



Australian Government  
Department of Industry,  
Science and Resources

**National  
Measurement  
Institute**

36 Bradfield Road, West Lindfield NSW 2070

**Certificate of Approval**  
**NMI 14/3/66**

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 174 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 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, 2 & 3 provisionally approved – certificate issued	28/04/23
1	Pattern & variant 1 amended, variant 4 provisionally approved – certificate issued	14/06/23
2	Pattern & variants 1, 2, 3 & 4 approved – certificate issued	24/08/23

## CONDITIONS OF APPROVAL

### General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/66' 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*.



**Darryl Hines**  
Manager  
Policy and Regulatory Services

TECHNICAL SCHEDULE No 14/3/66

**1. Description of Pattern** **provisionally approved on 28/04/23**  
**amended on 14/06/23**  
**approved on 24/08/23**

A DN50 sized Diehl Metering Hydrus Type 174 model 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 DN50 Hydrus Type 174 model water meter is determined by the following characteristics:

Minimum flow rate, Q <sub>1</sub> :	0.0313 m <sup>3</sup> /h
Transition flow rate, Q <sub>2</sub> :	0.05 m <sup>3</sup> /h
Maximum continuous flow rate, Q <sub>3</sub> :	25.0 m <sup>3</sup> /h
Overload flow rate, Q <sub>4</sub> :	31.25 m <sup>3</sup> /h
Flow rate ratio, Q <sub>3</sub> /Q <sub>1</sub> :	800
Temperature class:	T50
Maximum admissible temperature:	50 °C
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp 16
Accuracy class:	2
Flow profile sensitivity class:	U0/D0 (see 1.3.1)
Electromagnetic class:	E1/E2
Environmental class:	B/O
Orientation:	Horizontal
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:	Flanged
Display:	A digital, electronic, liquid crystal display allowing for a maximum indication range of 9,999,999.99 m <sup>3</sup> in 0.01 m <sup>3</sup> increments
Communications:	Radio (434/868 MHz), L-Bus, M-Bus, optical and pulse outputs
Materials:	Meter body: Epoxy coated cast iron Meter casing/cover: Polymer material
Meter length:	200 mm

## 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:

- 001.000.006 (CRC 0H604A)
- 001.000.008 (CRC 0H1003)

## 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 stickers which overlays the 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):

Manufacturer's name or mark	...
Serial number	...
Pattern approval number	NMI 14/3/66
Numerical value of maximum continuous flow rate, $Q_3$	...
Flow rate ratio, $Q_3/Q_1$	...
Unit of measurement	$m^3$
Temperature class <sup>(1)</sup>	T50
Maximum admissible pressure <sup>(2)</sup>	1600 kPa
Pressure loss class <sup>(3)</sup>	16 kPa or $\Delta p$ 16
Orientation <sup>(4)</sup>	...
Flow profile sensitive class <sup>(5)</sup>	U0/D0
Direction of flow	→ or similar
Accuracy class <sup>(6)</sup>	2

<sup>(1)</sup> Optional for temperature class T30 meters

<sup>(2)</sup> Optional for meters with MAP = 1400 kPa

<sup>(3)</sup> Optional for pressure loss class  $\Delta p$  63

<sup>(4)</sup> Optional for meters approved for all orientations

<sup>(5)</sup> Optional for U0/D0 class meters and accuracy class 2.5 meters

<sup>(6)</sup> 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**

**provisionally approved on 28/04/23  
amended on 14/06/23  
approved on 24/08/23**

The pattern and variants are approved in all orientations with a range of different sizes, flowrates and associated characteristics as specified in Table 1 (for meters installed in horizontal orientation) and Table 2 (for meters installed in all orientations) below. The Pattern is shown in **bold** for completeness.

**Table 1 - Meter information (horizontal orientation)**

Meter size	<b>DN50</b>	DN65	DN80	DN100	DN125	DN150	DN200
Minimum flowrate Q1 (m3/h)	<b>0.0313</b>	0.05	0.0788	0.125	0.200	0.3125	0.5
Transitional flowrate Q2 (m3/h)	<b>0.05</b>	0.08	0.126	0.200	0.320	0.5	0.8
Maximum continuous flowrate Q3 (m3/h)	<b>25.0</b>	40.0	63.0	100.0	160.0	250.0	400.0
Overload flowrate Q4 (m3/h)	<b>31.25</b>	50	78.75	125	200	312.5	500
Ratio Q3/Q1	<b>800</b>	800	800	800	800	800	800
Minimum meter length (mm)	<b>200</b>	200	200	250	250	300	350
Maximum admissible pressure (kPa)	<b>1600</b>	1600	1600	1600	1600	1600	1600
Pressure loss class	<b>Δp 16</b>	Δp 16	Δp 16	Δp 16	Δp 16	Δp 16	Δp 16
Verification scale interval (m3)	<b>0.01</b>	0.01	0.01	0.01	0.1	0.1	0.1

**Table 2 - Meter information (all orientations)**

Meter size	DN50	DN65	DN80	DN100	DN125	DN150	DN200
Minimum flowrate Q1 (m3/h)	0.1	0.16	0.256	0.4	0.64	1	1.6
Transitional flowrate Q2 (m3/h)	0.16	0.256	0.4	0.64	1	1.6	2.56
Maximum continuous flowrate Q3 (m3/h)	25.0	40.0	63.0	100.0	160.0	250.0	400.0
Overload flowrate Q4 (m3/h)	31.25	50	78.75	125	200	312.5	500
Ratio Q3/Q1	250	250	250	250	250	250	250
Minimum meter length (mm)	200	200	200	250	250	300	350
Maximum admissible pressure (kPa)	1600	1600	1600	1600	1600	1600	1600
Pressure loss class	$\Delta p$ 16	$\Delta p$ 16	$\Delta p$ 16	$\Delta p$ 16	$\Delta p$ 16	$\Delta p$ 16	$\Delta p$ 16
Verification scale interval (m3)	0.01	0.01	0.01	0.01	0.1	0.1	0.1

**3. Description of Variant 2** **provisionally approved on 28/04/23**  
**approved on 24/08/23**

The DN100 size meter is approved with rotatable flanged end connections (Figure 3). The DN100 size meter with rotatable flanged end connections has a meter length of 350 mm.

**4. Description of Variant 3** **provisionally approved on 28/04/23**  
**approved on 24/08/23**

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

**5. Description of Variant 4**

**provisionally approved on 14/06/23  
approved on 24/08/23**

The pattern and variants are approved in all orientations with a temperature class T30 and the following range of different sizes, flowrates and associated characteristics as specified in Table 3.

**Table 3 - Meter information (T30 temperature class, all orientations)**

Meter size	DN50	DN65	DN80	DN100	DN125	DN150	DN200
Minimum flowrate Q1 (m <sup>3</sup> /h)	0.0313	0.05	0.0788	0.125	0.200	0.3125	0.5
Transitional flowrate Q2 (m <sup>3</sup> /h)	0.05	0.08	0.126	0.200	0.320	0.5	0.8
Maximum continuous flowrate Q3 (m <sup>3</sup> /h)	25.0	40.0	63.0	100.0	160.0	250.0	400.0
Overload flowrate Q4 (m <sup>3</sup> /h)	31.25	50	78.75	125	200	312.5	500
Ratio Q3/Q1	800	800	800	800	800	800	800
Minimum meter length (mm)	200	200	200	250	250	300	350
Maximum admissible pressure (kPa)	1600	1600	1600	1600	1600	1600	1600
Pressure loss class	$\Delta p$ 16	$\Delta p$ 16	$\Delta p$ 16	$\Delta p$ 16	$\Delta p$ 16	$\Delta p$ 16	$\Delta p$ 16
Verification scale interval (m <sup>3</sup> )	0.01	0.01	0.01	0.01	0.1	0.1	0.1

## TEST PROCEDURE No 14/3/66

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 the 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*.

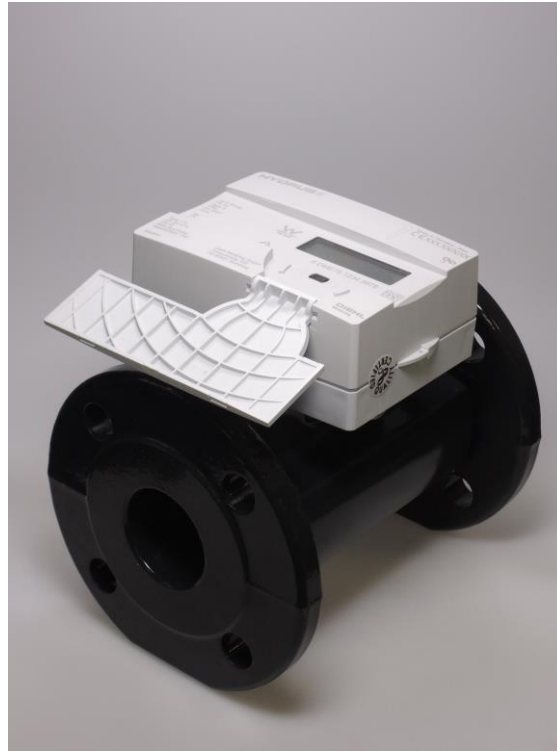
The following exceptions apply for accuracy class 2 meters:

- The working water temperature range for verification is dependent on the temperature class of the meter as follows:
  - T30, T50:  $20\text{ °C} \pm 10\text{ °C}$ ;
  - T70 to T180:  $20\text{ °C} \pm 10\text{ °C}$  and  $50\text{ °C} \pm 10\text{ °C}$ ;
  - T30/70 to T30/180:  $50\text{ °C} \pm 10\text{ °C}$ .
- Where a meter is tested with a working water temperature greater than 30 °C, the maximum permissible errors shall be:
  - $\pm 5\%$  within the flowrate range  $Q_1 \leq Q < Q_2$ ; and
  - $\pm 3\%$  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 14/3/66 – 1



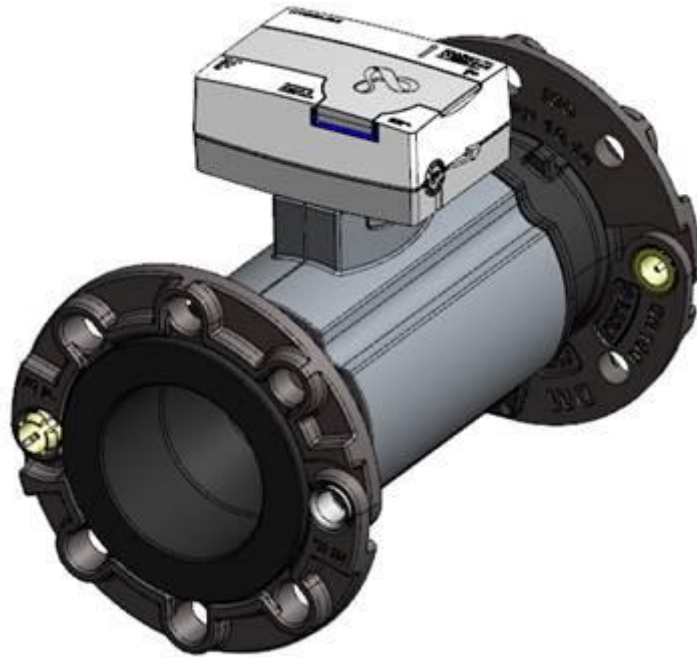
Diehl Metering Hydrus Type 174 DN50 water meter (the pattern)

FIGURE 14/3/66 – 2



Example of indicating device and required markings

FIGURE 14/3/66 – 3



Variant 2 – DN100 size meter with rotatable flanged end connections

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