

RTC48 Temperature Controller
Quick Start Guide

03/2013

Important Information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

DANGER
DANGER indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING
WARNING indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

CAUTION
CAUTION indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury and equipment damage.

1. Controller References and Characteristics

The following table shows the controller references with the characteristics of each:

Table with 7 columns: Part Number, Power Supply, Input, Output 1, Output 2, Modbus, Alarm. It lists various RTC48 models and their specifications.

3. Main Specifications

Table with 3 columns: Name, Description. It details technical specifications such as supply voltage, accuracy, control output, alarm, and power consumption.

4. Dimensions and Installation of RTC48

Installation Precautions

WARNING
UNINTENDED EQUIPMENT OPERATION
Do not install the controller where:
- Ambient temperature is outside the range of 0 °C...50 °C (32 °F...122 °F) while in operation.
- Ambient humidity is more than 85% RH while in operation.
- Condensation can occur.
- Corrosive or combustible gases are present.
- There is vibration or shock higher than the specified value.
- Exposure to water oil, chemicals, steam or vapor.
- Exposure to dust, salty air, or air containing high concentrations of metal particles.
- Subject to electromagnetic interference from static electricity, magnetism, and external electromagnetic interference sources.
- Exposure to direct sunshine.
- Heat accumulation due to solar radiation.
Failure to follow these instructions can result in death or serious injury.

WARNING
UNINTENDED EQUIPMENT OPERATION
- Do not allow the openings around the controller to be blocked, heat dissipation ability will be reduced.
- Do not allow the ventilation openings on top of the terminal block to be blocked.
Failure to follow these instructions can result in death or serious injury.

4.1 Dimensions of Controller

Diagram showing the dimensions of the RTC48 controller and its mounting frame. Includes a table for Item (1: Gasket, 2: Mounting frame, 3: Terminal cover) and a note about the terminal cover.

Table with 7 columns: Part Number, Power Supply, Input, Output 1, Output 2, Modbus, Alarm. It lists various RTC48 models and their specifications.

Accessories included : Quick Start Guide 1 copy, Mounting frame 1 piece, Gasket (Front mounted to the RTC48) 1 piece, and 50 Ω Shunt resistor (DC current input)

Accessories sold separately : Terminal cover x 2 pieces (RTCCOV), Communication cable (RTCCBL), and Spare parts (RTCACC)

2. Display of RTC48

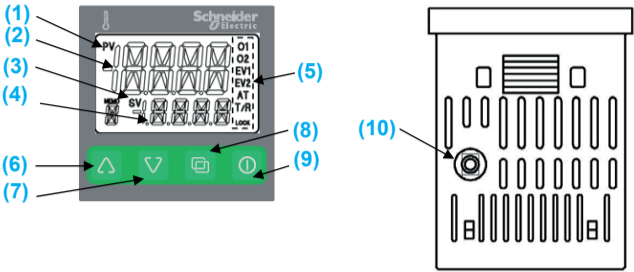


Table with 3 columns: Item, Name, Function. It lists 10 items including PV indicator, PV display, SV indicator, SV display, Action indicators, Increase key, Decrease key, Page key, OUT/OFF key, and Console connector.

4.2 Panel Cut-out and Wiring

CAUTION
UNINTENDED EQUIPMENT OPERATION
To ensure protection against dust and water (IP66):
- Use the appropriate panel cut out.
- Use the appropriate gasket and panel mounting adapter provided.
- Assemble the product according to installation guide.
Failure to follow these instructions can result in minor or moderate injury.

Diagram showing the panel cut-out dimensions and wiring connections for the RTC48 controller.

Lead wire solderless terminal
Use a solderless terminal with an insulation sleeve in which an M3 screw fits as shown below.
The torque should be 0.63 N·m (5.57 lb-in)
φ3.2mm
5.8mm or less

4.3 How to Mount the RTC48

Mount the controller vertically to the flat, rigid panel to ensure it adheres to the Drip-proof/Dust-proof specification (IP66). Mountable panel thickness: 1...5 mm.

When using a terminal cover
When using a terminal cover (sold separately), pass terminal wires numbered 7 to 12 into the holes of the terminal cover.

Diagram showing the steps to mount the RTC48 controller onto a panel, including the use of a gasket, mounting frame, and terminal cover.

Table with 2 columns: Step, Action. It lists the steps for mounting the controller.

4.4 How to Remove the Mounting Adapter and Unit

Diagram showing the steps to remove the mounting adapter and unit from the panel.

Table with 2 columns: Step, Action. It lists the steps for removing the controller.

5. Wiring Diagram of RTC48

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power from the controller.
- Always use a properly rated voltage sensing device to confirm power is off.
- Use only the specified voltage when operating the controller.

Failure to follow these instructions will result in death or serious injury.

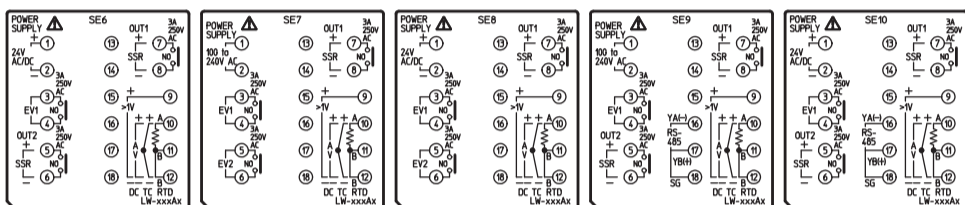
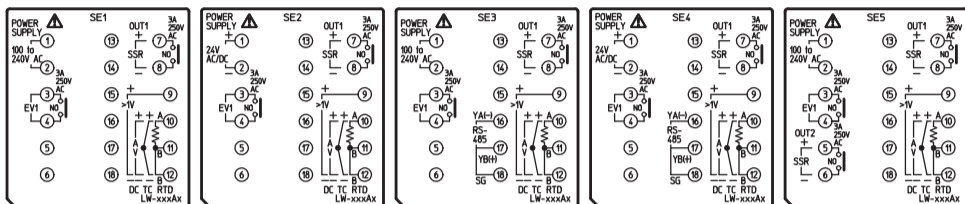
CAUTION

UNINTENDED EQUIPMENT OPERATION

To ensure protection against dust and water (IP66):

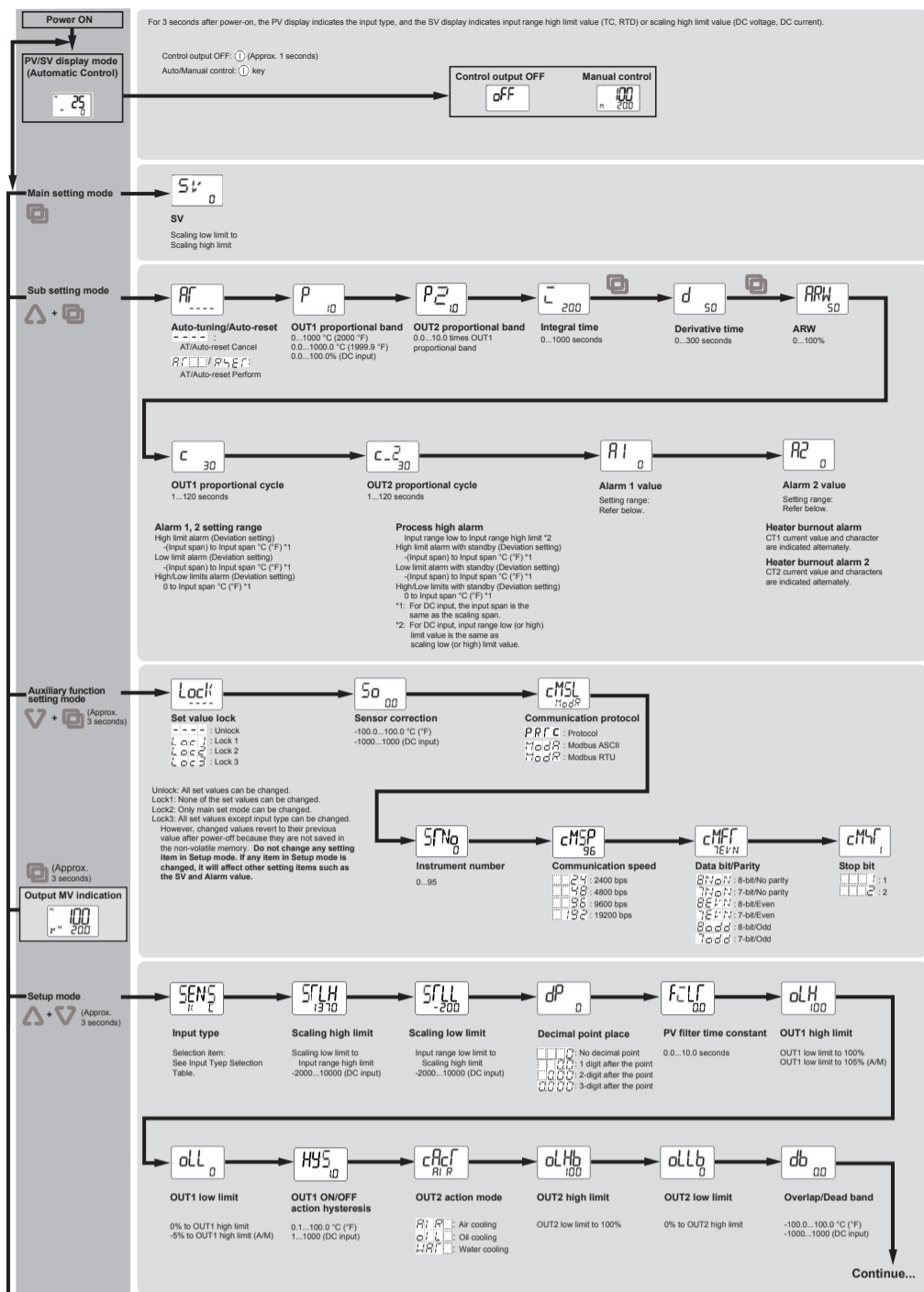
- The terminal block of this instrument is designed to be wired from the left side. The lead wire must be inserted from the left side of the terminal, and fastened with the terminal screw. The torque should be 0.63 N•m (5.57 lb-in).
- This instrument does not have a built-in power switch, circuit breaker, or fuse. It is necessary to install them near the controller. (Recommended fuse: Time-lag fuse, rated voltage 250 Vac, rated current 2A).
- For a 24V ac/dc power source, do not confuse polarity when using direct current (DC).
- Use a thermocouple and compensating lead wire according to the sensor input specifications of this controller.
- Use the 3-wire RTD according to the sensor input specifications of this controller.
- (+) side input terminal number of 0...5 Vdc, 1...5 Vdc, 0...10 Vdc differs from that of 0...1 Vdc.
- (+) side input terminal number of 0...5 Vdc, 1...5 Vdc, 0...10 Vdc: 9
- (+) side input terminal number of 0...1 Vdc: 10.
- When using a relay contact output type, externally use a relay according to the capacity of the load to protect the built-in relay contact.
- When wiring, keep input wires (thermocouple, RTD, and so on.) away from AC sources or load wires to avoid external interference.

Failure to follow these instructions can result in minor or moderate injury.



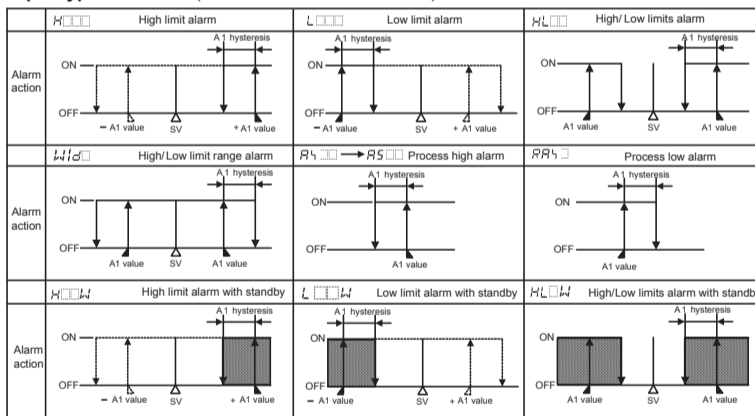
Symbols	Description
EV1	Alarm 1 output
EV2	Alarm 2 output
O2	Control output (OUT2)
O1	Control output (OUT1)
DC	DC current, DC voltage input (For DC voltage input, + side terminal number differs depending on the voltage input.) For DC current input, connect 50 Ω shunt resistor externally.
TC	Thermocouple input
RTD	Resistance temperature detector input
RS485	Serial communication
SSR	Solid State Relay

6. Operation Flowchart



8. Alarm Type Selection

Input type selection (Default oFF: No alarm action)



: Standby functions.

A1 = Alarm 1. For Alarm 2, read A2 for A1.









9. Basic Setting

After the unit is mounted to the control panel and wiring is completed, operate the unit following the procedures below.

Step	Action
1	Power ON RTC48.
2	Set up the unit (Refer to Operation Flowchart). Setup should occur before using the controller, to set the input type (Refer to Input Type Selection), Alarm type (Refer to Alarm Type Selection), Direct/Reverse control, and so on in the Setup mode. If the specification is the same as the default value of RTC48, it is not necessary to set up the controller.
3	Turn the load circuit power ON. Control action starts.










9.1 Changing SV

The following steps explain how to set the SV to 100 °C (212 °F)

Step	Action	Remarks	
1	Press the  key in the PV/SV display mode.	The display unit proceeds to Main Setting mode.	
2	Use the  ,  keys to set the SV.	–	
3	Press the  key to register the SV.	The display unit reverts to PV/SV display mode.	
4	The control starts so as to keep measuring the temperature at 100 °C (212 °F)	–	

9.2 Auto-tuning Perform/Cancel Mode (PID Control)

The following steps explain how to auto-tune the perform/cancel mode.

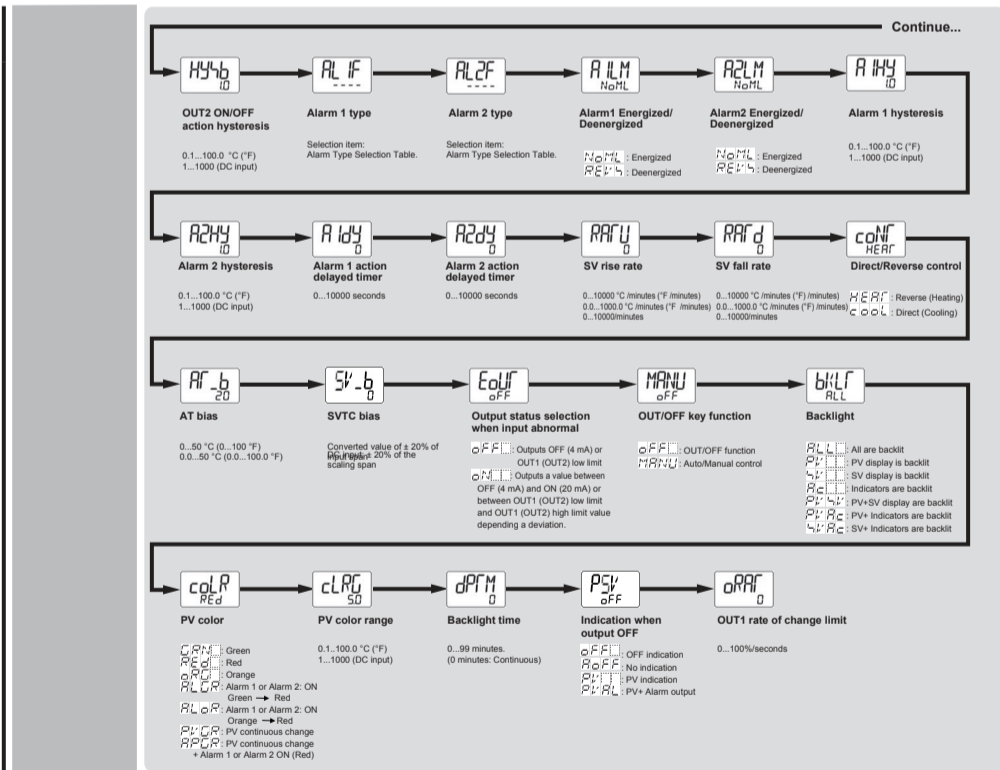
Step	Action	Remarks	
1	Press the  key while pressing the  key in the PV/SV display mode.	The display unit proceeds to Sub setting mode.	
2	Use the  key to select AT Perform or use the  key to select AT oFF.	–	
3	Press the  key to confirm the setting.	The display unit reverts to PV/SV display mode.	
4	While AT is performing, the AT indicator flashes, and it goes off if AT is cancelled.	–	

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- PV display indicates setting item characters, and SV display indicates default value.
- Setting items with dotted lines are optional and they appear when the options are added.
- Key operation

- This means that if the key is pressed, the unit proceeds to the next setting mode.
-  +  Press the  key while pressing the  key.
- (Approx. 3 seconds): Press the key for approx. 3 seconds while holding down the key.
- + (Approx. 3 seconds): Press the key for approx. 3 seconds while holding down the key.

7. Input Type Selection

Input type selection [SENS] (Default: K K , -200...137 °C)

K	K	-200...1370	°C	K	K	-320...2500	°F
K	K	-200.0...400.0	°C	K	K	-320.0...750.0	°F
J	J	-200...1000	°C	J	J	-320...1800	°F
R	R	0...1760	°C	R	R	0...3200	°F
S	S	0...1760	°C	S	S	0...3200	°F
b	B	0...1820	°C	b	B	0...3300	°F
E	E	-200...800	°C	E	E	-320...1500	°F
F	T	-200.0...400.0	°C	F	T	-320.0...750.0	°F
N	N	-200...1300	°C	N	N	-320...2300	°F
PL	PL- II	0...1390	°C	PL	PL- II	0...2500	°F
c	C(W/Re 5-26)	0...2315	°C	c	C(W/Re 5-26)	0...4200	°F
Pt	Pt100	-200.0...850.0	°C	Pt	Pt100	-320.0...1500.0	°F
JPt	JPt100	-200.0...500.0	°C	JPt	JPt100	-320.0...900.0	°F
Pt	Pt100	-200...850	°C	Pt	Pt100	-320...1500	°F
JPt	JPt100	-200...500	°C	JPt	JPt100	-320.0...900.0	°F
420R	4...20 mA	-2000...10000 (Connect 50 Ω shunt resistor)					
020R	0...20 mA						
01V	0...1 Vdc	-2000...10000					
05V	0...5 Vdc						
15V	1...5 Vdc						
010V	0...10 Vdc						