Australian Government
Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 14/3/65

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.

Diehl Metering Hydrus Type 173 Water Meter

submitted by Diehl Metering GmbH
Industriestr. 13
91522 ANSBACH, 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 September 2015.

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 & 2 approved – certificate issued	27/04/23

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/65' 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.

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 14/3/65

1. Description of Pattern approved on 27/04/23

A DN15 sized Diehl Metering Hydrus Type 173 model water meter used to measure cold potable and hot water supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the DN15 Hydrus Type 173 model water meter is determined by the following characteristics:

Minimum flow rate, Q_1:	0.0031 m^3/h
Transition flow rate, Q_2:	0.005 m^3/h
Maximum continuous flow rate, Q_3:	2.5 m^3/h
Overload flow rate, Q_4:	3.125 m^3/h
Flow rate ratio, Q_3/Q_1:	800
Temperature class:	T30, T50, T70, or T90
Maximum admissible temperature:	90 °C
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp 63
Accuracy class:	2
Flow profile sensitivity class:	U0/D0 (see 1.3.1)
Electromagnetic class:	E1/E2
Environmental class:	B/O
Orientation:	All positions
Flow Direction:	Forward only
Power supply:	Non-replaceable battery

1.2 Features/Functions

The pattern (Figure 1) consists of an ultrasonic flow sensor and an indicating flow converter (calculator/indicator) and has features/functions as listed below:

Connection type:	Threaded
Display:	A digital, electronic, liquid crystal display allowing for a maximum indication range of 999,999 m^3 in 0.001 m^3 increments
Communications:	Radio (434/868 MHz), L-Bus, M-Bus, optical and pulse outputs
Materials:	Flow sensor: Brass (lead-free)
	Flow converter: Polymer material
Meter length:	110 mm
Non-return device(s):	Single or double check valve

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 Versions

The pattern is approved for use with firmware versions:

- 001.001.001
- 002.000.001
- 002.000.002
- 002.000.003

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

The meter is sealed via the use of tamper-evident sticker which overlays upper and lower components of the meter housing, 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 2 & Figure 3):

Manufacturer's name or mark	...
Serial number	...
Pattern approval number	NMI 14/3/65
Numerical value of maximum continuous flow rate, Q_3	...
Flow rate ratio, Q_3/Q_1	...
Unit of measurement	m^3
Temperature class (1)	T90
Maximum admissible pressure (2)	1600 kPa
Pressure loss class (3)	63 kPa or Δp 63
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 and accuracy class 2.5 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	B or 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 27/04/23

The pattern and variants are approved with a range of different sizes, 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	DN25	DN32	DN40	DN50
Minimum flowrate Q_1 (m^3/h)	**0.0031**	0.005	0.0079	0.0125	0.0125	0.02	0.0625
Transitional flowrate Q_2 (m^3/h)	**0.005**	0.008	0.0126	0.02	0.02	0.032	0.1
Maximum continuous flowrate Q_3 (m^3/h)	**2.5**	4	6.3	10	10	16	25
Overload flowrate Q_4 (m^3/h)	**3.125**	5	7.875	12.5	12.5	20	31.25
Ratio Q_3/Q_1	**800**	800	500	800	800	800	400
Minimum Meter Length (mm)	**110**	110	135	135	135	200	270
Maximum Meter Length (mm)	**170**	190	260	260	260	300	300
Maximum admissible pressure (kPa)	**1600**	1600	1600	1600	1600	1600	1600
Pressure loss class	**Δp 63**	Δp 63	Δp 40	Δp 63	Δp 63	Δp 25	Δp 40
Verification scale interval (m^3)	**0.00001**	0.00001	0.00001	0.0001	0.0001	0.0001	0.0001

Note: The verification scale intervals detailed are the respective display resolutions when the water meter is placed into test mode.

3. Description of Variant 2 approved on 27/04/23

The pattern and variants are approved to display the unit of measurement and other associated information by reference to kilolitre (kl).

TEST PROCEDURE No 14/3/65

Water meters tested for initial verification shall comply with the Certificate of Approval, Technical Schedule, and the maximum permissible errors for initial and subsequent verifications at the operating conditions in effect at the time of verification. Maximum permissible errors for the initial and subsequent 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*.

The following exceptions apply for accuracy class 2 meters:

- The working water temperature range for verification is dependent on the temperature class of the meter as follows:

  T30, T50: 20 °C ± 10 °C;

  T70 to T180: 20 °C ± 10 °C and 50 °C ± 10 °C;

  T30/70 to T30/180: 50 °C ± 10 °C.

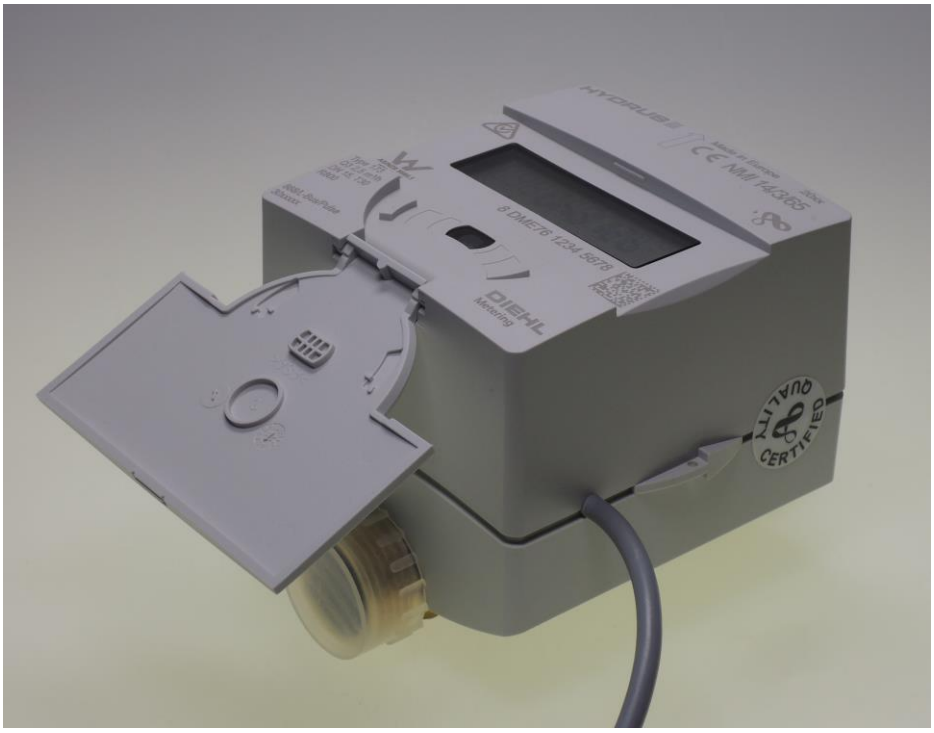
- Where a meter is tested with a working water temperature greater than 30 °C, the maximum permissible errors shall be:

  ±5% within the flowrate range $Q_1 \leq Q < Q_2$; and

  ±3% within the flowrate range $Q_2 \leq Q \leq Q_4$.

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

FIGURE 14/3/65 – 1



Diehl Metering Hydrus Type 173 DN15 water meter (the pattern)

FIGURE 14/3/65 – 2

Indicating device and example of required markings

FIGURE 14/3/65 – 3

Example of required markings (continued) on side of case

~ End of Document ~