

RMC-500 Installation Manual

All Rights Reserved. Copyright © 2010, RKC INSTRUMENT INC.

IMR02G01-E2

Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference.

This manual describes the mounting, wiring and specifications only. For the operations, refer to separate RMC-500 Quick Operation Manual (IMR02G03-ED) and RMC-500 Parameter List (IMR02G02-ED).

These manuals can be downloaded from the official RKC website:
http://www.rkcinst.com/english/manual_load.htm

Accessories check

RMC-500 Installation Manual (IMR02G01-E2)	1
RMC-500 Quick Operation Manual (IMR02G03-ED)	1
RMC-500 Parameter List (IMR02G02-ED)	1
Mounting brackets (with screw)	2
Ferrite core (For RMC-500 with Reference)	1
Ring core (For RMC-500 with Reference)	1
Optional (Sold separately):	
Front cover (KRB400-36)	1
Conversion cable (For B electrode: W-BK-250, For B+A electrodes: W-BK-251)	

Safety precautions



WARNING

- To prevent injury to persons, damage to instrument and equipment, a suitable external protection device shall be required.
- 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 disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

CAUTION

- This product is intended for use with industrial 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 instrument power supply, source of power and loads.
- Be sure to provide an appropriate surge control circuit respectively for the following:
 - If input/output or signal lines within the building are longer than 30 meters.
 - If input/output or signal lines leave the building, regardless the length.
- This instrument is designed for installation 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.
- All wiring must be in accordance with local codes and regulations.
- To prevent instrument damage as a result of failure, protect the power line and the input/output lines from high currents with a suitable overcurrent protection device with adequate breaking capacity such as a fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Tighten each terminal screw to the specified torque found in the manual to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for purpose of illustration.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

1. MOUNTING



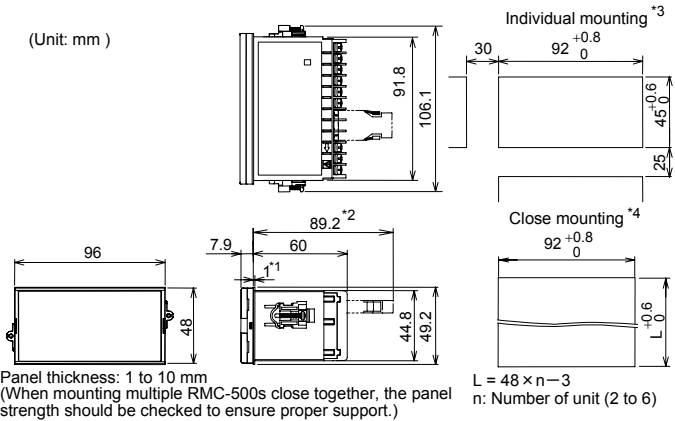
WARNING

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

1.1 Mounting Cautions

- This instrument is intended to be used under the following environmental conditions. (IEC61010-1) [OVERVOLTAGE CATEGORY II, POLLUTION DEGREE 2]
 - Use this instrument within the following environment conditions:
 - Allowable ambient temperature: -10 to +55°C
 - Allowable ambient humidity: 5 to 95% RH (Absolute humidity: MAX.W.C 29 g/m³ dry air at 101.3 kPa)
- Avoid the following conditions when selecting the mounting location:
 - 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.
 - Exposure to direct sunlight.
 - Excessive heat accumulation.
- Mount this instrument in the panel considering the following conditions:
 - Ensure at least 25 mm space on top and bottom of the instrument for maintenance and environmental reasons.
 - Do not mount this instrument directly above equipment that generates large amount of heat (heaters, transformers, semi-conductor functional devices, large-wattage resistors.)
 - If the ambient temperature rises above 55 °C, cool this instrument with a forced air fan, cooler, etc. Cooled air should not blow directly on this instrument.
 - In order to improve safety and the immunity to withstand noise, mount this instrument as far away as possible from high voltage equipment, power lines, and rotating machinery.
 - High voltage equipment: Do not mount within the same panel.
 - Power lines: Separate at least 200 mm.
 - Rotating machinery: Separate as far as possible.
- In case this instrument is connected to a supply by means of a permanent connection, a switch or circuit-breaker shall be included in the installation. This shall be in close proximity to the equipment and within easy reach of the operator. It shall be marked as the disconnecting device for the equipment.

1.2 Dimensions

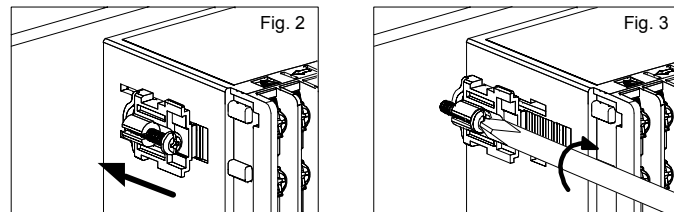


- *1 Case rubber packing
- *2 Space for connector
- *3 To keep the instrument as waterproof as possible, make sure that the panel surface has no burr or distortion where the hole is to be cut out.
- *4 Remove the case rubber packing. When the RMC-500 is mounted closely protection will be compromised and they will not meet IP66 (NEMA 4X) standards.

1.3 Procedures of Mounting and Removing

Mounting procedures

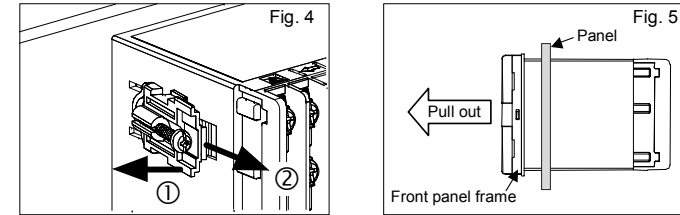
- Prepare the panel cutout as specified in 1.2 Dimensions.
- Insert the instrument through the panel cutout.
- Insert the mounting bracket into the mounting groove of the instrument. (Fig. 1)
- Push the mounting bracket forward until the bracket is firmly secured to the panel. (Fig. 2)
- Only turn one full revolution after the screw touches the panel. (Fig. 3)
- The other mounting bracket should be installed in the same way described in 3. to 5.



The front of the instrument conforms to IP66 (NEMA4X) when mounted on the panel. For effective Waterproof/Dustproof, the rubber packing must be securely placed between instrument and panel without any gap. If rubber packing is damaged, please contact RKC sales office or the agent.

Removal procedures

- Turn the power OFF.
- Remove the wiring.
- Loosen the screw of the mounting bracket.
- Lift the latch of the mounting bracket (1), and then pull the mounting bracket (2) to remove it from the case. (Fig. 4)
- Use long-nose pliers to remove mounting brackets from the instrument that is installed in a narrow place or installed tightly in a horizontal position.
- The other mounting bracket should be removed in the same way as described in 3. and 4.
- Pull out the instrument from the mounting cutout while holding the front panel frame of this instrument. (Fig. 5)



2. WIRING

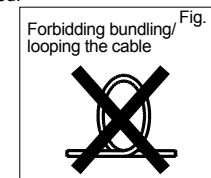
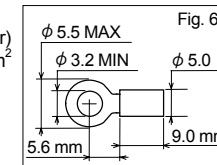


WARNING

- 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.
- If inappropriate Level sensor construction or material is selected, the instrument may malfunction and also a serious accident may happen as a result of physical or chemical reaction with the measured liquid or environment. Therefore, check whether or not appropriate Level sensor is selected prior to its connection.

2.1 Wiring Cautions

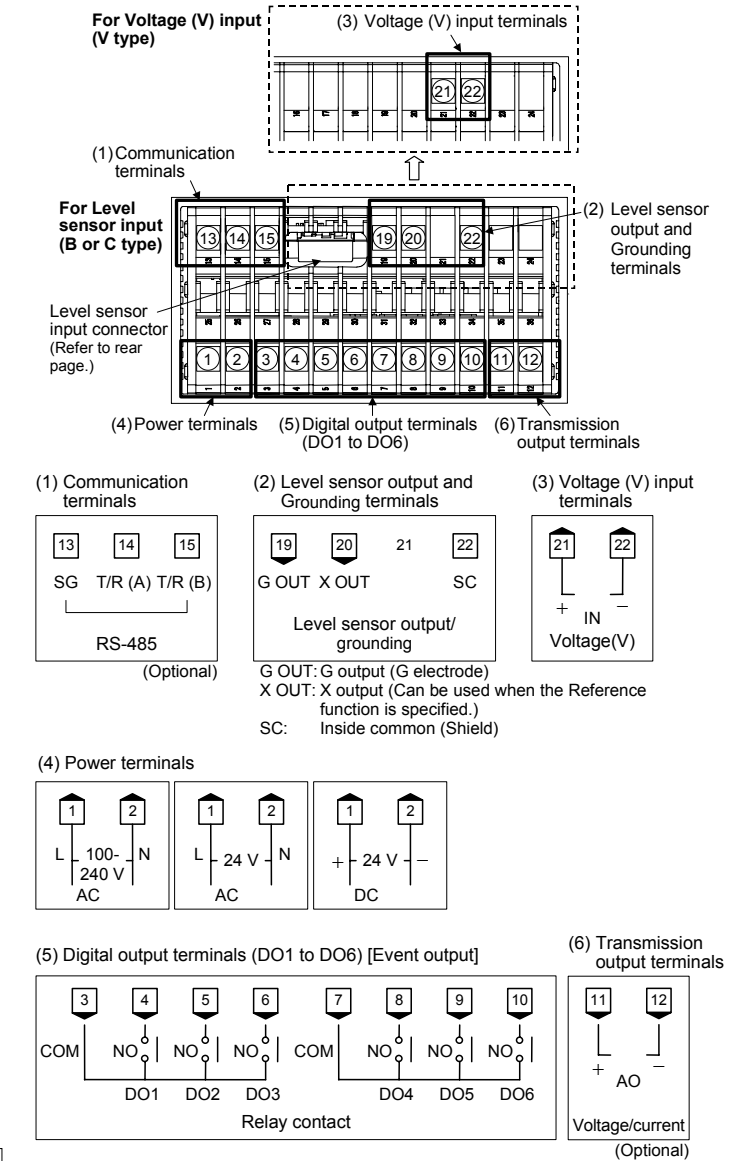
- To avoid noise induction, keep communication signal wire away from instrument power line, load lines and power lines of other electric equipment.
- If there is electrical noise in the vicinity of the instrument that could affect operation, use a noise filter.
 - Shorten the distance between the twisted power supply wire pitches to achieve the most effective 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 most effective noise reduction.
 - Do not connect fuses or switches to the noise filter output wiring as this will reduce the effectiveness of the noise filter.
- About 5 seconds are required as preparation time for output every time the instrument is turned on. Use a delay relay when the output line is used for an external interlock circuit.
- Power supply wiring must be twisted and have a low voltage drop.
- For an instrument with 24 V power supply input, supply power from "SELV" circuit defined as IEC 60950-1.
- A suitable power supply should be considered in end-use equipment. The power supply must be in compliance with a limited-energy circuits (maximum available current of 8 A).
- This instrument is not furnished with a power supply switch or fuse. Therefore, if a fuse or power supply switch is required, install close to the instrument.
 Recommended fuse rating: Rated voltage 250 V, Rated current 1 A
 Fuse type: Time-lag fuse
- Use the solderless terminal appropriate to the screw size.
 Screw size: M3 × 7 (with 5.8 × 5.8 square washer)
 Applicable wire: Solid/twisted wire of 0.25 to 1.65 mm²
 Specified dimension: Refer to Fig. 6
 Recommended tightening torque: 0.4 N·m (4 kgf·cm)
 Specified solderless terminals:
 Manufactured by J.S.T MFG CO., LTD.
 Circular terminal with isolation V1.25-MS3
- Make sure that during field wiring parts of conductors can not come into contact with adjacent conductive parts.
- If solderless terminal lugs other than those in not specified dimensions are used, terminal screws may not be tightened. In such a case, bend each solderless terminal lug in advance and then conduct wiring. If the terminal screw is forcibly tightened, it may be damaged.
- Up to two solderless terminal lugs can be connected to one terminal screw. However, in this case, reinforced insulation cannot be used.
- Do not bundle or loop the input signal cable from the Level sensor. The transmission (measurement) signal may be interfered with an L (coil: inductance) component caused by this bundling or looping.



2.2 Level Sensor Connection Cautions

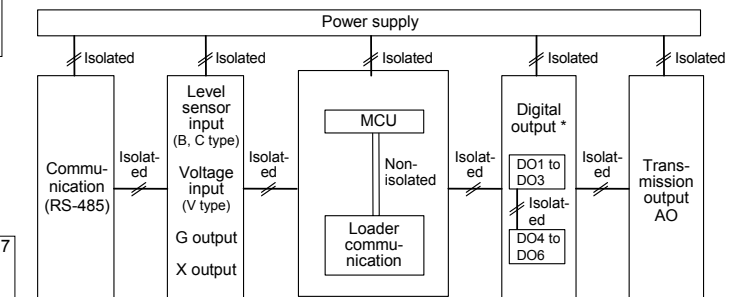
- If the Level sensor you have purchased is not intended for measurement use, do not use that Level sensor.
- There are three types of electrodes: "A," "B" and "G." "A" indicates a reference electrode, "B" indicates a measuring electrode, and "G" indicates a ground electrode. Combinations of "A+B," "B+G" and "A+B+G" are available depending on the types of Level sensor. Therefore carefully connect them.
- For grounding, select any one of "G output" and "X output" by referring to the instruction manual for the relevant connecting Level sensor. Do not ground the "G output" at the same time as the "X output." Grounding both outputs may damage the device.
- When connecting to the tank wall and ground, always directly connect G output (terminal No. 19).
 - Do not connect indirectly to the container wall, etc. through panel ground.
 - Do not directly connect G output (terminal No. 19) to the common ground terminal for various noise filters and lightning arrester.

2.3 Terminal Configuration



Screws are removed at the terminal of optional functions that were not specified when you placed the order.

Isolation: For isolated device input/output blocks, refer to the following



* Outputs of DO1/DO2/DO3 group and DO4/DO5/DO6 group are isolated.
 "DO1, DO2 and DO3" or "DO4, DO5 and DO6" use the same common terminal (No. 3 for DO1/DO2/DO3, and No. 7 for DO4/DO5/DO6) and are not isolated.

