

We thank you for your purchase of our model NRE-65A series meter relay. For safety use of this product, please observe the following caution. For proper operation of it, please also read the instructions to follow before the initial operation.

| ⚠ CAUTION | |
|---|--|
| <p>To prevent electric shock, observe the following cautions:</p> <ul style="list-style-type: none"> ◆ Never make power line connections with active lines. ◆ Ensure firm and tight connections to the terminals. ◆ Do not touch the power source terminals while the instrument is powered on. | <p>To avoid electric shock, failure or abnormal heat-up of the instrument, do not use the instruments in such places where:</p> <ul style="list-style-type: none"> ◆ exposed to rain, water drops or direct sunlight. ◆ high temperature or humidity, much dust or corrosive gas. ◆ affected by external noise, radio waves or static electricity. ◆ where there is constant vibration shock. |

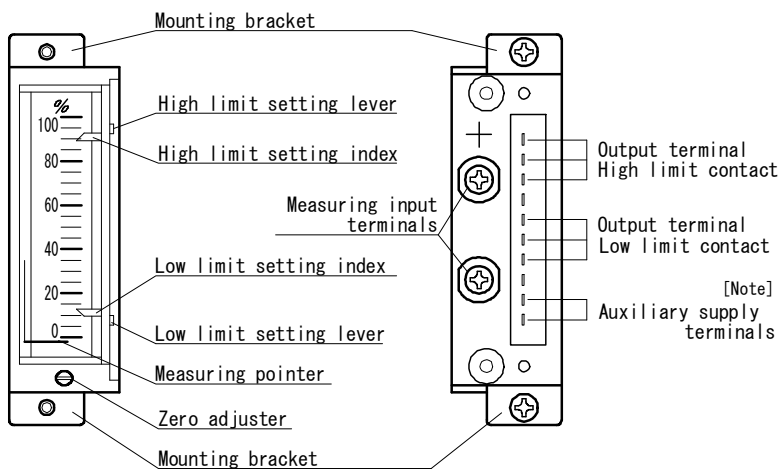
■ Check at Delivery

When the product is delivered to you, please check that its specifications conform to your requirement and that there is no damage in transit. This instrument is carefully inspected before delivery from factory under our strict quality control program, but if you find any defect or inconvenience, please inform us of the model name and serial number of the product, etc.

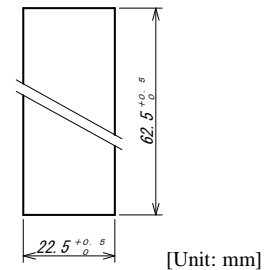
■ Cautions for Use

- ① This product is a precision instrument, so please take utmost care for transportation, installation or any other handling of it.
- ② No power on-off switch is provided on this product, so it immediately starts to operate when connected to the power source.
- ③ In case of fear that the external noise of surge may cause malfunction or breakdown of this instrument, it is necessary to take proper protective solution against noise.
- ④ In case of fear that this instrument suffers the surge voltage, ground one side of the measuring input terminals.
- ⑤ Use this product within the range or conditions conforming to its specifications and standard.

■ Name of Parts



■ Panel Cut-Out Dimensions



■ Installation

Insert the instrument from the front of the panel to install. Attach the mounting brackets to the top and bottom of the instruments (right and left sides in case of vertical types) and tighten a screw with a driver.

Optimum fastening torque of attached mounting brackets: 0.36~0.48 N·m

Note:

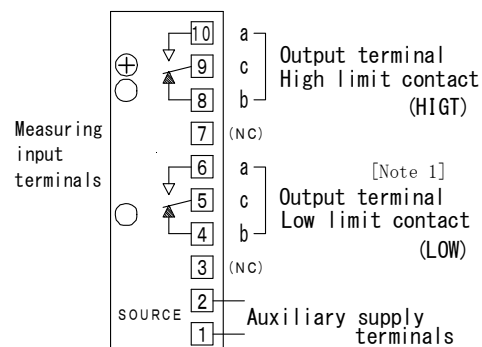
In case that the model name is NRE-65AH, no low limit setting lever, set point index bar or contact output terminal is provided.

■ Connections

Measuring input terminals of the instrument are M3. Make firm and correct connections with crimp type terminal. Optimum torque of M3 terminal screws: 0.36~0.48N·m. The edge connector is adopted in auxiliary supply terminals and output terminals. As the edge connector can be used in only one side, attention should be paid on mount direction of this meter relay.

Note 1:

In case that the model name is NRE-65AH, no contact output terminals for the low limit is provided.

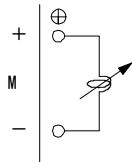


● Measuring Input Terminals

Arrange a cabling of measuring input line and power source line as distant as possible from each other. Close and parallel wiring of these two lines may cause unstable reading of the instrument.

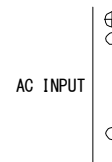
- ① DC Volt Meter
DC Current Meter
Receiving Meter

Connect the measuring input with correct polarity.
Use the particular accessory when it is designated.



- ② AC Volt Meter
AC Current Meter

Connect the measuring input.
Use the particular accessory when it is designated.

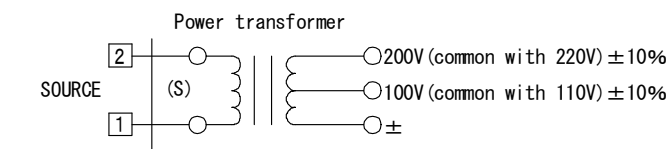


● Auxiliary supply Terminals (SOURCE)

The measurement input terminal and circuit portion of meter relay (power circuit portion) are not insulated. Therefore, the operation of more than 2 meter relays in parallel connection must not be done in order to avoid malfunction of meter relay.

- ① AC power source model

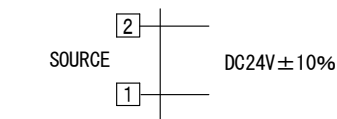
Connect the power transformer to
terminals of \pm and 100/110V (during AC100V power source)
terminals of \pm and 200/220V (during AC200V power source)



Connect the secondary signal from power transformer (S)
to the auxiliary supply terminals (SOURCE).

- ② DC power source model

Connect the DV24V to the auxiliary supply
terminals (SOURCE). The polarity of power supply
is not specified.



● High Limit (HIGH) and Low Limit (LOW) Contact Output Terminals

The contact capacity of high and low limit contact output is, with resistive load: AC 250V 2A, or DC 220V 2A.

Make the connections with the cable conforming to these capacities.

In case of that the relay needs to be controlled with larger capacity than above, provide the auxiliary relay externally.

■ Operation

- ① Prior to the operation of instrument, check that the input rate, auxiliary supply voltage and connections are correct.
- ② Before starting the measurement, check if the measuring pointer is accurately at zero (which is the point when the DC4mA or DC1V generated by a standard voltage/current generator is input to the input terminals, respectively when the rated input is DC4~20mA or DC1~5V). If there is a discrepancy at zero, adjust the pointer to indicate zero with the adjuster provided on the front of the instrument.
- ③ When measuring, read in a direction at right angle of the scale.
- ④ Slide the setting lever of high limit (or low limit) until the setting index comes to the desired point of relay actuation. Do not force the index moving beyond its stops which are at a little over the scale range, as it may cause a breakdown of the instrument.
- ⑤ While the instrument is powered on and when the measuring pointer exceeds the setting index (set point), the relay is actuated and, a-c turns ON (close) and c-b turns OFF (open).

Contact Information

Name : Tsuruga Electric Corporation
Address : 1-3-23 Minami-Sumiyoshi, Sumiyoshi-ku, Osaka-shi
558-0041 Japan
Email : ft.info@tsuruga.co.jp

We thank you for your purchase of our model NRE-100A series meter relay. For safety use of this product, please observe the following caution. For proper operation of it, please also read the instructions to follow before the initial operation.

⚠ CAUTION

To prevent electric shock, observe the following cautions:

- ◆ Never make power line connections with active lines.
- ◆ Ensure firm and tight connections to the terminals.
- ◆ Do not touch the power source terminals while the instrument is powered on.

To avoid electric shock, failure or abnormal heat-up of the instrument, do not use the instruments in such places where:

- ◆ exposed to rain, water drops or direct sunlight.
- ◆ high temperature or humidity, much dust or corrosive gas.
- ◆ affected by external noise, radio waves or static electricity.
- ◆ where there is constant vibration shock.

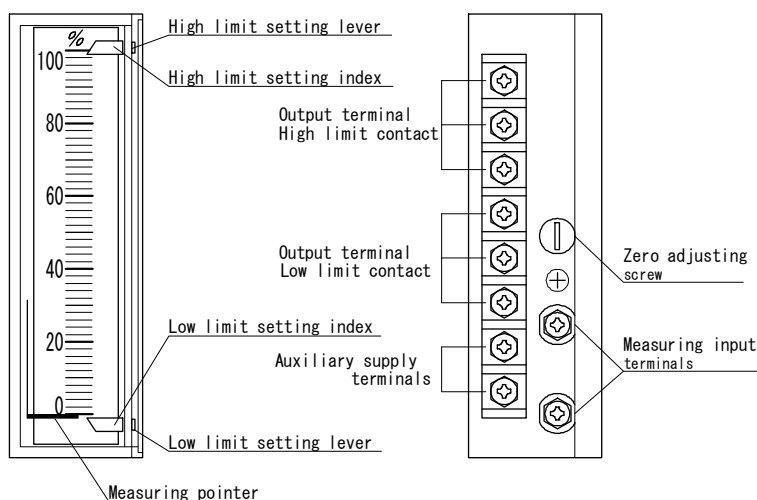
■ Check at Delivery

When the product is delivered to you, please check that its specifications conform to your requirement and that there is no damage in transit. This instrument is carefully inspected before delivery from factory under our strict quality control program, but if you find any defect or inconvenience, please inform us of the model name and serial number of the product, etc.

■ Cautions for Use

- ① This product is a precision instrument, so please take utmost care for transportation, installation or any other handling of it.
- ② No power on-off switch is provided on this product, so it immediately starts to operate when connected to the power source.
- ③ In case of fear that the external noise of surge may cause malfunction or breakdown of this instrument, it is necessary to take proper protective solution against noise.
- ④ In case of fear that this instrument suffers the surge voltage, ground one side of the measuring input terminals.
- ⑤ Use this product within the range or conditions conforming to its specifications and standard.

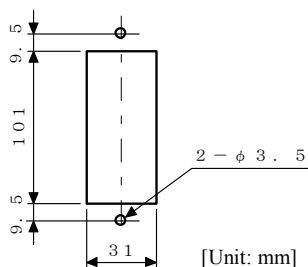
■ Name of Parts



Note:

In case that the model name is NRE-100AH, no low limit setting lever, set point index bar or contact output terminal is provided.

■ Panel Cut-Out Dimensions



Note: Dimension remains same even though escutcheon is used.

■ Installation

Fix the metal fittings on top and lower side of the instrument (left and right side if the instrument is horizontal) by tightening the screws. A set of metal fittings and screws are provided with the instruments.

① In case of standard installation

The instrument fixed with metal fittings is inserted from the back side of the panel and the screw is inserted from the front side of the panel. A Flat washer, a spring washer and a nut are inserted on each screw and tightened properly.

Note: Screws (M3) suitable with the panel thickness, flat washers and spring washers are not included along with instrument and customers are requested to arrange before installation.

② In case of escutcheon use

Insert the escutcheon from the front side of the panel and instrument fixed with the metal fitting is mounted with the screw of the escutcheon from the back side of the panel and is tightened with a flat washer, a spring washer and a nut provided with instrument.

Optimum fastening torque of attached mounting brackets: 0.36~0.48 N·m

■ Connections

Measuring input terminals of the instrument are M3.
 Make firm and correct connections with crimp type terminal.
 Optimum torque of M3 terminal screws: 0.36~0.48N·m

Note 1: In case that the model name is NRE-100AH,
 no contact output terminals for the low limit is provided.

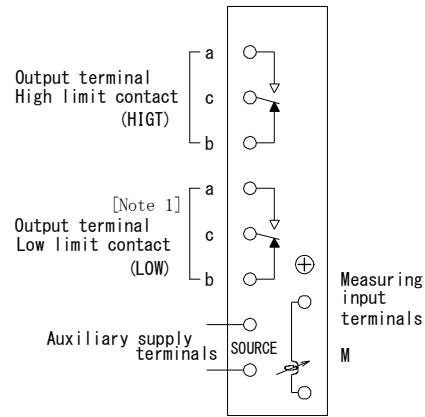
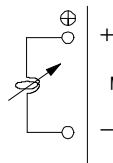
● Measuring Input Terminals

Arrange a cabling of measuring input line and power source line as distant as possible from each other. Close and parallel wiring of these two lines may cause unstable reading of the instrument.

① DC Volt Meter

DC Current Meter
 Receiving Meter

Connect the measuring input with correct polarity.
 Use the particular accessory when it is designated.



② AC Volt Meter

AC Current Meter

Connect the measuring input.

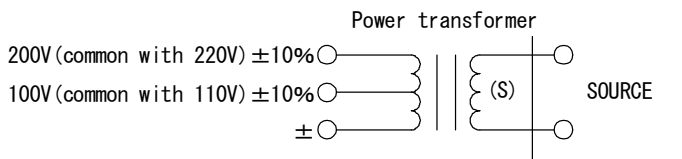
Use the particular accessory when it is designated.



● Auxiliary supply Terminals

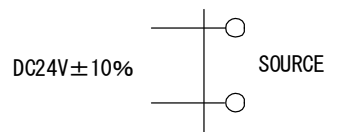
① AC power source model

Be sure to use the supply power transformer and try to place it near the body as much as possible. Connect the secondary side (S) of power transformer with power supply terminal.



② DC power source model

Connect the DV24V to SOURCE terminals.
 The polarity of power supply is not specified



● High Limit (HIGH) and Low Limit (LOW) Contact Output Terminals

The contact capacity of high and low limit contact output is, with resistive load: AC 250V 3A or DC 30V 3A.

Make the connections with the cable conforming to these capacities. In case that the relay control with the capacity higher than these, provide the auxiliary relay externally.

○ When no power is connected to this instrument, a-c is normally open and c-b normally close.

■ Operation

① Prior to the operation of instrument, check that the input rate, auxiliary supply voltage and connections are correct.

② Before starting the measurement, check if the measuring pointer is accurately at zero (which is the point when the DC4mA or DC1V generated by a standard voltage/current generator is input to the input terminals, respectively when the rated input is DC4~20mA or DC1~5V). If there is a discrepancy at zero, adjust the pointer to indicate zero with the adjuster provided on the front of the instrument.

Note)

When the input impedance at the input rating DC1 ~ 5V with the specification of 7331 accessory having more than 1 MΩ is inserted the auxiliary power with opened condition of input terminal of 7331, the measuring pointer indicates more than the upper limit of the scale.

③ When measuring, read in a direction at right angle of the scale.

④ Slide the setting lever of high limit (or low limit) until the setting index comes to the desired point of relay actuation. Do not force the index moving beyond its stops which are at a little over the scale range, as it may cause a breakdown of the instrument.

⑤ While the instrument is powered on and when the measuring pointer exceeds the setting index (set point), the relay is actuated and, a-c turns ON (close) and c-b turns OFF (open).

| Contact Information | |
|----------------------------|--|
| Name | : Tsuruga Electric Corporation |
| Address | : 1-3-23 Minami-Sumiyoshi, Sumiyoshi-ku, Osaka-shi 558-0041 Japan |
| Email | : ft.info@tsuruga.co.jp |

We thank you for your purchase of our model NRE-152 series meter relay. For safety use of this product, please observe the following caution. For proper operation of it, please also read the instructions to follow before the initial operation.

⚠ CAUTION

| | |
|---|--|
| <p>To prevent electric shock, observe the following cautions:</p> <ul style="list-style-type: none"> ◆ Never make power line connections with active lines. ◆ Ensure firm and tight connections to the terminals. ◆ Do not touch the power source terminals while the instrument is powered on. | <p>To avoid electric shock, failure or abnormal heat-up of the instrument, do not use the instruments in such places where:</p> <ul style="list-style-type: none"> ◆ exposed to rain, water drops or direct sunlight. ◆ high temperature or humidity, much dust or corrosive gas. ◆ affected by external noise, radio waves or static electricity. ◆ where there is constant vibration shock. |
|---|--|

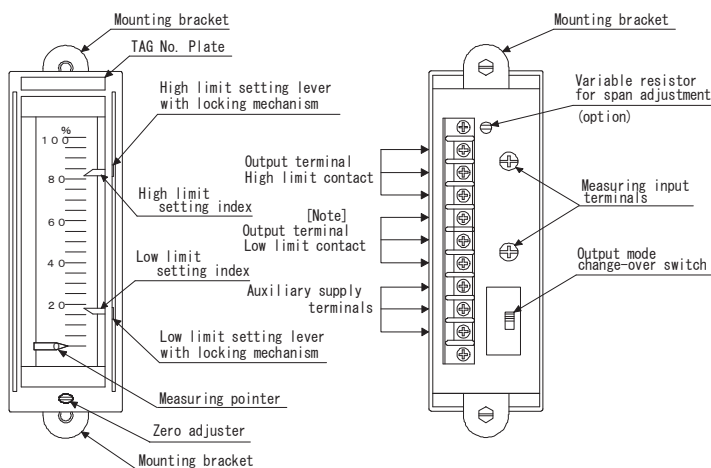
■ Check at Delivery

When the product is delivered to you, please check that its specifications conform to your requirement and that there is no damage in transit. This instrument is carefully inspected before delivery from factory under our strict quality control program, but if you find any defect or inconvenience, please inform us of the model name and serial number of the product, etc.

■ Cautions for Use

- ① This product is a precision instrument, so please take utmost care for transportation, installation or any other handling of it.
- ② No power on-off switch is provided on this product, so it immediately starts to operate when connected to the power source.
- ③ In case of fear that the external noise of surge may cause malfunction or breakdown of this instrument, it is necessary to take proper protective solution against noise.
- ④ In case of fear that this instrument suffers the surge voltage, ground one side of the measuring input terminals.
- ⑤ Use this product within the range or conditions conforming to its specifications and standard.

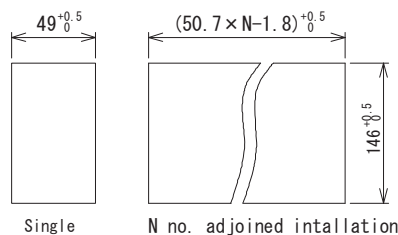
■ Name of Parts



Note:

In case that the model name is NRE-152H, no low limit setting lever, set point index bar or contact output terminal is provided.

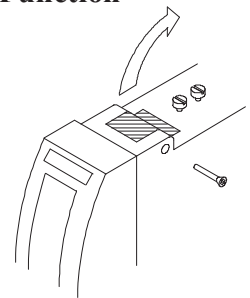
■ Panel Cut-Out Dimensions



[Unit: mm]

■ Additional Device & Function

- Cassette type scale plate
When replacing a scale plate, remove the mounting brackets, white sticker and locking screw of scale holder and pull out the shaded part toward the arrow \Rightarrow shows. The scale plate held in the holder can be removed then.
- Setting levers with lock
The setting levers are provided with a lock mechanism. When moving the setting lever, pull it out to release its locking. And after the setting press in the lever to lock its position. Thus, the accidental movement of the setting lever due to unintentional touch or vibration is avoidable.
- Change over switch of output mode
When the switch of "Normally Open"/"Normally Close" provided on the back of the instrument is set to "Normally Close", "a" contact and "b" contact of output are reversed. In this case, make an external connections following the terminal codes specified in the brackets ().
The symbols on the back of instrument shows the state in "Power source OFF" and "Normally Open".



■ Installation

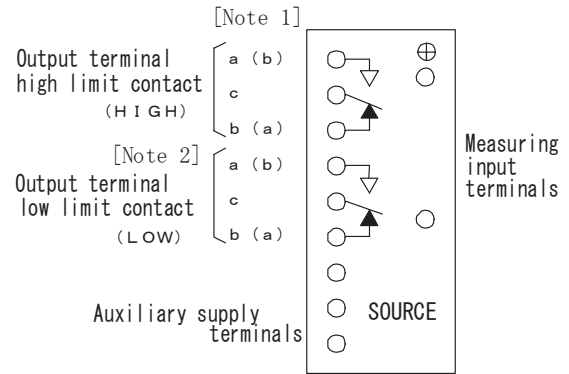
Insert the instrument from the front of the panel to install. Attach the mounting brackets to the top and bottom of the instruments (right and left sides in case of horizontal types) and fasten them with the attached threaded bars.

Optimum fastening torque of attached mounting brackets: 0.6~0.8N·m

■ Connections

Measuring input terminals of the instrument are M5 and, the contact output and auxiliary supply terminals M3. Make firm and correct connections with crimp type terminal. Optimum torque of M5 terminal screws: 1.2~1.3N·m Optimum torque of M3 terminal screws: 0.36~0.48N·m

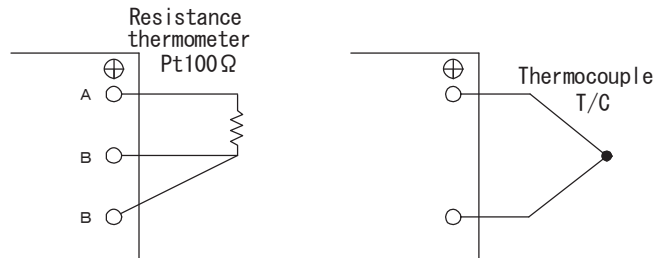
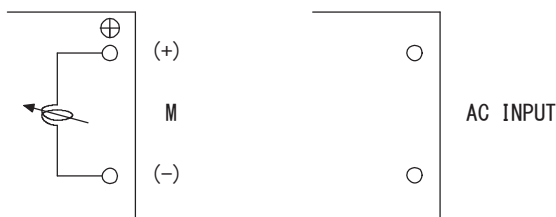
- Note 1:** Be careful that, when the switch for output mode (ref. Name of Parts) is changed to NC (normally close), the terminal codes are as specified in the brackets ().
- Note 2:** In case that the model name is NRE-152H, no contact output terminals for the low limit is provided.



● Measuring Input Terminals

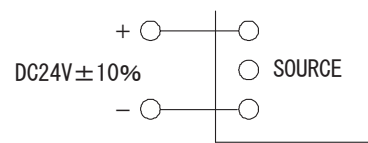
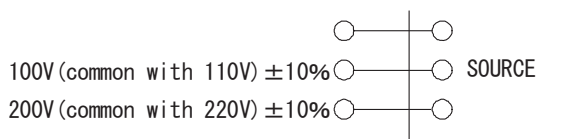
Arrange a cabling of measuring input line and power source line as distant as possible from each other. Close and parallel wiring of these two lines may cause unstable reading of the instrument.

- ① DC Volt Meter
DC Current Meter
Receiving Meter
Connect the measuring input with correct polarity. Use the particular accessory when it is designated.
- ② AC Volt Meter
AC Current Meter
Connect the measuring input. Use the particular accessory when it is designated.
- ③ Resistance Bulb Thermometer (built-in converter)
Connect the 3-wire system resistance thermometer (Pt100Ω).
- ④ Thermocouple Thermometer (built-in converter)
Connect the thermocouple K, J and etc. with correct polarity.



● Auxiliary supply Terminals

- ① AC power source model
Connect the AC voltage to the respective terminals of auxiliary supply terminals (SOURCE).
AC100V power source voltage: Terminals ± and 100/110V
AC200V power source voltage: Terminals ± and 200/220V
- ② DC power source model
Connect the DV24V to the auxiliary supply terminals (SOURCE) with correct polarity.



● High Limit (HIGH) and Low Limit (LOW) Contact Output Terminals

The contact capacity of high and low limit contact output is, with resistive load:
AC230V, 2.5A or
DC30V, 2.5A

Make the connections with the cable conforming to these capacities. In case that the relay control with the capacity higher than these, provide the auxiliary relay externally.

- When no power is connected to this instrument, a-c is normally open and c-b normally close. When the switch for output mode is changed to NC (normally close), the terminal codes are as per those in the brackets (), and a-c is normally close and c-b normally open.

■ Operation

- ① Prior to the operation of instrument, check that the input rate, auxiliary supply voltage and connections are correct.
- ② Before starting the measurement, check if the measuring pointer is accurately at zero (which is the point when the DC4mA or DC1V generated by a standard voltage/current generator is input to the input terminals, respectively when the rated input is DC4~20mA or DC1~5V). If there is a discrepancy at zero, adjust the pointer to indicate zero with the adjuster provided on the front of the instrument.

Note)

When the input impedance at the input rating DC1 ~ 5V with the specification more than 1 MΩ is inserted the auxiliary power with opened condition of input terminal, the measuring pointer indicates more than the upper limit of the scale.

- ③ When measuring, read in a direction at right angle of the scale.
- ④ Pull out the setting lever of high limit (or low limit) to release its lock, and slide it until the setting index comes to the desired point of relay actuation. Then press in the setting lever to lock its position. Do not force the index moving beyond its stops which are at a little over the scale range, as it may cause a breakdown of the instrument.
- ⑤ While the instrument is powered on and when the measuring pointer exceeds the setting index (set point), the relay is actuated and, a-c turns ON (close) and c-b turns OFF (open).

■ Calibration

When the variable resistor for span adjustment is provided, calibrate the instrument at an interval of about one year in order to maintain a long term accuracy. The calibration can be done with the zero adjuster provided on the panel front and the variable resistor for span adjustment on the rear of the instrument. Make the calibration with the ambient condition of $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and 75%RH or less.

Contact Information

| | |
|---------|--|
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