Features & Benefits

- Linear signals from flow transmitters affords control circuit design flexibility
- Powder coating provides improved corrosion resistance

Description

The Model 65 Square Root Extractor uses the cosine function of a small angle to convert square root-related input signals to linear output signals. Its most common use is in linearizing signals from differential pressure-type flow transmitters whenever:

- Several rate-of-flow signals are added, subtracted, or averaged
- Maximum readability and control rangeability are required
- Linear flow-rate signals are needed to provide proper characterization in open-loop or multiple-loop control systems
- Linearized flow-rate signals are required in analog computing systems

Summing Devices

Summing devices require a 3 psig input for each zero-flow condition. However, the output of the square-root extractor will drop to an indeterminate value below 3 psig due to its infinite gain at a zero-flow input (i.e. 3 psig).

The device most often used to provide the required 3 psig output is a Model 41N15 Precision Pressure Regulator. Other devices that will provide the 3 psig output are the Model 58S High-Pressure Selector Relay and the Model 58L Low-Limit Relay.

The Model 58S selects the 3 psig zero-flow output of the differential pressure meter when the output of the square root extractor drops below 3 psig. The Model 58L selects the 3 psig output of its built-in regulator when the output of the square root extractor drops below 3 psig.

Specifications

Functional Specifications

Supply Pressure
- Recommended: 20 psig
- Minimum: 16 psig
- Maximum: 30 psig

Air Consumption
- 0.08 scfm @ 20 psig supply

Input/Output
- Input/Output Range: 3 to 15 psig
- Input Overrange Limit: 30 psig

Ambient Temperature Limits
- -40 to 180°F (-40 to 82°C)

Calibration Accuracy
- ±0.5% of span (maximum deviation of output values from theoretical output values from 10% to 100% flow)
Relays
Model 65 Square Root Extractor

Technical data

Performance Specifications
Response Level
<0.1% of span (0.05% typical)

Hysteresis
33% of span from 20% to 100% output

Supply Pressure Effect
<1.7% of span @ 10% output
<0.17% of span @ 100% output
(Values for a 2 psi change of the supply)

Ambient Temperature Effect
±2% of span per 75°F (24°C) change at 10% output
±1% of span per 75°F (24°C) change at 50% output

Mechanical Specifications
Approximate Weight
6.5 lbs.

Mounting Dimensions