NEW PRODUCTS

ISO 9001
KEMA
CERT. No.60033
DUTCH COUNCIL
FOR ACCREDITATION

C E

JCL-33A

A compact and versatile controller!
JCL-33A from Shinko can be mounted almost anywhere!

Shinko

Features

Compact

Traditional 48mm square controllers → 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 main setting value 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.

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.
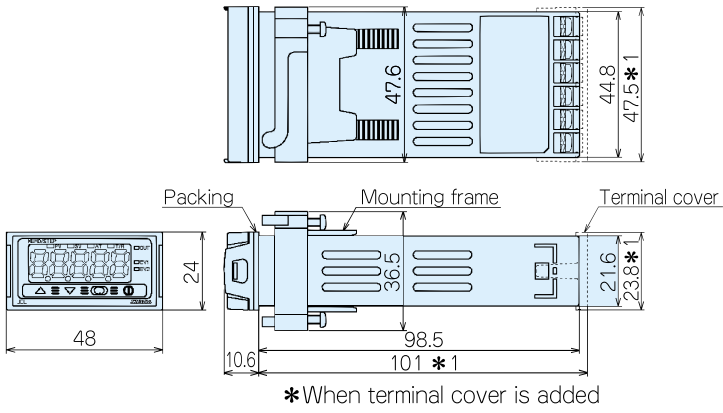
Safety conformity

UL/CSA (Approval pending)

Specifications

■Model name

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 option C5 is added, Event output 2 and DI input cannot be used.
・ If option DR 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.

■Name and functions of the sections
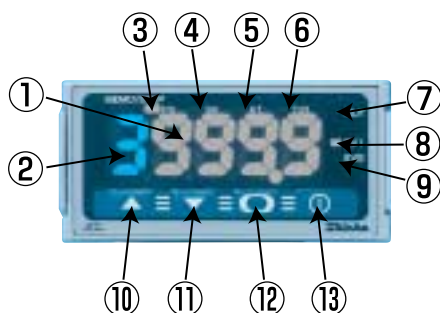
①PV/SV display : Indicates process variable (PV) or setting value (SV).
  Indicates the character and setting value in turn during setup.
②MEMO/STEP display: Indicates setting value memory number and step number.
③PV indicator : Lights while PV is indicated on the PV/SV display.
④SV indicator : Lights while SV is indicated on the PV/SV display.
⑤AT indicator : Blinks during PID auto-tuning.
⑥T/R indicator : Blinks during serial communication (Lights when sending data and goes out when receiving data).
⑦OUT indicator : Lights when control output (OUT) is on or Heating output (option DR) is on.
  (For DC current output type, this blinks in a 0.25 second cycle corresponding to the output manipulated variable)
⑧EV1 indicator : Lights when either Event output 1 or Cooling output (option DR) is on.
⑨EV2 indicator : Lights when Event output 2 is on.
⑩Increase key : Sets the values or selects the setting item. (Increases the numeric value)
⑪Decrease key : Sets the values or selects the setting item. (Decreases the numeric value)
⑫Mode key : Switches the setting mode and registers the setting value.
⑬OUT/OFF key : Switches the output OUT/OFF or the program RUN/STOP.

■ 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		
	0 to 20mA DC		
DC voltage	0 to 1V DC	−1999 to 9999, −199.9 to 999.9	
	0 to 10V DC	−19.99 to 99.99, −1.999 to 9.999	
	1 to 5V DC		
	0 to 5V DC		

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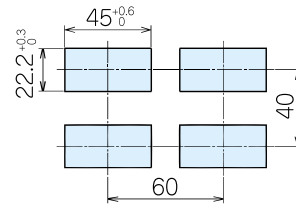・ For DC current input, 50Ω shunt register (sold separately) must be installed.

■Standard specifications

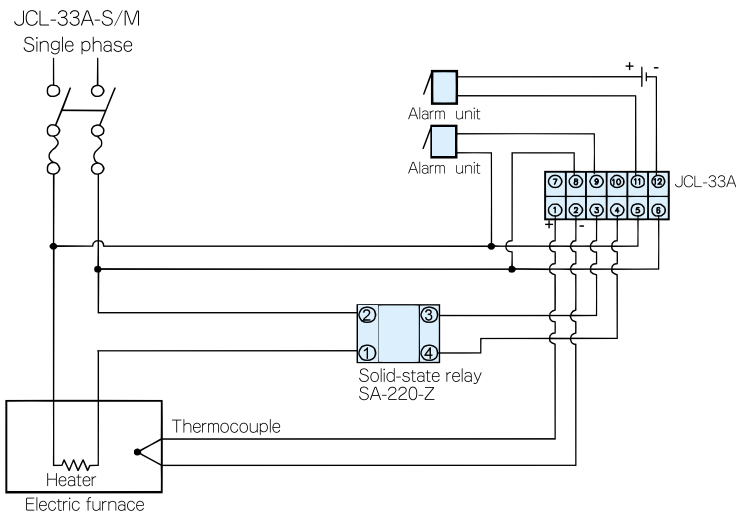|	
Display	PV/SV: [Red 4-digit, character size: 8.7 x 5mm (H x W)], MEMO/STOP: [Green, 1 digit, character size: 8.7 x 5mm (H x W)]
Input	Thermocouple -- K, J, R, S, B, E, T, N, PL-Ⅱ, C (W/Re5-26) External resistance: 100Ω or less, however, for B input, 40Ω or less RTD---------------- Pt100, JPt100 3-wire 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 greater 　　　　　　　　　　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 greater, 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°F), whichever is greater 　　　　　　　　　　　However, R, S input, the range is 0 to 200℃ (0 to 400°F): Within ±6℃ (12°F) 　　　　　　　　　　　B input, the range is 0 to 300℃ (0 to 600°F): The accuracy is not guaranteed. 　　　　　　　　　　　K, J, E, T, N input, less than 0℃(32°F): Within ±0.4% of input span±1digit, or within ±4℃(8°F), whichever is greater RTD-------------------------- Within ±0.1% of each input span±1digit, or within ±1℃ (2°F), whichever is greater DC current, DC 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 times 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℃ (°F) 　　　　　　　　　　　　　　DC current, DC 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℃(°F) 　　　　　　　　　　　　　　　　DC current, DC 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 times EV2-------------------------------------- Open collector, Control capacity: 0.1A 24V DC (Max.) Alarm action delayed timer function - 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 (Main setting 1), and SV2 (Main setting 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 (Main setting)=Scaling low limit value, Integral time=0, Derivative time=0, OUT proportional band=100.0%, Manual reset=0.0, 　A1 setting=0，A2 setting=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. 6VA
Isolation resistance	10MΩ or greater 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℃ Ambient humidity: 35 to 85%RH (non-condensing)
Case Material·Color	Material: Flame resistant resin Color: Light gray
Mounting method	Designated mounting frame is used. (Mountable thickness of the control panel: Within 1 to 10mm)
Setting method	Sheet key input
External dimensions	W48 x H24 x D98.5mm
Weight	Approx. 120g
Attached functions	Sensor correction, Setting 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

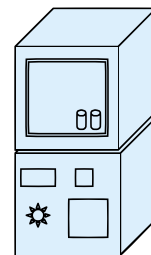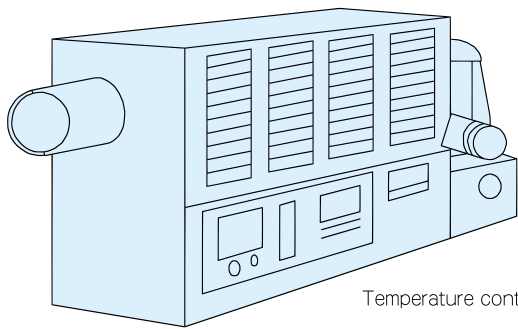[Please add options according to the users' needs. When ordering, designate an option code to be applied]

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℃ (˚F)
	                DC current, DC voltage : -1000 to 1000 (The placement of the decimal point follows the selection)
	  Hysteresis ------------------ Thermocouple, RTD : 0.1 to 100.0℃ (˚F)
	                DC current, DC 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 times

Serial communication [C5]	Performs operations such as various setting status changes, setting 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 ---------- Based on EIA RS-485
	  Communication system ------------ Half-duplex communication start-stop synchronous
	  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}}
	
	[Setting value digital transmission]
	The JCL-33As (slave) can receive SV of the programmable controller PCD-33A (master) that has the SVTC option.
	Wiring example of Setting value digital transmission (A maximum of 31 units of the JCL-33A that has option C5 can be connected.)

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.

Data format table:

Communication protocol	Shinko	Modbus RTU	Modbus ASCII
Start bit	1	1	1
Data bit	7	8	7
Parity	Even	No parity	Even
Stop bit	1	1	1

■ Terminal arrangement

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.)

⚠
· If option C5 is added, Event output 2 and DI input cannot be used.
· If option DR 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 DC is applied.

■ Solderless terminal

Use a solderless terminal with an isolation sleeve that fits to the M3 terminal. Tightening torque is 0.6N・m to 1.0N・m

■External dimensions

47.6

44.8 *1

47.5 *1

Packing   Mounting frame   Terminal cover

24

36.5

21.6 *1

23.8 *1

48

10.6

98.5

101 *1

*When terminal cover is added

■ Panel cutout

45 +0.6/0

22.2 +0.3/0

40

60

■Wiring example

JCL-33A-S/M
Single phase

+   -

Alarm unit

Alarm unit

⑦ ⑧ ⑨ ⑩ ⑪ ⑫   JCL-33A

① ② ③ ④ ⑤ ⑥

+   -

②   ③

①   ④

Solid-state relay
SA-220-Z

Thermocouple

Heater

Electric furnace

■Application example

Temperature control for hot air generator

Temperature control for
portable electric furnace

Ideal for a wide range of applications
such as hot air generators and small
incubators where small size operation
panels are required

Temperature control for small incubator

Temperature control for film sealing in packaging machines
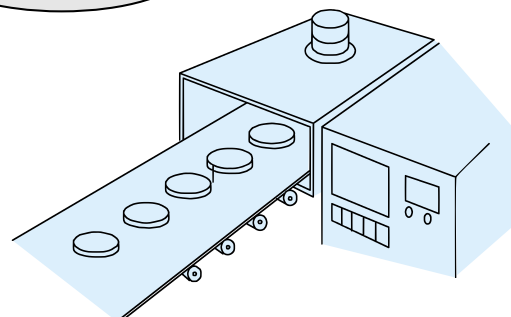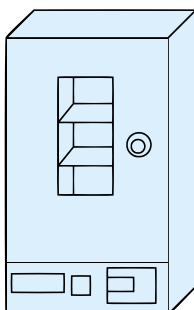
When monitoring multiple JCL-33A units with a personal computer

If a personal computer is connected to JCL-33A units via a communication converter, a maximum of 40 temperature control points can be monitored. (The communication converter is not necessary if RS-485 communication lines for the personal computer are used)
For the communication converter, use Shinko IF-300-C5.
Please use our monitoring software [SWM-JC001M] for the JCL-33A.

Communicaton converter
JCL-33A   JCL-33A   JCL-33A
RS-232C
Personal computer
RS-485
Communication cable
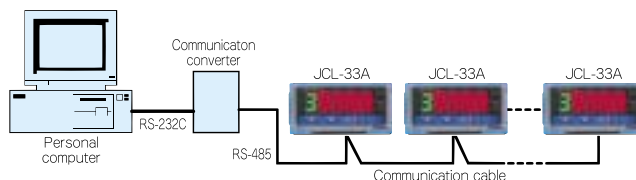
When monitoring multiple JCL-33A units with a touch panel unit

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

Touch panel unit
RS-485
JCL-33A   JCL-33A   JCL-33A
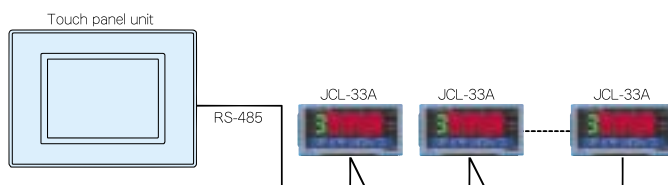
When using JCL-33A as a programmable controller

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.)

Programmable controller
PTN   PV
STEP   SV
△ ▽ RST MODE
PTN   RUN STOP
PCD
RS-485
JCL-33A   JCL-33A   JCL-33A
RS-485

When using the JCL-33A as a converter

Various process signals can be converted to input, output and 4 to 20mA DC output isolated from power source.
4 to 20mA output can be used for the PLC.
(DC current output type JCL-33A is used.)

PLC
Environment testing equipment
Converter
Output:4 to 20mA DC
Output:4 to 20mA DC
TC
RTD
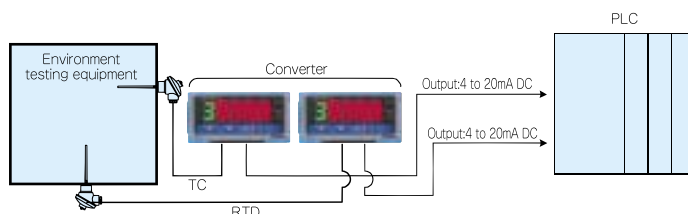
When connecting up to 50 units of JCL-33A with a PLC

By connecting a PLC via PLC interface unit [SIF-200-GCS], up to 50 units of JCL-33A can be connected.
To check which PLC units correspond to the SIF-200-GCS, please consult us.

Link unit
SIF-200-GCS
PLC
JCL-33A   JCL-33A
RS-232C or
RS-442(RS-485)
RS-485
RS-485
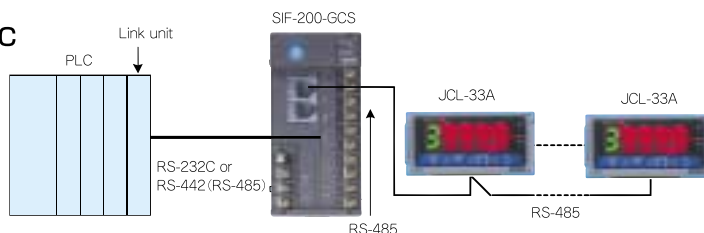
· This catalog is as of October 2003, and specifications are subject to change without notice.
· If you have any inquiries, please consult us or our agency.

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