GEM-ITALIA-ROSA COMBI

Maintenance
And Use Manual

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1. INTRODUCTION

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

1.2. HOW TO USE THE MACHINE

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

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

- Directive N° 2006/95/CE
- Directive N° 97/23/EC (P.E.D.)
- Norm CEI 17-13/1 (EN 80494/1)
- Norm CEI EN 80335-1 (CEI 61-150)
- UL 471
- NSF 7

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

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

1.5. WARNING
Anytime Oscartek reserves the right to 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

<table>
<thead>
<tr>
<th>Sample</th>
</tr>
</thead>
</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 compressors
9. Refrigerant type
10. Refrigerant weight
11. Climatic rate (C/W: +25°C/60% U.R.; C/L: +30°C/55% U.R.)
12. Test pressure – system high pressure side
13. Test pressure – system low pressure side
14. Nominal power absorbed during defrost
15. Max. power absorbed during defrost
16. Nominal power absorbed by heating elements (only if higher than 100 W)
17. Lighting nominal power
3. INSTALLATION

3.1. MACHINE HANDLING

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

3.2. STOCK OF THE SHOWCASE

- Whenever the showcase has to be stoked, follow carefully what suggested before.
- Environmental temperature during the showcase stock can have following range -15°C and +55°C and humidity between 30% and 90%.
- The wall showcase has always to be protected by sunrays and raining.
- In case the wall showcase has to remain in stock quite long time before its use, keep it with its packaging in order to maintain its protection.

3.3. PACKAGING REMOVE

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

3.4. SHOWCASE POSITION

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

- Floor has to be levelled perfectly, on the contrary keep the wall showcase on the horizontal position in order to guarantee a perfect defrosting water drain and avoid boring compressor noises.
- The wall showcase has not to be under the sun-rays in order to have its better refrigeration performance, has to remain inside the local or to be sheltered by window curtain. If what described above is not observed, it can determine an increase of temperature of displayed product and an increasing power consume.
- The wall showcase has not to be under air currents due to open doors or windows, or under roof ventilators or under air condition outlets. In case will be not respected the above 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 wall showcase has not to be placed close any heat source as heaters, ovens, etc.
- The wall showcase has to have a sufficient place in order to ensure a correct custom service, to make an easy maintenance operation, to guarantee the right air flow necessary to make cool 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

- The remote condensing unit has to be checked by specialised technicians and according to the required refrigerating power and their position respect the showcase.
  - The condensing unit has to be placed following these points:
    - The condensing unit has to be located at least 250 mm from any eventual wall. (pic.5.5)
    - Air flow direction has to be from the eventual wall towards compressor.
    - The local, in case will be closed, has to be with enough air circulation.
    - By the condenser has to be guaranteed in any case as much as possible cold air.
    - In case will be necessary it has to be foreseen a forced air exchange by any fan according to the air flow of condenser.
  - The condensing units of display showcase have to be fixed properly.
  - The generated noise has not exceed the admitted noise levels relevant to the public places, especially in case of domestic buildings.
  - It is always necessary a sufficient place along the four sides of the wall showcase in order to make easy any type of check and maintenance operations.
  - When the condensing units are external will be necessary a frame holder that has to be fixed in a proper way and eventually added with amortising elements. Besides this frame has to be 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 wall showcase.
- The electric connection has to be made by qualified personnel and following manufacturer’s instructions.
- The wall showcase has already a general switch, however it is necessary an omni polar switch, with a minimum distance among the contacts of 3mm.
- It is obligatory that the wall showcase will be connected properly with an efficient ground socket.

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

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

pic.3.6

3.7. IDRAULIC CONNECTION - REMOTE CONDENSING UNIT

- In the case then wall showcaset has a remote condensing unit, it is necessary make the connection of defrosting water outlet with the main water drain outlet.
### GEM/ITALIA/ROSA COMBI - REFRIGERATED TOP

<table>
<thead>
<tr>
<th>TECHNICAL FEATURES</th>
<th>COMBI 1150RT</th>
<th>COMBI 1650RT</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External Dimensions (L-D-H)</strong></td>
<td>Inches 45 1/4&quot; - 38 15/16&quot; - 45 1/4&quot;</td>
<td>Inches 64 15/16&quot; - 38 15/16&quot; - 45 1/4&quot;</td>
</tr>
<tr>
<td><strong>Inches-MM</strong></td>
<td>1150 - 989 - 1150</td>
<td>1650 - 989 - 1150</td>
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<tr>
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<td>Inches 54&quot; - 45&quot; - 51&quot;</td>
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<td>Type Bottom Display</td>
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<tr>
<td><strong>Operating Temperature</strong></td>
<td>°F 41°F</td>
<td>°F 41°F</td>
</tr>
<tr>
<td><strong>Compressor</strong></td>
<td>N.r./Type Hermetic</td>
<td>N.r./Type Hermetic</td>
</tr>
<tr>
<td><strong>Cooling Power</strong></td>
<td>(W/BTU'S) 380W / 3600BTU'S</td>
<td>(W/BTU'S) 550W / 4650BTU'S</td>
</tr>
<tr>
<td><strong>Electric Supply</strong></td>
<td>(V/Ph/Hz) 230/1/50 (EU)</td>
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</tr>
<tr>
<td><strong>Power Consumption</strong></td>
<td>(A) 7A</td>
<td>(A) 10A</td>
</tr>
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<td><strong>Defrost</strong></td>
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<td>Kg/Lb 165Kgs / 364Lbs</td>
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<tr>
<td><strong>Crated Weights</strong></td>
<td>Kg/Lb 185Kgs / 410Lbs</td>
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*Dimensions are without side panels*

### GEM/ITALIA/ROSA COMBI - DRY TOP

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<td><strong>External Dimensions (L-D-H)</strong></td>
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*Dimensions are without side panels*
| 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 FAN | RES31 | GLASS CURTAIN FRAME HEATING ELEMENT |
| CAR | AIR CONDENSER | RES32 | HEATED DOORS HEATING ELEMENTS |
| CE | ELECTRONIC CONTROL | RES33 | WATER DRAIN HEATING ELEMENT |
| CN | MULTIPOLAR CONNECTOR | RES34 | DOORS FRAME HEATING ELEMENT |
| CO | COMPRESSOR | RES35 | COMPRESSOR CRANKCASE HEATING ELEMENT |
| D | DIO | RES36 | FRONT GLASS FRAME HEATING ELEMENT |
| DEV | SHUNT | RES37 | CABINET FRAME HEATING ELEMENT |
| DR | REMOTE DISPLAY | RES38 | HOT COMPARTMENT HEATING ELEMENT |
| EM | PHOTOCELL EMITTER | REV | CONDENSER FAN SPEED CONTROL |
| EV | EVAPORATOR | REVC | CONDENSER FAN RELAY |
| F | FUSE | RI | REFRIGERANT TAP |
| FD | FILTER DRIER | RIC | COMPRESSOR DELAY |
| FLU | WATER FLOW SWITCH | RICV | PHOTOCELL RECEIVER |
| FR | COMRESSOR THERMAL PROTECTION | RIS | RESERVE, ANTI-FOG HEATING ELEMENT |
| HL | COMPRESSOR ALARM LIGHT | RL | LIQUID RECEIVER |
| I | GENERIC SWITCH | RLA | WATER LEVEL ELECTRONIC CONTROL |
| IEC | WATER EVAPORATION BIN SWITCH | RO | OIL HEATER ELEMENT |
| IGD | DIGITAL FLAVOURS DISPLAY | SAA | ABSENCE OF WATER LIGHT |
| IV | LIGHTING SWITCH | SC | CONDENSER PROBE |
| IL | SIGHT GLASS | SD | TERMINAL BOX |
| IMC | WARM SHELF SWITCH | SDC | COMPRESSOR TERMINAL BOX |
| INV | INVERTER | SE | PROXIMITY SENSOR |
| IR | REFRIGERATION SWITCH | SEC | MAIN SWITCH |
| IRP | LIGHT REFRIGERATION SWITCH | SFV | TANK BOTTOM HEATING COIL |
| IV | INTERNAL FAN SWITCH | SDG | FLAVOURS DISPLAY DIGITAL SYSTEM |
| KM | CONTACTOR | SL | LIQUID SEPARATOR |
| LF | FRONT LIGHTING | SLA | WATER LEVEL PROBE |
| LI | INTERNAL UPPER LIGHTING | SPR | COMPRESSOR LIGHT |
| LLA | FRONT LIGHTING | SPMC | WARM SHELF LIGHT |
| LIG | FLAVOURS DISPLAY LIGHTING | SPR | ELECTRIC SUPPLY LIGHT |
| LIP | REAR LIGHTING | SPR | DEFROSTING LIGHT |
| MDIG | DIGITAL MODULE FOR FLAVOURS DISPLAY | SS | DEFROSTING PROBE |
| MM | SPINNING SHIELS ELECTRIC MOTOR | ST | TEMPERATURE PROBE |
| MUC | CONDENSING UNIT ELECTRIC CONNECTIONS | STR | LIGHTING STARTER |
| PA | HIGH PRESSURE CONTROL | SU | HUMIDITY PROBE |
| PD | HIGH-LOW PRESSURE CONTROL | TI | TEMPERATURE CONTROL |
| PO | WATER PUMP | TC | WINTER THERMOSTAT |
| QE | EXTERNAL ELECTRIC PANEL | TE | CAPILLARY TUBE |
| QF | MAGNETIC-HEAT SWICH | TERR | THERMOMETER |
| R | LIGHTING BALLAST | TF | FUSIBLE PLUG |
| RADD | RECIFIER | TMC | WARM SHELF THERMOSTAT |
| RE | GENERIC RELAY | TP | LIGHTING FIXTURES REFRIGERATOR THERMOSTAT |
| REL | ELECTRONIC BALLAST | TRA | TRANSFORMER |
| REP | ELECTRONIC CONTROL TEMPERATURE REPEATERS | TRC | ELECTRONIC CONTROL TRANSFORMER |
| RES1 | COLD AIR DISCHARGE HEATING ELEMENT | TREV | WATER EVAPORATION HEATER ELEMENT THERMOSTAT |
| RES2 | FRONT PROFILE HEATING ELEMENT | TS | SECURITY THERMOSTAT |
| RES3 | RIGHT/LEFT GLASS HEATING ELEMENT | TVC | CONDENSER FAN THERMOSTAT |
| RES4 | FRONT GLASS HEATING ELEMENT | VT | COMPRESSOR FAN / GENERAL USE |
| RES5 | DEFROSTING HEATING ELEMENT | VCF | CONDENSER FAN |
| RES6 | WATER EVAPORATION HEATING ELEMENT | VEC | WATER EVAPORATION BIN |
| RES7 | TOP LIGHTING FIXTURE HEATING ELEMENT | VES | EXPANSION VALVE |
| RES8 | LATERAL GLASS SUPPORT HEATING ELEMENT | V1 | INTERNAL FAN |
| RES9 | FRONT BAND HEATING ELEMENT | VPA | CONDENSING PRESSURE CONTROL WATER VALVE |
| RES10 | COUPLING BAND HEATING ELEMENT | VR | CHECK VALVE |
| RES11 | SERVICE TOP HEATING ELEMENT | VRA | SUCTION PRESSURE REGULATION VALVE |
| RES12 | UPPER BAND/DOOR FRAME HEATING ELEMENT | VRE | EVAPORATING PRESSURE REGULATION VALVE |
| RES13 | HOT DRY/BAIN MARIE DISPLAY HEATING ELEMENT | VS | GENERAL USE SOLENOID VALVE |
| RES14 | ANTI-FOG SUCTION AIR BAND HEATING ELEMENT | VSA | SOLENOID WATER VALVE |
| RES15 | WARM SHELF HEATING ELEMENT | VSB | BY-PASS SOLENOID WATER VALVE |
| RES16 | SIDE BANDS/FRONT GLASS HINGE HEATING ELEMENT | VSC | REVERSING CYCLE SOLENOID VALVE |
| RES17 | DEHUMIDIFICATION HEATING ELEMENT | VSL | LIQUID SOLENOID VALVE |
| RES18 | DEFROSTING WATER DRAIN HEATING ELEMENT | VSS | DEFROSTING SOLENOID VALVE |
| RES19 | RING FRAME HEATING ELEMENT | VT | POWER REGULATOR |
| RES20 | SIDE BAND HEATING ELEMENT | VV | GLASS FAN |
| RES21 | SUCTION AIR GLASS HEATING ELEMENT | XI | CABINET CONNECTIONS |
| RES22 | OUTLET AIR HEATING ELEMENT | X0 | EXTERNAL ELECTRIC PANEL CONNECTIONS |
| RES23 | REAR GLASS HEATING ELEMENT | XJ | CONDENSING UNIT CONNECTIONS |
| RES24 | INTERNAL GLASS HEATING ELEMENT | RES25 | FRONT GLASS UPPER FRAME HEATING ELEMENT |
| RES26 | FRONT GLASS LATERAL/LOWER FRAME HEATING ELEMENT | RES27 | FRONT GLASS LATERAL FRAME HEATING ELEMENT |
Digital controller for medium-low temperature refrigeration applications

XW60L

1. GENERAL WARNING

1.1 PLEASE READ BEFORE USING THIS MANUAL

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

1.2 SAFETY PRECAUTIONS

- Check the supply voltage is correct before connecting the instrument.
- Place the instrument in a stable location to avoid damage to the display or keypad.
- Do not expose the instrument to extreme conditions such as high temperatures or humidity or any kind of vibration.
- Mount the instrument in a well-ventilated area.
- Do not place heavy objects on the instrument.
- Follow all warnings and instructions for use.

2. GENERAL DESCRIPTION

Model XW60L, format 2Sx16S, is a microprocessor-based controller, suitable for applications on medium or low temperature ventilated refrigerating units. It has 4 relay outputs to control compressors, fans, defrost, which can be either electrical or reverse cycle (hot gas) and light (configurable). It can control up to four sets of relays, each set including compressor, fan, defrost timer, and light. The control is performed through a user-friendly interface, which can be configured to meet specific requirements.

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. Each set point and differential are programmed by the user to meet specific requirements.

3.2 DEFROST

Two defrost modes are available: a "DF" mode, which operates at the lowest temperature, and a "HY" mode, which operates at the highest temperature. The defrost timer is controlled by the controller and can be set to operate at regular intervals or as needed.

3.3 CONTROL OF EVAPORATOR FANS

The fan control mode is selected by means of the "FDC" parameter:
- If FDC = 0, fans will not run, even if the compressor is off, and the temperature is higher than the set point.
- If FDC = 1, fans will run continuously, and the temperature is lower than the set point.
- If FDC = 2, fans will run only when the compressor is on and the temperature is lower than the set point.

3.4 CYCLICAL ACTIVATION OF THE FANS WITH COMPRESSOR OFF

When FDC = 0 or 1 (fans in parallel to the compressor), and the temperature is lower than the set point, the fans will run continuously, increasing the temperature. When FDC = 2 (fans in series), the fans will run only when the compressor is on and the temperature is lower than the set point.

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 increase the set point, in programming mode it increases the parameter value.

DOWN: To decrease the set point, in programming mode it decreases the parameter value.

To switch the instrument on, if ON = 0, OFF = 1.
To switch the light, if O3 = Lg.

KEY COMBINATIONS:

+ To lock & unlock the keyboard.

NOTE: XW60L RTC GS r1.6 27.30.2006.doc

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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. (ST message will be displayed)
2. To confirm the operation the "ST" 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 is necessary to program the time and day.
1. Enter the P1 programming menu, by pushing the "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 10s key to display the time, and then push SET to confirm the value.
5. Repeat the same operations on the "Min" parameter and 60(min) parameters.
6. To exit: Push SET +UP keys or wait for 10s 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 - arrow within 10s.
4. To memorize the new set point value push the SET key again or wait 10s.

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

6.5 HOW TO CHANGE A PARAMETER VALUE
To change the parameter value operate as follows:
1. Enter the Programming mode by pressing the "set + " keys for 3s (the "C" or "F" LED starts blinking).
2. Select the required parameter. Push 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: Push SET +UP or wait 60s 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 + " 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 P12 label will be displayed immediately followed from the HY parameter.

NOW YOU ARE IN THE HIDDEN MENU.
1. Select the required parameter.
2. 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 + or wait 60s without pressing a key.

NOTE: If none parameter is present in P12, after 3s the "END" message is displayed. Keep the keys pushed until the P12 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 "POFF" 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. or min temperature stored.
3. If a key is pressed more than 3s, the "POFF" message will be displayed.

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

6.9 THE ON-OFF FUNCTION
With "eoff = eoff", pushing the ON-OFF key, the instrument is switched off. The "OFF" message is displayed. In this configuration, the regulation is disabled.

WARNING: Connections to the normally closed contacts of the relays are always supplied and under voltage, even if the instrument is to stand by mode.

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°C/1-25°F) Intervention differential for set point. Compressor Cut IN is Set Point + differential (Hy). Compressor Cut OUT when the temperature reaches the set point.
LS Minimum set point: (+50°C/95°F) Sets the minimum value for the set point.
US Maximum set point: (+110°C/230°F) Sets the maximum value for set point.
O terribly probe calibration: (-12.0-12.0°C, -120-120°F) allows to adjust possible offset of the thermocouple probe.
P2P Evaporator probe presence: n = present, the defrost stops by time, y = present: the defrost stops by temperature.
OEP Evaporator probe calibration: (-12.0-12.0°C, -120-120°F) allows to adjust possible offset of the evaporator probe.
P3P Third probe calibration (P3): n = not present, the terminals 13-14 operate as digital input; y = present; the terminals 13-14 operate as third probe.
P4P Fourth probe calibration (P4): n = not present, y = present.
G1 Fourth probe calibration (-12.0-12.0°C) allows to adjust possible offset of the fourth probe.
O0S Output activation delay at start up: (0-255min) This function is enabled at the initial start up of the instrument and inhibits any output activation for the period of time in the parameter.
AC Anti-short cycle delay: (0-30 min) minimum interval between the compressor stop and the following restart.
AC1 1st compressor delay at start up (0:255a) Used only if OAS = C2P time interval between the switching on of the first compressor and the second one.
rtr Percentage of the first and second 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 (µTh/P1+P2)/P2.
CCI Compressor ON time during continuous cycle: (0.0-24.0h; res. 10min). Allows to set the length of the continuous cycle in which the compressor stays on without interruption for the OCC time. Can be used, in ordinary cases, when the room is filled with new products.
CCS Set point for continuous cycle: (+50-150°C) it sets the set point used during the continuous cycle.
CO Compression ON time with faulty probe: (0-255a) time during which the compressor is active in case of faulty thermostat probe. With CO=0 compressor is always OFF.
COF Compressor OFF time with faulty probe: (0-255a) 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 measurement unit is changed the SET point and the values of the parameters Hy, LS, US, ATU, and ALU have to be checked and modified if necessary.
rES Resolution for °C (n = 1; °F = 0.1°C) allows decimal point display.
Installing and Operating Instructions

CONDENSER TEMPERATURE ALARM

AP2 Probe selection for temperature alarm of condenser: nP = no probe; P1 = thermostat probe; P2 = evaporator probe; P3 = no configuration probe; P4 = Probe on Hot Key plug.
AL1 Low temperature alarm of condenser: (55±15°C) when this temperature is reached the L2 alarm is signalled, possibly after the A2 delay.

A2 High temperature alarm of condenser: (55±15°C) when this temperature is reached the H2 alarm is signalled, possibly after the A2 delay.

A2 Differential for temperature condenser alarm recovery: (0.1±25°C; 1-45°F)
A2 Condenser temperature alarm delay: (0.25-15 minutes) time interval between the detection of the condenser alarm condition and alarm signalling.
A2A Condenser temperature alarm delay exclusion at start up: (from 0.0 min to 25.35, min 0.1 sec).
BL Compressor with low temperature alarm of condenser: n = no compressor keeps on working; y = yes, compressor is switched off till the alarm is present, in any case regulation reduces AC loading on compressor.
A2C Compressor off with high temperature alarm of condenser: n = no compressor keeps on working; y = yes, compressor is switched off till the alarm is present, in any case regulation reduces AC loading on compressor.

AUXILIARY RELAY

ibA Alarm relay silencing (with a3A->A4L): n = silencing disabled; alarm relay stays on till alarm condition lasts, y = silencing enabled; alarm relay is switched off by pressing a key during an alarm.
aA3 Fourth relay configuration (1-3): dEF, FAn; do not select if; aL; alarm, lIg; light; AuS; auxiliary relay, off; always on with instrument on; db2 = neutral zone; cp2 = second compressor; dEF2; do not select if; hES, night blind.
aaP Alarm relay polarity; it sets if the alarm relay is open or closed when an alarm happens. CL= terminals 1-3 closed during an alarm, dpTerminals 1-2 open during a delay.

DIGITAL INPUTS

1TF Digital input polarity (15-14): op; the digital input is activated by opening the contact; CL; the digital input is activated by closing the contact.
1TF Digital input configuration (15-14); EL2; external alarm: "EA" message is displayed, bA2; serious alarm "CA" message is displayed, PAl; pressure switch alarm, "CA" message is displayed, dor door switch function, dEF; activation of a door cycle, AUS; not enabled, hB; alarm of action implemented, hES; energy saving, hF; Holiday disable (not enabled with control and OTC); op; to switch the controller on.
did (0.25-5 minutes) with IFlA EAL or 1TF B2 digital input alarm delay (13-14); delay between the detection of the external alarm condition and its signalling, with dIF2; door open signalling delay, with hF; pressure switch function; time interval to calculate the number of the pressure switch activation.

2IP 2nd digital input polarity (13-12): op; the digital input is activated by opening the contact; CL; the digital input is activated by closing the contact.
2TF Digital input configuration (15-12); EL2; external alarm: "EA" message is displayed, bAI; serious alarm "CA" message is displayed, PAl; pressure switch alarm, "CA" message is displayed, dor door switch function, dEF; activation of a door cycle, AUs; not enabled, hB; alarm of action implemented, hES; energy saving, hF; Holiday disable (not enabled with control and OTC); op; to switch the controller on.
did (0.25-5 minutes) with IFlA EAL or 1TF B2 2nd digital input alarm delay (13-12): delay between the detection of the external alarm condition and its signalling, with dIF2; door open signalling delay, with hF; pressure switch function; time interval to calculate the number of the pressure switch activation.

mP8 Pressure switch number: (0…+15) Number of operation of the pressure switch, during the "did" internal, before signalling the alarm event (2IF=PA).

IF the mP8 activation in the did time is reached, switch off and on the instrument to reset the alarm and to operate during the "did" internal, before signalling the alarm event (2IF=PA).

ocd Compressor and fan status when open door: n = normal; Fan = Fan OFF, CpF = Compressor OFF, F = C = Compressor and fan OFF.
rdv Outputs restart after alarm: no = output not affected by the doA alarm; yES = outputs are restarted by the doA alarm.

HES Temperature increase during the Energy Saving cycle:

(25°C; 77°F) at the increasing value of the set point during the Energy Saving cycle.

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

Hr Current hour (0 to 23 h).
Min Current minute (0 to 59 min).
dAY Current day (Sun = 0), Sat = 6).
hd1 First weekly holiday (Sun - nu) Set the first day of the week which follows the holiday times.
hd2 Second weekly holiday (Sun - nu) Set the second day of the week which follows the holiday times.

N-B hF1,hF2 can be set also as “nu value” (Not Used).

To SET ENERGY SAVING TIMES (ONLY FOR MODELS WITH RTC)

IE Energy Saving cycle start during workdays: (0 + 26h 50 min.) During the Energy Saving cycle the set point is increased by the value in HES so that the operation set point is SET + 10°C during workdays.

IE Energy Saving cycle length during workdays: (0 + 24h 00 min.) Sets the duration of the IE Energy Saving cycle on workdays.

IE Energy Saving cycle start on holidays: (0 + 23h 50 min.)

IE Energy Saving cycle length on holidays: (0 + 24h 00 min.)

To SET DEFROST TIMES (ONLY FOR MODELS WITH RTC)

Lt1=Lt6 Workday defrost start (0 + 23h 50 min.) These parameters set the beginning of the IE programmable defrost cycles during workdays. Ex. When Lt2 = 12 the second start defrost at 12:00 during workdays.
Sd1=Sd6 Holiday defrost start (0 + 23h 50 min.) These parameters set the beginning of the 6 programmable defrost cycles on holidays. Ex. When Sd2 = 3 the second defrost start at 3:00 during holidays.
N.B. To disable a defrost cycle set it to “nu”(not used), Ex. if Lt2=nu; the sixth defrost cycle is disabled.

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

The first digital input 13-14 is enabled with P3P = n.
With P3P = n and IF = I2F the second digital input is disabled.
The free voltage digital inputs are programmable by the "I1F" and "I2F" parameters.

8.1 GENERIC ALARM (I1F or I2F = EAL)

As soon as the digital input is activated the unit will wait for "did" time delay before signaling 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 (I1F or I2F = 0A)

When the digital input is activated, the unit will wait for "did" delay before signaling 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 (I1F or I2F = PSL)

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 door status and the corresponding relay output status through the "odc" parameter; no = normal (any change); fan = Fan OFF; comp = Compressor OFF; f. c. = Compressor and fan OFF.

8.5 START DEFROST (I1F or I2F = eDF)

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 "MST" safety time is expired.

8.6 SWITCH THE AUXILIARY RELAY (I1F or I2F = AUS)

With a = AUS the digital input switched the status of the auxiliary relay.

8.7 INVERSION OF THE KIND OF ACTION: HEATING-COOLING (I1F or I2F = I1F)

This function allows to invert the regulation of the set point: from cooling to heating and viceversa.

8.8 ENERGY SAVING (I1F = ES)

The Energy Saving function allows to change the set point value as the result of the set + FES (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. I1P or I2P = "corn": the input is activated by closing the contact.
I1F or I2F = "POF": the input is activated by opening the contact.

9. TTL SERIAL LINE - FOR MONITORING SYSTEMS

The TTL serial line, available through the HTD KEY connector, allows by means of the external TTLRS485 converter, X485-C, to connect the instrument to a monitoring system ModBUS-RTU compatible such as the X486800000000300.

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/REP(1x1m), CAB/REP(2m), CAB/REP65 (6m).

11. INSTALLATION AND MOUNTING

The controller is meant to be mounted on a vertical panel, in a 150x31mm hole, and fixed using two screws of 3.2.2mm. To obtain an IP5 protection grade use the front panel rubber gasket (mod. RG).

The temperature range allowed for correct operation is 0 - 60 °C. Avoid places subject to strong vibrations, corrosive gases, excessive dust 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 (6.3mm). Heat-resistant cables have to be used. Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier loads use a suitable external relay.

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 thermistor probe away from air streams to correctly measure the average room temperature. Place the defrost termination probe among the evaporator fins in the coldest place, where most ice is formed, far from heaters or from the warmest place during defrost, to prevent premature defrost termination.

13. HOW TO USE THE HOT KEY

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

1. Program one controller with the front keypad.
2. When the controller is ON, insert the "Hot key" and push a key: the "nPL" 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 again a key if you want to restart the upload again or remove the "Hot Key" to abort the operation.

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

1. Turn OFF the instrument.
2. Insert a programmed "Hot Key" into the 5 PIN receptacle and then turn the Controller ON.
3. Automatically the parameter list of the "Hot Key" is downloaded into the Controller memory, the "dol" 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 then if you want to restart the download again 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>R1</td>
<td>Room probe failure</td>
<td>Compressor output is low, to par. &quot;Com&quot; and &quot;COF&quot;</td>
</tr>
<tr>
<td>R2</td>
<td>Evaporator probe failure</td>
<td>Defrost is timed</td>
</tr>
<tr>
<td>R3</td>
<td>Third probe failure</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>R4</td>
<td>Fourth probe failure</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>R5</td>
<td>Maximum temperature alarm</td>
<td>Outputs unchanged</td>
</tr>
<tr>
<td>R6</td>
<td>Condenser high temperature alarm</td>
<td>It depends of the &quot;ACF&quot; parameter</td>
</tr>
</tbody>
</table>
14.1 SILENCING BUZZER / ALARM RELAY OUTPUT

If 'B' = 'Y', the buzzer and the relay are silenced by pressing any key.
If 'B' = 'N', only the buzzer is silenced while the alarm relay is on until the alarm condition clears.

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 resets normal operation. Check connections before replacing the probe.
Temperature alarms 'HA', 'LA', 'HA2', and 'LA2' automatically stop as soon as the temperature returns to normal values.
Alarm 'EM' and 'EM2' (with IF-NL) recover as soon as the digital output is disabled. Alarm 'CA' (with IF-NL) remains open until the output is switched off and then enabled.

14.3 OTHER MESSAGES

Pen
Keyboard unlocked

PwF
Keyboard locked

np
None in programming mode; none parameter is present in Pr1

15. TECHNICAL DATA

Housing: self-extinguishing ABS.
Case: 30x30x15 mm, depth 1.8 mm.
Mounting: panel mounting in a 105x105 mm panel cut-out with two screws. Or 3 x 3 mm.
Distance between the holes 15 mm.
Protection: IP20; Frontal protection: IP65 with frontal gasket and RL-G (optional).
Connections: Screws terminal block 2 x 2 mm² heat-resistant wire and 0.5 mm Fasten.
Power supply: 220Vac or 110Vac ±10%.
Power absorption: 1W max.
Display: 3 digits, red LED, 14 mm high.
Display: 3 digits, red LED, 14 mm high, inputs: Up to 4 relay outputs or PT100 probes.
Digital inputs: 2 line voltage.
Relay outputs: Total current on loads MAX 20 A.
 compressor relay: SPST 8 (8) A, 250Vac
 light relay: SPST 8 (8) A, 250Vac
 fan relay: SPST 8 (8) A, 250Vac
 delay relay: SPST 8 (8) A, 250Vac

Other output: buzzer (optional).
Serial output: TTL standard Communication protocol: Modbus - RTU
Data storage: on the non-volatile memory (EEPROM).
Internal clock back-up: 24 hours (only for model with RTC).
Kind of action: 1A. Pollution grade: A. Software class: A.
Rated impulse voltage: 2500V. Over voltage Category: II.
Operating temperature: 0-40 °C; Storage temperature: -30-85 °C.
Relative humidity: 20-90% (no condensing).
PTC probe: -50-150 °C (-50-302 °F).
Resolution: 1 °C or 1 °C 1 °F (selectable). Accuracy: ambient temp. 25 °C ±0.3 °C ±1 digit

16. CONNECTIONS

Supply: 120Vac or 24Vac: connect to terminals 11-12.
The X-REP output is optional.
The light relay can be also 15A according to the model.

17. DEFAULT SETTING VALUES

<table>
<thead>
<tr>
<th>Label</th>
<th>Name</th>
<th>Range</th>
<th>°C/F Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>rT</td>
<td>Set point</td>
<td>L5-US</td>
<td>5.9</td>
</tr>
<tr>
<td>Hz</td>
<td>Temperature</td>
<td>L5-US</td>
<td>5.9</td>
</tr>
<tr>
<td>LS</td>
<td>Minimum set point</td>
<td>20-30°C</td>
<td>20</td>
</tr>
<tr>
<td>US</td>
<td>Maximum set point</td>
<td>20-30°C</td>
<td>20</td>
</tr>
<tr>
<td>PO</td>
<td>Thermostat probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>PPO</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>PPF</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>PPI</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>PII</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>PIV</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>PIII</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>QOS</td>
<td>Error alarm output</td>
<td>0-255 min</td>
<td>0</td>
</tr>
</tbody>
</table>

18. ALARM RELAY POLARITY

Alarming relay polarity (IA3+AL): x+Polarizing (Cl-Closing)

19. DIGITAL INPUT POLARITY (13-14)

<table>
<thead>
<tr>
<th>Label</th>
<th>Name</th>
<th>Range</th>
<th>°C/F Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>rT</td>
<td>Set point</td>
<td>L5-US</td>
<td>5.9</td>
</tr>
<tr>
<td>Hz</td>
<td>Temperature</td>
<td>L5-US</td>
<td>5.9</td>
</tr>
<tr>
<td>LS</td>
<td>Minimum set point</td>
<td>20-30°C</td>
<td>20</td>
</tr>
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<td>US</td>
<td>Maximum set point</td>
<td>20-30°C</td>
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</tr>
<tr>
<td>PO</td>
<td>Thermostat probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>PPO</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>PPF</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>PPI</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>PII</td>
<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
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<td>Evaporator probe calibration</td>
<td>-12-12°C</td>
<td>20-20°F</td>
</tr>
<tr>
<td>QOS</td>
<td>Error alarm output</td>
<td>0-255 min</td>
<td>0</td>
</tr>
</tbody>
</table>

19. DIGITAL INPUT POLARITY (13-14)

Digital input 1 configuration (13-14):
EAL, BAL, PAL, OR, DE, HD, HTR, AUS
Digital input 2 configuration (13-14):
EAL, BAL, PAL, OR, DE, HD, HTR, AUS
Digital input 3 configuration (13-14):
EAL, BAL, PAL, OR, DE, HD, HTR, AUS
Digital input 4 configuration (13-14):
EAL, BAL, PAL, OR, DE, HD, HTR, AUS
<table>
<thead>
<tr>
<th>Label</th>
<th>Name</th>
<th>Range</th>
<th>°C/°F</th>
<th>Level</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>
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<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>
<tr>
<td>Adr</td>
<td>Serial address</td>
<td>1-247</td>
<td>1</td>
<td>Fv2</td>
</tr>
<tr>
<td>PhC</td>
<td>Kind of probe</td>
<td>Ptc, ret</td>
<td>ret</td>
<td>Fv2</td>
</tr>
<tr>
<td>cmF</td>
<td>Clock key enabling</td>
<td>nu, off, ES</td>
<td>off</td>
<td>Fv2</td>
</tr>
<tr>
<td>dp1</td>
<td>Room probe display</td>
<td>--</td>
<td>--</td>
<td>Fv2</td>
</tr>
<tr>
<td>dp2</td>
<td>Evaporator probe display</td>
<td>--</td>
<td>--</td>
<td>Fv2</td>
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* Only for model with real time clock

2 Only for XW60L with X-REP output

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