

Module Type Controller SRZ

Digital I/O Module

Z-DIO

Instruction Manual

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IMS01T03-E3

Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual. Please place this manual in a convenient location for easy reference. This manual describes the mounting, wiring and specifications only. For detailed handling procedures and various function settings, please refer to separate SRZ Instruction Manual (IMS01T04-E □).

The above manuals can be downloaded from our website:
URL: http://www.rkcinst.com/english/manual_load.htm

Product Check

Z-DIO Instruction Manual (this manual)	1
Joint connector cover (KSRZ-517A)	2
Power terminal cover (KSRZ-518A)	1

Safety Precautions

!

WARNING

- An external protection device must be installed if failure of this instrument could result in damage to the instrument, equipment or injury to personnel.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.
- RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

- CAUTION

- This product is intended for use with industrial machines, test and measuring equipment. It is not designed for use with medical equipment and nuclear energy.
 - This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take adequate measures.
 - This instrument is protected from electric shock by reinforced insulation. Provide reinforced insulation between the wire for the input signal and the wires for instrument power supply, source of power and loads.
 - Be sure to provide an appropriate surge control circuit respectively for the following:
 - If input/output or signal lines within the building are longer than 30 meters.
 - If input/output or signal lines leave the building, regardless the length.
 - This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.
 - All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
 - All wiring must be in accordance with local codes and regulations.
 - To prevent instrument damage or failure, protect the power line and the input/output lines from high currents with a protection device such as fuse, circuit breaker, etc.
 - Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
 - Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
 - For proper operation of this instrument, provide adequate ventilation for heat dissipation.
 - Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
 - Turn off the power supply before cleaning the instrument.
 - Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
 - To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for purpose of illustration.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

1. PARTS DESCRIPTION

Module Mainframe

Terminal type

Connector type

Loader communication connector

Loader communication connector

Indication lamps

Indication lamps

Address setting switch

Address setting switch

Digital Input/output terminals

Digital Input/output connector

[Indication lamps]

- FAIL/RUN
When normal (RUN): A green lamp is on
- Self-diagnostic error (FAIL): A green lamp flashes
- Instrument abnormality (FAIL): A red lamp is on
- RX/TX
During data send and receive: A green lamp turns on

Base

Mounting holes (M3 screw)
Holes for screws to fix the base to a panel, etc.
Customer must provide the M3 screws.

Joint connector
Used to mechanically and electrically connect each module.

Power supply terminals
Supply power to only one of the joined modules, and all of the joined modules will receive power.
(See 4.1 Wiring Cautions .)

Communication terminals (RS-485)
Connect communication wires to only one of the joined modules, and all of the joined modules will communicate.

Mounting bracket
Used to fix the module on DIN rails and also to fix each module joined together.

2. COMMUNICATION SETTING

CAUTION

Do not separate the module mainframe from the base with the power turned on. If so, instrument failure may result.

2.1 Module Address Setting

Set an address for the module using a small blade screwdriver.

Address setting switch

Setting range: 0 to F [0 to 15: Decimal]

Factory set value: 0

For RKC communication, the value obtained by adding "16" to the set address corresponds to the address used for the actual program.

For Modbus, the value obtained by adding "17" to the set address corresponds to the address used for the actual program.

To avoid problems or malfunction, do not duplicate an address on the same communication line.

2.2 Protocol Selections and Communication Speed Setting

Use the DIP switch on the right side of module to select communication speed, data bit configuration and protocol. The data changes become valid when the power is turned on again or when changed to RUN/STOP.

Module mainframe

DIP switch

Right side view

OFF ON

(The above figure is for the terminal type. However, the switch positions are the same for the connector type.)

1 2 Communication speed

OFF	OFF	4800 bps
ON	OFF	9600 bps
OFF	ON	19200 bps
ON	ON	38400 bps

Factory set value: 19200 bps

3 4 5 Data bit configuration

OFF	OFF	OFF	Data 7-bit, without parity, Stop 1-bit *
ON	OFF	OFF	Don't set this one
OFF	ON	OFF	Data 7-bit, Even parity, Stop 1-bit *
ON	ON	OFF	Data 7-bit, Odd parity, Stop 1-bit *
OFF	OFF	ON	Data 8-bit, without parity, Stop 1-bit
ON	OFF	ON	Don't set this one
OFF	ON	ON	Data 8-bit, Even parity, Stop 1-bit
ON	ON	ON	Data 8-bit, Odd parity, Stop 1-bit

Factory set value: Data 8-bit, without parity, Stop 1-bit

* When the Modbus communication protocol is selected, this setting becomes invalid.

6 Protocol

OFF	RKC communication
ON	Modbus

Factory set value: RKC communication

Switch No. 7 and No. 8 must be always OFF. Do not set to ON.

When two or more modules are connected on the same communication line, the DIP switch settings of all modules must be the same. However, when a Z-DIO module is joined to a Z-TIO-C/D module used for "PLC communication," set the communication speed and data bit configuration to the same settings as the Z-TIO-C/D module and set the communication protocol to "RKC communication."

Connect a termination resistor between the communication terminals (No.3 and 4) of the module at the end of the communication line from the host computer.

3. MOUNTING

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WARNING

To prevent electric shock or instrument failure, always turn off the power before mounting or removing the instrument.

3.1 Mounting Cautions

(1) This instrument is intended to be used under the following environmental conditions. (IEC61010-1) [OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]

Use this instrument within the following environment conditions.

- Allowable ambient temperature: -10 to +50 °C
- Allowable ambient humidity: 5 to 95 % RH (Absolute humidity: MAX. W. C 29.3 g/m³ dry air at 101.3 kPa)

Installation environment conditions: Indoor use
Altitude up to 2000 m

(3) Avoid the following conditions when selecting the mounting location:

- Rapid changes in ambient temperature which may cause condensation.
- Corrosive or inflammable gases.
- Direct vibration or shock to the mainframe.
- Water, oil, chemicals, vapor or steam splashes.
- Excessive dust, salt or iron particles.
- Excessive induction noise, static electricity, magnetic fields or noise.
- Direct air flow from an air conditioner.
- Exposure to direct sunlight.
- Excessive heat accumulation.

(4) Take the following points into consideration when mounting this instrument in the panel.

- Ensure at least 50 mm space on top and bottom of the instrument for maintenance and environmental reasons.
- Do not mount this instrument directly above equipment that generates large amount of heat (heaters, transformers, semiconductor functional devices, large-wattage resistors).
- If the ambient temperature rises above 50 °C, cool this instrument with a forced air fan, cooler, or the like. However, do not allow cooled air to blow this instrument directly.
- In order to improve safety and the immunity to withstand noise, mount this instrument as far away as possible from high voltage equipment, power lines, and rotating machinery.

High voltage equipment: Do not mount within the same panel.

Power lines: Separate at least 200 mm.

Rotating machinery: Separate as far as possible.

(5) This instrument is Permanently connected to equipment, please take the following points.

- A switch or circuit-breaker shall be included in the building installation.
- It shall be in close proximity to the equipment and within easy reach of the operator.
- It shall be marked as the disconnecting device for the equipment.

3.2 Dimensions

[Terminal type]

[Connector type]

(Unit: mm)

85

76.9

2.9

30

6.7

100

100

100

When the module is mounted on the panel, allow a minimum of 50 mm at the top and bottom of the module to attach the module to the mainframe.

Space for connectors and cable must be considered when installing.

For instruction of module joining, mounting and removal, refer to the Z-TIO Instruction Manual (IMS01T01-E □).

Up to 16 Z-DIO modules can be connected. The maximum number of SRZ modules (including other function modules) on the same communication line is 31.

In case of PLC communication, Z-DIO module cannot be connected to a Z-COM module.

4. WIRING

!

WARNING

To prevent electric shock or instrument failure, do not turn on the power until all the wiring is completed.

4.1 Wiring Cautions

- To avoid noise induction, keep input/output signal wires away from instrument power line, load lines and power lines of other electric equipment.
- If there is electrical noise in the vicinity of the instrument that could affect operation, use a noise filter.
 - Shorten the distance between the twisted power supply wire pitches to achieve the most effective noise reduction.
 - Always install the noise filter on a grounded panel. Minimize the wiring distance between the noise filter output and the instrument power supply terminals to achieve the most effective noise reduction.
 - Do not connect fuses or switches to the noise filter output wiring as this will reduce the effectiveness of the noise filter.
- About eight seconds are required as preparation time for contact output every time the instrument is turned on. Use a delay relay when the output line is used for an external interlock circuit.
- Power supply wiring must be twisted and have a low voltage drop.
- For an instrument with 24 V power supply, supply power from a SELV circuit.
- A suitable power supply should be considered in the end-use equipment. The power supply must be in compliance with a limited-energy circuits (maximum available current of 8 A).
- Supply the power to only one of the joined modules. When power is supplied to any one of the joined modules, all of the joined modules will receive power.
- Select the power capacity which is appropriate for the total power consumption of all joined modules and the initial current surge when the power is turned on.

Power consumption (at maximum load): 70 mA max. (at 24 V DC)
Rush current: 10 A or less
- For the terminal type module, use the specified solderless terminals. Only these specified solderless terminals can be used due to the insulation between the terminals.

Screw Size: M3 × 7 (with 5.8 × 5.8 square washer)
Recommended tightening torque: 0.4 N · m (4 kgf · cm)
Applicable wire: Solid/twisted wire of 0.25 to 1.65 mm²
Specified solderless terminals:

Manufactured by J.S.T MFG CO., LTD.
Circular terminal with isolation V1.25 –MS3 (M3 screw, width 5.5 mm, hole diameter 3.2 mm)
- For the connector type module, use the following our connector (plug) [sold separately].

Connector type: SRZP-01 (Front-screw type)
SRZP-02 (Side-screw type)
Screw size: M2.5
Recommended tightening torque: 0.43 to 0.5 N · m (4.3 to 5.0 kgf · cm)
Used cable specifications:

Lead wire type:
Solid (AWG 28 [cross-section: 0.081 mm²] to 12 [cross-section: 3.309 mm²]) or
Twisted wire (AWG 30 [cross-section: 0.051 mm²] to 12 [cross-section: 3.309 mm²])
Stripping length: 9 to 10 mm (SRZP-01), 7 to 8 mm (SRZP-02)

4.2 Terminal Configuration

Digital input (DI1 to DI8)

Voltage contact input *

DI4 21

DI3 22

DI2 23

DI1 24

COM 25

Voltage contact input *

CN3

Pin No. Description

1 DI4

2 DI3

3 DI2

4 DI1

5 COM

Voltage contact input *

CN4

Pin No. Description

1 DI8

2 DI7

3 DI6

4 DI5

5 COM

* An external power supply of 24 V DC is required for the voltage contact input.

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RKC

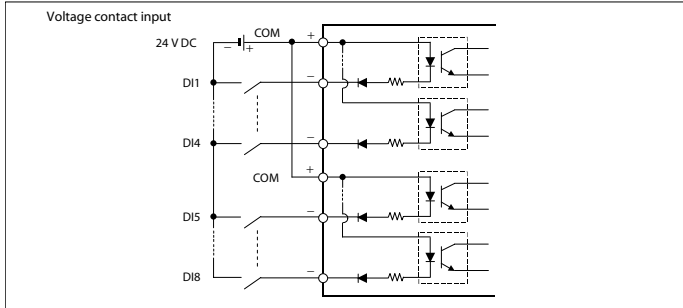
Distributed By

ALV Inc.

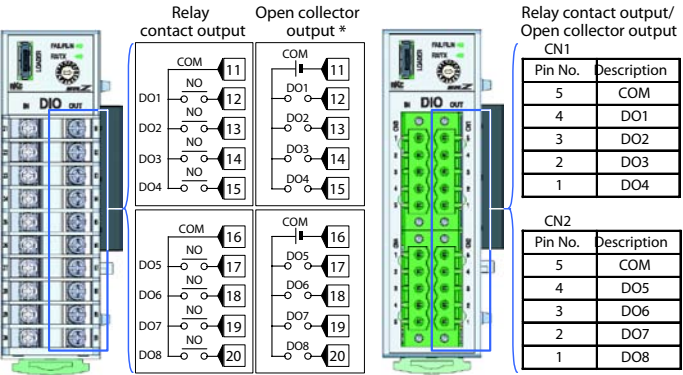
(800) 576 - 6308

(Continued on the next page →)

Circuit configuration of digital input:

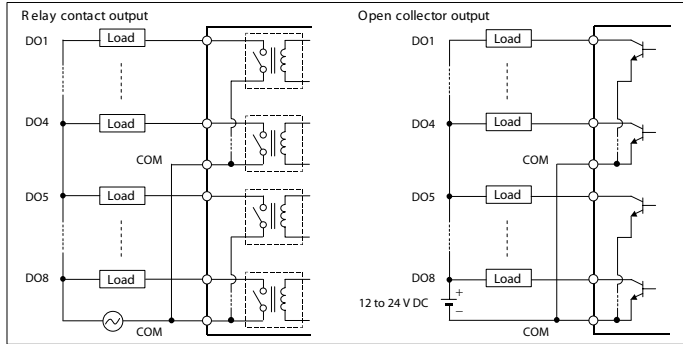


Digital output (DO1 to DO8)



* An external power supply of 12 to 24 V DC is required for the open collector output.

Circuit configuration of digital output:



Base

Terminal configurations of the base are the same as the base of Z-TIO module. For the details, see the Z-TIO Instruction Manual (IMS01T01-E □).

5. SPECIFICATIONS

Digital input (DI)

Number of inputs: None or 8 points (DI1 to DI8)
Isolated input (each common block)
Number of commons: 2 points (DI 4 points/common)
Input method: Voltage contact input (Sink type)
Open state: 5 V or less, Close state: 17.5 V or more
Contact current: 3.0 mA or less
Allowable applied voltage : 26.4 V DC or less
Capture judgment time: 250 ms

Digital output (DO)

Number of outputs: None or 8 points (DO1 to DO8)
Number of commons: 2 points (DO 4 points/common)

Output method:

- Relay contact output:
 - Contact type: 1a contact
 - Contact rating (Resistive load) : 250 V AC 1 A, 30 V DC 1 A
 - Electrical life: 300,000 times or more (Rated load)
 - Mechanical life: 20 million times or more (Switching: 300 times/min)
- Open collector output (Sink type):
 - Allowable load current: 100 mA
 - Load voltage: 30 V DC or less
 - Minimum load current: 0.5 mA
 - ON voltage: 2 V or less (at maximum load current)
 - Leakage current at OFF: 0.1 mA or less

Digital input (DI) function

The following Z-TIO functions can be assigned as digital input:
Memory area transfer, Operation mode, Interlock release, Auto/Manual transfer,
Remote/Local transfer, RUN/STOP transfer, Area soak time stop function, EDS start signal

Digital output (DO) function

The following signals can be assigned as digital output:
Z-TIO module: Event output 1 to 4 states, Heater break alarm (HBA) state, Temperature rise completion, Burnout status
Z-DIO module: DO manual output 1 to 8 states
Z-CT module: Heater break alarm (HBA) state

Output distribution function

Outputs the value calculated by another channel of Z-TIO or Z-DIO modules from the DO.

Communication

Interface: Based on RS-485 EIA standard
Protocol: RKC communication (ANSI X3.28-1976 subcategory 2.5, B1)
Modbus-RTU

General specifications

Power supply voltage: 24 V DC (Rating)
21.6 to 26.4 V DC [Including power supply voltage variation]
Power consumption (at maximum load): 70 mA max. (at 24 V DC)
Rush current: 10 A or less
Allowable ambient temperature: -10 to +50 °C
Allowable ambient humidity: 5 to 95 % RH
(Absolute humidity: MAX.W.C 29.3 g/m³ dry air at 101.3 kPa)

Installation environment conditions:

Indoor use
Altitude up to 2000 m
Weight: Terminal type module: Approx. 150 g
Connector type module: Approx. 130 g

Standard

Safety standards: UL: UL61010-1
cUL: CAN/CSA-C22.2 No. 61010-1

CE marking:

- LVD: EN61010-1
OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2,
Class II (Reinforced insulation)
EN61326
- EMC: AS/NZS CISPR 11 (equivalent to EN55011)

6. COMMUNICATION DATA MAP

Modbus register address (HEX: Hexadecimal DEC: Decimal)
The register address of the Z-DIO module.

Digits
The number of communication data digits in RKC communication.

Attribute
RO: Read only data (Host computer ← The controller)
R/W: Read and Write data (Host computer ↔ The controller)

Data
RKC communication
ASCII code data (Example: 7 digits)
Modbus
16-bit data

Most significant digit Least significant digit

b15 b0

Symbols used in MAP
▲: Data for each channel ♦: Data for each module

For details on the data and the Modbus data mapping function, see the SRZ Instruction Manual (IMS01T04-E □).

Communication data (RKC communication)

Name	RKC Identifier	Digits	Attribute	Data range	Factory set value
Model code ♦	ID	32	RO	Model character code	—
ROM version ♦	VR	8	RO	ROM version	—
Digital input (DI) state 1 ♦	L1	7	RO	Least significant digit to 4th digit: DI1 to DI4 5th digit to Most significant digit: Unused Data 0: Contact open 1: Contact closed	—
Digital input (DI) state 2 ♦	L6	7	RO	Least significant digit to 4th digit: DI5 to DI8 5th digit to Most significant digit: Unused Data 0: Contact open 1: Contact closed	—
Digital output (DO) state 1 ♦	Q2	7	RO	Least significant digit to 4th digit: DO1 to DO4 5th digit to Most significant digit: Unused Data 0: OFF 1: ON	—
Digital output (DO) state 2 ♦	Q3	7	RO	Least significant digit to 4th digit: DO5 to DO8 5th digit to Most significant digit: Unused Data 0: OFF 1: ON	—
Error code ♦	ER	7	RO	2: Data back-up error	—
Integrated operating time monitor ♦	UT	7	RO	0 to 19999 hours	—
Backup memory state monitor ♦	EM	1	RO	0: The content of the backup memory does not coincide with that of the RAM. 1: The content of the backup memory coincides with that of the RAM.	—
RUN/STOP transfer ♦	SR	1	R/W	0: STOP (Control stop) 1: RUN (Control start)	0
DO manual output 1 ♦	Q4	7	R/W	Least significant digit to 4th digit: DO1 manual output to DO4 manual output 5th digit to Most significant digit: Unused Data 0: OFF 1: ON	0
DO manual output 2 ♦	Q5	7	R/W	Least significant digit to 4th digit: DO5 manual output to DO8 manual output 5th digit to Most significant digit: Unused Data 0: OFF 1: ON	0

Name	RKC Identifier	Digits	Attribute	Data range	Factory set value
DO output distribution selection ▲	DO	1	R/W	0: DO output 1: Distribution output	0
DO output distribution bias ▲	O8	7	R/W	-100.0 to +100.0 %	0.0
DO output distribution ratio ▲	O9	7	R/W	-9.999 to +9.999	1.000
DO proportioning cycle time ▲	V0	7	R/W	0.1 to 100.0 seconds M: Relay contact output, D: Open collector output	M: 20 D: 2
DO minimum ON/OFF time of proportioning cycle ▲	VJ	7	R/W	0 to 1000 ms	0
For communication data (Engineering setting), refer to the SRZ Instruction Manual (IMS01T04-E □).					

Communication data (Modbus)

Name	Modbus register address		Attribute	Data range	Factory set value
	HEX	DEC			
Digital input (DI) state ◆	0000	0	RO	b0 to b7: DI1 to DI8 b8 to b15: Unused Data 0: Contact open 1: Contact closed [Decimal number: 0 to 255]	—
Digital input (DO) state ◆	0001	1	RO	b0 to b7: DO1 to DO8 b8 to b15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 255]	—
Error code ◆	0002	2	RO	b1: Data back-up error b0, b2 to b15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 2]	—
Integrated operating time monitor ◆	0003	3	RO	0 to 19999 hours	—
Backup memory state monitor ◆	0004	4	RO	0: The content of the backup memory does not coincide with that of the RAM. 1: The content of the backup memory coincides with that of the RAM.	—
Unused	0005 ⋮ 0045	5 ⋮ 69	—	—	—
RUN/STOP transfer ◆	0046	70	R/W	0: STOP (Control stop) 1: RUN (Control start)	0
DO manual output ◆	0047	71	R/W	b0 to b7: DO1 manual output to DO8 manual output b8 to b15: Unused Data 0: OFF 1: ON [Decimal number: 0 to 255]	0
DO output distribution selection ▲	0048 ⋮ 004F	72 ⋮ 79	R/W	0: DO output 1: Distribution output	0
DO output distribution bias ▲	0050 ⋮ 0057	80 ⋮ 87	R/W	−100.0 to +100.0 %	0.0
DO output distribution ratio ▲	0058 ⋮ 005F	88 ⋮ 95	R/W	−9.999 to +9.999	1.000
DO proportioning cycle time ▲	0060 ⋮ 0067	96 ⋮ 103	R/W	0.1 to 100.0 seconds M: Relay contact output D: Open collector output	M: 20 D: 2
DO minimum ON/OFF time of proportioning cycle ▲	0068 ⋮ 006F	104 ⋮ 111	R/W	0 to 1000 ms	0
Unused	0070 ⋮ 00A3	112 ⋮ 163	—	—	—
For communication data (Engineering setting), refer to the SRZ Instruction Manual (IMS01T04-E □).					

7. MODEL CODE

Z-DIO-A □ - □□/□ - □□□□□□□

(1) (2)(3) (4) (5) (6) (7) (8)

□ : Code 5, 6, 7 and 8 are for quick start codes to specify software configurable settings. If not specified, these codes will not be printed on labels and all settings will be factory default.

(1) Wiring type

T: Terminal type C: Connector type

(2) Digital input (DI)

N: None A: 8 points

(3) Digital output (DO)

N: None
M: Relay contact output (8 points) D: Open collector output (8 points)

(4) Quick start code (DI/DO assignments)

N: No quick start code (Configured as factory default)

1: Specify quick start code 1

(5) DI signal assignments (DI1 to DI8) [Quick start code 1]

No code: No specify quick start code

N: None □: See DI Assignment Code Table.

(6) DO signal assignments (DO1 to DO4) [Quick start code 1]

(7) DO signal assignments (DO5 to DO8) [Quick start code 1]

No code: No specify quick start code

N: None □: See DO Assignment Code Table.

(8) Communication [Quick start code 1]

No code: No specify quick start code

1: RKC communication (ANSI X3.28)

2: Modbus

DI Assignment Code Table

Code	DI1	DI2	DI3	DI4	DI5	DI6	DI7	DI8
00	No assignment							
01	Memory area transfer (1 to 8) ¹				Area set ²		Interlock release	AUTO/MAN
02								REM/LOC
03								EDS start signal 1
04								Soak stop
05								RUN/STOP
06							AUTO/MAN	REM/LOC
07								EDS start signal 1
08								Soak stop
09							REM/LOC	RUN/STOP
10								EDS start signal 1
11								Soak stop
12							Interlock release	RUN/STOP
13								EDS start signal 1
14								Soak stop
15							AUTO/MAN	EDS start signal 1
16								Soak stop
17								RUN/STOP
18							AUTO/MAN	EDS start signal 1
19								Soak stop
20								RUN/STOP
21							REM/LOC	EDS start signal 1
22								Soak stop
23								RUN/STOP
24							REM/LOC	EDS start signal 1
25								Soak stop
26								RUN/STOP
27							AUTO/MAN	EDS start signal 1
28								Soak stop
29								RUN/STOP

RUN/STOP: RUN/STOP transfer (Contact closed: RUN)
AUTO/MAN: Auto/Manual transfer (Contact closed: Manual mode)
REM/LOC: Remote/Local transfer (Contact closed: Remote mode)
Interlock release (Interlock release when rising edge is detected)
EDS start signal 1 (EDS start signal ON when rising edge is detected [for disturbance 1])
EDS start signal 2 (EDS start signal ON when rising edge is detected [for disturbance 2])
Soak stop (Contact closed: Soak stop)

DI signal will become valid at rising edge after the closed contact is held for 250ms.

250 ms or more
↑ (Rising edge)
Contact closed
Contact open

¹ Memory area transfer

	Memory area number (×: Contact open —: Contact closed)							
	1	2	3	4	5	6	7	8
DI1	×	—	×	—	×	—	×	—
DI2	×	×	—	—	×	×	—	—
DI3	×	×	×	×	×	×	×	×

² Area set becomes invalid prior to factory shipment.

³ Operation mode transfer

	Operation mode (×: Contact open —: Contact closed)			
	Unused	Monitor	Monitor + Event function	Control
DI5 (DI7)	×	—	×	—
DI6 (DI8)	×	×	—	—

DO Assignment Code Table

Code	DO1	DO2	DO3	DO4
00	No assignment			
01	DO1 manual output	DO2 manual output	DO3 manual output	DO4 manual output
02	Event 1 comprehensive output	Event 2 comprehensive output	Event 3 comprehensive output	Event 4 comprehensive output
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	Z-TIO HBA (CH1)	Z-TIO HBA (CH2)	Z-TIO HBA (CH3)	Z-TIO HBA (CH4)
12	Burnout status (CH1)	Burnout status (CH2)	Burnout status (CH3)	Burnout status (CH4)
13	Temperature rise completion	HBA comprehensive output	Burnout state comprehensive output	DO4 manual output

[DO5 to DO8]

Code	DO5	DO6	DO7	DO8
00	No assignment			
01	DO5 manual output	DO6 manual output	DO7 manual output	DO8 manual output
02	Event 1 comprehensive output	Event 2 comprehensive output	Event 3 comprehensive output	Event 4 comprehensive output
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	Z-TIO HBA (CH1)	Z-TIO HBA (CH2)	Z-TIO HBA (CH3)	Z-TIO HBA (CH4)
12	Burnout status (CH1)	Burnout status (CH2)	Burnout status (CH3)	Burnout status (CH4)
13	Temperature rise completion	HBA comprehensive output	Burnout state comprehensive output	DO8 manual output

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