

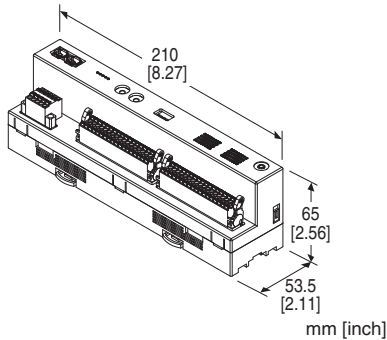
## Remote I/O R7K4J Series

### MECHATROLINK I/O MODULE

(MECHATROLINK-III use, NPN/PNP discrete high-speed input & NPN transistor output, 32 points each, tension clamp terminal block)

#### Functions & Features

- 32 points NPN/PNP discrete high-speed input & 32 points NPN transistor output for MECHATROLINK-III



### MODEL: R7K4JML3-E-DAFC64A-R[1]

#### ORDERING INFORMATION

- Code number: R7K4JML3-E-DAFC64A-R[1]  
Specify a code from below for [1].  
(e.g. R7K4JML3-E-DAFC64A-R/Q)
- Specify the specification for option code /Q  
(e.g. /C01)

#### TERMINAL BLOCK

E: Tension clamp terminal block for power supply  
Connector for MECHATROLINK-III for communication  
Tension clamp terminal block for I/O

#### I/O TYPE

**DAFC64A:** NPN/PNP discrete input, 32 points, high-speed & NPN transistor output, 32 points

#### POWER INPUT

##### DC power

R: 24 V DC

(Operational voltage range:  $\pm 10\%$ ; ripple 10 %p-p max.)

#### [1] OPTIONS

blank: none

/Q: With options (specify the specification)

#### SPECIFICATIONS OF OPTION: Q

**COATING (For the detail, refer to M-System's web site.)**

/C01: Silicone coating

/C02: Polyurethane coating

/C03: Rubber coating

#### GENERAL SPECIFICATIONS

##### Connection

- **MECHATROLINK-III:** MECHATROLINK-III connector
- **Power input, I/O:** Separable tension clamp terminal

**Housing material:** Flame-resistant resin (gray)

**Isolation:** Input to output to MECHATROLINK or FE to power

##### Output at the loss of communication:

Output hold (\*), Output clear

Selectable with the front DIP SW

(\* factory default setting)

**Status indicator LEDs:** PWR, ERR, CON, LNK1, LNK2 (5 LEDs) indicate the module's operating conditions. (Refer to the instruction manual)

**Discrete I/O status indicator LED:** Green LED turns on with I/O ON

**Read rate:** 100(\*) / 200 / 400 / 800 $\mu$ sec. / 4 / 8 / 16 / 40 msec. selectable with the front DIP SW

(\* factory default setting)

#### MECHATROLINK-III COMMUNICATION

**Baud rate:** 100 Mbps

**Transmission distance:** 6300 m max.

**Distance between stations:** 100 m max.

**Transmission media:** MECHATROLINK cable (Model JEPMC-W6013-x-E, Yaskawa Controls Co., Ltd.)

**Connector:** TYCO AMP Industrial mini I/O connector

**Max. number of slaves:** 62

(The maximum number of slaves might change depending on the master unit. Refer to the manual of the master unit)

**Transmission cycle:** 125  $\mu$ sec., 250  $\mu$ sec., 500  $\mu$ sec., 1 - 64 msec. (with 1 msec. increments)

**Communication cycle:** 125  $\mu$ sec. through 64 msec.

**Applicable profile:** Standard I/O profile (cyclic communication)

Event-driven communication acquiring ID profile (event-driven communication)

**Transmission bytes:** 16 bytes

**Station address:** 03H through EFH (set with rotary switches)

**Cyclic communication:** Available

**Event-driven communication:** Available

**Slave monitoring:** None

## INPUT SPECIFICATIONS

**Common:** Positive or negative common (NPN/PNP) per 32 points

**Maximum inputs applicable at once:** No limit (at 24 V DC)

**Rated input voltage:** 24 V DC  $\pm 10\%$ ; ripple 5 %p-p max.

**ON voltage / current:**  $\geq 15$  V DC (input - COM) /  $\geq 3.5$  mA

**OFF voltage / current:**  $\leq 5$  V DC (input - COM) /  $\leq 1$  mA

**Input current:**  $\leq 5.5$  mA per point at 24 V DC

**Input resistance:** Approx. 4.4 k $\Omega$

**ON delay:**  $\leq 0.2$  msec.

**OFF delay:**  $\leq 0.5$  msec.

## OUTPUT SPECIFICATIONS

**Common:** Negative common (NPN) per 32 points

**Maximum outputs applicable at once:** No limit (at 24 V DC)

**Rated load voltage:** 24 V DC  $\pm 10\%$ , ripple 5 %p-p max.

**Rated output current:** 0.1 A per point, 3.2 A per common

**Residual voltage:**  $\leq 1.2$  V

**Leakage current:**  $\leq 0.1$  mA

**ON delay:**  $\leq 0.2$  msec.

**OFF delay:**  $\leq 0.5$  msec.

**Overload current protection function:** Limits the current value when overcurrent is detected

**Overheat protection function:** Turns OFF the outputs when overheat is detected

(When driving an inductive load, connect a diode in parallel with the load.)

## INSTALLATION

### Current consumption

• **DC:** Approx. 85 mA (Discrete I/O load charge is not included.)

**Operating temperature:** -10 to +55°C (14 to 131°F)

**Storage temperature:** -20 to +65°C (-4 to +149°F)

**Operating humidity:** 30 to 90 %RH (non-condensing)

**Atmosphere:** No corrosive gas or heavy dust

**Mounting:** Surface or DIN rail (35 mm rail)

**Weight:** 330 g (0.73 lb)

## PERFORMANCE

**Insulation resistance:**  $\geq 100$  M $\Omega$  with 500 V DC

**Dielectric strength:** 1500 V AC @ 1 minute (input to output to MECHATROLINK or FE to power)

## STANDARDS & APPROVALS

### EU conformity:

EMC Directive

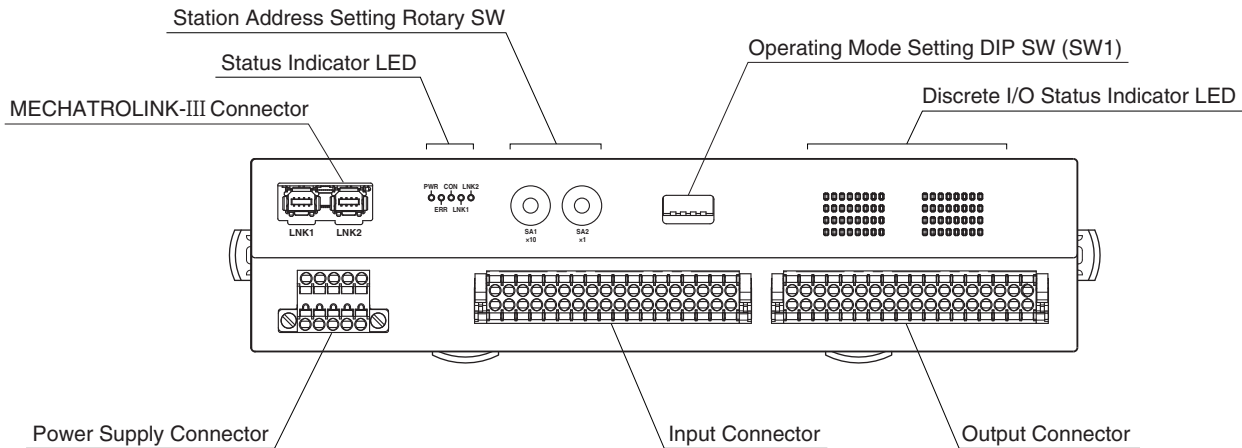
EMI EN 61000-6-4

EMS EN 61000-6-2

RoHS Directive

# MODEL: R7K4JML3-E-DAFC64A

## EXTERNAL VIEW



## TERMINAL ASSIGNMENTS

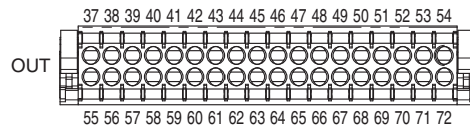
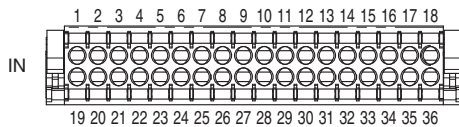
### I/O TERMINAL ASSIGNMENT

Applicable connector: DFMC1,5/18-ST-3,5-LR (Phoenix Contact) (included in the package)

Applicable wire size: 0.2 – 1.5 mm<sup>2</sup>; stripped length 10 mm

Recommended solderless terminal

- AI0,25-10YE 0.25 mm<sup>2</sup> (Phoenix Contact)
- AI0,34-10TQ 0.34 mm<sup>2</sup> (Phoenix Contact)
- AI0,5-10WH 0.5 mm<sup>2</sup> (Phoenix Contact)
- AI0,75-10GY 0.75 mm<sup>2</sup> (Phoenix Contact)
- A1-10 1.0 mm<sup>2</sup> (Phoenix Contact)
- A1,5-10 1.5 mm<sup>2</sup> (Phoenix Contact)



NO.	ID	FUNCTION	NO.	ID	FUNCTION	NO.	ID	FUNCTION	NO.	ID	FUNCTION
1	COM	In. Common	19	COM	In. Common	37	V+	External excitation	55	V+	External excitation
2	COM	In. Common	20	COM	In. Common	38	V-	Out. Common	56	V-	Out. Common
3	X0	Input 0	21	X16	Input 16	39	Y0	Output 0	57	Y16	Output 16
4	X1	Input 1	22	X17	Input 17	40	Y1	Output 1	58	Y17	Output 17
5	X2	Input 2	23	X18	Input 18	41	Y2	Output 2	59	Y18	Output 18
6	X3	Input 3	24	X19	Input 19	42	Y3	Output 3	60	Y19	Output 19
7	X4	Input 4	25	X20	Input 20	43	Y4	Output 4	61	Y20	Output 20
8	X5	Input 5	26	X21	Input 21	44	Y5	Output 5	62	Y21	Output 21
9	X6	Input 6	27	X22	Input 22	45	Y6	Output 6	63	Y22	Output 22
10	X7	Input 7	28	X23	Input 23	46	Y7	Output 7	64	Y23	Output 23
11	X8	Input 8	29	X24	Input 24	47	Y8	Output 8	65	Y24	Output 24
12	X9	Input 9	30	X25	Input 25	48	Y9	Output 9	66	Y25	Output 25
13	X10	Input 10	31	X26	Input 26	49	Y10	Output 10	67	Y26	Output 26
14	X11	Input 11	32	X27	Input 27	50	Y11	Output 11	68	Y27	Output 27
15	X12	Input 12	33	X28	Input 28	51	Y12	Output 12	69	Y28	Output 28
16	X13	Input 13	34	X29	Input 29	52	Y13	Output 13	70	Y29	Output 29
17	X14	Input 14	35	X30	Input 30	53	Y14	Output 14	71	Y30	Output 30
18	X15	Input 15	36	X31	Input 31	54	Y15	Output 15	72	Y31	Output 31

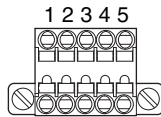
## POWER SUPPLY TERMINAL ASSIGNMENT

Applicable connector: TFMC1,5 / 5-STF-3,5(Phoenix Contact)  
(included in the package)

Applicable wire size: 0.2 – 1.5 mm<sup>2</sup>; stripped length 10 mm

Recommended solderless terminal

- AI0,25-10YE 0.25 mm<sup>2</sup> (Phoenix Contact)
- AI0,34-10TQ 0.34 mm<sup>2</sup> (Phoenix Contact)
- AI0,5-10WH 0.5 mm<sup>2</sup> (Phoenix Contact)
- AI0,75-10GY 0.75 mm<sup>2</sup> (Phoenix Contact)
- A1-10 1.0 mm<sup>2</sup> (Phoenix Contact)
- A1,5-10 1.5 mm<sup>2</sup> (Phoenix Contact)



- |         |                      |
|---------|----------------------|
| 1. FE   | Functional Earth     |
| 2. NC   | —                    |
| 3. NC   | —                    |
| 4. +24V | Power Input (24V DC) |
| 5. 0V   | Power Input (0V)     |

## MECHATROLINK RELATED COMMANDS

Commands available with this unit are the following.

PROFILE	COMMAND	CODE	FUNCTION
Common command	NOP	00H	No operation command
	ID_RD	03H	Read ID command
	CONFIG	04H	Setup device command
	ALM_RD	05H	Read alarm or warning command
	ALM_CLR	06H	Clear alarm or warning command
	CONNECT	0EH	Establish connection command
	DISCONNECT	0FH	Release connection command
Standard I/O profile	DATA_RWA	20H	Transmit I/O data

## RESPONSE TIME

Response time of discrete input module is the time till when the communication ASIC of the module transmits input data from when input signal is applied to the module.

Response time of discrete output module is the time till when the module output the signal from when output data is received by the communication ASIC of the module.

$T_{COM}$ : MECHATROLINK-III transmission cycle set at master  
(depends on system and configuration)

$T_{INP}$ : Response of input module  $\leq$  Delay of input circuit ( $T_a$ , ON delay time or OFF delay time) + Acquire cycle ( $T_s$ ) + input internal processing delay time ( $T_c$ , two transmission cycle)

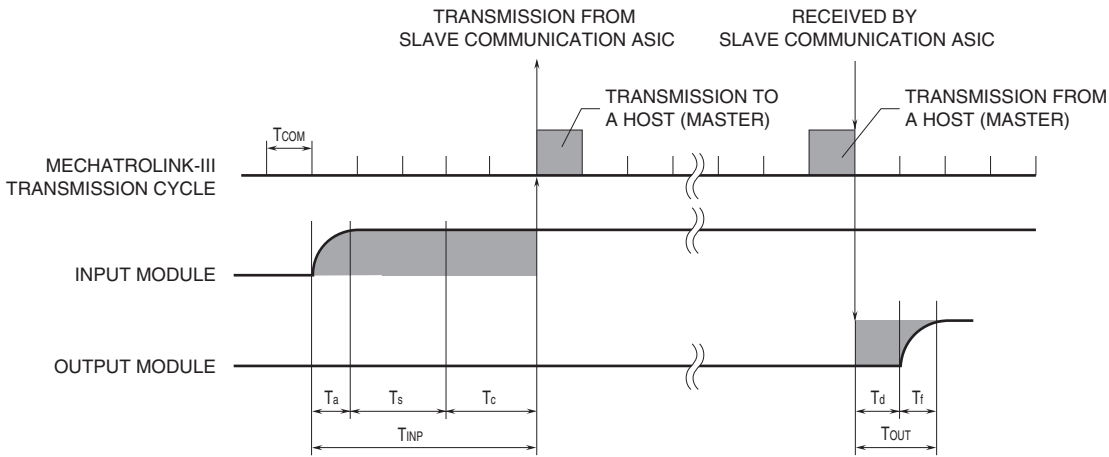
$T_{OUT}$ : Response of output module  $\leq$  Output internal processing delay time ( $T_d$ , one minimum transmission cycle the unit can handle) + Conversion time ( $T_e$ ) + Delay of output circuit ( $T_f$ , ON delay time or OFF delay time)

E.g. 1: R7K4JML3-E-DAFC64A: Acquire cycle: 0.1 msec., MECHATROLINK-III transmission cycle: 0.125 msec., discrete input ON  
Response of input module ( $T_{INP}$ ): Delay of input circuit (0.2 msec.) + Acquire cycle (0.1 msec.) + input internal processing delay time (0.125 msec. x 2) = 0.55 [msec.]

# MODEL: R7K4JML3-E-DAFC64A

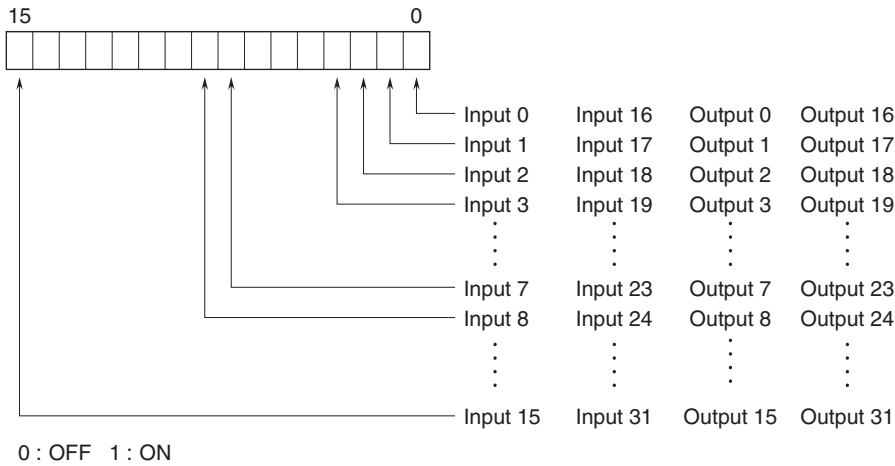
E.g. 2: R7K4JML3-E-DAFC64A: MECHATROLINK-III transmission cycle: 0.5 msec., discrete output OFF

Response of output module ( $T_{OUT}$ ): Output internal processing delay time (0.125 msec.) + Delay of output circuit (0.5 msec.) = 0.625 [msec.]

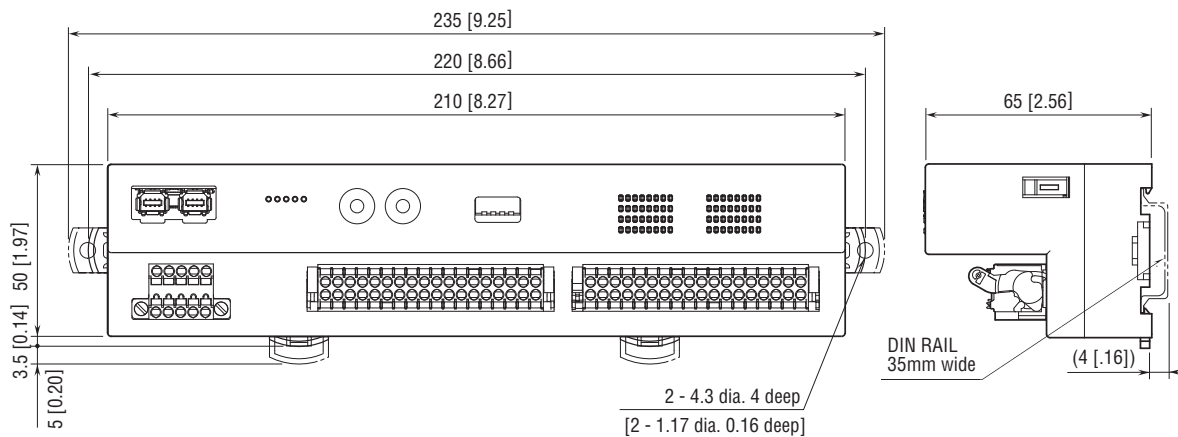


## I/O DATA DESCRIPTIONS

### DISCRETE I/O MODULE

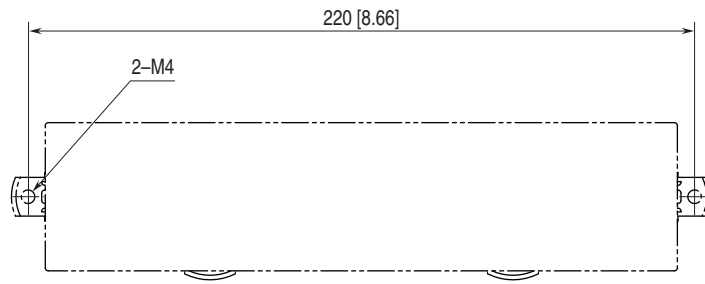


## EXTERNAL DIMENSIONS unit: mm [inch]



# MODEL: R7K4JML3-E-DAFC64A

## MOUNTING REQUIREMENTS unit: mm [inch]

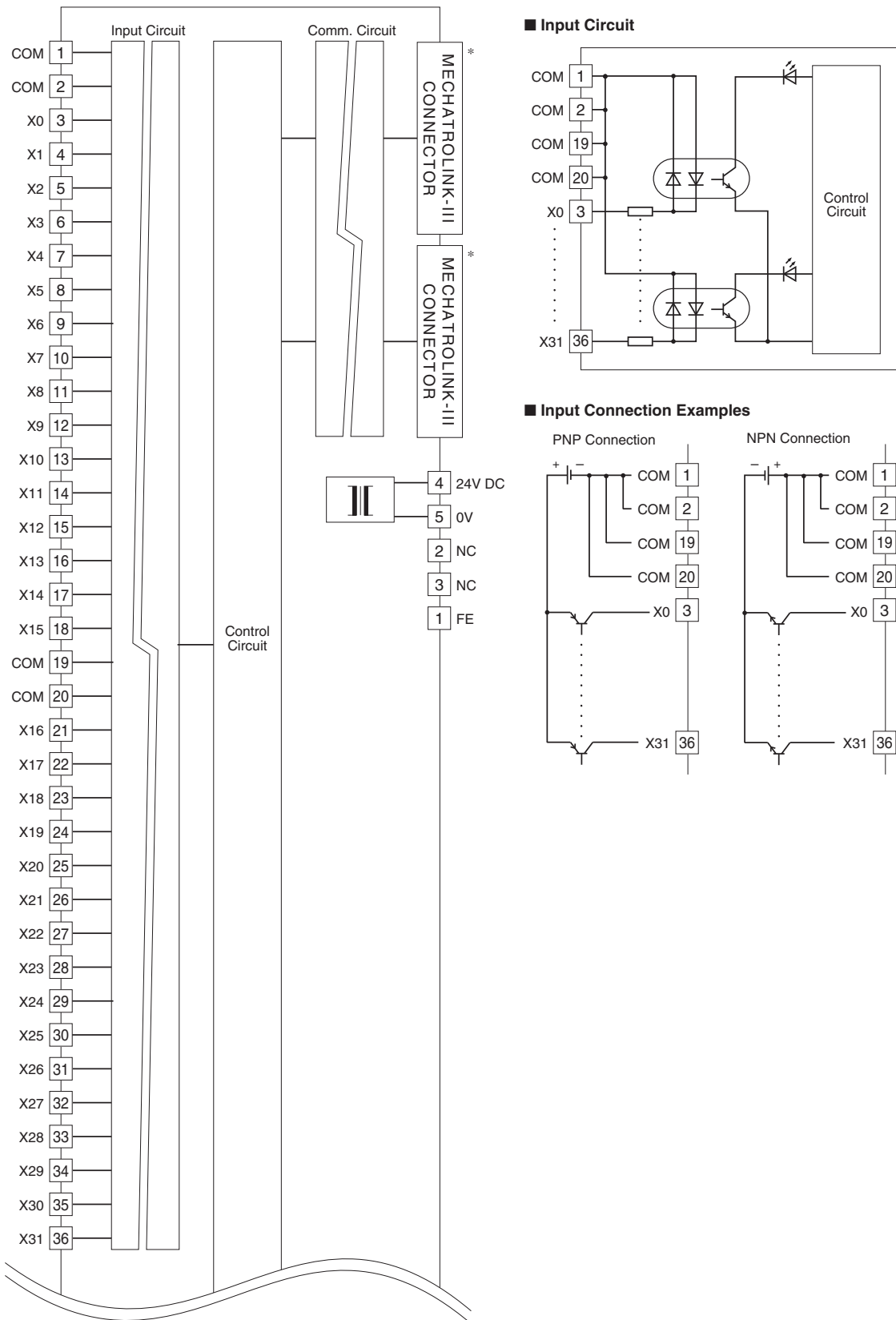


# MODEL: R7K4JML3-E-DAFC64A

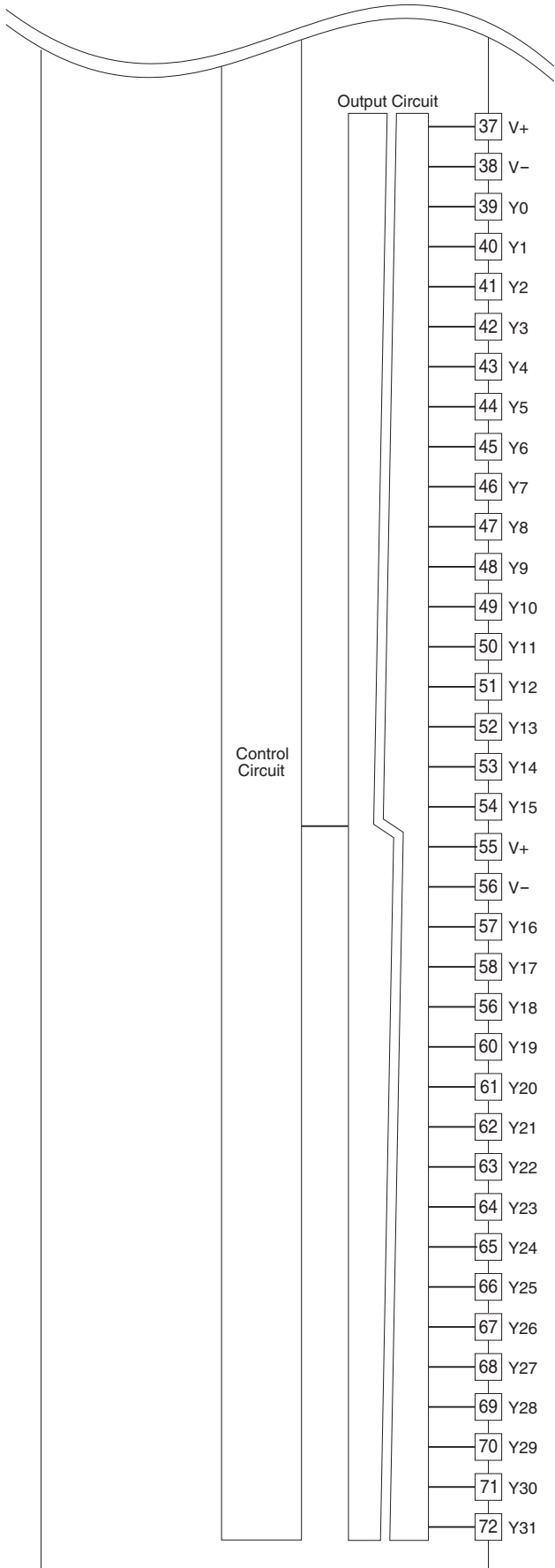
## SCHEMATIC CIRCUITRY & CONNECTION DIAGRAM

Note: In order to improve EMC performance, bond the FE terminal to ground.

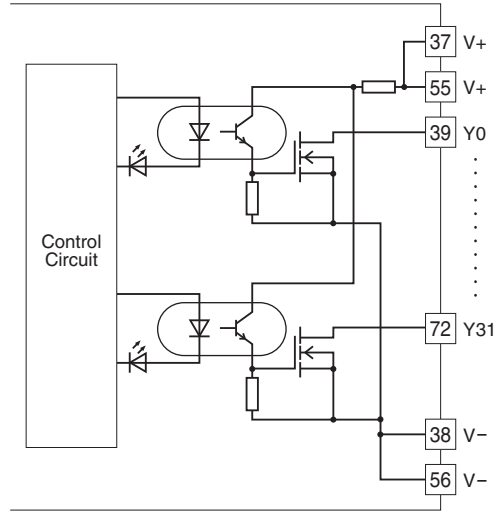
Caution: FE terminal is NOT a protective conductor terminal.



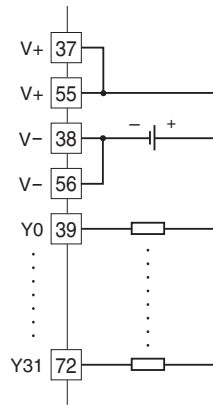
\* The network cable can be connected to either one.



### ■ Output Circuit



### ■ Output Connection Examples







Specifications are subject to change without notice.