovers only by switching off and on the instrument.

15. TECHNICAL DATA

Housing: self-extinguishing ABS.
Case: facia 38x185 mm; depth 76mm
Mounting: panel mounting in a 150x31 mm panel cut-out with two screws: ø 3 x 2 mm.
Distance between the holes 160mm
Protection: IP65; Frontal protection: IP66 with frontal gasket mod RG-L (optional)
Connections: Screw terminal block ± 2.5 mm² heat-resistant wiring and 6,3mm Faston
Power supply: 230Vac or. 110Vac or 24Vac ± 10%
Power absorption: 5VA max.
Display: 3 digits, red LED, 14,2 mm high.
On the display or in dp2, dp3, dp4: the selected probe is not enabled.

16. CONNECTIONS

Supply: 120Vac or 24Vac; connect to terminals 11-12
The X-REP output is optional
The light relay is also 16/50A according to the model.

17. DEFAULT SETTING VALUES

<table>
<thead>
<tr>
<th>Label</th>
<th>Name</th>
<th>Range</th>
<th>°C/F</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Set</td>
<td>Set point</td>
<td>LS=US</td>
<td>5,0</td>
<td>- -</td>
</tr>
<tr>
<td>Hy</td>
<td>RH</td>
<td>0.1-25.5°C/ 0-250 °F</td>
<td>2</td>
<td>P1</td>
</tr>
<tr>
<td>LS</td>
<td>Minimum set point</td>
<td>-50°C-SET/-50°F-SET</td>
<td>50,0</td>
<td>P2</td>
</tr>
<tr>
<td>US</td>
<td>Maximum set point</td>
<td>SET+110°C-SET+230°F</td>
<td>110</td>
<td>P2</td>
</tr>
<tr>
<td>Ot</td>
<td>Thermostat probe calibration</td>
<td>-12-12°C/-120-120°F</td>
<td>0,0</td>
<td>P1</td>
</tr>
<tr>
<td>P2F</td>
<td>Upper probe presence</td>
<td>n=not present; Y=yes.</td>
<td>n</td>
<td>P2</td>
</tr>
<tr>
<td>OE</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C/-120-120°F</td>
<td>0,0</td>
<td>P2</td>
</tr>
<tr>
<td>P3P</td>
<td>Third probe presence</td>
<td>n=not present; Y=yes.</td>
<td>n</td>
<td>P2</td>
</tr>
<tr>
<td>O3</td>
<td>Third probe calibration</td>
<td>-12-12°C/-120-120°F</td>
<td>0</td>
<td>P2</td>
</tr>
<tr>
<td>P3P</td>
<td>Fourth probe presence</td>
<td>n=not present; Y=yes.</td>
<td>n</td>
<td>P2</td>
</tr>
<tr>
<td>O4</td>
<td>Fourth probe calibration</td>
<td>-12-12°C/-120-120°F</td>
<td>0</td>
<td>P2</td>
</tr>
<tr>
<td>OdS</td>
<td>Outputs delay at start up</td>
<td>0-255 min</td>
<td>0</td>
<td>P2</td>
</tr>
</tbody>
</table>

18. ALARM RELAY PILOT (I2F)

- Alarm relay polarity (I2A/I2B)
- I2A | Output polarity (I2A-I2B)
- I2F | Digital input configuration (I2A-I2B)

19. LABELS FOR TEMPERATURE MEASUREMENT UNITS

- Resolution in=integer; dE= dec.point
- °C/°F
- Real time clock alarm
- Pressure switch alarm (UP=PAL)
- Alarm relay enabling
- Energy Saving cycle start on holidays
- Compressor OFF time with faulty probe
- Compressor ON time with faulty probe
- Temperature measurement unit
- Temperature alarms configuration
- Probe for temperature alarm of condenser
- Temperature alarm delay
- Probe selection for auxiliary relay
- Temperature alarm of condenser
- Temperature alarm of compressor
- Temperature alarm of condenser
- Temperature alarm of condenser
- Temperature alarm of condenser
- Temperature alarm of condenser
- Temperature alarm of condenser
### Label | Name | Range | °C/°F | Level |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Ld1*</td>
<td>1st workdays defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>6.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Ld2*</td>
<td>2nd workdays defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>13.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Ld3*</td>
<td>3rd workdays defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>21.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Ld4*</td>
<td>4th workdays defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Ld5*</td>
<td>5th workdays defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Ld6*</td>
<td>6th workdays defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd1*</td>
<td>1st holiday defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>6.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd2*</td>
<td>2nd holiday defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>13.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd3*</td>
<td>3rd holiday defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>21.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd4*</td>
<td>4th holiday defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd5*</td>
<td>5th holiday defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
<tr>
<td>Sd6*</td>
<td>6th holiday defrost start</td>
<td>0 ÷ 23h 50 min. - nu</td>
<td>0.0</td>
<td>rtc</td>
</tr>
</tbody>
</table>

### Adr
- Serial address: 1÷247
- **PbC:** Kind of probe
  - Ptc, ntc
  - ntc
- **onF:** on/off key enabling
  - nu, off, ES
  - off
- **dP1:** Room probe display
  - --
- **dP2:** Evaporator probe display
  - --
- **dP3:** Third probe display
  - --
- **dP4:** Fourth probe display
  - --
- **rSE:** Real set
  - actual set
- **rEL:** Software release
  - --

### * Only for model with real time clock

### 2 Only for XW60L with X-REP output