



NATIONAL TYPE EVALUATION PROGRAM

Certificate of Conformance

for Weighing and Measuring Devices

For:

Meter Indicating Volume
Electromagnetic Flow Meter
Sensor Models: 8705 and 8721 (See Page 2)
Transmitter Models: M-8712E and M-8732E
Flow Rate: See Page 2

Submitted By: Contact Info. Updated October 2022

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Standard Features and Options

Standard Features:

- Sensors
- Fully welded housing 4x rating, IP68
- Model and Line size designation (see page 2)
- Lining Materials: PFA, Polyurethane, PTFE
- Category 2 Method of Sealing
- Transmitter
- Dual compartment housing
- Local Operator Interface with Liquid Crystal Display (LOI/LCD)
- Category 2 Method of Sealing

This device was evaluated under the National Type Evaluation Program and was found to comply with the applicable technical requirements of *Handbook 44: Specifications, Tolerances and Other Technical Requirements for Weighing and Measuring Devices*. Evaluation results and device characteristics necessary for inspection and use in commerce are on the following pages. *Editorial changes, not affecting the type or metrological content, corrected this certificate.

Ivan Hankins
Chairman, NCWM, Inc.

Hal Prince
Chair, NTEP Committee
Issued: December 28, 2021

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Meter Indicating Volume / 8705, 8721, M-8712E and M-8732E

Application: The Rosemount magnetic flow meter system consists of a magnetic flow meter sensor (either the flanged 8705 or the hygienic 8721) and a magnetic flow meter transmitter (either the 8732EM available as integral and remote mount, or the 8712EM available as a remote / wall / panel mount only). Magnetic flow meters work off the principle of Faraday’s Law. The transmitter powers coils within the sensor generating a magnetic field. As the fluid being measured passes through this magnetic field, an induced potential (voltage) is generated that is proportional to the velocity of the fluid through the magnetic field. Electrodes in the sensor detect this voltage and send the mV signal back to the transmitter. The transmitter then takes this signal, converts it to the velocity value and uses the sensor size to calculate a volumetric flow rate. The transmitter then takes this flow rate and converts it to a 4-20 mA signal that is proportional to the fluid flow. The transmitter will also record total flow through the sensor based on the measured fluid flow rate. In addition to the analog signal, a pulse output can be generated that can be sent to a flow computer or other system for totalization. Alternatively, a modus output is also available should that be preferred over an analog signal. The transmitter can be either integrally mounted to the sensor or can be remotely mounted away from the sensor using interconnecting cables.

Table 1: 8705 (lined with PFA, Polyurethane or PTFE) flanged magnetic flow meter sensor with 8732EM or 8712EM transmitter

Line size (in)	Minimum flow Rate (GPM)	Maximum flow rate (GPM)
0.5	3	40
1	9	120
1.5	20	275
2	40	600
3	60	900
4	105	1,550
6	115	3,200
8	200	5,500
10	325	8,500

Table 2: 8721 (lined with PFA) hygienic magnetic flow meter sensor with 8732EM or 8712EM transmitter

Line size (in)	Minimum flow Rate (GPM)	Maximum flow rate (GPM)
0.5	3	40
1	9	120
1.5	20	275
2	40	600
3	60	900
4	105	1,550



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Table 3: Products covered under this certification – Test D Products of NTEP Publication 14

Product Category	Typical Products	Conductivity (micro-siemens/centimeter)
Alcohols, Glycols and Water Mixes	Water Mixes of Alcohols and Glycols	40
Crop Chemicals (Type A)	Banvel	120
Crop Chemicals (Type A)	Herbicides	275
Crop Chemicals (Type A)	Paraquat	600
Crop Chemicals (Type A)	Prowl	900
Crop Chemicals (Type A)	Round-up	1,550
Crop Chemicals (Type A)	Touchdown	
Crop Chemicals (Type A)	Treflan	
Crop Chemicals (Type B)	Adjuvants	
Crop Chemicals (Type B)	Fumigants	
Crop Chemicals (Type B)	Fungicides	
Crop Chemicals (Type B)	Insecticides	
Crop Chemicals (Type C)	Fungicides	
Crop Chemicals (Type D)	Micronutrients	
Chemicals	Hydrochloric Acid	395000
Chemicals	Phosphoric Acid	56600
Chemicals	Sulfuric Acid	209000
Fertilizers	9-18-0	
Fertilizers	10-34-0	
Fertilizers	20% Aqua-Ammonia	
Fertilizers	28%, 30% or 32%	
Fertilizers	Ammonia Nitrate	
Fertilizers	Clear Liquid Fertilizer	
Fertilizers	Nitrogen Solution	



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Fertilizers	N-P-K Solutions	
Fertilizers	Urea	5000
Diesel Exhaust Fluid	Diesel Exhaust Fluid	2000-5000
Liquid Feeds	Liquid Molasses	300
Liquid Feeds	Molasses Plus Phos Acid and/or Urea (TreaChle)	
Suspension Fertilizers	3-10-30	
Suspension Fertilizers	4-4-27	
Water	Beverages	
Water	Juices	
Water	Milk	4-7
Water	Non-potable	72 ^s
Water	Potable	72 ^s
Water	Tap Water	72 ^s

Identification: The identification tag is located below the brand badge on the meter body. Tags are secured by permanent adhesive.

Sealing: Once the operation of the flow meter and the custody transfer system has been tested and confirmed, the flow meter configuration must be locked to prevent configuration changes, and the transmitter sealed with tamper evident regulatory seals. Each Rosemount flow transmitter has a transmitter security switch located on the main transmitter circuit board that when set to the ON position prevents any changes to the configuration. The operator can still view parameters but cannot make any changes. Once the inspector has confirmed proper operation, the following steps should be used to lock out and seal the flow meter:

1. Open the Transmitter cover and locate the Transmitter Security switch on the main transmitter board.
2. Set the hardware switch to the ON position, enabling the transmitter security.

Close the covers tightly and seal with tamper evident seals. (Tamperproof Kits are included with the WM option code to simplify sealing the flow meter.)

Operation: All Rosemount Magnetic Flow Meters are shipped with a Quick Start Guide (QSG) that provides basic installation and operation instructions, including mounting, wiring and configuration. Product Manuals can also be found online at www.emerson.com or can be obtained by your local Emerson flow sales representative. The flow meter system can be ordered pre-configured from the factory or can be configured on-site through the local operator interface (LOI), the Prolink III configuration software, AMS Device Manager, or a field communicator such as the TREX. Note that the TREX and AMS Device Manager will only work to configure HART 4-20 mA devices. For devices with Modbus as the primary output, the LOI or Prolink III should be used. The tools mentioned can be used to check or change device configuration in the field. Detailed menus and guides for the LOI or a HART Handheld device



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can be found in the transmitter QSGs and Product Manuals along with instructions on how to navigate the menu structure if using the LOI.

The Magnetic Flow Transmitter Model 8732EM indicates the product flow rate on the first line and the quantity delivered on the second line of the display. There are four buttons around the display to traverse the menu. There are four totalizers: A, B, C and D. Prior to sealing the unit, one or more totalizers can be configured to non-resettable, leaving the other totalizers resettable. The resettable totalizer can be reset by navigating to the Totalizers menu and selecting the “Reset Total” menu.

The Magnetic Flow Transmitter Model 8712EM indicates the product flow rate on the first line and the quantity delivered on the second line of the display. There are fifteen buttons below the display to traverse the menu and perform certain operations. There are four totalizers: A, B, C and D. Prior to sealing the unit, one or more totalizers can be configured to non-resettable, leaving the other totalizers resettable. The totalizer can be reset by pressing the “View Total” button to select the totalizer to be reset. Pressing the “Stop/Reset” button twice will stop and reset the totalizer. Pressing the “Start/Read” button will restart the totalizer.

Test Conditions The emphasis of the evaluation was on device design, performance, and operation of the system. The following sensor/transmitter combinations were evaluated in a NIST traceable laboratory using water as the test liquid. The laboratory uses a gravimetric flow calibration method that conforms to methods described in ISO 4185 Measurement of liquid flow in closed conduits-weighing method.

To meet the requirements of the NTEP evaluation the scales were calibrated within two weeks of evaluation and the following test plans were used. Meters were tested at 5 flowrates with four data points at each flowrate. Once this testing was complete the transmitter and sensor were sealed with a lead and wire seal, and throughput was done by flowing over 2,000 times the maximum rated flow rate for each meter. Once the throughput process was completed the meters were tested again to verify the results were within the acceptance and repeatability tolerances for liquid-measuring devices. This Certificate is approved for stationary applications.

Meters tested during evaluation:

8705TSA010C1M0/8732EMR1A1M4
8705TSA030C1M0L1/8732EMR1A1M4
8705PHA080C1M0/8732EMR1A1M4
8721ASA010RBX/8732EMR1A1M4
8721AHA030RBX/8712EMR1A1M4

Evaluated By: R. Ramsey (NC)

Type Evaluation Criteria Used: *Handbook 44 Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices*, 2020 Edition. *NCWM Publication 14: Weighing Devices*, 2021 Edition.

Conclusion: The results of the evaluation and information provided by the manufacturer indicate the device complies with applicable requirements.

Information Reviewed By: D. Flocken (NCWM)

Example(s) of Device:



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