

**OIML Member State**  
The Netherlands

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Project number 3567045  
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Issuing authority  
Person responsible: NMi Certin B.V.  
M.Ph.D. Schmidt

Applicant and  
Manufacturer: Elster GmbH  
Steinern Straße 19-21  
55252 Mainz-Kastel  
Germany

Identification of the  
certified type: An **Ultrasonic Gas Meter**  
Type: Q.Sonic<sup>max</sup>

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.

This certificate and supporting reports comply with the requirements of OIML-CS-PD-07 clause 6.2.

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Issuing Authority: **NMi Certin B.V., OIML Issuing Authority NL1**  
13 December 2022

#### Certification Board

**NMi Certin B.V.**  
Thijssseweg 11  
2629 JA Delft  
The Netherlands  
T +31 88 636 2332  
[certin@nmi.nl](mailto:certin@nmi.nl)  
[www.nmi.nl](http://www.nmi.nl)

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

- No. NMI-9200288-01 dated 18 January 2012 that includes in total 48 pages;
- No. NMI-16200535-01 revision 1 dated 1 September 2017 that includes 35 pages;
- No. NMI-1902121-01 dated 12 October 2018 that includes 14 pages.
- No. NMI-2326650-01 dated 12 October 2020 that includes 20 pages.
- No. NMI-2500011-01 dated 29 June 2021 that included 21 pages.
- No. NMI-3567045-01 dated 13 December 2022 that included 19 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 software versions of the electronics.

Table 3 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. T10586-4.

**Table 1 General characteristics**

Destined for the measurement of	Gas volume
Environmental classes	M1 / E2
Accuracy class	0,5 <sup>[1]</sup>
Working pressure	The meter is either programmed with a density and viscosity setting, corresponding to the applied gas at preset pressure or using live pressure value from the optional pressure sensor. When using a preset value, the maximum operating range for pressure $p_{max} / p_{min}$ is 6,25 symmetrically divided around the preset pressure.
Ambient temperature range	-40 – +70 °C gas meter -40 – +55 °C gas meter with EVCD
Gas temperature range	-40 – +100 °C gas meter -30 – +80 °C gas meter with EVCD
Designed for	Non-condensing humidity and condensing humidity
Orientation	Horizontal; vertical up; vertical down and all orientations.
Power supply voltage	18 – 30 V DC

<sup>[1]</sup> When the instrument complies with class 0,5 it is deemed to meet the class 1,0 requirements.

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**Table 2 Software identification**

Software part	Software version	Checksum	Software version	Checksum
NGQFB	01.00.06	0x8A36A8B7	01.00.08	0x350616D6
	01.00.07	0xB7568107		
NGQMB	01.00.08	0x81905758	01.00.12	0xD8615DF7
	01.00.10	0x0C432F97		
Basic system	02.08.00.0029	0xEBF74980	03.02.00.0000 03-40-A	0x36B6BE1E 0x0EA0B879
	02.10.01.0003	0x7C01880E		
	02.11.00.0018	0x75574588		
Density & Viscosity	02.04.00.0000	0x804BDA24	03.00.00.0000 03-01-A	0xE062B4B9 0xA5C2AE67
	02.04.00.0001	0xBB87257F		
	02.04.00.0005	0x1DF2525D		
Geometry Correction	02.04.00.0000	0x90D4BD88	03.00.00.0000 03-01-A	0x4F26E00E 0xFD14CF91
	02.04.00.0001	0xD8D14A5F		
	02.05.00.0000	0x6C1DF991		
USM	02.08.00.0000	0x57D99098	03.02.00.0000 03-03-A	0x46340214 0xC1006EAD
	02.10.00.0000	0x3DE0303F		
	02.11.00.0018	0x9B8E6234		
Gas Quality	02-09-B	0x31D9C769	03-13-A 03-15-F	0x98B1FD23 0x05CB4161
	02-09-C	0xC83315E2		
	02-09-D	0xBD083158		
Flow Conversion	02-07-C	0x5A084FC6	03-10-D 03-14-C	0xC2172756 0x3BE626FB
	02-07-D	0x587979DE		
	02-07-E	0xC960A68C		
Postprocessing	02-08-B	0x2C4B20EC	03-09-D 03-12-E	0x816A45E3 0xDBEB2D99
	02-08-C	0x459B14C1		
	02-08-D	0x65397437		
Archive	02-06-A	0xB9652A43	03-10-D 03-10-P	0xB6E506A1 0x384639C5
	02-07-A	0x420652AC		
	02-07-B	0x013C7919		
Modbus	02-20-A	0x9221E790	03-12-B 03-17-A	0x8E1DD57B 0x47A64C44
	02-20-B	0xF4348ED8		
	02-20-C	0xF20B85FE		

**Table 3 General characteristics of the family of instruments**

Diameter size		minimum Internal bore	maximum Internal bore	Minimum flow velocity	Minimum Transitional flow velocity	Maximum flow velocity
Inch	DN	ID <sub>min</sub> [mm]	ID <sub>max</sub> [mm]	V <sub>min</sub> <sup>[1]</sup> [m/s]	V <sub>t</sub> <sup>[1], [2]</sup> [m/s]	V <sub>max</sub> <sup>[1]</sup> [m/s]
4	100	90	102,3	0,49	2,3	37,6
6	150	139	154,1	0,29	2,0	36,6
8	200	180	206,4	0,29	2,1	39,2
10	250	230	254,4	0,29	2,0	36,2
12	300	280	311,2	0,30	1,5	33,8
14	350	305	325	0,28	1,5	33,5
16	400	350	393,7	0,30	1,5	33,6
18	450	387,1	437,9	0,24	2,7	27,1
20	500	431,8	488,9	0,30	1,6	31,1
22	550	489	530	0,28	1,4	28,7
24	600	532,2	590,9	0,30	1,5	30,4
26	650	609,2	640,9	0,26	2,8	28,4
30	750	730,3	742,9	0,25	2,9	29,5
36	900	850,5	894,9	0,30	1,5	29,8

The corresponding flow rates can be calculated as follows:

$$Q = V \cdot \frac{1}{4} \cdot \pi \cdot ID^2 \cdot 3600$$

Where:

Q = flow rate [m<sup>3</sup>/h]

V = velocity [m/s]

ID = inner diameter [m]

Notes:

[1] If higher values are chosen for Q<sub>min</sub> and/or lower values for Q<sub>max</sub>, it has to be taken into account that:

$$Q_{min} \leq 0,05 Q_{max} \text{ and}$$

$$Q_{max} / Q_t \geq 5.$$

[2] According to the manufacturers specification the following Q<sub>t</sub> restrictions are applicable:

$$\text{for } 1:20 \leq Q_{min} / Q_{max} \leq 1:50 \quad Q_t \leq 0,2 \cdot Q_{max}$$

$$\text{for } 1:50 \leq Q_{min} / Q_{max} \quad Q_t \leq 0,1 \cdot Q_{max}$$




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## Installation conditions:



### *Installation of the ultrasonic gas meter*



For mild and severe flow disturbances the meter needs to be installed with the following minimum piping configuration as upstream inlet:

- mild disturbances: 5D straight piping.
- severe disturbances: 5D straight piping + flow conditioner + 5D straight piping.

The flow conditioner can be of the following types:

- CPA50 type A
- NOVA 50E

The outlet piping shall comply with:

- 3D straight piping (for both mild and severe disturbances).

Any components which could affect the gas flow must be avoided within the above prescribed inlet pipe length. The necessary straight pipe length is stated on the name plate of the meter. The inlet pipe must be designed as a straight pipe section of the same nominal diameter as the gas meter with a maximum tolerance of +/- 3%.

### *Bi-directional flow measurement*

During conformity assessment it is sufficient to verify a bi-directional meter only in one direction.

### *Temperature sensor*

The installation of a temperature sensor is at 2–5D from the outlet of the meter or of a dedicated measuring skid section (as described in chapter *Measuring skid with two meters in series*). For bi-directional applications, an additional temperature sensor can be installed 2–5D upstream of the meter or of a dedicated measuring skid section. The pipe spools including the thermo well(s) shall be installed and considered during the examination for putting into use of the gas meter.




### *Measuring skid with two meters in series*

A conformity assessment is needed when the meter will be used in series with another ultrasonic meter (same or different type) and the length of the straight piping between the two meters is smaller than the minimum inlet or outlet length as mentioned in chapter 3.1 or if the meters are direct connected (flange to flange) to each other.

The conformity assessment has to be done on the complete measuring skid (USM package, including meter tubes, flow conditioner and thermowells) and the upstream meter must fulfill the inlet requirements of the downstream meter.

### *Alternative welded installation*

The meters can be welded directly without flanges to the inlet and outlet pipes. The inlet and outlet pipe length shall be according the requirements as prescribed above for mild and/or severe disturbances. The complete meter package (meter including welded piping) shall be calibrated in order to guarantee compliance with Class 0.5.



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### Interchangeable components:

The ultrasonic transducers mounts are an interchangeable component and can be replaced with units of the same type with additional gasket. After exchange of a part of the system, it is necessary to perform a functional test.

### Certificate history:

This revision replaces the previous version.

Revision	Date	Description of the modification
Initial	2 November 2020	-
1	26 August 2021	Revision due to new hardware: <ul style="list-style-type: none"><li>- Field terminal board version BD.</li><li>- Main Board version AJ.</li></ul>
2	18 August 2022	Addition of firmware V3.40.
3	13 December 2022	New Board (Ethernet Range Extender)