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

CERTIFIED MANAGEMENT SYSTEM JQA QUALITY SYSTEM
ISO9001 Certified
JQA−2055

CE

Makes Control Simpler with the Cost merit.

GC series

96 × 96mm **GCD-200** series
48 × 96mm **GCR-100** series
48 × 96mm **GCR-200** series
48 × 48mm **GCS-100** series
48 × 48mm **GCS-200** series

Shinko

GC series is ...

GCD-200series   GCR-200series   GCS-200series

■ Features

Stable Control

Equipped with the Overshoot preventing function by new algorithm.
The accuracy is ±0.3% of maximum scale range ±1 digit or within ±2℃ (±4℉), whichever is greater.

Fast operation

Using 250ms of input sampling period, there is little fear on lag time of the controller.
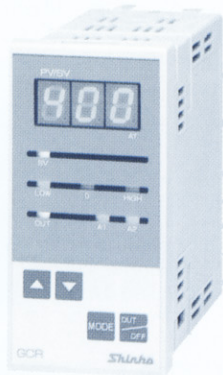(In case Option Heater burnout alarm is applied, the sampling period becomes to 500ms.)

Multi-function

It allows the specification settings for Alarm output action selection, Output limit setting,
Direct/Reverse action change, etc. at will.

Safety design

The hardware structure is based on various safety standard.

GCR-100series

GCS-100series

■ Attached functions

● **Multi-control action**
Control action type is key selectable.
➡ Refer to the Control action drawings (below).
• PID (With Auto-tuning function)
• PD (With Auto-reset function)
• ON/OFF (Hysteresis changeable)

● **Control output OFF**
Control performance and cancellation can be changed by key operation.
(It is changed if the OUT/OFF key is pressed for approx. 1 second.)

● **Burnout**
It detects the burnout of the PV input loop, when burnout is found, it automatically stops the control and tells the abnormality.

● **Setting value lock**
It prevents the setting value change from careless operation.

● **Sensor input correction**
When the indicated PV differs from desired value, it corrects the PV by shifting the sensor input value.
Correction range
GCR, GCS-100 : −100 to 100℃ (℉)
GCD, GCR, GCS-200 : −199 to 200℃ (℉)
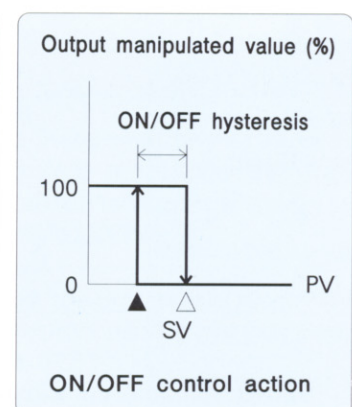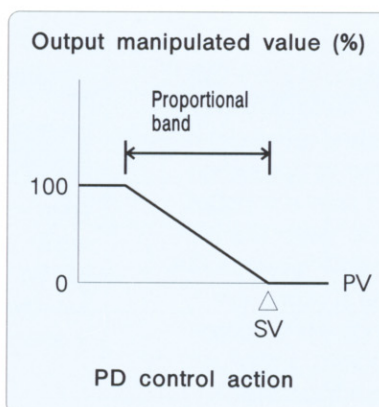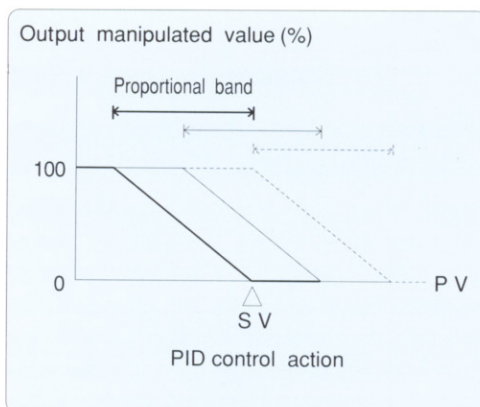−19.9 to 20.0℃ (when the indication has a decimal point.)

● **Self-diagnostics**
When abnormal status is found on the CPU, it prevents the controller from reckless control.

● **Automatic cold junction temperature compensation (for Thermocouple input type)**
It detects the temperature at the connecting terminal between thermocouple and instrument, and always makes it the same status at which the reference junction is located at 0℃ (32℉).

Control action drawings

Output manipulated value (%)

Proportional band

100

0   SV   PV

PID control action

Output manipulated value (%)

Proportional band

100

0   SV   PV

PD control action

Output manipulated value (%)

ON/OFF hysteresis

100

0   SV   PV

ON/OFF control action

· In the figures for PID control action and PD control action, representation of the derivative output manipulated value is omitted.
· The place of proportional band when PID controlling moves by the functioning status of the integral action.
· Output manipulated value when PD controlling is 0% in case of PV ≧ SV. When offset occurs, it can be dissolved by using Auto-reset function.
· ON/OFF hysteresis setting point (▲) can be set by key operation. [Factory adjusted as 1.0℃ (℉)]

Temperature alarm   Options

■ Temperature alarm

2 Temperature alarms can be applied (specify when ordering). Both Alarm 1 and Alarm 2 have the same specifications. Select the output action to fit to the use.
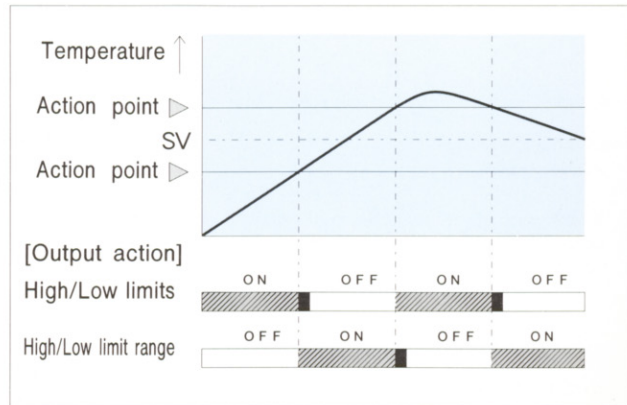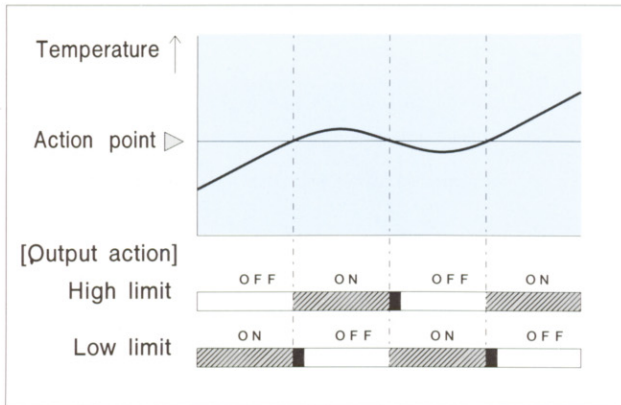
Action point ·············· Set the deviation value to SV in temperature by key operation (In case the Process value action is
(▷)   applied, set the process value).
     When High/Low limits action or High/Low limit range action is applied, the same values are set to high limit side and low limit side.

Hysteresis ················ The temperature at which the alarm turns from ON to OFF is 1℃ (℉) beside the action point (high
(▮)   limit side is lower than the action point and low limit side is higher than the action point). This action span is hysteresis.

Standby function ······ If the standby function is applied, the alarm output does not work even if the PV is in alarm ON area when the power is turned on or the SV is changed. After the PV enters into the alarm OFF area, the alarm functions usually.

■ Options

When ordering, designate the option codes to be applied referring to page 8 (for GCR-100 and GCS-100) or page 10 (for GCD-200, GCR-200 and GCS-200).

When adding the options, there are following restrictions on the types.

◎ Option application table (○ : Applicable, × : Not applicable)

Option name	Type (Series name)				
	GCS-100	GCR-100	GCS-200	GCR-200	GCD-200
Standby function	○*1	○*1	Standard	Standard	Standard
Alarm 2	○*2	○	○*3	○	○
Color Black	○	○	○	○	○
Screw type Mounting bracket	○	○	○	○	Standard
Heating/Cooling control	×	×	×	○*4	○*4
Dust-proof·Drip-proof	○	○	○	○	○
Multi-range input	×	×	○	○	○
Terminal cover	○	○	○	○	○
Heater burnout alarm	×	×	○*3, *6	○*5, *6	○*5, *6

(*1) : Standby function can be applied only when the designation of Alarm 1 output action is High limit, Low limit or High/Low limits.
(*2) : Terminal ③ is common to Alarm 1. (Capacity of common terminal ③ : 250Vac 3A when resistive load)
(*3) : Common output is used for Alarm 2 and Heater burnout alarm.
     (Capacity of common terminal ③ : 250Vac 3A when resistive load)
(*4) : When Heater burnout alarm function and Temperature alarm are applied together, this option cannot be added.
(*5) : When Heating/Cooling control output and Temperature alarm are applied together, this option cannot be added.
(*6) : Heater burnout alarm cannot be applied when the designation of control output is current type.

Heating/Cooling control

If this option is applied, control output 2 is added and Heating/Cooling control can be performed. Designate the type of control output 2 (Relay contact, Non-contact voltage or Current) when ordering.

[Specifications]

Control action (Control output 2) ⋯⋯ PID or ON/OFF
  Proportional band ⋯⋯⋯⋯⋯⋯⋯ 0.0 to 10.0 times as much as control output 1
    (ON/OFF action when set to 0.0) [Factory adjusted as 1.0 time]
  Integral time ⋯⋯⋯⋯⋯⋯⋯⋯ The same value as control output 1
  Derivative time ⋯⋯⋯⋯⋯⋯⋯ The same value as control output 1
  Proportional cycle ⋯⋯⋯⋯⋯⋯ 1 to 120s (Not available to Current output type)
    [Factory adjusted as 30s for Relay contact output
    and 3s for Non-contact voltage output]
  Overlap band/Dead band setting ⋯⋯ ±0 to 100.0% of Heating side proportional
    band value
  ON/OFF action hysteresis ⋯⋯ 0.1 to 99.9℃ (℉) [Factory adjusted as 1.0℃ (℉)]
Control output ⋯⋯ Designate the output type when ordering.
  Relay contact ⋯⋯⋯⋯⋯⋯ 1a1b, Capacity 250Vac 3A (resistive load)
    250Vac 1A (inductive load, cos ϕ =0.4)
  Non-contact voltage ⋯⋯ For SSR drive, 12^{+2}_{0} Vdc, Load current maximum 40mA
  Current ⋯⋯⋯⋯⋯⋯⋯⋯ 4 to 20mAdc, Load resistance maximum 550Ω
Cooling action mode ⋯⋯ Designate the Cooling action mode by key operation.
    (Factory adjusted as Air cooling)
  Air cooling mode   : The manipulating value changes by linear characteristic in
    the proportional band.
  Oil cooling mode   : The manipulating value changes by 1.5th power of air cooling.
  Water cooling mode : The manipulating value changes by 2nd power of air cooling.

Control output 2 manipulating value
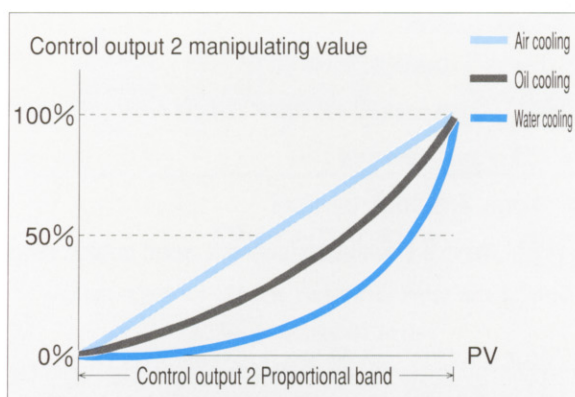
Heater burnout alarm

If this option is applied, Heater burnout can be detected by using the Current transformer (CT). The action point of the Heater burnout alarm is settable in 1A steps of action current by key operation. Improving the setting resolution (compared with our company), burnout detection becomes possible for 5A or less of the heater with CT input rated value 20A of controller.

[Specifications]

CT input rating ⋯⋯⋯⋯ Designate the current when ordering.
    · 20A (For single phase)
    · 50A (For single phase)
Setting accuracy ⋯⋯⋯ ±5% of CT input rated value
Control output ⋯⋯⋯⋯ Relay contact 1a, Capacity 250Vac 3A (resistive load)
    250Vac 1A (inductive load, cos ϕ =0.4)
Accessory ⋯⋯⋯⋯⋯⋯ Current transformer, 1set
※In case this option is applied, Input sampling period becomes to 500ms.

Multi-range input

If this option is applied, the type of sensor and the unit of temperature can be changed with key operation. It is possible to change the type of sensor between Thermocouple and RTD.

· The scale (SV setting limit range) can be changed without this option.
  However, it is not available to the GCR-100 and GCS-100 series.

[Specifications]

Type of sensor, Scale and Unit of temperature ⋯⋯ See below table.

Sensor		Scale (maximum), Unit	
Thermocouple	K	0~999℃	0~999℉
	J		
	E	0~600℃	0~999℉
RTD	Pt100	-199~400℃	-199~999℉
	JPt100		
	Pt100	-19.9~99.9℃	
	JPt100	(Only scale when it has a decimal point.)	

Others

● Standby function
  Designate this option to apply the Standby function to the Alarm 1 for GCR-100 and GCS-100. (No extra charge)
● Alarm 2
  If this option is designated, Alarm 2 is added. The specification of the output, and so on are the same as Alarm 1.
● Color Black
  The standard color is Light gray. If this option is designated, the color is Black. (No extra charge)
● Screw type mounting bracket
  The standard mounting bracket is One-touch type excepting GCD-200 series. If this option is designated, Screw type mounting bracket is attached as the accessory. (No extra charge)
● Terminal cover
  If this option is applied, the terminal cover is attached as the accessory. In case there is a possibility that somebody touch the rear of the controller during power on, the terminal cover must be equipped.
● Dust-proof·Drip-proof
  If this option is applied, the Dust-proof·Drip-proof specification of the controller front panel is improved to IEC IP54 equivalent. (Standard: IP50 equivalent)
  · To protect the controller from water leak between control panel and controller, make notes of the following items.
    * Use the Screw type mounting bracket. * Panel cutout dimension should be proper and no burrs. * Control panel surface to be mounted should be vertical.
  · If the Soft front cover (sold separately) is mounted, the Dust-proof·Drip-proof specification becomes better.

Mounting·Wiring

■ Terminal arrangements

● GCD-200, GCR-200series

GND ①
②
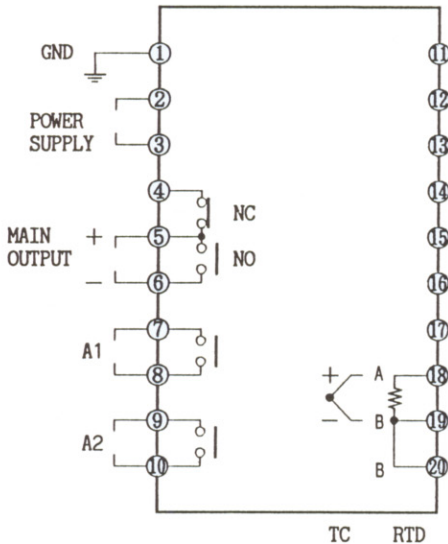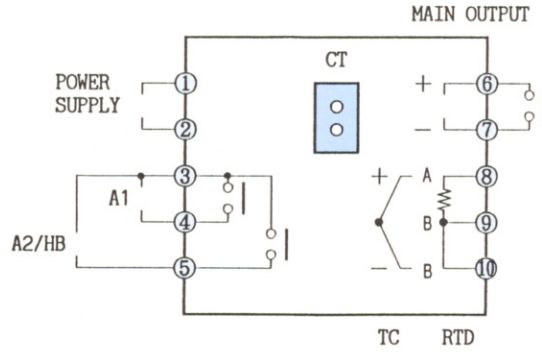POWER SUPPLY ③
④
MAIN OUTPUT + ⑤   NC
− ⑥   NO
A1 ⑦
⑧
C2/HB + ⑨
− ⑩

⑪
A2/HB ⑫
⑬
⑭
CT ⑮
⑯
⑰
+ A ⑱
− B ⑲
B ⑳

TC   RTD

● GCR-100series

GND ①
②
POWER SUPPLY ③
④
MAIN OUTPUT + ⑤   NC
− ⑥   NO
A1 ⑦
⑧
A2 ⑨
⑩

⑪
⑫
⑬
⑭
⑮
⑯
⑰
+ A ⑱
− B ⑲
B ⑳

TC   RTD

● GCS-100, GCS-200series

MAIN OUTPUT

POWER SUPPLY ①
②
CT
A1 ③
④
A2/HB ⑤

+ ⑥
− ⑦
+ A ⑧
B ⑨
− B ⑩

TC   RTD
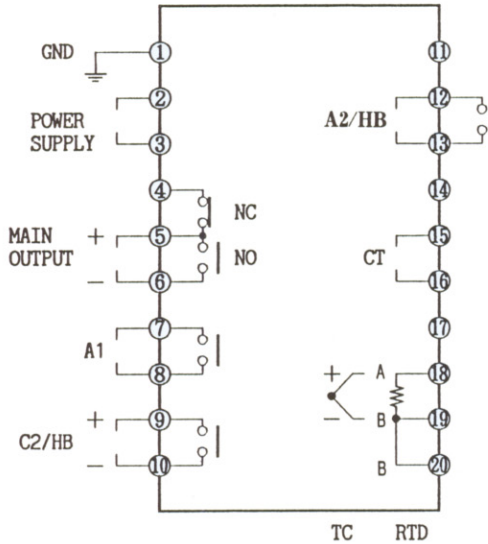
CT input terminal is Connector type.
The Connector is attached as accessory.

GND	Ground terminal

POWER SUPPLY   Power terminal

MAIN OUTPUT   Control output 1 terminal

TC   Thermocouple
(PV) input terminal

RTD   RTD
(PV) input terminal

A1   Alarm 1 output terminal

C2/HB   Control output 2 and Heater burnout Alarm output terminal

CT   CT input terminal

A2   Alarm 2 output terminal

A2/HB   Alarm 2 and Heater burnout alarm output terminal

· Size of the terminal screws are M3 for each series.

─── ⚠ Notice ───

When mounting or wiring, to avoid the accidents such as Electric Shock, operate following the descriptions and notices of the instruction manual.

■ Wiring examples

Example: GCS-200 series   Relay contact output type

Power source

* : CR filter

Electromagnetic switch

Alarm unit

Heater

Thermocouple
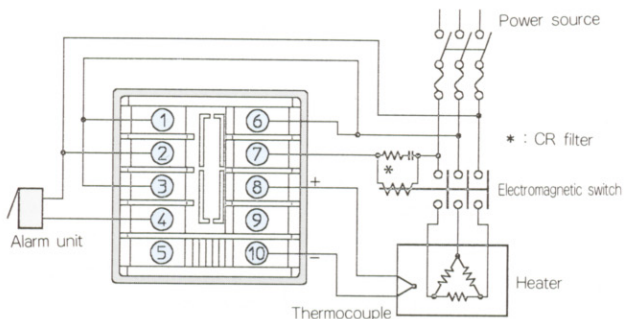
· Influence of external noise can be reduced by mounting the CR filter between the coil of the electromagnetic switch.

Example: GCR-200 series   Current output type

Power source

Power controller

Thermocouple

Heater
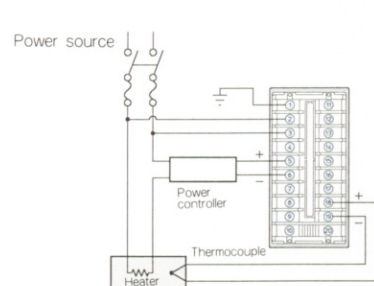
· Power controller: PA-200 series Shinko made

Mounting・Wiring

■ External dimensions

1 to 15mm of panel thickness is available when Screw type mounting bracket is used, and 1 to 3 mm when One-touch type mounting bracket is used.
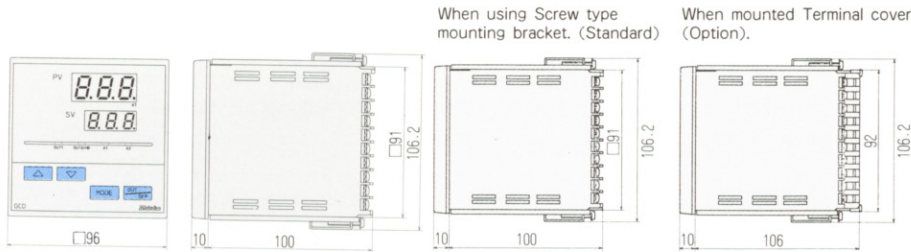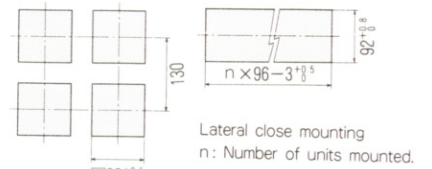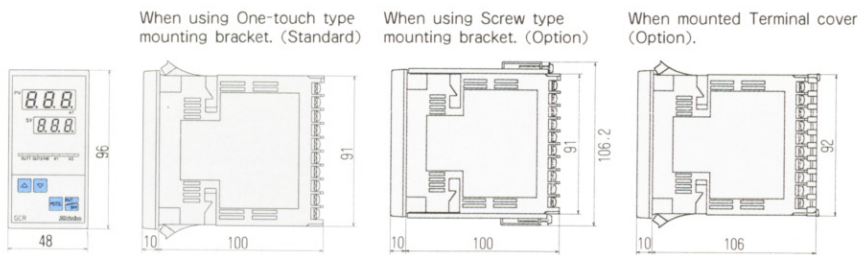
● GCD-200 series

When using Screw type mounting bracket. (Standard)

When mounted Terminal cover (Option).

Panel cutout dimension

Lateral close mounting
n : Number of units mounted.

$\square 92^{+0.5}_{0}$

$n \times 96 - 3^{+0.5}_{0}$

$92^{+0.8}_{0}$

● GCR-100, GCR-200 series (Common)

When using One-touch type mounting bracket. (Standard)

When using Screw type mounting bracket. (Option)

When mounted Terminal cover (Option).

Panel cutout dimension

Lateral close mounting
n : Number of units mounted.

$45^{+0.5}_{0}$

$n \times 48 - 3^{+0.5}_{0}$

$92^{+0.8}_{0}$
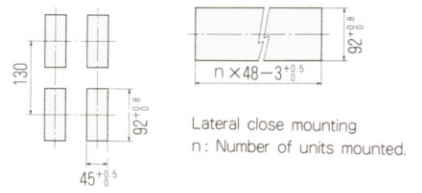
● GCS-100, GCS-200 series (Common)

When using One-touch type mounting bracket. (Standard)

When using Screw type mounting bracket. (Option)

When mounted Terminal cover (Option).

Panel cutout dimension

Lateral close mounting
n : Number of units mounted.

$45^{+0.5}_{0}$

$n \times 48 - 3^{+0.5}_{0}$

$45^{+0.5}_{0}$

Character size

GCR-100 series
10×5.5mm (H×W) 3-digit

GCS-100 series
10×5.5mm (H×W) 3-digit

GCD-200 series
14.3×8 mm (H×W) 3-digit
10×5.5mm (H×W) 3-digit

GCR-200 series
10×5.5mm (H×W) 3-digit
8 × 4 mm (H×W) 3-digit

GCS-200 series
10×5.5mm (H×W) 3-digit
8 × 4 mm (H×W) 3-digit

Current transformer size

CT : CTL-6-S
Accessory when Heater burnout alarm (20A) is applied.

CT : CTL-12-S36-10L1
Accessory when Heater burnout alarm (50A) is applied.

GCR-100, GCS-100 series

◎ When ordering

Please designate following items when ordering GCR-100 or GCS-100 series.

- **Model name**   Decide the model name by entering the code to designate the specification in □ described below. When adding the options, add the option codes to be applied to the model name using the commas between the codes.
- **Input rating**   Designate one input rating to be applied from undermentioned input rating table.
- **Supply voltage** Designate either **100 to 240Vac** or **24Vac/dc**.

■ Model name

							Digital temperature indicating controller: GC□-100 series
	GC□−13	□	-□	/E	,	□	(Control action PID, PD or ON/OFF is selectable by key operation.)
Series name	**GCR−13**						GCR-100 series (48×96mm)
	GCS−13						GCS-100 series (48×48mm)
Alarm 1 (Designate the option [H] when standby function is applied.)		0					No alarm action
		2					High limit alarm action
		3					Low limit alarm action
		4					High/Low limits alarm action
		6					High/Low limit range alarm action
		8					Process high alarm action
Control output			R				Relay contact
			S				Non-contact voltage (for SSR drive)
PV input				E			Thermocouple (K or J, specified when ordering)
Options (See page 4 and 5)					H		Standby function (Alarm 1)
					AL2		High limit alarm action
					AL3		Low limit alarm action
					AL4		High/Low limits alarm action
					AL6	Alarm 2	High/Low limit range alarm action
					AL8		Process high alarm action
					AL2H		High limit alarm action with standby
					AL3H		Low limit alarm action with standby
					AL4H		High/Low limits alarm action with standby
					BL		Screw type mounting bracket
					IP		Dust-proof·Drip-proof (IP54), Only for front panel
					TC		Terminal cover
					BK		Color black

· Output actions to Alarm 1 and 2 are to be designated when ordering. It cannot be changed after shipped.

■ Input rating

PV input	Input rating (Scale, Unit of temperature, Sensor type)			Indicating resolution	Burnout indication	Maximum rated scale span
Thermocouple	0 to 400℃ K	0 to 999℃ K	0 to 999℉ K	1℃(℉)		999℃, 999℉
	0 to 400℃ J	0 to 999℃ J	0 to 999℉ J			
		0 to 600℃ E	0 to 999℉ E		Upscale	
RTD	−19.9 to 99.9℃ Pt100			0.1℃		
	−199 to 400℃ Pt100	−999 to 999℉ Pt 100		1℃(℉)		400℃, 999℉
	−19.9 to 99.9℃ JPt100			0.1℃		
	−199 to 400℃ JPt100	−199 to 999℉ JPt 100		1℃(℉)		

■ Standard specification　　· See page 3 to 5 for the attached functions and options.

Display	PV/SV ······ 7-segment red LED,　3-digit,　Character size (See page 7)
PV input	Input impedance, 100Ω or less ＊See page 8 for the Input rating and so on.
Accuracy (Setting, Indication)	Within ± 0.3 % of maximum scale span ± 1 digit or within ± 2℃ (4℉), whichever is greater. ＊Including Cold junction temperature compensating error.
Input sampling period	250 ms
Control action	Any action described below can be selected by key operation. (Factory adjusted as PID) • PID (with auto-tuning function) 　Proportional band（P）······ 0 to 999℃ (℉)　　(ON/OFF action when set to 0)　(Factory adjusted as 10℃ [20℉]) 　　　　　　　　　　0.0 to 99.9℃　　(ON/OFF action when set to 0.0)　(Factory adjusted as 10.0℃) 　Integral time　　（I）······ 0 to 999s　　(off when set to 0)　　　　(Factory adjusted as 200s) 　Derivative time　（D）······ 0 to 300s　　(off when set to 0)　　　　(Factory adjusted as 50s) 　Proportional cycle ············· 1 to 120s　　(Factory adjusted as 30s to Relay contact, 3s to Non-contact voltage) • PD (with auto-reset function) ······ when setting integral time to 0. • ON/OFF ································ when setting proportional band to 0. 　Hysteresis ······ 0.1 to 99.9℃ (℉) (Factory adjusted as 1℃ [℉])
Control output	Any action type is to be designated when ordering. • Relay contact ··············· 1a1b Capacity,　250Vac 3A (resistive) 　　　　　　　　　　　　　　250Vac 1A (inductive, cos Φ =0.4) • Non-contact voltage ······ for SSR drive ······ 12 $^{+2}_{0}$ Vdc,　maximum 40 mA ＊With Relay contact output type of GCS-100,　the contact is 1a.
Alarm 1	Output action ······ Any action type is to be designated when ordering. 　　　　　　　[With standby function, Option (code : H) should be designated.] • No alarm action • High limit alarm　　　　　　　−199 to input range maximum value℃ (℉)　　−19.9 to 99.9℃ (℉)　(off when set to 0 or 0.0) • Low limit alarm　　　　　　　−199 to input range maximum value℃ (℉)　　−19.9 to 99.9℃ (℉)　(off when set to 0 or 0.0) • High/Low limits alarm　　　　±[0 to input range maximum value℃ (℉)]　　±(0.0 to 99.9)℃　(off when set to 0 or 0.0) • High/Low limit range alarm　　±[0 to input range maximum value℃ (℉)]　　±(0.0 to 99.9)℃　(off when set to 0 or 0.0) • Process value alarm　　　　　Input range minimum value to input range maximum value • High limit alarm, w/standby　　−199 to input range maximum value℃ (℉)　　19.9 to 99.9℃ (℉)　(off when set to 0 or 0.0) • Low limit alarm, w/standby　　−199 to input range maximum value℃ (℉)　　19.9 to 99.9℃　(off when set to 0 or 0.0) • Hi/Lo limits alarm, w/standby　±[0 to input range maximum value℃ (℉)]　　±(0.0 to 99.9)℃　(off when set to 0 or 0.0) Setting accuracy ······ The same as the indicating accuracy of PV input. Control action ·········· ON/OFF action, hysteresis, 0.1 to 99.9℃ (℉) [Factory adjusted as 1.0℃(℉)] Control output ········· Relay contact 1a, Capacity,　250Vac 3A (resistive) 　　　　　　　　　　　250Vac 1A (inductive, cos Φ =0.4)
Supply voltage	Any supply voltage is to be designated when ordering. • 100 to 240Vac, 50/60Hz　　Allowable voltage fluctuation: 85 to 264Vac • 24Vac/dc　　　　　　　　　Allowable voltage fluctuation: 20 to 28Vac/dc
Power consumption	Approximately 8 VA
Instantaneous power failure	Within 30 ms,　Data hold: Non-volatile memory
Insulation, Dielectric strength	Insulation resistance ······ 10 MΩ or greater at 500 Vdc (Excluding the terminals non-isolated) Dielectric strength ········Between input terminal and ground ····················· 1.5kVac for 1 minute 　　　　　　　　　　　 Between input terminal and power terminal ············· 1.5kVac for 1 minute 　　　　　　　　　　　 Between power terminal and ground ···················· 1.5kVac for 1 minute 　　　　　　　　　　　 Between output terminal and ground ··················· 1.5kVac for 1 minute 　　　　　　　　　　　 Between output terminal and power terminal ··········· 1.5kVac for 1 minute
Environmental	Ambient temperature : 0 to 50℃,　Ambient humidity: 35 to 85 %RH (non-condensing)
Dimension, Weight	Dimension : See page 7,　Weight: 250 g (GCR-100),　130 g (GCS-100)
Material, Color	Flame resisting resin, Color : Color : Light gray
Mounting system	Flush, fixed by One-touch type or Screw type mounting bracket
Setting system	Input system by using front key
Accessories	Mounting bracket 1 set,　Instruction manual 1 copy　Terminal cover 1 piece (when option TC is applied)

GCD-200,GCR-200,GCS-200 series

◎ When ordering

Please designate following items when ordering GCD-200, GCR-200 or GCS-200 series.

- **Model name**   Decide the model name by entering the code to designate the specification in □ described below. When adding the options, add the option codes to be applied to the model name using the commas between the codes.
- **Input rating**   Designate one input rating to be applied from undermentioned input rating table. However, if the option MR is applied, the designation is not required (shipped as 0 to 400℃, K).
- **Supply voltage**   Designate either **100 to 240Vac** or **24Vac/dc**.

■ Model name

	GC□-23 □-□/□, ⬚					**Digital temperature indicating controller : GC□-200 series** (Control action PID, PD or ON/OFF is selectable by key operation.)
Series name	GCD-23					GCD-200 series (96×96mm)
	GCR-23					GCR-200 series (48×96mm)
	GCS-23					GCS-200 series (48×48mm)
Alarm 1		0				No alarm action
		A				Designated (Output action type is key selectable.)
Control output			R			Relay contact
			S			Non-contact voltage (for SSR drive)
			A			Current (4 to 20mA)
PV input (Multi-range input				E		Thermocouple (K, J or E, designate when ordering.)
is available by option.)				R		RTD (Pt100 or JPt100, designate when ordering.)
Options (See page 4 and 5)					A2	Alarm 2 (Output action is key selectable.)
					BK	Color Black
					BL	Screw type mounting bracket
					DR	Heating/Cooling control (Control output 2) / Relay contact output
					DS	Non-contact voltage output (for SSR)
					DA	Current output (4 to 20mA)
					IP	Dust-proof・Drip-proof (IP54), Only for front panel
					MR	Multi-range input
					TC	Terminal cover
					W(20A)	Heater burnout alarm / CT input rating: 20A
					W(50A)	CT input rating: 50A

■ Input rating

PV input	Input rating (Scale, Unit of temperature, Sensor type)			Indicating resolution	Burnout indication	Maximum rated scale span
Thermocouple	0 to 400℃ K	0 to 999℃ K	0 to 999℉ K	1℃(℉)		999℃, 999℉
	0 to 400℃ J	0 to 999℃ J	0 to 999℉ J			
		0 to 600℃ E	0 to 999℉ E			600℃, 999℉
RTD	-19.9 to 99.9℃ Pt100			0.1℃	Upscale	119.8℃
	-199 to 400℃ Pt100	-199 to 999℉ Pt100		1℃(℉)		599℃, 1198℉
	-19.9 to 99.9℃ JPt100			0.1℃		119.8℃
	-199 to 400℃ JPt100	-199 to 999℉ JPt100		1℃(℉)		559℃, 1198℉

■ Standard specification   · See page 3 to 5 for the attached functions and options.

Display	PV······7-segment red LED, 3-digit, Character size (See page 7) SV······7-segment green LED, 3-digit, Character size (See page 7)
PV input	Input impedance, Allowable input lead wire resistance • Thermocouple······Input impedance, 100Ω or less • RTD······Allowable input lead wire resistance, per wire 10Ω or less ∗See page 10 for the Input rating and so on.
Accuracy (Setting and Indication)	Within ±0.3% of maximum scale span +1 digit or within ±2℃ (4℉), whichever is greater. ∗In case of thermocouple input, Cold junction temperature compensating error is included.
Input sampling period	250ms [When the option W(20A) or W(50A) is applied, it is 500ms.]
Control action	Any action described below can be selected by key operation.(Factory adjusted as PID) • PID (with auto-tuning function) Proportional band (P)······0 to 999℃ (℉) (ON/OFF action when set to 0) (Factory adjusted as 10℃ [20℉]) Integral time (I)······0 to 999s (off when set to 0) (Factory adjusted as 200s) Derivative time (D)······0 to 300s (off when set to 0) (Factory adjusted as 50s) Proportional cycle ············1 to 120s (Not available to the type Current output) (Factory adjusted as 30s to Relay contact, 3s to Non-contact voltage) Output limit ····················0 to 100% (Current output type, −5 to 105%) (Factory adjusted as 0% [Low limit] 100% [High limit]) • PD (with auto-reset function)······when setting integral time to 0. • ON/OFF······························when setting proportional band to 0. Hysteresis······0.1 to 99.9℃ (℉) (Factory adjusted as 1.0℃ [℉]) ∗Proportional band setting range when the scale has a decimal point is 0.0 to 99.9℃ (Factory adjusted as 10.0℃)
Control output	Any action type is to be designated when ordering. • Relay contact ·················· 1a1b Capacity, 250Vac 3A (resistive) 250Vac 1A (inductive, cos φ =0.4) • Non-contact voltage············for SSR drive···12+2/0 Vdc, maximum 40mA • Current ······························ 4 to 20mAdc (Isolation type) maximum 550Ω ∗With Relay contact output type of GCS-200, the contact is 1a.
Alarm 1	**If No alarm action is designated when ordering, the output action cannot be changed.** Output action······Any action type is selectable by key operation. (Factory adjusted as No alarm action) • No alarm action • High limit alarm −199 to input range maximum value℃ (℉) −19.9 to 99.9℃ (℉) (off when set to 0 or 0.0) • Low limit alarm −199 to input range maximum value℃ (℉) −19.9 to 99.9℃ (℉) (off when set to 0 or 0.0) • High/Low limits alarm ±[0 to input range maximum value℃ (℉)] ±(0.0 to 99.9)℃ (off when set to 0 or 0.0) • High/Low limit range alarm ±[0 to input range maximum value℃ (℉)] ±(0.0 to 99.9)℃ (off when set to 0 or 0.0) • Process value alarm Input range minimum value to input range maximum value • High limit alarm, w/standby −199 to input range maximum value℃ (℉) 19.9 to 99.9℃ (off when set to 0 or 0.0) • Low limit alarm, w/standby −199 to input range maximum value℃ (℉) 19.9 to 99.9℃ (off when set to 0 or 0.0) • Hi/Lo limits alarm, w/standby ±[0 to input range maximum value℃ (℉)] ±(0.0 to 99.9)℃ (off when set to 0 or 0.0) ∗Excepting Process high alarm, deviation setting and off when set to 0. Setting accuracy······The same as the indicating accuracy of PV input. Control action·········ON/OFF action, Hysteresis, 0.1℃ to 99.0℃ (℉) [Factory adjusted as 1.0℃ (℉)] (If the scale has a decimal point, 0.1℃) Control output·········Relay contact 1a, Capacity, 250Vac 3A (resistive) 250Vac 1A (inductive, cos φ =0.4) ∗Action point setting range when the scale has a decimal point, the decimal point is applied to the range value.
Supply voltage	Any supply voltage is to be designated when ordering. • 100 to 240Vac, 50/60Hz Allowable voltage fluctuation: 85 to 264Vac • 24Vac/dc Allowable voltage fluctuation: 20 to 28Vac/dc
Power consumption	Approximately 8VA
Instantaneous power failure	Within 30ms, Data hold: Non-volatile memory

Insulation,
Dielectric strength
	Insulation resistance········· 10MΩ or greater at 500Vdc
	                        (Excluding the terminals non-isolated)
	Dielectric strength··········· Between input terminal and ground ···················· 1.5kVac for 1 minute
	                        Between input terminal and power terminal ··········· 1.5kVac for 1 minute
	                        Between power terminal and ground ···················· 1.5kVac for 1 minute
	                        Between output terminal and ground ···················· 1.5kVac for 1 minute
	                        Between output terminal and power terminal ········· 1.5kVac for 1 minute

Environmental	Ambient temperature: 0 to 50℃, Ambient humidity: 35 to 85%RH (non-condensing)
Dimension, Weight	Dimension: See page 7, Weight: 500g (GCD-200), 250g (GCR-200), 130g (GCS-200)
Material, Color	Material: Polycarbonate resin, Color: Light gray
Mounting system	Flush, fixed by One-touch type or Screw type mounting bracket (With the type GCD-200, only Screw type)
Setting system	Input system by using front key
Accessories	Current transformer 1 piece, when option [W(20A)] is applied. CTL-6-S Current transformer 1 piece, when option [W(50A)] is applied. CTL-11-TE Terminal cover (FCR) 1 set, when option TC is applied.

■ Ordering examples　· Designating items are explained in this text.

GCS-132-R/E　0 to 400℃　K

Designating items	Series name	: GCS-100 series
	Alarm 1	: High limit action
	Control output	: Relay contact type
	PV input	: Thermocouple type
	Option	: None
	Input rating	: 0 to 400℃ K

GCR-230-S/E, IP, MR, W (20A) 0 to 999℃　J　100 to 240V

Designating items	Series name	: GCR-200 series
	Alarm 1	: None
	Control output	: Non-contact voltage type
	PV input	: Thermocouple type
	Option	: Dust-proof·Drip-proof, Multi-range, Heater burnout alarm (Rating 20A)
	Input rating	: 0 to 999℃ J
	Supply voltage	: 100 to 240Vac

GCD-23A-A/R, A2, BK, DA　-19.9 to 99.9℃　Pt100　24 V

Designating items	Series name	: GCD-200 series
	Alarm 1	: Applied
	Control output	: Current
	PV input	: RTD type
	Option	: Alarm 2, Color Black, Heating/Cooling control (Current output type)
	Input rating	: -19.9 to 99.9℃, Pt100
	Supply voltage	: 24Vac/dc

**Black type
(When Color Black [BK] is designated)**

Brief operation manual

GC series has 3 setting modes. (Examples mentioned below are to the GCS-200 series.)

Press the MODE key.	Press the MODE key while the ▲ key is being pressed.	Press the MODE key for 3sec while the ▼ key is being pressed
⇩	⇩	⇩

Main setting mode
(Mode to set the Main setting value)

Sub setting mode
(Mode to set the Auto-tuning or Auto-reset performance, PID parameter, Alarm action point, etc.)

Auxiliary function setting mode
(Mode to set the Setting value lock, Setting value limit, Sensor correction, Alarm output action, etc.)

· On each display, the setting item character is indicated on upper display, and the registered content on lower display. The ▲ and ▼ keys are used for setting. (With the GCR-100 and GCS-100 series, the character and the registered content are indicated alternately.)
· The characters are not indicated if the functions to the controller are not applied.

· The contents of this catalog is as of August 2002. Specifications subject to change without notice.
· For any inquiry of this controller, please contact your shop where purchased or our agency.