FAREX SR Mini SYSTEM

Communication level conversion module

COM-A/ COM-B module

Instruction Manual

FEB. 2007 IMSRM33−E3

▶ NOTE ◀

Make sure that this Instruction Manual is always readily available to personnel who use the SR Mini SYSTEM.
The contents of the Instruction Manual are subject to change without notice.
If only have any question regarding the manual, contact one of our sales people, our nearest sales office, or the place whrere you have purchased this SYSTEM. Also keep this manual with much care for future reference.

▶ MARKING CAUTIONS ◀

＜Signal wards＞

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.

CAUTION :

These describe precautions to be taken if unit damage may result if operating procedures are not strictly followed.

NOTE :

Extra notes or precautions are added to operating procedures and explanations.

＜Symbol Marks＞

⚠ : This mark is used when great care is needed especially for safety.

＊ : This mark is used to add extra notes, precautions or supplementary explanations to table and figures.

⚠ WARNING

● Wiring precaution
- 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.
- 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.

● Power supply
- In order to prevent instrument damage or failure, supply power of the specified rating.
- In order to prevent electric shock or instrument failure, do not turn on the power supply until all of the wiring is completed.

● Never use the instrument near inflammable gases
- In order to prevent fire, explosion or instrument damage, never use this instrument at a location where inflammable or explosive gases or vapour exist.

● Never touch the inside of the instrument.
- 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.

● Never modify the instrument.
- In order to prevent accident or instrument failure, never modify the instrument.

● Maintenance
- In order to prevent electric shock, burns or instrument failure, only RKC service engineers may replace parts.
- 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

(1) COM-A : For conversion between RS-232C and RS-422A
(2) COM-B : For conversion between RS-232C and RS-485

2. MOUNTING

⚠ WARNING

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

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

●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:

- Ambient temperature of less than 0℃ or more than 50℃.
- Ambient humidity of less than 45% or more than 85% RH.
- 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.
- Should be used indoors where the system is not exposed to direct sunlight.

2.2 Mounting considerations ⚠

Temperature considerations

- Allow enough ventilation space.
- Do not mount this instrument directly above equipment which generates heat (heaters, transformers, large resisters, etc.).
- If the ambient temperature rises above 50 ℃, cool the panel inside using a forced fan or cooler. However, do not expose the control unit directly to the air.

Humidity considerations

- 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 codensation, always turn ON the power or pre-heat the system using space heaters.

Panel vibration or shock considerations

- Isolate the panel from external vibration or shock using rubber vibration insulators.
- If the electromagnetic switches cause vibration when they operate within the panel, isolate the switches using rubber vibration insulators.

Environment considerations

- 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

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

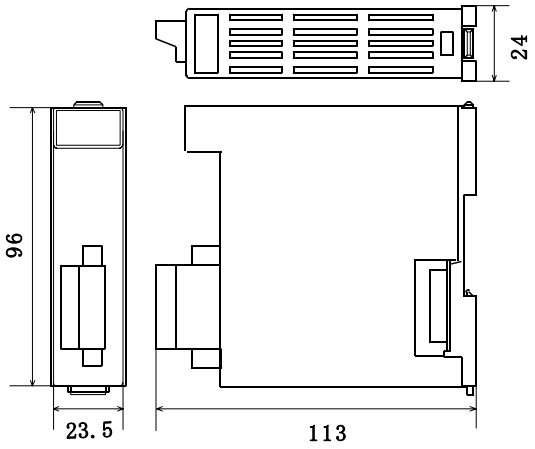
Anti-noise considerations

- Do not install the instrument in a panel where high-voltage equipment is installed.
- Separate the instrument from rotating machinery lines by more than 200 mm.

2.3 Control unit mounting

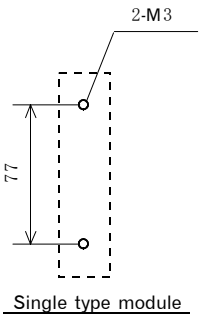
(1) External dimensions

(Unit : mm)

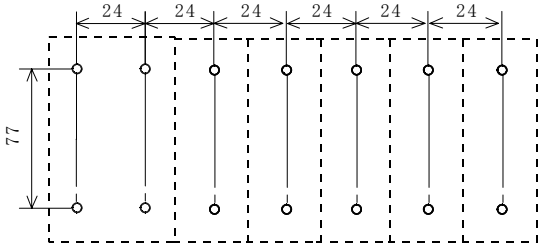


(2) Dimensions for mounting within panel

(Unit : mm)



Single type module

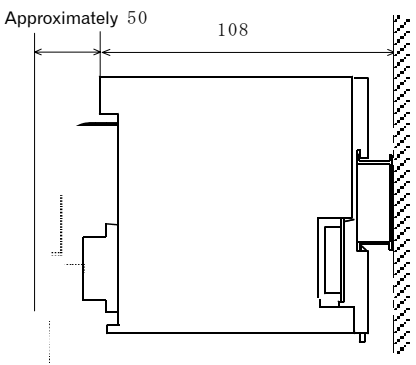


Dimensions for closely connected mounting

(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.

(Unit : mm)



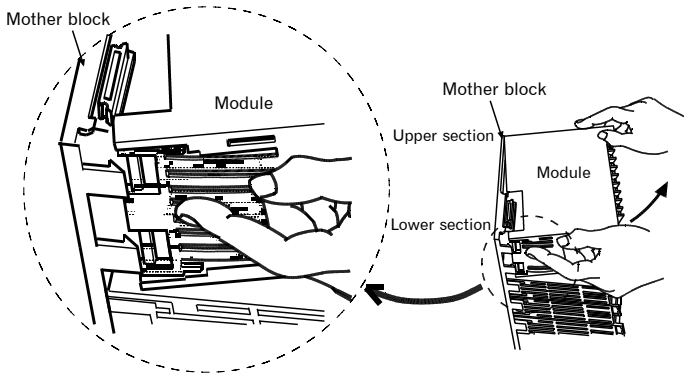
(4) Direct mounting within panel

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.**

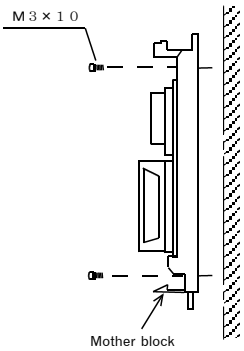
① Secure the mother block mounting space by referring to the mounting dimension diagram.

② Separte 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.)

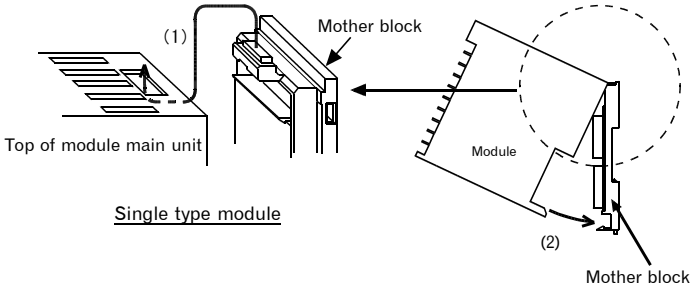


Tightening torque (Recommended value) : 0.3N·m(3kgf·cm)

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.



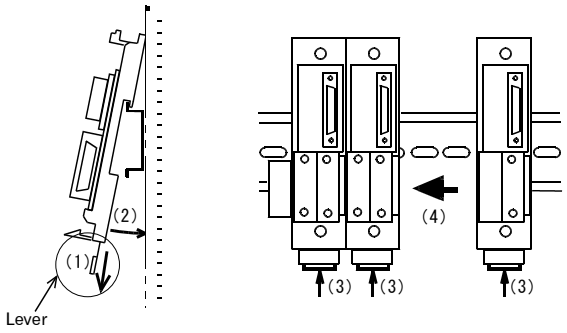
Single type module

(5) Mounting on DIN rail

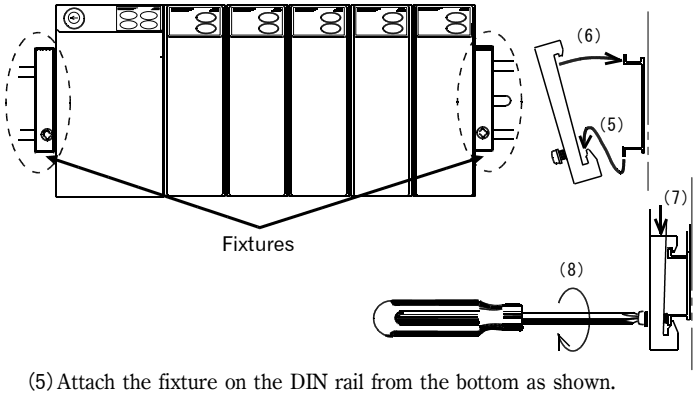
CAUTION

- **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 Separate the mother block from the module itself.
② Lower the detaching lever at the part of the mother block. (1)
③ Insert the recess at the rear of the mother block into the upper DIN rail. (2)
④ Lift the detaching lever. (3)
Confirm that the mother block is firmly inserted into the DIN rails.
⑤ Slide the mother block, then connect each mother block using a connector. (4)



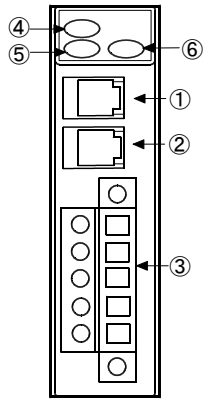
⑥ Mount the module on the mother block.
⑦ Fix the control units using fixtures. (5) **to** (8)



(5) Attach the fixture on the DIN rail from the bottom as shown.
(6) Then fit the top of the fixture on the DIN rail .
(7) After the fit the top of the fixture is snugly attached to the top of the DIN rail.
(8) Tighten the screw with a screwdriver.

3. NAME OF PARTS

3.1 Name of parts



① Modular connector 1 (COM.PORT1)
For RS-232C communication.
② Modular connector 2 (COM.PORT2)
For RS-422A/RS-485 communication.
③ Power connector
④ Data correctly received indicator lamp (Yellow)
Lights when data is correctly received.
⑤ Data correctly sent indicator lamp (Yellow)
Lights when data is correctly sent.
⑥ Power indicator lamp (Green)
Lights when module is turned on.

4. WIRING

⚠ WARNING

- **In order to prevent electric shock or instrument failure, do not turn on the power before all the wiring is finished.**
- **Wiring is necessary to be performed by personnel who have a fundamental knowledge of electricity and also experience in wiring.**

4.1 Cautions for wiring ⚠

Wiring of input/output signal wire

- In order to avoid the effect of noise on the input/output signal wires, use a separate power supply for electric equipment and motors.

Wiring of power supply wire

- Separate each of the instrument power supply line, input/output circuit power supply line, equipment and motor power supply line, and operating circuit power supply line.
- Use the power supply within the power supply voltage variation range.
- Use twisted power supply wire with a cross section of 1.25 mm^2 or more and a low voltage drop.

Wiring of grounding wire

- Do not ground the instrument together with other equipment.
- Do not mix this grounding wire with other grounding wires. Ground this grounding wire to a grounding resistance of less than 100 Ω.
- Use grounding wire with a cross section of 2.0 mm^2 or more.

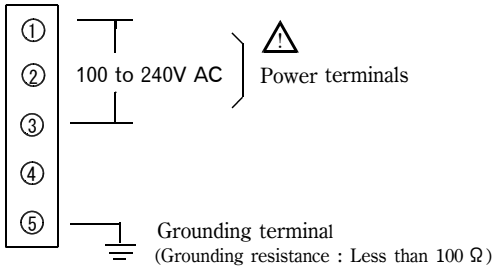
4.2 wiring

① Modular connector 1 (COM.PORT1)
This is a connector for connection with the RS-232C interface.

② Modular connector 2 (COM.PORT2)
This is a connector for connection with the RS-422A/RS-485 interface.

- For details on how to connect the modular connector, See " 5. CONNECTION METHODS ".

③ Power connector

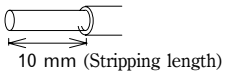


Power supply

- power supply : 100 to 240V AC
- Power supply voltage variation : 90 to 264V AC
- Power consumption : 5 VA or less (at 264V AC)

NOTE

- Recommended cable size : AWG 24 to 12

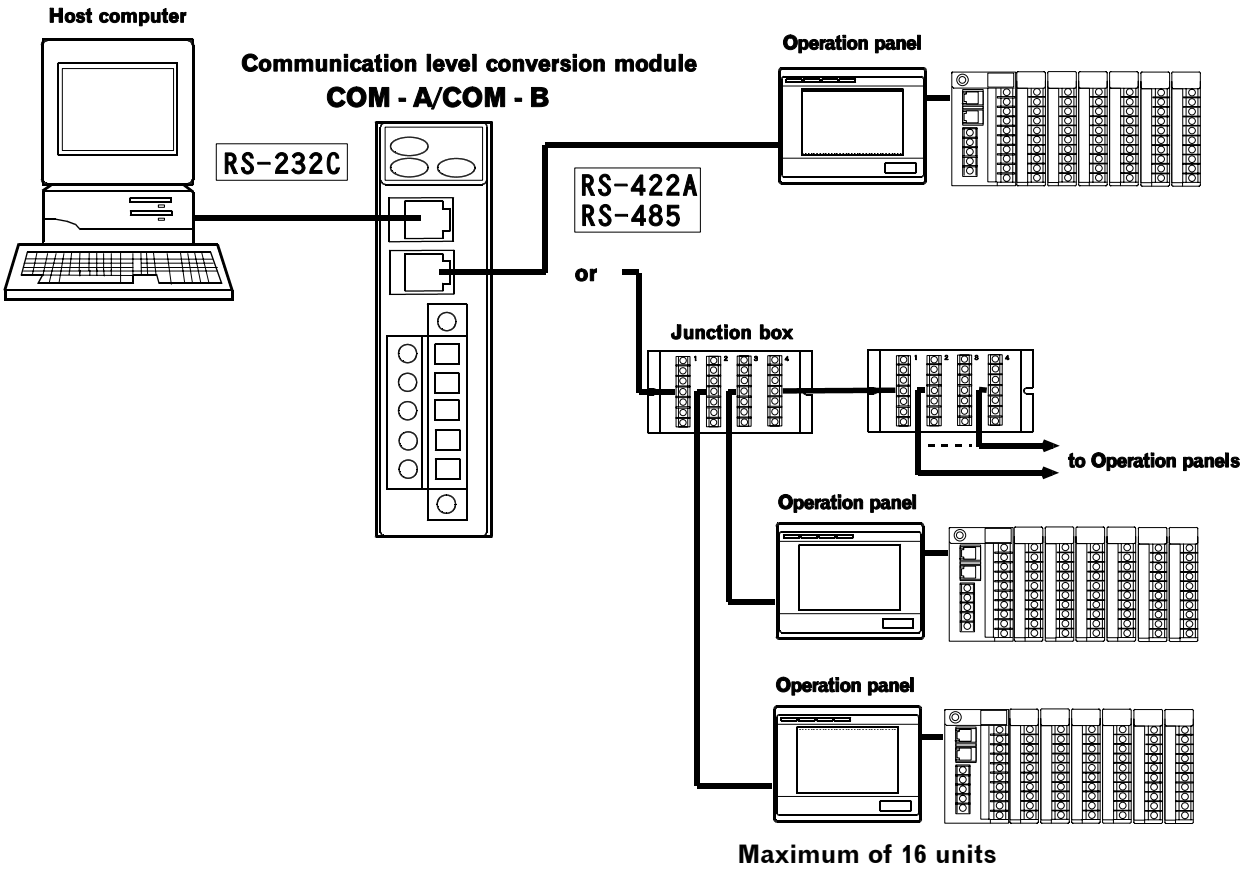


- Recommended torque : 0.5 to 0.6 N·m (5 to 6 kgf·cm)

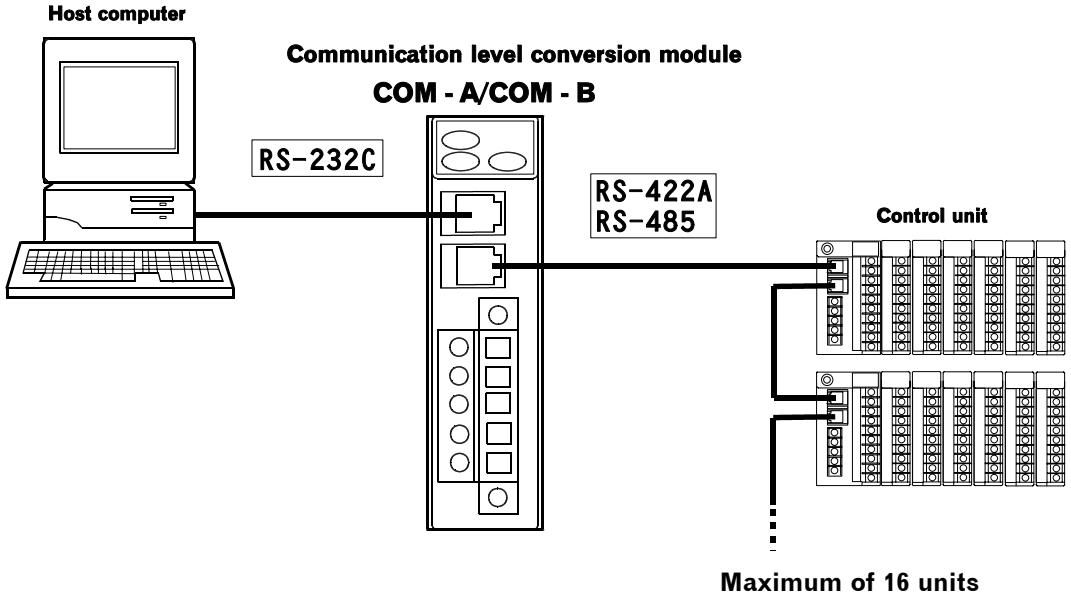
5. CONNECTION METHODS

5.1 Connection block diagram

● **Connection example 1**



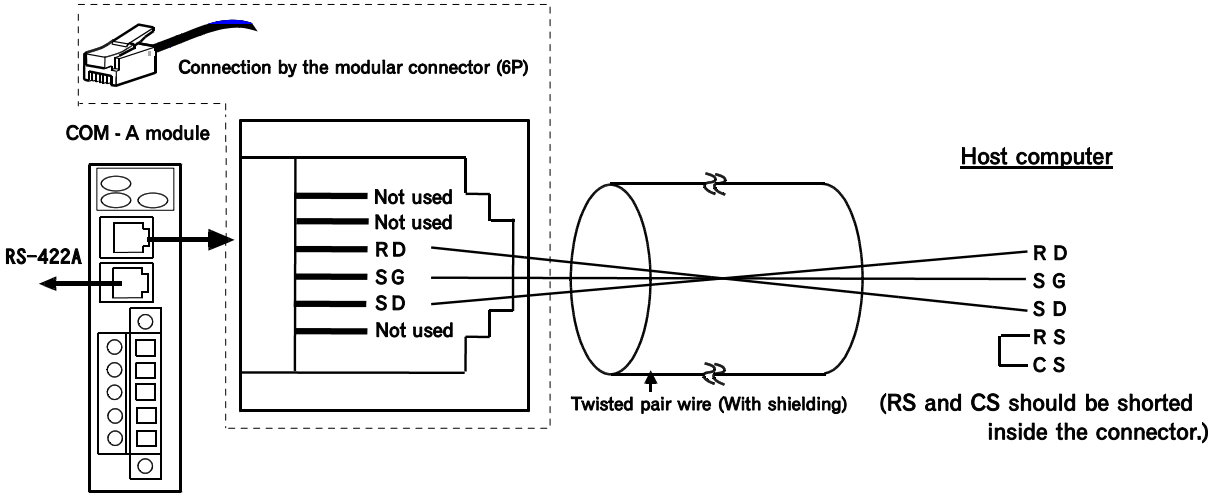
● **Connection example 2**



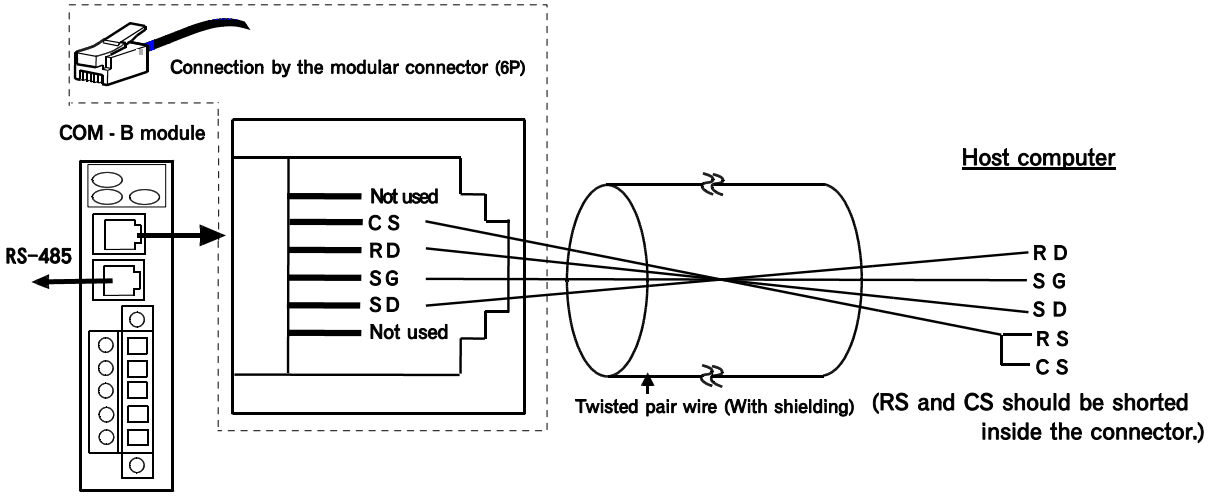
5.2 Connecting the communication level conversion module to the host computer

(1) RS−232C connection

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

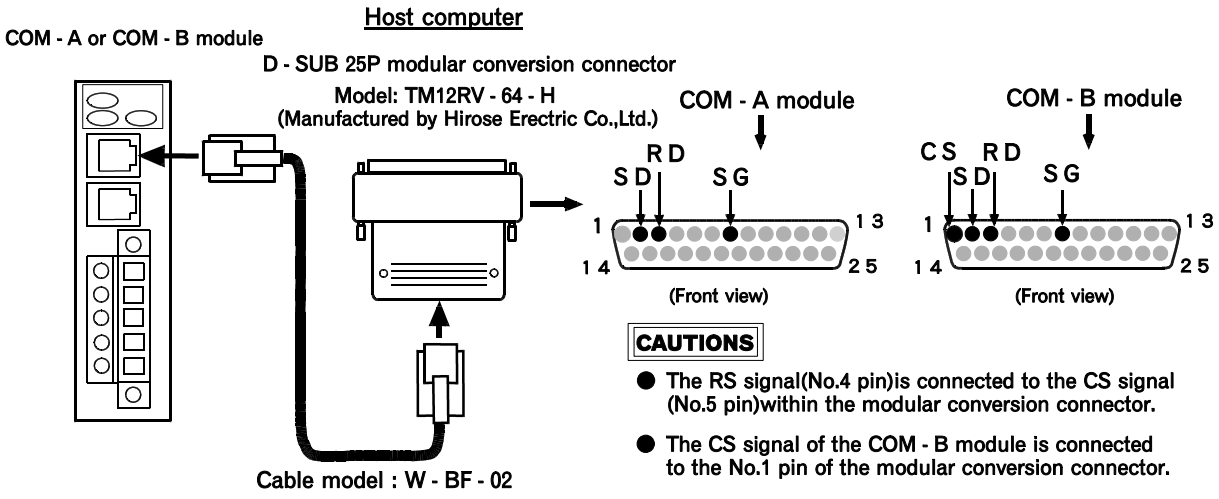


● When a special cable is not used for the COM−B module



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

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



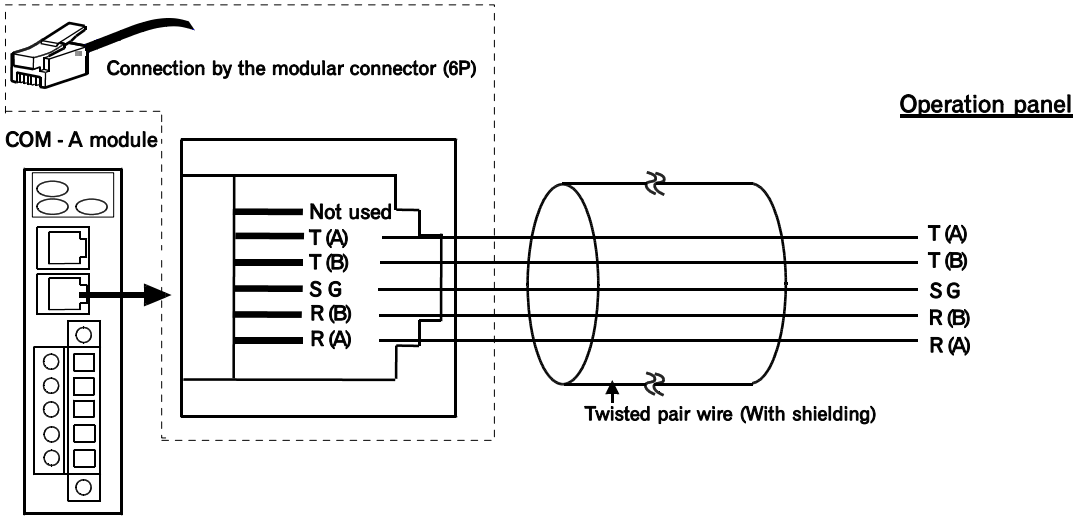
CAUTIONS

- The RS signal(No.4 pin)is connected to the CS signal (No.5 pin)within the modular conversion connector.
- The CS signal of the COM - B module is connected to the No.1 pin of the modular conversion connector.

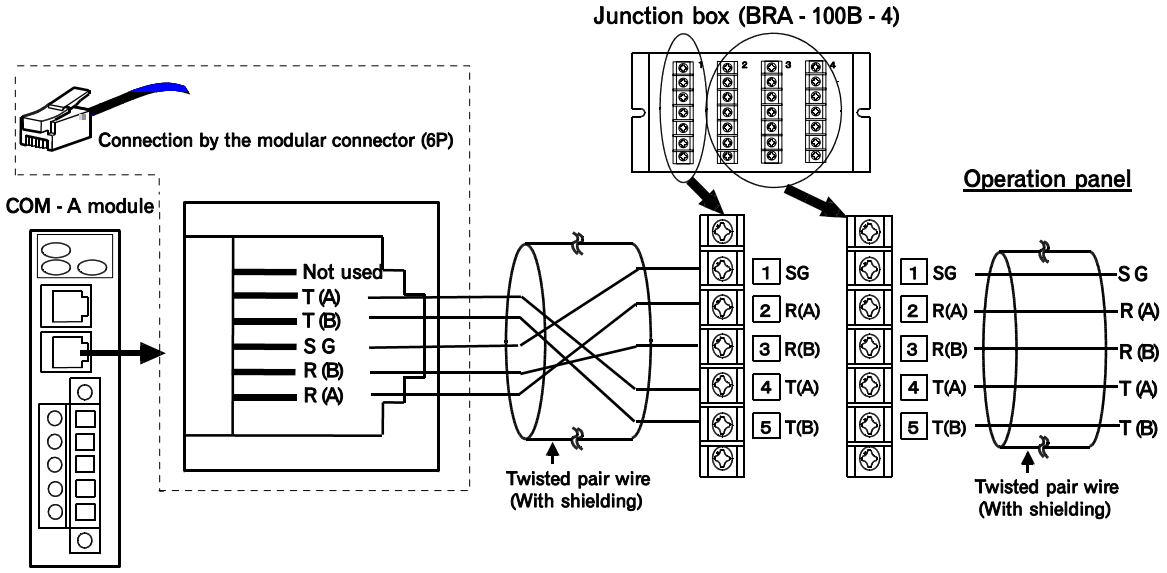
5.3 Connecting the communication level conversion module to the operation panel

(1) RS–422A connection

● When one operation panel is connected

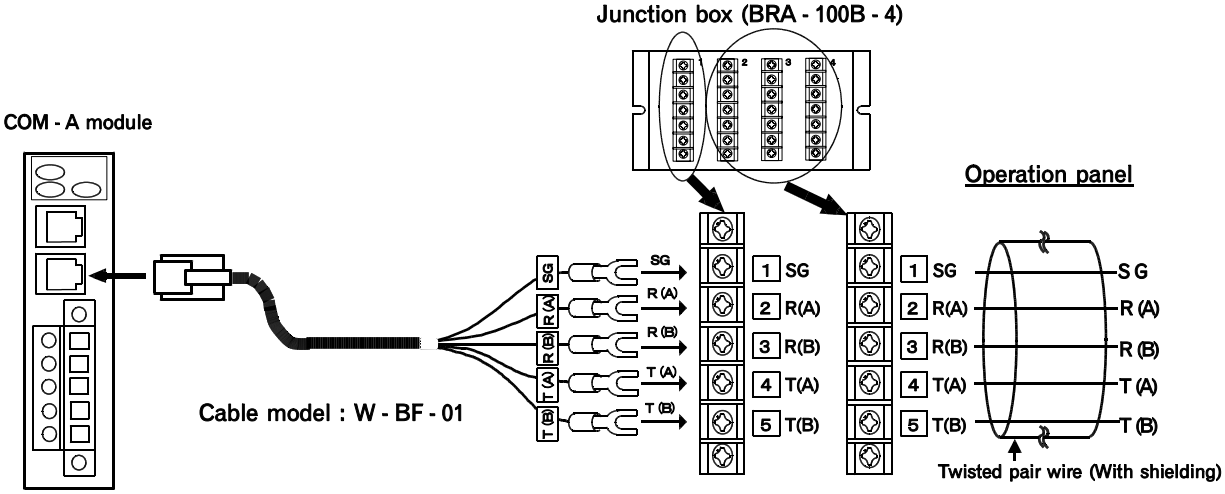


● When two or more operation panels are connected (Multidrop–connected)



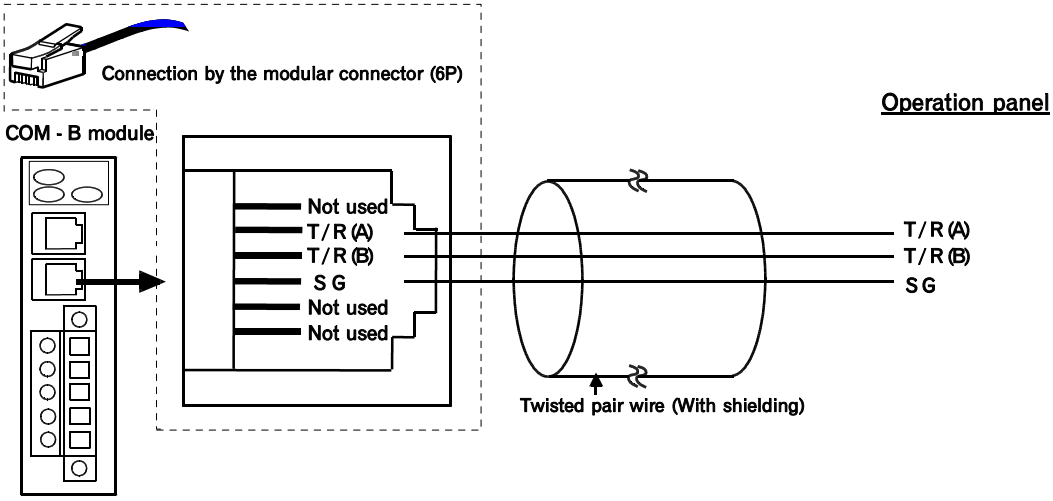
· The 6P type modular connector should be used. (Model: TM4P–66P manufactured by Hirose Erectric Co.,Ltd.)

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

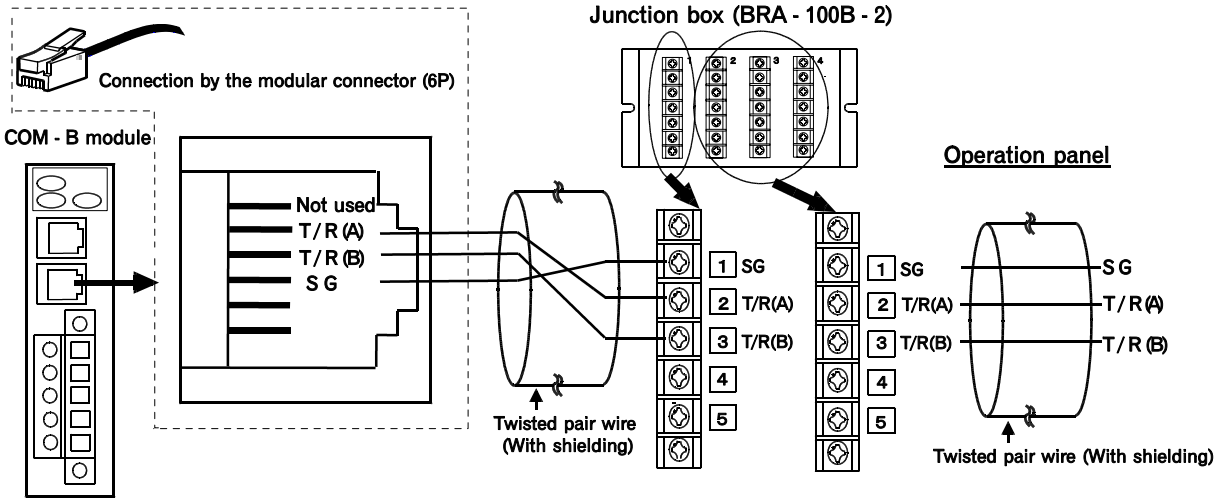


(2) RS–485 connection

● When one operation panel is connected

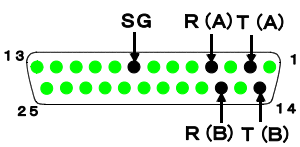
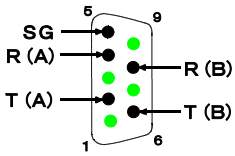
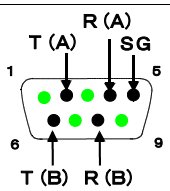
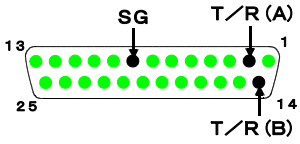
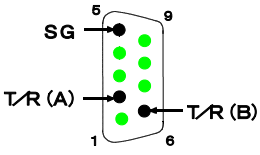
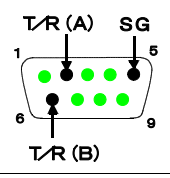


● When two or more operation panels are connected (Multidrop–connected)



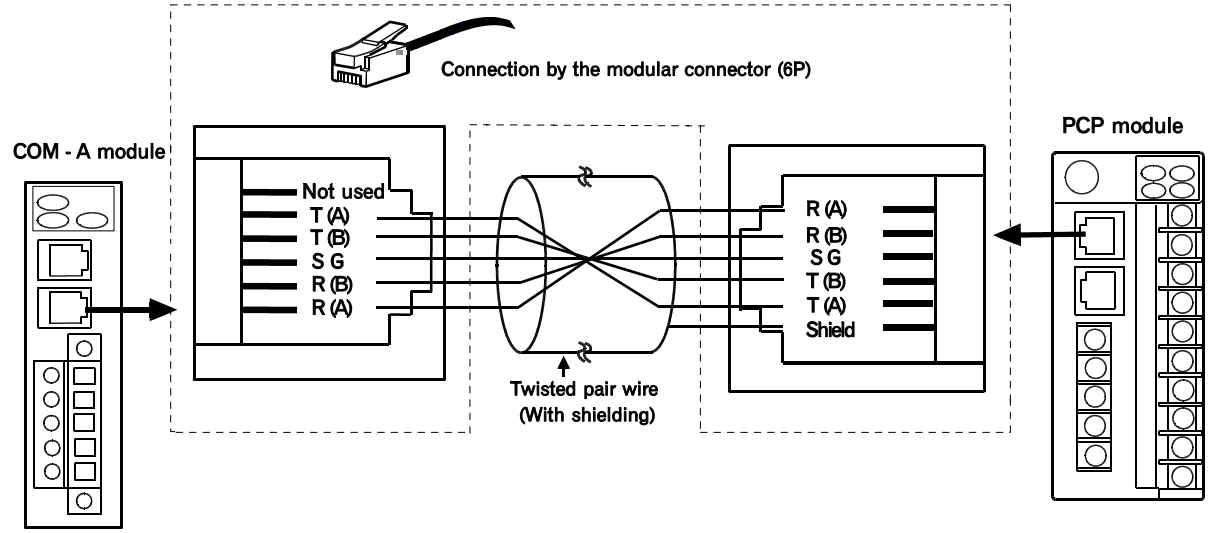
· The 6P type modular connector should be used. (Model: TM4P–66P manufactured by Hirose Erectric Co.,Ltd.)

NOTE ● **Operation panel connector pin arrangement**

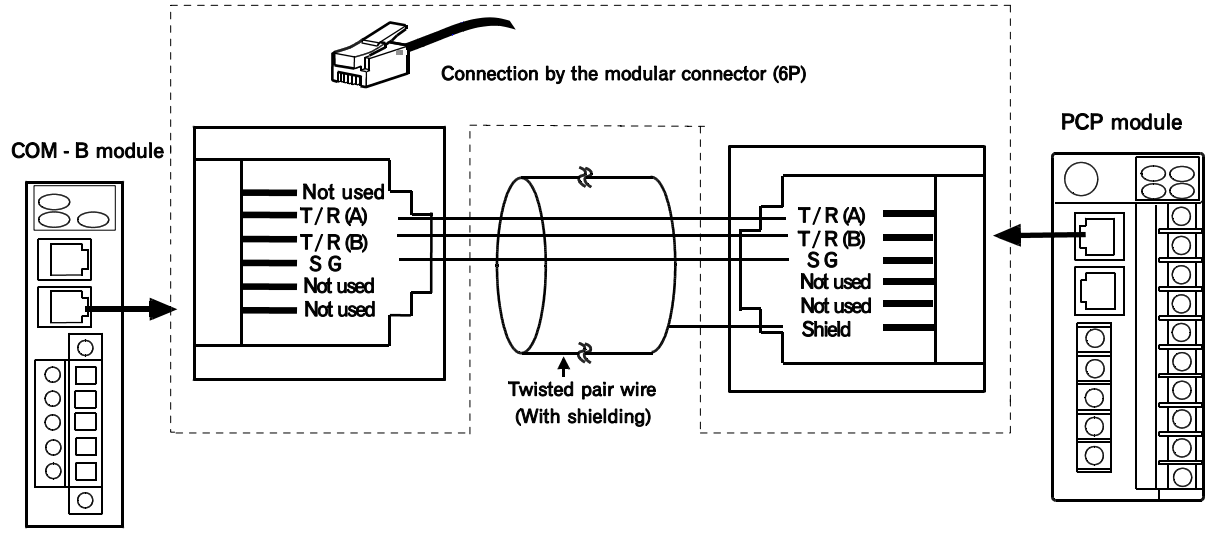
Operation panel (Rear view)	OPM D - SUB 25pins connector	OPC D - SUB 9pins connector	OPM–H D - SUB 9pins connector
RS–422A			
RS–485			

5.4 Connecting the communication level conversion module to the control unit

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

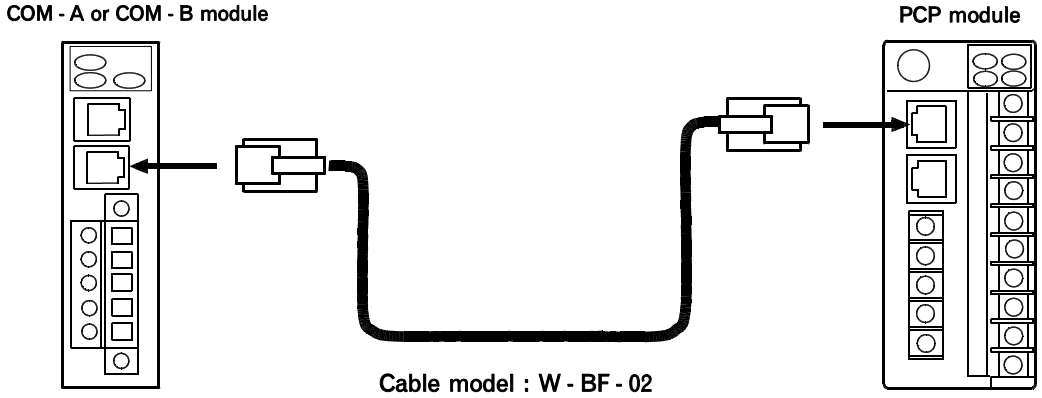


(2) RS–485 connection (When a special cable is not used)

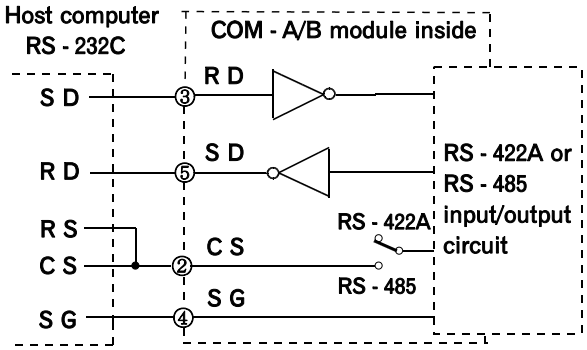
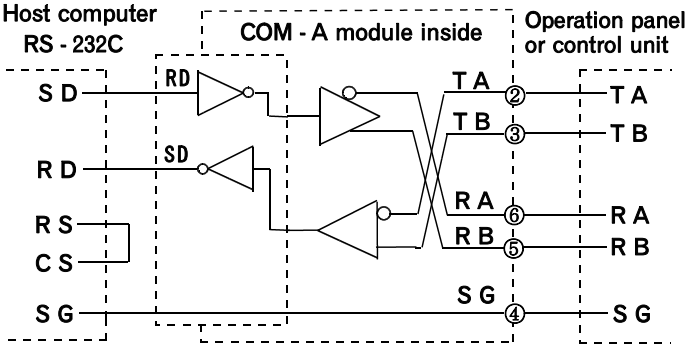
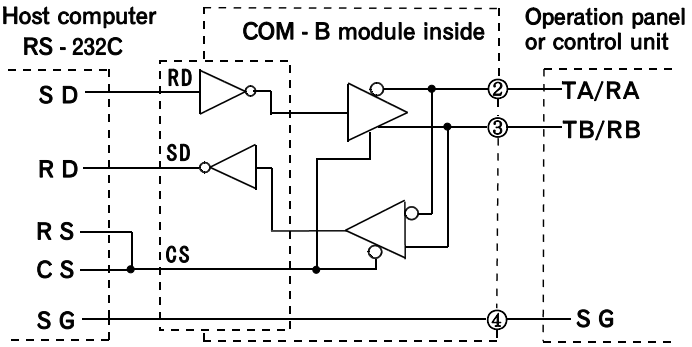


· The 6P type modular connector should be used. (Model: TM4P–66P manufactured by Hirose Erectric Co.,Ltd.)

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



6. SPECIFICATIONS

	Item	Specifications	Note
RS-232C	Communication interface	Based on EIA standard RS - 232C	Common to COM - A and COM - B module
	Input/output circuit		
RS-422A	Communication interface	Based on EIA standard RS - 422A	COM - A module
	Input/output circuit		
RS-485	Communication interface	Based on EIA standard RS - 485	COM - B module
	Input/output circuit		
Power	Power supply	100 to 240V AC	
	Power supply voltage variation	90 to 264V AC	
	Power consumption	5 VA or less (at 264V AC)	
Others	Connector used	TM5RE3 - 66(Manufactured by HIROSE ERECTRIC CO.,LTD.)	
	Dimensions	24(W)×96(H)×100(D) mm	
	Weight	Approx. 200 g	

The first edition: DEC.1996 [IMQ00]
The third edition: FEB. 2007 [IMQ00]

RKC® RKC INSTRUMENT INC.
HEADQUARTERS: 16-6, KUGAHARA 5-CHOME, OHTA-KU TOKYO 146-8515 JAPAN
PHONE: 03-3751-9799 (+81 3 3751 9799) E-mail: info@rkcinst.co.jp
FAX: 03-3751-8585 (+81 3 3751 8585)