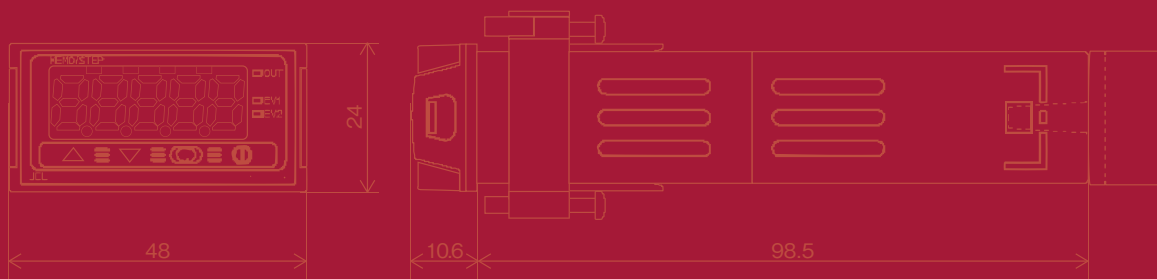# Compact Versatility

Size: 48 (W) x 24 (H) mm

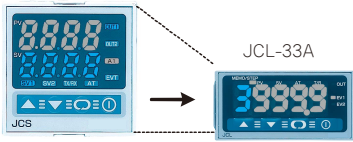*Programmable controller function*

Standard Event input/output

CE & UL conformity, Dust-proof/drip-proof (IP66)

Features

Compact

JCL-33A

The function and performance of the JCL-33A (width: 48mm, height: 24mm) are equivalent to those of traditional 48mm square controllers.

Multi-input

A total of 18 types of input are available from a choice of: thermocouple (10 types), RTD (2 types), DC current (2 types) and DC voltage (4 types). As input sampling period is short (0.25 seconds), this instrument is applicable to a wide range of process.

2-way usage: Controller and Converter

For DC current output type, JCL-33A can be used as a controller or a converter by keypad.
If it is used as a converter, thermocouple, RTD or DC input signal is converted to 4 to 20mA DC, and outputted.

Standard SV1 / SV2 external selection function

The memory function to switch SV1 or SV2 by external contact signal is equipped as a standard feature.
By registering value of SV1 and SV2 beforehand, the SV can be switched by external operation.

Standard 2-point Event output

2-point Event output is provided as a standard feature.
Event output comprises Alarm action, Timer function and Pattern end function.
One function can be easily selected by keypad of the JCL-33A.
(Default value: No alarm action)

Standard programmable controller function

Programmable controller function is also provided as a standard feature.
9-step/pattern program control can be carried out.

Serial communication (RS-485)

By connecting the JCL-33A to a personal computer or touch panel unit, monitoring and various settings can be performed through the optional serial communication (RS-485) function.
(A maximum of 31 units of the JCL-33A can be connected.)
As a communication protocol, Shinko protocol and Modbus protocol are provided.
(For Modbus protocol, RTU mode and ASCII mode can be selected by keypad.)
The JCL-33A can be connected to open network Modbus.

Set value digital transmission

The JCL-33As (slabe) can receive the SV of the PCD-33A (master) programmable controller that has the SVTC option.

Standard Dust-proof / Drip-proof structure (IP66)

IP66 structure enables the JCL-33A to be used in harsh environments such as those where it will be exposed to water and dust.
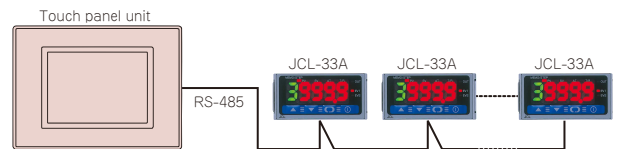
Safety Standards

UL/C-UL, CE marking

Configuration example

When monitoring multiple JCL-33A units with a touch panel unit

Up to 31 temperature control points can be monitored with a touch panel unit.
JCL-33A complies with the following touch panel units.
Digital Electronics Corp.: GLC series, GP series
Hakko Electronics Co., Ltd.: V7 series, V6 series

When using JCL-33A as a programmable controller

If Shinko programmable controller PCD-33A or PC-935 (with option SVTC) is used as a program setter, the JCL-33A (with option C5) can be used as a programmable controller for up to 31 places.
(Setting value digital transmission is available.)
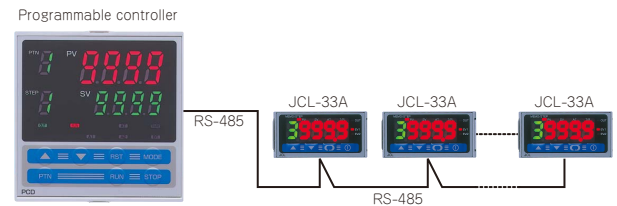
Specifications

■ Model

J C L - 33 A	□/□ □, □□□	
Control output (OUT)	R	Relay contact
	S	Non-contact voltage (for SSR drive)
	A	DC current
Input	M	Multi-input
Supply voltage	1	24V AC/DC
Option	DR	Heating/Cooling control output (Relay contact)
	C5	Serial communication (Based on EIA RS-485)
	TC	Terminal cover
	BK	Color: Black

Please designate the specifications from the □, □□□ columns.
When adding an option, enter it punctuated by a comma.
· Event outputs (EV1, EV2) are provided as a standard feature.
 Alarm action, Timer function and Pattern end function can be selected by front keypad.
· If C5 option is added, Event output 2 and DI input cannot be used.
· If DR option is added, Event output 1 cannot be used.
· For the supply voltage, 100 to 240V AC is standard, however, when ordering 24V AC/DC, enter "1" after the input code.

■ Rated range (Multi-input)

Input type		Input range	
Thermo-couple	K	−200 to 1370 ℃	−320 to 2500 °F
		−199.9 to 400.0 ℃	−199.9 to 750.0 °F
	J	−200 to 1000 ℃	−320 to 1800 °F
	R	0 to 1760 ℃	0 to 3200 °F
	S	0 to 1760 ℃	0 to 3200 °F
	B	0 to 1820 ℃	0 to 3300 °F
	E	−200 to 800 ℃	−320 to 1500 °F
	T	−199.9 to 400.0 ℃	−199.9 to 750.0 °F
	N	−200 to 1300 ℃	−320 to 2300 °F
	PL-Ⅱ	0 to 1390 ℃	0 to 2500 °F
	C (W/Re5-26)	0 to 2315 ℃	0 to 4200 °F
RTD	Pt100	−200 to 850 ℃	−300 to 1500 °F
		−199.9 to 850.0 ℃	−199.9 to 999.9 °F
	JPt100	−200 to 500 ℃	−300 to 900 °F
		−199.9 to 500.0 ℃	−199.9 to 900.0 °F
DC current	4 to 20mA DC	−1999 to 9999, −199.9 to 999.9 −19.99 to 99.99, −1.999 to 9.999	
	0 to 20mA DC		
DC voltage	0 to 1V DC		
	0 to 10V DC		
	1 to 5V DC		
	0 to 5V DC		

· For DC current and voltage inputs, decimal point place change and scaling are possible.
· For DC current input, 50Ω shunt register (sold separately) must be installed.

■ Standard specifications

Display	PV/SV: [Red 4-digit, character size: 8.7 x 5mm (H x W)], MEMO/STOP: [Green, 1 digit, character size: 8.7 x 5mm (H x W)]
Input	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, JPt100 3-wire system (allowable input lead wire resistance: 10Ω or less per wire) DC current-------- 0 to 20mA DC, 4 to 20mA DC: Input impedance: 50Ω (50Ω shunt resistor must be connected between input terminals.) Allowable input current: 50mA DC or less (when 50Ω shunt resistor is used) DC voltage -------- 0 to 1V DC: Input impedance 1MΩ or more Allowable input voltage: 5V DC 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 more, Allowable input voltage: 15V DC or less Allowable signal source resistance: 100Ω or less

Accuracy (setting·indication)	Thermocouple-------------	Within ±0.2% of each input span ±1digit, or within ±2℃ (4℉), whichever is greater However, R, S input, the range is 0 to 200℃ (0 to 400℉): Within ±6℃ (12℉) B input, the range is 0 to 300℃ (0 to 600℉): The accuracy is not guaranteed. K, J, E, T, N input, less than 0℃(32℉): Within ±0.4% of input span±1digit, or within ±4℃(8℉), whichever is greater
	RTD -------------------------	Within ±0.1% of each input span±1digit, or within ±1℃ (2℉), whichever is greater
	DC current, voltage-----	Within ±0.2% of each input span±1digit
Input sampling period	0.25 seconds	
Control output (OUT)	Relay contact -------------	1a, control capacity: 3A 250V AC (resistive load), 1A 250V AC (inductive load cos φ=0.4), Electric life: 100,000 cycles
	Non-contact voltage----	12$^{+2}_{0}$V DC Max. 40mA DC (short circuit protected)
	DC current ----------------	4 to 20mA DC load resistance: Max. 550Ω
Control action	The following actions can be selected by keypad. (Default value: PID) PID (with auto-tuning function), PI, PD (with manual reset function), P (with manual reset function), ON/OFF	
	OUT proportional band (P) --	0.0 to 110.0% (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)
	OUT proportional cycle -------	1 to 120 seconds (Not available for DC current output type)
	ARW --------------------------------	0 to 100%
	Hysteresis --------------------------	Thermocouple, RTD: 0.1 to 100.0℃ (℉) DC current, voltage: 1 to 1000 (The placement of the decimal point follows the selection)
Event output 1 (EV1), Event output 2 (EV2)	Alarm action, Timer function and Pattern end function can be selected by keypad. · No alarm action · High limit alarm (Deviation setting) Setting range: -(Scaling span) to Scaling span · Low limit alarm (Deviation setting) Setting range: -(Scaling span) to Scaling span · High/Low limits alarm (Deviation setting) Setting range: 0 to Scaling span · High/Low limit range alarm (Deviation setting) Setting range: 0 to Scaling span · Process high alarm Setting range: Scaling low limit value to Scaling high limit value · Process low alarm Setting range: Scaling low limit value to Scaling high limit value · High limit alarm with standby (Deviation setting) Setting range: -(Scaling span) to Scaling span · Low limit alarm with standby (Deviation setting) Setting range: -(Scaling span) to Scaling span · High/Low limits alarm w/standby (Deviation setting) Setting range: 0 to Scaling span For the inputs with a decimal point, the negative minimum value is -199.9 and the positive maximum value is 999.9.	
	Setting accuracy --------------------------	The same as the indicating accuracy
	Action -------------------------------------	ON/OFF action
	Hysteresis --------------------------------	Thermocouple, RTD: 0.1 to 100.0℃(℉) DC current, voltage: 1 to 1000 (The placement of the decimal point place follows the selection.)
	EV1 ---	Relay contact 1a, Control capacity: 3A 250V AC (Resistive load), 1A 250V AC (Inductive load cos φ=0.4), Electric life: 100,000 cycles
	EV2 ---	Open collector, Control capacity: 0.1A 24V DC (Max.)
	Alarm action delay timer -----------------	Alarm action is delayed by this function. If input enters alarm output range and the set time has passed, the output is turned on.
	Alarm output hold function --------------	Once the alarm is activated, the alarm output is maintained until the power is turned off.

DI (Digital input)	DI input has 3 functions as shown below. Each function can be selected by keypad.
	· Timer function: If input signal enters from outside, timer measurement starts, and ON delay timer, OFF delay timer or
	         ON/OFF delay timer action output is turned on after delay timer setting time has passed.
	· SV1/SV2 external selection function: SV1 (Desired value 1), and SV2 (Desired value 2) can be selected by external contact signal.
	         (If the JCL-33A is used as a programmable controller, this function is not available)
	         DI terminals (between 10 and 12) are open: SV1 can be set and indicated.
	         DI terminals (between 10 and 12) are closed: SV2 can be set and indicated.
	         Circuit current when closed: 6mA
	· OUT/OFF (RUN/STOP) external selection function:
	         Control output OUT/OFF (Fixed value control) or Program control RUN/STOP can be switched.
	         [Fixed value control]
	          (If the JCL-33A is used as a programmable controller, OUT/OFF external selection function is not available)
	          DI terminals between 10 and 12 Open: OUT status
	          DI terminals between 10 and 12 Closed: OFF status, Circuit current when closed: 6mA
	         [Program control]
	          Program control RUN/STOP can be switched by external contact pulse input (ON time, approx. 30ms).
	          If pulse input enters during program control standby, program control starts. If pulse input enters during program
	          control run, program control stops and the controller reverts to the program control standby mode.
	          If pulse input enters while pattern end output is turned ON, pattern end output is turned off.	

Simplified programmable controller function	JCL-33A can perform 1 pattern and 9 steps of simplified program control. (If the OUT/OFF key function is selected in the setting items, either fixed value control or program control can be selected) If the OUT/OFF key on the front face of the instrument is pressed during program standby, the program begins. (To cancel the program, press the OUT/OFF key one more time)	
	Progressing time error ----	Within ±1 minute
	Pattern end output ---------	Pattern end output can be selected by front keypad. (If the program ends normally, Pattern end output is turned on, and the output is maintained until it is cancelled by pressing the OUT/OFF key again. During pattern end output, program control cannot be performed.)
Converter function	JCL-33A has a converter function, which can be easily used by changing with keypad. (However, this is available only for the DC current output type) The setting values are changed as follows. SV1 (Desired value)=Scaling low limit value, Integral time=0, Derivative time=0, OUT proportional band=100.0%, Manual reset=0.0, A1 value=0, A2 value=0, Direct/Reverse action=Direct action	
Supply voltage	100 to 240V AC 50/60Hz, 24V AC/DC 50/60Hz Allowable voltage fluctuation range: 85 to 264V AC, 20 to 28V AC/DC	
Power consumption	Approx. 5VA	
Isolation resistance	10MΩ or more at 500V DC	
Dielectric strength	Between input terminal and power terminal, Between output terminal and power terminal ----- 1.5kV AC for 1 minute	
Environment	Ambient temperature: 0 to 50℃ (32 to 122℉) Ambient humidity: 35 to 85%RH (non-condensing)	
Safety standard	UL: Power input rating 100-240V AC, 24V AC/DC File No. E159038	
Case Material·Color	Material: Flame-resistant resin Color: Light gray	
Mounting method	Designated mounting frame is used. (Mountable thickness of the control panel: 1 to 10mm)	
Setting method	Sheet key input	
External dimensions	W48 x H24 x D98.5mm	
Weight	Approx. 120g	
Attached functions	Sensor correction, Set value lock, PV filter, Power failure countermeasure, Self-diagnosis, Automatic cold junction temperature compensation (only for thermocouple), Burnout, Input burnout, Warm-up indication, Temporary PV/SV indication switching, Dust-proof/Drip-proof IP66 (for the front face)	

■ Options

[Please add options according to the user's needs. When ordering, designate an option code to be applied]

Heating/Cooling control [DR]	If this option is added, Event output 1 cannot be used. For this option, use terminals 8 and 9 (EV1 terminals) Heating control action: The same as the control output (OUT) Cooling control action	
	Proportional band (P) -----	0.0 to 10.0 times the control output (OUT) (ON/OFF action when set to 0.0)
	Integral time (I) --------------	The same as that of the control output (OUT)
	Derivative time (D) ---------	The same as that of the control output (OUT)
	Proportional cycle ----------	1 to 120 seconds (Not available for DC current output type)
	Overlap/Dead band -------	Thermocouple, RTD : -100.0 to 100.0℃ (℉) DC current, voltage : -1000 to 1000 (The placement of the decimal point follows the selection)
	Hysteresis --------------------	Thermocouple, RTD : 0.1 to 100.0℃ (℉) DC current, voltage : 1 to 1000 (The placement of the decimal point follows the selection)
	Control output (EV1) ---------	Relay contact 1a, Control capacity: 3A 250V AC (resistive load), 1A 250V AC (inductive load cos φ=0.4), Electric life: 100,000 cycles

|	
Serial communication [C5]	Performs operations such as various setting status changes, set value reading and setting, etc. from the external computer. Shinko programmable controller which has the SVTC option can digitally transmit its SV to JCL-33A units which have the C5 option. Communication interface ------------ EIA RS-485 Communication method -------------- Harf-duplex communication Synchronization method ------------- Start-stop synchronization Communication speed ---------------- 2400/4800/9600/19200bps (Can be selected by keypad) Parity ----------------------------------- Even (Shinko protocol, Modbus ASCII), No parity (Modbus RTU) Start, Stop bit ---------------------------- 1 Communication protocol ------------- Shinko/Modbus RTU/Modbus ASCII (Can be selected by keypad) Number of connectable units ------ Max. 31 units per host computer Communication error detection --- Parity, checksum (LRC), CRC Data format <table><tr><th>Communication protocol</th><th>Shinko</th><th>Modbus RTU</th><th>Modbus ASCII</th></tr><tr><td>Start bit</td><td>1</td><td>1</td><td>1</td></tr><tr><td>Data bit</td><td>7</td><td>8</td><td>7</td></tr><tr><td>Parity</td><td>Even</td><td>No parity</td><td>Even</td></tr><tr><td>Stop bit</td><td>1</td><td>1</td><td>1</td></tr></table>
Terminal cover [TC]	Electric shock protection terminal cover Be sure to use this terminal cover by adding this option if operator may touch the back of the controller while running the controller.
Color black [BK]	Standard color (case, base) is light gray. However, if this option is added, the color of the case and base will be black.

■ External dimensions (Scale: mm)
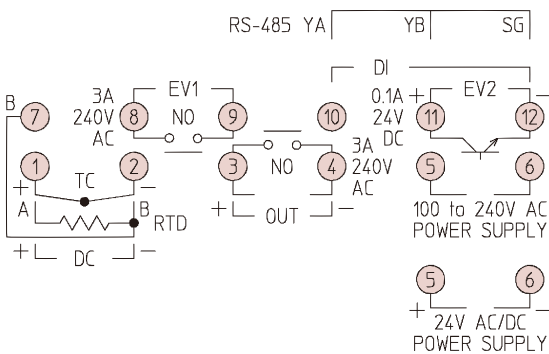

Packing　　Mounting frame　　Terminal cover

※When terminal cover is added
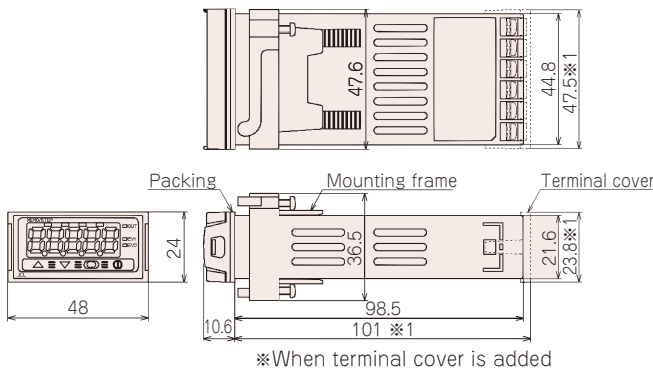
■ Panel cutout (Scale: mm)
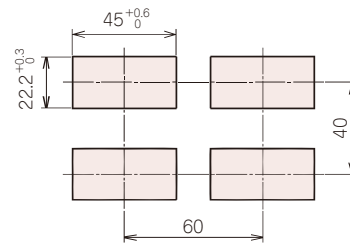
■ Terminal arrangement

⚠ · If C5 option is added, Event output 2 and DI input cannot be used.
· If DR option is added, Event output 1 can not be used.
· JCL-33A does not have built-in power switch, circuit breaker or fuse. Be sure to install externally this device near the controller.
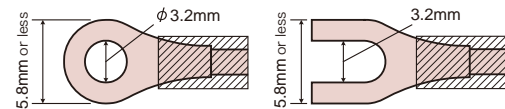· When the supply voltage is 24V AC/DC, do not confuse the polarity when using direct current (DC).

■ Solderless terminal

Use a solderless terminal with an insulation sleeve in which an M3 screw fits. The torque should be 0.63N·m.

POWER SUPPLY	Power terminals
EV1	Event output 1 or Cooling output (when option DR is added) terminals
EV2	Event output 2 terminals
OUT	Control output or Heating output (when option DR is added) terminals
DI	DI input terminals (DI input has 3 functions: Timer function, SV1/SV2 external selection function, OUT/OFF (RUN/STOP) external selection function
RS-485	Serial communication (C5) terminals
TC	Thermocouple input terminals
RTD	RTD input terminals
DC	DC current or DC voltage input terminals (For DC current input, connect 50Ω shunt resistor (sold separately) between input terminals.)

⚠ **SAFETY PRECAUTIONS**

● To ensure safe and correct use, thoroughly read and understand the 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 the 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.

· This catalog is as of March 2009, and specifications are subject to change without notice.
· If you have any inquiries, please consult us or our agency.