Digital controller with defrost, fans and auxiliary relay management

XR77CX

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.
- Dixell Srl reserves the right to change the composition of its products, even without notice, ensuring the same and unchanged functionality.

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 accessible by the End User. The instrument must not be opened.
- In case of failure or faulty operation send the instrument back to the distributor or to "Dixell S.r.l." (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.

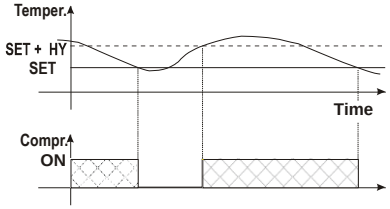
2. GENERAL DESCRIPTION

Model **XR77CX**, format 32x74mm, is microprocessor based controller, suitable for applications on 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 3 NTC or PT1000 probe inputs, the first one for temperature control, the second one, to be located onto the evaporator, to control the defrost termination temperature and to manage the fan and the third one for condenser alarm management or the display. A digital input can be set to operate as fourth temperature probe.
The RS485 serial output allows to connect the unit to a network line **ModBUS-RTU** compatible such as the Dixell monitoring units of X-WEB family. The **HOT KEY** receptacle allows programming the controller by means the **HOT KEY** programming keyboard.
The instrument is fully configurable through special parameters that can be easily programmed through the keyboard.

3. CONTROLLING LOADS

3.1 COMPRESSOR

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



In case of fault in the thermostat probe the start and stop of the compressor are timed through parameters **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=in**).
The defrost interval depends on the presence of the RTC (optional). If the RTC is present is controlled by means of parameter **EdF**:
- with **EdF=in** the defrost is made every **idF** time – standard way for controller without RTC.
- with **EdF=rtC** the defrost is made in real time

Other parameters are used to control the interval between defrost cycles (**idF**), its maximum length (**MdF**) and two defrost modes: timed or controlled by the evaporator's probe (**P2P**).
At the end of defrost dripping time is started, its length is set in the **Fdt** parameter. With **Fdt=0** the dripping time is disabled. To enable the second defrost output function, set the relay **oA3=dF2** and parameters **dSP** (probe), **dtS** (defrost stop temperature) and **MdS** (duration).

3.3 CONTROL OF EVAPORATOR FANS

The fan control mode is selected by means of the **FnC** parameter:
FnC=C_n, 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 **Fnd** parameter.
FnC=C_Y, fans will switch ON and OFF with the compressor and **run** during defrost.
FnC=o_Y, fans will run continuously also during defrost.

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 his 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. **How it works:** if the temperature difference between evaporator probe and room probe is higher than the **FCt** parameter value, fans will be switched on. With **FCt=0** the function is disabled.

3.3.2 Cyclical activation of the fans with compressor off.

When **FnC=C-n** or **C-Y** (fans working in parallel with the compressor), by means of the **Fon** and **FoF** parameters the fans can carry out on and off cycles even if the compressor is switched off. When the compressor is stopped the fans go on working for the **Fon** time. With **Fon=0** the fans remain always off, also when the compressor is off.

3.4 AUXILIARY RELAY CONFIGURATION - TERM. 10-11-12, PAR. OA3

The functioning of the auxiliary relay (terminals. 1-4) can be set by the **oA3** parameter, according to the kind of application. In the following paragraph the possible setting:

3.4.1 Light relay

With **oA3=LiG** the AUX relay operates as light output.

3.4.2 Auxiliary relay

a. Relay activation by digital input 1 or digital input 2 (oA3=AUS, i1F or i2F=AUS)
With **oA3=AUS** and **i1F, i2F=AUS** the AUX relay is switched on and off by digital inputs.

b. Auxiliary thermostat
Anti condensing heater with the possibility of switching it on and off also by using the frontal keyboard.

Parameters involved:
- **ACH** Kind of regulation for the auxiliary relay: **Ht** = heating; **CL** = cooling.
- **SAA** Set point for auxiliary relay.
- **SHy** Differential for auxiliary relay.
- **ArP** Probe for auxiliary relay.
- **Sdd** Auxiliary output off during defrost.

The differential threshold value is set by the **SHY** parameter.

NOTE: Set **oA3=AUS** and **ArP=nP** (no probe for auxiliary output).
In this case the AUX relay can be activated only by digital input if **i1F=AUS** or **i2F=AUS**.

3.4.3 On/off relay (oA3 = onF)

When **oA3=onF**, the AUX relay is activated when the controller is turned on and de-activated when the controller is turned off.

3.4.4 Neutral zone regulation

With **oA3 = db** the AUX relay can control a heater element to perform a neutral zone action.
- **oA3** cut in = **[SET-HY]**
- **oA3** cut out = **SET**

3.4.5 Alarm relay

With **oA3 = ALr** the AUX relay 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 stay on until the alarm condition recovers.

3.4.6 Night blind management during energy saving cycles

With **oA3=HES,** the AUX relay operates to manage the night blind: the relay is energised when the energy saving cycle is activated by digital input or frontal button.

4. FRONT PANEL COMMANDS

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 browses the parameter codes or increases the displayed value.
	(**DOWN**) To see the min stored temperature; in programming mode it browses the parameter codes or decreases the displayed value.
	To switch the instrument on and off (when **onF=oFF**).
	To switch on and off the light (when **oA3=LiG**).

KEY COMBINATIONS:

+	To lock & unlock the keyboard**.**
SET +	To enter in programming mode.
SET +	To return to the room temperature display.

4.1 USE OF LEDS

Each LED function is described in the following table.

LED	MODE	FUNCTION
	ON	Compressor enabled
	Flashing	Anti-short cycle delay enabled
	ON	Defrost enabled
	Flashing	Drip time in progress
	ON	Fans enabled
	Flashing	Fans delay after defrost in progress.
	ON	An alarm is occurring
	ON	Continuous cycle is running
	ON	Energy saving enabled
	ON	Light on
AUX	ON	Auxiliary relay on
°C/°F	ON	Measurement unit
	Flashing	Programming phase

5. MAX & MIN TEMPERATURE MEMORIZATION

5.1 HOW TO: SEE THE MIN TEMPERATURE

1. Press and release the **DOWN** key.
2. The "**Lo**" message will be displayed followed by the minimum temperature recorded.
3. By pressing the **DOWN** key again or by waiting 5 sec the normal display will be restored.

5.2 HOW TO: SEE THE MAX TEMPERATURE

1. Press and release the **UP** key.
2. The "**Hi**" message will be displayed followed by the maximum temperature recorded.
3. By pressing the **UP** key again or by waiting 5 sec the normal display will be restored.

5.3 HOW TO: RESET THE MAX AND MIN TEMPERATURE RECORDED

1. Keep the **SET** key pressed more than 3 sec, while the max or min temperature is displayed. ("**rSt**" message will be displayed)
2. To confirm the operation the "**rSt**" message will start blinking and the normal temperature will be displayed.

6. MAIN FUNCTIONS

6.1 HOW TO: SET THE CURRENT TIME AND DAY

When the instrument is switched on, it's necessary to program the time and day.

1. Enter the Pr1 programming menu by pushing both **SET+DOWN** keys for 3 sec.
2. The **rtC** parameter will be displayed. Push the **SET** key to enter the real time clock menu.
3. The **Hur** (hour) parameter will be displayed.
4. Push the **SET** button and then set current hour by the **UP** and **DOWN** keys. At the end push **SET** button to confirm the value.
5. Repeat the same operations for the **Min** (minutes) and **dAy** (day) parameters.

To exit: Push **SET+UP** keys or wait for 15 sec without pushing any keys.

6.2 HOW TO: SEE THE SET POINT

SET

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 sec to display the probe value again.

6.3 HOW TO CHANGE THE SET POINT

1. Push the **SET** key more than 2 sec to change the Set point value.
2. The value of the set point will be displayed and the "**°C**" or "**°F**" LED will start blinking.
3. To change the Set value push the **UP** or **DOWN** arrows within 10 sec.
4. To save the new set point value, push the **SET** key again or wait for 10 sec.

6.4 HOW TO START A MANUAL DEFROST

Push the **DEF** key for more than 2 sec and a manual defrost will start.

6.5 HOW TO: CHANGE A PARAMETER VALUE

To change a parameter value, operate as follows:

1. Enter the Programming mode by pressing the **SET+DOWN** buttons for 3s (the **°C** or **°F** LED will start blinking).
2. Select the required parameter. Press the **SET** button to display its actual value.
3. Use **UP** or **DOWN** buttons to change its value.
4. Press **SET** button to store the new value and move to the following parameter.

To exit: Press **SET + UP** buttons or wait for 15s without pressing any key.

NOTE: the set value is stored even when the procedure is exited by waiting for 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+DOWN** buttons for 3 sec (the **°C** or **°F** LED will start blinking).
2. Released the buttons and then push again the **SET+DOWN** buttons for more than 7s. The Pr2 label will be displayed immediately followed from the **HY** parameter.
   Now it is possible to browse the hidden menu.
3. Select the required parameter.
4. Press the **SET** button to display its value.
5. Use **UP** or **DOWN** to change its value.
6. Press **SET** to store the new value and move to the following parameter.

To exit: Press **SET+DOWN** or wait 15 sec without pressing a key.

NOTE1: if no parameter is present in Pr1 menu, after 3 sec the "**noP**" message will be displayed. Keep the buttons pushed till the Pr2 message will be displayed.

NOTE2: the set value is stored even when the procedure is exited by waiting for 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 (Pr2) can be moved into the user level (Pr1) by pressing **SET+DOWN** buttons. If a parameter is part of the user level, when showed in the hidden menu the decimal point will be lit.

6.7 HOW TO: LOCK THE KEYBOARD

1. Keep both **UP** and **DOWN** buttons pressed for more than 3 sec.
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 o Min temperature stored
3. If a button is pressed more than 3 sec the "**PoF**" message will be displayed

6.8 HOW TO: UNLOCK THE KEYBOARD

Keep pressed together for more than 3 sec the **UP** and **DOWN** keys till the **"Pon"** message will be displayed.

6.9 THE CONTINUOUS CYCLE

When defrost is not in progress, it can be activated by holding the **UP** key pressed for about 3 sec. The compressor operates to maintain the **CCS** set point for the time set through the **CCt** parameter. The cycle can be terminated before the end of the set time using the same activation key **UP** for 3 sec.

6.10 THE ON/OFF FUNCTION

With "**onF = 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

rtc	**Real time clock menu:** to set the time and date and defrost start time.
REGULATION	
HY	**Differential:** (0.1 to 25.5°C; 1 to 45°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:** (-100°C to SET; -148°F to SET) sets the minimum value for the set point.
US	**Maximum set point:** (SET to 150°C; SET to 302°F) set the maximum value for set point.
ot	**Thermostat probe calibration:** (-12.0 to 12.0°C; -21 to 21°F) allows to adjust possible offset of the thermostat probe.
P2P	**Evaporator probe presence:** (n; Y) **n** = not present, the defrost stops by time; **Y** = present, the defrost stops by temperature.
oE	**Evaporator probe calibration:** (-12.0 to 12.0°C; -21 to 21°F) allows to adjust possible offset of the evaporator probe.
P3P	**Third probe presence (P3):** (n; Y) **n** = not present, the terminals 18-20 operate as digital input; **Y** = present, the terminals 18-20 operate as third probe.
o3	**Third probe calibration (P3):** (-12.0 to 12.0°C; -21 to 21°F) allows to adjust possible offset of the third probe.
P4P	**Fourth probe presence:** (n; Y) n = Not present; Y = present.
o4	**Fourth probe calibration:** (-12.0 to 12.0°C; -21 to 21°F) allows to adjust possible offset of the fourth probe.
odS	**Outputs activation delay at start up:** (0 to 255min) 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 to 50min) minimum interval between the compressor stop and the following restart.

rtr	**Percentage of the second and first probe for regulation:** (0 to 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 (**rtr**(P1-P2)/100 + P2).
CCt	**Compressor ON time during continuous cycle:** (0.0 to 24h00min, res. 10min) allows to set the length of the continuous cycle. Compressor stays on without interruption during **CCt** time. This is useful, for instance, when the room is filled with new products.
CCS	**Set point for continuous cycle:** (-55 to 150°C; -67 to 302°F) it sets the set point used during the continuous cycle.
Con	**Compressor ON time with faulty probe:** (0 to 255min) time during which the compressor is active in case of faulty thermostat probe. With **Con=0** compressor is always OFF.
CoF	**Compressor OFF time with faulty probe:** (0 to 255min) 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; °F) **°C** = Celsius; **°F** = Fahrenheit. **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):** (in=1°C; dE=0.1°C) allows decimal point display.
Lod	**Instrument display:** (P1; P2, P3, P4, SET, dtr) it selects which probe is displayed by the instrument. **P1** = Thermostat probe; **P2** = Evaporator probe; **P3** = Third probe (only for model with this option enabled); **P4** = Fourth probe, **SET** = set point; **dtr** = percentage of visualization.
rEd	**X-REP display (optional):** (P1; P2, P3, P4, SET, dtr) it selects which probe is displayed by X- REP. **P1** = Thermostat probe; **P2** = Evaporator probe; **P3** = Third probe (only for model with this option enabled); **P4** = Fourth probe, **SET** = set point; **dtr** = percentage of visualization.
dLY	**Display delay:** (0 to 20min00s; res. 10s) when the temperature increases, the display is updated of 1°C or 1°F after this time.
dtr	**Percentage of the second and first probe for visualization when Lod=dtr:** (0 to 99; 100=P1, 0=P2) if **Lod=dtr** it allows to set the visualization according to the percentage of the first and second probe, as for the following formula (**dtr**(P1-P2)/100 + P2).

DEFROST

EdF	**Defrost mode (for controller with RTC only):** - **rtC** = **Real Time Clock mode**. Defrost time follows **Ld1 to Ld6** parameters on workdays and **Sd1 to Sd6** on holidays. - **in** = **interval mode**. The defrost starts when the time **idf** is expired.
tdF	**Defrost type:** (EL; in) **EL** = electrical heater; **in** = hot gas.
dFP	**Probe selection for defrost termination:** (nP; P1; P2; P3; P4) **nP** = no probe; **P1** =thermostat probe; **P2** = evaporator probe; **P3** =configurable probe; **P4** = Probe on Hot Key plug.
dSP	**Probe selection for second defrost termination with oA3=dF2:** (nP; P1; P2; P3; P4) **nP** = no probe; **P1** =thermostat probe; **P2** = evaporator probe; **P3** =configurable probe; **P4** = Probe on Hot Key plug.
dtE	**Defrost termination temperature:** (-55 to 50°C; -67 to 122°F) (enabled only when **EdF=Pb**) sets the temperature measured by the evaporator probe, which causes the end of defrost.
dtS	**Second defrost termination temperature:** (-55 to 50°C; -67 to 122°F) with oA3=dF2, sets the temperature measured by the second evaporator probe, which causes the end of second defrost.
idF	**Interval between defrost cycles:** (0 to 120hours) determines the interval of time between two defrost cycles.
MdF	**(Maximum) length for defrost:** (0 to 255min) - **dFP=n:** no evaporator probe used, timed defrost. **MdF** sets the defrost duration. - **dFP=Px:** defrost end based on temperature. **MdF** sets the maximum length for any defrost.
MdS	**(Maximum) length for second defrost:** (0 to 255min) with **oA3=dF2**, it sets the second defrost maximum duration. - **dSP=n:** no evaporator probe used, timed defrost. **MdF** sets the defrost duration. - **dSP=Px:** defrost end based on temperature. **MdF** sets the maximum length for any defrost
dSd	**Start defrost delay:** (0 to 99min) this is useful when different defrost start times are necessary to avoid overloading the plant.
dFd	**Temperature displayed during defrost:** (rt; it; SEt; dEF) **rt** = real temperature; **it** = temperature at defrost start; **SEt** = set point; **dEF** = "**dEF**" label.
dAd	**MAX display delay after defrost:** (0 to 255min) sets the maximum time between the end of defrost and the restarting of the real room temperature display.
Fdt	**Drip time:** (0 to 120min) time interval between reaching defrost termination temperature and the restoring of the control's normal operation. This time allows the evaporator to eliminate water drops that might have formed due to defrost.
dPo	**First defrost after start-up:** (n; Y) **n** = after the **idF** time, **Y** = immediately.
dAF	**Defrost delay after continuous cycle:** (0.0 to 24h00min, res. 10min) time interval between the end of the fast freezing cycle and the following defrost related to it.

FANS

FnC	**Fans operating mode:** (C-n; o-n; C-Y; o-Y) **C-n** = runs with the compressor, OFF during defrost; **o-n** = continuous mode, OFF during defrost; **C-Y** = runs with the compressor, ON during defrost; **o-Y** = continuous mode, ON during defrost.
Fnd	**Fans delay after defrost:** (0 to 255min) interval between end of defrost and evaporator fans start.
FCt	**Temperature differential to avoid fan short cycles:** (0 to 59°C; 0 to 90°F) (N.B.: if **FCt=0** function disabled) if the difference of temperature between the evaporator and the room probes is higher than **FCt** value, the fans will be switched on.
FSt	**Fans stop temperature:** (-55 to 50°C; -67 to 122°F) setting of temperature, detected by evaporator probe, above which fans are always OFF.
Fon	**Fan ON time:** (0 to 15min) with **Fnc=C_n** or **C_Y**, (fan activated in parallel with compressor) it sets the evaporator fan ON cycling time when the compressor is off. With **Fon=0** and **FoF≠0** the fan are always off, with **Fon=0** and **FoF=0** the fan are always off.
FoF	**Fan OFF time:** (0 to 15min) With **FnC=C_n** or **C_Y**, (fan activated in parallel with compressor) it sets the evaporator fan off cycling time when the compressor is off. With **Fon=0** and **FoF≠0** the fan are always off, with **Fon=0** and **FoF=0** the fan are always off.
FAP	**Probe selection for fan management:** (nP; P1; P2; P3; P4) **nP** = no probe; **P1** =thermostat probe; **P2** = evaporator probe; **P3** =configurable probe; **P4** = Probe on Hot Key plug.

AUXILIARY THERMOSTAT CONFIGURATION (terms. 10-11-12) – OA3 = AUS

ACH	**Kind of regulation for auxiliary relay:** (Ht; CL) **Ht** = heating; **CL** = cooling.
SAA	**Set Point for auxiliary relay:** (-100.0 to 150.0°C; -148 to 302°F) it defines the room temperature set point to switch auxiliary relay.
SHY	**Differential for auxiliary output:** (0.1 to 25.5°C; 1 to 45°F) intervention differential for auxiliary output set point. • **ACH=CL**, AUX Cut in is [**SAA+SHY**]; AUX Cut out is **SAA**. • **ACH=Ht**, AUX Cut in is [**SAA–SHY**]; AUX Cut out is **SAA**.
ArP	**Probe selection for auxiliary:** (nP; P1; P2; P3; P4) **nP** = no probe, the auxiliary relay is switched only by the digital input; **P1** = Probe 1 (Thermostat probe); **P2** = Probe 2 (evaporator probe); **P3** = Probe 3 (display probe); **P4** = Probe 4.
Sdd	**Auxiliary relay off during defrost:** (n; Y) **n** = the auxiliary relay operates during defrost. **Y** = the auxiliary relay is switched off during defrost.

ALARMS

ALP	**Probe selection for alarm:** (nP; P1; P2; P3; P4) **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:** (Ab; rE) **Ab** = absolute temperature, alarm temperature is given by the **ALL** or **ALU** values. **rE** = temperature alarms are referred to the set point. Temperature alarm is enabled when the temperature exceeds the [**SET+ALU**] or [**SET-ALL**] values.
ALU	**MAXIMUM temperature alarm:** • If **ALC=Ab**: [ALL to 150.0°C or ALL to 302°F] • If **ALC=rE**: [0.0 to 50.0°C or 0 to 90°F] when this temperature is reached the alarm is enabled, after the **ALd** delay time.
ALL	**Minimum temperature alarm:** • If **ALC=Ab**: [-100°C to ALU; -148 to ALU] • If **ALC=rE**: [0.0 to 50.0°C or 0 to 90°F] when this temperature is reached the alarm is enabled, after the **ALd** delay time.
AFH	**Differential for temperature alarm recovery:** (0.1 to 25.5°C; 1 to 45°F) intervention differential for recovery of temperature alarm.
ALd	**Temperature alarm delay:** (0 to 255 min) time interval between the detection of an alarm condition and alarm signalling.
dAo	**Exclusion of temperature alarm at start-up:** (0.0 to 24h00min, res. 10min) time interval between the detection of the temperature alarm condition after instrument power on and alarm signalling.

CONDENSER TEMPERATURE ALARM

AP2	**Probe selection for temperature alarm of condenser:** (nP; P1; P2; P3; P4) **nP** = no probe; **P1** = thermostat probe; **P2** = evaporator probe; **P3** = configurable probe; **P4** = Probe on Hot Key plug.
AL2	**Low temperature alarm of condenser:** (-100 to 150°C; -148 to 302°F) when this temperature is reached the **LA2** alarm is signalled, possibly after the Ad2 delay.
Au2	**High temperature alarm of condenser:** (-100 to 150°C; -148 to 302°F) when this temperature is reached the **HA2** alarm is signalled, possibly after the **Ad2** delay.
AH2	**Differential for temperature condenser alarm recovery:** 0.1 to 25.5°C; 1 to 45°F
Ad2	**Condenser temperature alarm delay:** (0 to 255 min) time interval between the detection of the condenser alarm condition and alarm signalling.
dA2	**Condenser temperature alarm exclusion at start up:** 0.0 to 24h00min, res. 10min.
bLL	**Compressor off with low temperature alarm of condenser:** (n; Y) **n** = compressor keeps on working; **Y** = compressor is switched off till the alarm is present, in any case regulation restarts after **AC** time at minimum.
AC2	**Compressor off with high temperature alarm of condenser:** (n; Y) **n** = compressor keeps on working; **Y** = compressor is switched off till the alarm is present, in any case regulation restarts after **AC** time at minimum.

AUXILIARY RELAY

tbA	**Alarm relay silencing (with oA3 =ALr):** (n; Y) **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.
oA3	**Second relay configuration (1-4):** (dEF; FAn; ALr; LiG; AUS; onF; db; dEF2; HES) **dEF** = defrost; **FAn** = do not select it; **ALr** = alarm; **LiG** = light; **AUS** = Auxiliary relay; **onF** = always on with instrument on; **db** = neutral zone; **dEF2** = do not select it; **HES** = night blind.
SbL	**Light on during Sabbath:** (n; Y) set the light status when in Sabbath mode. • **n** = light is always OFF. • **Y** = light is always on.
AoP	**Alarm relay polarity:** (CL; oP) it set if the alarm relay is open or closed when an alarm occurs. **CL** = terminals 1-4 closed during an alarm; **oP** = terminals 1-4 open during an alarm.

DIGITAL INPUTS

i1P	**First digital input polarity:** (oP; CL) **oP** = the digital input is activated by opening the contact; **CL** = the digital input is activated by closing the contact.
i1F	**First digital input configuration:** (dor; dEF) **dor** = door switch function; **dEF** = activation of a defrost cycle.

i2P	**Second digital input polarity:** (oP; CL) **oP** = the digital input is activated by opening the contact; **CL** = the digital input is activated by closing the contact.
i2F	**Second digital input configuration:** (EAL; bAL; PAL; dor; dEF; ES; AUS; Htr; FAn; HdF; onF) **EAL** = external alarm: "**EA**" message is displayed; **bAL** = serious alarm "**CA**" message is displayed; **PAL** = pressure switch alarm, "**CA**" message is displayed; **dor** = door switch function; **dEF** = activation of a defrost cycle; **ES** = energy saving; **AUS** = auxiliary relay activation with **oA3=AUS**; **Htr** = type of inverting action (cooling or heating); **FAn** = fan; **HdF** = Holiday defrost (enable only with RTC); **onF** = to switch the controller off.
did	**Digital input 1 alarm delay:** (0 to 255 min) delay between the detection of the external alarm condition and its signalling. When **i1F= PAL**, it is the interval of time to calculate the number of pressure switch activation.
d2d	**Digital input 2 alarm delay:** (0 to 255 min) delay between the detection of the external alarm condition and its signalling. When **i2F= PAL**, it is the interval of time to calculate the number of pressure switch activation.
nPS	**Number of pressure switch activation:** (0 to 15) Number of activation, during the **did** or **d2d** interval, before signalling an alarm event (**i1F, i2F=PAL**). If the **nPS** activation during **did** or **d2d** time is reached, switch off and on the instrument to restart normal regulation.
odC	**Compressor status when open door:** (no; FAn; CPr;F_C;) **no** = normal; **FAn** = normal; **CPr** = compressor OFF, **F_C** = compressor OFF.
rrd	**Outputs restart after door open alarm:** (n; Y) **n** = outputs follow the **odC** parameter. **Y** = outputs restart with a door open alarm.
HES	**Delta temperature during an Energy Saving cycle:** (-30.0 to 30.0°C; -54 to 54°F) it sets the increasing value of the set point **[SET+HES]** during the Energy Saving cycle.

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

Hur	**Current hour:** 0 to 23 hours.
Min	**Current minute:** 0 to 59 min.
dAY	**Current day:** Sun to SAt.
Hd1	**First weekly holiday: (**Sun to nu) sets the first day of the week which follows the holiday times.
Hd2	**Second weekly holiday:** (Sun ÷ nu) sets the second day of the week which follows the holiday times.
N.B.	**Hd1,Hd2** can be set also as **"nu"** value (Not Used).

HOW TO SET ENERGY SAVING TIMES (FOR MODELS WITH RTC ONLY)

iLE	**Energy Saving cycle start during workdays:** (0 to 23h50min, res. 10 min) during the Energy Saving cycle the set point is increased by the value in **HES** so that the operation set point is **SET+HES**.
dLE	**Energy Saving cycle length during workdays:** (0 to 24h00min, res. 10 min) sets the duration of the Energy Saving cycle on workdays.
iSE	**Energy Saving cycle start on holidays:** 0 to 23h50min
dSE	**Energy Saving cycle length on holidays:** 0 to 24h00min

HOW TO SET DEFROST TIMES (FOR MODELS WITH RTC ONLY)

Ld1 to Ld6	**Beginning of the defrost cycle on workdays:** (0 to 23h50min, res. 10 min) These parameters set the beginning of the 6 programmable defrost cycles during workdays. Ex: when **Ld2=12.4** the second defrost starts at 12.40 on workdays.
Sd1 to Sd6	**Beginning of the defrost cycle on holidays:** (0 to 23h50min, res. 10 min) These parameters set the beginning of the 6 programmable defrost cycles on holidays. Ex: when **Sd2=3.4** the second defrost starts at 3.40 on holidays. **N.B. :To disable a defrost cycle set it to "nu"(not used).** ***Ex.*** *If **Ld6**=nu ; the sixth defrost cycle is disabled*

OTHER

Adr	**Serial address:** (1 to 247) identifies the instrument address when connected to a ModBUS compatible monitoring system.
PbC	**Type of probe:** (Pt1; ntC) it allows to set the kind of probe used by the instrument: **Pt1** = PT1000 probe, **ntC** = NTC probe.
onF	**On/Off key enabling:** (nU; oFF; ES) **nU** = disabled; **oFF** = enabled; **ES** = not set it.
dP1	Thermostat probe display.
dP2	Evaporator probe display.
dP3	Third probe display- optional.
dP4	Fourth probe display.
rSE	Real set point: it shows the set point used during the energy saving cycle or during the continuous cycle.
rEL	Software release for internal use.
Ptb	Parameter table code: readable only.

8. DIGITAL INPUTS

The first digital input is enabled when **P3P=n**.
With **P3P=n** and **i1F=i2F** the second digital input is disabled.
The free voltage digital inputs are programmable by the **i1F** and **i2F** parameters.

8.1 GENERIC ALARM (i2F = EAL)

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

8.2 SERIOUS ALARM MODE (i2F = BAL)

When the digital input is activated, the unit will wait for **did** 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 (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 door status and the corresponding relay output status through the **odC** parameter:
no = normal (any change); **FAn** = Fan OFF; **CPr** = Compressor OFF; **F_C** = Compressor and fan OFF. Since the door is opened, after the delay time set through parameter **doA**, the door alarm is enabled, the display shows the message **dA** and **the regulation restarts is rtr=YES.** The alarm stops as soon as the external digital input is disabled again. With the door open, the high and low temperature alarms are disabled.

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 "MdF" safety time is expired.

8.6 SWITCH THE AUXILIARY RELAY (i2F = AUS)

With oA3 = AUS the digital input switched the status of the auxiliary relay

8.7 INVERSION OF THE KIND OF ACTION: HEATING-COOLING (i2F=Htr)

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

8.8 ENERGY SAVING (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 (i2F = HDF) –ONLY FOR MODELS WITH RTC

This function enabled the holiday defrost setting.

8.10 ON OFF FUNCTION (i2F = onF)

To switch the controller on and off.

8.11 DIGITAL INPUTS POLARITY

The digital input polarity depends on the "**i1P**" and **"i2P"** parameters.
i1P or i2P =CL: the input is activated by closing the contact.
i1P or i2P=OP: the input is activated by opening the contact

9. RS485 SERIAL LINE – FOR MONITORING SYSTEMS

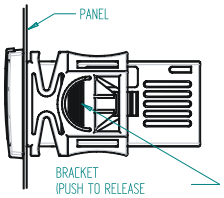
The RS485 serial line, allows to connect the instrument to a monitoring system **ModBUS-RTU** compatible such as the **XWEB500**.

10. X-REP OUTPUT – OPTIONAL

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

To connect the X-REP to the instrument the following connectors must be used CAB-51F(1m), CAB-52F(2m), CAB-55F(5m),

11. INSTALLATION AND MOUNTING



Instrument **XR77CX** shall be mounted on vertical panel, in a 29x71 mm hole, and fixed using the special bracket supplied.
The temperature range allowed for correct operation is 0 to 60°C. Avoid places subject to strong vibrations, corrosive gases, excessive dirt or humidity. The same recommendations apply to probes. Let air circulate by the cooling holes.

12. ELECTRICAL CONNECTIONS

The instrument is provided with screw terminal block to connect cables with a cross section up to 2.5mm^2. Before connecting cables make sure the power supply complies with the instrument's requirements. Separate the probe cables from the power supply cables, from the outputs and the power connections. Do not exceed the maximum current allowed on each relay, in case of heavier loads use a suitable external relay.

12.1 PROBE CONNECTION

The probes shall be mounted with the bulb upwards to prevent damages due to casual liquid infiltration. It is recommended to place the 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. 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 **UP** button; the "**uPL**" message appears followed a by a flashing "**End**" label.
3. Push **SET** button and the "**End**" will stop flashing.
4. Turn OFF the instrument, remove the "**HOT-KEY**" and then turn it ON again.

NOTE: the "**Err**" message appears in case of a failed programming operation. In this case push again button 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 **pre-programmed** "**HOT-KEY**" **into the 5-PIN receptacle** and then turn the Controller ON.
3. The parameter list of the "**HOT-KEY**" will be automatically downloaded into the Controller memory. The "**doL**" message will blink followed a by a flashing "**End**" label.
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

Message	Cause	Outputs
"P1"	Room probe failure	Compressor output acc. to par. **Con** and **CoF**
"P2"	Evaporator probe failure	Defrost end is timed
"P3"	Third probe failure	Outputs unchanged
"P4"	Fourth probe failure	Outputs unchanged
"HA"	Maximum temperature alarm	Outputs unchanged.
"LA"	Minimum temperature alarm	Outputs unchanged.
"HA2"	Condenser high temperature	It depends on the **AC2** parameter
"LA2"	Condenser low temperature	It depends on the **bLL** parameter
"dA"	Door open	Compressor and fans restarts
"EA"	External alarm	Output unchanged.
"CA"	Serious external alarm (**i2F=bAL**)	All outputs OFF.
"CA"	Pressure switch alarm (**i2F=PAL**)	All outputs OFF
"rtc"	Real time clock alarm	Alarm output ON; Other outputs unchanged; Defrosts according to par. **idF** Set real time clock has to be set
rtF	Real time clock board failure	Alarm output ON; Other outputs unchanged; Defrosts according to par. **idF** Contact the service

14.1 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 restarts 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.
Alarms **"EA"** and **"CA"** (with **i2F=bAL**) recover as soon as the digital input is disabled.
Alarm "**CA**" (with **i2F=PAL**) recovers only by **switching off and on** the instrument.

14.2 OTHER MESSAGES

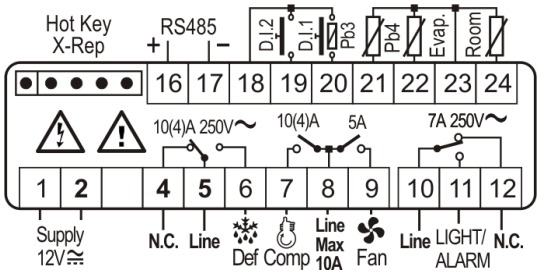
Pon	Keyboard unlocked.
PoF	Keyboard locked
noP	**In programming mode**: none parameter is present in Pr1 **On the display** or in dP2, dP3, dP4: the selected probe is nor enabled

15. TECHNICAL DATA

Housing: self extinguishing ABS.
Case: frontal 32x74 mm; depth 60mm;
Mounting: panel mounting in a 71x29mm panel cut-out
Protection: IP20; **Frontal protection:** IP65
Connections: Screw terminal block ≤ 2.5 mm² wiring.
Power supply: according to the model
24VAC, ±10%
12 to 40 VDC, ±10%
110AC ±10%, 50/60Hz
230VAC ±10%, 50/60Hz
Power absorption: 3VA max
Display: 3 digits, red LED, 14.2 mm high
Inputs: Up to 4 NTC or PT1000 probes.
Digital inputs: free voltage contact
Relay outputs: compressor SPST 8(3) A, 250VAC or SPST 16A 250VAC
Defrost: SPDT 8(3) A, 250VAC
Fan: SPST 5A, 250VAC
Aux: SPDT 8(3) A, 250VAC
Buzzer: optional
Data storing: on the non-volatile memory (EEPROM)
Internal clock back-up: 24 hours
Kind of action: 1B
Pollution grade: 2
Software class: A
Rated impulsive voltage: 2500V
Overvoltage Category: II
Operating temperature: 0 to 55°C
Storage temperature: -25 to 60°C.
Relative humidity: 20 to 85% (no condensing)
Measuring and regulation range:
NTC probe: -40 to 110°C (-40 to 230°F)
PT1000 probe: -100 to 150°C (-148 to 302°F)
Resolution: 0.1°C or 1°C or 1°F (selectable)
Accuracy (ambient temp. 25°C): ±0.7°C ±1 digit

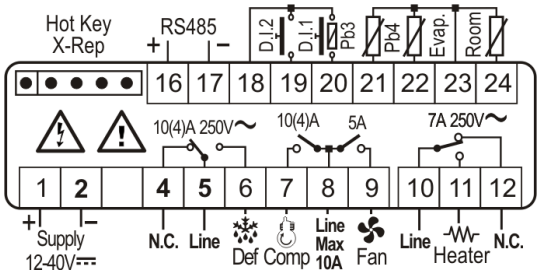
16. CONNECTIONS

16.1 12VAC/DC SUPPLY

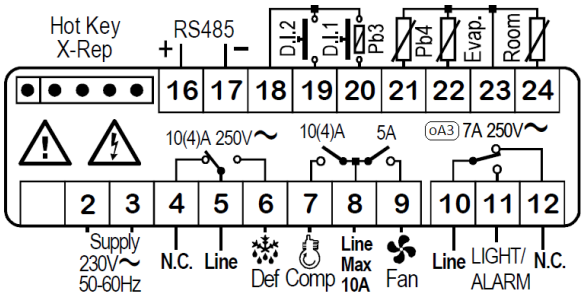


Supply: 24Vac/dc: connect to terminals 1-2.

16.2 12 TO 40 VDC SUPPLY



16.3 230VAC SUPPLY



Supply: 110Vac: connect to terminals 2-3.
oA3= configurable relay

17. DEFAULT SETTING VALUES

Label	Name	Range	Value	Level
SEt	Set point	LS; US	-5.0	- - -
rtC	Real time clock menu	-	-	Pr1
HY	Differential	[0.1 to 25.5°C] [1 to 45°F]	2.0	Pr1
LS	Minimum set point	[-100°C to SET] [-148°F to SET]	-50.0	Pr2
US	Maximum set point	[SET to 150°C] [SET to 302°F]	110	Pr2
ot	Thermostat probe calibration	[-12.0 to 12.0°C] [-21 to 21°F]	0.0	Pr1
P2P	Evaporator probe presence	n; Y	Y	Pr1
oE	Evaporator probe calibration	[-12.0 to 12.0°C] [-21 to 21°F]	0.0	Pr2
P3P	Third probe presence	n; Y	n	Pr2
o3	Third probe calibration	[-12.0 to 12.0°C] [-21 to 21°F]	0	Pr2
P4P	Fourth probe presence	n; Y	n	Pr2
o4	Fourth probe calibration	[-12.0 to 12.0°C] [-21 to 21°F]	0	Pr2
odS	Outputs delay at start up	0 to 255 min	0	Pr2
AC	Anti-short cycle delay	0 to 50 min	1	Pr1
rtr	P1-P2 percentage for regulation	0 to 100 (100=P1 , 0=P2)	100	Pr2
CCt	Continuous cycle duration	0.0 to 24h00min, res. 10 min	0.0	Pr2
CCS	Set point for continuous cycle	[-100 to 150.0°C] [-148 to 302°F]	-5	Pr2
Con	Compressor ON time with faulty probe	0 to 255 min	15	Pr2
CoF	Compressor OFF time with faulty probe	0 to 255 min	30	Pr2
CF	Temperature measurement unit	°C; °F	°C	Pr2
rES	Resolution	dE; in	dE	Pr1
Lod	Probe displayed	P1; P2; P3; P4; SEt; dtr	P1	Pr2
rEd²	X-REP display	P1; P2; P3; P4; SEt; dtr	P1	Pr2
dLY	Display temperature delay	0.0 to 20min00sec, res. 10 sec	0.0	Pr2
dtr	P1-P2 percentage for display	1 to 99	50	Pr2
EdF*	Kind of interval for defrost	rtC; in	rtC	Pr2
tdF	Defrost type	EL; in	EL	Pr1
dFP	Probe selection for defrost termination	nP; P1; P2; P3; P4	P2	Pr2
dSP	2nd Probe defrost termination	nP; P1; P2; P3; P4	nP	Pr2

Label	Name	Range	Value	Level
dtE	Defrost termination temperature	[-55 to 50.0°C] [-67 to 122°F]	8	Pr1
dtS	2nd Defrost termination temperature	[-55 to 50.0°C] [-67 to 122°F]	8	Pr2
idF	Interval between defrost cycles	0 to 120 hours	6	Pr1
MdF	(Maximum) length for defrost	0 to 255 min	30	Pr1
MdS	(Maximum) length for 2nd defrost	0 to 255 min	30	Pr2
dSd	Start defrost delay	0 to 255 min	0	Pr2
dFd	Displaying during defrost	rt; it; SEt; dEF	it	Pr2
dAd	MAX display delay after defrost	0 to 255 min	30	Pr2
Fdt	Draining time	0 to 255 min	0	Pr2
dPo	First defrost after start-up	n; Y	n	Pr2
dAF	Defrost delay after fast freezing	0.0 to 24h00min, res. 10 min	0.0	Pr2
FnC	Fan operating mode	C-n; o-n; C-Y; o-Y	o-n	Pr1
Fnd	Fan delay after defrost	0 to 255 min	10	Pr1
FCt	Differential of temperature for forced activation of fans	[0 to 50°C] [0 to 90°F]	10	Pr2
FSt	Fan stop temperature	[-55 to 50.0°C] [-67 to 122°F]	2	Pr1
Fon	Fan on time with compressor off	0 to 15 min	0	Pr2
FoF	Fan off time with compressor off	0 to 15 min	0	Pr2
FAP	Probe selection for fan management	nP; P1; P2; P3; P4	P2	Pr2
ACH	Kind of action for auxiliary relay	CL; Ht	CL	Pr2
SAA	Set Point for auxiliary relay	[-100 to 150°C] [-148 to 302°F]	0.0	Pr2
SHY	Differential for auxiliary relay	[0.1 to 25.5°C] [1 to 45°F]	2.0	Pr2
ArP	Probe selection for auxiliary relay	nP; P1; P2; P3; P4	nP	Pr2
Sdd	Auxiliary relay operating during defrost	n; Y	n	Pr2
ALP	Alarm probe selection	nP; P1; P2; P3; P4	P1	Pr2
ALC	Temperat. alarms configuration	rE; Ab	Ab	Pr2
ALU	MAXIMUM temperature alarm	Rel: [0.0 to 50.0°C] [0 to 90°F] AbS: [ALL to 150°C] [ALL to 302°F]	110.0	Pr1
ALL	Minimum temperature alarm	Rel: [0.0 to 50.0°C] [0 to 90°F] AbS: [-100°C to ALU] [-148°F to ALU]	-50.0	Pr1
AFH	Differential for temperat. alarm recovery	[0.1 to 25.5°C] [1 to 45°F]	2.0	Pr2
ALd	Temperature alarm delay	0 to 255 min	15	Pr2
dAo	Delay of temperature alarm at start up	0.0 to 24h00min, res. 10 min	1.3	Pr2
AP2	Probe for temperat. alarm of condenser	nP; P1; P2; P3; P4	P4	Pr2
AL2	Condenser for low temperat. alarm	[-100 to 150°C] [-148 to 302°F]	-40	Pr2
AU2	Condenser for high temperat. alarm	[-100 to 150°C] [-148 to 302°F]	110	Pr2
AH2	Differ. for condenser temp. alar. recovery	[0.1 to 25.5°C] [1 to 45°F]	5	Pr2
Ad2	Condenser temperature alarm delay	0 to 254 min, 255(nu)	15	Pr2
dA2	Delay of cond. temper. alarm at start up	0.0 to 24h00min, res. 10 min	1.3	Pr2
bLL	Compr. off for condenser low temperature alarm	n; Y	n	Pr2
AC2	Compr. off for condenser high temperature alarm	n; Y	n	Pr2
tbA	Alarm relay disabling	n; Y	Y	Pr2
oA3	Fourth relay configuration	ALr = alarm; dEF = do not select it; LiG =Light; AUS =AUX; onF=always on; FAn= do not select it; db = neutral zone; CP2 = second compressor; dF2 = do not select it	LiG	Pr2
AoP	Alarm relay polarity (oA3=ALr)	oP; CL	CL	Pr2
i1P	Digital input polarity (18-20)	oP; CL	CL	Pr1
i1F	Digital input 1 configuration (18-20)	dor; dEF	dor	Pr1
i2P	Digital input polarity (18-19)	oP; CL	CL	Pr2
i2F	Digital input configuration (18-19)	EAL; bAL; PAL; dor; dEF; ES; AUS; Htr; FAn; HdF; onF	EAL	Pr2
did	Digital input alarm delay (18-20)	0 to 255 min	15	Pr1
doA	Door open alarm delay	0 to 255 min	15	Pr1
nPS	Number of activation of pressure switch	0 to 15	15	Pr2
odC	Compress and fan status when open door	no; FAn; CPr; F-C	F-C	Pr2
rrd	Regulation restart with door open alarm	n; Y	Y	Pr2
HES	Differential for Energy Saving	[-30 to 30°C] [-54 to 54°F]	0	Pr2
Hur	Current hour	0 to 23	-	Pr1
Min	Current minute	0 to 59	-	Pr1
dAY	Current day	Sun to SAt	-	Pr1
Hd1	First weekly holiday	Sun to SAt; nu	nu	Pr1
Hd2	Second weekly holiday	Sun to SAt; nu	nu	Pr1
iLE	Energy Saving cycle start during workdays	0.0 to 23h50min, res. 10 min	0.0	Pr1
dLE	Energy Saving cycle length during workdays	0.0 to 23h50min, res. 10 min	0	Pr1
iSE	Energy Saving cycle start on holidays	0.0 to 23h50min, res. 10 min	0.0	Pr1
dSE	Energy Saving cycle length on holidays	0.0 to 24h00min, res. 10 min	0	Pr1
Ld1	1st workdays defrost start	0.0 to 23h50min; nu	6.0	Pr1
Ld2	2nd workdays defrost start	0.0 to 23h50min; nu	13.0	Pr1
Ld3	3rd workdays defrost start	0.0 to 23h50min; nu	21.0	Pr1
Ld4	4th workdays defrost start	0.0 to 23h50min; nu	nu	Pr1
Ld5	5th workdays defrost start	0.0 to 23h50min; nu	nu	Pr1
Ld6	6th workdays defrost start	0.0 to 23h50min; nu	nu	Pr1

Label	Name	Range	Value	Level
Sd1	1st holiday defrost start	0.0 to 23h50min; nu	6.0	Pr1
Sd2	2nd holiday defrost start	0.0 to 23h50min; nu	13.0	Pr1
Sd3	3rd holiday defrost start	0.0 to 23h50min; nu	21.0	Pr1
Sd4	4th holiday defrost start	0.0 to 23h50min; nu	nu	Pr1
Sd5	5th holiday defrost start	0.0 to 23h50min; nu	nu	Pr1
Sd6	6th holiday defrost start	0.0 to 23h50min; nu	nu	Pr1
Adr	Serial address	0 to 247	1	Pr2
PbC	Kind of probe	Pt1000; ntC	ntC	Pr2
onF	on/off key enabling	nu; oFF; ES	nu	Pr2
dP1	Room probe display	probe value	-	Pr1
dP2	Evaporator probe display	probe value	-	Pr1
dP3	Third probe display	probe value	-	Pr1
dP4	Fourth probe display	probe value	-	Pr1
rSE	Real set	actual set	-	Pr2
rEL	Software release	read only	2.6	Pr2
Ptb	Map code	read only	-	Pr2

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