OPERATING PROCEDURES ARE NOT STRICTLY FOLLOWED.

THese describe precautions to be taken if unit damage may result if dangers are described.

Where there are possible dangers such as electric shock, fire (burns), etc which could cause loss of life or injury, precautions to avoid such dangers are described.

MARKING CAUTIONS

\(<\) Signal wards >

\(\bigtriangleup\) WARNING : Where there are possible dangers such as electric shock, fire (burns), etc which could cause loss of life or injury, precautions to avoid such dangers are described.

\(\bigtriangledown\) CAUTION : These describe precautions to be taken if unit damage may result if operating procedures are not strictly followed.

\(\text{NOTE} \) : Extra notes or precautions are added to operating procedures and explanations.

\(<\) Symbol Marks >

\(\bigtriangleup\) : This mark is used when great care is needed especially for safety.

\(\ast\) : This mark is used to add extra notes, precautions or supplementary explanations to table and figures.

WARNING

\(\bigtriangleup\) Wiring precaution

\(\bullet\) If failure or error of this instrument could result in a critical accident of the system, install an external protection circuit to prevent such an accident.

\(\bullet\) In order to prevent instrument damage or failure, protect the power line and the input/output lines from high currents by using fuses with appropriate ratings.

\(\bigtriangleup\) Power supply

\(\bullet\) In order to prevent instrument damage or failure, supply power of the specified rating.

\(\bullet\) In order to prevent electric shock or instrument failure, do not turn on the power supply until all of the wiring is completed.

\(\bigtriangleup\) Never use the instrument near inflammable gases

\(\bullet\) In order to prevent fire, explosion or instrument damage, never use this instrument at a location where inflammable or explosive gases or vapour exist.

\(\bigtriangleup\) Never touch the inside of the instrument.

\(\bullet\) In order to prevent electric shock or burns, never touch the inside of the instrument. Only RKc service engineers can touch the inside of the instrument to check the circuit or to replace parts.

High voltage and high temperature sections inside the instrument are extremely dangerous.

\(\bigtriangleup\) Never modify the instrument.

\(\bullet\) In order to prevent accident or instrument failure, never modify the instrument.

\(\bigtriangleup\) Maintenance

\(\bullet\) In order to prevent electric shock, burns or instrument failure, only RKc service engineers may replace parts.

\(\bullet\) In order to use this instrument continuously and safely, conduct periodic maintenance. Some parts used in this instrument have a limited service life and may deteriorate over time.

1. MODEL

\(\bullet\) COM-A : For conversion between RS-232C and RS-422A

\(\bullet\) COM-B : For conversion between RS-232C and RS-485

2. MOUNTING

\(\bigtriangleup\) WARNING

\(\bullet\) In order to prevent electric shock or instrument failure, always turn off the power before mounting or removing the module.

\(\bullet\) In order to prevent electric shock or instrument failure, do not turn on the power before all the wiring is finished.

\(\bullet\) In order to prevent electric shock or instrument failure, do not touch the inside of the module or connector pins.

2.1 Mounting environment

Avoid the following when selecting the mounting location:

\(\bullet\) Ambient temperature of less than 0°C or more than 50°C.

\(\bullet\) Ambient humidity of less than 45% or more than 85% RH. Rapid changes in ambient temperature which may cause condensation.

\(\bullet\) Corrosive or inflammable gases.

\(\bullet\) Direct vibration or shock to the mainframe.

\(\bullet\) Water, oil, chemicals, vapor or steam splashes.

\(\bullet\) Excessive dust, salt or iron particles.

\(\bullet\) Excessive induction noise, static electricity, magnetic fields or noise.

\(\bullet\) Direct air flow from an air conditioner.

\(\bullet\) Should be used indoors where the system is not exposed to direct sunlight.

2.2 Mounting considerations

Temperature considerations

\(\bullet\) Allow enough ventilation space.

\(\bullet\) Do not mount this instrument directly above equipment which generates heat (heaters, transformers, large resistors, etc.).

\(\bullet\) If the ambient temperature rises above 50°C, cool the panel inside using a forced fan or cooler. However, do not expose the control unit directly to the air.

Humidity considerations

\(\bullet\) Condensation may from in the instrument due to rapid changes in temperatures by turning the air conditioner ON or OFF. Such condensation can cause instrument malfunctions due to insulation deterioration or shorting.

To prevent the risk of condensation, always turn ON the power or pre-heat the system using space heaters.

Panel vibration or shock considerations

\(\bullet\) Isolate the panel from external vibration or shock using rubber vibration insulators.

\(\bullet\) If the electromagnetic switches cause vibration when they operate within the panel, isolate the switches using rubber vibration insulators.

Environment considerations

\(\bullet\) If dust, steam, soot or poisonous gas exists, purge the panel inside using clean air and create a slight positive pressure inside the panel to keep out the harmful gases.

Operations and maintenance considerations

\(\bullet\) To ensure safety for maintenance and operation, separate the instrument from high-voltage equipment or rotating machinery where possible.

Anti-noise considerations

\(\bullet\) Do not install the instrument in a panel where high-voltage equipment is installed.

\(\bullet\) Separate the instrument from rotating machinery lines by more than 200 mm.
2.3 Control unit mounting

(1) External dimensions

(2) Dimensions for mounting within panel

(3) Module mounting depth

Each module mounting depth is 108 mm from the mounting surface to the module front when the module is mounted on the DIN rail. However, if a connection cable (modular connector cable) is connected, a longer mounting depth is required. Allow as much depth as possible in consideration of each of operation and safety.

(4) Direct mounting within panel

**CAUTION**
- If the COM module is mounted together with other modules, always mount it at the left or right end of the control unit. If it is mounted halfway at any position of the control unit, other modules do not operate normally.

1. Secure the mother block mounting space by referring to the mounting dimension diagram.
2. Separate the mother block from the module itself.

If the section marked with (removal lever) is lifted centering around the upper module engagement while pressing the above section, the module is separated from the mother block.

3. Before fixing the mother block to the mounting position, connect each mother block. (Customer must provide the setscrews.)

4. Mount the module on the mother block.

After mounting the mother block, (1) insert the projection at the top of the mother block into the hole at the top of module, (2) next, insert the lower part of module into the mother block centering around the section already inserted in item (1).

* Correctly clip the module main unit the mother block surely so that a click sound is heard.
4. WIRING

3. NAME OF PARTS

3.1 Name of parts

4. WIRING

3. NAME OF PARTS

3.1 Name of parts

4. WIRING

3. NAME OF PARTS

3.1 Name of parts

4. WIRING

3. NAME OF PARTS

3.1 Name of parts

4. WIRING

3. NAME OF PARTS

3.1 Name of parts

4. WIRING

3. NAME OF PARTS

3.1 Name of parts

4. WIRING

3. NAME OF PARTS

3.1 Name of parts

4. WIRING

3. NAME OF PARTS

3.1 Name of parts

4. WIRING

3. NAME OF PARTS

3.1 Name of parts

4. WIRING

3. NAME OF PARTS

3.1 Name of parts
5.1 Connection block diagram

- Connection example 1

- Connection example 2

Maximum of 16 units
5.2 Connecting the communication level conversion module to the host computer

(1) RS-232C connection

- When a special cable is not used for the COM-A module

- When a special cable is not used for the COM-B module

- When an RKC special cable is used for the COM-A/COM-B module

- The 6P type modular connector should be used. (Model: TM4P-66P manufactured by Hirose Electric Co., Ltd.)
5.3 Connecting the communication level conversion module to the operation panel

(1) RS-422A connection

- When one operation panel is connected

- When two or more operation panels are connected (Multidrop-connected)

- When an RKC special cable is used between the COM module and junction box

· The 6P type modular connector should be used. (Model: TM4P–66P manufactured by Hirose Electric Co., Ltd.)
(2) RS-485 connection

- When one operation panel is connected

- When two or more operation panels are connected (Multidrop-connected)

- The 6P type modular connector should be used. (Model: TM4P-66P manufactured by Hirose Electric Co., Ltd.)

NOTE

- Operation panel connector pin arrangement
5.4 Connecting the communication level conversion module to the control unit

(1) RS-422A connection (When a special cable is not used)

(2) RS-485 connection (When a special cable is not used)

(3) RS-422A/RS-485 connection (When an RKC special cable is used)

· The 6P type modular connector should be used. (Model: TM4P-66P manufactured by Hirose Electric Co., Ltd.)
### 6. SPECIFICATIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Specifications</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication interface</td>
<td>Based on EIA standard RS - 232C</td>
<td></td>
</tr>
<tr>
<td>RS - 232C Input/output circuit</td>
<td><img src="image" alt="RS-232C Diagram" /></td>
<td>Common to COM - A and COM - B module</td>
</tr>
<tr>
<td>Communication Interface</td>
<td>Based on EIA standard RS - 422A</td>
<td></td>
</tr>
<tr>
<td>RS - 422A Input/output circuit</td>
<td><img src="image" alt="RS-422A Diagram" /></td>
<td>COM - A module</td>
</tr>
<tr>
<td>Communication Interface</td>
<td>Based on EIA standard RS - 485</td>
<td></td>
</tr>
<tr>
<td>RS - 485 Input/output circuit</td>
<td><img src="image" alt="RS-485 Diagram" /></td>
<td>COM - B module</td>
</tr>
<tr>
<td>Power supply</td>
<td>100 to 240V AC</td>
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<tr>
<td>Power supply voltage variation</td>
<td>90 to 264V AC</td>
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<tr>
<td>Power consumption</td>
<td>5 VA or less (at 24V AC)</td>
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</tr>
<tr>
<td>Connector used</td>
<td>TM5RE9 - 68 (Manufactured by HIROSE ELECTRIC CO., LTD.)</td>
<td></td>
</tr>
<tr>
<td>Dimensions</td>
<td>24(H) × 26(H) × 100(D) mm</td>
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</tr>
<tr>
<td>Weight</td>
<td>Approx. 204 g</td>
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