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OPERATING INSTRUCTIONS



INDIA

SZ-75651-C3

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Introduction :

SZ-75651-C3 is a two compressor controller with separate setpoints, differentials and time delays for each compressor.

They are specifically designed for air conditioning applications wherein the compressor cuts off at setpoint and is restarted at a temperature of setpoint plus differential.

The controller features cycling of compressors so that there is no overload on one compressor.

Amongst others, the important features are:

Incase one compressor is not capable of handling the load, the second compressor will activate and both compressors will cutout at the lowest set point.

Current and Voltage sensing of both compressors is provided to protect them by switching them off incase of respective overload or under load condition.

Also separate HP,LP input for each compressor is provided.

Get to Know Your Controller :



Key Introduction :

	Unit1 Key		Up Key
	Unit2 Key		Down Key
	Reset Key		Set Key
	Program Key		Timer Key
	Backward / Log Key (Not Used)		

1. Set Mode

Function : To set the cutout point of the controller.

Press & hold set key for 4 seconds and release.

Display will show 0 and flash. Press Up/Down keys to enter password. User can go into set mode by entering correct password.



Parameter "On" will flash along with ● Comp1 led. Press set key to enter into On1 setpoint .

On1 parameter

Function : To set cutin tepearature for compressor1.

To change On1 parameter, Press set key.

Use UP/DOWN key to set desired range.

Min.	Max.	Fac.
Off1	P2-1	23°C

Example : Setting this parameter to 27deg C will switch ON compressor1 on at and above 27deg C.

Off1 parameter

Function : To set cutout tepearature for compressor1.

To change Off1 parameter, Press set key.

Use UP/DOWN key to set desired range.

Min.	Max.	Fac.
P3+1	On1	21°C

Example : Setting this parameter to 23deg C will switch OFF compressor1 at and below 23deg C.

On2 parameter


Function : To set cutin tepearature for compressor2.

To change On2 parameter, Press set key.



Use UP/DOWN key to set desired range.

Min.	Max.	Fac.
Off2	P2-1	24°C

Example : Setting this parameter to 27deg C will switch ON compressor2 on at and above 27deg C.

Off2 parameter	Function : To set cutout temperature for compressor2.
To change Off2 parameter, Press set key.	Use UP/DOWN key to set desired range. Example : Setting this parameter to 23deg C will switch OFF compressor2 at and below 23deg C.
Min. Max. Fac. P3+1 On2 22°C	
2. Parameter Setting Hold PRG Key for 4 seconds.	Display will show 0 & flash.To enter programming mode enter correct password by using Up/Down keys and press set key. Once user enters correct password display will show P2 and flash. To go to other parameters, use up / down keys. If user enters incorrect password, controller will come out of programming mode after 10 seconds and will display temperature.
	
3. P2 parameter	Function : To set maximum allowable high temperature limit.
To change P2 parameter, Press set key.	Use UP/DOWN key to set desired range. Once set at a particular range, this will not allow both set points to go above this range. Example : Setting this parameter at 40°C will not allow both set points to go above 40°C. Also if the temperature reaches 40°C, the display will show Ht (High Temperature), indicating that the temperature has reached or gone above the range in this parameter.
Min. Max. Fac. On2+1 40°C 25°C	
Ht	

4. P3 Parameter	Function : To set minimum allowable low temperature limit.
To change P3 parameter, press set key.	Use UP/DOWN key to set desired range. Once set at a particular range, this will not allow both set points to go below this range. Example : Setting this parameter at 10°C will not allow both set points to go below 10°C. Also if the temperature reaches 10°C, the display will show Lt (Low Temperature), indicating that the temperature has reached or gone below the range in this parameter.
Min. Max. Fac. 10°C XX°C 10°C	
Lt	
5. P5 Parameter	Function : To set probe calibration.
To change P5 parameter, press set key.	Use UP/DOWN keys to set desired range. 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 range is from - 10°C to +10°C. Example : The temperature on the display is 28°C, whereas the actual temperature is 30°C. You will need to set the P5 mode to 2, which means that once out of the programming mode, the display will show temperature 30°C (28°C+2°C).
Min. Max. Fac. -10°C 10°C 0°C	

6. P6 parameter			Func.: Set time delay between relay restart time for comp1 and comp2.
To change P6 parameter, press set key. Units :Seconds Time delay 1			● Comp1 & time delay of setpoint 1 will flash. Use UP/DOWN keys to set desired range. Once desired range is achieved, press set key and you will see "---" which confirms time delay for set point 1 has been stored in memory.
Min.	Max.	Fac.	After pressing UP key ● Comp.2 flashes alongwith the time delay for setpoint 2. Use UP/DOWN keys to set desired, range. Once desired range is achieved, press set key and you will see "---" which confirms time delay for set point 2 has been stored in memory.
0	999	30	
Comp 1 			To prevent both compressors from switching on together, there is an internal 10 second time delay between simultaneous startups to prevent an electrical surge.
Units :Seconds Time delay 2			
Min.	Max.	Fac.	
0	999	60	
Comp 2 			
7. t3 parameter			Function : To set minimum off time between two compressor.
To change t3 parameter, press set key.			This mode is used to set the time delay between the switching off of both compressors so that they do not switch off simultaneously.
Min.	Max.	Fac.	Example : If this mode is set to 5 seconds the second compressor will switch off after a minimum of 5 seconds from the first compressor switching off.
0 Sec	15 Sec	5 Sec	
			If set to 0, this feature will not activate.

8. t4 parameter			Function : To avoid overloading of either compressor.
To change t4 parameter, press set key. Unit: Minutes			This function is used to avoid overloading of any one compressor working at a stretch over a period of time. Example : If this parameter is set at 360 minutes, the setpoint, differential & time delay of both compressors will interchange after 360 minutes The interchange will occur every 360 minutes. Controller save unit run hours after every 30 mins. This helps by not overworking any one compressor for long hours and increases compressor life. If for any reason the t4 and setpoints have been changed, the time calculation will start from the last change in any of these parameters.
Min.	Max.	Fac.	
0	999	360	
9. Ad Parameter			Function: To set power on time delay for High temp alarm .
To change the Ad parameter, press the set key.			Use UP/DOWN keys to set desired range. This parameter sets a time delay on power on for the High temperature Alarm.
Min	Max	Fac.	Example: If this parameter is set to 1 Min, once the unit is powered on the high temperature alarm will not activate for 1 minutes even if there is a fault. This is very useful to eliminate the nuisance alarm when a unit is switched on and the ambient is above the max set limit. in P2.After 1 min if the temperature is above P2 parameter then Display will show "Ht" and alarm3 will come on.
0 Min	20Min	1 Min	

10. C0 parameter	Function : To set low current limit for compressor1.	
To change C0 parameter press set key when display shows C0.	Use UP/DOWN keys to set desired range. This parameter is used to switch off the compressor incase it draws lower than the set current.	
Min.	Max.	Fac.
0	C2	0
Unit : Amp		
Example: If this parameter is set at 2A, the controller will trip comp1 if it draws less than 2A. Controller will restart the compressor after the set timedelay. If after 3retrials current drawn is less than 2A, the controller will go into manual reset mode. Display will flash "UL" and alarm relay will activate. Once fault is rectified user can press reset key to restart the comp. Comp will restart after time delay set in P6.		
11. C1 parameter	Function : To set low current limit for compressor2.	
To change C1 parameter press set key when display shows C1.	Use UP/DOWN keys to set desired range. This parameter is used to switch off the compressor incase it draws lower than the set current.	
Min.	Max.	Fac.
0	C3	0
Unit : Amp		
Example: If this parameter is set at 2A, the controller will trip comp2 if it draws less than 2A. Controller will restart the compressor after the set timedelay. If after 3retrials current drawn is less than 2A, the controller will go into manual reset mode. Display will flash "UL" and alarm relay will activate. Once fault is rectified user can press reset key to restart the comp. Comp will restart after time delay set in P6.		


12. C2 parameter	Function : To set high current limit for compressor1.	
To change C2 parameter press set key when display shows C2.	Use UP/DOWN keys to set desired range. This parameter is used to switch off the compressor1 incase it draws higher than the set current.	
Min.	Max.	Fac.
C0	20	18
Unit : Amp		
Example: If this parameter is set at 15A, the controller will trip comp1 if it drawn more than 15A. Controller will restart the compressor after the set timedelay. If after 3retrials current dawn is more than 15A, the controller will go into manual reset mode. Display will flash "OL" and alarm relay will activate. Once fault is rectified user can press reset key to restart the comp. Comp will restart after time delay set in P6.		
13. C3 parameter	Function : To set high current limit for compressor2.	
To change C3 parameter press set key when display shows C3.	Use UP/DOWN keys to set desired range. This parameter is used to switch off the compressor2 incase it draws higher than the set current.	
Min.	Max.	Fac.
C1	20	18
Unit : Amp		
Example: If this parameter is set at 15A, the controller will trip comp2 if it draws more than 15A. Controller will restart the compressor after the set timedelay. If after 3retrials current dawn is more than 15A, the controller will go into manual reset mode. Display will flash "OL" and alarm relay will activate. Once fault is rectified user can press reset key to restart the comp. Comp will restart after time delay set in P6.		

14. C4 & C5 parameter	Function: To set time delay for current alarms.	
To change the parameter, press the set key.	Use UP/DOWN keys to set desired range. This parameter sets a time delay on compressor start up before Overload, Underload or CT fail alarm.	
Min	Max	Fac.
0 Min	30Min	1Min
Example: If this parameter is set to 4 Min, once the compressor is on will ignore Overload, Underload or CT fail alarms for 4mins. If the alarm persists even after 4min then controller will sense Overload, Underload or CT fail alarms as described in C0, C1, C2 & C3 parameters. C4-Delay for Comp1 current Alarms C5-Delay for Comp2 current Alarms		
15. H1 parameter	Function : To enable/disable HP1 fault inputs.	
To change H1 parameter, Press set key.	Use UP/DOWN key to set desired range. This parameter is used to enable or disable HP1 inputs for compressor1 . 0 = To disable HP1 Fault Input. 1 = To enable HP1 Fault Input.	
Min.	Max.	Fac.
0	1	1
Example : Setting this parameter at 0 will ignore the HP1 fault for the compressor1. If this parameter is set at 1 then controller will detect HP1 trip and in case of HP trip controller will trip A/C1 compressor on fault and switch on stand by a/c. Also switch on alarm relay. Also display will show "HP" fault. After attending the fault user has to press RST key for 4secs to restart the compressor.		

16. L1 parameter	Function : To enable/disable LP1 fault inputs.	
To change L1 parameter, Press set key.	Use UP/DOWN key to set desired range. This parameter is used to enable or disable LP1 inputs for compressor1. 0 = To disable LP1 Fault Input. 1 = To enable LP1 Fault Input.	
Min.	Max.	Fac.
0	1	1
Example : Setting this parameter at 0 will ignore the LP1 fault for compressor1. If this parameter is set at 1 then controller will detect LP1 trip and controller will trip A/C1 compressor on fault and switch on stand by a/c. Also switch on alarm relay. Also display will show "Lp" fault. This fault is auto resettable		
17. H2 parameter	Function : To enable/disable HP2 fault inputs.	
To change H2 parameter, Press set key.	Use UP/DOWN key to set desired range. This parameter is used to enable or disable HP2 inputs for compressor2. 0 = To disable HP2 Fault Input. 1 = To enable HP2 Fault Input.	
Min.	Max.	Fac.
0	1	1
Example : Setting this parameter at 0 will ignore the HP2 fault for compressor2. If this parameter is set at 1 then controller will detect HP2 trip and in case of HP trip controller will trip A/C2 compressor on fault and switch on stand by a/c. Also switch on alarm relay. Also display will show "HP" fault. After attending the fault user has to press RST key for 4secs to restart the compressor .		








18. L2 parameter	Function : To enable/disable LP2 fault inputs.
To change L2 parameter, Press set key.	Use UP/DOWN key to set desired range. This parameter is used to enable or disable LP2 inputs for compressor2. 0 = To disable LP2 Fault Input. 1 = To enable LP2 Fault Input. Example : Setting this parameter at 0 will ignore the LP2 fault for compressor2. If this parameter is set at 1 then controller will detect LP2 trip and controller will trip A/C2 compressor on fault and switch on stand by a/c. Also switch on alarm relay. Also display will show "Lp" fault. This fault is auto resettable .
Min. Max. Fac.	
0 1 1	
19. Hpd Parameter	Function : To set HP alarm sensing time delay.
To change Hpd parameter, Press set key.	If this parameter is set to 10Seconds then it will only trip a/c on HP only if persists for more than 10Seconds.
Min. Max. Fac.	
0 180 5	
Unit : Seconds	
20. Lpd Parameter	Function : To set LP alarm sensing time delay from compressor on.
To change Lpd parameter, Press set key.	If this parameter is set to 60Seconds then it will only sense LP trip after 60 seconds of compressor on.
Min. Max. Fac.	
0 999 360	
Unit : Seconds	

21. AL Parameter	Function : To set the Alarm Logic.
To change AL parameter, press set key.	This parameter is used to set Alarm Logic in the controller.
Min. Max. Fac.	AL=0 CONDITION ALARM1 ALARM2 ALARM3
0 1 0	AC1 FAIL ON(NC) OFF OFF
	AC2 FAIL OFF ON(NC) OFF
	Ht ALARM OFF OFF ON(NC)
	AL = 1 CONDITION ALARM1 ALARM2 ALARM3
	AC1/AC2 FAIL ON OFF OFF
	BOTH AC FAIL OFF ON OFF
	Ht ALARM OFF OFF ON(NC)
	Power Fail OFF OFF ON(NC)
22. U0 Parameter	Function : To ENABLE / DISABLE VOLTAGE FAULTS of the controller.
To change the U0 parameter, press set key.	When set to 1 enables undervoltage and overvoltage faults for the controller. When set to 0 disables undervoltage and overvoltage faults.
Min. Max. Fac.	
0 1 1	
23. Uv Parameter	Function : To set undervoltage Limits
To change the Uv parameter, press set key.	If the a/c voltages goes below this limit will trip respective a/c on undervoltage("Uu") fault .
Min. Max. Fac.	
160 225 160	

24. Ud Parameter	Function : To set undervoltage differential.		
To change the Ud parameter, press set key.	This parameter set a/c on voltage differential once it trips on undervoltage. For example: If Uv is set to 180Vac and Ud is set to 10Vac , then controller will trip a/c below 170Vac and restart again only when voltage goes above 180Vac(170+10).		
Min.	Max.	Fac.	
5	30	10	
25. Ov Parameter			
Function : To set Overvoltage Limits			
To change the Ov parameter, press set key.	If the a/c voltages goes above this limit will trip respective a/c on Overvoltage("Ou") fault .		
Min.	Max.	Fac.	
230	275	275	
26. Od Parameter			
Function : To set overvoltage differential.			
To change the Od parameter, press set key.	This parameter set a/c on voltage differential once it trips on overvoltage. For example: If Ov is set to 260Vac and Od is set to 10Vac , then controller will trip a/c above 260Vac and restart again only when voltage goes below 250Vac(260-10).		
Min.	Max.	Fac.	
5	30	5	
27. PL parameter			
Function : Parameter Lock.			
To change the PL parameter, press set key.	Use UP/DOWN keys to set desired range. This parameter can lock all Parameters so that tampering is not possible by bystanders.		
Min.	Max.	Fac.	
0	1	1	
			
0= Parameters unlocked. 1= Parameters locked.			
When locked all parameters can only be viewed, but not modified.			

28. E1 parameter	Function : Relay status on probe failure.		
To change the E1 parameter, press the set key.	Use UP/DOWN keys to set desired range. When set to 0 both the relays will stay on with initial start-up delay of 2 minutes. When set to 1 both compressor performs a duty cycle of 10 minutes ON and 4 minutes OFF. When set to 2 both relays will stay OFF.		
Min.	Max.	Fac.	
0	2	1	
29. PA Parameter			
Function : To change password .			
To change the PA parameter, press the set key.	Use UP/DOWN keys to change password. User can not enter into program mode, set mode if correct password is not entered.		
Min.	Max.	Fac.	
0	99	12	
30. FS Parameter			
Function : To restore the default settings of the controller.			
To change the FS parameter, press the set key.	When set to 1 all parameters are programmed to factory values. Useful to debug setting related problems.		
Min.	Max.	Fac.	
0	1	0	
31. EP Parameter			
Function : To end programming.			
To end programming press set key.	Once the set key is pressed, the controller goes into the normal mode and displays the temperature and all settings are recorded.		

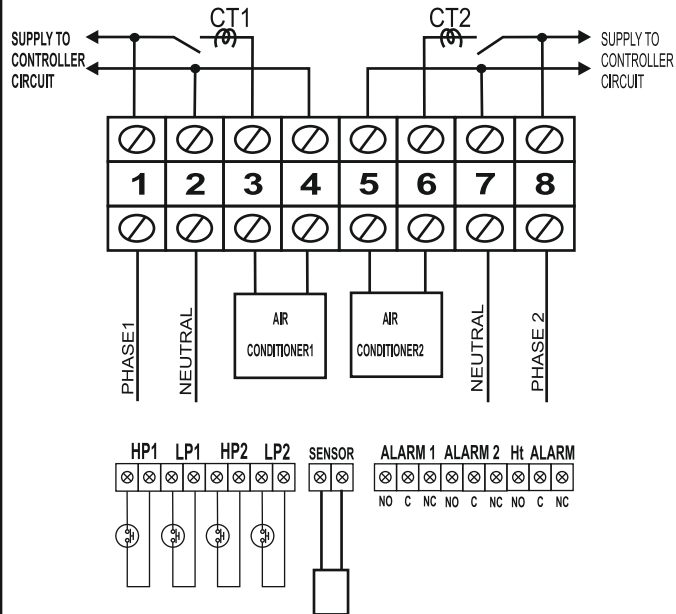
Operating messages and Icon status

Message	Description	Parameter
Ht	Temperature equal to or above the maximum limit of the set point.	P2
Lt	Temperature equal to or below the minimum limit of the set point.	P3
PP	Probe short circuit, circuit open or without probe, or temperature >50°C or <0 °C	
● Comp1 ON/OFF	Compressor 1 relay ON/OFF.	ON1,OFF1
● Comp2 ON/OFF	Compressor 2 relay ON/OFF.	ON2,OFF2
●  ON/OFF	Parameter locked/unlocked	PL
● Comp1 Flashing	Comp 1 relay time delay active	P6
● Comp2 Flashing	Comp 2 relay time delay active	P6
● HP1/ Hp2 Flashing	Compressor trip on HP fault	H1
● LP1/LP2 Flashing	Compressor trip on LP fault	L1
● UL1/UL2 Flashing	Compressor trip on Underload fault	C0, C1, C4, C5
● OL1/OL2 Flashing	Compressor trip on Overload fault	C2, C3, C4, C5
● UV1/UV2 Flashing	Compressor trip on Undervoltage fault	Uo, Uv
● OV1/OV2 Flashing	Compressor trip on Overvoltage fault	Uo, Ov
● MCB1 Flashing	Problem with MCB1 Input.	
● MCB2 Flashing	Problem with MCB2 Input.	
Press 	Key to view compressor1 current.	
Press 	Key to view compressor2 current.	
Press 	Key to view Compressor1 Voltage.	
Press 	Key to view Compressor2 Voltage.	
Press 	Key to view unit run hours.	
Press 	Key to reset all faults.	

Technical Data

Housing : ABS plastic .
Front cover : Polycarbonate plastic.
Dimensions : Length 227mm, Width 200mm, Depth 93 mm
Mounting : Wall mounting with screws.
Connectors :
Compressor :Open Type Connectors (230Vac,30A) ≤ 2.5mm² wire
Alarms & Digital Inputs:Close type connectors (8(3)A,250Vac),1mm² wire.
Digital Inputs : Potential contacts
Display : 0.56"RED 7-segment display 5mm RED LEDs.
Data storage : Non-volatile EEPROM memory .
Compressor Relay : 2 SPST Relay 20A, 250VAC,cos Φ = 0.4.
Alarm Relay : 3 SPDT Relay 8(3)A,250Vac.
Storage temp : -20°C to 70°C(non-condensing).
Operating temp.: 5°C to 50°C(Non-condensing)
Temperature Input : NTC probe SZ-N75.
Range : 0°C to 50°C.
Resolution : 1°C.
Accuracy : +/- 1°C.
Probe tolerance at 25°C : +/- 0.3°C.
Current Input : Through PCB mounted Current Transformer.
Range :1Ato 20A.
Resolution : 1A
Accuracy : +/- 1A.
Digital Input :2Potential (230Vac)Inputs from MCB.
4Potential (12Vdc)Inputs from HP1,LP1,HP2,LP2.
Power input :230V, 50Hz Ac looped with MCB, Other on request.

WIRING DIAGRAM



COMPRESSOR CONNECTION LEGEND

	1.	2.	3.	4.	5.	6.	7.	8.
A/C1	PHASE IN	NEUTRAL IN	UNIT1 PHASE OUT	NEUTRAL OUT	NEUTRAL OUT	UNIT2 PHASE OUT	NEUTRAL IN	PHASE IN
A/C2								

TITLE : WIRING DIAGRAM

CLIENT : VIDEOCON

MODEL : TWIN A/C CONTROLLER

MODEL NO. : SZ75651-C3

FACTORY SET

Parameter	Factory Value
ON1	23 °C
OFF1	21 °C
ON2	24 °C
OFF2	22 °C
P2	25 °C
P3	10 °C
P5	0 °C
P6	1) 30 Sec 2) 60 Sec
t3	5 sec
t4	360 min
Ad	1 min
C0	0 A
C1	0 A
C2	18 A
C3	18 A
C4-C5	1 min
H1	1
LI	1
H2	1
L2	1
Hpd	5 Sec
Lpd	360 Sec
AL	0
U0	1
Uv	160
Ud	10
Ov	275
Od	5
PL	1
E1	1
PA	12
FS	0

CAUTION

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.

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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