



Australian Government  
Department of Industry, Science,  
Energy and Resources

## National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

### Supplementary Certificate of Approval NMI S559

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.

Fluid Management Technology Model SmartFill GEN 2 Control System for Liquid-measuring Systems

submitted by      Fluid Management Technology Pty Ltd  
169 Grange Road  
Beverley SA 5009

**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 June 2011.

This approval is subject to review at the decision of the Chief Metrologist in accordance with the conditions specified in the document NMI P 106.

#### DOCUMENT HISTORY

Rev	Reason/Details	Date
0	Pattern provisionally approved – interim certificate issued	11/10/13
1	Variant 1 provisionally approved – interim certificate issued	8/11/13
2	Pattern & variant 1 approved – certificate issued	4/03/15
3	Variant 2 provisionally approved – interim certificate issued	01/04/20
4	Variant 2 approved – certificate issued	2/11/20
5	Variant 3 to 5 approved – certificate issued	19/08/22

## CONDITIONS OF APPROVAL

### General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI S559' and only by persons authorised by the submitter.

Instruments incorporating a component purporting to comply with this approval shall be marked 'NMI S559' in addition to the approval number of the instrument, and only by persons authorised by the submitter.

Instruments purporting to comply with this approval and currently marked 'NMI PS559' may be re-marked 'NMI S559' but only by persons authorised by the submitter.

It is the submitter'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*.



**Darryl Hines**  
Manager  
Policy and Regulatory Services

TECHNICAL SCHEDULE No S559

**1. Description of Pattern** **provisionally approved on 11/10/13**  
**approved 4/03/15**

The pattern is a Fluid Management Technology model SmartFill GEN 2 control system to provide unattended self-service facility for compatible (#) NMI-approved liquid-measuring systems for registered account customers only.

**1.1 Field of Operation**

- The model Smartfill GEN2 controller is approved for environmental class N for outdoor use between -10°C and 55°C.
- The system operates in a single mode operation, i.e. authorisation of dispensers via unattended method only.
- Maximum input frequency 1000 pulses/second
- Liquid temperature range -10°C to 50°C
- Accuracy class Class 0.5
- Can operate on 12 to 24 V DC or 240 V AC

**1.2 System Description**

The Fluid Management Technology model Smartfill GEN2 control system is in a metal, weatherproof enclosure (Figure 1). The terminal comprises a controller, a battery-backed power supply, a keypad, an LCD display and radio frequency identification (RF-ID) tag reader.

The SmartFill GEN 2 uses Fluid Management Technology version V1.xx software. The software version number is displayed at the completion of each delivery and on power up.

The volume displays up to a maximum of 99999.99 L in 0.01 L increments

Dedicated module(s) for the control of solenoids/valves and/or motors on NMI-approved liquid measuring systems. This module is capable of detecting the failure or removal of an approved pulse generator.

The delivery operation is authorised by the user placing an authorised key against the reader sensors or entering a PIN (personal identification number) to identify the equipment to be fuelled and, if required, using their key or PIN to identify the user and entering their odometer reading.

**1.3 Pulse Generator**

The controller/indicator is approved for use with an Acme model EPU 200 pulse generator as described in the documentation of approval NMI S189B, or any other compatible (#) approved measurement transducer.

- (#) 'Compatible' is defined to mean that no additions/changes to hardware/software are required for satisfactory operation of the complete system.

## 1.4 Checking Facilities

An automatic segment test is performed at the start of each delivery.

The calculator monitors the presence and correct transmission of signal from the measurement transducer, and in the event of detecting a fault the instrument indicates an error code and has provision for controlling electrically-operated valves to stop the delivery.

In the event of a power failure while a delivery is in progress, the delivery will stop and the system will finalise the transaction. Further deliveries cannot be authorised.

## 1.5 Verification Provision

Provision is made for the application of a verification mark.

## 1.6 Sealing Provision

Provision is made for the pattern to be sealed via electronic sealing devices. Parameters are accessed via a code and previous interventions are recorded in an audit log.

## 1.7 Descriptive Markings and Notices

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	.....
Model number of the instrument	.....
Serial number of the instrument	.....
Pattern approval number for the instrument	NMI S559
Year of manufacture	.....
Accuracy class	0.5
Environmental class	Class N

The minimum measured quantity specified for the fuel dispenser is marked or displayed on the face of the indicator in the form 'Minimum Delivery 2 L'. (Note that is notice is NOT required for variant 1 systems.)

## 2. Description of Variant 1 **provisionally approved on 8/11/13** **approved on 4/03/15**

The Fluid Management Technology model Smartfill GEN2 control system (Figure 2) to provide unattended self-service operation for use with compatible (#) NMI-approved fuel dispensers.

## 3. Description of Variant 2 **provisionally approved on 01/04/20** **approved on 2/11/20**

The Fluid Management Technology model SmartFill OPT (Outdoor Payment Terminal) control system to provide unattended self-service facility for compatible (#) NMI-approved liquid-measuring systems.

This variant allows authorisation of fuel by customers without a pre-existing arrangement with the supplier.

The SmartFill OPT (Figure 4) is similar to the pattern comprising the same hardware components as the pattern, with the inclusion of a receipt printer and electronic payment hardware which include a display, keypad, card reader and contactless card reading device.

The variant uses version 2.xx software to support the electronic payment hardware and operation mode for sale to customers without a pre-existing arrangement with the supplier.

The variant is approved for use with NMI-approved liquid-measuring systems similar to the pattern, or for use with compatible (#) NMI-approved fuel dispensers similar to variant 1.

### **3.1 Checking Facilities**

#### **(i) Power Supply**

In the event of a power failure while a delivery is in progress, the delivery will stop and the system will finalise the transaction. Further deliveries cannot be authorised.

#### **(ii) Receipt Printer**

The system monitors the condition of the receipt printer and provides a visual warning of an error. If the receipt printer is unavailable or out of paper the SmartFill OPT will indicate that a receipt will not be available before a user agrees to authorise a fuel dispenser and continue with a fuel delivery.

### **4. Description of Variant 3**

**approved on 19/08/22**

The Fluid Management Technology model Smartfill GEN3 control system (Figure 5) to provide unattended self-service operation for use with compatible (#) NMI-approved fuel dispensers.

#### **4.1 System Description**

The Fluid Management Technology model Smartfill GEN3 control system is in a glass filled, nylon weatherproof enclosure. The terminal comprises a controller, a battery-backed power supply, a keypad, an LCD display and radio frequency identification (RF-ID) tag reader.

The SmartFill GEN 3 uses Fluid Management Technology version V3.xx software. The software version number is displayed at the completion of each delivery and on power up.

The volume displays up to a maximum of 99999.99 L in 0.01 L increments

Dedicated module(s) for the control of solenoids/valves and/or motors on NMI-approved liquid measuring systems. This module is capable of detecting the failure or removal of an approved pulse generator.

The delivery operation is authorised by the user placing an authorised key against the reader sensors or entering a PIN (personal identification number) to identify the equipment to be fuelled and, if required, using their key or PIN to identify the user and entering their odometer reading.

#### **4.2 Pulse Generator**

The controller/indicator is approved for use with an Acme model EPU 200 pulse generator as described in the documentation of approval NMI S189B, or any other compatible (#) approved measurement transducer.

(#) 'Compatible' is defined to mean that no additions/changes to hardware/software are required for satisfactory operation of the complete system.

### **4.3 Checking Facilities**

An automatic segment test is performed at the start of each delivery.

The calculator monitors the presence and correct transmission of signal from the measurement transducer, and in the event of detecting a fault the instrument indicates an error code and has provision for controlling electrically-operated valves to stop the delivery.

In the event of a power failure while a delivery is in progress, the delivery will stop and the system will finalise the transaction. Further deliveries cannot be authorised.

### **5. Description of Variant 4**

**approved on 19/08/22**

The Fluid Management Technology model Smartfill GEN3 control system to provide unattended self-service operation for use with compatible (#) NMI-approved fuel dispensers.

### **6. Description of Variant 5**

**approved on 19/08/22**

The Fluid Management Technology model SmartFill GEN3 OPT (Outdoor Payment Terminal) control system to provide unattended self-service facility for compatible (#) NMI-approved liquid-measuring systems.

This variant allows authorisation of fuel by customers without a pre-existing arrangement with the supplier.

The SmartFill GEN3 OPT (Figure 6) is similar to Variant 3 comprising the same hardware components as Variant 3 in a stainless steel enclosure and with the inclusion of a receipt printer and electronic payment hardware which include a display, keypad, card reader and contactless card reading device.

The variant uses version 3.xx software to support the electronic payment hardware and operation mode for sale to customers without a pre-existing arrangement with the supplier.

The variant is approved for use with NMI-approved liquid-measuring systems similar to the pattern, or for use with compatible (#) NMI-approved fuel dispensers similar to variant 1.

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.

### **Maximum Permissible Errors**

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

### **For variations connected to an NMI approved fuel dispenser**

The maximum permissible errors applicable are those applicable to the fuel dispensers to which the instrument approved herein is fitted, as stated in the approval documentation for the fuel dispensers or in Schedule 1 of the *National Trade Measurement Regulations 2009*.

### **Tests**

The software version number is displayed on the bottom centre of the display when the system is not actively controlling the dispensing of a liquid, i.e. the default screen (Figure 3).

### **Tests for variant 2**

1. Check that the system identifies, displays and prints the correct data for the corresponding number allocated to the fuel dispenser.
2. Authorise a delivery and check that the delivery details on the fuel dispenser agree with the receipt obtained.
3. Remove paper from the receipt printer to check that when the receipt printer is unavailable, a warning is provided before authorisation of a fuel dispenser can occur.

FIGURE S559 – 1



Fluid Management Technology Model SmartFill GEN 2 Control System (Pattern)



FIGURE S559 – 2



Model SmartFill GEN 2 Control System (Variant 1)

FIGURE S559 – 3



Model SmartFill GEN 2 Control System (Pattern & Variant 1)  
Showing Default (Idle) Screen incl. Software Version Number

FIGURE S559 – 4



Model SmartFill OPT Control System (Variant 2)



FIGURE S559 – 5



Model SmartFill GEN3 Control System (Variant 3 and 4)

FIGURE S559 – 6



Model SmartFill GEN3 OPT Control System (Variant 5)

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