Quick Start Guide
00825-0100-4764, Rev DA
March 2014

Rosemount® 8714D (Calibration Standard) Magnetic Flowtube Simulator

EMERSON.
Process Management

NOTICE

This document provides basic guidelines for the Rosemount 8714D. It does not provide instructions for detailed configuration, diagnostics, maintenance, service, troubleshooting. This QSG is also available electronically on www.rosemount.com.

WARNING

Explosions could result in death or serious injury.

Installation of this device in an explosive environment must be in accordance with the appropriate local, national, and international standards, codes, and practices. Please review the Product Certifications section for any restrictions associated with a safe installation.

- Before connecting a Field Communicator in an explosive atmosphere, ensure the instruments are installed in accordance with intrinsically safe or non-incendive field wiring practices.

Electrical shock can result in death or serious injury.

Avoid contact with the leads and terminals. High voltage that may be present on leads can cause electrical shock.

Contents

8714D introduction

The Rosemount 8714D is a high-precision instrument that can be used to recalibrate the following transmitters 8712 C/D/E, 8732 C/E, and the 8742C. The 8714D supplies an exact voltage, precisely simulating flow rates of 0.00 ft/s, 3.00 ft/s, 10.00 ft/s, and 30.00 ft/s. The precise 30.00 ft/s voltage signal may be used to recalibrate or verify operation of the transmitter. *Perform this procedure only if you believe that the transmitter is no longer accurate.*

Step 1: Change transmitter parameters

1. Use a Field Communicator or Local Operator Interface (LOI) to change the parameters of the transmitter to the following:
   - **Tube Calibration Number:** 1000015010000000
   - **Units:** ft/s
   - **Analog Output Range:** 20mA = 30.00 ft/s
   - **Analog Output Zero:** 4mA = 0 ft/s
   - **Coil Pulse Mode:** 5 Hz (6Hz 8712C only)
2. Set the loop to manual (if necessary).
3. Power down the transmitter.

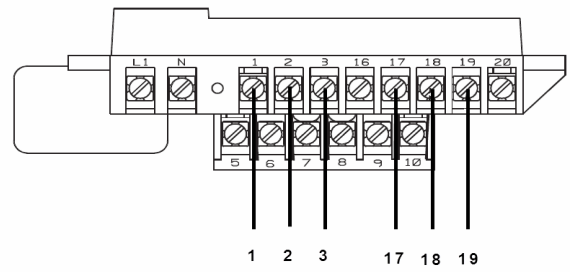
Step 2: Connect wiring and power-up

1. Insert the metal end of the wiring assembly into the 8714D Calibration Standard.
2. Connect the transmitter.
   - For 8712, see Figure 1.
   - For 8732/8742, see Figure 2.

Rosemount 8712 (Figure 1)

Use the six contact pin terminal plug-style wiring assembly. Follow the numeric convention for the 8712 so the plugs match the terminal block.

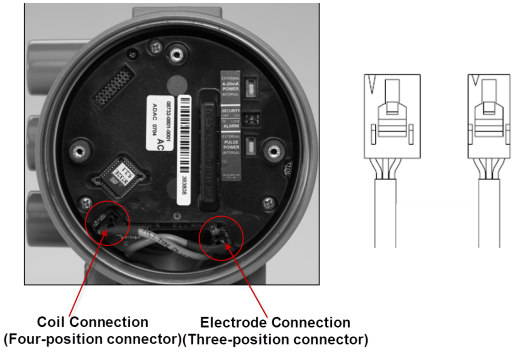
Figure 1. 8712 Terminal Block



Rosemount 8732/8742 (Figure 2)

Use the two black connector-style wiring assembly (one connector has four contacts, the other has three.) Remove the electronics side cover (furthest away from the conduit plugs). If you do not have a LOI, the connectors will be clearly visible on the bottom side of the board. If you have a LOI, remove the three mounting screws from the LOI assembly and pull the display assembly away from the connector assembly until the connector assembly on the back of the board is fully released. Then, plug the calibrator connectors into the appropriate receptacles.

Figure 2. Rosemount 8732E Electronics



⚠ CAUTION

Attempting an electronics trim without a Rosemount 8714D may result in an inaccurate transmitter. It may also generate a DIGITAL TRIM FAILURE message. If this message appears, no values were changed in the transmitter. Simply power down the transmitter to clear the message. If the trim was completed, or no error message was generated, correction requires a Rosemount 8714D.

Step 3: Perform electronics trim

1. Set the Rosemount 8714D to simulate a flow rate of 30 ft/s.
2. Power up the transmitter with the Rosemount 8714D connected. Allow the electronics 30 minutes to warm-up before reading the flow rate.
3. Read the flow rate. It should be between 29.97 and 30.03 ft/s. If the reading is within this range, return the transmitter to the original configuration. If the reading is not within this range, continue to Step 4: Verify Rosemount 8714D flowtube simulator page 5.
4. Initiate an electronics trim with the LOI or Field communicator. The electronics trim takes about six minutes to complete. No transmitter adjustments are required.

HART Fast Keys	1.5
LOI	Auxiliary Function

Step 4: Verify Rosemount 8714D flowtube simulator

Procedure for verifying the Model 8714D flowtube simulator

The Rosemount model 8714D Flowtube Simulator is a “Calibration Standard” made to operate specifically with the Rosemount models 8712 C/D/E, 8732 C/E, and the 8742C Magnetic Flowmeter Transmitters. The 8714D simulates a sensor coil load. It accurately produces a simulated flow signal for the purpose of transmitter calibration.

Note

Rosemount strongly encourages the 8714D be sent back to the factory to be calibrated. Typically on a yearly basis.

Method 1 verification: required equipment

- NIST* traceable DC current source capable of sourcing 500mA. Accuracy should be +/- 0.1%.
- NIST traceable DMM (voltmeter). For example the Agilent 34401A or equivalent.

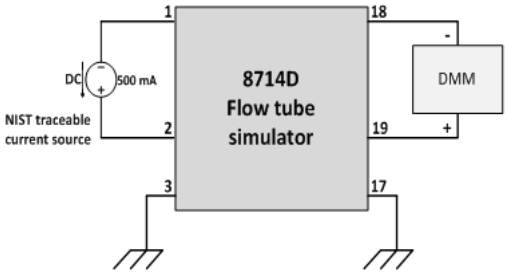
**NIST stands for “National Institute of Standards and Technology”*

Limitations

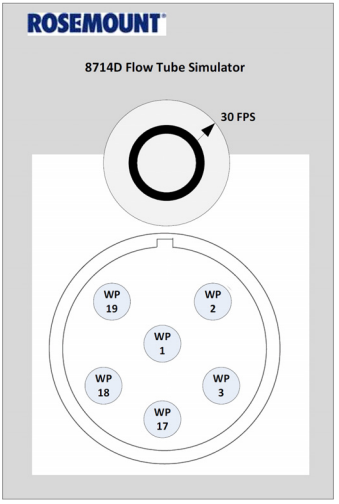
- Current thru terminals 1 and 2 should not exceed 600mA.
- Limit the output voltage on the current source to 12 VDC max. This is to protect the 8714D input at pins 1 and 2 and also for operator safety.
- Calibration shall occur with the 8714D standard set at 30 per feet per second.

Figure 3. Test setup for method 1 and the front panel connection

Test setup for method 1



Front panel connections



Method 1 - verification procedure

1. Set the output voltage limit on the current source to 12VDC max.
2. Set the current source output to 500mA dc.
3. Connect the current source to the 8714D input terminals 1 and 2 as shown in the test setup diagram.
4. Allow the 8714D to stabilize for 30 minutes.
5. Measure and record the average voltage at pins 18 and 19 over a 5 minute span.
6. The value should equate to 1.078mV ±.05%.

Note
If your device does not operate within this specification, return the Rosemount 8714D to the Rosemount factory for calibration.

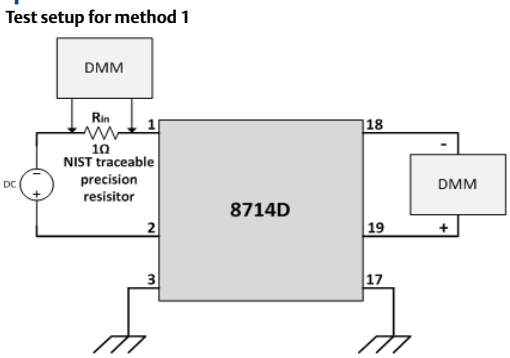
Method 2 verification: required equipment

- DC voltage source. Set current limit to ≤ 600mA
- NIST traceable 1 ohm, 1 watt precision resistor; 10ppm, measurable to 5 digits (for example the Tegam SR1-1)
- NIST traceable DMM(s) (voltmeter); (for example, the Agilent 33401A or equivalent)

Limitations

- Current through terminals 1 and 2 should not exceed 600mA.
- Calibration shall occur with the 8714D standard set at 30 per feet per second.

Figure 4. Test setup for method 2



Method 2 - verification procedure:

1. Verify the DC power supply is at 0 volts.
2. Connect the supply as shown in the above diagram.
3. Gradually increase the DC power supply voltage until 0.5V is measured across the 1 ohm sense resistor (R_{in}).

4. Allow the 8714D to stabilize for 30 minutes.
5. Re-verify the voltage across R_{in} = 0.5V.
6. Measure and record the average voltage at pins 18 and 19 over a 5 minute span. Also, measure and record the average voltage across R_{in} over the same 5 minute span. This will be VR_{in}.
7. Calculate IR_{in} as (VR_{in} / 1Ω).
8. Due to the possible variation of IR_{in} over the 5 minute time period, the expected value at pins 18 and 19 can be calculated as:

   [(IR_{in}/0.500)*1.078mV] = expected value across pins 18 and 19 ± 0.05%.
9. For example:
   - If the measured current through R_{in} is 499mA, then: [(0.499)/(0.500)]*1.078mV=1.075mV ± 0.05% at pins 18 and 19
   - If the measured current through R_{in} is 501mA, then: [(0.501)/(0.500)]*1.078mV=1.080mV ± 0.05% at pins 18 and 19
   - If the measured current through R_{in} is 500mA, then: [(0.500)/(0.500)]*1.078mV=1.078mV ± 0.05% at pins 18 and 19

Note
If your device does not operate within this specification, return the Rosemount 8714D to the Rosemount factory for calibration.

Within the United States, Rosemount Inc. has two toll-free assistance numbers.

Customer Support Center:	Tel (USA) 800 522 6277 (7:00 a.m. to 7:00 p.m. CST) Technical support, quoting, and order-related questions.
North American Response Center:	1-800-654-7768 (24 hours a day - Includes Canada) Equipment service needs.

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