

NATIONAL STANDARDS COMMISSION

NATIONAL MEASUREMENT (PATTERNS OF INSTRUMENTS) REGULATIONS

REGULATION 9

CERTIFICATE OF APPROVAL No 5/6B/67A

This is to certify that an approval for use for trade has been granted in respect of the pattern of the

Micro Motion Model D100F Mass Flowmetering System

submitted by Rosemount Instruments Pty Ltd 2/9 Orion Road Lane Cove NSW 2066.

This Certificate is issued upon completion of a review of NSC approval No P5/6B/67, for which only Provisional Interim Certificates were ever issued.

CONDITIONS OF APPROVAL General:

This approval is subject to review on or after 1/9/92. This approval expires in respect of new instruments on 1/9/93.

Instruments purporting to comply with this approval shall be marked NSC No 5/6B/67A.

This approval may be withdrawn if instruments are constructed other than as described in the drawings and specifications lodged with the Commission.

The Commission reserves the right to examine any instruments purporting to comply with this approval.

Auxiliary devices used with this instrument shall comply with the requirements of General Supplementary Certificate No S1/0.

Special:

The submittor shall notify the Commission of each instrument to be installed prior its submission to Weights and Measures authorities for verification.

Instruments shall be used with either anhydrous ammonia or aqueous ammonia solutions at flow rates between 30 kg/min and 200 kg/min.

Signed

Executive Director

Descriptive Advice

Pattern: approved 6/8/87

Micro Motion D100F mass flowmetering system.

Technical Schedule No 5/6B/67A describes the pattern.

Certificate of Approval No 5/6B/67A

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Filing Advice

This documentation cancels Provisional Interim Certificate of Approval No P5/6B/67 dated 22/5/85, which may be destroyed.

The documentation for this approval comprises:

Certificate of Approval No 5/6B/67A dated 25/1/88 Technical Schedule No 5/6B/67A dated 25/1/88 Test Procedure No 5/6B/67A dated 25/1/88 Figures 1 to 3 dated 25/1/88



NATIONAL STANDARDS COMMISSION

TECHNICAL SCHEDULE No 5/6B/67A

Pattern: Micro Motion Model D100F Mass Flowmetering System

<u>Submittor</u>: Rosemount Instruments Pty Ltd 2/9 Orion Road Lane Cove NSW 2066.

1. Description of Pattern

A mobile bulk flowmetering system using a Micro Motion model D100F mass flowmeter which is approved for use with either anhydrous ammonia or aqueous ammonia solutions at flow rates between 30 kg/min and 200 kg/min. The flowmetering system may be mounted on a vehicle or on a transportable pallet.

1.1 Vehicle-mounted Flowmetering System (Figure 1)

The system comprises:

- (i) A supply tank.
- (ii) A pump of either positive displacement or centrifugal type in the latter case, the pump is mounted lower than the minimum height of the liquid in the supply tank. The supply pipe from the tank has a continuous fall to the pump. Provision is made for a pressure gauge to be connected downstream of the meter.

If the pump is not for the exclusive use of the flowmeter, the flow rate through the meter must stay within the appropriate flow rate range for all combinations of alternative uses of the pump.

- (iii) A non-return valve between the pump and the meter, or an arrangement of the components and piping to keep the system full of liquid at all times.
- (iv) A means of preventing vapour or air entering the system, either by the provision of a low liquid-level switching device or a gas detector.
- A Micro Motion D100F flowmeter being a flow sensor comprising two U-tubes in an hermetically-sealed housing (Figure 2).
- (vi) A Micro Motion model DT10RT digital indicator (Figure 3).
- (vii) A Micro Motion D series remote electronics unit with signal processing providing an output in mass units (Figure 2).
- (viii) An outlet control valve located downstream of the meter with no intermediate outlet.
- (ix) For anhydrous ammonia A differential shut-off valve, located at or near to the delivery point, which is set to operate at not less than 50 kPa to ensure that the hose is filled before a delivery can be made.

A strainer, with air release head (aqueous ammonia solutions ONLY), and a flow rate control valve may be fitted.

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1.2 Description of Components

1.2.1 Indicator

The model D10RT digital indicator consists of:

4 digit LED rate display with 1 Hz resolution, 7 digit LED total mass display, Power selector switch 220V AC / 8-12V DC, Selector switch for the decimal point of the rate display, Sample rate adjustment from 0.2 seconds to 2 seconds, Selector switch for the decimal point of the totaliser, Timebase compensator, Totaliser reset push-button.

The digital indicator accepts input signals at a rate of up to 100 Hz at 1 to 5 volts peak (input high).

1.2.2 Electronics Unit

The D series electronics unit consists of:

External primary zero adjustment to set "no flow" condition, Span selection adjustment, Time constant adjustment for meter response time, Frequency range selection adjustment to set the appropriate flow rates, Output selector switch to select output in mA or V.

1.3 Markings

Instruments are marked with the following data, together in one location:

Manufacturer's name or mark Meter model Serial number NSC approval number 5/6B/67A Maximum flow rate 200 kg/min Minimum flow rate 30 kg/min Nominal flow rate (when flow rate is within ± 5% of nominal) Minimum delivery Type of liquid for which the meter is verified

Note: The minimum delivery for each model is determined at verification - see Test Procedure.

1.4 Verification Provision

Provision is made for a verification mark to be applied.

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NATIONAL STANDARDS COMMISSION

TEST PROCEDURE No 5/6B/67A

Instruments should be tested with the liquid with which they will be used and which is marked on the data plate.

The maximum permissible errors at verification are given in Document 118.

1. Low Liquid-level Device Test

If a device is fitted to prevent delivery should the level of liquid in the supply tank fall to the level of the centrifugal pump, at least one delivery should be made during which the delivery is interrupted by the operation of this device; it will be necessary to refill the supply tank to finish the delivery.

The effect on the measurement of the quantity delivered should not exceed 1% of the minimum delivery.

Note: This test should only be done where it could be expected that the device may operate during a normal day's operation.

2. Minimum Delivery

- (a) The minimum quantity to be delivered is the sum of:
- (i) 100 times the scale interval, if fitted with a digital indicator, OR

100 times the scale interval, if fitted with a zero start indicator/ printer, OR

200 times the scale interval, if fitted with an accumulative printer or indicator, OR

The largest of the appropriate minimum quantities as listed above, if more than one indicator and/or printer is fitted.

PLUS

- (ii) 100 times the sum of the hose dilation and gas purging error (where applicable). The latter should be determined where there is a possibility of a supply tank emptying.
- (b) Hose dilation may be found as follows:

With the pump stopped and the hose fully wound onto its reel or in its normal hang-up position, open the nozzle to reduce the hose pressure. Then fully unwind the hose from the reel or its hang-up position, zero the indicator or printer, start the pump and, after allowing the hose to fully dilate, the quantity on the indicator or printer is equal to the hose dilation.

Note: Instruments used for anhydrous ammonia should not be vented to atmosphere, but rather to a return line or suitable container.



FIGURE 5/68/67A - 2



Micro Motion Flowmeter and Electronics Unit

Micro Motion DTIGRT Indicator

