

Instruction Manual Digital Indicating Controller ACS-13A

No. ACS11JE1 2005.07  
Thank you for purchasing our microcomputer based temperature indicating controller ACS-13A. This manual contains instructions for the mounting, functions, operations and notes when operating the ACS-13A. To prevent accidents arising from the misuse of this controller, please ensure the operator receives this manual. For detailed usage and options, refer to the detailed instruction manual for the ACS-13A. For the detailed manual, please contact our agency or us.

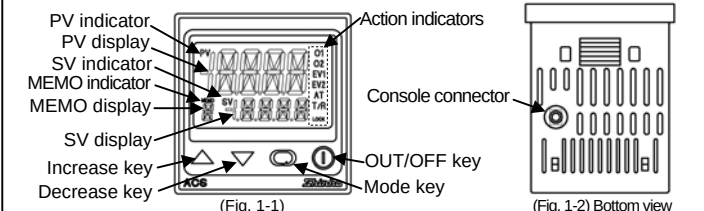
**SAFETY PRECAUTIONS** (Be sure to read these precautions before using our products.)  
The safety precautions are classified into categories: "Warning" and "Caution".  
**Warning:** Procedures which may lead to dangerous conditions and cause death or serious injury, if not carried out properly.  
**Caution:** 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 electric shock or fire, only Shinko or qualified service personnel may handle the inner assembly.  
• To prevent an electric shock, fire or damage to instrument, parts replacement may only be undertaken by Shinko or 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 consulting purpose of use with our agency or main office. (Never use this instrument for medical purposes with which human lives are involved.)  
• External protection devices such as protection 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.  
• Also proper periodic maintenance is 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. Name and functions of the sections

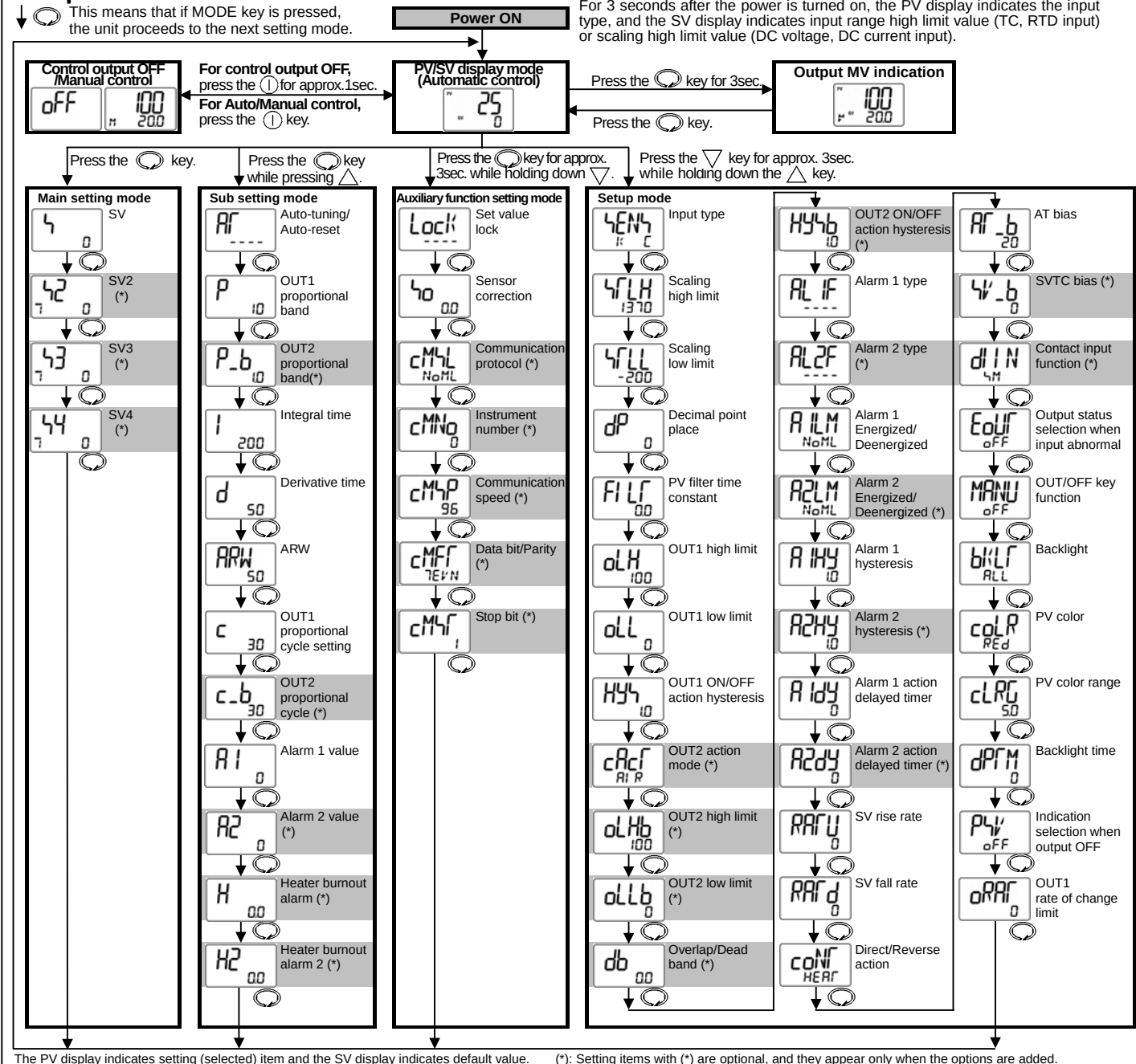


**PV indicator** : Lights when the PV is indicated in the PV/SV display mode.  
**PV display** : Indicates the PV (process variable).  
**SV indicator** : Lights when the SV is indicated in the PV/SV display mode.  
**SV display** : Indicates the SV (Set value).  
**MEMO indicator** : Lights when Set value memory number external selection (SM option) is added.  
**MEMO display** : Indicates the set value memory number.  
**Action indicators**  
O1 : Lights when control output is ON or when Heating output (D□ option) is ON. For DC current output type, flashes corresponding to the MV in 0.25 second cycles.  
O2 : Lights when cooling output (D□ option) is ON.  
EV1 : Lights when Alarm 1 output is ON.  
EV2 : Lights 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 when Serial communication (C5 option) is performing (TX output).  
LOCK : Lights when Lock 1, Lock 2 or Lock 3 is selected.  
**Increase key** : Increases the numeric value.  
**Decrease key** : Decreases the numeric value.  
**MODE key** : Selects the setting mode, or registers the set value.  
To register the set (selected) value, use this key.  
**OUT/OFF key** : Switches control ON/OFF or Auto/Manual control function.  
To release the control output ON/OFF, press this key for approx. 1 second.  
**Console connector**: The following operations can be conducted from external computer by connecting the USB communication cable CMA (sold separately) using the Console software SWS-ACS01M. (1) Reading and setting of SV, PID and various set values, (2) Reading of PV and action status, (3) Function change

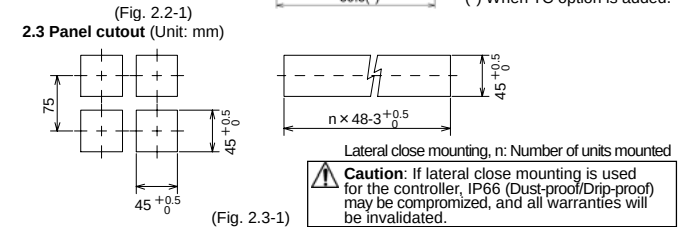
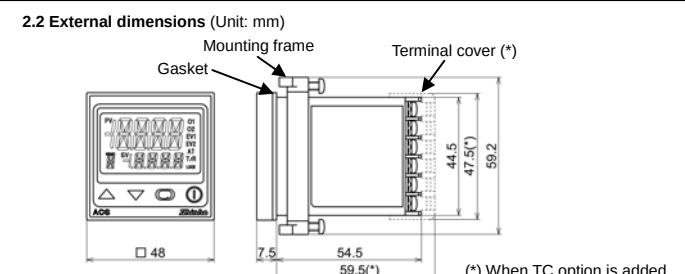
2. Mounting to the control panel

**2.1 Site selection**  
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°C (32 to 122°F) that does not change rapidly  
• 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 where the vapors of these substances can come into direct contact with the controller

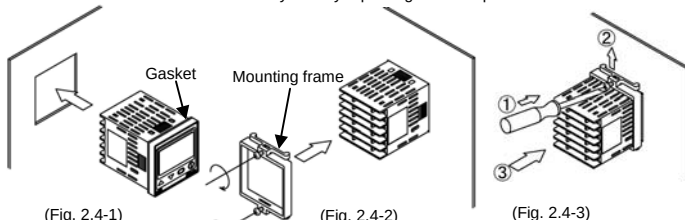
5. Operation flowchart



The PV display indicates setting (selected) item and the SV display indicates default value. (\*): Setting items with (\*) are optional, and they appear only when the options are added.



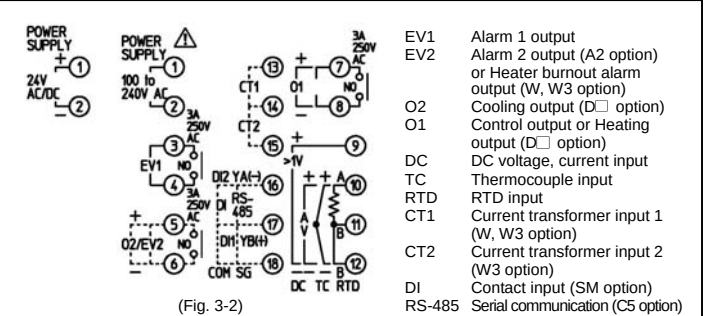
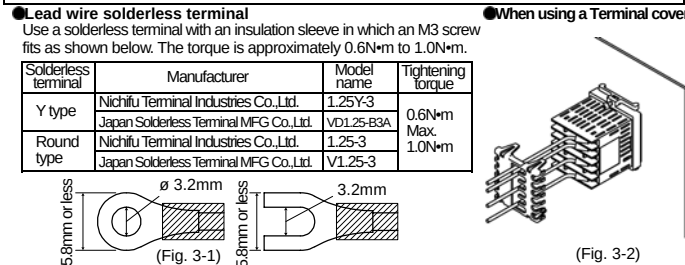
**2.4 Mounting and removal to/from the control panel**  
**How to mount the ACS-13A (Fig. 2.4-1, Fig. 2.4-2)**  
Mount the controller vertically to the flat, rigid panel to ensure it adheres to the Dust-proof/Drip-proof specification (IP66). Mountable panel thickness: Within 1 to 5mm  
(1) Insert the controller from the front side of the panel.  
(2) Insert the mounting frame until the frame comes into contact with the panel, and fasten with screws. Tighten screws with one rotation upon the screw tips touching the panel. Torque: 0.05 to 0.06N·m  
**How to remove the mounting frame (Fig. 2.4-3)**  
(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 screw frame and unit.  
(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.



3. Wiring

**Warning**  
Turn the power supply to the instrument off before wiring or checking it. Working or touching the terminal with the power switched on may result in severe injury or death due to Electric 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 by the terminal screw. The torque is approximately 0.6N·m to 1.0N·m.  
• When using a terminal cover, pass terminal wires numbered 7 to 12 into the holes of the terminal cover. See (Fig. 3-2).  
• This controller does not have a built-in power switch, circuit breaker or fuse. Therefore, it is necessary to install them in the circuit near the external controller. (Recommended fuse: Time-lag fuse, rated voltage 250V AC, 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 in accordance with the sensor input specification of this controller.  
• Use the 3-wire RTD which corresponds to the input specification of this controller.  
• (+) Side input terminal number of 0 to 5V DC, 1 to 5V DC, 0 to 10V DC differs from that of 0 to 1V DC.  
• 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, etc.) away from AC sources or load wires to avoid external interference.



**Wiring of Heater burnout alarm (W, W3 option)**  
This alarm is not usable for detecting heater current under phase control. Use the current transformer (CT) provided, and pass one lead wire of the heater circuit into the hole of the CT. (Fig. 3-3)  
When wiring, keep the CT wire away from AC sources or load wires to avoid the 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 with CT1 (13, 14) and CT2 (14, 15) terminals.

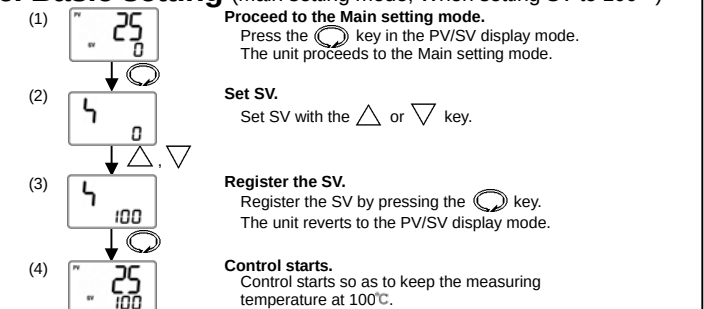
4. Operation

After the unit is mounted to the control panel and wiring is completed, operate the unit following the procedures.  
(1) Turn the power supply to the ACS-13A ON.  
(2) Setup  
Set up the unit. Refer to "5. Operation flowchart" and "6. Basic setting".  
Select an input type, alarm type, Direct/Reverse action, etc. during Setup mode. If setup is not required, skip this step, and proceed to step (3).  
• Input type selection (Default: K, -200 to 1370°C; F, -320 to 2500°F)

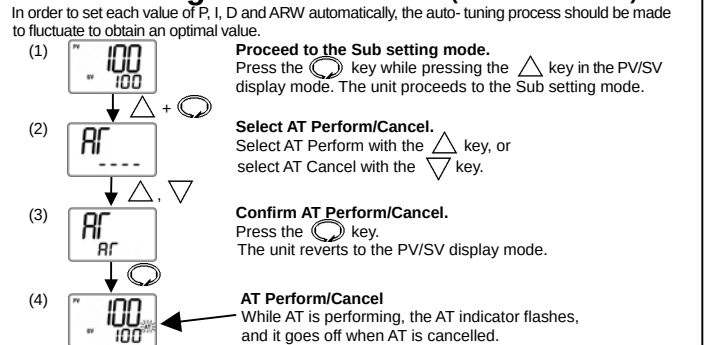
|             |                                                           |   |                  |
|-------------|-----------------------------------------------------------|---|------------------|
| K           | -200 to 1370                                              | F | -320 to 2500     |
| K           | -200.0 to 400.0                                           | F | -320.0 to 750.0  |
| J           | -200 to 1000                                              | F | -320 to 1800     |
| R           | 0 to 1760                                                 | F | 0 to 3200        |
| S           | 0 to 1760                                                 | F | 0 to 3200        |
| B           | 0 to 1820                                                 | F | 0 to 3300        |
| E           | -200 to 800                                               | F | -320 to 1500     |
| T           | -200 to 400.0                                             | F | -320.0 to 750.0  |
| N           | -200 to 1300                                              | F | -320 to 2300     |
| PL-11       | 0 to 1390                                                 | F | 0 to 2500        |
| C(W/Re5-26) | 0 to 2315                                                 | F | 0 to 4200        |
| PT100       | -200.0 to 850.0                                           | F | -320.0 to 1500.0 |
| JPT100      | -200.0 to 500.0                                           | F | -320.0 to 900.0  |
| PT100       | -200 to 850                                               | F | -320 to 1500     |
| JPT100      | -200 to 500                                               | F | -320 to 900      |
| 4 to 20mA   | -2000 to 10000                                            |   |                  |
| 0 to 20mA   | Externally connect shunt resistor (50Ω, sold separately). |   |                  |
| 0 to 1V     |                                                           |   |                  |
| 0 to 5V     |                                                           |   |                  |
| 1 to 5V     | -2000 to 10000                                            |   |                  |
| 0 to 10V    |                                                           |   |                  |

• Alarm type selection (Default: No alarm action) H, L, HL  
• Alarm Energized/Deenergized (Default: EV1 contact output ON (Energized), NoML)  
• Direct/Reverse action (Default: Reverse (Heating) HEAR)  
• OUT/OFF key function selection (Default: OUT/OFF function OFF)  
• Set value lock selection (Default: Unlock) Lock 1, Lock 2, Lock 3  
• Input each set value. Refer to Chapters "5. Operation flowchart" and "6. Basic setting".  
• Control action starts so as to keep the control target at the SV (desired value).

6. Basic setting (Main setting mode, When setting SV to 100°C)



7. Auto-tuning Perform/Cancel (PID control action)



8. Specifications

**Power supply:** 100 to 240V AC 50/60Hz, or 24V AC/DC 50/60Hz  
Allowable fluctuation range: 100 to 240V AC: 85 to 264V AC, 24V AC/DC: 20 to 28V AC/DC  
**Indication accuracy**  
Thermocouple: Within ±0.2% of each input span±1digit, or within ±2°C (4°F), whichever is greater  
However, for R, S inputs, 0 to 200°C (0 to 400°F): Within ±6°C (12°F)  
B input, 0 to 300°C (0 to 600°F): Accuracy is not guaranteed  
K, J, E, T, N inputs, less than 0°C (32°F): Within ±0.4% of input span±1digit  
RTD: Within ±0.1% of each input span ±1digit, or within ±1°C (2°F), whichever is greater  
DC current, voltage input: Within ±0.2% of each input span±1digit  
**Control output (OUT1)**  
Relay contact: 1a, Control capacity, 3A 250V AC (resistive load), 1A 250V AC (inductive load cosφ=0.4)  
Electric life, 100,000 times  
Non-contact voltage (for SSR drive): 12V DC±15%, Max.40mA (short circuit protected)  
DC current: 4 to 20mA DC, Load resistance, Max. 550Ω  
**Alarm 1 output, Alarm 2 output, Heater burnout alarm output**  
Relay contact 1a, Control capacity, 3A 250V AC (resistive load), Electric life, 100,000 times  
**Cooling output (OUT2)**  
Relay contact 1a, Control capacity, 3A 250V AC (resistive load), Electric life, 100,000 times  
Non-contact voltage (for SSR drive): 12V DC±15%, Max. 40mA DC (short circuit protected)  
**Contact input** : Circuit current when closed: Approx. 6mA  
**Power consumption** : Approx. 8VA  
**Ambient temperature** : 0 to 50°C (32 to 122°F)  
**Ambient humidity** : 35 to 85%RH (no condensation)  
**Weight** : Approx. 120g  
**Accessories included** : Mounting frame 1 piece, Gasket (Mounted to the unit) 1 piece, Instruction manual 1 copy  
CT (Current transformer): CTL-6S(W20A), CTL-12-S36-10L(W50A), 1 piece  
CTL-6S(W320A), CTL-12-S36-10L(W350A), 2 pieces  
**Accessories sold separately**: Terminal cover, Shunt resistor (50Ω) for DC current input  
USB communication cable: Model name CMA