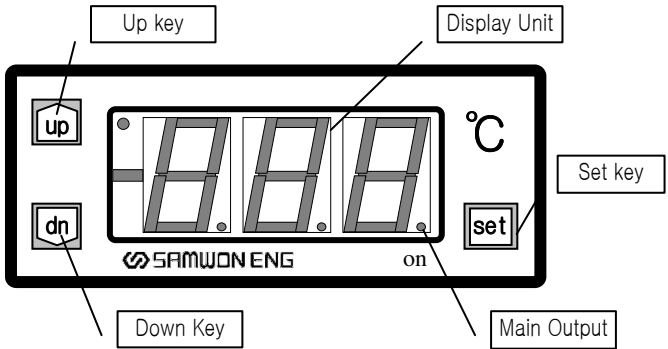


| Automatic Temperature Controller SU-105 User Manual | | | |
|--|-------------------|---------------|------------------------------------|
| Model | Temperature range | | Output |
| SU-105 IP | IC | (-50.0℃~150℃) | Main/Aux(DC12V) Main/Aux(Relay) |
| ※ Thank you for purchasing a SamWon ENG CO.,LTD product. This manual contains the information on how to use the product. Keep it in a safe place and refer to it whenever necessary. | | | |

1. Description of display



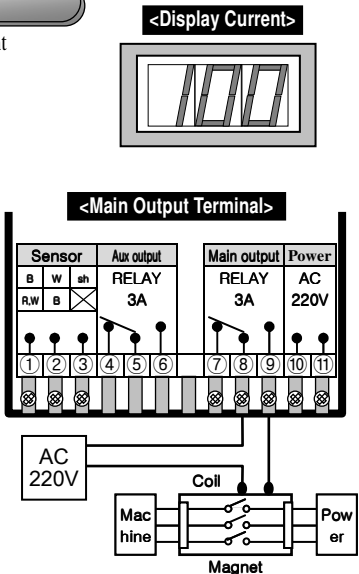
| | | |
|-----------------|--|------------------|
| Display Unit | Displays a current temperature or user-set temperature | |
| Main/Aux Output | Indicates the main or auxiliary output is ON or OFF | |
| Set key | [set] | Setting button |
| Up key | [up] | Increment button |
| Down key | [dn] | Decrement button |

2.Capability and applications of the product

- ▶ Power controller for heaters and coolers
Hysteresis 0.0~9.9 degree C., 0~240 second delay timer, Normal/Reverse selection.
- ▶ Contains a digital timer to control defrosting. Range: 1~999 minute.
- ▶ User configuration control
 - You can specify a valid temperature range that a user is allowed to use.
 - You can prevent a user from changing the setting of hysteresis, delay time, and normal/reverse.

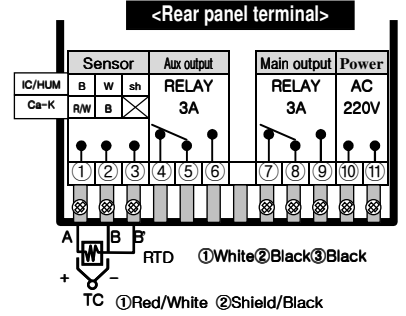
3.How to set main output

- ▶ Turn on the power and wait until the current temperature appears on the display.
 - ▶ Press [set] key once and notice the display unit blinks.
 - ▶ Use [Up] or [Dn] key to change the setting. If you hold down a key for longer than 4 seconds, the number will increase or decrease rapidly.
- Note: The selectable range might be limited by User configuration control.
- ▶ Store the setting in memory by pressing [set] key for longer than 5 seconds.
 - ▶ The unit show the current temperature and start working.
 - ▶ The main output uses terminal 7 ~ 9.
- Note: For information on Auxiliary output (Alarm/Timer), refer to Section 13. How to set Alarm Output.



4. How to connect sensors

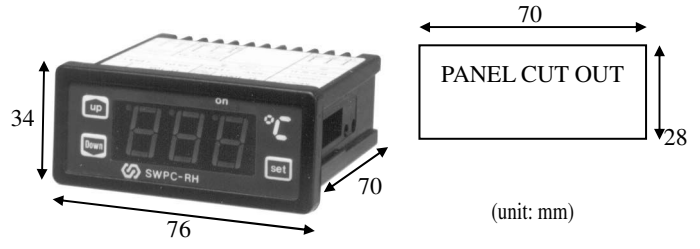
- ① How to connect sensors
 - ▶ When connecting sensors, use the following figure. If you connect the lines incorrectly or a different type of sensors, the display unit will show 'Err'.
- ② Sensor line extension
 - ▶ A Pt100 sensor line can be extended up to 100 M.
 - ▶ An IC/Humidity sensor line can be extended up to 500 M.
 - ▶ You MUST use a shielded line to prevent the noise when extending a line.
- ③ Sensor input correction (when current temperature is incorrect)
 - ▶ Press [set] key for longer than 5 seconds, when the display unit shows a current temperature
 - ▶ Release the key when you see diF. Select rSt by pressing [set] key.
 - ▶ Select a correction temperature using [Up] or [Dn] key.
 - ▶ Store the setting in memory by pressing the [set] key for longer than 5 seconds.



For example,

| | | | | |
|---------------------|---|---------------------------|---|-------------------------------|
| Current temperature | | rSt corrected temperature | | Displayed current temperature |
| 20.0 ℃ | + | -5.0 ℃ | = | 15.0 ℃ |
| 20.0 ℃ | + | 10.0 ℃ | = | 30.0 ℃ |

5.External dimension



6.Product specification

| | |
|-------------------------|---|
| Voltage | AC220V (50/60Hz) ±10% (AC110V,option) |
| Power | 5VA or less |
| Input Sensor | K(CA) with a load/line of 100Ω or less PT100Ω with a load/line of 5Ω or less |
| Accuracy | K(CA):display the value ±0.5% +1digit Pt100:display the value ±0.2% +1digit |
| Hysteresis | 0.1℃ ~ 9.9℃ |
| Control output | Relay Output:AC250V 5A Relay life time:300,000 or grater |
| Control operation | ON/OFF Control |
| Setting Methode | Digital Methode with Up or Down key |
| Etc. | Sensor input correction,Delay timer,Normal/Reverse selection,Defrosting Timer |
| Environment Temperature | 0℃ ~ 50℃ |
| Environment humidity | 85% RH or less |

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7. Hysteresis setting

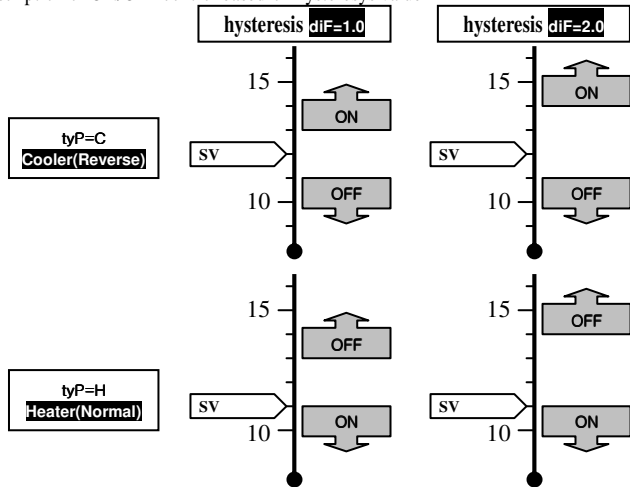
► To change hysteresis, press SET key for longer than 5 seconds. Release the key when the display unit shows diF.

► Set the configuration as following using Up and Dn keys.

| User setting | Item | Setting | Description |
|--------------|------|---------|---|
| | diF | 0.1~9.9 | Prevent relay vibration from hysteresis |

► Store the setting in memory by pressing the SET key for longer than 5 seconds.

► Description of ON/OFF control based-on hysteresis value



8. Normal/Reverse output

| User setting | Item | Setting | Description |
|--------------|------|---------|--------------------------------------|
| | tyP | C | Controls the cooler (Reverse output) |
| | tyP | H | Controls the heater (Normal output) |

① Cooler On/Off control

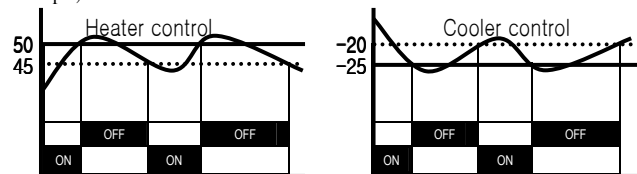
► When the current temperature becomes higher than a configured temperature, the main output relay turns on.

► You can use a delay timer to protect a compressor.

② Heater On/Off control

► When the current temperature becomes lower than a configured temperature, the main output relay turns on.

Note: In general, the B contact of a relay is used for reverse output. In this case, be cautious since the contact B is ON even though the power to the unit is turned off. For example)



SV=50.0, diF=5.0, dLt=0, tyP=H SV=-25.0, diF=5.0, dLt=0, tyP=C

9. Delay timer setting

► In order to change the delay timer setting, press SET key for longer than 5 seconds while the display unit shows the current temperature. Release the key when the display unit shows diF. Press SET key several times to select dLt.

► After selecting a value using Up or Dn key, press SET key to store the setting in the memory.

Description: When the delay time expires, the output turns on.

| User setting | Item | Setting | Description |
|--------------|------|----------|---------------------------------------|
| | dLt | 0~240sec | Output become on after specified time |

► How the delay timer works

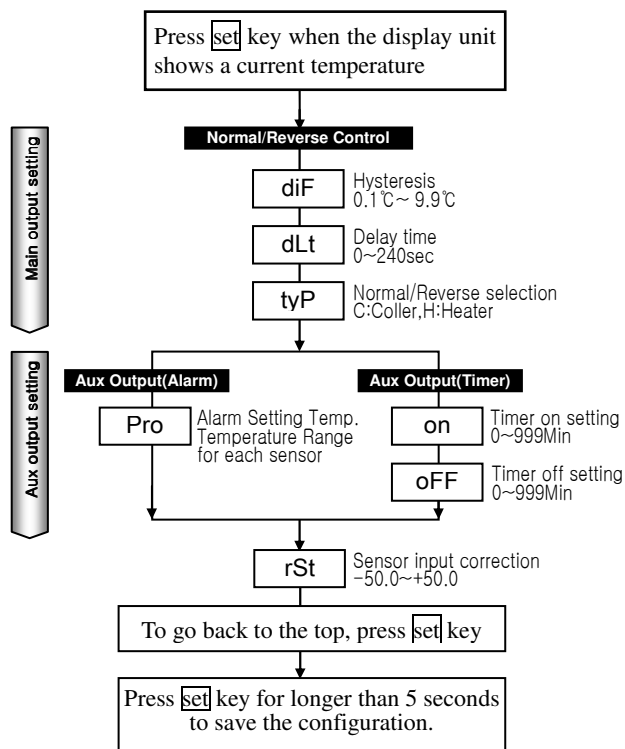
Case: the delay time is 0 second => the relay turns on as soon as output signal arrives.



Case: the delay time is 5 seconds => the relay turns on after 5 seconds upon the arrival of output signal.

10. User configurable settings

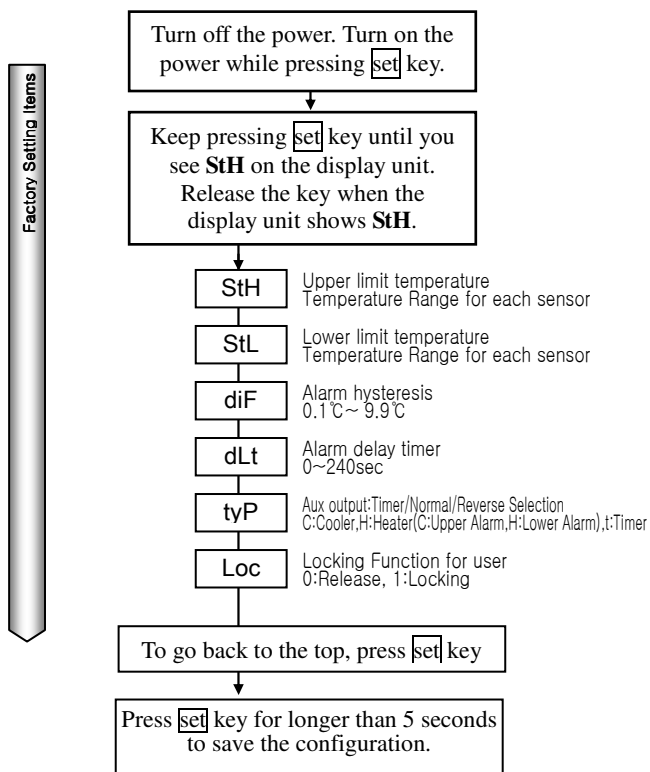
► The following diagram shows configurable items. Select an item by pressing **set** key.



11. Factory default settings

► Make a note of the factory default settings before changing any one of them. Before making any change, understand and verify the validity of your setting(s).

► Invalid factory settings may require service from the manufacturer.



12. Prevention of re-configuration and configuration lock

- You can prevent a user from changing a pre-set configuration.
 - Turn off the power. Turn on the power while pressing **set** key. Keep pressing **set** key until you see **StH** on the display unit. Release the key when the display unit shows **StH**.
 - Press **set** key several times to select **Loc**. Set the configuration as following using **Up** and **Dn** keys

| Factory Setting | Item | Setting | Description |
|-----------------|------|---------|--|
| | Loc | 0 | Unlocked – a user can change settings |
| | | 1 | Locked – a user can't change a pre-set configuration |

- Press **set** key for longer than 5 seconds to save the configuration.
- Note: Once locked, a user can't change a pre-set configuration by pressing **set** key for longer than 5 seconds. The unit must be unlocked before a user can change the pre-set configuration.

- You can specify the range of temperature that a user can set.
 - Turn off the power. Turn on the power while pressing **set** key. Keep pressing **set** key until you see **StH** on the display unit.
 - Press **set** key several times to select **StL**. Set the configuration as following using **Up** and **Dn** keys.

| Factory Setting | Item | Setting | Description |
|-----------------|------|---------|--|
| | StH | 50.0 | The highest value for high temperature is 50 degree. |
| | | 40.0 | The lowest value for low temperature is 40 degree. |

- Press **set** key for longer than 5 seconds to save the configuration.
- Note: After this configuration, the main temperature can be set only within the range of 40 to 50 degree.

13. How to set Alarm Output (Auxiliary output)

- Set the auxiliary relay output to Alarm Output
 - The auxiliary relay selects either Alarm Output or Timer Output. Set the relay to Alarm Output. (Alarm Output is factory default setting)
 - You MUST turn off the power to change the factory settings.
 - Turn on the power while pressing **set** key. And keep pressing the **set** key.
 - Release the **set** key when the display shows **StH**.
 - Press **set** key several times until you see **tyP**.
 - Set the configuration as following using **Up** and **Dn** keys

| Factory Setting | Item | Setting | Description |
|-----------------|------|---------|---|
| | tyP | H or C | Use Auxiliary output as Alarm output (C = Alarm High, H = Alarm Low) |

- Store the setting in memory by pressing the **set** key for longer than 5 seconds.
- How to set Alarm Output Temperature
 - When the display shows current temperature, press **set** key for longer than 5 seconds. Release the **set** key when the display shows **diF**.
 - If **Pro** is not displayed, you have to the auxiliary output to Alarm Output. Refer to the item 1) above.
 - Select **Pro** by pressing **set** key several times.
 - Set the configuration as following using **Up** and **Dn** keys

| User Setting | Item | Setting | Description |
|--------------|------|---------|--|
| | Pro | 100.0 | Alarm Output Temperature is set to 100 degree C. |

- Store the setting in memory by pressing the **set** key for longer than 5 seconds.
- How to set Alarm High or Low
 - To change the factory setting, you MUST turn off the power.
 - Turn the power on while pressing **set** key. And keep pressing the **set** key.
 - Release the key when the you see **StH** in the display unit.
 - Select **tyP** by pressing **set** key several times.

- Set the configuration as following using **Up** and **Dn** keys than the alarm temperature

- Press **set** key for longer than 5 seconds to save the configuration.

| Factory Setting | Item | Setting | Description |
|-----------------|------|---------|---|
| | tyP | H | The output is turn on when the current temperature becomes lower |
| | | C | The output is turn off when the current temperature becomes higher than the alarm temperature |

- How to disable the alarm output
 - When you want to turn off alarm relay output, follow the procedure described below.
 - Press **set** key for longer than 5 seconds when the display shows a current temperature. Release the key when you see **diF**.
 - Press **set** key several times to select **Pro**.
 - Select either the highest value or lowest value using **Up** or **Dn** key.

| User setting | Item | Setting | Description |
|--------------|------|---------|---|
| | Pro | oFF | This configuration disables the alarm output. |

- Press **SET** key for longer than 5 seconds to save the configuration.

14. Timer setting

- How to set the auxiliary relay to the timer output
 - The auxiliary relay selects either the alarm output or timer output. As a factory setting, the relay is set to the alarm output.
 - To change the factory setting, you MUST turn off the power.
 - Turn the power on while pressing **set** key. And keep pressing the **set** key.
 - Release the key when the you see **StH** in the display unit.
 - Select **tyP** by pressing **set** key several times.
 - Set the configuration as following using **Up** and **Dn** keys

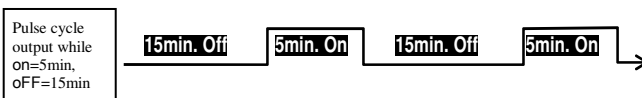
| Factory setting | Item | Setting | Description |
|-----------------|------|---------|---|
| | tyP | t | Use the auxiliary relay as the timer output |

- Press **set** key for longer than 5 seconds to save the configuration.
- How to set timer
 - Press **set** key for longer than 5 seconds when the display shows a current temperature. Release the key when you see **diF**.
 - Press **set** key several times to select **On**. If **ON** does not appear, the auxiliary output is not selected as the timer output. See 1) How to set the auxiliary relay to the timer output
 - Set the configuration as following using **Up** and **Dn** keys

| User setting | Item | Setting | Description |
|--------------|------|---------|---|
| | on | 5 | The output will be ON for 5 minutes after a OFF period of 15 minutes |
| | oFF | 15 | The output will be OFF for 15 minutes after a ON period of 5 minutes. |

- Press **set** key for longer than 5 seconds to save the configuration.

- Description of the pulse cycle



Note: Periodic timer is operated separatory operated from temperature controller

15. Installation

- Install the unit in an environment where
 - the temperature is relatively constant,
 - there is no corrosive gas,
 - the humidity is normal, and
 - there is no excessive dust and electric noise.
- Wire (or line) connections
 - Sensor line is sensitive to noise from high-voltage power line. Use a separate pipe.
- For applications where bodily injury or property damage can occur, you connect the product using a double safety device.