sub-zero®
INDIA
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COLD ROOM CONTROLLER

USER MANUAL

sub-zero®

CRC-2052

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Introduction

The CRC-2052 is single set point cold room controller. The Sub-Zero CRC-2052 is aesthetically superior versions of their predecessors.

Features:

The controller controls the defrost in the system based on either an electrical heater where the compressor is stopped, or at cycle inversion using warm gas where the compressor keeps on working.

There are safety features which include shutting down the system incase of a fault from a pressure control or similar device.

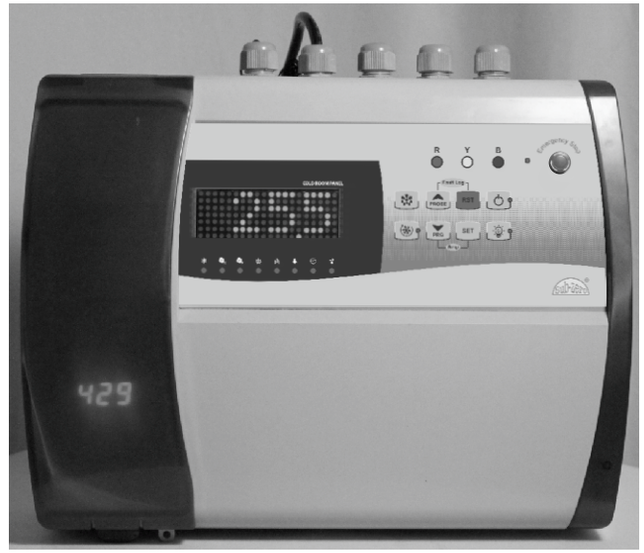
A series of “safety controls” (delay at start-up, minimum disable time, minimum time between activation) protects the compressors from close starts. In case of probe error or temperature alarm, the instrument signals the event through acoustic signal and by closing the relay contact. By pressing the mute key, the buzzer is silenced.

A number of parameters are displayed alphanumerically to set up the instrument for each specific function.

Computer Connectivity over RS485 and Remote monitoring(Optional).

Single Operation Quick Freeze Mode(Press QF Key for 2 sec), set system in quick freeze mode which is time based for that period new set point will be lower than running set point and system will try to achieve that set point, after time period over set point will be normal set point.

Get to Know Your Controller



Items included

NO.	ITEMS	QTY
1.	CONTROLLER	1
2.	NTC SENSOR 5 METER	3
3.	CATALOGUE	1
4.	8 X 38 SCREW WITH RAWL PLUG	4

Key Introduction

	Used to enter in manual defrost and to stop defrost if defrosting is ON.
PROBE	Used to increment/scroll in Program Mode. When not in any mode if this key is pressed for 2 secs controller will enter in display Probe mode where Condenser/Evap temperature & RH can be viewed.
RST	Used to come mute the buzzer/Alarm & to exit any mode.
Fault Log PROBE RST	Used to enter in fault log mode.
	Used to switch OFF/ON the controller.
	Used to enter in quick freeze mode.
PRG	Used to decrement/scroll in Program mode. Used to enter into the program mode.
SET	Used to enter into the Set mode. Also used as enter key if controller is in Set mode/program mode.
PRG SET Amp	Used to enter in display Amp. mode where compressor and defrost current can be viewed.
	Used to switch OFF/ON the light.

Fault Messages :

Ht	High temperature alarm for Room means, room temperature is equal or above the set value of P2 parameter.
Lt	Low temperature alarm for Room means, room temperature is equal or below the set value of P3 parameter.
HH	High humidity alarm means, humidity is equal or above the set value of H2 parameter.
LH	Low humidity alarm Means humidity is equal or above the set value of H3 parameter.
PP	Room temperature fail means, Room sensor not connected or out of range.
C-PP	Condenser temperature fail means, condenser sensor not connected or out of range.
E-PP	Evaporator temperature fail means, Evaporator sensor not connected or out of range.
H-PP	Humidity fail means, Humidity sensor not connected or out of value.
SPPR	SPPR Fault.
C-OL	Compressor over load fault.
C-UL	Compressor under load fault.
D-OL	Defrost over load fault.
D-UL	Defrost under load fault.
HP	HP fault.
LP	LP fault.
AUX	Auxiliary fault.

LED Indication

Messages	Mode	Discription
❄	On Off Flashing	Comp. Relay On. Comp. Relay Off. Comp. Relay Timedelay.
C	On Off	Cond. Relay On. Cond. Relay Off.
E	On Off Flashing	Evap. Relay On. Evap. Relay Off. Evap. Relay Timedelay.
❄	On Off Flashing	Defrost Relay On. Defrost Relay Off. Defrost Relay Timedelay.
	On Off	LSV Relay On. LSV Relay Off.
	On Off	Alarm Relay On. Alarm Relay Off.
	Flashing	Controller is in drip time.
	On Off Flashing	Humidifier On. Humidifier Off. Humidifier is in Timedelay.
	On Off	Controller is in quick freeze mode. Controller is not in quick freeze mode.
	Off On	Power Off. Power On.
	On Off	Light Relay On. Light Relay Off.
R	On Off	R-phase present. R-phase absent.
Y	On Off	Y-phase present. Y-phase absent.
B	On Off	B-phase present. B-phase absent.
Emergency Stop	On Off	Controller is in emergency stop mode. Controller is not in emergency stop mode.

Min: MINIMUM Max : MAXIMUM
Fact. Set : FACTORY SETTING(DEFAULT)

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
	To set other parameter	
	Press & hold SET key for 2 seconds 	Display will show 'SET' and scroll the description of the parameter. To go to other parameters, use up / down keys.
01	SP	To set the cut-out point of the controller.
	To change Set Point parameter, press the set key.	Display will change to set value. The set point value can now be changed by using the UP/DOWN key. After desired value, press the SET key & you will see "--" which confirms that the set point has been stored in memory.

Range		
Min	**Max**	**Fact. Set**
QFS	P2-0.5ºC	0ºC

02	QFS	To set the quick freeze set point.
	To change QFS parameter, press the set key.	Use UP/DOWN keys to set desired value. If controller is in quick freeze mode then compressor will cut in/ cut out as per this set point till the quick freeze duration is over. SP : Set Point.

Range		
Min	**Max**	**Fact. Set**
-50.0ºC	SP	-5.0ºC

03	CSET	To set the Condenser set point.
	To change CSET parameter, press the set key.	Use UP/DOWN keys to set desired value. If condenser logic is set to SP then condenser will switch off at this set point.

Range		
Min	**Max**	**Fact. Set**
0.0ºC	99.9ºC	20.0ºC

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
04	HSET	Function : To set cut out point of the controller for Humidity.
	To change EXIT parameter, press the set key.	Use UP/DOWN keys to set desired value. **Example :** If this parameter is set to 70 then humidifier will be off at this humidity .

Range		
Min	**Max**	**Fact. Set**
H3+1%	H2-1%	70%

05	EXIT	End of set mode
	To set other parameter	
	Press & hold PRG key for 2 seconds 	Display will show 'P2' and scroll the description of the parameter. To go to other parameters , use up / down keys.
01	P2 Parameter	Function : To set allowable high temperature limit.
	To change P2 parameter, press the set key.	Use UP/DOWN key to set desired value. Once set at a particular value, this will not allow the set point to go above this value and below P3 setting. **Example :** Setting this parameter at 30.0^{0}C will not allow the set point to go above 30.0^{0}C also if the temperature reaches 30.0^{0}C, the display will show HT (High Temperature). The alarm will be ON. But at power on till the AL delay is over controller will not generate HT Alarm.

Range		
Min	**Max**	**Fact. Set**
SP+0.5ºC	50.0ºC	50.0ºC

HT
(Message on Display)

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
02	P3 Parameter	Function : To set allowable low temperature limit.
To change P3 parameter, press the set key.		Use UP/DOWN key to set desired value. Once set at a particular value, this will not allow the set point to go below this value and above P2 setting. **Example** : Setting this parameter at -30.0°C will not allow the set point to go below -30.0°C also if the temperature reaches -30.0°C, the display will show LT (Low Temperature). The alarm will be ON.

Range		
Min	**Max**	**Fact. Set**
-50.0ºC	SP-0.5ºC	-50.0ºC

LT
(Message on Display)

03	P4 Parameter	Function : To set the differential for compressor restart.
To change P4 parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example(Cooling Mode) :** If the set point is set at 10.0°C and differential is set at 2.0°C, then when the system reaches 10.0°C, the comp. relay will cutout. Since the differential is 2.0°C, the comp. Relay will cutin at 12.0°C (10.0°C + 2.0°C).

Range		
Min	**Max**	**Fact. Set**
0.5ºC	20.0ºC	2.0ºC

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
04	P5 Parameter	Function : To set probe calibration.
To change P5 parameter, press the set key.		Use UP/DOWN keys to set desired value. In time it may be possible that the display may be offset by a degree or so. To compensate for this error, you may need to add or minus the degrees required to achieve the correct temperature. **Example** : The temperature on the display is 28.0°C, whereas the actual temperature is 30.0°C. You will need to set this parameter to 2.0°C, which means that once out of the programming parameter, the display will show the temperature 30.0°C (28.0°C + 2.0°C).

Range		
Min	**Max**	**Fact. Set**
-10.0ºC	10.0ºC	0.0ºC

05	P6 Parameter	Function : To set time delay between relay restart time.
To change P6 parameter, press the set key.		Use UP/DOWN keys to set desired value. This parameter is used to protect the fan from restarting in a short period of time and can be set between 0 to 20 minutes. **Example** : If this parameter is set at 3 minutes, the compressor will cut off at the set temperature, but will not restart for a minimum of 3 minutes, even if the differential is achieved earlier. This parameter is good to protect the life of the compressor when there are power fluctuations and the compressor is switched off and on within a few seconds.

Range		
Min	**Max**	**Fact. Set**
1 Min	20 Min	3 Min

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
06	P7 Parameter	Function : To set duration of defrost.
To change the P7 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. This is maximum amount of time allowed for defrost. If set to 0, there will be no defrost cycle. **Example :** If P7 is set to 15 Mins and P8 parameter is set to 1 Hr. then after every 1 Hr defrosting will take place for 15 mins.
Range		
Min	**Max**	**Fact. Set**
0 Min	99 Min	30 Min
07	P8 Parameter	Function : To set defrost frequency.
To change the P8 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. This is the amount of time between two defrost cycles. **Example :** same as P7 parameter.
Range		
Min	**Max**	**Fact. Set**
1 Hr	31 Hrs	6 Hr
08	P9 Parameter	Function : To set power on defrost delay.
To change the P9 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. This is the amount of time at power on after which defrosting will take place once. **Example :** If P9 parameter is 30 mins then at power after 30 mins defrosting will take place once.
Range		
Min	**Max**	**Fact. Set**
0 Min	99 Min	30 Min

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
09	P10 Parameter	Function : To set type of defrost.
To change the P10 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. HTR : Heater defrost where compressor is OFF. HTG : Hot Gas defrost where compressor is ON.
Range		
Min	**Max**	**Fact. Set**
HTR	HTG	HTR
10	P11 Parameter	Function : To set drip time for defrost.
To change the P11 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. During this period Compressor, Evaporator Fan, LSV relay and Heater will stay off so that the defrost water can drain out.
Range		
Min	**Max**	**Fact. Set**
0 Min	30 Min	1 Min
11	P12 Parameter	Function : To set type of computation for defrost time..
To change the P9 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. **REAL = Total of real time.** **Example :** This means that the time calculation for defrost frequency will be for the total hours the unit has been running. **CRH - Sum of total compressor operating times.** This means that for time calculation, the unit will add the total time the compressor has been in an ON mode. It keeps a record of the hours worked +/-½ Hour incase of a power failure.
Range		
Min	**Max**	**Fact. Set**
REAL	CRH	REAL

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
		Example : If Defrost frequency is set to 6hrs. and 3.45 hrs have passed after unit has started and power fails, then defrost cycle will stat after 3½ hours when power resumes.
12	P13 Parameter	Function : To set defrost stop temperature
To change the P13 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. If coil/Evap temperature is reached upto this temperature defrost will stop. **Example :** If this parameter is set to 7.0ºC,then if defrosting is in progress then when temperature reaches 7.0ºC, the defrost process will stop.

Range		
Min	**Max**	**Fact. Set**
-50.0ºC	50.0ºC	4.0ºC

13	RH Parameter	Function : To enable or disable humidity sensing.
To change the RH Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. DISABLE : Humidity sensing disable. ENABLE : Humidity sensing enable.

Range		
Min	**Max**	**Fact. Set**
DIS	ENB	DIS

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
14	H2 Parameter	Function : To set allowable high humidity limit.
To change the H2 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. Once set at a particular value, this will not allow the set point for Humidity to go above this value and below H3 Set value. **Example :** Setting this parameter at 70% will not allow the set point of Humidity to go above 70% . Also, if the humidity reaches 70% or above. the display will show HH(High Humidity) indicating that the humidity has gone above the value in this parameter

Range		
Min	**Max**	**Fact. Set**
Hset+1	100%	100%

HH
(Message on Display)

15	H3 Parameter	Function : To set allowable low humidity limit.
To change the H3 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. Once set at a particular value, this will not allow the set point for Humidity to go below this value and above H2 Set value. **Example :** Setting this parameter at 40% will not allow the set point of Humidity to go below 40% . Also, if the humidity reaches 40%. the display will show LH(Low Humidity) indicating that the humidity has gone below the value in this parameter.

Range		
Min	**Max**	**Fact. Set**
0%	Hset-1	0%

LH
(Message on Display)

16	H4 Parameter	Function : To set differential (Hysterisis) for humidity.
To change the H4 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If the set point is set at 60% and differential is set at 3, then when the system reaches 60%, the Relay will cut out. Since the differential is 3, the relay will cut in (restart) at 63% (60% -3%).

Range		
Min	**Max**	**Fact. Set**
1%	10%	2%

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
17	H5 Parameter	Function : To set probe calibration for humidity.
To change the H5 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. In time it may be possible that the display for Humidity may be offset by a % or so. To compensate for this error, you may need to add or minus the % required to achieve the correct Humidity. **Example :** The Humidity on the display is 40%, whereas the actual Humidity is 42%. You will need to set the H5 parameter to 2, which means that once out of the programming mode, the Humidity will show 42%(40% + 2%).

Range		
Min	**Max**	**Fact. Set**
-10%	10%	0%

Sr. No.	Parameter	Parameter setting method
18	H6 Parameter	Function : To set time delay between relay restart time for humidity.
To change the H6 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. This parameter is used to protect the Humidifier from restarting in a short period of time. **Example :** If H6 set at 3 minutes, the relay for Humidifier will cut off at the set Humidity, but will not restart for a minimum of 3 minutes, even if the differential is achieved earlier. This parameter is good to protect the life of the Humidifier or even in applications where the probe is placed at places where there are sudden & short changes in humidity like above a cold room door.

Range		
Min	**Max**	**Fact. Set**
1 Min	20 Min	2 Min

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
19	QFD Parameter	Function : To set quick freeze duration.
To change the QFD Parameter, press the set key.		Use UP/DOWN keys to set desired value. This is the maximum amount of time allowed for Quick Freeze. If set to “0”, there will be no quick freeze. **Example :** If QFS is set to -20.0 C, and quick freeze duration is set to 1 hr ,then when it is in quick freeze mode, then the Comp. will work on -20.0C set point for 1hr.

Range		
Min	**Max**	**Fact. Set**
0 Hr	12 Hrs	2 Hr

Sr. No.	Parameter	Parameter setting method
20	CND3 Parameter	Function : To set condenser logic.
To change the CND3 parameter, press the set key.		Use UP/DOWN keys to set desired value. This function is used to set condenser logic as per compressor or condenser Set point COMP = As per compressor. SP = As per condenser SP. If this parameter is set to Compressor then condenser will switch ON / OFF as per compressor. But if set to SP then Condenser will be OFF when condenser temperature reaches condenser SP.

Range		
Min	**Max**	**Fact. Set**
COMP	SP	COMP

Sr. No.	Parameter	Parameter setting method
21	CND4 Parameter	Function : To set condenser differential.
To change the CND4 parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If this parameter is set to SP and CSET (Condenser set point) is 20.0 deg & CND4 to 2.0 deg then at 20.0 degree condenser relay will be off and restart at (20.0 +2.0) 22.0 deg

Range		
Min	**Max**	**Fact. Set**
0.5ºC	20.0ºC	2.0ºC

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
22	CND5 Parameter	Function : To set condenser probe calibration.
To change the CND5 parameter, press the set key.		Use UP/DOWN keys to set desired value. In time it may be possible that the display for condenser may be offset by a deg or so. To compensate for this error, you may need to add or minus the offset required to achieve the correct condenser temperature. **Example :** The temperature on the display is 28.0ºC, whereas the actual temperature is 30.0ºC. You will need to set the CND5 parameter to 2.0ºC, which means that once out of the programming mode, the temperature will show 30.0ºC (28.0ºC+ 2.0ºC).

Range		
Min	**Max**	**Fact. Set**
-10.0ºC	10.0ºC	0.0ºC

Sr. No.	Parameter	Parameter setting method
23	CND6 Parameter	Function : To set condenser on delay timings.
To change the CND6 parameter, press the set key.		Use UP/DOWN keys to set desired value. When Compressor delay over Condenser Fan will come ON first, after cond. On delay over Comp will come ON.

Range		
Min	**Max**	**Fact. Set**
0 Sec	30 Sec	15 Sec

Sr. No.	Parameter	Parameter setting method
24	CND7 Parameter	Function : To set condenser status at hot gas defrost.
To change the CND7 parameter, press the set key.		Use UP/DOWN keys to set desired value. This function is used to decide the condenser status when hot gas defrost is on. This parameter is not applicable for Heater defrost. At hot gas defrost, OFF : Condenser will be OFF ON : Condenser will be ON

Range		
Min	**Max**	**Fact. Set**
OFF	ON	OFF

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
25	L1 Parameter	Function : To set Evaporator Fan stop temperature.
To change the L1 parameter, press the set key.		Use UP/DOWN keys to set desired value. This setting is used to limit the max. temperature beyond which the Evap.Fan will cut off. **Example :** If this parameter is set to 2.0ºC, then Evap. Fan will cut off at 2.0ºC.

Range		
Min	**Max**	**Fact. Set**
-50.0ºC	50.0ºC	2.0ºC

Sr. No.	Parameter	Parameter setting method
26	L2 Parameter	Function : To set Evaporator Restart Delay.
To change the L2 parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If this is set at 3 minutes, Evap. Fan relay will cut off at the set by Evap. Fan Stop TC. Parameter but the Fan will not come on for a minimum of 3 minutes even if it's differential is achieved earlier.

Range		
Min	**Max**	**Fact. Set**
0 Min	20 Min	1 Min

Sr. No.	Parameter	Parameter setting method
27	L3 Parameter	Function : To set Evaporator Fan status at compressor off.
To change the L3 parameter, press the set key.		Use UP/DOWN keys to set desired value. OFF : Evaporator Fan will be Off at compressor OFF. ON : Evaporator Fan will be On at compressor OFF.

Range		
Min	**Max**	**Fact. Set**
OFF	ON	ON

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
28	L4 Parameter	Function : To set Evaporator Fan differential.
To change the L4 parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If Evaporator Fan Stop Tc parameteris set to 2.0ºC, and if EVAP DIFFERENTIAL parameter is set to 2.0ºC,then Evap. Fan will cut off at 2.0ºC and restart only at 0.0ºC. (2.0ºC-2.0ºC = 0.0ºC).

Range		
Min	**Max**	**Fact. Set**
0.5ºC	20.0ºC	2.0ºC

29	L5 Parameter	Function : To set Evaporator probe calibration.
To change the L5 parameter, press the set key.		Use UP/DOWN keys to set desired value. In time it may be possible that the display may be offset by a degree or so. To compensate for this error, you may need to add or minus the degrees required to achieve the correct temperature. Setting value is from -10ºC to + 10ºC.

Range		
Min	**Max**	**Fact. Set**
-10.0ºC	10.0ºC	0.0ºC

30	L7 Parameter	Function : To set Compressor-Evaporator Fan status at Door open condition.
To change the L7 parameter, press the set key.		Use UP/DOWN keys to set desired value. At Door Open, NORM : Normal. FAN : Evaporator Fan Off. COMP : Compressor Off. F-C : Compressor and Evaporator Fan Off.

Range		
Min	**Max**	**Fact. Set**
NORM	F-C	NORM

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
31	L8 Parameter	Function : To set Evaporator Fan status during defrost.
To change the L8 Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. OFF : Evaporator Fan Off during defrost. ON : Evaporator Fan On during defrost.

Range		
Min	**Max**	**Fact. Set**
OFF	ON	OFF

32	BUZ Parameter	Function : To enable / disable buzzer.
To change the BUZ Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example:** ENB : Buzzer enabled. DIS : Buzzer disabled.

Range		
Min	**Max**	**Fact. Set**
DIS	ENB	ENB

33	AL Parameter	Function : This parameter is used to set power on delay for alarm.
To change the AL Parameter parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If you set this parameter to 20, once the power is switched on, the alarm will not activate for 20 minutes after the power is switched on. This is most useful to avoid the nuisance alarms when the ambients are high when the machine is switched on after a long time.

Range		
Min	**Max**	**Fact. Set**
0 Min	99 Min	30 Min

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
34	C-UL Parameter	Function : Under load limit for compressor current.
To change the C-UL parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If C-UL= 1.0A and compressor current is less than 1.0A then and exists till C2 current sensing delay then it is registered as UL fault. Compressor will get OFF on this fault. If after 3 retries within 1 Hour current drawn is still less than 1.0Amp the controller will trip the compressor on fault and activate respective alarm relay. Also display will flash 'C-UL'. Controller will go in manual reset mode.

Range		
Min	**Max**	**Fact. Set**
0.0A	(C-OL -1.0)A	1.0A

Sr. No.	Parameter	Parameter setting method
35	C-OL Parameter	Function : Over load limit for compressor current.
To change the C-OL parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If C-OL= 10 A and compressor current is greater than 10 A then and exist till C2 current sensing delay then C-OL fault exists and flash on display. Compressor will be tripped on this fault.

Range		
Min	**Max**	**Fact. Set**
(C-UL +1.0) A	18.0A	10.0A

Sr. No.	Parameter	Parameter setting method
36	D-UL Parameter	Function : Under load limit for Heater / Solenoid.
To change the D-UL parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If D-UL= 1.0A and Heater / Solenoid current is less than 1.0A then and exists till C2 current sensing delay then it is registered as UL fault. Heater / Solenoid will get OFF on this fault. If after 3 retries within 1 Hour current drawn is still less than 1.0Amp the

Range		
Min	**Max**	**Fact. Set**
0.0A	(D-OL -1.0) A	1.0A

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
		controller will trip the Heater/Solenoid on fault and activate respective alarm relay. Also display will flash 'D-UL'. Controller will go in manual reset mode.
37	D-OL Parameter	Function : Over load limit for Heater/Solenoid.
To change the D-OL parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If D-OL= 10 A and Heater / Solenoid current is greater than 10 A then and exist till C2 current sensing delay then D-OL fault exists and flash on display. Heater / Solenoid will be tripped on this fault.

Range		
Min	**Max**	**Fact. Set**
(D-UL +1.0) A	18.0A	10.0A

Sr. No.	Parameter	Parameter setting method
38	C2 Parameter	Function : Current sensing delay.
To change the C2 parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If C2 = 5 sec then, any current fault will be valid only when it exists for more than 5 sec.

Range		
Min	**Max**	**Fact. Set**
5 Sec	60 Sec	5 Sec

Sr. No.	Parameter	Parameter setting method
39	D0 Parameter	Function : To enable or Disable HP sensing.
To change the D0 parameter, press the set key.		Use UP/DOWN keys to set desired value. **Example :** If this parameter is set to ENB : HP sensing is enabled. DIS : HP sensing is disabled Setting this parameter to disable will ignore HP fault for compressor. If this parameter is set to Enable then controller will detect HP trip.

Range		
Min	**Max**	**Fact. Set**
DIS	ENB	ENB

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
40	D1 Parameter	Function : To enable or disable LP sensing.
To change D1 parameter, press the set key.		Use UP/DOWN keys to set desired value.
Range		**Example:** If this parameter is set to ENB : LP sensing is enabled. DIS : LP sensing is disabled. Setting this parameter to disable will ignore LP fault for compressor. If this parameter is set to Enable then controller will detect LP trip.
Min: DIS	Max: ENB	Fact. Set: ENB
41	D2 Parameter	Function : Fault sensing logic.
To change D2 parameter, press the set key.		Use UP/DOWN keys to set desired value.
Range		0v : 0V at HP/LP/AUX input will be sensed as fault and trip the compressor. 230V : 230V at HP/LP/AUX input will be sensed as fault and trip the compressor.
Min: 0V	Max: 230V	Fact. Set: 230V
42	D3 Parameter	Function : To set LP sensing delay.
To change D3 parameter, press the set key.		Use UP/DOWN keys to set desired value.
Range		**Example :** If this parameter is set to 5 sec,then LP fault will be sensed only when it present continuously for 5 Secs.
Min: 0 Sec	Max: 180 Sec	Fact. Set: 30 Sec

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
43	D4 Parameter	Function : To set reset mode for HP fault.
To change D4 parameter, press the set key.		Use UP/DOWN keys to set desired value. MAN : Manual Mode. AUTO : Auto mode.
Range		If this parameter set to “MAN” mode HP fault will be cleared only after pressing reset key for 2 seconds. If this parameter is set to “AUTO” mode HP fault will be cleared automatically when it is healthy.
Min: MAN	Max: AUTO	Fact. Set: AUTO
44	E1 Parameter	Function : To set Compressor Relay status on Probe Failure.
To change E1 parameter, press the set key.		Use UP/DOWN keys to set desired value. When set to ON : Relay will stay ON. CYC : Relay performs a duty cycle of as per TON & TOFF . OFF : Relay will stay OFF.
Range		
Min: ON	Max: OFF	Fact. Set: CYC
45	TON Parameter	Function : To set On cycle at room probe fail.
To change TON parameter, press the set key.		Use UP/DOWN keys to set desired value. At room probe fail condition when E1 parameter is selected as 'CYC' then the on cycle is specified by Ton parameter.
Range		
Min: 1 Min	Max: 30 Min	Fact. Set: 10 Min

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
46	TOFF Parameter	Function : To set Off cycle at room probe fail.
To change TON parameter, press the set key.		Use UP/DOWN keys to set desired value.
Range		At room probe fail condition when E1 parameter is selected as 'CYC' then the Off cycle is specified by Ton parameter.
Min / Max / Fact. Set		
1 Min / 30 Min / 4 Min		
47	E7 Parameter	Function : To set Display at defrosting.
To change E7 parameter, press the SET key.		Use UP/DOWN keys to set desired value.
Range		TEMP : At defrosting temperature will be dispalyed.
Min / Max / Fact. Set		DEFR : At Defrosting 'Defrost ON' will scroll.
TEMP / DEFR / TEMP		
47	E8 Parameter	Function : Defrost duration during Coil probe failure.
To change E8 parameter, press the SET key.		Use UP/DOWN keys to set desired value.
Range		**Example:** If this is set to 10 min, then manual defrost for 10 min will take place during Coil probe fail.
Min / Max / Fact. Set		
1 Min / 10 Min / 5 Min		

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
48	LD Parameter	Function : To set time delay to switch off the light .
To change LD parameter, press the SET key.		Use UP/DOWN keys to set desired value.
Range		This parameter is used set the time delay to automatically switch off the light. If LD is set to 0 then this parameter is disabled.
Min / Max / Fact. Set		**Example :** If this parameter is set to 7 mins then, when light is switched on after 7 mins it will be switch off automatically.
0 Min / 30 Min / 7 Min		
49	PDN Parameter	Function : To activate Solenoid Valve relay.
To change PDN parameter, press the set key.		Use UP/DOWN keys to set desired value.
Range		DIS : SV relay will not activate.
Min / Max / Fact. Set		ENB : SV relay will get activated and will cut out and cut-in according to set temperature.
DIS / ENB / DIS		
50	PW Parameter	Function : To change password.
To change the PW parameter, press the set key.		Use UP/DOWN key to change the password.
Range		User can enter into program mode only if correct password is entered. If the password is wrong it will show 'INVALID PASSWORD'.
Min / Max / Fact. Set		
0 / 9999 / 0		

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
51	CRH Parameter	Function : To view Compressor run Hours.
		It will display compressor run hours. It's a read only parameter.
52	CCRH	Function : Clear Compressor Run Hours.
	Range: Min / Max / Fact. Set = NO / YES / NO	If this parameter is set to 'YES' compressor run hours (CRH) are cleared.
53	ID Parameter	Function : To set Unit ID.
To change Unit ID parameter, press the SET key.	Range: Min / Max / Fact. Set = 1 / 240 / 1	This parameter is used to set the Unit ID of the device.
54	LP	Function: To activate Keypad Lock.
To change Keypad Lock parameter, press the set key.	Range: Min / Max / Fact. Set = NO / YES / NO	This parameter can lock the keypad so that tempering is not possible by by-standers. NO : deactivates keypad lock. YES : activates keypad lock. On activation, all the parameters can only be viewed, but not modified. If the keypad is locked "LOCK" message will be displayed..

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
55	PO Parameter	Function : To enable/disable Power Switch.
To change PO parameter, press the SET key.	Range: Min / Max / Fact. Set = DIS / ENB / DIS	Use UP/DOWN keys to get desired value & press SET key to confirm. DIS : Disable power switch ENB : Enables power switch Controller has power switch, which if enable puts controller in active or stand by state. If press for 2 seconds controller will go in stand by mode, display will be as per "PDIS" parameter. To again switch to ACTIVE WORKING MODE, press power switch again for 2 seconds. All leds and display will flash and enter into NORMAL WORKING MODE.
56	PDIS Parameter	Function : To set display at power OFF mode.
To change PDIS parameter, press the SET key.	Range: Min / Max / Fact. Set = LED / TEMP / LED	Use UP/DOWN keys to set desired value. At power OFF mode power OFF LED will glow & display will be as below, LED : Display Will be Blank. OFF : Display will show OFF. TEMP : Display will show Temperature.

Description of parameters and functions.

Sr. No.	Parameter	Parameter setting method
57	FS Parameter	Function : To restore default settings of the controller.
To change FS parameter, press the SET key.		Use UP/DOWN keys to set desired value.
Range		When set to YES all parameters are programmed to factory values. Useful to debug setting related problems.
Min: NO	Max: YES	Fact. Set: NO
58	EP Parameter	Function: To exit programming.
To exit programming parameter, press the SET key.		Once the set key is pressed, the controller goes into the normal mode and displays the Room Temperature and all settings are recorded.

Technical Data

Housing : ABS Plastic.
Dimensions : 400 x 300 x 135 mm
Mounting : Wall mounting.
Connection : Spring clamp terminal block. 4 sq. mm wire.
Display : 4 Digit, 1" Dot matrix Display and 14 LEDs for indication.
Data Storage : Non-Volatile EEPROM Memory.
Power Input (Options) : 415Vac +/-10%, 50-60Hz. 3Phase Supply with Neutral
Operating Temp : 5°C to 50°C(non-condensing).
Storage temp : -20°C to 70°C(non-condensing).
Output :
Contactors Comp & Def. : 18A.
Contactor Evap. : 9A.
Condenser Relay : 10A/250Vac.
Light Relay : 10A/250Vac.
Alarm Relay : 5A/250Vac.
Humidifier Relay : 10A/250Vac.

Sensors :

1) Temperature sensor:
Sensor Type : NTC Thermistor.
Resolution : 0.1°C.
Accuracy : +/-1°C.
Probe Tolerance at 25°C : +/-0.3°C.

Room & Evap Temperature :
Range : -50.0°C to 50.0°C

Condenser Temperature :
Range : 0.0°C to 99.9°C

2) Humidity sensor
Sensor Type : 4-20mA out.
Range : 0 to 100%
Resolution : 1%.

Analog I/p:
Compressor current (R,Y,B)
Defrost current(R,Y,B)
Resolution : 0.1Amp.
Accuracy : +/-1 Amp.

Technical Data

Digital Inputs:
HP, LP, Auxillary, Door, Sppr, R-Ph, Y-Ph, B- Ph.

Buzzer : Internal

RS485 Connectivity : Modbus RTU Protocol
Baud Rate : 9600
Device ID : 1 (By Default)

Controller

Controller should be installed in a place protected by vibration, water and corrosive gasses and where ambient temperature does not exceed the values specified in the technical data.

Probe

To give a correct reading, the probe must be installed in a place protected from thermal influences, which may affect the temperature to be controlled.

Caution

WIRING : The probe and its corresponding wires should never be installed in a conduit next to control or power supply lines. The electrical wiring should be done as shown in the diagram. The power supply circuit should be connected to a protection switch.

WARNING : Improper wiring may cause irreparable damage and personal injury. Kindly ensure that wiring is done by qualified personnel only.

Maintenance : Cleaning : Clean the surface of the controller with a soft moist cloth. Do not use abrasive detergents, petrol, alcohol or solvents.

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Flow Switches
Solenoid Valves

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SUGGESTED CONNECTION DIAGRAM