Remote AI

ZE7400A

Instruction Manual

RKC® RKC INSTRUMENT INC.

WXPZE7400AR001E
February, 2013(Rev.2)

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.

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.

⚠ Warning

- 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 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.
- 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.
- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action.
  The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.
- To prevent instrument damage or failure, protect the power line and the input/output lines from high currents with a protection device such as fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Firmly tighten each terminal screw 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.
- This instrument is intended to be used under the following environmental conditions.

Installation features:	Indoor
Altitude:	2000 m or less
Ambient temperature:	0-50 °C
Ambient humidity:	20-80 %RH (Non-condensing)
Overvoltage category:	Category II
Allowable pollution degree:	Pollution degree 2

- When installing this instrument, put on a protective gear such as safety shoes, helmet, etc. for your safety.
- Do not put your foot on the installed instrument or get on it, because it is dangerous.
- Only our serviceman or persons authorized by RKC are allowed to remove and take the inner module, the main unit and printed circuit boards apart.

FOR PROPER DISPOSAL

When disposing of each part used for this instrument, always follows the procedure for disposing of industrial wastes stipulated by the respective local community.

SYMBOLS USED ON THE INSTRUMENT

The symbols below are used on this instrument for the cautioning information.

This shows “Caution for handling”.
This symbol is used on the parts need to reference the instruction manual for saving human body and the instrument.

This shows “Protective grounding”.
Be sure to provide protective grounding prior to operate this instrument.

This shows “Risk of electric shock”.
This symbol is used on the parts, which has a risk of electric shock.

＜CONTENTS＞

1. INTRODUCTION

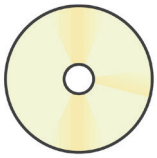
1.1 Remote AI

This book is an Instruction manual of the ZE7400A type Remote AI. This equipment takes in an analog signal and can transmit data to VGR-B100 type paperless recorder. In addition, as for this equipment, 6 points of input is possible in one. Can connect these up to 6 equipment to VGR-B100. The input data are transmitted to VGR-B100 through Modbus RTU(RS-485) communication, and a trend display and a record are possible.

This book has indicated the procedure until it actually uses it from the connection method with VGR-B100. About the specification of the recorder, please use it after fully reading a main manual (WXPVM70mnAR001E).

1.2 Accessory check

If this equipment arrives, check the appearance for damage, and if the correct quantity of the accessories are supplied. Please contact the shop that purchases it or our salesman when there is a part not suitable by any chance.



CD-ROM

（Instruction manual）

1.3 Option

The following product are available as an option. For details, please refer to a store of the purchase or our salesperson.

Clause number	Article name	Part No.	Remarks
1	AC/DC adapter	WMSU0678B01	
2	DIN rail mounting bracket	WMSU0678B02	
3	Shunt resistance	HMSU3081A11	For current input（250Ω±0.1%）
4	Termination resistance	WMSU0303A01	Termination resistance for RS-485 (200Ω)

1.4 Temporary storage

Please store this equipment in the environment below. If the equipment is embedded in another device, it should be stored in the same condition as below.

⚠ CAUTION

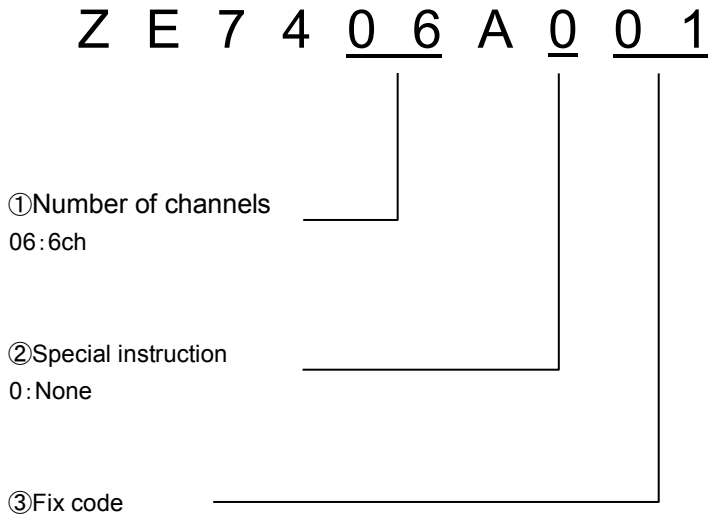
External equipment, function, life and other aspects of the product may be damaged if stored in an inappropriate environment.

Requirements for storage environment

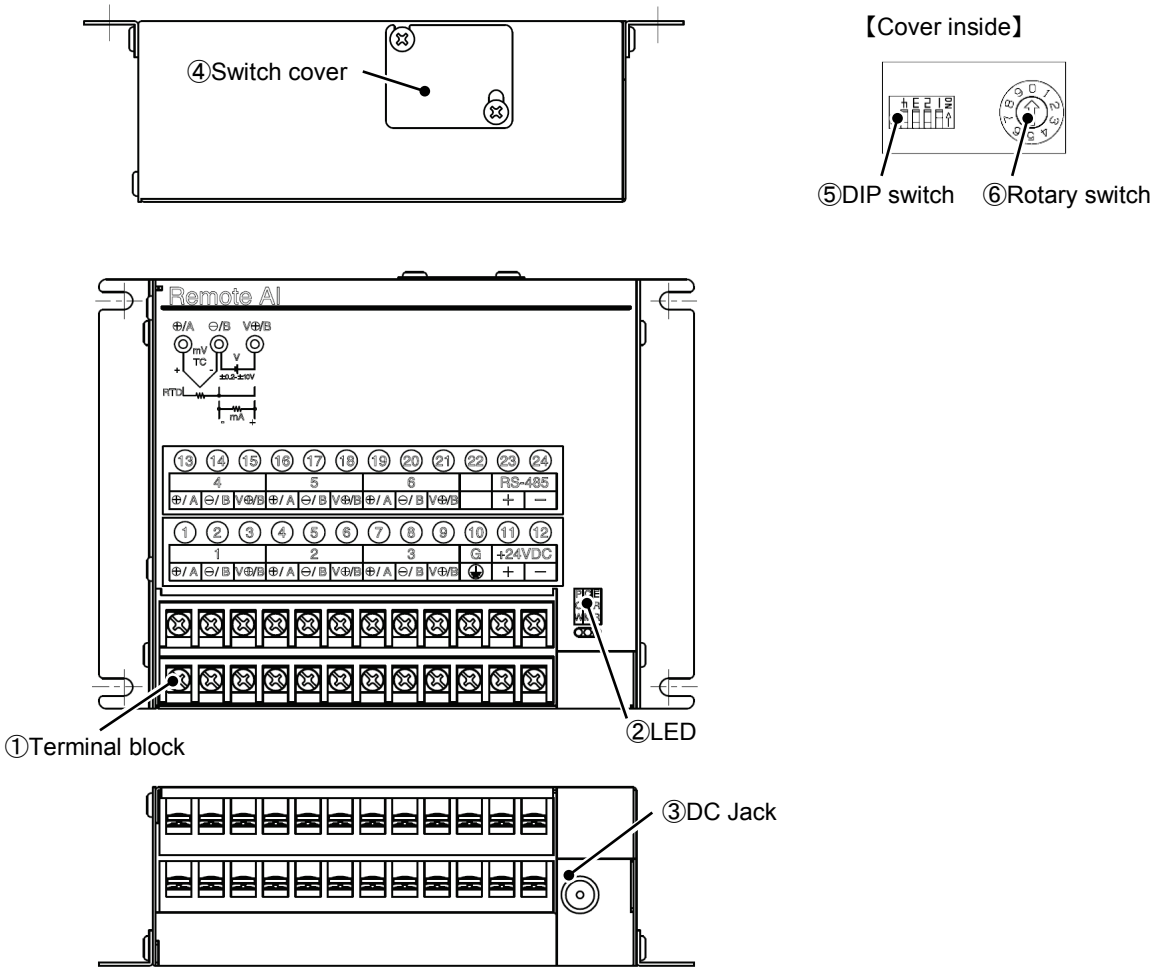
- ･Less dirt and dust
- ･No inflammable, explosive or corrosive gas (such as SO_2 or H_2S)
- ･No vibration or shock
- ･No spray of water or steam and free from high humidity (over 95% RH)
- ･No direct sunlight and free from high temperature (over 50°C)
- ･No extremely low temperature (not below -20°C)

1.5 Confirmation of the Model No.

The nameplate which Model No. are listed in is affixed to the top surface of the case. Please confirm that this equipment is specifications according to order with reference to follows.



2. PARTS AND FUNCTIONS



① Terminal block

For wiring a power supply, RS-485, and analog inputs.

(Refer item "5. WIRING" of Remote AI manual (The following, this book) for terminal block and wiring.)

② LED

For indication a state of a power supply and the communication and the operating conditions of this equipment.

POW（Green） : For indication the state of the power supply. When a power supply is supplied, turn on. When a power supply is cut, turn off the light.

COM（Yellow） : For indication a state of the communication with the master. When this equipment received a command, turn on.

ERR（Red） : When error occurs to this equipment, turn on.

③ DC Jack

When this equipment performs the power supply with the AC/DC adapter, use it.

(Refer item "5. WIRING" of this book for wiring.)

④ Switch cover

For protecting "⑤DIP switch" and "⑥Rotary switch".

⑤ DIP switch

For setting transmission rate and the parity of this equipment.

(Refer item "6.2 Setting of the communication condition" of this book for setting contents.)

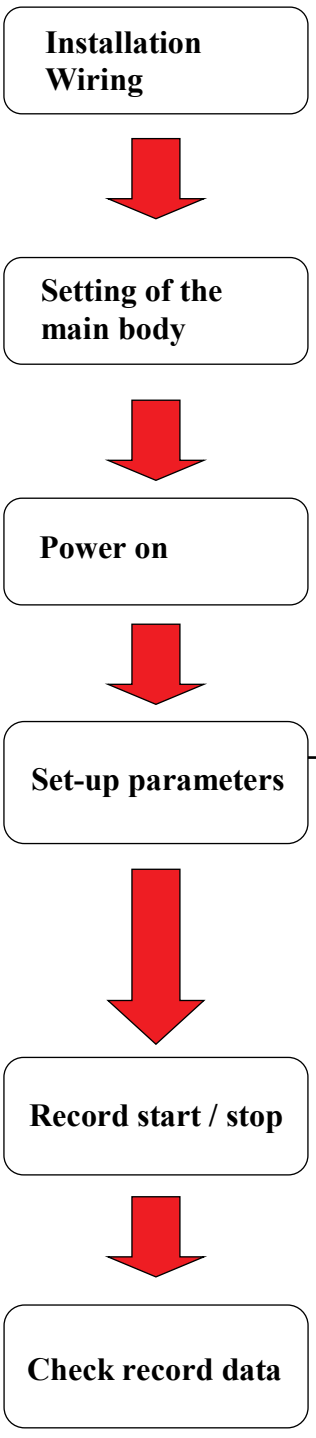
⑥ Rotary switch

For setting the station number of this equipment.

(Refer item "6.3 Setting of station number" of this book for setting contents.)

3. FLOW OF OPERATION

The flow chart of various operation



·····Refer item "4. INSTALLATION", "5. WIRING" of this book for installation and wiring.

·····Set the main body.
Refer item"6. SETTING OF REMOTE AI" of this book for setting.

Setting of VGR-B100

·····Set a parameter of the Modbus communication in VGR-B100.
Refer item"7. SETTING OF VGR-B100" of this book for setting.

Setting of Remote AI (Parameter Loader)

·····Set the range / scaling of this equipment from VGR-B100 parameter loader.
Refer item"8. SETTING OF REMOTE AI (PARAMETER LOADER)" of this book for setting.

·····A start/stop of record is performed from the VGR-B100 of the master.
Refer item"5. OPERATION" of the main maunal for operation.
(WXPVM70mnAR001E)

·····Can confirm the recorded data from a recorder of the master side or Data Viewer.
Refer item"6. DISPLAY FUNCTION" of the main maunal (WXPVM70mnAR001E) or DataViewer manual (WXPVM70mnAR101E) for details.

4. INSTALLATION

4.1 Installation place

Install place

This equipment can be attached to a wall surface or a DIN rail.

Please select and install the following places.

- No vibration or shock.
- Less dirt and dust.
- Place where ambient temperature doesn't exceed 0 ～ 50℃, and place where temperature change is a little.
- No direct high temperature radiation.
- No spray of water or steam.
- No dewing.
- Place with sufficient circulation of air.
- Place where space to be able to facilitate wiring, maintenance and check.
- No electromagnetic radiation.
- No flammable gas, firedamp, corrosive gas (SO_2, H_2S).
- The inclination at the installation must not incline at the right and the left, and it become the horizontal. (Inclining forward 0°, Backward tilting 0 ～ 30°)

4.2 Wall surface installation

Please refer to the chart below for the installation to a wall surface.

Use screw：M4×4

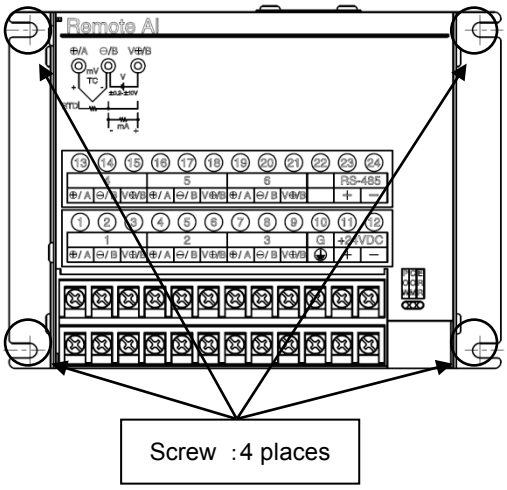
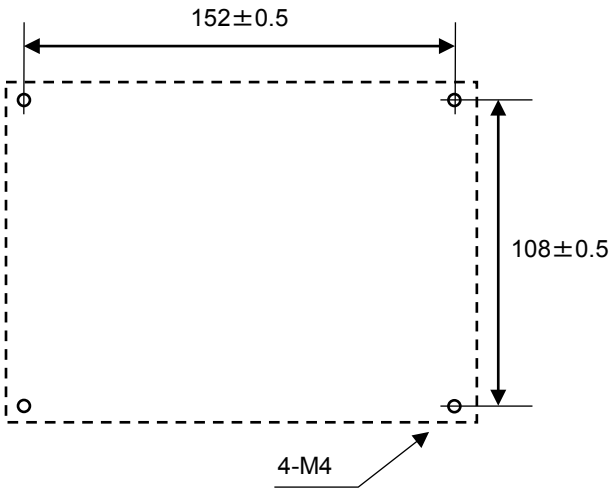


Figure of installation dimensions（Unit：mm）



［Note］

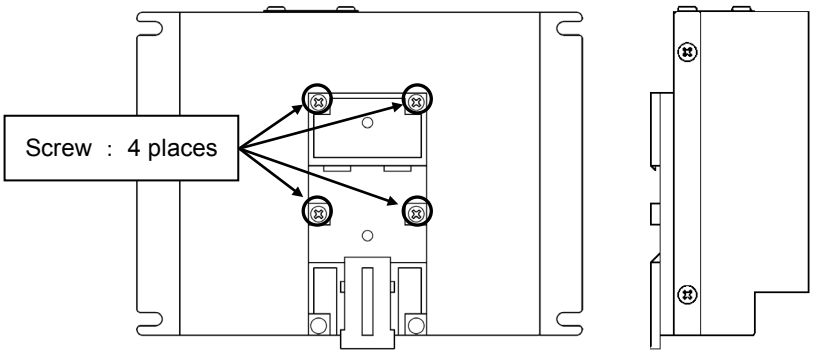
Please do the installation with the direction of the upper figure. Be suitable for installation except the above, and heat radiation is not carried out enough, and may not show performance enough.

4.3 Installation to a DIN rail

A mounting bracket (WMSU0678B02: an option) is necessary for the installation to a DIN rail.

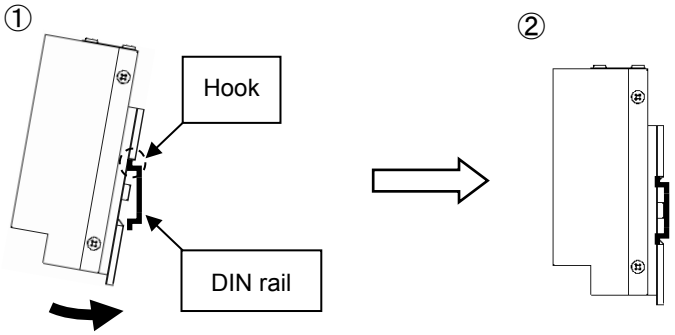
4.3.1 Installation of the DIN rail mounting bracket

With a bundled plate screw (4 pieces), please attach mounting bracket to the back of this equipment.
Please be careful about the positions fixing a direction and the screw of mounting bracket.
(Refer to the chart below.)

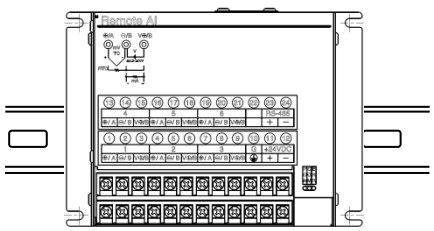


4.3.2 Fixation to a DIN rail

①Hang the hook of mounting bracket on a DIN rail.
②Push the main body to the arrow direction, and, please confirm fixed to the DIN rail.



Installation direction



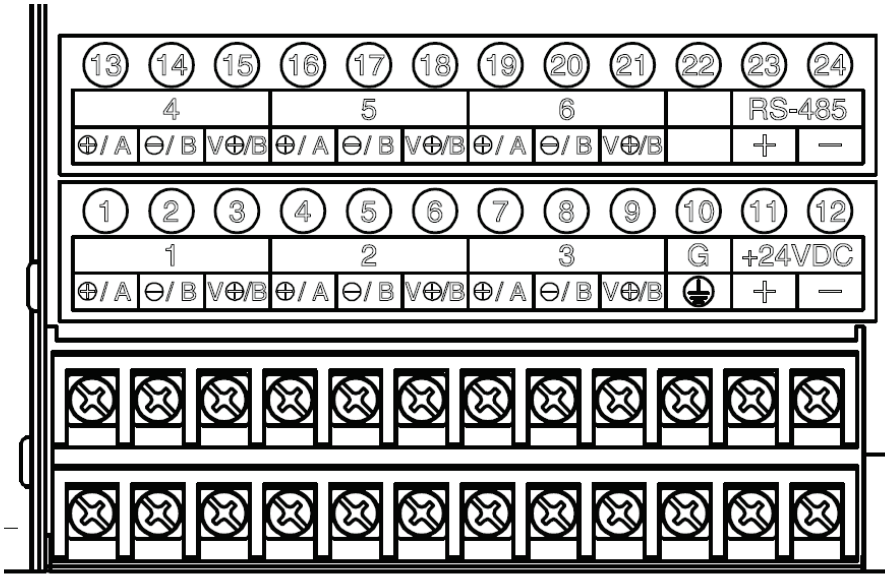
［Note］

Please install it according to an upper figure. In the direction except the above, heat radiation is not carried out enough, and may not show performance enough.

5. WIRING

5.1 Terminal block array

The terminal block is used in power supply / RS-485 communication / analog input.



Terminal No.	13	14	15	16	17	18	19	20	21	22	23	24
CH.	4			5			6			NC	RS-485	
Input	+/A	-/B	V+/B	+/A	-/B	V+/B	+/A	-/B	V+/B		+	-
Terminal No.	1	2	3	4	5	6	7	8	9	10	11	12
CH.	1			2			3			POW		
Input	+/A	-/B	V+/B	+/A	-/B	V+/B	+/A	-/B	V+/B	G	+	-

5.2 Wiring for power supply

⚠ Warning

- Please energize to this equipment after doing the protection earth without fail for the electric shock prevention.
- Please do not cut the protective earth, and please do not remove connecting wires of the protective earth.
- Please confirm the power-supply voltage of this equipment is corresponding to the voltage of the power supply.
- Please energize to this equipment after applying the protection cover of the transparency.

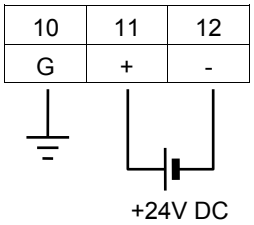
⚠ CAUTION

- Please use the one that corresponds to 600V vinyl insulation electric wire (IEC 60227-3) or it for the electric wire for the power supply.
- Please install round shape pressure connection terminal (for M3.5) to which the insulation sleeve adheres on the electric wire terminal.
- Please connect the protective grounding terminal (resistance:100Ω or lower, minimum diameter of a ground line 1.6 mm) to protective ground.
- When you share the protective earth conductor with other equipment, the influence of the noise from the ground line might be received. Sharing with other equipment is recommended to be avoided.
- Please install the circuit breaker and the switch, etc. for safety, and specify that these are the cutting switches of this equipment in the power supply wiring.
- The voltage rating must use the main source of electrical power in the variation range in ±10%.
- A transitional current might flow to the main source of electrical power when the power supply is turned on.

The power supply can use terminal block input or an AC/DC adapter.

［Terminal block input］

The power supply terminal is terminal No.10-12.



●Wiring step

①Take off a protective cover of the transparence of the terminal block.

②As for the + side of the power supply, No.11(+), the - side of the power supply connect terminal No. 12(-).

③Attach a protective cover of the transparence.

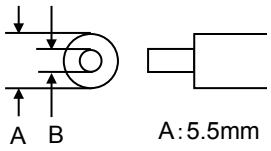
④Confirm that protective grounding is connected correctly.

［AC/DC adapter use］

Please use the following AC/DC adapters.

●Polarity

●Plug external form



●Rated power supply

24V DC

●Amperage rating

0.5A

CAUTION

Please use the appointed AC adaptor for this equipment. It may become a cause of trouble if AC adaptors other than specification are used.

［Reference］

An AC/DC adapter (WMSU0678B01) is available as an option. For details, please refer to a store of the purchase or our salesperson.

5.3 Wiring of the input signal

CAUTION

● Notes of input wire

・Please do not mix the noise about the input wiring. Moreover, the use of an effective shield line or twist line is recommended to the noise in the input wiring.

・At the thermo couple input, connect a thermo couple wire directly or use a compensating lead wire. It is recommended to use a shield input line.

・At the resistance temperature sensor input, the difference of the line resistance in three lines is assumed below the following. The use of the input line with the shield is recommended.
Pt100, JPt100: Under 50mΩ.

・When there is a possibility of receiving the influence by the inductive noise, especially, when wiring near the high frequency power supply, the use of the twist line with the shield is recommended.

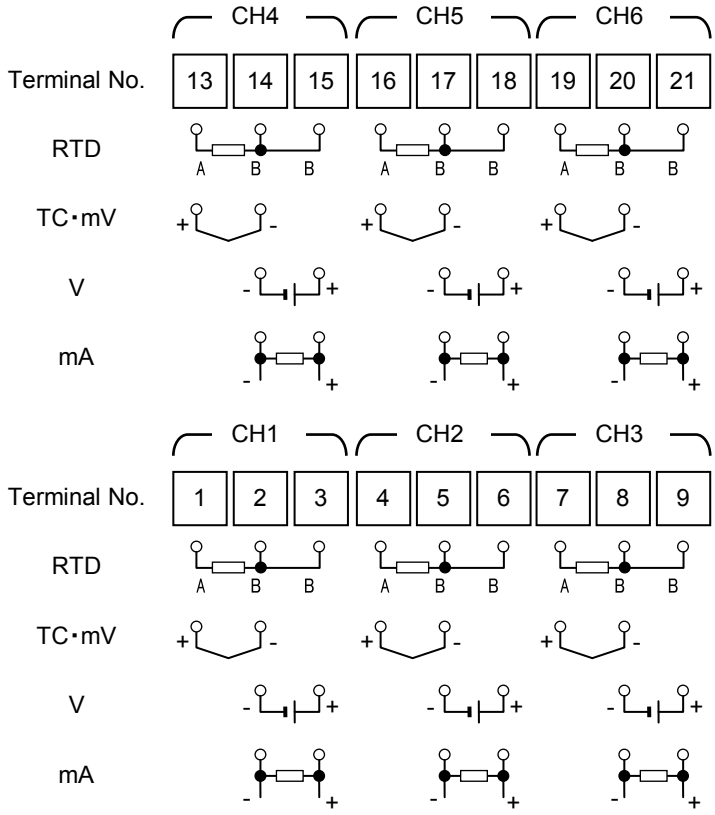
・Please install round shape pressure connection terminal (for M3.5) to which the insulation sleeve attaches on the electric wire terminal.

● Notes in wiring

・Please separate from the power supply circuit (power supply or DO circuit of 25V or more) and use this equipment and wiring between measurement points.

・Please ground the shield of the shield line.

Please wire it with reference to the chart below. Please attach shunt resistance (250 Ω, 1/4W, +-0.1%) at the time of the current input.



[Reference]

A shunt resistance (HMSU3081A11) is available as an option. For details, please refer to a store of the purchase or our salesperson.

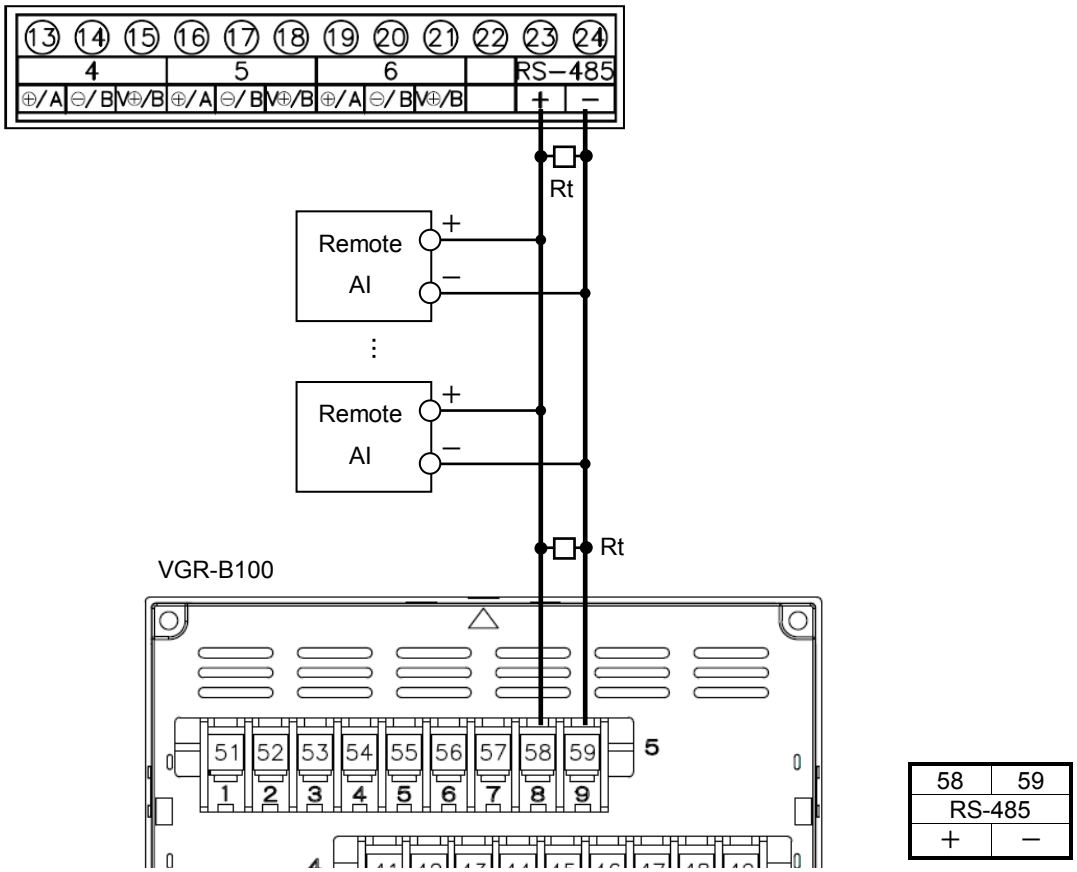
5.4 Wiring for RS-485

［RS-485 terminal］

RS-485 terminal is “Terminal No. 23, 24”.

23	24
+	-
(TX/RX+)	(TX/RX-)

It wires for the cable according to the figure below.



［Note］

- Please connect termination resistance (Rt = 200 Ω) to the both ends of the line.
- The number of these equipment which can be connected for a VGR-B100 is up to six.
- The length of the cable is 1.2 km or less.
- The use of “UL20620-SB(M)(Hitachi Cable, Ltd.)” equivalent goods cable is recommended.

［Reference］

A termination resistance (WMSU0303A01) is available as an option. For details, please refer to a store of the purchase or our salesperson.

6. SETTING OF REMOTE AI

6.1 Opening and shutting of the cover

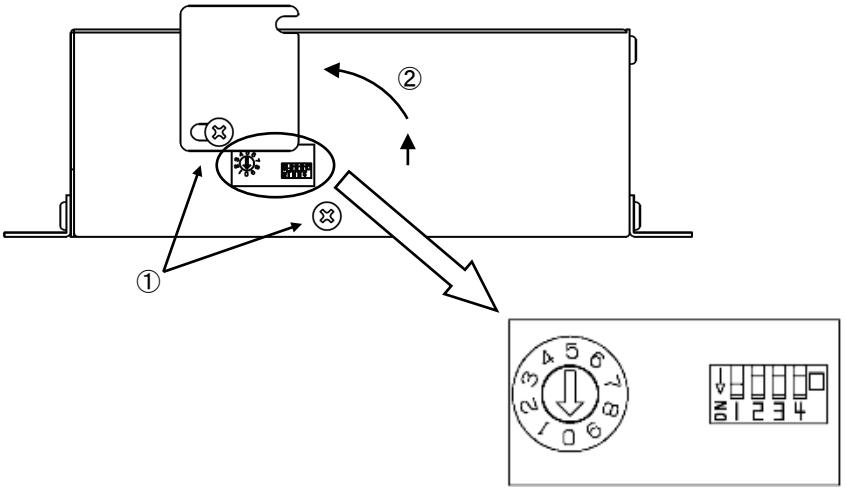
A configuration switch is implemented in a switch cover of the main body top surface. Please open a cover with reference to the chart below.

①Please unscrew it. (2 places)

※ It is not necessary to take off a screw.

②Open the cover.

When you are closed, please be closed in a reverse procedure.



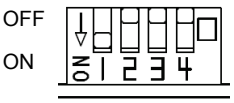
6.2 Setting of the communication condition

Set the communication condition with DIP switch. Please refer to the chart below for the contents.

When setting of VGR-B100 does not accord with this equipment, cannot communicate.

Refer item"7. SETTING OF VGR-B100" of this book for communication condition and setting of VGR-B100.

[DIP switch]



Trans. rate	SW1	SW2
9600bps	OFF	OFF
19200bps	ON	OFF
38400bps	OFF	ON
Unused	ON	ON

Parity	SW3	SW4
None	OFF	OFF
Even	ON	OFF
Odd	OFF	ON
Unused	ON	ON

[Note]

The transmission rate of the VGR-B100 is "9600bps" fixation. (Version 1.40 (VGR-B100))
However, the transmission rate is going to be expanded sequentially.

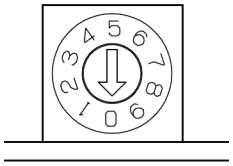
6.3 Setting of station number

Set a station number with a rotary switch. Refer chart below for the contents.

When setting of VGR-B100 does not accord with this equipment, cannot communicate.

Refer item"7. SETTING OF VGR-B100" of this book for communication condition and setting of VGR-B100.

[Rotary switch]



Set a station number in one of 0-9.

[Note]

When a rotary switch is set to "0", do not communicate.

6.4 Initial setting

The initial setting of this equipment is as follows.

○DIP switch

	SW1	SW2	SW3	SW4
	OFF	OFF	ON	OFF
Transmission rate	9600bps		-	
Parity	-		Even	

○Rotary switch

	Setting
Station number	1

7. SETTING OF VGR-B100

7.1 Setting the ON/OFF of Remote AI function

[Note]

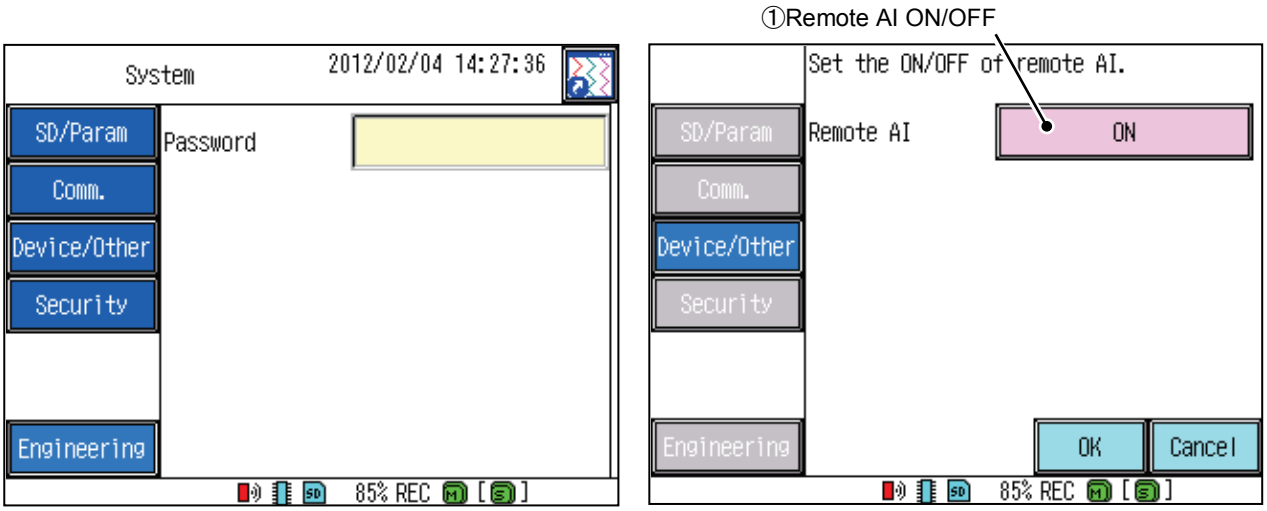
To use this equipment, 1.40 or higher version of VGR-B100 is required. Refer the main manual (WXPVM70mnAR001E) for confirmation of the version and operating of VGR-B100.

[Explanation]

In order to use a Remote AI, it is necessary to “ON” a Remote AI function of VGR-B100.
(Default status is “OFF”.)
If a setup “ON”, the setting item about Remote AI will be displayed on menu panel.

[Operation]

Select the Engineering ⇒ Remote AI on the System.
※ The password of engineering is “REMOTE”.



① Remote AI ON/OFF
Setting the ON/OFF of Remote AI function.
ON : A setting item required for a Remote AI function is displayed on a menu.
OFF : A setting item required for a Remote AI function is not displayed on a menu.
※ Refer item "7.2 Setting the Remote AI function" of this book for displayed setting item.

[Note]

A setup of the input range of Remote AI and a setup of the operation channel which specifies the output place of the measured value of Remote AI can be set up only from a parameter loader. (Refer chapter "8. SETTING OF REMOTE AI (PARAMETER LOADER)" for Parameter Loader.)

7.2 Setting the Remote AI function

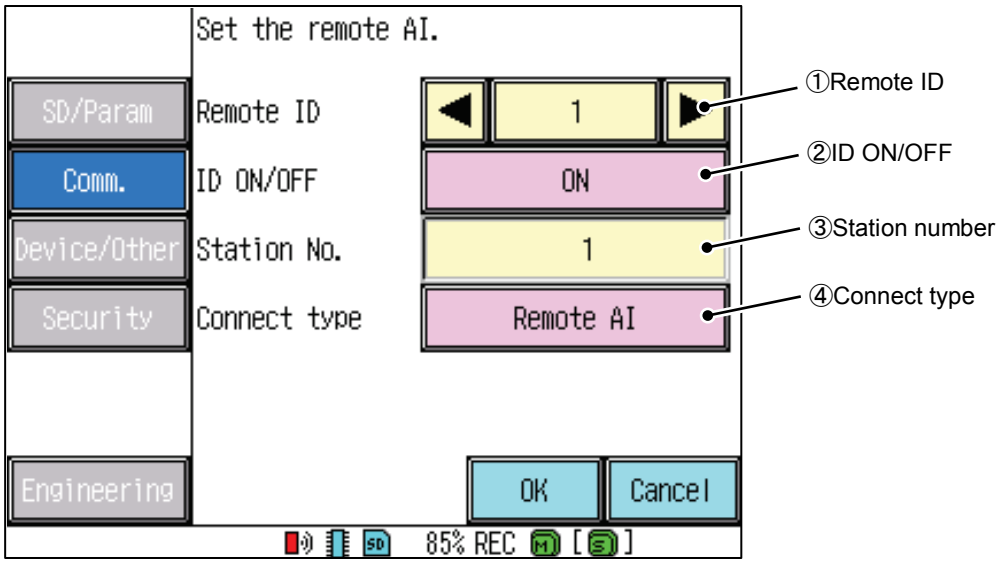
[Explanation]

Station number of Remote AI which communicates with a VGR-B100, a connection type, etc. are set up.

[Operation]

Select the Comm. ⇒ Remote AI on the System.

The content of the display is different according to the connect type of setting.



① Remote ID

The set ID number of Remote AI is selected. Can select 1-6.

② ID ON/OFF

The ON/OFF of each Remote ID is selected.

ON : Connection of Remote AI is validated and it communicates with a recorder.

OFF : Connection of Remote AI is nullified and it does not communicates with a recorder.

③ Station number

The station number of each remote ID is selected. It is necessary to set a station number the same as a setup of the rotary switch of a Remote AI.

(Refer item "6.3 Setting of station number" of this book for rotary switch.)

④ Connect type

The kind of connection equipment is selected.

※ When you use this equipment, please select "Remote AI".

[Note]

- When the recorder is in recording, the setting cannot be changed.
- After the power supply is turned on again, it becomes effective.
- Can set the setting of the range / scaling only from a parameter loader.

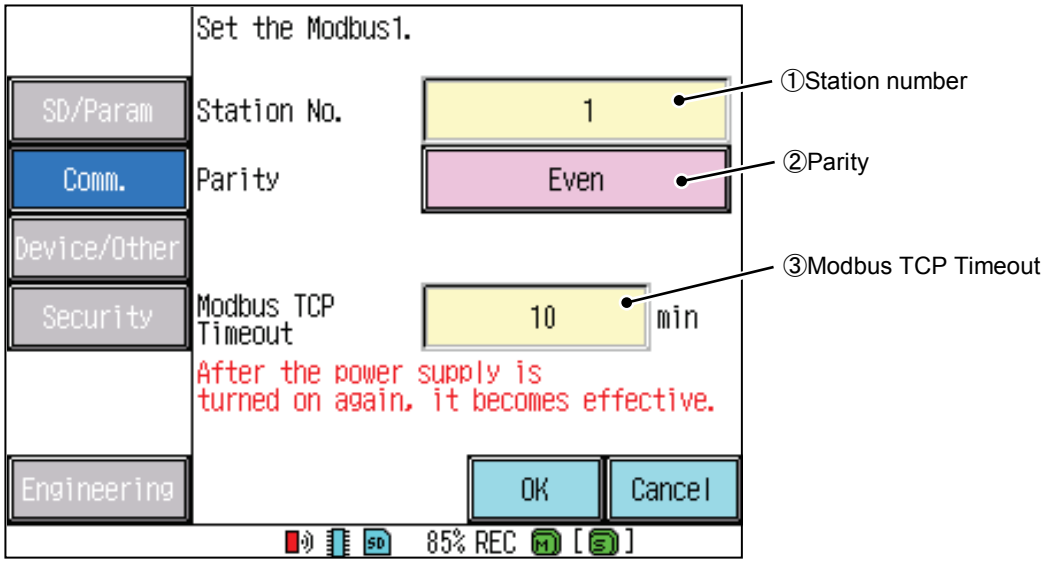
7.3 Setting the Modbus1

[Explanation]

Parity for Modbus communication is set up.

[Operation]

Select the Comm. ⇒ Modbus1 on the System.



① Station number
When Remote AI is used, do not use this setting.

② Parity
Parity is selected from “None”, “Even” and “Odd”.
It is necessary to set parity the same as a setup of the DIP switch of a Remote AI.
(Refer item "6.2 Setting of the communication condition" of this book for DIP switch.)

③ Modbus TCP Timeout
Reception timeout of the communication in Modbus TCP is set up.
※This item becomes effective only when a "Communication type" is "Modbus TCP". When Remote AI is used, do not use this setting.

[Note]

- When the recorder is in recording, the setting cannot be changed.
- After the power supply is turned on again, it becomes effective.

7.4 Setting the Modbus2

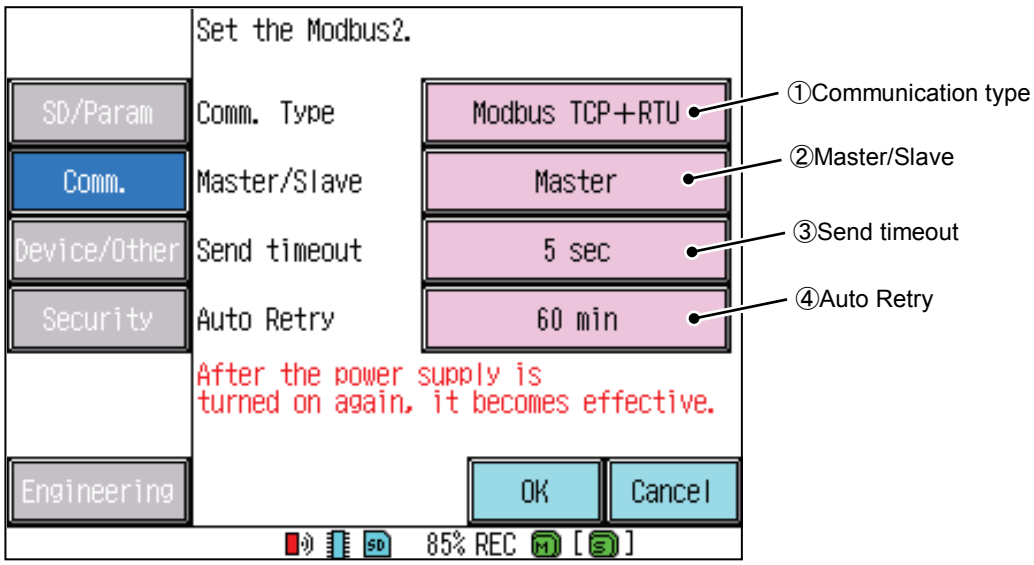
[Explanation]

Communication type for Modbus, Master/Slave etc. is set up.

[Operation]

Select the Comm. ⇒ Modbus2 on the System.

The content of the display is different according to the communication type of setting.



① Communication type

Operation of Modbus is set up.

※ When you use this equipment, please select "Modbus TCP+RTU".

② Master/Slave

This item can only be set when the "①Communication type" is "Modbus TCP + RTU".

About Modbus protocol, set the node type of the recorder.

※ When you use this equipment, please select "Master".

③ Send timeout

This item can only be set when the "②Master/Slave" is "Master".

When the response of Remote AI communication is lost, it times out in set-up time.

④ Auto Retry

This item can only be set when the "②Master/Slave" is "Master".

When an error occurs in communication of Remote AI, auto connection is carried out in set-up time.

[Note]

- When the recorder is in recording, the setting cannot be changed.
- After the power supply is turned on again, it becomes effective.
- This setting screen is only be display when the "Operation mode" of VGR-B100 is "Advanced".

  (Refer the main manual (WXPVM70mnAR001E) for setting of operation mode.)

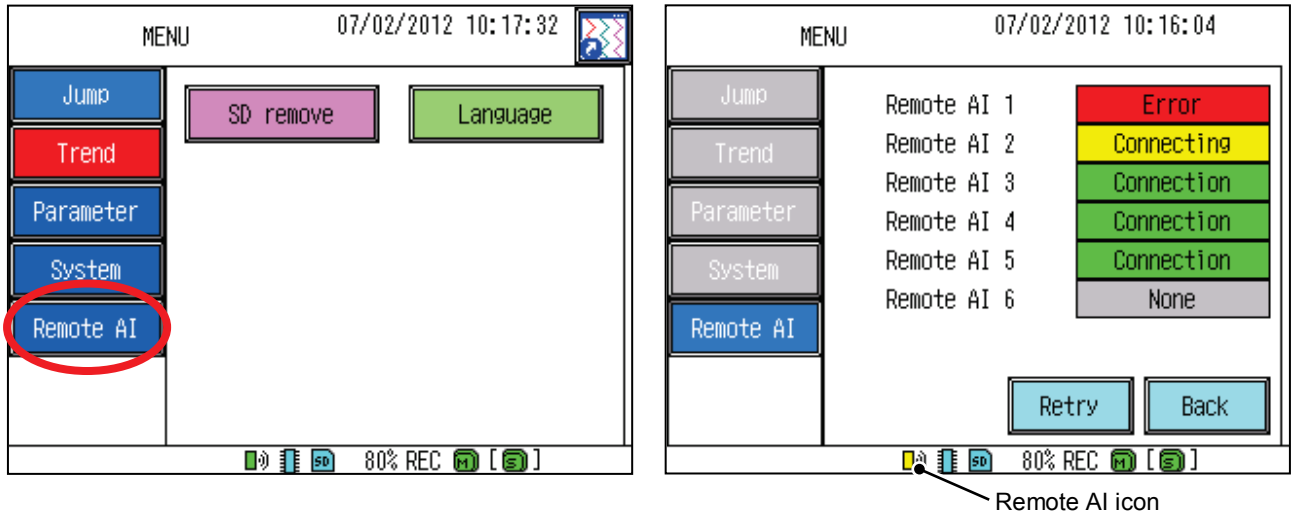
7.5 Check the communication state of Remote AI

[Explanation]

The state of the communication to Remote AI is checked. Moreover, when a communication error occurs, it can connect again.

[Operation]

Select the Remote AI on the MENU.



The communicating state of Remote AI is displayed.

Connection : It is communicating of Remote AI normally. A Remote AI icon indicates "green".

Connecting : The communicating state of Remote AI is checked. According to a communicating state, it changes to the state of "Connection" or "Error". A Remote AI icon indicates "yellow".

Error : It is in the state where the communication error has occurred and communication with Remote AI is not carried out. A Remote AI icon indicates "red".
When error occurs in either in enabled Remote ID, the icon indicates "red".

None : It is in the state where Remote ID is set as the "OFF".
(Refer item "7.2 Setting the Remote AI function" of this book for ON/OFF of Remote AI.)

When there is Remote AI of an "Error" state, it communicates again by touching the "Retry".
(When "Auto Retry" is set up, retry is automatically performed at intervals of the setting. Refer item "7.4 Setting the Modbus2" for Auto Retry.)

7.6 Display the measurements

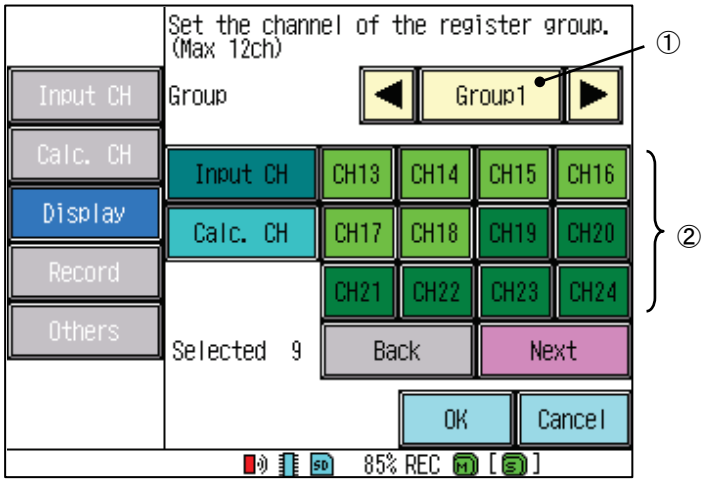
［Explanation］

Display the measurements of this equipment to a trend screen of VGR-B100.

［Operation］

Select the Display ⇒ Group CH on the Parameter.

○Group channel setting screen



①Selecting display group number.

②Selecting channel register in the display group.

※Assign the measurements of this equipment to a calculation channel, and display it. Refer chapter "8. SETTING OF REMOTE AI（PARAMETER LOADER）" of this book for allotment to a calculation channel.

※To the display group can be registered up to a maximum 12ch. The calculation channel can be mixed with input channel.

8. SETTING OF REMOTE AI (PARAMETER LOADER)

8.1 Parameter loader

The setting such as the range / scaling of this equipment sets it from a parameter loader attached as standard equipment in VGR-B100.

※ To use this equipment, 1.41 of higher version of Parameter Loader is required.
※ Refer the Parameter Loader manual (WXPVM70mnAR102E) for install and other details.

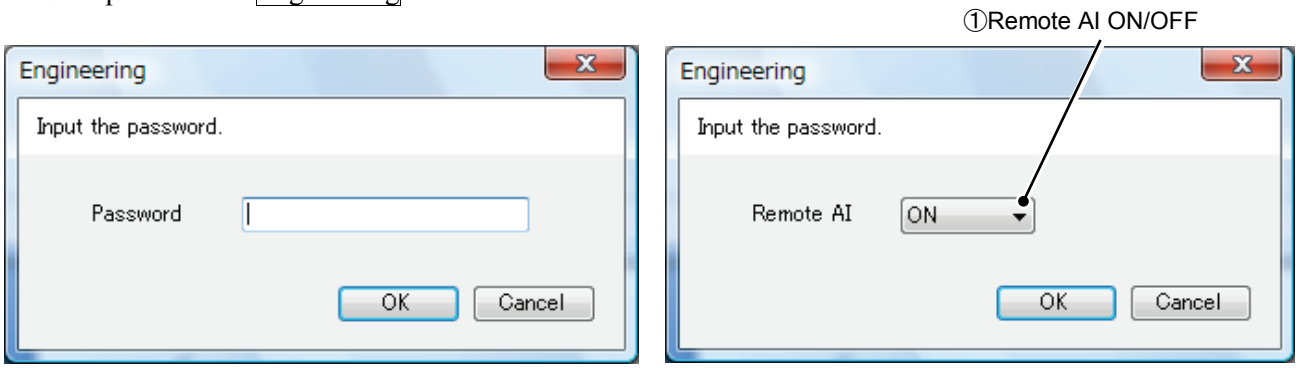
8.2 Setting the ON/OFF of Remote AI function (Parameter Loader)

[Explanation]

In order to use a Remote AI, it is necessary to "ON" a Remote AI function from the engineering window of Menu bar. (Default status is "OFF".)
If a setup "ON", the setting item about Remote AI will be displayed on menu panel.

[Operation]

Select the View ⇒ Engineering on the Menu bar.
※The password of Engineering is "REMOTE".



① Remote AI ON/OFF
Setting the ON/OFF of Remote AI function.
ON : A setting item required for a Remote AI function is displayed on a menu.
OFF : A setting item required for a Remote AI function is not displayed on a menu.
※ Refer item "8.3 Remote AI channel" for displayed setting item.

8.3 Remote AI channel

[Explanation]

The input type and scaling of Remote AI are set up. (Max 6 units)

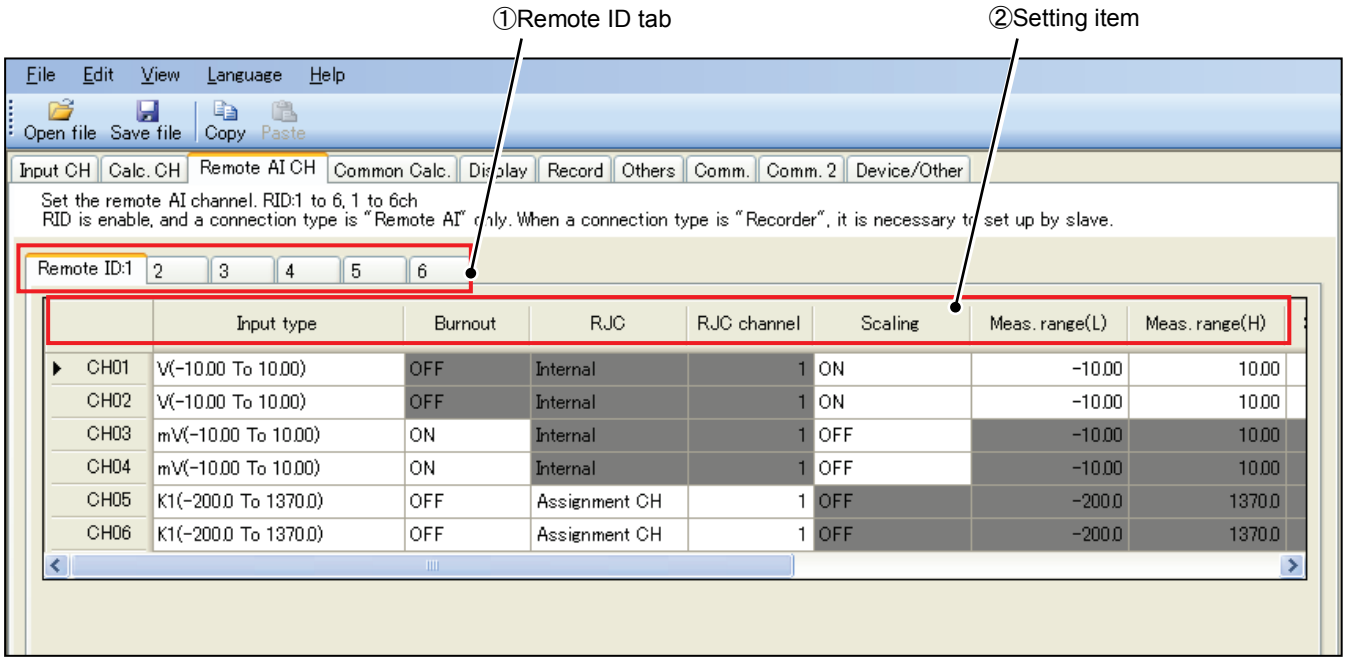
※ Remote AI channel setup can be set up only from a Parameter Loader.

※ This setting item becomes effective only when “Remote ID” is "ON" and a "Connect Type" is "Remote AI".

(Refer item "7.2 Setting the Remote AI function" for "Remote ID" and "Connect Type".)

[Operation]

Select the Remote AI CH.



① Remote ID tab

[①Remote ID tab] is selected, it will switch to the setting screen of each Remote AI connected.

② Setting item

Perform various input setting of the Remote AI.

- ・Input type : Refer chapter "10. SPECIFICATIONS" of this book for settable input type.
- ・Burnout : ON（UP direction）/OFF
- ・RJC : OFF/Internal/Assignment CH
- ・Scaling : OFF/ON/Square root ON
- ・Meas. range : Meas. range（L），（H）
- ・Decimal point : 0～4
- ・Input filter : 0～99
- ・Offset : -32000～32000digit
- ・Gain : -32000～32000digit

(Refer the main manual (WXPVM70mnAR001E) for details of each item.)

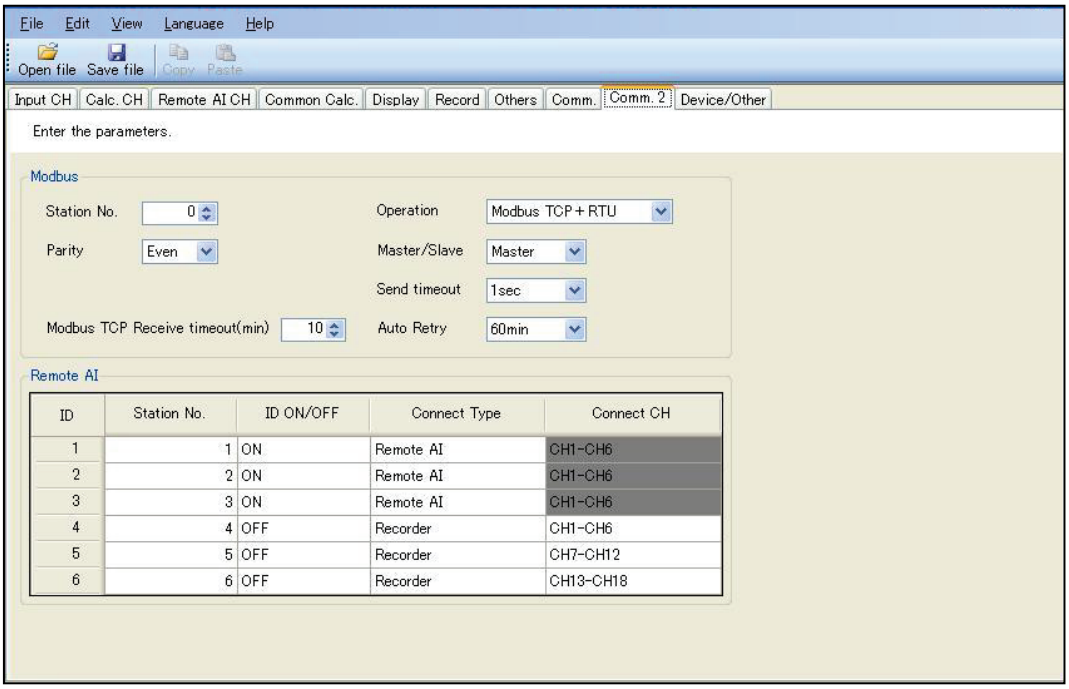
8.4 Comm.2

[Explanation]

Communication setup required for Remote AI, such as "Modbus operation" and "selection of a Master/Slave", is set up.

[Operation]

Select the Comm.2.



① Station number
When Remote AI is used, do not use this setting.

② Parity
Parity is selected from “None”, “Even” and “Odd”.
It is necessary to set parity the same as a setup of the Remote AI.

③ Modbus TCP timeout
Reception timeout of the communication in Modbus TCP is set up.
※ When Remote AI is used, do not use this setting.

④ Communication type
Operation of Modbus is set up.
※ When you use this equipment, please select "Modbus TCP+RTU".

⑤ Master/Slave
This item can only be set when the "④Communication type" is "Modbus TCP + RTU".
About Modbus protocol, set the node type of the recorder.
※ When you use this equipment, please select "Master".

⑥ Send timeout
This item can only be set when the "⑤Master/Slave" is "Master".
When the response of Remote AI communication is lost, it times out in set-up time.

⑦ Auto Retry
This item can only be set when the "⑤Master/Slave" is "Master".
When an error occurs in communication of Remote AI, auto connection is carried out in set-up time.

[Reference]

This setting item can set even the VGR-B100 becoming a master.

8.5 Calculation channel setting

[Explanation]

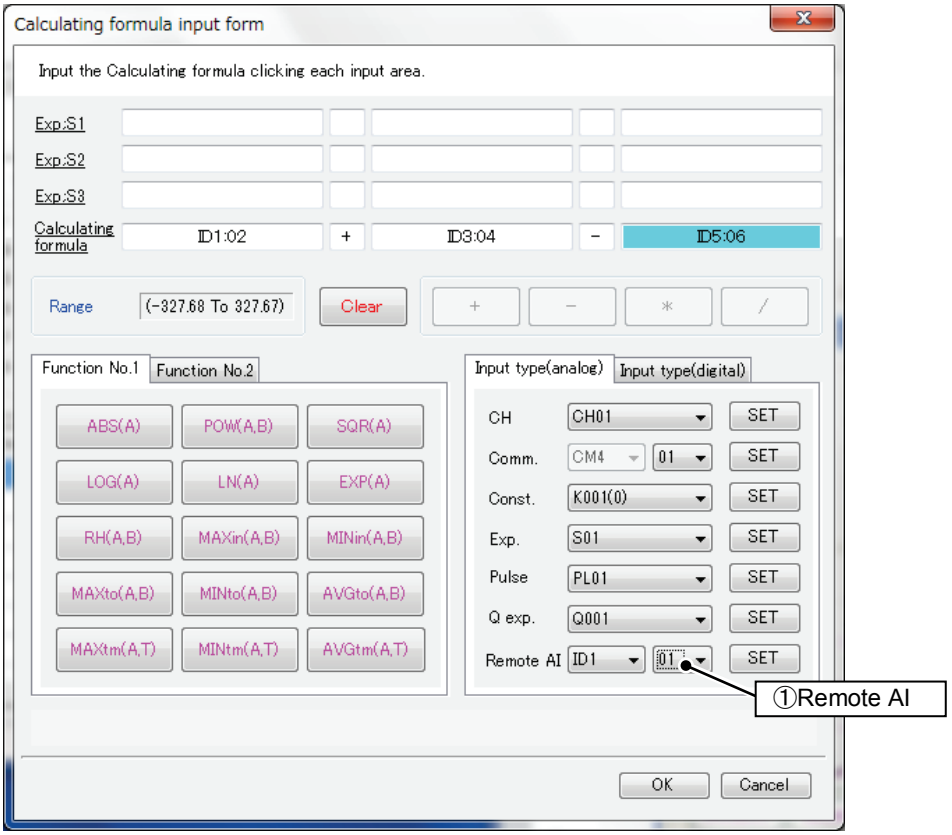
The measured value of Remote AI can be trend display and record to VGR-B100 by assigning the calculation channel CH 13-48 by the side of a master.

※ Calculation channel setup can be set up only from a parameter loader.

※ Refer the Parameter Loader manual (WXPVM70mnAR102E) for other setting of calculation channel.

[Operation]

Select the Calc. CH ⇒ Calculating formula.



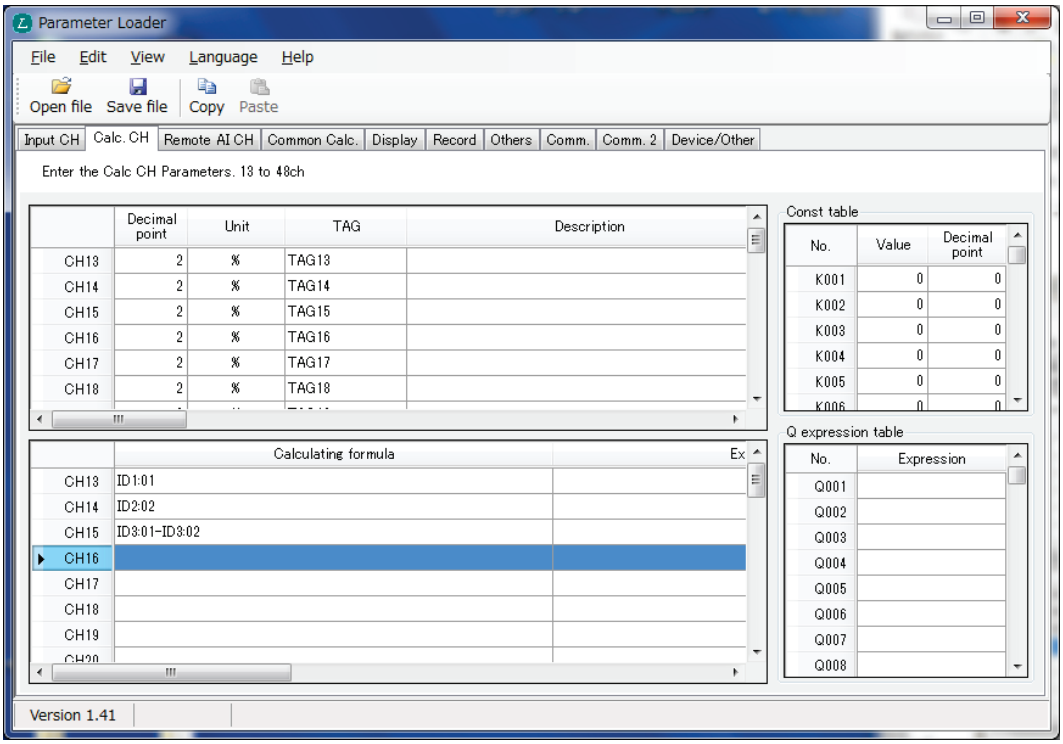
① Remote AI (ID1～6：01～06)

The arbitrary measured value of Remote AI is used as an argument of a calculation channel. In addition, VGR-B100 can trend display and record the result that operated measurements of the Remote AI.

[Reference]

For example, when set to "ID3:06", the input value of CH06 of Remote AI of ID No.3 will be used.

In the lower example, assign "Remote ID:1 CH1" to CH13. In addition, assign "Remote ID:2 CH2" to CH14. In addition, assign "differences between Remote ID:3 CH1 and Remote ID:3 CH2".



[Note]

When you register in a calculation channel, please set "Record type" of the applicable channel in one of "MAX / MIN", "Average" or "Instant value" by all means. In "OFF" of the initial state, data are not recorded.

※ Can set "Record type" in a tab [Calc. CH].

9. TROUBLE SHOOTING

When this equipment does not operate normally, please grasp a situation and cope with it according to the following table.

In addition, if it seems that it is failure, please inform a purchase place or the nearby service network of our company.

Situation	Check point	Disposal
It does not operate.	①Is supply of the power supply performed correctly?	A power supply state is checked. (Item 5.2 of this book)
	②Is connection of a power supply terminal wired correctly?	It connects correctly. (Item 5.2 of this book)
Error status LED is illuminated.	Is "WDT error" displayed on the Ethernet log of VGR-B100?	Contact our dealer that you purchased the sales representative of appliance or us.
	Is "Parameter lost" displayed on the Ethernet log of VGR-B100?	
	Is "Adjust CRC error" displayed on the Ethernet log of VGR-B100?	
	Is "EEPROM read error" displayed on the Ethernet log of VGR-B100?	
In the VGR-B100 side of the master, a setting item for Remote AI is not displayed.	Is a setup of a Remote AI function "ON"?	Parameter is set correctly. (Item 7.1 of this book)
A setup of a parameter cannot be changed	Isn't VGR-B100 by the side of a master in the record state?	Change the setting of the parameter after stopping a record.
It becomes a communication error.	①Is wiring of the communication connected definitely?	Connect wiring definitely (Item 5.4 of this book)
	②Does the setting of the station number and parity accord with this equipment each between VGR-B100?	・A setting of DIP switch and a rotary switch are checked. (Item 6.2 of this book) ・Parameter is set correctly. (Item 7.2 and 7.3 of this book)
	③Is communication type set up correctly? When communication type is not set as "Modbus TCP + RTU", communication with Remote AI is not performed.	Parameter is set correctly. (Item 7.4 of this book)

Situation	Check point	Disposal
The measured value is not displayed to a trend screen.	①Is the destination of the Remote AI channel set to a calculation channel?	Parameter is set correctly. （Item 8.5 of this book）
	②Is the set-up calculation channel displayed on the trend screen?	Parameter is set correctly. （Item 7.16 of this book）
Data display will be "-H -", "-L -","B.OUT" or "INVALID"	Is wiring of the input connected definitely? When electric wiring includes an error or when the signal which is different from the input type that you set are input, right instructions are not displayed.	・Connect wiring definitely （Item 5.3 of this book） ・The same input type as an incoming signal is set up. （Item 8.3 of this book）
The data which measured with this equipment are no saved.	Is the record type of the calculation channel not set in "OFF"? As for the record type of the calculation channel of VGR-B100, initial state becomes "OFF".	Change the record type of the calculation channel. （Item 7.11 of main manual）

10. SPECIFICATIONS

Input specification

Number of input	:	6 point
Input type	:	TC, RTD, V, mA (Shunt resistance attaching externally)
Measurement accuracy	:	±0.1%+1digit
Reference junction compensation accuracy	:	R, S, PR40-20, Au-Fe : ±1℃ K, E, J, T, C, N, PLⅡ, U, L : ±0.5℃
Measuring cycle	:	100ms / All points
Burnout	:	Incoming signal disconnection is judged in a thermo couple and a resistance temperature sensor input. Selection of UP/none is possible for each input.
Scaling	:	The setting of the input depends on a parameter lorder.

Communication specification

Electric specification	:	RS-485 conformity
Communication method	:	2-wire system half duplex, Asynchronous
Data format	:	Data length 8 bits Stop bit 1bit Parity Even / Odd / None
Transmission rate	:	9600bps, 19200bps, 38400bps
Data communication cycle	:	1 sec
Connection number	:	MAX 6 sets

Normal specification

Rated supply voltage range	:	DC24V （Terminal block input or AC/DC adapter use is possible）
Operation supply voltage range	:	DC21.6～26.4V
Power consumption	:	1.8W
Electric strength	:	Between power supply terminal－FG terminals 500V AC 1min Between input terminal－FG terminals 500V AC 1min
Insulation resistance	:	Between power supply terminal－FG terminals 500V AC more than 20MΩ Between input terminal－FG terminals 500V AC more than 20MΩ
Ambient temperature	:	0～50℃
Surrounding humidity	:	20～80%RH（Non condensing）
Attachment method	:	Wall-mounting or DIN rail (Mounting bracket option)

Digital measurement accuracy

Code	Type	Measuring range	Unit	Max resolution	Measurement accuracy	Notes
000	mV	-10.0 - +10.0		10μV	±(0.1% F.S.+1digit)	*1 0～400℃: ±4% F.S. 400～800℃:±(0.15% F.S.+1digit) *2 0～200℃:±(0.15% F.S.+1digit) *3 1～20K:±(0.5% F.S.+1digit) 20～50K:±(0.3% F.S.+1digit) *4 0～300℃:±(1.5% F.S.+1digit) 300～800℃:±(0.8% F.S.+1digit)
001	mV	0.00 - +20.00		10μV		
002	mV	0.00 - +50.00		10μV		
003	V	-0.200 - +0.200		1mV		
004	V	-1.000 - +1.000		1mV		
005	V	-10.00 - +10.00		10mV		
006	V	0.000 - +5.000		1mV		
007	mA	4.0 - 20.0		0.01mA		
008	B *1	0.0 - 1820.0	℃	0.1℃		
009	R1 *2	0.0 - 1760.0	℃	0.1℃		
010	R2 *2	0.0 - 1200.0	℃	0.1℃		
011	S *2	0.0 - 1760.0	℃	0.1℃		
012	K1	-200.0 - 1370.0	℃	0.1℃	±(0.1% F.S.+1digit) However, -200.0 to 0.0℃ is ±(0.15% F.S.+1digit)	
013	K2	-200.0 - 600.0	℃	0.1℃		
014	K3	-200.0 - 300.0	℃	0.1℃		
015	E1	-200.0 - 800.0	℃	0.1℃		
016	E2	-200.0 - 300.0	℃	0.1℃		
017	E3	-200.0 - 150.0	℃	0.1℃		
018	J1	-200.0 - 1100.0	℃	0.1℃		
019	J2	-200.0 - 400.0	℃	0.1℃		
020	J3	-200.0 - 200.0	℃	0.1℃		
021	T1	-200.0 - 400.0	℃	0.1℃		
022	T2	-200.0 - 200.0	℃	0.1℃		
023	C	0.0 - 2320.0	℃	0.1℃	±(0.1% F.S.+1digit)	
024	Au-Fe *3	1.0 - 300.0	K	0.1K	±(0.2% F.S.+1digit)	
025	N	0.0 - 1300.0	℃	0.1℃	±(0.1% F.S.+1digit)	
026	PR40-20 *4	0.0 - 1880.0	℃	0.1℃	±(0.2% F.S.+1digit)	
027	PLⅡ	0.0 - 1390.0	℃	0.1℃	±(0.1% F.S.+1digit)	
028	U	-200.0 - 400.0	℃	0.1℃	±(0.1% F.S.+1digit) However, -200.0 to 0.0℃ is ±(0.15% F.S.+1digit)	
029	L	-200.0 - 900.0	℃	0.1℃		
030	Pt100-1	-200.0 - 650.0	℃	0.1℃	±(0.1% F.S.+1digit)	
031	Pt100-2	-200.0 - 200.0	℃	0.1℃		
032	JPt100-1	-200.0 - 630.0	℃	0.1℃		
033	JPt100-2	-200.0 - 200.0	℃	0.1℃		

Note: C: W5Re - W26Re（Hoskins Mfg. Co. USA）

[Caution] Accuracy in reference condition. Reference junction compensation accuracy is not included in digital display accuracy.

- Reference junction compensation accuracy:
  - R,S,PR40-20,Au-Fe : ±1.0℃
  - K,E,J,T,C,N,PLII,U,L : ±0.5℃

- Reference condition:
  - Ambient temperature : 23 ± 2 ℃
  - Ambient humidity : 55 ± 10 %RH
  - Supply voltage : 24 V DC ± 10 %
  - Warm up time : 30 min or more after power on

Dimension

Unit : mm

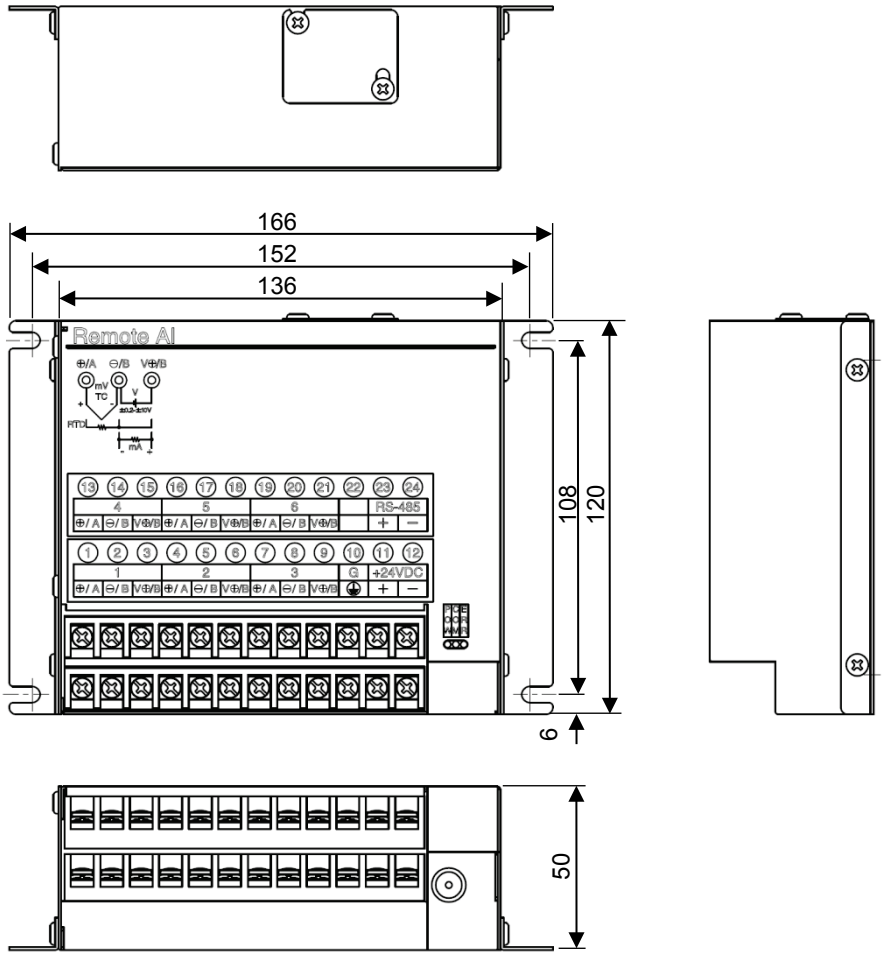
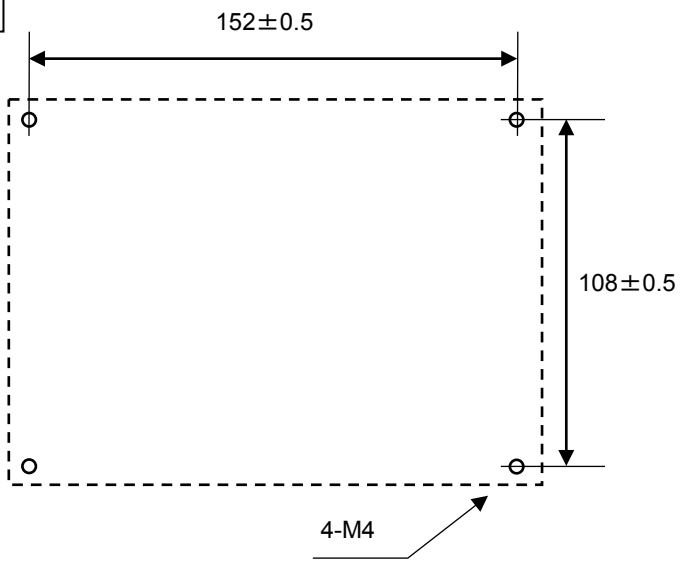


Figure of installation dimensions

Unit : mm



For questions about this instrument, please inform us of the model number and manufacture number inscribed on the nameplate inside the instrument (or on case surface).