NOTICE

2. WIRING

principles of electricity, process control, computer technology and communications.

2.1 Wiring Cautions

Some components have a limited service life, or characteristics that change over time.

2.2 Terminal Configuration

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 additional measures.

This instrument is designed to be installed 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.

1. MOUNTING

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

1.1 Mounting Cautions

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 dismantled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

1.2 Dimensions

This product is intended for use with rotating 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 additional 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 power supply, source of measurement, etc.

Be sure to provide an appropriate surge control circuit respectively for the following:

- If input/output or signal lines are longer than 30 meters.
- If input/output or signal lines leave the building, regardless of the length.
- This instrument is designed to be installed 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.

1.3 DIN rail Mounting

1.3.1 Mounting procedures

1. Pull down the mounting bracket at the bottom of the instrument (A). Attach the hooks on the top of the instrument to the DIN rail and push the lower section into place on the DIN rail (B).

2. Slide the mounting bracket up to secure the instrument to the DIN rail (C).

1.3.2 DIN rail Mounting:

DIN rail

Mounting bracket

(A) Pull down

(B) Lift and take off

(A) Pull down

(B) Insert

(C) Loaded

1.4 Panel Mounting

1.4.1 Mounting procedures

1. Mount the mounting bracket (A) until locked and that a mounting hole appears.

2. Prepare one mounting bracket per instrument (B) sold separately (KSRO-55) and then insert it in the slot of the terminal board at top of the instrument until locked, but a mounting hole does not disappear.

3. Mount each module directly on the panel with screws which are inserted in the mounting holes of the top and bottom mounting brackets.

Recommended tightening torque: 0.3 N·cm (3 kgf·cm)

The customer needs to provide the M3 size screws. Select the screw length that matches the mounting panel.

2. WIRING

To prevent electric shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.

2.1 Wiring Cautions

To avoid noise induction, keep communication signal wire away from instrument power line, load lines and power supply terminal. Separate them as far as possible.

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 best possible 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 best possible noise-reduction.

Do not connect fuses or switches to the noise filter output wiring as this will reduce the effectiveness of the noise filter.

Power supply wiring must be twisted and have a low voltage drop. For an instrument with 24 V power supply, power supply from a SELV circuit.

A suitable power supply should be considered in end-use equipment. The power supply must be in compliance with a limited-energy circuit (maximum available current of 8 A).

Use the solderless terminal appropriate to the screw size (M3).

4.9 mm or less

Recommended tightening torque: 0.4 N·cm (4 kgf·cm)

3.2 mm or more

Make sure that the any wiring such as solderless terminal is not in contact with the adjoining terminals.

2.2 Terminal Configuration

The part of internal wiring

The customer needs to provide the M3 size screws. Select the screw length that matches the mounting panel.

2.3 Mounting Cautions:

- As controller communication terminal Nos. 1, 4 and 5 are internally connected to terminal Nos. 3, 6 and 7, any terminals can be used.

- As ground and power supply terminal Nos. 8, 9 and 12 are internally connected to terminal Nos. 10, 11 and 14, any terminals can be used.

- Terminal No. 2 and No. 13 is not used.

To prevent electric shock or instrument failure, do not turn on the power until all wiring is completed. Make sure that the wiring is correct before applying power to the instrument.
2.3 Connection to PROFIBUS

**Pin Layout of Connector**

![PROFIBUS connector (COM. PORT)](image)

<table>
<thead>
<tr>
<th>Pin No.</th>
<th>Signal name</th>
<th>Symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Unused</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Unused</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Receive data</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Transmission data</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Signal ground</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Termination resistor supply voltage</td>
<td>VP</td>
</tr>
<tr>
<td>7</td>
<td>Unused</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Receive data</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Transmission data</td>
<td></td>
</tr>
</tbody>
</table>

**PROFIBUS cables**

Use the PROFIBUS cable which fitted the following requirement:
- Use the shielded twisted pair wire
- Based on IEC61158, Standard (Recommend cable type A)

- Cable type A specification
  - Impedance: 135 to 165 Ω
  - Capacitance: < 30 pF/m
  - Loop resistance: 110 Ω/km
  - Core diameter: 0.64 mm
  - Core cross section: > 0.34 mm²

- Maximum cable length by communication speed (For cable type A)
  - Communication speed (kbps): 9.6, 19.2, 93.75, 187.5, 500, 1500, 12000
  - Cable length (m): 1200, 1200, 1000, 400, 200, 100

- Connect the termination resistor to the end of a bus (See below)

**2.4 Connection to the Controllers**

Conduct wiring between the COM-JG and controller (FB100/400/900) as shown in the following. (When conducting wiring to the FB100/400/900, always conduct wiring to the Communication 1 terminal.)

- **Pin Layout of Connector**
- **PROFIBUS-DP specification**
  - Interface: Based on RS-485, EIA standard
  - Protocol: PROFIBUS-DP
  - Communication speed: 9600 bps, 19200 bps, 93.75 kbps, 187.5 kbps, 500 kbps, 4.25 Mbps, 12 Mbps
  - A master judges the quality situation of a line, and set it automatically.
  - Number of connection nodes: 1 to 126
  - Connection cable: Special cable (Shielded twisted pair wire)

- **Connection example**
  - Maximum connections: 31 controllers (FB100/400/900)
  - Maximum controller connections: 31 controllers

**2.5 System Configuration Example**

- Programmable controller
  - PLC (Master)
  - Based on IEC61158, Standard (Recommend cable type A)

**3. SPECIFICATIONS**

- **PROFIBUS communication**
  - Interface: Based on RS-485, EIA standard
  - Protocol: PROFIBUS-DP
  - Communication speed: 9600 bps, 19200 bps, 93.75 kbps, 187.5 kbps, 500 kbps, 1.5 Mbps, 12 Mbps
  - A master judges the quality situation of a line, and set it automatically.
  - Number of connection nodes:
  - Connection cable: Special cable (Shielded twisted pair wire)

- **Controller communication**
  - Interface: Based on RS-485, EIA standard
  - Protocol: Modbus-RTU
  - Communication speed: 9600 bps, 19200 bps, 38400 bps
  - Data bit configuration: Data 8-bit, Without parity, Stop 1-bit
  - Communication terminals
  - Terminal block (communication 1 side)
  - Interface: Based on RS-485, EIA standard
  - Protocol: PROFIBUS-DP

- **4. MODEL CODE**

- **COM-JG # 01**
  - (1) Corresponding to the RKC controller
  - 01: FB100/400/900

- Customer must provide the PROFIBUS cable (a connection cable of PLC and COM-JG). As for the PROFIBUS cable, there is a case prepared by a PLC manufacturer.

- The details except the above are connected to the website of PROFIBUS International, and obtain necessary information.

- URL: http://www.profibus.com/