

# 3-port Isolation AMP (High-gain) MODEL ZM-310 INSTRUCTION MANUAL



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



- (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

The ZM-310 is a high-gain, 3-port, isolation-type amplifier capable of handling input of small voltages(mV). Employing a transformer with a high coupling coefficient means few losses and high linearity. Despite the compact size of the transformer, the ZM-310 can withstand high voltages and, thanks to its case-filled structure, offers a high level of airtightness. It is also best suited to the isolation of many types of signals, including and transducer instrumentation signals.

The ZM-310 is of the board-mounting type, and has pitch of 2.54mm, which greatly facilitates board layout.

### ■ Input Characteristics

Input voltage range	: $\pm 10\text{V DC}$ (minimum input voltage range: 0 to 10mV DC)
Input offset voltage	: Max. 20mV DC (25°C) Max. 30mV DC (0 to 70°C)
Offset temperature drift	: 70ppm/°Cmax (0 to 60°C)
CMR	: 110dB (CMV=1500V AC rms)

### ■ Output Characteristics

Output voltage range	: $\pm 10\text{V}$ DC
Output impedance	: $300\Omega$ or below
Ripple	: $20\text{mV}$ (TYP)

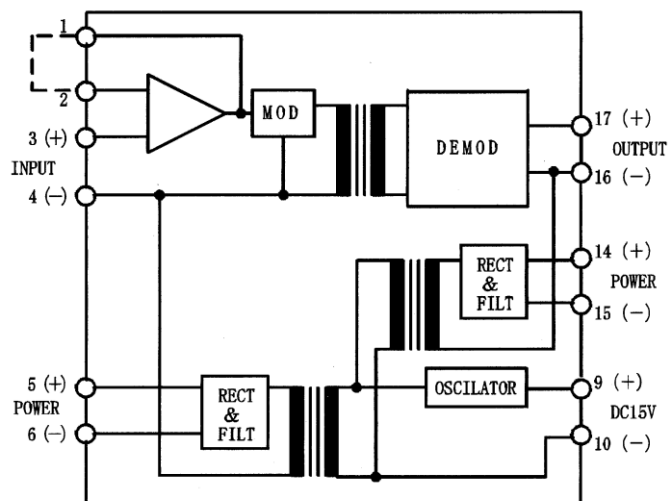
## ■ General Specifications

Amplifier gain range	: G=0 to 1000 (V/V)
Allowable difference	: $\pm 0.5\%$ (TYP)
Temperature drift	: $\pm 30\text{ppm}/^{\circ}\text{C}$ (TYP)
Linearity	: $\pm 0.05\%$ max (G=1)
Response speed	: 1.5msec (TYP) (0 $\rightarrow$ 90%)
Power output	: Voltage; $\pm 15\text{V}$ DC $\pm 20\%$ Current; 1mA DC (max) Ripple; 250mVp-p (TYP)
Power	: $\pm 15\text{V}$ DC $\pm 10\%$ , 25mA (TYP)
Weight	: Approximately 30g
Operating temperature range	: 0 to 70 $^{\circ}\text{C}$
Withstand voltage	: 1500V AC for one minute for inputs, output, and power sources
Isolation resistance	: 100M $\Omega$ or above for inputs, outputs, and power sources

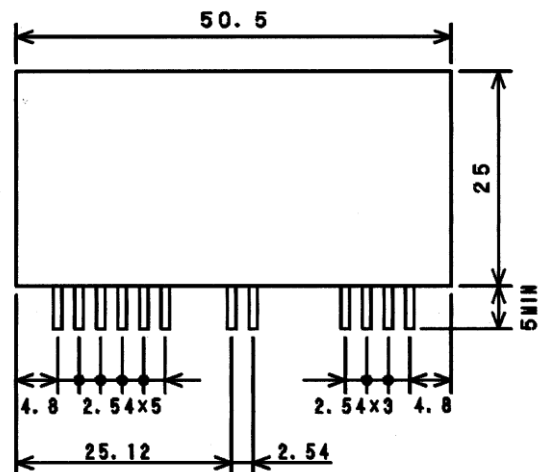
## ■ Applications

- 1.Isolation of transducer signals
- 2.Isolation of instrumentation signals
- 3.Isolation of ground loops
- 4.Isolation of other types of signals

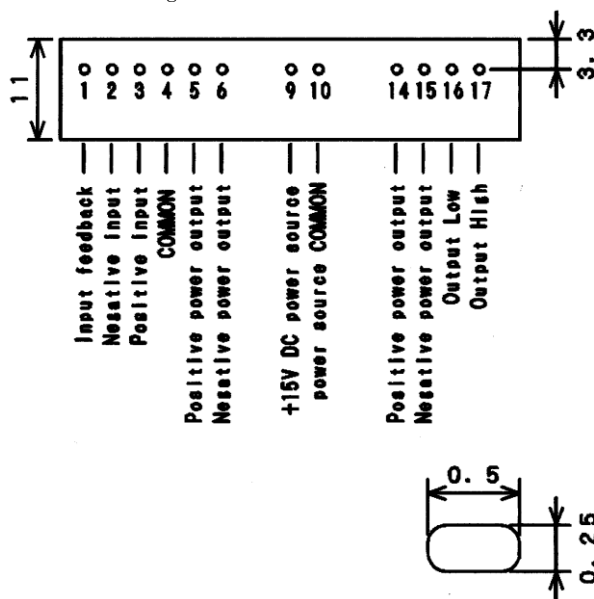
■ Block diagram



## ■ Dimensions



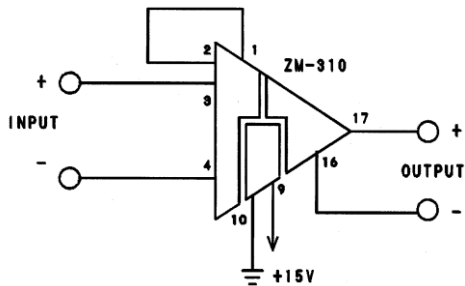
### ■ Pin Function Diagram



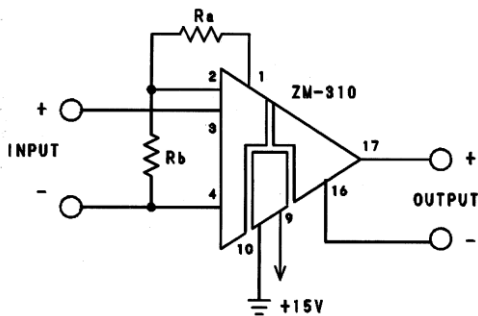
### Pin size

## ■ Standard Application Circuits

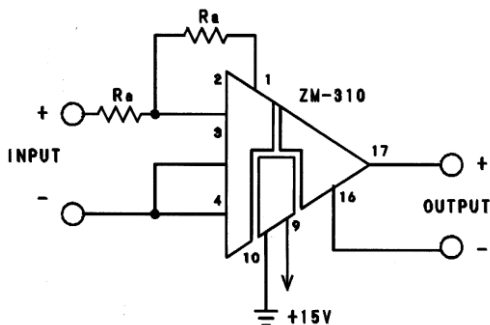
### ① Non-inverting amplifier circuit ( $G=1$ )



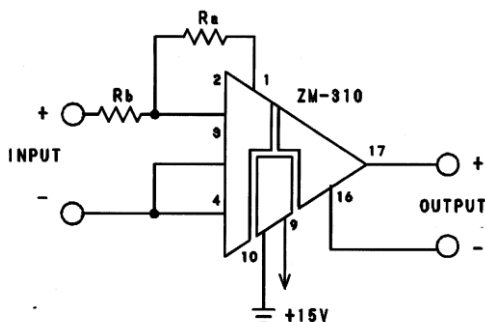
### ② Non-inverting amplifier circuit ( $G=1 + \frac{R_a}{R_b}$ )



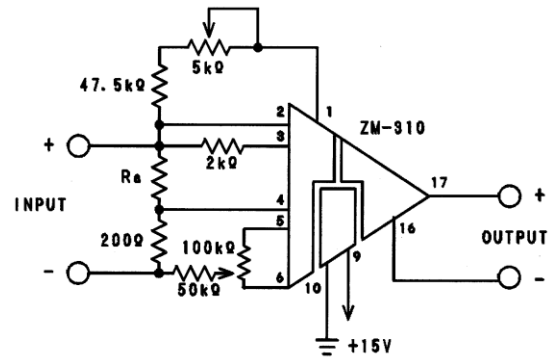
### ③ Inverting amplifier circuit ( $G=1$ )



### ④ Inverting amplifier circuit ( $G=-\frac{R_b}{R_a}$ )



### ⑤ Input into a non-inverting amplifier circuit Offset/gain control circuit



Note: Refer to the Standard Catalog for other types of control circuits.

## ■ Cautions

- Store the converter at a storage temperature of  $-10^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$  and a humidity of less than 60% RH.
- Use the converter at a location where there are no chemicals or gases harmful to electrical parts and components, nor dust.
- Do not apply any shock or vibration to the converter.
- In order to reduce the effect of noise on the converter, do not bundle the input/output wires with the power supply wires, nor accommodate these wires in the same duct.

## ■ Warranty

This converter 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 Electric Industry's faults will be remedied free of charge. This warranty does not apply to the converter showing abuse or damage which has been altered or repaired by others except as authorized by Watanabe Electric Industry Co., Ltd.

## ■ After-sale service

This converter is delivered after being manufactured, tested and 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

Non

**watanabe**

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