Australian Government
Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 14/1/3

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.

EDMI GR8BU Model Gas Meter

submitted by EDMI Pty Ltd
51 Alfred Street
Fortitude Valley QLD 4006
Australia

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 137 Gas meters, Part 1 *Metrological and Technical Requirements* and Part 2 *Metrological Controls and Tests*, dated October 2013.

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 & variant 1 approved – certificate issued	24/02/22
1	Pattern amended (installation conditions) – certificate issued	10/05/22
2	Variant 2 provisionally approved – certificate issued	16/09/22
3	Change of submittor – certificate issued	22/07/25

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/1/3' 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.

Special Conditions of Provisional Approval for Variant 2

Instruments purporting to comply with Variant 2 of this approval shall be marked with the provisional pattern approval number 'NMI P14/1/3' and only by persons authorised by the submittor.

The approval will remain provisional pending completion of satisfactory testing and evaluation. In the event of unsatisfactory performance the approval may be cancelled (or altered).

The submittor shall implement such modifications as required by the Chief Metrologist (or their authorised delegate). In the event that such modifications (if any are required) are not made to the satisfaction of the Chief Metrologist, this approval may be cancelled or withdrawn.

The submittor shall provide the Chief Metrologist with copies of test results demonstrating compliance with NMI R 137-2, clause 12.6.6 (Working Pressure) within 12 (twelve) months of the issue date of this Provisional Approval.

The Provisional Approval is limited to 1000 meters.

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

Phillip Mitchell
A/g Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 14/1/3

1. Description of Pattern

approved on 24/02/22
amended on 10/05/22

An EDMI GR8BU accuracy class 1.5 ultrasonic gas meter intended for the volumetric measurement of gas supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the EDMI GR8BU gas meter is determined by the following characteristics:

Maximum flow rate, Q_{max}:	10.0 m^3/h
Transitional flow rate, Q_t:	0.6 m^3/h
Minimum flow rate, Q_{min}:	0.04 m^3/h
Cyclic volume, V:	NA
Minimum working pressure, p_{min}:	Atmospheric
Maximum working pressure, p_{max}:	50 kPa
Ambient temperature range:	−10 °C to +55 °C
Gas temperature range:	−10 °C to +55 °C
Pressure loss, Δp:	0.2 kPa
Accuracy class:	1.5
Electromagnetic class:	E2
Mechanical class:	M1
Orientation:	Horizontal only
Flow Direction:	Forward only (indicated with an arrow)
Power supply:	3.6 V replaceable battery

1.2 Features and Functions

The pattern (Figure 1) consists of an accuracy class 1.5 ultrasonic gas meter, incorporating an electronic indicating device (Figure 2), and has features/functions as listed below:

Connection type:	Vertical threaded connections 1” BS746:2014 centres
Display:	An electronic indicating device having a series of 8 aligned digits allowing for a maximum indication range of 99,999.999 m^3.
Verification Scale Interval:	The meter may be placed into a verification mode (prior to sealing) which provides for a verification scale interval of 0.00025 m^3.
Materials:	Metal chassis: powder coated SuperDyma™ special hot dip galvanized steel
	Indicating device: Polycarbonate
	Ultrasonic unit: Polybutylene terephthalate flow path sensor and PCB
Output:	The meter may be fitted with a communication module with LTE-M1 and NB-IoT capabilities.
Reverse flow:	The meter incorporates a reverse flow alarm.

1.3 Conditions

1.3.1 Installation Conditions:

a) The meter is approved for installation in piping arrangements where only mild flow disturbances may occur. The meter shall be marked with an “M” to indicate this condition (see clause 1.7).
b) No flow conditioner or flow straightener is required.

1.3.2 Gas Conditions:

a) The meter is approved for the metering of air and natural gas.
b) The meter is approved for the metering of natural gas with a hydrogen concentration of up to 23% by volume.

1.4 Software Version

The Pattern is approved with the following software version:

Version number: 01.01.02.05

Checksum: 7A60C50A

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

The front cover of the meter and the battery cover are fitted with tamper evident seals, the battery cover seals are marked ‘EDMI’ with the company logo (Figure 3). Upon opening the battery/meter cover, a tamper alarm is registered by the meter which is transmitted to the head-end next available transmission window.

The meter is fitted with a physical calibration seal (Figure 4) which needs to be broken in order to adjust any calibration settings. Each meter is also locked after verification and access is restricted by encrypted key to allow access to the meter console.

1.7 Descriptive Markings and Notices

Instruments shall be marked with the following data, either grouped or distributed on the casing, the indicating device dial or an identification plate (Figure 5):

Manufacturer’s name or trade mark	.....
Model designation	…..
Serial number	.....
Year of manufacture	20YY
Pattern approval mark	NMI 14/1/3
Accuracy class	.....
Maximum flow rate, Q_{max}	..... m^3/h
Minimum flow rate, Q_{min}	..... m^3/h
Unit of measurement	m^3
Pulse output value (1)	.....imp/m^3
Orientation (2)	H or V
Flow disturbance (3)	M
Direction of flow	→ or similar
Measurement point for the working pressure	.....
Maximum pressure loss	..... Pa

(1) only applicable for meters fitted with a pulse output
(2) applicable for meters that operate in vertical or horizontal orientations only
(3) applicable for meters designed only to be installed in piping arrangements where only mild flow disturbances may occur

For instruments that incorporate electronic devices, the following information can either be physically marked on the instrument or provided electronically via the indicating device or similar means:

Transitional flow rate, Q_t	..... m^3/h
Gas temperature range	.....-..... °C
Gas pressure range	.....-..... kPa
Electromagnetic class	E2

Environmental class	M1
For meters with an external power supply	the voltage and frequency
For battery powered meters	a replacement date or similar indication of expected battery life
Software identification:	01.01.02.05

2. Description of Variant 1 approved on 24/02/22

The EDMI GR8BU gas meter is approved for the metering of air with the alternative flowrate range specified below:

Maximum flow rate, Q_{max}:	8.0 m^3/h
Transitional flow rate, Q_t:	0.6 m^3/h
Minimum flow rate, Q_{min}:	0.04 m^3/h

3. Description of Variant 2 provisionally approved on 16/09/22

3.1 General

The EDMI GC25AU accuracy class 1.5 ultrasonic gas meter is provisionally approved for the volumetric measurement of gas supplies for trade (Figure 6 and Figure 7). The EDMI GC25AU gas meter incorporates the same electronics, indicating device and communications outputs as the Pattern. The EDMI GC25AU gas meter incorporates a different ultrasonic flow senor and meter casing, providing alterative pressure ratings and flowrate ranges.

The alternative Field of Operation, Features and Functions, Conditions and Software Version for the EDMI GC25AU gas meter is specified in clauses 3.2 to 3.5.

3.2 Field of Operation

The field of operation of the measuring system using the EDMI GC25AU gas meter is determined by the following characteristics:

Maximum flow rate, Q_{max}:	25.0 m^3/h
Transitional flow rate, Q_t:	2.5 m^3/h
Minimum flow rate, Q_{min}:	0.16 m^3/h
Overload flow rate, Q_r:	30.0 m^3/h
Cyclic volume, V:	NA
Minimum working pressure, p_{min}:	Atmospheric
Maximum working pressure, p_{max}:	50 kPa
Ambient temperature range:	−10 °C to +55 °C
Gas temperature range:	−10 °C to +55 °C
Pressure loss, Δp:	0.2 kPa at 25 m^3/h
	0.125 kPa at 22 m^3/h
Accuracy class:	1.5

Electromagnetic class:	E2
Mechanical class:	M1
Orientation:	Horizontal only
Flow Direction:	Forward only (indicated with an arrow)
Power supply:	3.6 V replaceable battery

3.3 Features and Functions

The features and functions of the EDMI GC25AU gas meter are the same as the Pattern with the exception of the connections as indicated below.

Connection type:	Vertical threaded connections 1.25” bosses (30LT) with threads compliant to ANSI B109.1. Boss spacing 8.25”.

3.4 Conditions

The conditions of the EDMI GC25AU gas meter are the same as the Pattern.

3.5 Software Version

The EDMI GC25AU gas meter is approved with the following software version:

Version number:	01.02.02.05
Checksum:	D3B853D2

TEST PROCEDURE No 14/1/3

Gas meters tested for verification shall comply with the Certificate of Approval, Technical Schedule, and the maximum permissible errors and weighted mean errors for initial and subsequent verification at the operating conditions in effect at the time of verification.

Maximum permissible errors (MPEs) and weighted mean error (WME) for the initial and subsequent verification of gas meters are given below in Table 4 and Table 5.

Table 4. MPEs for Gas Meters

Flow rate Q	During pattern evaluation and initial verification Accuracy class			During subsequent verification and in-service Accuracy class		
	0.5	1	1.5	0.5	1	1.5
$Q_{min} \leq Q < Q_t$	± 1 %	± 2 %	± 3 %	± 2 %	± 4 %	± 6 %
$Q_t \leq Q \leq Q_{max}$	± 0.5 %	± 1 %	± 1.5 %	± 1 %	± 2 %	± 3 %

Table 4. Maximum Permissible WME for Gas Meters

	During pattern evaluation and initial verification Accuracy class		
	0.5	1	1.5
WME	± 0.2 %	± 0.4 %	± 0.6 %

The verification test procedure for the Pattern and Variants is given below.

Test conditions

The meter shall be tested within its rated operating conditions.

The meter may be tested with air or natural gas.

Test points

The errors of indication for the gas meter shall be determined at flow rates distributed over the measuring range of the meter at regular intervals, including Q_{min} and Q_{max} and preferably Q_t.

Based on three test points per decade the minimum number (N) of test points, ranking from $i = 1$ to $i = N$ can be calculated according to:

$$N = 1 + 3 \cdot \log\left(\frac{Q_{max}}{Q_{min}}\right)$$

Where $N \geq 6$, and rounded to the nearest integer.

For flow rates covering two decades or more the following formula presents an adequate regular distribution of flow rates for i = 1 to $i = N-1$ and $Q_N = Q_{min}$.

$$Q_i = \left(\sqrt[3]{10}\right)^{1-i} \cdot Q_{max}$$

NOTE: NMI reserves the right to vary this procedure. Any such variation shall be notified in writing by NMI.

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FIGURE 14/1/3 – 1

The EDMI GR8BU Model Gas Meter – The Pattern

FIGURE 14/1/3 – 2

The indicating device

FIGURE 14/1/3 – 3

Sealing provisions

FIGURE 14/1/3 – 4

Calibration seal

FIGURE 14/1/3 – 5

Example of required markings

FIGURE 14/1/3 – 6

The EDMI GC25AU gas meter – Variant 2

FIGURE 14/1/3 – 7

The EDMI GC25AU gas meter and Pattern (for size comparison) – Variant 2

~ End of Document ~