



Australian Government
Department of Industry and Science

**National
Measurement
Institute**

Certificate of Approval

NMI 5/6E/19

Issued by the Chief Metrologist under Regulation 60
of the
National Measurement Regulations 1999

This is to certify that an approval for use for trade has been granted in respect of the instruments herein described.

ACSE Model FMS112012 Milk Flowmetering System

submitted by ACSE Limited
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Papatoetoe, Manukau, Auckland 2144
NEW ZEALAND

NOTE: This Certificate relates to the suitability of the pattern of the instrument for use for trade only in respect of its metrological characteristics. This Certificate does not constitute or imply any guarantee of compliance by the manufacturer or any other person with any requirements regarding safety.

This approval has been granted with reference to document NMI R 117, Measuring Systems for Liquids Other than Water, dated July 2004.

This approval becomes subject to review on 1/01/20, and then every 5 years thereafter.

DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern approved – interim certificate issued	19/12/14
1	Pattern & variant 1 approved – certificate issued	4/09/15

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 5/6E/19' and only by persons authorised by the submittor.

It is the submittor's responsibility to ensure that all instruments marked with this approval number are constructed as described in the documentation lodged with the National Measurement Institute (NMI) and with the relevant Certificate of Approval and Technical Schedule. Failure to comply with this Condition may attract penalties under Section 19B of the National Measurement Act and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

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

Signed by a person authorised by the Chief Metrologist to exercise their powers under Regulation 60 of the *National Measurement Regulations 1999*.



Dr A Rawlinson

TECHNICAL SCHEDULE No 5/6E/19

1. Description of Pattern **approved on 19/12/14**

The ACSE model FMS112012 vehicle-mounted milk flowmetering system using a PROCES-DATA model PD340-C102 (*) electromagnetic flowmeter approved for measuring the milk collected from a milk tank.

Instruments may be fitted with output sockets (output interfacing capability) for the connection of auxiliary and/or peripheral devices.

(*) May also be known as a DME model PD340-C102 flowmeter.

1.1 Field of Operation

The field of operation of the measuring system is determined by the following characteristics:

- Minimum measured quantity (V_{min}) 200 L
- Maximum flow rate (Q_{max}) 3600 L/min
- Minimum flow rate (Q_{min}) 480 L/min
- Maximum pressure of the liquid (P_{max}) 800 kPa
- Ambient temperature range -10°C to 55°C
- Accuracy class 0.5
- Vehicle-mounted operation
- Product – milk at nominal controlled temperature

The flowmeter is adjusted to be correct for the liquid (milk) for which it is to be verified as marked on the data plate.

1.2 The System (Figure 1)

(i) A supply tank.

The supply tank is a milk tank or a vat to which the metering system is temporarily connected. The base of these tanks slopes towards the outlet to facilitate emptying of the contents during the measuring process.

(ii) Pump

A centrifugal type pump or a positive displacement pump of sufficient capacity to draw the milk from the supply tank outlet, which may be located lower than the inlet of the pump; however for the centrifugal type pump the level of milk in the supply tank is higher than the pump inlet.

Flexible piping may be used with an appropriate adaptor/reducer to connect the pump to the outlet of the supply tank.

(iii) Air Elimination Device

A Jensen model MK 3 or equivalent (#) air elimination device installed after the non-return valve to eliminate any detected air and prevent it from passing through the flowmeter.

(#) 'Equivalent' is defined to mean other proprietary equipment of the same or better specifications requiring no changes to the software specified in this approval for satisfactory operation of the system.

(iv) Measurement Transducer

A PROCES-DATA model PD340-C102 electromagnetic flowmeter (Figure 2) installed in a horizontal or vertical position downstream of air elimination device. May also be known as a DME model PD340-C102 flowmeter.

(v) Check and Flow Control Valves

To prevent reverse flow, a spring-loaded non-return valve, which can be located immediately downstream or upstream of the flowmeter, opens at pressures above 20 kPa. An optional product sampler and/or strainer may be fitted after the pump.

A flow control valve/device may be fitted downstream of the flowmeter.

(vi) Transfer Point

The transfer point is defined by the electrodes of the electromagnetic flowmeter.

(vii) Calculator/Indicator

An ACSE_model FMS 112012 calculator/indicator (Figure 3) compatible for use with an electromagnetic flowmeter and configured for displaying the volume in 1 L increments. The calculator/indicator uses version 1.1.0.3 software.

The signal from the measuring transducer is transferred to the calculator/indicator via an output, represent the volume throughput. The calculator/indicator features an 'empty pipe detection' facility accessible via the pumping screen which allows suppression of measurement while the pipe is empty.

The FMS112012 calculator/indicator (software version 1.1.0.3) has the following features:

- A '12 inch' LCD touch screen.
- A docket printer.
- Function, open, start, stop and quit soft buttons.
- An RFID writer and/or bar code printer.
- Eight digital inputs and outputs (controlling pumps, valves and samplers) and one analogue input for temperature measurement.
- Incorporates programmable levels of security. Access to meter calibration is only possible via a 'USB Dongle' located on the side of the unit. During normal operation the USB Dongle is removed.

(viii) Power Supply

The power supply is provided by the vehicle to ensure the system operates on a voltage between 10 and 30 volts DC.

1.3 Sealing Provision

The 'cal/measure' switch for the flow sensor electronics module and terminal box should be secured by means of a destructible adhesive label over the switch (Figure 4). Note that the 'program enable' switch in the terminal box must be set to the 'off' position.

Access to meter calibration parameter is only possible via a 'USB Dongle' located on the side of the model FMS 112012 calculator/indicator (Figure 5). During normal operation the USB Dongle is removed.

1.4 Verification Provision

Provision is made for the application of a verification mark.

1.5 Descriptive Markings

Instruments are marked with the following data, together in one location, in the form shown at right:

Manufacturer's mark, or name written in full
Pattern approval number for the instrument	NMI 5/6E/19
Meter model full	
Serial number of the instrument
Maximum flow rate, Q_{max} L/min
Minimum flow rate, Q_{min} L/min
Minimum measured quantity (V_{min}) L
Priming quantity L
Approved for use with milk

2. Description of Variant 1

approved on 4/09/15

With alternative electromagnetic flowmeters as listed in Table 1 – apart from the specifications listed in Table 1, these flowmeters have the same specifications as the pattern as listed in clause 1.1 **Field of Operation**. The calculator/indicator is configured to display the volume at least in 1 litre increments.

TABLE 1

Make Original Meter Model	Make Alternative Meter Model	Maximum Flow Rate (L/min)	Minimum Flow Rate (L/min)	Minimum Quantity (L)
PROCES-DATA	DME			
PD340-C76	MIF-C76	3000	300	200
PD340-C63	MIF-C63	1600	200	100

TEST PROCEDURE

Instruments shall be tested in accordance with any relevant tests specified in the National Instrument Test Procedures.

The instrument shall not be adjusted to anything other than as close as practical to zero error, even when these values are within the maximum permissible errors.

Instruments are to be tested with milk and the system either primed with milk before commencing the delivery, or the priming quantity marked on the data plate is added to the quantity measured.

NOTE: The quantity required to prime the system shall be determined at verification and shall be stamped on the nameplate. Complete one or more deliveries and check the volume indicated against the actual volume.

Maximum Permissible Errors

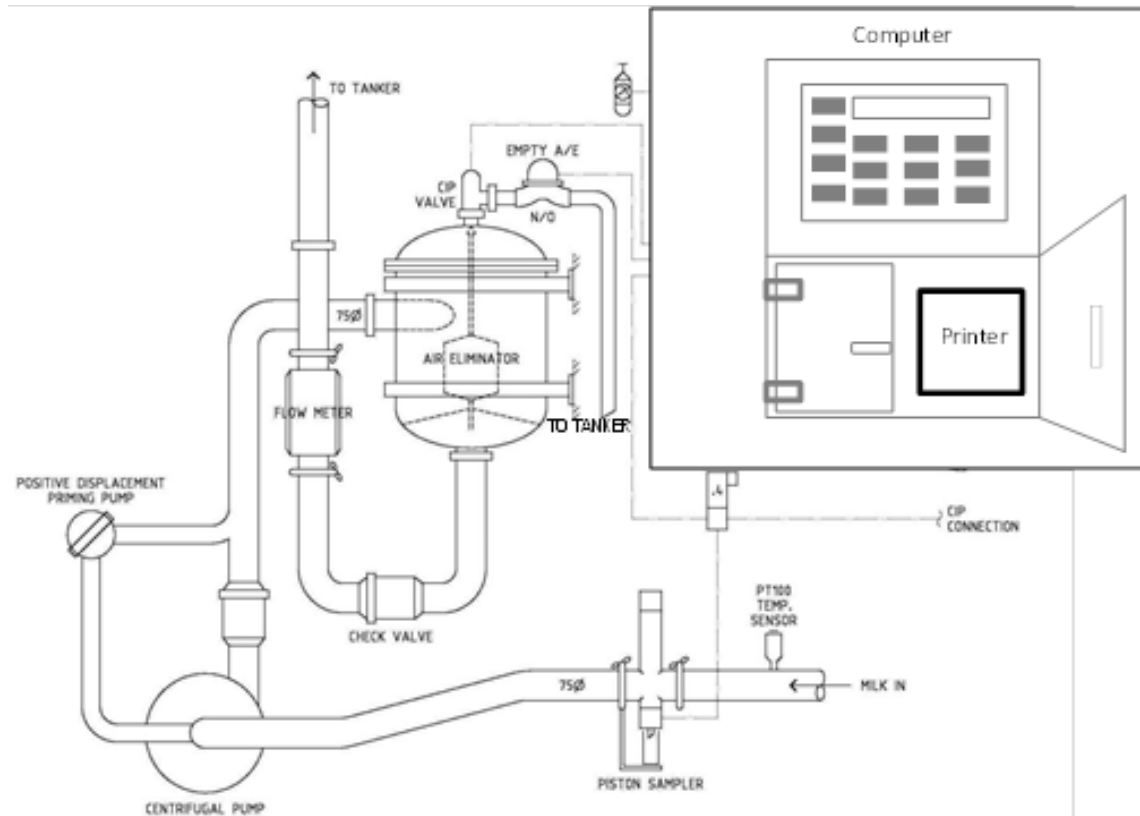
The maximum permissible errors are specified in Schedule 1 of the *National Trade Measurement Regulations 2009*.

1. Empty Compartment Test

- (a) Allow the supply to run dry during a test delivery; stop the pump motor and refill or change either the supply tank or the proving measure. Then start the pump motor to allow the delivery into the proving measure to continue; or
- (b) Allow the proving measure to run dry during a test delivery.

NOTE: This test should only be carried out where it could be expected that the tank will be completely emptied during a normal day's operation. The maximum allowable difference between metering with no air/gas and introducing air/gas is 1%.

FIGURE 5/6E/19 – 1



ACSE Model FMS112012 Milk Flowmetering System

FIGURE 5/6E/19 – 2



PROCES-DATA Model PD340-C102 Electromagnetic Flowmeter

FIGURE 5/6E/19 – 3



ACSE Model FMS 112012 Calculator/Indicator

FIGURE 5/6E/19 – 4



Typical Sealing of 'cal/measure' Switch for the Flow Sensor Electronics Module

FIGURE 5/6E/19 – 5



USB Dongle

~ End of Document ~