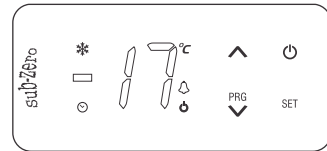




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SZ-7510T / SZ-7569T



Temperature Controller



Introduction :

The new SZ-7510T/7569T are the next generation of Subzero controllers. Their IP ratings are greatly improved and have an excellent iconic display. The touch feature whilst increasing reliability also gives a great user experience.

These controllers designed for refrigeration have several features specially designed for safety of compressors. They work on the system that the compressor cuts off at set point and is restarted at a temperature of set point + differential.

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 SZ-7510T/7569T can be used for several applications with a measuring range from -40°C to 99°C.

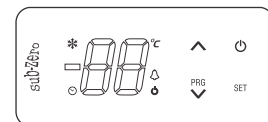
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USER INTERFACE





KEYS


| | |
|--|--|
| <p>UP</p> <p>In Program mode: Scroll through parameters & Increases parameter value.</p> <p>In Set mode: Increases parameter value.</p> | <p>Stand by</p> <p>Touch and hold for 2sec to switch ON / OFF the controller.</p> |
| <p>Down/Program</p> <p>Touch and hold for 2sec to enter into program mode.</p> <p>In program mode and set mode: Decreases parameter value</p> | <p>SET Set</p> <p>Touch and hold for 2sec to enter into set mode.</p> <p>In program mode and set mode: set/save the changed value of parameter.</p> |

| | | |
|---|---|------|
| Set point | Function: To set compressor relay 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. | |
| SZ-7510T/7569T | | |
| Min | Max | Fac. |
| LS+1 | HS-1 | 0°C |
| SZ-7510-P/7569-P | | |
| Min | Max | Fac. |
| P3+1 | P2-1 | 0°C |
| SZ-7510-E/7569-E | | |
| Min | Max | Fac. |
| -40°C | 50°C | 0°C |


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| | | |
|---|--|------|
| To set other Parameters. | Display will flash "P1". To select other parameters, use UP/DOWN keys. | |
| Touch & hold PRG  key for 2 seconds. | For E- Type Controller "P4" will be displayed. | |
| P1 Parameter | Function: To set controller for heating or cooling. | |
| To change value use  PRG keys | 0 = Cooling mode 1 = Heating mode. | |
| To set value touch "SET" key | | |
| Min | Max | Fac. |
| 0 | 1 | 0 |


6

| | | |
|--|---|------|
| P2 Parameter (only for T & P type) | Function: To set maximum allowable high temperature limit. | |
| To change value use  PRG keys | Example: If this parameter is set to 50°C and the temperature reaches or goes above 50°C, display will show Ht (High Temp.) indicating that the temperature has reached or gone above the value set in this parameter. | |
| To set value touch "SET" key | | |
| SZ-7510T/7569T | | |
| Min | Max | Fac. |
| P3+1 | 99°C | 99°C |
| SZ-7510-P/7569-P | | |
| Min | Max | Fac. |
| SP+1 | 99°C | 99°C |
| Ht (Message on display) | | |


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| | | |
|---|---|-------|
| P3 Parameter (only for T & P type) | Function: To set minimum allowable low temperature limit. | |
| To change value use  PRG keys | Example: If this parameter is set to -10°C and the temperature reaches or goes below -10°C, display will show Lt (Low temp) indicating that the temperature has reached or gone below the value set in this parameter. | |
| To set value touch "SET" key | | |
| SZ-7510T/7569T | | |
| Min | Max | Fac. |
| -40°C | P2-1 | -40°C |
| SZ-7510-P/7569-P | | |
| Min | Max | Fac. |
| -40°C | SP-1 | -40°C |
| Lt (Message on display) | | |

8

| | | |
|--|--|------|
| HS Parameter (only for T type) | Function: To set Maximum set point limit. | |
| To change value use  PRG keys | Once set at a particular value, this will not allow the set point to go above this value. | |
| To set value touch "SET" key | Example: Setting this parameter at 25°C will not allow the set point to go above 24°C (HS-1). | |
| Min | Max | Fac. |
| SP+1 | 99°C | 99°C |
| SP = Set Point | | |


9

| | | |
|---|---|-------|
| LS Parameter (only for T type) | Function: To set Minimum set point limit. | |
| To change value use  PRG keys | Once set at a particular value, this will not allow the set point to go below this value. | |
| To set value touch "SET" key | Example: Setting this parameter at -10°C will not allow the set point to go below -9°C (LS+1). | |
| Min | Max | Fac. |
| -40°C | SP-1 | -40°C |
| SP = Set Point | | |

10

| | | |
|-----------------------------------|------|---|
| P4 Parameter | | Function: To set the differential for compressor relay ON condition. |
| To change value use ^ PRG keys | | Example : If the set point is set at 10°C and differential is set at 2°C, then when the system reaches 10°C, the compressor relay will go OFF. Since the differential is 2°C, the compressor relay will come ON (restart) at 12°C (10°C +2°C). |
| To set value touch "SET" key | | |
| Min | Max | |
| 1°C | 20°C | 2°C |
| 11 | | |


| | | |
|-----------------------------------|------|--|
| P5 Parameter | | Function: To set probe calibration. |
| To change value use ^ PRG keys | | 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°C, whereas the actual temperature is 30°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°C (28°C +2°C). |
| To set value touch "SET" key | | |
| Min | Max | |
| -10°C | 10°C | 0°C |
| 12 | | |

| | | |
|---|--------|---|
| P6 Parameter | | Function: To set time delay between compressor relay restart. |
| To change value use ^ PRG keys | | 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. |
| To set value touch "SET" key | | |
| Min | Max | |
| 0 Min | 99 Min | 3 Min |
|  Flashing Time delay in progress | | |
| 13 | | |


| | | |
|---------------------------------------|--------|---|
| Ot Parameter (only for T type) | | Function: Minimum ON Time For Compressor relay. |
| To change value use ^ PRG keys | | 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 1Min 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. |
| To set value touch "SET" key | | |
| Min | Max | |
| 0 Min | 20 Min | 0 Min |
| 14 | | |

| | | |
|-----------------------------------|-----|--|
| E1 Parameter | | Function : Compressor relay status in case of Probe Failure. |
| To change value use ^ PRG keys | | When set to 0 = Compressor relay status is OFF. 1 = Compressor relay status is ON. 2 = Compressor relay performs a duty cycle for Cn for minutes OFF and Cy for minutes ON. Note: For E and P type duty cycle is fixed for 4 Minutes OFF and 10 minutes ON. |
| To set value touch "SET" key | | |
| Min | Max | |
| 0 | 2 | 2 |
| 15 | | |


| | | |
|---------------------------------------|-------|---|
| Cn Parameter (only for T type) | | Function : Compressor relay OFF Time during probe fault. |
| To change value use ^ PRG keys | | (This will be considered only when E1 is selected 2) . Example : If this parameter is set to 4 minutes, then compressor relay will be OFF for 4 minutes while performing the duty cycle. |
| To set value touch "SET" key | | |
| Min | Max | |
| 1Min | 99Min | 4Min |
| Cy Parameter (only for T type) | | Function : Compressor relay ON Time during probe fault. |
| To change value use ^ PRG keys | | (This will be considered only when E1 is selected 2) . Example : If this parameter is set to 10 minutes, then compressor relay will be ON for 10 minutes while performing the duty cycle. |
| To set value touch "SET" key | | |
| Min | Max | |
| 1Min | 99Min | 10Min |
| 16 | | |

| | | |
|---|-----|---|
| dd Parameter (only for T type) | | Function : This parameter is used to delay the display of temperature by the set in this parameter. |
| To change value use  keys | | Each value corresponds to 5 seconds, if the value is set to 1, it corresponds to 5 seconds, if it is set to 2, it corresponds to 10 seconds and so on. |
| To set value touch "SET" key | | |
| Min | Max | Fac. |
| 0 | 36 | 0 |
| | | For example, if this parameter is set to 1, temperature on the display will be updated after 5 seconds. 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. If this parameter is set to 0, this feature will be disabled. |


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| | | |
|--|-------|---|
| Ad Parameter (only for T type) | | Function : This parameter is used to set the time delay at Power ON for Alarm Indication |
| To change value use  keys | | Example: If this parameter is set to 20 minutes, once the controller is powered ON, no fault indication will be activated for 20 minutes. |
| To set value touch "SET" key | | |
| Min | Max | Fac. |
| 0Min | 99Min | 0Min |
| | | Alarm delay is used only for High Temperature and Low Temperature, but not for Room Sensor fail. If Control Probe Temperature reaches or goes above P2 parameter value, High Temperature (Ht) fault will displayed. |
| | | If Control Probe Temperature reaches or drops below P3 parameter value, Low Temperature (Lt) fault will displayed. Differential of 1°C is considered for clearing the fault. |


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| | | |
|---|-----|--|
| PO Parameter (only for T & P type) | | Function : To enable/disable Power ON/OFF of the controller through Power key. |
| To change value use  keys | | Controller has a power key, which if enabled, puts controller in active or stand by state |
| To set value touch "SET" key | | |
| Min | Max | Fac. |
| 0 | 2 | 0 |
| | | 0 = Power ON/OFF is disabled. 1 = Power ON/OFF is enabled. ON/OFF Status will not be stored. 2 = Power ON/OFF is enabled. ON/OFF Status will be stored. |
| | | If user presses the Power Key for 2 seconds, controller will go into Standby Mode. Display will be OFF and Power LED icon will be ON. Controller will be in Standby Mode. Again if user presses the Power key for 2 seconds, controller will start normal functioning. |


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| | | |
|--|-----|---|
| PA Parameter (only for T type) | | Function : To change Password. |
| To change value use  keys | | User cannot enter into program mode & set mode, if correct password is not entered. |
| To set value touch "SET" key | | |
| Min | Max | Fac. |
| -99 | 99 | 0 |
| | | See page no.29 to know more about password function to access program & set mode and to alter the parameter values. |
| | | If the password is kept other then 0, user need to enter correct password to enter into set/program mode. |
| | | If password is 0, user can directly access set/program mode. |

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| | | |
|---|-----|---|
| LP Parameter. | | Function: To lock keypad. |
| To change value use  keys | | This parameter is used to lock the keypad so that tampering is not possible by by-standers. |
| To set value touch "SET" key | | |
| Min | Max | Fac. |
| 0 | 1 | 0 |
| | | 0 = keypad unlocked 1 = keypad locked |
| | | When locked all parameters can only be viewed, but not modified. |
| | | Note : If LP parameter is set to 1 and if user tries to change any parameter value, " LP" will flash on the display. |
| | | LP Flashing |

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| | | |
|--|-----|---|
| FS Parameter | | Function : To restore default settings of the controller. |
| To change value use  keys | | When set to 1 all parameters are programmed to factory set values. Useful to debug setting related Problems. |
| To set value touch "SET" key | | |
| Min | Max | Fac. |
| 0 | 2 | 0 |
| | | When set to, 0 = FS is disable. 1 = FS as per default value. 2 = FS as per user define(only for T-type). |
| EP 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. |

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| LEDS | |
|--|---|
| ❄️ Compressor ON: Compressor is ON. OFF: Compressor is OFF. | 🔔 Alarm ON: Alarm relay ON. OFF: Alarm relay OFF. |
| 🕒 Time Delay ON: Compressor is ON and in time delay for switching OFF. (Ot parameter) FLASHING: Compressor is in time delay and about to start. | 🔌 Power ON: Controller in stand by mode. OFF: Controller in active mode. |
| °C ON: When temperature is displayed. | |

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| OPERATING MESSAGES (Normal Mode) | |
|---|---|
| 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 > 99°C or < -40°C | LP Keypad lock Keypad is locked |
| LL Last low temperature Last low temperature logged. | LH Last high temperature Last high temperature logged. |
| rS In log function: When LL and LH values are cleared. | |

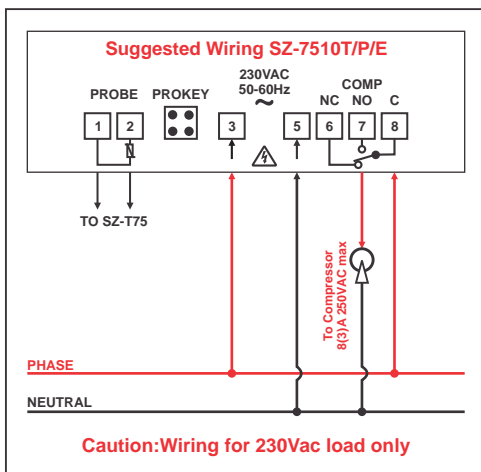
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| OPERATING MESSAGES (Pro-key Mode) | |
|---|---|
| Pr Shows controller in Pro-key mode. | uP Shows selection of uploading mode, parameter values can be uploaded from controller to pro key. |
| dn Shows selection of down loading mode, parameter values can be down loaded from pro key to controller. | En Shows the Pro-key is validated by controller. |
| Er Shows an error in Pro-key validation / error in uploading or down loading parameters/error in setting user lock function. | CL User lock is active. |
| UL User lock is not active. | |

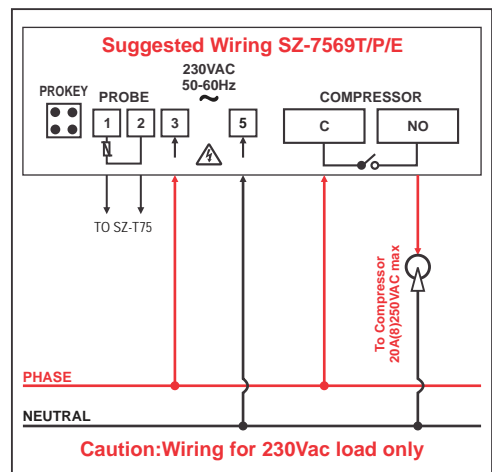
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| Technical data: | |
|---------------------------|---|
| Housing | : Black ABS Plastic, Auto-extinguish |
| Front Cover | : Polycarbonate Plastic |
| Dimensions | : Frontal : 78 X 36mm, Depth : 59mm |
| Panel Cutout | : 29 X 71mm |
| Mounting | : Flush panel mounting with fasteners |
| Protection | : IP65 Front (with gasket) |
| Connections | : Screw terminal blocks. < 2.5sq mm terminal only. |
| Display | : 2 X 17mm 7 segment display & 5 LEDs for Indication |
| Data storage | : Non-volatile EEPROM memory |
| Power input | : 230 Vac ±15 % , 50-60Hz. |
| Relay output | : Comp SPST relay 20(8)A,250V AC (for SZ-7569T) Comp SPDT relay 8(3)A,250V AC (for SZ-7510T) |
| 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) |
| Measuring Range | : -40°C to 99°C |
| Input | : NTC probe, SZ-T75 |
| Resolution | : +/- 1°C |
| Accuracy | : +/- 1°C |

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Password function (only for "T" type)

● **In Program mode:**

Touch & hold "PRG" key for 2sec. Display will flash "P1" 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 "P1". 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.

High and Low temperature logging function (only for "T" type)

● **How to see the logged values:**

LL : Last Low temperature
LH : Last High temperature

Touch and hold "▲" key for 1sec. 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 1sec, the logged values will be cleared and "rS" will be displayed.

Log Values will get reset after Power ON/OFF.

Controller Selection mode

User can select three different types of controllers.

1. SZ-7510/69-E
2. SZ-7510/69-P
3. SZ-7510/69-T

While controller in normal operation, to access selection mode, touch "PRG" and "SET" keys together for 10sec. Controller will enter into Controller selection mode. The present selection will be shown on the display E, P or T.

E = SZ-7510/69-E
P = SZ-7510/69-P
T = SZ-7510/69-T

User can select any of these by using "▲" or "PRG" keys. Touch "SET" key to confirm the new selection.

When the type of controller is changed, the factory settings for parameters P2, P3, LS, HS and set point for corresponding controller will be restored to factory set.

(Note: Keypad lock parameter LP will not be taken into consideration while modifying this parameter.)

When E-Type controller is selected P1 parameter will be set to "0" means cooling.

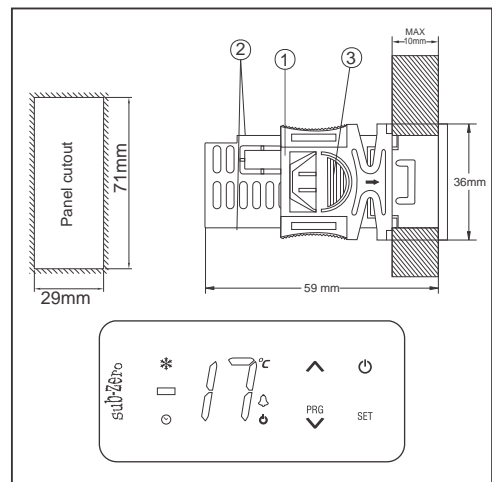
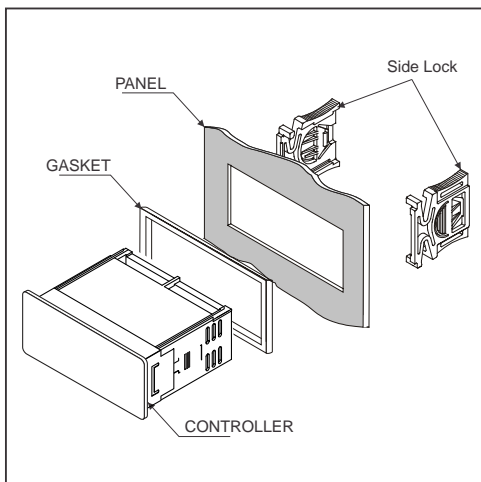
User selectable Default values (only for "T" type)

User can set their own set of Default Set values for all parameters. If user wants to activate this feature, Program mode must be accessed and then change Factory set (FS) parameter accordingly.

This can be done by following steps:

- Modify values of set point and other parameters as desired by entering set mode and program mode respectively.
- Select FS parameter and touch "SET" key. While display flashing "0", touch and hold "PRG" for 10sec. Controller will flash "-2". Then touch "SET" key. All the user defined parameter values will be stored as 'User Default set'.
- If user wants to use this set of parameters, access Program mode and set the FS parameter to "2". Controller will restore the user defined parameter values.

(Note: Keypad parameter LP and User lock parameter will be taken into consideration while modifying this parameter.)



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.

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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OUR 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