

✗ Please observe all safety considerations for safe and proper product operation to avoid hazards.

✗ ⚠ symbol represents caution due to special circumstances in which hazards may occur.

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**⚠ Warning** Failure to follow these instructions may result in serious injury or death.

**⚠ Caution** Failure to follow these instructions may result in personal injury or product damage.

- 1. Fail-safe device must be installed when using the unit with machinery that may cause serious injury or substantial economic loss, (e.g. nuclear power control, medical equipment, ships, vehicles, railways, aircraft, combustion apparatus, safety equipment, crime/disaster prevention devices, etc.)**  
Failure to follow this instruction may result in personal injury, fire or economic loss.
- 2. Do not use the unit in the place where flammable/explosive/corrosive gas, high humidity, direct sunlight, radiant heat, vibration, impact, or salinity may be present.**  
Failure to follow this instruction may result in explosion or fire.
- 3. Do not connect, repair, or inspect the unit while connected to a power source.**  
Failure to follow this instruction may result in electric shock or malfunction.
- 4. Do not disassemble or modify the unit.**  
Failure to follow this instruction may result in fire or electric shock.

- 1. Use the unit within the rated specifications.**  
Failure to follow this instruction may result in fire or product damage.
- 2. Do not use a load over the range of rated relay specification.**  
Failure to follow this instruction may result in fire, relay broken, contact melt, insulation failure or contact failure.
- 3. Use a dry cloth to clean the unit, and do not use water or organic solvent.**  
Failure to follow this instruction may result in fire or electric shock.
- 4. Keep metal chip, dust, and wire residue from flowing into the unit.**  
Failure to follow this instruction may result in fire or product damage.
- 5. Check the polarity of the contact before wiring the unit.**  
Failure to follow this instruction may result in product damage by a fire.

**AL1 OUT**  
250VAC 1A 1a  
30VDC 3A 1a  
RESISTIVE LOAD

**AL2 OUT**  
250VAC 1A 1a  
30VDC 3A 1a  
RESISTIVE LOAD

**SOURCE**  
24VDC 3W

\* The above specifications are subject to change and some models may be discontinued without notice.  
\* Be sure to follow cautions written in the instruction manual and the technical descriptions (catalog, homepage).

SS-48   2   2   - 100   - 1   - D   - S   - 080   - 316  
 ①   ②   ③   ④   ⑤   ⑥   ⑦   ⑧   ⑨  
 - 100   /   2000   - 150   - PT1/2  
           ⑩           ⑪           ⑫           ⑬

※Specifications of temperature sensor is manufacturable by customer's order.

Series	SS-4800
Power supply	24 VDC≒
Allowable voltage range	90 to 110% of rated voltage
Power consumption	Max. 3W
Display method	4digit 7 Segment LED Display (character height : 15mm)
Input type	RTD TC
	DPT100Ω(allowable line resistance: max. 5Ω) K(CA), J(IC), T(CC), R(PR), S(PR)
Display accuracy ×1	RTD TC
	At room temperature(23±5°C) : (PV ±0.5% or ±1°C, select the higher one) ±1 digit Out of room temperature : (PV ±0.5% or ±2°C, select the higher one) ±1 digit According to standard JIS thermocouple
Alarm output	AL1, AL2 relay output: 250VAC~ 1A 1a, 30VDC≒ 3A
Alarm output hysteresis	1 to 100 °C (P <sub>LRH</sub> , J <sub>LRH</sub> , E <sub>LRH</sub> , P <sub>PR</sub> , S <sub>PR</sub> , dP <sub>EH</sub> ) 0.1 to 50.0 °C (P <sub>CLL</sub> , J <sub>CLL</sub> , E <sub>CLL</sub> , dP <sub>EL</sub> )
Sampling cycle	100ms
Dielectric voltage	1,000 VAC 50/60 Hz for 1 min.
Vibration	0.75 mm amplitude at frequency of 5 to 55Hz (for 1 min.) in each of X, Y, Z directions for 2 hours
Relay life cycle	Mechanical Min. 5,000,000 operations Electrical Min. 200,000 operations (250VAC 1A at resistive load)
Insulation resistance	Min. 100 MΩ (at 500VDC megger)
Noise resistance	±0.5kV the square wave noise (pulse width: 1μs) by the noise simulator
Memory retention	Approx. 10 years (non-volatile semiconductor memory type)
Environment	Ambient temp. -10 to 50 °C, storage: -20 to 60 °C Ambient humi. 35 to 85%RH, storage: 35 to 85%RH
Unit weight	Approx. 1 kg

※1. ● At room temperature (23±5 °C)  
: Thermocouples R, S type, below 200 °C: (PV ±0.5% or ±3 °C, select the higher one) ±1 digit  
over 200 °C: (PV ±0.5% or ±2 °C, select the higher one) ±1 digit  
○ Out of room temperature: Thermocouples R, S type, (PV ±1.0 % or ±5 °C, select the higher one) ±1 digit  
※Environment resistance is rated at no freezing or condensation.

•RUN mode: Displays present temperature (PV).  
 •Parameter setting mode: Displays parameter and set value.

- Alarm operation indicator  
 : Turns ON when AL1, AL2 alarm operating.
- Temperature unit (°C/°F) indicator  
 : Displays temperature unit set at temperature unit [Unit] in parameter 2 group.
- [Left Arrow], [Checkmark], [Right Arrow] keys: Used to change SV, move digits, or increase/decrease digits.
- [MODE] key: Used to enter parameter groups, return RUN mode, move the other parameter, or save SV.
- Temperature sensor part
- Terminal box: Remove this cover and wire it.

[illegible]

D(Connection)	a	b	c	d(Ø)
PF1/2	20	17	49	6.4, 8
NPT & PT1/2	18		47	

※1: L is customer specifications.  
 ※2: Ambient temperature of connection part  
 (sensor upside) should be max. 120°C .  
 ※() is proximity size.

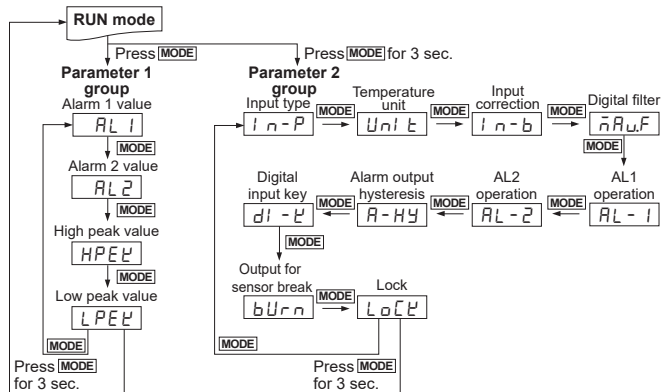
Input sensor		Display	Input range(°C)	Input range(°F)
Thermocouple	K(CA)	ℰℰRH	-50 to 1200	-58 to 2192
		ℰℰRL	-50.0 to 999.9	-58.0 to 999.9
	J(IC)	ℰℰH	-30 to 800	-22 to 1472
		ℰℰL	-30.0 to 800.0	-22.0 to 999.9
	T(CC)	ℰℰH	-50 to 400	-58 to 752
		ℰℰL	-50.0 to 400.0	-58.0 to 752.0
	R(PR)	ℰℰℰ	0 to 1700	32 to 3092
	S(PR)	ℰℰℰ	0 to 1700	32 to 3092
RTD	DPT100Q	ℰℰℰH	-100 to 400	-148 to 752
		ℰℰL	-100.0 to 400.0	-148.0 to 752.0

※Alarm temperature is able to set within the range.  
 ※Input sensor [I n-P] in parameter 1 group displays only the ordering input sensor.  
 (ex. If the ordered input sensor is DPT100Q, input sensor [I n-P] displays dP t.H and dP t.L.)



## Parameter Groups

### 1. Parameters



※After entering parameter group, press the [MODE] key for 3 sec. to save SV and it returns to RUN mode.  
 ※When there is no additional key operation in 30 sec., it returns to RUN mode.  
 ※When returning to RUN mode within 1 sec., press the [MODE] key to move the first parameter of previous parameter group.

### 2. Parameter 1 group [MODE] key: Moves/Saves setting items, [K] key: Moves digits, [V] or [F] key: Changes SV.

Setting item	Parameter	Descriptions
Alarm 1 value	AL1	• Set range: Within temperature range ※When alarm mode [AL-1, AL-2] in parameter 2 group is no alarm [AL-0], or sensor break alarm [SbR], these parameters are not displayed.
Alarm 2 value	AL2	
High peak value	HPEV	• Display range: Within temperature range by input sensor ※When changing power, input type, temperature unit, monitoring starts after value 2 sec. If max./min. value is out of the input range, it displays HHHH, LLLL. ※Press the [V]/[F] keys at the same time, the display value flashes twice and it initialized as the current input value and it moves to the next parameter.
Low peak value	LPEV	

### 3. Parameter 2 group [MODE] key: Moves/Saves setting items, [K] key: Moves digits, [V] or [F] key: Changes SV.

Setting item	Parameter	Descriptions
Input type	IN-P	Refer to [Input type and range] ※When changing input sensor, IN-b, AL1, AL2 parameters SVs are initialized.
Temperature unit	UNIT	°C ↔ °F ※When changing the temperature unit, IN-b, AL1, AL2 parameters SVs are initialized.
Input correction	IN-b	• Set range: -999 to 999°C/F (-199.9 to 999.9°C/F)
Digital filter	nARUF	• Set range: 0.1 to 120.0 sec.
AL1 operation	AL-1	For more information, refer to '1. Alarm' of [Function]. ※Black digits: flash, gray digits: fixed ※When changing AL1, AL2 operation, AL1, AL2 parameters SVs are initialized.
AL2 operation	AL-2	
Alarm output hysteresis	A-HY	• Set range: 1 to 100°C/F (0.1 to 50.0°C/F) ※When alarm mode [AL-1, AL-2] is no alarm [AL-0], sensor break alarm [SbR], this parameter is not displayed.
Digital input key	dl - V	Hold ↔ Error ↔ OFF ↔ ALRE ※Press the [V]/[F] keys for 3 sec. in RUN mode, it operates the set function. For more information, refer to '5. Digital input key' of [Function].
Output for sensor break	bUr n	ON ↔ OFF • ON: Alarm output is ON, when AL-1, AL-2 is set as high-limit alarm [AL1]. • OFF: Alarm output turns ON, when AL-1, AL-2 is set as low-limit alarm [AL2].
Lock	LoCk	OFF ↔ LoC1 ↔ LoC2 • LoC1: Locks parameter 2 group • LoC2: Locks parameter 1, 2 groups ※When lock is set, checking parameter SV is available.

## Function

### 1. Alarm [AL-1, AL-2]

This product has 2 alarms to operate individually when the value is too high or low. Alarm function is set by the combination of alarm operation and alarm option. To clear alarm, use digital input function (setting dl - V as ALRE) or turn the power OFF and ON.

Mode	Name	Alarm operation	Description
AL-0	-	-	No alarm operation
AL1	High limit alarm	OFF → H → ON High limit alarm value: 800°C PV	PV ≥ alarm temperature, alarm is ON
AL2	Low limit alarm	ON → H → OFF Low limit alarm PV value: 200°C	PV ≤ alarm temperature, alarm is ON
SbR	Sensor break alarm	-	It will be ON when it detects sensor disconnection. Sensor break alarm does not have alarm option.

※ H: Alarm output hysteresis [A-HY]

### 2) Alarm option

Mode	Name	Description
AL1A	Standard alarm	If it is an alarm condition, alarm output is ON. Unless an alarm condition, alarm output is OFF
AL1b	Alarm latch	If it is an alarm condition, alarm output is ON. Before clearing the alarm, an ON condition is latched. (Holding the alarm output)
AL1C	Standby sequence 1	First alarm condition is ignored. From the second alarm condition, standard alarm operates. When power is ON and it is an alarm condition, it is ignored. From the second alarm condition, standard alarm operates.
AL1d	Alarm latch and standby sequence 1	If it is an alarm condition, it operates both alarm latch and standby sequence. When power is ON and it is an alarm condition, it is ignored. From the second alarm condition, alarm latch operates.
AL1E	Standby sequence 2	First alarm condition is ignored. From the second alarm condition, standard alarm operates. When standby sequence is repeated and it is an alarm condition, alarm output does not run. After clearing alarm condition, standard alarm operates.
AL1F	Alarm latch and standby sequence 2	Basic operation is same as alarm latch and standby sequence 1. It operates not only by power ON/OFF, but also changing alarm value and option. When standby sequence is repeated and it is an alarm condition, alarm output does not run. After clearing alarm condition, alarm latch operates.

※Condition of re-applied standby sequence for standby sequence 1, alarm latch and standby sequence 1: Power ON

※Condition of re-applied standby sequence for standby sequence 2, alarm latch and standby sequence 2: Power ON, changing alarm temperature [AL1, AL2], alarm mode and option [AL-1, AL-2]

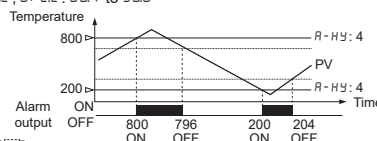
### 2. Alarm output hysteresis [A-HY]

Set the interval of ON/OFF alarm output.

Set range is applied to AL1 and AL2 and it is as below.

- Set range: ECRH, J1CH, ECLH, rPr, SP, dPEH: 00.1 to 100  
 ECR L, J1CL, ECL L, dPE L: 00.1 to 50.0

- Ex) A-HY: 4,  
 high limit alarm value: 800,  
 low limit alarm value: 200



### 3. Sensor break alarm [SbR]

When sensor is not connected or the cable which connects sensor is disconnected, alarm output is ON. You can check the break by a buzzer or others with alarm output contact. This AL1/AL2 operation [AL-1, AL-2] are available to set for standard alarm [SbRA] or alarm latch [SbRb].

### 4. Input correction [IN-b]

Even though this indicator does not have error, there may be constant error when inputting temperature. This function is to add or subtract correction value for the measured value.

Ex) When actual temperature is 80°C but the indicator displays 78°C, set [IN-b] as 002.

The indicator displays 80°C.

※When input correction value is out of the rated range, it displays HHHH or LLLL.

## 5. Digital input key [dl - V]

With front digital input keys (V/F keys for 3 sec.), it operates one of 3 functions as below table.

Function	Operation
ALRE	Alarm clear When alarm is ON in RUN mode, it clears alarm forcibly. (It applies only for alarm latch, alarm latch and standby sequence 1/2 options.) Alarm clear operates only when the temperature is out of the alarm temperature range. After clearing by digital input key, alarm operates its option normally.
HoLd	Display Hold Temporarily indicated value is stopped in order to confirm indicated value in unstable input.
Error	Zero-point adjustment Set preset display value as 0. This function is related with input correction [IN-b]. When executing zero adjustment function in display value as 4, input correction value IN-b is set -4 automatically. Zero setting range is -999 to 999/-199.9 to 999.9. If setting is out of the range, [Error] flashes twice and returns to the previous display.

## 6. Digital filter [nARUF]

This function is to stabilize display value which fluctuates by noise of input signal and rapid change of input signal. When setting input digital filter as 0.4, it applies digital filter to the input values during 0.4 sec. The display value is different by actual input value.

## 7. Error display

Display	Descriptions	Troubleshooting
bUr n	Flashes when the input sensor is broken or not connected.	Check temperature sensor connection.
HHHH	Flashes when measured sensor input is higher than the temperature range.	When input is moved within the temperature range, it is cleared.
LLLL	Flashes when measured sensor input is lower than the temperature range.	
Error	Flashes twice when error occurs during setting, and it moves to previous parameter.	Check set conditions and re-set it.

## Factory Default

### •Parameter 1 group •Parameter 2 group

Parameter	Default	Parameter	Default	Parameter	Default	Parameter	Default
AL1※1	400.0	IN-P※1	dPE L	AL-1	AL1A	bUr n	oFF
AL2※1	400.0	UNIT	°C	AL-2	AL2A	LoCk	oFF
HPEV	----	IN-b	000.0	A-HY	00.1		
LPEV	----	nARUF	000.1	dl - V	HoLd		

※1. Factory default is different by the order of input sensor.

## Caution during Use

- Follow instructions in 'Cautions during Use'. Otherwise, It may cause unexpected accidents.
- 24VDC power supply should be insulated and limited voltage/current or Class 2, SELV power supply device.
- The connection of this unit should be separated from the power line and high voltage line in order to prevent inductive noise.
- Do not use this unit near the high frequency instruments
- Switch or circuit breaker for supplying or cutting off the power should be installed nearby users for convenient control.
- This unit may be used in the following environments.
  - Indoor / Outdoor (in the environment condition rated in 'Specifications')
  - Altitude max. 2,000 m
  - Pollution Degree 2
  - Installation Category II