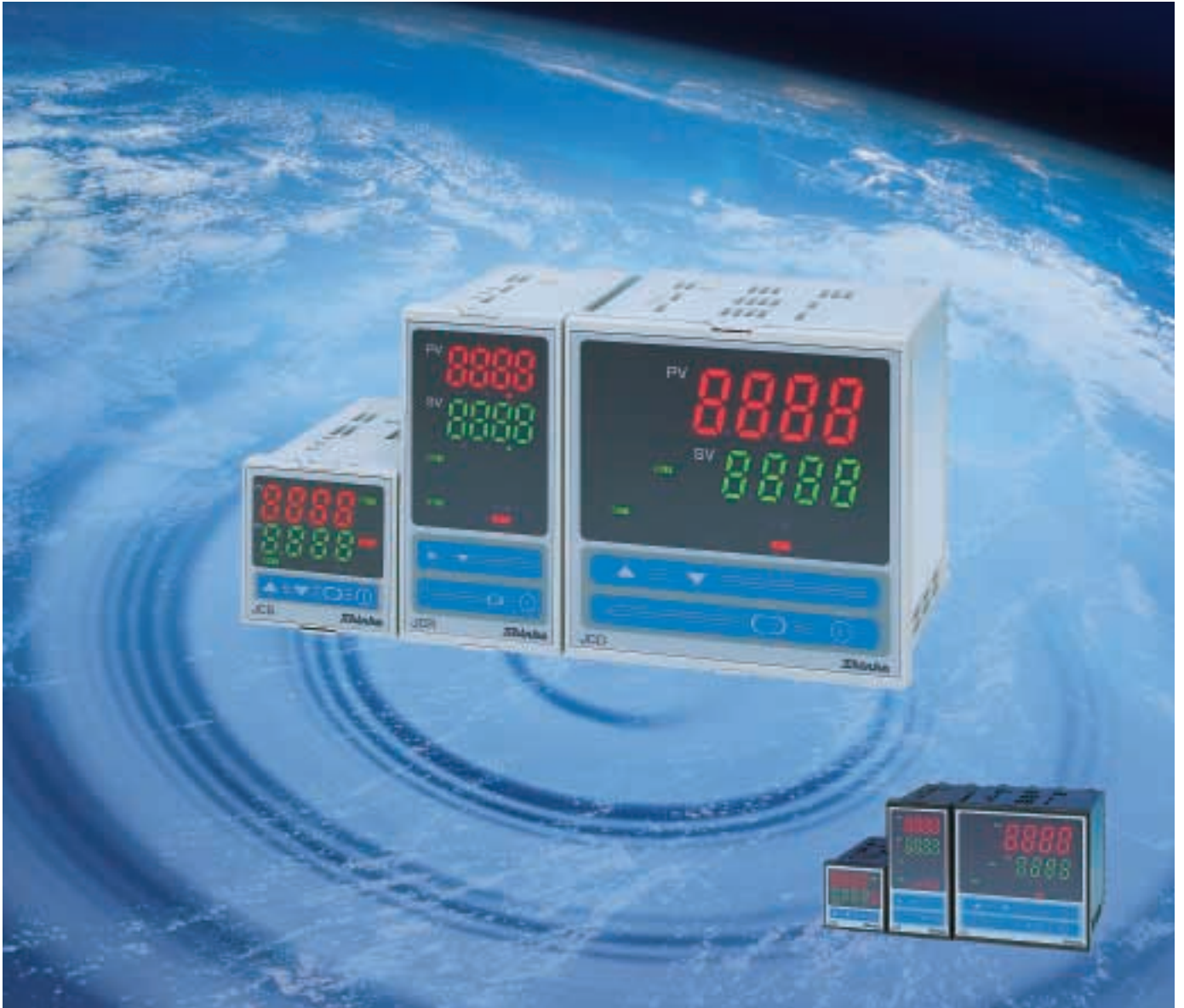




# JC SERIES



*Go Global !*

*By meeting global specifications, our new  
JC series can be used anywhere.*

**Shinko**

# Features

# Enhanced functions and flexibility

## Multi-input

Accepts thermocouple (10 types), RTD (2 types), DC current (2 types) and DC voltage (4 types).  
As the input sampling period is very short (0.25 seconds), multi-input function enables the controllers to deal with a broader range of processes.

## Two types of setting value can be switched externally.

As memory function that switches SV1 or SV2 from an external contact signal is provided as standard, it is possible to switch the main setting externally after the values of SV1 and SV2 are registered.  
(for JCS-33A: Option)

## Alarm one point (relay output) is provided as standard.

Alarm action is provided as standard for JC series.  
Alarm action and Energized/Deenergized can easily be selected by key.  
(Default: No alarm action, Energized)

## Safety standard

UL/CSA and CE marking

## More communication functions

- Shinko protocol and Modbus protocol are provided as standard for serial communication (Option: C5)  
(For Modbus protocol, RTU mode or ASCII mode can be selected by key operation.)  
It is possible to connect Modbus based instruments without using a communication converter.
- When using our programmable controller with option SVTC as a program setter and the JC -33A with option C5, JC -33 can be used as a multi-point programmable controller.  
(Setting value digital transmission is enabled, and a maximum of 31 units of JC -33A can be connected.)

## Dust-proof, Drip-proof structure (Provided as standard)

The controllers can be used even in harsh environments exposed to water and dust. (IP66)

## Immediate use

This product is shipped with optimal setting value preset for use in the industry rubber, plastic and packaging. Just unpack and turn it on. You can use it immediately.  
(Default: Proportional band 10, Integral time 200 seconds  
Derivative time 50 seconds, Control action is set to reverse action.)

Model name		J C - 3 3 A - / ,	
Series name	S		W48 x H48 x D96.5mm
	R		W48 x H96 x D98.5mm
	D		W96 x H96 x D98.5mm
Control output (OUT1)	R		Relay contact
	S		Non-contact voltage (for SSR drive)
	A		DC current
Input	M		Multi-input
Supply voltage	1		24V AC/DC
Option	A 2		Alarm 2 (A2)
	W ( 5A )		Rated current: 5A
	W ( 10A )		Rated current: 10A
	W ( 20A )		Rated current: 20A
	W ( 50A )		Rated current: 50A
	D R		Heater burnout alarm
	D S		Control output (OUT2)
	D A		(Heating/Cooling control output)
	D T		
	C 5		Serial communication (Based on EIA RS-485)
	S M		SV1/SV2 external selection
	L A		Loop break alarm
P 2 4		Insulated power supply output	
T C		Terminal cover	
B K		Color Black	

When ordering, select the alphanumeric characters from the table above for .  
When adding option, enter the code using a comma (,).

- For DC current output type, [Option: W] cannot be added.
- [Option: P24] cannot be added to the JCS-33A. [Option: SM] can be added only to the JCS-33A.  
[Option: SM] is provided as standard for the JCR-33A and JCD-33A.
- For control output (OUT2), only [Option: DT] can be added to the JCS-33A.
- When [Option: C5] is added to the JCR-33A or JCD-33A, SV1/SV2 external selection cannot be used.
- Standard voltage is 100 to 240V AC. Only when ordering 24V AC/DC, enter [1] after input code.

### [Option combination for the JCS-33A]

	A 2	W	D T	C 5	S M	L A	T C	B K
Combination 1			x		x			
Combination 2	x	x			x	x		
Combination 3			x	x				
Combination 4	x	x		x		x		

## Rated scale

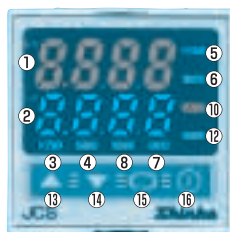
Input type		Scale	
Thermocouple	K	- 200 to 1370	- 320 to 2500 F
	J	- 199.9 to 400.0	- 199.9 to 750.0 F
	R	- 200 to 1000	- 320 to 1800 F
	S	0 to 1760	0 to 3200 F
	B	0 to 1820	0 to 3300 F
	E	0 to 1760	0 to 3200 F
	T	- 200 to 800	- 320 to 1500 F
	N	- 199.9 to 400.0	- 199.9 to 750.0 F
	PL- II	- 200 to 1300	- 320 to 2300 F
	C ( W/Re5-26 )	0 to 1390	0 to 2500 F
RTD	Pt100	0 to 2315	0 to 4200 F
	JPt100	- 200 to 850	- 300 to 1500 F
		- 199.9 to 850.0	- 199.9 to 999.9 F
		- 200 to 500	- 300 to 900 F
DC	4 to 20mA DC 0 to 20mA DC 0 to 1V DC 0 to 10V DC 1 to 5V DC 0 to 5V DC	- 199.9 to 9999 ,	- 199.9 to 999.9
		- 19.99 to 99.99 ,	- 1.999 to 9.999

- For DC input and DC voltage input, scaling and decimal point place are changeable.
- For DC current input, shunt resistor 50 (sold separately) is needed as an external extension.

### [Option combination for the JCR-33A and JCD-33A]

	A 2	W	D	C 5	LA	P24	T C	B K
Combination 1			x			x		
Combination 2		x				x		
Combination 3	x				x	x		
Combination 4		x	x					

## Name and sections



[ JCS-33A ]



[ JCR-33A ]



[ JCD-33A ]

### : PV display

Indicates PV (process variable). While setting, this indicates characters.

### : SV display

Indicates SV (setting value). While setting, it indicates various setting values and the status of the selected value.

### : SV1 indicator

Lights when SV1 is indicated on the SV display.

### : SV2 indicator

Lights when SV2 is indicated on the SV display.

### : OUT 1 indicator

Lights when control output 1 is ON.  
(For current output type, it blinks according to output manipulated variable in 0.25 seconds cycle.)

### : OUT 2 indicator

Lights when control output 2 is ON.  
(For current output type, it blinks according to output manipulated variable in 0.25 seconds cycle.)

### : AT indicator

Blinks when PID auto-tuning and PD auto-reset are performing.

### : TX/RX indicator

Blinks when responding to the command from host computer during serial communication (Option).

### : HB indicator

Lights when Heater burnout alarm (Option) or Sensor burnout is ON.

### : A1 indicator

Lights when alarm 1 is ON.

### : A2/LA indicator

Lights when Alarm 2 (Option) is ON and/or Loop break alarm (Option) is ON.

### : EVT indicator (Only JCS-33A)

Lights when Alarm 2 (Option), Loop break alarm (Option), or Heater burnout alarm (Option) is ON.

### : Increase key

This key is used to select various setting items or value.  
(Increases numerical value of the setting value.)

### : Decrease key

This key is used to select various setting items or value.  
(Decreases numerical value of the setting value.)

### : Mode key

This key is used to switch the setting mode and register the setting value.

### : OUT/OFF key

Performs output ON or OFF.

## Standard specifications

Display	JCS-33A: PV [Red 4 digits, Character size: 10.2 x 4.9mm (H x W)], SV [Green 4 digits, Character size: 8.8 x 4.9mm (H x W)] JCR-33A: PV [Red 4 digits, Character size: 11.2 x 5.4mm (H x W)], SV [Green 4 digits, Character size: 11.2 x 5.4mm (H x W)] JCD-33A: PV [Red 4 digits, Character size: 18 x 8mm (H x W)], SV [Green 4 digits, Character size: 12.6 x 6mm (H x W)]
Input	Thermocouple----- K, J, R, S, B, E, T, N, PL-II, C (W/Re5-26) External resistance: 100 Ω or less (However, for B input: 40 Ω or less) RTD----- Pt100, JPt100 3-wire system (Allowable input lead wire resistance per wire: 10 Ω or less) DC current----- 0 to 20mA DC, 4 to 20mA DC Input impedance: 50 Ω (Connect shunt resistor 50 Ω between input terminals.) DC voltage----- 0 to 1V DC Allowable input current: 50mA or less (When shunt resistor 50 Ω is used) Input impedance: 1M Ω or greater Allowable input voltage: 5V or less Allowable signal source resistance: 2k Ω or less 0 to 5V DC, 1 to 5V DC, 0 to 10V DC Input impedance: 100k Ω or greater Allowable input voltage: 15V or less Allowable signal source resistance: 100 Ω or less
Accuracy (Setting · Indicating)	Thermocouple ----- Within ±0.2% of each input span ±1 digit or ±2 (4 ℉) whichever is greater However, R or S input 0 to 200 (0 to 400 ℉): Within ±6 (12 ℉) B input 0 to 300 (0 to 600 ℉): Accuracy is not guaranteed. K, J, E, and N input less than 0 (32 ℉): Within ±0.4% of each input span ±1 digit RTD----- Within ±0.1% of each input span ±1 digit or ±1 (2 ℉) whichever is greater DC current and DC voltage----- Within ±0.2% of each input span ±1 digit
Input sampling period	0.25 seconds
Control output (OUT 1)	Relay contact----- 1a1b (JCS-33A: 1a) 3A 250V AC (Resistive load), 1A 250V AC (Inductive load cos φ=0.4), Electric life: 100,000 times Non-contact voltage----- 12 V DC Max. 40mA (Short-circuit protected) DC current----- 4 to 20mA DC Load resistance: Max. 550 Ω
Control action	Actions mentioned below can be selected by key operation. [Default: PID] PID (with auto-tuning function), PI, PD (with auto reset function), P (with auto reset function), ON/OFF OUT1 proportional band (P)----- Thermocouple: 0 to 1000 (0 to 2000 ℉) (ON/OFF action when set to 0) RTD: 0.0 to 999.9 (0.0 to 999.9 ℉) (ON/OFF action when set to 0.0) DC current and DC voltage: 0.0 to 100.0% (ON/OFF action when set to 0.0) Integral time (I)----- 0 to 1000 seconds (OFF when set to 0) Derivative time (D)----- 0 to 300 seconds (OFF when set to 0) OUT1 proportional cycle----- 1 to 120 seconds (Not available for DC current output type) OUT1 ARW----- 0 to 100% Hysteresis----- Thermocouple and RTD: 0.1 to 100.0 ( ℉) DC current and DC voltage: 1 to 1000 (The placement of the decimal point follows the selection.) OUT1 output limit----- - 5 to 105%

Alarm 1 (A1)	<p>Alarm action and Energized/Deenergized can be selected by key operation.</p> <ul style="list-style-type: none"> <li>• No alarm</li> <li>• High limit alarm (Deviation setting) Setting range: - (Input span) to Input span</li> <li>• Low limit alarm (Deviation setting) Setting range: - (Input span) to Input span</li> <li>• High/Low limits alarm (Deviation setting) Setting range: 0 to Input span</li> <li>• High/Low limit range alarm (Deviation setting) Setting range: 0 to Input span</li> <li>• Process high alarm Setting range: Input range low limit value to Input range high limit value</li> <li>• Process low alarm Setting range: Input range low limit value to Input range high limit value</li> <li>• High limit alarm w/standby (Deviation setting) Setting range: - (Input span) to Input span</li> <li>• Low limit alarm w/standby (Deviation setting) Setting range: - (Input span) to Input span</li> <li>• High/Low limits alarm w/standby (Deviation setting) Setting range: 0 to Input span</li> </ul> <p>When input is with decimal point, the negative low limit value is -199.9 and the positive high limit value is 999.9.  When input is DC current or DC voltage, input span is scaling span.  When input is DC current or DC voltage, input range low limit value is scaling low limit value and input range high limit value is scaling high limit value.</p> <p>Setting accuracy-----The same as the indicating accuracy  Action-----ON/OFF action  Hysteresis----- Thermocouple and RTD: 0.1 to 100.0 (°F)  DC current and DC voltage: 1 to 1000 (The placement of the decimal point follows the selection.)  Output----- Relay contact 1a 3A 250V AC (Resistive load), Electric life: 100,000 times</p>
SV1/SV2 external selection	<p>Selects SV1 or SV2 from the external contact. (For JCS-33A, [Option: SM] needs to be added.)  SV1: Contact open (Terminal between 14 and 17 is open)  SV2: Contact closed (Terminal between 14 and 17 is closed)</p>
Supply voltage	<p>100 to 240V AC 50/60Hz, 24V AC/DC 50/60Hz  Allowable voltage fluctuation: 85 to 264V AC, 20 to 28V AC/DC</p>
Power consumption	<p>Approx. 8VA</p>
Insulated resistance	<p>When control output (OUT1) is Non-contact voltage or DC current output with [Option: DS or DA] is added, insulation test between Control output (OUT1) terminal and Heater burnout alarm output terminal, between Control output (OUT1) terminal and Control output (OUT2) terminal, between Control output (OUT1) terminal and Insulated power output terminal must not be carried out.  When control output (OUT1) is Non-contact voltage or DC current output, insulation test between Control output (OUT1) and SV1/SV2 external switch terminal, between control output (OUT1) and communication terminal must not be carried out.  When control output (OUT2) is Non-contact voltage or DC current output, insulation test between Control output 2 (OUT2) and SV1/SV2 external switch terminal, between control output (OUT2) and communication terminal must not be carried out.  Other combinations: 500V DC 10M or greater</p>
Dielectric strength	<p>1.5kV AC for 1min between input terminal and ground terminal, between input terminal and power terminal  1.5kV AC for 1min between power terminal and ground terminal  1.5kV AC for 1min between output terminal and ground terminal, between output terminal and power terminal</p>
Environment	<p>Ambient temperature: 0 to 50 Ambient humidity: 35 to 85%RH (No condensation)</p>
Material · Color	<p>Material: Flame resisting resin Color: Light gray</p>
Mounting method	<p>Screw type mounting bracket is used. (Mountable panel thickness: Within 1 to 15mm)</p>
Setting method	<p>Sheet key input</p>
External dimension	<p>JCS-33A: W48 x H48 x D96.5mm, JCR-33A: W48 x H96 x D98.5mm, JCD-33A: W96 x H96 x D98.5mm</p>
Weight	<p>JCS-33A (Approx.200g), JCR-33A (Approx. 250g), JCD-33A (Approx. 370g)</p>
Attached function	<p>Sensor correction, Setting value LOCK, Power failure countermeasure, Self diagnosis, Automatic cold junction temperature compensation (Only thermocouple), Sensor burnout alarm, Input burnout, Warm-up display, Auto/Manual control selection  Dust-proof and Drip-proof structure IP66</p>

## Options

[Select options according to your needs. When ordering, designate the Option code to be added.]

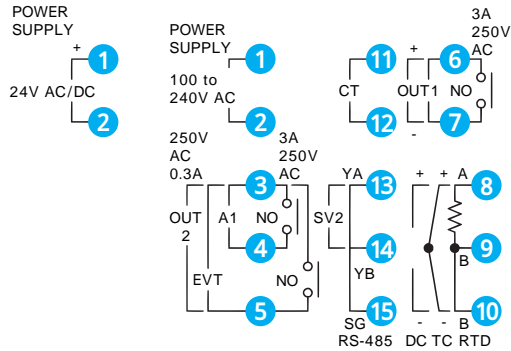
JCS-33A has Event output which involves Alarm 2 (A2), Heater burnout alarm (W), Control output (OUT 2) and Loop break alarm (LA) output.

Alarm 2 (A2) [A2]	<p>When this option is added, 1 alarm point is added.  Alarm action type, Setting range and Relay contact type are the same as those of Alarm 1 (A1). See Alarm 1 (A1) section.</p>
Heater burnout alarm [W]	<p>Watches the heater current with CT (current transformer), and detects the burnout.  Heater rated current must be selected from 5A, 10A, 20A and 50A.  Setting accuracy---Within ±5% of heater rated current  Output----- Relay contact 1a 3A 250V AC (Resistive load), Electric life: 100,000 times  Self-holding----- Not available  Accessories----- CT (for single phase: 1)</p>
Control output (OUT2) (Heating/Cooling control) [DR, DS, DA, DT]	<p>If this option is applied, control output 2 is added and enables Heating/Cooling control.  There are 4 types of control output i.e. Relay contact output (DR), Non-contact voltage output (DS), DC current output (DA) and Non-contact relay output (DT). The type must be designated when ordering.  (Relay contact output, Non-contact voltage output and DC current output can be applied to JCR-33A and JCD-33A series.)  [Only Non-contact relay output (DT) can be applied to the JCS-33A series.]  Heating control action (Heating side): The same as control output (OUT1)  Cooling control action (Cooling side):  Proportional band (P)----- 0.0 to 10.0 times the control output (OUT1) proportional band (ON/OFF action when set to 0.0)  Integral time (I)-----The same as the integral time setting value of the control output (OUT1).  Derivative time (D)----- The same as the derivative time setting value of the control output (OUT1).  Proportional cycle----- 1 to 120 seconds (Not available for DC current output type)  Overlap band/Dead band----- Thermocouple and RTD: -100.0 to 100.0 (°F)  DC current and DC voltage: -1000 to 1000 (The placement of the decimal point follows the selection.)  Hysteresis-----0.1 to 100.0 (°F)  Control output  • Relay contact (DR) : 1a 3A 250V AC (Resistive load), 1A 250V AC(Inductive load cos φ=0.4), Electric life:100,000 times  • Non-contact voltage (DS) : 12<sup>±</sup> V DC Max. 40mA (Short-circuit protected)  • DC current (DA) : 4 to 20mA DC Load resistance: Max. 550  • Non-contact relay (DT) : 0.3A 250V AC (Resistive load)  Cooling action mode (This must be selected by key operation from below.)  • Air cooling (Linear characteristic)  • Oil cooling (1.5<sup>th</sup> Power of the linear characteristic)  • Water cooling (2<sup>nd</sup> Power of the linear characteristic)</p>
Serial communication [C5]	<p>Various setting status changing, reading and setting of the JC -33A can be performed from external computer.  By combining Shinko programmable controller (Option: SVTC added) with JC -33A (Option: C5 added), it is possible to transmit the SV (setting value) of the programmable controller digitally to the JC -33A  Communication interface----- Based on EIA, RS-485  Communication method----- Half-duplex communication start-stop synchronous  Data transfer rate----- (2400/4800/9600/19200bps) Selectable by key operation</p>

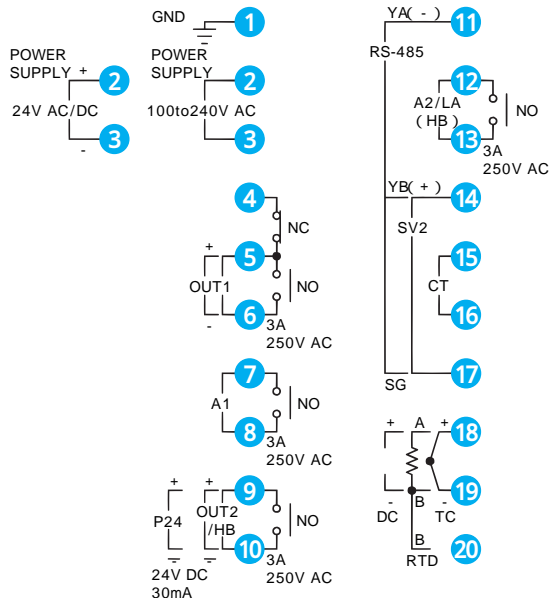
Serial communication [C5]	Parity ----- (Even/ Odd/ No parity) Selectable by key operation Stop bit----- (1 or 2) Selectable by key operation Communication protocol ----- Based on Shinko standard protocol or Modbus (Selectable by key operation) (When Modbus is selected, RTU mode or ASCII mode can be selected by key operation.) Number of connectable units----- A maximum of 31 units per host computer Communication error detection----- Parity check and Checksum
SV1/SV2 external selection [SM]	SV1 and SV2 can be changed by external contact. [Option: SM] can be added only to the JCS-33A. Terminal between 13 and 14 is open: SV1, Terminal between 13 and 14 is closed: SV2
Loop break alarm [LA]	This option enables Heater burnout, Sensor burnout and actuator trouble to be detected. Loop break alarm time----- 0 to 200 minutes Loop break alarm action span----- Thermocouple and RTD: 0 to 150 ( °F), 0.0 to 150.0 ( °C) DC current and DC voltage: 0 to 1500 Output----- Relay contact 1a 3A 250V AC (Resistive load), Electric life:100,000 times
Insulated power output [P24]	When this option is added, 24V DC is outputted from the terminal 9 to 10 of JCD-33A and JCR-33A and can be the power source of 2-wire transmitter. Output voltage : 24 ± 3V DC (When load current is 30mA.) Ripple voltage : 200mV (When load current is 30mA.) Maximum load current: 30mA
Terminal cover [TC]	Electrical shock protecting cover Be sure to designate this option, when there is a probability that the back of the controller is touched by someone when power is on.
Color Black [BK]	Case and base: black.

## Terminal arrangement

### JCS-33A series



### JCR-33A series, JCD-33A series



### GND

Ground terminal. JCS-33A series does not have this terminal.

### POWER SUPPLY

Power supply terminal.

### OUT 1

Output terminal for Control output 1

### A 1

Output terminal for Alarm 1

### OUT 2 / HB

Output terminal for Control output 2 or Heater burnout alarm (Only when option is added)

### P24

Output terminal for insulated power output 24V DC (Only when option is added)

### RS-485

Communication terminal for Serial communication (C5) (Only when option is added)

### A2 / LA (HB)

Alarm 2, Loop break alarm or Heater burnout alarm output terminal (Only when option is added)

### SV2

SV1/SV2 external selection terminal

### CT

CT (Current transformer) input terminal (Only when Heater burnout alarm (Option) is added)

### TC

Thermocouple input terminal

### RTD

RTD input terminal

### DC

DC current or DC voltage input terminal

### EVT

Event (Alarm 2, Heater burnout alarm or Loop break alarm) output terminal Only for the JCS-33A series

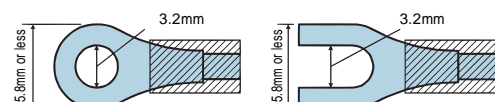


- The terminal board of this instrument is designed to be wired from the left.
- When [Option: P24] is added, [Option: W] or [Option: DR, DS, DA] cannot be applied together with [Option: P24].
- SV1/SV2 external selection cannot be used when [Option: C5] is added. ([Option: SM] cannot be added to the JCS-33A.)
- Only DT (Non-contact relay) from [Option: DR, DS, DA, DT] can be added to the JCS-33A.
- For DC current output type, [Option: W] cannot be added.

## Solderless terminal

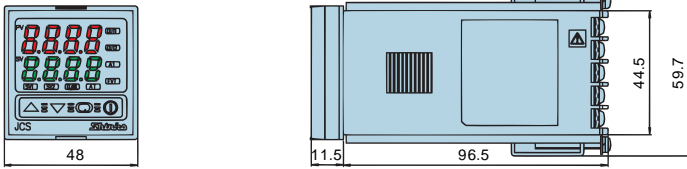
Use a solderless terminal with an insulation sleeve that fits to the M3 screw as shown below.

Tightening torque: 0.6N·m to 1.0N·m

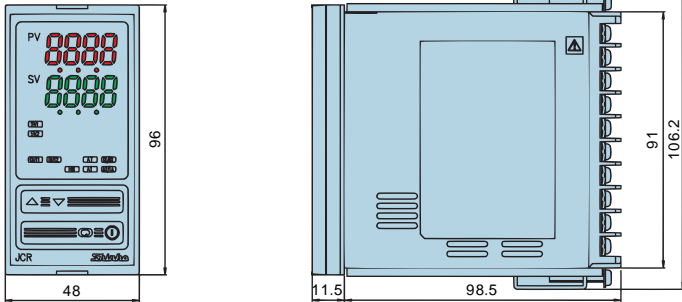


## External dimension

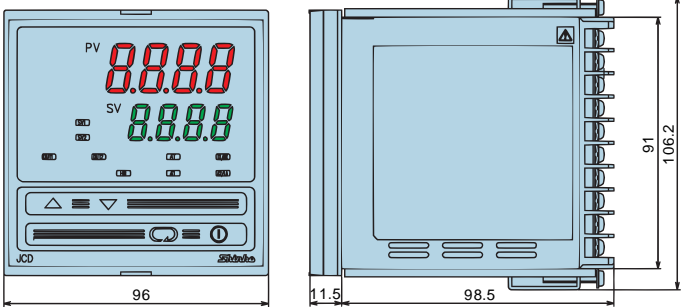
JCS-33A series



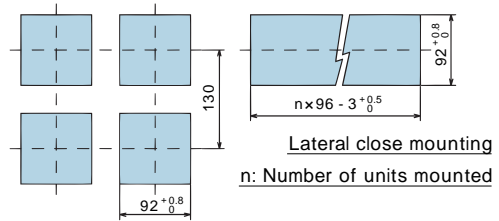
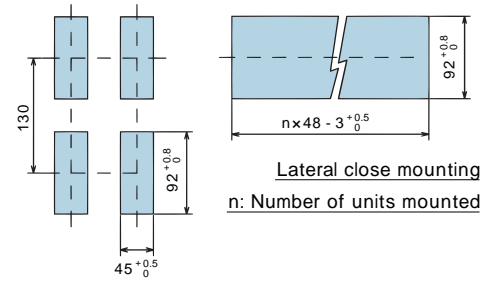
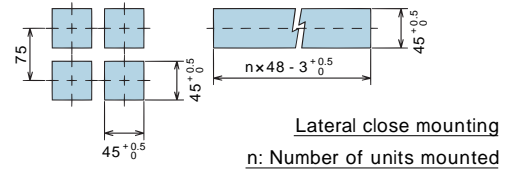
JCR-33A series



JCD-33A series



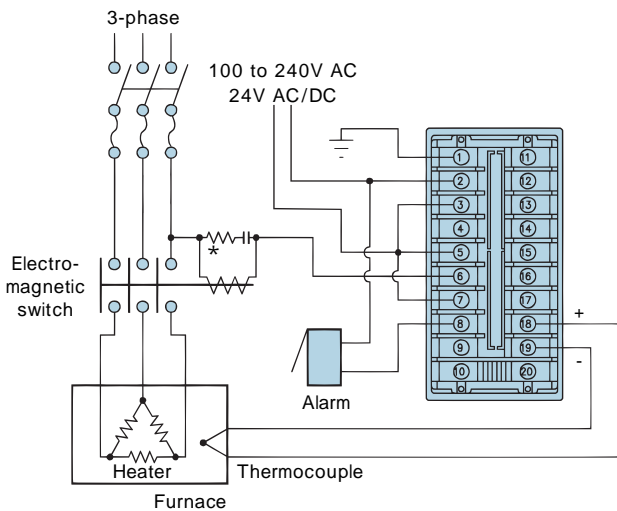
## Panel cutout



⚠ Caution: When Lateral close mounting is applied, Dust-proof and Drip-proof specification is not fulfilled.

## Wiring example

JCR-33A-R/M

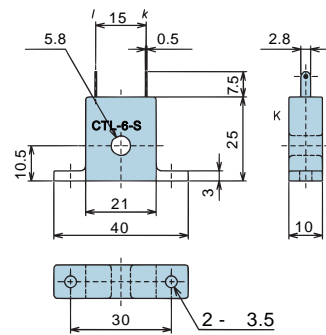


\* Surge absorber: To prevent the unit from harmful effects of unexpected level noise, it is recommended that a surge absorber be installed between the electromagnetic switch coils.

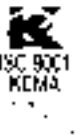
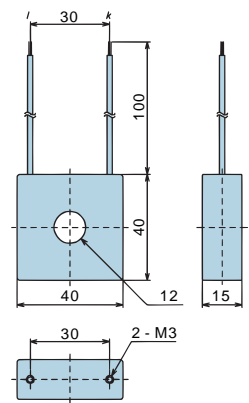
- This catalog is as of August 2003. Specifications are subject to change without notice.
- When inquiring, please consult our agency or the shop where you purchased the unit.

## CT dimension

CTL-6-S (for 5A, 10A, 20A)



CTL-12-S36-10L1 (for 50A)



## SHINKO TECHNOS CO., LTD. OVERSEAS DIVISION

Head Office: 1-7-46, Shi-Machi, Osaka 562-0075, Japan  
 Mail Address: P.O. Box 17, Minami, Osaka, Japan  
 Tel: 01 72 271 2701  
 Fax: 01 72 274 1760  
 E-Mail: <http://www.shinko-technos.co.jp>  
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