

OIML Member State
The Netherlands

Number R 137/2012-NL1-17.07
Project number 1901121
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Issuing authority Person responsible: NMi Certin B.V.
C. Oosterman

Applicant and Manufacturer: Flow Meter Group B.V.
Meniststraat 5c
7091 ZZ Dinxperlo
The Netherlands

Identification of the certified type: An **ultrasonic gas meter**
Type: FMU

Characteristics: See page 2 and further

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**
16 November 2017



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The conformity was established by the results of tests and examinations provided in the associated report(s):

- No. NMI-16200107-01 dated 28 October 2016 that includes 51 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.

The construction of the measuring instrument is recorded in the Documentation folder no. T1094-3.

Table 1 General characteristics

Destined for the measurement of	Gas volume	
Environmental classes	M1 / E2	
Accuracy class	0,5	
Maximum pressure	103 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	
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

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Table 2 General characteristics of the family of instruments

Diameter		V_{\min} [m/s]	V_t [m/s]	V_{\max} [m/s]
Nominal Size [-]	Inner diameter [mm]			
4" / DN100	80 ~ 105	0,51	1/10 V_{\max}	33,50
6" / DN150	130 ~ 155	0,40		30,00
8" / DN200	180 ~ 210	0,30		
10" / DN250	230 ~ 260			
12" / DN300	270 ~ 320			
14" / DN350	300 ~ 345			
16" / DN400	350 ~ 390	27,00		

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 with minimally 5D + a NOVA 50E design compliant flow conditioner + 10D of straight inlet pipe upstream and 4D of outlet pipe. A thermowell may be mounted at 2–5D 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.



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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. Additional information is recorded in document no. 10947/1-01.