OIML Certificate

OIML Member State
The Netherlands

Number R137/2012-A-NL1-24.09 revision 0
Project number 3860134

Issuing authority	NMi Certin B.V.
Person responsible:	M.Ph.D. Schmidt
Applicant and Manufacturer	Insight Metering Systems, LLC. 4267 Canal Ave SW Grandville, MI 49418 United States of America
Identification of the certified type	A **measuring instrument** Type: iSonic
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.

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**
28 November 2024

Certification Board

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The conformity was established by the results of tests and examinations provided in the associated report(s):
- Number NMi-3860134-01, dated 28 November 2024 that includes 53 pages.
- Number NMi-3860134-02, dated 28 November 2024 that includes 16 pages.
- Number NMi-3860134-04, dated 28 November 2024 that includes 23 pages.

Characteristics of the measuring instrument
In Table 1 the general characteristics of the measuring instrument are presented.
In Table 2 the general characteristics of the family of instruments of the 6-path meters are presented.
In Table 3 the general characteristics of the family of instruments of the 8-path meters are presented.

Table 1 General characteristics

Destined for the measurement of	Gas volume
Accuracy class	0.5
Intended for the measurement of	Natural gas
Minimum – maximum pressure	8 – 255 bar
Ambient temperature range	-40 – +55 °C
Gas temperature range	-40 – +55 °C
Designed for	Condensing humidity
Orientation	All orientations
Flow direction	Bi-directional
Path configuration	Direct measuring paths in an X-shape: - 6-path meters: 4 + 2 paths - 8-path meters: 4 + 4 paths
Path angle	62,5°
Sound frequency	200 kHz
Outlet pipe	5D
Power supply voltage	18 – 30 VDC

Software identification

Part	Version	Checksum	Remarks
MCU	3.1.1.8	F2E09A6A	
APU	1.0.0.36	BE0272B7	
FPGA	0.0.1.55	DE04FF99	

Table 2 General characteristics of the 6-path meters

Nominal Diameter	Nominal bore size	Maximum Qmax Mild[1] disturbance	Maximum Qmax Severe[2] disturbance	Minimum Qt	Minimum Qmin
	[mm]	[m/s]	[m/s]	[m/s]	[m/s]
4 (100 mm)	95	36	30	1,8	0,6
6 (150 mm)	140				
8 (200 mm)	185				
10 (250 mm)	235	35			
12 (300 mm)	270				
14 (350 mm)	310				
16 (400 mm)	355				

Table 3 General characteristics of the 8-path meters

Nominal Diameter	Nominal bore size	Maximum Qmax Mild[1] disturbance	Maximum Qmax Severe[2] disturbance	Minimum Qt	Minimum Qmin
	[mm]	[m/s]	[m/s]	[m/s]	[m/s]
4 (100 mm)	95	40	22	1,5	0,6
6 (150 mm)	140				
8 (200 mm)	185				
10 (250 mm)	235				
12 (300 mm)	270				
14 (350 mm)	310				
16 (400 mm)	355				

Notes to tables 2 and 3:

(1) In case only mild flow disturbances may occur. These meters shall be marked with the character "M" placed on the nameplate.

(2) In case of severe flow disturbances.

(3) In case it is unknown if mild or severe flow disturbances are applicable, the maximum flow velocity for severe conditions shall be used.

The corresponding flow rates can be calculated as follows:

$$Q = 3600 \cdot \frac{1}{4} \cdot \pi \cdot D^2 \cdot v = 900 \cdot \pi \cdot D^2 \cdot v$$

Where:

Q	= flow rate	[m³/h]
v	= velocity	[m/s]
D	= nominal bore size diameter	[m]

Note regarding tables 2 and 3:

- Higher values for Qmin or Qt and/or lower values for Qmax can be chosen, under the condition that:
  - If ratio $5 \leq$ Qmax:Qmin $<$ 50 then ratio Qmax:Qt $\geq$ 5
  - If ratio Qmax:Qmin $\geq$ 50 then ratio Qmax:Qt $\geq$ 10

Installation conditions:

Installation requirements

The meter needs to be installed according the following configurations:

- 6-path meters:
  - Upstream: a minimum of 5D + FC + 5D of straight pipe.
    The flow conditioner (FC) shall be a CPA type 50E compliant design.
  - Downstream: a minimum of 5D
- 8-path meters:
  - Upstream: a minimum of 10D of straight pipe without a flow conditioner.
  - Downstream: a minimum of 5D

Bi-directional flow measurement

- 6-path meters
  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 thermowell(s), shall be calibrated as a meter package during the examination for putting into use of the gas meter.
- 8-path meters
  During conformity assessment, the meter shall be calibrated in both directions if the meter is intended to be used for bi-directional measurements. The requirements shall be met without modification of the meter's parameter settings.

Certificate history:

Revision	Date	Description of the modification
0	28 November 2024	Initial issue.