sub-Zero®

INDIA

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OPERATING INSTRUCTIONS

sub-Zero®

SZ-7510-P-DI

Instructions :

GENERAL DESCRIPTION

The Sub-Zero Series SZ-7510-P-DI are aesthetically superior versions of their predecessors. The SZ-7510-P-DI is a single set point controller. with digital input. They are specifically designed for refrigeration applications wherein the compressor cuts off at set point and is restarted at a temperature of set point plus differential.

Additionally these controllers offer several protection features that are easily understood by the examples in the instructions below. The controller can be used for heating applications, when the P1 parameter is set to "1" .

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

The SZ-7510-P-DI controller can be used for several applications with a measuring value from -50°C to 99°C.

INDEX

Set point	Function: To set the cut out point of the controller.
Press and hold the SET key for 2 Seconds. 	Display will change to set value. The set point range can now be changed by using the UP/DOWN key. After setting the desired value, press the set key and you will see "- - -" which confirms that the set point has been stored in memory.

Min	Max	Fac.
-50° C	99° C	10°C

To set other Parameters.	
Press & hold the DOWN(prg) key for 2 seconds. 	Display will show P1 & flash. To go to other parameters, use UP/DOWN keys.

P1 Parameter	Function: To set controller for heating or cooling.
To change the P1 parameter, press the SET key.	Use UP/DOWN keys to get desired value & press set to confirm. 0: Cooling mode. 1: Heating mode.

Min	Max	Fac.
0	1	0

P2 Parameter	Function: To set maximum allowable high temperature limit.
To change the P2 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 to go above this value.

Min	Max	Fac.
XX°C	99°C	99°C

HL
(Message on display)

Example: Setting this parameter at 25°C will not allow the set point to go above 25°C. Also, if the temperature reaches 25°C, the display will show Ht (High Temp.) indicating that the temperature has gone above the value in this parameter.

P3 Parameter	Function: To set minimum allowable low temperature set point.
To change the P3 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 to go below this value.

Min	Max	Fac.
-50°C	XX°C	-50°C

Lt
(Message on display)

Example: Setting this parameter at -30°C will not allow the set point to go below -30°C. Also, if the temperature reaches -30°C, the display will show Lt (LowTemp.) indicating that the temperature has gone below the value in this parameter.

P4 Parameter	Function: To set the differential.
To change the P4 parameter, press the SET key.	Use UP/DOWN keys to set desired value. Differential between cut out and cut in temperature can be set between 1°C to 20°C.

Min	Max	Fac.
1°C	20°C	2°C

Example (in cooling mode): If the set point is set at 10°C and differential is set at 2°C, then when the system reaches 10°C, the relay will cut out. Since the differential is 2°C, the relay will cut in (restart) at 12°C (10°C+2°C).

P5 Parameter	Function: To set probe calibration.
To change the 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. Setting value is from -10°C to +10°C.

Min	Max	Fac.
-10°C	10°C	0°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°C, which means that once out of the programming mode, the temperature will show 30°C (28°C + 2°C).

P6 Parameter	Function: To set time delay between relay restart time.
To change the P6 parameter, press the SET key.	Use UP/DOWN keys to set desired value. This parameter is used to protect the compressor from restarting in a short period of time and can be set between 0 to 99 minutes.

Min	Max	Fac.
0 Min	99 Min	3 Min

Flashing
Time delay in progress

Example: If this parameter is set at 3 minutes, the relay 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.

d0 Parameter	Function : To activate or deactive digital input function.
To change the d0 parameter press the SET key	Use UP/DOWN keys to set desired value. 0: Digital input disable. 1: DI with 230VAC present 2: DI with 0VAC present.
Min | Max | Fac. 0 | 2 | 1	Example : If this parameter is set to 0, controller will not sense any digital input. If set to 1, when 230VAC is present, controller will treat it as a fault and turn off the compressor and DI (☀)will flash. If set to 2, when 0VAC is present, controller will treat it as a fault and turn off the compressor and DI (☀)will flash.

d1 Parameter	Function : To set reset mode for digital input.
To change the d1 parameter press the SET key	Use UP/DOWN keys to set desired value. 0: Auto reset. 1: Manual reset.
Min | Max | Fac. 0 | 1 | 0 AUTO / MAN	Example : If this parameter is set to 0, then incase of a fault in d0 parameter, unit will auto reset after fault is cleared. If this parameter is set to 1, then incase of a fault in d0 parameter, unit will allow reset after pressing AUTO/MAN button. (after d0 fault is cleared).

d2 Parameter	Function : To set the count mode for CCF . CCF- compressor count fault.
To change the d2 parameter press the SET key	Use UP/DOWN keys to set desired value. 0: CCF count increment with each Comp. OFF and DI fault. 1: CCF count increment only with DI fault.
Min | Max | Fac. 0 | 1 | 0	

d3 Parameter	Function : To set the number of reset cycles of compressor.
To change the d3 parameter press the SET key	Use UP/DOWN keys to set desired value. This parameter sets the permissible number of reset cycles of compressor. When number of compressor reset cycles within 1 Hr. goes above the d3 parameter, controller switch to manual reset mode and “CCF” led ☀ will be ON. NOTE: This parameter saves the compressor from multiple (more than max.10 nos.) reset within 1 Hr.
Min | Max | Fac. 0 | 10 | 5 RST	Use RST key to reset this CCF fault.

d4 parameter	Function : To set digital input sensing delay.
To change the d4 parameter press the SET key	Use UP/DOWN keys to set desired value. This parameter is use to set sensing delay of digital input. Example : If d4 = 5seconds and if digital input (Fault) is present for 5 second then fault is detected.
Min | Max | Fac. 0 | 60Sec | 5Sec RST	

LP Parameter.	Function: To lock keypad.
To change the LP parameter press the SET key.	Use UP/DOWN keys to set desired value. This parameter can lock the keypad so that tampering is not possible by by-standers. 0 = keypad unlocked 1 = keypad locked
Min | Max | Fac. 0 | 1 | 0 🔑 ●	When locked all parameters can only be viewed, but not modified.

PA Parameter	Function : To change password.
To change the PA parameter, press the set key when display shows PA .	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	0

FS Parameter	Function : To restore 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

E1 Parameter	Function : Relay status on Probe Failure.
To change the E1 parameter press the SET key.	Use UP/DOWN keys to set desired value. When set to 0 = Relay status is ON. 1 = Relay performs a duty cycle 10 minutes ON and 4minutes OFF. 2 = Relay status is OFF.

Min	Max	Fac.
0	2	2

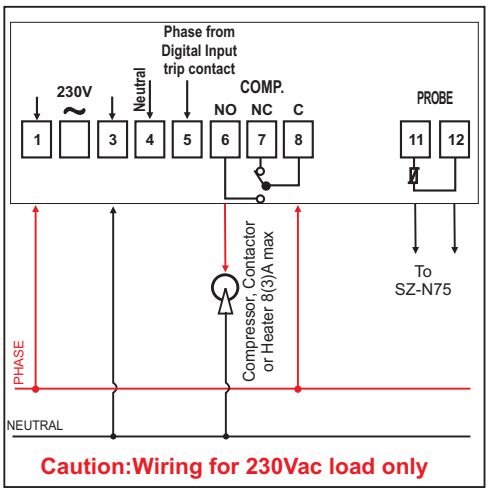
EP Parameter.	Function: To end programming.
To end programming press the SET key	Once the SET key is pressed, the control goes into the normal mode and displays the temperature and all settings are recorded.

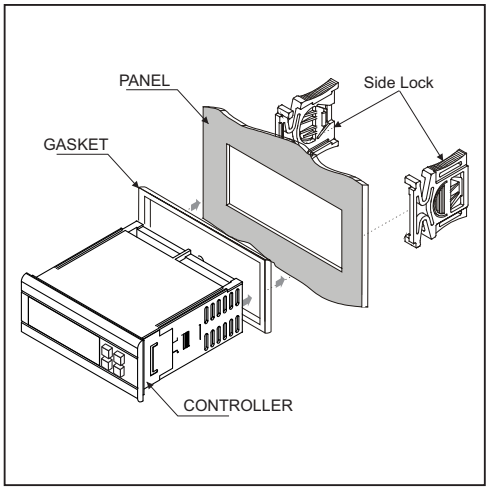
Operating messages and Icon status

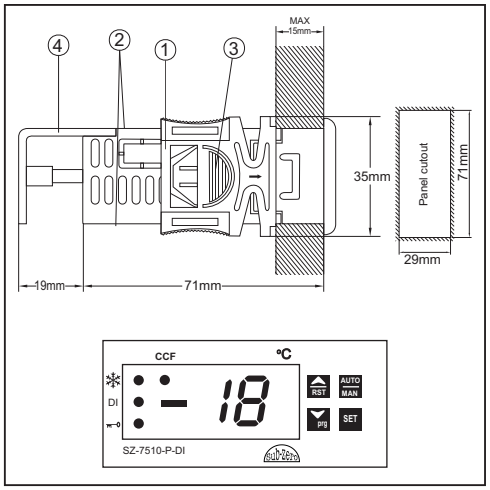
Message	Description	Parameter
Ht	Temperature above the maximum limit of the set point.	P2
Lt	Temperature below the minimum limit of the set point.	P3
PP	Probe short circuit, circuit open or without probe, or temperature > 99°C or <-50°C	
❄ ● On/Off	Comp. Relay on/off	SP, P4
🔑 ● On/Off	Keypad locked/unlocked	LP
DI ● On	Digital input fault ON	d0,d1
CCF ● On	Compressor count fault : CCF	d2,d3
❄ ☀ Flashing	Time delay in progress	P6

Technical data:

Housing : Black, ABS Plastic
Front Cover : Polycarbonate plastic.
Dimensions : Front : 75 X 34.5 MM,
Depth : 71 MM (w/o back lid)
Panel Cutout : 29 X 71 MM
Mounting : Flush panel mounting with fasteners
Frontal protection : I.P65
Connections : Screw terminal blocks.
≤ 2.5sqmm one wire/ terminal only.
Display : 2 X14.2 mm (0.56") LED
Data storage : Non-volatile EEPROM memory
Power input : 230Vac +/-10%,50-60Hz.
Other on request
Operating temp.: 5°C to 50°C(non-condensing)
Storage temp : -20°C to 70°C(non-condensing)
Output :1 SPDT relay 8 (3)A, 250Vac.
Input : NTC probe, SZ-T75
Range : -50°C to 99°C
Resolution : 1°C
Accuracy : +/- 1°C
Probe tolerance: +/- 0.3°C at 25°C







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. Once the controller has been connected, they should be covered with the lid ④
Silicon sealant should be applied along the perimeter of the panel cut out or a rubber 'O' ring supplied before the unit is fitted to obtain IP65 grade.

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. 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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