Australian Government
Department of Industry, Science and Resources

National Measurement Institute

36 Bradfield Road, West Lindfield NSW 2070

Certificate of Approval

NMI 14/3/50

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.

Siemens Model MAG5100W with MAG6000CT series water meter

submitted by Siemens AG
76187 Karlsruhe
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 for cold potable water and hot water, Part 1 Metrological and technical requirements*, dated May 2022 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 to 10 approved – certificate issued	15/01/20
1	Pattern amended (Conditions), variants 2, 3, 4, 5 & 7 amended – certificate issued	25/03/22
2	Pattern reviewed, Variant 7 amended (orientation) – certificate issued	12/09/25

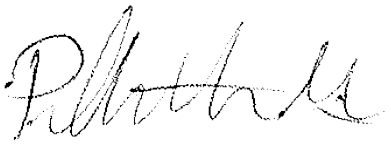
CONDITIONS OF APPROVAL

General

Instruments purporting to comply with this approval shall be marked with pattern approval number 'NMI 14/3/50' 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*.



Phillip Mitchell
Acting Manager
Policy and Regulatory Services

TECHNICAL SCHEDULE No 14/3/50

1. Description of Pattern

approved on 15/01/20
amended on 25/03/22
amended on 12/09/25

Siemens Model SITRANS F M MAG5100W with SITRANS F M MAG6000CT series water meter used to measure water supplies for trade.

1.1 Field of Operation

The field of operation of the measuring system using the Siemens SITRANS F M MAG5100W DN50 sized electromagnetic flow sensor and SITRANS FM MAG6000CT signal transmitter is determined by the following characteristics:

Minimum flow rate, Q_1:	0.16 m^3/h
Transition flow rate, Q_2:	0.25 m^3/h
Maximum continuous flow rate, Q_3:	63.00 m^3/h
Overload flow rate, Q_4:	78.75 m^3/h
Flow rate ratio, Q_3/Q_1:	400
Maximum admissible temperature:	50 °C
Temperature class:	T50
Maximum admissible pressure:	1600 kPa
Pressure loss class:	Δp 16
Accuracy class:	2
Flow profile sensitivity class:	U0/D0
Electromagnetic class:	E2 (industrial)
Environmental class:	O (outdoors)
Orientation:	All positions – see Variant 7 for other sizes
Flow Direction:	Forward and reverse
Power supply:	12-24 V AC/DC

The meter incorporates type P checking facilities in accordance with Annex B of NMI R 49-1.

1.2 Features/Functions

The pattern (Figure 1) consists of an electromagnetic flow sensor, SITRANS F M MAG5100W, and a signal transmitter, SITRANS F M MAG6000CT, incorporating an electronic indicating device with the features and functions as listed below:

Connection type: Flanged end connections.

Display: A digital, electronic, liquid crystal display allowing for a maximum indication range of 9 999 999.9 m^3 in 0.00001 m^3 increments

Communications: The meter includes provision for a configurable pulse and analogue output, Modbus and PROFIBUS.

Materials: Flow sensor: Carbon steel, with corrosion resistant two-component epoxy coating

Liner: EPDM, NBR hard rubber or Ebonite hard rubber

Flow converter: Composite material

Meter length: 200 mm (for DN50)

1.3 Conditions

1.3.1 Installation Conditions:

No flow straightener or flow conditioner is required.

For Accuracy class 2, the flow profile sensitivity class is U0/D0.

For Accuracy class 2.5, the installation conditions are specified in Table 1.

Table 1 Minimum pipe lengths required by flow disturbance type

Disturbance Type (*)	Minimum upstream pipe length (mm)	Minimum downstream pipe length (mm)
1	0	0
2	0	0
3	0	0

(*) 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 Specified Installations and Open Channel Emplacements (accuracy class 2.5 only)

The meter (pattern and variants) has not been tested or evaluated for performance in specified installations or open channel emplacements as part of this approval.

More information regarding specified installation and open channel emplacement testing may be found in NMI M 10-1 and NMI M 10-2.

1.3.3 Water Quality

The meter is approved for use in the metering of potable water supplies (EPDM or Ebonite liners only).

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

1.4 Software Version

The SITRANS F M MAG6000CT signal transmitter is approved with firmware versions 3.03 and 4.09 X02.

1.5 Verification Provision

Provision is made for the application of a verification mark.

1.6 Sealing Provision

Provision is made for the instrument to be sealed by the application of one or more mechanical seals (Figure 2):

- 3 internal sealings in the transmitter;
- a sealing wire system (that may be applied by the water authority); and
- a sealing on the nameplate.

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 3):

Manufacturer's name or mark	...
Serial number	...
Pattern approval number	NMI 14/3/50
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
Maximum pressure loss (2)	16 kPa or Δp 16
Maximum admissible temperature (3)	T50
Orientation (4)	…
Flow profile sensitive class (5)	U0/D0
Direction of flow	→ or similar
Accuracy class (6)	2 or 2.5

(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, otherwise H, V, H/V, etc

(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	E2
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 15/01/20**

The Pattern and Variants are approved with the alternative signal transmitter SITRANS F M MAG5000CT with the same features and functions as the SITRANS F M MAG6000CT.

3. Description of Variant 2 **approved on 15/01/20**
amended on 25/03/22

The Pattern and Variants are approved with **accuracy class 2** (NMI R 49) with the different sensor sizes (Figure 4), flowrates and associated characteristics as specified in Tables 2 to 8. The Pattern is included in **Bold** for completeness.

Table 2 Meter sizes, flowrates and related information

Meter size	**DN50***	**DN65**	**DN80**	**DN100**
Minimum flow rate Q1 (m^3/h)	**0.16**	0.25	0.40	0.63
Transitional flow rate Q2 (m^3/h)	**0.25**	0.40	0.63	1.00
Maximum continuous flow rate Q3 (m^3/h)	**63.00**	100	160	250
Overload flow rate Q4 (m^3/h)	**78.75**	125	200	312.50
Ratio Q3/Q1	**400**	400	400	400
Meter length (mm)	**200**	200	200	250

(*) The specifications for the pattern are shown in **bold** type

Table 3 Meter sizes, flowrates and related information

Meter size	**DN125**	**DN150**	**DN200**	**DN250**
Minimum flow rate Q1 (m^3/h)	1.00	1.60	2.50	4.00
Transitional flow rate Q2 (m^3/h)	1.60	2.50	4.00	6.40
Maximum continuous flow rate Q3 (m^3/h)	400	630	1000	1600
Overload flow rate Q4 (m^3/h)	500	787.50	1250	2000
Ratio Q3/Q1	400	400	400	400
Meter length (mm)	250	300	350	450

Table 4 Meter sizes, flowrates and related information

Meter size	DN300	DN350	DN400	DN450
Minimum flow rate Q1 (m^3/h)	4	15.63	25	39.38
Transitional flow rate Q2 (m^3/h)	6.40	25	40	63
Maximum continuous flow rate Q3 (m^3/h)	1600	2500	4000	6300
Overload flow rate Q4 (m^3/h)	2000	3125	5000	7875
Ratio Q3/Q1	400	160	160	160
Meter length (mm)	500	550	600	600

Table 5 Meter sizes, flowrates and related information

Meter size	DN500	DN600	DN700
Minimum flow rate Q1 (m^3/h)	39.38	39.38	39.38
Transitional flow rate Q2 (m^3/h)	63	63	63
Maximum continuous flow rate Q3 (m^3/h)	6300	6300	6300
Overload flow rate Q4 (m^3/h)	7875	7875	7875
Ratio Q3/Q1	160	160	160
Meter length (mm)	600	600	700

Table 6 Meter sizes, flowrates and related information

Meter size	**DN750**	**DN800**	**DN900**	**DN1000**
Minimum flow rate Q1 (m^3/h)	39.38	39.38	62.5	62.5
Transitional flow rate Q2 (m^3/h)	63	63	100	100
Maximum continuous flow rate Q3 (m^3/h)	6300	6300	10000	10000
Overload flow rate Q4 (m^3/h)	7875	7875	12500	12500
Ratio Q3/Q1	160	160	160	160
Meter length (mm)	750	800	900	1000
Maximum admissible pressure (kPa)	600, 1000 or 1600			

Table 7 Meter sizes, flowrates and related information

Meter size	**DN1050***	**DN1100***	**DN1200**	**DN1400**
Minimum flow rate Q1 (m^3/h)	62.5	62.5	62.5	250
Transitional flow rate Q2 (m^3/h)	100	100	100	400
Maximum continuous flow rate Q3 (m^3/h)	10000	10000	10000	10000
Overload flow rate Q4 (m^3/h)	12500	12500	12500	12500
Ratio Q3/Q1	160	160	160	40
Meter length (mm)	1000	1000	1200	1400
Maximum admissible pressure (kPa)	600, 1000 or 1600			

(*) DN1050, DN1100 and other unique sizes within DN50 to DN1200 will bear part numbers starting with FDK:083XXX

Table 8 Meter sizes, flowrates and related information

Meter size	**DN1500**	**DN1600**	**DN1800**	**DN2000**
Minimum flow rate Q1 (m^3/h)	250	250	250	250
Transitional flow rate Q2 (m^3/h)	400	400	400	400
Maximum continuous flow rate Q3 (m^3/h)	10000	10000	10000	10000
Overload flow rate Q4 (m^3/h)	12500	12500	12500	12500
Ratio Q3/Q1	40	40	40	40
Meter length (mm)	1500	1600	1800	2000
Maximum admissible pressure (kPa)	600, 1000 or 1600			

4. Description of Variant 3

approved on 15/01/20
amended on 25/03/22

The Pattern and Variants are approved with **accuracy class 2** (NMI R 49), at the values of Q3 specified in Tables 2 to 8, with the following alternative Q3/Q1 ratios for meter sizes specified in Table 9.

Table 9 – Q3/Q1 ratios

Meter Size	**Q3/Q1 ratios**
DN50 to DN300	40, 50, 63, 80, 100, 125, 160, 200, 250 & 315
DN350 to DN1200	40, 50, 63, 80, 100 & 125

5. Description of Variant 4 **approved on 15/01/20**
amended on 25/03/22

The Pattern and Variants are approved with **accuracy class 2.5** (NMI M 10) with the sensor sizes, flow rates and related information as specified in Table 10 to 16 below.

Table 10 Meter sizes, flowrates and related information

Meter size	**DN50**	**DN65**	**DN80**	**DN100**
Minimum flow rate Q1 (m^3/h)	0.39	0.63	1.00	1.56
Maximum continuous flow rate Q3 (m^3/h)	63	100	160	250
Overload flow rate Q4 (m^3/h)	78.75	125	200	312.5
Ratio Q3/Q1	160	160	160	160
Meter length (mm)	200	200	200	250

Table 11 Meter sizes, flowrates and related information

Meter size	**DN125**	**DN150**	**DN200**	**DN250**
Minimum flow rate Q1 (m^3/h)	2.50	3.94	6.25	10.00
Maximum continuous flow rate Q3 (m^3/h)	400	630	1000	1600
Overload flow rate Q4 (m^3/h)	500	787.5	1250	2000
Ratio Q3/Q1	160	160	160	160
Meter length (mm)	250	300	350	450

Table 12 Meter sizes, flowrates and related information

Meter size	DN300	DN350	DN400	DN450
Minimum flow rate Q1 (m^3/h)	12.8	20	25	39.38
Maximum continuous flow rate Q3 (m^3/h)	1600	2500	4000	6300
Overload flow rate Q4 (m^3/h)	2000	3125	5000	7875
Ratio Q3/Q1	125	125	160	160
Meter length (mm)	500	550	600	600

Table 13 Meter sizes, flowrates and related information

Meter size	DN500	DN600	DN700	DN800
Minimum flow rate Q1 (m^3/h)	39.38	63	78.75	78.75
Maximum continuous flow rate Q3 (m^3/h)	6300	6300	6300	6300
Overload flow rate Q4 (m^3/h)	7875	7875	7875	7875
Ratio Q3/Q1	160	100	80	80
Meter length (mm)	600	600	700	800

Table 14 Meter sizes, flowrates and related information

Meter size	DN900	DN1000	DN1050	DN1100
Minimum flow rate Q1 (m^3/h)	125	158.73	158.73	158.73
Maximum continuous flow rate Q3 (m^3/h)	10,000	10,000	10,000	10,000
Overload flow rate Q4 (m^3/h)	12,500	12,500	12,500	12,500
Ratio Q3/Q1	80	63	63	63
Meter length (mm)	900	1000	1000	1100

Table 15 Meter sizes, flowrates and related information

Meter size	DN1200	DN1400	DN1500	DN1600
Minimum flow rate Q1 (m^3/h)	158.73	317.46	400	400
Maximum continuous flow rate Q3 (m^3/h)	10,000	10,000	10,000	10,000
Overload flow rate Q4 (m^3/h)	12,500	12,500	12,500	12,500
Ratio Q3/Q1	63	31.5	25	25
Meter length (mm)	1200	1400	1500	1600

Table 16 Meter sizes, flowrates and related information

Meter size	DN1800	DN2000
Minimum flow rate Q1 (m^3/h)	400	500
Maximum continuous flow rate Q3 (m^3/h)	10,000	10,000
Overload flow rate Q4 (m^3/h)	12,500	12,500
Ratio Q3/Q1	25	20
Meter length (mm)	1800	2000

6. Description of Variant 5 **approved on 15/01/20**
amended on 25/03/22

The Pattern and Variants are approved with **accuracy class 2.5** (NMI M 10), at the values of Q3 specified in Tables 10 to 16, with the following alternative Q3/Q1 ratios for meter sizes specified in Table 17.

Table 17 – Q3/Q1 ratios

Meter Size	Q3/Q1 ratios
DN50 to DN250	10, 12.5, 16, 20, 25, 31.5, 40, 50, 63, 80, 100, 125
DN300 to DN350	10, 12.5, 16, 20, 25, 31.5, 40, 50, 63, 80, 100
DN400 to DN500	10, 12.5, 16, 20, 25, 31.5, 40, 50, 63, 80, 100, 125
DN600	10, 12.5, 16, 20, 25, 31.5, 40, 50, 63, 80
DN700 to DN900	10, 12.5, 16, 20, 25, 31.5, 40, 50, 63
DN1000 to DN1200	10, 12.5, 16, 20, 25, 31.5, 40, 50
DN1400	10, 12.5, 16, 20, 25
DN1500 to DN1800	10, 12.5, 16, 20
DN2000	10, 12.5, 16

7. Description of Variant 6 **approved on 15/01/20**

The Pattern and Variants are approved with **accuracy class 2.5** (NMI M 10) with maximum admissible pressures of 600 kPa, 1000 kPa or 1600 kPa; the value is to be marked on the meter.

8. Description of Variant 7 **approved on 15/01/20**
amended on 25/03/22
amended on 12/09/25

The Pattern and Variants are approved with orientations as follows:

a) DN50 – DN 300: The meter is approved for all orientations.

b) DN350 – DN1200: The meter is approved for horizontal and vertical use only.

When installed in the vertical orientation, DN350 to DN1200 sized meters are approved with the alternative characteristic:

Flow profile sensitivity class: U3/D3

The meter must be installed with 3 x DN lengths of straight pipe both upstream and downstream of the meter.

c) DN1400 – DN2000: The meter is approved for horizontal use only.

In all cases, the meter must be appropriately marked as per the requirements of clause 1.7.

9. Description of Variant 8 approved on 15/01/20

The Pattern and Variants are approved with communications modules and software versions specified in Tables 18 & 19.

The designations of the products with the communication modules are specified in Table 18 below.

Table 18 Product designations

Product designation	Sensor	Transmitter
MAG5100W with MAG5000CT (7ME652)	MAG5100W	MAG5000CT with communication module
MAG5100W with MAG6000CT (7ME652)	MAG5100W	MAG6000CT with communication module

The above signal transmitters are approved with the firmware versions specified in Table 19 below.

Table 19 Software versions

Signal Transmitter	Firmware versions
SITRANS F M MAG5000CT	4.09 X05
SITRANS F M MAG6000CT	3.03 and 4.09 X02

10. Description of Variant 9 approved on 15/01/20

The Pattern and Variants are approved in both compact and remote arrangements (Figure 5). In the compact arrangement, the sensor and signal transmitter (Figure 6) are connected as part of an integral unit. In the remote arrangement, the sensor and signal transmitter are housed separately and connected via a cable with a maximum length of 100 meters.

11. Description of Variant 10 approved on 15/01/20

The Pattern and Variants are approved with the following power supplies:

a) 11 – 30 V DC
b) 11 – 24 V AC
c) 115 – 230 V AC
d) 110 – 240 V AC

TEST PROCEDURE No 14/3/50

This Approval and Certificate is issued only with respect to the design (the pattern and variants) of the water meter described herein. The calibration and measurement accuracy of individual water meters manufactured and marked in accordance with the approved pattern and variants should be verified in accordance with the test procedures specified below, or as required by relevant legislation.

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:

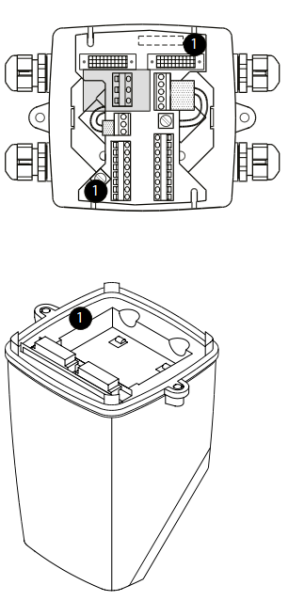
- NITP 14.0 – Utility meters – general requirements
- NITP 14.3 – Utility meters – water meters

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

FIGURE 14/3/50 – 1

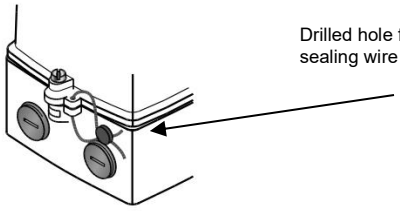
Siemens Model MAG5100W with MAG6000CT water meter (The Pattern)

FIGURE 14/3/50 – 2

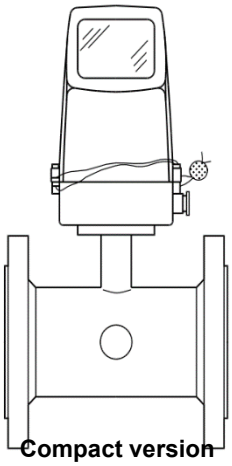


Verification sealing locations
for Transmitter

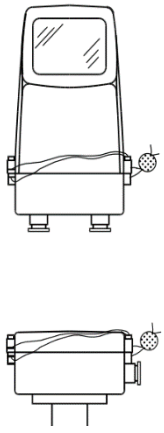
Verification sealing on Label
System Nameplate



Compact version
sealed each side



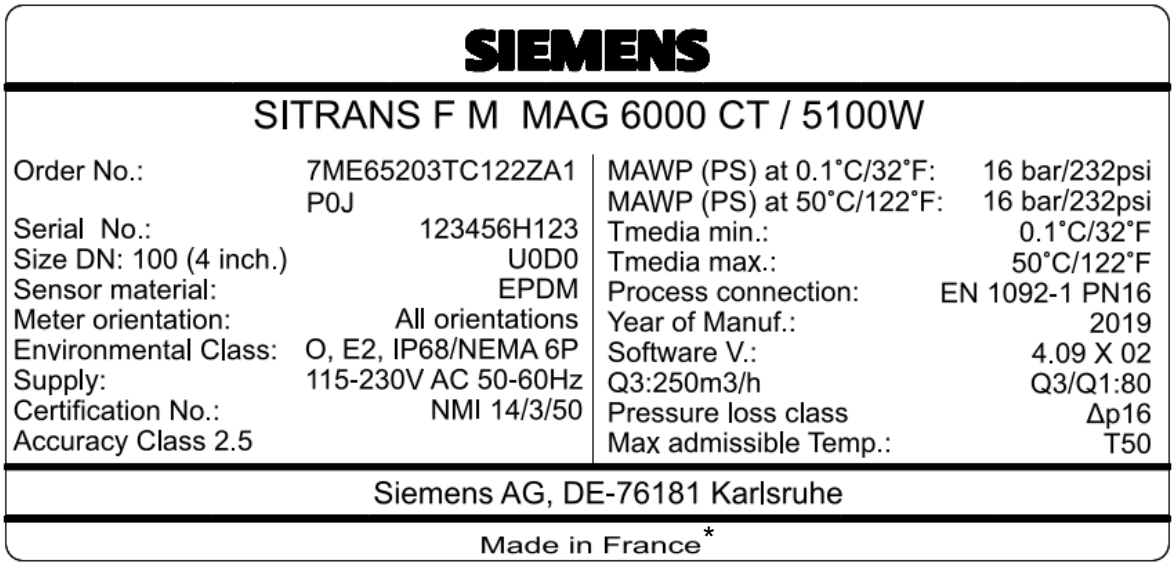
Compact version
with 1 wire



Remote version
with 1 wire

Typical Mechanical Sealing of MAG5000CT/6000CT

FIGURE 14/3/50 – 3



**: Made in France or Made in China*

Example Markings MAG5000CT/6000CT

FIGURE 14/3/50 – 4

Showing Different Size Meters MAG5000CT/6000CT (Various Variants)

FIGURE 14/3/50 – 5

Siemens Model MAG 5000CT/6000CT DN50 Water Meter
(compact & remote version (Variant 9)

FIGURE 14/3/50 – 6

SITRANS F M MAG5000CT/6000CT signal transmitter (Variant 9)

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