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# JH5160/5170

## SQUARE/SQUARE ROOT DIN-RAIL TRANSMITTERS

### FEATURES

- Takes the Square or Square Root of a DC Signal
- Input and Output Ranges Need Not be the Same
- Input/Output Isolation Standard
- High Speed Option HS Available
- Quick-Check Red/Green Output LEDs
- Unpluggable Terminal Strip
- AC or DC Power Options



### DESCRIPTION

JH5160/5170 Square/Square Root Transmitters provide DC outputs proportional to the square or square root of the input. The square root function is most commonly used to linearize differential pressure flow signals.

The input and output ranges need not be the same; for example, the input could be 0/10Vdc while the output could be 4/20mA. These are fixed-range devices, precisely calibrated to your specified ranges at the factory.

Input/output isolation is standard. Standard transmitters include filtering to smooth measurements and minimize noise pickup. When fast response is needed Option HS speeds the response time to approximately 1 millisecond. Other response speeds are readily available on special order.

Other options include AC or DC power choices and reverse-action transmitter (decreasing output with increasing input).

### HOW TO ORDER

**Model Numbers:**

JH5160: Square Function  
JH5170: Square Root Function

**Power:**

Add suffix A (for example, JH5160A) for AC power, D for DC power. Specify 115Vac, 230Vac, 12Vdc or 24Vdc.

**Input Range:**

Specify any DC voltage or current range allowed by the "Input Capabilities" spec (see back).

**Output Range:**

Specify any DC voltage or current range allowed by the "Output Capabilities" spec (see back).

**Reverse-Acting Transmitter:**

Decreasing output with increasing input. Change last digit of the model number to 1 (for example, JH5161A).

**Loop-Powered Output:**

4/20mA "current sink" output stage for connection to devices

whose inputs provide 24Vdc loop excitation. Change the last digit of the model number to 2 (for example, JH5162A).

**High Speed Response:**

Approximately 1 msec. (see Specifications). Specify Option HS.

**Urethane Coating:**

Specify Option U.

## INSTALLATION

JH5000 Series transmitters snap onto 35mm DIN rail. Connections are made to the front-panel terminals. The terminal strip unplugs to facilitate calibrating or replacing the transmitter.

## CONNECTIONS

Connections to the 8 terminals (top to bottom) are:

- 1: Input plus.
- 2: Input minus.
- 3: No connection.
- 4: No connection.
- 5: Output plus.
- 6: Output minus.
- 7: Power (AC or, if DC power option, DC plus).
- 8: Power (AC or, if DC power option, DC minus).

## SQUARE/SQUARE ROOT FUNCTIONS

The square and square root are calculated on a percent-of-span basis. For example, using the square root function with a 4/20mA input range and 0/10V output range, if the input is at 0.5, or 50% (12mA) the output will be the square root of 0.5 which is 0.707 (70.7% of 10V), or 7.07 volts.

## QUICK-CHECK LEDS

Red-green Quick-Check LEDs give a quick indication of the relative output. Red is brighter at the low end, green at high, while at mid-scale both are approximately equal. Red-only indicates offscale low while green-only indicates offscale high.

## SPECIFICATIONS

### Voltage Input Capabilities:

100mV minimum span, +/-20V maximum input. Offset ranges are allowed. (Input Impedance: 200kohms or greater.)

### Current Input Capabilities:

1mA minimum span, +/-100mA maximum input. Offset ranges are allowed. (Input Resistance: Varies with input range. Contact factory for details. 62 ohms for 4/20mA input.)

### Voltage Output Capabilities:

1 volt minimum output span, -10 to +15V absolute limit. Offset ranges are allowed. Maximum output load, 10mA (1Kohm at 10V output).

### Current Output Capabilities:

1mA minimum output span, 0 to +25mA absolute limit. Positive offsets are allowed, negative outputs are not. Output drive capability, 24V (1,200 ohms max. at 20mA output).

### Accuracy:

+/-0.2% of span or better. (For square root function Model JH5170 the input must be greater than 20% of span for rated accuracy.)

### Adjustability:

Zero and span each are adjustable approx. +/-15% of span.

### Response Time:

Standard: Under 100 milliseconds.  
Option HS: Approx. 95% complete in 1msec. Frequency response 3dB down at approx. 600 Hz. Others available on special order.

### Isolation:

3-way (Power/Input/Output) 1,500Vac rms (2,100V peak). (The inputs are not isolated from each other.)

### Operating Temperature:

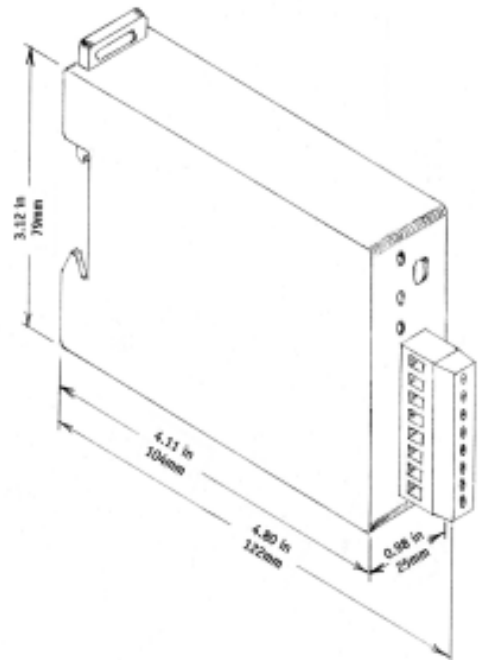
-10 to +60°C (14 to 140°F).

### Temperature Stability:

+/-0.02% of span per °C, or better.

### Power Requirements:

AC, 115 or 230Vrms, 50/60Hz, 2.5V-A. DC, 12 or 24V, 2.5W.



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