FCL-100 Series

High performance,
Easy viewing, Compact unit !

FCL -130 type

FCL-130 —□/□, □ □, □□□□□□□					FCL-130 (W48 x H24 x D98.5mm)
Temperature alarm	0				No temperature alarm
Control output	R				Relay contact output
	S				Non-contact voltage output
	A				Current output: 4 to 20mA DC
Input		E			Thermocouple multi-input, or Thermocouple K type only (Scale range needs to be designated.)
Option			TC		Terminal cover
			BK		Color: Black
Range designation				0 to 400℃	Needs to be designated when using Thermocouple K type only. (Range is changeable by key operation.)
				0.0 to 400.0℃	
				0 to 750℉	
				0.0 to 750.0℉	

- FCL-130 type has no temperature alarm output (temperature alarm action).
- FCL-130 type has two kinds of input, "Thermocouple multi-input" and "Thermocouple K only input". In the case using "Thermocouple K only input", the range must be designated when ordering.
- There are only 2 options that can be added to FCL-130 type, "Terminal cover [TC]" and "Color : Black [BK]".
- When ordering, select the alphanumeric characters from the table above for □ (including code, if necessary) besides entering the rated scale (Thermocouple K only) by using a "comma".

FCL-13A type

FCL-13A —□/□, □□□□, □□□□□□□						FCL-13A (W48 x H24 x D98.5 mm)
Temperature alarm	A					Temperature alarm available (Output action is selectable by key operation)
Control output	R					Relay contact
	S					Non-contact voltage output
	A					Current output: 4 to 20mA DC
Input		M				Multi-range
		E				Thermocouple K type only
Option			C5			Serial communication RS-485
			W (5A)			Heater burnout alarm Rated current: 5A
			W (10A)			Heater burnout alarm Rated current: 10A
			W (20A)			Heater burnout alarm Rated current: 20A
			W (50A)			Heater burnout alarm Rated current: 50A
						Open collector Control capacity : 24V DC 0.1A(Max.)
			SM			Setting value memory (External selection)
			TC			Terminal cover
			BK			Color: Black
Range designation				0 to 400℃		Needs to be designated when using Thermocouple K type only. (Range is changeable by key operation.)
				0.0 to 400.0℃		
				0 to 750℉		
				0.0 to 750.0℉		

- FCL-13A type has two kinds of input, "Multi-range" and "Thermocouple K only", the latter, the range must be designated when ordering.
- Serial communication [C5], Heater burnout alarm [W], and Setting value memory (external selection) [SM], they cannot be added simultaneously. (Only 1 of them can be added.) In the case of Thermocouple K only input, range designation is needed when ordering.
- When ordering, select the alphanumeric characters from the table above for □ (including code, if necessary) besides entering the rated scale (Thermocouple K only) by using a "comma".

Example: When ordering

FCL-13A-R/E, SM, 0 to 400℃

- Temperature alarm action: When alarm action is designated
- Control output : When [Relay contact] is designated
- Input : When [Thermocouple K only] is selected
- Option : When [Setting value memory (External selection)] is added
- Scale range : [0 to 400℃] Designate the range when using thermocouple K only

Rated scale

In the case of multi-range input

Input type		Scale	
Thermocouple	K	0 to 1370℃	0 to 2500℉
	J	0 to 1000℃	0 to 1800℉
	E	0 to 800℃	0 to 1500℉
	N	0 to 1300℃	0 to 2300℉
	PL-Ⅱ	0 to 1390℃	0 to 2500℉
RTD	Pt100	—200 to 850℃	—300 to 1500℉
	Pt100	—199.9 to 850.0℃	—199.9 to 999.9℉
	JPt100	—200 to 500℃	—300 to 900℉
	JPt100	—199.9 to 500.0℃	—199.9 to 900.0℉

In the case of Thermocouple multi-range input

Input type		Scale	
Thermocouple	K	0 to 1370℃	0 to 2500℉
	J	0 to 1000℃	0 to 1800℉
	E	0 to 800℃	0 to 1500℉
	N	0 to 1300℃	0 to 2300℉
	PL-Ⅱ	0 to 1390℃	0 to 2500℉

In the case of Thermocouple K only

Input type		Scale	
Thermocouple	K	0 to 400℃	0 to 750℉
		0.0 to 400.0℃	0.0 to 750.0℉

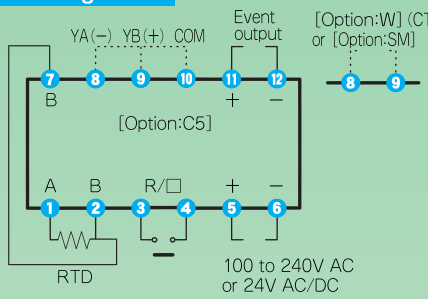
Specification

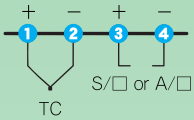
Display	PV/SV ----- Red 4 digits 8(H)×4(W)mm
Input	Type • Thermocouple---------- K, J, E, N, PL-Ⅱ External resistance: 100Ω or less • RTD---------- Pt100, JPt100 3-wire system (Resistance per wire: 10Ω or less) Scale---------- Refer to the Rated Scale. Resolution • Thermocouple, RTD --- 1 (1℉) • With decimal point----- 0.1 (0.1℉)
Accuracy (Set, Indication)	Thermocouple ---------- Within ±0.3% of full scale ±1digit or±2℃(4℉) whichever is greater RTD ---------- Within ±0.2% of full scale ±1digit or±1℃(2℉) whichever is greater
Input sampling period	0.25 seconds
Control action	PID (With auto-tuning function) Proportional band (P)----- 0 to maximum of rated scale or 0.0 to maximum of rated scale Integral time (I)---------- 0 to 3600s (Off when set to 0) Derivative time (D)------- 0 to 3600s (Off when set to 0) Proportional cycle-------- 1 to 120s (Not available for DC output) ARW ---------- Automatic PD (With auto-reset function) Proportional band (P)----- 0 to maximum of rated scale or 0.0 to maximum of rated scale Derivative time (I)-------- 0 to 3600s(Off when set to 0) Proportional cycle -------- 1 to 120s (Not available for DC output) ON/OFF action Hysteresis----------0.1 to 100.0℃(℉)
Control output	• Relay contact---------- 1a 250V AC 3A (Resistive load) 250V AC 1A (Inductive load cosφ=0.4) • Non contact voltage---- 12^{+2}_{0} V DC Maximum 40mA (Short circuit protected) • Current---------- 4 to 20mA DC Load resistance : Maximum 550Ω } To be specified
Temperature alarm	Output action is selectable by key operation • No alarm • High limit alarm (Deviation setting): −input range span to input range span or −199.9 to input range span℃(℉) • Low limit alarm (Deviation setting): −input range span or −199.9 to input range span℃(℉) • High/ low limits alarm (Deviation setting): ±0 to input range span or 0.0 to input range span℃(℉) • High/ low limit range alarm (Deviation setting): ±0 to input range span or 0.0 to input range span℃(℉) • Process high alarm : Input range minimum to input range maximum℃(℉) • Process low alarm : Input range minimum to input range maximum℃(℉) Standby function---------- Selectable by key operation Alarm action delayed timer----- Settable (Setting range: 0 to 9999s) Setting accuracy---------- Thermocouple: Within ±0.3% of full scale ±1 digit or±2℃(4℉) whichever is greater RTD : Within ±0.2% of full scale ±1 digit or±1℃(2℉) whichever is greater Action----------ON／OFF Action Hysteresis----------0.1 to 100.0℃(℉) Output---------- Open collector Control capacity---------- 24V DC 0.1A (maximum)
Loop break alarm	When manipulating value is in its maximum or minimum, the alarm works in the case the process variable does not change more than the setting span within the setting time. (with FCL-130 type, this function is not applied.) It detects Heater burnout, Sensor burnout and actuator trouble. Setting range: Loop break alarm time ----------0 to 200min. : Loop break alarm span ---------- 0 to 150 or 0.0 to 150℃(℉) Output---------- Open collector Control capacity---- 24V DC 0.1A (maximum)
Supply voltage	• 100 to 240V AC 50／60Hz • 24V AC 50／60Hz } To be specified Allowable voltage fluctuation: 85 to 264V AC, 20 to 28V AC/DC
Power consumption	Approx. 5VA
Isolation resistance	10MΩ or greater at 500 V DC When output is current output or non-contact voltage output, isolation test between communication terminal and output terminal must not be carried out.
Dielectric strength	1.5kV AC for 1min between input terminal and ground 1.5kV AC for 1min between input terminal and power terminal 1.5kV AC for 1min between power terminal and ground 1.5kV AC for 1min between output terminal and ground 1.5kV AC for 1min between output terminal and power terminal
Ambient temperature Ambient humidity	0 to 50℃ 35 to 85%RH (Non-condensing)
Case, Base	Flame resisting resin, Color: Light gray
Mounting method	Flush, Special mounting frame, Panel thickness : 1 to 10mm
Setting system	Membrane sheet key
Weight	Approx. 100g
Attached function	Power failure countermeasure, Self-diagnosis, Automatic cold junction compensation (only thermocouple), Input burnout

Options

Serial communication [C5]	Operates from the external computer. Communication contents----------Various setting status changes and the values reading of the FCL-100 Code form----------ASCII Connectable units----------A maximum of 31 units per host computer Communication speed ----------9600bps(2400／4800／19200bps changeable by key operation) Communication system ----------Half-duplex start stop synchronous Error detection ----------Parity check, checksum
Heater burnout alarm [W]	Watches the heater current with CT (current transformer), and detects the heater burnout. Rating ----------5A, 10A, 20A or 50A (specified) Setting accuracy------ Within±5% of heater current Control output-------- Open collector Control capacity------ 24V DC 0.1A (maximum) Accessories---------- CT (For single phase : 1 piece)
Setting value memory (External selection) [SM]	Main setting value1 and 2 can be changed by external contact. Contact open for Main setting value 1, contact closed for main setting value 2
Terminal cover [TC]	Electrical 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]	Color: Black (Face plate: Dark gray)

■Terminal arrangement

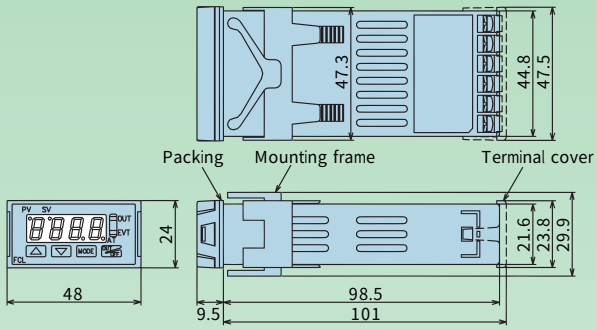




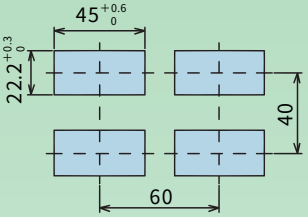
- R / □ : Relay contact output
- S / □ : Non-contact voltage output
- A / □ : Current output
- C5 : Serial communication (RS-485)
- W : Heater burnout alarm
- SM : Setting value memory (External selection)
- Even toutput : Temperature alarm, Loop break alarm or Heater burnout alarm

- Any of [Option: C5], [Option: W], and [Option: SM] cannot be added to FCL-130 type.
- For FCL-13A type, only one option out of [Option: C5], [Option: W] and [Option: SM] can be added.
- When designating control output to current output type, [Option: W] cannot be added.

■External dimensions

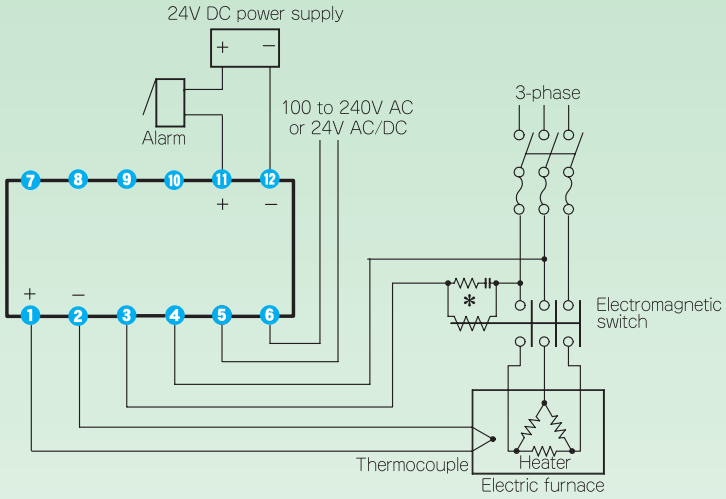


■Panel cutout



■Wiring example

FCL-13A-R/E



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 the 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 July 2004. Specifications and external appearance are subject to change without prior notice.
· If you have any inquiries, please consult our agency or with us directly.