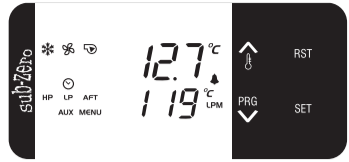


PiCOHILL (PiC-175)

Operating Instructions



Chiller Controller

Introduction :

PiC-175 is a single set point chiller controller.

Their IP ratings are greatly improved and have an excellent iconic display. The touch feature whilst increasing reliability also gives a great user experience.

Their operation is very user friendly and is easily understood with the examples in the instructions below.

Various parameters help set up the instruments functions for different applications.

The PiC-175 can be used for several applications with a measuring range from -40.0°C to 80.0°C.

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. The terminals admit wires of upto 2.5sq mm.

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.

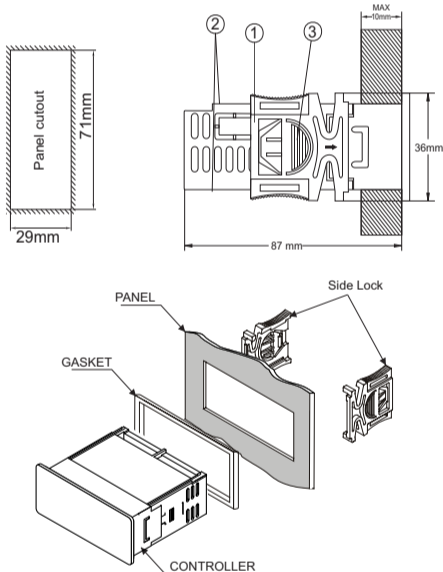
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Installation : Fixing and dimensions of panel models: To fix the unit, slide the fastener ① through the guides ② as per the position shown in the figure. Move the fastener in the direction of the arrow, pressing tab ③ it permits to move the fastener in the opposite direction of the arrow.

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.

Panel Cutout and Dimensions :



TECHNICAL DATA

Housing	: Black ABS Plastic, Auto-extinguish
Front Cover	: Polycarbonate Plastic
Dimensions	: Frontal: 78 X 36mm, Depth: 87mm
Panel Cutout	: 29 X 71mm
Mounting	: Flush panel mounting with fasteners
Protection	: IP65 Front (with gasket)
Connections	: Screw terminal blocks ≤ 2.5sq mm terminal only + Minifit connector.
Display	: 4 X 8.6mm (0.33") 7 segment display 4 X 4.9mm (0.27") 7 segment display & 13 LEDs for Indication
Data storage	: Non-volatile EEPROM memory
Power input	: 9Vac (From External Transformer) External Transformer Input 230Vac, +/- 20%, 50Hz/60Hz
Relay output	: Comp SPST relay 20(8)A,250VAC Fan SPST relay 10A, 250VAC Pump SPST relay 10A, 250VAC Alarm SPST relay 5A,250VAC HGVS SPST relay 5A,250VAC
Operating temp.	: 0°C to 60°C (non-condensing)
Operating humidity	: 20% to 85% (non-condensing)
Storage temp	: -25°C to 60°C (non-condensing)
Input	: NTC probe, SZ-T75
Measuring Range	: -40.0°C to 80.0°C
Flow Sensor Input	: Resolution : 0.1 LPM Range : 2 to 30 LPM
Digital Input (Potential free)	: HP, LP, AUX/WFS, COMP O/L, FAN O/L, PUMP O/L, SPP, Water Level
RS485 Connectivity	: Modbus RTU Protocol Baud Rate : 9600 Device ID : 1 (By Default)
Resolution	: +/- 0.5°C
Accuracy	: +/- 1°C

USER INTERFACE

UP / Probe	In Program mode: Scroll through parameters & Increases parameter value. In Set mode : Increases parameter value. When SV1 is set to OtsV, if UP key is pressed, then it will display inlet temp. and then it will display outlet temp in second line and then it will come out and will display main screen.
Down/ Program	Touch and hold for 2sec to enter into program mode. In program mode and set mode: Decreases parameter value
Reset	Touch and hold for 2sec to Mute the Alarm Relay.
SET Set	Touch and hold for 2sec to enter into set mode. In program mode and set mode: set/save the changed value of parameter.

INDEX

Sr. No.	Para.	Description
1	St2	Set Mode
1	St2	Cut out set point of controller.
		Program Mode
2		Set other parameter.
3	St3	Differential
4	St4	Hi Temp. Alarm
5	St5	Lo Temp. Alarm
6	St6	High Set Limit
7	St7	Low Set Limit
8	St8	Ht Power On Dly
9	St9	HT-LT Normal Dly
10	St11	Comp Time Delay
11	St12	Comp Min ON Delay
12	St14	Pump Output
13	St16	Fan Output
14	St17	Fan start delay before compressor ON.
15	St18	Liquid Probe Cal.
16	St19	Inlet Probe Cal.
17	St20	Outlet Probe Cal.
18	Sv1	Enable / disable Controller to function in precision mode.
19	Sv2	SV set point.
20	Sv3	Differential for HGVS.
21	Rf1	AFT Probe Status
22	Rf2	AFT Set Temp.
23	Rf3	AFT Differential
24	Rf4	AFT Probe Cal.
25	Rf5	AFT Sense Delay
26	Fl1	To enable/disable flow sensor
27	Fl2	To set Low LPM set point for flow sensor
28	Fl3	Flow sensor calibration.
29	Rl1	HP Fault Sensing Logic
30	Rl2	Fault Sensing Delay for (HP/Comp O/L/Fan O/L/PUMP O/L)
31	Rl3	HP/AFT Reset
32	Rl4	No of retrials of HP
33	Rl5	LP Fault Sensing Logic
34	Rl6	LP Sensing Delay
35	Rl7	LP Fault Reset
36	Rl8	No. of retrials of LP
37	Rl9	Comp O/L Sensing Logic
38	Rl10	Comp O/L Reset
39	Rl11	No.of retrials of Comp O/L
40	Rl12	Pump O/L Sensing Logic
41	Rl13	Pump O/L Reset
42	Rl14	No of retrials of Pump O/L
43	Rl15	Fan O/L Sensing Logic
44	Rl16	Fan O/L Reset
45	Rl17	No of retrials of Fan O/L
46	Rl21	SPPR Logic
47	Rl22	AUX/EWFS Logic
48	Rl27	Level Switch Logic
49	Rl28	Level Switch Delay
50	Rl29	To Configure Alarm Relay
51	Cs1	EWFS Startup Delay
52	Cs2	Normal delay for EWFS fault sensing
53	Cs12	Second Line Display
54	Cs13	Modbus unit ID.
55	Cs14	Baud Rate
56	Cs15	Password
57	Cs16	Keypad Lock
58	Cs17	Factory Defaults
59	Cs18	Comp. Run Hrs
60	Cs19	Pump Run Hrs.
61	Cs20	Fan Run Hrs.
62	Cs22	Clr. Comp. Run Hrs.
63	Cs23	Clr. Pump. Run Hrs.
64	Cs24	Clr. Fan Run Hrs.
65	Cs26	Software Version.
66	EndP	End Programming.

Parameter List :

SET MODE		
1 St2	Parameter	Function: To set cut out set point of controller.
Touch & hold SET key for 2 seconds.		
Display will show set value. Touch SET key again and set value will flash. The set point value can now be modified by using the UP/DOWN key. After selecting the desired value, touch the set key and user can see "--" which confirms that the set point has been stored in memory.		
	Min	Max
	ST7+ 1.0	ST6- 1.0
		10.0°C
PROGRAM MODE		
2 To set other Parameters.	To enter into program mode touch DOWN key for 2 seconds, Display will ask for Password. After entering correct password "ST3" parameter will be displayed. To go to other parameters, use UP/DOWN keys.	
Touch & hold PRG key for 2 seconds.		

3 St3	Parameter	Function: To set temperature differential for compressor restart.
Touch & hold SET key for 2 seconds.		
Display will show set value. The set point value can now be modified by using the UP/DOWN key. After selecting the desired value, touch the set key and user can see "--" which confirms that the set point has been stored in memory.		
Example: If the set point is set at 10.0°C and differential is set as 2.0°C, then when the system reaches 10.0°C the compressor will cutout. Since differential is 2.0°C, the compressor will cut in (restart) at 12.0°C (10.0°C + 2.0°C).		
	Min	Max
	1.0°C	10.0°C
		2.0°C
4 St4	Parameter	Function : To set maximum allowable high temperature alarm.
Example : If this parameter is set to 50.0°C, then once chiller temperature goes above 50.0°C, then controller will show "Ht" And alarm will be ON.		
	Min	Max
	ST5+ 1.0	70.0°C
		70.0°C
5 St5	Parameter	Function: To set minimum allowable low temperature alarm.
Example: Setting this parameter at 5.0°C will not allow the set point to go below 5.0°C. Also, if the temperature reaches or goes below 5.0°C the display will show Low Temp. Alarm and at this point the alarm will activate.		
	Min	Max
	-40.0°C	ST4-1.0
		5.0°C
6 St6	Parameter	Function: To set maximum set point limit.
Once set at a particular value, this will not allow the set point to go above this value.		
Example: Setting this parameter at 50.0°C will not allow the set point to go above 49.0°C (ST6-1.0).		
	Min	Max
	ST2 + 1.0	70.0°C
		70.0°C
7 St7	Parameter	Function: To set minimum set point limit.
Once set at a particular value, this will not allow the set point to go below this value.		
Example: Setting this parameter at -10.0°C will not allow the set point to go below -9.0°C (ST7+1.0).		
	Min	Max
	AF2+ 1.0	ST2 - 1.0
		5.0°C
8 St8	Parameter	Function : To set Power ON delay for high temperature alarm to avoid false alarms.
Example : If this parameter is set to 20minutes then after power on controller will ignore HT alarm for 20 minutes.		
	Min	Max
	0Min	20Min
		20Min
9 St9	Parameter	Function: To sets sensing delay for high and low temperature alarms.
Example : If this parameter is set to 1 seconds then controller will ignore HT-LT alarms for 5 seconds.		
	Min	Max
	0Sec	20Sec
		5Sec
10 St11	Parameter	Function : To set compressor restart delay.
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. This time delay is also effective at 'Power On' of the system. This safety feature is used to protect the compressor from restarting within a short period due to power fluctuations.		
	Min	Max
	0 Min	20 Min
		3 Min
11 St12	Parameter	Function : To set time delay for which compressor has to run once cut in.
This parameter is used to protect the compressor so that there is enough time for oil to return back to the compressor. This delay starts once the compressor relay is ON.		
Example: If this parameter is set at 2 minute and if the temperature is achieved before 2 minute, then the compressor relay will remain ON for minimum 2 minute, though set point is achieved.		
	Min	Max
	0 Min	20 Min
		2 Min
12 St14	Parameter	Function : To configure Pump O/P.
d15 = Pump is Disable R-on = Pump will remain always ON. C-on = Pump will switch ON/OFF with compressor.		
	Min	Max
	d15	C-on
		R-on
13 St16	Parameter	Function : To configure Fan O/P.
d15 = Fan is Disable R-on = Fan will remain always ON. C-on = Fan will switch ON/OFF with compressor.		
	Min	Max
	d15	C-on
		C-on
14 St17	Parameter	Function: To set Fan start delay before compressor ON.
Example : If fan is running with compressor and if this delay is set to 10seconds then fan will switch ON 10seconds before compressor..		
	Min	Max
	10sec	20sec
		10 sec
15 St18	Parameter	Function : To set Liquid probe calibration.
Example : If the actual temperature is 20.0°C and the temperature on the controller shows 22.0°C set this parameter to -2.0°C and once out of this mode, the temperature will display 20.0°C. (22.0°C-2.0°C).		
	Min	Max
	-10.0°C	10.0°C
		0.0°C

16 St19	Parameter	Function : To set Inlet probe calibration.
Example : If the actual temperature is 20.0°C and the temperature on the controller shows 22.0°C set this parameter to -2.0°C and once out of this mode, the temperature will display 20.0°C. (22.0°C-2.0°C).		
	Min	Max
	-10.0°C	10.0°C
		0.0°C
17 St20	Parameter	Function : To set Outlet probe calibration.
Example : If the actual temperature is 20.0°C and the temperature on the controller shows 22.0°C set this parameter to -2.0°C and once out of this mode, the temperature will display 20.0°C. (22.0°C-2.0°C).		
	Min	Max
	-10.0°C	10.0°C
		0.0°C
18 Sv1	Parameter	Function : To enable / disable Controller to function in precision mode.
Example : If PrSv is enabled, then the compressor will remain in the on state, while Precision SV will switch ON/OFF on the set point to maintain the temperature precisely.		
If otSv is enabled, then SV set point is set to 30°C and differential is set to 2°C, then when the outlet temp. reaches 30°C, HGVS relay will go OFF. Since the differential is 2°C, the HGVS will come ON (restart) at 28°C (30°C - 2°C).		
	Min	Max
	d15	PrSv / otSv
		d15
19 Sv2	Parameter	Function: To set SV set point.
Example: See Sv1 parameter		
	Min	Max
	-40.0°C	70.0°C
		30.0°C
20 Sv3	Parameter	Function : To set the differential for HGVS relay ON condition.
Example: See Sv1 parameter		
	Min	Max
	1.0°C	10.0°C
		2.0°C
21 Rf1	Parameter	Function : To enable / disable Antifreeze function.
d15 = It disables the Antifreeze Trip function of the controller. Enb = It enables the Antifreeze Trip function of the controller.		
	Min	Max
	d15	Enb
		d15
22 Rf2	Parameter	Function: To set Antifreeze tripping point.
Example: If this parameter is set to -6.0°C controller will trip the compressor on Antifreeze fault if the AFT sensor goes below -6.0°C.		
	Min	Max
	-40.0°C	ST7 - 1.0
		4.0°C
23 Rf3	Parameter	Function : To set fault resetting differential once it tripped of AFT set point.
Example : If the AFT set point is set at 4.0°C and differential is set to 2.0°C then after tripping on AFT fault controller will clear the AFT fault only when the AFT Temperature goes above 6.0°C (4.0°C+2.0°C).		
	Min	Max
	1.0°C	10.0°C
		2.0°C
24 Rf4	Parameter	Function : To set Antifreeze probe calibration.
EXAMPLE : If the actual temperature is 20.0°C and the temperature on the controller shows 22.0°C set this parameter to -2.0°C and once out of this mode, the temperature will display 20.0°C. (22.0°C-2.0°C).		
	Min	Max
	-10.0°C	10.0°C
		0.0°C
25 Rf5	Parameter	Function: To set AFT fault sensing delay on compressor ON.
Example: If this delay is set to 60 seconds then the controller will ignore AFT fault for 60 seconds after compressor ON it avoid false tripping of Compressor.		
	Min	Max
	0 sec	60 sec
		60 sec
26 Fl1	Parameter	Function : To enable/disable flow sensor.
d15 = Disable Flow Sensor. I = 1/2" Flow Sensor selected.		
	Min	Max
	d15	I
		d15
27 Fl2	Parameter	Function : To set Low LPM set point for Flow sensor
Example: if this parameter is set to 12 LPM controller will generate FL fault and system will trip.		
CS1 and CS2 delay are also applicable for this fault.		
	Min	Max
	8 LPM	15 LPM
		12 LPM
28 Fl3	Parameter	Function : To set flow sensor calibration.
Example : If the actual temperature is 20.0°C and the temperature on the controller shows 22.0°C set this parameter to -2.0°C and once out of this mode, the temperature will display 20.0°C. (22.0°C-2.0°C).		
	Min	Max
	-10.0°C	10.0°C
		0.0°C
29 Rl1	Parameter	Function : To set logic for HP fault sensing.
d15 = HP fault sensing disabled. GPEn = Controller will sense HP fault when switch is open. CL05 = Controller will sense HP fault when switch is closed.		
	Min	Max
	d15	CL05
		CL05

30 <i>RL2</i> Parameter	Function: To set fault sensing delay on compressor ON for (HP / Comp O/L / Fan O/L / Pump O/L).	Min Max Fac. 5 sec 90 sec 5 sec
31 <i>RL3</i> Parameter	Function : This parameter will set HP/AFT fault to Auto or Manual reset. <i>Ruto</i> = Sets HP/AFT faults as Auto resettable. <i>nRn</i> = Sets HP/AFT faults as Manual resettable. User need to press RST key To clear these faults.	Min Max Fac. <i>Ruto nRn Ruto</i>
32 <i>RL4</i> Parameter	Function : No. of retrials of HP.	Min Max Fac. 0 5 3
33 <i>RL5</i> Parameter	Function : To set logic for LP fault sensing. <i>d15</i> = LP fault sensing disabled. <i>OPEN</i> = Controller will sense LP fault when switch is open. <i>CLDS</i> = Controller will sense LP fault when switch is closed.	Min Max Fac. <i>d15 CLDS CLDS</i>
34 <i>RL6</i> Parameter	Function: To set LP fault sensing delay on compressor on. Example: If this delay is set to 40 seconds then the controller will ignore LP fault for 40 seconds after compressor on it avoid false tripping of Compressor.	Min Max Fac. 5 sec 90 sec 40 sec
35 <i>RL7</i> Parameter	Function : This parameter will set LP fault to Auto or Manual reset. <i>Ruto</i> = Sets LP faults as Auto resettable. <i>nRn</i> = Sets LP faults as Manual resettable. User need to press RST key To clear these faults.	Min Max Fac. <i>Ruto nRn Ruto</i>
36 <i>RL8</i> Parameter	Function : No. of retrials of LP.	Min Max Fac. 0 5 3
37 <i>RL9</i> Parameter	Function : To set logic for Comp O/L fault sensing. <i>d15</i> = Comp O/L fault sensing disabled. <i>OPEN</i> = Controller will sense Comp O/L fault when switch is open. <i>CLDS</i> = Controller will sense Comp O/L fault when switch is closed.	Min Max Fac. <i>d15 CLDS CLDS</i>
38 <i>RL10</i> Parameter	Function : This parameter will set Comp O/L fault to Auto or Manual reset. <i>Ruto</i> = Sets Comp O/L faults as Auto resettable. <i>nRn</i> = Sets Comp O/L faults as Manual resettable. User need to press RST key To clear these faults.	Min Max Fac. <i>Ruto nRn Ruto</i>
39 <i>RL11</i> Parameter	Function : No. of retrials of Comp O/L.	Min Max Fac. 0 5 3
40 <i>RL12</i> Parameter	Function : To set logic for Pump O/L fault sensing. <i>d15</i> = Pump O/L fault sensing disabled. <i>OPEN</i> = Controller will sense Pump O/L fault when switch is open. <i>CLDS</i> = Controller will sense Pump O/L fault when switch is closed.	Min Max Fac. <i>d15 CLDS CLDS</i>
41 <i>RL13</i> Parameter	Function : This parameter will set Pump O/L fault to Auto or Manual reset. <i>Ruto</i> = Sets Pump O/L faults as Auto resettable. <i>nRn</i> = Sets Pump O/L faults as Manual resettable. User need to press RST key To clear these faults.	Min Max Fac. <i>Ruto nRn Ruto</i>
42 <i>RL14</i> Parameter	Function : No. of retrials of Pump O/L.	Min Max Fac. 0 5 3
43 <i>RL15</i> Parameter	Function : To set logic for Fan O/L fault sensing. <i>d15</i> = Fan O/L fault sensing disabled. <i>OPEN</i> = Controller will sense Fan O/L fault when switch is open. <i>CLDS</i> = Controller will sense Fan O/L fault when switch is closed.	Min Max Fac. <i>d15 CLDS CLDS</i>
44 <i>RL16</i> Parameter	Function : This parameter will set Fan O/L fault to Auto or Manual reset. <i>Ruto</i> = Sets Fan O/L faults as Auto resettable. <i>nRn</i> = Sets Fan O/L faults as Manual resettable. User need to press RST key To clear these faults.	Min Max Fac. <i>Ruto nRn Ruto</i>
45 <i>RL17</i> Parameter	Function : No. of retrials of Fan O/L.	Min Max Fac. 0 5 3

46 <i>RL21</i> Parameter	Function : To set logic for SPPR fault sensing. <i>d15</i> = SPP fault sensing disabled. <i>OPEN</i> = Controller will sense SPP fault when switch is open. <i>CLDS</i> = Controller will sense SPP fault when switch is closed.	Min Max Fac. <i>d15 CLDS CLDS</i>
47 <i>RL22</i> Parameter	Function : To set logic for AUX/EWFS fault sensing. <i>d15</i> = Disable. <i>OPEN</i> = Switch is open. <i>CLDS</i> = Switch is closed.	Min Max Fac. <i>d15 CLDS CLDS</i>
48 <i>RL27</i> Parameter	Function : To set logic for Level Switch fault sensing. <i>d15</i> = Disable. <i>OPEN</i> = Controller will sense Level switch fault when switch is open. <i>CLDS</i> = Controller will sense Level switch fault when switch is closed.	Min Max Fac. <i>d15 CLDS CLDS</i>
49 <i>RL28</i> Parameter	Function : To set liquid level switching delay.	Min Max Fac. 1 Sec 90 Sec 10 Sec
50 <i>RL29</i> Parameter	Function : To configure alarm relay. <i>nC</i> : Alarm will activate at nO. <i>nL</i> : Alarm will activate at nC.	Min Max Fac. <i>nC nL nC</i>
51 <i>CS1</i> Parameter	Function : It sets power ON delay for EWFS fault sensing. Example : If this delay is set to 30 sec then at power ON controller will ignore EWFS fault for 30 seconds.	Min Max Fac. 0 Sec 120 Sec 10 Sec
52 <i>CS2</i> Parameter	Function : It sets normal delay for EWFS fault sensing. This avoids false tripping due to water splashing. Example : If this delay is set to 5 sec then controller will trip on EWFS fault only if it persists for more than 5 seconds.	Min Max Fac. 0 Sec 90 Sec 5 Sec
53 <i>CS12</i> Parameter	Function: Second line display. Example : <i>SEtP</i> = It will display set point value. <i>RfE</i> = It will display antifreeze value. <i>Lpñ</i> = It will display LPM value. <i>botH</i> = It will flash both AFT/LPM values alternative.	Min Max Fac. <i>SEtP botH SEtP</i>
54 <i>CS13</i> Parameter	Function : To change modbus unit ID. To change modbus unit ID for BMS connectivity. This parameter will not change on factory set.	Min Max Fac. 1 250 -
55 <i>CS14</i> Parameter	Function : To change baud rate. Communication baud rate can set to, 1 = 9600 2 = 19200 3 = 38400	Min Max Fac. 1 3 -
56 <i>CS15</i> Parameter	Function: To change Password. User cannot enter into program mode, if correct password is not entered.	Min Max Fac. 0 9999 0
57 <i>CS16</i> Parameter	Function: To lock keypad. This parameter is used to lock the keypad so that tampering is not possible by by-standers. <i>d15</i> = keypad unlocked <i>Enb</i> = keypad locked When locked all parameters can only be viewed, but not modified. Note : If LP parameter is set to ENB and if user tries to change any parameter value, "LP" will flash on the display.	Min Max Fac. <i>d15 Enb d15</i>
58 <i>CS17</i> Parameter	Function : To restore default settings of the controller. When set to YES all parameters are programmed to factory values. Useful to debug setting related Problems.	Min Max Fac. <i>no YES no</i>
59 <i>CS18</i> Parameter	Function : To display total Compressor working hours.	Min Max Fac. <i>no YES no</i>
60 <i>CS19</i> Parameter	Function : To display total Pump working hours.	Min Max Fac. <i>no YES no</i>
61 <i>CS20</i> Parameter	Function : To display total Fan working hours.	Min Max Fac. <i>no YES no</i>
62 <i>CS22</i> Parameter	Function : To clear Compressor run hours. If it is set to YES, it will clear all previous compressor run hours.	Min Max Fac. <i>no YES no</i>

63 <i>CS23</i> Parameter	Function : To clear Pump run hours. If it is set to YES, it will clear all previous Pump run hours.	Min Max Fac. <i>no YES no</i>
64 <i>CS24</i> Parameter	Function : To clear Fan run hours. If it is set to YES, it will clear all previous Fan run hours.	Min Max Fac. <i>no YES no</i>
65 <i>CS26</i> Parameter	Function : To display Software version.	Min Max Fac. <i>no YES no</i>
66 <i>EndP</i> Parameter	Function: To end programming. To end programming press "SET" key Once the key is pressed, the controller goes into the normal mode and displays the temperature and all settings are recorded.	Min Max Fac. <i>no YES no</i>
67 LEADS		
Compressor	ON: Compressor is ON. OFF: Compressor is OFF.	Fan ON: Fan is ON. OFF: Fan is OFF. FLASHING : Fan is in time delay.
Pump	ON: Pump is ON. OFF: Pump is OFF. FLASHING : Pump is in time delay.	Alarm ON: Alarm relay ON. OFF: Alarm relay OFF. FLASHING : Fault is present.
Time Delay	ON: Compressor is ON and in time delay for switching OFF. (ST12 parameter) FLASHING: Compressor is in time delay and about to start.	HP FLASHING : HP Fault present. LP FLASHING : LP Fault present. AFT FLASHING : AFT Fault present. AUX FLASHING : WFS Fault present.
ON: When temperature is displayed.	MENU ON: Controller is in Programe mode or set mode LPM ON: LPM value will display in second line. (CS12 Parameter)	
68 OPERATING MESSAGES		
Ht High temperature alarm Temperature above the maximum high temperature limit.	Lt Low temperature alarm Temperature below the minimum low temperature limit.	
PP Probe fail Probe short circuit, circuit open or without probe, or temperature is > 80.0°C or < -40.0°C	R-PP Antifreeze Probe fail AFT Probe short circuit, circuit open or without probe, or temperature is > 80.0°C or < -40.0°C	
SPP SPPR fault present.	C-ol Compressor over load fault.	
P-ol Pump over load fault.	F-ol Fan over load fault.	
LUL Water level switch fault.	FLt LPM fault.	

Pro-Key

To use Pro-key user must insert it prior to power ON. Insert the pro-key and power ON controller. When the display flashes for 5 seconds, touch the power key for 1 second. Controller will enter into Pro-key mode and will display "Pr". Then touch either of the below given keys to use the Pro-Key.

Functions of Pro-key and the keys to be used for are as given below:

Function	Keys to be Used
To upload the parameters from the controller	touch "↑" key
To download the parameters to the controller	touch "↓" key
To set the user Lock parameter	touch "SET" key

If user tries to enter Pro-key mode without inserting the pro key or with wrong connection, no further function will be activated after displaying "uP or dn". Controller will display "Er". Then switch off controller and insert the pro key properly and try to enter Pro key mode.

User has to first Upload the parameters in the Subzero Validated Blank Pro-Key and then subsequently use it for downloading.

● Uploading mode
When "Pr" is displayed user has to touch "↑" key to select uploading mode. Display will show "uP". Then touch "SET" key to confirm uploading of parameter values from controller to the Pro-key. After validation controller will show "En" and if Pro-key is not validated user will see "Er" on display. Touch "SET" key again, display will show "- -" which means the uploading is successful without error. If any error occurs then "Er" will be displayed. Touch "SET" key to come out of Pro-key mode.

● Downloading mode
When "Pr" is displayed user has to touch "↓" key to select downloading mode. Display will show "dn". Then touch "SET" key to confirm downloading of parameter values from Pro-key to the controller. After validation controller will show "En" and if Pro-key is not validated user will see "Er" on display. Touch "SET" key again, display will show "- -" which means the downloading is successful without error. If any error occurs then "Er" will be displayed. Touch "SET" key to come out of Pro-key mode.

● User lock
When "Pr" is displayed touch "SET" key for 1sec. Controller will validate the Pro-key and will display either "CL" if parameters are locked or "UL" if they are unlocked. If Pro-key is not validated "Er" will be displayed. User can select locking or unlocking by " " or " ". Touch "SET" key and display will show "- -". If any error occurs then "Er" will be displayed. Touch again "SET" key to come out of Pro-key mode.

Note: If user has set this to "CL", once out of the Pro-Key mode, in normal operation, altering the value of any parameter will not be possible. For that 'User lock parameter' to be selected as "UL". The LP parameter will also be considered for the same.

Suggested Wiring Diagram

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