



Australian Government
Department of Industry, Science,
Energy and Resources

**National
Measurement
Institute**

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval
NMI 14/3/54

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.

BIL WPD model Water Meter

submitted by Klasse Ltd
18 Viaduct Harbour Avenue
Maritime Square, Auckland
New Zealand

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 and NMI M 10-1 Meters Intended for the Metering of Water in Full Flowing Pipes, *Part 1: Metrological and Technical Requirements*, dated July 2010.

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 – 3 approved – certificate issued	4/11/20
1	Pattern & variants 1 – 3 amended (model name) – certificate issued	08/12/20

CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/54' 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 14/3/54

1. Description of Pattern **approved on 4/11/20**

A DN50 sized BIL WPD model water meter used to measure water supplies for trade.

The Pattern and Variants are manufactured by Zenner Fuzhou Water Meters Co Ltd.

1.1 Field of Operation

The field of operation of the measuring system using the DN50 BIL WPD model water meter is determined by the following characteristics:

Minimum flow rate, Q ₁ :	0.20 m ³ /h
Transition flow rate, Q ₂ :	0.32 m ³ /h
Maximum continuous flow rate, Q ₃ :	25.00 m ³ /h
Overload flow rate, Q ₄ :	31.25 m ³ /h
Flow rate ratio, Q ₃ /Q ₁ :	125
Maximum admissible temperature:	50 °C
Temperature Class:	T50
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp 10
Accuracy class:	2
Flow profile sensitivity class:	See clause 1.3.1
Environmental class:	B & O (indoor & outdoor)
Orientation:	Horizontal
Flow Direction:	Forward only

1.2 Features/Functions

The pattern (Figure 1) consists of a Woltman type flow meter incorporating a mechanical indicating device and has features/functions as listed below:

Connection type: Flanged

Display: A mechanical display allowing for a maximum indication range of 999,999 m³ in 0.0005 m³ increments (Figure 2)

Materials: Meter body: coated steel
Indicating device: glass, copper and polymer material

Meter length: 200 mm

1.3 Conditions

1.3.1 Installation Conditions:

No external flow straightener or flow conditioner is required.

The meter body housing incorporates an integrated flow conditioner located at the inlet (Figure 3).

For Accuracy Class 2 (NMI R 49-1), the flow profile sensitivity class is U0/D0.

For Accuracy Class 2.5 (NMI M 10-1), the installation conditions, based on meter size, are specified in Table 1 and Table 2.

**Table 1 Minimum pipe lengths required by flow disturbance type:
DN50 meters**

Disturbance Type (*)	Minimum number of upstream pipe lengths (DN)	Minimum number of downstream pipe lengths (DN)
1	5	2
2	5	2
3	5	2

**Table 2 Minimum pipe lengths required by flow disturbance type:
DN65-DN300 meters**

Disturbance Type (*)	Minimum number of upstream pipe lengths (DN)	Minimum number of downstream pipe lengths (DN)
1	10	5
2	10	5
3	10	5

(*) For information on the different types of flow disturbances which are examined as part of pattern approval, refer to NMI M 10-2.

1.3.2 Water Quality

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

The meter is approved for use in the metering of non-potable water supplies of an unspecified nature.

1.4 Software Version

NA

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

The meter is sealed such that any attempt to access metrologically significant components is made evident (Figure 4). The flow sensor and flow converter are connected via stainless steel bolts. These bolts are sealed via the application of a tamper evident physical seal. The indicating device is sealed via the application of a tamper evident physical seal.

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	BIL
Serial number	...
Pattern approval number	NMI 14/3/54
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
Maximum pressure loss ⁽³⁾	10 kPa or Δp 10
Orientation ⁽⁴⁾	H or H/V
Flow profile sensitive class ⁽⁵⁾	U0/D0
Direction of flow	→ or similar
Accuracy class ⁽⁶⁾	2 or 2.5

⁽¹⁾ Optional for Class T30

⁽²⁾ Optional for meters with MAP of 1400 kPa or 600 kPa for DN \geq 500

⁽³⁾ Optional for Class Δp 63

⁽⁴⁾ Optional for meters approved for all orientations

⁽⁵⁾ Optional for U0/D0 meters

⁽⁶⁾ Optional for class 2 meters

2. Description of Variant 1 **approved on 4/11/20**

The BIL WPD model water meter is approved as Accuracy Class 2.5 in accordance with NMI M 10-1.

3. Description of Variant 2 **approved on 4/11/20**

The BIL WPD model water meter is approved with a range of different sizes, flowrates, orientations and associated characteristics as specified in Table 3 to Table 6 below (Figure 6). The Pattern is shown in **Bold** for completeness.

Table 3 Meter sizes, flowrates and related information

Meter size	DN50	DN50	DN50	DN50
Minimum flowrate Q ₁ (m ³ /h)	0.20	0.50	0.20	0.50
Transitional flowrate Q ₂ (m ³ /h)	0.32	0.80	0.32	0.80
Maximum continuous flowrate Q ₃ (m ³ /h)	25.00	25.00	40.00	40.00
Overload flowrate Q ₄ (m ³ /h)	31.25	31.25	50.00	50.00
Orientation	H	V	H	V
Ratio Q ₃ /Q ₁	125	50	200	80
Meter Length (mm)	200			
Pressure loss class	Δp 10		Δp 25	
Verification scale interval (m ³)	0.0005			

The Q₃/Q₁ values specified in Table 3 to Table 6 are the largest approved values for each meter size and orientation. The meter is also approved with all lower values of Q₃/Q₁ permitted under NMI R 49-1 within the approved values of Q₃ and Q₁ for each meter size and orientation.

For example, a DN50 sized meter approved in the vertical orientation is also approved with a Q₃/Q₁ ratio of 40, Q₃ of 25.00 m³/h and a Q₁ of 0.6 m³/h

Table 4 Meter sizes, flowrates and related information

Meter size	DN65	DN65	DN80	DN80
Minimum flowrate Q ₁ (m ³ /h)	0.20	0.50	0.32	0.79
Transitional flowrate Q ₂ (m ³ /h)	0.32	0.80	0.50	1.26
Maximum continuous flowrate Q ₃ (m ³ /h)	40.00	40.00	63.00	63.00
Overload flowrate Q ₄ (m ³ /h)	50.00	50.00	78.75	78.75
Orientation	H	V	H	V
Ratio Q ₃ /Q ₁	200	80	200	80
Meter Length (mm)	200		200 or 225	
Pressure loss class	Δp 16		Δp 10	
Verification scale interval (m ³)	0.0005			

Table 5 Meter sizes, flowrates and related information

Meter size	DN100	DN100	DN125	DN125
Minimum flowrate Q ₁ (m ³ /h)	0.32	0.50	0.32	0.50
Transitional flowrate Q ₂ (m ³ /h)	0.50	0.80	0.50	0.80
Maximum continuous flowrate Q ₃ (m ³ /h)	100.00	100.00	100.00	100.00
Overload flowrate Q ₄ (m ³ /h)	125.00	125.00	125.00	125.00
Orientation	H	V	H	V
Ratio Q ₃ /Q ₁	315	200	315	200
Meter Length (mm)	250		250	
Pressure loss class	Δp 16			
Verification scale interval (m ³)	0.0005			

Table 6 Meter sizes, flowrates and related information

Meter size	DN150	DN150
Minimum flowrate Q ₁ (m ³ /h)	0.79	1.25
Transitional flowrate Q ₂ (m ³ /h)	1.27	2.00
Maximum continuous flowrate Q ₃ (m ³ /h)	250.00	250.00
Overload flowrate Q ₄ (m ³ /h)	312.50	312.50
Orientation	H	V
Ratio Q ₃ /Q ₁	315	200
Meter Length (mm)	300	
Pressure loss class	Δp 16	
Verification scale interval (m ³)	0.005	

4. Description of Variant 3

approved on 4/11/20

The BIL WPD model water meter is approved with a range of different sizes, flowrates, orientations and associated characteristics as specified in Table 7 and Table 8 below (Figure 6).

Table 7 Meter sizes, flowrates and related information

Meter size	DN200	DN200	DN250	DN250
Minimum flowrate Q ₁ (m ³ /h)	2.50	3.20	3.94	5.04
Transitional flowrate Q ₂ (m ³ /h)	4.00	5.12	6.30	8.06
Maximum continuous flowrate Q ₃ (m ³ /h)	400.00	400.00	630.00	630.00
Overload flowrate Q ₄ (m ³ /h)	500.00	500.00	787.50	787.50
Orientation	H	V	H	V
Ratio Q ₃ /Q ₁	160	125	160	125
Meter Length (mm)	350		450	
Pressure loss class	Δp 10			
Verification scale interval (m ³)	0.005			

The Q₃/Q₁ values specified in Table 7 and Table 8 are the largest approved values for each meter size and orientation. The meter is also approved with all lower values of Q₃/Q₁ permitted under NMI R 49-1 within the approved values of Q₃ and Q₁ for each meter size and orientation.

For example, a DN200 sized meter approved in the vertical orientation is also approved with a Q₃/Q₁ ratio of 100, Q₃ of 400.00 m³/h and a Q₁ of 4.00 m³/h

Table 8 Meter sizes, flowrates and related information

Meter size	DN300	DN300
Minimum flowrate Q ₁ (m ³ /h)	6.25	8.00
Transitional flowrate Q ₂ (m ³ /h)	10.00	12.80
Maximum continuous flowrate Q ₃ (m ³ /h)	1000.00	1000.00
Overload flowrate Q ₄ (m ³ /h)	1250.00	1250.00
Orientation	H	V
Ratio Q ₃ /Q ₁	160	125
Meter Length (mm)	500	
Pressure loss class	Δp 10	
Verification scale interval (m ³)	0.005	

TEST PROCEDURE No 14/3/54

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*.

For accuracy class 2.5 meters:

- The maximum permissible errors for initial verification shall be $\pm 2.5\%$ from Q_1 to Q_4 .
- The flow rates specified for initial verification in NMI M 10-2 may replace the flow rates specified in NITP 14.

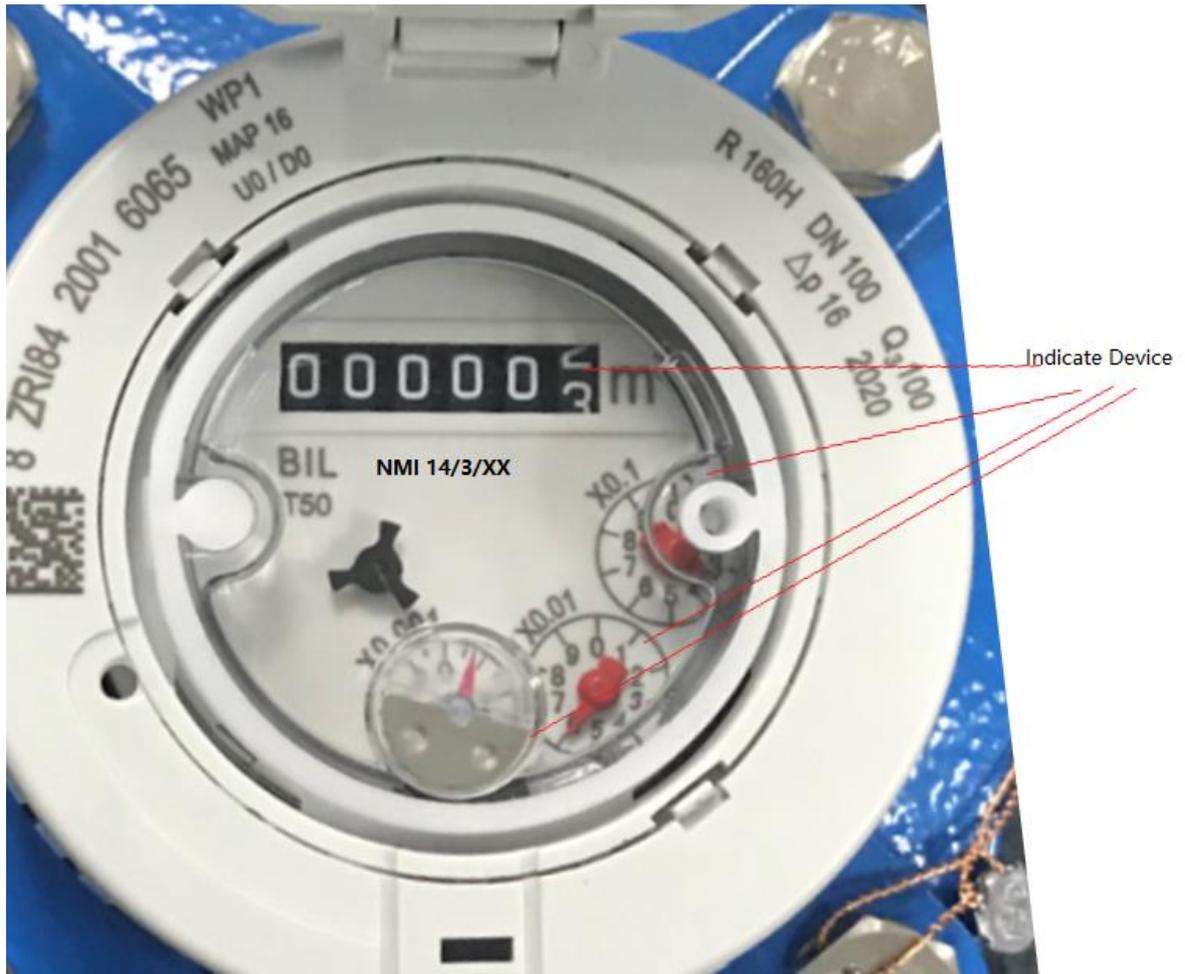
NOTE: NMI reserves the right to vary this procedure. Any such variation shall be notified in writing by NMI.

FIGURE 14/3/54 – 1



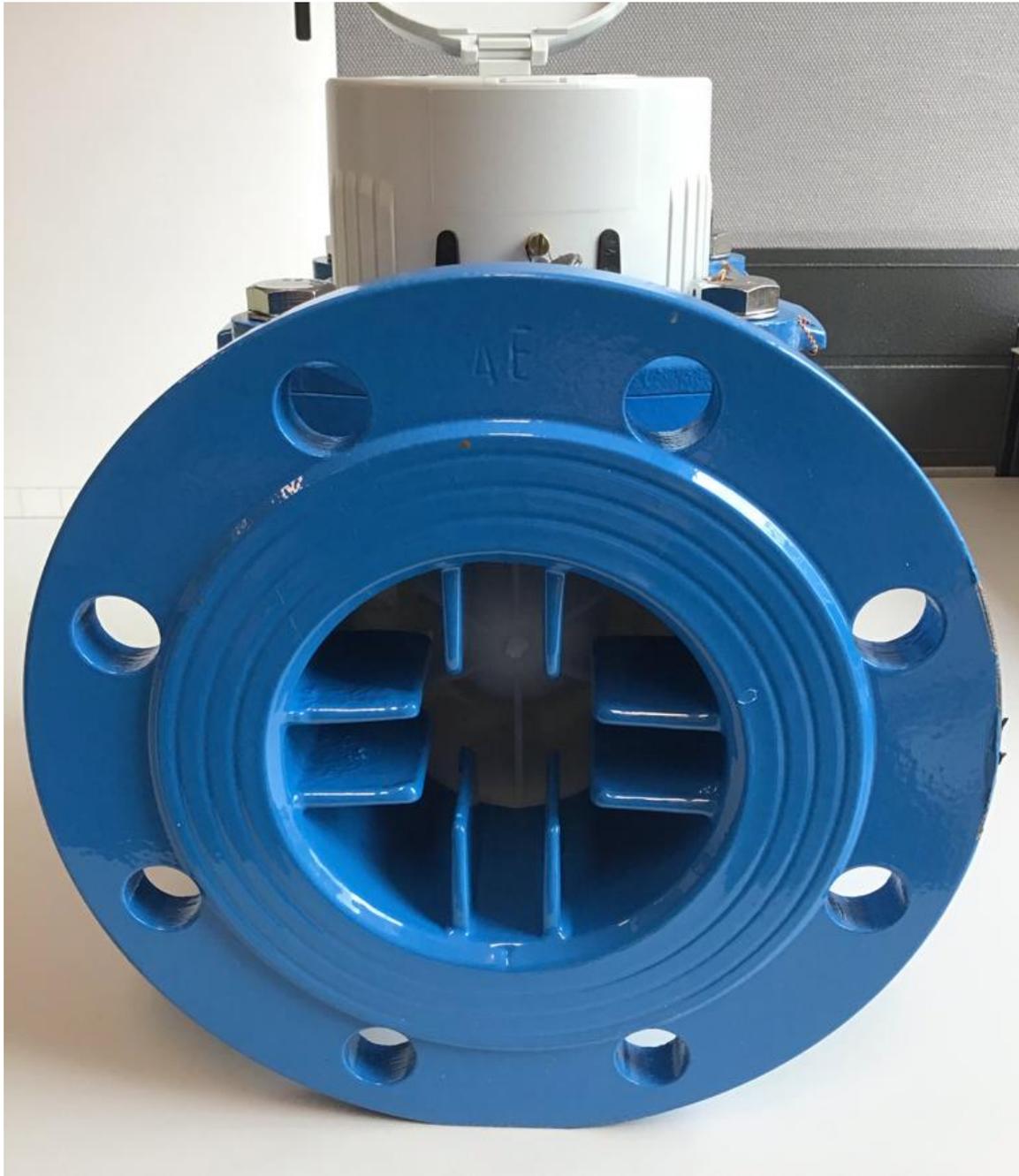
BIL WPD model DN50 sized water meter – The Pattern

FIGURE 14/3/54 – 2



The indicating device

FIGURE 14/3/54 – 3



Integrated flow conditioner

FIGURE 14/3/54 – 4



Sealing provision:
Lead Sealing

Sealing provisions

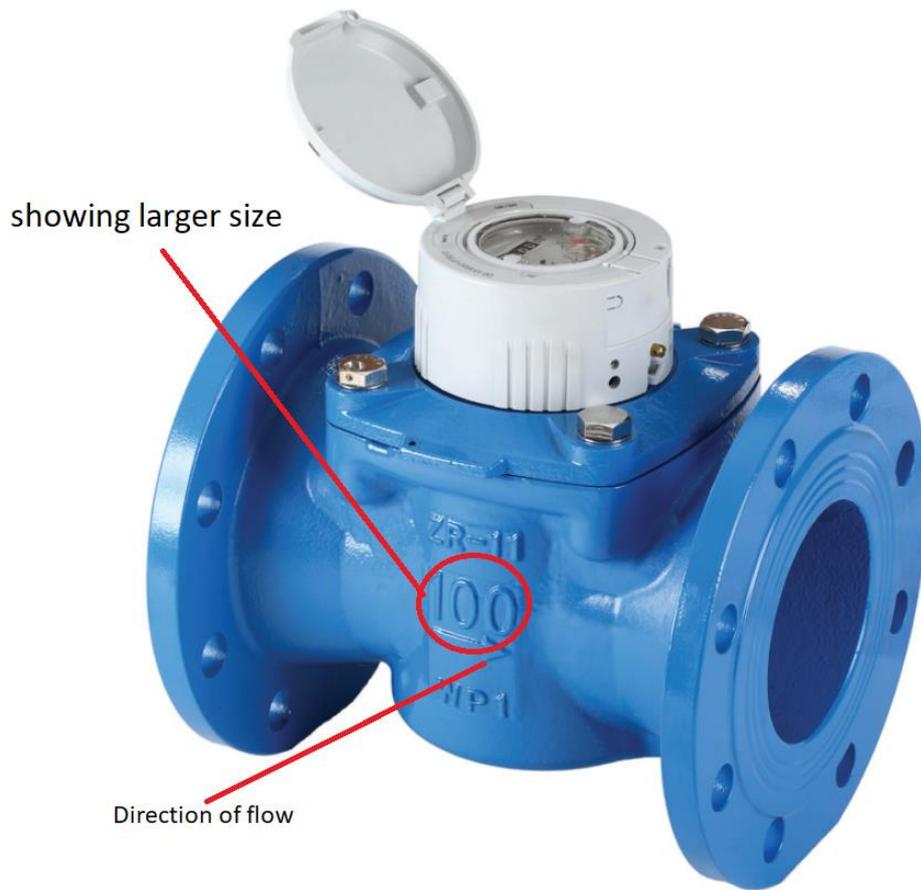
FIGURE 14/3/54 – 5



- Manufacturer's name or mark: BIL
- Serial number: 2001 6065
- Pattern approval number: NMI 14/3/XX
- Numerical value of maximum continuous flow rate, Q3 100 m³/h
- Flow rate ratio, Q3/Q1: R160
- Unit of measurement: m³
- Temperature class: T50°
- Maximum admissible pressure: 16 (1600 kPa)
- Maximum pressure loss: Δp 16
- Orientation: H
- Flow profile sensitive class: U0/D0
- Accuracy class : 2
- Direction of flow: → shown on body

Required markings

FIGURE 14/3/54 – 6



Larger meter sizes - Variants 2 and 3

~ End of Document ~