

OIML Member State
The Netherlands

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Issuing authority
Person responsible: NMi Certin B.V.
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Applicant and
Manufacturer: Endress+Hauser Flowtec AG
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Identification of the
certified type: **A measurement transducer**
Type: Promass F 300 DNx^[1]; Promass F 500 DNx^[1];
Promass O 300 DNx^[1]; Promass O 500 DNx^[1];
Promass X 300 DNx^[1]; Promass X 500 DNx^[1];
Promass Q 300 DNx^[1]; Promass Q 500 DNx^[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 117-1:2019 "Dynamic measuring systems for liquids other than water"

Accuracy class 0.3 / 0.5 / 1.0 / 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 x denoting the size of the meter (diameter of the in- and outlet in mm).

Issuing Authority: **NMi Certin B.V., OIML Issuing Authority NL1**
16 May 2024

Certification Board

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

| Report number | Issue date | Number of pages |
|--------------------------------------|------------------|-----------------|
| NMi-2466149-03 | 2 January 2023 | 63 |
| Measurement sensor: Promass F | | |
| PF/6491 | 2 July 1996 | 77 |
| CVN-302404-01 rev. 1 | 27 June 2003 | 15 |
| CPC-407631-1 | 31 March 2005 | 42 |
| CPC-412432-1 | 31 March 2005 | 32 |
| CPC-10200667-1 | 9 August 2010 | 7 |
| NMi-10201056-1 | 29 March 2012 | 6 |
| NMi-12200688-01 | 3 December 2013 | 6 |
| NMi-14200053-01 | 16 April 2014 | 6 |
| NMi-15200446-01 | 22 June 2016 | 5 |
| NMi-1902055-01 | 31 August 2018 | 11 |
| NMi-2389303-02 | 12 February 2021 | 11 |
| NMi-2463103-01 | 12 February 2021 | 11 |
| NMi-3147081-01 | 8 September 2022 | 16 |
| NMi-3619040-01 | 15 March 2024 | 15 |
| NMi-3619045-01 | 15 March 2024 | 13 |
| Measurement sensor: Promass O | | |
| NMi-12200149-1 | 24 May 2012 | 6 |
| Measurement sensor: Promass Q | | |
| NMi-15200323-01a | 12 February 2021 | 11 |
| NMi-1901704-01 | 31 August 2018 | 10 |
| NMi-2389303-01 | 12 May 2020 | 29 |
| NMi-2389303-03 | 12 February 2021 | 10 |
| NMi-2466149-01 | 12 August 2022 | 56 |
| NMi-3147081-01 | 8 September 2022 | 16 |
| Measurement sensor: Promass X | | |
| NMi-11200539-01 | 2 April 2012 | 6 |
| Promass 300/500 electronics | | |
| NMi-16200475-01a | 2 January 2023 | 31 |
| NMi-1901185-01 | 1 November 2017 | 35 |
| NMi-2202829-01 | 3 December 2019 | 40 |
| NMi-3619036-01 | 15 March 2024 | 12 |

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Characteristics of the measurement transducer

In Tables 1 to 6, the general characteristics of the measuring instrument are presented.

The construction of the measurement transducer is recorded in documentation folders TC7149-8 for the measurement sensor and TC10822-4 for the electronics.

Table 1 General characteristics applicable to all Promass measurement sensors

- Density range: 300 ... 1400 kg/m³ for mass measurement
400 ... 1400 kg/m³ for volume and density measurement
- Maximum viscosity: 1000 mPa·s
- Accuracy class: 0.3; 0.5; 1.0 and 1.5
- Environmental classes: M3 / E2 + E3^[2] / H3
- Ambient temperature range: -40 ... +55 °C
- Intended for the measurement of: Oil and oil products, chemicals, potable liquids, liquefied gases under pressure measured at temperatures equal and above -10 °C and liquefied gases under pressure measured below -10 °C.

| Sensor Type ^[3] | Oil and oil products, chemicals, and potable liquids | Liquefied gases under pressure ≥ -10°C (i.a. LPG, LCO ₂ ^[4]) | Liquefied gases below -10 °C (i.a. cryogenic liquids, LNG, LCO ₂) |
|----------------------------|--|---|---|
| | Accuracy class | | |
| | 0.3; 0.5 | 1.0 | 1.5 |
| Promass F | M D V | M D V | M |
| Promass O | M D V | M D V | M |
| Promass X | M D V | M D V | M |
| Promass Q | M D V | M D V | M |

[2] Environmental class E3 only applicable in combination with a DC-DC convertor and an OIML R117:2019 approved flow computer which is also certified for class E3.

[3] This table indicates the approved measurements: **M** for Mass, **D** for density, and **V** for volume.

[4] Liquefied CO₂ (LCO₂) is approved for mass only.

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Table 2 Specific characteristics of the Promass F measurement sensors

| Sensor size | DN8 | DN15 | DN25 | DN40 | DN50 |
|---|------|------|------|-------|-------|
| Maximum flow rate [kg/min] | 30 | 100 | 300 | 700 | 1000 |
| Minimum flow rate [kg/min] ^[5] | 1,5 | 5 | 15 | 37,5 | 58,3 |
| Minimum flow rate [kg/min] ^[6] | 0,75 | 2,5 | 7,5 | 18,75 | 29,15 |
| Minimum Measured Quantity [kg] | 2 | 5 | 20 | 20 | 20 |

| Sensor size | DN80 | DN100 | DN150 | DN250 |
|--|------|-------|-------|-------|
| Maximum flow rate [t/h] | 180 | 270 | 720 | 2200 |
| Minimum flow rate [t/h] ^[5] | 9 | 14 | 32 | 90 |
| Minimum flow rate [t/h] ^[6] | 4,5 | 7 | 16 | 45 |
| Minimum Measured Quantity [kg] | 200 | 200 | 500 | 1000 |

Further characteristics of the Promass F:

| Accuracy Class | 0.3 | 0.5 | 1.0 | 1.5 |
|---|--------------------|-----|-----|--------------------|
| Maximum pressure | 100 bar(g) | | | |
| Temperature range liquid for mass measurement | -10 °C ... +200 °C | | | -200 °C ... +85 °C |
| Temperature range liquid for density and volume measurement | -10 °C ... +90 °C | | | NA |

[4] For accuracy class 0.3 and 0.5
[5] For accuracy class 1.0 and 1.5

Table 3 Specific characteristics of the Promass O measurement sensors

| Sensor size | DN80 | DN100 | DN150 | DN250 | | |
|--|------|-------|-------|-------|--|--|
| Maximum flow rate [t/h] | 180 | 270 | 720 | 2200 | | |
| Minimum flow rate [t/h] ^[7] | 9 | 14 | 32 | 90 | | |
| Minimum flow rate [t/h] ^[8] | 4,5 | 7 | 16 | 45 | | |
| Minimum Measured Quantity [kg] | 200 | 200 | 500 | 1000 | | |

Further characteristics of the Promass O:

| Accuracy Class | 0.3 | 0.5 | 1.0 | 1.5 |
|---|--------------------|-----|-----|----------------------------------|
| Maximum pressure | 258 bar(g) | | | |
| Temperature range liquid for mass measurement | -10 °C ... +200 °C | | | -40 °C ... +90 °C ^[9] |
| Temperature range liquid for density and volume measurement | -10 °C ... +90 °C | | | NA |

Table 4 Specific characteristics of the Promass X measurement sensors

| Sensor size | DN350 | | | | | |
|---|-------|--|--|--|--|--|
| Maximum flow rate [t/h] | 3353 | | | | | |
| Minimum flow rate [t/h] ^[10] | 137 | | | | | |
| Minimum flow rate [t/h] ^[11] | 68,5 | | | | | |
| Minimum Measured Quantity [kg] | 1000 | | | | | |

Further characteristics of the Promass X:

| Accuracy Class | 0.3 | 0.5 | 1.0 | 1.5 |
|---|--------------------|-----|-----|-------------------|
| Maximum pressure | 100 bar(g) | | | |
| Temperature range liquid for mass measurement | -10 °C ... +180 °C | | | -10 °C ... +85 °C |
| Temperature range liquid for density and volume measurement | -10 °C ... +90 °C | | | NA |

[7] For accuracy class 0.3 and 0.5

[8] For accuracy class 1.0 and 1.5

[9] Product temperature range for measuring liquefied CO₂ (LCO₂)

[10] For accuracy class 0.3 and 0.5

[11] For accuracy class 1.0 and 1.5

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Table 5 Specific characteristics of the Promass Q measurement sensors

| Sensor size | DN25 | DN50 | DN80 | DN100 | DN150 | DN200 |
|---|-------|------|------|-------|-------|-------|
| Maximum flow rate [t/h] | 20 | 80 | 200 | 400 | 850 | 1500 |
| Minimum flow rate [t/h] ^[12] | 0,45 | 2 | 6 | 14 | 16 | 24 |
| Minimum flow rate [t/h] ^[13] | 0,225 | 1 | 3 | 7 | 8 | 12 |
| Minimum Measured Quantity [kg] | 10 | 20 | 100 | 200 | 200 | 200 |

| Sensor size | DN250 | | | | | |
|---|-------|--|--|--|--|--|
| Maximum flow rate [t/h] | 2400 | | | | | |
| Minimum flow rate [t/h] ^[12] | 50 | | | | | |
| Minimum flow rate [t/h] ^[13] | 25 | | | | | |
| Minimum Measured Quantity [kg] | 500 | | | | | |

Further characteristics of the Promass Q:

| Accuracy Class | 0.3 | 0.5 | 1.0 | 1.5 |
|---|--------------------|-----|-----|--------------------|
| Maximum pressure | 100 bar(g) | | | |
| Temperature range liquid for mass measurement | -10 °C ... +200 °C | | | -200 °C ... +90 °C |
| Temperature range liquid for density and volume measurement | -10 °C ... +200 °C | | | NA |

^[12] For accuracy class 0.3 and 0.5
^[13] For accuracy class 1.0 and 1.5

Table 6 General characteristics of the Promass 300 and Promass 500 electronics

| | | | | | |
|---------------------------|---|--------|----------------|----------|--------|
| Environmental classes | M3 / E2 + E3 ^[14] / H3 | | | | |
| Ambient temperature range | -40...+55 °C; condensing humidity | | | | |
| Power supply voltage | 24 VDC 100...240 VAC, 50...60 Hz 24 VDC / 100...240 VAC, 50...60 Hz | | | | |
| Software identification | | | | | |
| Version number | Checksum | | Version number | Checksum | |
| | Modbus | Hart | | Modbus | Hart |
| 01.00.02 ^[15] | 0xE87F | 0x321F | 01.02.01 | 0x559B | - |
| 01.00.03 ^[15] | 0x79B5 | 0x1585 | 01.02.02 | 0x0A92 | - |
| 01.00.04 | 0xE109 | 0xB075 | 01.02.03 | 0xECE3 | - |
| 01.01.01 | 0xA476 | 0x977D | 01.05.00 | 0xA9EE | 0xB4A1 |
| 01.01.02 | 0x2AAB | 0xED44 | 01.05.01 | 0x2B95 | 0x59D4 |
| 01.01.03 | 0x6A37 | 0x86FC | 01.05.02 | 0xF1B7- | 0xE6B5 |
| 01.01.04 | 0x6D79 | 0x674 | 01.05.03 | - | 0xD79D |
| 01.01.05 | 0x4670- | 0x559B | 01.06.00 | 0x8894 | 0x4BDD |
| 01.01.06 | - | 0x0891 | 01.06.01 | 0x58FD | 0x9BB4 |
| 01.01.07 | - | 0xB7B2 | 01.06.02 | 0x7860 | 0x4604 |
| 01.02.00 | 0x5645 | - | | | |

The Promass 300 and Promass 500 flow transmitters may only be used in combination with Coriolis measurement sensors manufactured by Endress+Hauser Flowtec AG.

[14] Environmental class E3 only applicable in combination with a DC-DC converter and an OIML R117:2019 approved flow computer which is also certified for class E3.

[15] This software version is only allowed for the Promass 300 electronics.

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Certificate history

| Revision | Date | Description of the modification |
|----------|----------------|---|
| 0 | 2 January 2023 | Initial release. |
| 1 | 30 May 2023 | Addition of software version 01.06.01. |
| 2 | 15 March 2024 | Addition of: <ul style="list-style-type: none">- Environmental class E3- Liquid CO₂ applications for Promass O- Minimum density lowered for mass measurements. |
| 3 | 8 May 2024 | Adding accuracy class 1.0 to Promass O. |
| 4 | 16 May 2024 | Addition of software version 01.06.02. |