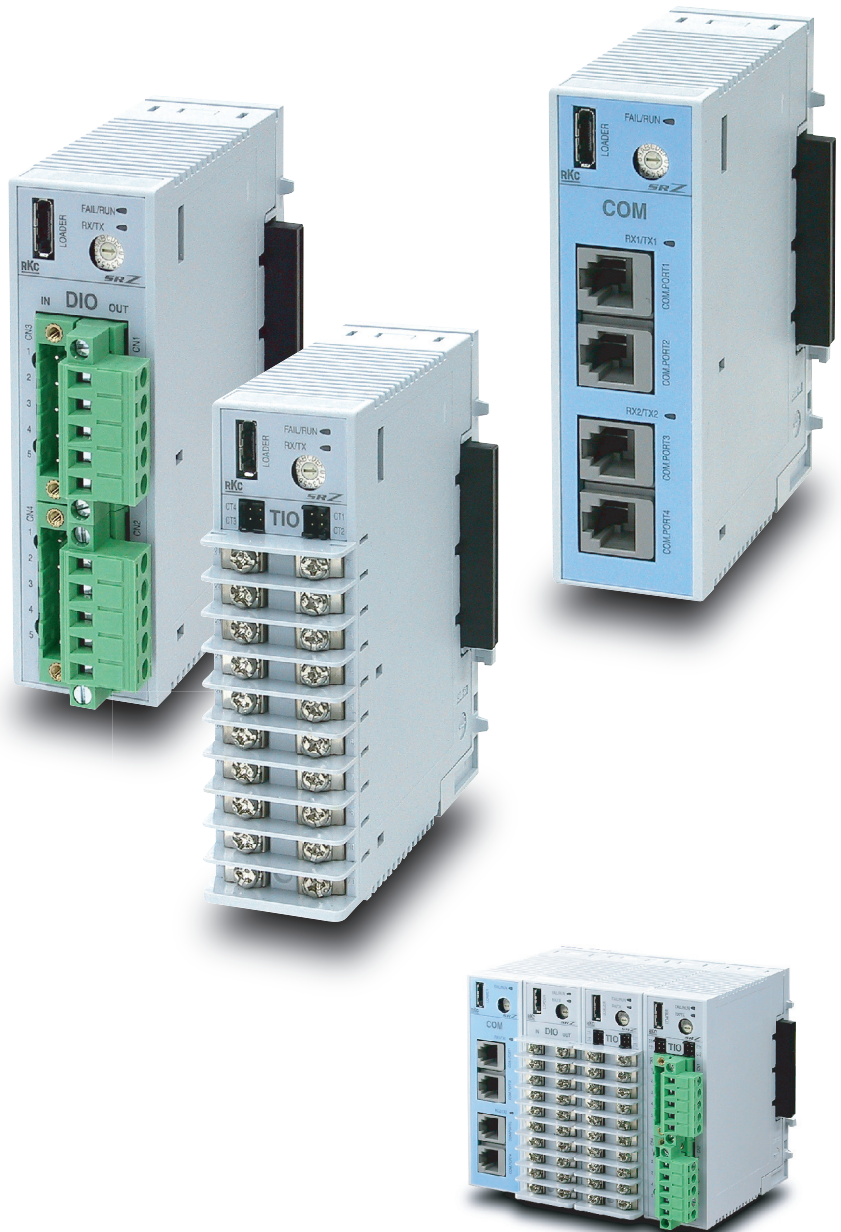


# SRZ SERIES

Module type  
Digital Temperature Controller

**SRZ**  
High-Performance



CE cUL<sup>us</sup> C-Tick  
CE,UL,c-UL,C-Tick

**RKC** RKC INSTRUMENT INC.

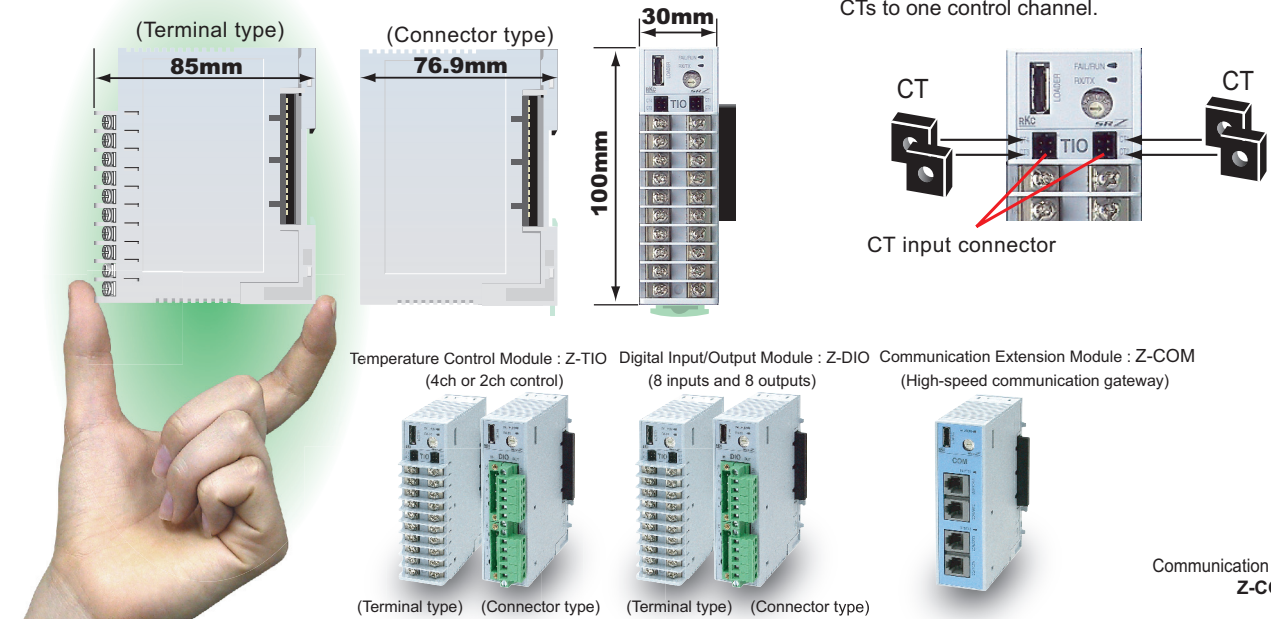
## 4CH temperature controller packed in one compact module

### ● Compact

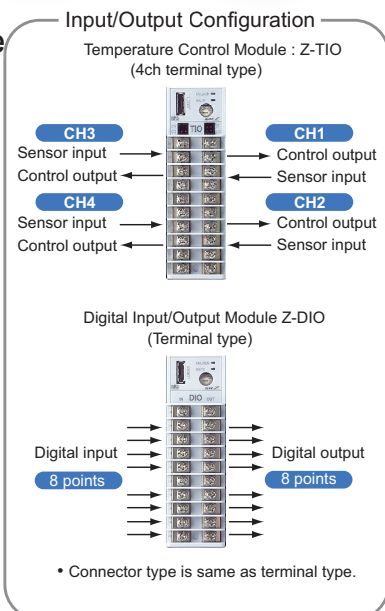
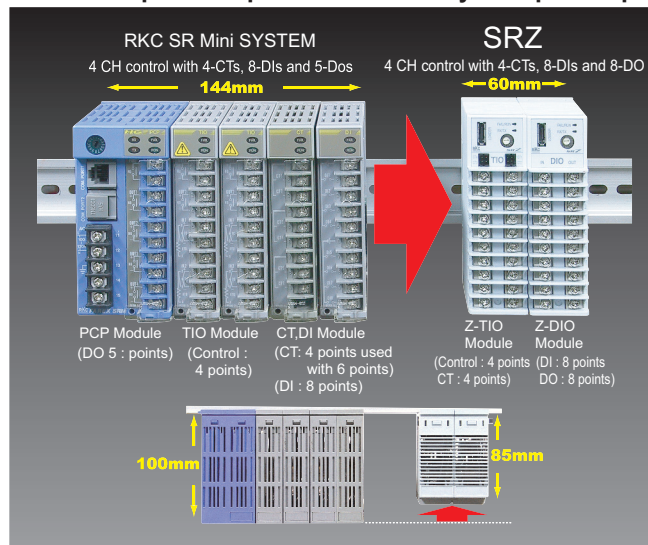
Width 30mm, depth 85mm (connector type : 76.9mm) compact design with 4ch control type.

### ● 4 CT inputs and 4 CH controls in one module

4-CH Z-TIO module can have 4 CT (current transformer) inputs. 3-phase heater can be monitored by allocating two CTs to one control channel.



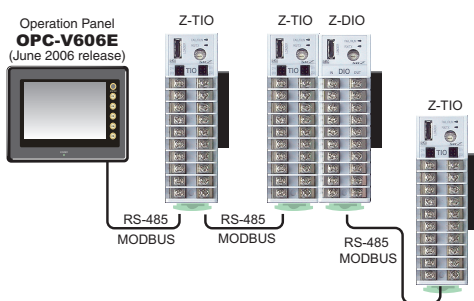
### ● Ultra compact - requires substantially less panel space



## Flexible temperature control system configuration

### ● Distributed installation

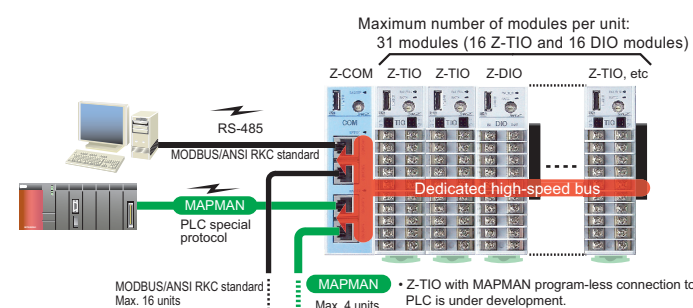
Modules can be remotely distributed by connecting them via RS-485 communication. Up to 16 Z-TIO (128 DIs) and 16 Z-DIO (128 DOs) modules can be connected to one serial communication line by distributed installation. The maximum number of modules connected by distributed installation is 31 modules.



### ● High-speed communication with large systems, Program-less connection to PLCs

Z-COM module can manage data from connected control modules via high-speed bus connection. MAPMAN program-less connection to PLC is also available.

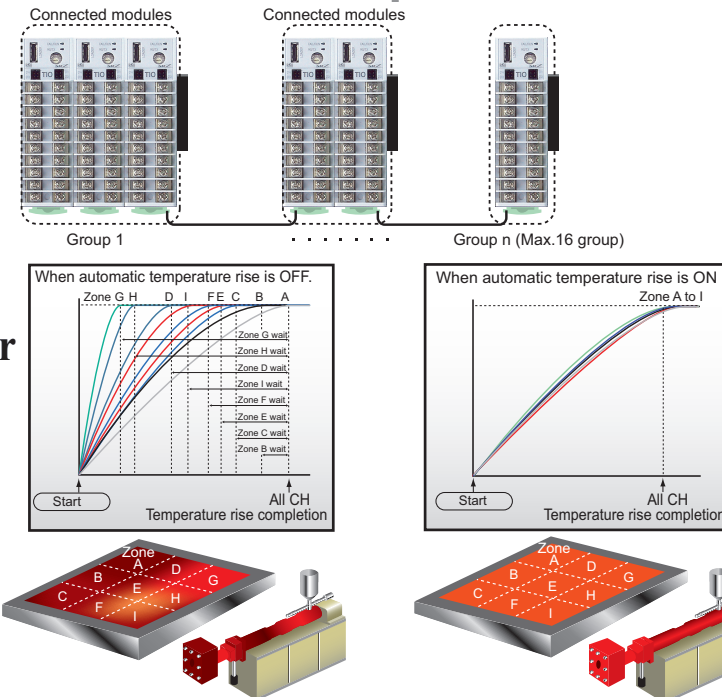
Program-less connectable PLCs: Mitsubishi Electric MELSEC Series



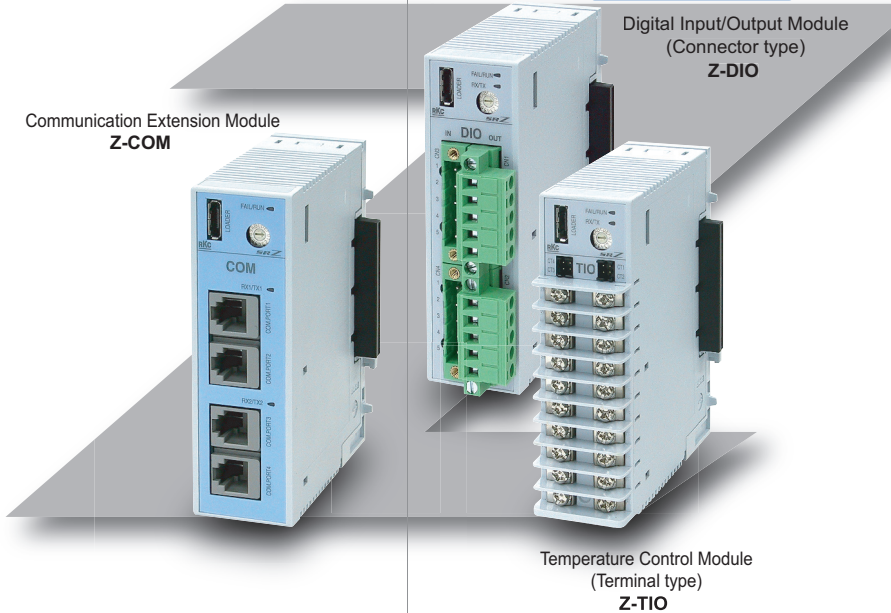
## Advanced functions enhance multi-loop control

### ● Temperature uniformity at ramp-up (Auto-temperature rise function)

The Auto-temperature rise function controls the rate of temperature rise uniformly across all the channels in a specified group. The SRZ system has the ability to have multiple groups within each system. This uniform controlled temperature rise will suppress local overheating and mechanical distortion in the tools, contributing to higher product quality.

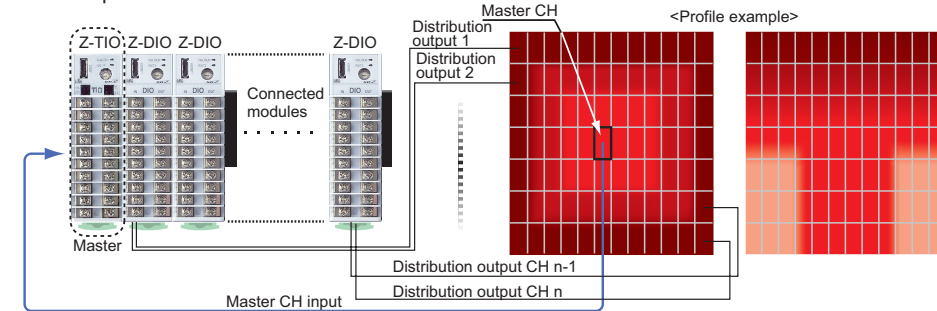


### Ultra-compact modular controller with advanced functions



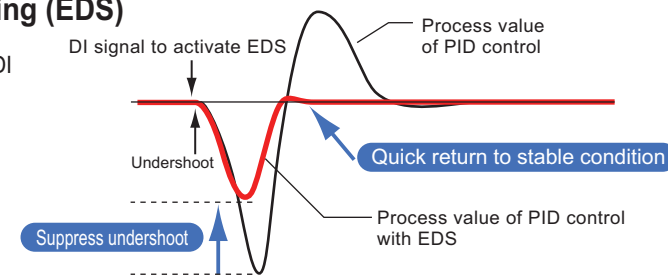
### ● Multi-loop profile control (Output ratio distribution function)

This function enables one master loop to distribute its output value to multiple outputs of Z-DIO modules. Bias and ratio can be set for each output independently. A maximum of 187 distribution outputs from one control loop is possible when Z-DIOs and Z-TIOs are used for output ratio distribution.



### ● External disturbance suppression with autotuning (EDS)

EDS with autotuning calculates optimum settings to suppress control disturbance caused by external factors. The function is activated by a DI signal to adjust control output (feed-forward) to compensate for the disturbance. It is suitable for an application in which external disturbance can be predicted, such as wafer-in/out in semiconductor manufacturing equipment, and during injection in injection molding machine.



## Communications

### ● Easy parameter setup via USB loader port with Win-UCI software (Loader communication)

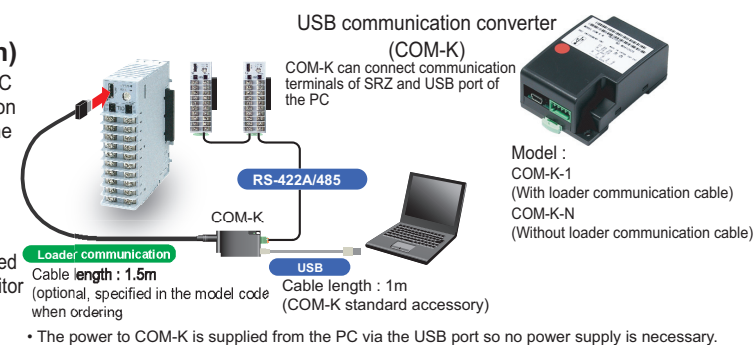
The SRZ module has a standard loader port on the front panel to connect to a PC USB port via COM-K (USB communication converter). Using Win-UCI software on the PC, parameter settings can be easily saved on the PC in CSV format, and the same parameter settings are easily copied to other SRZ modules.

### ● Easy data monitoring and logging with Win-UCI software

The Win-UCI software enables data monitoring and logging on the PC via communication terminals of SRZ. When SRZ communication terminals are connected to COM-K (see the diagram below), the USB port can be used on the PC side. Monitor and log data can be exported as an electronic file in CSV format.

• Win-UCI for SRZ is coming soon on the RKC Instrument website (www.rkcinst.com).

The Loader port is only for parameter setup





# Specifications

## Temperature Control Module (Z-TIO)

### Input Universal input

Number of inputs  
4 or 2 channel (Isolated between inputs)

Input

a) Temperature, Current, Low voltage input group  
Thermocouple : K, J, E, T, R, S, B, N (JIS/IEC)  
PLII (NBS), W5Re/W26Re (ASTM)  
RTD : Pt100 (JIS/IEC), JPt100 (JIS)  
• 3-wire system  
Low voltage (Input impedance : More than 1MΩ)  
0 to 1V DC, 0 to 100mV, 0 to 10mV DC  
Current (Input impedance : 50Ω)  
4 to 20mA, 0 to 20mA

b) High voltage input group  
High voltage (Input impedance : 1MΩ)  
-1 to +1V DC, 0 to 5V DC, 1 to 5V DC, 0 to 10V DC  
• Available for feedback resistance input

Sampling time : 0.25sec  
Influence of external resistance : 0.125μV/Ω (Thermocouple input)  
Influence of lead resistance : 0.02% of reading/Ω (RTD input)  
• Maximum 10Ω per wire

Input break action

a) Thermocouple input : Up-scale/Down-scale (Selectable)  
b) RTD input : Up-scale  
c) Low voltage input : Up-scale/Down-scale (Selectable)  
d) Current input : Value around 0mA  
e) High voltage input : Value around 0V

Input short action : Down-scale (RTD input)  
Input digital filter : 0.1 to 100.0 sec. (OFF when 0 is set.)  
PV bias : -span to +span  
PV ratio : 0.500 to 1.500

### Control

- Brilliant II PID control
  - Direct action/Reverse action is selectable
- Brilliant II PID control (Heat/Cool type)
- Position proportioning control without feedback resistance
  - a), b), c) is selectable
  - With auto-tuning and start-up tuning (Except for position proportioning control)
- Proportional band :
  - Temperature input : 0 to input span (°C,°F)
  - Voltage/Current input : 0.0 to 1000.0% of input span
  - Differential gap at ON/OFF control (High/Low individual setting) : Temperature input : 0 to input span (°C,°F)
  - Voltage/Current input : 0.0 to 100.0% of input span
- Integral time : 0 to 3600 sec or 0.0 to 1999.9 sec (selectable)
- Derivative time : 0 to 3600 sec or 0.0 to 1999.9 sec (selectable)
- Cool side proportional band :
  - Temperature input : 1(0.1, 0.01) to input span (°C,°F)
  - Voltage/Current input : 0.1 to 1000.0% of input span
- Cool side Integral time :
  - 0 to 3600 sec or 0.0 to 1999.9 sec (selectable)
- Cool side Derivative time :
  - 0 to 3600 sec or 0.0 to 1999.9 sec (selectable)
- Overlap/Deadband
  - Temperature input : -span to +span (°C,°F)
  - Voltage/Current input : -100.0 to +100.0% of input span
- Control response : Slow, Medium, Fast
- Ramp-to-setpoint : 0 to span per Time  
(Time is settable between 1 and 3600 sec)  
Up/Down 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)
- Proportional cycle time : 0.1 to 100.0 sec
- Cool side proportional cycle time : 0.1 to 100.0 sec
- Manual reset : -100.0 to +100.0%
- Output at Control Stop mode : -5.0 to +105.0%  
(Heat side/Cool side individual setting)

### Performance

Input	Input Range	Accuracy
K, J, T, PLII, E	Less than -100°C (-148°F)	±2.0°C (±3.6°F)
	-100 to +500°C (-148 to 932°F)	±1.0°C (±1.8°F)
	More than 500°C (932°F)	±(0.2% of reading+1digit)
N, S, R, W5Re/W26Re	Less than 1000°C (1832°F)	±2.0°C (±3.6°F)
	More than 1000°C (1832°F)	±(0.2% of reading+1digit)
	Less than 400°C (752°F)	±70.0°C (±126°F)
B	400 to 1000°C (752 to 1832°F)	±2.0°C (±3.6°F)
	More than 1000°C (1832°F)	±(0.2% of reading+1digit)
	Pt100, JPt100	Less than 200°C (392°F)
	More than 200°C (392°F)	±(0.2% of reading+1digit)
DC V, DC A		±0.2% of span
FBR input		±1.0% of span +1digit ±1digit

• Cold junction temperature compensation error when close horizontal mounting  
±1.0°C (1.8°F) [Terminal type], ±2.0°C (3.6°F) [Connector type]

#### 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 and power terminals

#### Dielectric voltage

750V AC for one minute between measured terminals and ground  
750V AC for one minute between power terminals and ground  
750V AC for one minute between measured and power terminals

### Output

Number of outputs : 4 points or 2 points

Output

a) Relay contact output, Form a contact  
250V AC 3A (Resistive load)

b) Voltage pulse output, 0/12V DC  
(Load resistance : More than 600Ω)  
• Power supply and output are not isolated.

c) Current output, 4 to 20mA DC, 0 to 20mA DC  
(Load resistance : Less than 600Ω)  
• Power supply and output are not isolated.

d) Continuous voltage output  
1 to 5V, 0 to 5V DC, 1 to 5V DC, 0 to 10V DC  
(Load resistance : More than 1kΩ)  
• Power supply and output are not isolated.

e) SSR (Triac) output, Rated current : 0.5A

f) Open collector output (Sink type)  
Load current : Less than 100mA

### Event (Alarm) function

Number of events : Up to 4 points per channel

Event type

Process high, Process low, Deviation high, Deviation low, Deviation high/low, Band, Set value high, Set value low, MV value high, MV value low, Cool side MV value high, Cool side MV value low, FBR value high, FBR value low, LBA (Control loop break alarm), Deviation high between channel, Deviation low between channel, Deviation high/low between channel, Deviation band between channel LBA, Temperature rise completion  
• LBA is assignable to event 4.  
• Temperature rise completion is assignable to event 3.

a) Hold/Re-hold action is configurable.  
• Valid for deviation/band/process alarm only.

b) Energized/de-energized action is configurable.

c) Delay timer : 0 to 1800sec

d) Interlock (latch) function is configurable.

### Heater break alarm function

Number of alarms : 4 or 2 points (1 point per CT input)  
CT type : CTL-6-P-N : 0 to 30A  
CTL-12-S56-10L-N : 0 to 100A

Input accuracy  
±(5% of input value + 1 digit) or 2A (whichever is larger)

### Communication function

Communication method : RS-485  
Communication speed : 4800bps, 9600bps, 19200bps, 38400bps

Protocol

a) ANSI X3.28 sub-category 2.5B4 (RKC standard)

b) MODBUS-RTU

Bit format

- a) RKC standard protocol  
Start bit : 1  
Data bit : 7 or 8  
Parity bit : 1 (odd or even) or none  
Stop bit : 1 or 2
- b) MODBUS protocol  
Start bit : 1  
Data bit : 8 (binary or byte data)  
Parity bit : none  
Stop bit : 1

Maximum connection : 32 units (Including host)

### Multi-Memory Area (recipe)

Number of areas : 8 areas (recipes) per channel

Stored parameters

Set value (SV), Event set values 1 to 4, LBA time, LBA dead band, Proportional band, Integral time, Derivative time, Cool side proportional band, Cool side integral time, Cool side derivative time, Overlap/Deadband, Manual reset, Control response parameter, Ramp-to-setpoint (Up/Down), Soak time  
Linking area number

### Other functions

- Remote setpoint input
- Temperature ratio setting
- Cascade control mode
- Output ratio distribution function  
Function which distributes the control output value of the master channel to the Z-DIO/TIO module output.
- EDS function  
Function which suppresses overshoot and undershoot.
- Auto-temperature-rise with learning function  
Function which achieves temperature uniformity at ramp-up in the same control group while learning function calculates optimum parameter settings for this function.  
Up to 16 groups can be configured within modules which are connected each other by connectors on the base
- Peak current suppression function  
This function is effective for modules connected each other by connectors on the base  
• The peak current suppression function is performed in coupled modules.
- Master-slave Mode  
With this function, when a mode of Mode-master channel is changed, the mode of all slave channels (preset) will be also automatically changed. Modes can be selected among various mode function such as memory area (recipe).

# Specifications

## Digital Input/Output Module (Z-DIO)

### Digital Input

- Number of inputs : 8 points
  - Isolated input (4 points/common)
- Input method
  - Voltage contact input
    - Open : Less than 5.0V, Close : More than 17.5V
    - Contact current : Less than 3.0mA
    - Allowable input voltage : Less than 26.4V DC
- Function : Interlock reset, RUN/STOP, Remote/Local, Auto/Manual, Memory area selection, Nice-Meet start.
- Function allocation : See digital input allocation table

### Digital Output

- Number of inputs : 8 points (4 points/common)
- Output signal
  - a) Relay contact output, Form a contact
    - 250V AC 1A , 30V DC 1A (Resistive load)
  - b) Open collector output (Sink type)
    - Allowable load current : Less than 100mA
    - Load voltage : Less than 30V
    - Minimum load : 0.5mA
    - ON voltage : Less than 2.0V (at maximum load current)
    - Leakage current at OFF : Less than 0.1mA
- Function :
  - Event 1 output (CH1 to CH4), Event 2 output (CH1 to CH4)
  - Event 3 output (CH1 to CH4), Event 4 output (CH1 to CH4)
  - HBA output, Burn-out status output, Temperature rise completion output, Manual output
- Function allocation : See output allocation table

### Communication Function

- Communication method : RS-485
- Communication speed : 4800bps, 9600bps, 19200bps, 38400bps
- Protocol
  - a) ANSI X3.28 sub-category 2.5B4 (RKC standard)
  - b) MODBUS-RTU
- Bit format
  - a) RKC standard protocol
    - Start bit : 1
    - Data bit : 7 or 8
    - Parity bit : 1 (odd or even) or none
    - Stop bit : 1 or 2
  - b) MODBUS protocol
    - Start bit : 1
    - Data bit : 8 (binary or byte data)
    - Parity bit : none
    - Stop bit : 1
- Maximum connection : 16 units

## Communication Extension Module (Z-COM)

### Communication Function

- Communication method : RS-485/RS-422A
- Communication speed : 4800bps, 9600bps, 19200bps, 38400bps
- Protocol
  - a) ANSI X3.28 sub-category 2.5B4 (RKC standard)
  - b) MODBUS-RTU
  - c) PLC special protocol (Mapman)
    - Corresponding to PLC
    - MITSUBISHI MELSEC series
    - Ana/AnU common command (QR/QW)
    - (ANA/QNA series, Q series)
- Bit format
  - a) RKC standard protocol
    - Start bit : 1
    - Data bit : 7 or 8
    - Parity bit : 1 (odd or even) or none
    - Stop bit : 1 or 2
  - b) MODBUS protocol
    - Start bit : 1
    - Data bit : 8 (binary or byte data)
    - Parity bit : none
    - Stop bit : 1
  - c) PLC special protocol (Mapman)
    - Start bit : 1
    - Data bit : 7 or 8
    - Parity bit : 1 (odd or even) or none
    - Stop bit : 1 or 2
- Communication allocation
  - Communication 1 (COM PORT 1 to 2)
    - RKC standard communication or MODBUS protocol
  - Communication 2 (COM PORT 3 to 4)
    - RKC standard communication, MODBUS protocol or PLC special protocol (Mapman)
- Maximum connection
  - RKC standard protocol, MODBUS protocol : 16 units
  - PLC special protocol (Mapman) : 4 units
- Maximum connection function module
  - Same function module : 16 units
  - Total function module : 31 units

## Z-TIO, Z-DIO, Z-COM Common Specifications

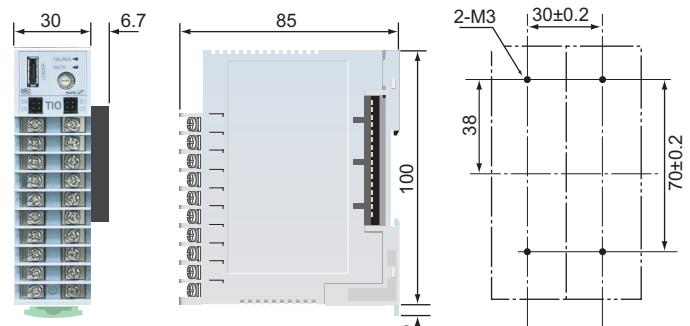
### General Specifications

- Supply voltage : 21.6 to 26.4V DC (Including supply voltage variation)
    - Rating : 24V DC
  - Power consumption
    - a) Z-TIO : Less than 140mA, Surge current : Less than 10A
    - b) Z-DIO : Less than 70mA, Surge current : Less than 10A
    - c) Z-COM : Less than 30mA, Surge current : Less than 10A
  - Power failure
    - A power failure of 4m 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 or COLD start. (Only Z-TIO)
  - Memory backup
    - Backed up by non-volatile memory (FRAM)
      - Data retaining period : Approx. 10 years
      - Number of writing : Approx. 10,000,000,000 times. (Depending on storage and operating conditions.)
  - Ambient temperature : -10 to +50°C (14 to 122°F)
  - Ambient humidity : 5 to 95% RH (Non condensing)
    - Absolute humidity : MAX.W.C 29g/m<sup>3</sup> dry air at 101.3kPa
  - Weight
    - Z-TIO
      - Terminal type : Approx 130g (2ch type), Approx 160g (4ch type)
      - Connector type : Approx 120g (2ch type), Approx 140g (4ch type)
    - Z-DIO
      - Terminal type : Approx 150g (DI/DO 8ch type)
      - Approx 120g (DI 8ch type)
      - Approx 140g (DO 8ch type)
    - Connector type : Approx 130g (DI/DO 8ch type)
    - Approx 100g (DI 8ch type)
    - Approx 120g (DO 8ch type)
- Operating environment
  - Free from corrosive and flammable gas and dust.
  - Free from external noise, vibration, shock and exposure to direct sunlight.
- Compliance with Standards
  - CE Mark, UL, c-UL, C-Tick mark

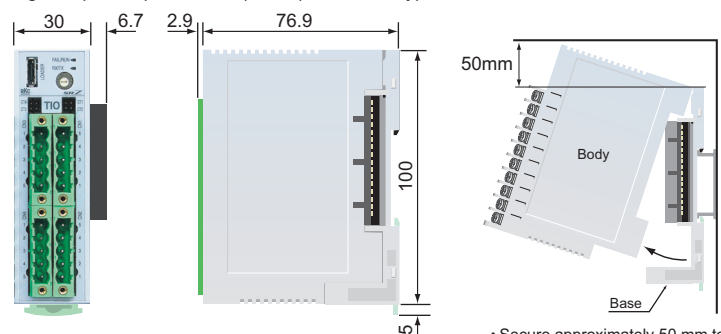
## External Dimensions

(Unit:mm)

Temperature Control Module (Z-TIO), Terminal type  
Digital Input/Output Module (Z-DIO), Terminal type



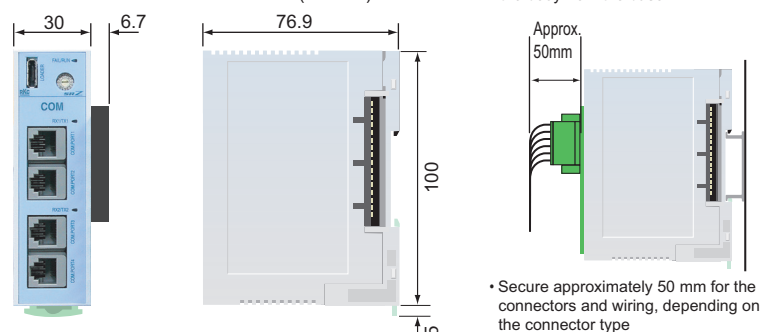
Temperature Control Module (Z-TIO), Terminal type  
Digital Input/Output Module (Z-DIO), Terminal type



(When installed with screws)

• Secure approximately 50 mm to remove the body from the base.

Communication Extension Module (Z-COM)



• Secure approximately 50 mm for the connectors and wiring, depending on the connector type

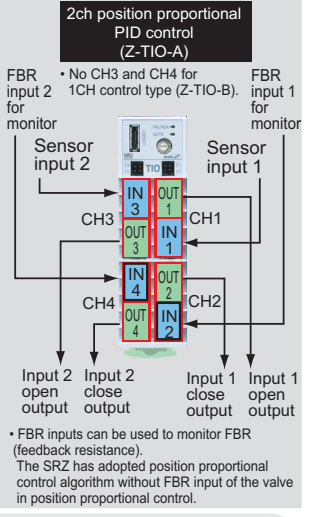
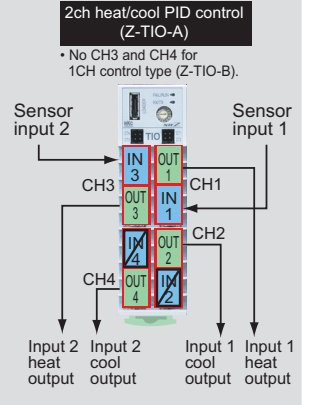
# Model and Suffix Code

## 4ch type Temperature Control Module (Z-TIO-A) (If used as a heat and cool module or position proportional controller then it is only 2 channels.)

Specifications		Hardware coding only										Quick start code			PID control	Heat/Cool PID control	Position proportional PID control without FBR	
		Z-TIO-A										①	②	③				
Wiring method	① Terminal type	T																
	① Connector type	C																
Output 1	② See Output Code Table														CH1 output	CH1 Heat output	CH1 Open output	
Output 2	③ See Output Code Table														CH2 output	CH1 Cool output	CH1 Close output	
Output 3	④ See Output Code Table														CH3 output	CH2 Heat output	CH2 Open output	
Output 4	⑤ See Output Code Table														CH4 output	CH2 Cool output	CH2 Close output	
CT input	⑥ Not supplied																	
	⑥ CT input 4 points																	
Quick start code	⑦ No quick start code (Default setting)																	
	⑦ Specify quick start code 1																	
	⑦ Specify quick start code 1 and 2 (See page 7)																	
	⑦ No quick start code																	
Control method	⑧ No quick start code																	
	⑧ PID control with AT (Reverse action)																	
	⑧ PID control with AT (Direct action)																	
	⑧ Heat/Cool PID control with AT (Air cooling type) (CH2 and CH4 are unused.)																	
	⑧ Heat/Cool PID control with AT (Water cooling type) (CH2 and CH4 are unused.)																	
	⑧ Heat/Cool PID control with AT (CH2 and CH4 are unused.)																	
Input range	⑨ No quick start code																	
	⑨ See Input range Code Table																	
Instrument version	⑩ Version symbol																	

## Input/Output configuration

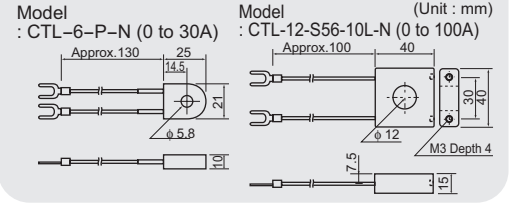
(Heat/Cool PID control or Position proportional PID control)



## 2ch type Temperature Control Module (Z-TIO-B) (If used as a heat and cool module or position proportional controller then it is only 1 channels.)

Specifications		Hardware coding only									Quick start code		PID control	Heat/Cool PID control	Position proportional PID control without FBR		
		Z-TIO-B									①	②					
Wiring method	① Terminal type	T															
	① Connector type	C															
Output 1	② See Output Code Table														CH1 output	CH1 Heat output	CH1 Open output
Output 2	③ See Output Code Table														CH2 output	CH1 Cool output	CH1 Close output
CT input	④ Not supplied																
	④ CT input 2 points																
Option	⑤ Not supplied																
Quick start code	⑥ No quick start code (Default setting)																
	⑥ Specify quick start code 1																
	⑥ Specify quick start code 1 and 2 (See page 7)																
	⑥ No quick start code																
Control method	⑦ No quick start code																
	⑦ PID control with AT (Reverse action)																
	⑦ PID control with AT (Direct action)																
	⑦ Heat/Cool PID control with AT (Air cooling type) (CH2 and CH4 are unused.)																
	⑦ Heat/Cool PID control with AT (Water cooling type) (CH2 and CH4 are unused.)																
	⑦ Heat/Cool PID control with AT (CH2 and CH4 are unused.)																
Input range	⑧ No quick start code																
	⑧ See Input Range Code Table																
Instrument version	Version symbol																

## Current transformer for heater break alarm (HBA)



## Output Code Table

Output Type	Code
Relay contact output	M
Voltage pulse output (0/12V DC)	V
0 to 1V DC	3
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
Triac output*	T
Open Collector output	D

\*When a triac output is specified, CE marking and UL/CSA are not applied.

## Input Range Code Table

Thermocouple			RTD		
Input	Code	Range	Input	Code	Range
K	K : 35	-200.0 to +400.0°C	J	J : 02	0 to 400°C
	K : 40	-200.0 to +800.0°C		J : 04	0 to 800°C
	K : 09	0.0 to 400.0°C		J : 15	-200 to +1200°C
	K : 10	0.0 to 800.0°C		J : B6	0.0 to 800.0°F
	K : 42	-200.0 to +1372.0°C		J : B9	-328 to +2192°F
	K : 02	0 to 400°C		J : A1	0 to 800°F
	K : 04	0 to 800°C	J : A2	0 to 1600°F	
	K : 41	-200 to +1372°C	T : 19	-200.0 to +400.0°C	
	K : C7	-328 to +2501°F	T : C5	-328 to +752°F	
	K : A4	0.0 to 800.0°F	T : C6	0.0 to +752.0°F	
	K : A1	0 to 800°F	S	S : 06	-50 to +1768°C
	K : A2	0 to 1600°F		S : A7	-58 to +3214°F
J	J : 27	-200.0 to +400.0°C		R	R : 07
	J : 32	-200.0 to +800.0°C	R : A7		-58 to +3214°F
	J : 08	0.0 to 400.0°C	E	E : 20	-200.0 to +1000.0°C
	J : 09	0.0 to 800.0°C		E : B2	0.0 to +800.0°F
	J : 29	-200.0 to +1200.0°C	E : B1	-328 to +1832°F	

## DC Current • Voltage

Input	Code	Range
0 to 10mV	1 : 01	0.0 to 100.0%
0 to 100mV	2 : 01	
0 to 1V	3 : 01	
0 to 5V	4 : 01	

• Quick start code 2 tells the factory to ship with each parameter preset to the values detailed as specified by the customer. Quick start code is not necessarily specified when ordering, unless the preset is requested. These parameters are software selectable items and can be re-programmed in the field via the manual.

## Quick Start Code 2

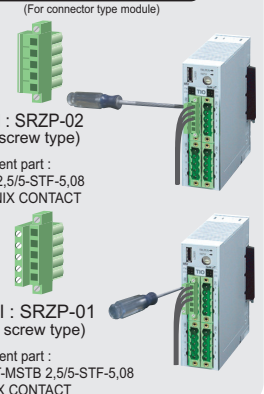
Specifications	Quick Start Code 2
Event 1 type	① See Event Type Code Table
Event 2 type	② See Event Type Code Table
Event 3 type	③ See Event Type Code Table
Event 4 type	④ See Event Type Code Table
CT type	⑤ No CT input CTL-6-P-N CTL-12-S56-10L-N
Communication Protocol	⑥ ANSI/RKC standard protocol MODBUS protocol

## Event Type Code Table

Event Type	Code
No event	N
Deviation High	A
Deviation Low	B
Deviation High/Low	C
Band	D
Deviation High with Alarm Hold	E
Deviation Low with Alarm Hold	F
Deviation High/Low with Alarm Hold	G
Process High	H
Process Low	J
Process High with Alarm Hold	K
Process Low with Alarm Hold	L
Deviation High with Alarm Re-Hold	Q
Deviation Low with Alarm Re-Hold	R
Deviation High/Low with Alarm Re-Hold	T
Set value High	V
Set value Low	W
MV value High	1
MV value Low	2
Cool side MV value High	3
Cool side MV value Low	4
LBA (Loop break alarm)	1 5
Temperature rise completion 2	6

1 LBA is available with event 4 only.  
2 Temperature rise completion is available with event 3 only.

## Plug-in connector





## Digital Input/Output Module (Z-DIO-A)

Specifications	Z-DIO-A	Hardware coding only				Quick start code			
		①	②	③	④	⑤	⑥	⑦	⑧
Wiring method	Terminal type	T							
	Connector type	C							
Number of digital input (DI)	Not supplied	N							
	DI 8 points	A							
Digital output (DO) signal	Not supplied	N							
	Relay contact output, 8 points	M							
	Open Collector output, 8 points	D							
Quick start code	No quick start code (Default setting)	N							
	Specify quick start code	1							
Digital input (DI) allocation	No quick start code	No symbol							
	No digital input	N							
Digital output (DO) allocation (DO1 to DO4)	No quick start code	No symbol							
	No digital output	N							
Digital output (DO) allocation (DO5 to DO8)	No quick start code	No symbol							
	No digital output	N							
Communication protocol	No quick start code	No symbol							
	ANSI/RKC standard protocol								1
	MODBUS protocol								2

## DO1 to 4 Allocation Table

Code	Digital output			
	DO 1	DO 2	DO 3	DO 4
01	DO1 manual output	DO manual output	DO manual output	DO4 manual output
02	Event 1 (All CH)	Event 2 (All CH)	Event 3 (All CH)	Event 4 (All CH)
03	Event 1 (CH1)	Event 2 (CH1)	Event 3 (CH1)	Event 4 (CH1)
04	Event 1 (CH2)	Event 2 (CH2)	Event 3 (CH2)	Event 4 (CH2)
05	Event 1 (CH3)	Event 2 (CH3)	Event 3 (CH3)	Event 4 (CH3)
06	Event 1 (CH4)	Event 2 (CH4)	Event 3 (CH4)	Event 4 (CH4)
07	Event 1 (CH1)	Event 1 (CH2)	Event 1 (CH3)	Event 1 (CH4)
08	Event 2 (CH1)	Event 2 (CH2)	Event 2 (CH3)	Event 2 (CH4)
09	Event 3 (CH1)	Event 3 (CH2)	Event 3 (CH3)	Event 3 (CH4)
10	Event 4 (CH1)	Event 4 (CH2)	Event 4 (CH3)	Event 4 (CH4)
11	HBA (CH1)	HBA (CH2)	HBA (CH3)	HBA (CH4)
12	Burnout (CH1)	Burnout (CH2)	Burnout (CH3)	Burnout (CH4)
13	Temperature rise	HBA (All CH)	Burnout (All CH)	DO4 manual output

## DO5 to 8 Allocation Table

Code	Digital output			
	DO 5	DO 6	DO 7	DO 8
01	DO5 manual output	DO6 manual output	DO7 manual output	DO8 manual output
02	Event 1 (All CH)	Event 2 (All CH)	Event 3 (All CH)	Event 4 (All CH)
03	Event 1 (CH1)	Event 2 (CH1)	Event 3 (CH1)	Event 4 (CH1)
04	Event 1 (CH2)	Event 2 (CH2)	Event 3 (CH2)	Event 4 (CH2)
05	Event 1 (CH3)	Event 2 (CH3)	Event 3 (CH3)	Event 4 (CH3)
06	Event 1 (CH4)	Event 2 (CH4)	Event 3 (CH4)	Event 4 (CH4)
07	Event 1 (CH1)	Event 1 (CH2)	Event 1 (CH3)	Event 1 (CH4)
08	Event 2 (CH1)	Event 2 (CH2)	Event 2 (CH3)	Event 2 (CH4)
09	Event 3 (CH1)	Event 3 (CH2)	Event 3 (CH3)	Event 3 (CH4)
10	Event 4 (CH1)	Event 4 (CH2)	Event 4 (CH3)	Event 4 (CH4)
11	HBA (CH1)	HBA (CH2)	HBA (CH3)	HBA (CH4)
12	Burnout (CH1)	Burnout (CH2)	Burnout (CH3)	Burnout (CH4)
13	Temperature rise completion	HBA (All CH)	Burnout (All CH)	DO8 manual output

## DI Allocation Table

	Digital input							
	DI 1	DI 2	DI 3	DI 4	DI 5	DI 6	DI 7	DI 8
01	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	Alarm interlock reset	AUTO/MANUAL
02	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	Alarm interlock reset	LOCAL/REMOTE
03	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	Alarm interlock reset	Feed-forward start
04	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	Alarm interlock reset	Soak stop
05	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	Alarm interlock reset	STOP/RUN
06	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	AUTO/MANUAL	LOCAL/REMOTE
07	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	AUTO/MANUAL	Feed-forward start
08	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	AUTO/MANUAL	Soak stop
09	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	AUTO/MANUAL	STOP/RUN
10	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	LOCAL/REMOTE	Feed-forward start
11	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	LOCAL/REMOTE	Soak stop
12	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	LOCAL/REMOTE	STOP/RUN
13	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	EDS start	Soak stop
14	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	EDS start	STOP/RUN
15	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	Soak stop	STOP/RUN
16	Memory area selection (1 to 8)			Area set	Alarm interlock reset	AUTO/MANUAL	LOCAL/REMOTE	Feed-forward start
17	Memory area selection (1 to 8)			Area set	Alarm interlock reset	AUTO/MANUAL	LOCAL/REMOTE	Soak stop
18	Memory area selection (1 to 8)			Area set	Alarm interlock reset	AUTO/MANUAL	LOCAL/REMOTE	STOP/RUN
19	Memory area selection (1 to 8)			Area set	Alarm interlock reset	AUTO/MANUAL	EDS start	Soak stop
20	Memory area selection (1 to 8)			Area set	Alarm interlock reset	AUTO/MANUAL	EDS start	STOP/RUN
21	Memory area selection (1 to 8)			Area set	Alarm interlock reset	AUTO/MANUAL	Soak stop	STOP/RUN
22	Memory area selection (1 to 8)			Area set	AUTO/MANUAL	LOCAL/REMOTE	EDS start	Soak stop
23	Memory area selection (1 to 8)			Area set	AUTO/MANUAL	LOCAL/REMOTE	EDS start	STOP/RUN
24	Memory area selection (1 to 8)			Area set	AUTO/MANUAL	LOCAL/REMOTE	Soak stop	STOP/RUN
25	Memory area selection (1 to 8)			Area set	LOCAL/REMOTE	Feed-forward start	Soak stop	STOP/RUN
26	Memory area selection (2 points)	Area set	Alarm interlock reset	STOP/RUN	AUTO/MANUAL	LOCAL/REMOTE	Operation mode 1	Operation mode 2
27	Memory area selection (1 to 8)			Area set	Operation mode 1	Operation mode 2	EDS start 1	EDS start 2
28	Memory area selection (2 points)	Area set	Alarm interlock reset	Area set	AUTO/MANUAL	LOCAL/REMOTE	EDS start 1	EDS start 2
29	EDS start 1	EDS start 2	Alarm interlock reset	Area set	AUTO/MANUAL	LOCAL/REMOTE	Operation mode 1	Operation mode 2

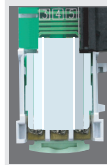
- Area setting is set to disabled at the factory.
- EDS function : External disturbance suppression function

Operation mode 1 : Only monitoring. (Control stop, Event function OFF)  
 Operation mode 2 : Monitoring and Event function (Control stop)

## Terminal and connector cover



**Connector cover**  
Model : KSRZ-517A



**Power supply terminal cover**  
Model : KSRZ-518A



**Front terminal cover**  
Model : KSRZ-510A



## Communication Module (Z-COM-A)

Specifications	Z-COM-A	Hardware coding only					Quick start code
		①	②	③	④	⑤	
COM PORT 1,2 communication	RS-422A	4					
	RS-485	5					
COM PORT 3,4 communication	RS-422A		4				
	RS-485		5				
Quick start code	No quick start code (Default setting)				N		
	Specify quick start code				1		
COM PORT 1,2 communication protocol	No quick start code					No symbol	
	ANSI/RKC standard protocol					1	
	MODBUS protocol					2	
COM PORT 3,4 communication protocol	No quick start code					No symbol	
	ANSI/RKC standard protocol					1	
	MODBUS protocol					2	
	PLC special protocol (MAPMAN) (Mitsubishi MELSEC series)					3	

## Termination resistor connector



Model : W-BW-01 (For RS-485)  
 Model : W-BW-02 (For RS-422A)

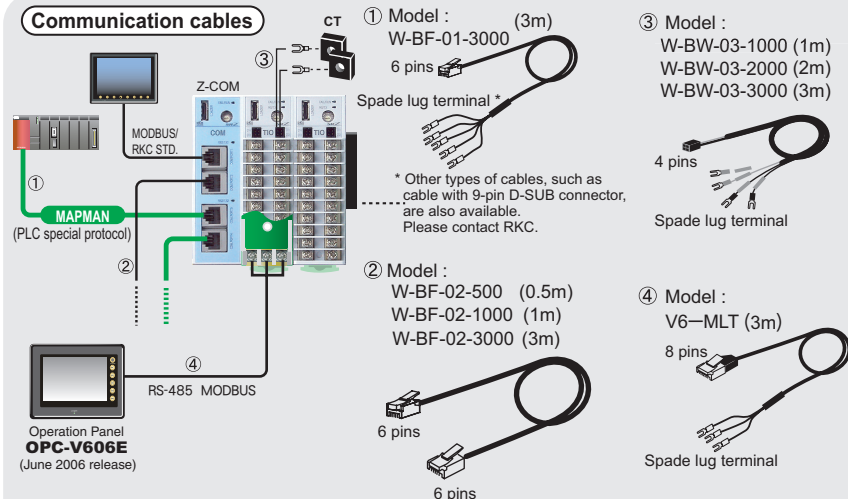
## End plates

Model : DEP-01

To firmly fix the modules, use end plates on both sides of the mounted modules on the DIN rail.



## Communication cables



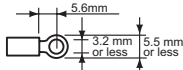
# Terminal/ Connector Configuration

## Temperature Control Module (Z-TIO) Terminal type

No.	Description	No.	Description
21	Measured Input 3 (CH3) (1) Thermocouple (2) RTD (3) Voltage/Current	11	Control Output 1 (CH1) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac
22	Measured Input 1 (CH1) (1) Thermocouple (2) RTD (3) Voltage/Current	12	Control Output 3 (CH3) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac
23	Control Output 3 (CH3) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	13	Measured Input 1 (CH1) (1) Thermocouple (2) RTD (3) Voltage/Current
24	Control Output 3 (CH3) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	14	Control Output 3 (CH3) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac
25	Control Output 3 (CH3) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	15	Control Output 3 (CH3) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac
26	Measured Input 4 (CH4) (1) Thermocouple (2) RTD (3) Voltage/Current (4) Feedback resistance	16	Control Output 2 (CH2) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac
27	Measured Input 4 (CH4) (1) Thermocouple (2) RTD (3) Voltage/Current (4) Feedback resistance	17	Control Output 2 (CH2) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac
28	Control Output 4 (CH4) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	18	Measured Input 2 (CH2) (1) Thermocouple (2) RTD (3) Voltage/Current (4) Feedback resistance
29	Control Output 4 (CH4) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	19	Measured Input 2 (CH2) (1) Thermocouple (2) RTD (3) Voltage/Current (4) Feedback resistance
30	Control Output 4 (CH4) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	20	Measured Input 2 (CH2) (1) Thermocouple (2) RTD (3) Voltage/Current (4) Feedback resistance

CT : Current transformer for heater break alarm  
Feedback resistance input is used only for monitoring.  
<Caution> Voltage / current outputs are not isolated from the power supply voltage.

Screw Size : M3 X 7  
Solderless terminal is recommended



## Temperature Control Module (Z-TIO) Connector type

CN (Connector) 3		CN (Connector) 1	
No.	Description	No.	Description
1	Measured Input 3 (CH3) (1) Thermocouple (2) RTD (3) Voltage/Current	5	Control Output 1 (CH1) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac
2	Measured Input 3 (CH3) (1) Thermocouple (2) RTD (3) Voltage/Current	4	Control Output 1 (CH1) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac
3	Measured Input 3 (CH3) (1) Thermocouple (2) RTD (3) Voltage/Current	3	Measured Input 1 (CH1) (1) Thermocouple (2) RTD (3) Voltage/Current
4	Control Output 3 (CH3) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	2	Measured Input 1 (CH1) (1) Thermocouple (2) RTD (3) Voltage/Current
5	Control Output 3 (CH3) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	1	Measured Input 1 (CH1) (1) Thermocouple (2) RTD (3) Voltage/Current

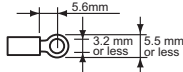
CN (Connector) 4		CN (Connector) 2	
No.	Description	No.	Description
1	Measured Input 4 (CH4) (1) Thermocouple (2) RTD (3) Voltage/Current (4) Feedback resistance	5	Control Output 2 (CH2) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac
2	Measured Input 4 (CH4) (1) Thermocouple (2) RTD (3) Voltage/Current (4) Feedback resistance	4	Control Output 2 (CH2) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac
3	Control Output 4 (CH4) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	3	Measured Input 2 (CH2) (1) Thermocouple (2) RTD (3) Voltage/Current (4) Feedback resistance
4	Control Output 4 (CH4) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	2	Measured Input 2 (CH2) (1) Thermocouple (2) RTD (3) Voltage/Current (4) Feedback resistance
5	Control Output 4 (CH4) (1) Relay contact (2) Voltage pulse/Voltage/ Current/Open collector (3) Triac	1	Measured Input 2 (CH2) (1) Thermocouple (2) RTD (3) Voltage/Current (4) Feedback resistance

\* For 2CH specifications, connectors CN3 and CN4 are not mounted. \*1 : Optional  
CT : Current transformer for heater break alarm  
Feedback resistance input is used only for monitoring.  
<Caution> Voltage / current outputs are not isolated from the power supply voltage.

## Digital Input/Output Module (Z-DIO) Terminal type

No.	Description	No.	Description
21	DI4	11	COM
22	DI3	12	DO1
23	DI2	13	DO2
24	DI1	14	DO3
25	Voltage sink type input	15	DO4
26	COM	16	COM
27	DI8	17	DO5
28	DI7	18	DO6
29	DI6	19	DO7
30	DI5	20	DO8

Screw Size : M3 X 7  
Solderless terminal is recommended



## Digital Input/Output Module (Z-DIO) Connector type

CN3		CN1	
No.	Description	No.	Description
1	DI4	5	COM
2	DI3	4	DO1
3	DI2	3	DO2
4	DI1	2	DO3
5	Voltage sink type input	1	DO4

CN4		CN2	
No.	Description	No.	Description
1	DI8	5	COM
2	DI7	4	DO5
3	DI6	3	DO6
4	DI5	2	DO7
5	Voltage sink type input	1	DO8

## Communication Extension Module (Z-COM) Z-TIO/DIO/COM

COM PORT 1: Communication 1  
COM PORT 2: RKC standard/MODBUS RS-485,422A  
COM PORT 3: Communication 2  
COM PORT 4: RKC standard/MODBUS PLC special protocol (Mapman), RS-485,422A

Power Supply connections:  
1: T/R (A)  
2: T/R (B)  
3: SG  
4: RS-485  
5: Communication

\* Z-COM: No.3,4,5 terminals are not mounted.



- Before operating this product, read the instruction manual carefully to avoid incorrect operation.
- This product is intended for use with industrial machines, test and measuring equipment. It is not designed for use with medical equipment.
- If it is possible that an accident may occur as a result of the failure of the product or some other abnormality, an appropriate independent protection device must be installed.

### Caution for the export trade

Investigate the final application and final user so that this product is not used in weapons of mass destruction, etc. (military application, military facility, etc.). Regarding resale also be sure it is not to be exported illegally.

### Caution for imitated products

As products imitating our product now appear on the market, be careful that you don't purchase these imitated products. We will not warrant such products nor bear the responsibility for any damage and/or accident caused by their use.

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