Australian Government
Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 14/3/74

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.

SCL-61H-100 Ultrasonic Water Meter

submitted by Huizhong Instrumentation Co., Ltd.
No. 126 West Gaoxin Road
High-Tech Industrial Development Zone
Tangshan
Hebei 063020
CHINA

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 49-1 Water Meters Intended for the Metering of Cold Potable Water and Hot Water, *Part 1 Metrological and Technical Requirements*, dated May 2022.

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, variants 1 and 2 approved – certificate issued	26/07/24

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/74' 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 1960* and may result in cancellation or withdrawal of the approval, in accordance with document NMI P 106.

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 14/3/74

1. Description of Pattern approved on 26/07/24

A Huizhong Instrumentation Co., Ltd. DN20 sized SCL-61H-100 Ultrasonic Water Meter used to measure cold potable water supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the DN20 SCL-61H-100 model water meter is determined by the following characteristics:

Minimum flow rate, Q_1	0.010 m^3/h
Transition flow rate, Q_2	0.016 m^3/h
Maximum continuous flow rate, Q_3:	4.0 m^3/h
Overload flow rate, Q_4	5.0 m^3/h
Flow rate ratio, Q_3/Q_1:	400
Maximum admissible temperature:	50 °C
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp 40
Accuracy class:	2
Flow profile sensitivity class:	U0/D0
Electromagnetic class:	E1 (residential, commercial & light industrial)
Environmental class:	O (outdoors)
Orientation:	All positions
Flow Direction:	Forward only
Power supply:	Non-replaceable battery 3.35 – 3.70 V

1.2 Features/Functions

The pattern (Figure 1) consists of an ultrasonic flow sensor, a flow computer electronic indicating device and has features/functions as listed below:

Connection type:	Threaded end connections.
Display:	A digital, electronic, liquid crystal display allowing for a maximum indication range of 19,999 m^3 in 0.00001 m^3 increments
Communications(1):	Infrared port, wireless NB-IoT
Materials:	Inlet/Outlet connections: brass
	Meter housing: Composite material
Meter length:	154 mm

(1) The pattern and variants may be fitted and/or configured with the communication options listed in this Certificate. However, the primary indication of volume displayed by the indicating device of the meter is the approved indication of volume.

1.3 Conditions

1.3.1 Installation Conditions:

The flow profile sensitivity class is U0/D0.

1.3.2 Water Quality

The meter is approved for use in the metering of potable water supplies.

1.4 Software Version

The Pattern is approved with the metrology firmware version V80-1.01, with checksum 0xC662.

The firmware version is displayed on the LCD screen (Figure 2).

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

The meter is mechanically sealed via the use of tamper-evident seals, such that attempts to mechanically access the meter will result in evidence of tampering (Figure 3). The connection of the case is protected with a lead seal, and the screw is fixed with a plastic seal.

The metrology firmware (clause 1.4) is electronically protected against unauthorised access or modification and provides evidence of tampering via event logs. The metrology firmware may be upgraded via authorised processes. All upgrades and modifications are recorded in event logs.

Any modifications to the metrology firmware, including the manner of the modification, must be approved by the Chief Metrologist (or their Delegate) and documented as part of this Certificate of Approval.

1.7 Descriptive Markings and Notices

Instruments are marked with the following data, either grouped or distributed on the casing, the indicating device dial or an identification plate (Figure 4):

Manufacturer's name or mark	...
Serial number	...
Pattern approval number	NMI 14/3/74
Numerical value of maximum continuous flow rate, Q_3	...
Flow rate ratio, Q_3/Q_1	...
Unit of measurement	m^3
Maximum admissible pressure (1)	1600 kPa
Pressure loss class (2)	40 kPa or Δp 40
Maximum admissible temperature (3)	T50
Orientation (4)	…
Flow profile sensitive class (5)	U0/D0
Direction of flow	→ or similar
Accuracy class (6)	2

(1) Optional for meters with MAP = 1400 kPa

(2) Optional for class Δp63

(3) Optional for T30 meters

(4) Optional for meters approved for all orientations

(5) Optional for U0/D0 class meters

(6) Optional for class 2 meters

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:

Electromagnetic class	E1
Environmental class	O
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

2. Description of Variant 1 approved on 26/07/24

The Pattern and Variants are approved with a range of alternative meter sizes (Figure 5), flowrates and associated characteristics as specified in Tables 1 to 4 below. The Pattern is shown in **Bold** for completeness.

Table 1 Meter sizes, flowrates and related information

Meter size	**DN20**	**DN20**	**DN20**
Minimum flowrate Q_1 (m^3/h)	**0.01**	0.008	0.0063
Transitional flowrate Q_2 (m^3/h)	**0.016**	0.0128	0.010
Maximum continuous flowrate Q_3 (m^3/h)	**4.0**	4.0	4.0
Overload flowrate Q_4 (m^3/h)	**5.0**	5.0	5.0
Ratio Q_3/Q_1	**400**	500	630
Meter length (mm)	130 to 195		
Maximum indicating range (m^3)	19,999		
Verification scale interval (m^3)	**0.00001**		

Table 2 - Meter sizes, flowrates and related information

Meter size	**DN25**	**DN25**	**DN25**	**DN25**
Minimum flowrate Q_1 (m^3/h)	0.01	0.01575	0.0126	0.01
Transitional flowrate Q_2 (m^3/h)	0.016	0.0252	0.020	0.016
Maximum continuous flowrate Q_3 (m^3/h)	4.0	6.3	6.3	6.3
Overload flowrate Q_4 (m^3/h)	5.0	7.875	7.875	7.875
Ratio Q_3/Q_1	400	400	500	630
Meter length (mm)	160 to 225			
Maximum indicating range (m^3)	19,999			
Verification scale interval (m^3)	0.00001			

Table 3 - Meter sizes, flowrates and related information

Meter size	**DN32**	**DN32**	**DN32**
Minimum flowrate Q_1 (m^3/h)	0.025	0.02	0.016
Transitional flowrate Q_2 (m^3/h)	0.04	0.032	0.026
Maximum continuous flowrate Q_3 (m^3/h)	10	10	10
Overload flowrate Q_4 (m^3/h)	12.5	12.5	12.5
Ratio Q_3/Q_1	400	500	630
Meter length (mm)	180 to 260		
Maximum indicating range (m^3)	199,999		
Verification scale interval (m^3)	0.0001		

Table 4 - Meter sizes, flowrates and related information

Meter size	**DN40**	**DN40**	**DN40**
Minimum flowrate Q_1 (m^3/h)	0.04	0.032	0.025
Transitional flowrate Q_2 (m^3/h)	0.064	0.051	0.04
Maximum continuous flowrate Q_3 (m^3/h)	16	16	16
Overload flowrate Q_4 (m^3/h)	20	20	20
Ratio Q_3/Q_1	400	500	630
Meter length (mm)	200 to 300		
Maximum indicating range (m^3)	199,999		
Verification scale interval (m^3)	0.0001		

3. Description of Variant 2 approved on 26/07/24

The Pattern and Variants are approved for use with connecting fittings as described in Figure 5.

TEST PROCEDURE No 14/3/74

Water meters tested for initial verification shall comply with the Certificate of Approval, Technical Schedule, and the maximum permissible errors for verification at the operating conditions in effect at the time of verification. Maximum permissible errors for verification of water meters are given in the *National Trade Measurement Regulations 2009* (Cth).

Water meters shall be verified in accordance with NITP 14 *National Instrument Test Procedures for Utility Meters*.

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

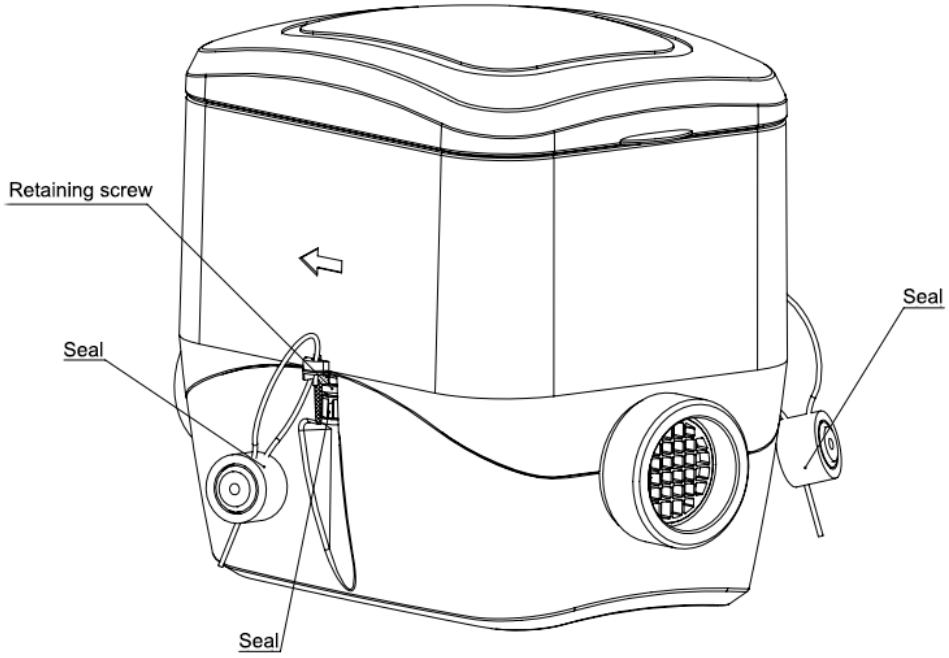
FIGURE 14/3/74 – 1

SCL-61H-100 Ultrasonic Water Meter

FIGURE 14/3/74 – 2

Indicating device and firmware version information

FIGURE 14/3/74 – 3

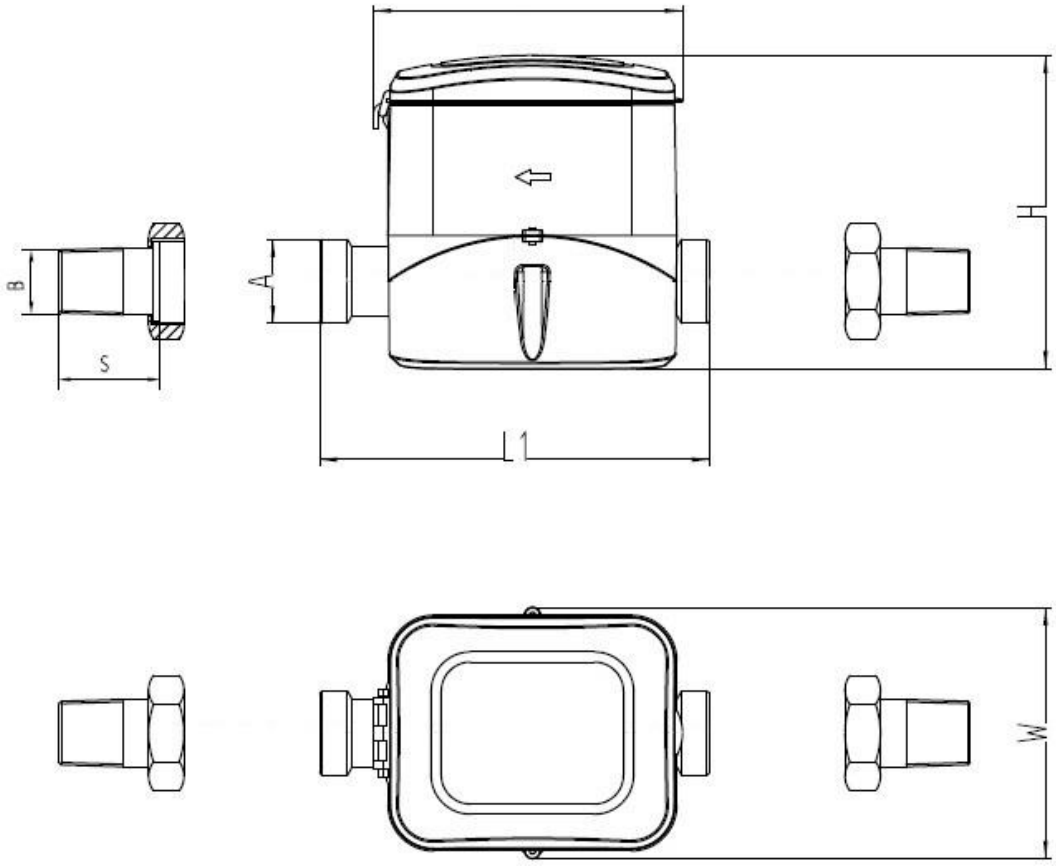


Mechanical sealing and protection devices

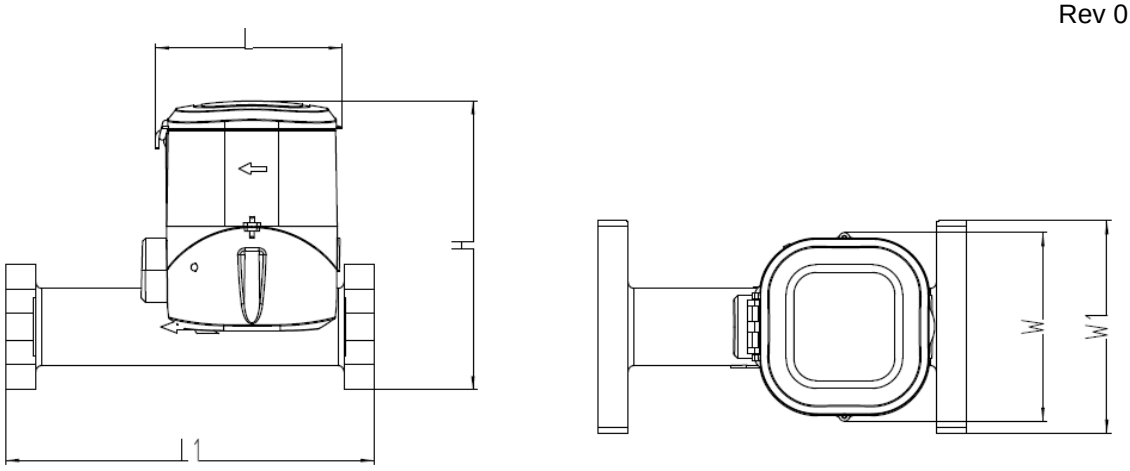
FIGURE 14/3/74 – 4

Required markings

FIGURE 14/3/74 – 5



Meter size	DN20	DN25
A (mm) (meter mounted without connecting fittings)	32.512 Note: (1.280 in). Major diameter, 14TPI (Whitworth Form)	38.862 Note: (1.530 in). Major diameter, 14TPI (Whitworth)
B (mm) (meter mounted with connecting fittings)	20 Note: (¾ in.) BSP, 14TPI (Whitworth Form)	25 Note: (1 in.) BSP, 14TPI (Whitworth Form)
L (mm)	123	
L1 (mm)	130 to 195	160 to 225
H (mm)	119	
W (mm)	98	
S (mm) (Length of connecting fittings)	51	59



Meter size	DN32	DN40
L (mm)	123	
L1 (mm)	180 to 260	200 to 300
H (mm)	150	159
W (mm)	98	
W1 (mm)	110	124

Different meter sizes and dimensions – Variant 1 and Variant 2

~ End of Document ~