



Australian Government

Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 14/3/28

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.

Sensus Model iPERL DN20 Water Meter

submitted by Sensus Germany GmbH & Co.KG
Industriestraße 16
Ludwigshafen am Rhein
Rhineland-Palatinate 67063
GERMANY

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 to 3 approved – interim certificate issued | 2/04/15 |
| 1 | Pattern & Variants 1 to 3 approved – certificate issued | 4/06/15 |
| 2 | Pattern & Variant 1 amended – Variant 4 approved – certificate issued | 24/11/16 |
| 3 | Pattern & Variants 1 to 4 reviewed and amended (various) – certificate issued | 04/12/20 |

| Rev | Reason/Details | Date |
|-----|---|----------|
| 4 | Variant 5 approved – certificate issued | 09/05/23 |
| 5 | Pattern amended (software version), Variant 6 approved – certificate issued | 12/08/25 |
| 6 | Pattern amended (change of company) – certificate issued | 12/02/26 |

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/28' and 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.

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

1. Description of Pattern

**approved on 02/04/15
amended on 12/02/26**

A Sensus model iPERL DN20 water meter intended for the metering of cold potable water supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the Sensus model iPERL DN20 meter is determined by the following characteristics:

| | |
|---------------------------------------|--|
| Minimum flow rate, Q_1 : | 0.005 m ³ /h |
| Transition flow rate, Q_2 : | 0.008 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 : | 800 |
| Temperature class: | T50 |
| 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) E2 (industrial) |
| Environmental class: | B (indoors) O (outdoors) |
| Orientation: | All positions |
| Flow Direction: | Forward and reverse |
| Power supply: | Non-replaceable lithium battery 3.70 V |

1.2 Features/Functions

The pattern (Figures 1, 2 & 3) consists of an electromagnetic flow sensor, a flow computer and electronic indicating device with the features/functions listed below:

Connection type: Threaded end connections type standard G1B.

Display: A digital, electronic, liquid crystal display (Figure 2) allowing for a maximum indication range of 999,999 m³ in 0.001 m³ increments

Communications: The meter is equipped with a low power 868 MHz or 433 MHz integrated radio module with consumption and diagnostic outputs

Materials: Composite material

Meter length: 105 mm

Non-return device(s): A non-return device may be fitted.

An optional non-return device may be fitted.

1.3 Conditions

1.3.1 Installation Conditions:

No flow straightener or flow conditioner is required.

For Accuracy Class 2 (NMI R 49-1) 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 meter is approved with iPERL firmware version 5.0.

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

The meter is electronically sealed following calibration via a defined bit pattern, preventing changes to calibration values.

The meter is mechanically sealed via the snap-fitting of the two housing shells (Figure 4), such that attempts to mechanically access the meter will result in evidence of tampering.

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 5):

| | |
|--|-------------------------|
| Manufacturer's name or mark | ... |
| Serial number | ... |
| Pattern approval number | NMI 14/3/28 |
| Numerical value of maximum continuous flow rate, Q_3 | ... |
| Flow rate ratio, Q_3/Q_1 | ... |
| Unit of measurement | m^3 |
| Temperature class ⁽¹⁾ | T50 |
| Maximum admissible pressure ⁽²⁾ | 1600 kPa |
| Pressure loss class ⁽³⁾ | 40 kPa or Δp 40 |
| Orientation ⁽⁴⁾ | ... |
| Flow profile sensitive class ⁽⁵⁾ | U0/D0 |
| Direction of flow | → or similar |
| Accuracy class ⁽⁶⁾ | 2 |

⁽¹⁾ Optional for temperature class T30 meters

⁽²⁾ Optional for meters with MAP = 1400 kPa

⁽³⁾ Optional for pressure loss class Δp 63

⁽⁴⁾ Optional for meters approved for all orientations

⁽⁵⁾ Optional for U0/D0 class meters

⁽⁶⁾ Optional for accuracy 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 or E2 |
| Environmental class | O or B |
| 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 02/04/15
amended on 04/12/20

The Pattern and Variants are approved with a range of different sizes (Figures 6, 7, 8 and 9), flowrates and associated characteristics as specified in Table 1 below. The Pattern is shown in **Bold** for completeness.

Table 1 Meter sizes, flowrates and related information

| Meter size | DN15 | DN20 | DN25 | DN32 | DN40 |
|---|---------------------|--------------|----------|----------|-------|
| Minimum flowrate Q ₁ (m ³ /h) | 0.003 | 0.005 | 0.008 | 0.013 | 0.020 |
| Transitional flowrate Q ₂ (m ³ /h) | 0.005 | 0.008 | 0.013 | 0.020 | 0.032 |
| Maximum continuous flowrate Q ₃ (m ³ /h) | 2.5 | 4.0 | 6.3 | 10 | 16 |
| Overload flowrate Q ₄ (m ³ /h) | 3.125 | 5.0 | 7.875 | 12.5 | 20 |
| Ratio Q ₃ /Q ₁ | 800 | 800 | 800 | 800 | 800 |
| Meter Length (mm) | ≥134 | ≥154 | ≥178 | ≥190 | ≥232 |
| Threaded end connection | ≥G ³ /4B | ≥G1B | ≥G1 1/4B | ≥G1 1/4B | ≥G2B |

The Pattern and Variants are approved with the alternative Q₃/Q₁ ratios: 630, 500, 400, 315, 250 and 200.

3. Description of Variant 2

approved on 02/04/15

The DN20 sized Sensus model iPERL water meter, approved with the following meter lengths: 115 mm, 154 mm, 165 mm and 190 mm

4. Description of Variant 3

approved on 02/04/15

amended on 04/12/20

The Pattern and Variants are approved with end connections normally used in QLD, NSW, ACT, VIC, TAS, WA, SA and NT.

The DN40 sized Sensus model iPERL water meter is approved with flanged end connections.

5. Description of Variant 4

approved on 04/12/20

The Pattern and Variants are approved with the model designation iPERL169, an alternative housing design (Figures 10 and 11) and with the following alternative characteristics, features and functions:

Power Supply: 2 batteries (3.7 V)

Communications: The meter is equipped with a 169 MHz integrated radio module

Software version: Metrology Communication Interface v2.10
Metrology Firmware source code V2.112

6. Description of Variant 5

approved on 09/05/23

The Pattern and Variants are approved with the following software:

Software version: Metrology Firmware source code V2.114

7. Description of Variant 6

approved on 12/08/25

The pattern and variants are approved with iPERL firmware version 5.1.

TEST PROCEDURE No 14/3/28

Water meters tested for 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 the verification of water meters are given in the *National Trade Measurement Regulations 2009* (Cth).

Water meters shall be verified in accordance with the following national instrument test procedures:

- NITP 14.0 – Utility meters – general requirements
- NITP 14.3 – Utility meters – water meters

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

FIGURE 14/3/28 – 1



Sensus Model iPERL DN20 Water Meter (The Pattern)

FIGURE 14/3/28 – 2



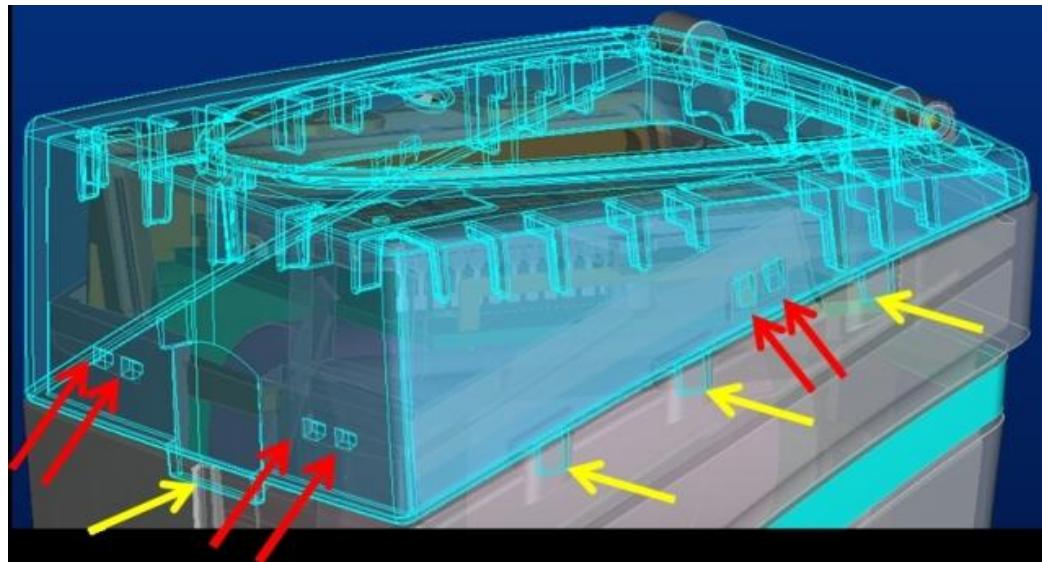
Sensus Model iPERL DN20 Water Meter (The Pattern – End View)

FIGURE 14/3/28 – 3



Sensus Model iPERL DN20 Water Meter (The Pattern – Side View)

FIGURE 14/3/28 – 4



Typical Sealing Arrangement (During Manufacture)

FIGURE 14/3/28 – 5



Indicating Device and Markings

FIGURE 14/3/28 – 6



Sensus Model iPERL DN15 Water Meter

FIGURE 14/3/28 – 7



Sensus Model iPERL DN25 Water Meter

FIGURE 14/3/28 – 8



Sensus Model iPERL DN32 Water Meter

FIGURE 14/3/28 – 9



Sensus Model iPERL DN40 Water Meter

FIGURE 14/3/28 – 10



Sensus iPERL169 DN20 – Variant 4

FIGURE 14/3/28 – 11



Sensus iPERL169 DN40 – Variant 4

~ End of Document ~