

Rosemount 8700 Series



Rosemount 8732E Transmitter Specifications

Functional Specifications

Flowtube Sensor Compatibility

Compatible with Rosemount 8705, 8711, 8721, and 570TM flowtube sensors. Compatible with Rosemount 8707 flowtube sensor with D2 Dual calibration option. Compatible with AC and DC powered flowtube sensors of other manufacturers.

Compatible with Rosemount 8707 flowtube sensor with D2 Dual Calibration Option.

Compatible with AC and DC powered flowtube sensors of other manufacturers.

Flowtube Sensor Coil Resistance

350 Ω maximum

Flow Rate Range

Capable of processing signals from fluids that are traveling between 0.04 and 39 ft/s (0.01 to 12 m/s) for both forward and reverse flow in all flowtube sensor sizes. Full scale continuously adjustable between -39 and 39 ft/s (-12 to 12 m/s).

Conductivity Limits

Process liquid must have a conductivity of 5 microsiemens/cm (5 micromhos/cm) or greater for 8732E. Excludes the effect of interconnecting cable length in remote mount transmitter installations.

Power Supply

90 -250 V AC $\pm 10\%$, 50-60 Hz or 12-42 V DC

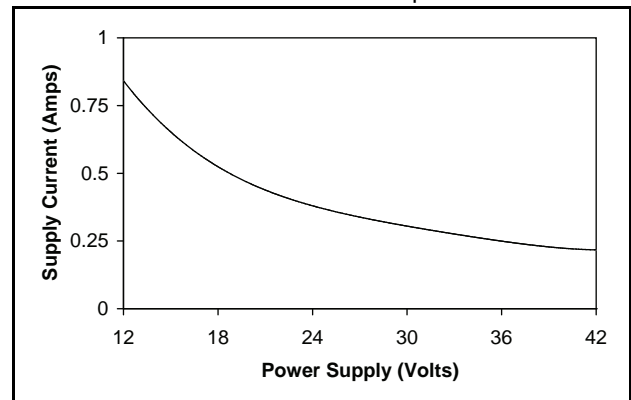
AC Power Supply Requirements

Units powered by 90-250 V AC have the following power requirements.

DC Supply Current Requirements

Units powered by 12-42 V DC power supply may draw up to 1 amp of current steady state.

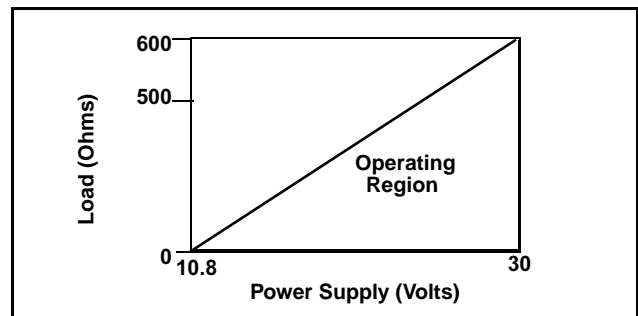
FIGURE 1. DC Current Requirements



DC Load Limitations (Analog Output)

Maximum loop resistance is determined by the voltage level of the external power supply, as described by:

FIGURE 2. DC Load Limitations



$$R_{\max} = 31.25 (V_{ps} - 10.8)$$

V_{ps} = Power Supply Voltage (Volts)

R_{\max} = Maximum Loop Resistance (Ohms)

Product Data Sheet

00813-0100-4727, Rev RA

December 2007

Rosemount 8700 Series

NOTE

HART Communication requires a minimum loop resistance of 250 ohms.

Installation Coordination

Installation (overvoltage) Category II

Power Consumption

10 watts maximum

Switch-on current

AC: Maximum 26 A (< 5 ms) at 250 V AC

DC: Maximum 30 A (< 5 ms) at 42 V DC

Ambient Temperature Limits

Operating

–58 to 165 °F (–50 to 74 °C) without local operator interface

13 to 149 °F (–25 to 65 °C) with local operator interface

Storage

–40 to 185 °F (–40 to 85 °C)

–22 to 176 °F (–30 to 80 °C) with local operator interface

Humidity Limits

0–100% RH to 150 °F (65 °C)

Enclosure Rating

NEMA 4X CSA Type 4X, IEC 60529, IP66 (transmitter), Pollution Degree 2

Output Signals

Analog Output Adjustment⁽¹⁾

4–20 mA, switch-selectable as internally or externally powered 10 to 30 V DC; 0 to 600 Ω load.

Engineering units—lower and upper range values are user-selectable.

Output automatically scaled to provide 4 mA at lower range value and 20 mA at upper range value. Full scale continuously adjustable between –39 and 39 ft/s (–12 to 12 m/sec), 1 ft/s (0.3 m/s) minimum span.

HART Communications, digital flow signal, superimposed on 4–20 mA signal, available for control system interface. 250 Ω required for HART communications.

Scalable Frequency Adjustment⁽¹⁾

0–10,000 Hz, switch-selectable as internally or externally powered 10 to 30 V DC, transistor switch closure up to 5.75 w. Pulse value can be set to equal desired volume in selected engineering units. Pulse width adjustable from 0.5 to 100 m/s. Local operator interface automatically calculates and displays maximum allowable output frequency.

(1) For transmitters with intrinsically safe outputs, power must be supplied externally.

Rosemount 8700 Series

Optional Digital Output Function

Externally powered at 5 to 24 V DC, transistor switch closure up to 3 W to indicate either:

Reverse Flow:

Activates switch closure output when reverse flow is detected. The reverse flow rate is displayed.

Zero Flow:

Activates switch closure output when flow goes to 0 ft/s.

Empty Pipe:

Activates switch closure output when empty pipe is detected.

Transmitter Fault:

Activates switch closure output when a transmitter fault is detected.

Optional Digital Input Function

Externally powered at 5 to 24 V DC, transistor switch closure up to 3 W to indicate either:

Net Total Reset:

Resets the net totalizer value to zero.

Positive Zero Return (PZR):

Simulates zero-flow condition.

Security Lockout

Security lockout switch on the electronics board can be set to deactivate all LOI and HART-based communicator functions to protect configuration variables from unwanted or accidental change.

Display Lockout

All optical switches on the display can be locked locally from the display layout configuration screen by holding the upper right optical switch for 10 seconds. The display can be reactivated holding the same switch for 10 seconds.

Output Testing

Analog Output Test

Transmitter may be commanded to supply a specified current between 3.5 and 23 mA.

Pulse Output Test

Transmitter may be commanded to supply a specified frequency between 1 and 10,000 Hz.

Turn-on Time

5 minutes to rated accuracy from power up; 5 seconds from power interruption.

Start-up Time

50 ms from zero flow.

Low Flow Cutoff

Adjustable between 0.01 and 38.37 ft/s (0.003 and 11.7 m/s). Below selected value, output is driven to the zero flow rate signal level.

Overrange Capability

Signal output will remain linear until 110% of upper range value or 44 ft/s (13 m/s). The signal output will remain constant above these values. Out of range message displayed on LOI and the HART Communicator.

Damping

Adjustable between 0 and 256 seconds.

Flowtube Sensor Compensation

Rosemount flowtube sensors are flow-calibrated and assigned a calibration factor at the factory. The calibration factor is entered into the transmitter, enabling interchangeability of flowtube sensors without calculations or a compromise in standard accuracy.

8732E transmitters and other manufacturer's flowtube sensors can be calibrated at known process conditions or at the Rosemount NIST-Traceable Flow Facility. Transmitters calibrated on site require a two-step procedure to match a known flow rate. This procedure can be found in the Operations Manual 00809-0100-4662.

Diagnostics

Basic

- Self test
- Transmitter faults
- Analog output test
- Pulse output test
- Tunable empty pipe
- Reverse flow
- Coil circuit fault
- Electronics temperature

Advanced (DA1 Suite)

- Ground/wiring fault
- High process noise

Advanced (DA2 Suite)

- 8714i Calibration Verification
- 4-20 mA loop verification

Performance Specifications

(System specifications are given using the frequency output and with the unit at reference conditions.)

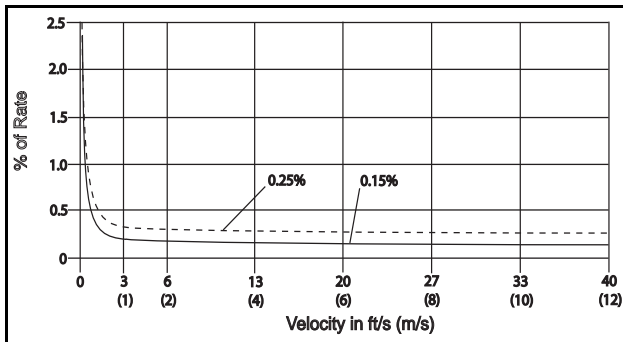
Accuracy

Includes the combined effects of linearity, hysteresis, repeatability, and calibration uncertainty.

Rosemount 8732E with 8705/8707 Flowtube Sensor:

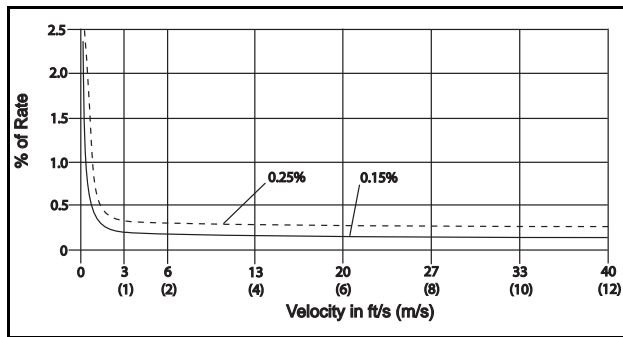
Standard system accuracy is $\pm 0.25\%$ of rate ± 1.0 mm/sec from 0.04 to 6 ft/s (0.01 to 2 m/s); above 6 ft/s (2 m/s), the system has an accuracy of $\pm 0.25\%$ of rate ± 1.5 mm/sec.

Optional high accuracy is $\pm 0.15\%$ of rate ± 1.0 mm/sec from 0.04 to 13 ft/s (0.01 to 4 m/s); above 13 ft/s (4 m/s), the system has an accuracy of $\pm 0.18\%$ of rate.⁽¹⁾



Rosemount 8732E with 8711 Flowtube Sensor:
 Standard system accuracy is $\pm 0.25\%$ of rate ± 2.0 mm/sec from 0.04 to 39 ft/s (0.01 to 12 m/s).

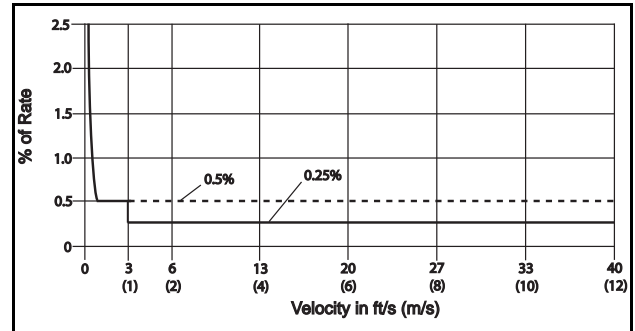
Optional high accuracy is $\pm 0.15\%$ of rate ± 1.0 mm/sec from 0.04 to 13 ft/s (0.01 to 4 m/s); above 13 ft/s (4 m/s), the system has an accuracy of $\pm 0.18\%$ of rate.



Rosemount 8732E with 8721 Flowtube Sensor:

Standard system accuracy is $\pm 0.5\%$ of rate from 1 to 39 ft/s (0.3 to 12 m/s); between 0.04 and 1.0 ft/s (0.01 and 0.3 m/s), the system has an accuracy of ± 0.005 ft/s (0.0015 m/s).

Optional high accuracy is $\pm 0.25\%$ of rate from 3 to 39 ft/s (1 to 12 m/s).



Rosemount 8732E with Legacy 8705 Flowtube Sensors:

Standard system accuracy is $\pm 0.5\%$ of rate from 1 to 39 ft/s (0.3 to 12 m/s); between 0.04 and 1.0 ft/s (0.01 and 0.3 m/s), the system has an accuracy of ± 0.005 ft/s (0.0015 m/s).

Rosemount 8732E with Legacy 8711 Flowtube Sensors:

Standard system accuracy is $\pm 0.5\%$ of rate from 3 to 39 ft/s (1 to 12 m/s); between 0.04 and 3.0 ft/s (0.01 and 1 m/s), the system has an accuracy of ± 0.015 ft/s (0.005 m/s).

Rosemount 8732E with Other Manufacturers' Flowtube Sensors:

When calibrated in the Rosemount Flow Facility, system accuracies as good as 0.5% of rate can be attained.

There is no accuracy specification for other manufacturers' flowtube sensors calibrated in the process line.

Analog Output Effect

Analog output has the same accuracy as frequency output plus an additional $\pm 4\mu\text{A}$.

Vibration Effect

IEC 60770-1

Repeatability

$\pm 0.1\%$ of reading

(1) For Flowtube Sensor sizes greater than 12 in. (300 mm) the high accuracy is $\pm 0.25\%$ of rate from 3 to 39 ft/sec (1 to 12 m/sec).

Rosemount 8700 Series

Response Time (Analog Output)

50 ms maximum response time to step change in input

Stability

±0.1% of rate over six months

Ambient Temperature Effect

±0.25% change over operating temperature range

EMC Compliance

EN61326-1 1997 + A1/A2/A3 (Industrial)
electromagnetic compatibility (EMC) for process and laboratory apparatus.

Physical Specifications

Materials of Construction

Housing

Low copper aluminum, NEMA 4X and IEC 60529 IP66

Pollution Degree 2

Paint

Polyurethane

Cover Gasket

Rubber

Electrical Connections

Two 1/2–14 NPT connections provided on the transmitter housing (optional third connection available). PG13.5 and CM20 adapters are available. Screw terminals provided for all connections. Power wiring connected to transmitter only. Integrally mounted transmitters are factory wired to the flowtube sensor.

Transmitter Weight

Approximately 7 pounds (3.2 kg). Add 1 pound (0.5 kg) for Option Code M4.