

OIML Member State
The Netherlands

Number R117/2007-A-NL1-21.04 Revision 1
Project number 3534918
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Issuing authority
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Applicant and
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Identification of the
Certified type A **measurement device** (Coriolis), intended to be used as a part of a
measuring instrument.
Type: LNGmass DNxx^[1]

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 117-1 (2007) "Dynamic measuring systems for liquids other than water"

Accuracy class 1,5

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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^[1] With xx denoting the size of the meter (diameter of the in- and outlet in mm).

Issuing Authority **NMi Certin B.V., OIML Issuing Authority NL1**
17 June 2022

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

- NMI-14200053-02 dated 15 January 2015 that includes 47 pages;
- NMI-16200170-01 dated 24 June 2016 that includes 5 pages;
- NMI-1901042-01 dated 20 July 2017 that includes 8 pages;
- NMI-2636338-01 dated 23 August 2021 that includes 22 pages.
- NMI-3534918-01 dated 17 June 2022 that includes 13 pages.

Characteristics of the measuring instrument

The measurement sensor consists of a housing in which the two parallel measuring tubes are mounted. The measurement tubes are set into a vibrating motion by a drive coil, which is controlled by means of an alternating current generated by the measurement transducer. Two measuring coils are also mounted on the measurement tubes, which generate signals representative of the frequency of the measurement tubes.

The frequency of the measurement tubes is representative for the density of the liquid. The time shift between the two signals is representative of the mass flow rate.

The electronic module in the measurement transducer consists of an amplifier board and a connection board. The amplifier board drives the sensor and processes the measuring values. The connection or IO board is a simple connection board with some user interface functions.

LNGmass can be used as the measuring device in the main cryogenic liquid system or can also be used in the vapor return line, in order to measure and compensate for the mass of gas returned from the receiving tank.

In Table 1 the general characteristics of the measuring instrument are presented. The construction of the measuring instrument is recorded in the Documentation folder no. TC8502-1.

Table 1 General characteristics

Accuracy class		1,5
Approved measuring quantity		Mass
Environmental classes		M3 / E2 / H3; condensing humidity
Density range	[kg/m ³]	300 – 1100
Maximum pressure	[bar(g)]	100
Maximum viscosity	[mPa.s]	2
Ambient temperature range	[°C]	-40 – +55
Product temperature range	[°C]	-200 – +55
Intended for the measurement of		Liquified Natural Gas (LNG)
Flow characteristics		Details in table 2

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Electrical power	230 VAC/50...60 Hz	
AC/DC convertor	Voltage input	100...230 VAC/ 50...60 Hz
	Voltage output	20...30 VDC
	Power failure bypass	> 20 ms
	The power unit shall be tested to ensure it meets safety requirements (e.g., PELV, SELV class 2) and must be connected to the Ex i barrier.	
Ex i barrier	Voltage input	20...30 VDC
	Voltage output	14 VDC
Software identification	Details in table 3	

The complete family of meter consists of one family (which are of similar construction) and have the following flow characteristics indicated in table 2.

Table 2 Flow characteristics of the family of meter

Meter size	DN08	DN15	DN25
Minimum flow rate [kg/min]	1,5	5	15
Maximum flow rate [kg/min]	30	100	300
MMQ [kg]	2	5	20

Table 3 Software Identification

Version	CRC32 checksum	Remarks
V1.03.01	0xF41E4DB9	Dated 14 May 2014
V1.03.02	0x54AE3887	Dated 1 July 2016
V1.03.03	0x87DFCB30	Dated 30 October 2017

Certificate history:

This revision replaces the previous version.

Revision	Date	Description of the modification
0	23 August 2021	Initial version
1	17 June 2022	Minimum density lowered to 300 kg/m ³ .