INSTRUCTION MANUAL (EXCERPT) **Digital Indicating Controller** **ACS-13A-□/A**

(For Use with the Infrared Temperature Sensor)

No.ACS11AE3 2019.11

The digital indicating controller ACS-13A-□/A is an exclusive instrument for use with the infrared temperature sensor RD-500 series or RD-715-HA. For detailed usage and options, refer to the full Instruction manual for the ACS-13A (standard product). Please download the full Instruction manual for ACS-13A at http://www.shinko-technos.co.jp/e/
Support & Downloads → Downloads → Manuals
The ACS-13A (standard product) has no infrared emissivity setting function, and its input types are different.

Thank you for purchasing our digital indicating controller ACS-13A-□/A. This manual contains instructions for the mounting, functions, operations and notes when operating the ACS-13A-□/A. To prevent accidents arising from the misuse of this controller, please ensure the operator receives this manual.

Safety Precautions (Be sure to read these precautions before using our products.)

The safety precautions are classified into categories: "Warning" and "Caution".

⚠ **Warning**: Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.

⚠ **Caution**: Procedures which may lead to dangerous conditions and cause superficial to medium injury or physical damage or may degrade or damage the product, if not carried out properly.

⚠ Warning

- To prevent an electrical shock or fire, only Shinko or other qualified service personnel may handle the inner assembly.
- To prevent an electrical shock, fire or damage to the instrument, parts replacement may only be undertaken by Shinko or other qualified service personnel.

⚠ Safety Precautions

- To ensure safe and correct use, thoroughly read and understand this manual before using this instrument.
- This instrument is intended to be used for industrial machinery, machine tools and measuring equipment. Verify correct usage after purpose-of-use consultation with our agency or main office. (Never use this instrument for medical purposes with which human lives are involved.)
- External protection devices such as protective equipment against excessive temperature rise, etc. must be installed, as malfunction of this product could result in serious damage to the system or injury to personnel. Proper periodic maintenance is also required.
- This instrument must be used under the conditions and environment described in this manual. Shinko Technos Co., Ltd. does not accept liability for any injury, loss of life or damage occurring due to the instrument being used under conditions not otherwise stated in this manual.

⚠ Caution with Respect to Export Trade Control Ordinance

To avoid this instrument from being used as a component in, or as being utilized in the manufacture of weapons of mass destruction (i.e. military applications, military equipment, etc.), please investigate the end users and the final use of this instrument. In the case of resale, ensure that this instrument is not illegally exported.

1. Model

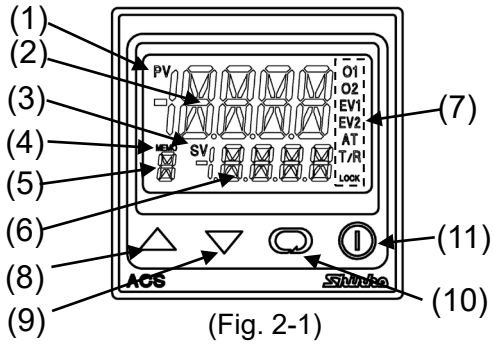
ACS – 1 3 A – □ / A □ , □ □ □								Series name: ACS-13A-□/A (W48 x H48 x D62 mm)
Control action	3							PID
A1		A						Alarm type can be selected by keypad. *1
Control output (OUT1)			R					Relay contact: 1a
			S					Non-contact voltage (for SSR drive): 12 V DC±15%
			A					Direct current: 4 to 20 mA DC
Input				A				Direct current: 4 to 20 mA DC *2
Power supply voltage								100 to 240 V AC (standard)
					1			24 V AC/DC *3
Option (Multiple options are selectable.)						A2		Alarm 2 output (A2) *1
						W(20A)	Heater burnout alarm	CT rated current: 20 A (Single-phase)
						W(50A)		CT rated current: 50 A (Single-phase)
						W3(20A)		CT rated current: 20 A (3-phase)
						W3(50A)		CT rated current: 50 A (3-phase)
						DR	Heating/Cooling control, Control output (OUT2)	Relay contact: 1a
						DS		Non-contact voltage:12 V DC±15%
						C5	Serial communication (RS-485)	
						SM	Set value memory external selection	

*1 Alarm types (9 types and No alarm action) and Energized/De-energized can be selected by keypad.

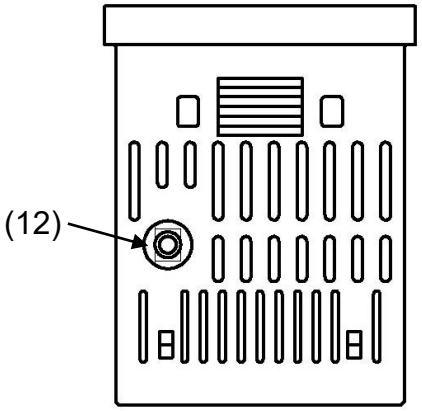
2 Infrared temperature sensor RD-500 series or RD-715-HA is used for an input. Temperature range for the sensor (0.0 to 250.0℃, 0.0 to 500.0℃, 32.0 to 482.0℉, 32.0 to 932.0℉*) is selectable by keypad.
* For the RD-715-HA, ranges 0.0 to 500.0℃ and 32.0 to 932.0℉ are available.

*3 Power supply voltage 100 to 240 V AC is standard. When ordering 24 V AC/DC, enter "1" after the input code.

2. Names and Functions



(Fig. 2-1)



(Fig. 2-2)

(1) **PV indicator**: Lights up when PV is indicated in PV/SV Display Mode.
(2) **PV Display**: Indicates the PV (process variable) or setting characters during setting mode.
(3) **SV indicator**: Lights up when SV is indicated in PV/SV Display Mode.
(4) **MEMO indicator**: Lights up when the Set value memory external selection (SM option) is ordered.
(5) **MEMO display**: Indicates the set value memory number.
(6) **SV Display**: Indicates the SV (desired value), MV (manipulated variable) or each set value during setting mode.
(7) **Action indicators**
O1 (OUT1): Lights up when control output (OUT1) is ON.
For Direct current output type, flashes corresponding to the MV in 250 ms cycles.
O2 (OUT2): Lights up when control output (OUT2) (D□ option) is ON.
EV1: Lights up when Alarm 1 output is ON.
EV2: Lights up when Alarm 2 output (A2 option) is ON or when Heater burnout alarm (W, W3 option) is ON.
AT: Flashes while AT (auto-tuning) or auto-reset is performing.
T/R: Lights up during Serial communication (C5 option) (TX output).
LOCK: Lights up when Lock 1, Lock 2 or Lock 3 is selected.
(8) △ **UP key**: Increases the numeric value.
(9) ▽ **DOWN key**: Decreases the numeric value.
(10) ◯ **Mode key**: Switches the setting mode, or registers the set value. To register the set value (or selection), press this key.
(11) ⏻ **OUT/OFF key**: Switches control output ON/OFF or Auto/Manual control.
(12) **Console connector**: By connecting to the USB communication cable (CMA, sold separately), the following operations can be conducted from an external computer using the Console software SWS-ACS01M.
①Reading and setting of SV, PID, various set values ②Reading of PV and action status ③Function change

3. Mounting to the Control Panel

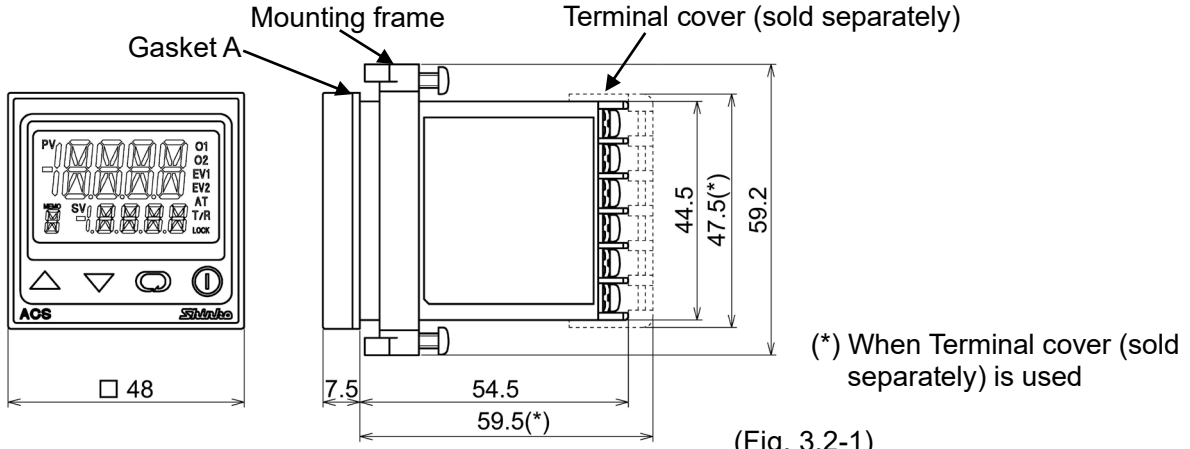
3.1 Site Selection

⚠ Caution

Use within the following temperature and humidity ranges.
Temperature: 0 to 50℃ (32 to 122℉), Humidity: 35 to 85 %RH (No icing and non-condensing)
If this unit is installed through the face of a control panel, the ambient temperature of the unit - not the ambient temperature of the control panel - must be kept under 50℃. Otherwise the life of electronic parts (especially electrolytic capacitors) of this unit will be shortened.

This instrument is intended to be used under the following environmental conditions (IEC61010-1): Overvoltage category Ⅱ, Pollution degree 2
Ensure the mounting location corresponds to the following conditions:
- A minimum of dust, and an absence of corrosive gases
- No flammable, explosive gases
- Few mechanical vibrations or shocks
- No exposure to direct sunlight, an ambient temperature of 0 to 50℃ (32 to 122℉) that does not change rapidly, and no icing
- An ambient non-condensing humidity of 35 to 85 %RH
- No large capacity electromagnetic switches or cables through which large current is flowing
- No water, oil or chemicals or the vapors of these substances can come into direct contact with the controller

3.2 External Dimensions (Scale: mm)



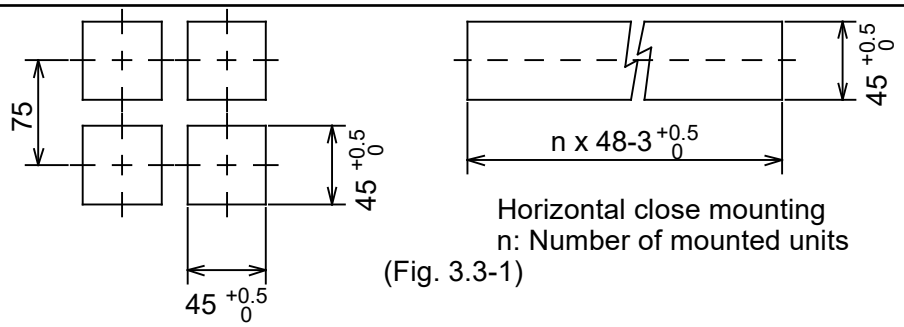
(*) When Terminal cover (sold separately) is used

(Fig. 3.2-1)

3.3 Panel Cutout (Scale: mm)

⚠ Caution

If horizontal close mounting is used for the controller, IP66 specifications (Drip-proof/Dust-proof) may be compromised, and all warranties will be invalidated.



Horizontal close mounting
n: Number of mounted units

(Fig. 3.3-1)

3.4 Mounting to and Removal from the Control Panel

3.4.1 How to Mount the ACS-13A-□/A

Mount the controller vertically to the flat, rigid panel to ensure it adheres to the Drip-proof/Dust-proof specifications (IP66).

Mountable panel thickness: 1 to 5 mm

(1) Insert the controller from the front side of the panel. (Fig.3.4.1-1)

(2) Insert the mounting frame until it comes into contact with the panel, and fasten with screws. Tighten screws with one rotation upon the screw tips touching the panel. (Fig.3.4.1-2) The torque is 0.05 to 0.06 N•m.

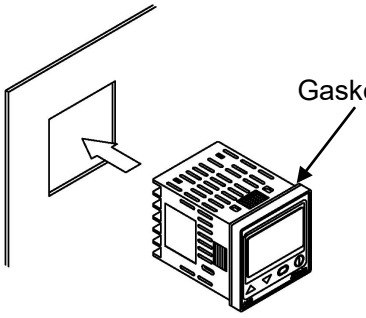
3.4.2 How to Remove the Mounting Frame and Unit (Fig. 3.4.2-1)

(1) Turn the power to the unit OFF, and disconnect all wires before removing the mounting frame.

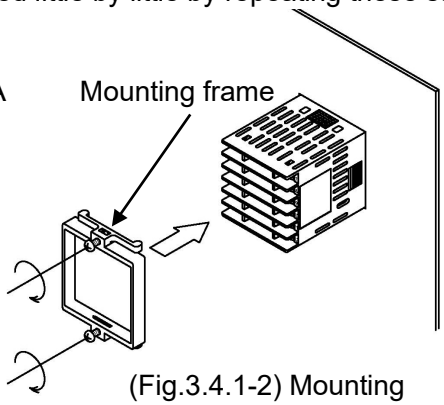
(2) Insert a flat blade screwdriver between the mounting (screw) frame and unit ①.

(3) Slowly push the frame upward using the screwdriver ②, while pushing the unit toward the panel ③.

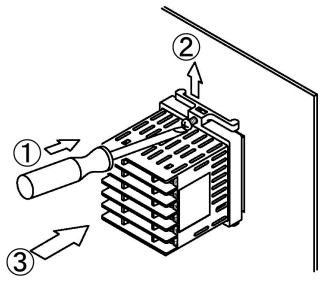
(4) Repeat step (2) and slowly push the frame downward using the screwdriver for the other side. The frame can be removed little by little by repeating these steps.



(Fig.3.4.1-1) Mounting



(Fig.3.4.1-2) Mounting



(Fig.3.4.2-1) Removal

4. Wiring

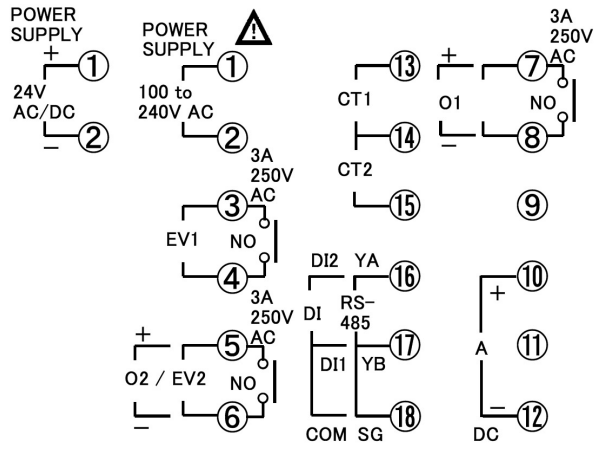
⚠ Warning

Turn the power supply to the instrument off before wiring or checking. Working on or touching the terminal with the power switched on may result in severe injury or death due to electrical shock.

⚠ Caution

- **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.**
- **This instrument does not have a built-in power switch, circuit breaker and fuse. It is necessary to install a power switch, circuit breaker and fuse near the controller. (Recommended fuse: Time-lag fuse, rated voltage 250 V AC, rated current 2 A)**
- **For a 24 V AC/DC power source, do not confuse polarity when using direct current (DC).**
- **For the input, use the infrared temperature sensor RD-500 series or RD-715-HA.**
- **When using a relay contact output type, externally use a relay according to the capacity of the load.**
- **When wiring, keep input wires away from AC sources or load wires.**

4.1 Terminal Arrangement



(Fig. 4.1-1)

- EV1: Alarm 1 output
- EV2: Alarm 2 output (A2 option) or Heater burnout alarm output (W, W3 option)
- O2: Control output (OUT2) (D□ option)
- O1: Control output (OUT1)
- DC: Direct current input (Infrared temperature sensor RD-500 series, or RD-715-HA)
- CT1: Current transformer input 1 (W, W3 option)
- CT2: Current transformer input 2 (W3 option)
- DI: Contact input (SM option)
- RS-485: Serial communication (C5 option)

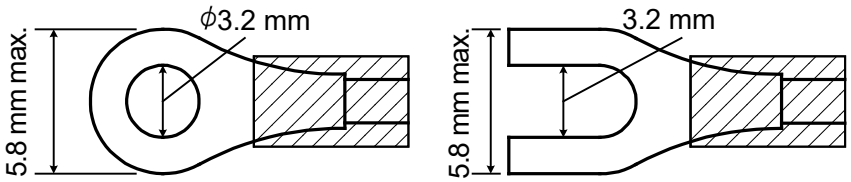
4.2 Lead Wire Solderless Terminal

Use a solderless terminal with an insulation sleeve in which an M3 screw fits as shown below. (Fig. 4.2-1)
The torque should be 0.63 N•m.

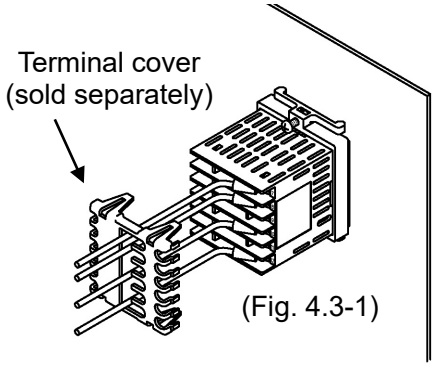
4.3 When Using a Terminal Cover

When using a terminal cover (sold separately), pass terminal wires numbered 7 to 12 into the holes of the terminal cover. (Fig. 4.3-1)

Solderless terminal	Manufacturer	Model	Tightening torque
Y-type	Nichifu Terminal Industries CO., LTD.	TMEV1.25Y-3	0.63 N•m
	Japan Solderless Terminal MFG CO., LTD.	VD1.25-B3A	
Ring-type	Nichifu Terminal Industries CO., LTD.	TMEV1.25-3	
	Japan Solderless Terminal MFG CO., LTD.	V1.25-3	



(Fig. 4.2-1)



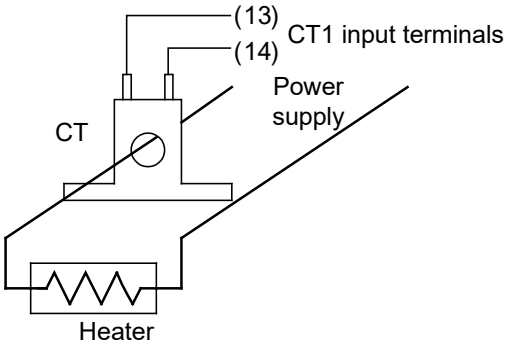
(Fig. 4.3-1)

4.4 Heater Burnout Alarm (W, W3 option) Wiring

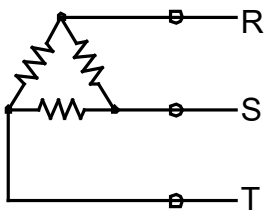
This alarm is not usable for detecting heater current under phase control.

Use the CT (current transformer) provided, and pass one lead wire of the heater circuit into the hole of the CT. (Fig. 4.4-1). When wiring, keep the CT wire away from AC sources or load wires to avoid external interference.

In the case of 3-phase (W3 option), pass any 2 lead wires of R, S, T into the CT, and connect them to CT1 (13, 14) and CT2 terminals (14, 15). (Fig. 4.4-2)



(Fig. 4.4-1)



Pass any 2 wires of R, S and T into CT.

(Fig. 4.4-2)

5. Operation Flowchart

Abbreviation: Temp.: Temperature

Power ON

For 3 seconds after power-on, the PV Display indicates the temperature range of the infrared temperature sensor, and the SV Display indicates temperature range high limit value.

PV/SV Display Mode (Automatic control)

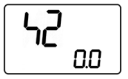
Control output OFF: ⓘ (Approx. 1 sec)
Auto/Manual control: ⓘ key

Control output OFF

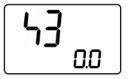
Manual control

Main Setting Mode

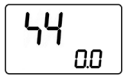
SV
Temp. range low limit to Temp. range high limit



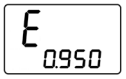
SV2
Temp. range low limit to Temp. range high limit



SV3
Temp. range low limit to Temp. range high limit

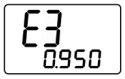


SV4
Temp. range low limit to Temp. range high limit

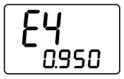


Infrared emissivity
0.200 to 1.000

Infrared emissivity 2
0.200 to 1.000



Infrared emissivity 3
0.200 to 1.000



Infrared emissivity 4
0.200 to 1.000

Infrared emissivity setting: Setting characters and PV are indicated alternately. (Same as Infrared emissivity 2-4)

(Approx. 3 sec)

Output MV indication

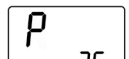
Heater burnout alarm:
CT1 current value and character H are indicated alternately.
Setting the value to 0.0 disables the alarm.

Heater burnout alarm 2:
CT2 current value and characters H2 are indicated alternately.
Setting the value to 0.0 disables the alarm.

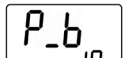
Sub Setting Mode

△ + ⟳

Auto-tuning/Auto-reset
- - - - : AT/Auto-reset Cancel
AT□□/RSET: AT/Auto-reset Perform

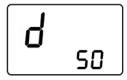


OUT1 proportional band
0.0 to 100.0%



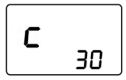
OUT2 proportional band
0.0 to 10.0 times (Multiplied value of OUT1 proportional band

Integral time
0 to 1000 seconds

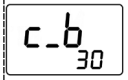


Derivative time
0 to 300 seconds

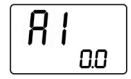
ARW
0 to 100%



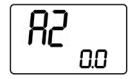
OUT1 proportional cycle
1 to 120 seconds
30 sec (R/M), 3 sec (S/M)



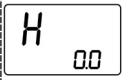
OUT2 proportional cycle
1 to 120 seconds
30 sec (DR), 3 sec (DS)



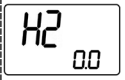
Alarm 1 value
Setting range: See Table 5-1.



Alarm 2 value
Setting range: See Table 5-1.



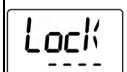
Heater burnout alarm value
0.0 to 20.0 A (Rated current: 20 A)
0.0 to 50.0 A (Rated current: 50 A)



Heater burnout alarm 2 value
0.0 to 20.0 A (Rated current: 20 A)
0.0 to 50.0 A (Rated current: 50 A)

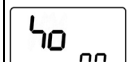
Auxiliary Function Setting Mode

▽ + ⟳ (Approx. 3 sec)

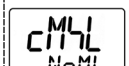


Set value lock
- - - - : Unlock
Loc1 : Lock 1
Loc2 : Lock 2
Loc3 : Lock 3

Unlock: All set values can be changed.
Lock1: None of the set values can be changed.
Lock2: Only main set mode can be changed.
Lock3: All set values except Temperature range can be changed. However, changed values revert to their previous value after power-off because they are not saved in the non-volatile memory. **Do not change any setting item in Setup mode. If any item in Setup mode is changed, it will affect other setting items such as the SV and Alarm value.**



Sensor correction
-100.0 to 100.0℃ (℉)



Communication protocol
NoML : Shinko protocol
ModA : MODBUS ASCII
ModR : MODBUS RTU

Instrument number
0 to 95

Communication speed
□□24 : 2400 bps
□□48 : 4800 bps
□□96 : 9600 bps
□192 : 19200 bps

Data bit/Parity
8NoN : 8-bits/No parity
7NoN : 7-bits/No parity
8EvN : 8-bits/Even
7EvN : 7-bits/Even
8odd : 8-bits/Odd
7odd : 7-bits/Odd

Stop bit
□□□1 : 1
□□□2 : 2

Characters Used in this Manual:

Indication	-1	0	1	2	3	4	5	6	7	8	9	℃	℉
Number, ℃/℉	-1	0	1	2	3	4	5	6	7	8	9	℃	℉
Indication	A	b	c	d	E	F	G	H	I	J	K	L	M
Alphabet	A	B	C	D	E	F	G	H	I	J	K	L	M
Indication	N	o	P	Q	R	S	T	U	V	W	X	Y	Z
Alphabet	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

[Infrared Emissivity Setting]

If the surface temperature and controller indication value do not match in the high temperature range, control can be performed by adjusting the temperature to the desired level via the infrared emissivity setting.

• Setting range: 0.200 to 1.000 (Factory default: 0.900)

[Emissivity]

Emissivity is the ratio between the energy amount radiated from the black body (or an object which has a perfect radiation) at a certain temperature and the energy amount radiated from any object at the same temperature. Therefore, the easier the infrared ray is to be radiated, the higher the emissivity value becomes. The more difficult the infrared ray is to be radiated, the lower the emissivity value.

For objects such as organic substances or ceramics, emissivity is so high that high accuracy measurement and control are possible. On the contrary, for the highly lustrous metals or other objects with low emissivity, its emissivity is greatly affected by reflection. In this case, by attaching black body tape to the surface of those objects, the emissivity can be increased, from which high accuracy measurement and control can be derived.

Emissivity of Main Objects

Object	Emissivity	Object	Emissivity	Object	Emissivity
Concrete	0.94	Brick (Red)	0.93 to 0.96	Painted lacquer	0.80 to 0.95
Water	0.92 to 0.96	Fabric (Black)	0.98	Painted lacquer (Lusterless black)	0.97
Ice	0.92 to 0.98	Human skin	0.98	Rubber (Black)	0.94
Paper	0.70 to 0.94	Iron oxide	0.78 to 0.82	Plastic	0.85

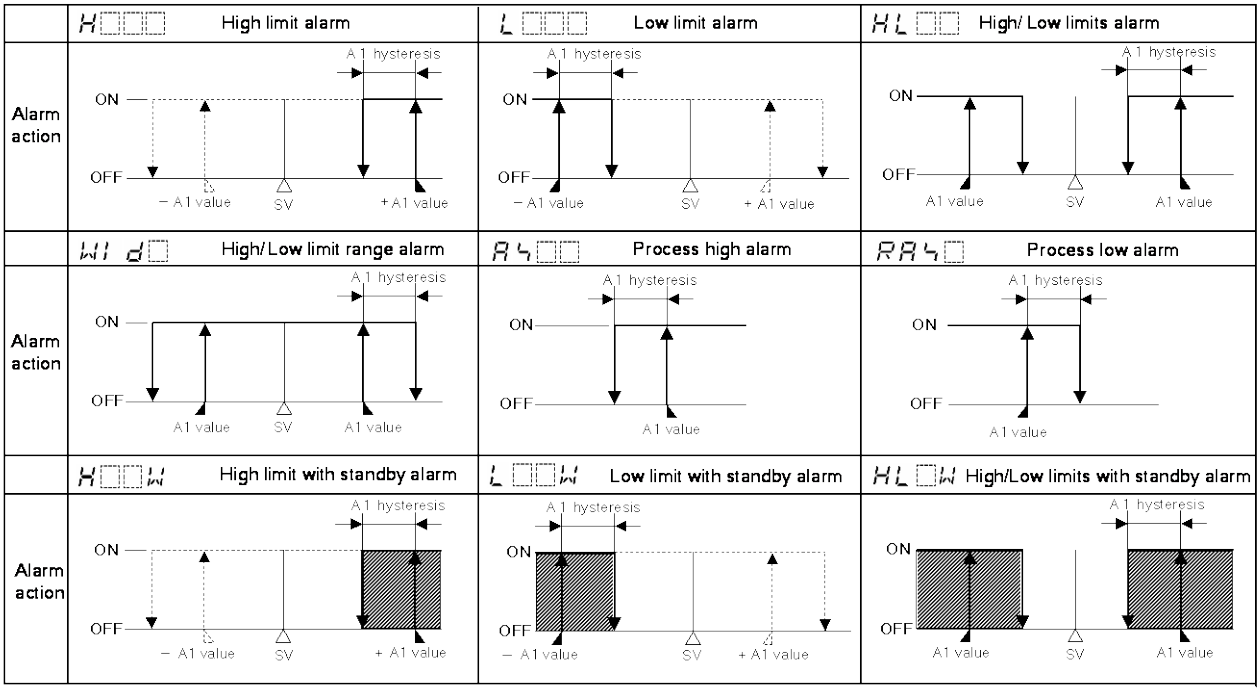
(Table 5-1) Alarm 1, 2 Values Setting Range

Alarm Type	Setting Range
High limit alarm	-(Temperature span) to temperature span℃ (℉)
Low limit alarm	-(Temperature span) to temperature span℃ (℉)
High/Low limits alarm	0 to temperature span℃ (℉)
High/Low limit range alarm	0 to temperature span℃ (℉)
Process high alarm	Temp. range low limit to temp. range high limit
Process low alarm	Temp. range low limit to temp. range high limit
High limit with standby alarm	-(Temperature span) to temperature span℃ (℉)
Low limit with standby alarm	-(Temperature span) to temperature span℃ (℉)
High/Low limits with standby alarm	0 to temperature span℃ (℉)

Setting the value to 0 or 0.0 disables the alarm. (Except Process high alarm and Process low alarm)

Abbreviation:
Temp: Temperature

(Table 5-2) Alarm 1 Type [AL 1F] (Factory default: ---- : No alarm action)



: Alarm output is in standby.

"A1" means Alarm 1. For Alarm 2, read "A2" for "A1".

● PV Display indicates setting item characters, and SV Display indicates factory default.
● Setting items with dotted lines are optional, and they appear only when the corresponding option is ordered.
● **Key operation** (Use the △ or ▽ key to set or select each setting item.)
• If the ◯ key is held down for 3 seconds at any setting mode, the unit will return to PV/SV Display Mode.
• ↓◯: This means that if the ◯ key is pressed, the unit proceeds to the next mode, illustrated by an arrow.
• △ +◯: Press the △ and ◯ keys (in that order) together.
• ▽+ ◯ (Approx. 3 sec): Press and hold the ▽ and ◯ keys (in that order) together for 3 seconds.
• △ + ▽ (Approx. 3 sec): Press and hold the △ and ▽ keys (in that order) together for 3 seconds.

△ + ▽ (Approx. 3 sec)

Setup Mode

RANG 250C — Temperature range
250C : 0.0 to 250.0℃
500C : 0.0 to 500.0℃*
482F : 32.0 to 482.0℉
932F : 32.0 to 932.0℉*

FILT 0.0 — PV filter time constant
0.0 to 10.0 seconds

oLH 100 — OUT1 high limit
OUT1 low limit to 100%
OUT1 low limit to 105% (A/M)

oLL 0 — OUT1 low limit
0% to OUT1 high limit
-5% to OUT1 high limit (A/M)

HYS 1.0 — OUT1 ON/OFF hysteresis
0.1 to 100.0℃ (℉)

cACT AIR — OUT2 cooling method
AIR□: Air cooling
oIL□: Oil cooling
WAT□: Water cooling

oLHb 100 — OUT2 high limit
OUT2 low limit to 100%

oLLb 0 — OUT2 low limit
0% to OUT2 high limit

db 0.0 — Overlap/Dead band
100.0 to 100.0℃ (℉)

HYSb 1.0 — OUT2 ON/OFF hysteresis
0.1 to 100.0℃ (℉)

AL1F ---- — Alarm 1 type
Selection item: See Table 5-2.

AL2F ---- — Alarm 2 type
Selection item: See Table 5-2.

A1LM NoML — Alarm 1 Energized/De-energized
NoML : Energized
REVS : De-energized

A2LM NoML — Alarm 2 Energized/De-energized
NoML : Energized
REVS : De-energized

A1HY 1.0 — Alarm 1 hysteresis
0.1 to 100.0℃ (℉)

A2HY 1.0 — Alarm 2 hysteresis
0.1 to 100.0℃ (℉)

A1DY 0 — Alarm 1 delay time
0 to 10000 seconds

A2DY 0 — Alarm 2 delay time
0 to 10000 seconds

RATU 0.0 — SV rise rate
0.0 to 1000.0 ℃/min. (℉/min.)

RATd 0.0 — SV fall rate
0.0 to 1000.0 ℃/min. (℉/min.)

CONT HEAT — Direct/Reverse action
HEAT : Reverse (Heating)
cool : Direct (Cooling)

SV_b 0.0 — SVTC bias
Converted value of ±20% of temperature range

DIIN SM — Contact input function
SM□□: Set value memory external selection
oUT□: OUT/OFF external selection 1 (SV, SV2 switchable)
oUT2: OUT/OFF external selection 2

EoUT oFF — Output status when input errors occur
oFF□: Outputs OFF(4mA) or OUT1(OUT2) low limit
oN□□: Outputs a value between OFF(4mA) and ON(20mA) or between OUT1 (OUT2) low limit and OUT1 (OUT2) high limit value depending on a deviation.

MANU oFF — OUT/OFF Key function
oFF□: Control output OFF
MANU: Auto/Manual control

bKLT ALL — Backlight selection
ALL□: All backlit
PV□□: PV Display backlit
SV□□: SV Display backlit
Ac□□: Indicators backlit
PVSV: PV+SV Displays backlit
PVAc: PV+ Indicators backlit
SVAc: SV+ Indicators backlit

COLR REd — PV color
GRN□: Green
REd□: Red
oRG□: Orange
ALOR: Alarm 1 or Alarm 2: ON Green → Red
ALoR: Alarm 1 or Alarm 2: ON Orange → Red
PVOR: PV continuous change
APOR: PV continuous change + Alarm 1 or Alarm 2 ON (Red)

CLRU 5.0 — PV color range
0.1 to 100.0℃ (℉)

dPTM 0 — Backlight time
0 to 99 minutes
(0 minutes: Continuous)

PSV oFF — Indication when output OFF
oFF□: OFF indication
AoFF: No indication
PV□□: PV indication
PVAL: PV+ Alarm output

oRAT 0 — OUT1 rate-of-change
0 to 100 %/sec

* Temperature range:
For the RD-715-HA, ranges 0.0 to 500.0℃ and 32.0 to 932.0℉ are available.

6. Operation

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

(1) Turn the power supply to the ACS-13A-□/A ON.

(2) Set up the unit. (Refer to "5. Operation Flowchart".) Setup (setting the Temperature range, Alarm type, Direct/Reverse action, etc.) should be done in Setup mode before using this controller. If the user's specifications are the same as the factory default of the instrument, it is not necessary to set up the controller. Proceed to Step (3).

(3) Input each set value. Input each set value. Refer to "5. Operation Flowchart" and "7. Basic Settings".

(4) Turn the load circuit power ON. Control action starts so as to keep the control target at the SV.

7. Basic Settings

● **Main Setting Mode** (When setting SV to 100.0℃)

(1) **Proceed to Main setting mode.**
Press the ◯ key in PV/SV Display Mode. The unit proceeds to Main setting mode.

(2) **Set SV.**
Set SV with the △ or ▽ key.

(3) **Register the SV.**
Register the SV by pressing the ◯ key. The unit reverts to PV/SV Display Mode.

(4) **Control starts.**
Control starts so as to keep the measuring temperature at 100.0℃.

● **Auto-tuning Perform/Cancel** (PID control)

(1) **Proceed to Sub setting mode.**
Press the △, ◯ keys (in that order) together in PV/SV Display Mode. The unit proceeds to Sub setting mode.

(2) **Select AT Perform/Cancel.**
Select AT Perform with the △ key, or select AT Cancel with the ▽ key.

(3) **Confirm AT Perform/Cancel.**
Press the ◯ key. The unit reverts to PV/SV Display Mode.

(4) **AT Perform/Cancel**
While AT is performing, the AT indicator flashes, and it turns off if AT is cancelled.

- In order to decide each P, I, D and ARW values automatically, the auto-tuning process has been made to fluctuate to get an optimal value.
- Sometimes the auto-tuning process will not fluctuate if auto-tuning is performed at or near room temperature. Therefore, auto-tuning might not finish normally.
- Auto-reset is available for P or PD action. Auto-reset is cancelled in approx. 4 minutes. It cannot be released while performing this function.

8. Specifications

Power supply voltage: 100 to 240 V AC 50/60 Hz, 24 V AC/DC 50/60 Hz
Allowable voltage fluctuation: 100 to 240 V AC: 85 to 264 V AC, 24 V AC/DC: 20 to 28 V AC/DC
Accuracy (Setting, Indication): Within ±0.2% of temperature span±1 digit
Control output (OUT1):
Relay contact 1a, Control capacity: 3 A 250 V AC (resistive load)
1 A 250 V AC (inductive load cosϕ=0.4), Electrical life: 100,000 cycles
Non-contact voltage (for SSR drive): 12 V DC±15%, Max. 40 mA DC (short circuit protected)
Direct current: 4 to 20 mA DC, Load resistance: Max. 550 Ω
Alarm 1, Alarm 2 (A2 option), Heater burnout alarm output (W, W3 option):
Relay contact 1a, Control capacity: 3 A 250 V AC (resistive load), Electrical life: 100,000 cycles
Control output (OUT2) (D□ option):
Relay contact 1a, Control capacity: 3 A 250 V AC (resistive load), Electrical life: 100,000 cycles
Non-contact voltage (for SSR drive): 12 V DC±15%, Max. 40 mA DC (short circuit protected)
Contact input: Circuit current when closed: Approx. 12 mA
Power consumption: Approx. 8 VA
Ambient temperature: 0 to 50℃ (32 to 122℉) (No icing)
Ambient humidity: 35 to 85 %RH (Non-condensing)
Weight: Approx. 120 g
Accessories included: Instruction manual: 1 copy, Mounting frame: 1 piece
Gasket A (Front mounted to the ACS-13A-□/A): 1 piece
CT (Current transformer):
CTL-6S: 1 piece [W (20A) option], 2 pieces [W3 (20A) option]
CTL-12-S36-10L1U: 1 piece [W (50A) option], 2 pieces [W3 (50A) option]
Accessories sold separately: Terminal cover

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