

INSTRUCTION MANUAL

WSPF-MS

POTENTIOMETER CONVERTER

Thank you for selecting another fine *watanabe* product. Please check the description given on the rating label of this unit to make sure that it meets your specifications and be sure to read this instruction manual before using the product.

This manual outlines the operation, connection and adjustment procedures of this product.

The unit has been manufactured and inspected according to our strict quality control standard. If you should find a defect including damage incurred during transportation, contact us or the dealer where you purchased it immediately.

○PACKAGE INCLUDES:

- Potentiometer converter.....1
- Base socket.....1

* For details of models and specifications, please download the product catalog from our website, and then check it.

1. PRECAUTIONS

1) Conformity with CE directive

- This equipment is compliant with Installation Category II and Pollution Degree 2 environment. The insulation capability between signal input and output is basic insulation. Before installing, please check that the insulation class of this equipment satisfies your system requirements.
- Please be sure to install this equipment to the inside of a panel.
- Please use this equipment at an altitude of up to 2000 m.
- Compliance with EN standards:
 - EN61326-1 EMS: Industrial environments; EMI: Class A
 - EN61010-1 The wiring length should be not more than 30 m.
 - EN IEC 63000
- * Custom-made items other than a catalog standard specification are outside CE conformity.

2) Power supply

- Check the rated voltage on the rating label, and use the product within the range of each of the following ratings (△ is indicated on the rating label.)
 - ① 100 to 240VAC
100 to 240VAC $\pm 10\%$ (50/60 Hz) approx. 4.4 VA
 - ② 24VDC
24VDC $\pm 10\%$ approx. 64 mA
* You can use it as 10.8 to 30 V, if you do not use this product as a CE compliant article.
 - ③ 110VDC
110VDC $\pm 10\%$ approx. 11 mA

3) Handling

- When removing or mounting the main body from/to the socket, be sure to turn OFF the power supply and the input signal in advance to prevent any problems.

4) Installation

- This equipment is designed for indoor use.
- Please install the main body in a location where the ambient temperature is within -5 to 55°C.
- Please install the main body in a location where relative humidity is less than 90%RH (no freezing or condensation).
- When the equipment is to be installed in a location where there is excessive dust or metal particles, house it in a dust-proof cabinet, which has a heat radiation function.
- Avoid exposing the equipment to vibration and impact, which may cause malfunction.
- Please do not block ventilation openings of the main body.

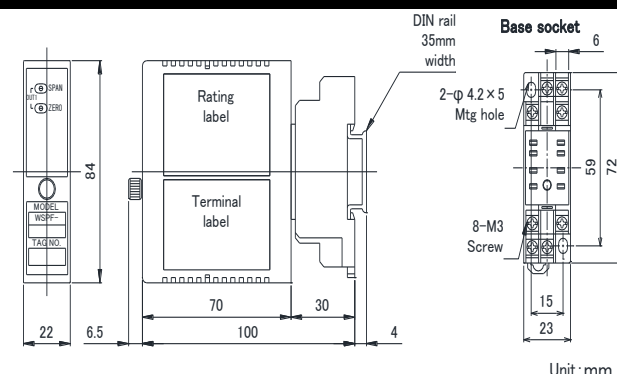
5) Wiring

- Be sure to keep the wiring of the power line, input signal line and output signal line away from any noise source, relay driving line and high-frequency line.
- Avoid clamping these lines together with a noise-superimposed line or putting them together in the same duct.

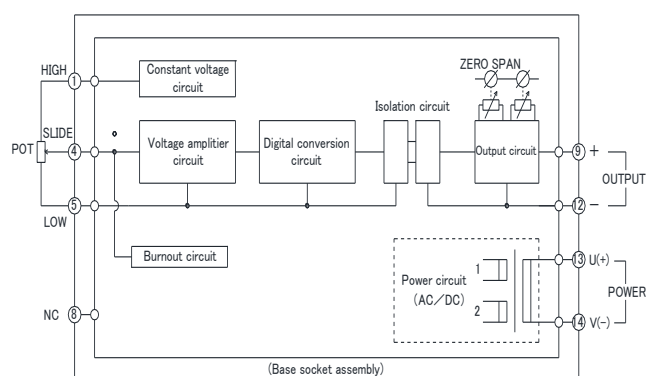
6) Others

- This equipment can be operated as soon as the power supply is turned ON. However, for optimum performance, allow 30 minutes of energizing time.
- This product is precision equipment. It is therefore recommended that you periodically calibrate it by performing ZERO and SPAN adjustments once a year.

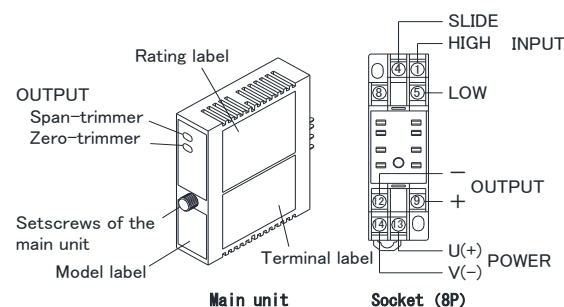
2. OUTLINE DIMENSIONS



3. CIRCUIT DIAGRAM



4. NAME OF EACH PART AND TERMINAL LAYOUT



Terminal No.	Symbol	Contents
1	INPUT	HIGH Please connect a HIGH(100%) connection.
4		SLIDE Please connect a SLIDE connection.
5		LOW Please connect a LOW(0%) connection.
8	NC	No Connection (*1)
9	OUTPUT	+
12		- The signal based on the input/output specification is output.
13	POWER	U(+)
14		V(-) Connect the power supply of the rated voltage.

Connection points : M3 SEMS screw

Screw tightening torque : Recommended: 0.6 N-m

*1 Please do not wire anything at NC terminal.

*This equipment has burnout protection circuit built-in, which upscale output signal higher than the 100% when connected potentiometer has been disconnected.

Therefore, if you turn on the power of this equipment without connecting potentiometer, output signal will rise to around 120% of full span.

So please turn off the power when potentiometer is not connected.

5. ADJUSTMENT

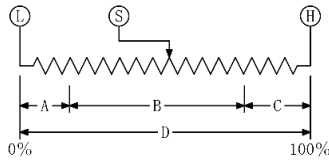
This equipment can adjust ZERO and SPAN by operation of each trimmer on the front.

The range of ZERO adjustment is 0 to 50%, SPAN adjustment is 50 to 100% of total resistance of a potentiometer.

But the measuring range must be 50% or more of total resistance of a potentiometer (See diagram below).

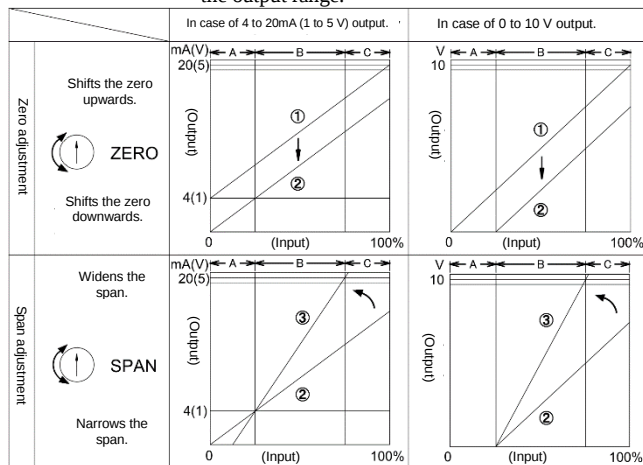
This calibration shall be made 30 minutes after the power supply is turned ON, using a signal source, and measuring instruments, whose accuracies are 10 times or higher than that of this equipment.

$$B = D - (A + C) \geq \frac{D}{2}$$



A: Out of range, lower side resistance
B: Measuring range
C: Out of range, upper side resistance
D: Total resistance of a potentiometer

- 1) ZERO adjustment: Apply a minimum value within the input range to the input terminals, and turn the zero-trimmer until the output signal reaches the minimum value within the output range.
- 2) SPAN adjustment: Apply a maximum value within the input range to the input terminals, and turn the span-trimmer until the output signal reaches the maximum value within the output range.



① Before adjustment ② After Zero adjustment
③ After Span adjustment

6. Operation Against Conditions out of Range

1) Excessively large input

In the case of the input signal exceeding the upper limit of the input range, the output signal increases increased nearly proportional to the input up to approx. 120%fs.

2) Excessively small input

If the input signal is lower than the lower limit of the input range, the output signal reduces nearly proportional to the input down to approx. -20%fs.

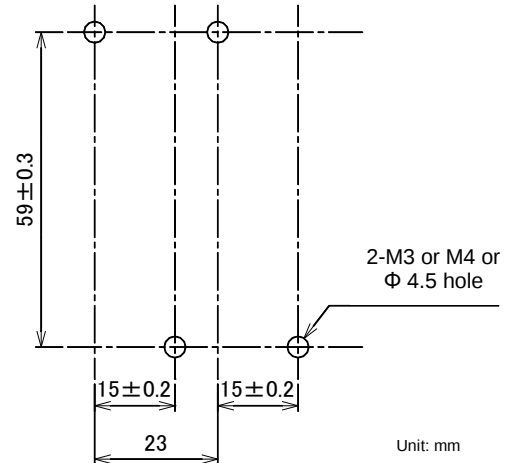
3) Load out of range

- ① In the case of current output, if the “allowable load resistance range” is exceeded, the output obtained will be roughly proportional to the input over the range to where the voltage between the output terminals becomes about 15 V. However, if the input exceeds this range, the output will saturate and the error will increase.
- ② In the case of voltage output, if the output is reduced below the “allowable load resistance range”, the output will saturate and the error will increase.

7. INSTALLATION DIMENSIONS

When mounting the product on a wall, refer to the installation dimension diagram.

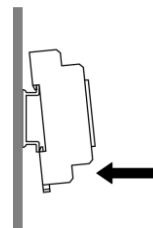
The diagram below shows the minimum mounting clearance between adjacent units.



8. Mounting and Removing to/from the DIN Rail

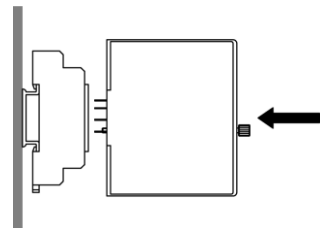
1) How to fix the socket

Hold the product with the slider at the bottom of the socket facing downward, engage the tab at the top of the rear surface of the socket with the rail, and then push in the bottom of the socket in the direction of the arrow to fix the product in place.



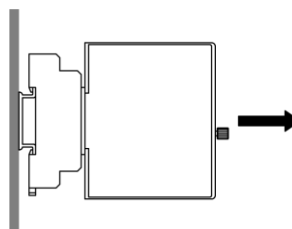
2) How to fix the main body to the socket

Hold the main unit in the direction such that the text on the label can be read correctly, insert it perfectly straight, and then tighten the screws on the front of the main unit. Be careful not to tighten the screws too hard.



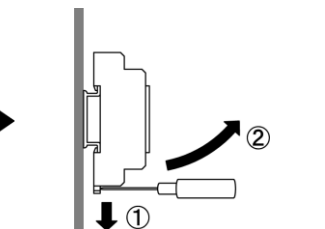
3) How to remove the main body from the socket

Slacken the screws on the front of the main unit, and withdraw the main unit perfectly straight.



4) How to remove the socket

Insert a screwdriver in the slider groove of the socket. While pulling the screwdriver in the direction of the arrow as shown in Figure ①, draw the lower part of the socket forward ② until it is removed.



Note)

Note that if you continue to slacken the screws on the front panel of the main unit, they will drop out of the main unit.

9. WARRANTY

The warranty period for this equipment is five (5) years after delivery. If it should fail under the normal operation conditions within the warranty period, contact us or the dealer where you purchased the equipment as soon as possible.

We will repair the defective equipment free of charge or replace it with a new one if necessary. This warranty does not apply to equipment damaged due to disassembly, modifications or operation under conditions other than those specified.

We will not take any responsibility for any damage incurred due to this product.