OIML Certificate

OIML Member State
The Netherlands

Number R137/2012-A-NL1-20.07 revision 6
Project number 4031533

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** Manufacturers mark: Elster Type: Q.Sonic^{max}, Q.Sonic^{max6}
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; 1.0 for Q.Sonic^{max} 1.0 for Q.Sonic^{max6}

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.

Important note: Apart from the mention of the Certificate's reference number and the name of the OIML Member State in which the Certificate was issued, partial quotation of the Certificate and of the associated OIML Type Evaluation Report(s) is not permitted, although either may be reproduced in full.

Issuing Authority

NMi Certin B.V., OIML Issuing Authority NL1
15 December 2025

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

- NMi-9200288-01 dated 18 January 2012 that includes in total 48 pages;
- NMi-16200535-01 revision 1 dated 1 September 2017 that includes 35 pages;
- NMi-1902121-01 dated 12 October 2018 that includes 14 pages.
- NMi-2326650-01 dated 12 October 2020 that includes 20 pages.
- NMi-2500011-01 dated 29 June 2021 that includes 21 pages.
- NMi-3567045-01 dated 13 December 2022 that includes 19 pages.
- NMi-3684021-01 dated 6 June 2025 that includes 40 pages.
- NMi-3715752-01 dated 6 June 2025 that includes 15 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 and Table 4 give an overview of the general characteristics of the family of instruments.
The construction of the measuring instrument is recorded in documentation folder number T10586-5.

Table 1 General characteristics

Destined for the measurement of	Gas volume
Environmental classes	M1 / E2 Condensing humidity
Accuracy class	0.5 ; 1.0 for Q.Sonic^{max} 1.0 for Q.Sonic^{max6}
Path configuration	Q.Sonic^{max}: 6 direct paths and 2 reflection swirl paths. Q.Sonic^{max6}: 6 direct paths[1].
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
Orientation	Horizontal; vertical up; vertical down and all orientations.
Power supply voltage	18 – 30 V DC

[1] Basically the Q.Sonic^{max6} is identical to the Q.Sonic^{max} with the two swirl paths removed.

Table 2 Software identification

Software part	Software version	Checksum	Software version	Checksum
NGQFB	01.00.06 01.00.07	0x8A36A8B7 0xB7568107	01.00.08 01.00.09	0x350616D6 0x06BDB754
NGQMB	01.00.08 01.00.10	0x81905758 0x0C432F97	01.00.12 01.00.13	0xD8615DF7 0x426E6956
Basic system	02.08.00.0029 02.10.01.0003 02.11.00.0018	0xEBF74980 0x7C01880E 0x75574588	03.02.00.0000 03-40-A 03-44-A	0x36B6BE1E 0x0EA0B879 0xCE9961F4
Density & Viscosity	02.04.00.0000 02.04.00.0001 02.04.00.0005	0x804BDA24 0xBB87257F 0x1DF2525D	03.00.00.0000 03-01-A 03-02-B	0xE062B4B9 0xA5C2AE67 0xC3614274
Geometry Correction	02.04.00.0000 02.04.00.0001 02.05.00.0000	0x90D4BD88 0xD8D14A5F 0x6C1DF991	03.00.00.0000 03-01-A 03-02-B	0x4F26E00E 0xFD14CF91 0xD84D93A5
USM	02.08.00.0000 02.10.00.0000 02.11.00.0018	0x57D99098 0x3DE0303F 0x9B8E6234	03.02.00.0000 03-03-A 03-05-A	0x46340214 0xC1006EAD 0x95DB58DB
Gas Quality(★)	02-09-B 02-09-C 02-09-D	0x31D9C769 0xC83315E2 0xBD083158	03-13-A 03-15-F 03-18-A	0x98B1FD23 0x05CB4161 0x0E781C1F
Flow Conversion(★)	02-07-C 02-07-D 02-07-E	0x5A084FC6 0x587979DE 0xC960A68C	03-10-D 03-14-C 03-14-F	0xC2172756 0x3BE626FB 0x6D579C63
Postprocessing	02-08-B 02-08-C 02-08-D	0x2C4B20EC 0x459B14C1 0x65397437	03-09-D 03-12-E 03-14-A	0x816A45E3 0xDBEB2D99 0x1602675F
Archive	02-06-A 02-07-A 02-07-B	0xB9652A43 0x420652AC 0x013C7919	03-10-D 03-10-P 03-11-C	0xB6E506A1 0x384639C5 0x9909DD67
Modbus	02-20-A 02-20-B 02-20-C	0x9221E790 0xF4348ED8 0xF20B85FE	03-12-B 03-17-A 03-19-B	0x8E1DD57B 0x47A64C44 0x6869AD67

Notes:
(★) These software modules are only mandatory if volume conversion is performed by the instrument. If this is not the case, the software modules are optional.

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Table 3 General characteristics of the Q.Sonic^{max} family of instruments

Diameter size		minimum Internal bore	maximum Internal bore	Minimum flow velocity	Minimum Transitional flow velocity	Maximum flow velocity
		ID_{min}	ID_{max}	V_{min}[1]	V_t[1], [2]	V_{max}[1]
Inch	DN	[mm]	[mm]	[m/s]	[m/s]	[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

Table 4 General characteristics of the Q.Sonic^{max6} family of instruments

Diameter size		minimum Internal bore	maximum Internal bore	Minimum flow velocity	Minimum transitional flow velocity	Maximum flow velocity
		ID_{min}	ID_{max}	V_{min}[1]	V_t[1]	V_{max}[1]
Inch	DN	[mm]	[mm]	[m/s]	[m/s]	[m/s]
3	80	58	85	0,5	2,2	38,2
4	100	80	112			
6	150	120	165	0,3	1,8	
8	200	165	215			
10	250	205	270			
12	300	255	320			
14	350	255	350			
16	400	325	400		1,5	
18	450	365	450			33,0
20	500	405	500			

Diameter size		minimum Internal bore	maximum Internal bore	Minimum flow velocity	Minimum transitional flow velocity	Maximum flow velocity
		ID_{min}	ID_{max}	V_{min}[1]	V_t[1]	V_{max}[1]
Inch	DN	[mm]	[mm]	[m/s]	[m/s]	[m/s]
22	550	450	550	0,3	1,5	33,0
24	600	490	600			
26	650	605	650			
30	750	695	750			
36	900	850	905			

For tables 3 and 4, the corresponding flow rates can be calculated as follows:

$$Q = V \cdot \frac{1}{4} \cdot \pi \cdot ID^2 \cdot 3600 = 900 \cdot \pi \cdot ID^2 \cdot V$$

Where:
Q = flow rate [m³/h]
V = velocity [m/s]
ID = inner diameter [m]

Notes:
[1] If higher values are chosen for Qmin and/or Qt and/or lower values for Qmax, it has to be taken into account that:
- $5 \le Q_{max}/Q_{min} < 50$: $Q_{max}/Q_t \ge 5$
- $Q_{max}/Q_{min} \ge 50$: $Q_{max}/Q_t \ge 10$

Installation conditions:

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

	Q.Sonic^{max}	Q.Sonic^{max6}
- Mild disturbances	≥5D	≥3D + FC + 5D or ≥6D
- Severe disturbances	≥5D + FC + 5D	≥3D + FC + 5D

The flow conditioner (FC) can be of the following types and shall always be placed at the exact distance from the ultrasonic gas meter as indicated in the table above:
- CPA50 type A
- NOVA 50E

The outlet piping shall comply with:
- ≥3D

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 thermowell(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 fulfil 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 for Q.Sonic^{max} or Class 1.0 for Q.Sonic^{max} or Q.Sonic^{max6}.

Interchangeable components:

The ultrasonic transducers and the electronics can be replaced with units of the same type and the meter still meets the requirements without the need for recalibration. After exchange of a part of the system, a diagnostic check shall be carried out. After exchange of an electronic board all parameters of the old electronics board need to be transferred to the replacement board.

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: - Field terminal board version BD. - Main Board version AJ.
2	18 August 2022	Addition of firmware V3.40.
3	13 December 2022	New Board (Ethernet Range Extender)
4	11 June 2025	Addition of Q.Sonic^{max6} 6-path meters for accuracy Class 1.0 only.
5	14 July 2025	Addition of firmware V3.44.
6	15 December 2025	Addition of firmware V3.44. (bugfix patch #1)