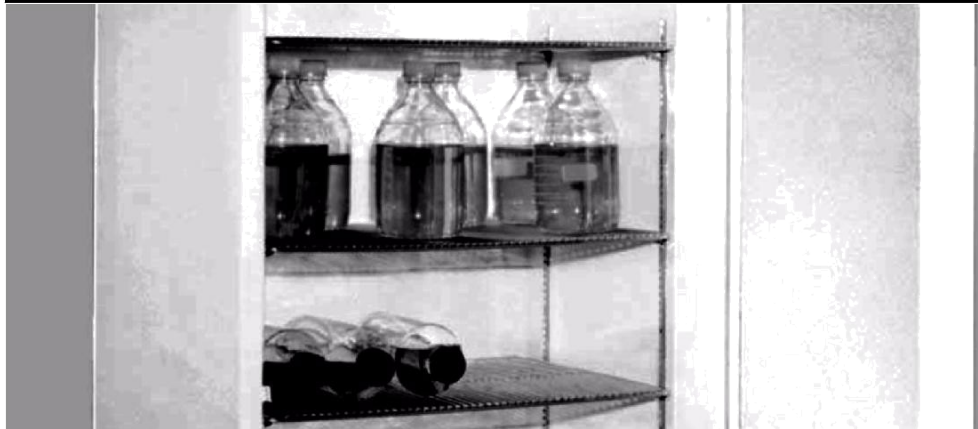


# Installation and Operation Manual

Thermo Scientific  
General Purpose and Flammable Storage  
Laboratory Refrigerators and Freezers



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# General Purpose and Flammable Materials Storage Refrigerators and Freezers

Cool-Lab General Purpose:

20LFEETSA  
20LREETSA  
20LFEETSV

Flammable Material Storage:

20FFEETSA  
20FREETSA  
20FFEETSV  
20FRCETSV  
20FREETSV

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# Safety Information






Your satisfaction and safety are important to Thermo Scientific and a complete understanding of this unit is necessary to attain these objectives.

As the ultimate user of this apparatus, it is your responsibility to understand its proper function and operational characteristics. This instruction manual should be thoroughly read and all operators given adequate training before attempting to place this unit in service. Awareness of the stated cautions and warnings, and compliance with recommended operating parameters – together with maintenance requirements – are important for safe and satisfactory operation. The unit should be used for its intended application; alterations or modifications will void the Warranty.

This product is not intended, nor can it be used, as a sterile or patient connected device. In addition, this apparatus is not designed for use in Class I, II or III locations as defined by the US National Electrical Code, unless otherwise noted.

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## Alert Signals

I	ON	
0	OFF	
	Safety Alert	Important operating instructions. To reduce the risk of injury or poor performance of the unit read the user manual before putting the equipment into operation.
	WARNING	Indicates an immediately hazardous situation, which if not avoided, will result in death or serious injury.
	CAUTION	Indicates an immediately hazardous situation, which if not avoided, may result in minor to moderate injury.
(No Symbol)	CAUTION	(Without Safety Alert Symbol) indicates a situation that may result in property damage.
	Shock Hazard	Use of this equipment involves power supplies which convert line voltage to low voltage power. Do not modify or use power supplies other than OEM equipment. Connection of the power supply may require a properly grounded receptacle. Potential for electrical shock or equipment damage exists if precautions are not followed.
	Frost bite/ Low Temperature	Avoid contact with cold freezer surfaces potential for cold burns or skin sticking to cold surfaces.

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Safety Information



DANGER RISK OF CHILD ENTRAPMENT Before you throw away your old refrigerator or freezer:

- Take off doors
- Leave the shelves in the place so that children may not easily climb inside.



If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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# Intended Use

The Refrigerators/Freezers described in this manual are for professional use only. These products are intended for use in research for the storage of samples or inventory in the following temperature ranges:

Refrigerators +1°C to +12°C  
Freezers -12°C to -20°C



**Warning**

Only Explosion Proof Units or Flammable Material Storage Units are to be used for the storage of flammable inventory/samples.

These are not considered medical devices and have therefore not been registered with a medical device regulatory body (e.g. FDA); that is, it has not been evaluated for the storage of samples for diagnostic use or for samples to be re-introduced to the body.

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# Unpacking

Save all packing material if apparatus is received damaged. This merchandise was carefully packed and thoroughly inspected before leaving our factory.

Responsibility for its safe delivery was assumed by the carrier upon acceptance of the shipment; therefore, claims for loss or damage sustained in transit must be made upon the carrier by the recipient as follows:

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## Visible Loss or Damage

Note any external evidence of loss or damage on the freight bill, or express receipt, and have it signed by the carrier's agent. Failure to adequately describe such external evidence of loss or damage may result in the carrier's refusing to honor your damage claim. The form required to file such a claim will be supplied by the carrier.

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## Concealed Loss or Damage

Concealed loss or damage refers to loss or damage, which does not become apparent until the merchandise has been unpacked and inspected. Should either occur, make a written request for the carrier's agent within 15 days of the delivery date; then file a claim with the carrier since the damage is the carrier's responsibility.

If you follow the above instructions carefully, we will guarantee our full support of your claim to be compensated for loss from concealed damage.

**DO NOT – FOR ANY REASON – RETURN THIS UNIT WITHOUT FIRST OBTAINING AUTHORIZATION**



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# Performance Characteristics

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## Temperature Ranges

Refrigerator: 1° to 12°C (34° to 54°F)

Freezer: -20° to -12°C (-4° to 10°F)

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## Electrical Requirements

For 20LFEETSA and 20FFEETSA

115 Volts ±10%, 60 Hz, 3.0 Amps

For 20LFEETSV, 20FFEETSV, 20FRCETSV, 20FREETSV

230 +/- 10%, 50 Hz, 6.22 Amps

For 20LREETSA

115 Volts ±10%, 60 Hz, 4.0 Amps

For 20FREETSA

115 Volts ±10%, 60 Hz, 3.0 Amps

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# Installation

**Caution**

DO NOT REMOVE, under any circumstance, the grounding prongs from the 3-prong power cord supplied with all units.

**Caution**

DO NOT USE electrical extension cords that may result in voltage loss and possible hazardous operation.

**Warning**

Explosion-proof units do not come with line cords. They require rigid conduit to be run directly in order to seal off the fitting on thermostat housing. This should be done by a licensed electrician and follow all local electrical codes. If any questions pertaining to electrical safety arise, please refer to article 501 of the US National Electrical Code.

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## Electrical

Flammable Material Storage and General Purpose units must be connected to a grounded outlet matching the nameplate and/or the information furnished in this manual. If you are not sure about the outlet, you should contact a qualified electrician for assistance. Explosion-Proof units must be hardwired by a qualified electrician.

Explosion-Proof unit should always be connected to a dedicated power source.

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## Be Advised

**Warning**

UNLESS UNIT IS SPECIFICALLY DESIGNED FOR COMBUSTIBLE OR FLAMMABLE ATMOSPHERES DO NOT USE IN THE PRESENCE OF FLAMMABLE OR COMBUSTIBLE MATERIALS OR EXPLOSIVE GASES. DO NOT USE IN THE PRESENCE OF PRESSURIZED OR SEALED CONTAINERS— FIRE OR EXPLOSION MAY RESULT CAUSING DEATH.

**Caution**

BEFORE CONNECTING THE FINAL POWER SUPPLY, CHECK THE ELECTRICAL CHARACTERISTICS OF THE UNIT NAMEPLATE TO SEE THAT IT IS IN AGREEMENT WITH THE POWER SUPPLIED. IN ADDITION, POWER SHOULD BE WIRED TO THE UNIT ACCORDING TO THE ELECTRICAL SCHEMATIC AND ALL APPLICABLE CODES. ONLY QUALIFIED ELECTRICIANS SHOULD WORK ON THE ELECTRICAL PORTION OF ANY UNIT INSTALLATION.

**Caution**

STORAGE BY USER OF ANY MATERIALS IN THE PRODUCT THAT MAY CAUSE A DETERIORATION OF THE PRODUCT SHALL BE DEEMED TO CONSTITUTE ABNORMAL AND IMPROPER USAGE OF THE PRODUCT FOR PURPOSES OF THIS WARRANTY.

**Warning**

RISK OF CHILD ENTRAPMENT! Before you discard your old refrigerator or freezer:

- Remove door(s),
- Leave the shelves in place so that children may not easily climb inside.

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## Selecting a Location

Choose a location for the refrigerator freezer that will provide at least three inches of clearance between the cabinet and any adjacent vertical surface at the sides, one inch at the bottom, 3 inches at the rear and top of the unit. Appropriate electrical power must be available. Locate the refrigerator within eight feet of the power outlet so that no extension cord is required.

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## Leveling the Unit

The refrigerator and freezer must be level in order to provide adequate condensate drainage as well as proper door alignment and operation. The refrigerator and freezer should be in its final operating location and set so that it is firmly positioned on the floor.

After discarding crating screws and wood base, level the freezer side-to-side and front to back by adjusting the supplied leveling feet.

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## Shelves

20LF & FF models : Shipped inside each cabinet are four fixed wire shelves which also serve as part of evaporator coils

20LR models : Shipped inside each cabinet are four adjustable wire shelves

20FR models : Shipped inside each cabinet are four shelves, one shelf is a sheet metal shelf & others are wired shelves that are fixed.

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## Electrical Connection



**Caution**

Be sure that the power supply is the same voltage that is specified on the unit's data plate.



**Warning**

For personal safety this unit must be properly grounded.



**Caution**

Do not use an extension cord. Use of an ungrounded cord or an overloaded circuit VOIDS the compressor warranty.



**Warning**

DO NOT under any circumstances cut or remove the third (ground) prong from the power cord. DO NOT use a two-prong adapter plug. Where a two-prong wall receptacle is encountered, it is the personal responsibility and obligation of the user to have it replaced with a properly grounded three-prong receptacle.

Determine the total amount of current presently being used by other apparatus connected to the circuit that will be used by this refrigerator. It is critical that this added current demand and other equipment on this circuit not exceed the rating of the fuse or circuit breaker in use. The frequency and nominal voltage requirements for the unit are specified on the data plate, which is located on the interior's upper left side. Only plug the unit into a power source that meets these requirements. Low line voltage is often the cause of service complaints. With the unit running, check that the line voltage is within  $\pm 10\%$  of that specified on the data plate.

The power cord on this product is equipped with a three-prong (grounding) plug appropriate for the voltage, current, and location for which it was designed. The plug will mate with a standard grounding outlet of the corresponding configuration to minimize the potential of an electrical shock hazard. It is the customer's responsibility to have the wall receptacle and supply circuit checked by a qualified electrician to verify that they are appropriate for the power requirements of the product, that they match the supplied plug, and that they are properly grounded and have over-current protection.

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# Operation

**Warning**

If the unit is tilted in excess of 30 degrees, do not apply electrical power for a minimum of 12 hours.

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## Initial Startup

Turn power on and verify that the condenser fan is running. This model has a condenser fan located on the condensing unit on top of the cabinet.

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## Condensate Disposal

20LF & FF models : The condensate drain is at the center rear of the interior floor. The condensate drain tube is connected to this drain and is attached to the left front bottom of the unit behind the front sheet metal. Unhook and place the drain tube into a suitable pan and remove the drain plug. Turn the power to the unit to the off position (O) and allow the unit to defrost.

20LR models : Equipped with a compressor-mounted drain pan that collects condensate during each defrost cycle. This compressor-mounted drain pan takes advantage of the heat generated by the compressor to evaporate condensate water, so there is no need to empty the pan during each defrost cycle.

20FR models : Equipped with a drain pan that collects condensate during manual defrost. This drain pan takes advantage of the heat generated by the compressor to evaporate condensate water, so there is no need to empty the pan during each defrost cycle.

**Warning**

Do not heat any substance above a temperature which will cause it to emit toxic fumes death or severe injury may result

## Material Compatibility

The interior cabinet of this unit is constructed of HIPS (High Impact Polystyrene) plastic. Care must be exercised when determining which chemicals may be stored in the refrigerator and freezer sections and which type of storage materials should be employed.

HIPS (High Impact Poly styrene) plastic deteriorates when exposed to, but not limited to the following:

Amines(Aromatic), Aldehydes(Aromatic, Aliphatic), Ketones (Aromatic, Aliphatic), esters(Aromatic, Aliphatic), Ethers (Aromatic, Aliphatic), Hydrocarbons(Aromatic, Halogenated)

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San Diego, California 92126

Digital controller for medium temperature refrigeration applications  
**XR35CX**

**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.

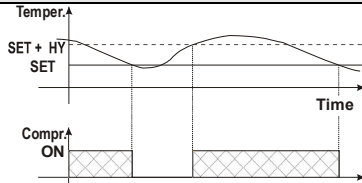
**2. GENERAL DESCRIPTION**

Model XR35CX, format 32 x 74 mm, is a digital thermostat with off cycle defrost designed for refrigeration applications at normal temperature. It provides two relay outputs, one for the compressor, the other one can be used as light, for alarm signalling or as auxiliary output.. It could be provided with a Real Time Clock which allows programming of up to 6 daily defrost cycles, divided into holidays and workdays. A "Day and Night" function with two different set points is fitted for energy saving. It is also provided with up to four NTC or PT1000 probe inputs, the first one for temperature control, the second one, to be located onto the evaporator, to control the defrost termination temperature. One of the 2 digital inputs can operate as third temperature probe. The fourth probe is used to signal the condenser temperature alarm or to display a temperature. 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 to program 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 "CO<sub>n</sub>" and "CO<sub>F</sub>".

**3.2 DEFROST**

With oA1 different from dEF and tdF = EL the controller performs timed defrost, simply stopping the compressor.  
With oA1 = dEF two defrost modes are available through the "tdF" parameter: defrost through electrical heater (tdF = EL) and hot gas defrost (tdF = in), in this case the second relay has to set ase  
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 "ldF" time – standard way for controller without RTC.  
- with EdF = "rtc", the defrost is made in real time depending on the hours set in the parameters Ld1...Ld6 on workdays and in Sd1...Sd6 in holidays;  
Other parameters are used to control defrost cycles: its maximum length (MdF) and two defrost modes: timed or controlled by the evaporator's probe (P2P).

**3.3 SECOND RELAY CONFIGURATION (PAR. OA1; TERM. 1-7)**

The functioning of the auxiliary relay (terminals. 1-7) can be set by the oA1 parameter, according to the kind of application. In the following paragraph the possible setting:

**3.3.1 Defrost relay – oA1 = dEF**  
With oA1 = dEF the second relay operates as defrost relay. See paragraph 3.2 for more details.

**3.3.2 Light relay**  
With oA1 = Lig the relay 1-7 operates as a light.

**3.3.3 Auxiliary relay – oA1 = AUS**  
a. Relay activation by digital input 2 (oA1 = AUS, i2F = AUS)  
With oA1 = AUS and i2F = AUS the relay 1-7 is switched on and off by digital.

b. Auxiliary thermostat  
I.E., anti condensing heater) with the possibility of switching it on and off also by keyboard  
Parameters involved:  
- ACH Kind of regulation for the auxiliary relay; Ht: heating; cl: cooling;  
- SAA Set point for auxiliary relay

- SHy Differential for auxiliary relay
- ArP Probe for auxiliary relay
- Sdd Auxiliary output off during defrost

By means of these 5 parameters the functioning of the auxiliary relay can be set.. The differential is given by the SHy parameter.  
**NOTE:** Set oA1 = AUS and ArP= nP (no probe for auxiliary output).  
In this case the relay 1-7 can be activated only by digital input with i1F or i2F = AUS.

**3.3.4 On/off relay – oA1 = onF**  
In this case the relay is activated when the controller is turned on and de-activated when the controller is turned off.

**3.3.5 Neutral zone regulation**  
With oA1 = db the relay 1-7 can control a heater element to perform a neutral zone action.  
oA1 cut in = SET-HY  
oA1 cut out = SET

**3.3.6 Alarm relay**  
With oA1 = ALr the relay 1-7 operates as alarm relay. It is activated every time an alarm happens. Its status depends on the tBA parameter: if "tBA = y", the relay is silenced by pressing any key. If "tBA = n", the alarm relay remains on until the alarm condition recovers.

**3.3.7 Night blind management during energy saving cycles**  
With oA1 = HES, the relay 1-7 operates to manage the night blind: the relay is energised when the energy saving cycle is activated , by digital input, frontal button or RTC (optional)

**4. FRONT PANEL COMMANDS**



**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 off, if onF = oFF.
- ☀ To switch the light, if oA1 = 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	An alarm is occurring
☸	ON	Continuous cycle is running
☸	ON	Energy saving enabled
☸	ON	Light on
☸	ON	Auxiliary relay on
☸	ON	Measurement unit
☸	Flashing	Programming phase

**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. (rSt message will be displayed)
2. To confirm the operation the "rSt" message starts blinking and the normal temperature will be displayed.

**6. MAIN FUNCTIONS**


**6.1 TO SET THE CURRENT TIME AND DAY (ONLY FOR INSTRUMENTS WITH RTC)**

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

1. Enter the Pr1 programming menu, by pushing the SET +  $\blacktriangledown$  keys for 3s.
2. The rtc parameter is displayed. Push the SET key to enter the real time clock menu.
3. The Hur (hour) parameter is displayed.
4. Push the SET and set current hour by the UP and Down keys, then push SET to confirm the value..
5. Repeat the same operations on the Min (minutes) and dAY (day) parameters.

To exit: Push SET+UP keys or wait for 15 sec without pushing 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  $\blacktriangle$  or  $\blacktriangledown$  arrows within 10s.
4. To memorise the new set point value push the SET key again or wait 10s.

**6.4 HOW TO START A MANUAL DEFROST**

- 
- Push the DEF key for more than 2 seconds and a manual defrost will start.

**6.5 HOW TO CHANGE A PARAMETER VALUE**

To change the parameter's value operate as follows:

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

To exit: Press SET + UP or wait 15s without pressing a key.

NOTE: the set value is stored even when the procedure is exited by waiting the time-out to expire.

**6.6 THE HIDDEN MENU**

The hidden menu Includes all the parameters of the instrument.

**6.6.1 HOW TO ENTER THE HIDDEN MENU**

1. Enter the Programming mode by pressing the Set +  $\blacktriangledown$  keys for 3s (the °C or °F LED starts blinking).
2. Released the keys, then push again the Set+ $\blacktriangledown$  keys for more than 7s. The Pr2 label will be displayed immediately followed from the HY parameter.

**NOW YOU ARE IN THE HIDDEN MENU.**

3. Select the required parameter.
4. Press the "SET" key to display its value
5. Use  $\blacktriangle$  or  $\blacktriangledown$  to change its value.
6. Press "SET" to store the new value and move to the following parameter.

To exit: Press SET +  $\blacktriangle$  or wait 15s without pressing a key.

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

NOTE2: the set value is stored even when the procedure is exited by waiting the time-out to expire.

**6.6.2 HOW TO MOVE A PARAMETER FROM THE HIDDEN MENU TO THE FIRST LEVEL AND VICEVERSA.**

Each parameter present in the HIDDEN MENU can be removed or put into "THE FIRST LEVEL" (user level) by pressing "SET +  $\blacktriangledown$ ".

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 3 s the UP + DOWN keys.
2. The "POF" message will be displayed and the keyboard will be locked. At this point it will be possible only to see the set point or the MAX o Min temperature stored
3. If a key is pressed more than 3s the "POF" message will be displayed.


**6.8 TO UNLOCK THE KEYBOARD**

Keep pressed together for more than 3s the  $\blacktriangle$  and  $\blacktriangledown$  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 " $\blacktriangle$ " key pressed for about 3 seconds. 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 " $\blacktriangle$ " for 3 seconds.

**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 (only for controller with RTC): to set the time and date and defrost start time.

**REGULATION**

- Hy Differential:** (0,1 + 25,5°C / 1+255 °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+SET/-148°F+SET): Sets the minimum value for the set point.
- US Maximum set point:** (SET+110°C/ SET+230°F). Set the maximum value for set point.
- Ot Thermostat probe calibration:** (-12,0+12,0°C; -120+120°F) allows to adjust possible offset of the thermostat probe.
- P2P Evaporator probe presence:** n= not present: the defrost stops by time; y= present: the defrost stops by temperature.
- OE Evaporator probe calibration:** (-12,0+12,0°C; -120+120°F). allows to adjust possible offset of the evaporator probe.
- P3P Third probe presence (P3):** n= not present.; the terminals 18-20 operate as digital input.; y= present.; the terminals 18-20 operate as third probe.
- O3 Third probe calibration (P3):** (-12,0+12,0°C; -120+120°F). allows to adjust possible offset of the third probe.
- P4P Fourth probe presence:** (n = Not present; y = present).
- o4 Fourth probe calibration:** (-12,0+12,0°C) allows to adjust possible offset of the fourth probe.
- OdS Outputs 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 set in the parameter.
- AC Anti-short cycle delay:** (0+50 min) minimum interval between the compressor stop and the following restart.
- rrt Percentage of the second and first probe for regulation (0+100; 100 = P1, 0 = P2 ):** it allows to set the regulation according to the percentage of the first and second probe, as for the following formula (rr(P1-P2)/100 + P2).
- CCt Compressor ON time during continuous cycle:** (0,0+24,0h; res. 10min) Allows to set the length of the continuous cycle: compressor stays on without interruption for the CCt time. Can be used, for instance, when the room is filled with new products.
- CCS Set point for continuous cycle:** (-100+150°C) it sets the set point used during the continuous cycle.
- CO n Compressor ON time with faulty probe:** (0+255 min) time during which the compressor is active in case of faulty thermostat probe. With CO n=0 compressor is always OFF.
- COF Compressor OFF time with faulty probe:** (0+255 min) time during which the compressor is OFF in case of faulty thermostat probe. With COF=0 compressor is always active.
- CH Type of action:** CL = cooling; Ht = heating.

**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, 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 +20,0m; resul. 10s) when the temperature increases, the display is updated of 1 °C/1°F after this time.
- dtr Percentage of the second and first probe for visualization when Lod = dtr (0+100; 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 (only for controller with RTC):**  
**rtc = Real Time Clock mode.** Defrost time follows Ld1+Ld6 parameters on workdays and Sd1+Sd6 on holidays.  
**in = interval mode.** The defrost starts when the time "ldf" is expired.
- tdF Defrost type:** EL = electrical heater; in = hot gas
- dFP Probe selection for defrost termination:** nP = no probe; P1 =thermostat probe; P2 = evaporator probe; P3 =configurable probe; P4 = Probe on Hot Key plug.
- dte Defrost termination temperature:** (-50+50 °C/ -58+122°F) (Enabled only when EdF=Pb) sets the temperature measured by the evaporator probe, which causes the end of defrost.
- ldF Interval between defrost cycles:** (0+120h) Determines the time interval between the beginning of two defrost cycles.
- MdF (Maximum) length for defrost:** (0+255min) When P2P = n, (not evaporator probe: timed defrost) it sets the defrost duration, when P2P = y (defrost end based on temperature) it sets the maximum length for defrost.
- dSd Start defrost delay:** ( 0+99min) This is useful when different defrost start times are necessary to avoid overloading the plant.
- dFd Temperature displayed during defrost:** (rt = real temperature; it = temperature at defrost start; SET = set point; dEF = "dEF" label)
- dAd MAX display delay after defrost:** (0+255min). Sets the maximum time between the end of defrost and the restarting of the real room temperature display.
- Fdt Drip time:** (0+120 min) 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:** (y = immediately; n = after the ldF time)
- dAF Defrost delay after continuous cycle:** (0+23,5h) time interval between the end of the fast freezing cycle and the following defrost related to it.

**AUXILIARY THERMOSTAT CONFIGURATION (terms. 1-7) – OA1 = AUS**

- ACH Kind of regulation for auxiliary relay:** Ht = heating; CL = cooling
- SAA Set Point for auxiliary relay:** (-100+110,0°C; -148+230°F) it defines the room temperature set point to switch auxiliary relay.
- SHy Differential for auxiliary output:** (0,1 + 25,5°C / 1+255 °F) Intervention differential for auxiliary output set point.  
 With ACH = cL AUX Cut in is SAA + SHy; . AUX Cut out is SAA  
 With ACH = Ht AUX Cut in is SAA - SHy; . AUX Cut out is SAA
- ArP Probe selection for auxiliary:** 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 = the auxiliary relay operates during defrost.  
 y = the auxiliary relay is switched off during defrost.



**ALARMS**

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

**ALC Temperature alarms configuration:** (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:** (ALL+110°C; ALL+230°F) when this temperature is reached the alarm is enabled, after the "ALD" delay time.

**ALL Minimum temperature alarm:** (-100°C + ALU; -148+302°F) when this temperature is reached the alarm is enabled, after the "ALD" delay time.

**AFH Differential for temperature alarm recovery:** (0,1+25,5°C; 1+45°F) Intervention differential for recovery of temperature alarm.

**ALd Temperature alarm delay:** (0+255 min) time interval between the detection of an alarm condition and alarm signalling.

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

**CONDENSER TEMPERATURE ALARM**

**AP2 Probe selection for temperature alarm of condenser:** 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+150°C; -148+302°F) when this temperature is reached the LA2 alarm is signalled, possibly after the Ad2 delay.

**Au2 High temperature alarm of condenser:** (-100+150°C; -148+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+25,5°C; 1+45°F)

**Ad2 Condenser temperature alarm delay:** (0+255 min) time interval between the detection of the condenser alarm condition and alarm signalling.

**dA2 Condenser temperature alarm exclusion at start up:** (from 0.0 min to 23.5h, res. 10min)

**bLL Compressor off 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 restarts after AC time at minimum.

**AC2 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 restarts after AC time at minimum.

**AUXILIARY RELAY**

**tbA Alarm relay silencing (with oA1 = ALR):**  
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

**oA1 Second relay configuration (1-7):** dEF = defrost, FAn: do not select it!; ALF: alarm; Lig: light; AuS: Auxiliary relay, onF: always on with instrument on; db = neutral zone; cP2 = do not select it!; dEF2: do not select it!; HES: night blind

**AOp Alarm relay polarity:** it set if the alarm relay is open or closed when an alarm happens. CL = terminals 1-7 closed during an alarm; oP = terminals 1-7 open during an alarm

**DIGITAL INPUTS**

**i1P Digital input polarity (18-20):** oP: the digital input is activated by opening the contact; CL: the digital input is activated by closing the contact.

**i1F Digital input configuration (18-20):** dor = door switch function; dEF = activation of a defrost cycle;

**i2P 2nd digital input polarity (18-19):** oP: the digital input is activated by opening the contact; CL: the digital input is activated by closing the contact.

**i2F 2nd digital input configuration (18-19):** 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 = kind of action inversion (cooling - heating); FAn = fan; HdF = Holiday defrost (enable only with RTC); onF = to switch the controller off.

**did (0+255 min) with i2F = EAL or i2F = bAL digital input alarm delay (18-20):** delay between the detection of the external alarm condition and its signalling.  
with i2F = PAL: time for pressure switch function: time interval to calculate the number of the pressure switch activation.

**doA Door open signalling delay (0+255 min):**

**nPS Pressure switch number:** (0 +15) Number of activation of the pressure switch, during the "did" interval, before signalling the alarm event (i2F = PAL).  
If the nPS activation in the did time is reached, switch off and on the instrument to restart normal regulation.

**odc Compressor status when open door:** no; FAn = normal; CPr, F\_C = Compressor OFF.

**rrd Outputs restart after doA alarm:** no = outputs not affected by the doA alarm; yES = outputs restart with the doA alarm.

**HES Temperature increase during the Energy Saving cycle:**  
(-30,0°C+30,0°C) it sets the increasing value of the set point during the Energy Saving cycle.

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

**Hur Current hour (0 + 23 h)**  
**Min Current minute (0 + 59min)**  
**dAY Current day (Sun + SA1)**  
**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. Hd1,Hd2 can be set also as "nu" value (Not Used).**

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

**ILE Energy Saving cycle start during workdays:** (0 + 23h 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 + HES.

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

**ISE Energy Saving cycle start on holidays.** (0 + 23h 50 min.)

**dSE Energy Saving cycle length on holidays** (0 + 24h 00 min.)

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

**Ld1+Ld6 Workday defrost start (0 + 23h 50 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 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 = 3.4 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+244):** Identifies the instrument address when connected to a ModBUS compatible monitoring system.

**PbC Type of probe:** it allows to set the kind of probe used by the instrument: Pt1 = Pt1000 probe, ntc = NTC probe.

**onF on/off key enabling:** 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 18-20 is enabled with 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 status 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, Fan = normal (any change); CPr, F\_C = Compressor 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 oA1 = 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 X-WEB500/3000/300.

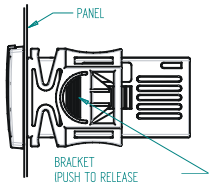
**10. X-REP OUTPUT – OPTIONAL**

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



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

**11. INSTALLATION AND MOUNTING**



Instrument XR35CX 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.

**12. ELECTRICAL CONNECTIONS**

The instrument is provided with screw terminal block to connect cables with a cross section up to 2,5 mm<sup>2</sup>. 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. HOW TO USE THE HOT KEY**

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

1. Program one controller with the front keypad.
2. When the controller is ON, insert the "Hot key" and push ▲ key; the "uPL" message appears followed a 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 ▲ 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 a 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 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 restarts
"EA"	External alarm	Output unchanged.
"CA"	Serious external alarm (i1F=bAL)	All outputs OFF.
"CA"	Pressure switch alarm (i1F=PAL)	All outputs OFF
"rtc"	Real time clock alarm	Alarm output ON; Other outputs unchanged; Defrosts according to par. "ldF" Set real time clock has to be set
rtF	Real time clock board failure	Alarm output ON; Other outputs unchanged; Defrosts according to par. "ldF" Contact the service

**14.1 SILENCING BUZZER / ALARM RELAY OUTPUT**

If "tbA = y", the buzzer and the relay are silenced by pressing any key.  
If "tbA = n", only the buzzer is silenced while the alarm relay is on until the alarm condition recovers.

**14.2 ALARM RECOVERY**

Probe alarms "P1", "P2", "P3" and "P4" start some seconds after the fault in the related probe; they automatically stop some seconds after the probe 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 i1F=bAL) recover as soon as the digital input is disabled.  
Alarm "CA" (with i1F=PAL) recovers only by switching off and on the instrument.

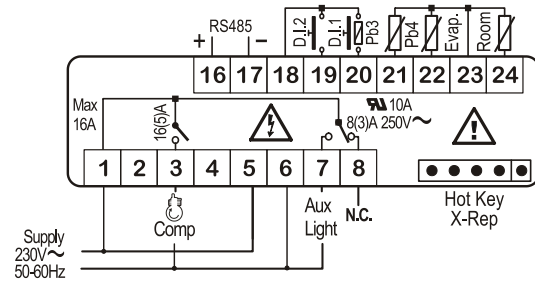
**14.3 OTHER MESSAGES**

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 mm<sup>2</sup> wiring.  
**Power supply:** according to the model 24Vac, ±10%; 230Vac ±10%, 50/60Hz, 110Vac ±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  
**aux:** SPDT 8(3) A, 250Vac  
**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÷55°C; **Storage temperature:** -30÷85 °C.  
**Relative humidity:** 20÷85% (no condensing)  
**Measuring and regulation range: NTC probe:** -40÷110°C (-40÷230°F);  
**PT1000 probe:** -100÷150°C (-148÷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**



Supply: 120Vac or 24Vac: connect to terminals 5-6.  
The X-REP output is optional

**17. DEFAULT SETTING VALUES**

Label	Name	Range	Value	Level
Set	Set point	LS+US	3.0	- - -
rtc*	Real time clock menu	-	-	Pr1
Hy	Differential	0.1÷25.5°C/ 1÷ 255°F	2.0	Pr1
LS	Minimum set point	-100C÷SET/-58°F÷SET	-50.0	Pr2
US	Maximum set point	SET÷110°C/ SET ÷ 230°F	110	Pr2
Ot	Thermostat probe calibration	-12±12°C /-120±120°F	0.0	Pr1
P2P	Evaporator probe presence	n=not present; Y=pres.	Y	Pr1
OE	Evaporator probe calibration	-12±12°C /-120±120°F	0.0	Pr2
P3P	Third probe presence	n=not present; Y=pres.	n	Pr2
O3	Third probe calibration	-12±12°C /-120±120°F	0	Pr2
P4P	Fourth probe presence	n=not present; Y=pres.	n	Pr2
O4	Fourth probe calibration	-12±12°C /-120±120°F	0	Pr2
OdS	Outputs delay at start up	0÷255 min	0	Pr2
AC	Anti-short cycle delay	0 ÷ 50 min	1	Pr1
rtr	P1-P2 percentage for regulation	0 + 100 (100=P1 , 0=P2)	100	Pr2
CCt	Continuous cycle duration	0.0÷24.0h	0.0	Pr2
CCS	Set point for continuous cycle	(-100+150,0°C) (-67+302°F)	3	Pr2
COon	Compressor ON time with faulty probe	0 ÷ 255 min	15	Pr2
COF	Compressor OFF time with faulty probe	0 ÷ 255 min	30	Pr2
CH	Kind of action	CL; Ht	cL	Pr1
CF	Temperature measurement unit	°C ÷ °F	°C	Pr2
rES	Resolution	in=integer; dE= dec.point	dE	Pr1
Lod	Probe displayed	P1;P2	P1	Pr2
rEd*	X-REP display	P1 - P2 - P3 - P4 - SEt - dtr	P1	Pr2
dLy	Display temperature delay	0 + 20.0 min (10 sec.)	0.0	Pr2
dtr	P1-P2 percentage for display	1 + 99	50	Pr2
EdF*	Kind of interval for defrost	rtc +in	rtc	Pr2
tdF	Defrost type	EL=el. heater; in= hot gas	EL	Pr2
dFP	Probe selection for defrost termination	nP; P1; P2; P3; P4	P2	Pr2
dIE	Defrost termination temperature	-50 ÷ 50 °C	8.0	Pr1
IdF	Interval between defrost cycles	1 ÷ 120 ore	8	Pr1
MdF	(Maximum) length for defrost	0 ÷ 255 min	20	Pr1
dSd	Start defrost delay	0÷99min	0	Pr2
dFd	Displaying during defrost	rt, it, SEt, DEF	it	Pr2
dAd	MAX display delay after defrost	0 + 255 min	30	Pr2
Fdt	Draining time	0+120 min	0	Pr2
dPo	First defrost after start-up	n=after IdF; y=immed.	n	Pr2
dAF	Defrost delay after fast freezing	0 ÷ 23h e 50'	0.0	Pr2
ACH	Kind of action for auxiliary relay	CL; Ht	cL	Pr2
SAa	Set Point for auxiliary relay	-100+110°C / -58+230°F	0.0	Pr2
SHy	Differential for auxiliary relay	0.1÷25.5°C/ 1÷ 255°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= related to set; Ab = absolute	Ab	Pr2
ALU	MAXIMUM temperature alarm	Set±110,0°C; Set±230°F	110,0	Pr1
ALL	Minimum temperature alarm	-100°C÷Set/-58°F÷Set	-50,0	Pr1
AFH	Differential for temperat. alarm recovery	(0,1°C±25,5°C) (1°F±45°F)	2.0	Pr2
ALd	Temperature alarm delay	0 ÷ 255 min	15	Pr2
dAO	Delay of temperature alarm at start up	0 ÷ 23h e 50'	1,3	Pr2
AP2	Probe for temperat. alarm of condenser	nP; P1; P2; P3; P4	P4	Pr2
AL2	Condenser for low temperat. alarm	(-100 + 150°C) (-67+ 302°F)	-40	Pr2
AU2	Condenser for high temperat. alarm	(-100 + 150°C) (-67+ 302°F)	110	Pr2
AH2	Differ. for condenser temp. alar. recovery	[0,1°C + 25,5°C] [1°F + 45°F]	5	Pr2
Ad2	Condenser temperature alarm delay	0 ÷ 254 (min.) , 255=nU	15	Pr2
dA2	Delay of cond. temper. alarm at start up	0.0 ÷ 23h 50'	1,3	Pr2
bLL	Compr. off for condenser low temperature alarm	n(0) - Y(1)	n	Pr2
AC2	Compr. off for condenser high temperature alarm	n(0) - Y(1)	n	Pr2
tbA	Alarm relay disabling	n=no; y=yes	y	Pr2
oA1	Second relay configuration	ALr = alarm; dEF = defrost; Lig =Light; AUS=AUX; onF=always on; Fan= do not select it; db = neutral zone; cP2 = second compressor; dF2 = do not select it; HES = night blind	Lig	Pr2
AoP	Alarm relay polarity (oA1=ALr)	oP; cL	cL	Pr2
i1P	Digital input polarity (18-20)	oP=opening;CL=closing	cL	Pr1
i1F	Digital input 1 configuration (18-20)	dor; dEF;	dor	Pr1
i2P	Digital input polarity (18-19)	oP=opening;CL=closing	15	Pr1
i2F	Digital input configuration (18-19)	EAL - bAL - PAL - dor - dEF - ES - AUS - Htr - FAn - HdF - onF	cL	Pr2
did	Digital input alarm delay (18-20)	0+255min	EAL	Pr2
doA	Door open alarm delay	0+255min	15	Pr1
Nps	Number of activation of pressure switch	0 +15	15	Pr2
odc	Compress 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°C+30°C) (-54°F+54°F)	0	Pr2
Hur*	Current hour	0 ÷ 23	-	Pr1
Min*	Current minute	0 ÷ 59	-	Pr1
dAY*	Current day	Sun + SAT	-	Pr1
Hd1*	First weekly holiday	Sun+ SAT - nu	nu	Pr1
Hd2*	Second weekly holiday	Sun+ SAT - nu	nu	Pr1

Label	Name	Range	Value	Level
ILE*	Energy Saving cycle start during workdays	0 + 23h 50 min.	0.0	Pr1
dLE*	Energy Saving cycle length during workdays	0 + 24h 00 min.	0	Pr1
ISE*	Energy Saving cycle start on holidays	0 + 23h 50 min.	0.0	Pr1
dSE*	Energy Saving cycle length on holidays	0 + 24h 00 min.	0	Pr1
Ld1*	1st workdays defrost start	0 + 23h 50 min. - nu	6.0	Pr1
Ld2*	2nd workdays defrost start	0 + 23h 50 min. - nu	13.0	Pr1
Ld3*	3rd workdays defrost start	0 + 23h 50 min. - nu	21.0	Pr1
Ld4*	4th workdays defrost start	0 + 23h 50 min. - nu	nu	Pr1
Ld5*	5th workdays defrost start	0 + 23h 50 min. - nu	nu	Pr1
Ld6*	6th workdays defrost start	0 + 23h 50 min. - nu	nu	Pr1
Sd1*	1st holiday defrost start	0 + 23h 50 min. - nu	6.0	Pr1
Sd2*	2nd holiday defrost start	0 + 23h 50 min. - nu	13.0	Pr1
Sd3*	3rd holiday defrost start	0 + 23h 50 min. - nu	21.0	Pr1
Sd4*	4th holiday defrost start	0 + 23h 50 min. - nu	nu	Pr1
Sd5*	5th holiday defrost start	0 + 23h 50 min. - nu	nu	Pr1
Sd6*	6th holiday defrost start	0 + 23h 50 min. - nu	nu	Pr1
Adr	Serial address	1+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	--	--	Pr1
dP2	Evaporator probe display	--	--	Pr1
dP3	Third probe display	--	--	Pr1
dP4	Fourth probe display	--	--	Pr1
rSE	Real set	actual set	--	Pr2
rEL	Software release	--	2.6	Pr2
Ptb	Map code	--	--	Pr2

\* Only for model with real time clock  
 \* Only for XR35CX with X-REP output

**18. THERMO FACTORY DEFAULTS:**

Label	Name	Range	Value	Level
Set	Set point	LS+US	5.5	- - -
P2P	Evaporator probe presence	n=not present; Y=pres.	n	Pr1

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# Troubleshooting

This table is intended to assist in resolving user-correctable refrigerator problems by relating symptoms to their likely causes. If service beyond the scope of this table is required, contact Customer Service at 1-800-438-4851.

<b><u>Symptom</u></b>	<b><u>Probable Cause</u></b>	<b><u>Action</u></b>
Does Not Run	Unit Unplugged Blown fuse or tripped circuit Breaker	Plug in Check fuse or circuit breaker at breaker box
Runs Continuously	Frost buildup on refrigeration coils	Defrost unit
Clicking Sound	The compressor is equipped with a thermal protector. This device shuts off the compressor when it becomes too hot. A clicking sound occurring about every 30 seconds indicates this protector is working	Unplug unit for 1 hr. Plug in and try running again. If the unit doesn't begin to run, call for service.
Insufficient Cooling	Thermostat set too high Unit frosted	Reduce thermostat setting Defrost unit

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# Maintenance

**Warning**

When servicing the unit, disconnect from the electrical power source

**Caution**

Do not use any type of abrasive such as steel wool, or fluids such as gasoline, Naphtha, and thinner. These materials could be harmful to aluminum, plastic materials, door gasket, and painted surfaces.

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## Cabinet Cleaning

The cabinet interior should be cleaned frequently. Any spilled liquid should be wiped off immediately. Stains resulting from some spills can be permanent if not quickly removed. The most convenient time to clean the interior is after defrosting. The cabinet exterior should be cleaned occasionally. A mild detergent and lukewarm water or a solution of bicarbonate of soda (1 tablespoon per gallon of water) is recommended for cleaning the interior and exterior of the cabinet. All surfaces should be rinsed and thoroughly dried.

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## Condenser

The condenser coil is located behind the sides and rear exterior panel. These surfaces may be warm to the touch. This is necessary to the operation of the refrigeration equipment and is normal.

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# One Year Limited Warranty

This Thermo Scientific product is warranted to be free of defects in materials and workmanship for one (1) year from the first to occur of (i) the date the product is sold by the manufacturer or (ii) the date the product is purchased by the original retail customer (the "Commencement Date"). Except as expressly stated above, the MANUFACTURER MAKES NO OTHER WARRANTY, EXPRESSED OR IMPLIED, WITH RESPECT TO THE PRODUCTS AND EXPRESSLY DISCLAIMS ANY AND ALL WARRANTIES, INCLUDING BUT NOT LIMITED TO, WARRANTIES OF DESIGN, MERCHANT ABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

An authorized representative of the manufacturer must perform all warranty inspections. In the event of a defect covered by the warranty, we shall, as our sole obligation and exclusive remedy, provide free replacement parts to remedy the defective product. In addition, for products sold within the continental United States or Canada, the manufacturer shall provide free labor to repair the products with the replacement parts, but only for a period of ninety (90) days from the Commencement Date.

The warranty provided hereunder shall be null and void and without further force or effect if there is any (i) repair made to the product by a party other than the manufacturer or its duly authorized service representative, (ii) misuse (including use inconsistent with written operating instructions for the product), mishandling, contamination, overheating, modification or alteration of the product by any customer or third party or (iii) use of replacement parts that are obtained from a party who is not an authorized dealer of Thermo Scientific products.

Heating elements, because of their susceptibility to overheating and contamination, must be returned to the factory and if, upon inspection, it is concluded that failure is due to factors other than excessive high temperature or contamination, the manufacturer will provide warranty replacement. As a condition to the return of any product, or any constituent part thereof, to the factory, it shall be sent prepaid and a prior written authorization from the manufacturer assigning a Return Materials Number to the product or part shall be obtained.

IN NO EVENT SHALL THE MANUFACTURER BE LIABLE TO ANY PARTY FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, OR FOR ANY DAMAGES RESULTING FROM LOSS OF USE OR PROFITS, ANTICIPATED OR OTHERWISE, ARISING OUT OF OR IN CONNECTION WITH THE SALE, USE OR PERFORMANCE OF ANY PRODUCTS, WHETHER SUCH CLAIM IS BASED ON CONTRACT, TORT (INCLUDING NEGLIGENCE), ANY THEORY OF STRICT LIABILITY OR REGULATORY ACTION.

For the name of the authorized Thermo Scientific product dealer nearest you or any additional information, contact us

[www.thermofisher.com](http://www.thermofisher.com)

1-866-9-THERMO

# WEEE Compliance

**WEEE Compliance.** This product is required to comply with the European Union's Waste Electrical & Electronic Equipment (WEEE) Directive 2002/96EC. It is marked with the following symbol. Thermo Fisher Scientific has contracted with one or more recycling/disposal companies in each EU Member State, and this product should be disposed of or recycled through them. Further information on Thermo Fisher Scientific compliance with these Directives, the recyclers in your country, and information on Thermo Scientific products which may assist the detection of substances subject to the RoHS Directive are available at [www.thermo.com/](http://www.thermo.com/)

**WEEE Konformität.** Dieses Produkt muss die EU Waste Electrical & Electronic Equipment (WEEE) Richtlinie 2002/96EC erfüllen. Das Produkt ist durch folgendes Symbol gekennzeichnet. Thermo Fisher Scientific hat Vereinbarungen getroffen mit Verwertungs/Entsorgungsanlagen in allen EU-Mitgliederstaaten und dieses Produkt muss durch diese Firmen verwertet oder entsorgt werden. Mehr Informationen über die Einhaltung dieser Anweisungen durch Thermo Fisher Scientific, die Verwerter und Hinweise die Ihnen nützlich sein können, die Thermo Scientific Produkte zu identifizieren, die unter diese RoHS. Anweisung fallen, finden Sie unter [www.thermo.com/](http://www.thermo.com/)

**Conformità WEEE.** Questo prodotto deve rispondere alla direttiva dell' Unione Europea 2002/96EC in merito ai Rifiuti degli Apparecchi Elettrici ed Elettronici (WEEE). È marcato col seguente simbolo. Thermo Fisher Scientific ha stipulato contratti con una o diverse società di riciclaggio/smaltimento in ognuno degli Stati Membri Europei. Questo prodotto verrà smaltito o riciclato tramite queste medesime. Ulteriori informazioni sulla conformità di Thermo Fisher Scientific con queste Direttive, l'elenco delle ditte di riciclaggio nel Vostro paese e informazioni sui prodotti Thermo Scientific che possono essere utili alla rilevazione di sostanze soggette alla Direttiva RoHS sono disponibili sul sito [www.thermo.com/](http://www.thermo.com/)

**Conformité WEEE.** Ce produit doit être conforme à la directive européenne (2002/96EC) des Déchets d'Equipements Electriques et Electroniques (DEEE). Il est marqué par le symbole suivant. Thermo Fisher Scientific s'est associé avec une ou plusieurs compagnies de recyclage dans chaque état membre de l'union européenne et ce produit devrait être collecté ou recyclé par celles- ci. Davantage d'informations sur la conformité de Thermo Fisher Scientific à ces directives, les recycleurs dans votre pays et les informations sur les produits Thermo Scientific qui peuvent aider le détection des substances sujettes à la directive RoHS sont disponibles sur [www.thermo.com/](http://www.thermo.com/)

Great Britain



Deutschland



Italian



French



# Important

For your future reference and when contacting the factory, please have the following information readily available:

Model Number: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Date Purchased: \_\_\_\_\_

The above information can be found on the dataplate attached to the equipment. If available, please provide the date purchased, the source of purchase (manufacturer or specific agent/rep organization), and purchase order number.

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## IF YOU NEED ASSISTANCE:

### SALES DIVISION

Phone: 828/658-2711 800/252-7100

FAX: 828/645-3368

### LABORATORY PARTS and SERVICE

Phone: 800/438-4851

FAX: 828/658-2576

### TECHNICAL SUPPORT

Phone: 800/438-4851



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