

Introduction
The Sub-Zero Series SZ-7518T is a single set point controller with digital input. It is used for Milk Tank Refrigerators with agitation cycle capability. Controller has communication port.

Additionally, these controllers offer several protection features that are easily understood by the examples in the instructions below.

A number of parameters are displayed alphanumerically to set up the instrument for each specific application. It can be used for several applications with a measuring value from -45.0°C to 100°C.

Cautions
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.

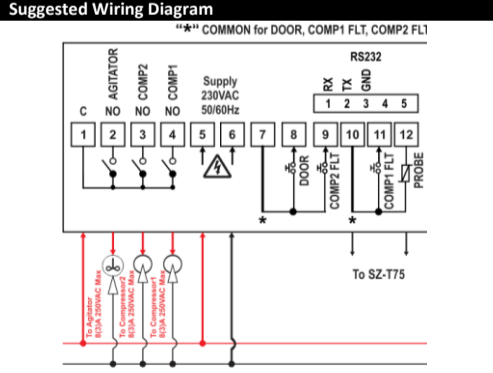
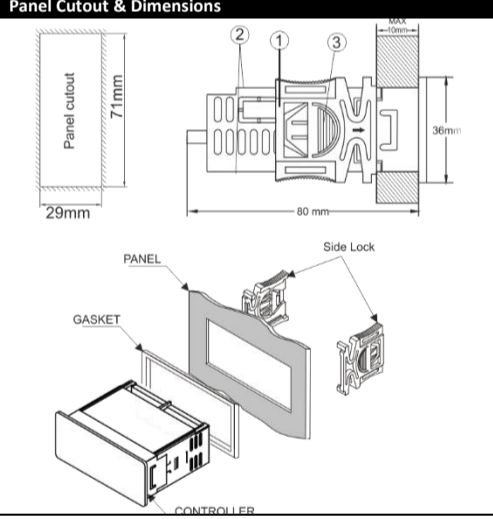
Maintenance: Cleaning: Clean the surface of the controller with a soft moist cloth. Do not use abrasive detergents, petrol, alcohol or solvents.

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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.



Technical Data

Housing	: Black ABS Plastic, Auto-extinguish
Front Cover	: Polycarbonate Plastic V0 Grade
Dimensions	: Frontal: 78 X 36mm, Depth: 80mm
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.
Display	: 3 X 17mm 7 segment display 9 LEDs for indication
Data storage	: Flash APROM Memory
Power input	: 230 Vac ±10%, 50/60Hz Standard.
Relay output	: Compressor1 Relay 8(3)A, 250V AC Compressor2 Relay 8(3)A, 250V AC Agitator Relay 8(3)A, 250V AC
Operating temp.	: 0°C to 60°C (non-condensing)
Operating humidity	: 20% to 85% (non-condensing)
Storage temp	: -25.0°C to 60.0°C (non-condensing)
Measuring Range	: -45.0°C to 100°C
Input	: NTC Probe-SZ-T75
Digital Input (Potential Free)	: Digital Input for Compressor1

Resolution Accuracy	: 1°C / 0.1°C (Selectable) : +/- 1°C
RS232 Connectivity	: Modbus RTU Protocol Baud Rate (settable) Device ID (settable)
User Interface	
UP	In Program mode: Scroll through parameters & Increases parameter value. In Set Mode: Increases parameter value. Touch and hold key for 2 sec to check LL (Last low temp) and LH (Last high temp) Log.
PRG	Press and hold for 2sec to enter into program mode. In program mode and Set Mode: Scroll through parameters & decreases parameter value.
SET	Press and hold for 2sec to enter into Set Mode. In program mode and Set Mode: Set/Save the changed value of parameter.
RST	Press for 2 second to manually Reset the Faults. Also used to exit from Program Mode.
PRG + SET	Press for 2 seconds to enter in Run Hours and Fault Log Mode.
PRG + SET	Touch to see Control probe temperature if default display is other than Control probe.

Sr.	Para	Description
1	SP	Compressor relay set point
2		To Set Other Parameters
3	CS	Compressor Selection
4	P2	High temperature limit
5	P3	Low temperature limit
6	HS	Maximum Set Point limit
7	LS	Minimum Set Point limit
8	P4	Differential for compressor relay ON condition
9	P5	Probe calibration
10	P6	Time delay (compressor relay restart after cut-off)
11	ot	Minimum ON time for compressor relay
12	E1	Compressor relay status in probe fail
13	Cn	Compressor relay OFF time during probe fault
14	Cy	Compressor relay ON time during probe fault
15	t3	Minimum ON/OFF time between two Compressors
16	A0	To select type of agitator cycle
17	A1	Unit selection for Agitator ON/OFF cycle (Minutes / Seconds)
18	A2	Agitator ON cycle.
19	A3	Agitator OFF cycle.
20	do0	Activate/Deactivate Door Open Digital Input.
21	do1	Fault Sensing Delay for Door Open Digital Input.
22	do2	Compressor and Agitator status on Door Open Fault.
23	FD1	Activate or Deactivate Compressor1 Fault digital input.
24	F11	Compressor1 Fault digital input Sensing delay.
25	F21	Compressor1 Status on Compressor1 Fault digital input.
26	F31	Set reset mode for Compressor1 output, on Compressor1 Fault digital input.
27	F41	No of retrials of compressor1 when Manual reset is selected.
28	F02	Activate or Deactivate Compressor2 Fault digital input.
29	F12	Compressor2 Fault digital input Sensing delay.
30	F22	Compressor2 Status on Compressor2 Fault digital input.
31	F32	Set reset mode for Compressor2 output, on Compressor2 Fault digital input.
32	F42	No of retrials of compressor2 when Manual reset is selected.
33	d id	To set device ID.
34	bd	To change Baud Rate.
35	rS1	Reset Compressor1 Run Hours.
36	rS2	Reset Compressor2 Run Hours.
37	FCL	Clear Fault log.
38	nd	Default (Normal) Display.
39	dd	Display Delay.
40	Adt	Power On Time Delay For Alarm.
41	rS	To set controller Resolution.
42	PR	To Change Password.
43	LP	Keypad Lock.
44	FS	Restore factory defaults.
45	EP	End Programming.
		LED Indications
		Fault Messages
		Operating Messages
		Password Function
		Run hour and Fault Log Mode
		High and Low temperature logging function
Parameter List:		
1.	SP	Function: To set compressor set point.
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.

rS = 0.1			rS = 1		
Min	Max	Fac. Set	Min	Max	Fac. Set
LS+1.0	HS-1.0	0.0°C	LS+1	HS-1	0°C

2. To Set Other Parameters: Touch & hold PRG key for 2 seconds.

Display will flash "CS". To select other parameters, use UP/DOWN keys.

3. CS: Function: Compressor Selection.

To change value use UP/DOWN keys. To set value touch SET key.

This parameter is used to decide either both Compressors are working or only single Compressor is working. If this parameter is set to:

- C1(0) = Select Compressor1.
- C2(1) = Select Compressor2.
- bth(2) = Select both Compressors.

Min	Max	Fac. Set
C1	bth	bth

Note: Compressor related parameters are applicable for both compressors depend on CS parameter setting.

4. P2: Function: To set maximum allowable high temperature limit.

Example: If this parameter is set to 50.0°C and the temperature reaches or goes above 50.0°C, display will show Ht (High Temp.) indicating that the temperature has reached or gone above the value set in this parameter. Differential of 1.0°C is considered for clearing the fault.

rS = 0.1			rS = 1		
Min	Max	Fac. Set	Min	Max	Fac. Set
P2+1.0	50.0°C	50.0°C	P2+1	50°C	50°C

HL (Message on display)

5. P3: Function: To set minimum allowable low temperature limit.

Example: If this parameter is set to -40.0°C and the temperature reaches or goes below -40.0°C, display will show Lt (Low temp) indicating that the temperature has reached or gone below the value set in this parameter. Differential of 1.0°C is considered for clearing the fault.

rS = 0.1			rS = 1		
Min	Max	Fac. Set	Min	Max	Fac. Set
P3+1.0	50.0°C	50.0°C	P3+1	50°C	50°C

Lt (Message on display)

6. HS: 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 (HS-1.0).

rS = 0.1			rS = 1		
Min	Max	Fac. Set	Min	Max	Fac. Set
SP+1.0	50.0°C	50.0°C	SP+1	50°C	50°C

SP= Set Point

7. LS: 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 -40.0°C will not allow the set point to go below -39.0°C (LS+1).

rS = 0.1			rS = 1		
Min	Max	Fac. Set	Min	Max	Fac. Set
-40.0°C	SP-1.0	-40.0°C	-40°C	SP-1	-40°C

SP= Set Point

8. P4: Function: To set the Differential for compressor relay ON condition.

Example: If the Set Point is Set at 10.0°C and Differential is set to 2.0°C, When the System reached 10.0°C, Compressor Relay will go OFF. Since the Differential is 2.0°C, Compressor Relay will Come ON (Restart) at 12.0°C (10.0°C + 2.0°C).

rS = 0.1			rS = 1		
Min	Max	Fac. Set	Min	Max	Fac. Set
1.0°C	20.0°C	2.0°C	1°C	20°C	2°C

9. P5: Function: To set probe calibration.

In time it may be possible that the display may be offset by a degree or so. To compensate for this error, user 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. User will have to set the P5 parameter to 2, which means that once out of the programming mode, the temperature on display will be 30.0°C (28.0°C+ 2.0°C).

rS = 0.1			rS = 1		
Min	Max	Fac. Set	Min	Max	Fac. Set
-10.0°C	10.0°C	0.0°C	-10°C	10°C	0°C

10. P6: Function: To set time delay between compressor relay restart.

This parameter is used to protect the compressor from restarting in a short period of time.

Example: If this parameter is set at 3 minutes, the compressor relay goes OFF at the set point, it 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.

Min	Max	Fac. Set
0 Min	99 Min	3 Min

Flashing Time delay in progress

11. ot: Function: Minimum ON Time for Compressor relay.

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 1 minute and if the temperature is achieved before 1 minute, then the compressor relay will remain ON for minimum 1 minute, though set point is achieved.

Min	Max	Fac. Set
0 Min	20 Min	0 Min

12. E1: Function: Compressor relay status in case of Probe Failure.

When set to:

- off(0) = Compressor relay status is OFF.
- on(1) = Compressor relay status is ON.
- CyC(2) = Compressor relay performs a duty cycle for Cn for minutes OFF and Cy for minutes ON.

Min	Max	Fac. Set
off	CyC	CyC

13. Cn: Function: Compressor relay OFF Time during probe fault.

Example: If this parameter is set to 4 minutes, then compressor relay will be OFF for 4 minutes while performing the duty cycle.

Min	Max	Fac. Set
1 Min	99 Min	4 Min

Note: This parameter is considered if E1 is set to CyC.

14. Cy: Function: Compressor relay ON Time during probe fault.

Example: If this parameter is set to 10 minutes, then compressor relay will be ON for 10 minutes while performing the duty cycle.

Min	Max	Fac. Set
1 Min	99 Min	10 Min

Note: This parameter is considered if E1 is set to CyC.

15. t3: Function: Minimum On/Off Time between Two Compressors.

This parameter is provided to set the time delays between consecutive ON/OFF of both the Compressors if it is happening at the same time due to Temperature conditions.

Min	Max	Fac. Set
10 Sec	99 Sec	30 Sec

Note: This parameter is considered if CS is set to bth.

16. A0: Function: To select type of agitator cycle.

1) When A0 is set 0, Agitator will be ON/OFF along with Compressor. **ON Condition** When Temperature is above SP(Set Point) + P4(Differential) and once the time delay with P6 parameter is over, Agitator will be ON, after 5 seconds, Compressor1 will be ON and Compressor 2 will be ON after time delay t3. **OFF Condition** When Temperature reaches to set point or below, Agitator will be OFF and after 5 seconds Compressor1 will be OFF and then Compressor2 will be OFF after time delay t3.

2) When A0 is set 1, Agitator will be ON while Compressor is ON means it will get ON along with Compressor and on other times it will perform an ON/OFF Cycle. **ON Condition** When Temperature is above SP(Set Point) + P4(Differential) and once the time delay with P6 parameter is over, Agitator will be ON, after 5 seconds, Compressor1 will be ON and Compressor 2 will be ON after time delay t3. **OFF Condition** When Temperature reaches to set point or below, Compressor1 will be OFF and then Compressor2 will be OFF after time delay t3. Agitator will perform ON/OFF cycle with ON period first. When Compressor gets OFF the calculation for ON time counter starts.

3) When A0 is set 2, Agitator will perform an ON/OFF Cycle continuously and Compressor will be ON/OFF as per set point and differential.

4) When A0 is set 3, Agitator will be ON continuously and Compressor will be ON/OFF as per set point and differential. **On Condition** Agitator will be ON at Power ON and remains ON continuously. **When Temperature is above SP(Set Point) + P4(Differential) and once the time delay with P6 parameter is over, Compressor1 will be ON and Compressor 2 will be ON after time delay t3.** **OFF Condition** When Temperature reaches to set point or below, Compressor1 will be OFF and then Compressor2 will be OFF after time delay t3.

Min	Max	Fac. Set
0	3	1

17. A1: Function: Unit selection for Agitator ON/OFF cycle (Minutes / Seconds).

This parameter decides the unit for parameter A2 and A3. **Example:** If this parameter is set to "Min", Agitator will perform a ON/OFF cycle in minutes. If this parameter is set to "Sec", Agitator will perform a ON/OFF cycle in seconds.

Min	Max	Fac. Set
SEC	min	min

Note: This parameter is considered only if A0 is set 1 or 2.

18. A2: Function: Agitator ON cycle.

As per explanation given in A0 parameter, while performing ON/OFF cycle, Agitator remains ON for ON time given with A2 parameter. **Example:** If this parameter is set to 10 minutes, then Agitator relay will be ON for 10 minutes while performing the ON/OFF cycle.

Min	Max	Fac. Set
1	99	2

Note: This parameter is considered only if A0 is set 1 or 2.

19. A3: Function: Agitator OFF cycle.

As per explanation given in A0 parameter, while performing ON/OFF cycle, Agitator remains OFF for OFF time given with A3 parameter. **Example:** If this parameter is set to 10 minutes, then Agitator relay will be OFF for 10 minutes while performing the ON/OFF cycle.

		Min	Max	Fac. Set
		1	99	13
Note: This parameter is considered only if A0 is set 1 or 2.				
20.	do0	Function: To Activate/Deactivate Door Open Digital Input.		
If this parameter is set to,				
	$d_i S^{(0)}$	= Door Open digital input fault sensing is disabled.		
	$oP_n^{(1)}$	= Door open digital input is Open connection will be a fault.		
	$Cl_o^{(2)}$	= Door open digital input is Close connection will be a fault.		
		Min	Max	Fac. Set
		$d_i S$	Cl_o	$d_i S$
21.	do1	Function: To set Fault Sensing Delay for Door Open Digital Input.		
This parameter is used to set sensing delay for Door open digital input.				
Example: If this parameter is set to 5 seconds and if Door Open Fault is present for 5 seconds, then Door Open Digital Input Fault is detected.				
		Min	Max	Fac. Set
		0 sec	99 sec	5 sec
Note: This parameter is considered only if $do0$ is enabled.				
22.	do2	Function: To set Compressor and Agitator status on Door open digital input.		
If this parameter is set to,				
	$Enb^{(0)}$	= No action will be performed, only Door open icon ON, Door Open message "do" will be displayed.		
	$EnA^{(1)}$	= No action will be performed, only Door open icon ON, Door Open message "do" will be displayed, Alarm icon will be ON.		
	$RoF^{(2)}$	= Agitator will be OFF, Alarm icon and Door open icon will be ON.		
	$CoF^{(3)}$	= Both Compressors will be OFF, Alarm icon and Door open icon will be ON.		
	$ACF^{(4)}$	= Agitator and Both Compressors will be OFF, Alarm icon and Door open icon will be ON.		
		Min	Max	Fac. Set
		Enb	ACF	Enb
Note: This parameter is considered only if $do0$ is enabled.				
23.	F01	Function: To activate/deactivate Compressor1 Fault Digital Input.		
If this parameter is set to,				
	$d_i S^{(0)}$	= Digital Input is disabled.		
	$oP_n^{(1)}$	= Digital input is Open Connection will be Fault.		
	$Cl_o^{(2)}$	= Digital input is Close Connection will be Fault.		
		Min	Max	Fac. Set
		$d_i S$	Cl_o	$d_i S$
Note: This parameter is considered only if CS is "C1" or "bEtH".				
24.	F11	Function: To set Compressor1 Fault sensing delay.		
Example: If this parameter is set to 5 seconds and if Compressor1 Digital Input Fault is present for 5 seconds then fault is detected.				
		Min	Max	Fac. Set
		0 sec	99 sec	5 sec
Note: This parameter is considered only if CS is "C1" or "bEtH" and $F01$ is enabled.				
25.	F21	Function: Compressor1 Status on Compressor1 Fault digital input.		
If this parameter is set to,				
	$Enb^{(0)}$	= No action will be performed, only AUX icon will be ON and fault message will be displayed.		
	$EnA^{(1)}$	= No action will be performed, only AUX icon and Alarm icon will be ON and fault message will be displayed.		
	$CoF^{(2)}$	= Compressor1 will be OFF, AUX icon and Alarm icon will be ON and fault message will be displayed.		
		Min	Max	Fac. Set
		Enb	CoF	Enb
Note: This parameter is considered only if CS is "C1" or "bEtH" and $F01$ is enabled.				
26.	F31	Function: To set reset mode for Compressor1 output on Compressor1 Fault Digital Input.		
If this parameter is set to,				
	$AuT^{(0)}$	= Auto Reset		
	$nAn^{(1)}$	= Manual Reset Fault after $F41$ retrials in hour.		
Example: If this parameter is set to nAn & $F41$ is set to 5 then, if the Compressor gets tripped on Compressor 1 fault for 5 times in 1 hour, controller will go into Manual Reset and user has to reset the fault through RST key by pressing for 2 Seconds. Fault will get cleared only if the Input has become Healthy.				
If this parameter is set to "AuT" then Digital Input Fault for Compressor1 will be cleared automatically when it is healthy.				
		Min	Max	Fac. Set
		AuT	nAn	AuT
Note: This parameter is considered only if CS is "C1" or "bEtH" and $F01$ is enabled.				
27.	F41	Function: No. of retrials of Compressor1 Digital Input when Manual Reset is selected.		
Example: As mentioned in $F31$.				
		Min	Max	Fac. Set
		1	10	5
Note: The Fault counts will get cleared after every hour. • This parameter is considered only if CS is "C1" or "bEtH" and $F01$ is enabled.				
28.	F02	Function: To activate/deactivate Compressor2 Fault Digital Input.		

If this parameter is set to,				
	$d_i S^{(0)}$	= Digital Input is disabled.		
	$oP_n^{(1)}$	= Digital input is Open Connection will be Fault.		
	$Cl_o^{(2)}$	= Digital input is Close Connection will be Fault.		
		Min	Max	Fac. Set
		$d_i S$	Cl_o	$d_i S$
Note: This parameter is considered only if CS is "C2" or "bEtH".				
29.	F12	Function: To set Compressor2 Fault sensing delay.		
Example: If this parameter is set to 5 seconds and if Compressor2 Digital Input Fault is present for 5 seconds then fault is detected.				
		Min	Max	Fac. Set
		0 sec	99 sec	5 sec
Note: This parameter is considered only if CS is "C2" or "bEtH".				
30.	F22	Function: Compressor2 Status on Compressor2 Fault digital input.		
If this parameter is set to,				
	$Enb^{(0)}$	= No action will be performed, AUX icon will be ON and fault message will be displayed.		
	$EnA^{(1)}$	= No action will be performed, AUX icon and Alarm icon will be ON and fault message will be displayed.		
	$CoF^{(2)}$	= Compressor2 will be OFF, AUX icon and Alarm icon will be ON and fault message will be displayed.		
		Min	Max	Fac. Set
		nAn	CoF	nAn
Note: This parameter is considered only if CS is "C2" or "bEtH" and $F02$ is enabled.				
31.	F32	Function: To set reset mode for Compressor2 output, on Compressor2 Fault Digital Input.		
If this parameter is set to,				
	$AuT^{(0)}$	= Auto Reset		
	$nAn^{(1)}$	= Manual Reset Fault after $F42$ retrials in 1 hour.		
Example: If this parameter set to "nAn" & $F42$ is set to 5 then if the Compressor gets tripped on Compressor2 fault for 5 times in 1 hour, controller will go in to Manual Reset and user has to reset the fault through RST key by pressing for 2 Seconds, Fault will get cleared only if the Input has become Healthy.				
If this parameter is set to "AuT" then Digital Input Fault for Compressor2 will be cleared automatically when it is healthy.				
		Min	Max	Fac. Set
		AuT	nAn	AuT
Note: This parameter is considered only if CS is "C2" or "bEtH" and $F02$ is enabled.				
32.	F42	Function: No. of retrials of Compressor2 Digital Input when Manual Reset is selected.		
Example: As mentioned in $F32$.				
		Min	Max	Fac. Set
		1	10	5
Note: The Fault counts will get cleared after every hour. • This parameter is considered only if CS is "C2" or "bEtH" and $F02$ is enabled.				
33.	d id	To set device ID.		
To change modbus unit ID for BMS connectivity.				
		Min	Max	Fac. Set
		$d_i S$	250	-
Note: This parameter will not change on Factory Set. If it is set to "d i S", communication will be disabled.				
34.	bd	Function: To change Baud Rate.		
Communication baud rate from 9600 to 57600.				
When set to,				
		Min	Max	Fac. Set
		1	4	-
Note: This parameter is considered only if $d id$ is not equal to $d_i S$. This parameter will not change on Factory Set.				
35.	rS1	Function: To Reset Compressor1 Run Hours.		
If this parameter is set to,				
	$no^{(0)}$	= Don't clear Compressor1 Run Hours.		
	$YeS^{(1)}$	= Clear Compressor1 Run Hours.		
		Min	Max	Fac. Set
		no	YeS	no
Note: This parameter is considered only if CS is set to C1 or bEtH.				
36.	rS2	Function: To Reset Compressor2 Run Hours.		
If this parameter is set to,				
	$no^{(0)}$	= Don't clear Compressor2 Run Hours.		
	$YeS^{(1)}$	= Clear Compressor2 Run Hours.		
		Min	Max	Fac. Set
		no	YeS	no
Note: This parameter is considered only if CS is set to C2 or bEtH.				
37.	FCL	Function: Clear Fault Log		
If this parameter is set to,				
	$no^{(0)}$	= Don't clear Fault Log.		
	$YeS^{(1)}$	= Clear Fault Log.		
		Min	Max	Fac. Set
		no	YeS	no
38.	nd	Function: Default (Normal) Display.		

When this parameter is set to,				
	$Pr^{(0)}$	= Display will show Control probe temperature on normal display		
	$SP^{(1)}$	= Display will show Set Point on normal display		
		Min	Max	Fac. Set
		Pr	SP	Pr
39.	dd	Function: Display Delay.		
Example: If this parameter is set to 1, temperature on the display will be updated after 1 Second. The same value will be considered for calculation and logging. Display delay parameter is applicable only when temperature is increasing (rising). When temperature is decreasing (falling) this parameter will not be applicable.				
		Min	Max	Fac. Set
		0 sec	180 sec	0 sec
Note: If this parameter is set to 0, this feature will be disabled.				
40.	Adt	Function: To set Ht and Lt Power ON Delay for Alarm.		
Example: If this parameter is set to 20 Minutes, once the controller is powered ON, no fault indication will be activated for 20 Minutes. Alarm delay is used only for High Temperature and Low Temperature, but not for other faults.				
		Min	Max	Fac. Set
		0 Min	99 Min	0 Min
41.	rS	Function: To set Controller Resolution.		
This parameter when set to,				
	$0.1^{(0)}$	it will take temperature and its related parameters in 0.1°C resolution.		
	$1^{(1)}$	it will take temperature and its related parameters in 1°C resolution.		
		Min	Max	Fac. Set
		0.1	1	-
42.	PR	Function: To Change Password.		
User cannot enter into Program Mode & Set Mode, if correct password is not entered. If the password is kept other than 0, user need to enter correct password to enter into Set/Program Mode. If password is 0, user can directly access Set/Program Mode.				
		Min	Max	Fac. Set
		-999	999	0
43.	LP	Function: Keypad Lock.		
This parameter is used to lock the keypad so that tampering is not possible by by-standers.				
	$UnL^{(0)}$	= Deactivates Keypad Lock.		
	$LoL^{(1)}$	= Activates Keypad Lock.		
When locked all parameters can only be viewed, but not modified. Note: If LP is set to LoC, all parameters are only readable but cannot be modified, except LP Parameter.				
		Min	Max	Fac. Set
		UnL	LoL	UnL
44.	FS	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. Set
		no	YeS	no
45.	EP	Function: To end Programming.		
To end programming press Once the key is pressed, the controller goes into the normal mode and displays the temperature and all settings are recorded.				
LED Indications				
LED	Status	Description	Parameter	
	ON	Compressor1 Relay is ON.	$CS, SP, P4$	
	ON	Compressor2 Relay is ON.	$CS, SP, P4$	
	ON	Agitator is ON.	$Ro, R2, R3$	
	ON	Door Open fault is present.	$do0, do1, do2$	
	ON	Compressors are ON and in time delay for switching OFF.	ot	
	FLASHING	Compressors are in time delay and about to start.	$P6 t3$	
	OFF	Compressor 1 and Compressor2 faults are absent.	$F01, F11, F21, F31, F41, F02, F12, F22, F32, F42$	
	ON	Compressor 1 or Compressor2 fault are present.	$F01, F11, F21, F31, F41, F02, F12, F22, F32, F42$	
	FLASHING	Compressor 1 or Compressor2 fault is in Manual Reset.		
	ON	Any fault is present: Control Probe Fail / Door Open / Comp1 Fault - $CF1$ / Comp2 Fault - $CF2$ / Ht / Lt		
	ON	When temperature and temperature related parameters are displayed.		
Fault Messages				
Fault Message	Description	Parameter		
PFH	Control Probe Temperature Fail High Control Probe Temperature short circuit or temperature is > 100°C.	-		
PFL	Control Probe Temperature Fail Low	-		

	Control Probe Temperature circuit open or without probe, or temperature is < -45.0°C.	
Ht	High temperature fault	$P2$
Lt	Low temperature fault	$P3$
do	Door open fault	$do0, do1, do2$
$CF1$	Comp1 Fault	$F01, F11, F21, F31, F41$
$CF2$	Comp2 Fault	$F02, F12, F22, F32, F42$
Operating Messages		
Message	Description	
LP	Keypad Lock	
LL	Last low Temperature	
LH	Last high Temperature	
rS	In temperature log function: When LL and LH values are cleared.	
Password Function		
• In Programme Mode:		
Touch & hold "PRG" key for 2sec. Display will flash "CS" parameter if "PA" value is kept "0". If other than "0", then "PA" and "0" will flash. Use "▲" and "▼" keys to enter the password. On entering correct value, display will flash the first parameter "CS". User can scroll through parameters using "▲" or "PRG" keys.		
• In Set Mode:		
Touch & hold "SET" key for 2sec. Display will flash set point value if "PA" parameter value is kept to "0". If other than "0", then display will flash "PA" and "0". Use "▲" or "PRG" to enter the password. On entering correct value, display will flash set point value. User can set desired value using "▲" or "PRG" keys. To save the modified value use "SET" key.		
Run hour and Fault Log Mode		
• Press "▲" + "PRG" key simultaneously for 2 Seconds. Controller will enter into Run hour and Fault Log Mode.		
• Use "▲" or "PRG" keys to reach to FLG parameter and select the FLG parameter.		
• If there are no Fault records, Display will show "noF"		
• If Faults are present the latest Fault will be displayed first, Fault message will be flashed with Fault Number at the rate of 500ms.		
Note: For the Fault messages refer the table "Fault Messages". Scroll through faults using "▲" or "PRG" keys.		
High and Low temperature logging function		
• How to see the logged values:		
LL: Last Low temperature LH: Last High temperature Touch and hold "▲" key for 2 seconds display will flash "LL" and the corresponding temperature for 4 seconds. After this, display will flash "LH" and the corresponding temperature for 4 seconds and come out of Log mode and will display Control probe temperature.		
• How to reset the Logged values:		
While the display is showing the logged values, if user touches & holds the "SET" key for 2 seconds, the logged values will be cleared and "LrS" will be displayed. Log Values will get reset after Power ON/OFF. Note: High & Low temperature logs will be saved at every 10 mins.		
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OTHER PRODUCTS		
	Controlled cooling, always	
Cold Room Controller Chiller Controller Two Compressor Controller Heating Controller Humidity Controller Pressure Controller	Ball Valves Globe Valves Hand Valves Flow Switches Solenoid Valves	
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