CHINO

Graphic Recorder
KR2S
【Wiring/Installation】

Instruction Manual

Thank you for purchasing the KR2S series graphic recorder.
Before using your new recorder, please be sure to read this instruction manual that will advise you on how to use the instrument correctly and safely and how to prevent problems.

― Request to instrumentation engineers, constructors, and sale agents ―
Make sure to deliver this instruction manual to the operator of this instrument.

― Request to the operator of this instrument ―
This instruction manual is necessary for maintenance, too. Keep this manual with care until the instrument is discarded.

CHINO

PREFACE

Thank you for purchasing the KR2S series graphic recorder.
Before using your new recorder, please be sure to read this instruction manual that will advise you on how to use the instrument correctly and safely and how to prevent problems.

Product warranty scope

This product is warranted for one year from the date of delivery. If it is damaged during the warranty period, when used normally based on the cautions in the instruction manual labels attached to the product, etc., it will be repaired without any charge (only in Japan). In the case, we are sorry to trouble you, but please contact your dealer or nearest our sales office.
However, in cases of the followings, it will be repaired at your expense even during warranty period.

1. Failure or damage caused by improper use or connection, or invalid repair or modification.
2. Failure or damage caused by fire, earthquake, wind or flood, thunderbolt, or other extraordinary natural phenomena, or pollution, salt, harmful gas, abnormal voltage, or use of unspecified power.
3. Replacement of parts or accessories that have reached the end of their life.

Furthermore, the term 'warranty' in this sense covers only a CHINO's product itself. Therefore, we are not responsible for compensation for whatever the damage that is triggered by failure of our product.

Important notes for users

1. No part of this manual can be reproduced or copied in any form without permission.
2. The contents of this manual may be altered without prior notice.
3. This manual has been documented by making assurance doubly sure.
   However, if any question arises or if any error, an omission, or other deficiencies are found, please contact your nearest CHINO's sales office.
4. CHINO is not responsible for any operation results of this software.

Attention while unpacking

1. Do not drop the recorder while taking it out of the box.
2. When transporting this recorder, pack the instrument in the original box and then put it with cushions in another box. We recommend keeping the original box for transport.
3. When not using the recorder for a while after taking it from the panel, put the recorder in the original box and store at room temperature and in a dust free atmosphere.

- All company names and product names in this manual are trademarks or registered trademarks of their respective companies.
- Please note that the marks "TM" and "®" are omitted throughout this manual.

Disposal

■ Disposal

Separate the box, plastic bags, and cushioning materials the recorder is packaged in according to the garbage collection method of the each community, and please cooperates to recycle.

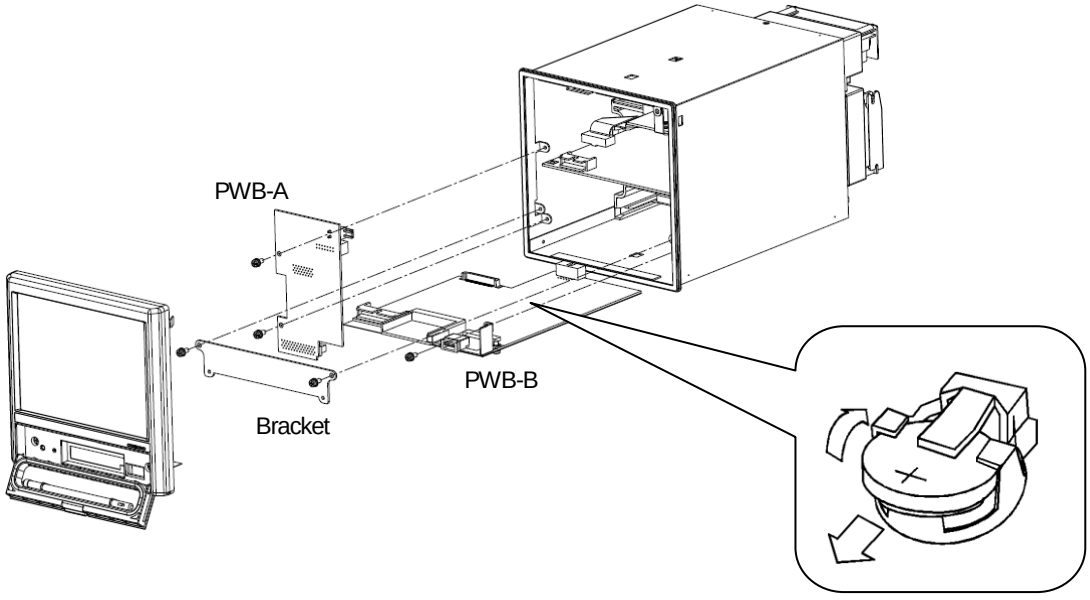
Warning	· A small amount of hazardous substance below the specified level with RoHS directive is included in this recorder. · When disposing the recorder always request a professional to do it or dispose it in accordance with local regulations. · This recorder includes a lithium battery. When disposing the lithium battery, first remove the battery and always request a professional to do it.

Caution	Perchlorate Material This instrument uses battery with Perchlorate Material. Special handling may apply, see http://www.dtsc.ca.gov/hazardouswaste/perchlorate

■ Battery removal method

Do not replace the battery. Doing so might cause damage or malfunction. Do not remove the battery, except when disposing the recorder.

(1) Open the cover and remove the 2 retaining screws.
(2) Pull the bottom of the front display panel toward you and lift up to remove the front display.
(3) The front display is connected to PWB-B by 1 type of cable. Disconnect it.
(4) Remove the 2 retaining screws holding PWB bracing and pull it out.
(5) Remove the 2 screws holding PWB-A, and pull it toward you.
(6) Remove the 1 screws holding PWB-B, and pulls it toward you.
(7) The battery holder is attached to the underside of PWB-B. Lift the front of the battery with a tool having a nonconductive tip and pull the battery out of the holder.



■ Disposal of this recorder

This section describes disposal method of this recorder subjected to the condition stated in Directive on Waste Electrical and Electronic Equipment (hereinafter referred to as WEEE) [2002/96/EC]. This directive is valid only in European Union.

● Marking

This recorder is governed and constructed by WEEE [2002/96/EC] marking requirement. Attached label indicates that this electrical and electric equipment must not dispose as general household waste.

● Product category

With the reference to the equipment types in WEEE [2002/96/EC] ANNEX I, this recorder is classified as a "Monitoring and control instruments". Do not dispose as general household waste.
When disposing discarded recorder, please contact local CHINO sales agent.

Table of Contents

1 For safe use

This section “For safe use” has been compiled to promote the correct use of the instrument in order to prevent human injury or damage to property before they occur. If this instrument is used other than description of this document, protection provided by the instrument may be vitiated. Please read the following information carefully and be sure to observe the warnings and cautions in it.

1-1 Preconditions for use

This instrument is a component type general product to be mounted on an indoor instrumentation panel. Do not use this instrument in different situations.
Before using this instrument, ensure the system safety by taking appropriate measures such as fail-safe designing and periodic maintenance for the equipment to which this instrument is installed. Connection, adjustment or operation of this instrument should be performed by a professional engineer with knowledge of instrumentation.
Also, a person who handles this instrument should read this instruction manual to fully understand the cautions and basic operations.

1-2 Labels on this instrument

The following labels are used for safe use.

Label	Name	Meaning
	Alert symbol mark	Indicates the location which should refer to the manual in order to prevent an electric shock and injury.
	Protective conductor terminal	A terminal is provided for connection to the protective conductor of the power supply facility for the prevention of an electric shock.

1-3 Symbols in this manual

The cautions to be observed for preventing the damage of this instrument and unexpected accidents are sorted by the following symbols according to their importance degrees for enabling operators to use this instrument safely.

Warning	**The nonobservance of information under this symbol may result in hazardous, critical or serious injury to the user.**

Caution	**The nonobservance of information under this symbol may result in a hazardous situation or a light injury to the user or in physical damage to the property.**

Remarks	This symbol shows a caution when the instrument dose not function as specified or when such a possibility exists.

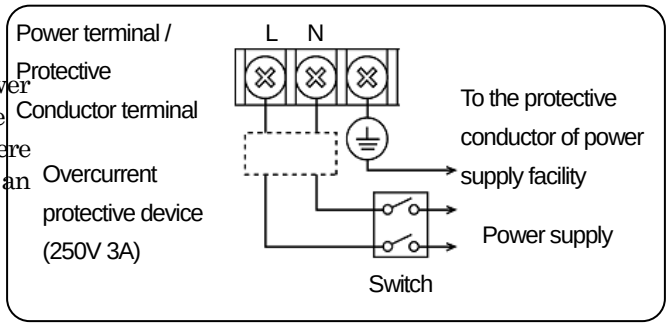
Reference	This reference servers as a supplement for handling and operation, and it may be convenient for the user.

Warning

This paragraph covers important warning for safety to be observed before reading the instructions. Fully understand the following warning before reading this manual. These warnings are important for preventing the damage to human bodies as well as accidents.

◆ Switch and overcurrent protective device

This recorder is not provided with a replaceable overcurrent protective device. Prepare a switch and an overcurrent protective device for the power supply (circuit breakers, circuit protectors or the like) within 3m of this recorder in a location where the operator can access easily Use a switch and an overcurrent protective device conforming to IEC947-1 and IEC947-3.

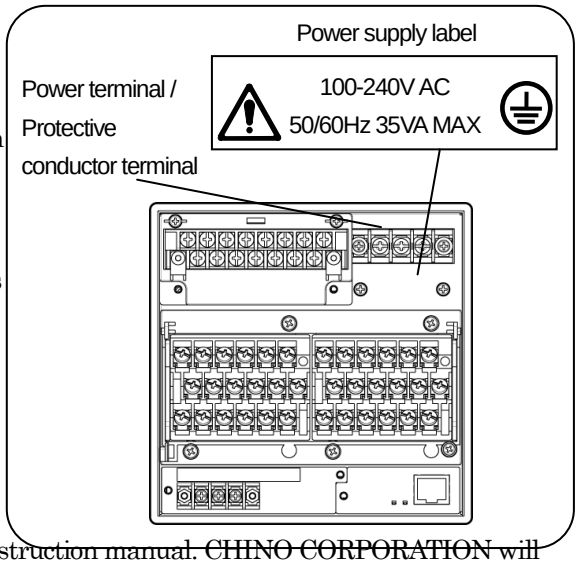


◆ Be sure to ground this instrument

Before turning the power on, connect the protective conductor terminal of this recorder to the protective conductor of the power supply facility. In order to prevent an accident by electric shock, do not disconnect this connection during operations.

◆ Before turning on the power supply

In order to ensure safety, before turning on the external power switch, make sure that the power voltage is within the range indicated on the power supply label.



◆ Don't repair or modify this instrument

Make sure that any persons other than service engineers approved by CHINO CORPORATION do not repair or modify this instrument by replacing parts. Otherwise it may be damaged or will not function normally or an accident such as electric shock may occur. For ordinary operation, it is not necessary to pull out the internal unit.

◆ Use this recorder following this instruction manual

Use this recorder correctly and safely by following this instruction manual. CHINO CORPORATION will not be responsible for any injury, damage, lost profit or any other claim, which may result from its wrong use.

◆ Installing the safety device

Regarding the use of devices that anticipates a big loss due to failure of this instrument, always install a safety device for preventing these losses and implement fail safe design in the final instrumentation. Do not use this instrument in important in facilities related to, human life, atomic energy, aviation and space.

◆ Turn off the power supply if an abnormal symptom occurs

Turn off the power supply immediately and contact your local CHINO's sales agent if any abnormal odor, noise or any smoke occurs, or if this recorder becomes high temperature that is too hot to be touched.

Remarks	■Fuse in the power supply The following fuse is mounted in the power supply unit of this recorder for safety use. However, this fuse is not replaceable. Maker: Nippon Seisen Co., Ltd Model: SLT 250V 2.5A

2 Before use

Check the following items before using the recorder. If something is wrong, contact your local CHINO's sales agent.

2-1 Exterior check

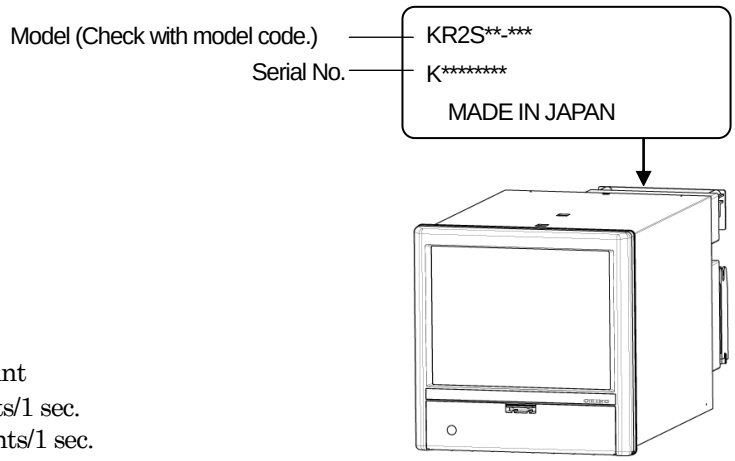
Check that the instrument is not broken on the outer side.

2-2 Model check

The model number and serial number of this recorder can be confirmed by the label on the upper side of the case.
Check the model of your instrument from the model code before use.

■ Model code

KR2S□□-□□□



Measurement point
- 6: Input 6 points/1 sec.
- 2: Input 12 points/1 sec.

Input type
- P: Universal input
  (voltage, thermocouple, resistance thermometer input, 1kV insulation between channels)

Communication interface (option)
- N: None
- E: Ethernet
- R: Low/high order communications (RS-485)
- G: Ethernet + low/high order communications (RS-485)

Alarm output, Contact input (option)
- 0: None
- 2: Mechanical relay output (4 points 'c' contact)
- 7: No-voltage contact input (4 points)
- 8: Mechanical relay output (2 points 'c' contact) + No-voltage contact input (2 points)

Installation type
- A: Device mounting (panel mounting type)
- T: Portable type (grip and rubber feet attached)

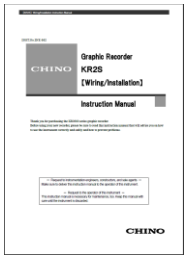
*If the recording cycle is set less than 0.5 seconds (0.1 to 0.5 seconds), input channel point becomes 4 points automatically.

2-3 Checking attachments

Package contains the following attachments. Please confirm.

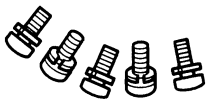
Parts name	Quantity	Remarks
Instruction manual	1	INE-861□(General) CD-ROM INE-863□(Communication interface)
	(1 copy)	INE-862□(Wiring/Installation) A4 Booklet
	1	RZMC-01-□(CF card)
Mounting bracket	2	For panel mounting
Terminal screw	5	M3.5 for measuring input terminals (Spares for missing)
CF card	1	RZ-CMC256(256MB)

①Instruction manual



②Mounting bracket

③Terminal screws



④CF card

3 Installation

Caution Make sure to read and understand this instruction manual to prevent any accident.

3-1 Mounting location

In order to avoid unfavorable effects on the measurement accuracy and recording operation, install this recorder at the following locations.

1. Industrial environment

Select a place away from a source generating an electric field and/or a magnetic field and where mechanical vibrations/shock is not existed.

- ●Over voltage category..... II (EN standard)
- ●Pollution degree ..... 2 (EN standard)
- ●Altitude ..... 2000m or less
- ●Place of use ..... Indoor

2. Ambient temperature/humidity

Keep away from direct sunlight and do not close an area around this recorder to avoid temperature increase.

- ●Place with stable ambient temperature of around 23°C and humidity 50%RH
- ●Place not exposed to hot blast (50°C or more) for avoiding deformation of the front panel
- ●Place where there are no wind and no heat source near terminals for avoiding measurement errors.

3. Atmosphere

- ●Avoid a place where flammable gases exist.
- ●Avoid a place with dust, smoke, vapors, etc.

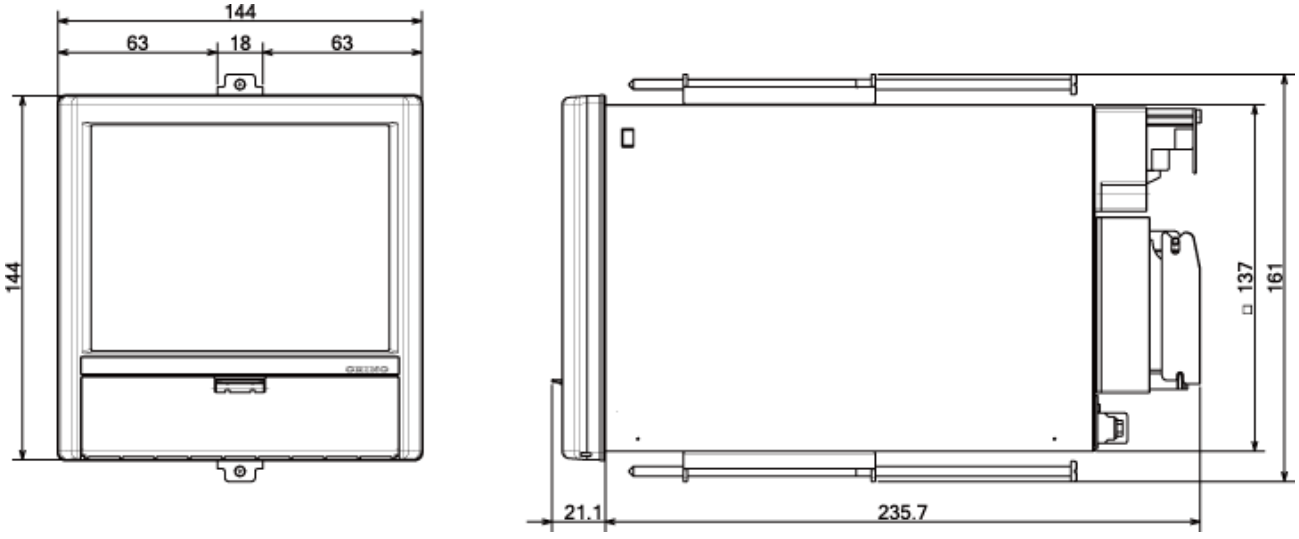
4. Mounting angle

- ●Lateral tilting ……0°
- ●Longitudinal tilting ……Forward tilting: 0°, Backward tilting: 0-20°

Mounting angle other than the above angles will have unfavorable effects on recording operation.

3-2 External dimensions

The following figure shows the dimensions of this recorder with its mounting brackets.



Unit : mm

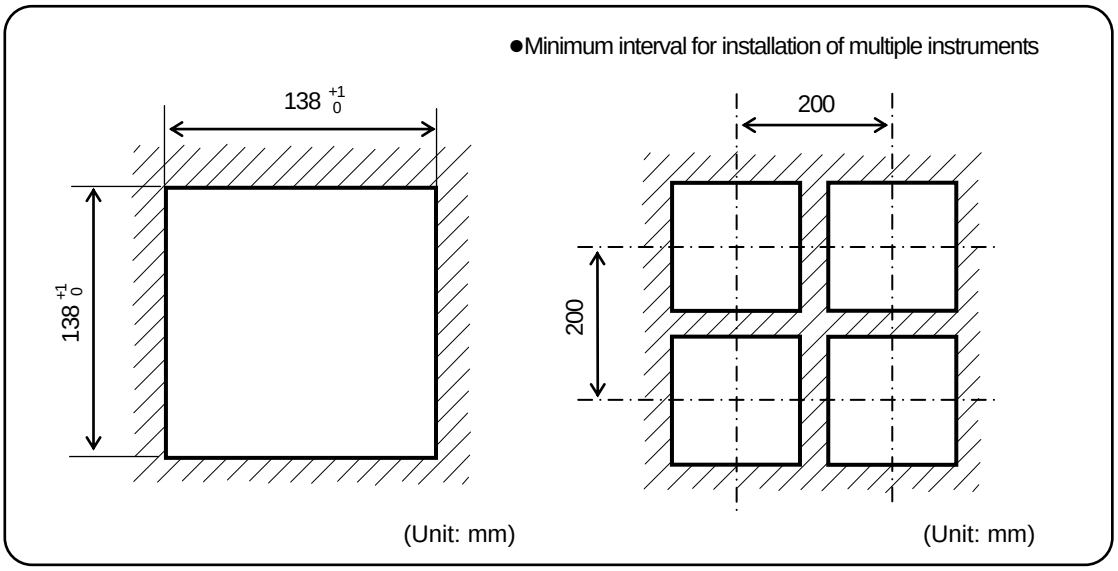
3-3 Method of mounting the panel

Caution

Mount on the panel and use

- This instrument has been designed to be mounted on an indoor instrumentation panel.
- Use a panel made of a steel plate of 2mm to 6mm in thickness or a panel equivalent in strength. Please consider the instrument's dimensions and its weight when you select the panel thickness along with the panel structure.

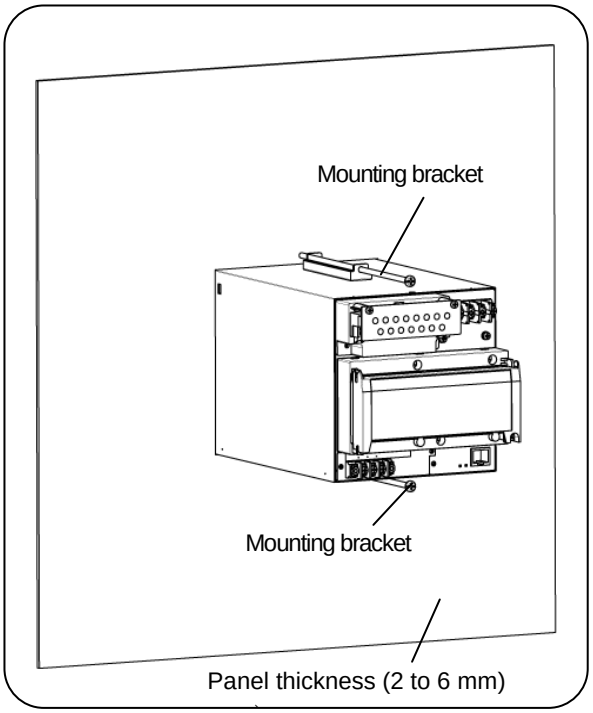
1. Panel cutout size



2. Mounting method

(1) Insert this recorder into the panel cutout from the front of the panel.

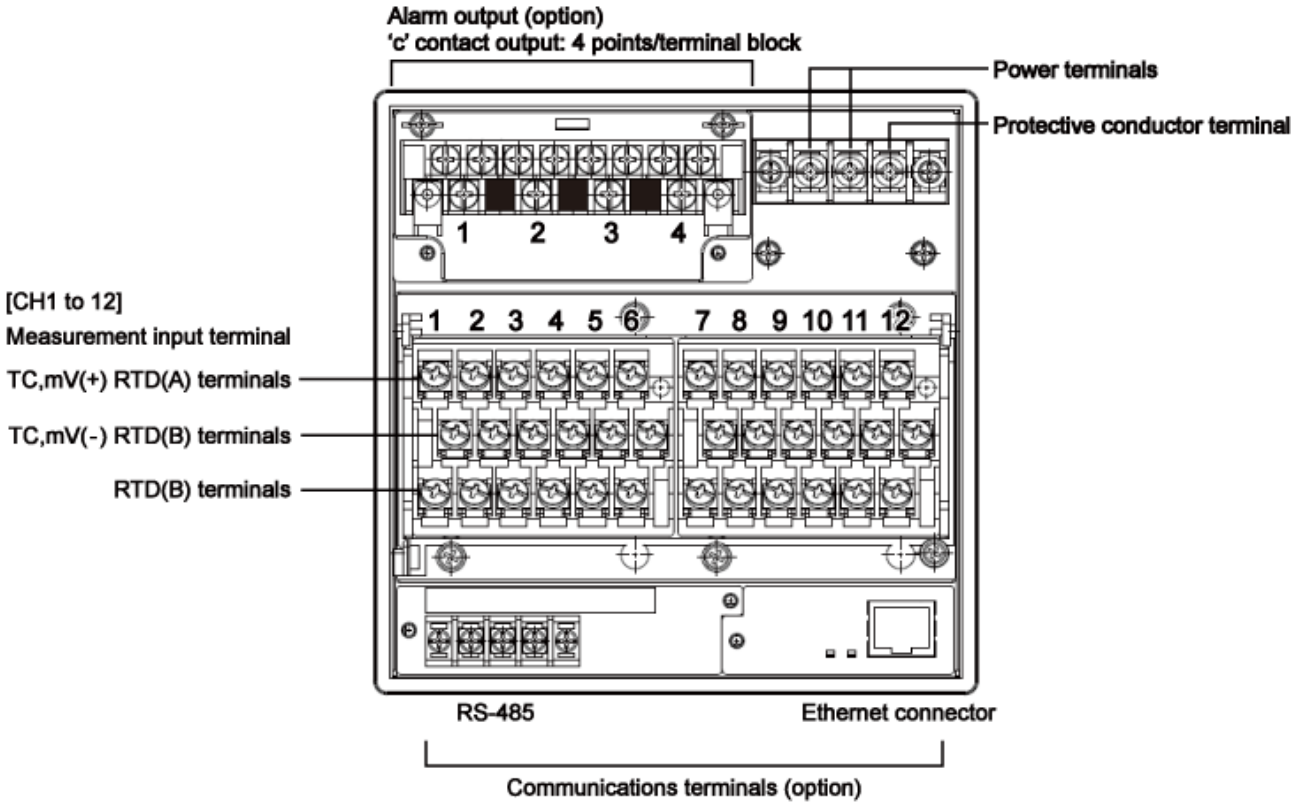
(2) Insert the mounting brackets into the holes of the top and bottom sides, and fix them with screws using a Phillips screwdriver. Set the tightening torque on screws to 1.0 N・m (when using Phillips-head screwdriver).



4 Connections

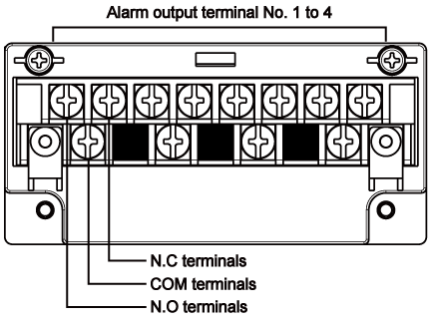
4-1 Terminal board arrangement

The following diagram shows the terminal board arrangements in which option (Mechanical relay output [4 points 'c' contact], communication interface) are mounted.

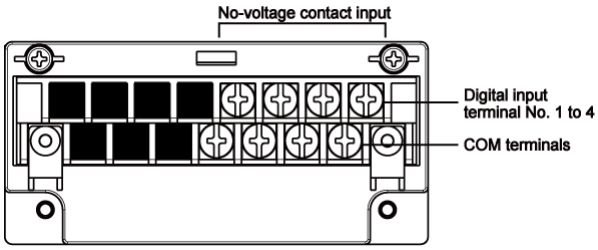


[Option terminal block]

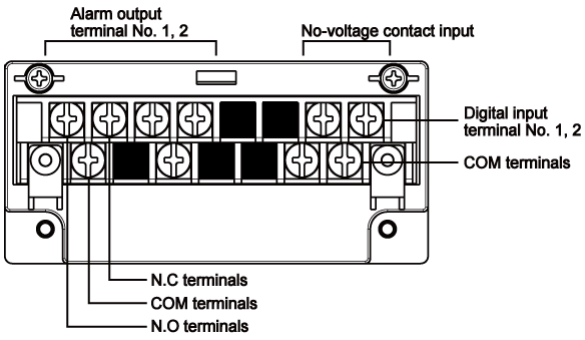
- Alarm relay output (4 points 'c' contact)



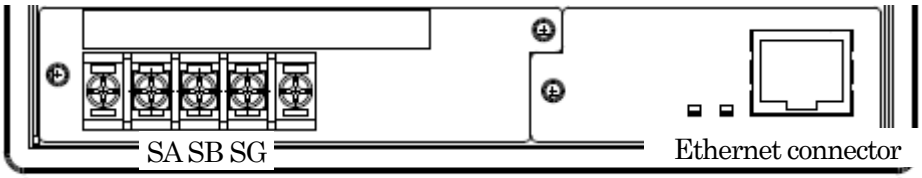
- Digital input (No-voltage contact input,4 points)



- Alarm relay output (2 points 'c' contact) + Digital input (No-voltage contact input, 2 points)



- Communication terminals



Warning

Alert symbol marks (⚠) and places
The alert mark ⚠ is pasted at danger places where may causes electric shock. (See the following table).

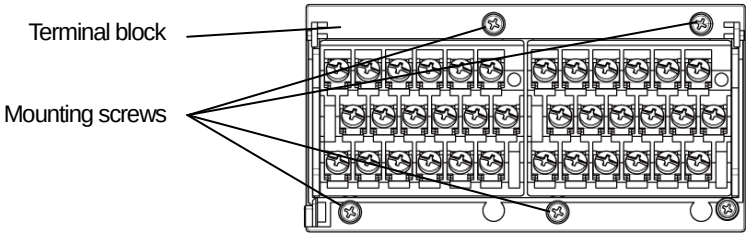
Name of terminals	Places marked with the symbol
Power terminals	Lower left of power terminals
Measurement input terminals	Upper left of terminal cover
Mechanical relay 'c' contact alarm terminals	Lower left of terminal cover

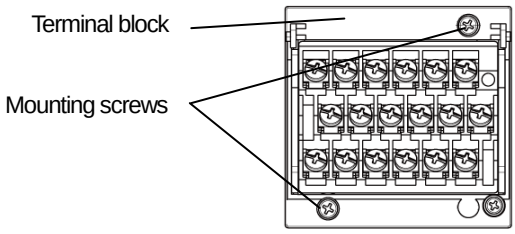
Reference

■ Input terminal block is removable

The input terminal block is removable for easy connections.

(1) Each terminal block can be removed by removing mounting screws.
(2) Each terminal block is connected to the recorder by a connector.





Caution

Turn off the power supply in advance
For mounting or dismounting the terminal block, turn off the external power switch to prevent the electric circuits from being damaged.

Remarks

■Replacement of thermocouple input terminal block
Thermocouple input terminal block cannot be replaced by terminal block of other instrument.
If replaced measurement error occurs.

4-2 Precautions while connections

Observe the following cautions during connections for securing safety and reliability.

4-2-1 Power supply

Use a single-phase power supply having a stable voltage without any waveform distortion for the purpose of preventing wrong operations.

⚠Warning

- **A switch and an overcurrent protective device**
  Prepare a switch and an overcurrent protective device (3A) to the power supply for preventing an electric shock accident during connection work. This recorder is not provided with any replaceable fuse.

- **Turn off the power supply before connections**
  Be sure to turn OFF the power supply before connecting cables to the power and the input/output terminals to prevent an electric shock.

4-2-2 Keep the input/output connections away from a high voltage power circuit

Don't place the input/output cables close or in parallel with any strong power circuits including power line. Place the cables 50 cm or more away from high voltage power circuits when they are placed close or in parallel to other circuits.

4-2-3 Keep the thermocouple input away from a heat source

For thermocouple inputs, keep the input terminals away from a heat source (a heating body) to reduce a reference junction compensation error.
Don't expose the input terminals to direct sunlight, etc.

4-2-4 Keep all connection cables away from noises

Keep all connection cables away from noise source as far as possible, otherwise unexpected malfunction may occur. Provide a solution if the cables cannot be separated from a noise source due to unavoidable circumstances.

Major noise sources	Counter measures
●Electromagnetic switch, etc. ●Power line having waveform distortion ●Inverter ●Thyristor regulator	Insert noise filters between power terminals and input/output terminals. A CR filter is often used.

4-2-5 Use crimp style terminals

Fix crimp style terminals to termination of connection cables for preventing the looseness or disconnection of terminals and a short-circuit failure between terminals.
Use the crimp style terminals with insulation sleeve for preventing an electric shock.

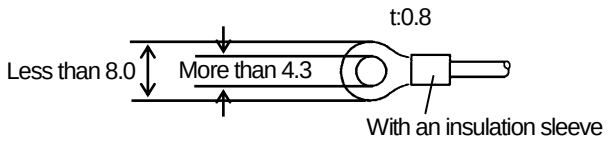
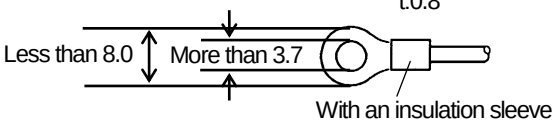
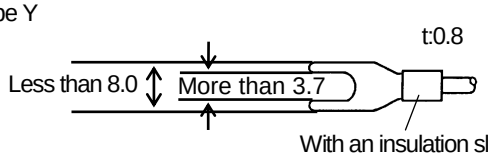
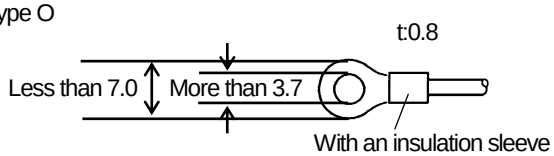
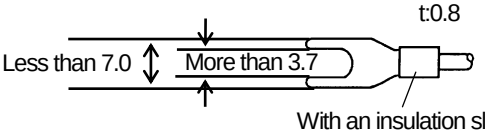
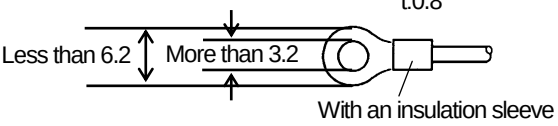
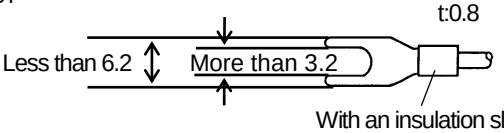
4-2-6 Unused terminals

Don't use any unused terminals for relaying; otherwise the electric circuits may be damaged.

Warning

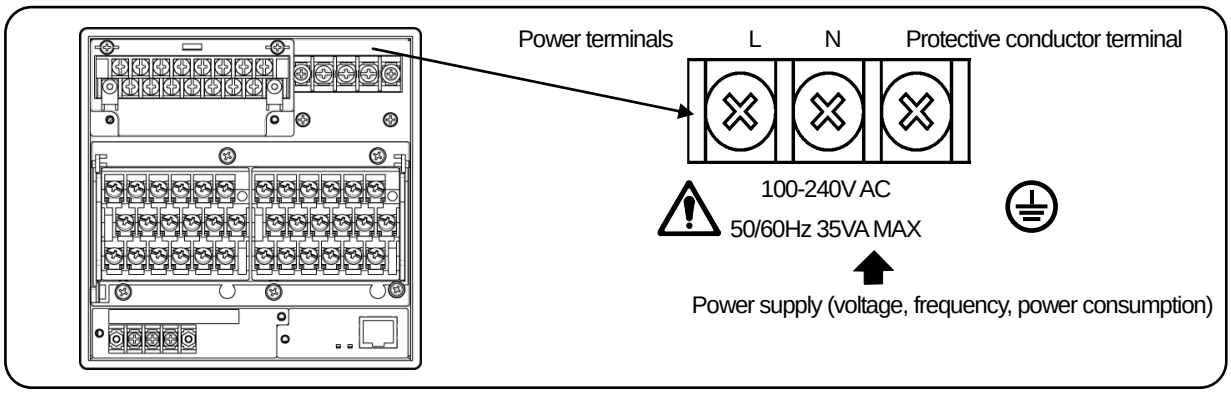
■Secure the connected cables properly.
Secure the connected cables so as not to allow them to be hooked by a person or a substance, otherwise the connections may be cut and disrupted that may cause an electric shock or other accidents.

Kinds of terminals and termination

Terminal name	Screw diameter	Tightening torque	Termination (Unit: mm)
Power and protective conductor and communication terminal	M4	1.2N·m	Type O 
Input terminal	M3.5	0.8N·m	Type O  Type Y  *Use Type O whenever possible.
Alarm relay output, non-voltage contact input terminal	M3.5	0.8N·m	Type O  Type Y  *Use Type O whenever possible.
Communication terminal	M3	0.5N·m	Type O  Type Y  *Use Type O whenever possible.

4-3 Connection of power and protective conductor terminals

4-3-1 Power and protective conductor terminals



Warning

Turn off the power supply
Be sure to turn off the power supply before connecting the cable to the power supply and protective conductor terminals to prevent an electric shock.

4-3-2 Connection of power terminals

For connection to the power terminals, use a 600 V PVC insulated cable terminated by the crimp style terminals with insulation sleeve.Note) Use the cords approved by the following standards.
(1) IEC 227-3
(2) ANSI/UL817
(3) CSA C22.2 No.21/49

4-3-3 Connection of protective conductor terminal

Be sure to connect this terminal to the protective conductor of the power supply facility. For this connection, use a cable terminated by the crimp style terminals with insulation sleeve.
・Grounding wire: Copper wire 2 mm^2 or more (green/yellow)

Warning

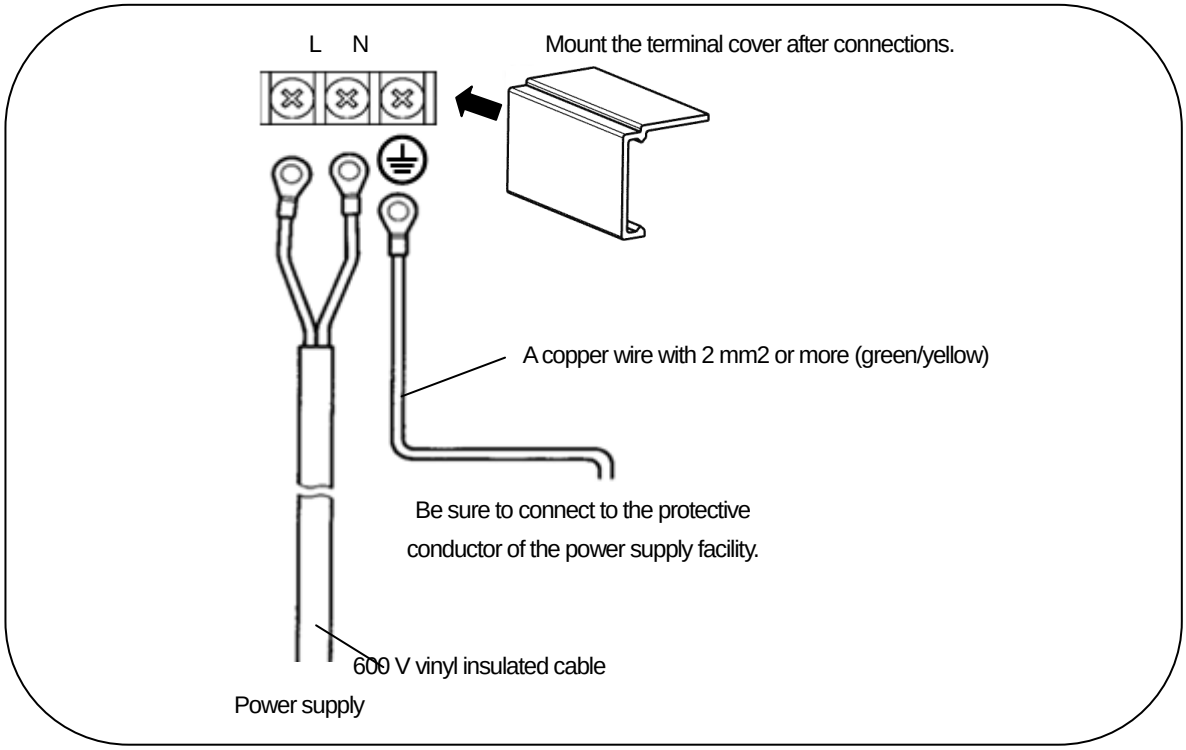
⚠ mark at power terminals
A voltage of 100 to 240 V AC is applied to the power terminals after connection. Be sure to mount the power terminal cover to prevent an electric shock.

Caution

Be careful with the power voltage and noise
The power voltage of this instrument is indicated beside the power terminals.
Don't apply any voltage other than indicated; otherwise a malfunction may result.
If noise is generated at the power supply, provide a noise reduction transformer, etc.

Remarks

■ L/N indication of power terminals
This indication conforms to the CSA standard, Canada. The live side of the single-phase AC power supply is indicated as L, and the neutral side is indicated as N. Observe the L and N connections for obtaining satisfactory performance.


L N
Mount the terminal cover after connections.
A copper wire with 2 mm2 or more (green/yellow)
Be sure to connect to the protective
conductor of the power supply facility.
600 V vinyl insulated cable
Power supply

4-4 Connection of measuring input terminals

4-4-1 Measuring input terminals

Be sure to turn off the power supply to prevent an electric shock.
For the connections to the input terminals, use cables terminated by the crimp style terminals with insulation sleeve.

Caution

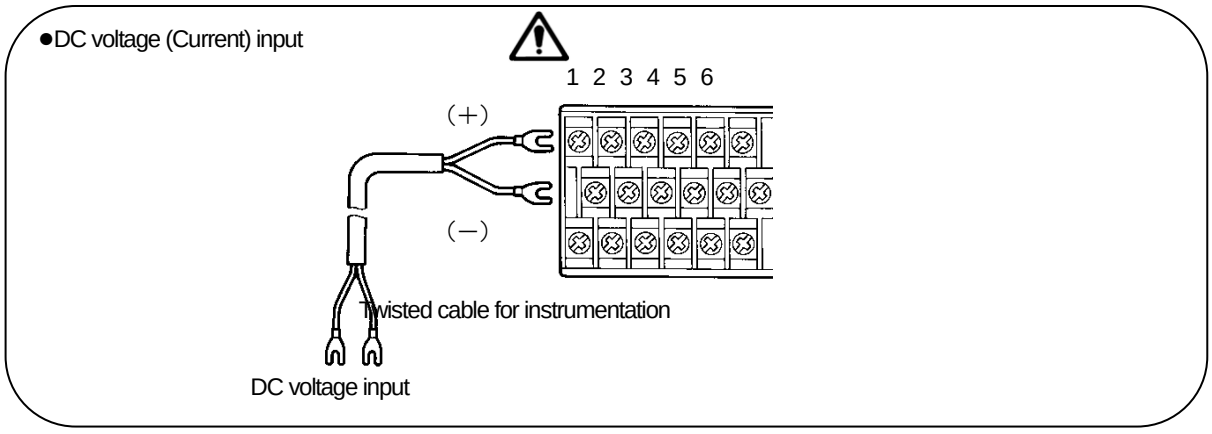
Allowable input voltage

Input type	Allowable input voltage
Voltage, thermocouple input	± 10VDC*
Resistance thermometer input	± 6VDC

*** ± 6 VDC with channel settings to the ± 5 V or higher range.**

4-4-2 Connections of DC voltage (current) input

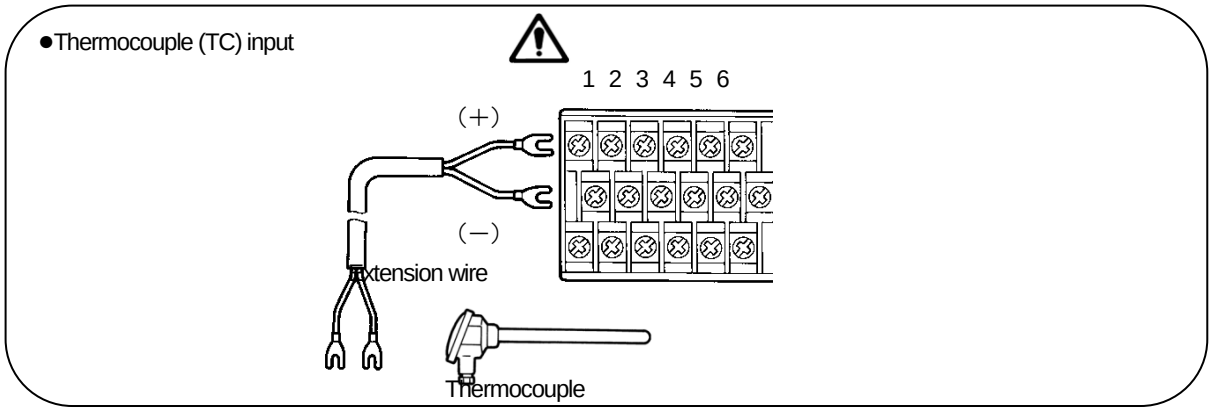
Use twisted cables for instrumentation as the input cables for the purpose of suppressing noises.
For current inputs, mount shunt resistors to the channels to be measured before connections.



Remarks	■ Isolation of measured input terminal TC, mV(+), RTD(A) terminal and TC, mV(-), RTD(B) terminal are insulated each channels but RTD(B) terminal is short-circuited between channels.

4-4-3 Connection of thermocouple (TC) inputs

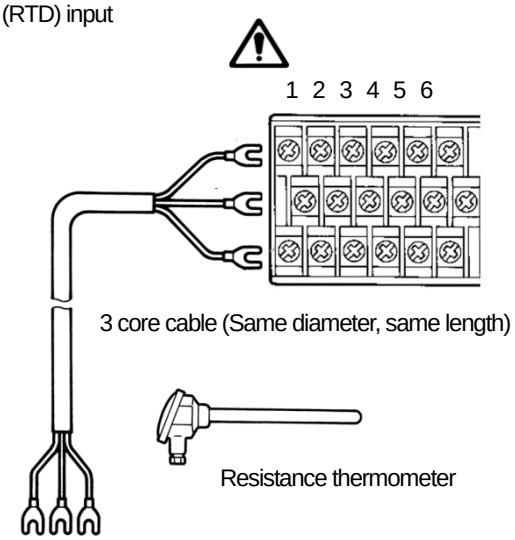
Be sure to use thermocouple wires (or extension wires) to the input terminals of this recorder. If a copper wire is used halfway, a noticeable measuring error occurs. Don't use a pair of thermocouple wires in parallel with other instruments (controller, etc.), otherwise a malfunction may occur.



4-4-4 Connection of resistance thermometer (RTD) input

Use a 3-core cable where each lead wire has an equal resistance value. Don't use one resistance thermometer in parallel with other instruments (controller, etc.).

●Resistance thermometer (RTD) input



*The resistance of each cable is less than 10 Ω. All the 3 wires should be of the same resistance value.

Warning

⚠ mark of measuring input terminals

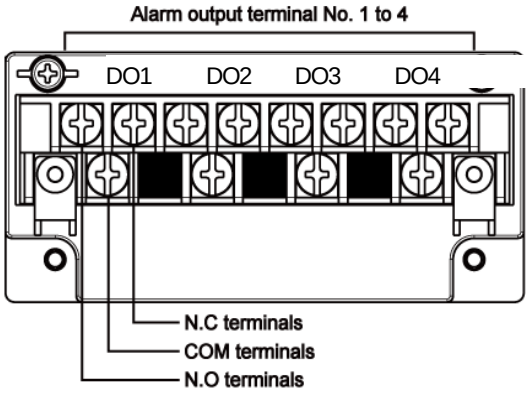
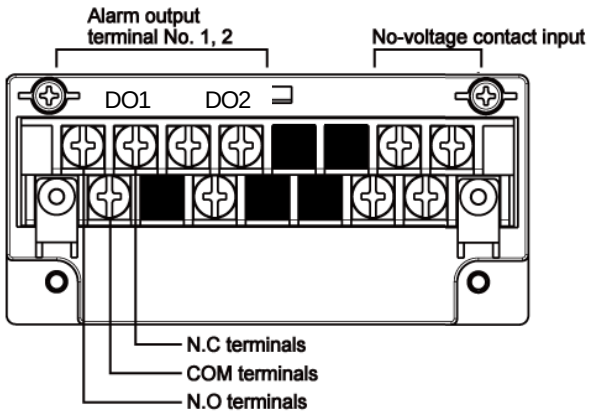
A high voltage may be applied to the measuring input terminals due to common mode noises. The allowable noise value is lower than 30 VAC or lower than 60 VDC. Make sure that the noises are lower than the allowable values. Mount the terminal cover after connections for the purpose of preventing an electric shock and to protect the input wires. In the case of thermocouple input, the mounting of the terminal cover can reduce the reference junction compensation error.

4-5 Connection of alarm output terminals (option)

This is for the recorder with alarm output terminals (option).

4-5-1 Alarm output terminal

The terminal arrangement depends upon the type of alarm output.

Alarm relay output 4 points ('c' contact)

Alarm relay output 2 points ('c' contact)


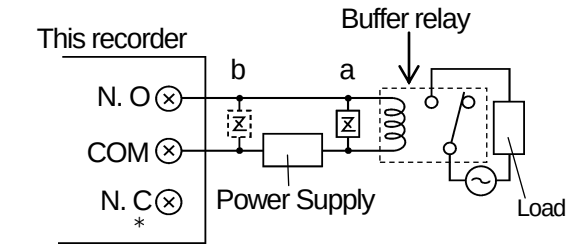
4-5-2 Connections

Turn off the power supply and buffer relay power supply before connections to prevent an electric shock.

(1) Connect cables to the load via a buffer relay.

(2) Use cables with the crimp style terminals with insulation sleeves for the alarm output terminals. Only one crimp style terminal is allowed to connect to the terminal.

Example of mechanical relay 'c' contact outputs



: Contact protective element (It is recommended to mount this element on the a side)

*N.C terminal - Open relay contact at alarm activation that is the reverse action to N.O terminal.

Warning

⚠ mark of alarm output terminals

Connect a load not exceeding the specified contact capacity to the alarm output terminals. If the voltage more than 30VAC/60VDC is to be applied to the alarm output terminal, use type O crimp style terminal with an insulation sleeve to connect double-insulated wires (dielectric strength of 2300 VAC or more) for the signal wires and for the other signal wire use basic insulated wires (dielectric strength of 1390 VAC), If the voltage more than 30VAC/60VDC is to be applied to either alarm output terminal of channel, use double-insulated wires or reinforced insulation for external circuit of all the channels. A buffer relay power supply is applied to the alarm output terminals after connections. Do not touch these terminals since an electric shock will occur. Be sure to mount the terminal cover after connections.

Caution

Take a safety measure.

An alarm output of this recorder may become defective caused by wrong operation, failures, and other abnormal inputs.

Take a safety measure against an output failure before use as occasion calls.

4-5-3 Precautions for connection

Be careful with the following cautions for connections.

<table>
<tr><th>Item</th><th>Contents</th></tr>
<tr><td>Contact rating of Mechanical relay outputs ('c' contact)</td><td>
<table>
<tr><th>Power supply</th><th>Resistive load</th><th>Inductive load</th></tr>
<tr><td>100V AC</td><td>3A</td><td>1.5A</td></tr>
<tr><td>240V AC</td><td>3A</td><td>1.5A</td></tr>
<tr><td>30V DC</td><td>3A</td><td>1.5A</td></tr>
</table>
(Minimum load)
100mA 5VDC
</td></tr>
<tr><td>Mounting of contact protective element Z</td><td>●Mount a contact protective element conforming to the buffer relay. The relay is broken, if a signal exceeding the contact rating is applied even if momentarily.
●To prevent a malfunction being caused by a light load, the most effective mounting position for the element is on the coil side of the buffer relay (refer to "4-5-2 Connection" example of mechanical relay 'c' contact outputs diagrams)</td></tr>
<tr><td>Selection of buffer relay</td><td>(1) Coil rating.....Less than the contact rating of output terminals
(2) Contact rating ...More than twice the load current

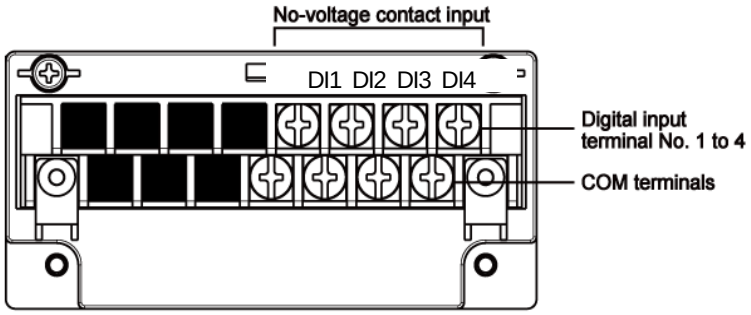
A coil surge absorption element built-in type relay is recommendable. Mount an additional buffer relay if a buffer relay satisfying the load rating is not available.</td></tr>
<tr><td>Selection of contact protective element</td><td>Mount a contact protective element if a surge absorption element built-in buffer relay is not available. This element is generally composed of C (capacitor) and R (resistor).
<Reference values of C・R> C: 0.01 μF(Rating about 1 kV)
R:100 to 150 Ω(Rating about 1 W)</td></tr>
</table>

4-6 Connection of digital input terminals and function selection (option)

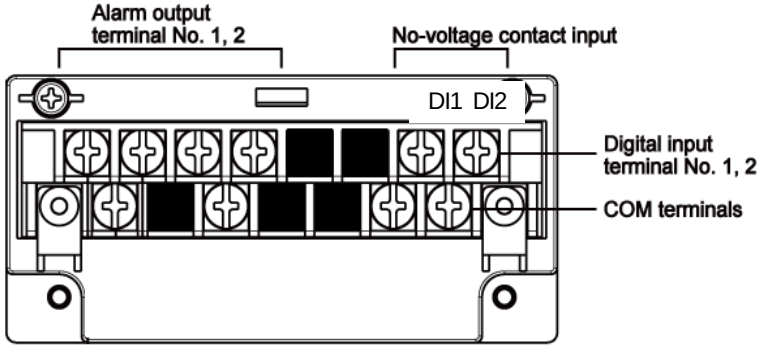
This is for the recorder with digital input terminals (option)

4-6-1 Digital input terminal

Digital input (No-voltage contact input, 4 points)



Digital input (No-voltage contact input, 2 points)



Remarks	■ Features of digital input terminal Voltage when the contact is open. : Approx. 5 V Current when the contact is short. : Approx. 2 mA

4-6-2 Connections

Turn off the power supply before connections to prevent an electric shock.
Apply a no-voltage contact signal to digital input terminals.
Use cables terminated by crimp style terminals with insulation sleeves for the digital input terminals.

⚠ Caution	No-voltage contacts For the contacts to be connected to the Digital input terminals, use a switch or relay driven at lower than 30 V AC or lower than 60 V DC, or manual contacts for very light loads.

4-6-3 Functions of terminals

Digital input ……ON/OFF (short/open) state can be measured. Select the range type as DI.
(Refer to '9-1 input operation settings'.)

Pulse input ……Used as the pulse input. Select the range type as Pulse (+) and Pulse (-).
(Refer to '9-1 input operation settings'.)

Totalizer reset ….he reset of totalizer is executed. When the digital input terminal specified becomes ON, the totalizer reset is executed.
(Refer to '9-6 Totalizer reset settings'.)

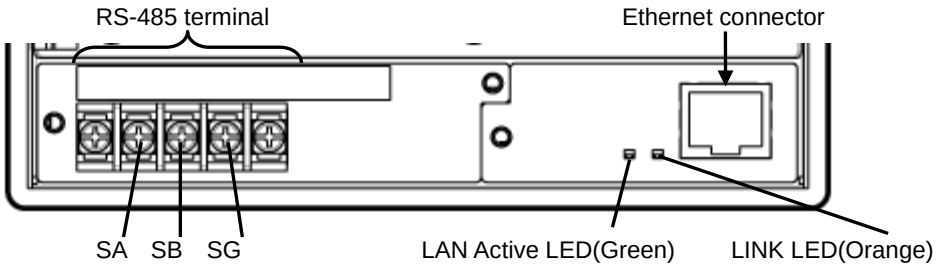
Marker ……The writing of marker. The marker can be written on the trends when the digital input terminals become ON.
(Refer to '9-8 Marker text settings'.)

File drive ……The recording start/stop of data file in the internal memory is executed. The recording starts or stops when the digital input terminals become ON or OFF.
(Refer to '9-5 File settings'.)

●Each function requires a short circuit of 0.1 second or more between the COM terminal and each terminal.

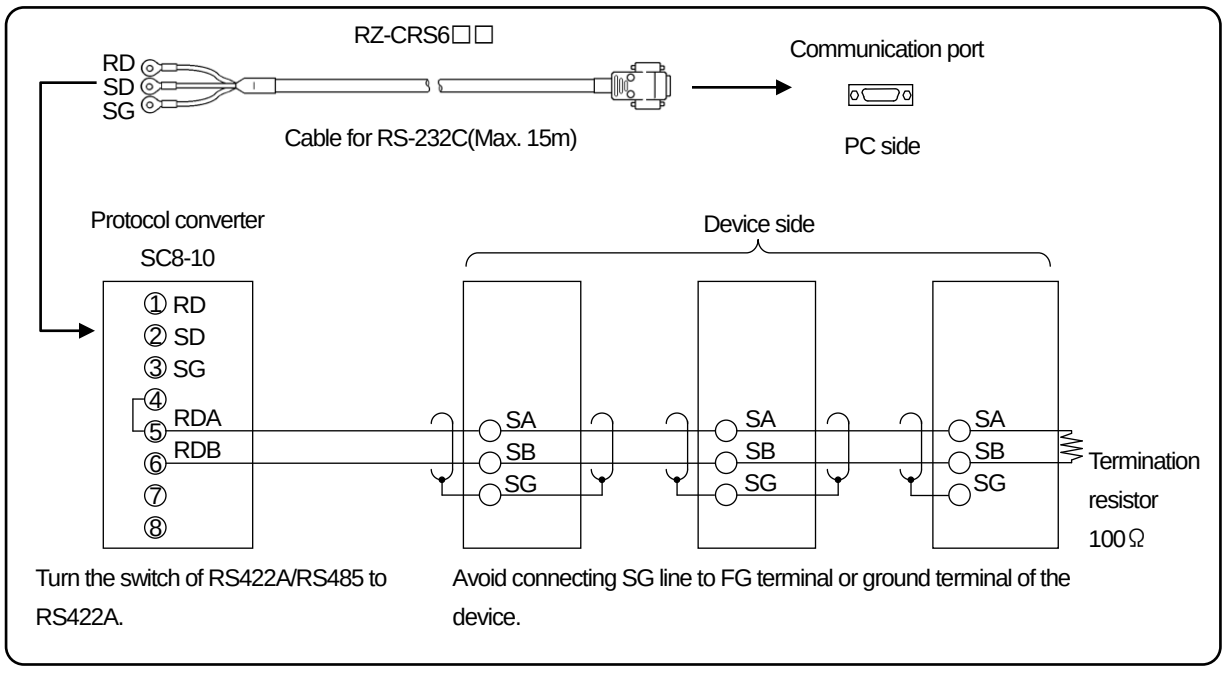
4-7 Connection of communication I/F terminal (option)

The KR can be communicated with a master unit (high order instrument) via Ethernet and RS-485, and with a slave unit (low order instrument) via RS-485.
*Ethernet and RS-485 communication function are optional.



4-7-1 Connections of High order communication RS-485

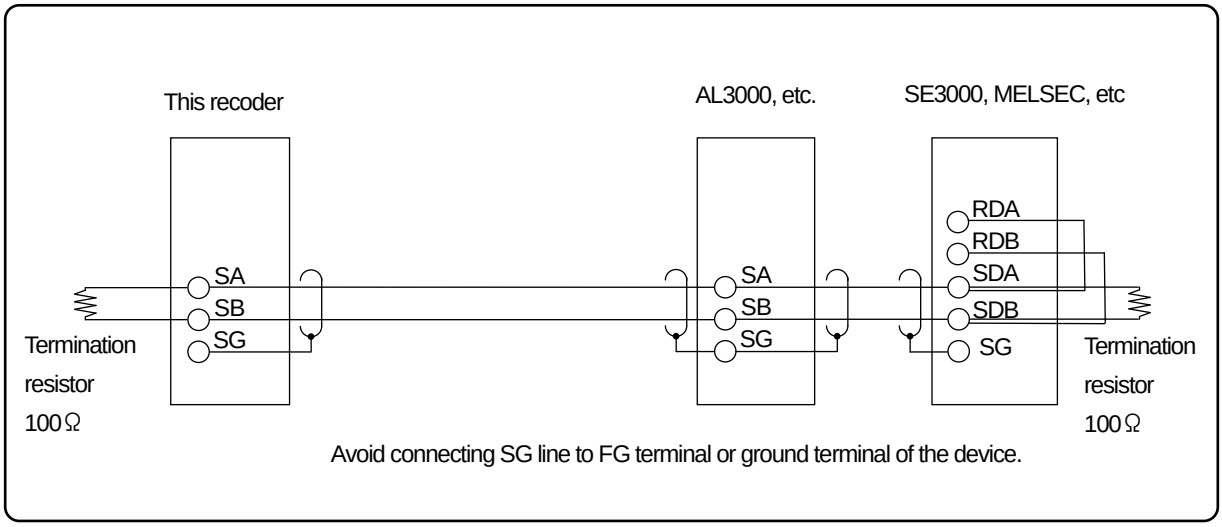
The RS-485 communications interface is connected to a personal computer via a protocol converter. Three signals of SA, SB and SG are used between the protocol converter and a personal computer and a control signal is not used. Wiring process of connector differs from how the personal computer uses the control signal hence please understand your personal computer.



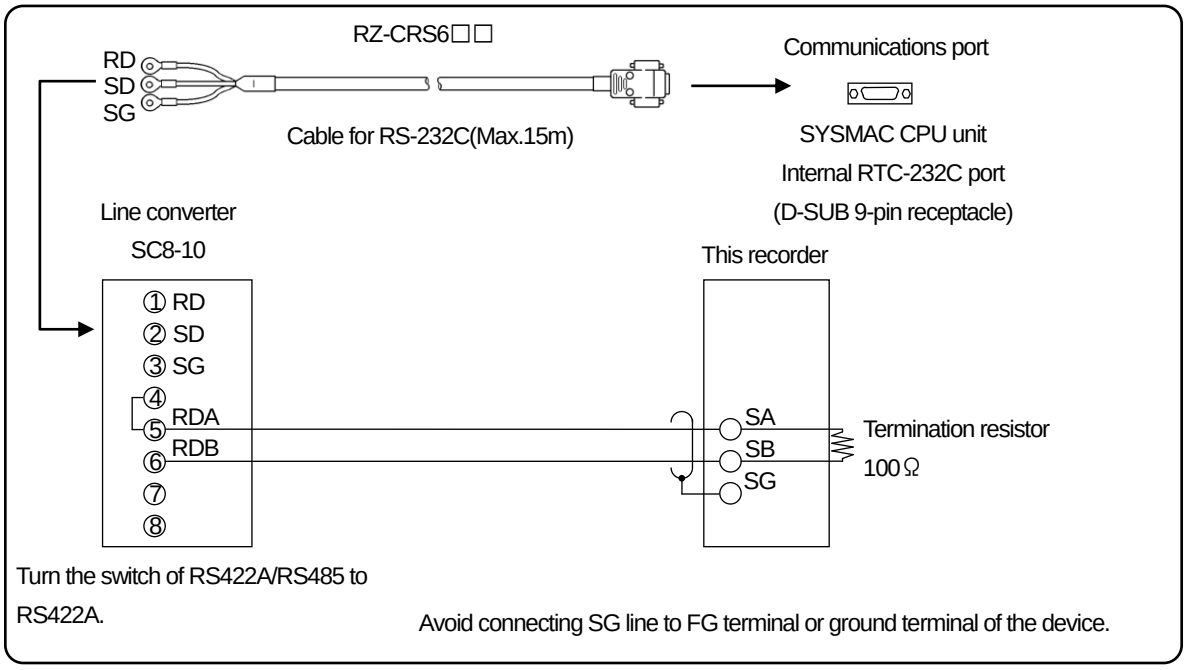
4-7-2 Connections of low order communication RS-485

Connect SA1, SB1 of KR2S and SA, SB of low order connected instrument like the following figure. Refer to instruction manual of each instrument for detail method of low order instrument connection.

Example of terminal connection 1

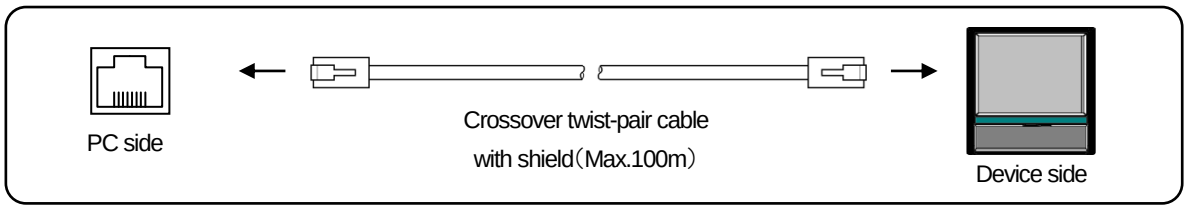


Example of terminal connection 2(SYSMAC)

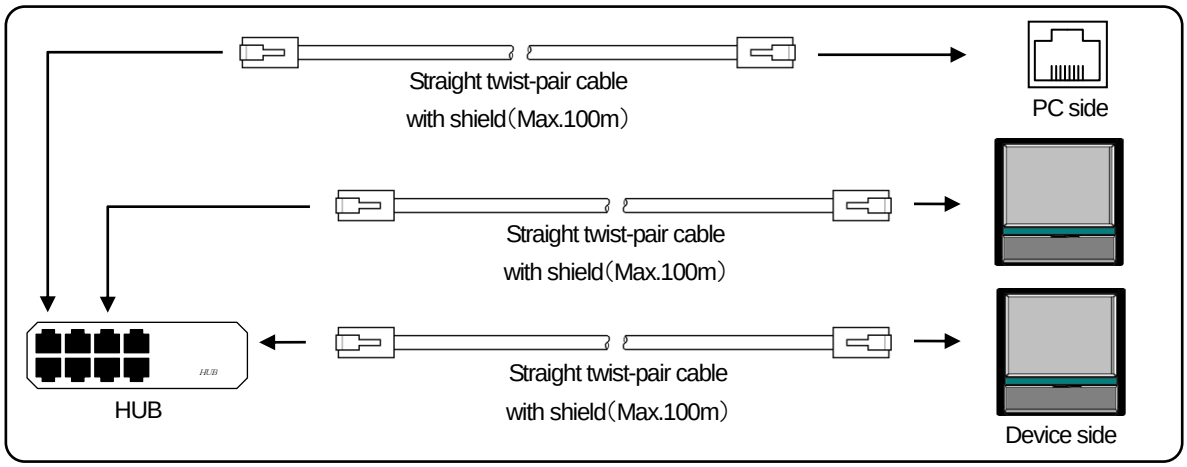


4-7-3 Ethernet wiring

① Example of connection between PC and Ethernet devices(one-to-one connection)



② Example of connection between PC and HUB/Ethernet devices(one-to-N connection)



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