UNIVERSAL ISOLATE TRANSDUCER
MODEL TW-4M-1-N,TW-4M-4-N
INSTRUCTION MANUAL

Warning

This marking indicates that the erroneous operation of this transducer may result in death or serious injury.

Precautions

(1) If voltage or current exceeding the allowable maximum voltage or current is applied to the input terminals, the transducer may be damaged.
(2) Apply power within the applicable range of the transducer. Otherwise fire, electric shock or transducer damage may result.
(3) The contents of this instruction manual are subject to change without prior notice.
(4) This instruction manual is carefully prepared. However, if any mistake or omission is found, contact your nearest Watanabe Electric Industry sales agent or Watanabe Electric Industry directly.
(5) Make this manual available easily anytime.

■Outline

This Model TW-4M universal isolate transducer is used to convert DC voltage/current input into DC voltage/ current output isolated from the input. The input /output can be set changed by input/ output setting dip switches.
In addition, the three ports of input, output and power are mutually isolated. The case can be mounted on a DIN rail in one touch.
4P screw type terminal blocks are used for the input and output.

■Model No. Configuration

Each code and the standard specifications of this transducer are as follows. First check whether or not your desired specifications are correct by comparing them to the following specifications.

TW- 4M- □ - N

Code to Specify power
- 1:100 to 240V AC ±10%
- 4:24V DC ±10%

*note: Receivable input signal is only from isolated secondary source. Output terminal shall be connected to isolated secondary circuit only.

■Input specification DC voltage / current

Input signal	Input resistance	Input allowable range
0 to 5V DC	More than 1MΩ	-50 to +150% F.S
1 to 10V DC		
0 to 60mV DC		
1 to 5V DC		
-5 to 5V DC		
-10 to 10V DC		
0 to 20mA DC	250Ω	
4 to 20mA DC		

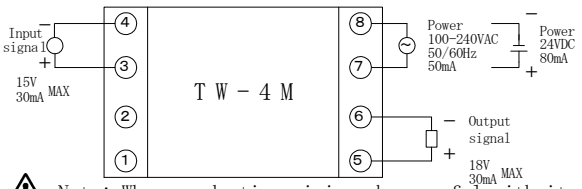
■Output specification DC voltage / current

Output signal	Allowable load resistance
0 to 5V DC	More than 2kΩ
1 to 5V DC	
-5 to 5V DC	
0 to 10V DC	More than 4kΩ
-10 to 10V DC	
0 to 20mA DC	Less than 550Ω
4 to 20mA DC	

■General specifications

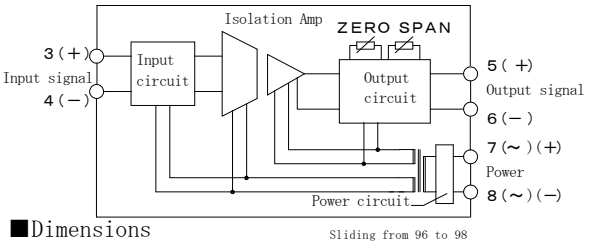
Base Accuracy	:	±0.1%F.S(At 25±2℃)
Power supply variation	:	±0.06%F.S
Load resistance variation	:	±0.06%F.S
Range setting before shipment	:	Input;1 to 5V DC,Output;4 to 20mA DC
Accuracy of range setting before shipment	:	±0.25% F.S
Error caused by input range setting change	:	±1% F.S Range setting for -5 to 5VDC, -10 to 10VDC:±2% F.S
Error caused by output range setting change	:	±1% F.S Range setting for -5 to 5VDC, -10 to 10VDC:±2% F.S
Error caused by output revers setting change	:	±2% F.S
Temperature characteristic	:	±0.02%F.S/℃
Response time	:	Less than 1ms,50ms or 500ms (Time required for arriving at 90% of rated output)
Insulation resistance	:	Between input and output or power supply, More than 100MΩ (At 500V DC)
Dielectric strength	:	Between input and output or power supply, For 1 min.(At 2000V AC)
Power supply voltage	:	100 to 240V AC ±10% 50/60Hz or 24V DC ±10%
Consuming current	:	Less than 50mA (At 100V AC) Less than 80mA (At 24V DC)
Installation Catecory	:	For use in Pollution Degree 2 Environment
Surrounding Air Temperature rating	:	-5 to +50℃
Operating humidity	:	Less than 90%RH (No dew-condensing)
Storage temperature	:	-10 to 70℃
Storage humidity	:	Less than 60%RH (No dew-condensing)
Case material	:	Black PBT 94-V0
Weight	:	Approx. 130g
Applicable standards	:	EN61326-1 (Only for TW-4M-4-N) At less than the cable length 30m. EMI: Group 1 Class A Immunity: Industrial locations EN IEC 63000

■Input/output connection diagram



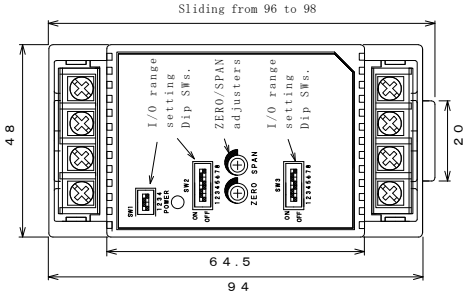
Note: When conducting wiring, be careful with its polarity

■Block diagram

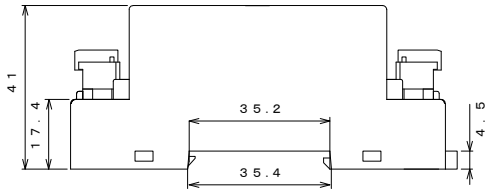


■Dimensions

Front view



Side view



■About solder less terminal to connect with the screw type terminal block

Screw size: M3.5×7L

Recommendation solder less terminal: Ring tongue(R type) M3.5
Spade tongue(A type)M3.5
Applicable Wire AWG# 22 to 14

Quality of material: Screw Iron, nickel plating
Connection board Yellow copper, tin plating

Tightening torque: 0.68N・m(6.0lbf・in)

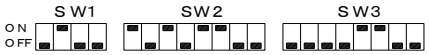
■Setting or changing input/output range

⚠ Always set or change the input/output range with the power turned off.

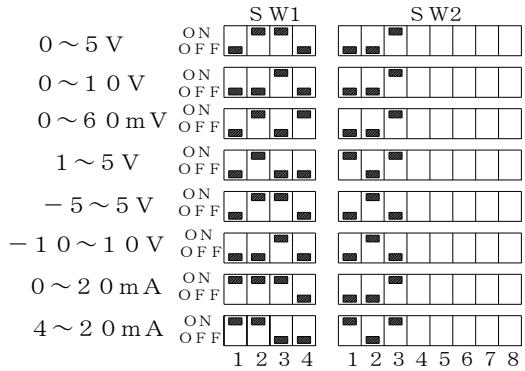
The input/output range can be set or changed by dip switches SW1 and SW2,SW3 on top of the transducer.

After finishing the setting, stick the attached seal to the window for dip switch operation. Prior to factory shipment, the input is set 1 to 5V and the output, 4 to 20mA.

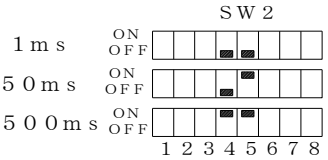
Range settings before shipment



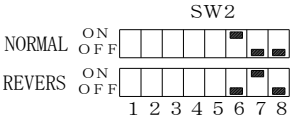
1. Setting or changing input range



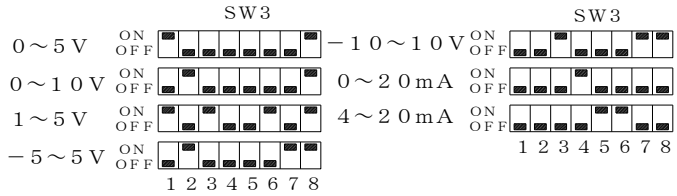
2. Setting Response time



3. Setting Revers(Output)



4. Setting or changing output range



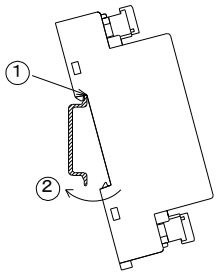
5. As this transducer is used for high-accuracy measurement. After setting or changing the input/output range (after re-checking that the setting is correct), make output ZERO and SPAN adjustments.

・ZERO adjustment
Apply the minimum input value to the input terminals. Then, turn the ZERO adjuster until the output at this time becomes the minimum value in the output specification.

・SPAN adjustment
Apply the maximum input value to the terminals. Then, turn the SPAN adjuster until the output at this time becomes the maximum value in the output specification.
Repeat the above ZERO and SPAN adjustments several times until the minimum output value in the output specifications is obtained at the minimum input value and also the maximum output value in the output specification is obtain at the maximum input value.

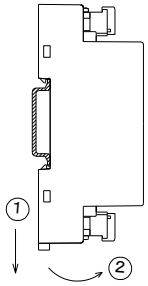
6. There is a list of the INPUT and OUTPUT signals as well as SW1 and SW2,SW3 on top of the transducer. Therefore it is convenient to put check marks on the input/output.

■Mounting



①Engage the top side of the transducer with the rail.
②Push the bottom side of the transducer into the rail.
*If the transducer is likely to be dislocated after its mounting, it is recommended that a clamp be used.
(For example E/NS35N made by PHOENIX CONTACT)
If two or more transducers are mounted in a row, do not contact each transducer, but leave some space between each transducer.

■Dismounting



①Push down the slider with a screwdriver.
Push up the bottom side of the transducer.
②Disengage the top side of the transducer from the rail.

■Caution

・Store the transducer at a location having a storage temperature of -10 to +70℃ and a humidity of less than 60% RH.
・Use the transducer at a location where there are no chemicals or gases harmful to its electrical parts or there is no dust.
・Do not apply any vibration or impact to the transducer.
・In order to lessen the effect of noise,etc., do not bundle the input/output wires with the power supply wires, nor put these wires in the same duct.

■Warranty

This transducer is warranted for a period of one year from date of delivery. Any defect which occurs in this period and is undoubtedly caused by Watanabe's faults will be remedied free of charge.

This warranty does not apply to the transducer showing abuse or damage which has been altered or repaired by others except as authorized by Watanabe Electric Industry.

■After－sale service

This transducer is delivered after being manufactured, tested inspected under strict quality control.

However, if any problem does occur, contact your nearest Watanabe Electric Industry sales agent or Watanabe Electric Industry directly giving as much information on problem as possible.

■Accessories

Dip switch seal: 2 sheet
Instruction Manual : 1 pcs.

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