

Issuing authority
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Applicant and
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Italy

Identification of the
certified type: An **ultrasonic gas meter**
Type: FLC-UFL-4F

Characteristics: See page 2 and further

This OIML Certificate is issued under scheme A

This Certificate attests the conformity of the above identified type (represented by the sample(s) identified in the OIML Type Evaluation Report) with the requirements of the following Recommendation of the International Organization of Legal Metrology (OIML):

R 137-1 (2012) "Gas meters"

Accuracy class: 0,5

This Certificate relates only to the metrological and technical characteristics of the type of measuring instrument covered by the relevant OIML International Recommendation identified above. This Certificate does not bestow any form of legal international approval.

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Issuing Authority: **NMi Certin B.V., OIML Issuing Authority NL1**
1 November 2024

Certification Board

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The conformity was established by the results of tests and examinations provided in the associated reports:

- No. NMI-16200107-01R1 dated 15 December 2016 that includes 52 pages.
- No. NMI-1901574-01 dated 2 November 2017 that includes 13 pages.
- No. NMI-2258343-01 dated 20 September 2019 that includes 17 pages.
- No. NMI-2258343-02 dated 23 April 2020 that includes 11 pages.

Characteristics of the measuring instrument

In Table 1 the general characteristics of the measuring instrument are presented. Table 2 gives an overview of the general characteristics of the family of instruments.

Table 1 General characteristics

| | | |
|---------------------------------|--|--------------------|
| Destined for the measurement of | Gas volume | |
| Environmental classes | M1 / E2 | |
| Accuracy class | 0.5 | |
| Maximum pressure | 153 bar a | |
| Ambient temperature range | -25 ... +55 °C | |
| Gas temperature range | -25 ... +55 °C | |
| Designed for | Condensing humidity | |
| Orientation | All orientations | |
| Power supply voltage | 18..28 V DC | |
| Transducer type | USM nominal size ≤12": Type UIM-U2 USM nominal size >12": Type UIM-U5 | |
| Software identification | Main version: 1.0.3 FPGA version: 1.0.0 | Checksum: E9B0C4B7 |
| | Main version: 1.0.4 FPGA version: 1.0.1 | Checksum: 77A54A9D |
| | Main version: 1.0.6 FPGA version: 1.0.4 | Checksum: 43F6D289 |
| | Main version: 1.0.7 FPGA version: 1.0.4 | Checksum: 544882BB |
| | Main version: 2.0.1 FPGA version: 2.0.1 | Checksum: 67D31506 |
| | Main version 2.3.1 FPGA version 2.3.0 | Checksum: 3C12C30A |
| | Main version: 2.4.1 FPGA version: 2.3.0 | Checksum: B87E9BB9 |
| | Main version: 2.5.0 FPGA version: 2.3.0 | Checksum: 94AC0AE9 |

| | | |
|--|---|--------------------|
| | Main version: 2.7.0 FPGA version: 2.3.0 | Checksum: 2A8D6FB7 |
| | Main version: 3.0.1 CFPGA version: 2.0.0.20 DFPGA version: 2.0.0.11 | Checksum: 440DC1CC |
| | Main version: 3.2.1 CFPGA version: 2.0.0.22 DFPGA version: 2.0.0.11 | Checksum: 4F6E915D |
| | Main version: 3.4.3 CFPGA version: 2.0.0.22 DFPGA version: 2.0.0.11 | Checksum: 396D7FC7 |

The meter consists of a cylindrical spool piece with 4 horizontal paths. Multiple configurations can be combined in a single housing:

- 4 paths configuration Single meter;
- 4+1 configuration 4 pay and 1 check;
- 4+2 configuration 4 pay and 2 check;
- 4+3 configuration 4 pay and 3 check;
- 4+4 configuration Either as Pay and check or as 2 separate meters.

When the meter is equipped with a double meter configuration, the pay and check meter shall have a different indicator. A clear distinction between Pay and check indicator shall be present, both meters must have their own nameplate with unique serial number.

Table 2 General characteristics of the family of instruments

| Diameter | | V_{max} | V_{min} | V_t |
|---------------------|------------------------|-----------|-----------|----------------|
| Nominal size [-] | Inner diameter [mm] | [m/s] | [m/s] | [m/s] |
| 3" / DN80 | 70 ~ 80 | 35,00 | 0,51 | 1/10 V_{max} |
| 4" / DN100 | 80 ~ 105 | 33,50 | 0,51 | |
| 6" / DN150 | 130 ~ 155 | 30,00 | 0,40 | |
| 8" / DN200 | 180 ~ 210 | 30,00 | 0,30 | |
| 10" / DN250 | 230 ~ 260 | 30,00 | | |
| 12" / DN300 | 270 ~ 320 | 30,00 | | |
| 14" / DN350 | 300 ~ 345 | 30,00 | | |
| 16" / DN400 | 350 ~ 390 | 30,00 | | |
| 18" / DN400 | 380 ~ 440 | 30,00 | | |
| 20" / DN450 | 450 ~ 490 | 30,00 | | |

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| | | | | |
|-------------|-----------|-------|--|---|
| 24" / DN550 | 520 ~ 590 | 29,00 | | + |
| 30" / DN700 | 680 ~ 730 | 28,00 | | |

The corresponding flow rates can be calculated as follows:

$$Q = v \cdot \frac{1}{4} \cdot \pi \cdot D^2 \cdot 3600$$

Where:

Q = flow rate [m³/h]

v = velocity [m/s]

D = internal diameter [m]

Higher values of Q_{\min} and lower values of Q_{\max} are allowed on condition that $Q_{\min} \leq 0,05 Q_{\max}$ and $Q_{\max} / Q_t \geq 5$.

Installation conditions:

Installation of the gas meter

The meter needs to be installed according one of the following configurations:

- Upstream: a minimum of 5D + NOVA 50E + 10D of straight pipe
Downstream: a minimum of 4D straight pipe.
The flow conditioner shall be a NOVA 50E compliant design.
- Upstream: a minimum of 5D + PTB Flow conditioner + 5D of straight inlet pipe
Downstream: a minimum of 3D straight pipe.
The flow conditioner shall be a PTB compliant design.

A thermowell may be mounted at 2D - 5D from the outlet of the meter.

Bi-directional flow measurement

During conformity assessment it is sufficient to verify a bi-directional meter in one direction only. For bi-directional flow measurement the outlet pipe and flow conditioner shall be identical to the inlet. The installation of a temperature sensor is at 2-5D from the outlet of the meter. For bi-directional applications an additional temperature sensor can be installed 2-5D upstream of the meter. For bi-directional applications the meter and pipe spools including the thermo well(s), shall be calibrated as a meter package during the examination for putting into use of the gas meter.

Alternative welded configuration of the gas meter

The central meter body can be welded directly onto the flanges or to inlet and outlet pipes. The welding may not cause more than a 3% diameter step. The meter shall be installed as stated in "Installation of the gas meter". The central meter body, including welded piping or welded flanges, shall be calibrated as a meter package during the examination for putting into use of the gas meter.

Maintenance

A transducer path pair can be exchanged without deterioration of the metrological performance.

The electronics mainboard can be exchanged without deterioration of the metrological performance.



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Revision history

| Revision | Date | Description of the modification |
|----------|------------------|---|
| Initial | 6 October 2020 | Initial issue |
| 1 | 10 November 2022 | SW update Added 153 bar max working pressure |
| 2 | 18 July 2024 | Name change |
| 3 | 1 November 2024 | Software update |