Turbo air Speeds Up the Pace of Innovation



Part No. KUCST210419 CAREL CONTROLLER



Refrigeration System Installation & Operation Manual

Please read this manual completely before attempting to install or operate this equipment !

Package Unit (TOP MOUNT)





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Safety Information

Be sure all power sources are turned off before checking the electric wiring or appliances to avoid electric shock.

Do not run fan if cover or case is removed. This is to avoid electric shock.

Keep finger away from moving parts.

Avoid touching refrigerant lines. Some parts are very hot and can cause burns.

Avoid contacting sharp edges or coil surface that are a potential injury hazard.

Avoid touching the units or electric box in wet hands to prevent electric shock.

Please call the specialized installation company or trained personnel when you installing, moving, operating of the unit.

Field wiring must confirm to the requirements of units' electric specification.

Inspection

A person at the job site to receive material holds responsibility. Each shipment should be carefully inspected against the bill of lading. The shipping receipt should not be signed before careful inspection. Check carefully for concealed damage. Any shortage or damages should be reported to the delivering carrier. If damaged material becomes the delivering carrier's responsibility and it should not be returned to Turbo air unless prior approval is given to do so. Check the serial tag information with invoice. Report any discrepancies to Turbo air sales representatives.

	Ambient 95°F					Refrigerant.			Matching	NET	
Model	Capacit	y BTUH	Voltage	MCA	MOPD	Def	Wt	Plug	NEMA	Weight	Fig.
	35°F	38°F				Ref.	oz	Supplied	Receptacle	(Lbs)	
STI068MR448A2	6626	6998	208~230/1/60	9.1	15	R448A	54	YES	6-15R	219	А
STI075MR448A2	7803	8186	208~230/1/60	11.4	15	R448A	54	YES	6-15R	218	А
STI100MR448A2	11690	12428	208~230/1/60	16.8	25	R448A	88	YES	6-20R	300	В
STI100MR448A3	11806	12527	208~230/3/60	9.4	15	R448A	88	NO	-	300	В
STI130MR448A2	13242	13981	208~230/1/60	16.1	25	R448A	88	NO	-	300	В
STI130MR448A3	13283	14107	208~230/3/60	13.9	20	R448A	88	NO	-	300	В

Table 1. INDOOR UNIT - Medium Temperature (Air Defrost System)

Table 2. INDOOR UNIT – Low Temperature (Electric Defrost System)

	Ambient 95°F			_			Refrigerant.		Dhum	Matching	NET				
Model	Ca	apacity B	ГИН	Voltage	MCA	MOPD	Ref. Wt	D.f	Def	D (Wt	Plug	NEMA	Weight	Fig.
	0°F	-10°F	-20° F					oz	oz	Receptacle	(Lbs)				
STI022LR448A2	3451	2773	2193	208~230/1/60	9.6	15	R448A	53	YES	6-15R	216	А			
STI045LR448A2	5417	4187	3197	208~230/1/60	16.6	25	R448A	53	YES	6-15R	216	А			
STI055LR448A2	7499	5903	4568	208~230/1/60	17.9	30	R448A	85	YES	6-20R	288	В			
STI055LR448A3	7540	5939	4559	208~230/3/60	17.2	25	R448A	85	NO	-	288	В			
STI070LR448A2	8414	6718	5275	208~230/1/60	22.6	35	R448A	85	NO	-	288	В			
STI070LR448A3	8414	6718	5275	208~230/3/60	20.6	30	R448A	85	NO	-	288	В			

	Table 3.	OUTDOOR	UNIT - Medium	Temperature (Air Defrost	System)
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	Ambient 95°F					Refrigerant.			Matching	NET	
Model	Capacit	y BTUH	Voltage	MCA	MOPD		Wt	Plug	NEMA	Weight	Fig.
	35°F	38°F				Ref.	oz	Supplied	Receptacle	(Lbs)	
STX068MR448A2	6626	6998	208~230/1/60	9.1	15	R448A	54	NO	-	233	С
STX075MR448A2	7803	8186	208~230/1/60	11.4	15	R448A	54	NO	-	231	С
STX100MR448A2	11690	12428	208~230/1/60	16.8	25	R448A	88	NO	-	317	D
STX100MR448A3	11806	12527	208~230/3/60	9.4	15	R448A	88	NO	-	317	D
STX130MR448A2	13242	13981	208~230/1/60	16.1	25	R448A	88	NO	-	317	D
STX130MR448A3	13283	14107	208~230/3/60	13.9	20	R448A	88	NO	-	317	D

Table 4. OUTDOOR UNIT – Low Temperature (Electric Defrost Sys	tem)
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	Ambient 95°F						Refrigerant.		Disco	Matching	NET									
Model	Ca	apacity B1	ГИН	Voltage	MCA	MOPD	MCA MOPD	Ref. V	Wt	Plug	NEMA	Weight	Fig.							
	0°F	-10°F	-20° F				CEL OZ		Rei.	Rel.	Rei.	Rei.	Kel.	Rei.	Rel.	Nel.	oz	Supplied	Receptacle	(Lbs)
STX022LR448A2	3451	2773	2193	208~230/1/60	9.6	15	R448A	53	NO	-	230	С								
STX045LR448A2	5417	4187	3197	208~230/1/60	16.6	25	R448A	53	NO	-	230	С								
STX055LR448A2	7499	5903	4568	208~230/1/60	17.9	30	R448A	85	NO	-	305	D								
STX055LR448A3	7540	5939	4559	208~230/3/60	17.2	25	R448A	85	NO	-	305	D								
STX070LR448A2	8414	6718	5275	208~230/1/60	22.6	35	R448A	85	NO	-	305	D								
STX070LR448A3	8414	6718	5275	208~230/3/60	20.6	30	R448A	85	NO	-	305	D								

Figure A. INDOOR UNIT – Medium Cabinet (Opening Size : 25 inch x 25 inch)



Figure B. INDOOR UNIT – Large Cabinet (Opening Size : 25 inch x 38.5 inch)



Figure C. OUTDOOR UNIT – Medium Cabinet (Opening Size : 25 inch x 25 inch)



Figure D. OUTDOOR UNIT – Large Cabinet (Opening Size : 25 inch x 38.5 inch)



Locating SMART 7 Package Unit

Unit Installation Requirements

- 1. You must ensure before unit placement on the roof of box that the structural strength of the box can withstand the weight of SMART7 equipment
- 2. The unit should be installed away from noise sensitive site and must have proper support for noise and vibration not to be transmitted into the building.
- 3. Unit must be located away from steam, hot air or heat generator and placement should be selected in consideration of ventilation.
- 4. Indoor units are designed for indoor use only with ambient between 50°F~100°F and have no system control following ambient variation.
- 5. Evaporator section must not be located over doors.
- 6. Air circulation must cover completely inner space.
- 7. Installation, service and maintenance must be carried out by licensed contractor in conformity with the local standard construction code.

Ignoring above requirement will result in system fault, shorten life span and void the warranty,

Unit Transport Requirements.

- 1. Do not remove shipping skid until ready to move it upon box rooftop.
- 2. Always watch out not to contact sharp edges and coil surfaces to avoid potential injury. Wear safety gears always during installation.
- 3. Use spreader bar to lift the unit upon roof of box not to damage on the cabinet.
- 4. Do not remove compartment cover of the compressor section, hood for outdoor unit.

Unit Installation location.

- 1. Space between wall and air in/outlet must be secured at least 2inch.(refer to Fig. 1)
- 2. There must be 2 feet space secured at least above unit for service and removal of top case.(Refer to Fig. 1)
- 3. Single unit installation must be carried out following Fig. 2.
- 4. More than dual units installation must be carried out following Fig. 3.



Figure 1. Minimum Clearance at Installation of Unit.



Figure 2. One Unit

Installation procedure

Indoor use only (STI Model)

- 1. Carefully check package for damages during transportation and unit after opening the package.
- 2. Requirements must be followed for installing location on the page of 6~7.
- 3. Ensure weights of units on the page of 4~5 and that structural strength of the box can withstand of the weight of the unit.
- 4. Clean the roof surface of box for close adhesion of unit gasket to the surface.
- 5. Consult to box manufacturer for any processes necessary to ensure the integrity of the exposed form in the panels is not compromised.
- 6. Check mounting surface as level of surface should be within 1/8inch per a feet.
- 7. Place carefully unit into the provided opening with the evaporator air flow directly forward the door and ensure the grill not to damage during installation.
- 8. Secure that the condenser airflow is not obstructed.
- 9. Drain is not needed as condensate is vaporized by hot gas lines in the drain panel from the compressor discharge.
- 10. Install trim pieces around the open on the ceiling of box.

Outdoor use only (STX Model)

Installation is the same as indoor models except as follows :

- 1. Units must be curb mounted (Figure 4 ~ 5). Cabinet size refer to dimension size on page 5.
- 2. The condensate drain outlet pipe is located on the side of the unit. Field piping may be connected to the outlet provided it is adequately sloped and heated for freezing weather conditions.
- 3. After connecting electrical power, reinstall compressor compartment cover and weather hood.





Figure 4. Curb placed on roof of box.

Figure 5. Roof membrane placed over curb.

Check before Unit Start-up.

- 1. Check all electrical and refrigerant connections.
- 2. Observe all applicable building and electrical codes when wiring.
- 3. Make sure power supply has correct voltage and phase for unit and is fused properly.
- If unit is connected with a power cord, use the cord with plug to connect to power supply.
 If unit is not connected with a power cord, use hard wire to connect to power supply.
 IMPORTANT
 - Do not use extension cords to connect unit to power.
 - Plug-in to grounded three prong outlet.
 - Do not remove grounding prong.
 - Do not use a power adapter.
- 5. All medium and low Temperature Models are preset to factory default settings at table 5.

Standard Maintenance Guideline.

After first year of operation and under normal usage, maintenance should cover the following items at least once every six months.

- 1. Check all electrical and refrigerant connections.
- 2. Check all wiring and insulators.
- 3. Check contactors for proper operation and for state of contact points.
- 4. Check all fan motor. Tighten motor mount bolts, nuts and fan set screws.
- 5. Clean the heatexchanger (evaporator and condenser) coil surface.
- 6. Check the operation of the control system. Make sure all safety controls are operating properly.
- 7. Check the defrost control system. Make sure all defrost controls are operating properly.
- 8. Check the drain pan and drain line. If necessary, clean the drain pan and drain line.
- 9. Check the all heaters. Make sure the crankcase and drain line heaters are operating properly.

After installation of unit, it must be checked at least once for proper defrosting. The amount and pattern of frosting can vary considerably. It is dependent on the temperature of the room, the type of product being stored, how often new product is brought into the room and how often door is opened. Therefore, it may be necessary to periodically change the number of defrost cycles or adjust the duration of defrost.

Sequence of Operation.

Operation of Refrigeration.

- 1. When switch is turned on, power is provided to the temperature control, compressor, condenser and evaporator fan motor. And they will run until the box temperature setting is reached.
- 2. When the box temperature reaches a setting, the compressor and condenser fan motors shut off while evaporator fan motor is working.
- 3. When the box temperature rises above the set point and minimum off-time has elapsed, the compressor contactor will be re-energized and re-operated.

Operation of Defrost.

- Under normal electric defrost operation, the temperature/defrost control will de-energize the compressor contactor, evaporator fans and energize the defrost heaters. But under normal air defrost operation, the control will de-energize the compressor contactor and keep an evaporator fan motor working.
- 2. When the coil has defrosted completely and reached the preset coil sensor temperature, defrost heater cuts off and fan delay / drip sequences begin.
- 3. The control energizes the compressor and condenser fan motor and they restart.
- 4. When the coil temperature reaches 65°For fan delay time has elapsed, the evaporator fans will be energized and started.

Controller Setting.

Carel PJEZC Electronic Controller.

The most complete solution for low temperature ventilated units, with three relays for complete control of the compressor, fan and defrost functions. The three relays are included in the very compact case in the versions with 230 V or 115 V power transformer, without compromising the performance or reliability of the product.

Panel installation using 2 rear brackets

- insert the instrument in the opening (phase 1);
- secure the instrument by sliding the brackets in the guides on the instrument until compressing them against the panel (phase 2);



Figure 6. Controller installed method

Electrical Connections

WARNINGS:

- the electrical connections must only be completed by a qualified electrician;
- a power supply other than the type specified may seriously damage the system;
- separate as much as possible the probes and digital input signal cables from the cables carrying inductive loads and power cables to avoid possible electromagnetic disturbance. Never lay power cables(including the electrical cables) and probe signal cables in the same conduits. Do not install the probe cables in the immediate vicinity of power devices (contactors, circuit breakers or similar);
- reduce the path of the probe and sensor cables as much as possible, and avoid spiral paths that enclose power devices. The probes must be connected using shielded cables (minimum cross-section of each wire: 0.5 mm²);
- avoid direct contact with internal electronic components;
- connection errors (and connections other than those indicated in this manual) may involve danger to the safety of the users and cause faults on the instruments and the components connected;
- fit the unit with all the electromechanical safety devices required to guarantee correct operation and the complete safety of the user.

The buttons;



Figure 7. Display



Figure 6. Keypads

Display

BUT.	EUNCTION	N	ORMAL OPERATION			
NO	FUNCTION	ON	OFF	FLASH	START UP	
1	COMPRESSOR	ON	OFF	CALL	ON	
2	FAN	ON	OFF	CALL	ON	
3	DEFROST	ON	OFF	CALL	ON	
4	Auxiliary output (AUX)	Output active	Output not active	-	ON	
5	Clock (RTC)	RTC available, enabled (tEN=1) and at least one time band has been set	RTC not available or not enabled (tEN=0) or no time band set		ON (if the clock is fitted)	
6	alarm	alarm in progress	no alarm in progress		on	
7	digits	three digits with decimal point and range in °C/°F and decimal point	-199 to 999. See parameters /4, /5, /6 for t	he type of probe disp	layed, values	

Keypads

BUT	NORMAL	OPERATION	074.57		
NO.	pressing the button alone	pressing with other buttons	START UP		
1	more than 3 s: switch ON/OFF	pressed together with 3 activates / deactivates the continuous cycle			
2	 1 s: displays/sets the set point more than 3 s: accesses the parameter setting menu (enter password 22) mutes the audible alarm (buzzer) 		for 1 s RESET current EZY set	Pressed together (2 and 3) activate	
3	more than 3 s: activates / deactivates the defrost	pressed together with 1 activates / deactivates the continuous cycle	for 1 s displays firmware version	reset procedure	

Preliminary configurations

Once the electrical connections have been completed, simply power-up the controller to make it operative.

Turbo air recommends to check that the display does not show any alarm signals (see par.

Table 7), and finally set the parameters as desired (see par. Table 5,6).

The main parameters are as follows	s:
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	Control parameters	Defrost parameters			Alarm parameters
st	set point	d0	type of defrost	Ad	temperature alarm delay
rd	set point differential	dl	interval between two defrosts	AL	low temperature alarm threshold/deviation
		dt	end defrost temperature	AH	high temperature alarm threshold/deviation
		dP	maximum defrost duration		

Functions available from the keypad.

On and off

Switching the instrument ON : press UP for more than 3 s (when pressing the button, the display shows ON).

Switching the instrument OFF : press UP for more than 3 s. The display shows the message "OFF", alternating with the temperature measured by the set probe.

In OFF status, the following functions are disabled (if featured by the model):

- · compressor control / duty setting / continuous cycle;
- defrost;
- fan control;
- alarms : 'LO', 'HI', 'IA', 'cht', 'CHT';
- door switch: A4=7/8
- buzzer (when available).

While the following are enabled:

- temperature display, alternating with the message "OFF";
- parameter display and setting;
- alarms: "E0", "E1", "E2";
- the internal timer relating to parameter 'dl' is updated. If 'dl' expires in OFF status, a defrost is performed when restarting;
- auxiliary relay management, only in the following configurations:
- H1= = 1/2 ("E0" alarm only);
- H1= 3, A4= 6;

A WARNINGS:

- when first connected, easy is already on and ready to be used;
- the instrument can be switched on from a supervisor PC and via an external contact (setting A4= 5). The latter has priority over the other modes.

Set point setting (desired temperature value)

The easy, easy compact devices control the desired temperature (set point) inside the cabinet or cold room directly and dynamically.

To view and modify the set point:

- press SET for 1 s, the set value will start fl ashing;
- · increase or decrease the value using UP or DOWN;
- press SET to confirm the new value.

Manual defrost

Press DOWN for more than 3 s (activated only if the temperature conditions are right).

Continuous cycle

Press UP+DOWN for more than 3 s (activated only if the temperature conditions are right and for easy split only when H6=0).

The continuous cycle is used to maintain refrigeration active in the cabinet or cold room, regardless of the temperature inside the unit. This may be useful for rapidly bringing the temperature below the set point value.

Rapid display of the temperature read by the other probes

Press the DOWN button to scroll the temperatures read by the probes. Each time the DOWN button is pressed, the display will show the name of the probe Pr1, Pr2 or Pr3 (only on the models with 3 inputs and with multifunction input configured as a probe) and after 1 s the temperature measured by the selected probe will be displayed.

To display the other probes, press DOWN again.

To return to the normal display, wait 3 s without pressing any buttons (exit by timeout).

Device setup.

Rapid parameter set selection (EZY)

The easy controllers feature the EZY parameter which is used to quickly choose a list of parameters, with corresponding values, for the control of the refrigeration system.

Parameter	Description	Min	Max	Default
St	Set point	-30	30	-10
r1	Minimum set point value	-50	30	-30
r2	Maximum set point value	-30	150	30
c2	Minimum compressor off time	0	100	4
do	Type of defrost	0	4	0
dl	Interval between defrost	0	199	6
dt	End defrost temperature set point	-50	127	65
dP	Maximum defrost duration	1	199	60
d4	Defrost on power-up	0	1	1
dd	Dripping time	0	15	2
F0	Enable evaporator fan control	0	1	0
F2	Stop evaporator fan if compressor stop	0	1	0
F3	Evaporator fan status during defrost	0	1	1
Fd	Post-dripping time	0	15	2

Table 5. SET 1 (EZY=1) – Low temperature (SET POINT : -10°F) Electric defrost

Table 6.	SET 2	(EZY=3)	– Medium tem	perature (SE	T POINT : 38°F) Air defrost
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Parameter	Description	Min	Мах	Default
St	Set point	0	50	38
r1	Minimum set point value	-50	50	35
r2	Maximum set point value	0	150	50
c2	Minimum compressor off time	0	100	4
do	Type of defrost	0	4	2
dl	Interval between defrost	0	199	6
dt	End defrost temperature set point	-50	127	40
dP	Maximum defrost duration	1	199	40
d4	Defrost on power-up	0	1	0
dd	Dripping time	0	15	0
F0	Enable evaporator fan control	0	1	0
F2	Stop evaporator fan if compressor stop	0	1	0
F3	Evaporator fan status during defrost	0	1	0
Fd	Post-dripping time	0	15	0

Table of alarms and signals.

When an alarm is activated, the display shows the corresponding message that flashes alternating with the temperature; if fi tted and enabled, the buzzer and the alarm relay are also activated.

All the alarms have automatic reset (that is, they stop when the causes are no longer present), except for alarm 'CHt' which has manual reset (instrument on/off using the UP button or by disconnecting the power supply).

Pressing the SET button mutes the buzzer, while the code displayed and the alarm relay only go off when the causes of the alarm have been resolved.

The alarm codes are shown in the table below:

alarm code	buzzer and alarm relay	LED	alarm description	reset	enable alarm parameters involved
E0	active	on	probe 1 error = control	automatic	
E1	not active	on	probe 1 error = defrost	automatic	d0=0/1/4, F0=1
E2	not active	on	probe 1 error = condenser/product	automatic	A4=10
IA	active	on	external alarm	automatic	A4=1, +A7
dOr	active	on	open door alarm	automatic	A4=7/8, +A7
LO	active	on	low temperature alarm	automatic	AL, Ad
н	active	on	high temperature alarm	automatic	AH, Ad
EE	not active	on	unit parameter error	not possible	
EF	not active	on	operating parameter error	manual	
Ed	not active	on	defrost running	on first defrost ended correctly	dP, dt, d4, A8
dF	not active	off	defrost running	automatic	d6=0
cht	not active	on	dirty condenser pre-alarm	automatic A4=10	
СНТ	active	on	dirty condenser alarm	manual	A4=10
EtC	not active	on	clock alarm	by setting the if band time	

Table 7. Alarm codes table.

Description of the main signals and alarms.

LED flashing

The activation of the corresponding function is delayed by a timer, awaiting an external signal or disabled by another procedure that is already in progress. e.g. if is a continuous cycle in progress and a defrost is called, the latter will remain pending until the end of the continuous cycle, and the corresponding LED (defrost) will flash.

E0 steady or flashing

control probe error:

- · probe not working : the probe signal is interrupted or short-circuited;
- probe not compatible with the instrument;
- The alarm signal E0 is steady if it is the only active alarm (the temperature value is not displayed), while it flashes if other alarms are active or the second probe is displayed.

E1 flashing

evaporator probe or food conservation probe error:

- · probe not working, the probe signal is interrupted or short-circuited;
- · probe not compatible with the instrument;

E2 flashing

condenser probe or food conservation probe error:

- probe not working, the probe signal is interrupted or short-circuited;
- · probe not compatible with the instrument;

IA flashing

immediate or delayed alarm from multifunction digital input:

• check the multifunction input and parameters A4 and A7.

dOr flashing

open door alarm:

• check the multifunction input and parameters A4 and A7.

LO flashing

low temperature alarm. The probe has measured a temperature lower than the set point by a value that exceeds parameter AL:

• check parameters AL, Ad and A0.

The alarm is automatically reset when the temperature returns within the set limits (see parameter AL).

HI flashing

high temperature alarm. The probe has measured a temperature higher than the set point by a value that exceeds parameter AH.

• check parameters AH, Ad and A0.

The alarm is automatically reset when the temperature returns within the set limits (see parameter AH).

EE displayed during operation or on power-up

unit parameter reading error. See Data errors.

EF displayed during operation or on power-up

operating parameter reading error. See Data errors.

Ed flashing

The last defrost ended after exceeding the maximum duration rather than when reaching the end defrost set point.

· check parameters dt, dP and d4;

• check the effi ciency of the defrost.

The message disappears when the next defrost ends correctly.

dF flashing

defrost running:

• this is not an alarm signal, but rather a message that the instrument is running a defrost. Only shown if d6= 0.

cht flashing

dirty condenser pre-alarm:

· check parameters A4, Ac, AE and Acd.

CHt flashing

dirty condenser alarm:

• check parameters A4, Ac, AE and Acd.

EtC flashing

internal clock error.

Data error

In certain operating conditions, the instrument may detect errors in the data saved. These errors may compromise the correct operation of the instrument. If the microprocessor detects a data saving error, the display shows the message "EE".

If the fault persists, the controller needs to be replaced. If, on the other hand, the message disappears, it can continue to be used. When "EE" error occurs frequently and/or remains for some time, the controller should be checked, as the original precision may not be guaranteed.

Modifying the parameters.

Parameter navigation

The operating parameters, modifiable using the keypad, are divided into two types: frequent (type F) and confi guration (type C). Access to the latter is protected by password (default= 22) to prevent accidental or unauthorised modifications.

Accessing the type F parameters:

- press the SET button for more than 3 s (if there are active alarms, mute the buzzer). The display shows the parameter code 'PS' (password);
- use the UP and DOWN buttons to scroll the parameters. The LED corresponding to the category of parameters will be on (see Table 8);
- press SET to display the value associated with the parameter
- increase or decrease the value using the UP or DOWN button respectively;
- press SET to temporarily save the new value and display the parameter again;
- repeat the procedure for any other parameters that need to be modified;
- press the SET button for more than 3 s to permanently save the parameters and exit the parameter setting procedure.

Accessing the type C parameters:

• press the SET button for more than 3 s (if there are active alarms, mute the buzzer), the display shows the parameter code "PS" (password);

- press the SET button to access the password setting;
- use the UP and DOWN buttons to scroll the numbers until displaying "22" (password to access the parameters);
- press the SET button to confi rm the password;
- use the UP and DOWN buttons to scroll the parameters. The LED corresponding to the category of parameters will be on (see Table 8);
- press SET to display the value associated with the parameter;
- increase or decrease the value using the UP or DOWN button respectively;
- press SET to temporarily save the new value and display the parameter again;
- repeat the procedure for any other parameters that need to be modified;
- press the SET button for more than 3 s to permanently save the parameters and exit the parameter setting procedure.

If no button is pressed for 60 s, all the changes made to the parameters, temporarily saved in the RAM, will be cancelled and the previous settings restored.

The dAY, hr, Min parameters are not restored, as these are saved instantly when entered. If power is disconnected from the instrument before saving the settings (pressing the SET button for 3 s), all the changes made to the parameters and temporarily saved will be lost.

Table 8. Category of parameters.

Category	Initial	lcon	Category	Initial	lcon
Probe parameters	/	-	Alarm parameters	А	
Control parameters	r	-	Fan parameters	F	ક્ષ
Compressor parameters	С	0	AUX output configuration parameters	H1	RUX
Defrost parameters	d	¥.	RTC parameters	-	0

Setting the default parameters.

running this procedure overwrites any custom parameter settings.

To reset the default parameters:

- disconnect power from the instrument;
- reconnect power while holding the SET and DOWN buttons;
- the display will show the message "CF";
- after a few seconds the instrument starts operating with the default configuration. Any different parameter settings will need to be updated.

Controller Troubleshooting.

The following table shows a number of anomalous situations that may occur on the various models.

The most frequent causes and	corresponding	checks are	described:

Problem	Cause	Checks
the compressor does not start (signalled by the	compressor delay set	parameters c0, c1 and c2 and dd
compressor LED flashing)	defrost post dripping in progress	
the temperature is over the set limits but there is	alarm delay set	parameters Ad, c6, d8
no alarm message and the buzzer, if fitted, does		
not sound		
alarm IA is signalled (multifunction input) without	the multifunction input generates an alarm when	connection of the input and whether this is closed
actually being active	the contact opens	in normal operation
the alarm connected to the multifunction input is	alarm delay set or parameter programming error	1. if A4=1
not detected		2. the status of digital input A7
the defrost is not activated	defrost duration too short (dP)	parameters dP and dI
	• interval between defrosts dI=0: in this case the	
	defrost is not activated	
	the end defrost temperature is too low or the	parameters dt and d/ (defrost probe)
	evaporator temperature is too high	
the manual defrost is not activated and the defrost	compressor protection times set	parameter d9 (select d9=1)
LED flashes		
the high temperature alarm is shown after a	the alarm delay after defrost is too short or the	parameters d8 and AH
defrost	alarm threshold is too low	
the display remains frozen even after the defrost	the ambient temperature has not yet reached the	wait or reduce d8
	set point or alternatively the time d8 has not	
	elapsed	
after modifying a parameter the controller	the instrument has not updated the old value or	turn the instrument off and on again or
continues working with the old values	alternatively the parameter setting procedure has	alternatively reprogram the parameters correctly
	not been ended correctly by pressing the SET	
	button for 3 s	
the evaporator fan does not start	1. a compressor and fan start delay has been set	1. parameter c0
	2. if F0=1 (fan managed by fan controller)	2. parameters F0, F1, Fd, dd and d/
	• the evaporator is "hot": the evaporator	
	temperature can be read by selecting	
	parameter /d;	
	 dripping in progress; 	
	• F1 (evaporator fan control set point) too low.	
	post-dripping delay set	
	3. if F0=0	3. parameters F0, F2, dd and Fd
	• F2=1 and the compressor is off	
	dripping in progress	
	post-dripping in progress	

Codes						Defaults		
	Description		Min	Max	UOM	Low temp.	Med temp.	
PS	password	F	00	+199	-	22	22	
1	PROBE PARAMETERS							
/2	probe measurement stability	С	1	15	-	4	4	
/4	select probe displayed	F	1	3		1	1	
/5	select °C/°F (0=°C, 1=°F)	С	0	1	flag	1	1	
/6	disable decimal point	С	0	1	flag	0	0	
/7	enable probe 2 alarm (model M only)	С	0	1	0	0	0	
/C1	probe 1 calibration	F	-50	+50	۴F	0	0	
/C2	probe 2 calibration	F	-50	+50	۴	0	0	
/C3	probe 3 calibration	F	-50	+50	۴F	0	0	
r	CONTROL PARAMETERS							
St	control temperature set point	S	r1	r2	۴F	-10	38	
r1	minimum set point value	С	-50	r2	۴F	-30	35	
r2	maximum set point value	С	r1	150	۴F	+30	50	
r3	select operating mode (0=direct+defrost , 1=direct , 2=reverse)	С	0	2	flag	0	0	
r4	automatic night-time set point variation	С	-50	+50	۴F	0	0	
rd	control differential	F	0	19	۴F	2	2	
с	COMPRESSOR PARAMETERS							
c0	compressor and fan start delay on power-up	С	0	100	min	0	0	
c1	minimum time between consecutive compressor starts	С	0	100	min	0	0	
c2	minimum compressor off time	С	0	100	min	4	4	
c3	minimum compressor on time	С	0	100	min	0	0	
c4	compressor on time with duty setting	С	0	100	min	0	0	
сс	continuous cycle duration	С	0	15	hours	4	4	
c6	temperature alarm bypass after continuous cycle	С	0	15	hours	2	2	
d	DEFROST PARAMETERS							
	type of defrost							
d0	(0 = heater by probe, 1 = hot gas by probe, 2 = heater by time,	с	0	4	flag	0	2	
	3 = hot gas by time, 4 = heater by time with temp. control)							
dl	interval between defrosts	F	0	199	hours	6	6	
dt	end defrost temperature set point	F	-50	+130	۴F	65	65	
dP	maximum defrost duration	F	1	199	min	60	40	
d4	defrost when the instrument is switched on (0=no, 1=yes)	С	0	1	flag	1	0	
d5	defrost delay on power-up or when enabled by digital input	с	0	199	min	0	0	
d6	disable temperature display during defrost (0=no, 1=yes)	с	0	1	flag	1	1	
dd	dripping time	F	0	15	min	2	1	
d8	alarm bypass time after defrost	F	0	15	hours	1	1	
d9	defrost priority over compressor protectors (0=no, 1=yes)	с	0	1	flag	0	0	
d/	display defrost probe temperature	F			۴F	-	-	
dC	time base (for defrost only : 0 = hr/min , 1 = min/s)	С	0	1	flag	0	0	

Listing of Controller Parameters and Settings.

А	ALARM PARAMETERS						
A0	alarm and fan temperature diff erential	С	-20	+20	۴F	2	2
AL	low temperature alarm threshold/deviation (AL= 0 : alarm disabled)	F	-50	+250	۴F	0	0
AH	high temperature alarm threshold/deviation (AH= 0 : alarm disabled)	F	-50	+250	۴F	0	0
Ad	low and high temperature alarm delay	С	0	199	min	0	0
	digital input configuration						
	0 : input not active						
	1 : exter. alarm, instant (A7=0) or delayed (A7>0)						
	2 : enable defrost (open=disabled)						
	3 : start defrost on closing						
	4 : curtain switch or night-time operation (open=normal set point)						
	5 : remote ON/OFF (open=OFF)						
	6 : AUX output control [H1=3] (open=AUX de-energised)						
A4	7 : AUX output [H1=3]+FAN OFF control (closed)(open=AUX energised)	С	0	11	-	0	0
	8 : AUX output [H1=3]+FAN OFF control (closed) + COMP. OFF control						
	(closed) (open=AUX energised)						
	9 : select direct/reverse operation						
	r3=0 \rightarrow open=direct + defrost, closed=reverse						
	r3=1/2 \rightarrow open=direct, closed=reverse						
	10 : condenser probe						
	11 : product probe						
A7	external alarm detection delay	С	0	199	Min	0	0
A8	enable alarm "Ed" : end defrost by timeout (1 = enabled)	С	0	1	-	0	0
Ac	high condenser temperature alarm	С	-50	+250	۴F	150	150
AE	high condenser temperature alarm differential	с	0.1	20.0	۴F	10	10
Acd	high condenser temperature alarm delay	С	0	250	min	0	0
F	FAN PARAMETERS						
F0	fan management (0 = fans on, 1 = controlled based on parameter F1)	С	0	1	-	0	0
F1	evaporator fan control set point	F	-50	+130	℃/°F	+5	+5
F2	fans OFF when compressor OFF (0=ON, 1=OFF)	С	0	1	-	0	0
F3	evaporator fan status during defrost (0: FAN ON, 1: FAN OFF)	С	0	1	-	1	0
Fd	post-dripping time	F	0	+15	min	2	0
н	OTHER SETTING	1	r	r	r		[
H0	serial address	С	0	199	-	1	1
	AUX output confi guration						
	0 : no function associated with the output						
	1 : alarm output usually energized						
H1	2 : alarm output usually de-energized	С	0	1	flag	1	1
	3 : auxiliary output driven by digital input [A4=6/7/8]						
	digital input OPEN = AUX de-energised						
	digital input CLOSED = AUX energised						
H2	enable keypad (0=disabled, 1=enabled, 2=enabled except for ON/OFF)	с	0	2	flag	1	1
H4	disable buzzer (0=enabled, 1=disabled)	С	0	1	-	0	0
H5	key ID code from supervisor	F	-99	+99	-	1	1
EZY	select Easy Set according to the model	С	0	4	-	1	3

System troubleshooting.

Symptoms	Possible causes	Solution
	Main switch open	Close switch
	Blown fuse	Check electrical circuits and motor winding for shorts or grounds. Replace fuse after fault is corrected.
	Loose wiring	Check all wire junctions. Tighten all terminal screws.
	System cable shut down	Replace shutdown cable.
Compressor not running	Thermal overload tripped	Overloads are automatically reset. Check unit when unit come back on line.
	Defective contactor or contactor coil	Replace or repair
	System shut down by safety devices.	Check cause of shut down
	No cooling required.	Wait until calls for cooling
	Motor electrical trouble.	Check motor for open windings, short circuit or burn out.
Nation Operation	Flooding of liquid refrigerant into crankcase	Check expansion valve setting
Noisy Compressor	Worn compressor.	Replace compressor
	Non-condensable in system.	Remove non-condensable.
	Too much refrigerant	Remove excess refrigerant
High discharge pressure.	Fan not running	Check electrical circuit and fuse.
	Dirty condenser coil	Clean condenser coil
	Liquid line solenoid not open	Repair or replace coil
	Insufficient refrigerant	Check leaks Add charge
Low discharge pressure.	Low suction pressure	See corrective steps for low suction pressure.
	Excessive loads	Reduce load.
High suction pressure	Expansion valve overfeeding	Check bulb location and clamping. Adjust superheat
	Expansion valve malfunctioning.	Check and reset for proper superheat.
Low suction pressure	Lack of refrigerant.	Check for leaks. Add charge.
Lon outdon protouro.	Evaporator dirty or iced.	Clean. Check defrost parameters and modify as required.
	Evaporator dirty or iced	Clean and defrost.
	Condenser coil dirty.	Clean coil
Compressor thermal	Too much refrigerant	Remove excess refrigerant
protector switch open.	Clogged liquid line filter drier.	Replace filter drier.
	Operating beyond design conditions	Add facilities so that conditions are within allowable limits.
	Main swich open.	Close switch.
	Blown fuses.	Replace fuses. Check for short circuits or overload conditions.
	Defective motor	Replace motor.
Fan(s) will not operate	Coil does not get cold enough to reset thermostat.	Adjust fan delay setting of control.
	Controller or sensor defective.	Replace defective component.
	Unit in defrost cycle.	Wait for completion of cycle.
	Controller temperature set too high.	Adjust control
Room temperature too	Superheat too high.	Check and reset for proper superheat
, high.	Insufficient refrigerant	Check leaks. Add charge
-	Evaporator coil iced	Manually defrost coil. Check defrost controls for malfunction.
	Defrost duration is too long.	Adjust defrost termination temperature.
Ice accumulating on	Fan delay not delaying fans after defrost period.	Adjust fan delay setting or replace sensor.
ceiling around grill.	Defective defrost control or sensor.	Replace defective component.
	Too many defrost.	Adjust number of defrosts.
	Coil temperature not getting above freezing point	Charly heater energian
Only and all a size of the st	during defrost.	
during defrect sures	Not enough defrost cycles per day.	Adjust control for more defrost cycles.
auning denost cycle.	Defrost cycle too short.	Adjust defrost control, defrost duration setting.
	Defective defrost control or sensor.	Replace defective component.
	Defective heaters.	Replace heater.
Ice accumulating in drain	Unit not installed properly (out of level)	Check and adjust if necessary.
pan.	Drain line plugged.	Clean drain line.
	Defective control.	Replace defective component.

Electrical Wiring Diagram.

Diagram 1. Wiring diagram for SMART 7, Air Defrost 208~230V / 1Ph / 60Hz.





Diagram 2. Wiring diagram for SMART 7, Air Defrost 208~230V / 1Ph / 60Hz.

Model : STI100MR448A2



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Diagram 3. Wiring diagram for SMART 7, Air Defrost 208~230V / 1Ph / 60Hz.



Diagram 4. Wiring diagram for SMART 7, Electric Defrost 208~230V / 3Ph / 60Hz.

Model : STI100MR448A3, STI130MR448A3



Diagram 5. Wiring diagram for SMART 7, Electric Defrost 208~230V / 1Ph / 60Hz. Model : STX068MR448A2, STX075MR448A2



Diagram 6. Wiring diagram for SMART 7, Electric Defrost 208~230V / 1Ph / 60Hz. Model : STX100MR448A2, STX130MR448A2



Diagram 7. Wiring diagram for SMART 7, Electric Defrost 208~230V / 3Ph / 60Hz. Model : STX100MR448A3, STX130MR448A3



Diagram 8. Wiring diagram for SMART 7, Electric Defrost 208~230V / 1Ph / 60Hz. Model : STI022LR448A2, STI045LR448A2



Diagram 9. Wiring diagram for SMART 7, Electric Defrost 208~230V / 1Ph / 60Hz. Model : STI055LR448A2



Diagram 10. Wiring diagram for SMART 7, Electric Defrost 208~230V / 1Ph / 60Hz. Model : STI070LR448A2



Diagram 11. Wiring diagram for SMART 7, Electric Defrost 208~230V / 3Ph / 60Hz. Model : STI055LR448A3 , STI070LR448A3



Diagram 12. Wiring diagram for SMART 7, Electric Defrost 208~230V / 1Ph / 60Hz. Model : STX022LR448A2, STX045LR448A2







Diagram 14. Wiring diagram for SMART 7, Electric Defrost 208~230V / 3Ph / 60Hz. Model : STX055LR448A3 , STX070LR448A3





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