Rosemount 8712D/H Transmitter Specifications

Functional Specifications

Flowtube Sensor Compatibility

8712D: 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.

8712H: Only compatible with 8707 High-Signal flowtube sensor.

Flowtube Sensor Coil Resistance

Rosemount 8712D: 350 Ω maximum

Rosemount 8712H: 12 Ω maximum

Flow Rate Range

8712D: Capable of processing signals from fluids that are traveling between 0.01 and 39 ft/s (0 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).

8712H: Capable of processing signals from fluids that are traveling between 0.04 and 30 ft/s (0.01 to 10 m/s) for both forward and reverse flow in all flowtube sensor sizes. Full scale continuously adjustable between –30 and 30 ft/s (–10 to 10 m/s).

Conductivity Limits

Process liquid must have a conductivity of 5 microsiemens/cm (5 micromhos/cm) or greater for Rosemount 8712D. Process liquid must have a conductivity of 50 microsiemens/cm (50 micromhos/cm) for the 8712H. Excludes the effect of interconnecting cable length in remote mount transmitter installations.

Power Supply

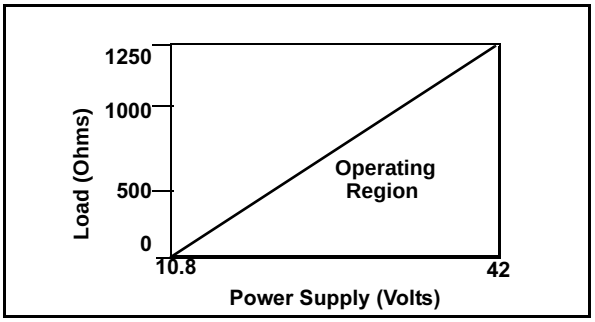
Rosemount 8712D: 90-250 V AC ±10%, 50–60 Hz or 12–42 V DC

Rosemount 8712H: 115 V AC ±10%, 50–60 Hz

DC Load Limitations (Analog Output)

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

FIGURE 3. DC Load Limitations



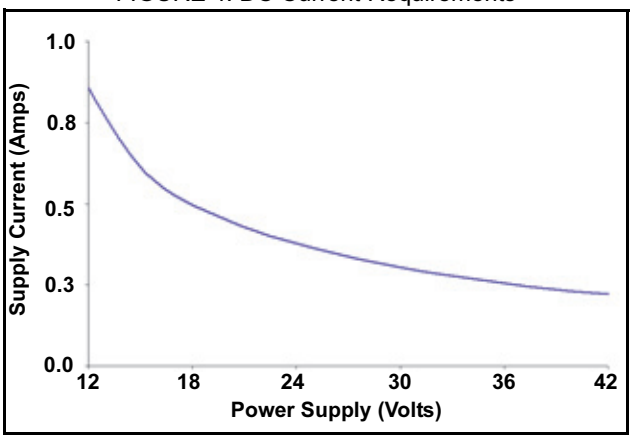
R_{max} = $41.7(V_{ps} – 10.8)$
V_{ps} = Power Supply Voltage (Volts)
R_{max} = Maximum Loop Resistance (Ohms)

NOTE
HART Communication requires a minimum loop resistance of 250 ohms.

Supply Current Requirements (8712D)

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

FIGURE 4. DC Current Requirements



Installation Coordination

Installation (overvoltage) Category II

Power Consumption

8712D: 10 watts maximum

8712H: 300 watts maximum

Ambient Temperature Limits

Operating

8712D: –20 to 140°F (–29 to 60 °C) with local operator interface

–40 to 165°F (–40 to 74°C) without local operator interface

8712H: –20 to 130 °F (–29 to 54 °C) with or without local operator interface

Storage

–40 to 176 °F (–40 to 80 °C)

Humidity Limits

0–100% RH at 120 °F (49 °C), decreases linearly to 10% RH at 130 °F (54 °C)

Enclosure Ratings

Enclosure Type NEMA 4X, IP66

Output Signals

Analog Output Adjustment

4–20 mA, switch-selectable as internally or externally powered 5 to 24 V DC; 0 to 1000 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.

8712D:
Full scale continuously adjustable between -39 and 39 ft/s (-12 to 12 m/sec), 1 ft/s (0.3 m/s) minimum span.

8712H:
Full scale continuously adjustable between -30 and 30 ft/s (-10 to 10 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

8712D:
0-10,000Hz, externally powered at 5 to 24 V DC, transistor switch closure supports power loads up to 2W for frequencies up to 4000Hz, and 5 V DC at 0.1 W at maximum frequency of 10,000 Hz. Pulse can be set to equal desired velocity or volume in user selectable engineering units. Pulse width is adjustable from 1.5 to 500 msec, below 1.5 msec pulse width automatically switches to 50% duty cycle.

8712H:
0-1000 Hz, externally powered at 5 to 24 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.

Auxiliary 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.

Positive Zero Return (PZR)[1]
Forces outputs of the transmitter to the zero flow rate signal level. Activated by applying a contact closure.

Security Lockout

Security lockout jumper 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.

Output Testing

Analog Output Test
Transmitter may be commanded to supply a specified current between 3.75 and 23.25 mA

Pulse Output Test

8712D:
Transmitter may be commanded to supply a specified frequency between 1 pulse/ day and 10,000 Hz

8712H:
Transmitter may be commanded to supply a specified frequency between 1 and 1000 Hz

Turn-on Time

8712D:
5 minutes to rated accuracy from power up, 5 seconds from power interruption

8712H:
30 minutes to rated accuracy from power up, 5 seconds from power interruption

Start-up Time

0.2 seconds 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. The signal output will remain constant above these values. Out of range message displayed on LOI and the HART Communicator.

Damping

8712D:

Adjustable between 0.0 and 256 seconds

8712H:

Adjustable between 0.2 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 accuracy.

8712D 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 00809-0100-4661.

(1) PZR is internally powered on the 8712H transmitter.

Performance Specifications

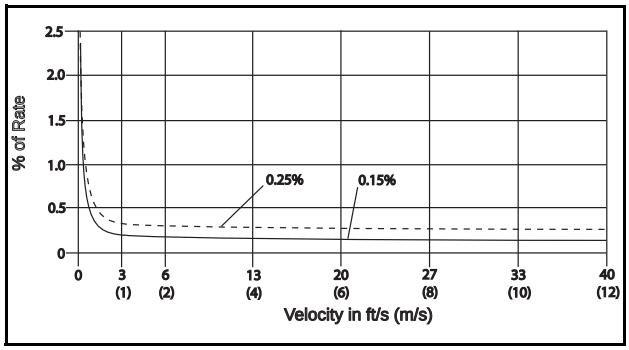
(System specifications are given using the frequency output and with the unit at referenced conditions.)

Accuracy

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

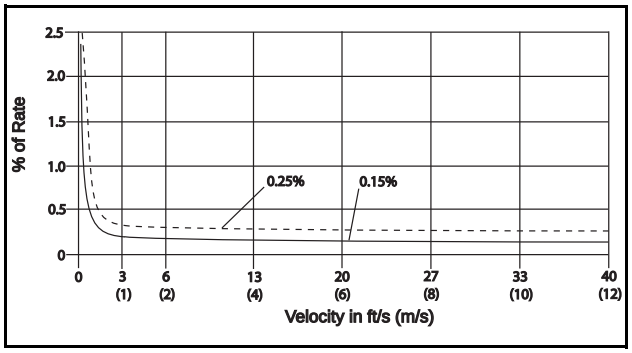
Rosemount 8712D with 8705/8707 Flowtube Sensor:
Standard system accuracy is ±0.25% of rate ±1.0 mm/sec from 0.04 to 6 ft/s (0.01 to 2 m/s); above 6 ft/s (2 m/s), the system has an accuracy of ±0.25% of rate ±1.5 mm/sec.

Optional high accuracy is ±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 ±0.18% of rate.(1)



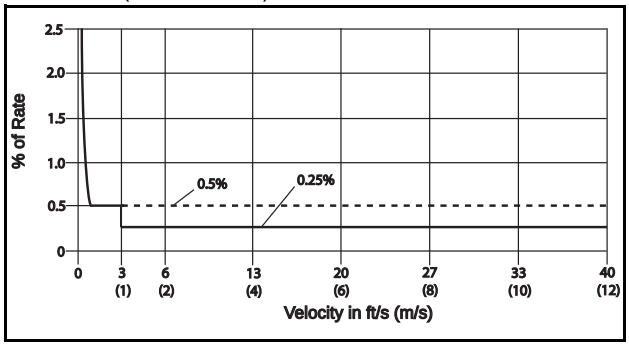
Rosemount 8712D with 8711 Flowtube Sensor:
Standard system accuracy is ±0.25% of rate ±2.0 mm/sec from 0.04 to 39 ft/s (0.01 to 12 m/s).

Optional high accuracy is ±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 ±0.18% of rate.



Rosemount 8712D with 8721 Flowtube Sensor:
Standard system accuracy is ±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 ±0.25% of rate from 3 to 39 ft/s (1 to 12 m/s).



Rosemount 8712D with Legacy 8705 Flowtube Sensors:
Standard system accuracy is ±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 8712D with Legacy 8711 Flowtube Sensors:
Standard system accuracy is ±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).

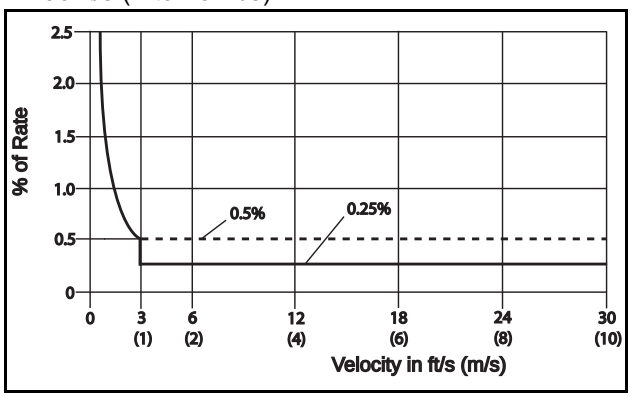
Rosemount 8712D with Other Manufacturers' Flowtube Sensors:
When calibrated in the Rosemount Flow Facility, system accuracies as good as 0.5% of rate can be attained.

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

(1) For Flowtube Sensor sizes greater than 12 in. (300 mm) the high accuracy is ±0.25% of rate from 3 to 40 ft/sec (1 to 12 m/sec).

Rosemount 8712H with 8707 Flowtube Sensor
System accuracy is ±0.5% of rate from 3 to 30 ft/s (1 to 10 m/s); between 0.04 and 3.0 ft/s (0.01 and 0.3 m/s), the system has an accuracy of ±0.015 ft/s (0.005 m/s).

Optional high accuracy is ±0.25% of rate from 3 to 30 ft/s (1 to 10 m/s).



Analog Output Effect

8712D:
Analog output has the same accuracy as frequency output plus an additional 0.05% of span.

8712H:
Analog output has the same accuracy as frequency output plus an additional 0.1% of span.

Vibration Effect

±0.1% of span per SAMA PMC 31.1, Level 2

Repeatability

±0.1% of reading

Response Time

0.2 seconds maximum response to step change in input

Stability

±0.1% of rate over six months

Ambient Temperature Effect

8712D:
0.25% over operating temperature range

8712H:
±1% per 100 °F (37.8 °C)

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 IP65

Pollution Degree 2

Paint
Polyurethane

Cover Gasket
Rubber

Electrical Connections

Four 1/2–14 NPT connections provided on the base of the transmitter. Screw terminals provided for all of the connections. Power wiring connected to the transmitter only. Remote mounted transmitters require only a single conduit connection to the flowtube sensor.

NOTE
If 3/4 - 14 NPT connections are required, 1/2 to 3/4 in. adapter kits are available for order.

Line Power Fuses

90–250 V AC systems (8712D)
2 amp, Quick-acting Bussman AGCI or equivalent

12–42 V DC systems (8712D)
3 amp, Quick-acting Bussman AGCI or equivalent

115 V AC systems (8712H)
5 amp, Quick-acting Bussman AGCI or equivalent (Rosemount 8712H only).

Transmitter Weight

Transmitter approximately 9 lb (4 kg). Add 1 lb (0.5 kg) for local operator interface.