High Speed
10ms

GZ400

PV
MAN1 MAN2 AT1 AT2 REM
480.00
SV
960.00
AREA MV
16 - 5.0
OUT 1 2 3 DO 1 2 3 4
R. SET MONI AREA FUNC
SET MODE

GZ900

PV
MAN1
MAN2
AT1
AT2
REM
960.00
SV
960.00
AREA
16
MV
105.0
OUT 1 2 3 DO 1 2 3 4
R. SET MONI AREA FUNC
SET MODE

GZ400

PV
MAN1 MAN2 AT1 AT2 REM
480.00
SV
960.00
AREA MV
16 - 5.0
OUT 1 2 3 DO 1 2 3 4
R. SET MONI AREA FUNC
SET MODE

GZ900

PV
MAN1
MAN2
AT1
AT2
REM
960.00
SV
960.00
AREA
16
MV
105.0
OUT 1 2 3 DO 1 2 3 4
R. SET MONI AREA FUNC
SET MODE

Digital Controller

Temperature/Process Controller

GZ Series

CE c(UL)us

□ Reinforced Insulation

RKC RKC INSTRUMENT INC.

Temperature/Process Controller
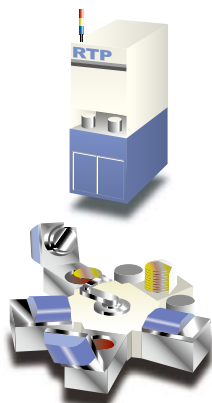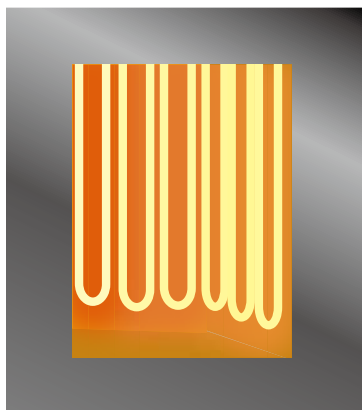
GZ Series

CE c(UL)us

☐ Reinforced Insulation

10ms (0.01 sec)
High Speed Sampling Time

Feedback control with 100 samplings per second enables controlling a fast changing process that was difficult to control.
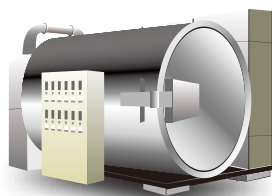Such applications include pressure, flow rate, and rapid thermal process.
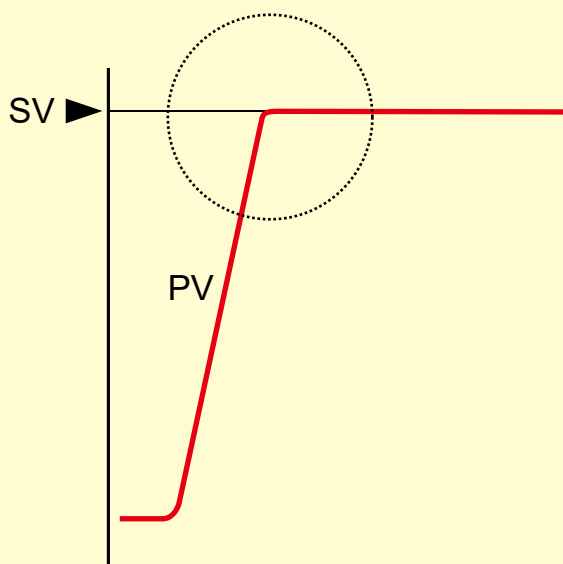
RTP : Rapid Thermal Process

Flow Control

Pressure Control

Controlling rapidly changing process is possible with greatly reduced overshoot.

SV ►

PV

Easy initial setup using the dedicated software

All models are supplied with a front loader port as standard. Configuration can be set from the computer without removing the controller from the panel.
Saved configuration data can be sent to the controller from your computer on your desk.

Front loader communication port

Loader communication cable
Length : 1.5m
Model code for cable only :
W-BV-05-1500

USB communication converter
COM-KG

COM-KG-4
 (With loader communication cable)
COM-KG-N
(Without loader communication cable)

USB

Length :1m
(Complete with loader communication cable)
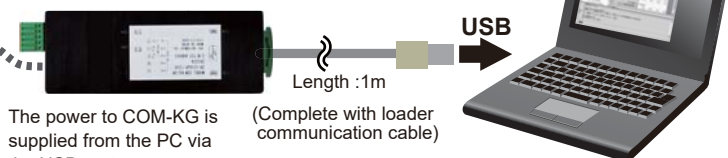
The power to COM-KG is supplied from the PC via the USB port so no power supply is necessary.

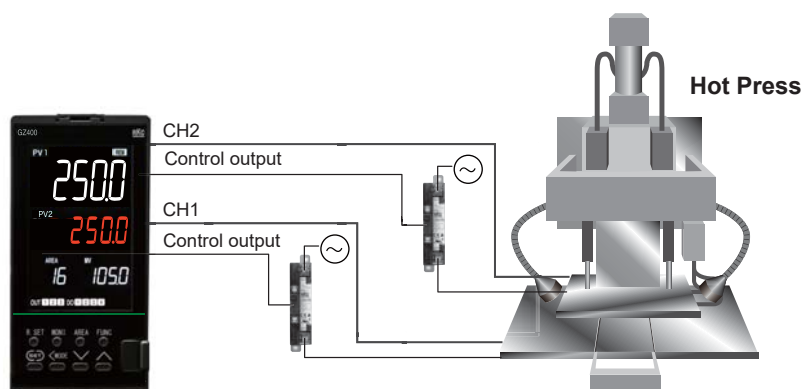### Easy Data Management
Communication Tool
PROTEM 2

Data monitoring, setting, storage, copy, transfer, logging, and report creation

Simply download "PROTEM2" from the RKC Instrument web site (www.rkcinst.com).
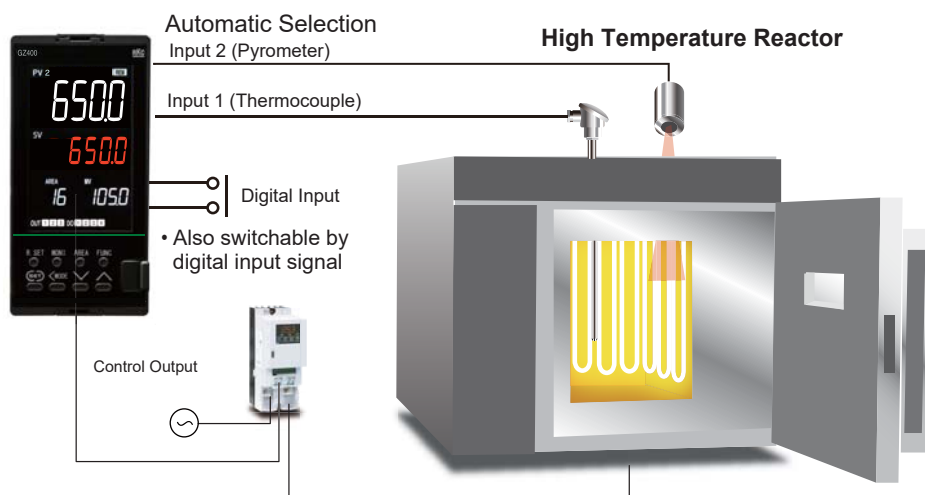
2 inputs for various applications

■ 2 Loop Control

Hot Press

GZ400
PV 1
250.0
PV2
250.0
AREA   MV
16   105.0

CH2
Control output
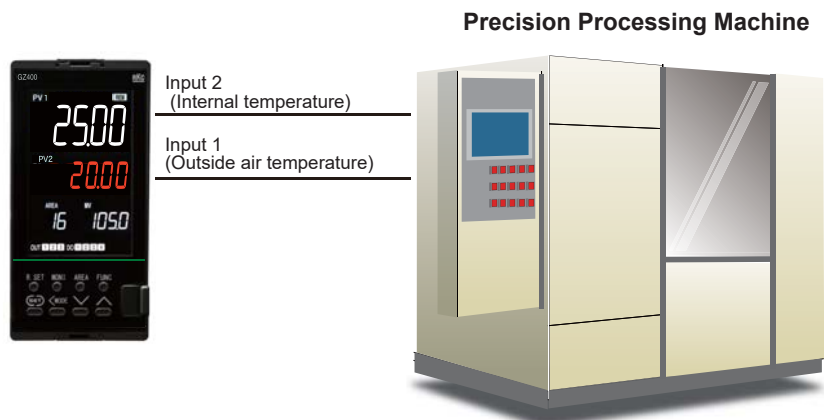
CH1
Control output

■ Control with PV select

This is a function to switch between Input 1 and Input 2 at a preset temperature.

• This function may be appropriate in such an application where a thermocouple (whose operating temperature range is relatively low) and a radiation pyrometer (which can be used for high temperature applications) are used being switched between them.

GZ400
PV 2
650.0
SV
650.0
AREA   MV
16   105.0

Automatic Selection
Input 2 (Pyrometer)

Input 1 (Thermocouple)

Digital Input

• Also switchable by digital input signal

Control Output

High Temperature Reactor

■ Math Control

This is a function to control to maintain constant difference between PV of Input 1 and Input 2.

GZ400
PV 1
250.0
PV2
200.0
AREA   MV
16   105.0

Precision Processing Machine

Input 2
(Internal temperature)

Input 1
(Outside air temperature)

Functions and performance designed for easy maintainability

■ Easy Maintenance

The internal assembly of the GZ400/900 can be removed from the front.

■ Flexible Output Configuration

OUT1,OUT2
: Relay contact/Voltage pulse/Current/
Continuous voltage/Transistor output
OUT3
: Voltage pulse/Current (Universal output)
DO1, DO2, DO3, DO4
: Relay contact
Output type is freely changeable to meet the requirements of different applications.

Control output (Heat/Cool)
Event output
LBA output
HBA output
RUN status monitor output
Output of communication monitoring result
Manual status output
Remote status output
AT status output
SV change status output
FAIL output
Retransmission output

OUT1
OUT2
OUT3 (Universal output)
DO1
DO2
DO3 [*2]
DO4 [*2]

■ Universal Output (OUT3)

OUT3 (Output 3) can be configured to voltage pulse output or continuous current output.
The output can be configured to control output or retransmission output.
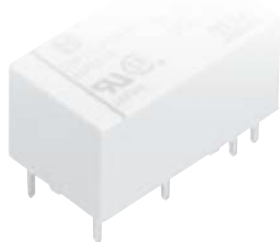
OUT3 (Universal output)
Voltage pulse (Control output)
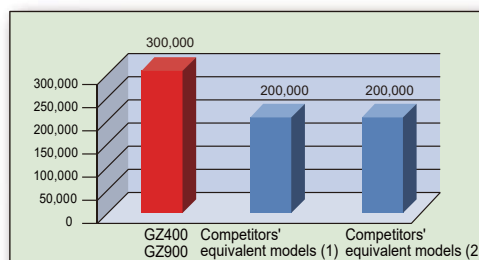Current (Control output/Retransmission output)
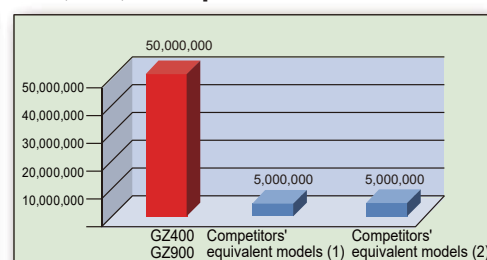Selectable

■ Long Operation Life

Use of high performance control relay assures long term operation.

Electrical Life (Relay contact output) : 300,000 operations or more

300,000

300,000	200,000	200,000
250,000		
200,000		
150,000		
100,000		
50,000		
0		
GZ400 GZ900	Competitors' equivalent models (1)	Competitors' equivalent models (2)

Mechanical life (Relay contact output) : 50,000,000 operations or more

50,000,000

50,000,000	5,000,000	5,000,000
40,000,000		
30,000,000		
20,000,000		
10,000,000		
GZ400 GZ900	Competitors' equivalent models (1)	Competitors' equivalent models (2)

· Data when used at a rated value. Depending on the operating conditions, there may be some exceptions that we cannot guarantee.
· Applies to the control output relays mounted on OUT1 and OUT2.

■ Reinforced Insulated Power Supply Circuit

Power supply circuit of the GZ Series has been designed to provide reinforced insulation, eliminating the necessity of providing basic insulation on the machine side for cost saving.

<Requirements for electrical equipment according to safety standards>
The safety standard for electrical equipment (IEC 61010-1 and JIS C1010-1) requires the secondary side of the equipment which may be accessible by the operator to be double insulated or reinforced insulated* for protection of the operators against electric shock.
• Insulation equal to or better than double insulation for protecting personnel from electric shock is termed "reinforced insulation".
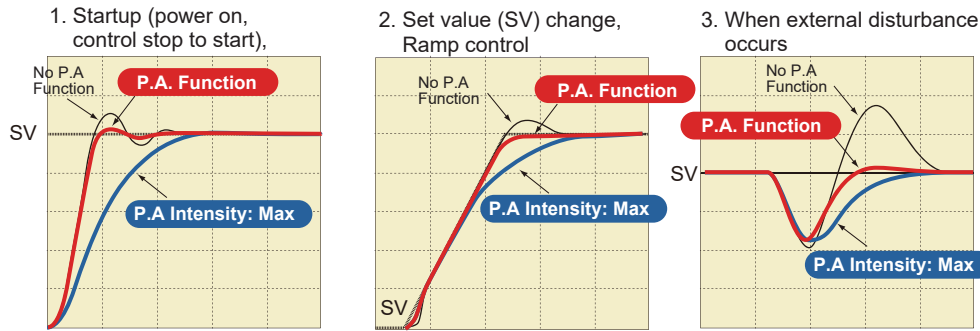
Advanced control performance and function

■ Suppresses fluctuations due to overshoot and external disturbance.

● Suppressing Overshoot   Proactive Function

Proactive function suppresses overshoot and provides fast and stable control.
Adjustable Proactive Intensity allows the GZ to be tuned appropriate for various process applications.
Determines response based on the deviation amount and speed and adjusts the PID factors using fuzzy logic operation.
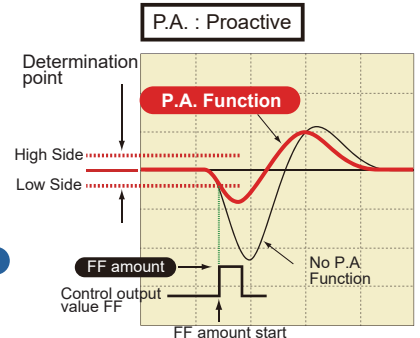
P.A. : Proactive

1. Startup (power on, control stop to start),

No P.A Function
SV
P.A. Function
P.A Intensity: Max

2. Set value (SV) change, Ramp control

No P.A Function
P.A. Function
P.A Intensity: Max
SV

3. When external disturbance occurs

No P.A Function
P.A. Function
SV
P.A Intensity: Max

Proactive Intensity setting : 0: No function, 1 (Min), 2, 3, 4(Max),   Default setting : 2

● Bottom suppression function

When the input fluctuation by external disturbance is detected, the amount of FF (Feed forward) is added to the output value to suppress the Bottom.

P.A. : Proactive

Determination point
P.A. Function
High Side
Low Side
FF amount
Control output value FF
No P.A Function
FF amount start

• Adding the FF amount can be triggered by either DI or communication.

■ Programless connection to PLCs
(Optional)

PLC Special Protocol   (MAPMAN Function)

A PLC special protocol (MAPMAN) function becomes a Master Unit to PLC, and automatically stores temperature data into registers in a PLC.
This enables easy handling of temperature control system to the exiting PLC system is available.

(MITSUBISHI PLC Protocol : QnA compatible, 3C frame (type 4))

MAPMAN

MITSUBISHI MELSEC series

Customizable versatile information display

■ Three Indicators

GZ400

GZ900

Measuring Value (PV)

Set Value (SV)

Selectable Display
- Control Output : %
- Memory Area Soak Time (Progress time of segment)
  : H:M / M:S
- Current transformer (CT) Input Value : A

• CT and CT input hardware are required. (Option)

CT input display

Enables display of load factor of the heater controlling the process and detects potential errors at an early stage.

High accuracy type CT(CTL-6-P-Z) can be used too.

Accurately measures current 1A or less.

CTL-6-P-Z
(U.R.D.Co.,LTD product)
Measured range : 0.0 to 10.0A
Accuracy : ±0.3A

■ Display Customization

Parameter Select Function

Select and display only necessary parameters.

"Set Value • Event 4"

| Set value |
| Event 1 |
| Event 2 |
| Event 3 |
| Event 4 |
| Proportional Band |
| Integral Time |
| Derivative Time |
| Control Response |
| Proactive intensity |
| FF Amount |

■ Numerous Inputs and Outputs

Communication
• ANSI, MODBUS communication
• MITSUBISHI PLC communication

GZ900 **GZ400**

Universal input :
Up to 2 points

Thermocouple • RTD
DC voltage • DC current

Measuring input,
Remote setting input

Up to 6 points

Digital input

Up to 3 points

Output

• Control Output
  (Heat, Cool, Heat/Cool)
• Analog retransmission output
• Event output

OUT3 : Universal output

Up to 4 points

Digital output

Loader communication

Specifications

● Measured Input (Universal Inputs)

a) Group 1

Input	Measured range	Reference
K	-200.0 to +400.0°C, -328.0 to +752.0°F -200.0 to +1372.0°C, -328.0 to +2502.0°F	
J	-200.0 to +400.0°C, -328.0 to +752.0°F -200.0 to +1200.0°C, -328.0 to +2192.0°F	
T	-200.0 to +400.0°C, -328.0 to +752.0°F	
S	-50.0 to +1768.0°C, -58.0 to +3214.0°F	JIS/IEC
R	-50.0 to +1768.0°C, -58.0 to +3214.0°F	
E	-200.0 to +1000.0°C, -328.0 to +1832.0°F	
B	0.0 to 1800.0°C, 0.0 to 3272.0°F	
N	0.0 to 1300.0°C, 0.0 to 2372.0°F	
PLII	0.0 to 1390.0°C, 0.0 to 2534.0°F	NBS
W5Re/W26Re	0 to 2300°C, 0 to 4200°F	ASTM
U	-200.0 to +600.0°C, -328.0 to +1112.0°F	DIN
L	0.0 to 900.0°C, 0.0 to 1652.0°F	
PR40-20	0 to 1800°C, 0 to 3200°F	ASTM
Pt100	-200.0 to +850.0°C, -328.0 to +1562.0°F -100.00 to +850.00°C, -148.00 to +999.99°F 0.00 to 50.00°C, 32.00 to 122.00°F	JIS/IEC • 3-wire system
JPt100	-200.0 to +640.0°C, -328.0 to +1184.0°F -100.00 to +640.00°C, -148.00 to +999.99°F 0.00 to 50.00°C, 32.00 to 122.00°F	JIS • 3-wire system
Low Voltage	0 to 10mV DC, 0 to 100mV DC	

b) Group 2

Input	Measured range
High Voltage	0 to 1V DC, 0 to 5V DC, 1 to 5V DC, 0 to 10V DC -5 to +5V DC, -10 to +10V DC

c) Group 3

Input	Measured range
Current	0 to 20mA DC, 4 to 20mA DC

Number of inputs : Max. 2 points
　• Isolated between each channel
Influence of external resistance : Approx. 0.18µV/Ω (Thermocouple input)
Influence of lead resistance : Approx. 0.006% of Span/Ω (RTD input)
　　　　　　　　　　　　　• Maximum 100Ω per wire
Input impedance (Voltage/Current Input)
　Low voltage : 1MΩ, or more, High voltage : 1MΩ or more
　Current : Approx. 50Ω,
Input Break Action
　Thermocouple input : Up-scale/Down-scale (Selectable)
　RTD input :　　　　　Up-scale
　Low voltage input :　Up-scale/Down-scale (Selectable)
　Current input :　　　Value around 0mA
　High voltage input :　Value around 0V
Input short action (RTD Input) : Down-scale (Except 0.00 to 50.00°C)
　　　　　　　　　　　　　Up-scale (0.00 to 50.00°C)
Measured input correction
　a) PV bias : -span to +span
　b) PV ratio : 0.500 to 1.500
　c) PV digital filter : 0.1 to 100.0 sec. (OFF when 0 is set.)

● Current Transformer (CT) Input <Optional>

Number of inputs
　FZ400/FZ900 : 2 points
　FZ110 : 1 point
CT Type
　CTL-6-P-Z, CTL-6-P-N, CTL-12-S56-10L-N
CT input range
　CTL-6-P-Z : 0.0 to 10.0A (High accuracy type)
　CTL-6-P-N : 0.0 to 30.0A
　CTL-12-S56-10L-N : 0.0 to 100.0A
Sampling Time : 0.5 sec

● Digital Input (DI) <Optional>

Number of inputs : Max. 6 points (DI1 to DI6)
Input method : Non-voltage contact input
OFF (Open state): 50 kΩ or more
ON (Close state): 1 kΩ or less
Capture judgment time: Within 200 ms

Function : Run/Stop, Auto/Mabual (Input 1/Input 2 : Common/Individual*)
　　　　　Remote/Local (Cascade mode select*, PV select*,
　　　　　2-loop control*/Differential temperature control*), Interlock release,
　　　　　Peak/Bottom hold reset (Input 1/Input 2 : Common/Individual*)
　　　　　Autotuning ON/OFF (Input 1/Input 2 : Common/Individual*)
　　　　　Unlock/Lock, Direct/Reverse action, Area select, Area jump

● Performance

Sampling Time : 0.01 sec

● Measuring display accuracy table

Input Type		Range	Accuracy
K, J, T, E, U, L	*1	Lower than -100°C (-148°F)	±1.0°C [1.8°F]　[Approximate value]
		-100 to 500°C (-148 to 932°F)	±0.5°C [0.9°F]
		500°C (932°F) or higher	±0.1% of Reading
N, R, S, PLII W5Re/W26Re	*2	Lower than 0°C (32°F)	±2.0°C [3.6°F]　[Approximate value]
		0 to 1000°C (32 to 1832°F)	±1.0°C [1.8°F]
		1000°C (1832°F) or higher	±0.1% of Reading
B		Lower than 400°C (752°F)	±70°C [126°F]　[Approximate value]
		400 to 1000°C (752 to 1832°F)	±1.4°C [2.52°F]
		1000°C (1832°F) or higher	±0.1% of Reading
PR40-20		Lower than 400°C (752°F)	±20°C [36°F]]　[Approximate value]
		400 to 1000°C (752 to 1832°F)	±10°C [18°F]
		1000°C (1832°F) or higher	±0.1% of Reading
Pt100, JPt100		Lower than 200°C (392°F)	±0.2°C [0.36°F]
		200°C (392°F) or higher	±0.1% of Reading
		0.00 to 50.00°C(90.00°F)	±0.10°C [0.18°F]
Voltage/Current		-span to +span	±0.1% of span

• Display accuracy:
　Is equal to the above accuracy with the value below the minimum resolution rounded up.
*1 : Accuracy is not guaranteed for less than -100°C .
*2 : Accuracy is not guaranteed for less than 400°C (752°F) for Input Type R, S, B, PR20-40
　　and W5Re/W26Re.

● Resolution

　a) Thermocouple : 1/200000 (PR40-20, B : 1/100000)
　b) RTD : -200 to +850°C : 1/200000,
　　　　　-100.00 to +100.00°C/0.00 to 50.00 : 1/60000
　c) Voltage/Current : 0 to 10mV : 1/120000, Except 0 to 10mV : 1/200000

● Control

Control method : Control Brilliant II PID control
Control action : PID control, Heat/Cool type PID control
　　　　　　　• P, PI, PD, ON/OFF control selectable
　　　　　　　• Direct action/Reverse action is selectable

Other control function :
　　　　　Manual control, 2 inputs control (Differential temperature
　　　　　control, Control with PV select, Input circuit error alarm), Proactive intensity,
　　　　　Level PID, Startup tuning
Additional function :
　　　　　Inverting the Input, Temperature compensation calculation, Parameter select
Proportional band :
　　　　　TC/RTD input : 0(0.0) to span (°C,°F)
　　　　　Voltage/Current input : 0.0 to 1000.0% of span
　　　　　(ON/OFF control when P = 0)
　　　　　• Differential gap at ON/OFF control (High/Low individual setting) :
　　　　　　　TC/RTD input : 0(0.0) to span (°C,°F)
　　　　　　　Voltage/Current input : 0.0 to 100.0% of span
Cool side proportional band :
　　　　　TC/RTD input : 0(0.0) to span (°C,°F)
　　　　　Voltage/Current input : 0.0 to 1000.0% of span
　　　　　• Heat-side and Cool-side are both ON/OFF control when P = 0.
　　　　　• Only cooling side ON/OFF control is not available.
Integral time :　　0 to 3600 sec, 0.0 to 3600.0 sec or 0.00 to 360.00 sec
　　　　　　　　(PD control when I = 0) (Heat/Cool individual setting)
Derivative time : 0 to 3600 sec, 0.0 to 3600.0 sec or 0.00 to 360.00 sec
　　　　　　　　(PI control when D = 0) (Heat/Cool individual setting)
Control response : Slow, Medium, Fast
Proportional cycle time : 0.1 to 100.0 sec (Heat/Cool individual setting)
Output limiter :　-5.0 to +105.0% (High/Low individual setting)
Output change rate limiter :
　　　　　0.0 to 100.0%/sec (Up/Down individual setting) , (OFF when 0 is set.)
Output at Control Stop mode :
　　　　　-5.0 to +105.0% (Heat/Cool individual setting)
Overlap/Deadband :
　　　　　TC/RTD input : -span to +span (°C,°F)
　　　　　Voltage/Current input : -100.0 to +100.0% of input span
Undershoot suppression factor : 0.0 to 1.0
Overlap/Deadband reference point :
　　　　　0.0 to 1.0
　　　　　(0.0: Proportional band on heat-side, 1.0: Proportional band on cool-side,
　　　　　0.5: Midpoint)

● Output

Output signal : OUT1, 2 : Relay contact output, Voltage pulse output, Current
output, Continuous voltage, Transistor output
OUT3 : Voltage pulse, Current output (Universal output)
DO1 to DO4 : Relay contact output
Output function : Control output (Heat/Cool), Event output,, LBA (Control loop
break alarm output), HBA (Heater break alarm output),
RUN status monitor, Output of communication monitoring result
Manual status output, Remote statusa output, AT status output,
SV change status output, FAIL output, Retransmission output
Number of event/alarm : Up to 4 points
Output specification
Relay contact output (1), [OUT1]
a) Contact type :   1c contact, 250V AC 3A, 30V DC 1A   (Resistive load)
b) Electric life :   300,000 operations or more   (Rated load)
c) Mechanical life : 50,000,000 operations or more (Switching: 180 times/min)
Relay contact output (2), [OUT2]
a) Contact type :   1a contact, 250V AC 3A, 30V DC 1A   (Resistive load)
b) Electric life :   300,000 operations or more   (Rated load)
c) Mechanical life : 50,000,000 operations or more (Switching: 180 times/min)
Relay contact output (3), [DO1 to DO4]
a) Contact type :   1a contact, 250V AC 1A, 30V DC 0.5A   (Resistive load)
b) Electric life :   150,000 operations or more   (Rated load)
c) Mechanical life : 20,000,000 operations or more (Switching: 300 times/min)
Voltage pulse output (1), [OUT1, OUT2]
0/12V DC (Load resistance : More than 500Ω)
Voltage pulse output (2), [OUT3]
0/14V DC (Load resistance : More than 600Ω)
Current output
4 to 20mA, 0 to 20mA (Load resistance : Less than 500Ω)
Continuous voltage output
0 to 5V DC, 1 to 5V DC, 0 to 10V DC (Load resistance : More than 1kΩ)
Transistor output
a) Load voltage : Less than 30V DC
b) Load current : Less than 100mA

● Analog Retransmission Output (AO)

Output type : Measured value (PV), Set value (SV), Manipulated value (MV),
Deviation (between PV and SV), Current transformer (CT) input
value, Measured value (PV) of differential temperature input
• Selectable

● Event, Alarm function

Type : Process high, Process low, Process high/low*1, Deviation high, Deviation low,
Deviation high/low*1, Band*1, Set value high, Set value low, Set value high/low
MV value high (Heat/Cool), MV value low (Heat/Cool)
*1: Two types of alarm settings are field-selectable.
1. Independent high and low settings.
2. Common high/low setting
(Factory setting, unless specified in alarm code when ordering)
• Hold/Re-hold action, Delay timer, Energized/de-energized action,
Interlock (latch) function, Alarm lamp ON condition available.
Control loop break alarm (LBA)
LBA time : 0 to 7200 sec (LBA is OFF when 0 is set.)
Dead band : 0 to input span
Heater break alarm (HBA)
a) Number of alarm : 2 points (1 point per CT input)
b) Setting range : 0.0 to 100.0A
(0.0: HBA function OFF [Current value monitoring is still available])
• CT does not detect current value when the control output ON time or
control output OFF time is less than 250 ms.
c) Delay times : 0 to 255 times
• Heater break alarm is available for time proportioning output only.
Output logic calculation : OR logic calculation from event 1 to 4, HBA1/2, LBA1/2
Input abnormal 1/2 (High/Low)

● Multi-Memory Area (recipe)

Number of memory area : 16 areas (recipes)
Stored parameters : Set value (SV), Ramp-to-setpoint (Up/Down), Output limiter
High/Low [Heat/Cool], Soak time, Linking area number,
Event set values 1 to 4, Remote/Local select,
Auto/Manual select, MV value, Area trigger select,
Proportional band (Heat/Cool), Integral time (Heat/Cool)
Derivative time (Heat/Cool), Control response parameter,
Manual reset, Overlap/Deadband, Proactive intensity,
FF amount, Control loop break alarm (LBA) time,
LBA deadband
Method of area select : Key operations/Communication function/External contact
signal/Area soak time/Event function.
Memory area link function
a) Area soak time : 0 hr 00 min to 99 hr 59 min, 0 min 00 sec to 199min 59 sec
0 min 00 sec to 9 hr 59 min 59 sec, 0.00 to 99.99 sec
b)Linking area number : 0 to 16

● Host communication   (Optional)

Communication method : RS-485, RS-422A
Protocol : a) ANSI X3.28 sub-category 2.5A4 (RKC standard)
b) MODBUS-RTU
c) PLC communication (MAPMAN)
Bit format : Data bit 7 or 8 (MODBUS-RTU : 8 bit fix)
Parity bit 1(odd or even) or none
Stop bit 1 or 2
Communication speed : 2400bps, 4800bps, 9600bps, 19200bps, 38400bps
57600bps
Maximum connection : 31 units

● Loader communication

Protocol : ANSI X3.28 sub-category 2.5 A4
Communication speed : 38400bps
Connection : 1 unit
Method of connection : Exclusive cable (COM-K2)

● General Specifications

Supply voltage
a) 85 to 264V AC   (50/60Hz, Selectable), Rating : 100 to 240V AC
b) 20.4 to 26.4V AC (50/60Hz, Selectable), Rating : 24V AC
c) 20.4 to 26.4V DC   Rating : 24V DC
Power consumption/Rush current
a) 100 to 240V AC type
GZ400 : Max. 6.8VA (100V),   Rush current : Less than 5.6A
Max. 10.1VZ (240V),   Rush current : Less than 13.3A
GZ900 : Max. 7.4VA (100V),   Rush current : Less than 5.6A
Max. 10.9VA (200V),   Rush current : Less than 13.3A
b) 24V AC type
GZ400 : Max. 6.9VA (24V),   Rush current : Less than 16.3A
GZ900 : Max. 7.4VA (24V),   Rush current : Less than 16.3A
c) 24V DC type
GZ400 : Max. 175mA (24V),   Rush current : Less than 11.5A
GZ900 : Max. 190mA (24V),   Rush current : Less than 11.5A
Insulation resistance
More than 20MΩ (500V DC) between measured terminals and ground
More than 20MΩ (500V DC) between power terminals and ground
More than 20MΩ(500V DC) between measured terminals and power
terminals
Dielectric voltage
1500V AC for one minute between measured terminals and ground
1500V AC for one minute between power terminals and ground
3000V AC for one minute between measured terminals and power
terminals
Power failure
a) 100 to 240V AC, 24V AC type
A power failure of 20m sec or less will not affect the control action.
If power failure of more than 20m sec occurs, controller will restart
with the state of HOT start 1, HOT start 2 or COLD start (selectable)
b) 24V DC type
A power failure of 5m sec or less will not affect the control action.
If power failure of more than 5m sec occurs, controller will restart
with the state of HOT start 1, HOT start 2 or COLD start (selectable)
Memory backup
Backed up by non-volatile memory (FRAM)
• Data retaining period : Approx. 10 years
• Number of writing : Approx. 1,000,000,000,000,000 times.
(Depending on storage and operating conditions.)
Waterproof/Dustproof (Optional)
IP65 (IEC60529)
• Waterproof/Dustproof protection only effective from the front in panel
mounted installation.
• When the front loader connector cover is not installed: IP00
Ambient temperature : -10 to +55°C (14 to 131°F)
Ambient humidity : 5 to 95% RH (Non condensing)
(MAX.W.C 29g/m3 dry air at 101.3kPa)
Weight
GZ400 : Approx.221g, GZ900 : 291g
Compliance with Standards
a) UL : UL61010-1
b) cUL : CAN/CSA-C22.2 No.61010-1
c) CE Mark
LVD: EN61010-1
EMC: EN61326-1
RoHS: EN IEC 63000
d) RCM : EN55011

Model and Suffix Codes

GZ400/900

				①	②	③④⑤⑥⑦⑧	⑨⑩⑪⑫
		48 x 96mm (1/8 DIN Vertical size) GZ400		□	□□□–	□ □ □*□ □ □	□ □ /□
		96 x 96mm (1/4 DIN size) GZ900		□	□□□–	□ □ □*□ □ □	□ □ /□

			Code
①	Control Method	PID control with AT (Reverse action)	F
		PID control with AT (Direct action)	D
		Heat/Cool PID control with AT	G
		Heat/Cool PID control with AT for extruder (Air cooling type)	A
		Heat/Cool PID control with AT for extruder (Water cooling type)	W
②	Input and range	See Input range Code Table	□□□
③	Output 1 (OUT1) (*1)	Not supplied	N
		Relay contact output	M
		Voltage pulse output (0/12V DC)	V
		DC mA, V See Output Code Table	□
		Transistor output	B
④	Output 2 (OUT2) (*1)	Not supplied	N
		Relay contact output	M
		Voltage pulse output (0/12V DC)	V
		DC mA, V See Output Code Table	□
		Transistor output	B
⑤	Power Supply	24V AC/DC	3
		100 to 240V AC	4
⑥	Digital output (*2)	Digital output 1 point	1
		Digital output 4 points	4
⑦	Option 1 (*3)	Not supplied	N
		CT input 2 points (CTL-6-P-N)	T
		CT input 2 points (CTL-12-S56-10L-N)	U
		CT input 2 points (CTL-6-Z)	V
⑧	Option 2 (*3)	Not supplied	N
		Output 3 (OUT3)	A
		Digital input 1 to 6 (DI1 to 6)	B
		Communication RS-422A	C
		Communication RS-485	D
		Output 3 (OUT3) + Digital input 1 to 6 (DI1 to 6)	E
		Output 3 (OUT3) + Communication RS-422A	F
		Output 3 (OUT3) + Communication RS-485	G
		Output 3 (OUT3) + Digital input 1 to 6 (DI1 to 6) + Communication RS-422A	H
		Output 3 (OUT3) + Digital input 1 to 6 (DI1 to 6) + Communication RS-485	J
⑨	Option 3 (*3) (Caution1)	Not supplied	N
		Remote setting input	1
		Measured input 2	2
⑩	Display color	Standard (PV : Green, SV : Orange)	N
		PV : White, SV : Orange	1
⑪	Waterproof/ Dustproof	Not supplied	N
		Waterproof/Dustproof protection (IP65)	1
⑫	Quick start code	No quick start code (Default setting)	N
		Specify quick start code (DO type)	1

Caution 1 : When Heat/Cool PID control or Position proportional PID control is selected, Select code "N" or "1" .

< Default setting of Output 1 (OUT1), Output 2 (OUT2), and Digital output >
  Quick start code not specified : Output allocation code "1" .
< Default setting of Option function >
  • CT input
    CT1 assignment: Output 1 (OUT1)
    CT2 assignment: PID control (without Measured input 2) : Output 1 (OUT1)
                    PID control (with Measured input 2) :   Output 2 (OUT2)
                    Heat/Cool PID control :   Output 2 (OUT2)
                    Position proportioning PID control :   Output 2 (OUT2)
  • Output 3 (OUT3)
    Current output (4 to 20mA), Analog retransmission output (Input 1 measured value)
  • Digital input (DI)
    Option 2 : Code "B" , "E" , "J"
            DI1 to D3 : Memory area select (8 points, No set signal)
            DI4 :   RUN/STOP *
            DI5 :   AUTO/MAN **
            DI6 :   Interlock release,
      Option 2 : Code "H"
            DI1 to D3 : Memory area select (8 points, No set signal)
            DI4 :   RUN/STOP *
      * When " Remote setting input" is specified at Option 3, this will be configured to "Remote/Local transfer" .
      ** When "Measured input 2" is specified at Option 3, "Auto/Manual transfer" will be assigned to Input 1 and Input 2.
  • Communication
    When quick start code not specified : RKC standard communication (ANSI X3.28-1976).
                          The digit of the communication data depends on the Input range code
  • Remote setting input
    When quick start code not specified : 0 to 10V DC, The range will be same as input 1.
  • Measured input 2
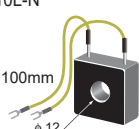   2-Loop control. Input range and the Control action will be the same as Measured input 1.

CT :Current transformer for heater break alarm

Model
: CTL–6–P–N
(0 to 30A)
φ5.8
Cable : Approx.130mm

Model
: CTL-12-S56-10L-N
(0 to 100A)
Cable : Approx.100mm
φ12

Model
: CTL–6–P–Z
(0 to 10A)
φ5.8
(U.R.D.Co.,LTD product)

Input Range Code Table
(Universal input, Field-programmable)
Thermocouple

Input	Range	Code
K	0 to 200℃	K01
	0 to 400℃	K02
	0 to 600℃	K03
	0 to 800℃	K04
	0 to 1200℃	K06
	0 to 1372℃	K07
	-199.9 to +300.0℃	K08
	0.0 to 400.0℃	K09
	0.0 to 800.0℃	K10
	0 to 300℃	K14
	-200 to +1372℃	K41
	-200.0 to +1372.0℃	K42
	0 to 800°F	KA1
	0 to 1600°F	KA2
	0 to 2502°F	KA3
J	0 to 200℃	J01
	0 to 400℃	J02
	0 to 600℃	J03
	0 to 800℃	J04
	0.0 to 400.0℃	J08
	-200.0 to +1200.0℃	J29
	0 to 800°F	JA1
	0 to 2192°F	JA3
	0 to 400°F	JA6
T	-199.9 to +400.0℃	T01
	-199.9 to +100.0℃	T02
	-100.0 to +200.0℃	T03
	-200.0 to +400.0℃	T19
S	-50 to +1768℃	S06
	-50.0 to +1768.0℃	S07
R	0 to 1600℃	R01
	-50 to +1768℃	R07
	-50.0 to +1768.0℃	R08
	0.0 to 1600.0℃	R09
E	0 to 800℃	E01
	0.0 to 800.0℃	E23
B	0 to 1800℃	B03
	0.0 to 1800.0℃	B04
N	0 to 1300℃	N02
	0.0 to 1300.0℃	N05
PLII	0 to 1300℃	A01
	0.0 to 1300.0℃	A05
W5Re/ W26Re	0 to 2300℃	W03
PR40-20	0 to 1800℃	F02
	0 to 3200°F	FA2
U	-199.9 to +600.0℃	U01
L	0.0 to 900.0℃	U04

RTD

Input	Range	Code
Pt100	-199.9 to +649.0℃	D01
	-100.0 to +100.0℃	D04
	-100.0 to +200.0℃	D05
	0.0 to 50.0℃	D06
	0.0 to 100.0℃	D07
	0.0 to 200.0℃	D08
	0.0 to 300.0℃	D09
	0.0 to 500.0℃	D10
	-199.9 to +600.0℃	D12
	-200.0 to +200.0℃	D21
	0.00 to 50.00℃	D27
	-100.00 to +100.00℃	D34
	-200.0 to +850.0℃	D35
	-199.9 to +999.9°F	DA1
	0.0 to 500.0°F	DA9
	-100.00 to +850.00℃	D48
JPt100	0.0 to 200.0℃	P08
	-100.00 to +100.00℃	P29
	-200.0 to +640.0℃	P30
	-100.00 to +640.00℃	P36

DC Current・voltage

Input	Code	Range
0 to 10mV DC	101	Scale range and decimal point are programmable in the range of -19999 to +99999
0 to 100mV DC	201	
0 to 1V DC	301	
0 to 5V DC	401	
0 to 10V DC	501	
1 to 5V DC	601	
0 to 20mA DC	701	
4 to 20mA DC	801	Factory set value 0.0 to 100.0%
-10 to +10V DC	904	
-5 to +5V DC	905	

C) Output Code Table

Output	Code
0 to 5V DC	4
0 to 10V DC	5
1 to 5V DC	6
0 to 20mA DC	7
4 to 20mA DC	8

Quick start code

GZ400/900

Quick start code	①	②	③④⑤⑥	⑦		Specifications
① Output allocation	□					See Output Allocation Code Table
② Remote setting input		N				None. When "Remote setting input" is not specified as an option, only "N: None" is selectable.
		3				0 to 1V DC
		4				0 to 5V DC
		5				0 to 10V DC
		6				1 to 5V DC
		7				0 to 20mA DC
		8				4 to 20mA DC
		9				-5 to +5V DC
		A				-10 to +10V DC
③ Event 1 ④ Event 2 ⑤ Event 3 ⑥ Event 4			N			None
			A			Deviation High
			B			Deviation Low
			C			Deviation High/Low
			D			Band
			E			Deviation High with Hold
			F			Deviation Low with Hold
			G			Deviation High/Low with Hold
• The input allocation the event will be configured as "Input 1."			H			Process High
			J			Process Low
			K			Process High with Hold
			L			Process Low with Hold
			Q			Deviation High with Alarm Re-hold
			R			Deviation Low with Alarm Re-hold
			T			Deviation High/Low with Re-Hold
			U			Band ()
			V			Set value High
			W			Set value Low
			X			Deviation High/Low (*)
			Y			Deviation High/Low with Alarm Hold (*)
			Z			Deviation High/Low with Alarm Re-Hold (*)
			1			MV value High
			2			MV value Low
			3			MV value High (Cool side)
			4			MV value Low (Heat side)
⑦ Communication				N		None. When "Communication" is not specified as an option, only "N: None" is selectable as the communication protocol.
				1		ANSI/RKC standard protocol
				2		MODBUS protocol
				3		PLC communication: MITSUBISHI MELSEC series special protocol

(*) Individual high and low settings

Output allocation code table

Code	OUT1	OUT2	DO1	DO2	DO3	DO4
1	Input 1 Control output [Heat side]	HBA1 HBA2	Event 1	Event 2	Event 3	Event 4
2	Input 1 Control output [Heat side]	HBA1 HBA2	Event 1	LBA1 LBA2	Event 3	Event 4
3	Input 1 Control output [Heat side]	FAIL	Event 1	HBA1 HBA2	Event 3	LBA1 LBA2
4	Input 1 Control output [Heat side]	HBA1 HBA2	Event 1	FAIL	Event 3	Event 4
5	Input 1 Control output [Heat side]	Event 1	LBA1 LBA2	HBA1 HBA2	Event 3	Event 4
6	Input 1 Control output [Heat side]	HBA1 HBA2	LBA1 LBA2	FAIL	Event 3	Event 4
7	Input 1 Control output [Heat side]	Event 1	LBA1 LBA2	FAIL	Event 3	Event 4
8	Input 1 Control output [Heat side]	Event 2 Event 4	Event 1 Event 3	HBA1 HBA2	LBA1 LBA2	FAIL
Note	When "Output 1 (OUT1)" is specified "N (None)", Allocation is None.	When "Output 12 (OUT2)" is specified "N (None)" Allocation is None.		When "Digital output " is specified "N (None)", Allocation is None.	When "Digital output " is specified "N (None)", Allocation is None.	When "Digital output " is specified "N (None)", Allocation is None.

• If two or more items are allocated to the same output, the resultant output is OR.

OUT2 allocation

The output allocation depends on the Control action and the selection of Option 3.

Control Action	Option 3	OUT2 allocation
PID control	None or Remote setting input	Output Allocation Code Table
Heat/Cool PID control	None or Remote setting input	Input 1 Control output Heat/Cool PID control: Cool-side
PID control	Measured input 2	Input 2 Control output

Loop break alarm (LBA) Initial setting code:
The output allocation has LBA output : 480
The output allocation has no LBA output: 0

Rear Terminals

• Use a solderless terminal for screw size M3, width 5.8mm or less.

GZ900   GZ400   `[    ]` : Option

No	Description	
1	AC 100-240V L / DC + 24V / 24V N −	Power supply
2		
3	NO (1) | (2) Voltage pulse/Current/ Voltage/Transistor	Output 2 (OUT2) (1) Relay contact output
4		(2) Voltage pulse/Current/ Voltage/Transistor
5	NO (2)	Output 1 (OUT1) (1) Relay contact output
6		(2) Voltage pulse/Current/ Voltage/Transistor
7	(1)	
8	NO	Digital output 1
9		Relay contact output
10	A	Measured input 1
11	+ B −	(1) Thermocouple (2) RTD
12	(1) B (2) (3)	(3) Voltage/Current

No	Description		
25	+		Output 3 (OUT3) Voltage pulse/ Current
26	−		
27	COM	COM	Digital input (DI1 to 6)
28	DI 1	DI 1	or (DI1 to 4)
29	DI 2	DI 2	Non voltage contact input
30	DI 3	DI 3	
31	DI 4	DI 4	
32	DI 5	R(A)	Communication
33	DI 6	R(B)	
34	SG	SG	
35	T/R(A)	T(A)	(1) RS-485
36	T/R(B)	T(B)	(2) RS-422A

No	Description	
13	NO	Digital output 2 (DO 2)
14		Relay contact output
15	NO	Digital output 3 (DO 3)
16		Relay contact output
17	NO	Digital output 4 (DO 4)
18		Relay contact output
19	COM CT1	CT1, CT2 input
20	CT2	
21		
22	A	Measured input 2 (Remote setting input)
23	+ B −	(1) Thermocouple (2) RTD
24	(1) B (2) (3)	(3) Voltage/Current

CT : Current transformer for heater break alarm

External Dimensions

Unit:mm

*1: Rubber packing for waterproof/dustproof.
*2: Terminal cover.
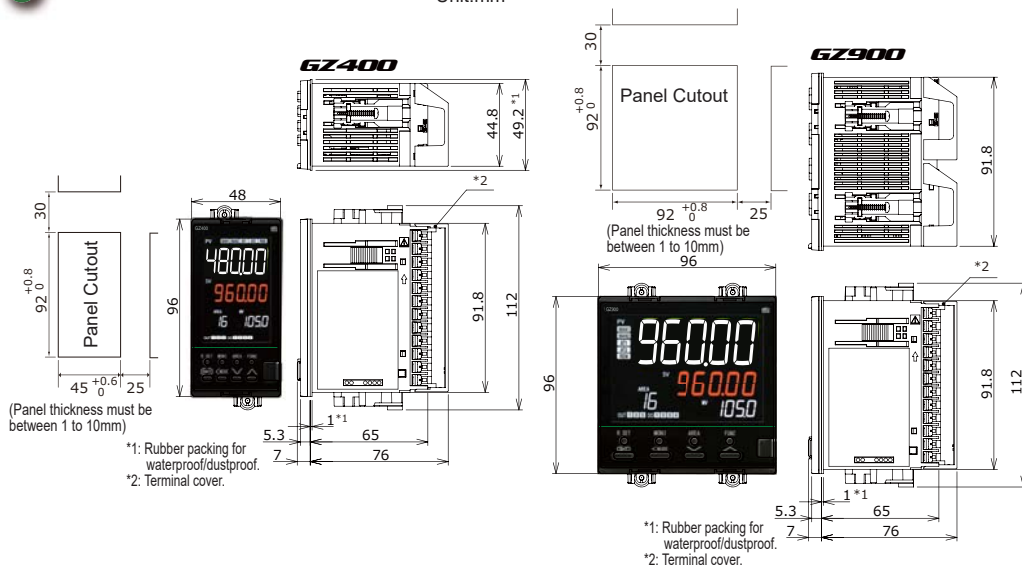
Accessories (Sold separately)

Terminal Cover

GZ400   GZ900

Model Code : KFB400-58

Model Code : KFB400-58
• Two pieces necessary

Front Cover

GZ400   GZ900

Model code : KRB400-36

Model code : KRB900-36