Australian Government
Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 5/6E/16

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.

Duotank Compact Delivery Unit Model CDU 0021547 Beer Flowmetering System

submitted by Duotank Australasia Pty Ltd
Factory 2
42-44 Garden Blvd
Dingley Village VIC 3172

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	10/06/13
1	Pattern amended (validity) – interim certificate issued	22/11/13
2	Pattern amended (validity) – interim certificate issued	21/03/14
3	Pattern amended (validity) – interim certificate issued	6/08/14
4	Pattern amended (validity) – interim certificate issued	29/01/15
5	Pattern amended (validity) – interim certificate issued	23/07/15

Document History (cont…)

Rev	Reason/Details	Date
6	Pattern amended (validity) – interim certificate issued	28/10/15
7	Pattern approved – interim certificate issued	10/02/16
8	Pattern approved – certificate issued	1/03/16
9	Pattern amended (Test Procedure) – certificate issued	15/12/16
10	Variants 1,2,3,and 4 – certificate issued	13/06/25

CONDITIONS OF APPROVAL

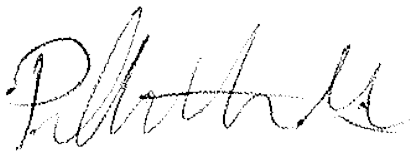
General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 5/6E/16' and only by persons authorised by the submittor. Instruments purporting to comply with this approval and currently marked 'NMI P5/6E/16' may be re-marked 'NMI 5/6E/16' but 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 Phillip Mitchell
A/g Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 5/6E/16

1. Description of Pattern — provisionally approved on 10/06/13, approved on 2/12/16

A Duotank Compact Delivery Unit model CDU 0021547 vehicle-mounted flowmetering system (Figure 1) using a Gea Diessel model IZM-G1DN25 (*) electromagnetic flowmeter approved for bulk delivering beer.

(*) May also be known as a model IZM-G2 DN25.

1.1 Field of Operation

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

- Minimum measured quantity (V_{min}) 20 L
- Maximum flow rate (Q_{max}) 200 L/min
- Minimum flow rate (Q_{min}) 10 L/min
- Maximum pressure of the liquid (P_{max}) 1600 kPa
- Ambient temperature range −25 °C to 55 °C
- Liquid temperature range −5 °C to 35 °C
- Accuracy class 0.5
- Vehicle-mounted operation
- Product – Beer at nominal controlled temperature

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

1.2 The System

(i) A supply tank.

The supply tank is a flexible bag, inside a stainless steel beer tank or a vat, to which the metering system is temporarily connected.

(ii) Pump

A centrifugal type pump or a positive displacement pump of sufficient capacity may be used to draw the beer 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 beer in the supply tank is higher than the pump inlet.

A check valve at the inlet of the pump may be required to prevent draining of liquid.

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

(iii) Gas Elimination Device

A gas elimination device is fitted between the pump and the meter is a Duotank International Group B.V float-operated gas separator (Figure 2) fitted between the pump and the meter. The device incorporates a round float that has a shaft through its centre which allows the float to move in a vertical plane. At the top of this shaft is a ‘needle’ that operates a seat assembly designed to seal off the vent located at the top of the gas separator. As the liquid level in the gas separator rises, the float rises until the seat assembly, seals off the vent and the flow is directed to the flowmeter

When the supply tank is emptied, pumping continues until the liquid level (and the float) in the gas eliminator drops, causing the 'needle' to lose contact with the vent seat, which allows the air to be vented to atmosphere and the flow to the meter stopped. The point at which the 'needle' loses contact with the vent seat defines the 'liquid reference level' in the gas separator for the start and end of the delivery. The spring-loaded vent valve located at the top of the gas separator can be operated manually or pneumatically for facilitating the clean-in-place (CIP) operation.

(iv) Measurement Transducer

The measurement transducer is a GEA Diessel model IZM-G1 DN25 (*) electromagnetic flowmeter (Figure 3) installed in a vertical position downstream of the gas separator. The flow through the flowmeter is in the upward direction.

(*) May also be known as a model IZM-G2 DN25.

(v) Calculator/Indicator

A GEA Diessel model Zevodat-Flash electronic calculator/indicator (Figure 4) or any other NMI-approved calculator/indicator compatible for use with an electromagnetic flowmeter and configured for displaying the volume in 1 L increments.

The signal from the measuring transducer is transferred to the calculator/indicator via three outputs – two outputs represent the volume throughput and the third output is used for detecting the flow direction. Each channel has an LED for checking integrity of operation. Flow in reverse direction will be indicated by a negative sign (-). Also, the calculator/indicator features an 'empty pipe detection' facility accessible via 'menu 2' which allows suppression of measurement while the pipe is empty.

The Zevodat-Flash calculator/indicator (software version V1.05.x and V22/x or V24/x) has the following features:

- A four-line liquid crystal display (20 digits per line with semi-graphics, background lighting, 2 lines changeable to bulk indication), four arrow keys and three soft keys.
- A keypad (0 to 9 digits, enter, clear, decimal point and minus keys).
- A function, open, start, stop and quit keys and a key-lock switch.
- A card or bar-code reader.
- Up to four digital inputs and outputs (controlling pumps, valves and sampler) and one analogue input for temperature measurement.
- Incorporates programmable levels of security. Access to meter calibration is only possible via a 'CAL/MEAS' switch located inside the unit. During normal operation the switch is set to 'MEAS' which locks access to calibration parameters.

(vi) Check 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 between the pump and the gas separator.

(vii) Flow Control

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

(viii) Transfer Point

Break-away coupling located at the end of a hose reel

(ix) 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 Verification Provision

Provision is made for the application of a verification mark.

1.4 Sealing Provision

The 'cal/measure' switch (Figure 5) for the flow sensor electronics module and terminal box can be secured by a sealing wire through the holes in the two sealing screws provided, or alternatively by means of a destructible adhesive label over the switch. Note that the 'program enable' switch in the terminal box must be set to the 'off' position.

1.5 Descriptive Markings and Notices

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

Manufacturer's mark, or name written in full	…..
Pattern approval number for the instrument	NMI 5/6E/16
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 Beer	…..

2. Description of Variant 1 **approved on 13/06/25**

Same as the pattern except that the body of the unit is shorter and has the model numbers CDU 10000010 and CDU 10005735.

3. Description of Variant 2 **approved on 13/06/25**

Same as the pattern but using a Proces-Data Model PD 340 C25 Electromagnetic flowmeter. Refer to Figure 6.

4. Description of Variant 3 approved on 13/06/25

Same as the pattern but with an alternative model Proces-Data PD 688 calculator/indicator. Refer to Figures 7 and 8.

To log into the system an NFC card is required. THE NFC card is held close to the bottom left side of the PD688 to be read. Different login credentials give access to different settings, no login allows starting and stopping measurements.

The model Proces-Data PD 688 calculator/indicator (legal components of firmware versions PD_16038-xx and PD_16786-xx) have the following features:

- 7″ Colour Graphics Display with capacitive touchscreen,
- Completely sealed, IP67@ front panel mounting.
- 4 programmable mechanical pushbuttons
- NFC/RFID Tag Reader compatible with a broad variety of Tags
- Joystick with pressure sensitive finger-pad
- Programmable in COPP hardware modules, includes a PD688 display with communication interface devices, PD 820, PD 850, PD 940 dipstick.
- 2 individual P-NET via RS485 and the option to indicate the sum of two phase shifted inpulses, simultaneously running at 3 different channels.
- Acoustic Alarm
- 2 configurable digital I/O’s
- 16 MByte Flash, 256 MByte RAM with Battery backup
- Micro SD-Card slot
- Incorporates programmable levels of security. Access to meter calibration is a Certification login. Refer to Figure 9. During normal operation the switch is set to the “off” position which locks access to calibration parameters.
- Calibration changes are digitally sealed. After saving new settings the ‘Event counter’ in the setting screen is increased by 1 and historical data is recorded on the SD card.
- The version numbers of the legally relevent firmware components are displayed when the flowmeter is started.

5. Description of Variant 4 approved on 13/06/25

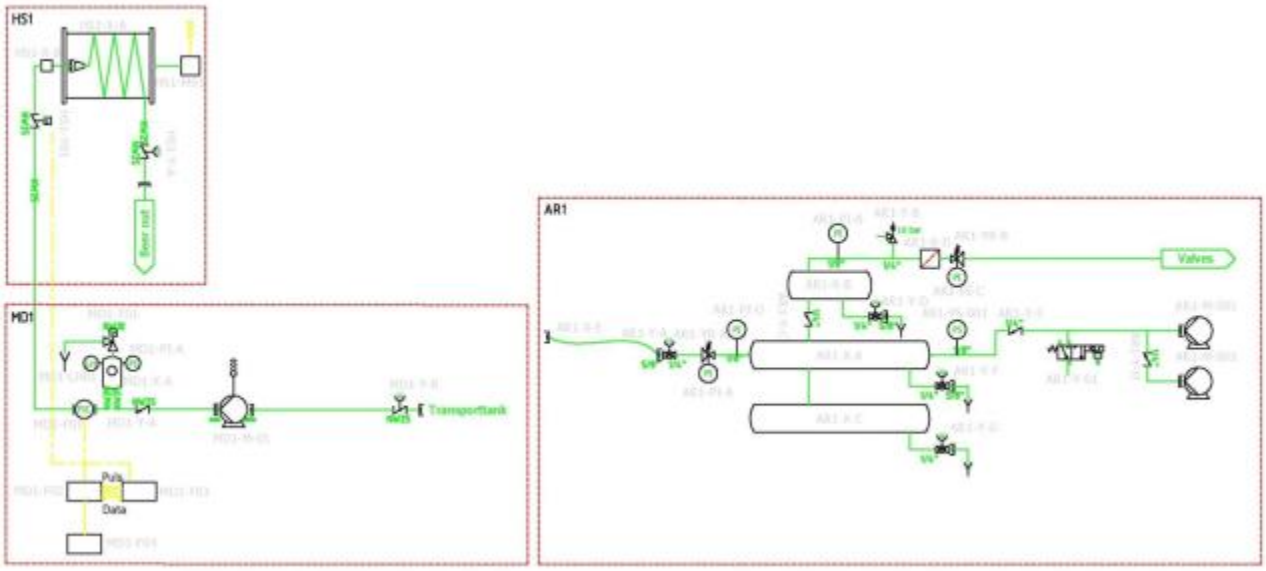
Similar to the pattern with the Gas Elimination Device replaced with a pressure sensor and liquid level switch, fitted upstream of the pump and configured to stop flow on detection of pressure less than the desaturation pressure of beer or a level lower than the inlet of the pump. Refer to Figure 9.

TEST PROCEDURE

A suitable Test Procedure may be obtained from the submittor (Duotank Australasia Pty Ltd) and must contain at least the following tests:

- Beer Flowmeter Test (Accuracy)
- Hose Dilation Test. If the Duotank reinforced EPDM inner and cloth impressioned EPDM rubber with external UHMQPE liner beer-hose is used the hose dilation test may not be required.
- Non-Return valve test
- Ticket Printer Test (if Printer fitted)

FIGURE 5/6E/16 – 1a



LEGENDE	
AR	Air
TK	Tank
MD	Mid.
HS	Hose
M	Motor
Y	Valve
PS	Pressure switch
PI	Pressure indicator
YR	Regulator valve

Duotank Compact Delivery Unit Model CDU 0021547 Beer Flowmetering System

FIGURE 5/6E/16 – 1b

TAG (HS1)				
HS	1	X	A	Beer hose NW25
HS	1	X	B	Swivel
HS	1	M	01	Electric motor
HS	1	Y	01	Pneumatic valve NW25
HS	1	Y	A	Butterfly valve NW25

TAG (MD1)				
MD	1	LH	01	Liquiphant level sensor
MD	1	F	01	Flowmeter
MD	1	F	02	Flowmeter
MD	1	F	03	Flowmeter
MD	1	F	04	Remote control T70
MD	1	X	A	Venting pot
MD	1	Y	01	Venting valve
MD	1	Y	A	Non-return valve NW25
MD	1	Y	B	Butterfly valve NW25
MD	1	M	01	Beer pump
MD	1	PI	A	Pressure indicator

TAG (AR1)				
AR	1	Y	01	Solenoid valve
AR	1	Y	A	Ball valve
AR	1	Y	B	Pressure relief valve
AR	1	Y	C	Non-return valve
AR	1	Y	D	Ball valve
AR	1	Y	E	Non-return valve
AR	1	Y	F	Ball valve
AR	1	Y	G	Ball valve
AR	1	Y	H	Non-return valve
AR	1	YR	A	Reduce valve
AR	1	YR	B	Reduce valve
AR	1	X	A	120 Liter tank
AR	1	X	B	25 Liter tank
AR	1	X	C	120 Liter tank
AR	1	X	D	Filter reduce valve
AR	1	X	E	Air hose
AR	1	PI	A	Pressure indicator
AR	1	PI	B	Pressure indicator
AR	1	PI	C	Pressure indicator
AR	1	PI	D	Pressure indicator
AR	1	PS	001	Pressure switch
AR	1	M	001	Compressor
AR	1	M	002	Compressor

FIGURE 5/6E/16 – 2

Duotank International Group B.V Float-operated Gas Separator

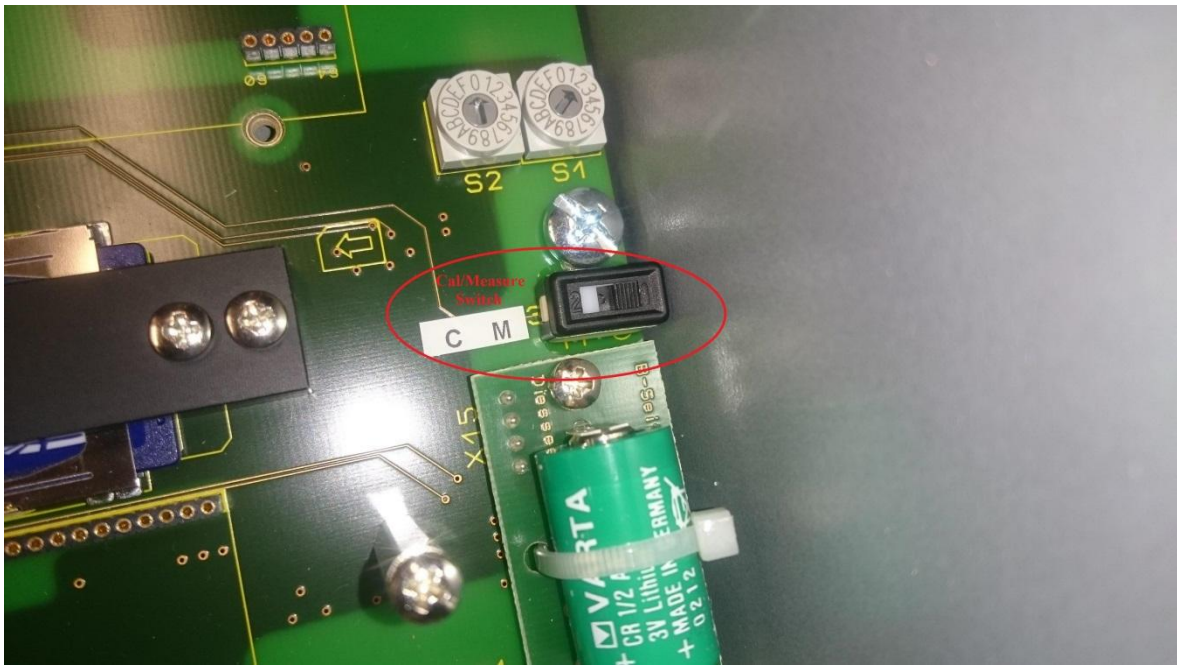
FIGURE 5/6E/16 – 3

GEA Diessel Model IZM-G1 DN25 Electromagnetic Flowmeter

FIGURE 5/6E/16 – 4

GEA Diessel Model Zevodat-Flash Calculator/Indicator

FIGURE 5/6E/16 – 5



Showing ‘cal/measure’ Switch (which needs to be sealed)

FIGURE 5/6E/16 – 6

Proces-Data Model PD 340 C25 Electromagnetic flowmeter – Variant 2

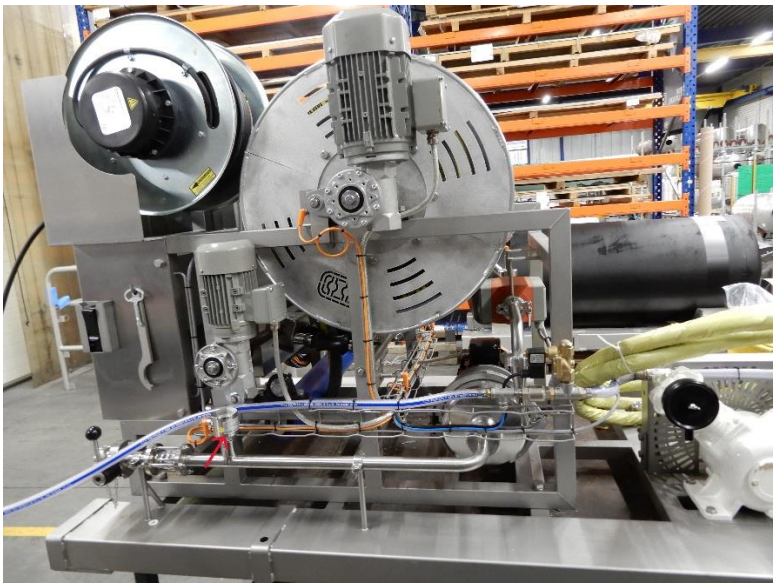
FIGURE 5/6E/16 – 7

Proces-Data model PD 688 calculator/indicator Variant –3

FIGURE 5/6E/16 – 8

Location of calibration microswitch with and without cover Variant –3

FIGURE 5/6E/16 – 9



Pressure sensor and liquid level switch Variant – 4

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