

Temperature Controllers:  
JC Series Digital Indicating Controllers

# JC Series



High Performance Controllers  
...at the lowest prices anywhere!

  
**CONVECTRONICS**

# Temperature Controllers: JC Series Digital Indicating Controllers



**Model JCS:**  
1/16 DIN (48mm x 48mm)



**Model JCR:**  
1/8 DIN (48mm x 96mm)



**Model JCD:**  
1/4 DIN (96mm x 96mm)

- Structure**  
 Units available in standard DIN sizes (1/16, 1/8, and 1/4 DIN)  
 NEMA 4X protective construction  
 Black enclosure
- Programmable Alarms**  
 Units feature standard single alarm output with optional second alarm
- True Multi-Input**  
 Units feature true multi-input capabilities: 10 Thermocouple types, 1 RTD type, 2 current inputs and 4 voltage inputs
- Auto/Manual Control**  
 Manual override allows you to take control of your process at anytime
- Large LED display**  
 All units feature dual display PV red 4 digits, SV green 4 digits
- PID Autotune**  
 All units feature as standard, full function third generation PID Autotune. This feature minimizes process overshoot under the most demanding applications.
- Modbus Protocol With RS485 (Option)**  
 Units offer communications capabilities
- Safety Approvals**  
 UL, cUL, and CE Safety Approvals
- Warranty**  
 All units manufactured to strict ISO standards and offer full 3-year manufacturer's warranty
- Low Cost**  
 Most advanced price/performance package available

## Input Range Table

Input	Type	Input Range	
Thermocouple	K	-200 to 1370°C	-320 to 2500°F
		-199.9 to 400.0°C	-199.9 to 750.0°F
	J	-200 to 1000°C	-320 to 1800°F
	R	0 to 1760°C	0 to 3200°F
	S	0 to 1760°C	0 to 3200°F
	B	0 to 1820°C	0 to 3300°F
	E	-200 to 800°C	-320 to 1500°F
	T	-199.9 to 400.0°C	-199.9 to 750.0°F
	N	-200 to 1300°C	-320 to 2300°F
	PL-II	0 to 1390°C	0 to 2500°F
C (W/Re5-26)	0 to 2315°C	0 to 4200°F	
RTD	Pt100	-199.9 to 850.0°C	-199.9 to 999.9°F
		-200 to 850°C	-300 to 1050°F
DC Voltage	4 to 20mA DC	-1999.9 to 9999, -199.9 to 999.9	-19.99 to 99.99, -1.999 to 9.999
	0 to 20mA DC		
	0 to 1V DC		
	0 to 10V DC		
	1 to 5V DC		
0 to 5V DC			

\*For DC current input a shunt resistor (50Ω) is provided as standard.

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Standard Specifications	
<b>Display</b>	JCS-33A: PV [Red 4 digits, Character size: 10.2 x 4.9mm], SV [Green 4 digits, Character size: 8.8 x 4.9mm] JCR-33A: PV [Red 4 digits, Character size: 11.2 x 5.4mm], SV [Green 4 digits, Character size: 11.2 x 5.4mm] JCD-33A: PV [Red 4 digits, Character size: 18 x 8mm], SV [Green 4 digits, Character size: 12.6 x 6.6mm]
<b>Input</b>	Thermocouple ----- K, J, R, S, B, E, T, N, PL-II, C (W/Re5-26) External resistance: 100Ω or less (However, for B input: 40Ω or less) RTD ----- Pt100, 3-wire system (Allowable input wire resistance per wire: 10Ω or less) DC current ----- 0 to 20mA DC, 4 to 20mA DC Input impedance: 50Ω (Connect shunt resistor 50Ω between input terminals) Allowable input current: 50mA or less (When shunt resistor 50Ω is used) DC voltage ----- 0 to 1V DC Input impedance: 1MΩ or greater Allowable input voltage: 5V or less Allowable signal source resistance: 2kΩ or less 0 to 5V DC, 1 to 5V DC, 0 to 10V DC Input impedance: 100kΩ or greater Allowable input voltage: 15V or less Allowable signal source resistance: 100Ω or less
<b>Accuracy (Setting - Indicating)</b>	Thermocouple ----- Within +/-0.2% of each input span +/-1 digit or +/-2°C (4°F) whichever is greater However, R or S input 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 and N input less than 0°C (32°F): Within +/-0.4% of input span +/-1 digit RTD ----- Within +/-0.1% of each input span +/-1 digit or +/-1°C (2°F) whichever is greater DC current and DC voltage ----- Within +/-0.2% of each input span +/-1 digit
<b>Input Sampling Period</b>	0.25 seconds
<b>Control Output (OUT 1)</b>	Relay contact ----- (JCS-33A) 3A 250V AC (Resistive load), 1A 250V AC (Inductive load cos φ=0.4), Electric life: 100,000 times Non-contact DC voltage ----- 12-14V DC Max. 40 mA (short-circuit protected) DC current ----- 4 to 20mA DC Load resistance: Max. 550Ω
<b>Control Action</b>	Actions mentioned below can be selected for key operation (Factory default set as PID) PID (with auto-tuning function), PI, PD (with manual reset function), P (with manual reset function), ON/OFF OUT1 proportional band (P) --- Thermocouple: 0 to 1000°C (0 to 2000°F) (ON/OFF action when set to 0) RTD: 0.0 to 999.9°C (0 to 999.9°F) (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) Proportional cycle ----- 1 to 120 seconds (DC current output type is not available) OUT1 ARW ----- 0 to 100% FS Hysteresis ----- Thermocouple and RTD: 0.1 to 100.0°C (°F) DC current and DC voltage: 1 to 1000 (Decimal point place follows the selection) OUT1 Output limit ----- -5 to 100%
<b>Alarm 1 [A1]</b>	Alarm action and Energized/De-energized can be selected by key operation • Setting Accuracy ----- The same as the indicating accuracy • Action ----- ON/OFF action • Hysteresis ----- Thermocouple and RTD: 0.1 to 100.0°C (°F) DC current and DC voltage: 1 to 1000 (Decimal point place follows the selection) • Output ----- Relay contact 3A 250V AC (Resistive load), Electric life: 100,000 times
<b>Mounting Method</b>	JCS provided with one piece mounting bracket. JCR and JCD include screw type mounting brackets
<b>Setting Method</b>	Sheet key input
<b>Material • Color</b>	Material: Flame resistant resin Color: Black
<b>Supply Voltage</b>	100 to 240V AC 50/60Hz, 24V AC/DC 50/60Hz Allowable voltage fluctuation: 85 to 264V AC, 20 to 28 AC/DC, Power consumption approximately 8VA
<b>Environment</b>	Ambient temperature: -10 to 50°C Ambient humidity: 35 to 85% RH (No condensation)
<b>External Dimension &amp; Weight</b>	JCS-33A: 48 x 48 x 96.5mm (W x H x D) Approx. 200g JCR-33A: 48 x 96 x 98.5mm (W x H x D) Approx. 250g JCD-33A: 96 x 96 x 98.5mm (W x H x D) Approx. 370g



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Options	
* Please specify options according to user's needs. When ordering, specify an option code to be applied.	
<b>Alarm 2 [A2]</b>	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
<b>Heater Break Alarm [W]</b>	Watches the heater current with CT (current transformer) and detects burnout Heater rated current must be selected from 5A, 10A, 20A and 50A Setting Accuracy ----- Within +/-5% of heater rated current Output ----- Relay contact 3A 250V AC (Resistive load), Electric life: 100,000 times Self-Holding ----- Not Available Accessories ----- CT (Current Transformer)
<b>Control Output (OUT2) (Heating/Cooling Control) [DR,DS,DA,DT]</b>	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). These 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 can be applied to JCS-33A series) Control action (Heating side): The same as control output (OUT1) 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) Overlap cycle ----- Thermocouple and RTD: -100.0 to 100.0°C (°F) Dead band ----- DC current and DC voltage: -1000 to 1000 (Decimal point follows this selection) Hysteresis ----- 0.1 to 100.0°C (°F) Control output • Relay contact (DR): 3A 250V AC (Resistive load), 1A 250V AC (Inductive load cos φ=0.4), Electric life: 100,000 times • Non-contact voltage (DS): 12-14V DC Max. 40mA (short-circuit protected) • DC current (DA): 4 to 20mA DC Load resistance: Max. 550Ω • Non-contact relay (DT): 3A 250V AC (Resistive load) Only available on model JCS Cooling action mode (This must be selected from below by key operation) • Air cooling (Linear characteristic) • Oil cooling (1.5th Power of characteristic) • Water cooling (2nd Power of characteristic)
<b>Serial Communication [C5]</b>	Various setting status changing, reading and setting of the JC•33A can be performed from an external computer. By combining 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 Data transfer rate ----- (2400/4800/9600/19200bps) 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) Number of connectable units: A maximum of 31 units per host computer
<b>SV1/SV2 External Selection [SM]</b>	Provided as standard feature on model JCR and JCD. Option only on model JCS Main setting value 1 and 2 can be changed by external contact Terminal between 13 and 14 is open: SV1 Terminal between 13 and 14 is closed: SV2
<b>Loop Break Alarm [LA]</b>	This option enables Heater burnout, Sensor burnout and Input burnout to be detected Loop break alarm time ----- 0 to 200 minutes Loop break alarm span ----- Thermocouple and RTD: 0 to 150°C (°F), 0.0 to 150.0°C (°F) DC current and DC voltage: 0 to 1500 Output ----- Relay contact 3A 250V AC (Resistive load), 1A 250V AC (Inductive load cos φ=0.4), Electric life: 100,000 times
<b>Transmitter Power Supply [P24]</b>	When this option is added, 24V DC is output from the terminal 9 to 10 of JCD-33A and JCR-33A Output voltage ----- 24V DC +/-3V (When load current is 30mA) Ripple voltage ----- 200mV (When load current is 30mA) Maximum load current ----- 30mA

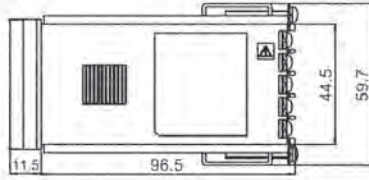
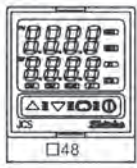
***All units feature a full 3-Year warranty  
and lifetime technical support!***



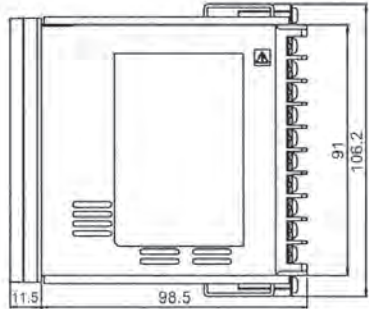
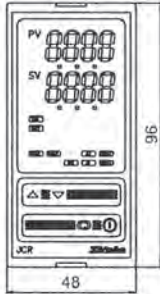
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## External Dimensions

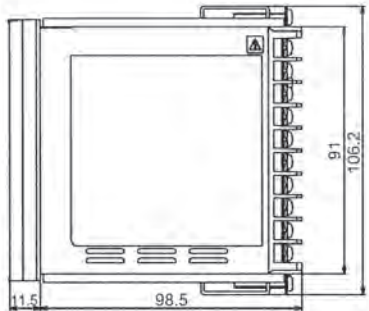
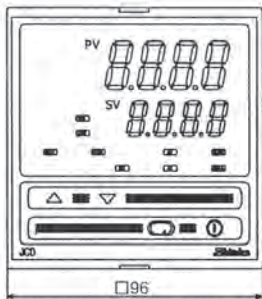
### JCS-33A Series



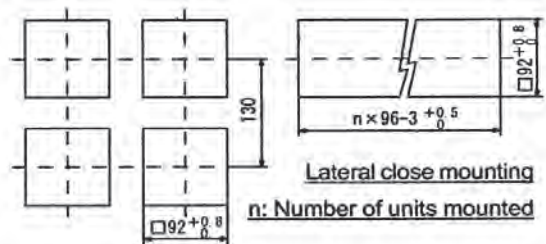
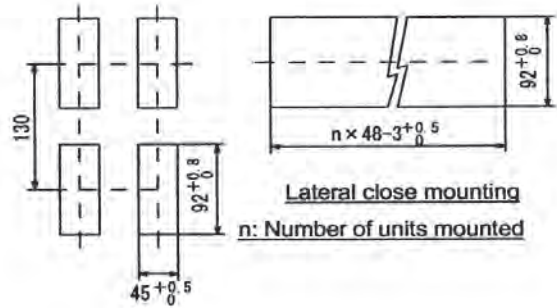
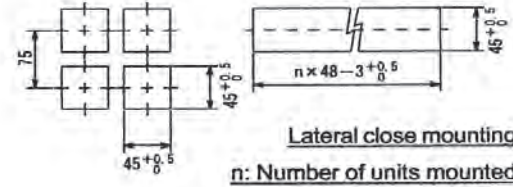
### JCR-33A Series



### JCD-33A Series

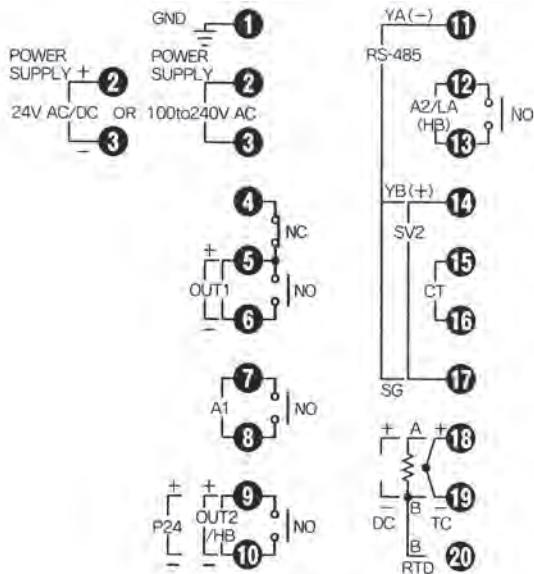


## Panel Cutout

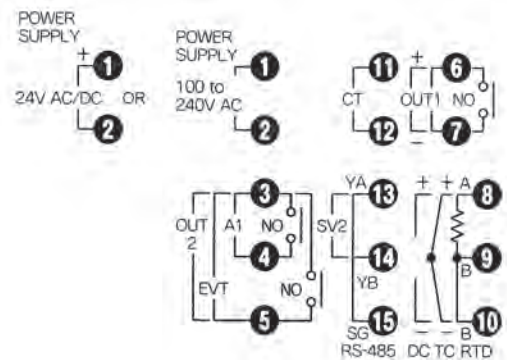


## Terminal Wiring

### JCR-33A, JCD-33A Series



### JCS-33A Series



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## Model Number Configuration

FRONT PANEL SIZE	CODE	PRICE
1/16 DIN (48mm x 48mm)	S	\$139.00
1/8 DIN (48mm x 96mm)	R	\$239.00
1/4 DIN (96mm x 96mm)	D	\$259.00

ALARM FUNCTION	CODE	PRICE
Standard	A	N/C

CONTROL OUTPUT	CODE	PRICE
Relay Contact	R	N/C
SSR Driver	S	N/C
4-20mA*	A	N/C

\*Not available with heater break alarm

INPUT	CODE	PRICE
True Multi-Input T/C, RTD, Voltage, Current	M	N/C

SUPPLY VOLTAGE	CODE	PRICE
24V AC/DC	1	N/C
100 - 240V AC	-	N/C

CONTROL OUTPUT 2	CODE	PRICE
Relay Contact	DR	\$35.00
SSR Driver	DS	\$35.00
4-20mA	DA	\$35.00
Solid State Relay Output*	DT	\$35.00

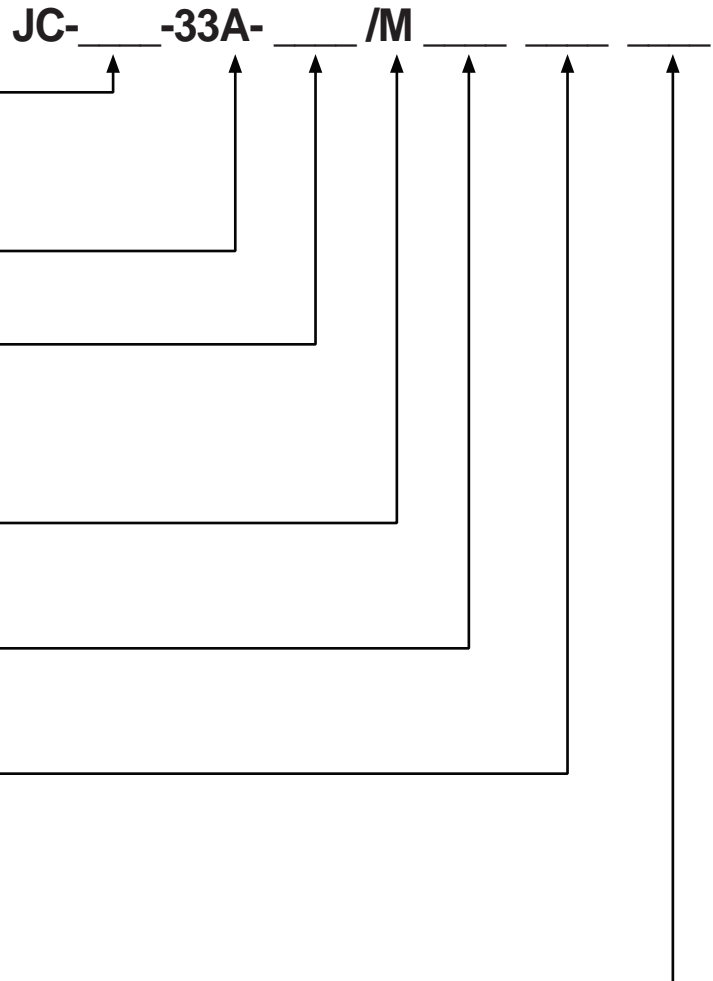
\*Only available on the JCS model

OPTIONS	CODE	PRICE
Alarm 2	A2	\$30.00
RS-485***	C5	\$40.00
Heater Break (5A)	W5A	\$60.00
(10A)	W10A	\$60.00
(20A)	W20A	\$60.00
(50A)	W50A	\$60.00
Remote SV**	SM	\$20.00
Loop Break Alarm	LA	\$30.00
Transmitter Power Supply 24V DC*	P24	\$100.00

\*Not available on the JCS

\*\*Standard feature on the JCR and JCD

\*\*\* Not available with SM option



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