

## EMRT1

RoHS

### Square root calculator

This instrument performs square root calculation of an electric signal that is in proportion to the input pressure and outputs a current signal that is in proportion to the airflow rate.

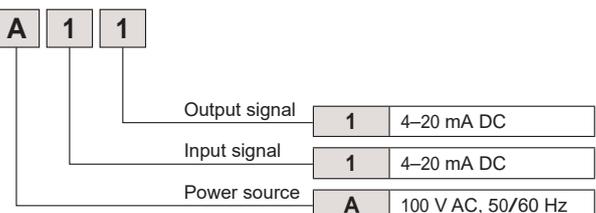
The input signal and the output signal are electrically insulated from each other.



EMRT1

### Product code

EMRT1 **A** **1** **1**



- ◆When making an inquiry or placing an order, specify the above product code.
- ◆When you use this product for airflow rate/airflow speed measurements in combination with an adjustment meter, we need to obtain the specifications of the pressure detection side. Fill out the airflow rate/airflow speed specification document preparation sheet on page 15, and inform us of the data.

- List of products
- WO81
- WO71
- FR51A
- MS99
- MS99S
- MS61A-RA
- QDP33
- EMD8A
- EMD7
- EMT1
- EMTGP1
- EMT1H
- EMT6
- EMP5A
- EMRT1
- HWS15A
- Accessories
- Application
- Precautions
- Maintenance

### Specifications

Model	EMRT1
<b>Input signal</b>	4 to 20 mA DC (input resistance of 50 Ω)
<b>Output signal</b>	4 to 20 mA DC (load resistance of 500 Ω or lower)
<b>Square root output cut point</b>	15% FS or below
<b>Accuracy</b>	±1% FS (at 20°C) However, at output signal range of 15 to 100% FS
<b>Temperature characteristics</b>	±0.01% FS/°C (at 0°C to 40°C)
<b>Power voltage</b>	100 V AC ± 10%, 50/60 Hz, approx. 3.5 VA
<b>Exterior material</b>	Polycarbonate and ABS resin
<b>Operating ambient temperature</b>	0 to 50°C (no freezing allowed)
<b>Operating ambient humidity</b>	90% RH or below (no condensation allowed)
<b>Insulation resistance</b>	Between terminal and case: 20 MΩ or higher (500 V DC megger)
<b>Withstand voltage</b>	Between power terminal and case: 1000 V AC, 50/60 Hz, for one minute
<b>Mounting method</b>	Rail mounting (applicable rail: 35 mm wide DIN rail)
<b>Mass</b>	Approx. 300 g

◆For use environment, refer to page 118.

### Square root output cut point

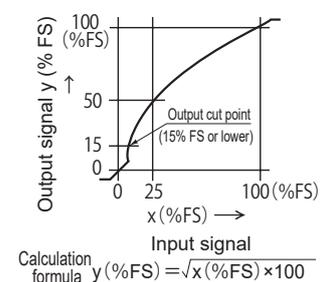
This refers to the point where output is cut so as not to perform square root output of the output signal in the range of 0% to 15% of FS. The results of comparison of input signals and output signals are shown in the table on the right. Since the input value becomes extremely small as the output value decreases, and then enters an action range out of the scope of the accuracy of the calculator, the cut point is set. In this instrument, the value range of 15% FS and below, which does not affect the actual use, is cut off.

### Square root calculation input/output comparison table

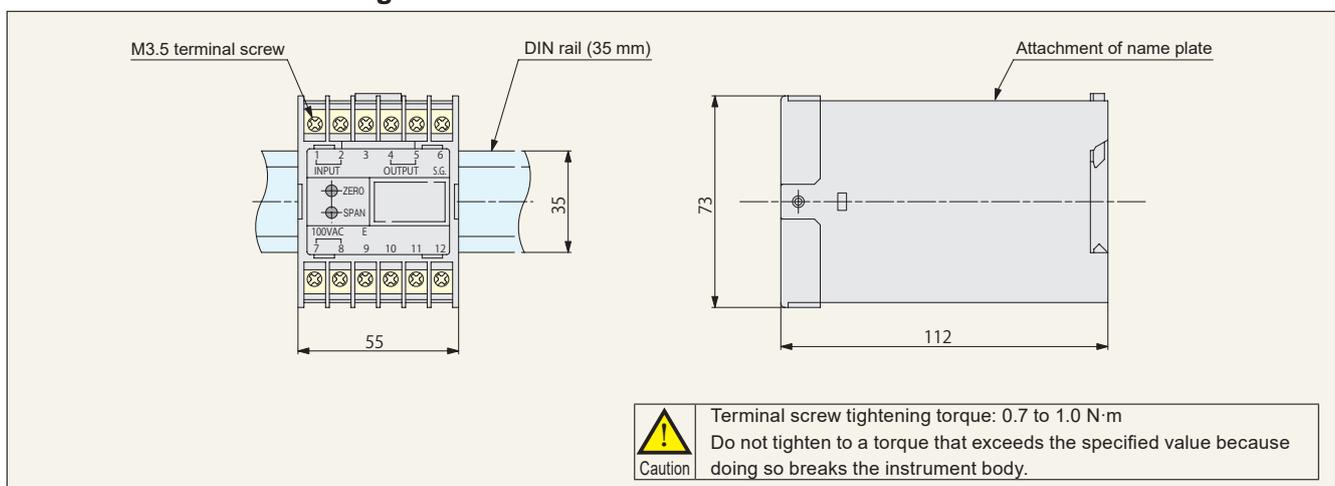
Output value	Input value
50%	$(0.5)^2 \times 100\% = 25\%$
20%	$(0.2)^2 \times 100\% = 4\%$
15%	$(0.15)^2 \times 100\% = 2.25\%$
10%	$(0.1)^2 \times 100\% = 1\%$
5%	$(0.05)^2 \times 100\% = 0.25\%$

### Table for output signal

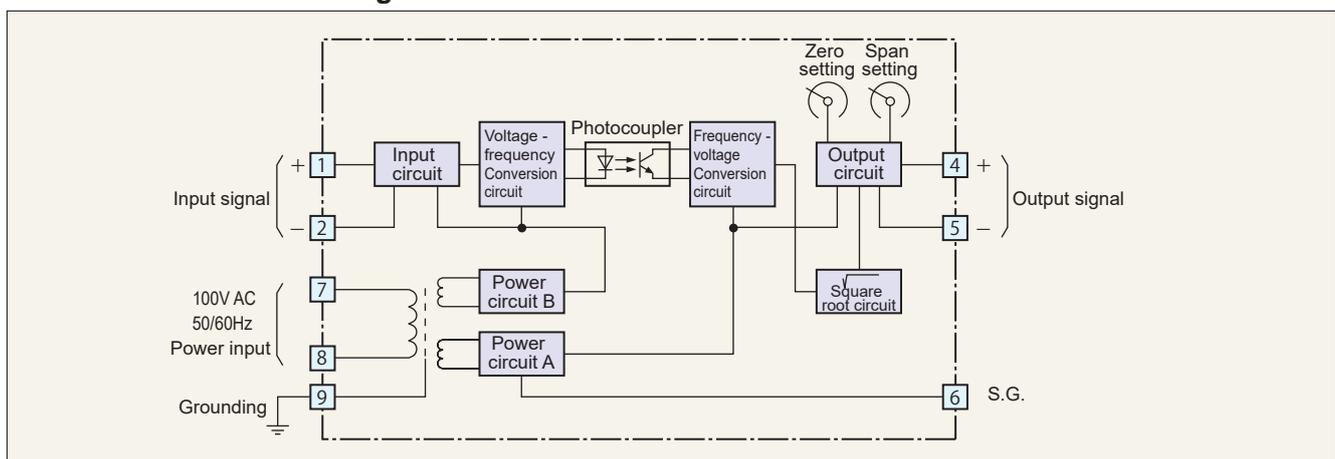
Input signal 4–20 mA DC	Output signal 4–20 mA DC	
4 mA	Zero point	4.0 mA
8 mA	1/2 span point	12.0 mA
20 mA	Span point	20.0 mA



### External dimension drawing



### Electronic circuit block diagram



## Warranty

### Warranty period

The warranty period for our product is one (1) year from delivery to the location specified by the orderer who makes a direct transaction with us.

### Scope of warranty

If any failure or defect attributable to us becomes clear during the above warranty period, we will repair the product or supply a substitute product free of charge. However, even during the warranty period, we will exclude the product from the scope of the warranty if the failure or defect corresponds to any of the following:

- (1) The failure or defect was caused by an unreasonable condition, environment, handling, or usage not mentioned in the instruction manual, specifications, and our product catalog.
- (2) The failure or defect was caused by a factor other than our product.
- (3) The failure or defect was caused by a modification or repair conducted by a party other than us.
- (4) The failure or defect was caused by an event that could not be foreseen at the scientific and technical levels at the time of product shipment from us.
- (5) The failure or defect was caused by an external factor not attributable to us, such as acts of God and disasters.

Please note that the warranty mentioned here means the warranty for our individual product, and damage provoked by a failure or defect of the product is excluded from the scope of the warranty.

\*This warranty is valid only in Japan.

## Application and usage

Our products are designed and manufactured as general-purpose instruments for general industries.

Therefore, our products are not intended for the following uses, and our products used in such a manner are outside the scope of application.

- (1) Equipment that is anticipated to greatly affect lives and properties, such as nuclear power generation, aviation, railways, marine vessels, vehicles, and medical devices
- (2) Utilities that include electricity, gas, and service water
- (3) Use in outdoor locations and under similar conditions or environments other than those stipulated in the instruction manual
- (4) Usage to which considerable safety consideration and attention equivalent to (1) and (2) above need to be given

## Service

### Scope of service

Because the product price does not include service expenses, such as the dispatch of engineers, we will separately charge for the expenses in the following cases:

- (1) Instruction for installation and adjustment and a witnessed test run
- (2) Maintenance inspection, adjustments, and repairs
- (3) Technical guidance and technical education
- (4) Witnessed inspections of products at our factory

<<Note>> The product specifications and information in this catalog are subject to change without prior notice for product improvement or other reasons.

● For order placement, contact

General agent  **Manostar Shop Co., Ltd.**

1-2-3 Nishishiriike-cho, Nagata-ku, Kobe City, Hyogo 653-0031  
TEL. +81-78-621-7000 FAX. +81-78-621-7788

Manufacturer  **Yamamoto Electric Works Co., Ltd.**

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