OIML Certificate

OIML Member State
The Netherlands

Number R137/2012-A-NL1-24.07 revision 0
Project number 3508131

Issuing authority	NMi Certin B.V. Person responsible: M.Ph.D. Schmidt
Manufacturer	Emerson Process Management Flow B.V. Neonstraat 1 6718 WX Ede The Netherlands
Identification of the certified type	A **Coriolis Gas Meter** Manufacturers mark: Micro Motion Type: HPC020 with 5700 transmitter
Characteristics	See following pages

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 1,0

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 Reports is not permitted, although either may be reproduced in full.

Issuing Authority **NMi Certin B.V., OIML Issuing Authority NL1**
1 October 2024

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

- No. NMi-2433143-01 dated 3 June 2021 that includes 55 pages;
- No. NMi-3508131-01 dated 1 October 2024 that includes 35 pages.

Characteristics of the measuring instrument

The HPC020 High Pressure Coriolis Meter

In Table 1 the general characteristics of the measuring instrument are presented.
In Table 2 the characteristics of the family of instruments are presented.

The gas meter consists:

- Measurement sensor:
  The measurement sensor consists of a housing in which two parallel measuring tubes are mounted. On the measurement tubes three coils are mounted: one drive-coil and two pick-off coils. The drive coil is controlled by an external device and sets the measurement tubes in a vibrating motion in its natural frequency. The time difference between the signals from both pick-off coils depends on the mass flow of the fluid through the measurement tubes. Processing of the measurement signals is performed by the same external device that controls the drive coil. The natural frequency depends on the density of the gas in the measurement tubes and is therefore a way to determine the density of the fluid.

- 5700 transmitter
  The 5700 transmitter has two options. Either it uses an integral core processor, in which case it is connected directly to a flow sensor, or it is connected to a core processor, in which case it is not equipped with an integral core processor.
  The flow transmitter hardware and sealing procedure can be found in documentation folder no. TC8519.

Table 1 General characteristics

Minimum – maximum flow rate	See table 2
Pressure range	See table 2
Environmental classes	M2 / E2
Ambient temperature range	-40 °C / +55 °C; non-condensing humidity
Gas temperature range	-40 °C / +55 °C
Orientation	Horizontal and Vertical orientation
Power supply voltage	18 to 100 VDC or 85 to 240 VAC, 50/60 Hz
Intended for the measurement of	Gaseous
Density range	$\geq$ 3,8 kg/m^3
Software identification core processor	Version number: 5.40 Checksum: 218C30B
Software identification transmitter	Version number: 4.30

Table 2 General characteristics of the family of instruments

Model	Maximum Mach number	Minimum Q_t [kg/h]	Minimum Q_{min} [kg/h]	Internal diameter of tubes [m]	Pressure range [bara]	Maximum Q_{max} [kg/h]
HPC020	0,3	1/5.Q_{max}	6	0,00381	0….839	See Formula 1

The ratio conditions in the table applies for $Q_{max}/Q_{min} \geq 5$ and $Q_{max}/Q_t \geq 5$.

$$Q_{max} = M * 2 * S * SOS_{gas} * \rho_{act} * 3600 \quad (1)$$

where:

Q_{max} - is maximum mass flow rate for the gas [kg/h],
$S = {}^1/_4 \pi * d^2$; the d is an internal diameter of the measuring tube (from table 2) [m^2],
M – is a maximum Mach number (from table 2) for the meter [-],
SOS_{gas} – is a speed of sound for the gas at operating conditions [m/s],
ρ_{act} – is the actual gas density at operating conditions [kg/m^3].

Installation conditions:

The Measurement sensor and 5700 transmitter should be electronically sealed. The flow transmitter 5700 should also be set with the following programmable parameters as described below:

- Security mode settings;
- Low flow cut off settings;
- Damping settings;
- Slug flow settings;
- Last measured value fault timeout settings.

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Provisions for performing initial and subsequent verification
The gas meter should be checked and calibrated with gas on the following operating conditions:
- Zero flow calibration can be accepted based on procedure C-SP-HW-280 for custody transfer in gas applications;
- One full calibration curve according to OIML R137-1&2:2012 for gas density $\rho_{gas} \geq 3{,}8$ kg/m^3;
- Initial or subsequent calibration should be performed with a gas similar to the process gas at an ISO17025 lab or with a reference installation valid and traceable to (inter)national standards.

Operation conditions:
- The gas meter can only be installed in horizontal flow direction. No reverse flow is allowed during custody transfer.
- No pressure correction, temperature correction or density correction is allowed during custody transfer.

Production location
The measuring instrument is produced at one of the following production locations:
- *Emerson Automation Solutions Flow Measurement*, 7070 Winchester Circle, Boulder, Colorado 80301, USA.
- *Emerson Process Management Flow Technologies Co.*, Ltd Asia Flow Technology Center, 111 Xing Min South Road Jiangning District Nanjing, Jiangsu Province, 211167, China.
- *F-R Technologias de Flujo, S.A. de C.V.*, Avenida Miguel de Cervantes #111, Complejo Industrial Chihuahua, 31136, Chihuahua, Chihuahua, Mexico.
- *Emerson Process Management Flow B.V.,* Neonstraat 1, 6718 WX Ede, The Netherlands.
- *Emerson SRL*, Str. Emerson Nr.4, Parcul Industrial, Tetarom 2, 400641, Cluj-Napoca, Romania.

Certificate history:

Revision	Date	Description of the modification
0	1 October 2024	-