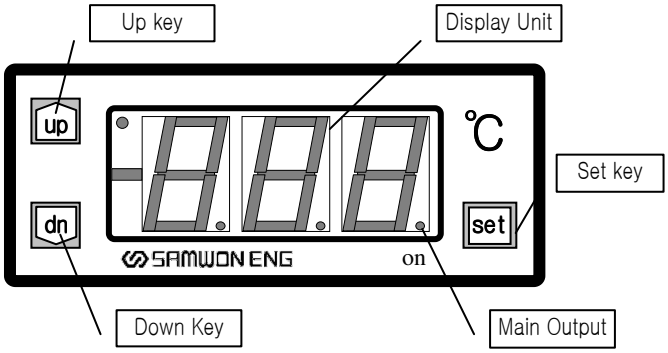
Automatic Temperature Controller SU-105 User Manual

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

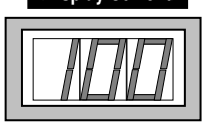
2.Capability and applications of the product

▶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.

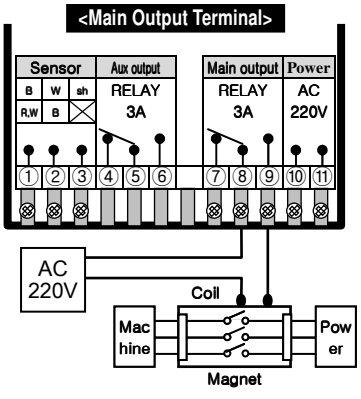
3.How to set main output

▶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.**

<Display Current>



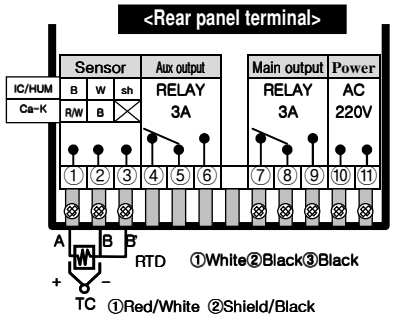
<Main Output Terminal>



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.

<Rear panel terminal>

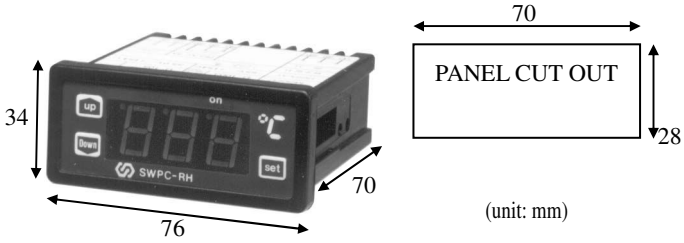


③ Sensor input correction (when current temperature is incorrect)
▶Press set key for longer than 5 seconds, when the display unit shows a current temperature
▶Release the key when you see **diF**. Select **rSt** by pressing set key.
▶Select a correction temperature using Up or Dn key.
▶Store the setting 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



(unit: mm)

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

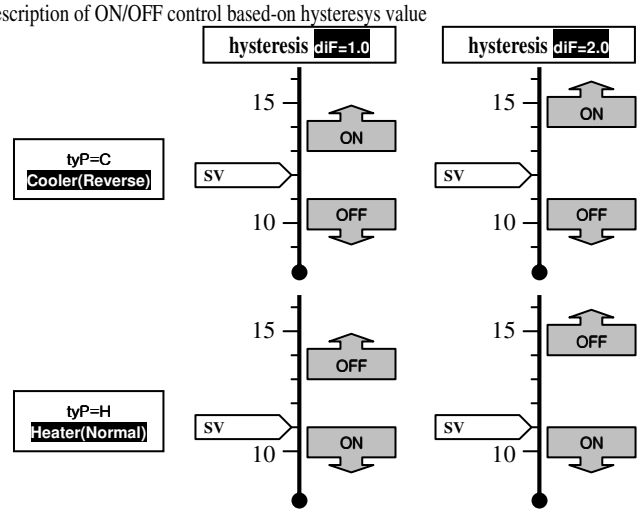
▶To change hysteresis, press SET key for longer than 5 seconds. Release the key when the display unit shows diF.

▶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 hysteresys value



8. Normal/Reverse output

User setting	Item	Setting	Description
	tyP	C	Controls the cooler (Reverse output)
		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.

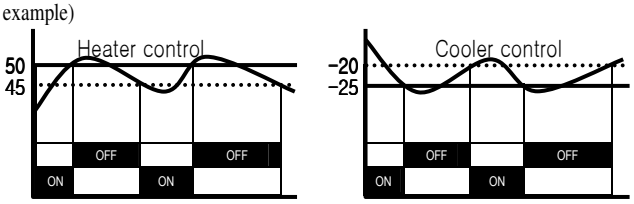
▶You can use a delay timer to protect a compressor.

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.

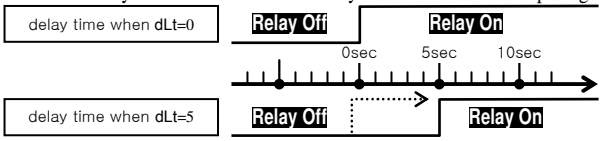
▶After selecting a value using Up or Dn key, press SET key to store the setting in the memory.

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

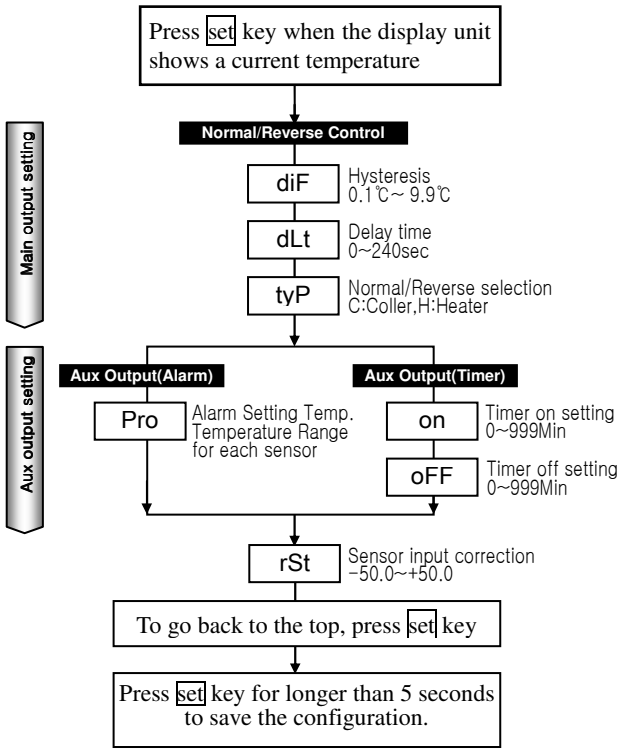
Case: the delay time is 0 second => the relay turns on as soon as output signal arrives.



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

10.User configurable settings

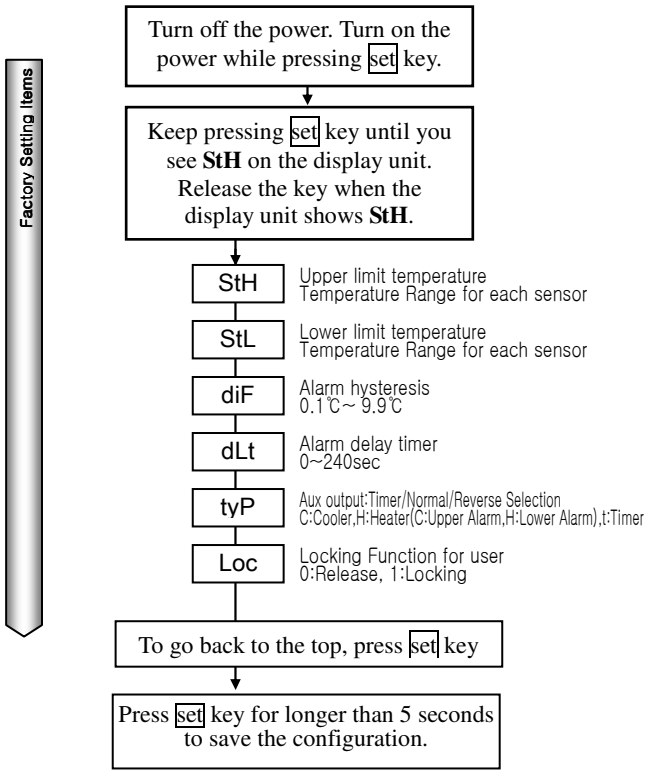
▶The following diagram shows configurable items. Select an item by pressing set key.



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

① 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

	Item	Setting	Description
Factory Setting	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.

② 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.

	Item	Setting	Description
Factory Setting	StH	50.0	The highest value for high temperature is 50 degree.
	StL	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)

① 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

	Item	Setting	Description
Factory Setting	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.

②How 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

	Item	Setting	Description
User Setting	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.

③ 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.

	Item	Setting	Description
Factory Setting	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

④ 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.

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

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

14.Timer setting

① 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

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

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

② 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**.

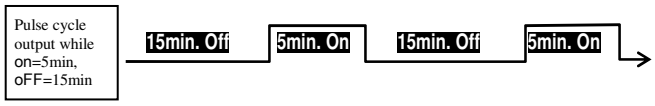
▶Press set key several times to select On. If ON does not appear, the auxiliary output is not selected as the timer output. See 1) How to set the auxiliary relay to the timer output

▶Set the configuration as following using Up and Dn keys

	Item	Setting	Description
User setting	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.

③Description of the pulse cycle



Note: Periodic timer is operated separatory operated from temperature controller

15. Installation

▶Install the unit in an environment where

1) the temperature is relatively constant,
2) there is no corrosive gas,
3) the humidity is normal, and
4) 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.

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