07/2018

# Mod: TABS2/D-R6

**Production code: DB200S-I**

Diamond
catering equipment

Diamond
refrigeration equipment

# BACKBAR COOLERS

## Original instructions

EN 3

## Models:

DB105H-I
DB125H-I
DB200H-I
DB200S-I
DB300H-3-P
DB300S-3-P

# CONTENTS

# IMPORTANT SAFETY INSTRUCTIONS

Before you use your cooler please read this instruction manual carefully.

This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.

The instructions concerning persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge and children playing with the appliance are not required.

Do not store explosive substances such as aerosol cans with a flammable propellant in this appliance.

WARNING: Keep clear of obstruction all ventilation openings in the appliance enclosure or in the structure for building-in.

WARNING: Do not use mechanical devices or other means to accelerate the defrosting process, other than those recommended by the manufacturer.

WARNING: Do not damage the refrigerant circuit.

WARNING: Do not use electrical appliances inside the food storage compartments of the appliance, unless they are of the type recommended by the manufacturer.

The refrigerant is R600a/R290 and insulation blowing gases is cyclopentane, servicing and disposal of appliance should be done by qualified person.

Appliance information

Climatic class: 4, the user should use the appliance below 32 °C.

The A-weighted emission sound pressure level is below 70 dB(A).

The max load for each shelf is no greater than 230kg/m².

This Symbol means risk of fire and flammable materials used in appliance.

# UNPACKING AND INSTALLATION

Remove the wooden pallet and the packing. External surfaces are supplied with a protection foil, which must be removed before installation.

# ELECTRICAL CONNECTION

The cabinet operates on 220-240 V/50 Hz.

The wall socket should be easily accessible.

All earthing requirements stipulated by the local electricity authorities must be observed. The cabinet plug and wall socket should then give correct earthing. If in doubt, contact your local supplier or authorized electrician.

The main electrical connections must be done by skilled electricians.

# START-UP OF THE CABINET

Before use, we recommend that the cabinet is cleaned, see the section on maintenance and cleaning.

## Important !

If the cabinet has been horizontally placed during transport, please wait 2 hours before starting up the cabinet.

# THERMOSTAT

The thermostat and the light switch is placed in the bottom panel.


The thermostat has been pre-set and in most cases it is not necessary to adjust the settings.

When turning on the cabinet the display will show the current temperature in the cabinet.

**Display set temperature:**

SET Press this key and the display will show the set temperature. Press the key again to return to normal reading

**Set new temperature:**

SET Press this key continuously for more than 3 seconds and the display shows the set temperature.

Press this key to increase the set temperature.

Press this key to lower the set temperature.

SET Press this key to save the new settings. The display will flash with the new value and will then return to normal reading.

**Alarm codes:**

‘P1’ Flashing in the display: indicates that the cabinet sensor is defective.
The cabinet will strive to keep the set temperature until it has been repaired.

# DEFROSTING

The cabinet defrosts automatically with pre-set intervals. If the door to the cabinet is opened or the contents of the cabinet is changed frequently it may become necessary to defrost the cabinet manually.

Pressing this key continuously for more than 3 seconds will start a manual defrosting and then return to normal operation.

Defrosted water runs to a container placed in the compressor compartment and evaporates.

# MOVING THE SHELVES

The shelf guides is moved by squeezing them together and lifting them upwards at the same time. Check that all 4 shelf guides are placed in the same height before placing the shelf in the cabinet.

# DOOR REVERSAL

## Single door cabinets only !

Remove the 3 screws in the bottom hinge and let the door slide out of the top hinge.
Move the top hinge to the opposite side and remount the door and bottom hinge.

# CLEANING AND MAINTENANCE

Switch off the electrical connection at the socket.

The cabinet must be periodically cleaned. Clean the external and internal surfaces of the cabinet with a light soap solution and subsequently wipe dry.
Do not spray the appliance with direct jets of water or using high pressure appliances.
Do NOT use cleansers containing chlorine or other harsh cleansers, as these can damage the surfaces and the internal cooling system.
Clean the condenser and the compressor compartment using a vacuum cleaner and a stiff brush.

# SERVICE

The cooling system is a hermetically sealed system and does not require supervision, only cleaning.

If the cabinet fails to cool, check if the reason is a power cut.

If you cannot locate the reason to the failure of the cabinet, please contact your supplier. Please inform model and serial number of the cabinet. You can find this information on the rating label which is placed inside the cabinet in the top right hand side.

# DISPOSAL

Disposal of the cabinet must take place in an environmentally correct way. Please note existing regulation on disposal. There may be special requirements and conditions which must be observed.

# DIGITAL CONTROLLER

# XR01-02CX

## 1. CONTENTS



## 2. GENERAL WARNINGS

### 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.

### 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.p.A." (see address) with a detailed description of the fault.
- Consider the maximum current which can be applied to each relay (see Technical Data).
- Ensure that the wires for probes, loads and the power supply are separated and far enough from each other, without crossing or intertwining.
- In case of applications in industrial environments, the use of mains filters (our mod. FT1) in parallel with inductive loads could be useful.

## 3. GENERAL DESCRIPTION

Model **XR01CX**, **format 32 x 74 x50 mm** format is a single stage temperature controller suitable for applications in the field of refrigeration or heating. It provides a relay output to drive the compressor. It is also provided with 1 NTC probe input and one configurable digital input. The instrument is fully configurable through special parameters that can be easily programmed through the keyboard or the by HOTKEY.

Model **XR02CX**, **format 32 x 74 x 50 mm**, is a digital thermostat with off cycle defrost designed for refrigeration applications at normal temperature. It provides a relay output to drive the compressor. It is also provided with 1 NTC probe input and one configurable digital input. The instrument is fully configurable through special parameters that can be easily programmed through the keyboard or the by HOTKEY.

## 4. REGULATION

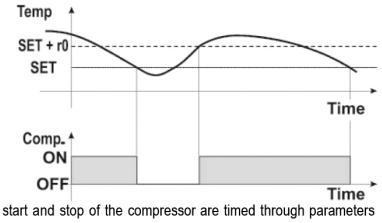
### THE REGULATION OUTPUT

The regulation is performed according to the temperature measured by probe. The XR01CX is provided with the **CH** programmable parameter wich enables the user to set the regulation both for heating or cooling applications:

- **CH=cL** --> cooling applications;
- **CH=Ht** --> heating applications;

### COOLING APPLICATIONS

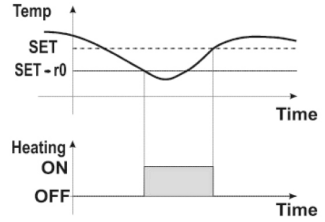
The regulation is performed according to the temperature measured by the thermostat probe with a positive differential from the set point: if the temperature increases and reaches set point plus differential the compressor is started and then turned off when the temperature reaches the set point value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




In case of fault in the thermostat probe the start and stop of the compressor are timed through parameters "**Cy**" and "**Cn**".

### HEATING APPLICATIONS ( ONLY FOR XR01CX)

The Hy value is automatically subtracted to the SET POINT. If the temperature decreases and reaches set point minus differential the output is started and then turned off when the temperature reaches set point value again.




## 5. DEFROST (ONLY XR02CX)

Defrost is performed through a simple stop of the compressor. Parameter "**id**" controls the interval between defrost cycles, while its length is controlled by parameter "**Md**".

## 6. FRONT PANEL COMMANDS

**SET** To display target set point, in programming mode it selects a parameter or confirm an operation

To start a manual defrost (Only XR02CX)

In programming mode it browses the parameter codes or increases the displayed value

**AUX** In programming mode it browses the parameter codes or decreases the displayed value

**KEYS COMBINATION**

To lock or unlock the keyboard

SET + ▼ To enter in programming mode

SET + ▲ To return to room temperature display

| LED | MODO | SIGNIFICATO |
|---|---|---|
| ❄ | On | Compressore enabled |
| | Flashing | Anti short cycle delay enabled (AC parameter) |
| ❄ | On | Defrost in progress |
| | Flashing | Dripping in progress |
| °C | On | Measurement unit |
| | Flashing | Programming mode |
| °F | On | Measurement unit |
| | Flashing | Programming mode |

### HOW TO SEE THE SET POINT

1. Push and immediately release the **SET** key, the set point will be showed;
2. Push and immediately release the **SET** key or wait about 5s to return to normal visualisation.

### HOW TO CHANGE THE SETPOINT

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 o or n arrows within 10s.
4. To memorise the new set point value push the SET key again or wait 10s.

### HOW TO START A MANUAL DEFROST (ONLY XR02CX)

Push the **DEF** ❄ key for more than 2 seconds and a manual defrost will start

### HOW TO CHANGE A PARAMETER VALUE

To change the parameter's value operate as follows:

1. Enter the Programming mode by pressing the **SET**+ ▼ keys for 3s ("**°C" or "°F"** LED starts blinking).
2. Select the required parameter. Press the "**SET**" key to display its value
3. Use ▲ or ▼ to change its value.
4. Press "**SET**" to store the new value and move to the following parameter.

**To exit**: Press **SET**+ ▲ or wait 15s without pressing a key.
**NOTE**: the set value is stored even when the procedure is exited by waiting the time-out to expire.

### HIDDEN MENU

The hidden menu includes all the parameters of the instrument.

HOW TO ENTER THE HIDDEN MENU

1. Enter the Programming mode by pressing the **SET**+ ▼ keys for 3s ("**°C" or "°F"** LED starts blinking).
2. Released the keys, then push again the **SET**+ ▼ keys for more than 7s. The L2 label will be displayed immediately followed from the Hy parameter.
   **NOW YOU ARE IN THE HIDDEN MENU.**
3. Select the required parameter.
4. Press the "**SET**" key to display its value
5. Use ▲ or ▼ to change its value.
6. Press "**SET**" to store the new value and move to the following parameter.

**To exit**: Press **SET**+ ▲ or wait 15s without pressing a key.
**NOTE1:** if none parameter is present in L1, after 3s the "nP" message is displayed. Keep the keys pushed till the L2 message is displayed.
**NOTE2**: the set value is stored even when the procedure is exited by waiting the time-out to expire.

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.

### TO LOCK THE KEYBOARD

1. Keep pressed for more than 3s the ▲ and ▼ keys.
2. The "**OF**" message will be displayed and the keyboard will be locked. If a key is pressed more than 3s the "OF" message will be displayed.

### TO UNLOCK THE KEYBOARD

Keep pressed together for more than 3s the ▲ and ▼ keys till the **"on"** message will be displayed.

# 7. PARAMETERS

### REGULATION

**Hy** **Differential:** (0,1°C ÷ 25°C / 1°F ÷ 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:** (-55°C÷SET/-67°F÷SET): Sets the minimum value for the set point..
**US** **Maximum SET POINT:** (SET÷99°C/ SET÷99°F). Set the maximum value for set point.
**ot** **First probe calibration:** (-9.9÷9.9°C /-17÷17°F) allows to adjust possible offset of the first probe.
**od** **Outputs activation delay at start up:** (0÷99min) This function is enabled at the initial start up of the instrument and inhibits any output activation for the period of time set in the parameter.
**AC** **Anti-short cycle delay**: (0÷50 min) minimum interval between the compressor stop and the following restart.
**Cy** **Compressor ON time with faulty probe:** (0÷99 min) time during which the compressor is active in case of faulty thermostat probe. With Cy=0 compressor is always OFF.
**Cn** **Compressor OFF time with faulty probe:** (0÷99 min) time during which the compressor is OFF in case of faulty thermostat probe. With Cn=0 compressor is always active.
**CH** **Kind of Action:** **cL**= cooling action; **Ht** = heating action.

### DISPLAY

**CF** **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, oE, o1, AU, AL have to be checked and modified if necessary).
**rE** **Resolution (only for °C):**(dE ÷ in) **dE**= decimal between -9.9 and 9.9°C; **in**= integer
**dy** **Display delay:** (0÷15 min.) when the temperature increases, the display is updated of 1 °C/1°F after this time.

### DEFROST (Only XR02CX)

**id** **Interval between defrost cycles:** (0÷99 ore) Determines the time interval between the beginning of two defrost cycles.
**Md** **Maximum length for defrost:** (0÷99 min. with 0 no defrost) when **P2=n**, (not evaporator probe: timed defrost) it sets the defrost duration, when **P2** = **y** (defrost end based on temperature) it sets the maximum length for defrost.
**dF** **Display during defrost:** (rt / it / St / dF) **rt**= real temperature; **it**= start defrost temperature; **St**= SET-POINT; **dF**= label **dF.**

### ALARMS

**AU** **Maximum temperature alarm:** (AL÷99°C/99°F) when this temperature is reached the alarm is enabled, after the "**Ad**" delay time.
**AL** **Minimum temperature alarm:** (-55÷AU°C /-67÷AU°F) when this temperature is reached the alarm is enabled, after the "**Ad**" delay time.
**Ad** **Temperature alarm delay:** (0÷99 min) time interval between the detection of an alarm condition and alarm signalling.
**dA** **Exclusion of temperature alarm at startup:** (0÷99 min) time interval between the detection of the temperature alarm condition after instrument power on and alarm signalling.

### DIGITAL INPUT

**iP** **Digital input polarity:** (oP ÷ cL) **oP**= activated by closing the contact; **cL**= activated by opening the contact;
**iF** **Digital input configuration:** (EA/bA/do/dF/Au/Hc) **EA**= external alarm: "EA" message is displayed; **bA**= serious alarm "CA" message is displayed; **do**= door switch function; **dF**= defrost activation; **Au** =not used; **Hc**= inversion of the kind of action;
**di** **Digital input delay:** (0÷99 min) with **iF=EA** or **bA** delay between the detection of the external alarm condition and its signalling. . With **iF=do** it represents the delay to activate the door open alarm.
**dC** **Compressor and fan status when open door**: (no/Fn/cP/Fc): **no**= normal; **Fn** = Fans OFF; **cP** =Compressor OFF; **Fc** = Compressor and fans OFF;
**rd** **Regulation with door open**: (n÷y) **n** = no regulation if door is opened; **Y**= when di is elapsed regulation restarts even if door open alarm is present;

### OTHER

**Pt** **Parameter code table**
**rL** **Software release**

# 8. DIGITAL INPUTS

The free voltage digital input is programmable in different configurations by the "**iF**" parameter.

### DOOR SWITCH (iF=do)

It signals the door status and the corresponding relay output status through the "**dC**" parameter: **no** = normal (any change); **Fn** = Fan OFF; **CP** = Compressor OFF; **FC** = Compressor and fan OFF.
Since the door is opened, after the delay time set through parameter "**di**", the door alarm is enabled, the display shows the message "**dA**" and **the regulation restarts if rd** = **y.** 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.

### EXTERNAL ALARM (iF=EA)

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

### SERIOUS ALARM (iF=bA)

When the digital input is activated, the unit will wait for "**di**" 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.

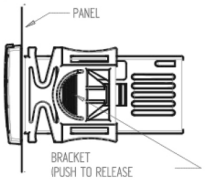
### START DEFROST (iF=dF)

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 "**dd**" safety time is expired.

### INVERSION OF THE KIND OF ACTION: HEATING - COOLING (iF=Hc)

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

# 9. INSTALLATION AND MOUNTING




The instruments 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÷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.

# 10. ELECTRICAL CONNECTIONS

The instrument is provided with screw terminal block to connect cables with a cross section up to 2,5 $mm^2$. 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.

### 10.1 PROBES

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.

# 11. HOW TO USE THE HOT KEY

### 11.1 HOW TO PROGRAM THE HOT KEY FROM THE INSTRUMENT (UPLOAD)

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

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

### 11.2 HOW TO PROGRAM AN INSTRUMENT USING 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 "**do**" message is blinking followed a by flashing "**En**".
4. After 10 seconds the instrument will restart working with the new parameters.
5. Remove the "Hot Key"..

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

# 12. ALARM SIGNALLING

| Mess. | Cause | Outputs |
|---|---|---|
| "P1" | Room probe failure | Compressor output according to "Cy" e "Cn" |
| "P2" | Evaporator probe failure | Defrost end is timed |
| "HA" | Maximum temperature alarm | Outputs unchanged |
| "LA" | Minimum temperature alarm | Outputs unchanged |
| "EA" | External alarm | Outputs unchanged |
| "CA" | Serious external alarm | All outputs OFF. |
| "dA" | Door Open | Compressor and fans restarts |

### 12.1 ALARM RECOVERY

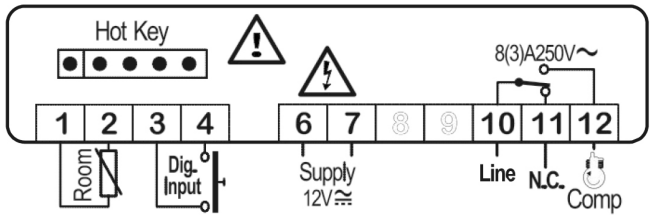
Probe alarms **P1**" and "**P2"** start some seconds after the fault in the related probe; they automatically stop some seconds after the probe restarts normal operation. Check connections before replacing the probe. Temperature alarms "**HA**" and "**LA**" automatically stop as soon as the temperature returns to normal values.
Alarms **"EA"** and **"CA"** (with iF=bL) recover as soon as the digital input is disabled.

# 13. TECHNICAL DATA

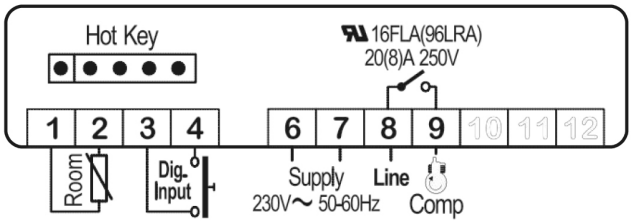
**Housing:** self extinguishing ABS.
**Case:** frontal 32x74 mm; depth 50mm;
**Mounting:** panel mounting in a 71x29mm panel cut-out
**Protection:** IP20; **Frontal protection:** IP65
**Connections:** Screw terminal block ≤ 2,5 $mm^2$ wiring.
**Power supply:** according to the model: 110Vac ±10%, 50/60Hz --- 230Vac ±10%, 50/60Hz
**Power absorption:** 3.5 VA max
**Display**: 2 digits, red LED, 14,2 mm high; **Inputs**: 1 NTC.
**Digital input:** free voltage contact
**Relay outputs: compressor** SPST 20(8)A 250Vac or 8(3) A 250Vac;
**Data storing**: on the non-volatile memory (EEPROM).
**Kind of action:** 1B; **Pollution grade:** 2; **Software class:** A.; **Rated impulsive voltage**: 2500V; **Overvoltage Category**: II **Operating temperature:** 0÷60 °C; **Storage temperature:** -25÷60 °C. **Relative humidity:** 20÷85% (no condensing)
**Measuring and regulation range: NTC** -40÷110°C;
**Resolution:** 0,1 °C or 1°C or 1 °F (selectable); **Accuracy (ambient temp. 25°C)**: ±0,1 °C ±1 digit

# 14. CONNECTIONS

## 14.1 XR01-02CX – 1 X 8A – 12VAC/DC




## 14.2 XR01-02CX – 20A OR 8A -- 110VAC OR 230VAC




**NOTE:** The compressor relay is 20(8)A or 8(3)A depending on the model.
**NOTE:** 120Vac connect to 6-7

# 15. DEFAULT SETTING VALUES

| LABEL | DESCRIPTION | RANGE | DEFAULT |
|---|---|---|---|
| REGULATION | | | |
| Hy | Differential | 0.1 ÷ 25°C/1 ÷ 45°F | 3 |
| LS | Minimum Set Point | -55°C÷SET/-67°F÷SET | 0 |
| US | Maximum Set Point | SET÷99°C/ SET÷99°F | 10 |
| ot | First probe calibration | -9.9÷9.9°C/-17÷17°F | 0.0 |
| od | Outputs activation delay at start up | 0 ÷ 99 min | 3 |
| AC | Anti-short cycle delay | 0 ÷ 50 min | 3 |
| Cy | Compressor ON time faulty probe | 0 ÷ 99 min | 15 |
| Cn | Compressor OFF time faulty probe | 0 ÷ 99 min | 30 |
| CH | Kind of action | cL ÷ Ht | cL |
| DISPLAY | | | |
| CF | Measurement units | °C - °F | °C / °F |
| rE | Resolution (only for °C) | dE – in | dE |
| dy | Display delay | 0 ÷ 15 min | 5 |
| DEFROST (Only XR02CX) | | | |
| id | Interval between defrost cycles | 0 ÷ 99 hours | 6 |
| Md | Maximum length for defrost | 0 ÷ 99 min. | 30 |
| dF | Display during defrost | rt – in – St – dF | St |
| ALARMS | | | |
| AU | Maximum temperature alarm | ALL÷99°C / ALL÷99°F | 99 °C / 99 °F |
| AL | Minimum temperature alarm | -55°C÷ALU/-67°F÷ALU | -55 °C / -55 °F |
| Ad | Temperature alarm delay | 0 ÷ 99 min | 15 |
| dA | Exclusion of temperature alarm at startup | 0 ÷ 99 min | 90 |
| DIGITAL INPUT | | | |
| iP | Digital input polarity | cL – oP | cL |
| iF | Digital input configuration | EA – bA – do – dF – Au – Hc | EA |
| di | Digital input delay | 0 ÷ 99 min | 5 |
| dC | Compressor and fan status when open door | no /Fn / cP / Fc | no |
| rd | Regulation with door open | n – Y | y |
| OTHER | | | |
| Pt | Parameter code table | Read Only | - - - |
| rL | Firmware release | Read Only | - - - |

dIXEL S.p.a.
Z.I. Via dell'Industria, 27 - 32010 Pieve d'Alpago (BL) ITALY
tel. +39 - 0437 - 98 33 - fax +39 - 0437 - 98 93 13
http://www.dixell.com E-mail: dixell@dixell.com